



YAMAHA

2016

SERVICE MANUAL

**YZF-R6
YZF-R6G**



2CX-28197-E0

EAS20002

**YZF-R6/YZF-R6G
SERVICE MANUAL
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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.

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.
 WARNING	A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
NOTICE	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.

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

CLUTCH

Removing the clutch cover

3

4

5

6

Order	Job/Parts to remove	Q'ty	Remarks
	Side cowl assembly		Refer to "GENERAL CHASSIS" on page 4-1.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-27.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-30.
1	Water pump breather hose	1	Disconnect.
2	Clutch cable	1	Disconnect.
3	Pull lever	1	
4	Pull lever spring	1	
5	Clutch cover	1	
6	Clutch cover gasket	1	
7	Dowel pin	2	

5-39

CLUTCH

REMOVING THE CLUTCH

1. Remove:

- Oil strainer
Refer to "OIL PUMP" on page 5-51.
- Water pump
Refer to "WATER PUMP" on page 6-9.
- Friction plates
- Clutch plates

TIP
Be sure to mark the friction plates and clutch plates or note the position of each part so that they are installed in their original positions.

2. Straighten the clutch boss nut rib "a".

3. Loosen:

- Clutch boss nut "1"

TIP
While holding the clutch boss "2" with the universal clutch holder "3", loosen the clutch boss nut.

Universal clutch holder
90890-04068
Universal clutch holder
YM-91042

4. Remove:

- Spacer "1"
- Bearing
- Clutch housing "2"
- Oil pump drive chain

TIP
Remove the spacer and bearing from the main axle, then remove the oil pump drive chain from the oil pump driven sprocket, and then remove the clutch housing and oil pump drive chain from the main axle.

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
2.80 mm (0.110 in)

CHECKING THE CLUTCH PLATES
The following procedure applies to all of the clutch plates.

5-43

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.
	Silicone fluid		

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GENERAL INFORMATION

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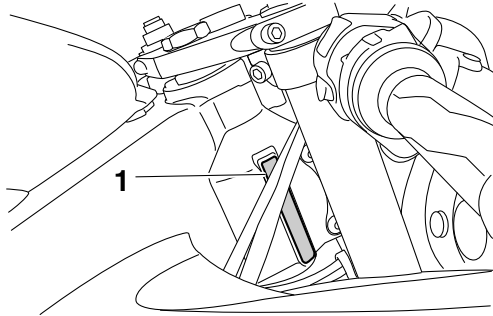
EAS20007

IDENTIFICATION

EAS30002

VEHICLE IDENTIFICATION NUMBER

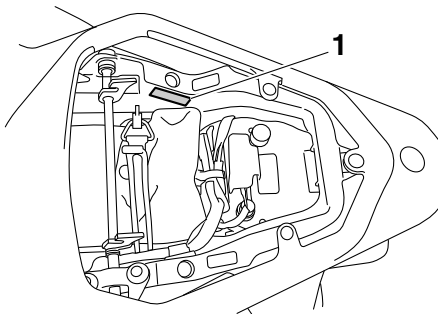
The vehicle identification number “1” is stamped on the right side of the steering head pipe.



EAS30003

MODEL LABEL

The model label “1” is affixed to the frame under the passenger seat. This information will be needed to order spare parts.



EAS20008

FEATURES

EAS30713

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.

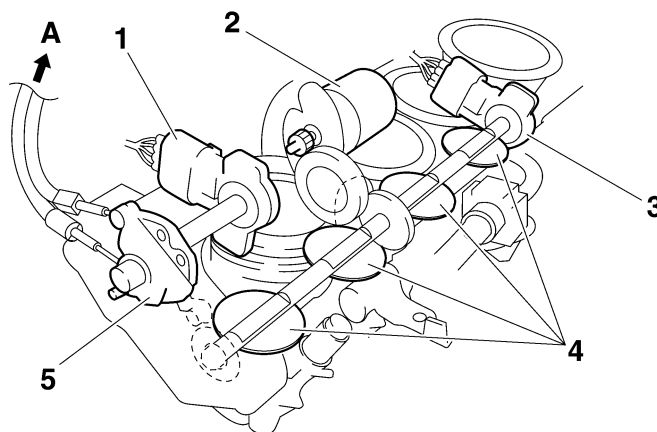
The YCC-T system is designed to respond to the throttle action of the rider by having the ECU instantaneously calculate the ideal throttle valve opening and generate signals to operate the motor-driven throttle valves and thus actively control the intake air volume.

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 revolution number 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 drive ability
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 position sensor (for throttle cable pulley)
2. Throttle servo motor
3. Throttle position sensor (for throttle valves)

4. Throttle valves
5. Throttle cable pulley with linkage guard
- A. To throttle grip

Aims and advantages of using YCC-I system

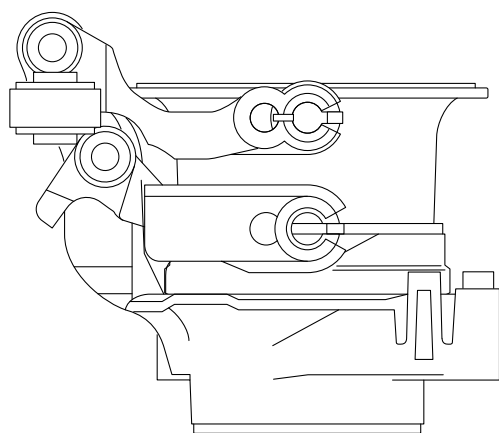
- Improvement of the engine power characteristics

The high power design in all ranges is now provided by having both two features of the short intake function to ensure the power at the high speed revolution of engine, and the long intake function to ensure the power in the practical use range.

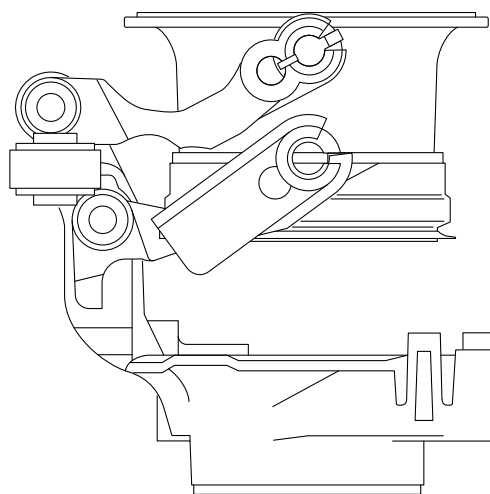
- Intake pipe length switching control using the motor

The intake pipe length switching operation in a minute time is now available by means of the motor drive using the electronic control. The smooth power characteristic is provided, which does not let an operator feel the switching action by the optimization of its switching revolution number and the most suitable application of engine at the time of changing the revolution.

A

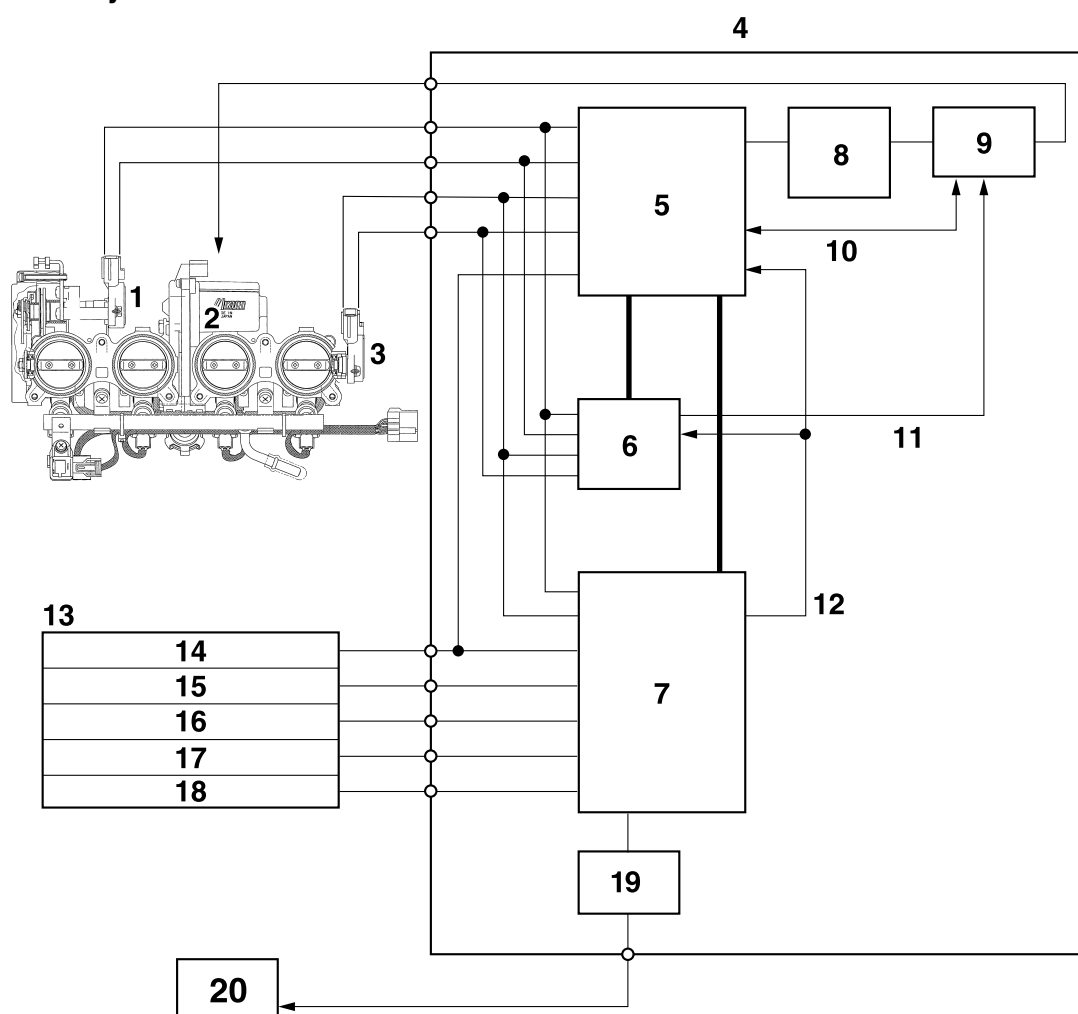


B



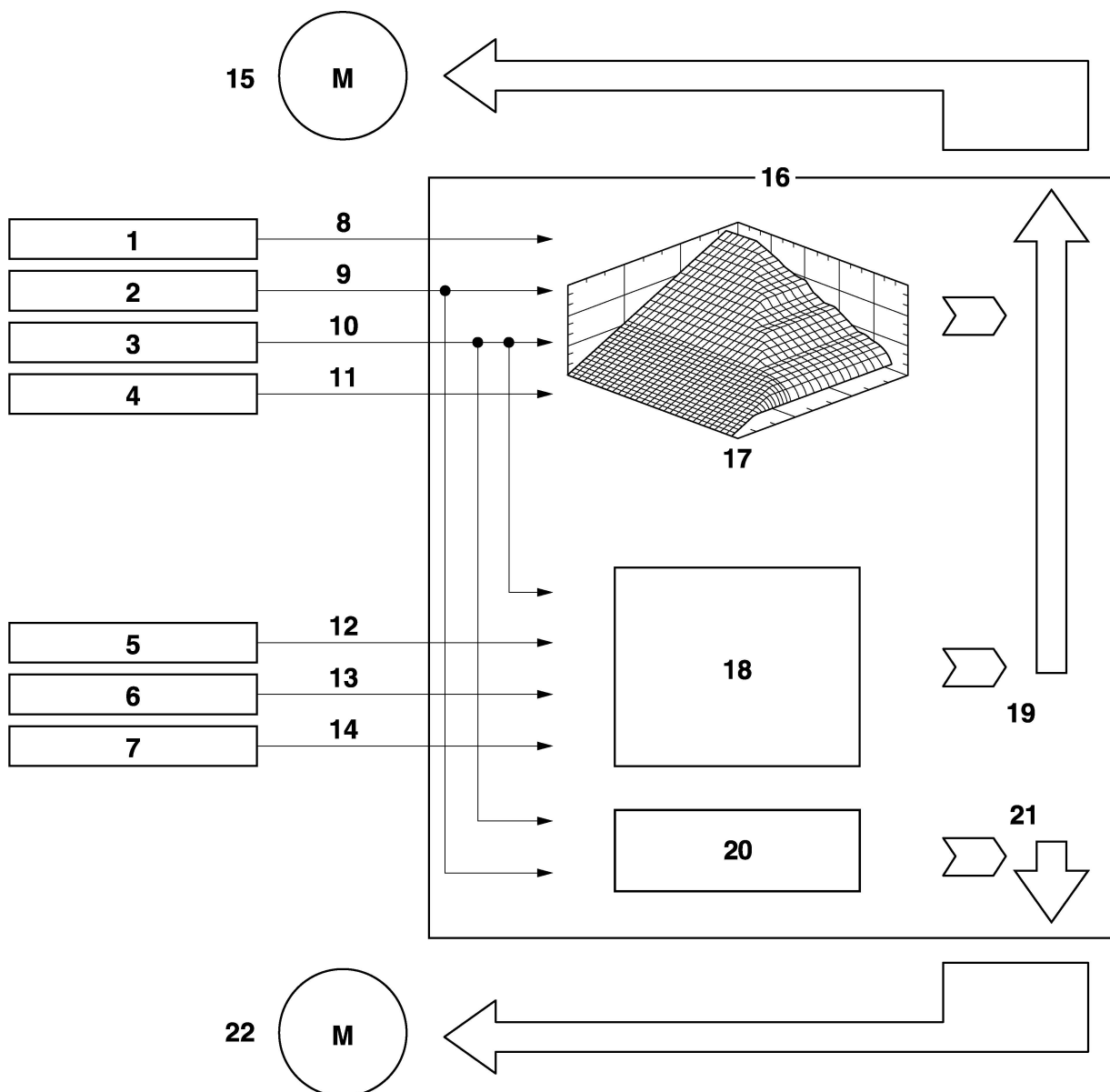
- A. Down position (long intake)
(Low rpm to Mid rpm)
- B. Up position (short intake)
(High rpm)

YCC-T/YCC-I system outline



1. Throttle position sensor (for throttle cable pulley)
2. Throttle servo motor
3. Throttle position sensor (for throttle valves)
4. ECU (Engine Control Unit)
5. ETV main CPU (32 bit)
6. ETV sub CPU (16 bit)
7. FI CPU (32 bit)
8. Throttle servo motor driver
9. Throttle servo motor driver operation sensing/shut off circuit
10. Throttle servo motor driver operation sensing feedback/emergency stop
11. Emergency stop
12. Engine revolution (pulse signal)
13. Sensor input
14. Neutral switch
15. Crankshaft position sensor
16. Speed sensor
17. Coolant temperature sensor
18. Atmospheric pressure sensor
19. Intake funnel servo motor driver
20. Intake funnel servo motor

YCC-T/YCC-I control outline



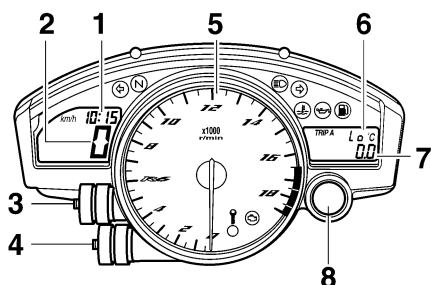
1. Throttle position sensor (for throttle cable pulley)
2. Throttle position sensor (for throttle valves)
3. Crankshaft position sensor
4. Speed sensor
5. Coolant temperature sensor
6. Neutral switch
7. Atmospheric pressure sensor
8. Accelerator position (two signals)
9. Throttle position (two signals)
10. Engine revolution
11. Vehicle speed
12. Coolant temperature
13. Neutral/In gear
14. Atmospheric pressure
15. Throttle servo motor

16. ECU (Engine Control Unit)
17. Base map
18. Idle speed control
19. Calculated throttle valve opening angle
20. Base map
21. Air funnel position (Calculation value)
22. Intake funnel servo motor

EAS30682

INSTRUMENT FUNCTIONS

Multi-function meter unit



1. Clock
2. Speedometer
3. "SELECT" button
4. "RESET" button
5. Tachometer
6. Coolant temperature display/air intake temperature display
7. Odometer/tripmeter/fuel reserve tripmeter/stopwatch
8. Shift timing indicator light

EWA17650



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
- a fuel reserve tripmeter
- a stopwatch
- a clock
- a coolant temperature display
- an air intake temperature display
- a self-diagnosis device
- a display brightness and shift timing indicator light control mode

TIP

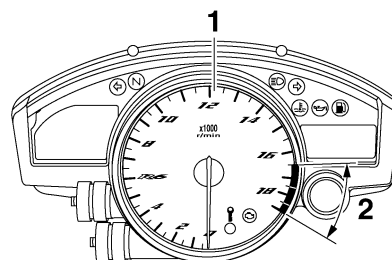
- Except when entering the display brightness and shift timing indicator light control mode, turn the key to "ON" before using the "SELECT" and "RESET" buttons.

- For the UK: To switch the multi-function meter unit between kilometers and miles, press the "SELECT" button for one second.

Speedometer

The speedometer shows the vehicle's traveling speed.

Tachometer



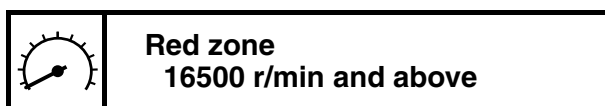
1. Tachometer
2. Tachometer red zone

The tachometer shows the engine speed in crankshaft revolutions per minute (r/min). When the vehicle is first powered on, the tachometer needle will sweep once across the r/min range and then return to zero r/min in order to test the electrical circuit.

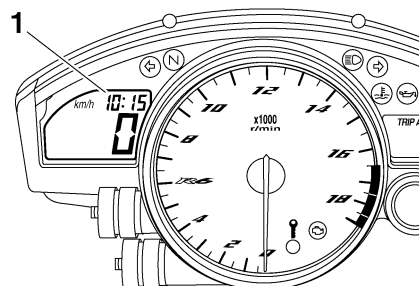
ECA19660

NOTICE

Do not operate the engine in the tachometer red zone.



Clock



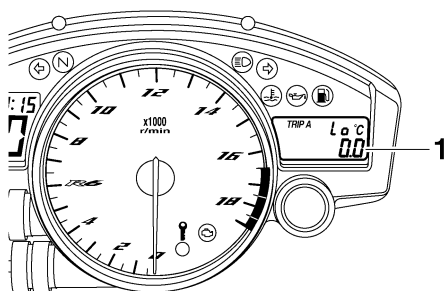
1. Clock

The clock uses a 12-hour time system.

To set the clock:

1. Turn the key to "ON".
2. Push both the "SELECT" button and "RESET" button for two seconds. The hour digits will start flashing.
3. Push the "RESET" button to set the hours.
4. Push the "SELECT" button, and the minute digits will start flashing.
5. Push the "RESET" button to set the minutes.
6. Push the "SELECT" button to confirm settings and start the clock.

Odometer, tripmeters, and stopwatch



1. Odometer/tripmeter/fuel reserve tripmeter/stopwatch

Odometer and tripmeters

The odometer shows the total distance traveled by the vehicle.

The tripmeters show the distance traveled since they were last reset.

TIP

- The odometer will lock at 999999.
- The tripmeters will reset and continue counting after 9999.9 is reached.

During normal operation, push the "SELECT" button to change the display between the odometer "ODO", the tripmeters "TRIP A" and "TRIP B", and the stopwatch in the following order:

TRIP A → TRIP B → ODO → Stopwatch → TRIP A

If the fuel level warning light comes on, the display will automatically change to the fuel reserve tripmeter "F-TRIP" and start counting the distance traveled from that point. In this case, push the "SELECT" button to change the display in the following order:

F-TRIP → Stopwatch → TRIP A → TRIP B → ODO → F-TRIP

To reset a tripmeter, push the "SELECT" button to change the display to the tripmeter you want to reset, and then push the "RESET" button for one second. If you do not reset the fuel reserve tripmeter manually, after refueling and traveling 5 km (3 mi), it will reset automatically and disappear from the display.

Stopwatch

To use the stopwatch, push the "SELECT" button to change the display to the stopwatch (the digits will flash when the stopwatch is selected), and then push the "SELECT" button for a few seconds until the digits stop flashing. The stopwatch can now be used as follows:

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.

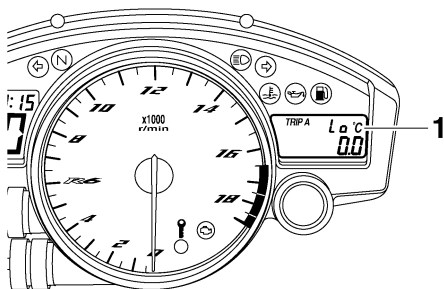
Split-time measurement

1. Push the "RESET" button to start the stopwatch.
2. Push the "RESET" button or start switch "⊗" to measure split-times. (The colon ":" will start flashing.)
3. Push the "RESET" button or start switch "⊗" to display the final split-time or push the "SELECT" button to stop the stopwatch and display total elapsed time.
4. Push the "SELECT" button to reset the stopwatch.

TIP

To exit the stopwatch, push the "SELECT" button for a few seconds until the digits start flashing.

Coolant temperature display



1. Coolant temperature display

The coolant temperature display indicates the temperature of the coolant.

TIP

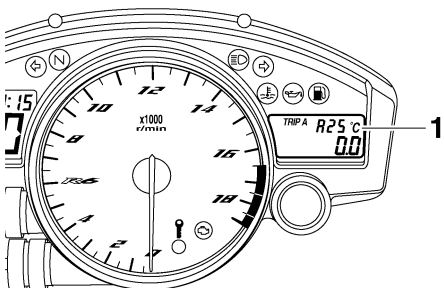
When the coolant temperature display is selected, “C” is displayed for one second, and then the coolant temperature is displayed.

ECA20730

NOTICE

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

Air intake temperature display



1. Air intake temperature display

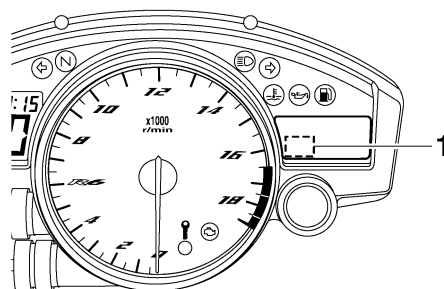
The air intake temperature display indicates the temperature of the air drawn into the air intake duct. Push the “RESET” button to switch the display between the coolant temperature and the air intake temperature.

TIP

- When the air intake temperature is below -9°C , “LO” will be displayed.
- Even when the air intake temperature is 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 for one second, and then “A” and the air intake temperature are displayed.

Self-diagnosis device



1. Fault code display

This model is equipped with a self-diagnosis device for various electrical circuits. If a problem is detected in any of those circuits, the engine trouble warning light will come on and the display will indicate a fault code. If the display indicates any fault codes, note the code number, and then check the fuel injection system. (Refer to “FUEL INJECTION SYSTEM” on page 8-31.)

The self-diagnosis device also detects problems in the immobilizer system circuits. If a problem is detected in the immobilizer system circuits, the immobilizer system indicator light will flash and the display will indicate a fault code.

TIP

If the display indicates fault code 52, this could be caused by transponder interference. If this fault code appears, try the following:

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.

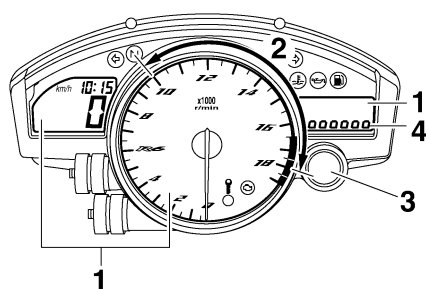
2. If the engine starts, turn it off and try starting the engine with the standard keys.
3. If one or both of the standard keys do not start the engine, re-register the standard keys. If the display indicates fault codes, note the code number, and then check the vehicle.

ECA20360

NOTICE

If the display indicates a fault 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. Display brightness
2. Shift timing indicator light activation/deactivation
3. Shift timing indicator light
4. Brightness level

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

- **Display brightness:**
This function allows you to adjust the brightness of the displays and tachometer.
- **Shift timing indicator light activity function:**
This function allows you to set the indicator light to on, flash, or off.
- **Shift timing indicator light activation:**
This function allows you to select the engine speed at which the indicator light will be activated.
- **Shift timing indicator light deactivation:**
This function allows you to select the engine speed at which the indicator light will be deactivated.
- **Shift timing indicator light brightness:**
This function allows you to adjust the brightness of the shift timing indicator light.

TIP

The brightness level display shows the brightness level setting.

[To adjust the brightness of the 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:
 - On - the indicator light will come on when activated. (This setting is selected when the indicator light stays on.)
 - Flash - the indicator light will flash when activated. (This setting is selected when the indicator light flashes four times per second.)
 - Off - the indicator light is deactivated; in other words, it will not come on or flash. (This setting is selected when the indicator light flashes once every two seconds.)
2. Push the "SELECT" button to confirm the selected indicator light activity. The control mode changes to the shift timing indicator light activation function.

[To set the shift timing indicator light activation function]

TIP

The shift timing indicator light activation function can be set between 10000 r/min and 18000 r/min. From 10000 r/min to 13000 r/min, the indicator light can be set in increments of 500 r/min. From 13000 r/min to 18000 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 10000 r/min and 18000 r/min. From 10000 r/min to 13000 r/min, the indicator light can be set in increments of 500 r/min. From 13000 r/min to 18000 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 will remain deactivated.
-

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

[To adjust the shift timing indicator light brightness]

1. Push the “RESET” button to select the desired indicator light brightness level.
2. Push the “SELECT” button to confirm the selected indicator light brightness level and exit the display brightness and shift timing indicator light control mode.

EAS20009

IMPORTANT INFORMATION

EAS30006

PREPARATION FOR REMOVAL AND DISASSEMBLY

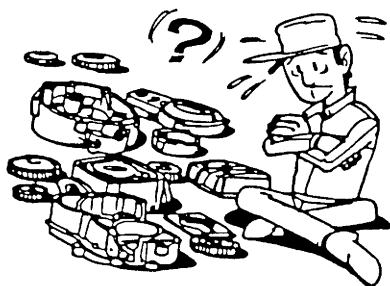
1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.



2. Use only the proper tools and cleaning equipment.

Refer to "SPECIAL TOOLS" on page 1-19.

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.

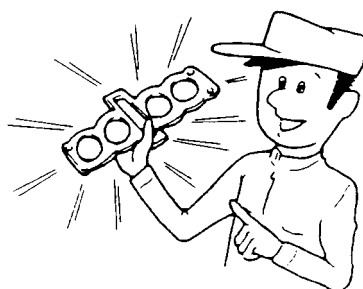


4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS30007

REPLACEMENT PARTS

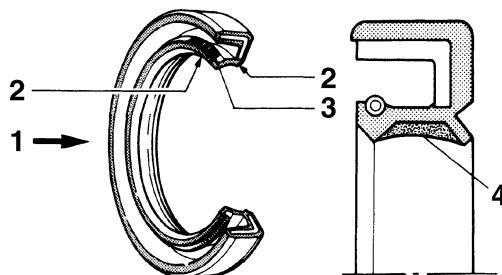
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS30008

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.

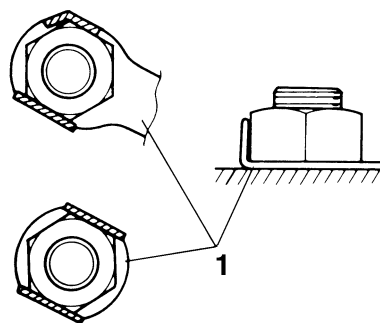


1. Oil
2. Lip
3. Spring
4. Grease

EAS30009

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.



EAS30010

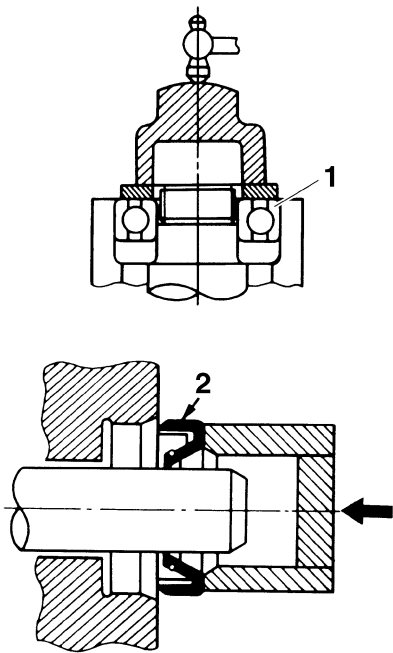
BEARINGS AND OIL SEALS

Install bearings "1" and oil seals "2" so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

ECA13300

NOTICE

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



EAS30012

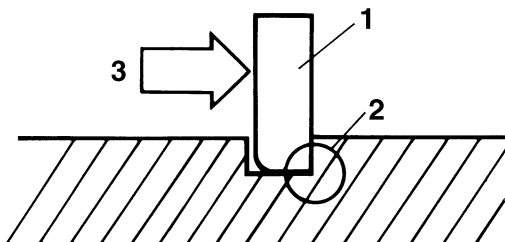
RUBBER PARTS

Check rubber parts for deterioration during inspection. Some of the rubber parts are sensitive to gasoline, flammable oil, grease, etc. Do not allow any items other than the specified one to contact the parts.

EAS30011

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.



EAS20010

BASIC SERVICE INFORMATION

EAS30013

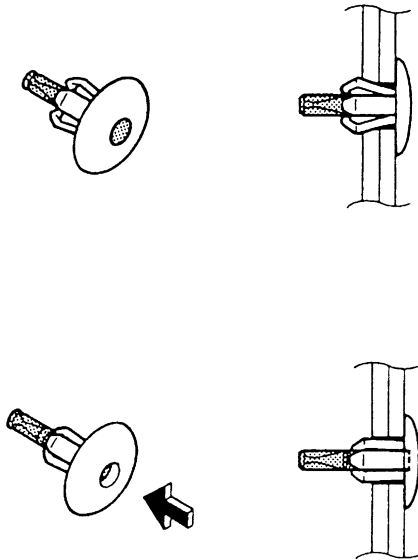
QUICK FASTENERS

Rivet type

1. Remove:
 - Quick fastener

TIP

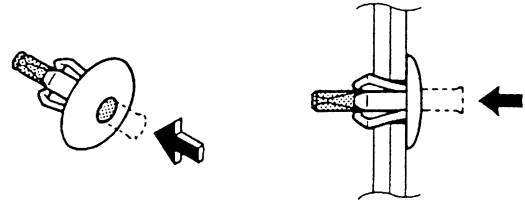
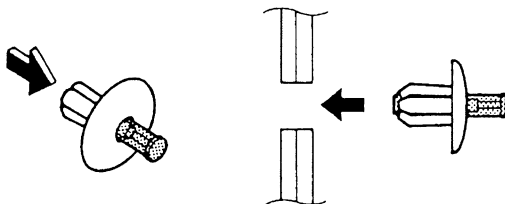
To remove the quick fastener, push its pin with a screwdriver, then pull the fastener out.



2. Install:
 - Quick fastener

TIP

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

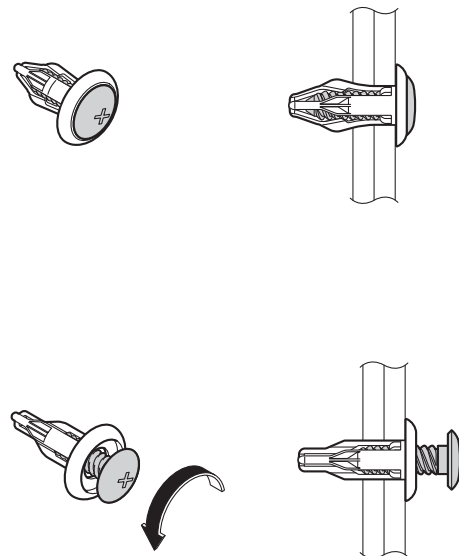


Screw type

1. Remove:
 - Quick fastener

TIP

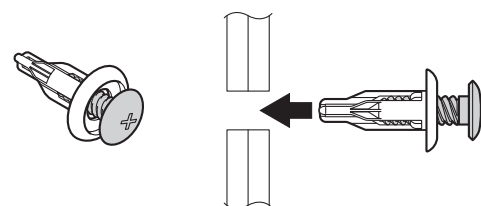
To remove the quick fastener, loosen the screw with a screwdriver, then pull the fastener out.

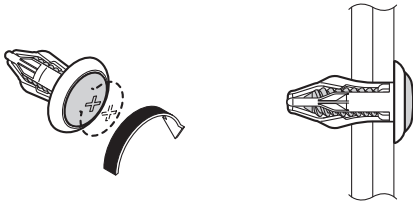


2. Install:
 - Quick fastener

TIP

To install the quick fastener, insert the fastener into the part to be secured and tighten the screw.





EAS30014

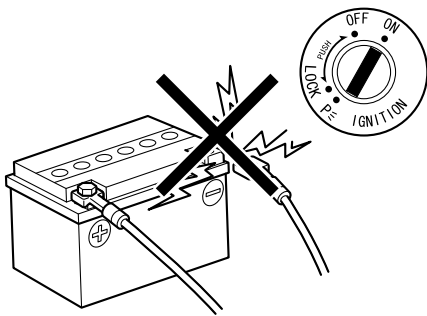
ELECTRICAL SYSTEM

Electrical parts handling

ECA16600

NOTICE

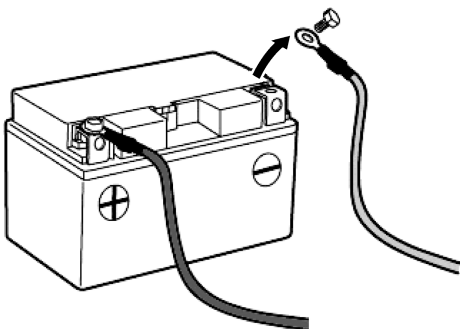
Never disconnect a battery lead while the engine is running; otherwise, the electrical components could be damaged.



ECA16751

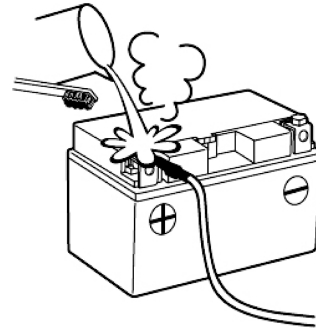
NOTICE

When disconnecting the battery leads from the battery, be sure to disconnect the negative battery lead first, then the positive battery lead. If the positive battery lead is disconnected first and a tool or similar item contacts the vehicle, a spark could be generated, which is extremely dangerous.



TIP

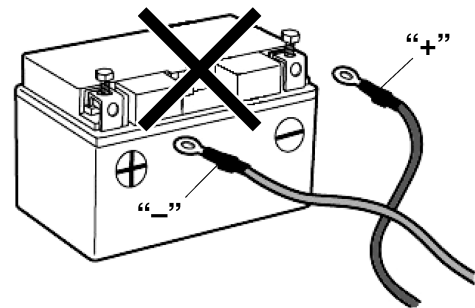
If a battery lead is difficult to disconnect due to rust on the battery terminal, remove the rust using hot water.



ECA16760

NOTICE

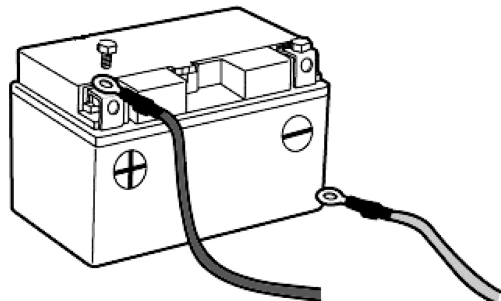
Be sure to connect the battery leads to the correct battery terminals. Reversing the battery lead connections could damage the electrical components.



ECA16771

NOTICE

When connecting the battery leads to the battery, be sure to connect the positive battery lead first, then the negative battery lead. If the negative battery lead is connected first and a tool or similar item contacts the vehicle while the positive battery lead is being connected, a spark could be generated, which is extremely dangerous.

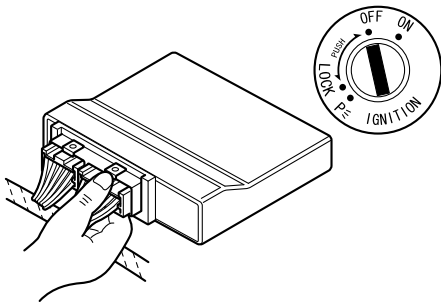


ECA16610

NOTICE

Turn the main switch to "OFF" before disconnecting or connecting an electrical component.

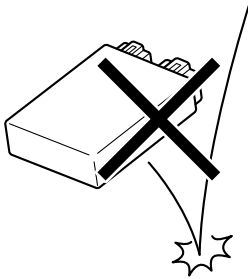
BASIC SERVICE INFORMATION



ECA16620

NOTICE

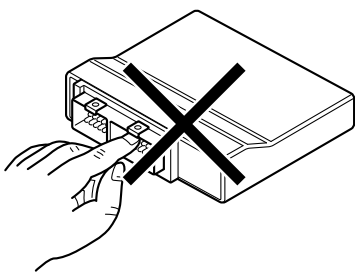
Handle electrical components with special care, and do not subject them to strong shocks.



ECA16630

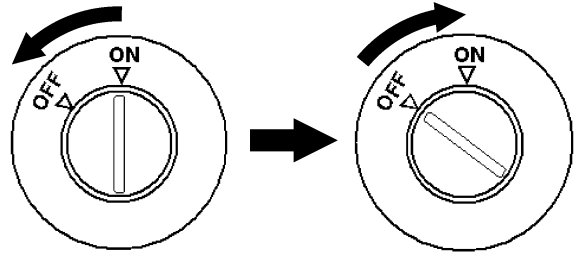
NOTICE

Electrical components are very sensitive to and can be damaged by static electricity. Therefore, never touch the terminals and be sure to keep the contacts clean.



TIP

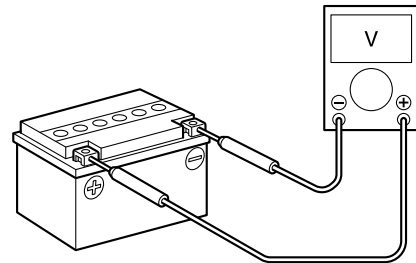
When resetting the ECU by turning the main switch to "OFF", be sure to wait approximately 5 seconds before turning the main switch back to "ON".



Checking the electrical system

TIP

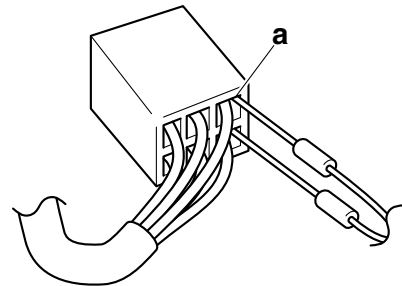
Before checking the electrical system, make sure that the battery voltage is at least 12 V.



ECA14371

NOTICE

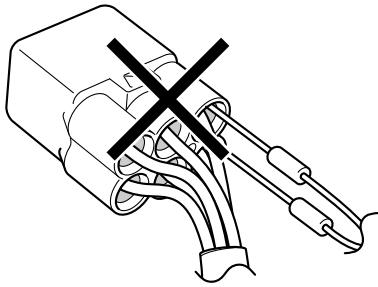
Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end "a" of the coupler, taking care not to loosen or damage the leads.



ECA16640

NOTICE

For waterproof couplers, never insert the tester probes directly into the coupler. When performing any checks using a waterproof coupler, use the specified test harness or a suitable commercially available test harness.



Checking the connections

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

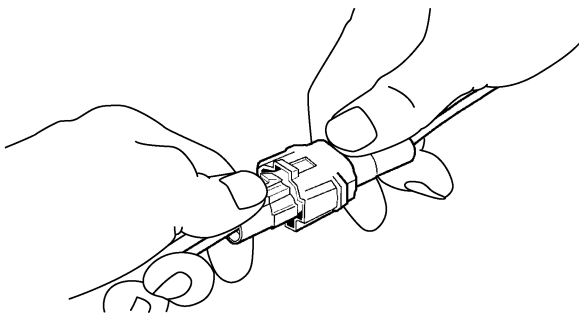
1. Disconnect:

- Lead
- Coupler
- Connector

ECA16780

NOTICE

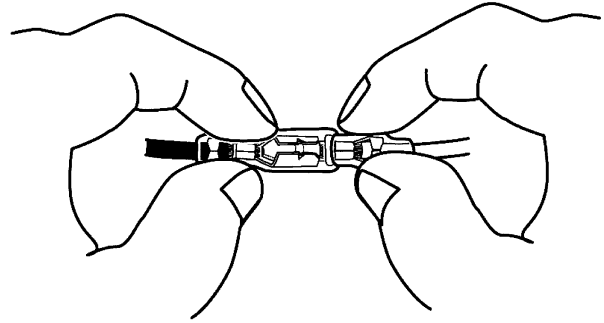
- When disconnecting a coupler, release the coupler lock, hold both sections of the coupler securely, and then disconnect the coupler.
- There are many types of coupler locks; therefore, be sure to check the type of coupler lock before disconnecting the coupler.



ECA16790

NOTICE

When disconnecting a connector, do not pull the leads. Hold both sections of the connector securely, and then disconnect the connector.

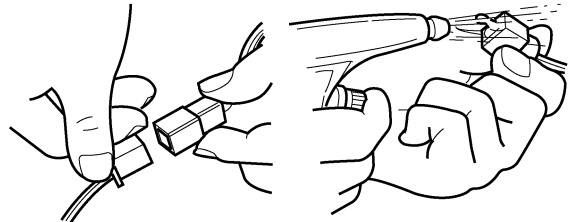


2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



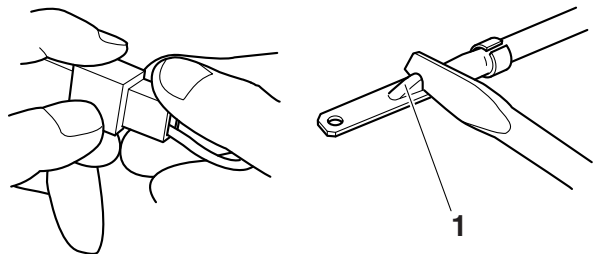
3. Check:

- All connections

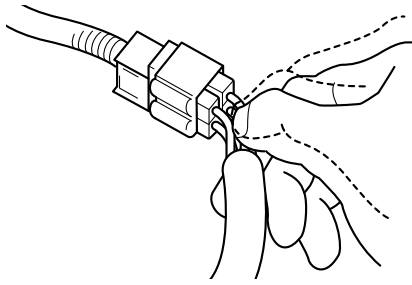
Loose connection → Connect properly.

TIP

- If the pin “1” on the terminal is flattened, bend it up.
- After disassembling and assembling a coupler, pull on the leads to make sure that they are installed securely.



BASIC SERVICE INFORMATION

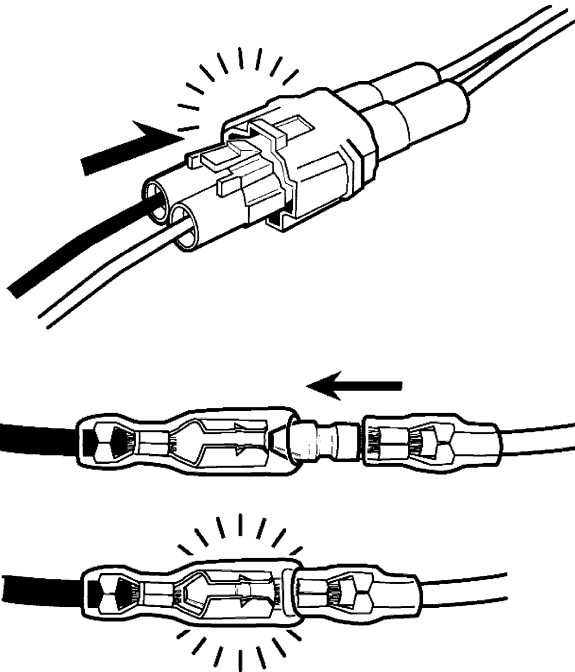


4. Connect:

- Lead
- Coupler
- Connector

TIP

- When connecting a coupler or connector, push both sections of the coupler or connector together until they are connected securely.
- Make sure all connections are tight.



5. Check:

- Continuity
(with the pocket tester)

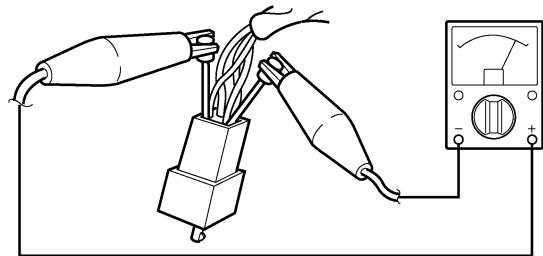
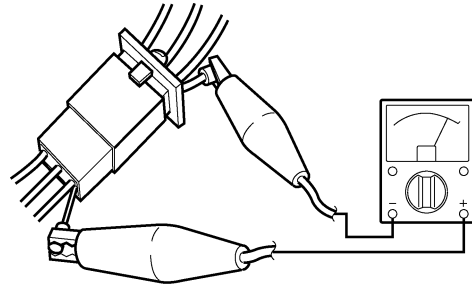


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

TIP

- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (4).

- As a quick remedy, use a contact revitalizer available at most part stores.



6. Check:

- Resistance



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

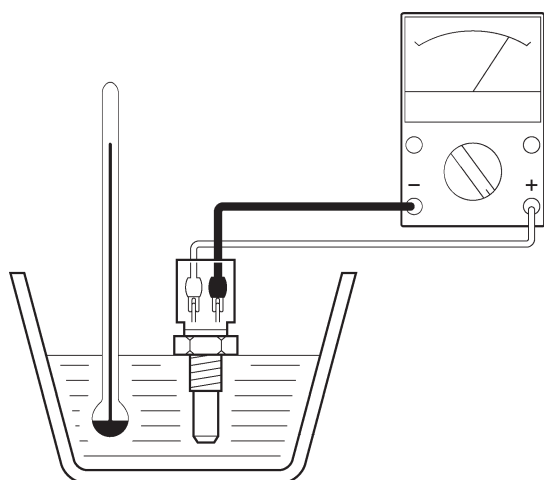
TIP

The resistance values shown were obtained at the standard measuring temperature of 20 °C (68 °F). If the measuring temperature is not 20 °C (68 °F), the specified measuring conditions will be shown.



Coolant temperature sensor re-
sistance
289–354 Ω at 80 °C (289–354 Ω
at 176 °F)

BASIC SERVICE INFORMATION



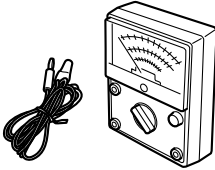
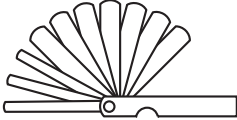
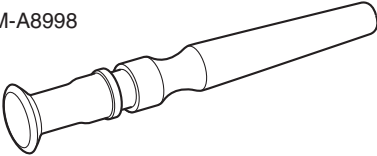
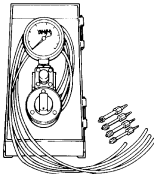
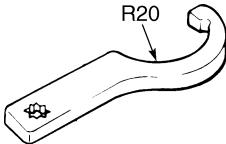
EAS20012

SPECIAL TOOLS

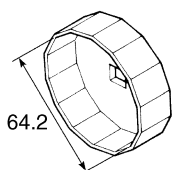
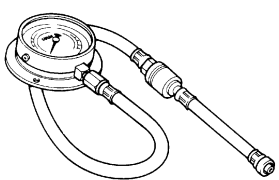
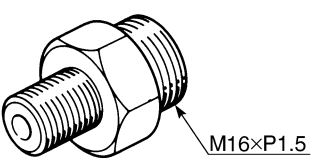
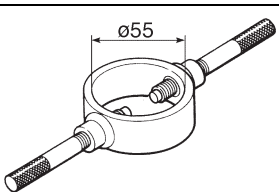
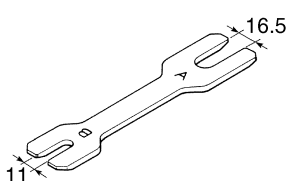
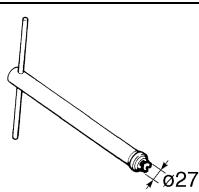
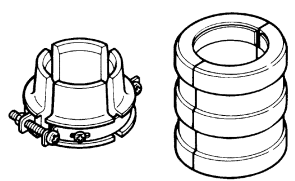
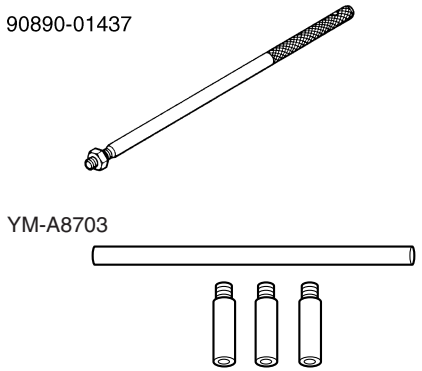
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

TIP

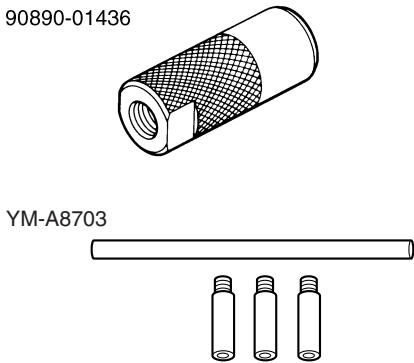
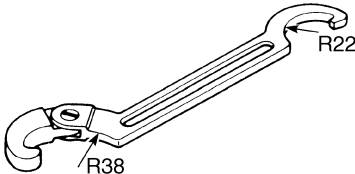
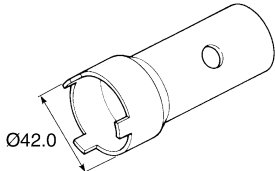
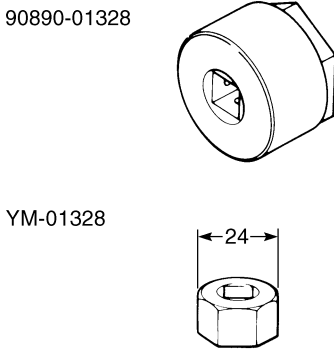
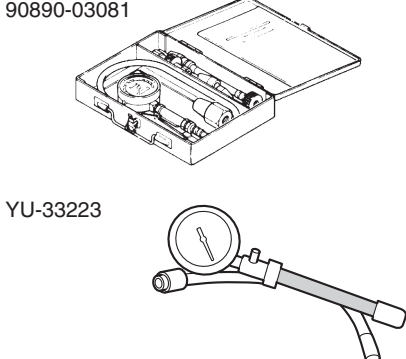
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part number starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-17, 1-17, 8-86, 8-87, 8-88, 8-88, 8-92, 8-93, 8-94, 8-94, 8-95, 8-95, 8-96, 8-96, 8-97, 8-97, 8-98, 8-99, 8-100, 8-100, 8-101
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-6, 5-44
Valve lapper 90890-04101 Valve lapping tool YM-A8998	90890-04101  YM-A8998 	3-6
Vacuum gauge 90890-03094 Vacuummate YU-44456	90890-03094  YU-44456 	3-8
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472		3-20, 4-56

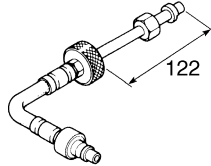
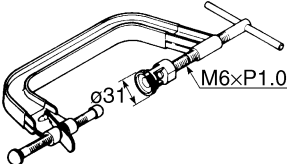
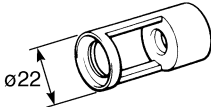
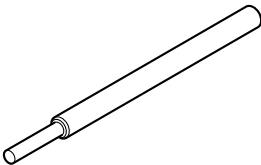
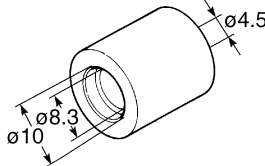
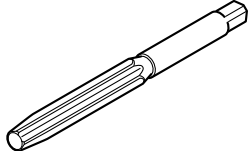
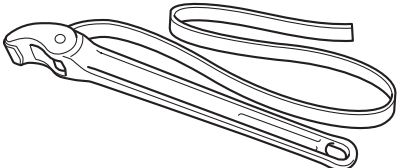
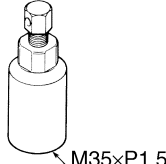
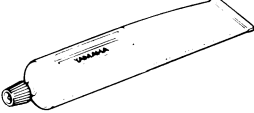
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Oil filter wrench 90890-01426 Oil filter wrench YU-38411		3-27
Oil pressure gauge set 90890-03120		3-28
Oil pressure adapter H 90890-03139		3-28
Fork spring compressor 90890-01441 Fork spring compressor YM-01441		4-47, 4-52
Rod holder 90890-01434 Damper rod holder double ended YM-01434		4-47, 4-52
Damper rod holder 90890-01423 Damping rod holder YM-01423		4-48, 4-49
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-50, 4-50
Rod puller 90890-01437 Universal damping rod bleeding tool set YM-A8703		4-50, 4-52

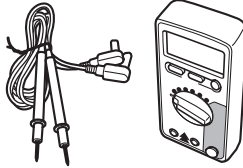
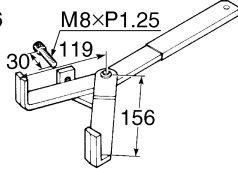
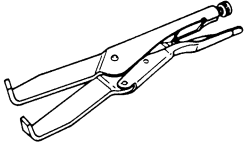
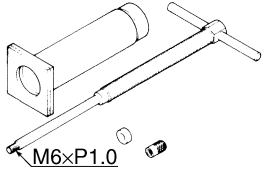
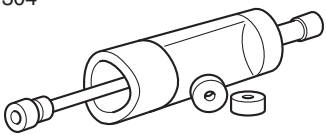
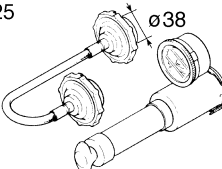
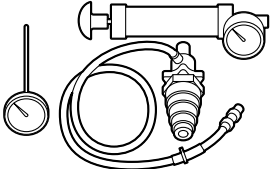
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Rod puller attachment (M10) 90890-01436 Universal damping rod bleeding tool set YM-A8703	 90890-01436 YM-A8703	4-50, 4-52
Ring nut wrench 90890-01268 Spanner wrench YU-01268		4-56
Ring nut wrench 90890-01507 Ring nut wrench YM-01507	 Ø42.0	4-64, 4-66
Damper rod holder (24 mm) 90890-01328 Damper rod holder (24 mm) YM-01328	 90890-01328 YM-01328 24	4-64, 4-65
Compression gauge 90890-03081 Engine compression tester YU-33223	 90890-03081 YU-33223	5-1

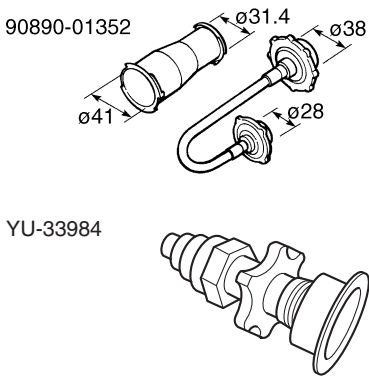
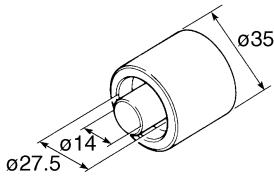
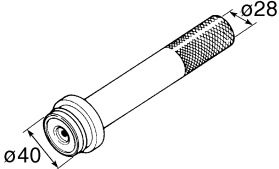
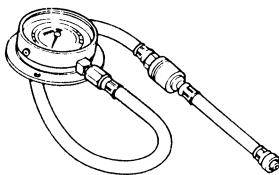
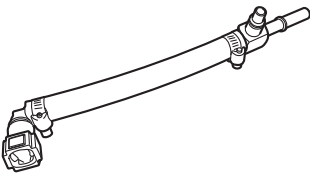
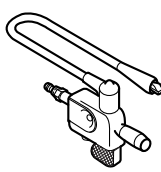
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Extension 90890-04136		5-1
Valve spring compressor 90890-04019 Valve spring compressor YM-04019		5-23, 5-28
Valve spring compressor attachment 90890-04108 Valve spring compressor adapter 22 mm YM-04108		5-23, 5-28
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-25
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117		5-25
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118		5-25
Rotor holding tool 90890-04166 YM-04166		5-30, 5-31, 5-33, 5-33
Flywheel puller 90890-01404 Flywheel puller YM-01404		5-30
Yamaha bond No. 1215 90890-85505 (Three bond No.1215®)		5-31, 5-33, 5-58

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		5-37
Universal clutch holder 90890-04086 Universal clutch holder YM-91042	90890-04086  YM-91042 	5-43, 5-47
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304  YU-01304 	5-61
Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A	90890-01325  YU-24460-A 	6-3, 6-3

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984	 90890-01352 YU-33984	6-3, 6-3
Mechanical seal installer 90890-04078 Water pump seal installer YM-33221-A	 90890-04078 YM-33221-A	6-12
Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 & 50 mm YM-04058	 90890-04058 YM-04058	6-12
Pressure gauge 90890-03153 Pressure gauge YU-03153	 90890-03153 YU-03153	7-11
Fuel pressure adapter 90890-03176 Fuel pressure adapter YM-03176	 90890-03176 YM-03176	7-11
Ignition checker 90890-06754 Oppama pet-4000 spark checker YM-34487	 90890-06754 YM-34487	8-95

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GENERAL SPECIFICATIONS

EAS20013

GENERAL SPECIFICATIONS

Model

Model	2CXM (EUR,ZAF) 2CXN (EUR) 2CXP (AUS) 2CXR (RUS) 2CXV (AUS)
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Dimensions

Overall length	2040 mm (80.3 in)
Overall width	705 mm (27.8 in)
Overall height	1095 mm (43.1 in)
Seat height	850 mm (33.5 in)
Wheelbase	1375 mm (54.1 in)
Ground clearance	130 mm (5.12 in)
Minimum turning radius	3.6 m (11.81 ft)

Weight

Curb weight	189 kg (417 lb)
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Loading

Maximum load	186 kg (410 lb)
Riding capacity	2 person

ENGINE SPECIFICATIONS

EAS20014

ENGINE SPECIFICATIONS

Engine

Combustion cycle	4-stroke
Cooling system	Liquid cooled
Valve train	DOHC
Displacement	599 cm ³
Cylinder arrangement	Inline
Number of cylinders	4-cylinder
Bore × stroke	67.0 × 42.5 mm (2.64 × 1.67 in)
Compression ratio	13.1 : 1
Compression pressure	1392–1792 kPa/400 r/min (13.9–17.9 kgf/cm ² /400 r/min, 198.0–254.9 psi/400 r/min)
Starting system	Electric starter

Fuel

Recommended fuel	Premium unleaded gasoline (Gasohol [E10] acceptable) (AUS, EUR, ZAF) Unleaded gasoline only. Minimum research octane number 95 (RUS)
Fuel tank capacity	17 L (4.5 US gal, 3.7 Imp. gal)
Fuel reserve amount	3.5 L (0.92 US gal, 0.77 Imp. gal)

Engine oil

Recommended brand	YAMALUBE
SAE viscosity grades	10W-40
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Lubrication system	Wet sump
Engine oil quantity	
Oil change	2.40 L (2.54 US qt, 2.11 Imp. qt)
With oil filter removal	2.60 L (2.75 US qt, 2.29 Imp. qt)
Quantity (disassembled)	3.40 L (3.59 US qt, 2.99 Imp. qt)

Oil filter

Oil filter type	Paper
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Oil pump

Inner-rotor-to-outer-rotor-tip clearance	Below 0.120 mm (-0.0047 in)
Limit	0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.09–0.15 mm (0.0035–0.0059 in)
Limit	0.22 mm (0.0087 in)
Oil pressure	40.0 kPa/1300 r/min at 90 °C (5.8 psi/1300 r/min at 194 °F)
Relief valve operating pressure	700.0 kPa (7.00 kgf/cm ² , 101.5 psi)

Cooling system

Coolant quantity	
Radiator (including all routes)	2.30 L (2.43 US qt, 2.02 Imp. qt)
Coolant reservoir (up to the maximum level mark)	0.25 L (0.26 US qt, 0.22 Imp. qt)

ENGINE SPECIFICATIONS

Radiator cap valve opening pressure	107.9–137.3 kPa (1.08–1.37 kgf/cm ² , 15.6–19.9 psi)
Thermostat	
Valve opening temperature	69.0–73.0 °C (156.20–163.40 °F)
Valve full open temperature	85.0 °C (185.00 °F)
Valve lift (full open)	8.0 mm (0.31 in)
Water pump	
Water pump type	Single suction centrifugal pump
Impeller shaft tilt limit	0.15 mm (0.006 in)
Spark plug(s)	
Manufacturer/model	NGK/CR10EK
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
Cylinder head	
Warpage limit	0.05 mm (0.0020 in)
Camshaft	
Camshaft cap inside diameter	22.500–22.521 mm (0.8858–0.8867 in)
Camshaft journal diameter	22.459–22.472 mm (0.8842–0.8847 in)
Camshaft-journal-to-camshaft-cap clearance	0.028–0.062 mm (0.0011–0.0024 in)
Limit	0.080 mm (0.0032 in)
Camshaft lobe dimensions	
Lobe height (Intake)	33.750–33.850 mm (1.3287–1.3327 in)
Limit	33.675 mm (1.3258 in)
Lobe height (Exhaust)	32.950–33.050 mm (1.2972–1.3012 in)
Limit	32.875 mm (1.2943 in)
Camshaft runout limit	0.030 mm (0.0012 in)
Valve, valve seat, valve guide	
Valve clearance (cold)	
Intake	0.12–0.19 mm (0.0047–0.0075 in)
Exhaust	0.16–0.23 mm (0.0063–0.0091 in)
Valve dimensions	
Valve seat contact width (intake)	1.90–2.10 mm (0.0748–0.0827 in)
Limit	1.6 mm (0.06 in)
Valve seat contact width (exhaust)	2.30–2.50 mm (0.0906–0.0984 in)
Limit	1.8 mm (0.07 in)
Valve stem diameter (intake)	4.475–4.490 mm (0.1762–0.1768 in)
Limit	4.460 mm (0.1756 in)
Valve stem diameter (exhaust)	4.460–4.475 mm (0.1756–0.1762 in)
Limit	4.445 mm (0.1750 in)
Valve guide inside diameter (intake)	4.500–4.512 mm (0.1772–0.1776 in)
Valve guide inside diameter (exhaust)	4.500–4.512 mm (0.1772–0.1776 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	0.095 mm (0.0037 in)
Valve stem runout	0.040 mm (0.0016 in)
Valve spring	
Free length (intake)	37.47 mm (1.48 in)

ENGINE SPECIFICATIONS

Limit	35.60 mm (1.40 in)
Free length (exhaust)	37.67 mm (1.48 in)
Limit	35.79 mm (1.41 in)
Spring tilt (intake)	1.6 mm (0.06 in)
Spring tilt (exhaust)	1.6 mm (0.06 in)
Cylinder	
Bore	67.000–67.010 mm (2.6378–2.6382 in)
Taper limit	0.006 mm (0.0002 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)
Diameter	66.975–66.990 mm (2.6368–2.6374 in)
Measuring point (from piston skirt bottom)	10.0 mm (0.39 in)
Piston pin bore inside diameter	15.002–15.013 mm (0.5906–0.5911 in)
Limit	15.043 mm (0.5922 in)
Piston pin outside diameter	14.991–15.000 mm (0.5902–0.5906 in)
Limit	14.971 mm (0.5894 in)
Piston-pin-to-piston-pin-bore clearance	0.002–0.022 mm (0.0001–0.0009 in)
Piston ring	
Top ring	
Ring type	Barrel
Limit	0.60 mm (0.0236 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
2nd ring	
Ring type	Taper
Limit	1.15 mm (0.0453 in)
Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)
Connecting rod	
Oil clearance	0.037–0.061 mm (0.0015–0.0024 in)
Bearing color code	
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green
Crankshaft	
Runout limit	0.030 mm (0.0012 in)
Journal oil clearance	0.044–0.020 mm (0.0017–0.0008 in)
Bearing color code	
Code 0	White
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green
Clutch	
Clutch type	Wet, multiple-disc
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Assembly width	42.4–43.0 mm (1.67–1.69 in)

ENGINE SPECIFICATIONS

Friction plate thickness	2.92–3.08 mm (0.115–0.121 in)
Wear limit	2.80 mm (0.110 in)
Plate quantity	9 pcs
Clutch plate thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	8 pcs
Warpage limit	0.10 mm (0.004 in)
Clutch spring free length	55.00 mm (2.17 in)
Limit	54.00 mm (2.13 in)
Spring quantity	6 pcs
Drivetrain	
Primary reduction ratio	2.073 (85/41)
Transmission type	Constant mesh 6-speed
Gear ratio	
1st	2.583 (31/12)
2nd	2.000 (32/16)
3rd	1.667 (30/18)
4th	1.444 (26/18)
5th	1.286 (27/21)
6th	1.150 (23/20)
Main axle runout limit	0.02 mm (0.0008 in)
Drive axle runout limit	0.02 mm (0.0008 in)
Secondary reduction ratio	2.813 (45/16)
Final drive	Chain
Shifting mechanism	
Installed shift rod length	267.2–269.2 mm (10.52–10.60 in)
Air filter	
Air filter element	Oil-coated paper element
Fuel pump	
Pump type	Electrical
Maximum consumption amperage	6.0 A
Throttle body	
ID mark	13S1 00
Fuel injector	
Resistance	12.0 Ω
Throttle position sensor	
Output voltage (at idle)	0.56–0.71 V
Idling condition	
Engine idling speed	1250–1350 r/min
AI system	Active
O2 feedback control	Inactive
Exhaust gas sampling point	Sampling port on the exhaust pipe
To be measured	Engine oil temperature
Temperature	82–92 °C (180–198 °F)
Difference in vacuum pressure between the cylinders	1.3 kPa (10 mmHg, 0.4 inHg)

ENGINE SPECIFICATIONS

CO%	3.0–4.0 %
Fuel line pressure (at idle)	300.0–390.0 kPa (3.00–3.90 kgf/cm ² , 43.5–56.6 psi)
Throttle grip free play	3.0–5.0 mm (0.12–0.20 in)
EXUP cable free play limit (at the EXUP valve pulley)	1.0–2.0 mm (0.04–0.08 in)

Air induction system	
Solenoid resistance	18–22 Ω

CHASSIS SPECIFICATIONS

EAS20015

CHASSIS SPECIFICATIONS

Chassis

Frame type	Diamond
Caster angle	24.0°
Trail	97 mm (3.8 in)

Front wheel

Wheel type	Cast wheel
Rim size	17M/CxMT3.50
Rim material	Aluminum
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/CxMT5.50
Rim material	Aluminum
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	BRIDGESTONE/BT016FF
Manufacturer/model	DUNLOP/Qualifier PTM (EUR,RUS,ZAF)

Rear tire

Type	Tubeless
Size	180/55 ZR17M/C (73W)
Manufacturer/model	BRIDGESTONE/BT016RF
Manufacturer/model	DUNLOP/Qualifier PTM (EUR,RUS,ZAF)

Tire air pressure (measured on cold tires)

Up to 90 kg (198 lb) load	
Front	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	290 kPa (2.90 kgf/cm ² , 42 psi)
90 kg (198 lb) load - maximum load	
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) (AUS, EUR, ZAF)
Rear	290 kPa (2.90 kgf/cm ² , 42 psi) (AUS, EUR, ZAF)

Front brake

Type	Hydraulic dual 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 runout limit (as measured on wheel)	0.10 mm (0.0039 in)
Brake pad lining thickness	4.5 mm (0.18 in)
Limit	0.5 mm (0.02 in)
Master cylinder inside diameter	16.00 mm (0.63 in)

CHASSIS SPECIFICATIONS

Caliper cylinder inside diameter (Left)	30.20 mm, 27.00 mm (1.19 in, 1.06 in)
Caliper cylinder inside diameter (Right)	30.20 mm, 27.00 mm (1.19 in, 1.06 in)
Specified brake fluid	DOT 4
Front brake lever free play	6.7–18.1 mm (0.26–0.71 in)

Rear brake

Type	Hydraulic single 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 runout limit (as measured on wheel)	0.15 mm (0.0059 in)
Brake pad lining thickness	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	38.10 mm (1.50 in)
Specified brake fluid	DOT 4
Brake pedal free play	4.3–9.0 mm (0.17–0.35 in)

Front suspension

Type	Telescopic fork
Spring	Coil spring
Shock absorber	Hydraulic damper
Front fork travel	115.0 mm (4.53 in)
Wheel travel	115 mm (4.5 in)
Fork spring free length	261.3 mm (10.29 in)
Limit	256.1 mm (10.08 in)
Inner tube bending limit	0.2 mm (0.01 in)
Recommended oil	Yamaha Suspension Oil M1
Quantity (left)	456.0 cm ³ (15.42 US oz, 16.08 Imp.oz)
Quantity (right)	456.0 cm ³ (15.42 US oz, 16.08 Imp.oz)
Level (left)	124 mm (4.9 in)
Level (right)	124 mm (4.9 in)
Spring preload	
Adjusting system	Mechanical adjustable type
Unit for adjustment	Turn
Adjustment value (Soft)	19.0 mm (0.75 in)
Adjustment value (STD)	13.0 mm (0.51 in)
Adjustment value (Hard)	4.0 mm (0.16 in)
Rebound damping	
Adjusting system	Mechanical adjustable type
Unit for adjustment	Click
Adjustment value from the start position (Soft)	26
Adjustment value from the start position (STD)	20
Adjustment value from the start position (Hard)	1
Compression damping	
Adjusting system	Mechanical adjustable type
Fast compression damping	
Unit for adjustment	Turn
Adjustment value from the start position (Soft)	5.5
Adjustment value from the start position (STD)	2
Adjustment value from the start position (Hard)	0
Slow compression damping	
Unit for adjustment	Click
Adjustment value from the start position (Soft)	32

CHASSIS SPECIFICATIONS

Adjustment value from the start position (STD)	15
Adjustment value from the start position (Hard)	1

Rear suspension

Type	Swingarm (link suspension)
Spring	Coil spring
Shock absorber	Gas-hydraulic damper
Rear shock absorber assembly travel	60.0 mm (2.36 in)
Wheel travel	120 mm (4.7 in)
Spring preload	
Adjusting system	Mechanical adjustable type
Unit for adjustment	Cam position
Adjustment value (Soft)	1
Adjustment value (STD)	4
Adjustment value (Hard)	9
Rebound damping	
Adjusting system	Mechanical adjustable type
Unit for adjustment	Click
Adjustment value from the start position (Soft)	23
Adjustment value from the start position (STD)	16
Adjustment value from the start position (Hard)	1
Compression damping	
Adjusting system	Mechanical adjustable type
Fast compression damping	
Unit for adjustment	Turn
Adjustment value from the start position (Soft)	5.5
Adjustment value from the start position (STD)	3
Adjustment value from the start position (Hard)	0
Slow compression damping	
Unit for adjustment	Click
Adjustment value from the start position (Soft)	18
Adjustment value from the start position (STD)	16
Adjustment value from the start position (Hard)	1

Drive chain

Size	525V8
Chain type	Sealed type
Number of links	114
Drive chain slack	30.0–45.0 mm (1.18–1.77 in)
Drive chain slack (on a suitable stand)	30.0–45.0 mm (1.18–1.77 in)
Limit	50.0 mm (1.97 in)
15-link length limit	239.3 mm (9.42 in)

ELECTRICAL SPECIFICATIONS

EAS20016

ELECTRICAL SPECIFICATIONS

Voltage

System voltage	12 V
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Engine control unit

Model/manufacturer	TBDFB5/DENSO (AUS, EUR, RUS, ZAF) TBDFB6/DENSO (EUR)
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Ignition system

Ignition system	TCI
Advancer type	Digital
Ignition timing (B.T.D.C.)	10.0°/1300 r/min
Pickup coil resistance	248.0–372.0 Ω

Ignition coil

Primary coil resistance	0.85–1.15 Ω
Secondary coil resistance	5.01–6.78 k Ω

Charging system

Charging system	AC magneto
Standard output	12.0 V, 31.0 A at 10000 r/min
Standard output	12.0 V, 372 W at 10000 r/min
Stator coil resistance	0.120–0.180 Ω (W-W)

Rectifier/regulator

Regulator type	Three-phase
Regulated voltage (DC)	14.1–14.9 V
Rectifier capacity (DC)	22.0 A

Battery

Model	YTZ10S
Voltage, capacity	12 V, 8.6 Ah (10 HR)

Headlight

Bulb type	Halogen bulb
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Bulb wattage $\times$ quantity

Headlight	H7, 55.0 W $\times$ 2
Brake/tail light	LED
Front turn signal light	10.0 W $\times$ 2
Rear turn signal light	10.0 W $\times$ 2
Auxiliary light	LED
License plate light	5.0 W $\times$ 1
Meter lighting	LED

Indicator light

Neutral indicator light	LED
High beam indicator light	LED
Oil level warning light	LED
Turn signal indicator light	LED
Fuel level warning light	LED

ELECTRICAL SPECIFICATIONS

Coolant temperature warning light	LED
Engine trouble warning light	LED
Immobilizer system indicator light	LED
Shift timing indicator light	LED
Starter motor	
Power output	0.60 kW
Armature coil resistance	0.0012–0.0022 Ω
Brush overall length	6.0 mm (0.24 in)
Limit	3.50 mm (0.14 in)
Brush spring force	7.16–9.52 N (730–971 gf, 25.77–34.27 oz)
Commutator diameter	28.0 mm (1.10 in)
Limit	27.0 mm (1.06 in)
Mica undercut (depth)	0.70 mm (0.03 in)
Oil level switch	
Oil level switch resistance (maximum level position)	484.0–536.0 Ω
Oil level switch resistance (minimum level position)	114.0–126.0 Ω
Fuel injection sensor	
Crankshaft position sensor resistance	248–372 Ω
Cylinder identification sensor output voltage (ON)	5.0 V
Cylinder identification sensor output voltage (OFF)	0.0 V
Intake air temperature sensor resistance	5400.0–6600.0 Ω at 0 °C (5400.0–6600.0 Ω at 32 °F)
Intake air temperature sensor resistance	289–391 Ω at 80 °C (289–391 Ω at 176 °F)
Coolant temperature sensor resistance	289–354 Ω at 80 °C (289–354 Ω at 176 °F)
Lean angle sensor output voltage	
Operating angle	65°
Output voltage up to operating angle	0.4–1.4 V
Output voltage over operating angle	3.7–4.4 V
Fuse(s)	
Main fuse	50.0 A
Headlight fuse	15.0 A
Taillight fuse	7.5 A
Signaling system fuse	10.0 A
Ignition fuse	15.0 A
Radiator fan motor fuse	15.0 A $\times$ 2
Fuel injection system fuse	15.0 A
Backup fuse	7.5 A
Electronic throttle valve fuse	7.5 A

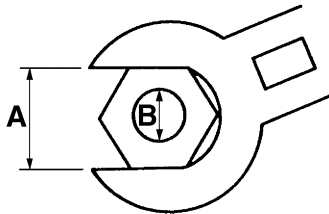
EAS20017

TIGHTENING TORQUES

EAS30015

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

EAS30016

ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Camshaft cap bolt (intake and exhaust)	M6	20	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Cylinder head stud bolt (exhaust pipe assembly)	M8	8	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Cylinder head nut (1st)	M10	8	25 Nm (2.5 m·kgf, 18 ft·lbf)	
Cylinder head nut (final)	M10	8	42 Nm (4.2 m·kgf, 30 ft·lbf)	
Cylinder head cap nut (1st)	M10	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Cylinder head cap nut (final)	M10	2	60 Nm (6.0 m·kgf, 43 ft·lbf)	
Cylinder head bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Spark plug	M10	4	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Cylinder head cover bolt	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil check bolt	M8	1	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Reed valve cover bolt	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)	
Coolant temperature sensor	M12	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Throttle body joint bolt	M6	8	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Connecting rod nut (1st)	M7	8	15 Nm (1.5 m·kgf, 11 ft·lbf)	See TIP. 
Connecting rod nut (final)	M7	8	Specified angle 175°–185°	See TIP. 
Generator rotor bolt	M12	1	70 Nm (7.0 m·kgf, 51 ft·lbf)	
Timing chain tensioner bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Thermostat cover bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Water jacket joint bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Water pump assembly bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Water pump housing cover bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Coolant drain bolt (water pump)	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil pump assembly bolt	M6	3	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Oil pan bolt	M6	13	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Engine oil drain bolt	M14	1	43 Nm (4.3 m·kgf, 31 ft·lbf)	
Oil filter cartridge 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 pump drive chain guide	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Oil pipe bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Oil cooler union bolt	M20	1	63 Nm (6.3 m·kgf, 46 ft·lbf)	
Upper air filter case to secondary injector holder bolt	M6	4	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Upper air filter case to lower air filter case bolt	M5	10	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Air filter bolt	M5	1	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Secondary injector fuel rail	M6	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Throttle body joint clamp	M5	4	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Intake funnel joint bolt 1	M5	6	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Intake funnel joint bolt 2	M5	2	3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)	
Locknut (throttle cable)	M6	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Exhaust pipe assembly nut	M8	8	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust pipe assembly bolt	M8	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust pipe assembly bracket bolt (left upper side and right side)	M8	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Exhaust pipe assembly bracket bolt (left lower side)	M8	1	34 Nm (3.4 m·kgf, 25 ft·lbf)	
Muffler clamp bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Muffler bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Locknut (EXUP cable adjusting bolt)	M6	2	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
EXUP servo motor drive pulley bolt	M5	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
EXUP servo motor bolt	M6	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
EXUP servo motor bracket bolt	M6	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
EXUP valve pulley cover bolt (front side)	M6	1	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
EXUP valve pulley cover bolt (rear side)	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
EXUP valve nut	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Crankcase bolt	M8	2	See TIP.	l=115 mm (4.53 in) 
Crankcase bolt	M8	8	See TIP.	l=85 mm (3.35 in) 
Crankcase bolt	M8	2	24 Nm (2.4 m·kgf, 17 ft·lbf)	l=65 mm (2.56 in) 
Crankcase bolt	M6	16	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Generator cover bolt	M6	9	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Clutch cover bolt	M6	7	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Clutch cover bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Pickup rotor cover bolt	M6	7	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Timing mark accessing bolt	M8	1	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Oil baffle plate 1 bolt	M6	1	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Oil baffle plate 2 bolt	M6	3	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Stator coil assembly bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Stator coil assembly lead holder bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Drive sprocket cover bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Main gallery bolt	M16	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Ventilation chamber cover bolt	M6	5	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Oil pipe	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Crankshaft position sensor bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Crankcase stud bolt	M10	10	See TIP.	
Clutch spring bolt	M6	6	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Clutch boss nut	M20	1	115 Nm (11.5 m·kgf, 83 ft·lbf)	Stake 
Clutch boss plate stud bolt	M8	6	25 Nm (2.5 m·kgf, 18 ft·lbf)	
Drive sprocket nut	M20	1	85 Nm (8.5 m·kgf, 61 ft·lbf)	Stake 
Main axle screw	M6	3	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	Stake 
Shift drum retainer bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Shift shaft spring stopper	M8	1	22 Nm (2.2 m·kgf, 16 ft·lbf)	
Shift arm bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Pickup rotor bolt	M8	1	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Starter motor bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Neutral switch	M10	1	17 Nm (1.7 m·kgf, 12 ft·lbf)	
Oil level switch bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Speed sensor bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Cylinder identification sensor bolt	M6	1	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Negative battery terminal/engine ground terminal bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
O ₂ sensor	M18	1	45 Nm (4.5 m·kgf, 33 ft·lbf)	

TIP

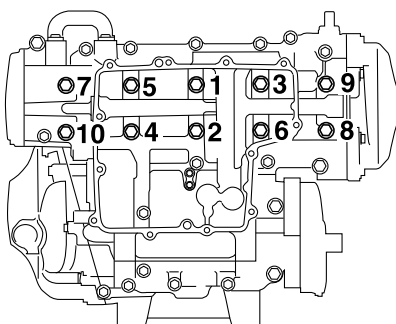
Connecting rod nut

Tighten the connecting rod nuts to 15 Nm (1.5 m·kgf, 11 ft·lbf), and then tighten them further to reach the specified angle 175°–185°.

TIP

Crankcase bolt

1. First, tighten the bolts to approximately 20 Nm (2.0 m·kgf, 14 ft·lbf) with a torque wrench.
2. Loosen all bolts one by one following the tightening order and then retighten the bolts 12 Nm (1.2 m·kgf, 8.7 ft·lbf) with a torque wrench.
3. Tighten bolts 1–7 & 10 additional 50°
Tighten bolts 8 & 9 additional 75°



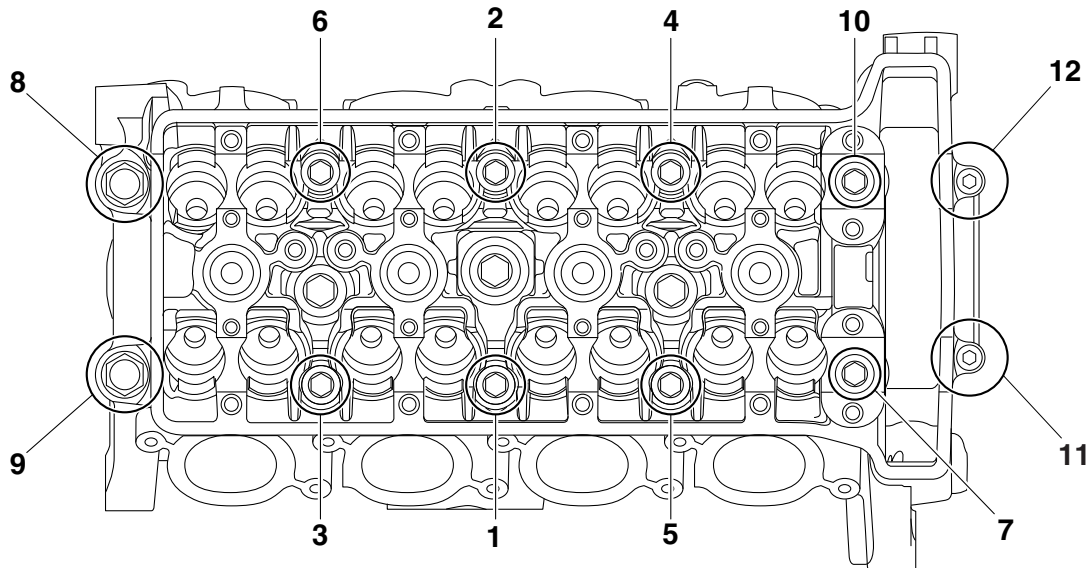
TIGHTENING TORQUES

TIP

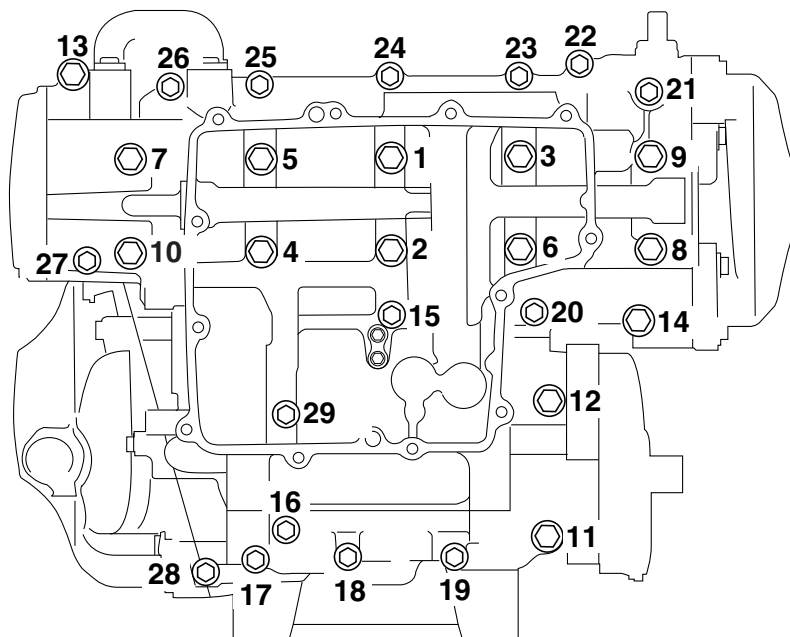
Crankcase stud bolt

Install the crankcase stud bolts (M10) so that their installed length is 68.2 mm (2.69 in).

Cylinder head tightening sequence:



Crankcase tightening sequence:



TIGHTENING TORQUES

EAS30017

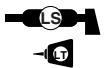
CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Engine mounting bolt (front right side)	M10	2	45 Nm (4.5 m·kgf, 33 ft·lbf)	
Engine mounting bolt (front left side)	M10	2	45 Nm (4.5 m·kgf, 33 ft·lbf)	
Engine mounting nut (rear upper side)	M12	1	64 Nm (6.4 m·kgf, 46 ft·lbf)	
Engine mounting nut (rear lower side)	M12	1	64 Nm (6.4 m·kgf, 46 ft·lbf)	
Main frame and rear frame bolt	M10	4	37 Nm (3.7 m·kgf, 27 ft·lbf)	
Front wheel axle	M14	1	91 Nm (9.1 m·kgf, 66 ft·lbf)	
Front wheel axle pinch bolt	M8	4	21 Nm (2.1 m·kgf, 15 ft·lbf)	See TIP.
Front brake disc bolt	M6	10	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Rear wheel axle nut	M24	1	110 Nm (11 m·kgf, 80 ft·lbf)	
Rear wheel sprocket nut	M10	6	100 Nm (10 m·kgf, 72 ft·lbf)	
Rear brake disc bolt	M8	5	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Front brake hose union bolt	M10	3	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Front brake caliper bolt	M10	4	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Brake caliper bleed screw (front and rear)	M8	3	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Front brake hose holder bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear brake hose union bolt	M10	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Rear brake caliper bolt (M8)	M8	1	22 Nm (2.2 m·kgf, 16 ft·lbf)	
Rear brake caliper bolt (M12)	M12	1	27 Nm (2.7 m·kgf, 20 ft·lbf)	
Rear brake pad pin	M10	1	17 Nm (1.7 m·kgf, 12 ft·lbf)	
Rear brake screw plug	—	1	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Handlebar pinch bolt	M8	2	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Handlebar bolt	M6	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Front brake master cylinder bolt	M6	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Front brake master cylinder bleed screw	M8	1	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Rearview mirror nut	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Clutch lever assembly bolt	M6	1	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	
Clutch cable locknut (engine side)	M8	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Upper bracket pinch bolt	M8	2	26 Nm (2.6 m·kgf, 19 ft·lbf)	
Steering stem nut	M28	1	115 Nm (11.5 m·kgf, 83 ft·lbf)	
Lower ring nut (initial tightening torque)	M30	1	52 Nm (5.2 m·kgf, 38 ft·lbf)	See TIP.
Lower ring nut (final tightening torque)	M30	1	14 Nm (1.4 m·kgf, 10 ft·lbf)	See TIP.
Lower bracket pinch bolt	M8	4	23 Nm (2.3 m·kgf, 17 ft·lbf)	See TIP.
Front brake hose joint bracket bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Front brake hose joint bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Cap bolt	M46	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Damper rod locknut	M10	2	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Damper rod assembly bolt	M10	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Front fender bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Relay arm and frame nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Connecting arm and relay arm nut	M12	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Connecting arm and swingarm nut	M12	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Rear shock absorber assembly upper nut	M12	1	44 Nm (4.4 m·kgf, 32 ft·lbf)	
Rear shock absorber assembly lower nut	M12	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Rear shock absorber assembly spacer bolt	M22	1	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Rear shock absorber assembly bracket nut	M14	1	52 Nm (5.2 m·kgf, 38 ft·lbf)	
Swingarm pivot shaft	M32	1	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Swingarm pivot shaft ring nut	M32	1	95 Nm (9.5 m·kgf, 69 ft·lbf)	
Swingarm pivot shaft nut	M22	1	70 Nm (7.0 m·kgf, 51 ft·lbf)	
Drive chain guide (swingarm side) bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Drive chain guard bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Drive chain adjusting locknut	M8	2	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Drive chain adjusting bolt	M8	2	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Rear fender bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel pump bolt	M5	6	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Fuel tank upper cover and frame bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel tank bolt	M6	2	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Fuel tank bracket and frame bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel tank bracket and fuel tank bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Radiator bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Radiator and radiator bracket bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Radiator bracket and frame bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Radiator outlet hose holder bolt	M10	1	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Radiator and rectifier/regulator bracket bolt	M6	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Coolant reservoir bolt	M6	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Front cowling assembly bolt	M6	4	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Seat lock assembly bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rider seat and frame	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Battery box and frame	M6	2	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Rear upper cowling damper plate and frame	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
License plate light assembly bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	

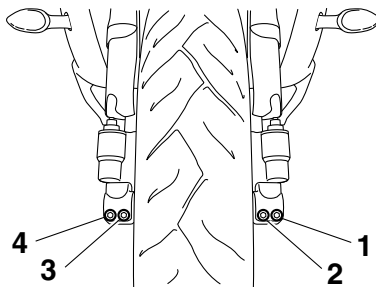
TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Rider footrest (left and right) assembly bolt	M8	4	28 Nm (2.8 m·kgf, 20 ft·lbf)	
Passenger footrest (left and right) bolt	M8	4	28 Nm (2.8 m·kgf, 20 ft·lbf)	
Rear brake master cylinder bolt	M6	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Rear brake pedal adjusting locknut	M8	1	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Sidestand assembly and frame bolt	M8	3	26 Nm (2.6 m·kgf, 19 ft·lbf)	
Coupler holder (left and right) and frame bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Shift arm bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Locknut (shift rod upper side)	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Locknut (shift rod lower side)	M8	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	

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) without performing temporary tightening.
2. In the order 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 right end of the front axle is flush with the front fork. If necessary, manually push the front axle or lightly tap it with a soft hammer until its end is flush with the front fork. However, if the surface of the front axle end is not parallel to the surface of the front fork, align a point on the outer edge of the axle with the fork, making sure that the axle does not protrude past the fork.
4. In the order 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.



TIP

Lower ring nut

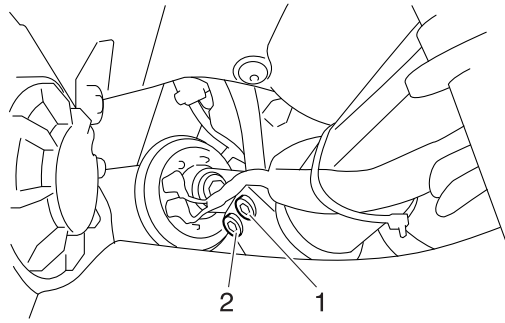
1. First, tighten the lower ring nut to approximately 52 Nm (5.2 m·kgf, 38 ft·lbf) with a torque wrench, then loosen the lower ring nut completely.
2. Retighten the lower ring nut to 14 Nm (1.4 m·kgf, 10 ft·lbf) with a torque wrench.

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".

TIGHTENING TORQUES



LUBRICATION POINTS AND LUBRICANT TYPES

EAS20018

LUBRICATION POINTS AND LUBRICANT TYPES

EAS30018

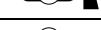
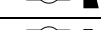
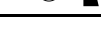
ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Crankshaft pins	
Piston surface	
Piston pins	
Connecting rod bolts and nuts	
Crankshaft journals	
Generator rotor bolt and washer	
Camshaft cam lobes and camshaft journals	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Valve lifter surface	
Oil pump rotors (inner and outer) and oil pump housing	
Oil strainer screen (inside oil strainer)	
Oil strainer seal	
Oil cooler bolt	
Oil nozzle (O-ring)	
Starter clutch idle gear shaft	
Starter clutch roller and starter clutch idle gear outer surface	
Primary driven gear inner surface	
Clutch boss nut	
Clutch pull rod	
Transmission gears (wheel and pinion) and collars	
Main axle and drive axle	
Shift forks and shift fork guide bars	
Shift shaft	
Cylinder head cover mating surface	Bond TB1541C
Cylinder head cover gasket	Bond TB1215B
Crankcase mating surface	Yamaha bond No.1215 (Three Bond No.1215®) Three Bond No.1280B
Crankshaft position sensor lead grommet	Yamaha bond No.1215 (Three Bond No.1215®)
Stator coil lead grommet	Yamaha bond No.1215 (Three Bond No.1215®)

LUBRICATION POINTS AND LUBRICANT TYPES

EAS30019

CHASSIS

Lubrication point	Lubricant
Steering bearings and upper bearing cover lip	
Lower bearing dust seal lip	
Tube guide (throttle grip) inner surface and throttle cables	
Brake lever pivoting point and metal-to-metal moving parts	
Brake caliper piston seal	
Brake caliper piston dust seal	
Clutch cable end	
Clutch lever pivoting point and metal-to-metal moving parts	
Relay arm, connecting arm and rear shock absorber spacer	
Swingarm pivot shaft	
Swingarm pivot shaft bearings	
Swingarm dust cover lips	
Swingarm pivot shaft nut	
Oil seals (rear shock absorber, relay arm and connecting arm)	
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 rod pivoting point	
Shift pedal pivoting point	
Brake pedal shaft pivoting point	
Front wheel oil seal lips (left and right)	
Front wheel axle bolt	
Rear wheel oil seal lips (left and right)	
Rear wheel drive hub oil seal	
Rear wheel drive hub mating surface	
Rear wheel axle	
Engine mounting bolts (rear upper and lower side)	

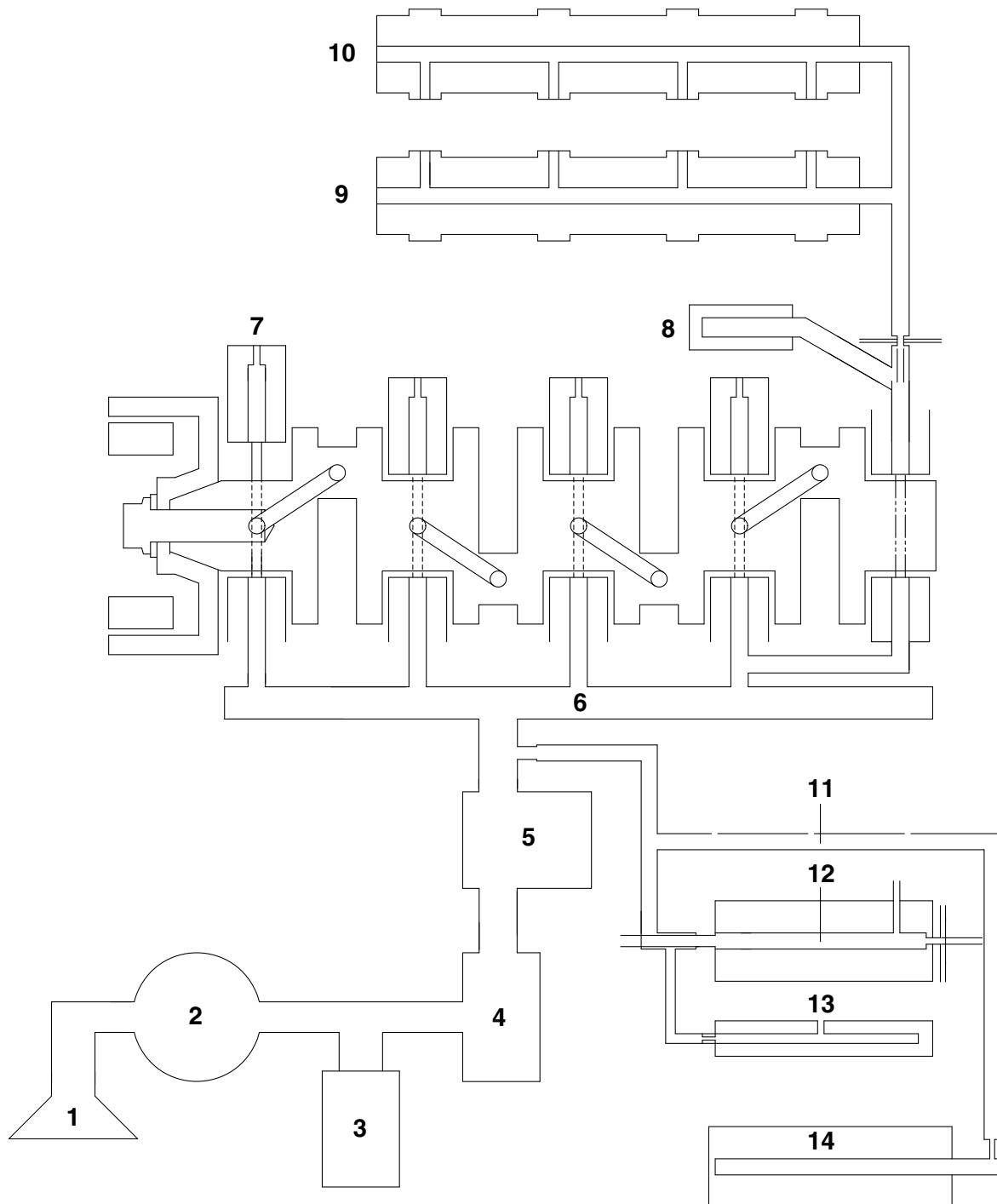
LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20019

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS30020

ENGINE OIL LUBRICATION CHART



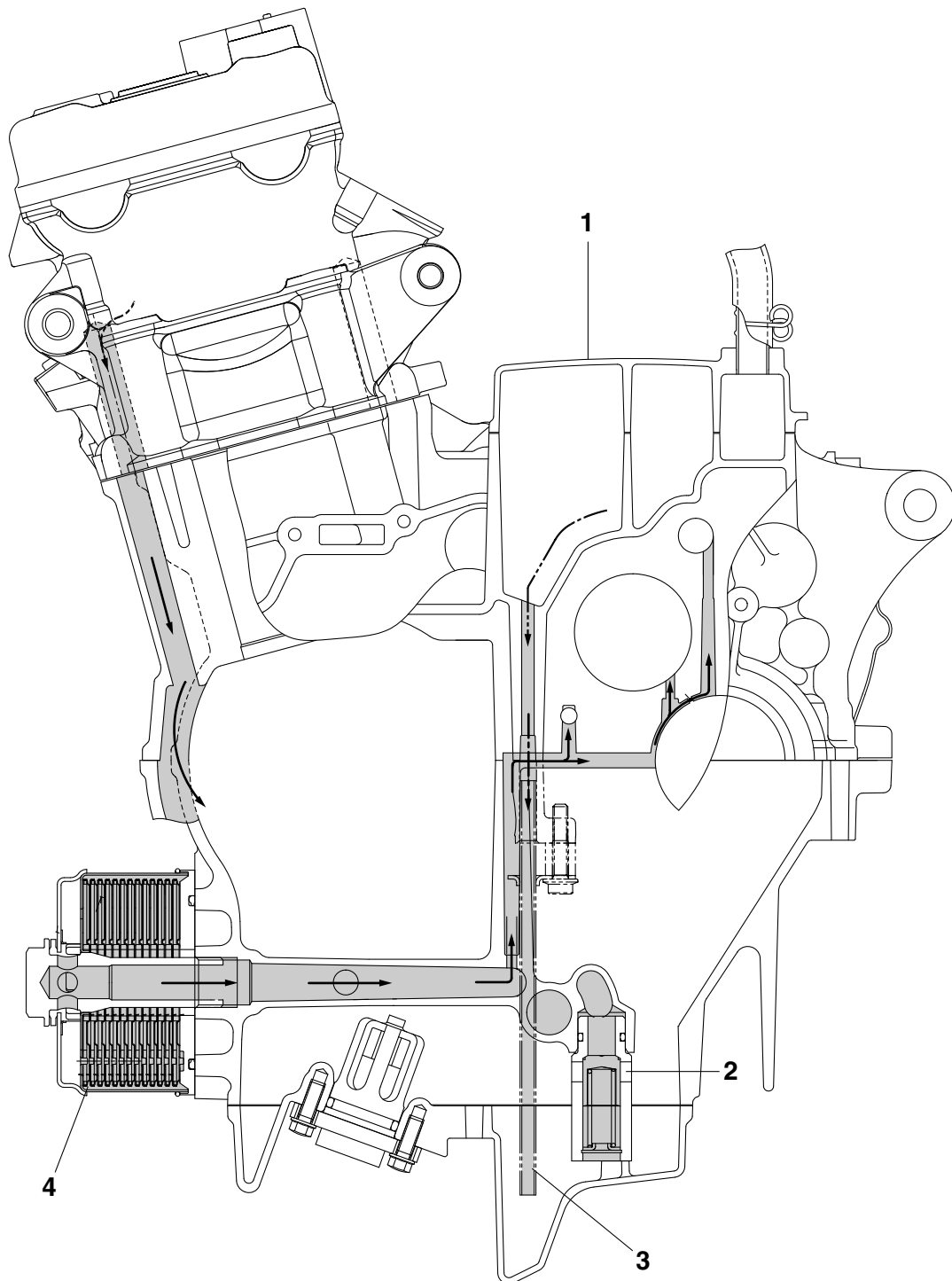
LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil strainer
2. Oil pump
3. Relief valve
4. Oil filter
5. Oil cooler
6. Main gallery
7. Oil nozzle
8. Timing chain tensioner
9. Intake camshaft
10. Exhaust camshaft
11. Oil pipe
12. Main axle
13. Shift fork
14. Drive axle

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS30021

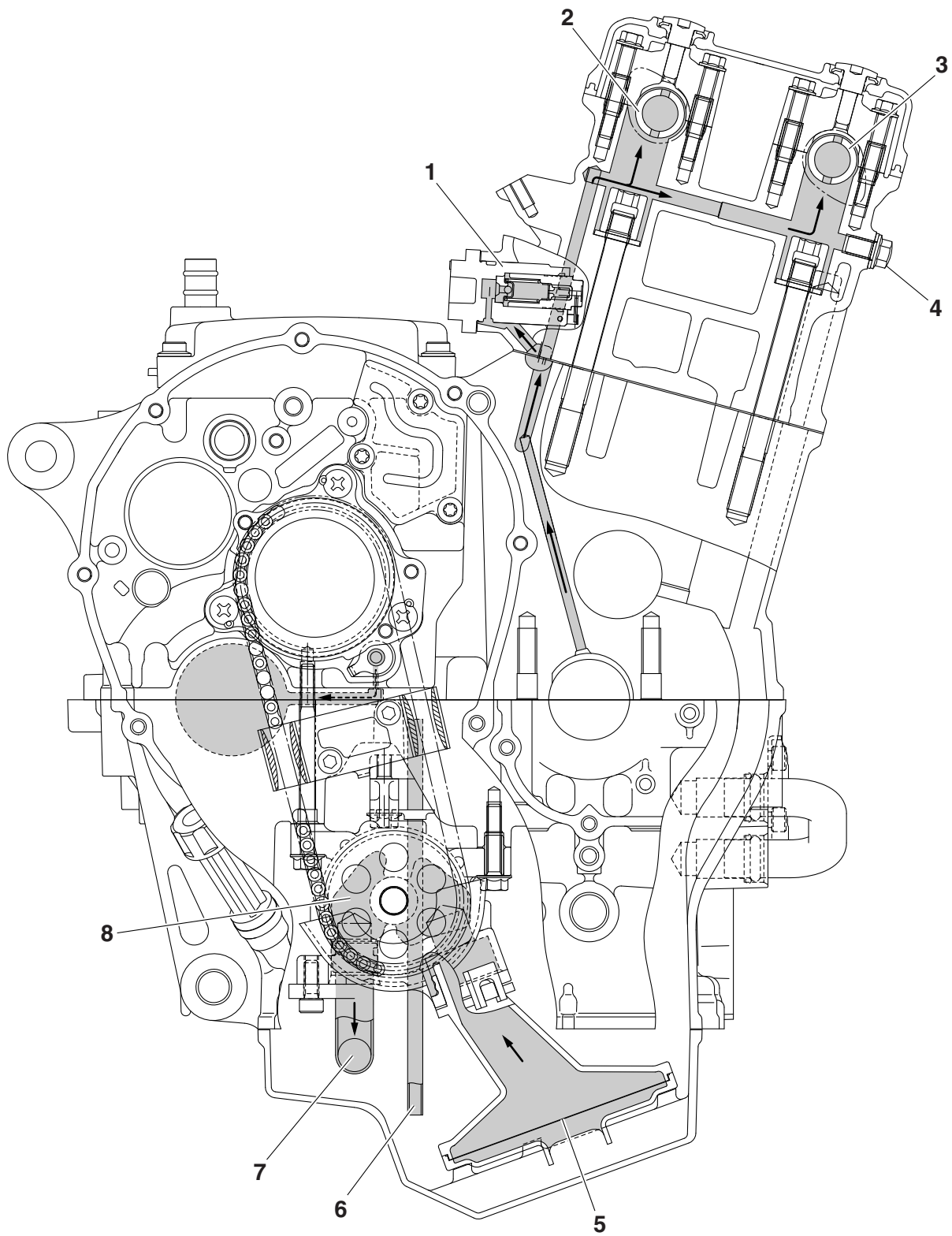
LUBRICATION DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Ventilation chamber cover
2. Relief valve
3. Ventilation chamber oil drain pipe
4. Oil cooler

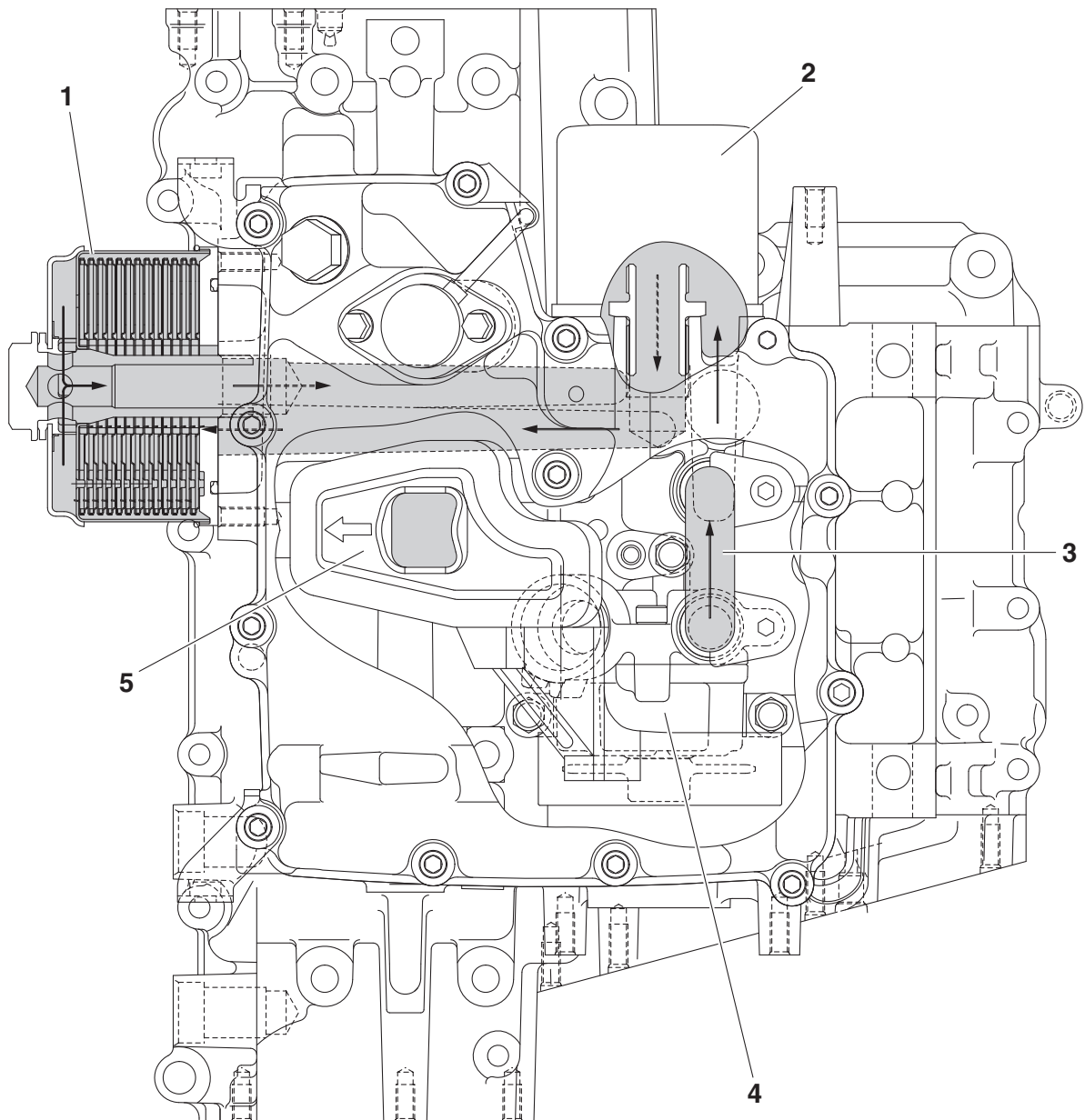
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Timing chain tensioner
2. Intake camshaft
3. Exhaust camshaft
4. Oil check bolt
5. Oil strainer
6. Ventilation chamber oil drain pipe
7. Oil pipe
8. Oil pump

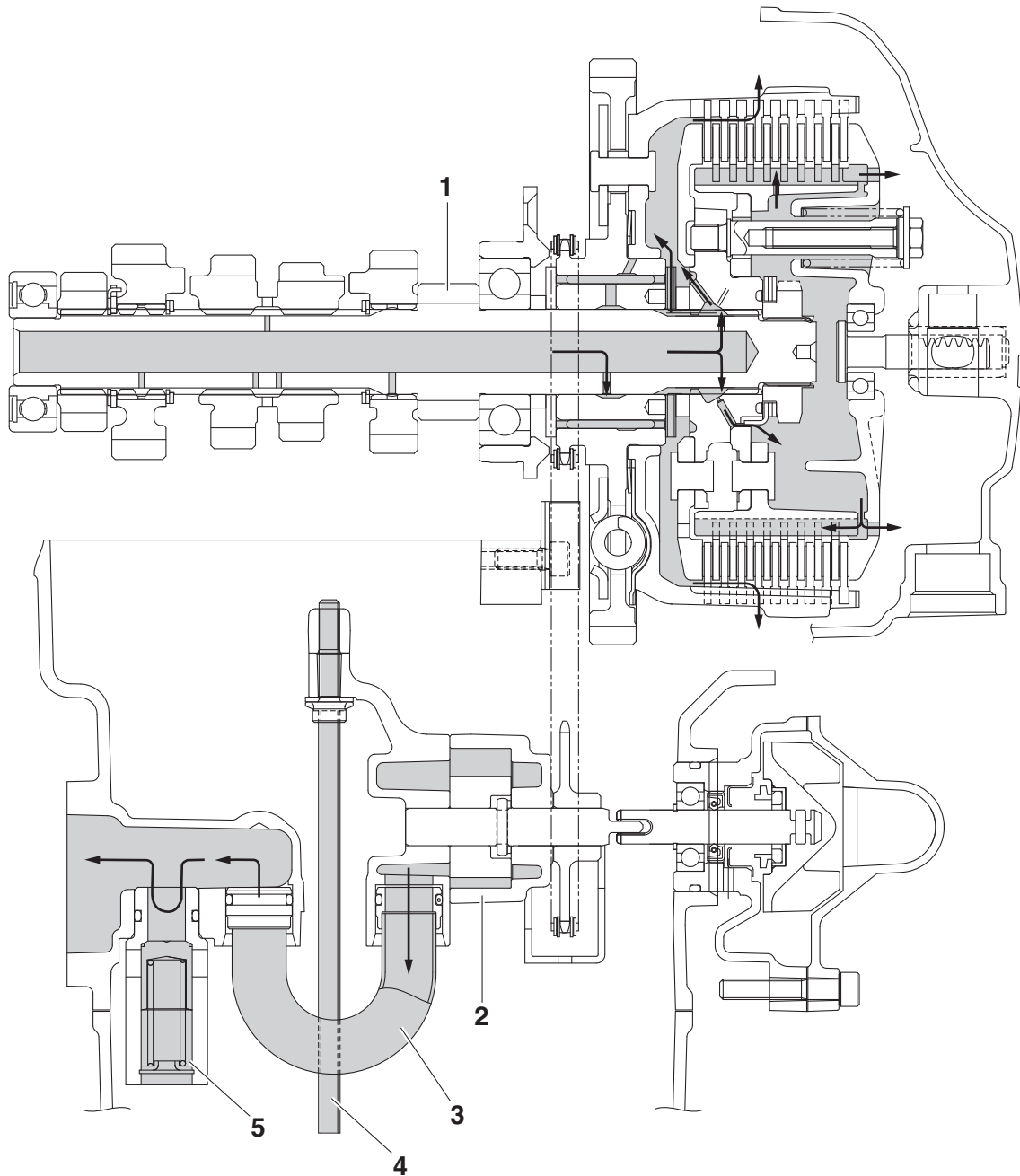
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil cooler
2. Oil filter
3. Oil pipe
4. Oil pump
5. Oil strainer

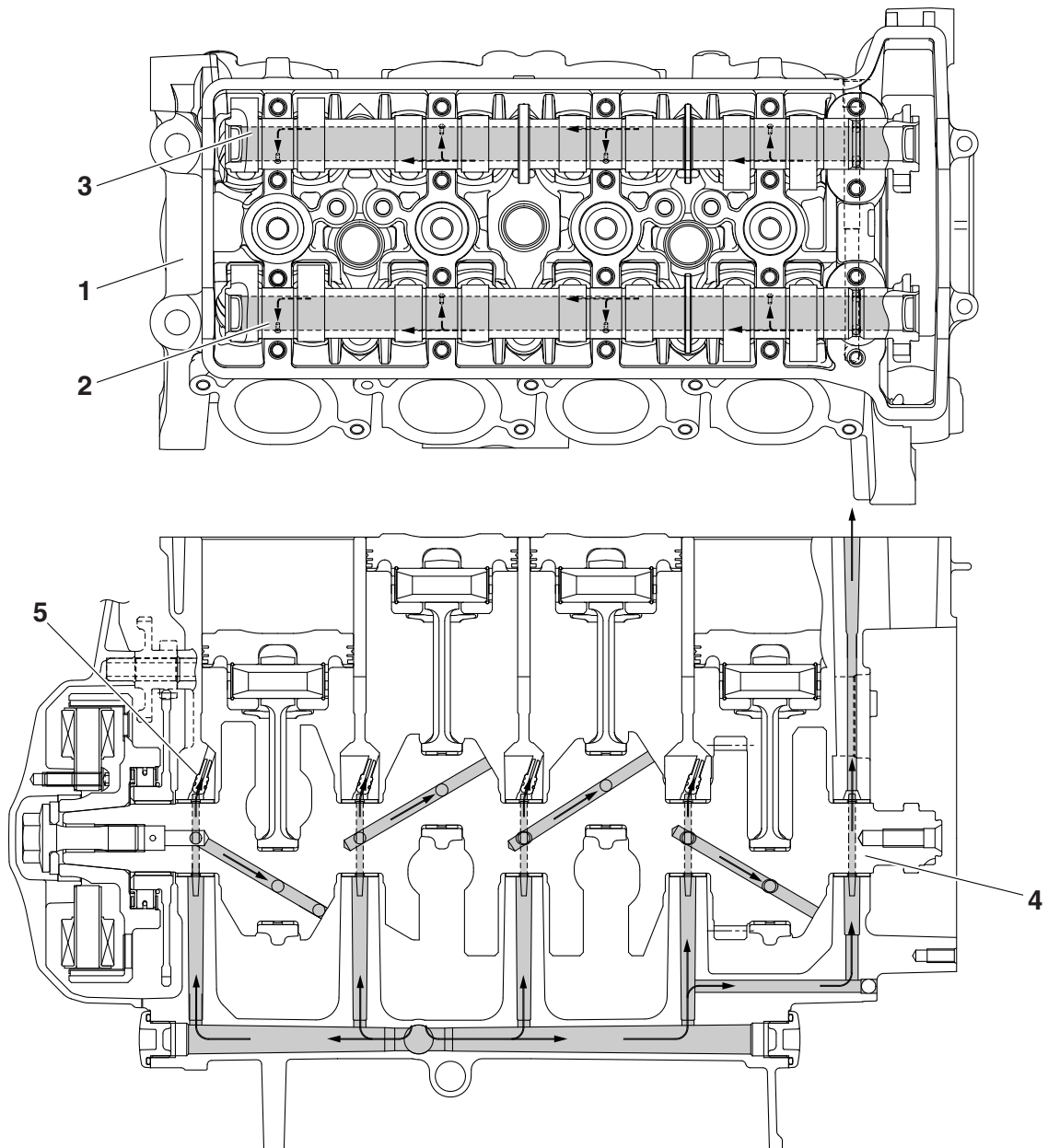
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Main axle
2. Oil pump
3. Oil pipe
4. Ventilation chamber oil drain pipe
5. Relief valve

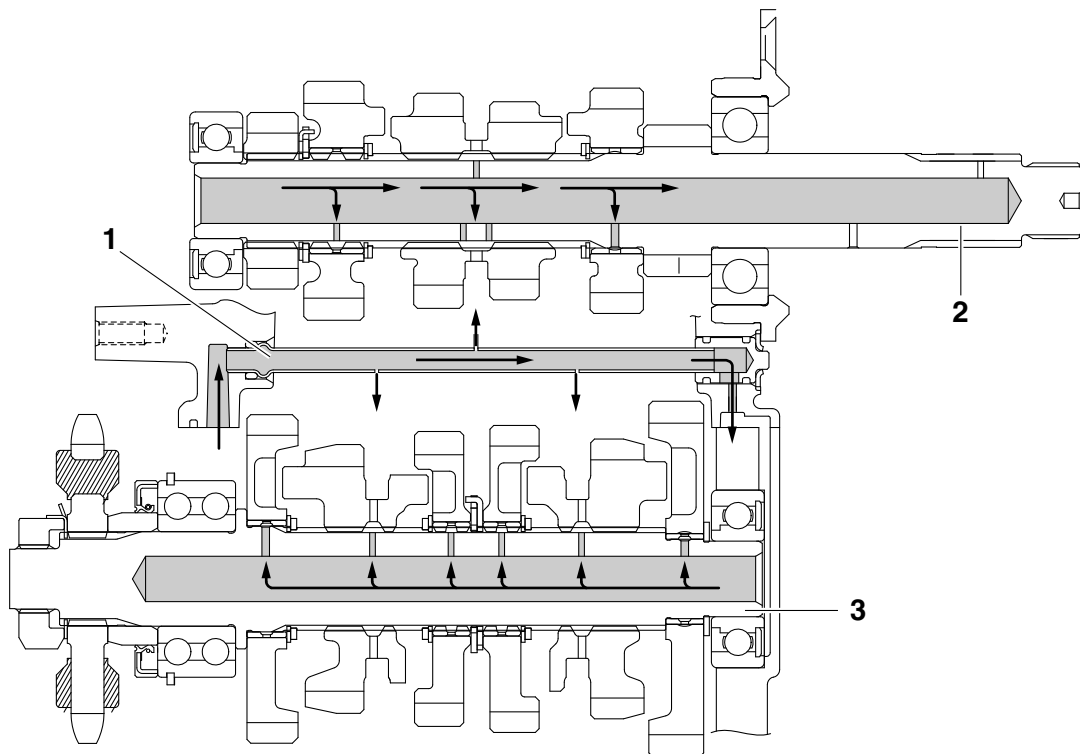
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

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

LUBRICATION SYSTEM CHART AND DIAGRAMS

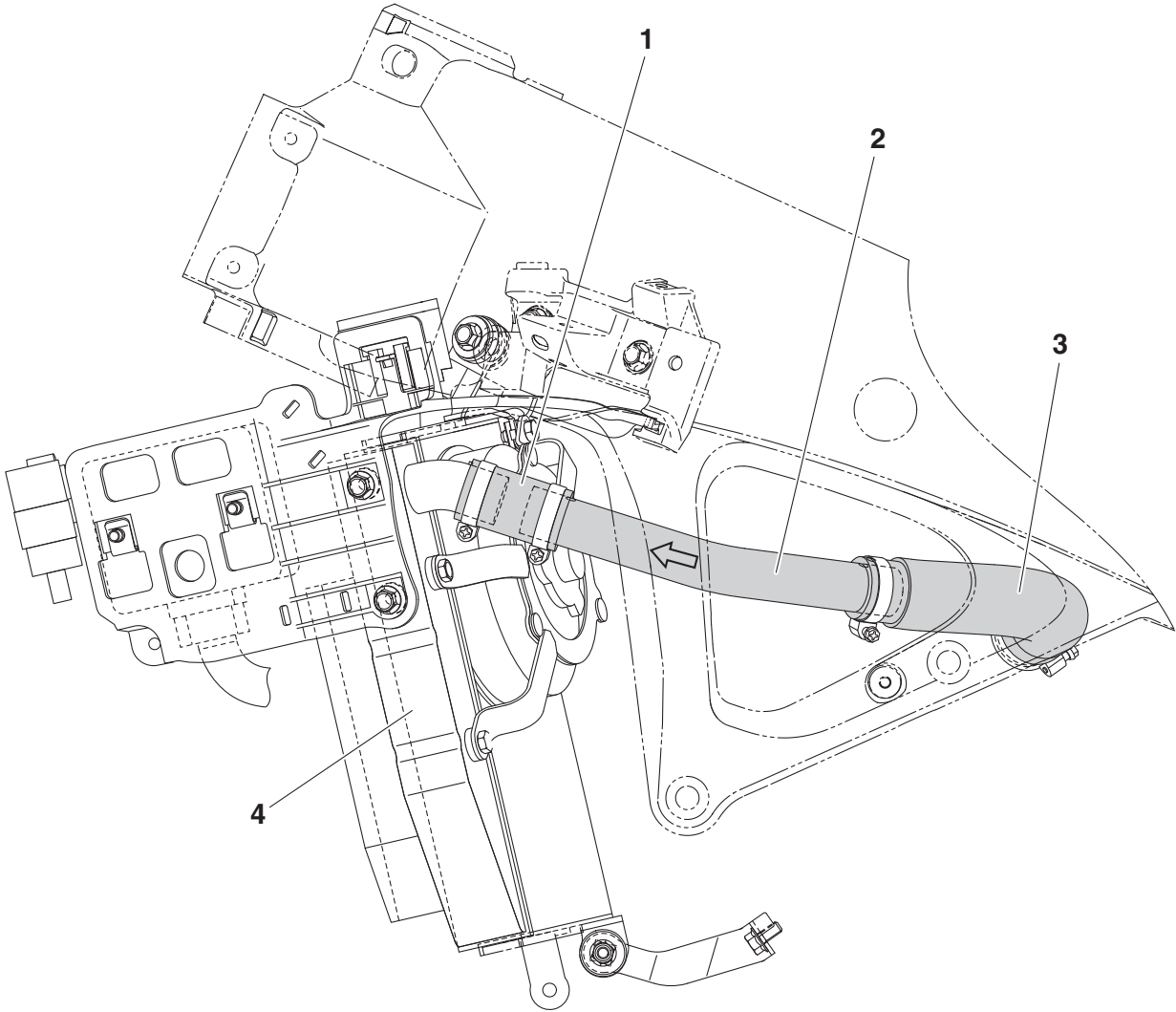


LUBRICATION SYSTEM CHART AND DIAGRAMS

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

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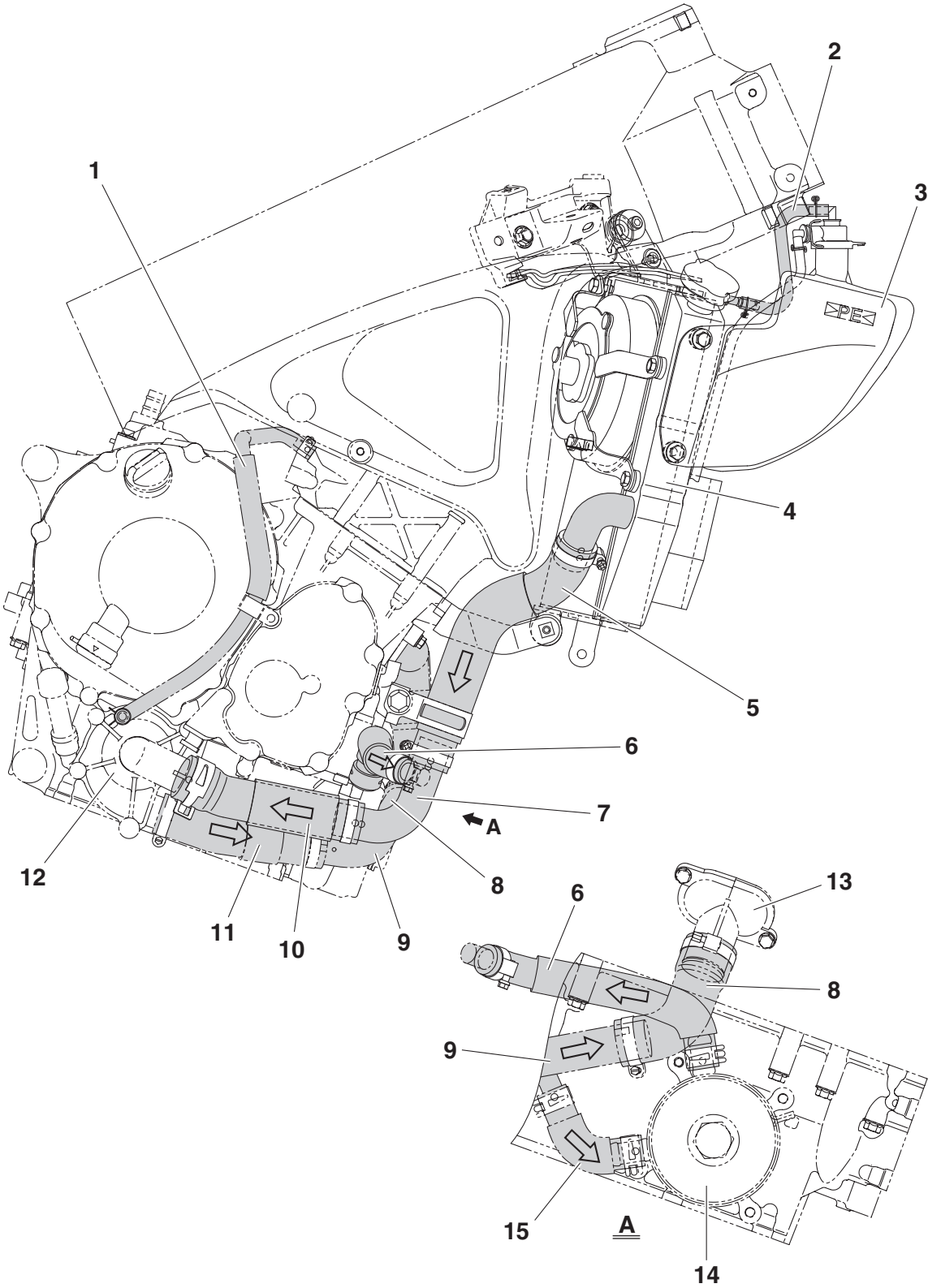
COOLING SYSTEM DIAGRAMS



COOLING SYSTEM DIAGRAMS

1. Radiator inlet hose
2. Radiator inlet pipe
3. Thermostat outlet hose
4. Radiator

COOLING SYSTEM DIAGRAMS



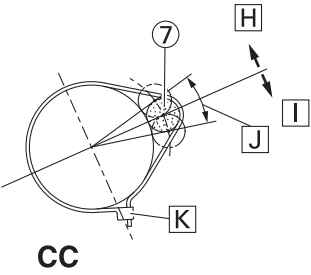
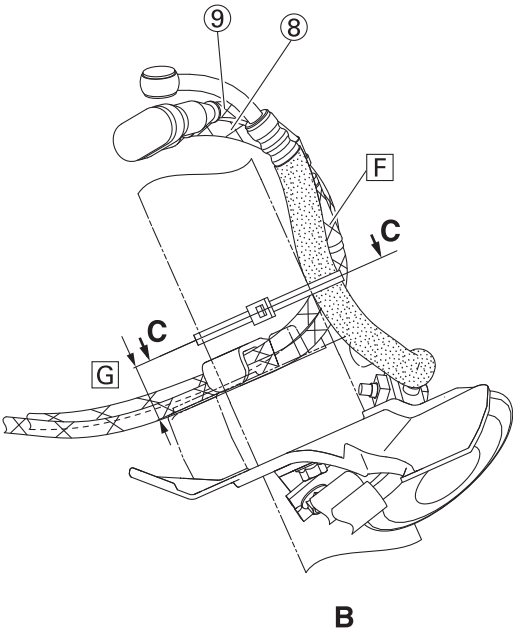
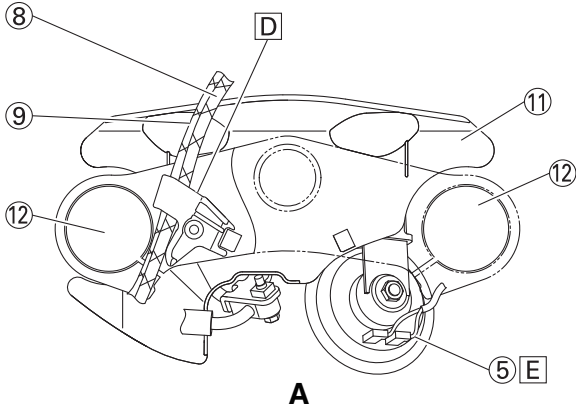
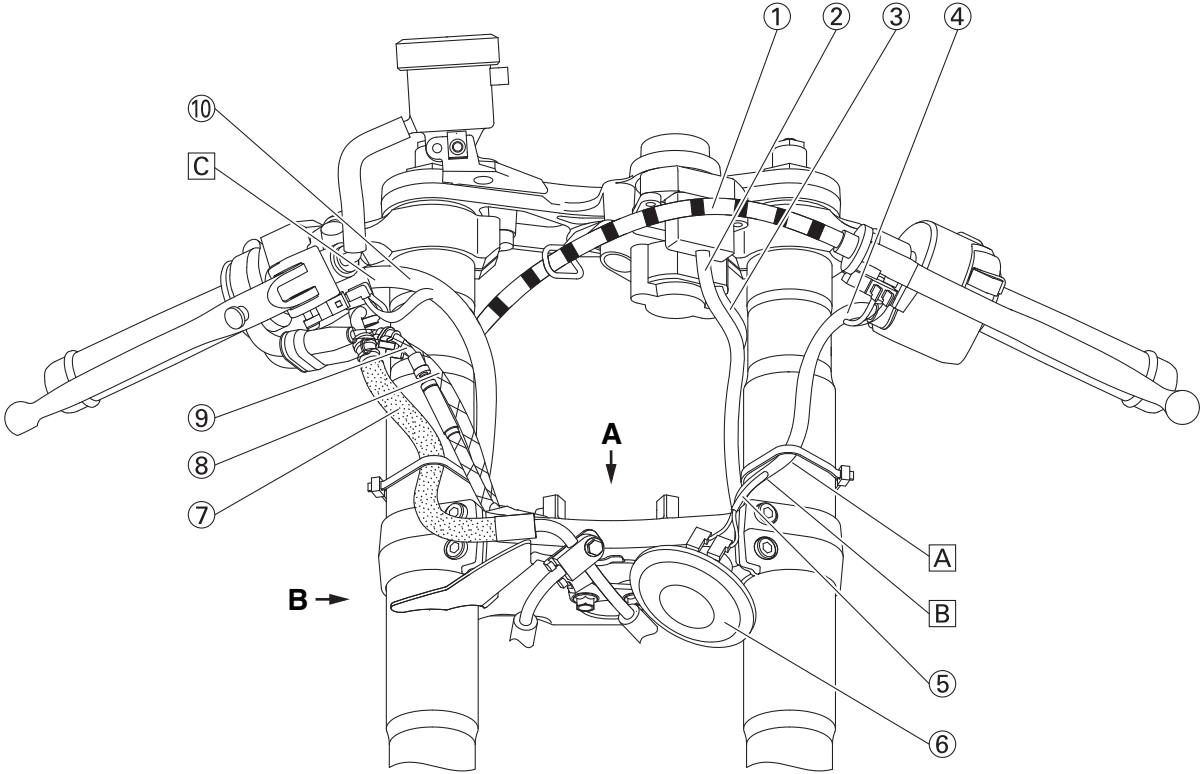
COOLING SYSTEM DIAGRAMS

1. Water pump breather hose
2. Coolant reservoir hose
3. Coolant reservoir
4. Radiator
5. Radiator outlet hose
6. Oil cooler outlet hose
7. Radiator outlet pipe
8. Water jacket joint inlet hose
9. Water pump outlet pipe
10. Water pump inlet hose
11. Water pump outlet hose
12. Water pump
13. Water jacket joint
14. Oil cooler
15. Oil cooler inlet hose

EAS20021

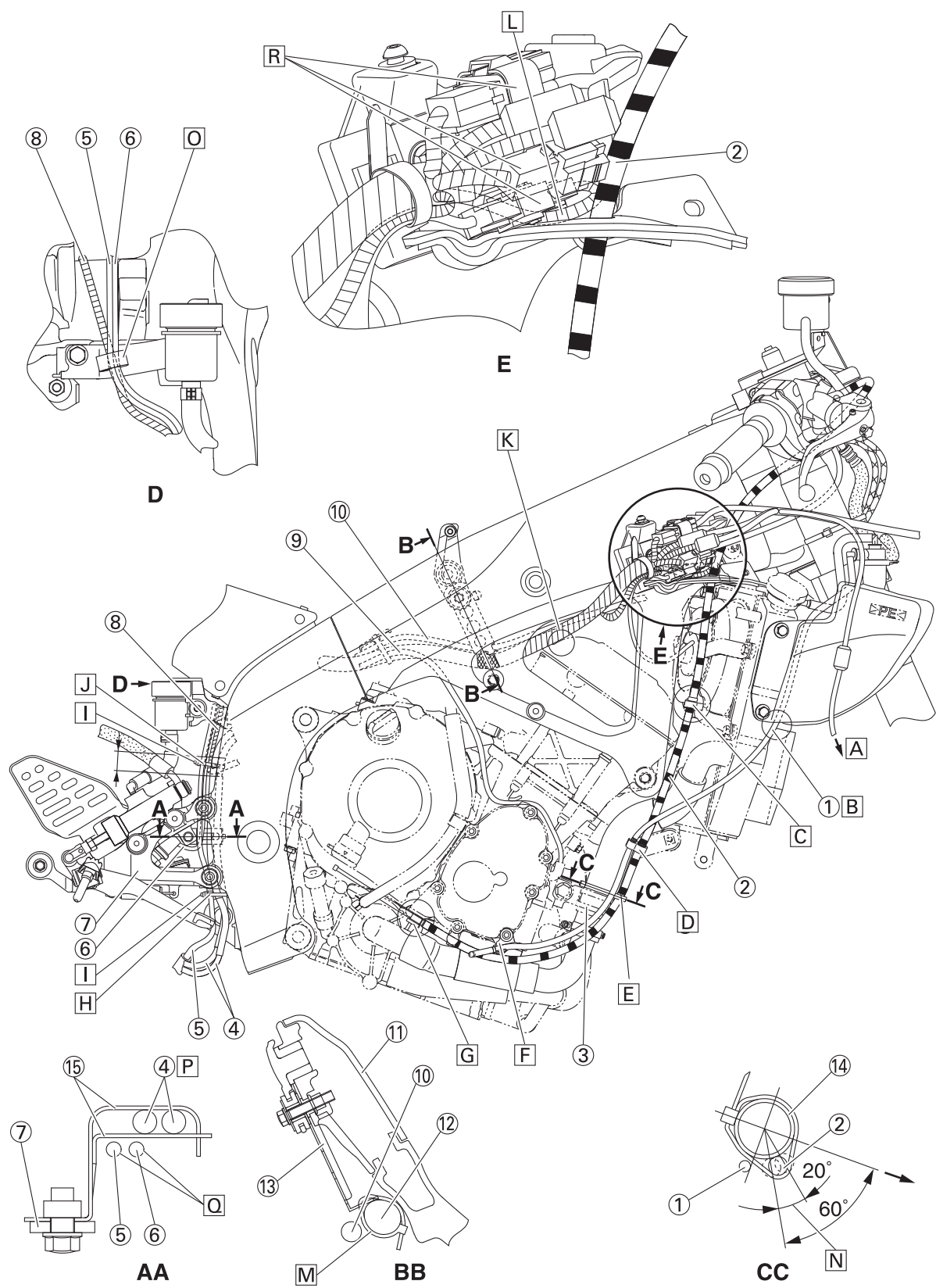
CABLE ROUTING

Handlebar (front view)



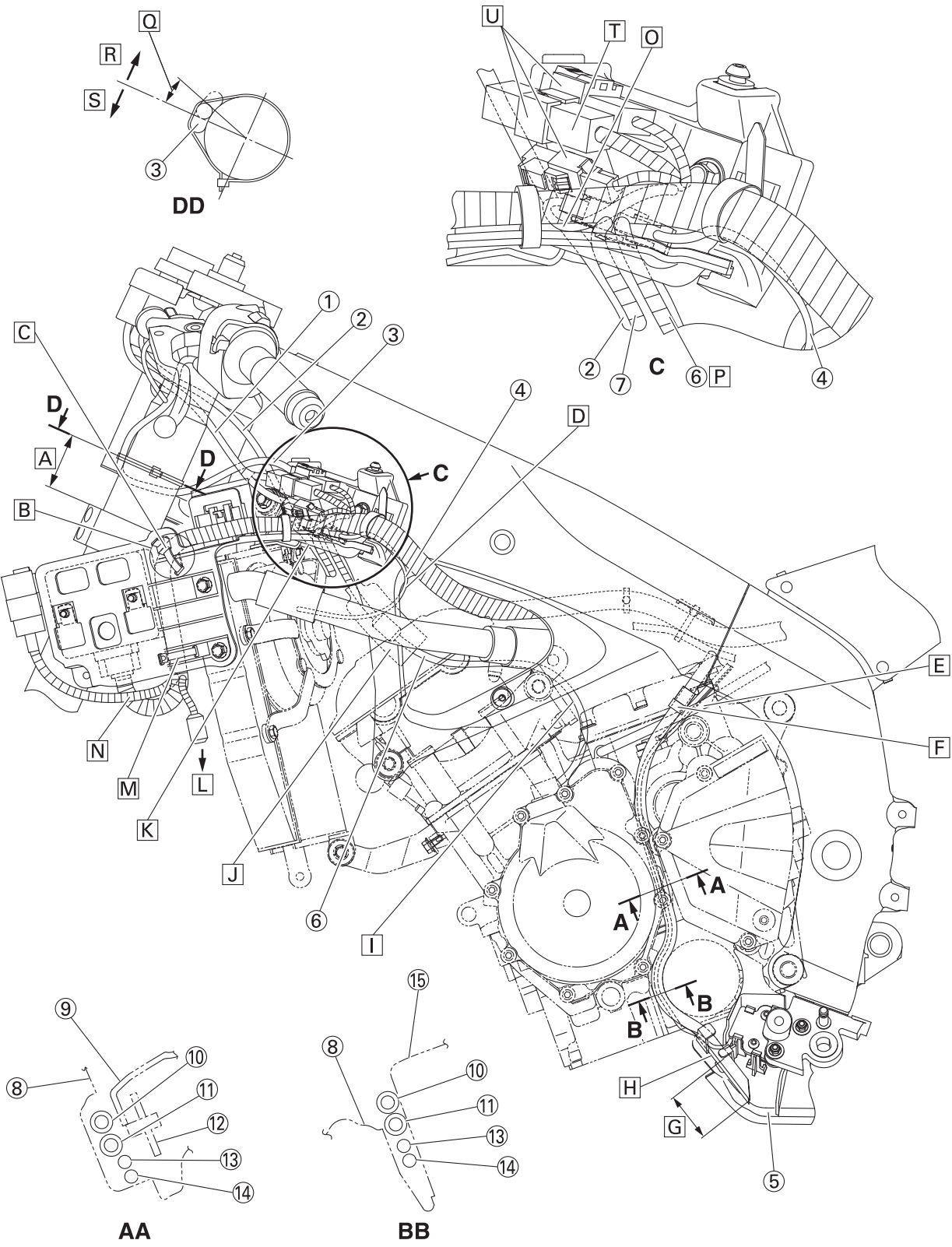
1. Clutch cable
2. Main switch lead
3. Immobilizer unit lead
4. Handlebar switch lead (left)
5. Horn lead
6. Horn
7. Front brake hose
8. Throttle cable (decelerator cable)
9. Throttle cable (accelerator cable)
10. Handlebar switch lead (right)
11. Steering cover
12. Front fork
 - A. Fasten the left handlebar switch lead in front of the front fork with a plastic locking tie. Face the end of the plastic locking tie outward and cut off the excess end of the tie to 1–5 mm (0.04–0.20 in).
 - B. Be sure to position the plastic locking tie above where the horn leads branch off from the other leads.
 - C. Route the right handlebar switch lead between the front brake master cylinder, front fork and handlebar and above the front brake hose union bolt.
 - D. Route the throttle cables through the cable guide so that the throttle cable (accelerator cable) is under the throttle cable (decelerator cable).
 - E. Install the horn lead L-shaped connectors so that the leads are routed outward.
 - F. Route the throttle cables between the front fork and front brake hose.
 - G. 20–30 mm (0.79–1.18 in)
 - H. Inside
 - I. Outside
 - J. Fasten the front brake hose with a plastic locking tie, making sure the front brake hose is positioned as shown in the illustration.
 - K. Face the end of the plastic locking tie outward and cut off the excess end of the tie to 1–5 mm (0.04–0.20 in).

Engine (right side view)



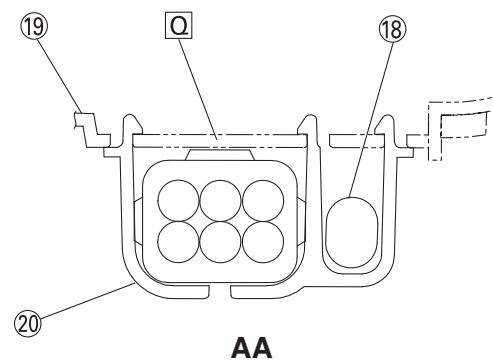
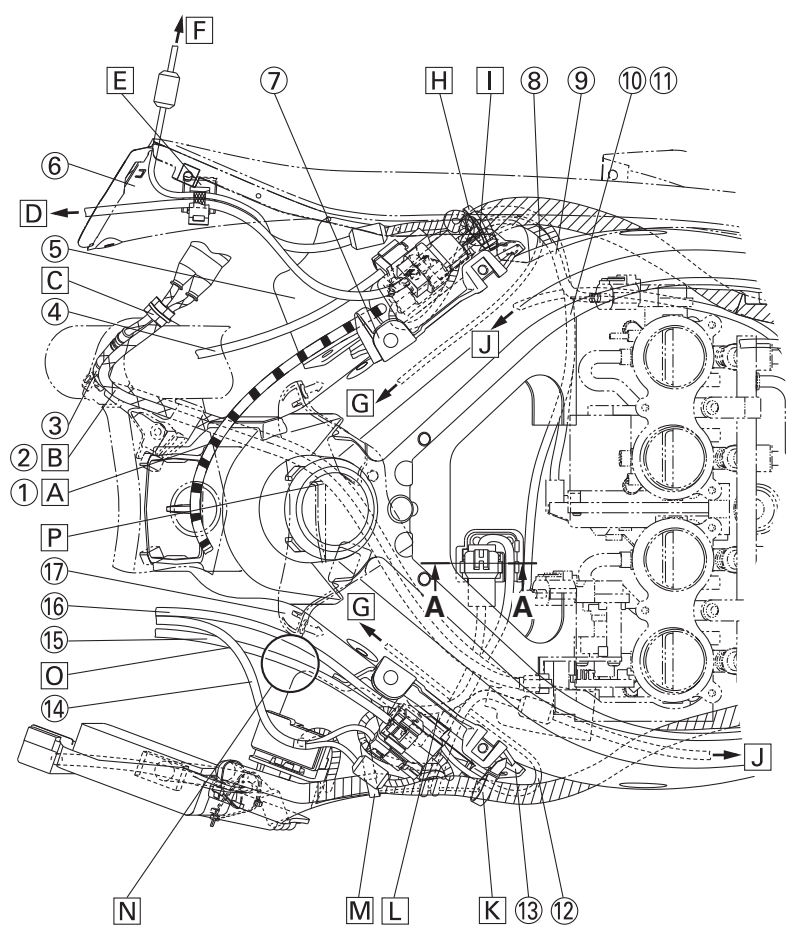
1. Coolant reservoir breather hose
2. Clutch cable
3. Hose clamp
4. EXUP cable
5. O₂ sensor lead
6. Rear brake light switch lead
7. Footrest bracket
8. EXUP servo motor lead
9. Crankshaft position sensor lead
10. Ignition coil lead
11. Frame
12. Main harness
13. Guide bars
14. Radiator outlet hose
15. Bracket
 - A. To the front right turn signal light.
 - B. Route the coolant reservoir breather hose between the radiator and coolant reservoir and outside of the damper to be attached to the radiator.
 - C. The clutch cable position should be at the top of the clutch.
 - D. Cross the clutch cable and coolant reservoir breather hose and then fasten them with a holder. Make sure the clamp is positioned below the white paint mark.
 - E. Fasten the clutch cable with a plastic locking tie along the top of the radiator outlet hose holder. Face the end of the plastic locking tie inward.
 - F. Clamp the coolant reservoir breather hose, making sure to position the white paint mark behind the clamp.
 - G. Route the clutch cable through the guide on the engine.
 - H. Fasten the EXUP cable and O₂ sensor lead under the O₂ sensor lead insulator lock within 20 mm (0.79 in) from insulator lock position. Face the end of the plastic locking tie backward. Cut off the excess end of the plastic locking tie to 1–5 mm (0.04–0.20 in).
 - I. Make sure that the EXUP cable and O₂ sensor lead between the top and bottom plastic locking ties are not twisted or crossed.
 - J. Clamp the EXUP servo motor lead, EXUP cable, rear brake light switch lead and O₂ sensor. Clamp position should be above the EXUP cable holder and within 20 mm (0.79 in) from the bottom of the EXUP cable holder. Face the tip of the plastic locking tie to back of the vehicle and cut off the excess end of the plastic locking tie to 1–5 mm (0.04–0.20 in).
 - K. Route the main harness on the heat protector, and making sure to push the main harness inward.
 - L. Bend the lead on the side of the fan motor main harness toward the back of the vehicle as shown in the illustration and insert it into the right coupler holder. Route the bended part inside of the fan lead coupler.
 - M. Fasten the main harness with a plastic locking tie, making sure to align the positioning tape of the main harness with the holes and groove of the guide bar. Face the end of the plastic locking tie to downward and cut off the excess end of the plastic locking tie to 1–5 mm (0.04–0.20 in).
 - N. Fasten the clutch cable with a plastic tie, making sure the clutch cable positioned within 20° as shown in the illustration.
 - O. Clamp the EXUP servo motor lead, rear brake light switch lead and O₂ sensor lead.
 - P. Temporally install the EXUP cables by aligning the paint marks of the EXUP cables to the upper edge of the brackets. Paint mark can be anywhere after installing the bracket to the footrest bracket.
 - Q. There is no order for placing the O₂ sensor lead and rear brake light switch lead.
 - R. Couplers to fasten onto the bracket are headlight lead, handlebar switch lead and radiator fan motor lead.

Engine (left side view)



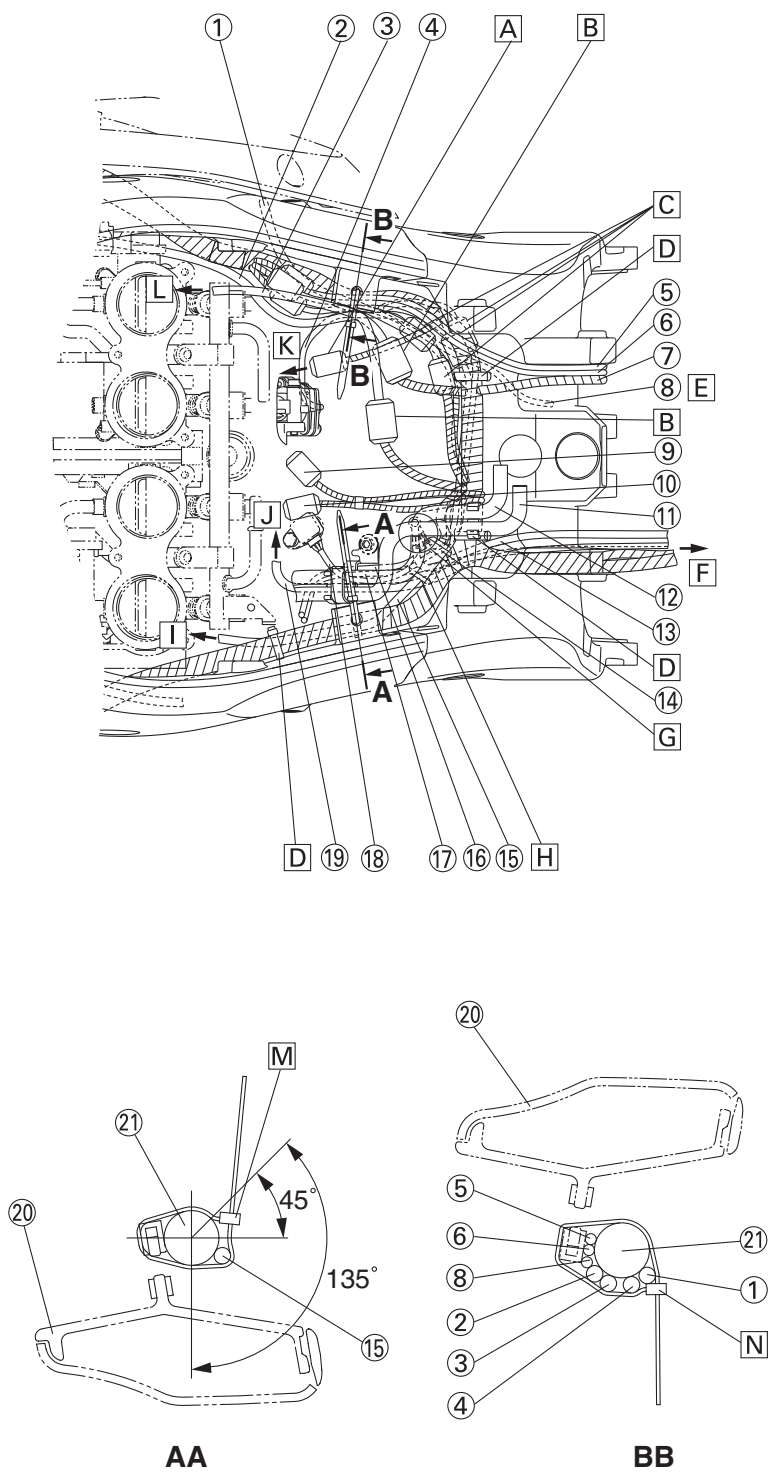
1. Main switch lead
2. Immobilizer unit lead
3. Handlebar switch lead (left)
4. Radiator fan motor lead (left)
5. Sidestand bracket cover
6. AC magneto lead
7. Immobilizer unit lead (main wire harness)
8. Crankcase
9. Drive sprocket cover
10. Fuel tank breather hose
11. Fuel tank drain hose
12. Drive chain guide
13. Sidestand switch lead
14. Oil level switch lead
15. Oil filter
- A. 45–55 mm (1.77–2.17 in)
- B. Bend the main harness as shown in the illustration.
- C. Route the plastic locking tie through the hole of the rectifier/regulator bracket and fasten the main harness. Face the end of the plastic locking tie outward. Cut off the excess end of the plastic locking tie to 1–5 mm (0.04–0.20 in).
- D. Route the left radiator fan motor lead from where engine is suspended to under the main harness.
- E. Route the starter motor lead, speed sensor lead, sidestand switch lead and oil level switch lead between the clamp and crankcase shift boss. When routing, set the starter motor lead outside. There is no order for placing other leads.
- F. The clamp on the fuel tank drain hose and fuel tank breather hose should be below the engine clamp.
- G. 30–50 mm (1.18–1.97 in)
- H. Route the fuel tank drain hose and fuel tank breather hose through the guide of the sidestand bracket cover. Route the sidestand switch lead from between the guides to inside of the hose.
- I. Route the AC magneto lead between the frame and throttle body and under the hose.
- J. After connecting the connector of the AC magneto lead, put a cover on.
- K. Route the immobilizer lead between the rectifier/regulator bracket and left coupler holder.
- L. To the front left turn signal light.
- M. Route the plastic locking tie through the hole of the rectifier/regulator bracket and fasten the main harness. Face the end of the plastic locking tie outward. Cut off the excess end of the plastic locking tie to 1–5 mm (0.04–0.20 in).
- N. There is no order of setting which harness front or back.
- O. Fold back the radiator fan motor lead (main harness side) toward back of the vehicle as shown in the illustration and insert it into the left coupler holder. The folded part can be either outside or inside of the radiator fan motor lead coupler.
- P. Route the AC magneto lead under the left radiator fan motor lead.
- Q. Fasten the left handle bar switch lead with a plastic locking tie, making sure the left handle bar switch lead is positioned as shown in the illustration.
- R. Inside
- S. Outside
- T. For U49 and California, the coupler is without a bullet terminal, so insertion is unnecessary. Connection point should be the same as for Europe (position shown in this illustration) (this coupler does not exist for Canada).
- U. Couplers to fasten onto the bracket are handlebar switch lead, main switch lead and radiator fan motor lead.

Frame (top view)



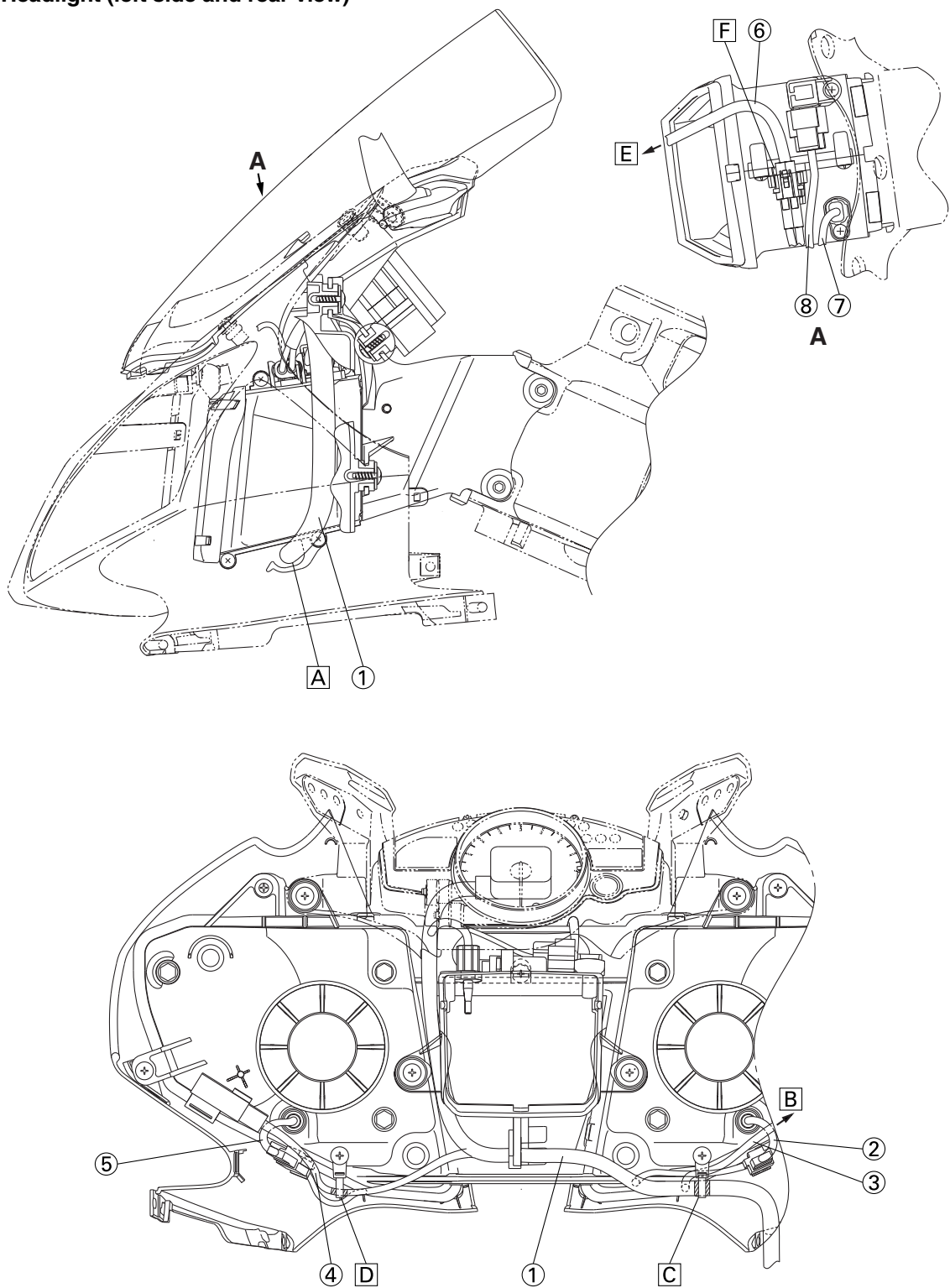
1. Clutch cable
 2. Throttle cable (decelerator cable)
 3. Throttle cable (accelerator cable)
 4. Handlebar switch lead (right)
 5. Radiator cover (right)
 6. Upper side cowling (right)
 7. Coupler holder (right)
 8. Radiator fan motor lead (right)
 9. TPS lead
 10. Throttle servo motor lead
 11. Accelerator position sensor lead
 12. Radiator fan motor lead (left)
 13. Coupler holder (left)
 14. Main switch lead
 15. Handlebar switch lead (left)
 16. Immobilizer unit lead
 17. Radiator plate
 18. Immobilizer unit lead (main switch)
 19. Air induction system cover
 20. Immobilizer unit coupler holder
- A. Route the clutch cable above the cover and from the space next to the right coupler holder to bottom of the vehicle.
- B. Make sure that the throttle cable is not twisted or crossed.
- C. Route the throttle cable along the edge of the protector on the return side of the throttle cable and fit in the clamp on the cable from upper side of the vehicle to the bottom.
- D. To the headlight.
- E. Fasten the headlight harness and right front turn signal light lead at the positioning tape with a clamp.
- F. To the front right turn signal light.
- G. To the radiator.
- H. Fasten the main harness, right radiator fan motor lead, throttle position sensor lead, throttle servo motor lead and accelerator position sensor lead with a plastic locking tie. Face the plastic locking tie to upward and insert it into the hole of the right coupler holder.
- I. Route the right radiator fan motor lead through the inside of the main harness. There is no order for placing the throttle position sensor lead and throttle servo motor lead.
- J. To the engine.
- K. Fasten the main harness and left radiator fan motor lead with a plastic locking tie. Face the tip of the plastic locking tie to upward and insert it into the hole of the left coupler holder.
- L. Route the immobilizer lead under the frame and throttle cable. There is no order for placing the lead.
- M. Face the end of the plastic locking tie inward, route the hole of the rectifier/regulator bracket, then fasten the main harness.
- N. When turning the handle fullest to the right, make sure that the left handlebar switch lead is not strained.
- O. The left handlebar switch lead and main switch lead can either be on top or bottom.
- P. Route the throttle cable through the right side of the rib on the plate above the radiator. Make sure that it is not twisted.
- Q. Fit the tab of the immobilizer lead coupler in the immobilizer unit coupler holder as shown in the illustration and secure it in the air induction system cover.

Frame (top view)



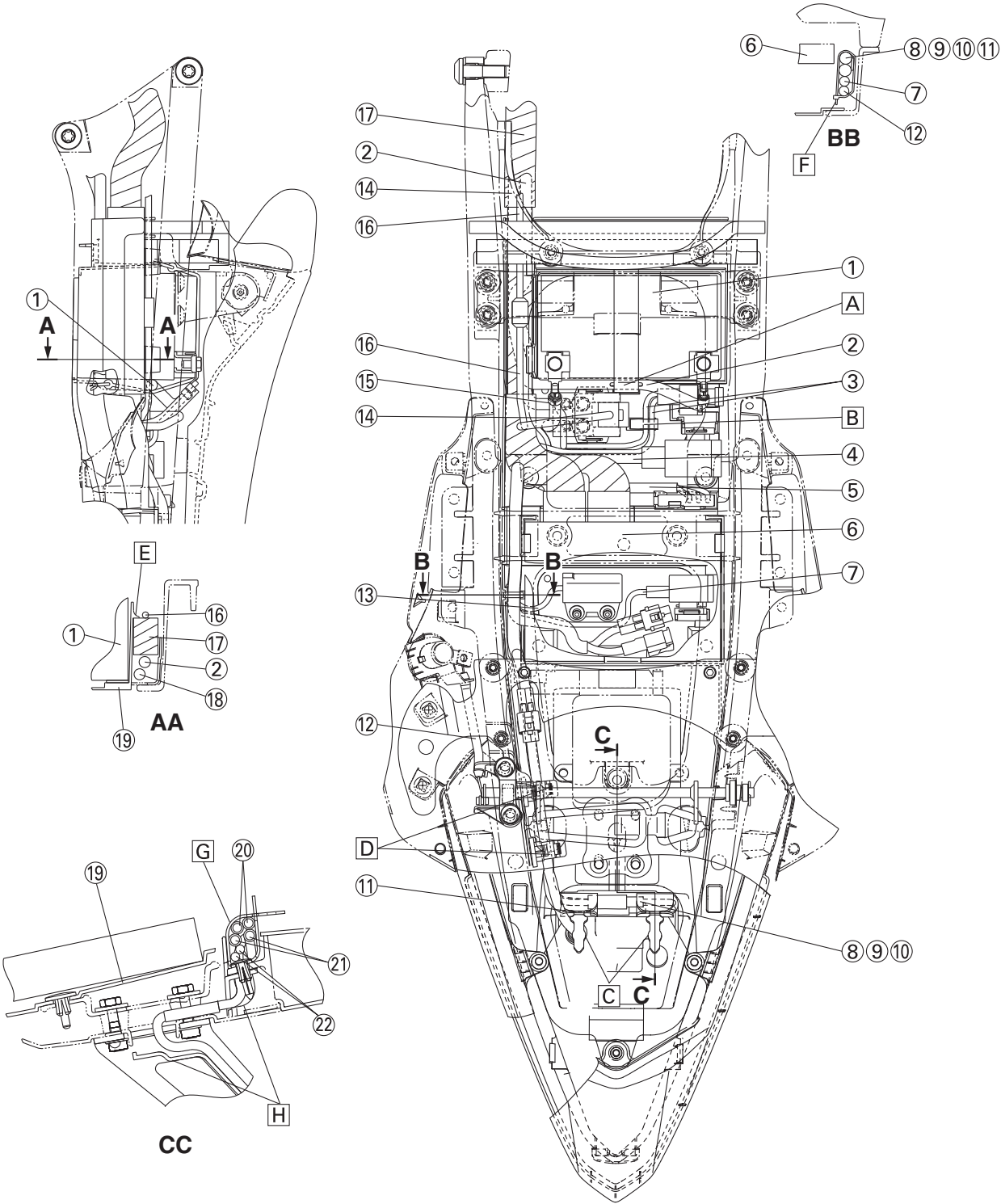
1. Crankshaft position sensor lead
2. Ignition coil lead
3. Throttle body lead
4. Intake funnel servo motor lead
5. Rear brake light switch lead
6. O₂ sensor lead
7. EXUP servo motor lead
8. Neutral switch lead
9. Fuel pump coupler
10. Fuel sender coupler
11. Fuel tank breather hose
12. Fuel tank drain hose
13. Battery negative lead
14. Engine ground lead
15. Sub-wire harness (secondary injector)
16. Oil level switch lead
17. Sidestand switch lead
18. Speed sensor lead
19. Starter motor lead
20. Frame
21. Main harness
 - A. Route the coolant temperature sensor lead above the crankshaft position sensor lead, neutral switch lead, oil level switch lead and speed sensor lead.
 - B. Push the throttle body lead inward and place the ignition coil lead coupler so that it does not overlap or underlap with the throttle body lead coupler.
 - C. The oil level switch lead, speed sensor lead, pickup coil lead coupler and intake funnel servo motor lead coupler should be at inner and under the main harness. There is no order for placing the neutral switch lead.
 - D. Insert the plastic locking tie on the main harness to the hole of the frame securely so that it does not float.
 - E. Route the neutral switch lead between the frame and engine.
 - F. To the rear fender.
 - G. Install both the negative battery lead and engine ground lead to the crankcase with the bolt. There is no order for placing the leads and install so that projection on each lead are facing up. Route the oil level switch lead and speed sensor lead under the negative battery lead and engine ground lead.
 - H. Sub-wire harness (secondary injector) coupler must be under the main harness.
 - I. To the secondary injector.
 - J. To the engine.
 - K. To the coolant temperature sensor.
 - L. To the throttle body.
 - M. Route the sub-wire harness (secondary injector) through the area shown in the illustration. Insert the plastic locking tie from upper part of the frame and direct the remaining part of the tip toward inner side of the vehicle.
 - N. Route each lead under the frame plate. There is no order for placing each lead. Insert the plastic locking tie from upper part of the frame and direct the remaining part of the tip toward inner side of the vehicle.

Headlight (left side and rear view)



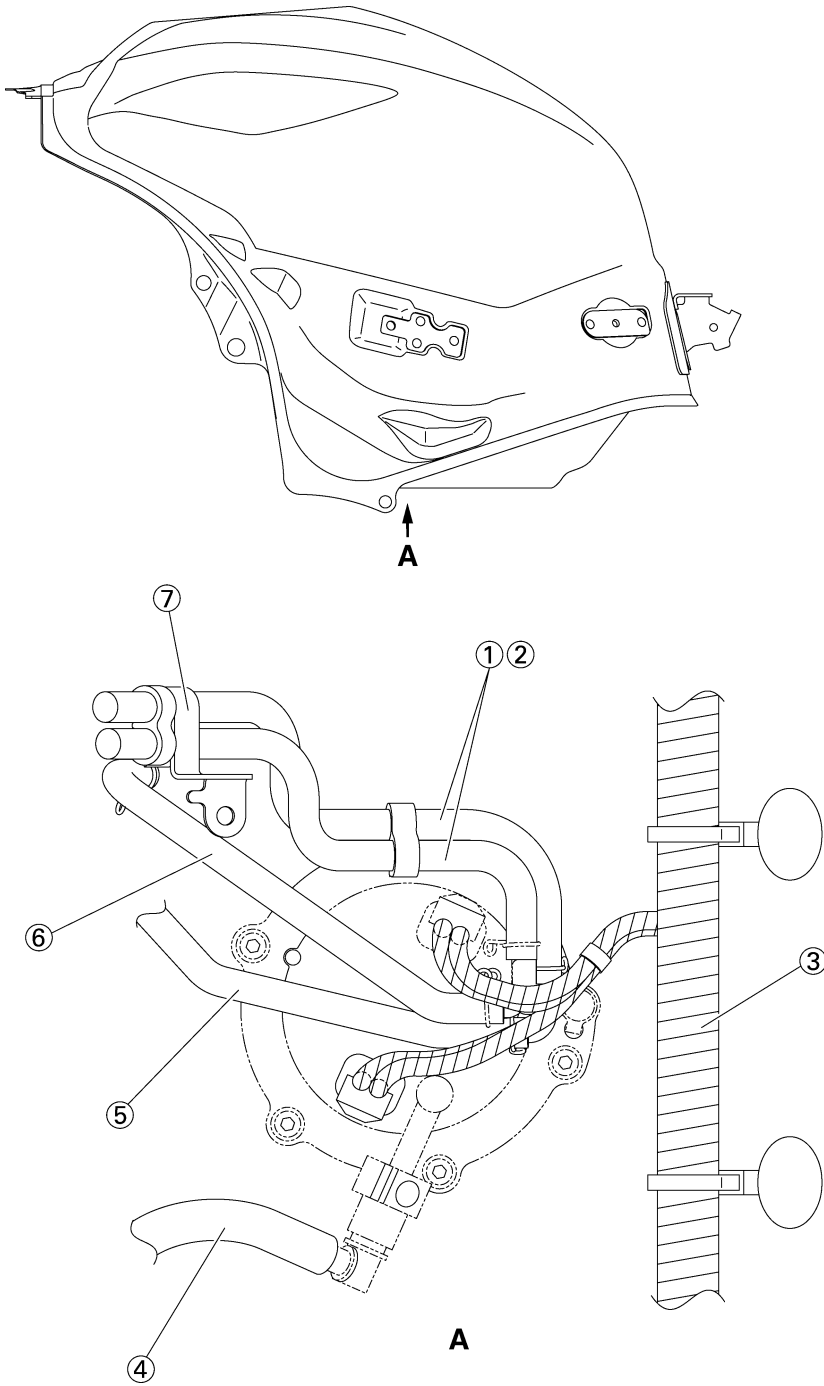
1. Headlight sub-wire harness
2. Headlight lead (low beam)
3. Headlight relay lead (on/off)
4. Headlight relay lead (dimmer)
5. Headlight lead (high beam)
6. Auxiliary light lead
7. Intake air temperature sensor lead
8. Atmospheric pressure sensor lead
- A. Secure the headlight sub-wire harness with the air duct hook.
- B. To the headlight relay (on/off)
- C. Clamp the white tape part on the headlight sub-wire harness.
- D. Clamp the white tape part only on the lead connecting to the headlight relay (dimmer).
- E. To the auxiliary light
- F. Secure the auxiliary light coupler (headlight sub-wire harness side) with the tab of the air duct.

Rear fender (top view)



1. Battery
2. Battery negative lead
3. Main fuse lead
4. Starting circuit cut-off relay lead
5. Fuse box lead
6. ECU (Engine Control Unit)
7. Turn signal relay lead
8. Rear turn signal light lead (left)
9. Rear turn signal light lead (right)
10. License plate light lead
11. Tail/brake light lead
12. Seat lock cable
13. Lean angle sensor lead
14. Starter relay lead
15. Battery positive lead
16. Sidestand switch lead
17. Main harness
18. Starter motor lead
19. Battery box assembly
20. Rear turn signal light connector (left)
21. Rear turn signal light connector (right)
22. License plate light connector
- A. Route the battery negative lead through the inside of the battery band.
- B. Make sure to fit in the main fuse lead to the hook on the battery box assembly.
- C. Wrap the lead cover around the rear left turn signal light leads, rear right turn signal light leads, and license plate light leads. Make sure that the wide portion of each flap of the lead cover is pulled through the hole in the cover.
- D. Fasten the left rear turn signal light lead, right rear turn signal light lead, license plate light lead and tail/brake light lead with a clamp.
- E. Make sure to hook the main harness case to the tab on the battery box assembly. Be careful not to pinch the leads.
- F. When securing each lead with the plastic locking tie, the leads should not touch the ECU (engine control unit). Face the end of the plastic locking tie downward. There is no order for placing each lead.
- G. The connectors may be positioned in any order.
- H. Route the left rear turn signal light lead, right rear turn signal light lead and license plate light lead through the hole of the rib of the rear fender. There is no order for placing each lead.

Fuel tank (left side and bottom view)



1. Fuel tank breather pipe
2. Fuel tank drain pipe
3. Main harness
4. Fuel hoses
5. Fuel tank breather hose
6. Fuel tank drain hose
7. Clamp

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PERIODIC MAINTENANCE

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PERIODIC MAINTENANCE

EAS30022

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.

EAS30614

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	• Check fuel hoses for cracks or damage.		✓	✓	✓	✓	✓
2	* Spark plugs	• Check condition. • Clean and regap.		✓		✓		
		• Replace.			✓		✓	
3	* Valves	• Check valve clearance. • Adjust.	Every 40000 km (24000 mi)					
4	* Fuel injection system	• Adjust synchronization.	✓	✓	✓	✓	✓	✓
5	* Muffler and exhaust pipe	• Check the screw clamp(s) for looseness.	✓	✓	✓	✓	✓	
6	* Air induction system	• Check the air cut-off valve, reed valve, and hose for damage. • Replace any damaged parts if necessary.		✓	✓	✓	✓	✓

EAS30615

GENERAL MAINTENANCE AND LUBRICATION CHART

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	* 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					

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)	
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	* Brake fluid	• Change.	Every 2 years					
7	* Wheels	• Check runout and for damage.		√	√	√	√	
8	* Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
9	* Wheel bearings	• Check bearings for looseness or damage.		√	√	√	√	
10	* Swingarm	• Check operation and for excessive play.		√	√	√	√	
		• Lubricate with lithium-soap-based grease.	Every 50000 km (30000 mi)					
11	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					
12	* Steering bearings	• Check bearing play and steering for roughness.	√	√	√	√	√	
		• Lubricate with lithium-soap-based grease.	Every 20000 km (12000 mi)					
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.		√	√	√	√	
22	* Rear suspension relay arm and connecting arm pivoting points	• Check operation.		√	√	√	√	
23	Engine oil	• Change. • Check oil level and vehicle for oil leakage.	√	√	√	√	√	√
24	Engine oil filter cartridge	• Replace.	√		√		√	
25	* Cooling system	• Check coolant level and vehicle for coolant leakage.		√	√	√	√	√
		• Change coolant.	Every 3 years					

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)	
26	* Front and rear brake switches	• Check operation.	√	√	√	√	√	√
27	Moving parts and cables	• Lubricate.		√	√	√	√	√
28	* Throttle grip	• Check operation. • Check throttle grip free play, and adjust if necessary. • Lubricate cable and grip housing.		√	√	√	√	√
29	* Lights, signals and switches	• 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.

EAS30057

CHECKING THE FUEL LINE

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

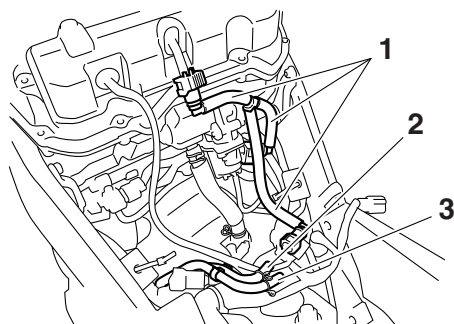
1. Remove:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
2. Check:
 - Fuel hoses "1"
 - Vacuum hoses
 - Overflow hose "2"
 - Breather hose "3"

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

ECA14940

NOTICE

Make sure the fuel tank breather hose is routed correctly.



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

EAS30035

CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

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 7-4.
 - Air induction system solenoid
Refer to "AIR INDUCTION SYSTEM" on page 7-15.
2. Remove:
 - Ignition coils
 - Spark plugs

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.

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



Manufacturer/model
NGK/CR10EK

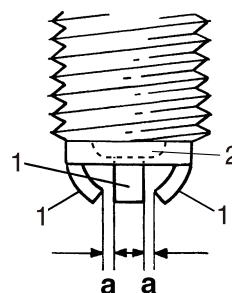
4. Check:
 - Electrode "1"
 - Insulator "2"

Damage/wear → Replace the spark plug.
Abnormal color → Replace the spark plug.
Normal color is medium-to-light tan.
5. Clean:
 - Spark plug
(with a spark plug cleaner or wire brush)
6. Measure:
 - Spark plug gap "a"

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



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



7. Install:
 - Spark plugs
 - Ignition coils



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.

8. Install:

- Air induction system solenoid
Refer to "AIR INDUCTION SYSTEM" on page 7-15.
- Air filter case
Refer to "AIR FILTER CASE" on page 7-4.
- Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS30023

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:

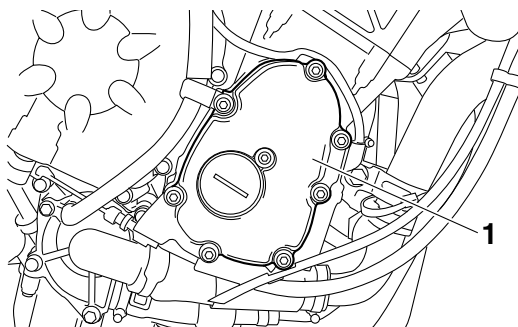
- Rider seat
- Side cowling assembly
Refer to "GENERAL CHASSIS" on page 4-1.
- Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Air filter case
Refer to "AIR FILTER CASE" on page 7-4.
- Throttle body
Refer to "THROTTLE BODIES" on page 7-9.
- Air cut-off valve
Refer to "AIR INDUCTION SYSTEM" on page 7-15.
- Radiator
Refer to "RADIATOR" on page 6-1.

2. Remove:

- Ignition coils
- Spark plugs
- Cylinder head cover
Refer to "CAMSHAFTS" on page 5-11.

3. Remove:

- Pickup rotor cover "1"



4. Measure:

- Valve clearance
Out of specification → Adjust.



Valve clearance (cold)

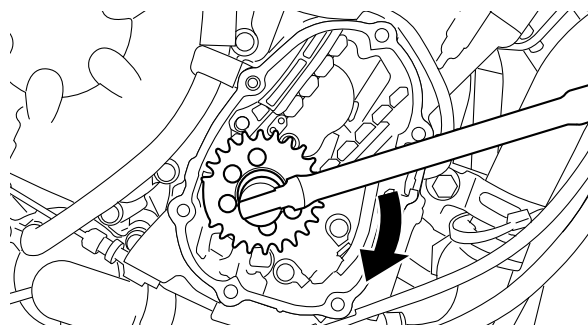
Intake

0.12–0.19 mm (0.0047–0.0075 in)

Exhaust

0.16–0.23 mm (0.0063–0.0091 in)

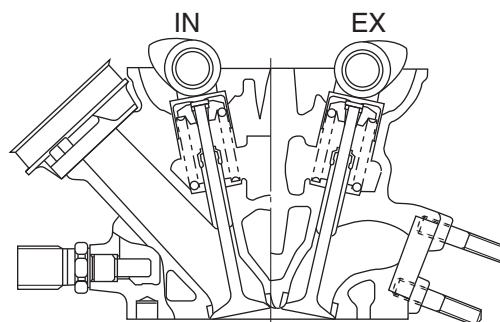
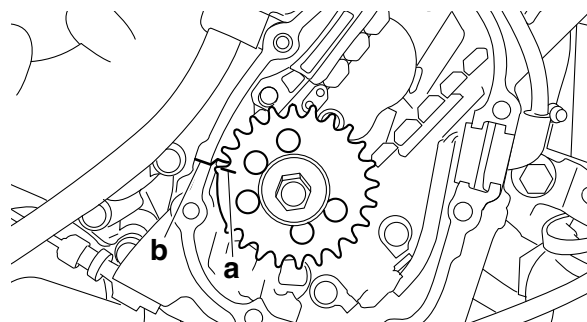
a. Turn the crankshaft clockwise.



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

TIP

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



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

PERIODIC MAINTENANCE

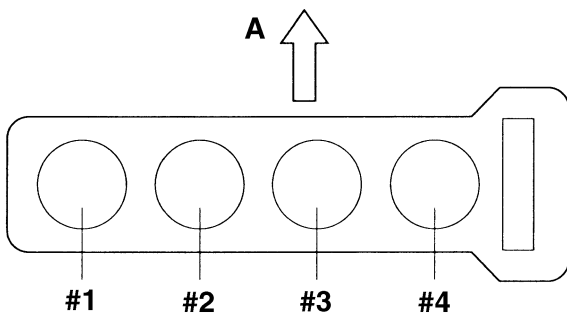
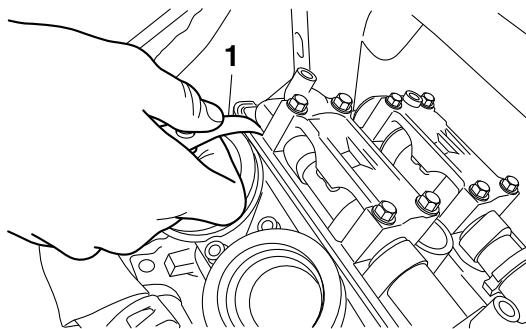


Thickness gauge
90890-03180
Feeler gauge set
YU-26900-9

TIP

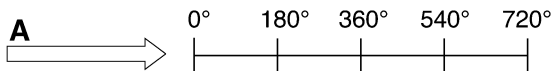
- If the valve clearance is incorrect, note the measured reading.
- Measure the valve clearance in the following sequence.

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



A. Front

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



B	#1	C			
	#2		C		
	#3				C
	#4			C	

A. Degrees that the crankshaft is turned clockwise

- B. Cylinder
C. Combustion cycle

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



5. Remove:
- Camshafts

TIP

- Refer to "CAMSHAFTS" on page 5-11.
- 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



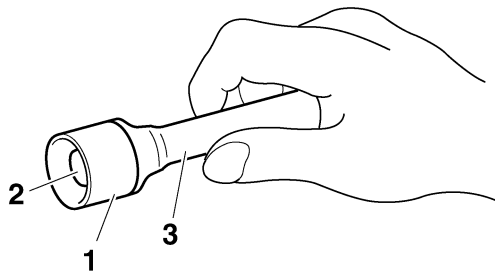
- a. Remove the valve lifter "1" and the valve pad "2" with a valve lapper "3".



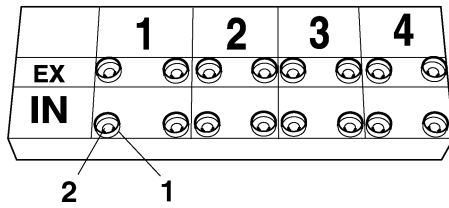
Valve lapper
90890-04101
Valve lapping tool
YM-A8998

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.



PERIODIC MAINTENANCE



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

Example:

Specified valve clearance = 0.11–0.20 mm (0.004–0.008 in)

Measured valve clearance = 0.23 mm (0.009 in)

0.23 mm (0.009 in) – 0.20 mm (0.008 in) = 0.03 mm (0.001 in)

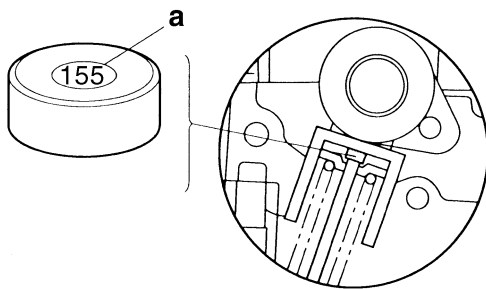
- c. Check the thickness of the current valve pad.

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 (0.061 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 mm (0.061 in) + 0.03 mm (0.001 in) = 1.58 mm (0.062 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

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

TIP

Refer to the following table for the available valve pads.

Valve pad range	Nos. 150–240
Valve pad thickness	1.50–2.40 mm (0.0591–0.0945 in)
Available valve pads	25 thicknesses in 0.05 mm (0.002 in) increments

Example:

Valve pad number = 158

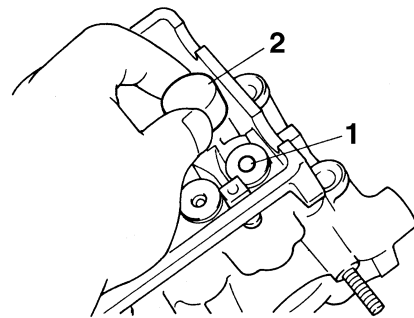
Rounded value = 160

New valve pad number = 160

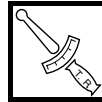
- f. Install the new valve pad “1” and the valve lifter “2”.

TIP

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



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



Camshaft cap bolt (intake and exhaust)
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

- Refer to “CAMSHAFTS” on page 5-11.
- Lubricate the camshaft bearings, camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshaft marks with the camshaft cap marks.

PERIODIC MAINTENANCE

- Turn the crankshaft clockwise several full turns to seat the parts.

- Measure the valve clearance again.
- 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.

EAS30027

SYNCHRONIZING THE THROTTLE BODIES

TIP

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

- Stand the vehicle on a level surface.

TIP

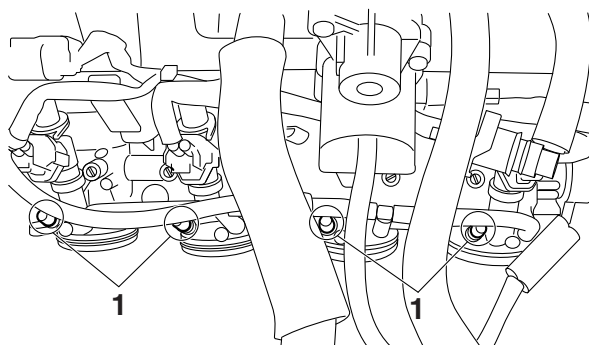
Place the vehicle on a suitable stand.

2. Remove:

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

3. Remove:

- Caps "1"

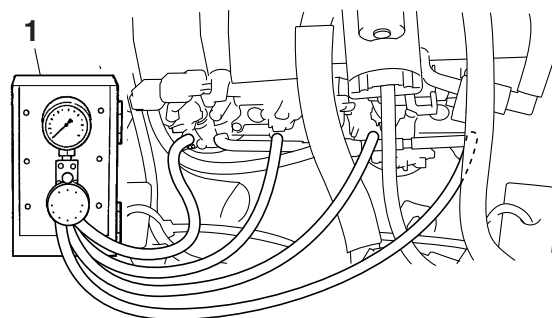


4. Install:

- Vacuum gauge "1"
- Digital tachometer



Vacuum gauge
90890-03094
Vacuummate
YU-44456



5. Install:

- Fuel tank
Refer to "FUEL TANK" on page 7-1.

6. Adjust:

- Throttle body synchronization



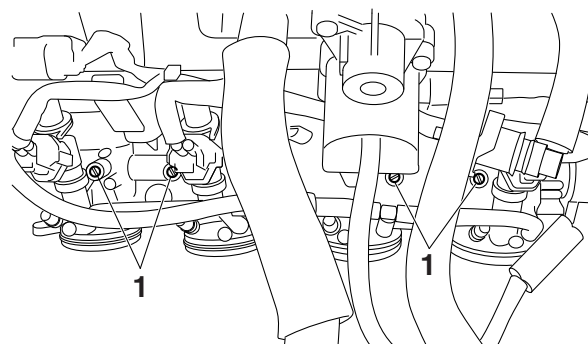
Basic procedure

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



Engine idling speed
1250–1350 r/min

- Turn the bypass air screw "1" with a white paint mark out a little, and then turn it in fully.



- Using the throttle body that has the bypass air screw with a white paint mark as the standard, turn the bypass air screws without white paint marks in or out to adjust the other throttle bodies.

TIP

- If more than one throttle body has a bypass air screw with a white paint mark, use the one with the lowest vacuum pressure as the standard.
- After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.
- If an air screw was removed, turn the screw 3/4 turn in and be sure to synchronize the throttle body.



**Difference in vacuum pressure
between the cylinders**
1.3 kPa (10 mmHg, 0.4 inHg)

TIP

- The difference in vacuum pressure between two throttle bodies should not exceed 1.33 kPa (10 mmHg).
- If you are unable to adjust the throttle body synchronization using this procedure, use the following procedure instead.



Alternate procedure

TIP

Use this alternate procedure if you are unable to adjust the throttle body synchronization using the basic procedure.

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



Engine idling speed
1250–1350 r/min

- Turn all of the bypass air screws in fully.
- Using the throttle body with the lowest vacuum pressure as the standard, turn out the bypass air screws of the other throttle bodies to adjust them.

TIP

- Do not turn out the bypass air screw of the throttle body with the lowest vacuum pressure.
- After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.
- If an air screw was removed, turn the screw 3/4 turn in and be sure to synchronize the throttle body.



**Difference in vacuum pressure
between the cylinders**
1.3 kPa (10 mmHg, 0.4 inHg)

TIP

The difference in vacuum pressure between two throttle bodies should not exceed 1.33 kPa (10 mmHg).



- Stop the engine and remove the measuring equipment.
- Allow the engine to cool, and then start the engine and check that the engine speed does not rise abnormally high.
- Adjust:
 - Throttle cable free play
Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-32.



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

- Install:
 - Caps
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
 - Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS30062

CHECKING THE EXHAUST SYSTEM

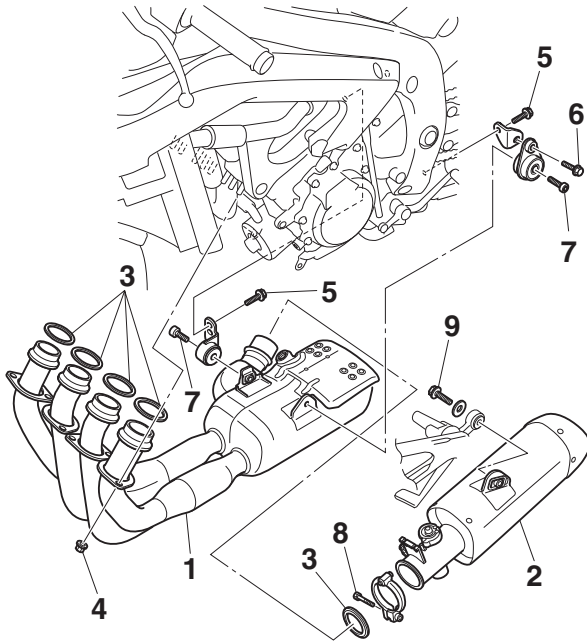
The following procedure applies to all of the exhaust pipe assembly and gaskets.

- Remove:
 - Side cowl assembly
Refer to “GENERAL CHASSIS” on page 4-1.
- Check:
 - Exhaust pipe assembly “1”
 - Muffler “2”
Cracks/damage → Replace.
 - Gaskets “3”
Exhaust gas leaks → Replace.
- Check:
 - Tightening torque
 - Exhaust pipe assembly nuts “4”
 - Exhaust pipe assembly bracket bolts (left upper side and right side) “5”
 - Exhaust pipe assembly bracket bolt (left lower side) “6”
 - Exhaust pipe assembly bolts “7”
 - Muffler clamp bolt “8”
 - Muffler bolt “9”

PERIODIC MAINTENANCE



Exhaust pipe assembly nut
 20 Nm (2.0 m·kgf, 14 ft·lbf)
Exhaust pipe assembly bracket bolt (left upper side and right side)
 30 Nm (3.0 m·kgf, 22 ft·lbf)
LOCTITE®
Exhaust pipe assembly bracket bolt (left lower side)
 34 Nm (3.4 m·kgf, 25 ft·lbf)
Exhaust pipe assembly bolt
 20 Nm (2.0 m·kgf, 14 ft·lbf)
Muffler clamp bolt
 10 Nm (1.0 m·kgf, 7.2 ft·lbf)
Muffler bolt
 20 Nm (2.0 m·kgf, 14 ft·lbf)



4. Install:

- Side cowling assembly
Refer to "GENERAL CHASSIS" on page 4-1.

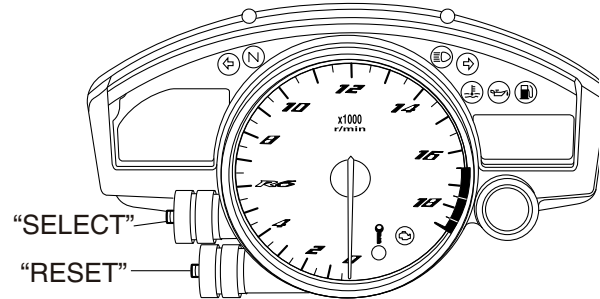
EAS30030

ADJUSTING THE EXHAUST GAS VOLUME

TIP

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

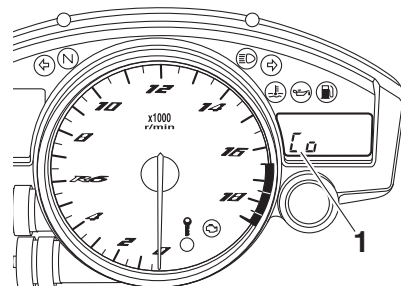
1. Turn the main switch to "OFF".
2. Simultaneously press and hold the "SELECT" and "RESET" buttons, turn the main switch to "ON", and continue to press the buttons for 8 seconds or more.



TIP

- All displays on the meter disappear except the odometer/trip meter/fuel reserve trip meter/stopwatch display.
- "dIAG" appears on the odometer/trip meter/fuel reserve trip meter/stopwatch LCD.

3. Press the "SELECT" button to select the CO adjustment mode "Co" "1" or the diagnostic mode "dIAG".



4. After selecting "Co", simultaneously press the "SELECT" and "RESET" buttons for 2 seconds or more to active the CO adjustment mode.

TIP

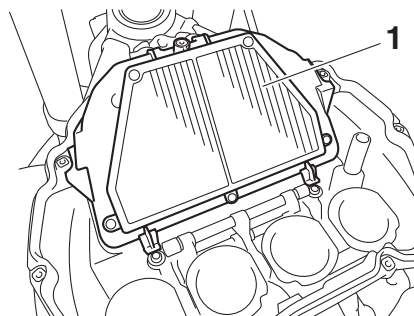
When changing the CO adjustment volume with the engine running, be sure to start the engine after step 4.

5. Press the "SELECT" and "RESET" buttons to select a cylinder "1".

TIP

The selected cylinder number appears on the odometer/trip meter/fuel reserve trip meter/stopwatch LCD.

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



3. Check:
- Air filter element
Damage → Replace.

TIP

- Replace the air filter element every 40000 km (2400 mi) of operation.
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

4. Install:
- Air filter element

- ECA20710

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 body synchronization, leading to poor engine performance and possible overheating.

EAS30627

TIP

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

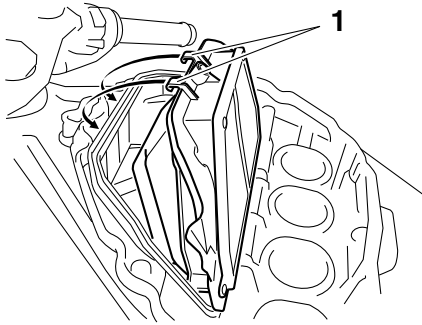
EAS30051

a. Insert the air filter projections “1” “2” into the part of the air filter case “3”.

-

- 3-11**

PERIODIC MAINTENANCE



5. Install:

- Upper air filter case
Refer to "AIR FILTER CASE" on page 7-4.
- Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS30061

CHECKING THE CRANKCASE BREATHER HOSE

1. Remove:

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

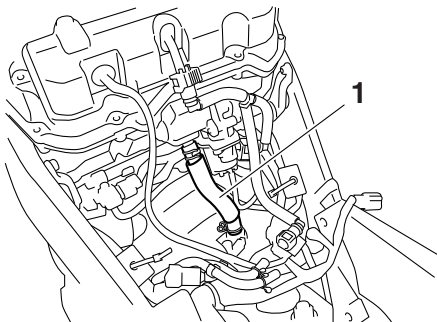
2. Check:

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

ECA13450

NOTICE

Make sure the crankcase breather hose is routed correctly.



3. Install:

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

EAS31089

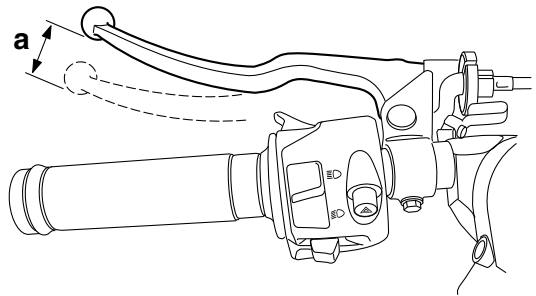
ADJUSTING THE CLUTCH LEVER FREE PLAY

1. Check:

- Clutch lever free play "a"
Out of specification → Adjust.



Clutch lever free play
10.0–15.0 mm (0.39–0.59 in)



2. Adjust:

- Clutch lever free play



Handlebar side

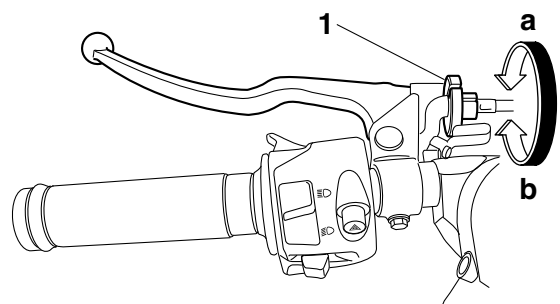
- Turn the adjusting bolt "1" in direction "a" or "b" until the specified clutch lever free play is obtained.

Direction "a"

Clutch lever free play is increased.

Direction "b"

Clutch lever free play is decreased.



TIP

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



Engine side

- Loosen the locknut "1".

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

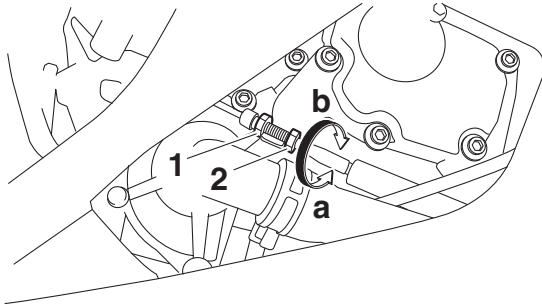
Direction "a"

Clutch lever free play is increased.

Direction "b"

Clutch lever free play is decreased.

- c. Tighten the locknut "1".



EAS30801

CHECKING THE BRAKE OPERATION

1. Check:

- Brake operation
Brake not working properly → Check the brake system.
Refer to "FRONT BRAKE" on page 4-18 and "REAR BRAKE" on page 4-30.

TIP

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

EAS30074

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 specified brake fluid to the proper level.



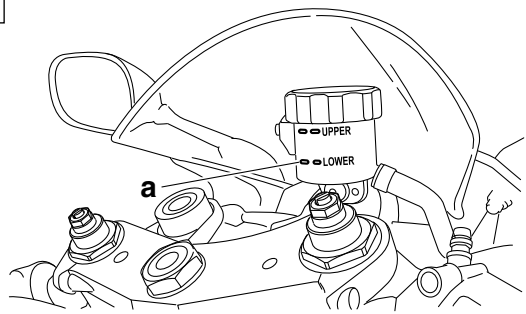
Front brake

Specified brake fluid
DOT 4

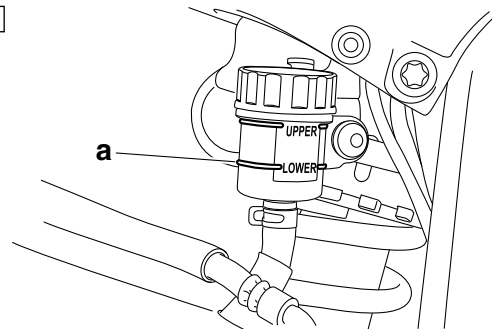
Rear brake

Specified brake fluid
DOT 4

A



B



A. Front brake

B. Rear brake

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

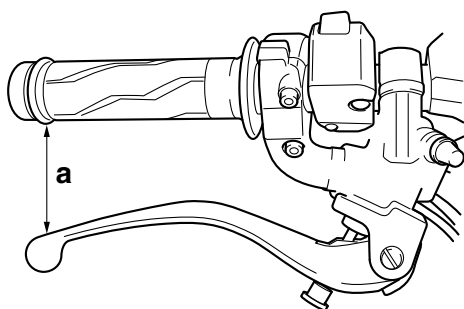
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

EAS30070

ADJUSTING THE FRONT DISC BRAKE

1. Adjust:

- Brake lever position
(distance "a" from the throttle grip to the brake lever)



- Push the brake lever forward.
- Turn the adjusting knob "1" in direction "a" or "b" until the brake lever is in the desired position.

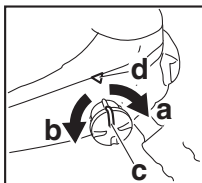
Direction “a”

Brake lever distance is increased.

Direction “b”

Brake lever distance is decreased.

- c. Align the mark “c” on the adjusting knob with the mark “d” on the brake lever.



EWA13050

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.

ECA13490

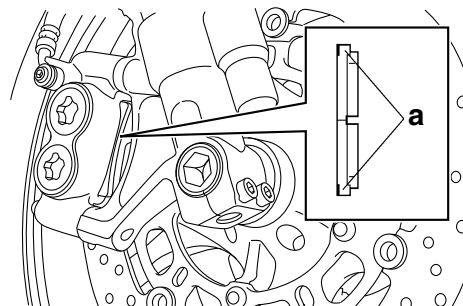
After adjusting the brake lever position, make sure there is no brake drag.

EAS30075

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:



EAS30072

EAS30072

ADJUSTING THE REAR DISC BRAKE

1. Adjust:
 - Brake pedal position

- a. Loosen the locknut "1".
- 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.

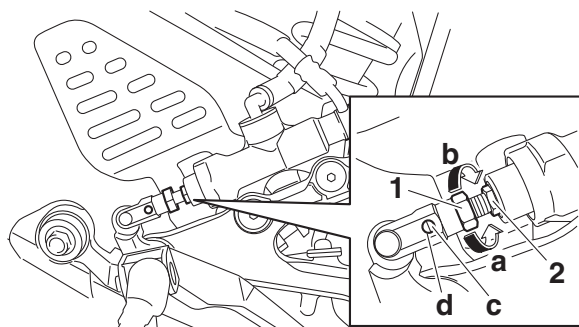
Direction “b”

Brake pedal is lowered.

EWA13070

WARNING

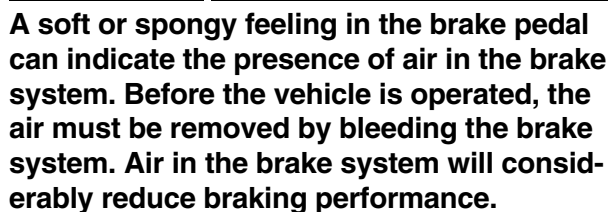
After adjusting the brake pedal position, check that the end of the adjusting bolt “c” is visible through the hole “d”.



- c. Tighten the locknut “1” to specification.

Rear brake pedal adjusting lock-nut

16 Nm (1.6 m·kgf, 12 ft·lbf)



ECA13510

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



2. Adjust:
- Rear brake light switch
- Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH” on page 3-31.

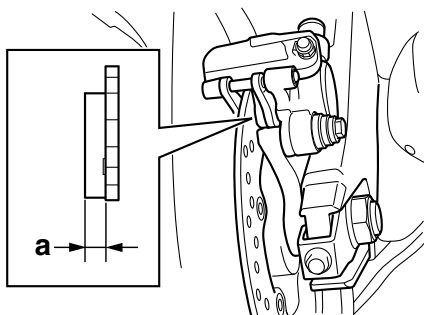
EAS30076

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
 - Rear brake pad
Wear limit “a” reached → Replace the brake pads as a set.
Refer to “REAR BRAKE” on page 4-30.



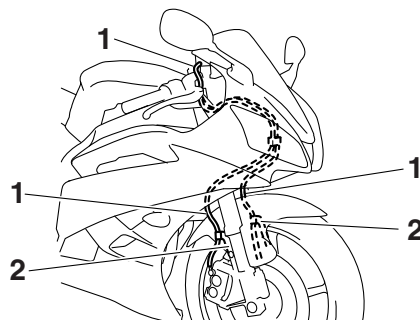
Limit
1.0 mm (0.04 in)



EAS30077

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

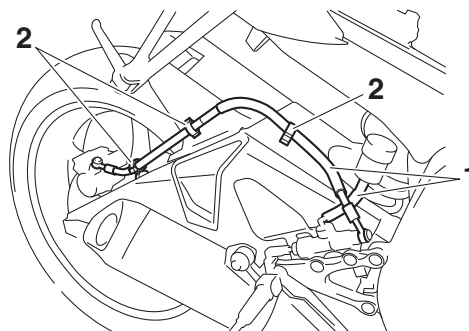
1. Check:
 - Brake hoses “1”
Cracks/damage/wear → Replace.
2. Check:
 - Brake hose holders “2”
Loose → Tighten the holder bolt.



3. Hold the vehicle upright and apply the brake several times.
4. Check:
 - Brake hoses
Brake fluid leakage → Replace the damaged hose.
Refer to “FRONT BRAKE” on page 4-18.

EAS30078

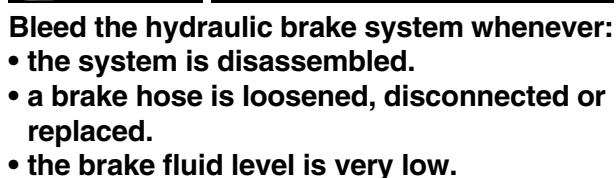
1. Check:
 - Brake hoses “1”
Cracks/damage/wear → Replace.
2. Check:
 - Brake hose holders “2”
Loose connection → Connect.



3. Hold the vehicle upright and apply the brake several times.
4. Check:
 - Brake hoses
Brake fluid leakage → Replace the damaged hose.
Refer to “REAR BRAKE” on page 4-30.

EAS30084

EWA13100



PERIODIC MAINTENANCE

- **brake operation is faulty.**

TIP

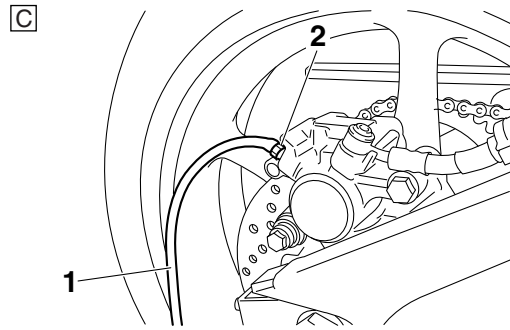
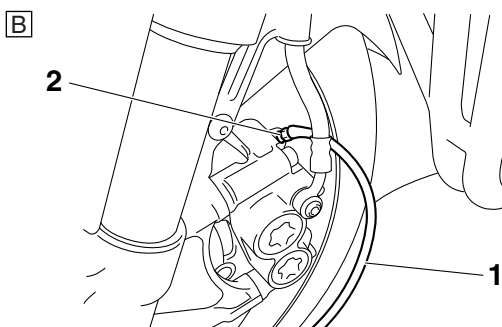
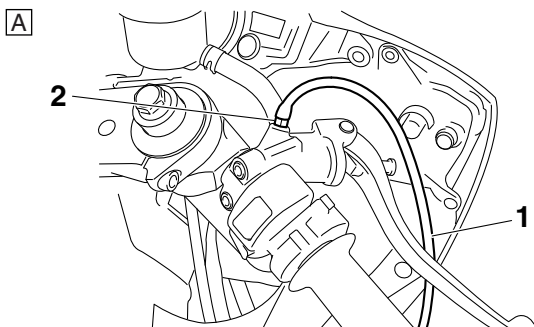
- Be careful not to spill any brake fluid or allow the brake fluid reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening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



- Fill the brake fluid reservoir to the proper level with the specified brake fluid.
- Install the brake fluid reservoir diaphragm.
- Connect a clear plastic hose "1" tightly to the bleed screw "2".



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

TIP

The bleeding order of the front hydraulic brake system is the following:

1. Front brake master cylinder
 2. Front brake calipers
 3. Front brake master cylinder
-
- 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.



Front brake master cylinder bleed screw

6 Nm (0.6 m·kgf, 4.3 ft·lbf)

Brake caliper bleed screw (front and rear)

5 Nm (0.5 m·kgf, 3.6 ft·lbf)

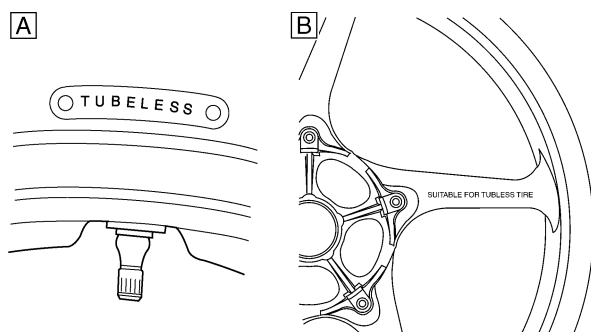
- k. Fill the brake fluid reservoir to the proper level with the specified brake fluid. Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-13.

PERIODIC MAINTENANCE

EWA14080

WARNING

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



A. Tire
B. Wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

EWA14090

WARNING

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



Front tire
Size
120/70 ZR17M/C (58W)
Manufacturer/model
BRIDGESTONE/BT016FF
Manufacturer/model
DUNLOP/Qualifier PTM
(EUR,RUS,ZAF)



Rear tire
Size
180/55 ZR17M/C (73W)
Manufacturer/model
BRIDGESTONE/BT016RF
Manufacturer/model
DUNLOP/Qualifier PTM
(EUR,RUS,ZAF)

EWA13210

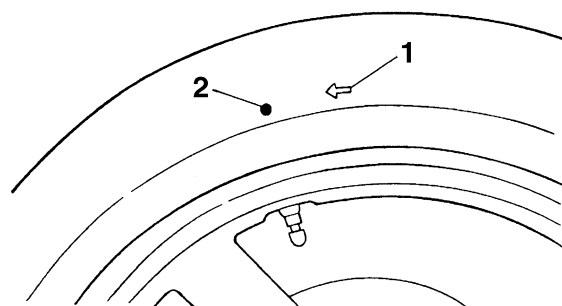
WARNING

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

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.



EAS30641

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 4-8 and "CHECKING THE REAR WHEEL" on page 4-15.

EAS30802

CHECKING THE SWINGARM OPERATION

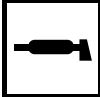
1. Check:
 - Swingarm operation
Swingarm not working properly → Check the swingarm.
Refer to "SWINGARM" on page 4-62.
2. Check:
 - Swingarm excessive play
Refer to "SWINGARM" on page 4-62.

PERIODIC MAINTENANCE

EAS30643

LUBRICATING THE SWINGARM PIVOT

1. Lubricate:
 - Bearings
 - Spacer
 - Dust covers



Recommended lubricant
Lithium-soap-based grease

Refer to "INSTALLING THE SWINGARM" on page 4-65.

EAS30089

ADJUSTING THE DRIVE CHAIN SLACK

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.

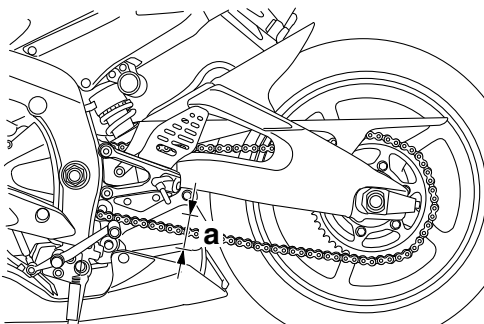
2. Check:
 - Drive chain slack "a"
 Out of specification → Adjust.



Drive chain slack (on a suitable stand)
30.0–45.0 mm (1.18–1.77 in)

TIP

Measure the drive chain slack halfway between the drive axle and the rear wheel axle.



3. Adjust:
 - Drive chain slack

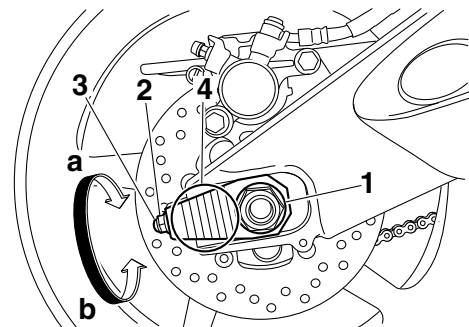


- a. Loosen the wheel axle nut "1".
- b. Loosen both locknuts "2".
- c. Turn both adjusting bolts "3" in direction "a" or "b" until the specified drive chain slack is obtained.

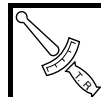
Direction "a"
Drive chain is tightened.
Direction "b"
Drive chain is loosened.

TIP

Using the alignment marks "4" on each side of the swingarm, make sure that both chain pullers are in the same position for proper wheel alignment.



- d. Tighten the wheel axle nut to specification.



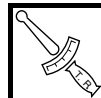
Rear wheel axle nut
110 Nm (11 m·kgf, 80 ft·lbf)

- e. Tighten the drive chain adjusting bolts in direction "a" to specification.



Drive chain adjusting bolt
2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)

- f. Tighten the locknuts to specification.



Drive chain adjusting locknut
16 Nm (1.6 m·kgf, 12 ft·lbf)



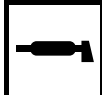
EAS30091

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.

PERIODIC MAINTENANCE

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
Engine oil or chain lubricant
suitable for O-ring chains

EAS30096

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.

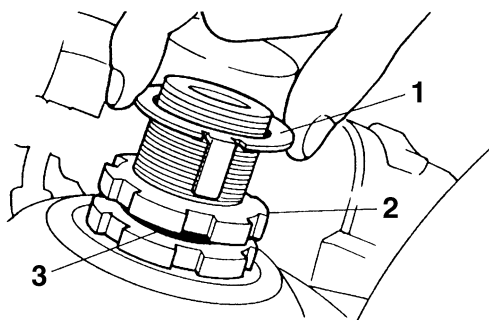
3. Remove:

- Upper bracket
Refer to "STEERING HEAD" on page 4-54.

4. Adjust:

- Steering head

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



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



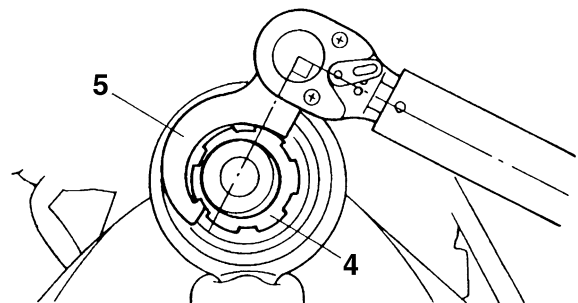
Steering nut wrench
90890-01403
Exhaust flange nut wrench
YU-A9472



Lower ring nut (initial tightening torque)
52 Nm (5.2 m·kgf, 38 ft·lbf)

TIP

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



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

EWA13140



WARNING

Do not overtighten the lower ring nut.

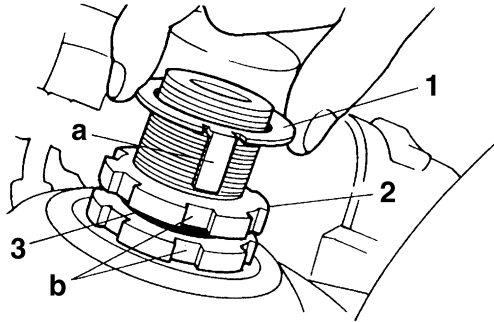


Lower ring nut (final tightening torque)
14 Nm (1.4 m·kgf, 10 ft·lbf)

- 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 4-54.
- e. Install the rubber washer "3".
- f. Install the upper ring nut "2".
- g. Finger tighten the upper ring nut "2", then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
- h. Install the lock washer "1".

TIP

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



5. Install:

- Upper bracket
Refer to "STEERING HEAD" on page 4-54.

EAS30646

LUBRICATING THE STEERING HEAD

1. Lubricate:
 - Upper bearing
 - Lower bearing
 - Bearing cover
 - Lower bearing dust seal



Recommended lubricant
Lithium-soap-based grease

EAS31186

CHECKING THE CHASSIS FASTENERS

Make sure that all nuts, bolts, and screws are properly tightened.
Refer to "CHASSIS TIGHTENING TORQUES" on page 2-17.

EAS30720

LUBRICATING THE LEVERS

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



Recommended lubricant
Lithium-soap-based grease

EAS30721

LUBRICATING THE PEDALS

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



Recommended lubricant
Lithium-soap-based grease

EAS30650

CHECKING THE SIDESTAND

1. Check:
 - Sidestand operation
Check that the sidestand moves smoothly.
Rough movement → Repair or replace.

EAS30117

LUBRICATING THE SIDESTAND

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



Recommended lubricant
Lithium-soap-based grease

EAS30652

CHECKING THE SIDESTAND SWITCH

Refer to "CHECKING THE SWITCHES" on page 8-85.

EAS30099

CHECKING THE FRONT FORK

1. Stand the vehicle on a level surface.

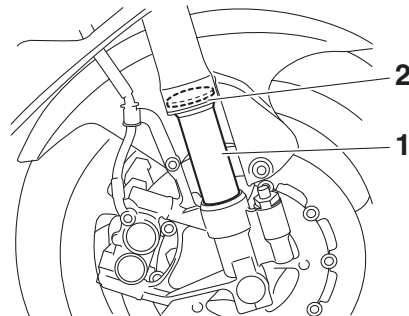
EWA13120



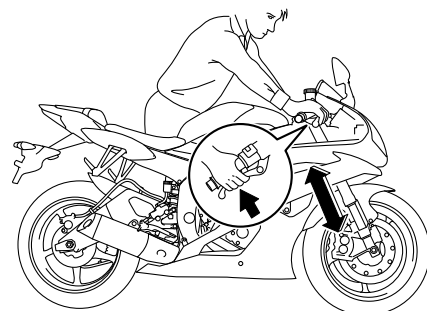
WARNING

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

2. Check:
 - Inner tube "1"
Damage/scratches → Replace.
 - Oil seal "2"
Oil leakage → Replace.



3. Hold the vehicle upright and apply the front brake.
4. Check:
 - Front fork operation
Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
Rough movement → Repair.
Refer to "FRONT FORK" on page 4-45.



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

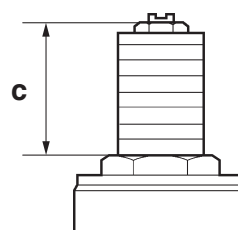
EWA16540

WARNING

- ECA13570

NOTICE

- 



FCA13590

NOTICE

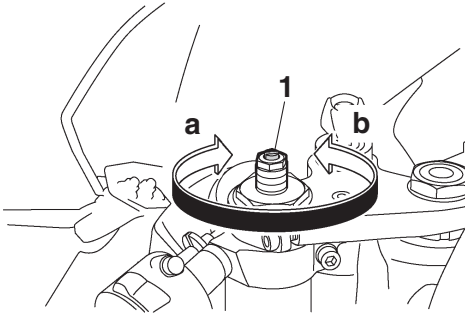


1

PERIODIC MAINTENANCE

TIP

- The adjustment value is the number of clicks that the adjusting screw is turned in direction “b” from the start position.
- The start position is the position with the adjusting screw fully turned in direction “a”.



Compression damping

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:

- Compression damping (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).



Fast compression damping

Adjustment value from the start position (Soft)

5.5

Adjustment value from the start position (STD)

2

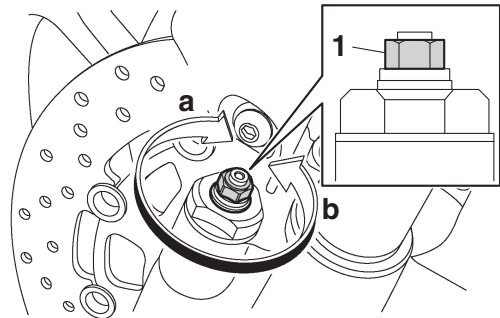
Adjustment value from the start position (Hard)

0

TIP

- The adjustment value is the number of turns that the adjusting bolt is turned in direction “b” from the start position.

- The start position is the position with the adjusting bolt fully turned in direction “a”.



2. Adjust:

- Compression damping (slow compression damping)

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

Direction “a” (turn in)

Compression damping is increased (suspension is harder).

Direction “b” (turn out)

Compression damping is decreased (suspension is softer).



Slow compression damping

Adjustment value from the start position (Soft)

32

Adjustment value from the start position (STD)

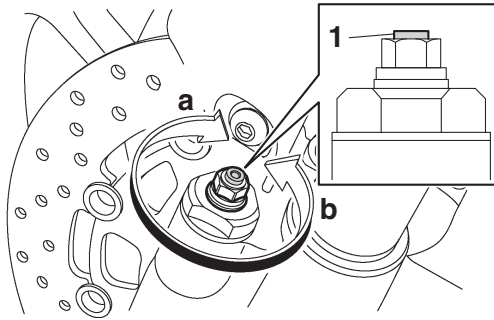
15

Adjustment value from the start position (Hard)

1

TIP

- The adjustment value is the number of clicks that the adjusting bolt is turned in direction “b” from the start position.
- The start position is the position with the adjusting bolt fully turned in direction “a”.



EAS30808

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

Refer to "CHECKING THE REAR SHOCK ABSORBER ASSEMBLY" on page 4-59.

EAS30103

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 the special wrench and wrench handle included in the owner's tool kit.
- b. Turn the adjusting ring "1" in direction "a" or "b".
- c. Align the desired position on the adjusting ring with the position indicator "2".

Direction "a"

Spring preload is increased (suspension is harder).

Direction "b"

Spring preload is decreased (suspension is softer).



Spring preload

Adjustment value (Soft)

1

Adjustment value (STD)

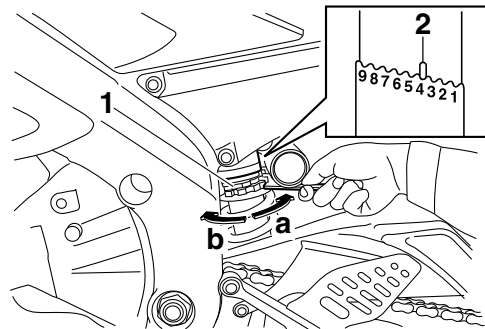
4

Adjustment value (Hard)

9

TIP

The adjustment value is the adjusting ring position number.



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" (turn in)

Rebound damping is increased (suspension is harder).

Direction "b" (turn out)

Rebound damping is decreased (suspension is softer).



Rebound damping

Adjustment value from the start position (Soft)

23

Adjustment value from the start position (STD)

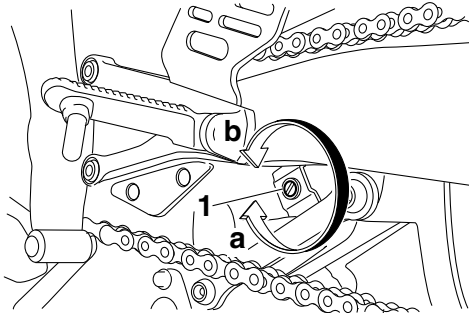
16

Adjustment value from the start position (Hard)

1

TIP

- The adjustment value is the number of clicks that the adjusting screw is turned in direction “b” from the start position.
- The start position is the position with the adjusting screw fully turned in direction “a”.



Compression damping

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:

- Compression damping (fast compression damping)

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

Direction “a” (turn in)
Compression damping is increased
(suspension is harder).
Direction “b” (turn out)
Compression damping is decreased
(suspension is softer).

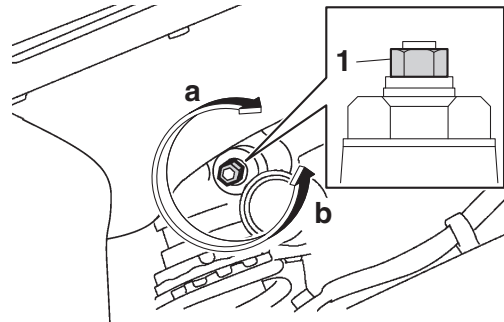


Fast compression damping
Adjustment value from the start position (Soft)
5.5
Adjustment value from the start position (STD)
3
Adjustment value from the start position (Hard)
0

TIP

- The adjustment value is the number of turns that the adjusting bolt is turned in direction “b” from the start position.

- The start position is the position with the adjusting bolt fully turned in direction “a”.



2. Adjust:

- Compression damping (slow compression damping)

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

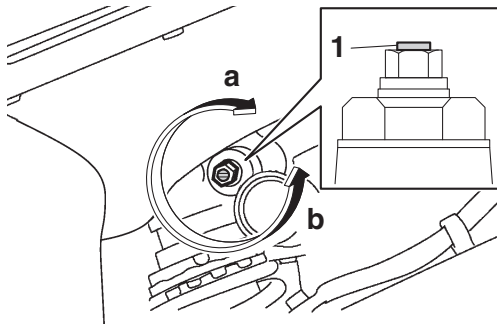
Direction “a” (turn in)
Compression damping is increased
(suspension is harder).
Direction “b” (turn out)
Compression damping is decreased
(suspension is softer).



Slow compression damping
Adjustment value from the start position (Soft)
18
Adjustment value from the start position (STD)
16
Adjustment value from the start position (Hard)
1

TIP

- The adjustment value is the number of clicks that the adjusting screw is turned in direction “b” from the start position.
- The start position is the position with the adjusting screw fully turned in direction “a”.



EAS30809

CHECKING THE CONNECTING ARM AND RELAY ARM

Refer to "CHECKING THE CONNECTING ARM AND RELAY ARM" on page 4-60.

EAS30038

CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

TIP

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

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

3. Remove:

- Dipstick "1"

4. Check:

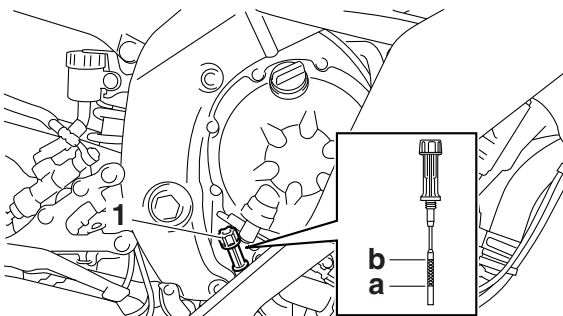
- Engine oil level

The engine oil level should be between the minimum level mark "a" and maximum level mark "b".

Below the minimum level mark → Add the recommended engine oil to the proper level.

TIP

- Before checking the engine oil level, wait a few minutes until the oil has settled.
- Do not screw the dipstick in when inspecting the oil level.



**Recommended brand
YAMALUBE
SAE viscosity grades
10W-40
Recommended engine oil grade
API service SG type or higher,
JASO standard MA**

ECA13361

NOTICE

- Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use engine oils with a grade of "CD" or higher and do not use oils labeled "ENERGY CONSERVING II".
- Do not allow foreign materials to enter the crankcase.

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

6. Check the engine oil level again.

TIP

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

7. Install:

- Dipstick

EAS30039

CHANGING THE ENGINE OIL

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

2. Remove:

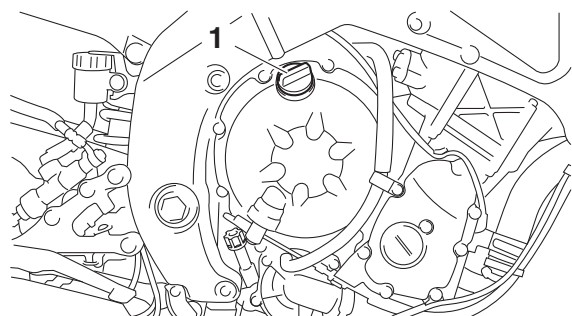
- Side cowling assembly

Refer to "GENERAL CHASSIS" on page 4-1.

3. Place a container under the engine oil drain bolt.

4. Remove:

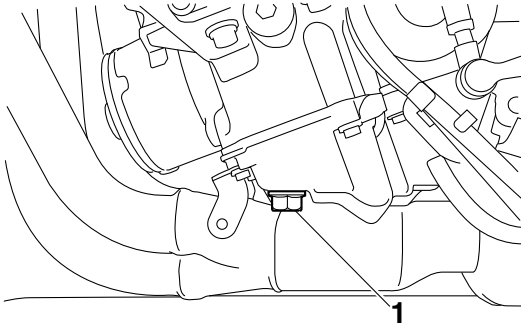
- Engine oil filler cap "1"



5. Remove:

- Engine oil drain bolt "1" (along with the gasket)

PERIODIC MAINTENANCE



6. Drain:

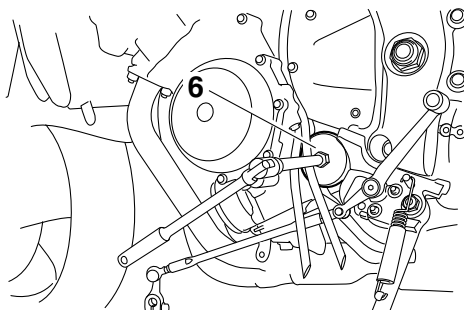
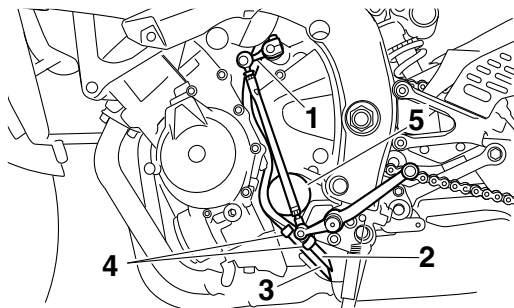
- Engine oil
(completely from the crankcase)

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

- Remove the shift arm "1".
- Pull the fuel tank breather hose "2" and fuel tank overflow hose "3" upward to remove them from the guide "4".
- Remove the oil filter cartridge "5" with an oil filter wrench "6".



Oil filter wrench
90890-01426
Oil filter wrench
YU-38411

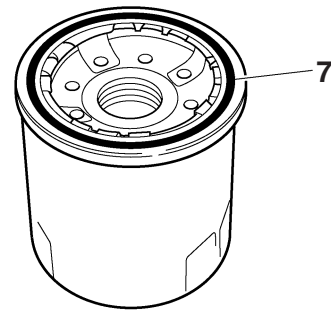


- Lubricate the O-ring "7" of the new oil filter cartridge with a thin coat of engine oil.

ECA23090

NOTICE

Make sure the O-ring "7" is positioned correctly in the groove of the oil filter cartridge.



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

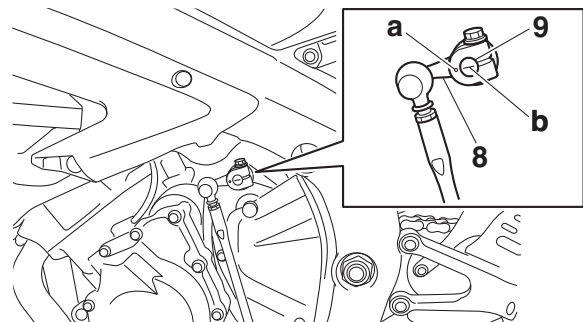


Oil filter cartridge
17 Nm (1.7 m·kgf, 12 ft·lbf)

- Insert the fuel tank breather hose and fuel tank overflow hose into the guide and place them in their original position.
- Install the shift arm "8" by aligning the match mark "a" on the shift arm with the match mark "b" on the shift shaft "9".



Shift arm bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)



8. Check:

- Engine oil drain bolt gasket
Damage → Replace.

9. Install:

- Engine oil drain bolt
(along with the gasket)



Engine oil drain bolt
43 Nm (4.3 m·kgf, 31 ft·lbf)

10.Fill:

- Crankcase
(with the specified amount of the recommended engine oil)



Engine oil quantity
Quantity (disassembled)
 3.40 L (3.59 US qt, 2.99 Imp.qt)
Oil change
 2.40 L (2.54 US qt, 2.11 Imp.qt)
With oil filter removal
 2.60 L (2.75 US qt, 2.29 Imp.qt)

11. Install:
 - Engine oil filler cap
12. Start the engine, warm it up for several minutes, and then turn it off.
13. Check:
 - Engine (for engine oil leaks)
14. Check:
 - Engine oil level
 Refer to "CHECKING THE ENGINE OIL LEVEL" on page 3-26.

EAS30040

MEASURING THE ENGINE OIL PRESSURE

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

ECA13410

NOTICE

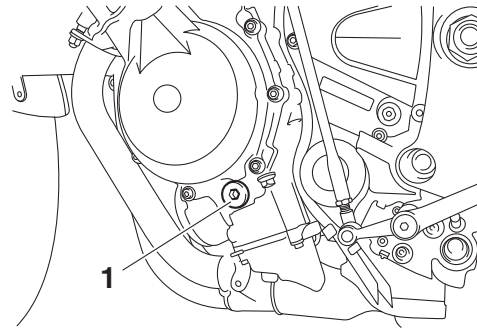
When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

3. Remove:
 - Side cowl assembly
 Refer to "GENERAL CHASSIS" on page 4-1.
4. Remove:
 - Main gallery bolt "1"

EWA12980

WARNING

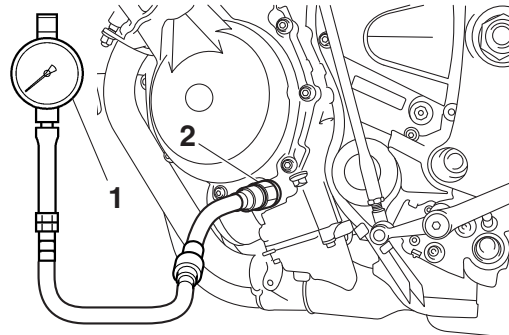
The engine, muffler and engine oil are extremely hot.



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



Oil pressure gauge set
 90890-03120
Oil pressure adapter H
 90890-03139



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



Oil pressure
 40.0 kPa/1300 r/min at 90 °C (5.8 psi/1300 r/min at 194 °F)

Out of specification → Adjust.

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

7. Install:
 - Main gallery bolt



Main gallery bolt
 8 Nm (0.8 m·kgf, 5.8 ft·lbf)

8. Install:

- Side cowl assembly
Refer to "GENERAL CHASSIS" on page 4-1.

EAS30066

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 → Remove the coolant reservoir cap, add the recommended coolant to the proper level.

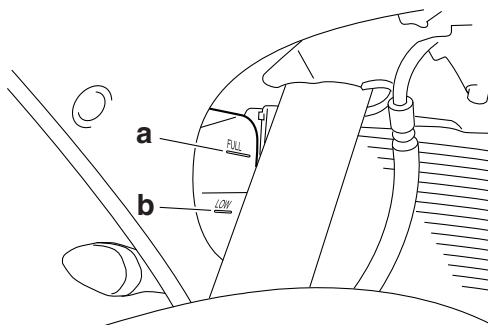
TIP

To access the coolant reservoir cap, remove the right side panel. Refer to "GENERAL CHASSIS" on page 4-1.

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.

EAS30067

CHECKING THE COOLING SYSTEM

1. Remove:

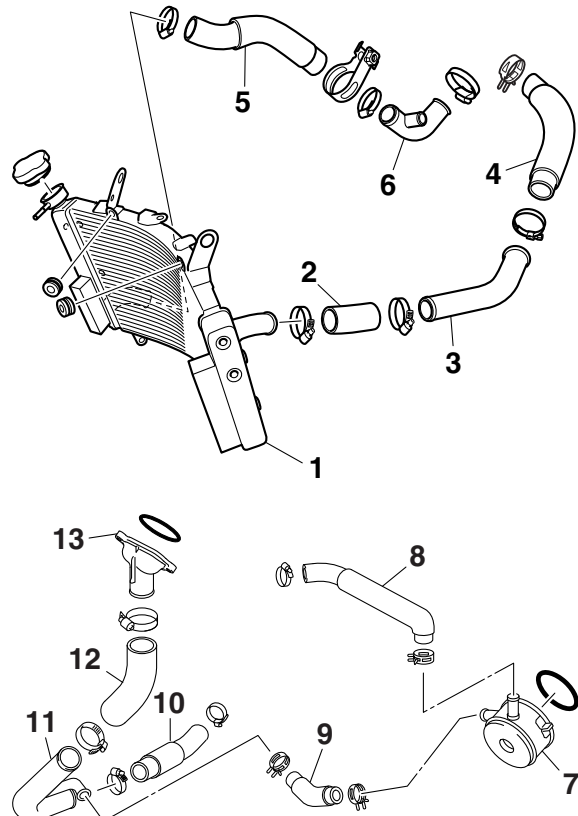
- Side cowl assembly
Refer to "GENERAL CHASSIS" on page 4-1.
- Exhaust pipe assembly
Refer to "ENGINE REMOVAL" on page 5-3.

2. Check:

- Radiator "1"
- Radiator inlet hose "2"
- Radiator inlet pipe "3"
- Thermostat outlet hose "4"
- Radiator outlet hose "5"
- Radiator outlet pipe "6"
- Oil cooler "7"
- Oil cooler outlet hose "8"
- Oil cooler inlet hose "9"
- Water pump outlet hose "10"
- Water pump inlet hose "11"
- Water pump outlet pipe "12"
- Water jacket joint inlet hose "13"

Cracks/damage → Replace.

Refer to and "OIL COOLER" on page 6-5.



3. Install:

- Exhaust pipe assembly
Refer to "ENGINE REMOVAL" on page 5-3.
- Side cowl assembly
Refer to "GENERAL CHASSIS" on page 4-1.

EAS30068

CHANGING THE COOLANT

1. Remove:

- Side panel
- Upper side cowl
- Side cowl assembly

Refer to "GENERAL CHASSIS" on page 4-1.

2. Remove:

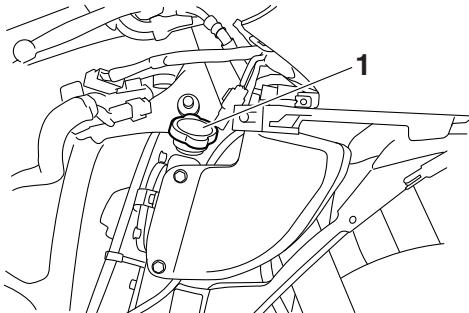
- Radiator cap "1"

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.

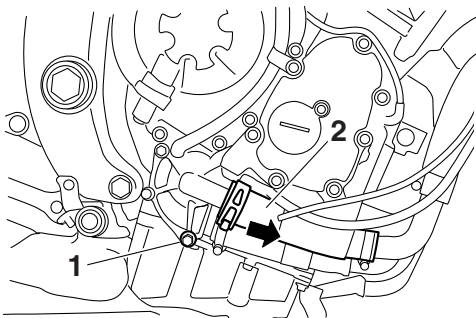


3. Remove:

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

4. Disconnect:

- Water pump inlet hose "2"

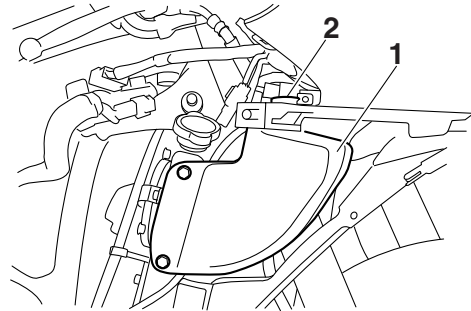


5. Drain:

- Coolant (from the engine and radiator)

6. Remove:

- Coolant reservoir "1"
- Coolant reservoir cap "2"



7. Drain:

- Coolant (from the coolant reservoir)

8. Install:

- Coolant reservoir

9. Connect:

- Water pump inlet hose

10. Install:

- Coolant drain bolt (water pump) (along with the copper washer **New**)



Coolant drain bolt (water pump)
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

11. Fill:

- Cooling system (with the specified amount of the recommended coolant)



Mixing ratio

1:1 (antifreeze:water)

Radiator (including all routes)

2.30 L (2.43 US qt, 2.02 Imp.qt)

Coolant reservoir (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.
- If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.
- If coolant is swallowed, induce vomiting and get immediate medical attention.

EAS30658

EAS30083

EAS30114

EWA13270

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

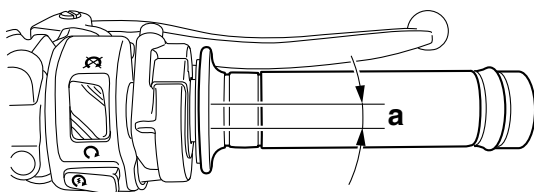


TIP
Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubricating device.

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.

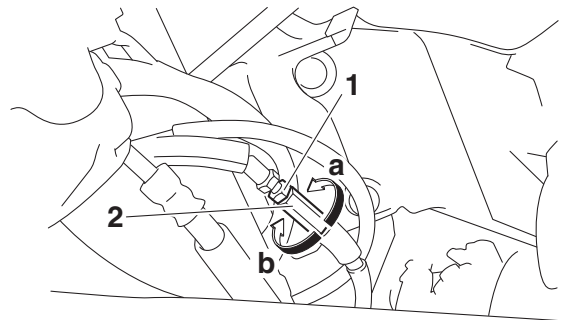
1. Check:
 - Throttle cable free play “a”
Out of specification → Adjust.



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”.



EWA12910

WARNING

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



EAS30663

CHECKING THE SWITCHES, LIGHTS AND SIGNALS

1. Check that all switches operate and that all lights come on.
Refer to “INSTRUMENT AND CONTROL FUNCTIONS” in Owner’s manual.
Faulty → Refer to “CHECKING THE SWITCHES” on page 8-85 and “CHECKING THE BULBS AND BULB SOCKETS” on page 8-87.

EAS30120

CHECKING AND CHARGING THE BATTERY

Refer to “ELECTRICAL COMPONENTS” on page 8-81.

EAS30121

CHECKING THE FUSES

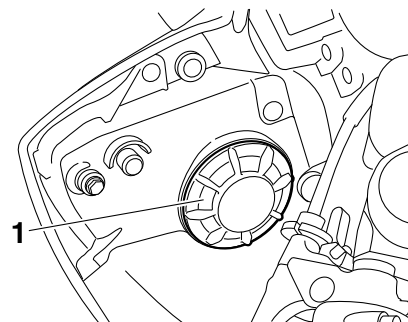
Refer to “ELECTRICAL COMPONENTS” on page 8-81.

EAS30123

REPLACING THE HEADLIGHT BULBS

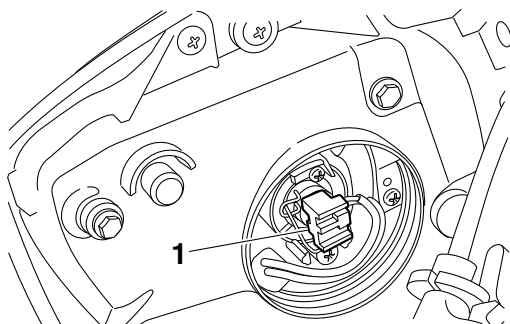
The following procedure applies to both of the headlight bulbs.

1. Remove:
 - Headlight bulb cover “1”

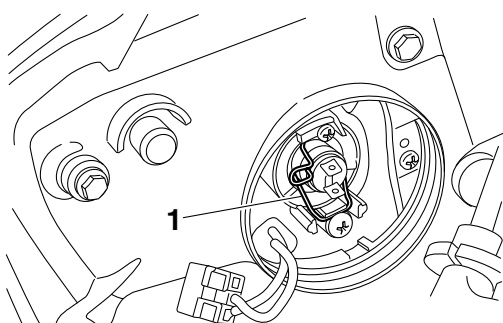


PERIODIC MAINTENANCE

- 2. Disconnect:
 - Headlight coupler “1”



3. Detach:
- Headlight bulb holder “1”



4. Remove:
- Headlight bulb

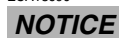
FWA13320



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

5. Install:
- Headlight bulb **New**
Secure the new headlight bulb with the headlight bulb holder.

ECA13690



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

6. Attach:
 - Headlight bulb holder
7. Connect:
 - Headlight coupler
8. Install:
 - Headlight bulb cover

EAS30124

ADJUSTING THE HEADLIGHT BEAMS

The following procedure applies to both of the headlights.

1. Adjust:
 - Headlight beam (vertically)

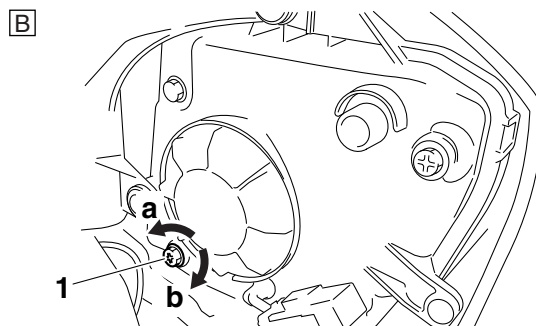
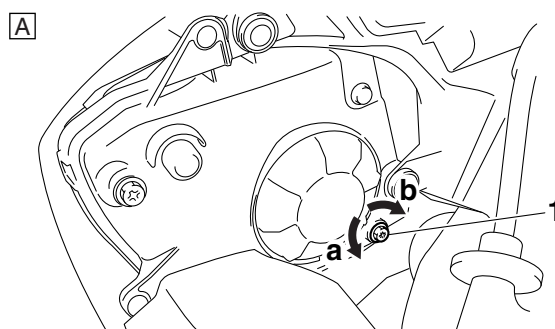
- a. Turn the adjusting screw “1” in direction “a” or “b”.

Direction “a”

Headlight beam is raised.

Direction “b”

Headlight beam is lowered.



A. Headlight (left)

B. Headlight (right)

2. Adjust:
- Headlight beam (horizontally)

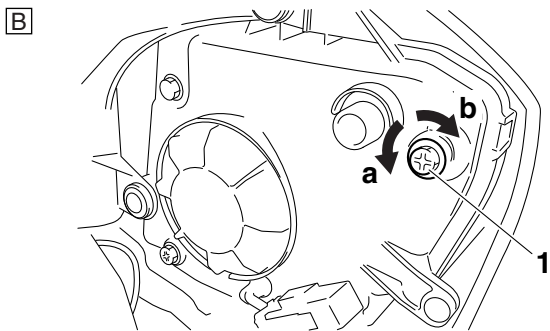
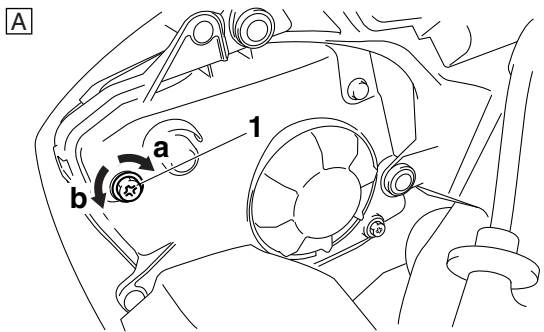
- a. Turn the adjusting screw “1” in direction “a” or “b”.

Direction “a”

Headlight beam moves to the left.

Direction “b”

Headlight beam moves to the right.



- A. Headlight (left)
B. Headlight (right)



CHASSIS

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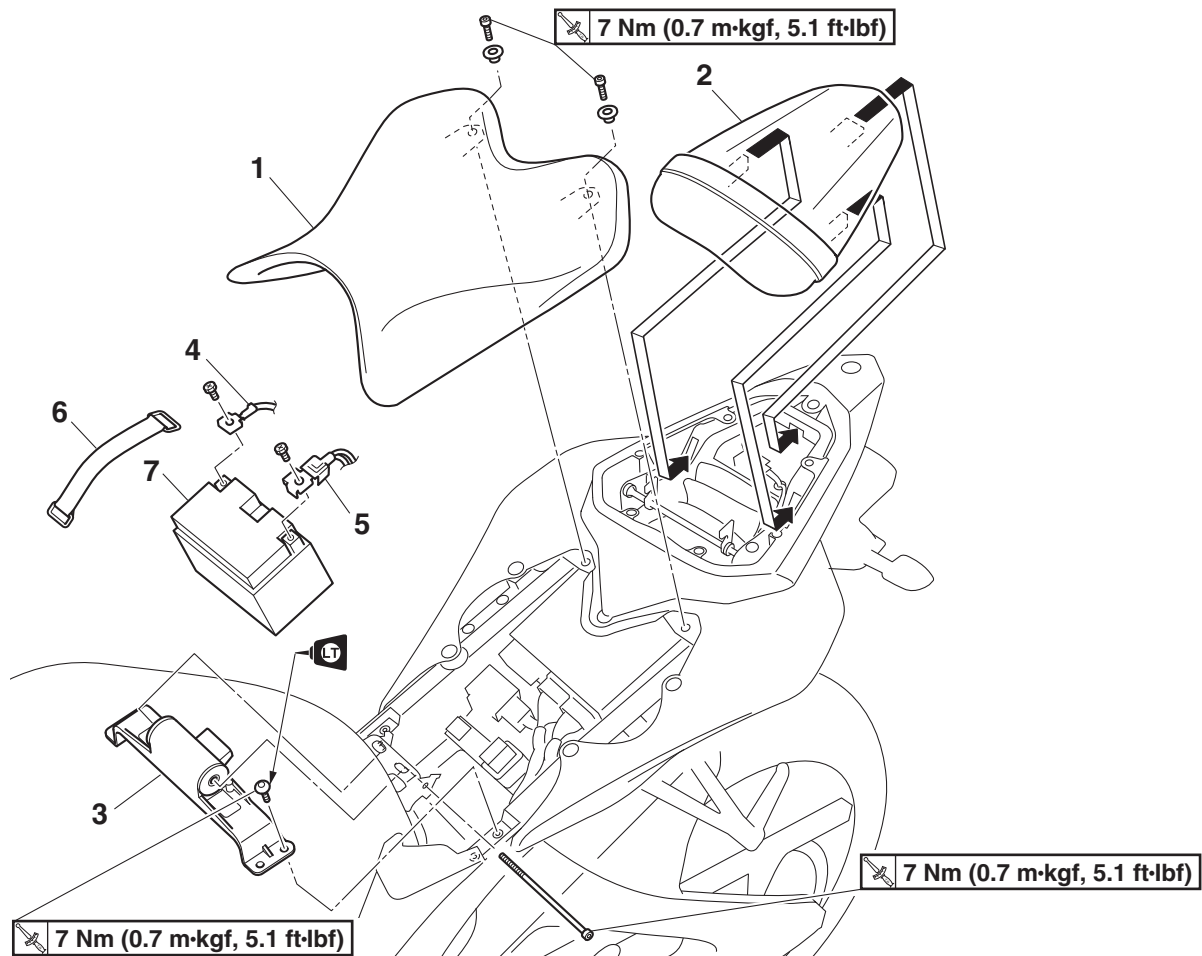
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EAS20026

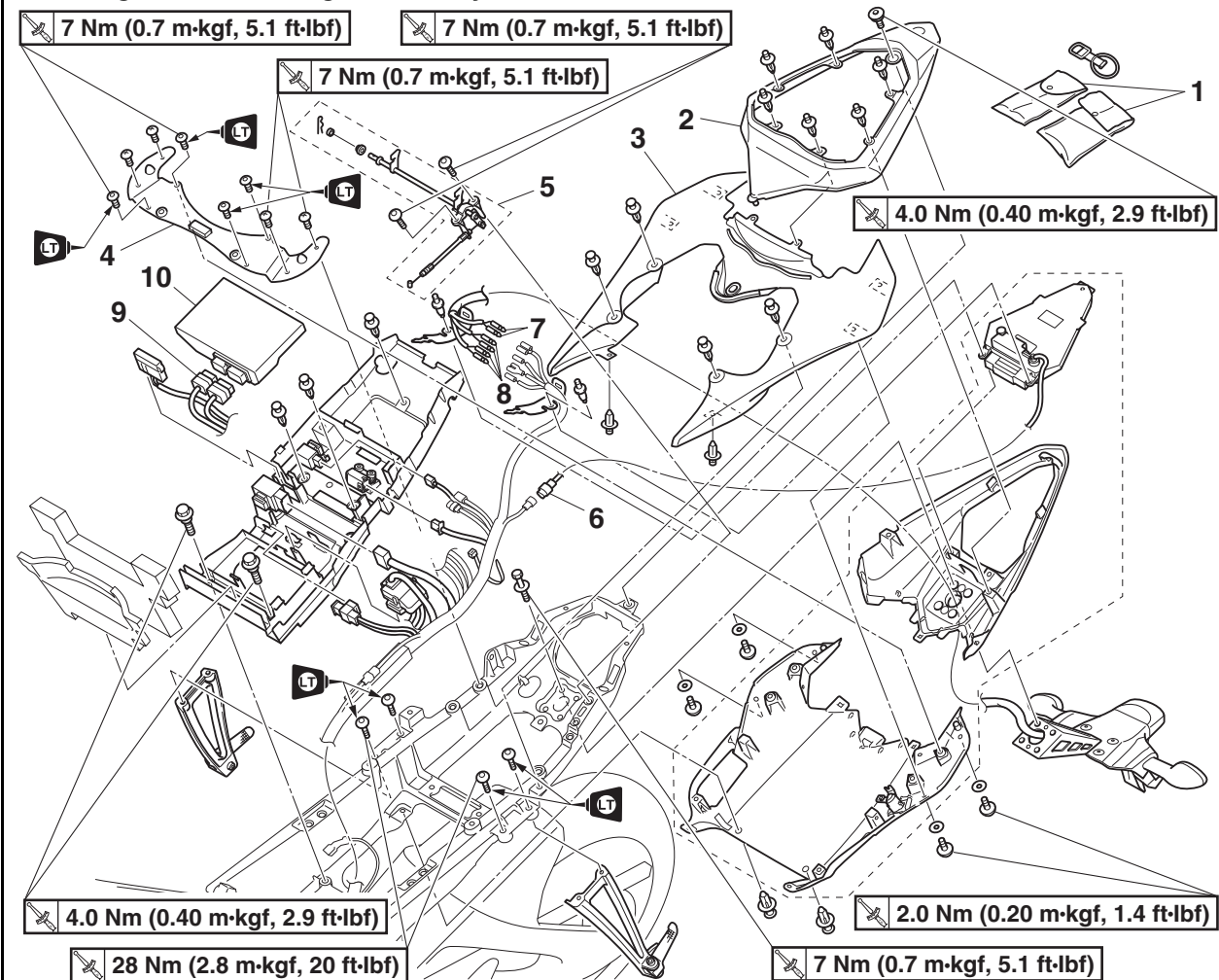
GENERAL CHASSIS

Removing the seat and battery



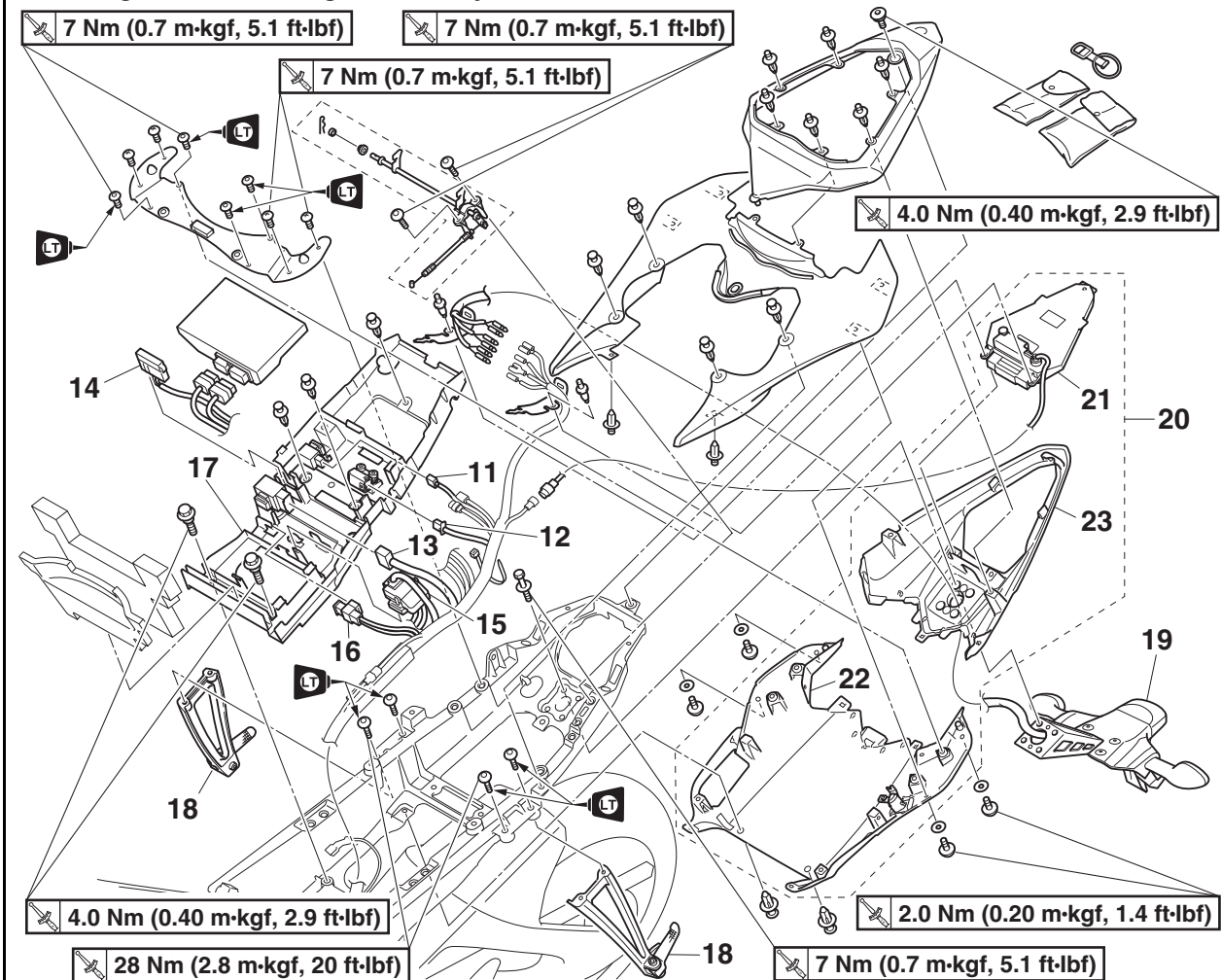
Order	Job/Parts to remove	Q'ty	Remarks
1	Rider seat	1	
2	Passenger seat	1	
3	Fuel tank bracket	1	
4	Battery negative lead	1	Disconnect.
5	Battery positive lead	1	Disconnect.
6	Battery band	1	
7	Battery	1	

Removing the tail/brake light assembly



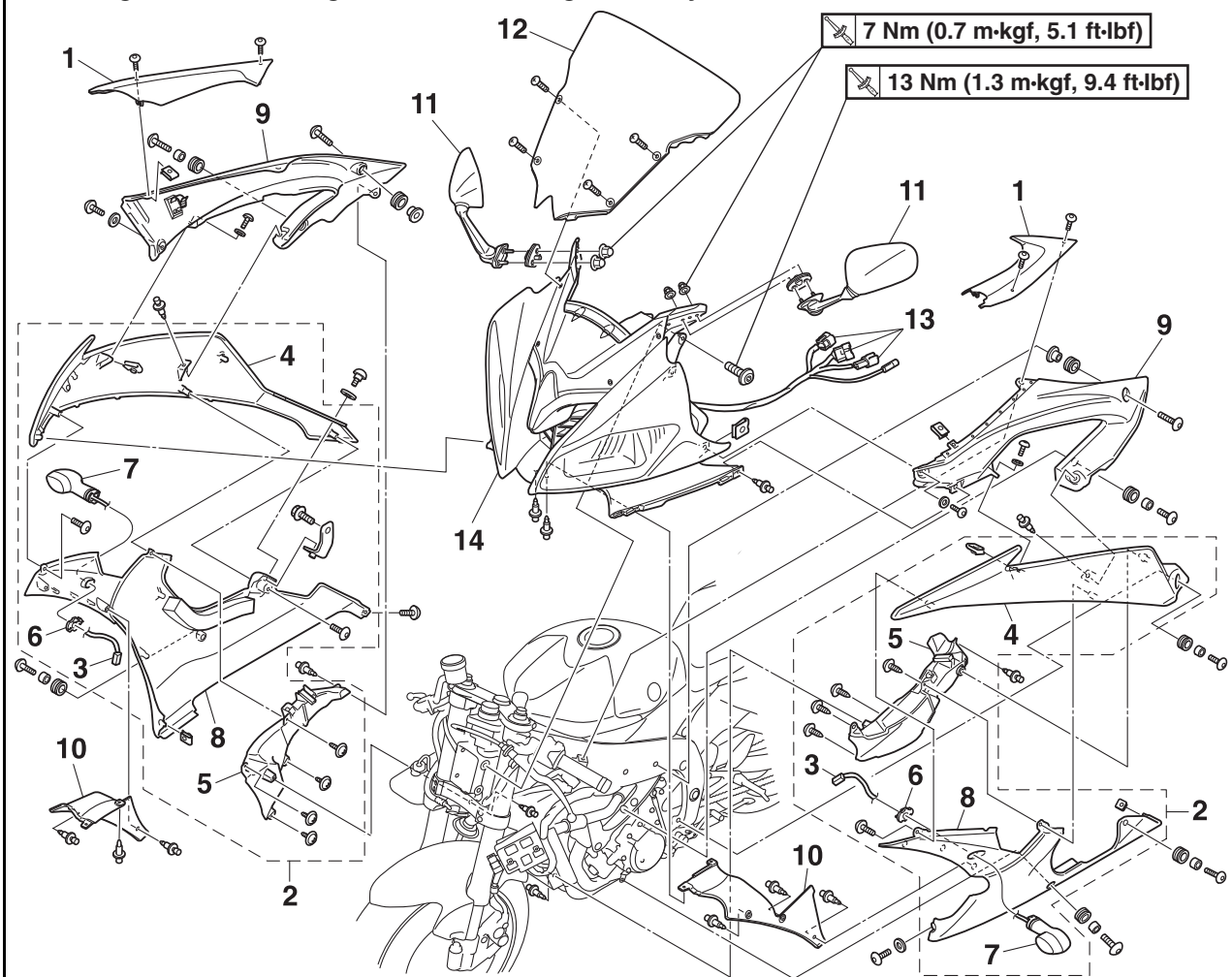
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Passenger seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Owner's tool kit	2	
2	Rear upper cowling cover	1	
3	Rear upper cowling	1	
4	Rear upper cowling damper plate	1	
5	Seat lock assembly	1	
6	Tail/brake light coupler	1	Disconnect.
7	License plate light connector	2	Disconnect.
8	Rear turn signal light connector	4	Disconnect.
9	ECU coupler	2	Disconnect.
10	ECU (Engine Control Unit)	1	

Removing the tail/brake light assembly



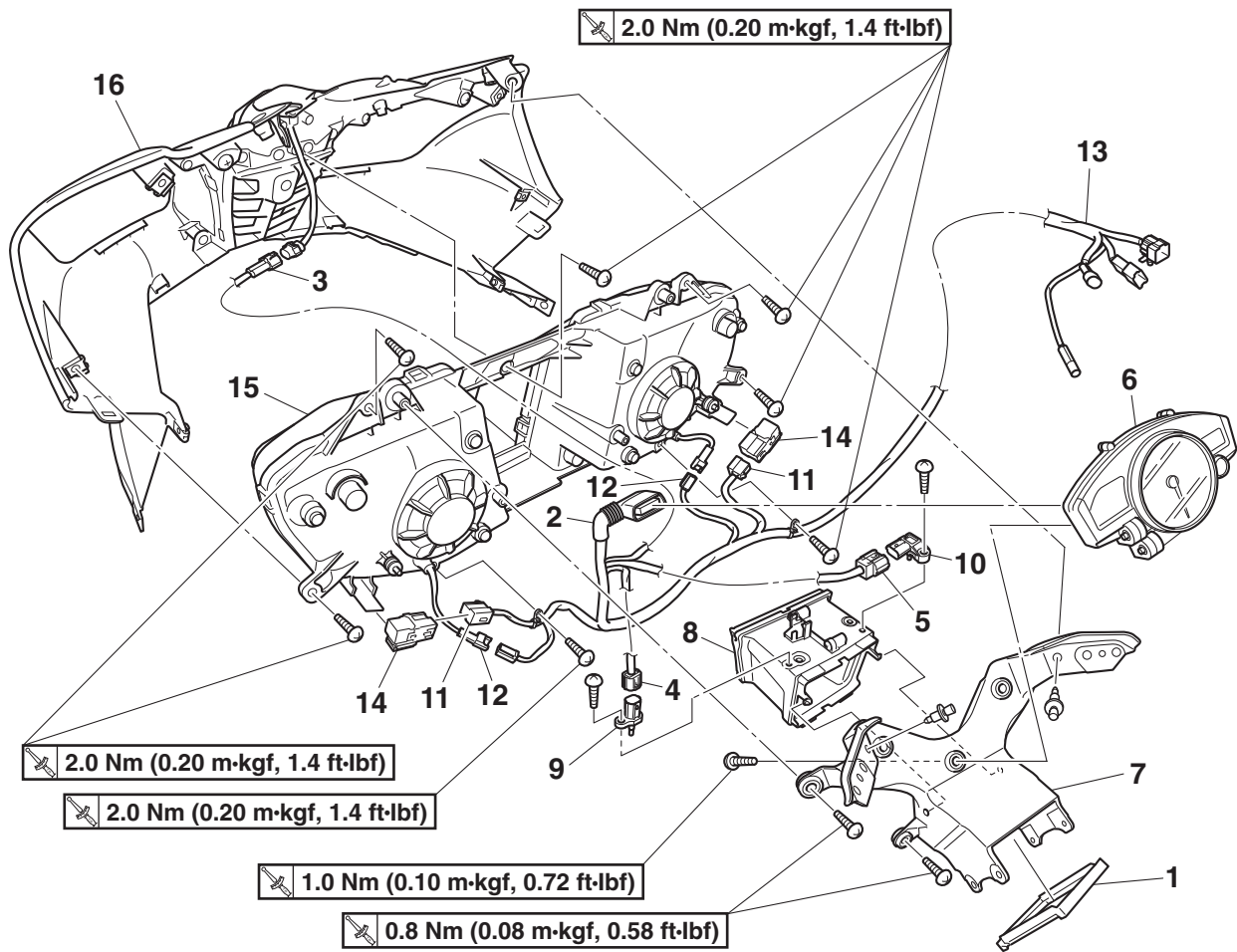
Order	Job/Parts to remove	Q'ty	Remarks
11	Turn signal light relay coupler	1	Disconnect.
12	Lean angle sensor coupler	1	Disconnect.
13	Starting circuit cut-off relay coupler	1	Disconnect.
14	Fuse box	1	
15	Starter relay	1	
16	Main fuse	1	
17	Battery case assembly	1	
18	Passenger footrest	2	
19	License plate light assembly	1	
20	Rear lower cowling assembly	1	
21	Tail/brake light assembly	1	
22	Rear lower cowling	1	
23	Tail/brake light cover	1	

Removing the side cowlings and front cowling assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Side panel	2	
2	Side cowling assembly	2	
3	Front turn signal light coupler	2	Disconnect.
4	Middle side cowling	2	
5	Air intake duct	2	
6	Front turn signal light bracket	2	
7	Front turn signal light	2	
8	Bottom cowling	2	
9	Upper side cowling	2	
10	Bottom cowling inner panel	2	
11	Rearview mirror	2	
12	Windshield	1	
13	Headlight sub-wire harness coupler	3	Disconnect.
14	Front cowling assembly	1	

Removing the front cowling assembly

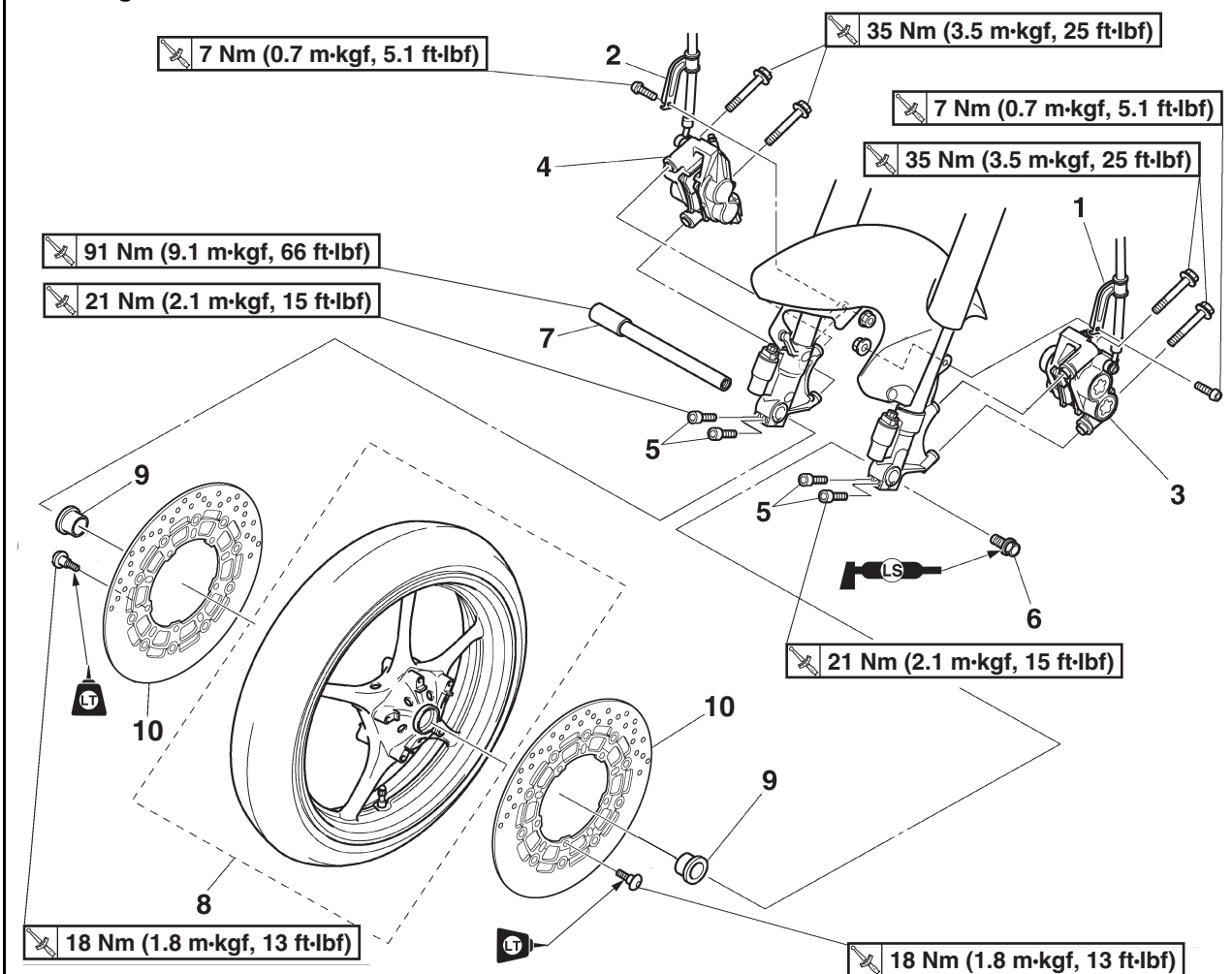


Order	Job/Parts to remove	Q'ty	Remarks
1	Spacer	1	
2	Meter assembly coupler	1	Disconnect.
3	Auxiliary light coupler	1	Disconnect.
4	Intake air temperature sensor coupler	1	Disconnect.
5	Atmospheric pressure sensor coupler	1	Disconnect.
6	Meter assembly	1	
7	Meter bracket	1	
8	Air duct	1	
9	Intake air temperature sensor	1	
10	Atmospheric pressure sensor	1	
11	Headlight relay coupler	2	Disconnect.
12	Headlight coupler	2	Disconnect.
13	Headlight sub-wire harness	1	
14	Headlight relay	2	
15	Headlight assembly	1	
16	Front cowling	1	

EAS20028

FRONT WHEEL

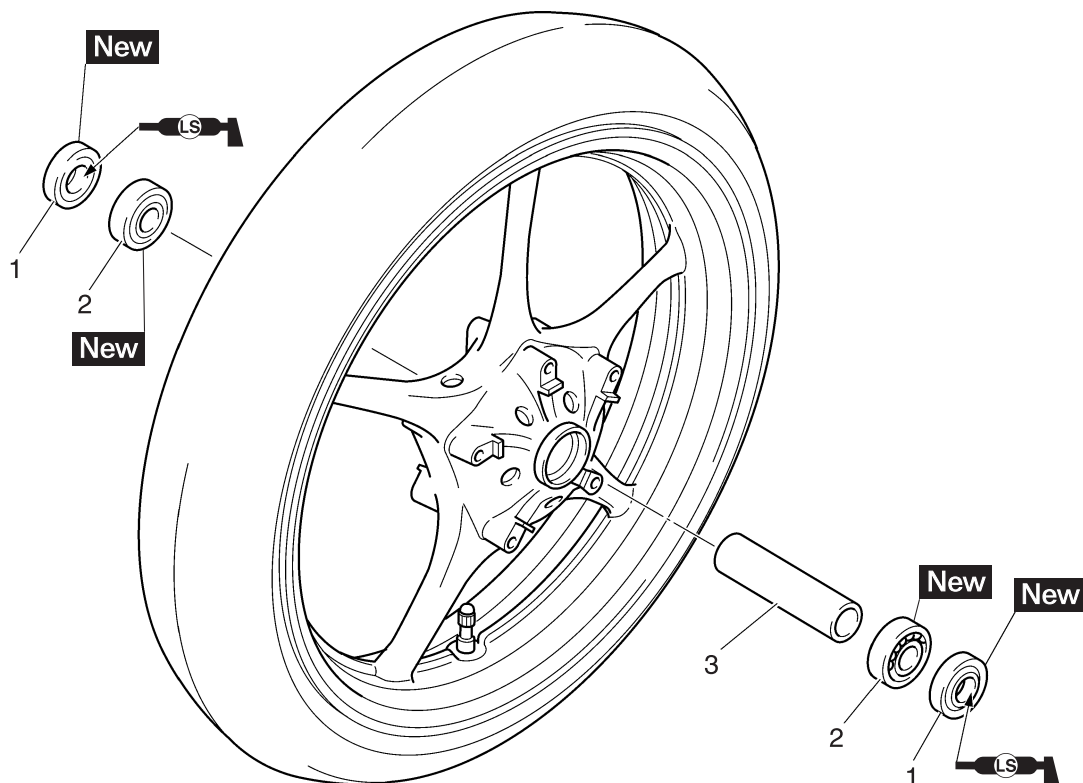
Removing the front wheel and brake discs



Order	Job/Parts to remove	Q'ty	Remarks
1	Front brake hose holder (left)	1	
2	Front brake hose holder (right)	1	
3	Front brake caliper (left)	1	
4	Front brake caliper (right)	1	
5	Front wheel axle pinch bolt	4	Loosen.
6	Front wheel axle bolt	1	
7	Front wheel axle	1	
8	Front wheel	1	
9	Collar	2	
10	Front brake disc	2	

FRONT WHEEL

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	2	
2	Wheel bearing	2	
3	Spacer	1	

EAS30145

REMOVING THE FRONT 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 front wheel is elevated.

2. Remove:

- Brake caliper (left)
- Brake caliper (right)

TIP

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

EAS30146

DISASSEMBLING THE FRONT WHEEL

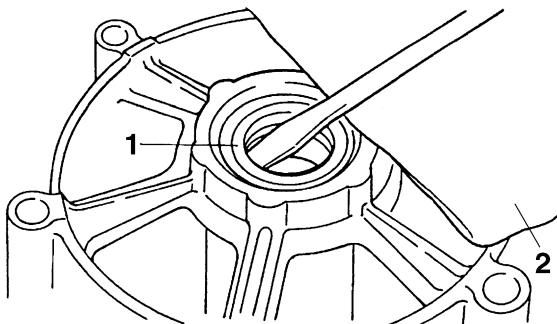
1. Remove:

- Oil seals
- Wheel bearings

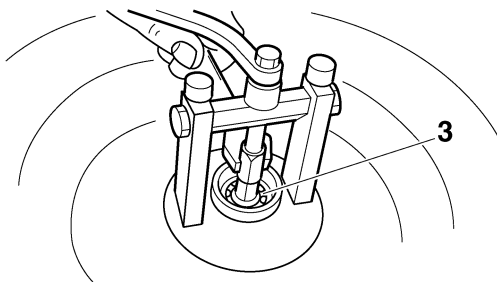
- a. Clean the outside of the front wheel hub.
- b. Remove the oil seals "1" with a flat-head screwdriver.

TIP

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



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



EAS30147

CHECKING THE FRONT WHEEL

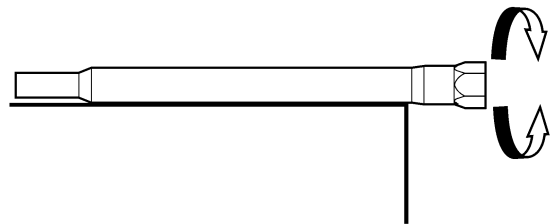
1. Check:

- 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:

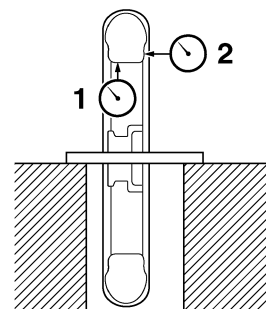
- Tire
- Front wheel
Damage/wear → Replace.
Refer to "CHECKING THE TIRES" on page 3-17 and "CHECKING THE WHEELS" on page 3-17.

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.

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

- ECA18110

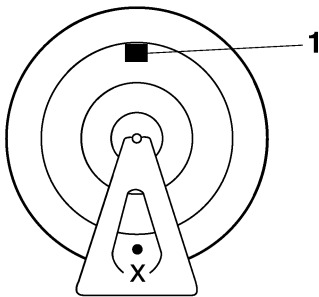
A schematic diagram of a mechanical assembly. A central vertical dashed line indicates a plane of symmetry. At the top, a downward-pointing arrow indicates an applied load. The assembly consists of a central vertical member (1) and two side members (2). These are connected by a horizontal member (4) at the top. The side members (2) are also connected to a base (3) at the bottom. The base (3) is shown as a cross-section of a larger structure.

EAS30152

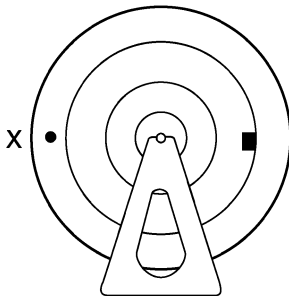
- Front wheel's heavy spot

-
- The figure consists of two side-by-side diagrams. Each diagram shows a target with four concentric circles. A triangular stand is positioned in front of the target. In the left diagram, a point labeled X_1 is marked on the horizontal axis of the target, and a curved arrow indicates a counter-clockwise rotation. In the right diagram, a point labeled X_2 is marked on the vertical axis of the target.

- 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.

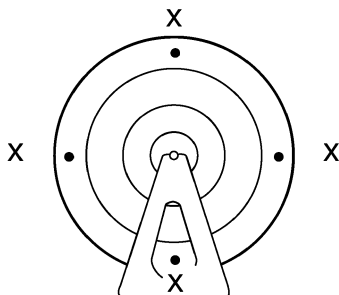


4. Check:

- Front wheel static balance



- a. Turn the front wheel and make sure it stays at each position shown.



- b. If the front wheel does not remain stationary at all of the positions, rebalance it.



EAS31782

CHECKING THE FRONT BRAKE DISCS

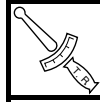
Refer to “CHECKING THE FRONT BRAKE DISCS” on page 4-23.

EAS31327

INSTALLING THE FRONT WHEEL (FRONT BRAKE DISCS)

The following procedure applies to both of the brake discs.

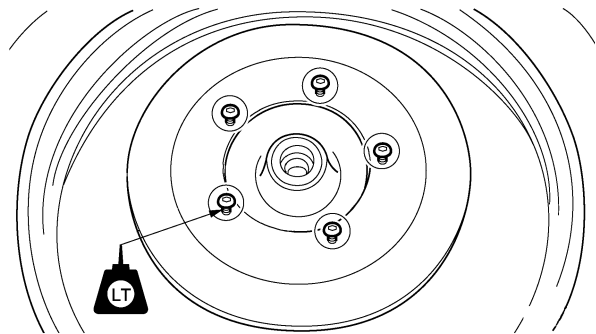
1. Install:
 - Front brake disc



Front brake disc bolt
18 Nm (1.8 m·kgf, 13 ft·lbf)
LOCTITE®

TIP

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



2. Check:

- Front brake discs

Refer to “CHECKING THE FRONT BRAKE DISCS” on page 4-23.

3. Lubricate:

- Oil seal lips



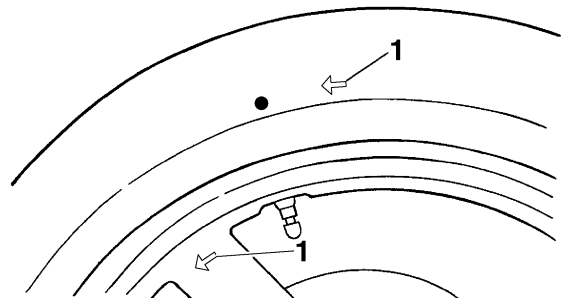
Recommended lubricant
Lithium-soap-based grease

4. Install:

- Front wheel

TIP

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



5. Install:

- Front wheel axle
- Front wheel axle bolt

FRONT WHEEL

- Front wheel axle pinch bolts



Front wheel axle
91 Nm (9.1 m-kgf, 66 ft-lbf)
Front wheel axle pinch bolt
21 Nm (2.1 m-kgf, 15 ft-lbf)

ECA17210

NOTICE

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

TIP

Lubricate the front wheel axle bolt mating surfaces with lithium-soap-based grease.



Front brake caliper bolt
35 Nm (3.5 m·kgf, 25 ft·lbf)

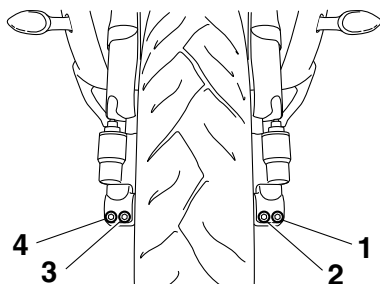
FWA13500



WARNING

Make sure the brake hose is routed properly.

- a. Insert the front wheel axle from the right side and tighten it with the front wheel axle bolt from the left side to 91 Nm (9.1 m·kgf, 66 ft·lbf) without performing temporary tightening.
- b. In the order 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.
- c. Check that the right end of the front wheel axle is flush with the front fork. If necessary, manually push the front wheel axle or lightly tap it with a soft hammer until its end is flush with the front fork. However, if the surface of the front wheel axle end is not parallel to the surface of the front fork, align a point on the outer edge of the axle with the fork, making sure that the axle does not protrude past the fork.
- d. In the order 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.

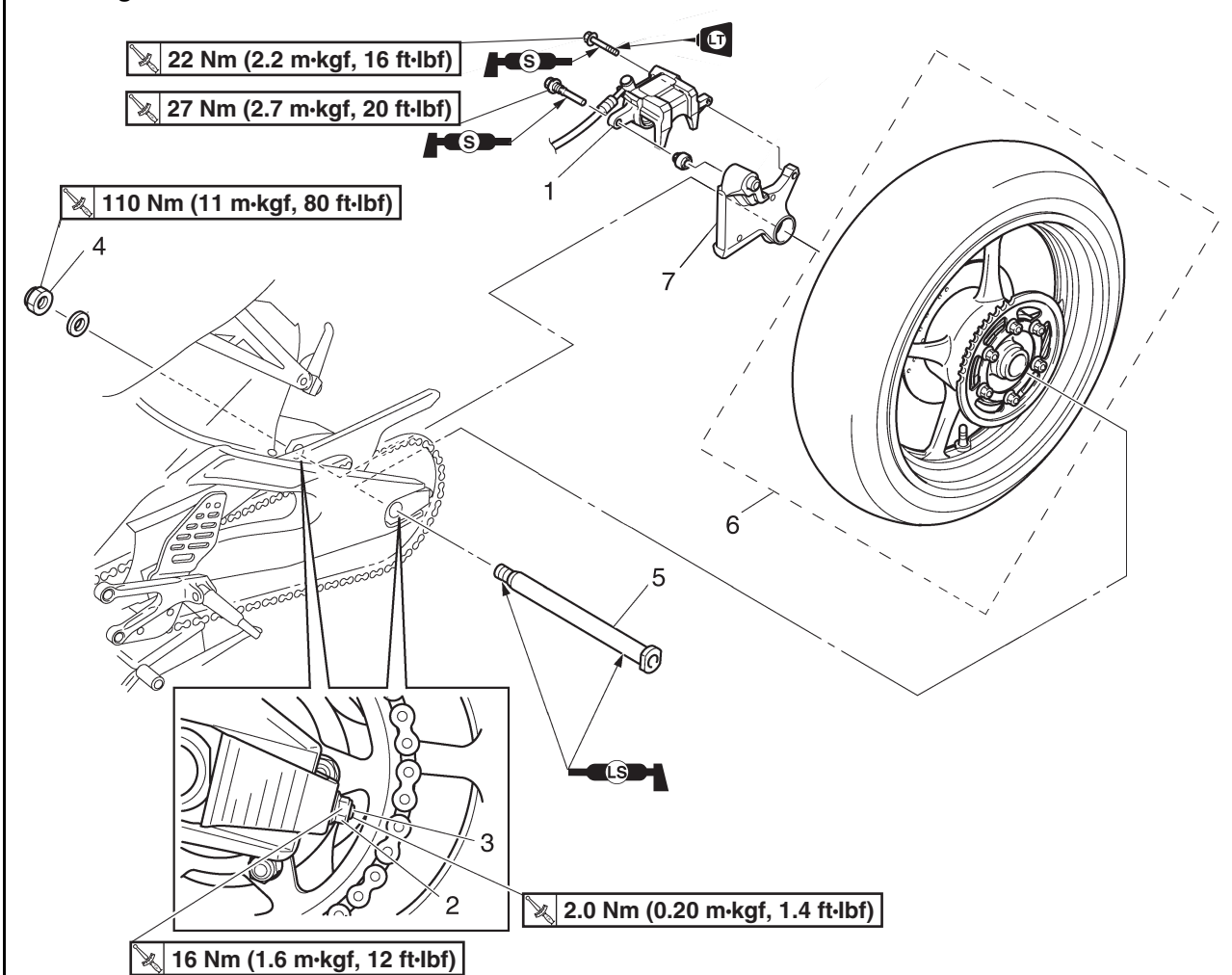


6. Install:
- Front brake calipers

EAS20029

REAR WHEEL

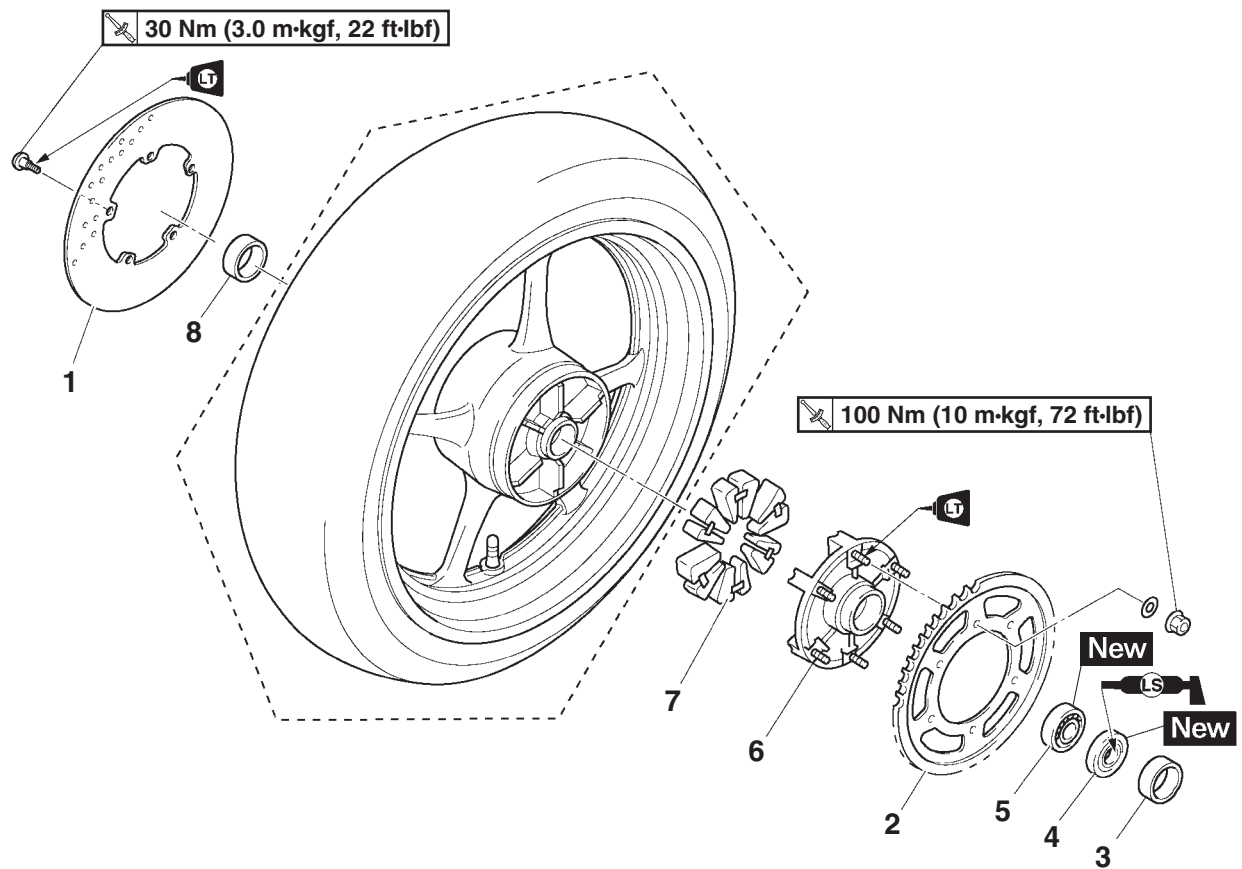
Removing the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake caliper	1	
2	Drive chain adjusting locknut	2	Loosen.
3	Drive chain adjusting bolt	2	Loosen.
4	Rear wheel axle nut	1	
5	Rear wheel axle	1	
6	Rear wheel	1	
7	Rear brake caliper bracket	1	

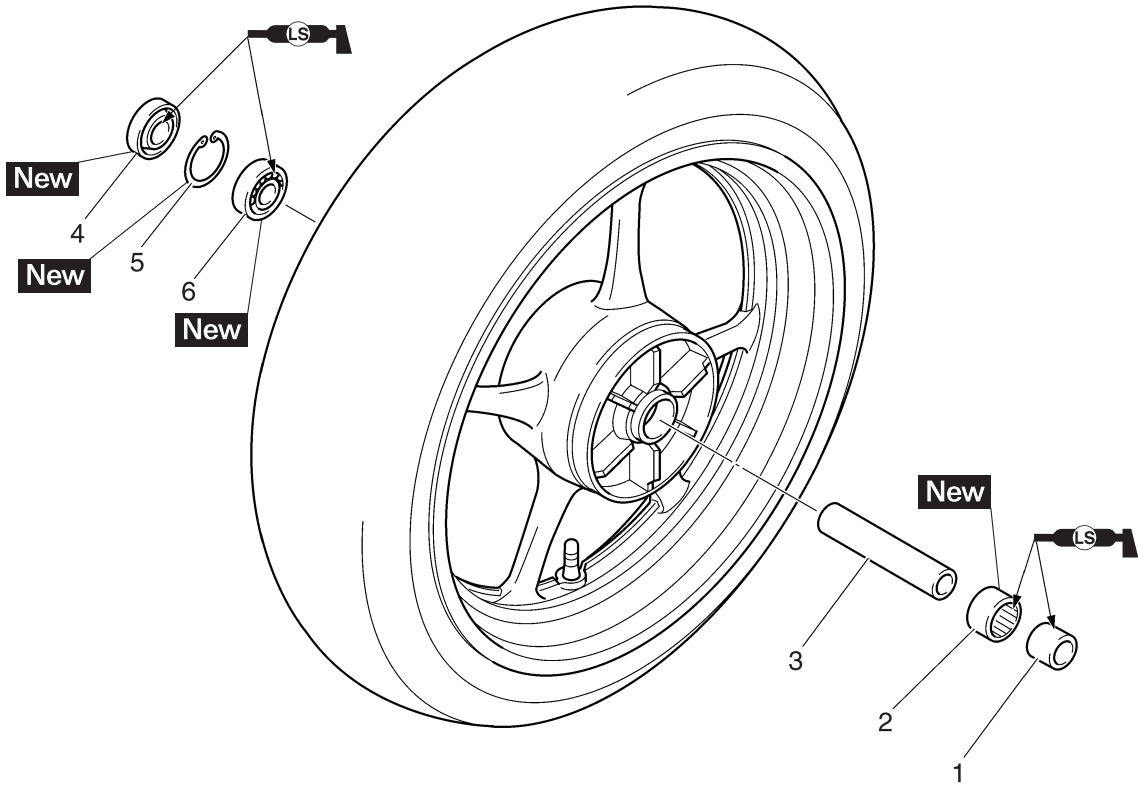
REAR WHEEL

Removing the rear 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	1	
4	Oil seal	1	
5	Bearing	1	
6	Rear wheel drive hub	1	
7	Rear wheel drive hub damper	6	
8	Collar	1	

Disassembling the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Collar	1	
2	Wheel bearing (left side)	1	
3	Spacer	1	
4	Oil seal	1	
5	Circlip	1	
6	Wheel bearing (right side)	1	

EAS30156

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

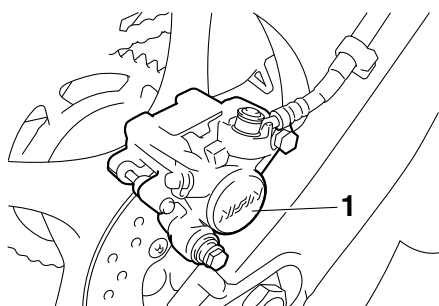
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Rear brake caliper "1"

TIP

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

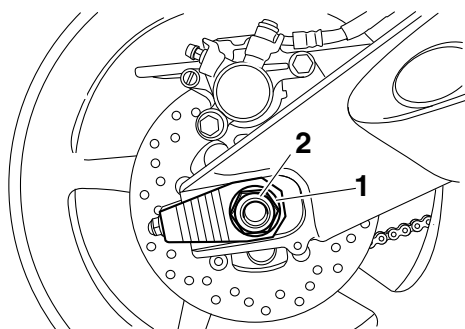


3. Remove:

- Rear wheel axle nut "1"
- Rear wheel axle "2"
- Rear wheel

TIP

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



EAS30158

DISASSEMBLING THE REAR WHEEL

1. Remove:

- Oil seals
- Wheel bearings

Refer to "DISASSEMBLING THE FRONT WHEEL" on page 4-8.

EAS30159

CHECKING THE REAR WHEEL

1. Check:

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

Refer to "CHECKING THE FRONT WHEEL" on page 4-8.

2. Check:

- Tire
- Rear wheel

Damage/wear → Replace.

Refer to "CHECKING THE TIRES" on page 3-17 and "CHECKING THE WHEELS" on page 3-17.

3. Measure:

- Radial wheel runout
- Lateral wheel runout

Refer to "CHECKING THE FRONT WHEEL" on page 4-8.



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

EAS31577

CHECKING THE REAR BRAKE CALIPER BRACKET

1. Check:

- Rear brake caliper bracket
- Cracks/damage → Replace.

EAS30160

CHECKING THE REAR WHEEL DRIVE HUB

1. Check:

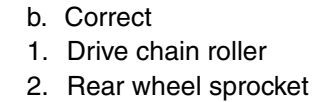
- Rear wheel drive hub
- Cracks/damage → Replace.
- Rear wheel drive hub dampers
- Damage/wear → Replace.

EAS30161

CHECKING AND REPLACING THE REAR WHEEL SPROCKET

1. Check:

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



-

-

TIP



Refer to “ASSEMBLING THE FRONT WHEEL” on page 4-9.

TIP

A diagram of a circular antenna array. It features a central feed point with a spiral pattern, surrounded by five circular elements arranged in a ring. A feed horn, labeled 'LT', is connected to the central feed point via a line. The entire structure is enclosed within a large circular boundary.

- Rear wheel axle
- Wheel bearings
- Oil seal lips
- Collars



4-16

4. Adjust:

- Drive chain slack

Refer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 3-19.



Drive chain slack (on a suitable stand)
30.0–45.0 mm (1.18–1.77 in)

5. Install:

- Rear brake caliper



Rear brake caliper bolt (M12)
27 Nm (2.7 m·kgf, 20 ft·lbf)
Rear brake caliper bolt (M8)
22 Nm (2.2 m·kgf, 16 ft·lbf)
LOCTITE®

EWA13500



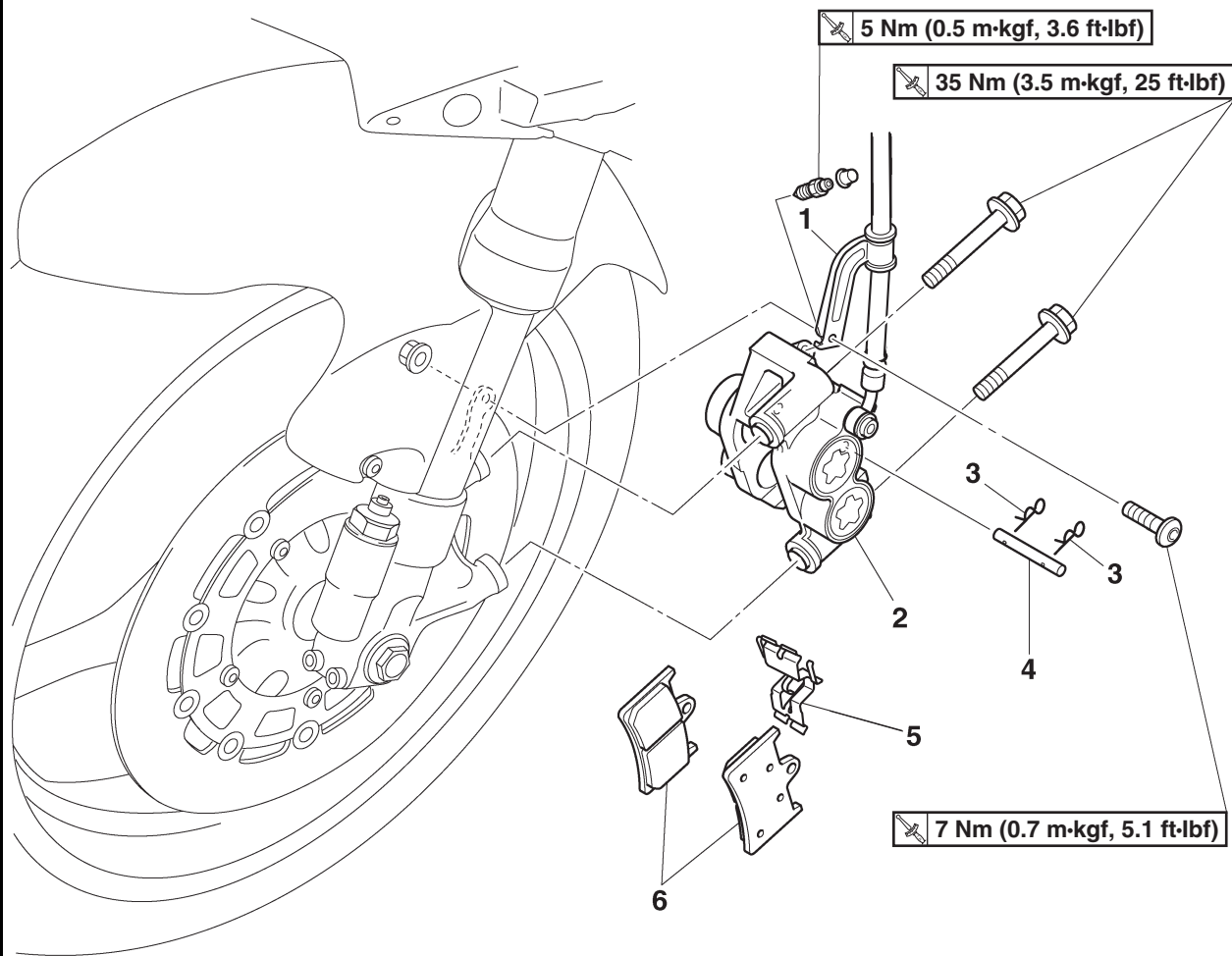
WARNING

Make sure the brake hose is routed properly.

EAS20030

FRONT BRAKE

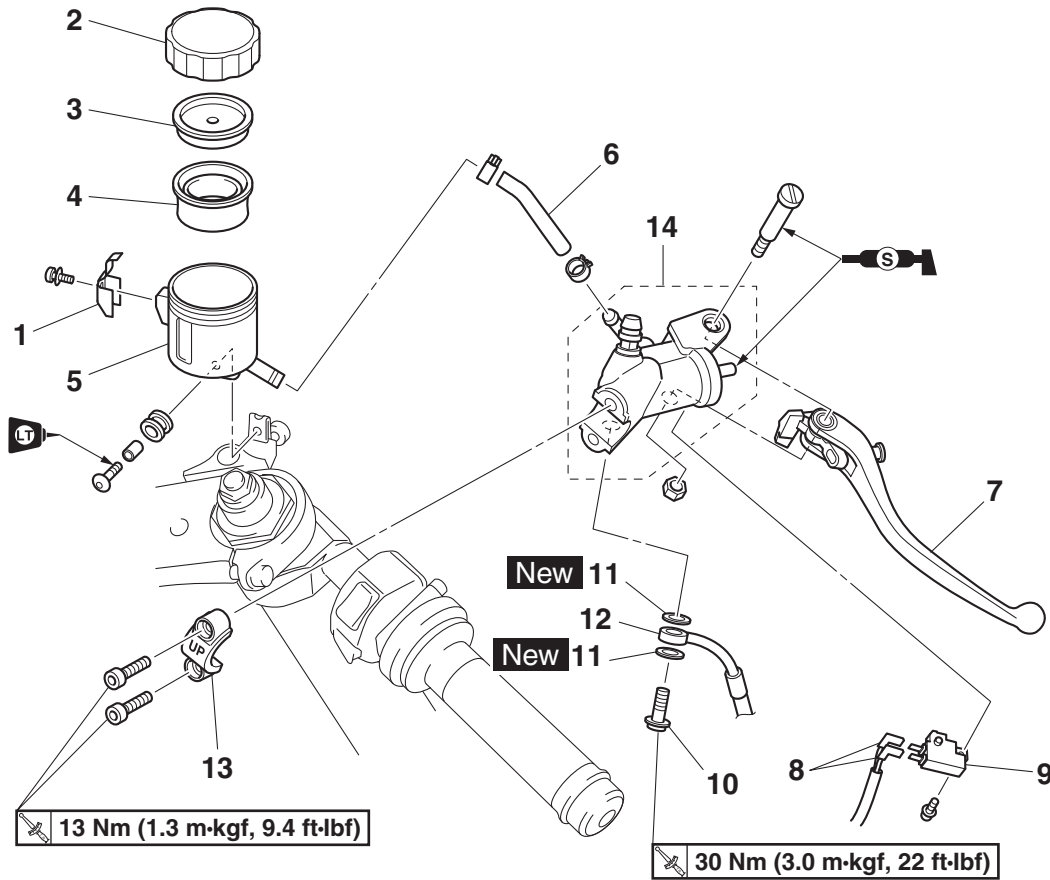
Removing the front brake pads



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
1	Brake hose holder	1	
2	Front brake caliper	1	
3	Brake pad clip	2	
4	Brake pad pin	1	
5	Brake pad spring	1	
6	Front brake pad	2	

FRONT BRAKE

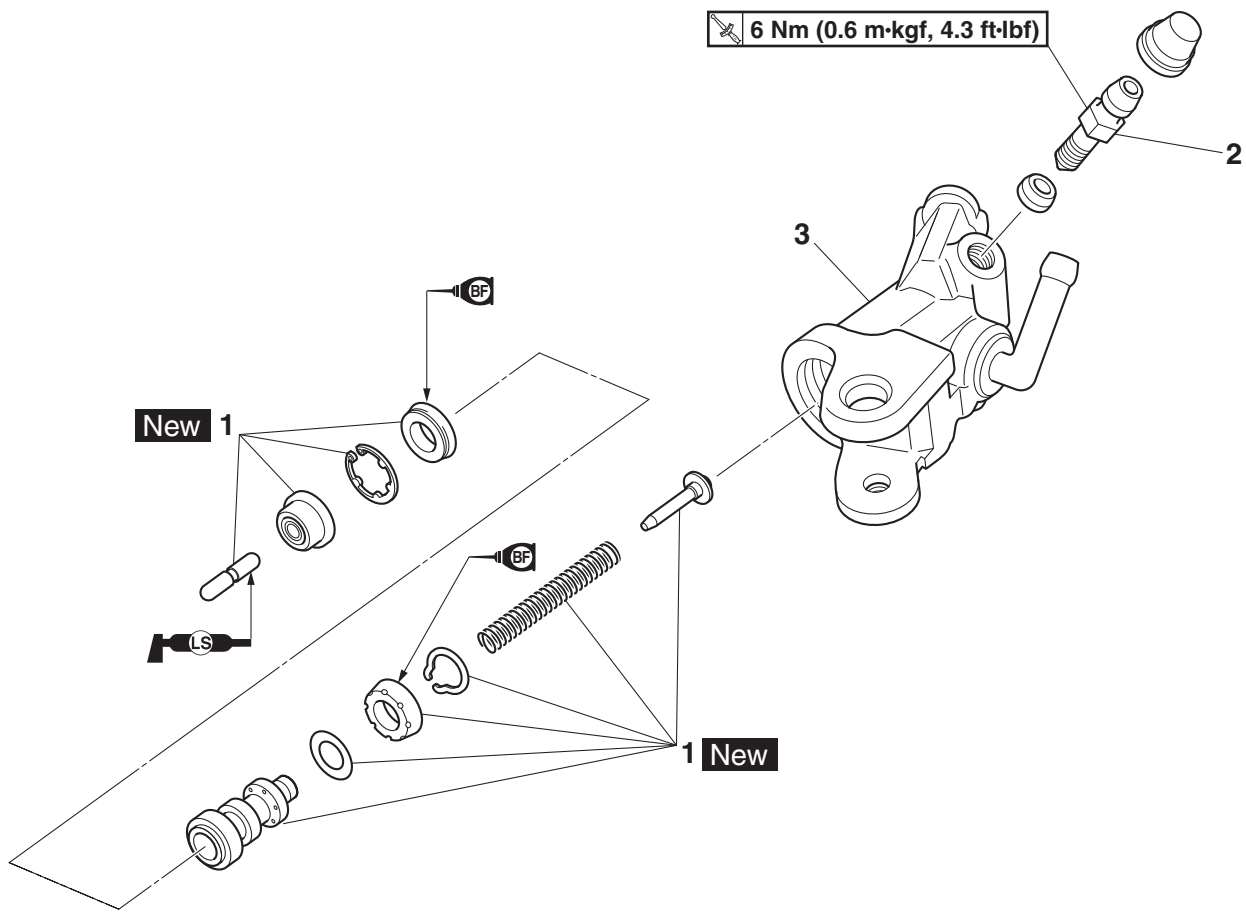
Removing the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-15.
1	Brake fluid reservoir cap holder	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Brake lever	1	
8	Front brake light switch connector	2	Disconnect.
9	Front brake light switch	1	
10	Front brake hose union bolt	1	
11	Copper washer	2	
12	Front brake hose	1	
13	Front brake master cylinder holder	1	
14	Front brake master cylinder	1	

FRONT BRAKE

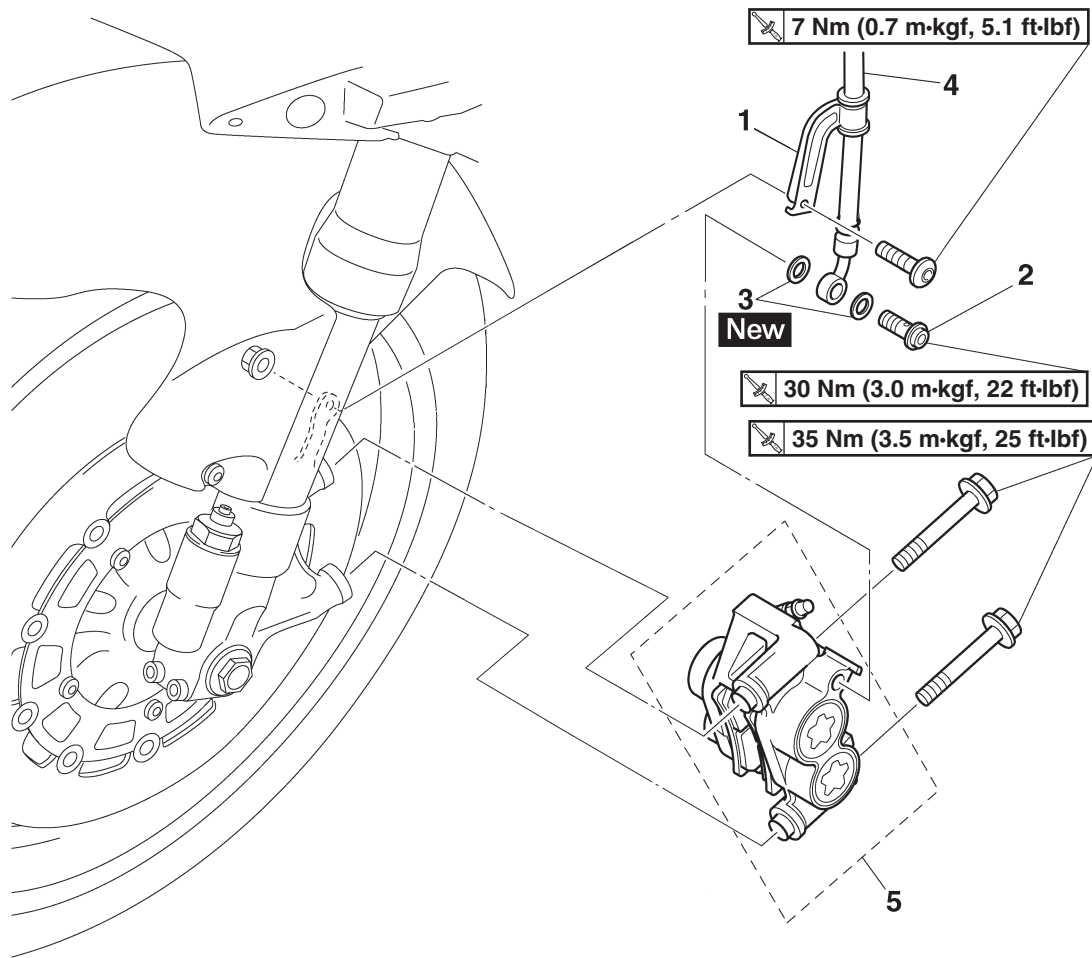
Disassembling the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Bleed screw	1	
3	Brake master cylinder body	1	

FRONT BRAKE

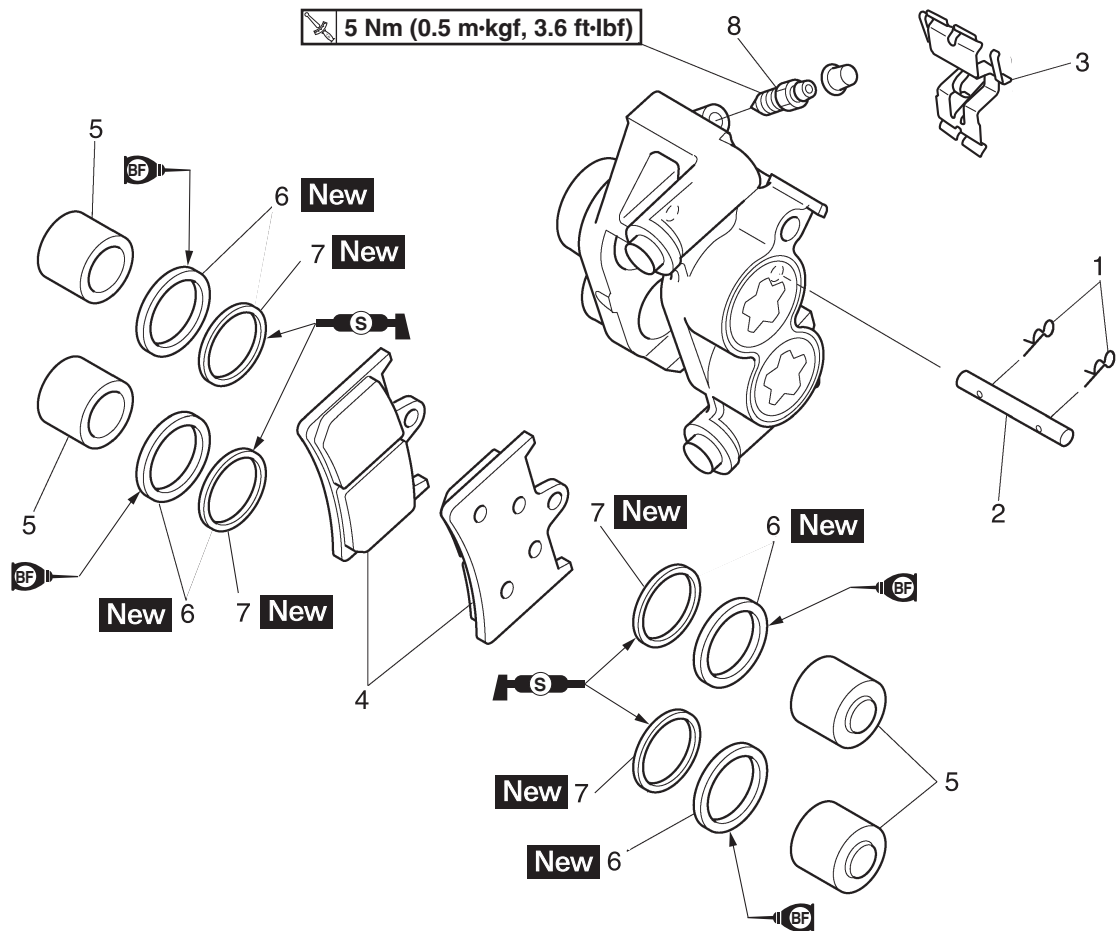
Removing the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-15.
1	Brake hose holder	1	
2	Front brake hose union bolt	1	
3	Copper washer	2	
4	Front brake hose	1	
5	Front brake caliper	1	

FRONT BRAKE

Disassembling the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad spring	1	
4	Front brake pad	2	
5	Brake caliper piston	4	
6	Brake caliper piston seal	4	
7	Brake caliper piston dust seal	4	
8	Bleed screw	1	

EAS30168

INTRODUCTION

EWA14101



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.**

EAS30169

CHECKING THE FRONT BRAKE DISCS

The following procedure applies to both brake discs.

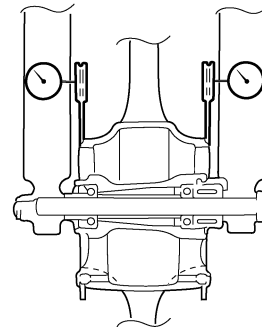
1. Remove:
 - Front wheelRefer to “FRONT WHEEL” on page 4-6.
2. Check:
 - Brake discDamage/galling → Replace.
3. Measure:
 - Brake disc deflectionOut of specification → Correct the brake disc deflection or replace the brake disc.



Brake disc runout limit (as measured on wheel)
0.10 mm (0.0039 in)

- Place the vehicle on a suitable stand so that the front wheel is elevated.
- Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- Remove the brake caliper.

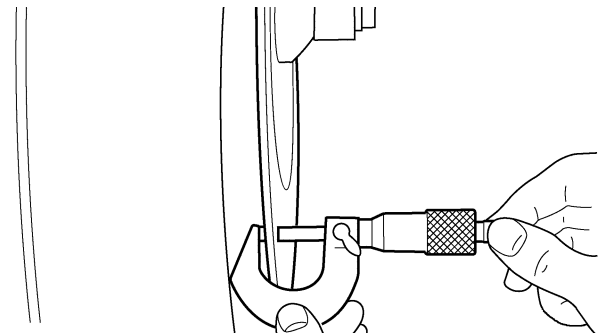
- d. Hold the dial gauge at a right angle against the brake disc surface.



- e. Measure the deflection 1.5 mm (0.06 in) below the edge of the brake disc.



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



Brake disc thickness limit
4.5 mm (0.18 in)

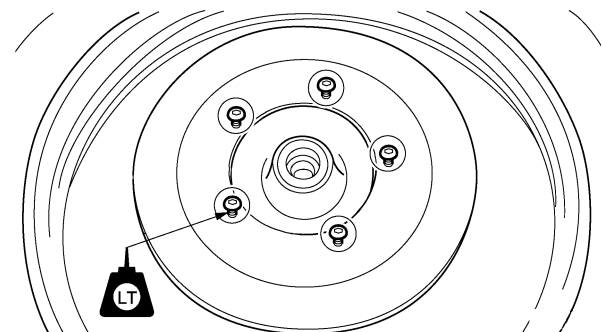
- Brake disc deflection



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

TIP

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





Front brake disc bolt
18 Nm (1.8 m·kgf, 13 ft·lbf)
LOCTITE®

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



6. Install:
 - Front wheel
 Refer to "FRONT WHEEL" on page 4-6.

EAS30170

REPLACING THE FRONT BRAKE PADS

The following procedure applies to both brake calipers.

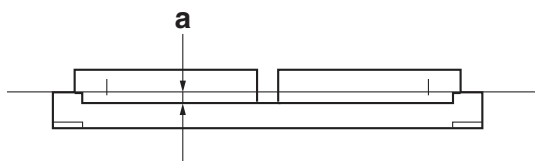
TIP

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

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



Brake pad lining thickness
4.5 mm (0.18 in)
Limit
0.5 mm (0.02 in)



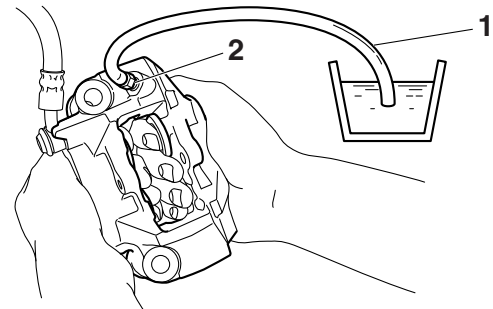
2. Install:
 - Brake pads
 - Brake pad spring

TIP

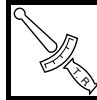
Always install new brake pads, and a brake pad spring as a set.

- a. Connect a clear plastic hose "1" tightly to the bleed screw "2". Put the other end of the hose into an open container.

- b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.



- c. Tighten the bleed screw.

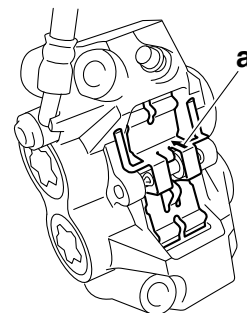


Brake caliper bleed screw (front and rear)
5 Nm (0.5 m·kgf, 3.6 ft·lbf)

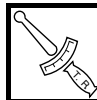
- d. Install new brake pads and a new brake pad spring.

TIP

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

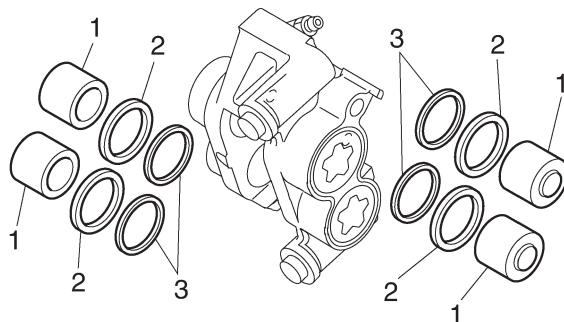


3. Install:
 - Brake pad pin
 - Brake pad clips
 - Front brake caliper



Front brake caliper bolt
35 Nm (3.5 m·kgf, 25 ft·lbf)

4. Check:
 - Brake fluid level
 Below the minimum level mark "a" → Add the specified brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-13.

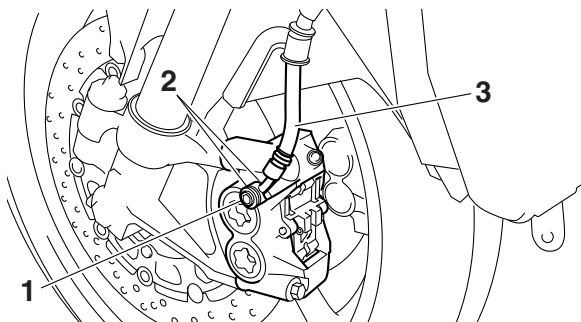


- **Brake lever operation**
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-15.

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

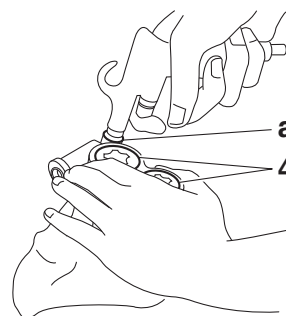
- Front brake hose union bolt “1”
- Copper washers “2”
- Front brake hose “3”

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



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

- **Cover the brake caliper pistons with a rag. Be careful not to get injured when the pistons are expelled from the brake caliper.**
- **Never try to pry out the brake caliper pistons.**
- **Do not loosen the bolts “4”.**



- b. Remove the brake caliper piston seals and brake caliper piston dust seals.

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

- Brake caliper pistons “1”
Rust/scratches/wear → Replace the brake caliper pistons.

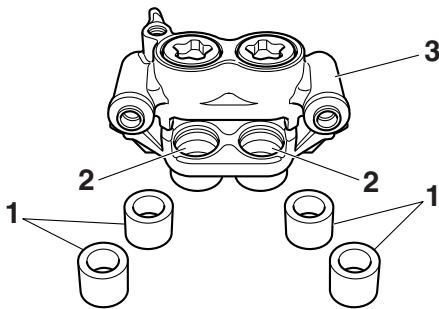
FRONT BRAKE

- 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.

EWA13611

WARNING

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



EAS30174

ASSEMBLING THE FRONT BRAKE CALIPERS

EWA13621

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 brake caliper piston dust seals and brake caliper piston seals to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston dust seals and brake caliper piston seals.



**Specified brake fluid
DOT 4**

EAS30175

INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

1. Install:
 - Front brake caliper “1” (temporarily)
 - Copper washers **New**
 - Front brake hose “2”
 - Front brake hose union bolt “3”



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

EWA13531

WARNING

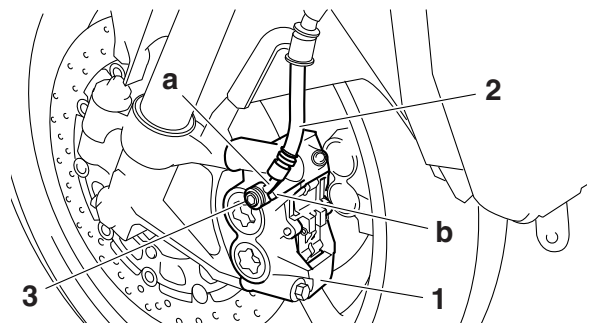
Proper brake hose routing is essential to insure safe vehicle operation.

Refer to “CABLE ROUTING” on page 2-41.

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:
 - Front brake caliper
3. Install:
 - Front brake pads
 - Brake pad spring
 - Brake pad pin
 - Brake pad clips
 - Front brake caliper



**Front brake caliper bolt
35 Nm (3.5 m·kgf, 25 ft·lbf)**

Refer to “REPLACING THE FRONT BRAKE PADS” on page 4-24.

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



**Specified brake 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

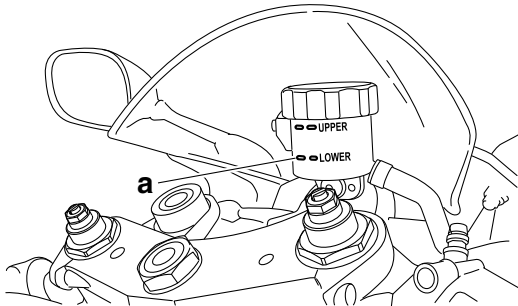
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-15.

6. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-13.



7. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-15.

EAS30179

REMOVING THE FRONT BRAKE MASTER CYLINDER

TIP

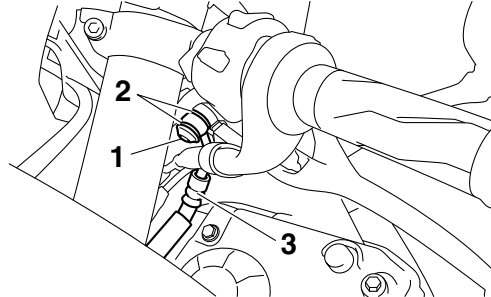
Before removing the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:

- Front brake hose union bolt “1”
- Copper washers “2”
- Front brake hoses “3”

TIP

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



EAS30725

CHECKING THE FRONT BRAKE MASTER CYLINDER

1. Check:

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

2. Check:

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

3. Check:

- Brake fluid reservoir
Cracks/damage → Replace.
- Brake fluid reservoir diaphragm
Damage/wear → Replace.

4. Check:

- Brake hose
Cracks/damage/wear → Replace.

EAS30181

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.



Specified brake fluid
DOT 4

EAS30182

INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:

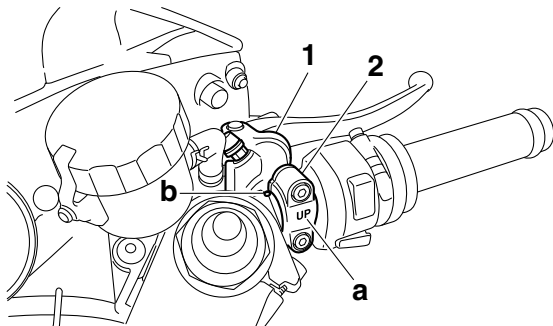
- Front brake master cylinder "1"
- Front brake master cylinder holder "2"



Front brake master cylinder 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.
- Align the mating surfaces of the brake master cylinder holder with the punch mark "b" on the handlebar.



2. Install:

- Front brake hose "1"
- Copper washers "2" **New**
- Front brake hose union bolt "3"



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

EWA13531



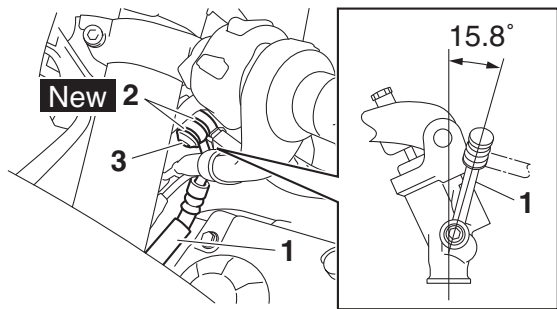
WARNING

Proper brake hose routing is essential to insure safe vehicle operation.

Refer to "CABLE ROUTING" on page 2-41.

TIP

- Install the brake hose at a 15.8° angle to the front brake master cylinder as shown in the illustration.
- While holding the brake hose, tighten the union bolt.
- 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.



3. Fill:

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



Specified brake 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

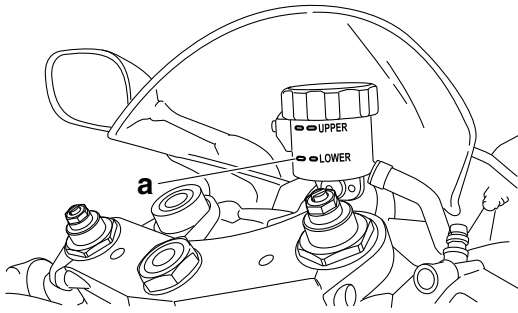
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:

- Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-15.

5. Check:

- Brake fluid level
Below the minimum level mark "a" → Add the specified brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-13.



6. Check:

- Brake lever operation

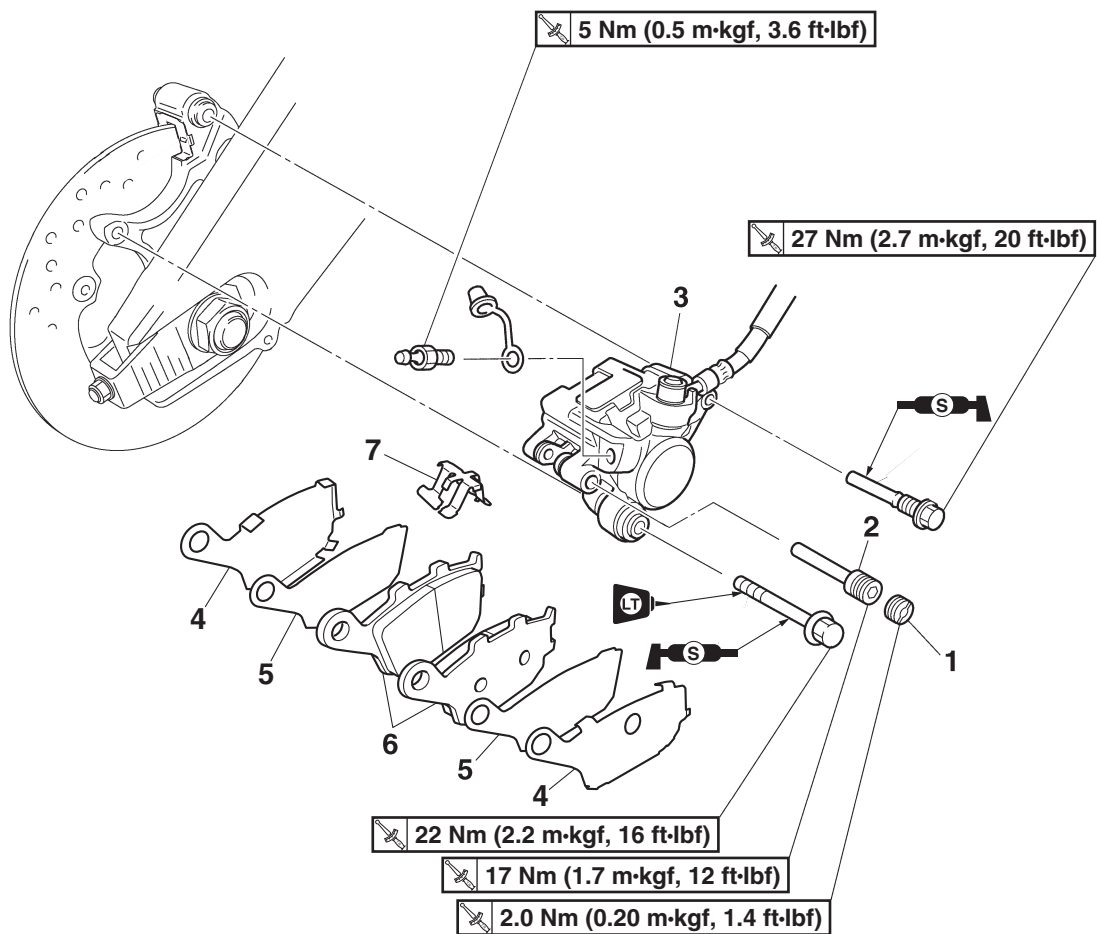
Soft or spongy feeling → Bleed the brake system.

Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-15.

EAS20031

REAR BRAKE

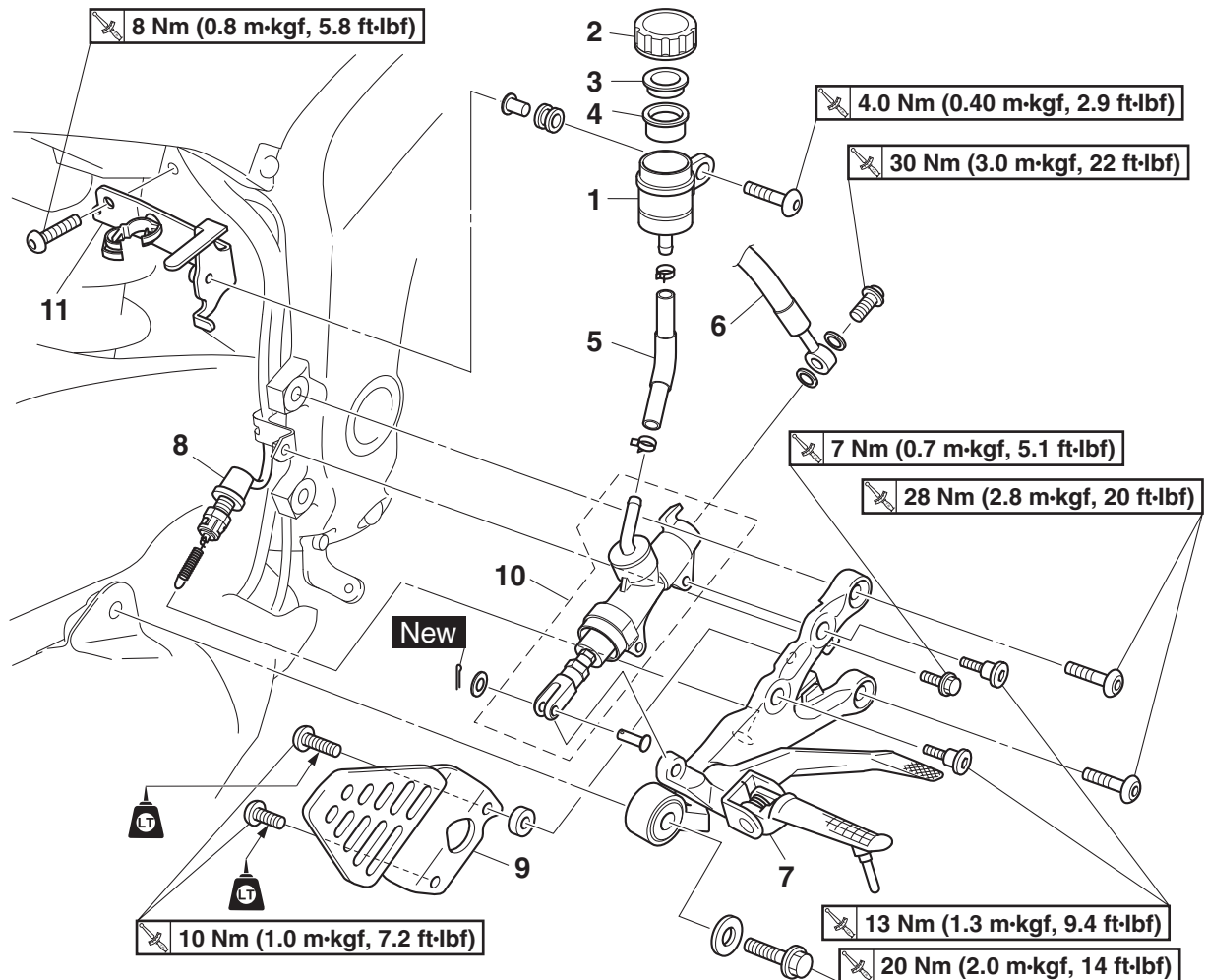
Removing the rear brake pads



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	2	
5	Brake pad insulator	2	
6	Rear brake pad	2	
7	Brake pad spring	1	

REAR BRAKE

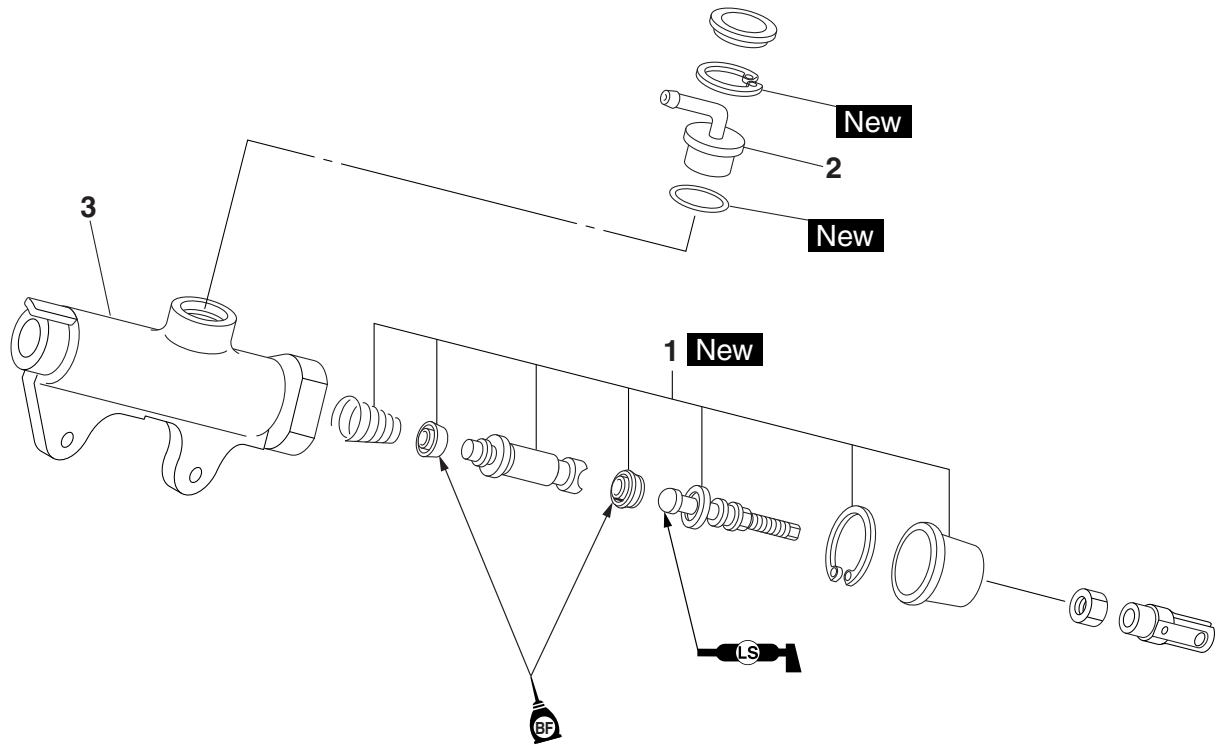
Removing the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-15.
1	Brake fluid reservoir	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir hose	1	
6	Rear brake hose	1	
7	Footrest assembly (right)	1	
8	Rear brake light switch	1	
9	Footrest plate	1	
10	Rear brake master cylinder	1	
11	Brake fluid reservoir bracket	1	

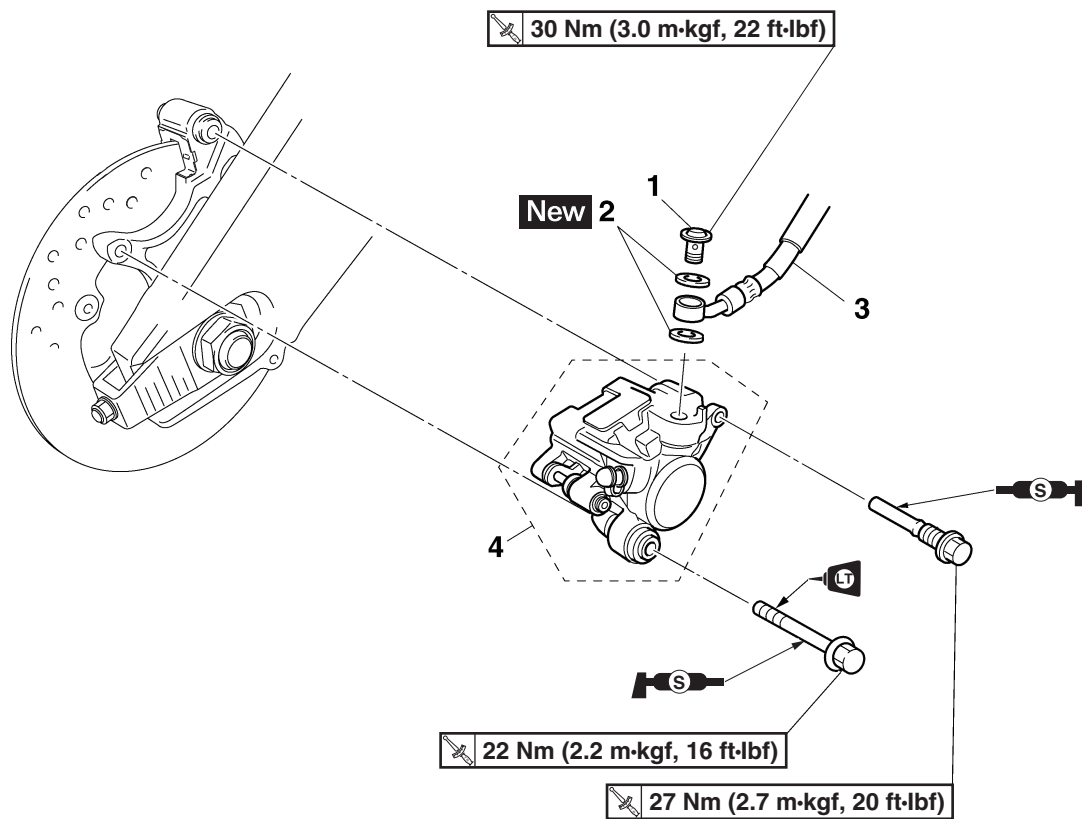
REAR BRAKE

Disassembling the rear brake master cylinder



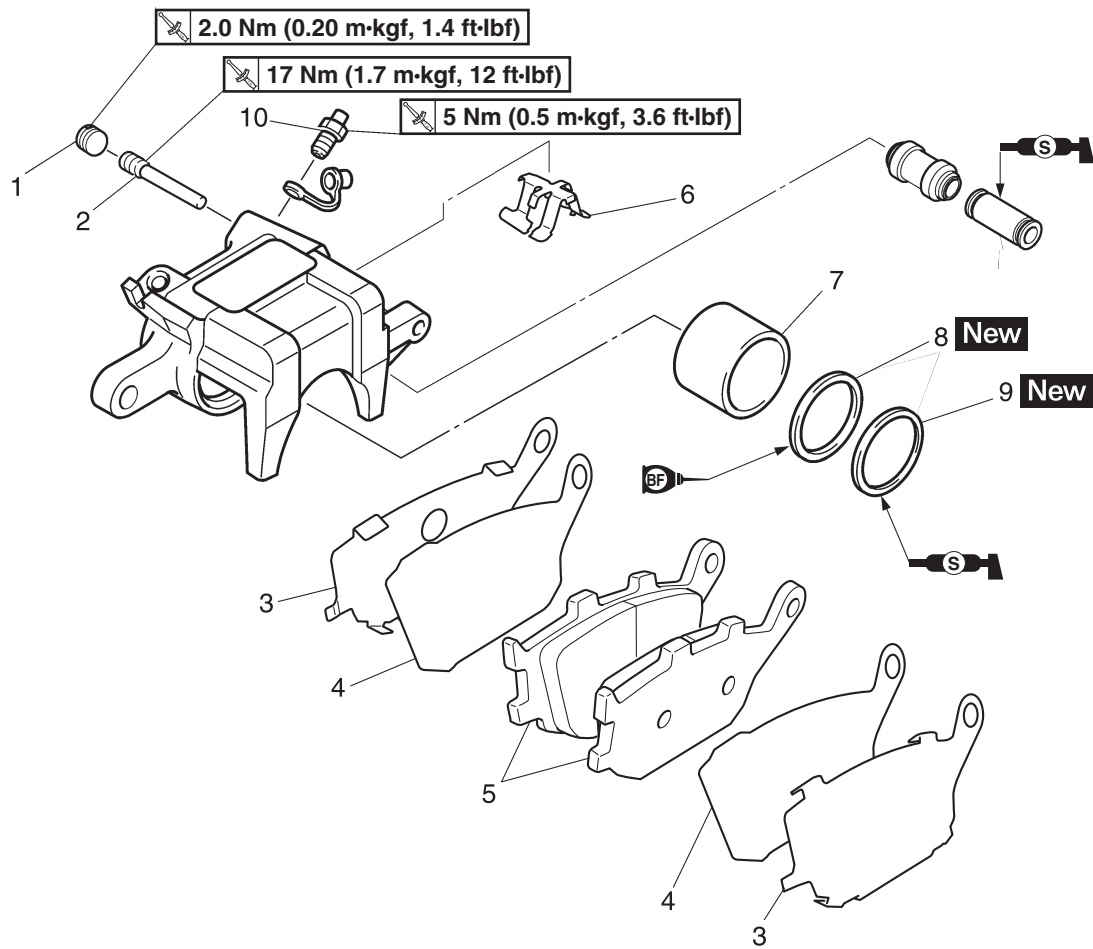
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Brake hose joint	1	
3	Brake master cylinder body	1	

Removing the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-15.
1	Rear brake hose union bolt	1	
2	Copper washer	2	
3	Rear brake hose	1	
4	Rear brake caliper	1	

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 shim	2	
4	Brake pad insulator	2	
5	Rear brake pad	2	
6	Brake pad spring	1	
7	Brake caliper piston	1	
8	Brake caliper piston seal	1	
9	Brake caliper piston dust seal	1	
10	Bleed screw	1	

EAS30183

INTRODUCTION

EWA14101

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.

EAS30184

CHECKING THE REAR BRAKE DISC

1. Remove:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-12.
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 4-23.



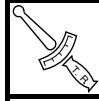
Brake disc runout limit (as measured on wheel)
0.15 mm (0.0059 in)

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 4-23.



Brake disc thickness limit
4.5 mm (0.18 in)

5. Adjust:
 - Brake disc deflection
Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-23.



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

6. Install:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-12.

EAS30185

REPLACING THE REAR BRAKE PADS

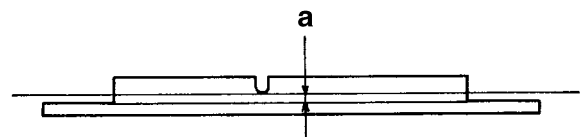
TIP

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

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



Brake pad lining thickness
6.0 mm (0.24 in)
Limit
1.0 mm (0.04 in)

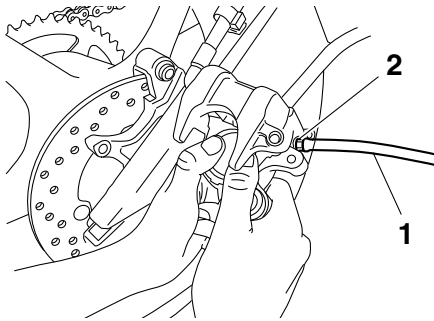


2. Install:
 - Brake pad insulators (onto the brake pads)
 - Brake pad shims (onto the brake pads)
 - Brake pads
 - Brake pad spring

TIP

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

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

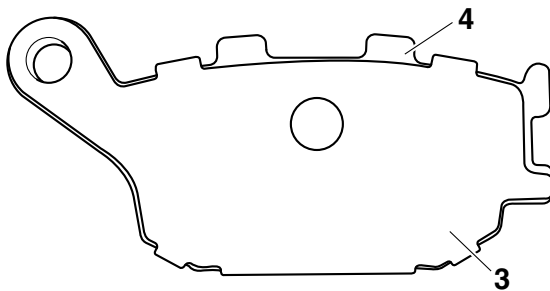


- c. Tighten the bleed screw.



Brake caliper bleed screw (front and rear)
5 Nm (0.5 m-kgf, 3.6 ft-lbf)

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

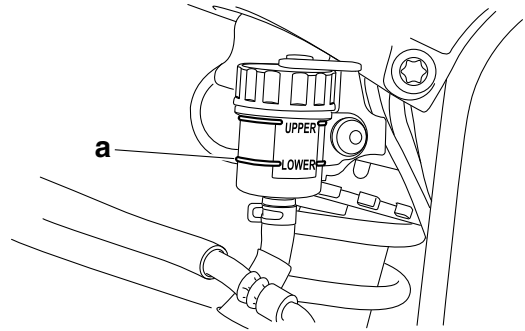


3. Install:
 - Rear brake caliper
 - Brake pad pin
 - Screw plug



Rear brake caliper bolt (M12)
27 Nm (2.7 m-kgf, 20 ft-lbf)
Rear brake caliper bolt (M8)
22 Nm (2.2 m-kgf, 16 ft-lbf)
LOCTITE®

4. Check:
 - Brake fluid level
 Below the minimum level mark "a" → Add the specified brake fluid to the proper level.
 Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-13.



5. Check:
 - Brake pedal operation
 Soft or spongy feeling → Bleed the brake system.
 Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-15.

EAS30186

REMOVING THE REAR BRAKE CALIPER

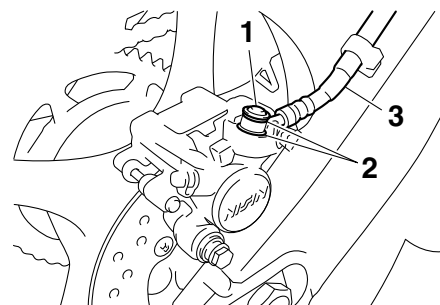
TIP

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

1. Remove:
 - Rear brake hose union bolt "1"
 - Copper washers "2"
 - Rear brake hose "3"

TIP

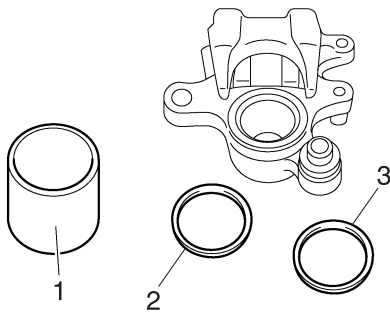
Put the end of the brake hose into a container and pump out the brake fluid carefully.



EAS30187

DISASSEMBLING THE REAR BRAKE CALIPER

1. Remove:
 - Brake caliper piston "1"
 - Brake caliper piston seal "2"
 - Brake caliper piston dust seal "3"



- Brake caliper body “3”
Cracks/damage → Replace the brake caliper assembly.
- Brake fluid delivery passages
(brake caliper body)
Obstruction → Blow out with compressed air.

EWA13611



WARNING

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

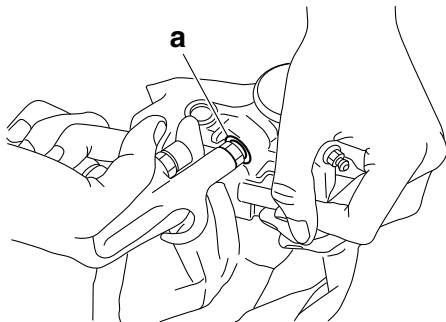
- a. Blow compressed air into the brake hose joint opening “a” to force out the piston from the brake caliper.

EWA13550

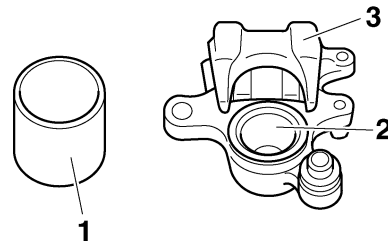


WARNING

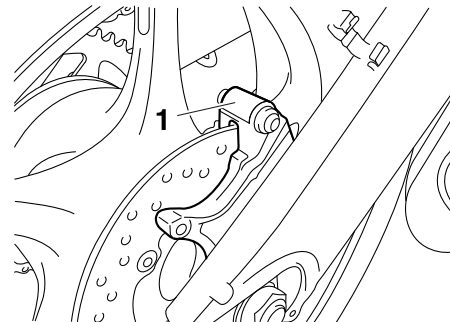
- **Cover the brake caliper piston with a rag. Be careful not to get injured when the piston is expelled from the brake caliper.**
- **Never try to pry out the brake caliper piston.**



- b. Remove the brake caliper piston seal and brake caliper piston dust seal.



- Brake caliper bracket “1” Cracks/damage → Replace.



EAS30188

CHECKING THE REAR BRAKE CALIPER

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

1. Check:
 - Brake caliper piston “1”
Rust/scratches/wear → Replace the brake caliper pistons.
 - Brake caliper cylinder “2”
Scratches/wear → Replace the brake caliper assembly.

EAS30189

ASSEMBLING THE REAR BRAKE CALIPER

EWA13621



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 brake caliper piston dust seals and brake caliper piston seals to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston dust seals and brake caliper piston seals.



Specified brake fluid
DOT 4

REAR BRAKE

EAS30190

INSTALLING THE REAR BRAKE CALIPER

1. Install:

- Rear brake caliper "1"
(temporarily)
- Copper washers **New**
- Rear brake hose "2"
- Rear brake hose union bolt "3"



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

EWA13531

WARNING

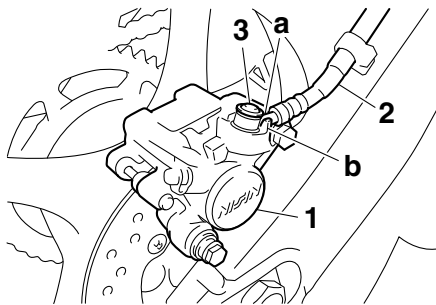
Proper brake hose routing is essential to insure safe vehicle operation.

Refer to "CABLE ROUTING" on page 2-41.

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:

- Rear brake caliper

3. Install:

- Rear brake pads
- Brake pad springs
- Brake pad pin
- Rear brake caliper

Refer to "REPLACING THE REAR BRAKE PADS" on page 4-35.



Rear brake caliper bolt (M12)
27 Nm (2.7 m·kgf, 20 ft·lbf)
Rear brake caliper bolt (M8)
22 Nm (2.2 m·kgf, 16 ft·lbf)
LOCTITE®

4. Fill:

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



Specified brake 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

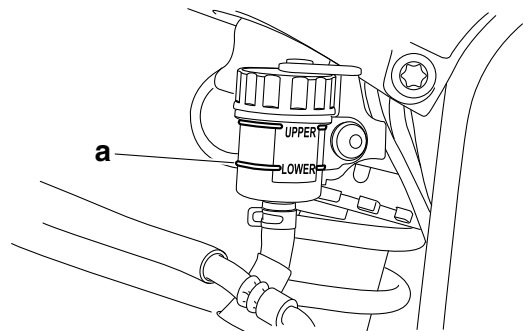
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:

- Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-15.

6. Check:

- Brake fluid level
Below the minimum level mark "a" → Add the specified brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-13.



7. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-15.

EAS30193

REMOVING THE REAR BRAKE MASTER CYLINDER

TIP

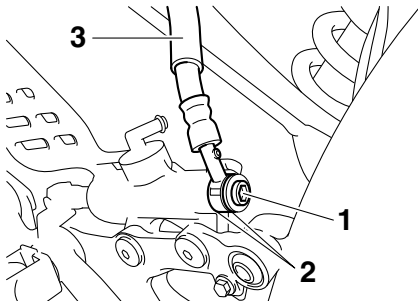
Before removing the rear brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:

- Rear brake hose union bolt "1"
- Copper washers "2"
- Rear brake hose "3"

TIP

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



EAS30194

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.

2. Check:

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

3. Check:

- Brake fluid reservoir
Cracks/damage → Replace.
- Brake fluid reservoir diaphragm
Cracks/damage → Replace.

4. Check:

- Rear brake hose
- Brake fluid reservoir hose
Cracks/damage/wear → Replace.

EAS30195

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.



**Specified brake fluid
DOT 4**

EAS30196

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:

- Rear brake hose "1"
- Copper washers "2" **New**
- Rear brake hose union bolt "3"



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

EWA13531

WARNING

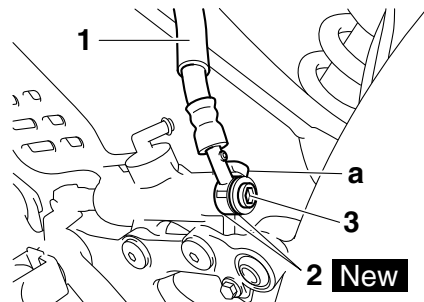
Proper brake hose routing is essential to insure safe vehicle operation.

Refer to "CABLE ROUTING" on page 2-41.

ECA14160

NOTICE

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



2. Fill:

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



**Specified brake 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

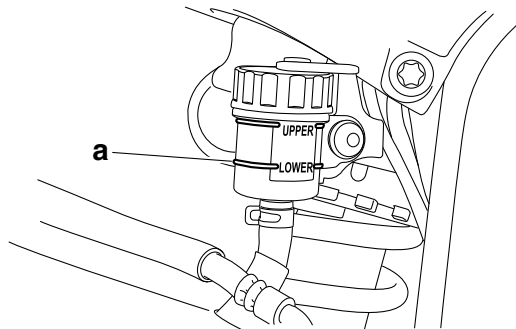
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

3. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-15.

4. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-13.



5. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-15.

6. Adjust:

- Brake pedal position
Refer to “ADJUSTING THE REAR DISC BRAKE” on page 3-14.

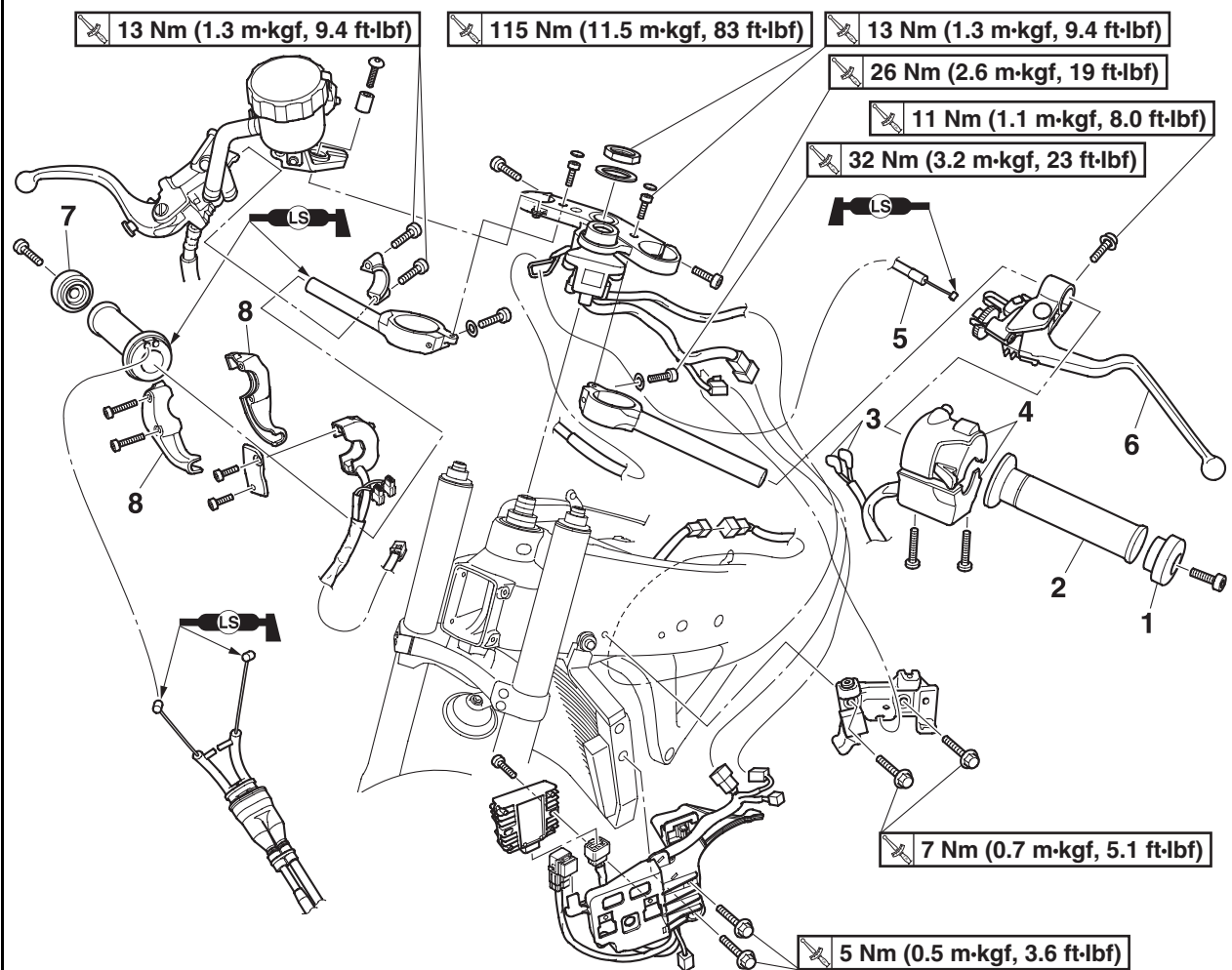
7. Adjust:

- Rear brake light operation timing
Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH” on page 3-31.

EAS20033

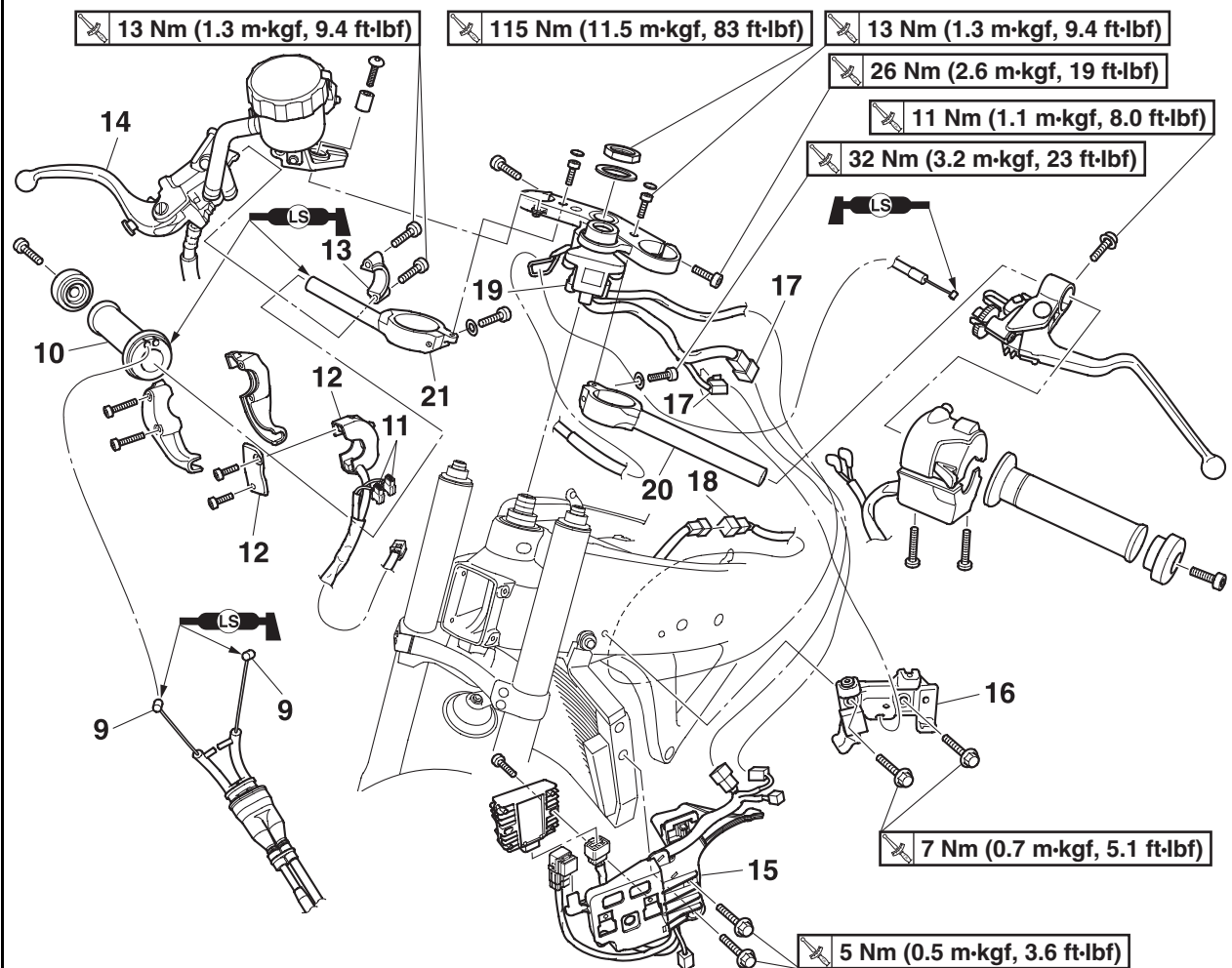
HANDLEBARS

Removing the handlebars



Order	Job/Parts to remove	Q'ty	Remarks
	Side panel (left)/Upper side cowling (left)		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 7-4.
	Air induction system cover		Refer to "AIR INDUCTION SYSTEM" on page 7-15.
1	Grip end (left)	1	
2	Handlebar grip	1	
3	Clutch switch connector	2	Disconnect.
4	Handlebar switch (left)	1	
5	Clutch cable	1	Disconnect.
6	Clutch lever assembly	1	
7	Grip end (right)	1	
8	Throttle cable housing	1	

Removing the handlebars



Order	Job/Parts to remove	Q'ty	Remarks
9	Throttle cable	2	Disconnect.
10	Throttle grip	1	
11	Front brake light switch connector	2	Disconnect.
12	Handlebar switch (right)/Handlebar switch holder (right)	1/1	
13	Front brake master cylinder holder	1	
14	Front brake master cylinder assembly	1	
15	Rectifier/regulator bracket	1	
16	Coupler holder (left)	1	
17	Main switch coupler	2	Disconnect.
18	Immobilizer unit coupler	1	Disconnect.
19	Upper bracket	1	
20	Handlebar (left)	1	
21	Handlebar (right)	1	

EAS30203

REMOVING THE HANDLEBARS

1. Stand the vehicle on a level surface.

EWA13120

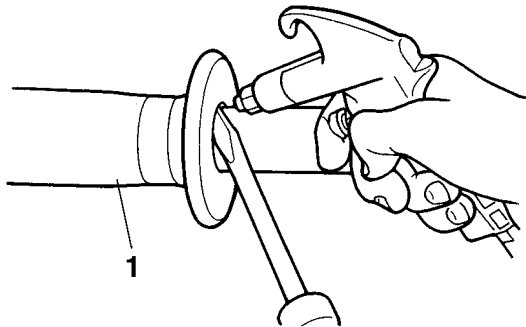
⚠ WARNING

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

2. Remove:
 - Handlebar grip “1”

TIP

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



EAS30204

CHECKING THE HANDLEBARS

1. Check:
 - Handlebar (left)
 - Handlebar (right)
 Bends/cracks/damage → Replace.

EWA13690

⚠ WARNING

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

EAS30205

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:
 - Front brake master cylinder “1”
 - Front brake master cylinder holder “2”

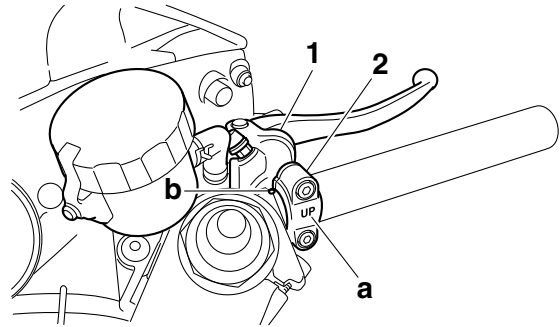


**Front brake master cylinder bolt
13 Nm (1.3 m·kgf, 9.4 ft·lbf)**

TIP

- Install the brake master cylinder holder with the “UP” mark “a” facing up.

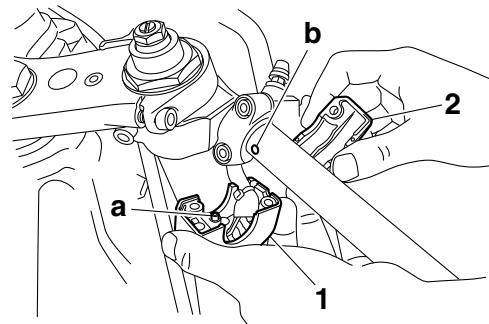
- Align the mating surfaces of the brake master cylinder holder with the punch mark “b” on the handlebar.



3. Install:
 - Handlebar switch (right) “1”
 - Handlebar switch bracket (right) “2”

TIP

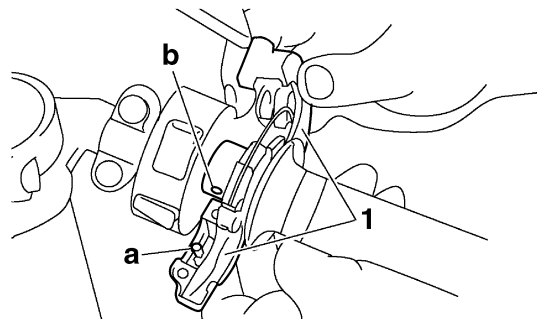
Align the projection “a” on the right handlebar switch with the hole “b” on the right handlebar.



4. Install:
 - Throttle grip
 - Throttle cables
 - Throttle cable housing “1”

TIP

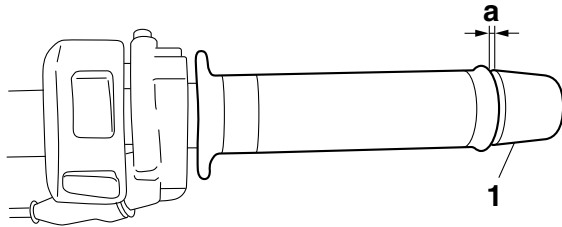
Align the projection “a” on the throttle cable housing with the hole “b” in the right handlebar.



5. Install:
 - Grip end (right) “1”

TIP

There should be 1–3 mm (0.04–0.12 in) of clearance “a” between the throttle grip and the right grip end.



6. Install:

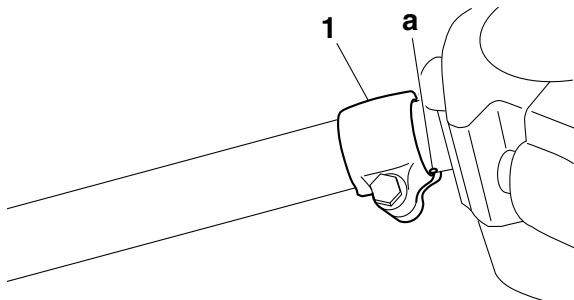
- Clutch lever assembly “1”



Clutch lever assembly bolt
11 Nm (1.1 m-kgf, 8.0 ft-lbf)

TIP

Align the mating surfaces of the clutch lever assembly with the punch mark “a” on the left handlebar.

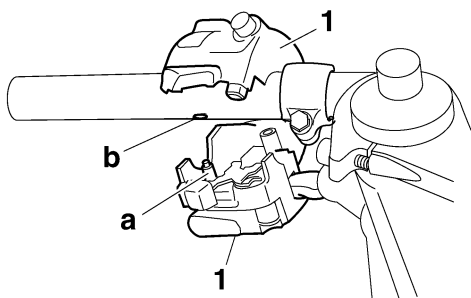


7. Install:

- Handlebar switch (left) “1”

TIP

Align the projection “a” on the left handlebar switch with the hole “b” in the left handlebar.



8. Install:

- Handlebar grip “1”

- Grip end (left) “2”



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

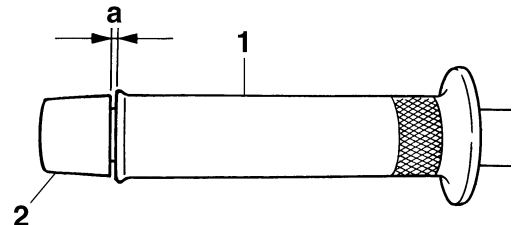
EWA13700

WARNING

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

TIP

There should be 1–3 mm (0.04–0.12 in) of clearance “a” between the handlebar grip and the grip end.



9. Check:

- Cable routing

TIP

Make sure the immobilizer unit lead, main switch lead, brake hoses, throttle cables, clutch cable, and handlebar switch leads are routed properly. Refer to “CABLE ROUTING” on page 2-41.

10. Adjust:

- Clutch cable free play

Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-12.



Clutch lever free play
10.0–15.0 mm (0.39–0.59 in)

11. Adjust:

- Throttle cable free play

Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-32.

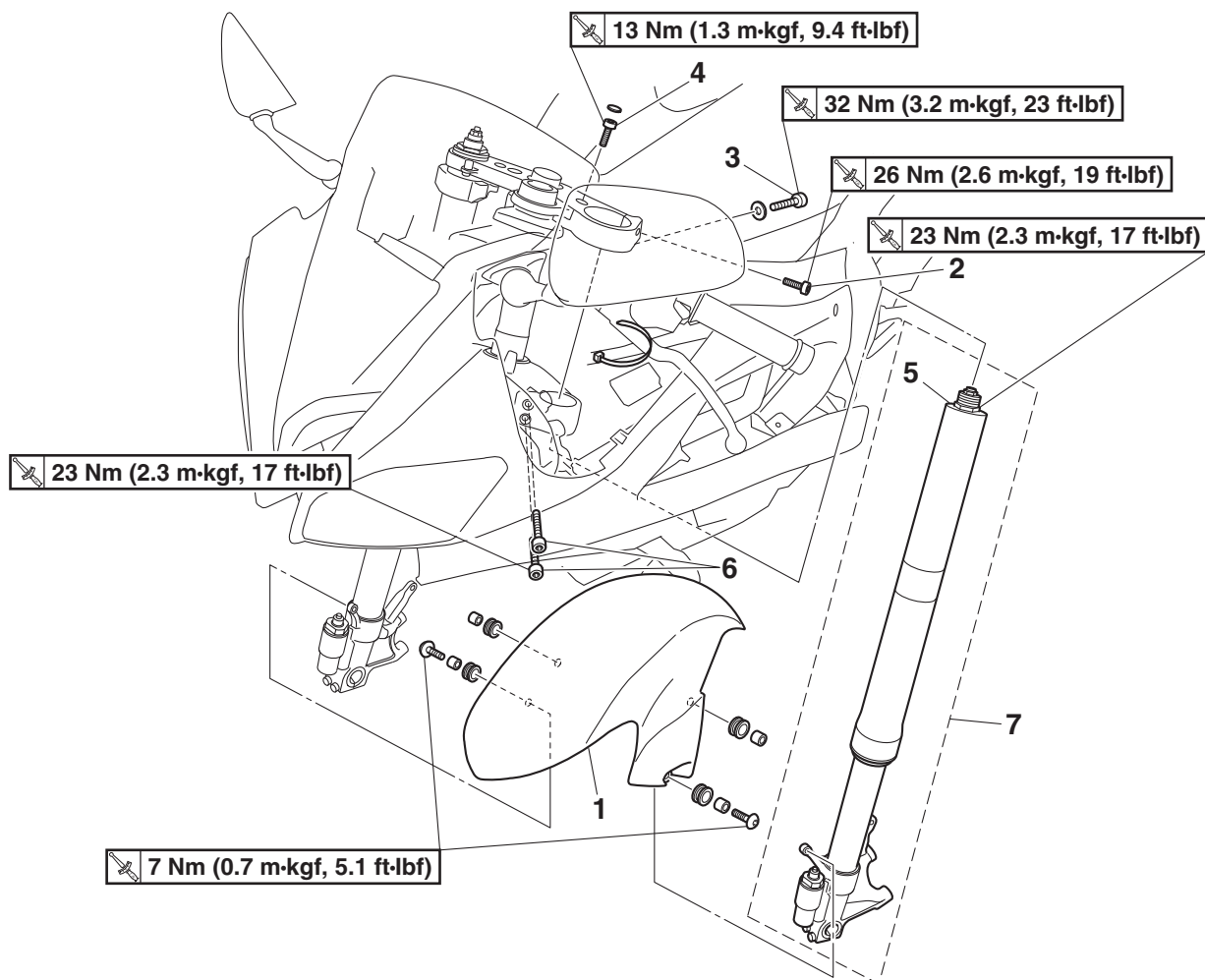


Throttle grip free play
3.0–5.0 mm (0.12–0.20 in)

EAS20034

FRONT FORK

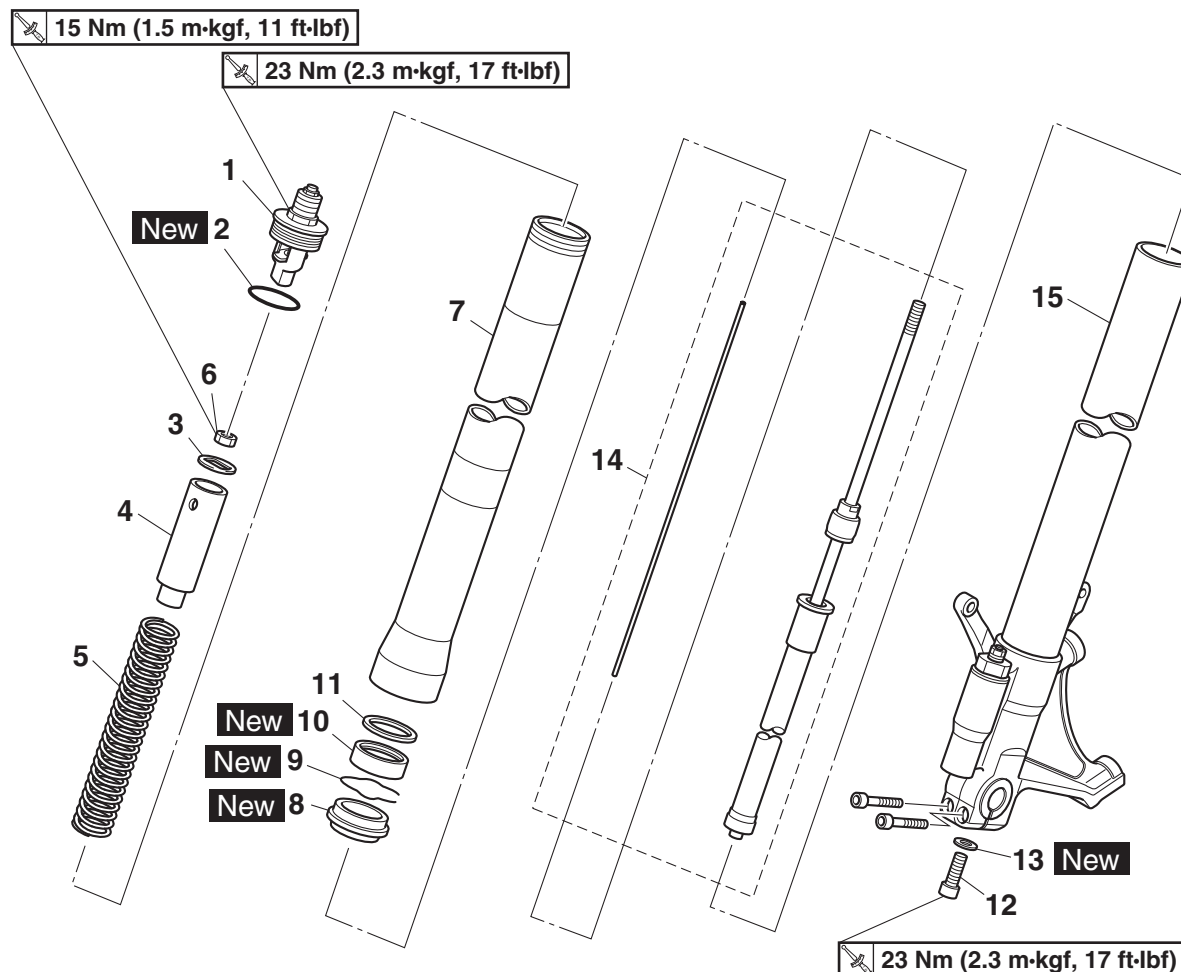
Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Side panels		Refer to "GENERAL CHASSIS" on page 4-1.
	Front wheel		Refer to "FRONT WHEEL" on page 4-6.
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	

FRONT FORK

Disassembling the front fork legs



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	Spacer	1	
5	Fork spring	1	
6	Damper rod locknut	1	
7	Outer tube	1	
8	Dust seal	1	
9	Oil seal clip	1	
10	Oil seal	1	
11	Washer	1	
12	Damper rod assembly bolt	1	
13	Copper washer	1	
14	Damper rod assembly	1	
15	Inner tube	1	

EAS30206

REMOVING THE FRONT FORK LEGS

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

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.

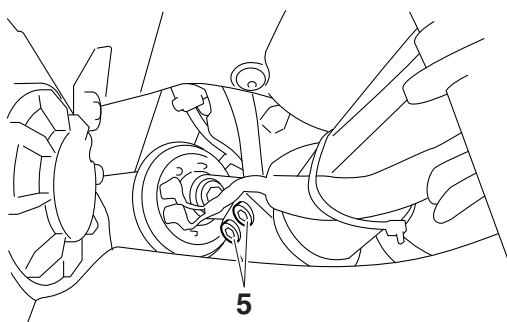
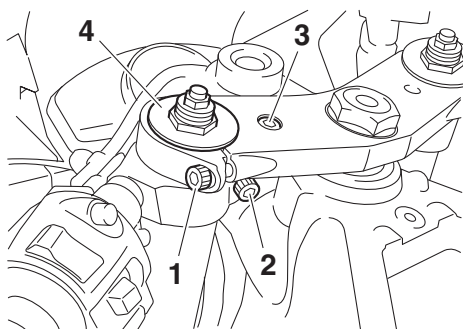
2. Loosen:

- Upper bracket pinch bolt “1”
- Handlebar pinch bolt “2”
- Handlebar bolt “3”
- Cap bolt “4”
- Lower bracket pinch bolts “5”

EWA13640

WARNING

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



EAS30207

DISASSEMBLING THE FRONT FORK LEGS

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

1. Remove:

- Cap bolt “1”
(from the damper rod assembly)
- Washer “2”
- Spacer “3”
- Damper rod locknut “4”



- a. Press down on the spacer with the fork spring compressor “5”.
- b. Install the rod holder “6” between the damper rod locknut “4” and the washer “2”.



Fork spring compressor
90890-01441

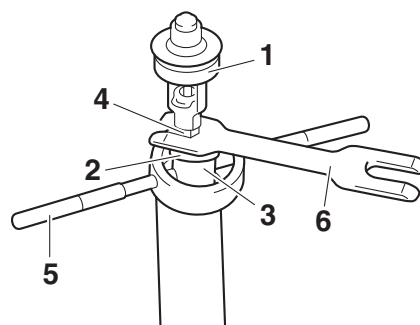
Fork spring compressor
YM-01441

Rod holder
90890-01434

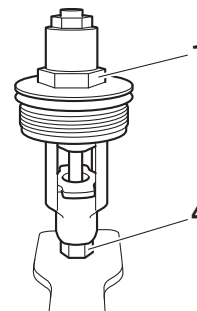
Damper rod holder double ended
YM-01434

TIP

Use the side of the rod holder that is marked “B”.



- c. While holding the damper rod locknut “4”, remove the cap bolt “1”.



- d. Remove the rod holder and fork spring compressor.
- e. Remove the washer and spacer.

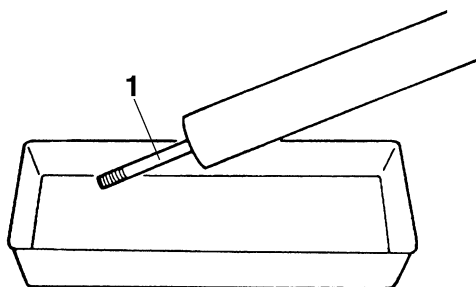


2. Drain:

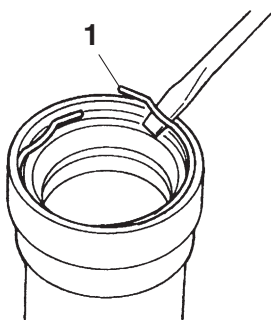
- Fork oil

TIP

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



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



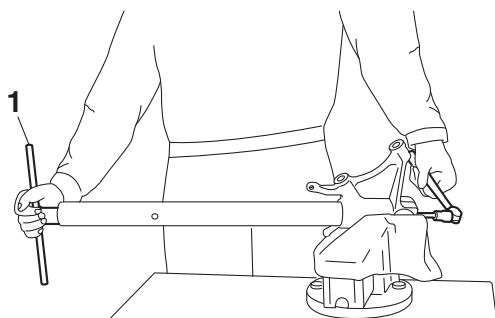
5. Remove:
 - Damper rod assembly bolt
 - Damper rod assembly

TIP

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



Damper rod holder
90890-01423
Damping rod holder
YM-01423



EAS30208

CHECKING THE FRONT FORK LEGS

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

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

EWA13650



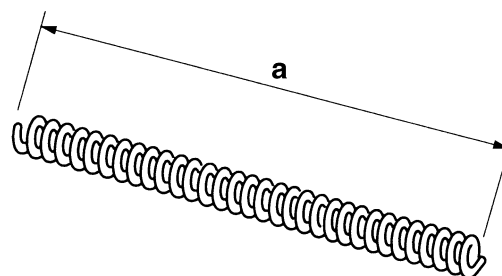
WARNING

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
261.3 mm (10.29 in)
Limit
256.1 mm (10.08 in)



3. Check:
 - Damper rod
 Damage/wear → Replace.
Obstruction → Blow out all of the oil passages with compressed air.
 - Damper adjusting rod (damper rod assembly)
 Bends/damage → Replace.

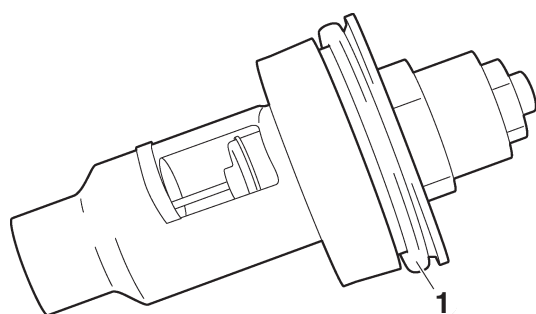
ECA14200

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 O-ring "1"
 Damage/wear → Replace.

FRONT FORK



EAS30209

ASSEMBLING THE FRONT FORK LEGS

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

EWA13660

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
 - Oil seal clip
 - Dust seal
 - O-ring
- Before assembling the front fork leg, make sure all of the components are clean.

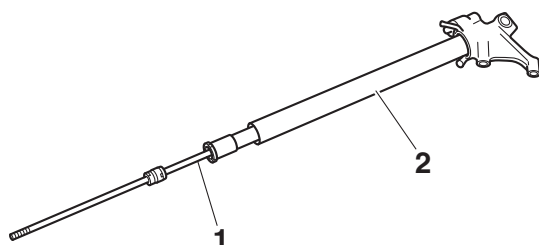
1. Install:

- Damper rod assembly “1”
- Inner tube “2”

ECA14210

NOTICE

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



2. Lubricate:

- Inner tube’s outer surface



Recommended oil
Yamaha Suspension Oil M1

3. Tighten:

- Damper rod assembly bolt “1”



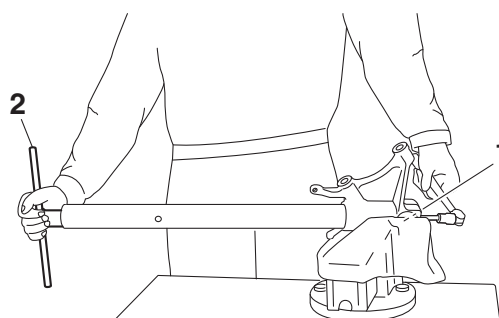
Damper rod assembly bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)

TIP

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



Damper rod holder
90890-01423
Damping rod holder
YM-01423



4. Install:

- Dust seal “1” **New**
- Oil seal clip “2” **New**
- Oil seal “3” **New**
- Washer “4”

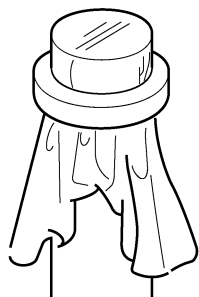
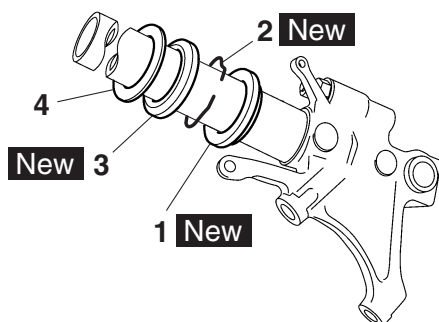
ECA19170

NOTICE

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

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.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag to protect the oil seal during installation.



5. Install:

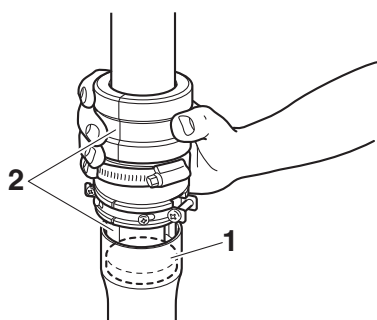
- Outer tube
(to the inner tube)

6. Install:

- Washer
- Oil seal "1"
(with the fork seal driver "2")



Fork seal driver
90890-01442
Adjustable fork seal driver (36–46 mm)
YM-01442

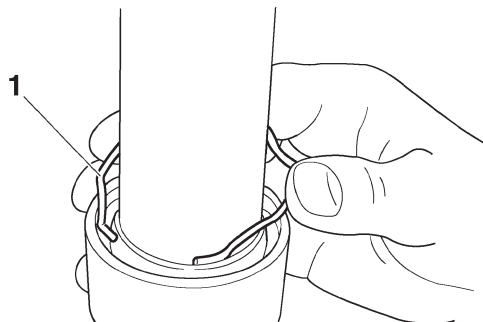


7. Install:

- Oil seal clip "1"

TIP

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

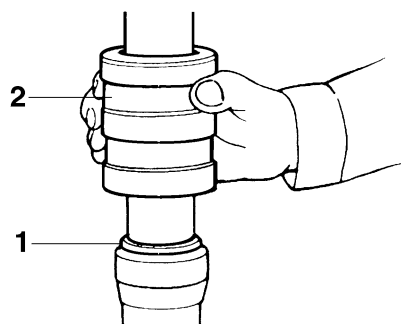


8. Install:

- Dust seal "1"
(with the fork seal driver weight "2")



Fork seal driver
90890-01442
Adjustable fork seal driver (36–46 mm)
YM-01442

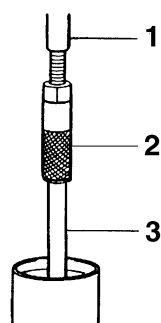


9. Install:

- Rod puller "1"
- Rod puller attachment "2"
(onto the damper rod "3")



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



10. Fully compress the front fork leg.

11. Fill:

- Front fork leg
(with the specified amount of the recommended fork oil)



Quantity (left)
456.0 cm³ (15.42 US oz, 16.08 Imp.oz)
Quantity (right)
456.0 cm³ (15.42 US oz, 16.08 Imp.oz)
Recommended oil
Yamaha Suspension Oil M1

ECA14230

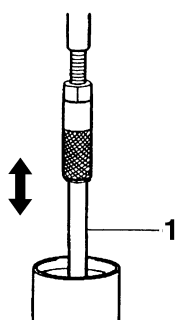
NOTICE

- 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.

TIP

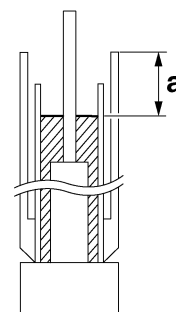
Be sure to bleed the front fork leg of any residual air.

14. Measure:

- Front fork leg oil level "a"
(from the top of the outer tube, with the outer tube fully compressed and without the fork spring)
Out of specification → Correct.

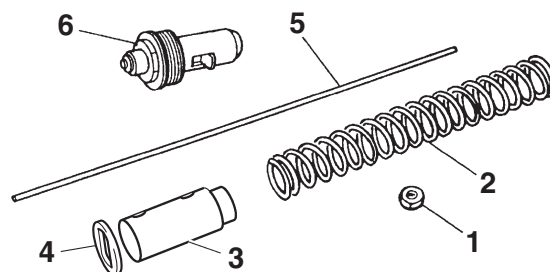


Level (left)
124 mm (4.9 in)
Level (right)
124 mm (4.9 in)



15. Install:

- Fork spring "2"
- Spacer "3"
- Damper rod locknut "1"
- Damper adjusting rod (damper rod assembly) "5"
- Washer "4"
- Cap bolt "6"
(with O-ring)

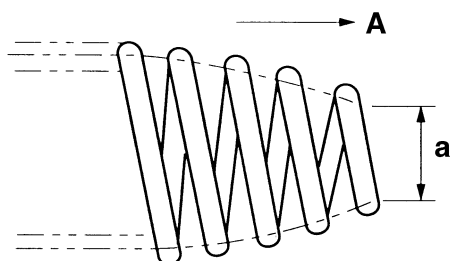


- Remove the rod puller attachment.
- Install the damper rod locknut.
- Install the fork spring.

FRONT FORK

TIP

Install the spring with the smaller pitch "a" facing up "A".



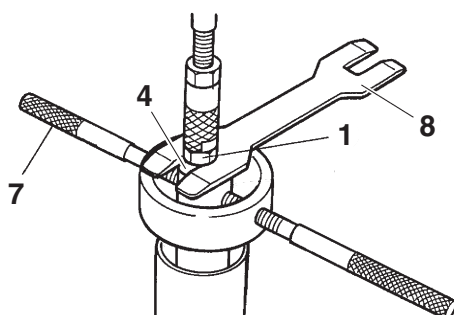
- d. Install the spacer and washer.
- e. Reinstall the rod puller attachment.
- f. Press down on the spacer with the fork spring compressor "7".
- g. Pull up the rod puller and install the rod holder "8" between the damper rod locknut "1" and the washer "4".



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
Fork spring compressor
90890-01441
Fork spring compressor
YM-01441
Rod holder
90890-01434
Damper rod holder double ended
YM-01434

TIP

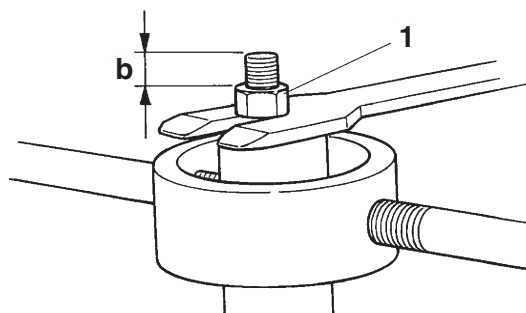
Use the side of the rod holder that is marked "B".



- h. Remove the rod puller and rod puller attachment.
- i. Install the damper rod locknut "1" and position it as specified "b".



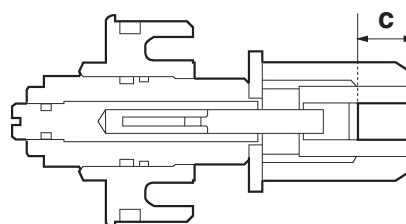
Distance "b"
12 mm (0.47 in)



- j. Install the damper adjusting rod.
- k. Set the cap bolt distance "c" to specification.



Distance "c"
13 mm (0.51 in)



- l. Install the washer and cap bolt, and then finger tighten the cap bolt.

EWA13670



WARNING

Always use a new cap bolt O-ring.

- m. Hold the cap bolt and tighten the damper rod locknut.



Damper rod locknut
15 Nm (1.5 m·kgf, 11 ft·lbf)

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



16. Install:
 - Cap bolt (to the outer tube)

TIP

Temporarily tighten the cap bolt.

EAS30210

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.

EWA13680

⚠ 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:

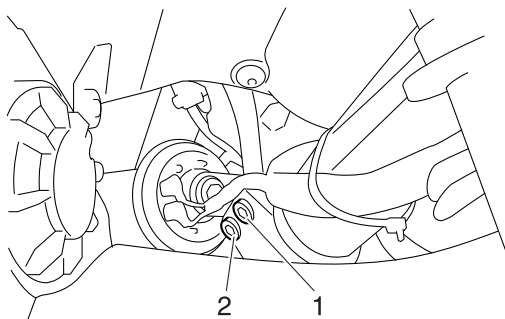
- Lower bracket pinch bolts “1” and “2”



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”.



3. Tighten:

- Cap bolt “1”



Cap bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)

- Handlebar bolt “2”



Handlebar bolt
13 Nm (1.3 m·kgf, 9.4 ft·lbf)

- Handlebar pinch bolt “3”

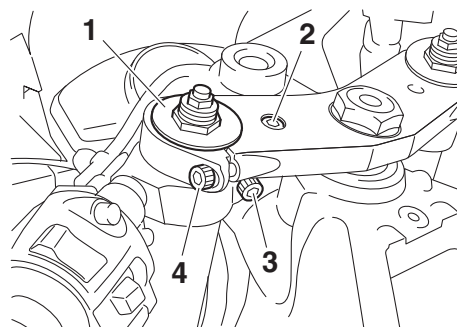


Handlebar pinch bolt
32 Nm (3.2 m·kgf, 23 ft·lbf)

- Upper bracket pinch bolt “4”



Upper bracket pinch bolt
26 Nm (2.6 m·kgf, 19 ft·lbf)



4. Check:

- Cable routing

TIP

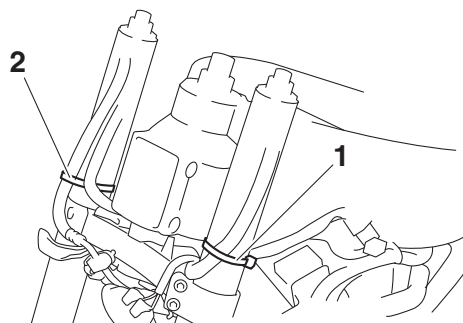
Make sure the brake hose, throttle cables, clutch cable, and handlebar switch leads are routed properly. Refer to “CABLE ROUTING” on page 2-41.

5. Install:

- Plastic locking tie “1”
- Plastic locking tie “2”

TIP

- Fasten the left handlebar switch lead to the left front fork leg with the plastic locking tie.
- Fasten the front brake hose to the right front fork leg with the plastic locking tie.



6. Adjust:

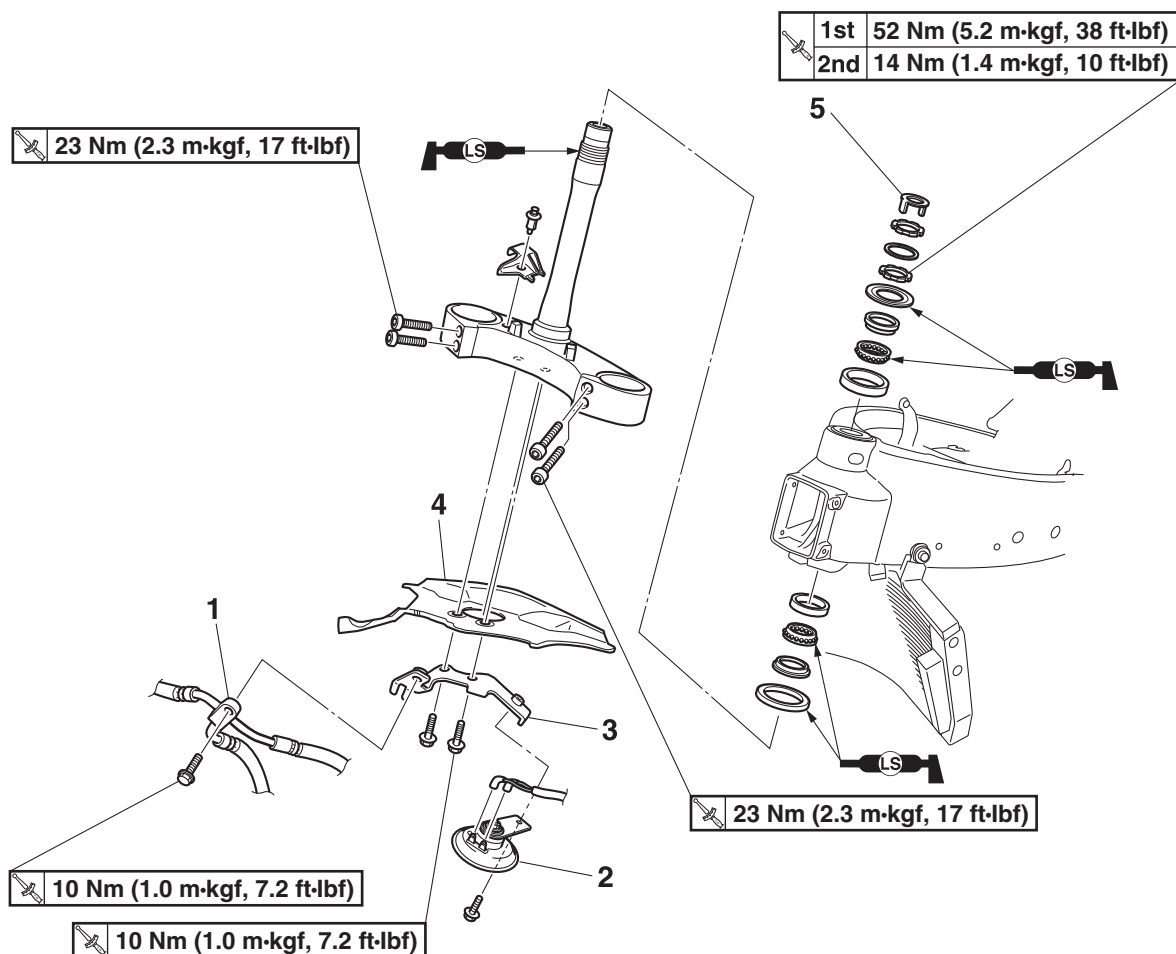
- Spring preload
- Rebound damping
- Compression damping

Refer to “ADJUSTING THE FRONT FORK LEGS” on page 3-22.

EAS20035

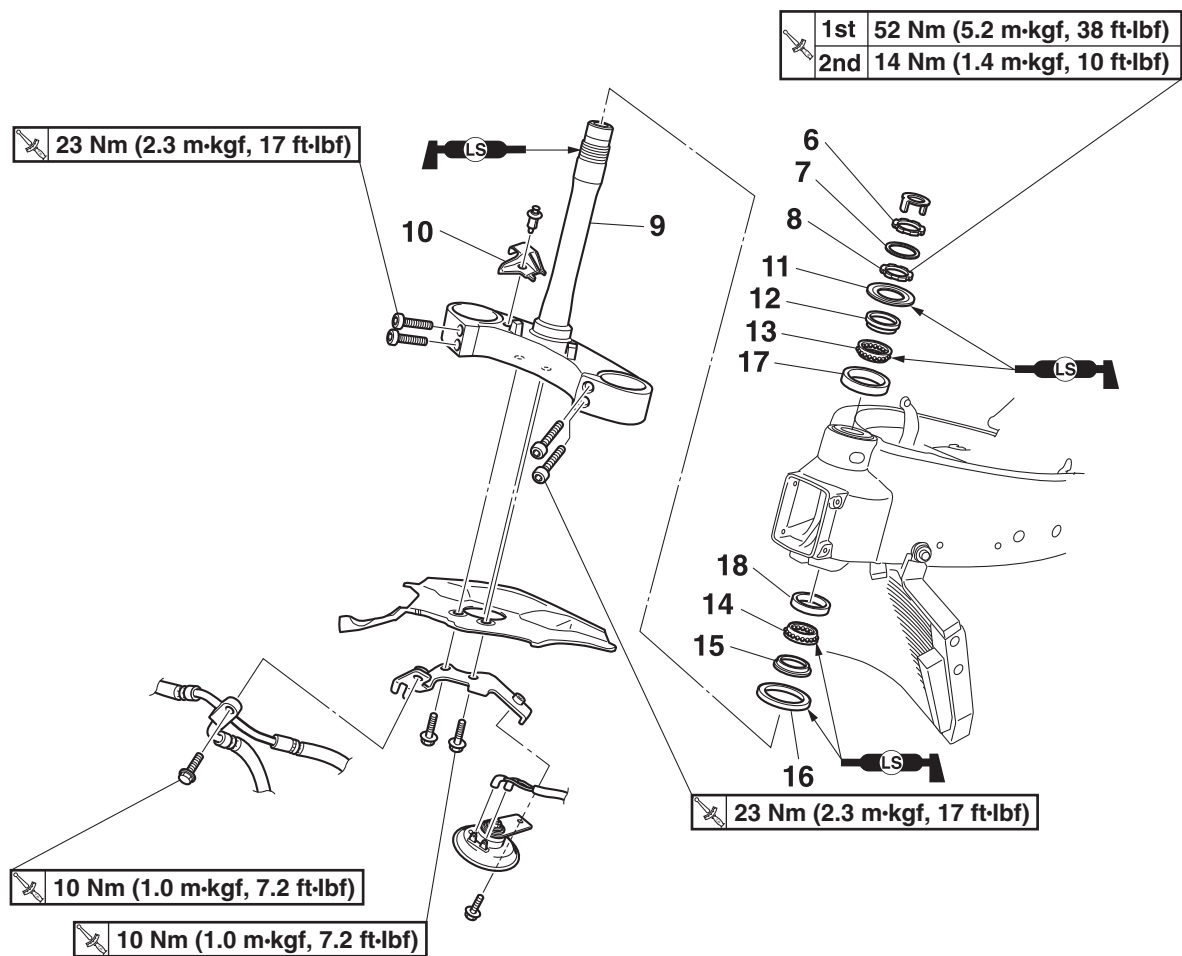
STEERING HEAD

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
	Front cowling assembly		Refer to "GENERAL CHASSIS" on page 4-1.
	Front fork legs		Refer to "FRONT FORK" on page 4-45.
	Handlebars		Refer to "HANDLEBARS" on page 4-41.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
	Air induction system cover		Refer to "AIR INDUCTION SYSTEM" on page 7-15.
1	Front brake hose joint	1	
2	Horn	1	
3	Front brake hose joint bracket	1	
4	Lower bracket cover	1	
5	Lock washer	1	

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
6	Upper ring nut	1	
7	Rubber washer	1	
8	Lower ring nut	1	
9	Lower bracket	1	
10	Throttle cable guide	1	
11	Upper bearing cover	1	
12	Upper bearing inner race	1	
13	Upper bearing	1	
14	Lower bearing	1	
15	Lower bearing inner race	1	
16	Lower bearing dust seal	1	
17	Upper bearing outer race	1	
18	Lower bearing outer race	1	

EAS30213

REMOVING THE LOWER BRACKET

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:
 - Upper ring nut "1"
 - Rubber washer
 - Lower ring nut "2"
 - Lower bracket

EWA13730

WARNING

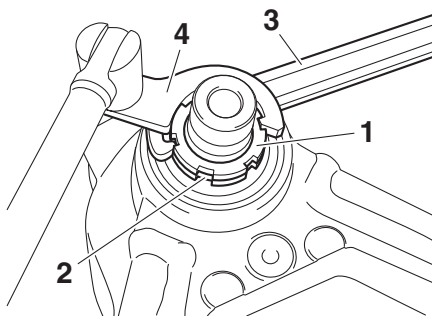
Securely support the lower bracket so that there is no danger of it falling.

TIP

Hold the lower ring nut with the ring nut wrench "3", and then remove the upper ring nut with the steering nut wrench "4".



Ring nut wrench
90890-01268
Spanner wrench
YU-01268
Steering nut wrench
90890-01403
Exhaust flange nut wrench
YU-A9472



EAS30214

CHECKING THE STEERING HEAD

1. Wash:
 - Bearings
 - Bearing races



Recommended cleaning solvent
Kerosene

2. Check:
 - Bearings
 - Bearing races
 Damage/pitting → Replace.

3. Replace:
 - Bearings
 - Bearing races

- a. Remove the bearing race from the steering head pipe "1" with a long rod "2" and hammer.
- b. Remove the bearing race from the lower bracket "3" with a floor chisel "4" and hammer.
- c. Install new bearing races.

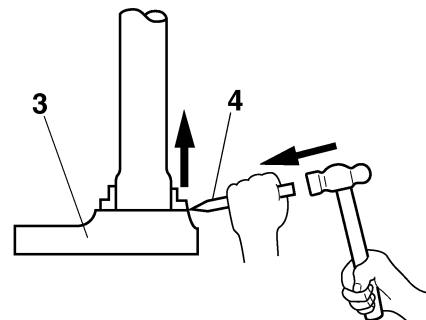
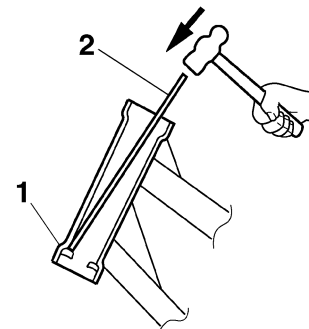
ECA14270

NOTICE

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

TIP

Always replace the bearings and bearing races as a set.



4. Check:
 - Upper bracket
Refer to "HANDLEBARS" on page 4-41.
 - Lower bracket
(along with the steering stem)
Bends/cracks/damage → Replace.

EAS30216

INSTALLING THE STEERING HEAD

1. Lubricate:
 - Upper bearing
 - Lower bearing
 - Bearing races

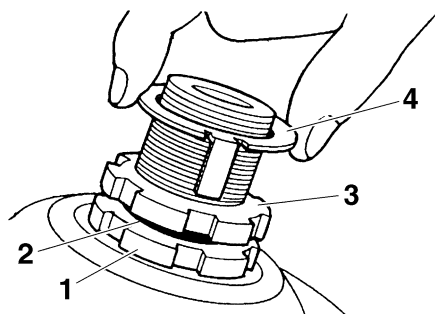


Recommended lubricant
Lithium-soap-based grease

2. Install:

- Lower ring nut “1”
- Rubber washer “2”
- Upper ring nut “3”
- Lock washer “4”

Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” on page 3-20.



3. Install:

- Upper bracket
- Steering stem nut
- Handlebar assembly (right)
- Handlebar assembly (left)

TIP

Temporarily tighten the steering stem nut and handlebar bolts.

4. Install:

- Front fork legs

Refer to “FRONT FORK” on page 4-45.

TIP

Temporarily tighten the lower bracket pinch bolts.

5. Tighten:

- Steering stem nut



Steering stem nut
115 Nm (11.5 m·kgf, 83 ft·lbf)

6. Install:

- Front brake hose joint bracket “1”



Front brake hose joint bracket bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

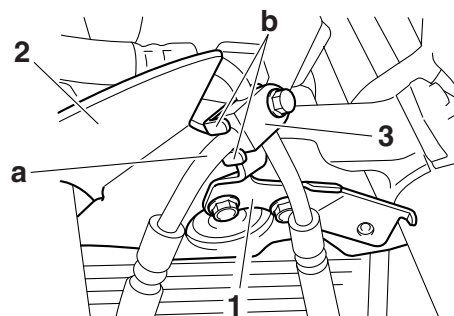
- Lower bracket cover “2”
- Front brake hose joint “3”



Front brake hose joint bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

Route the right brake pipe “a” through the projections “b” of the front brake hose joint bracket.



7. Check:

- Cable routing

TIP

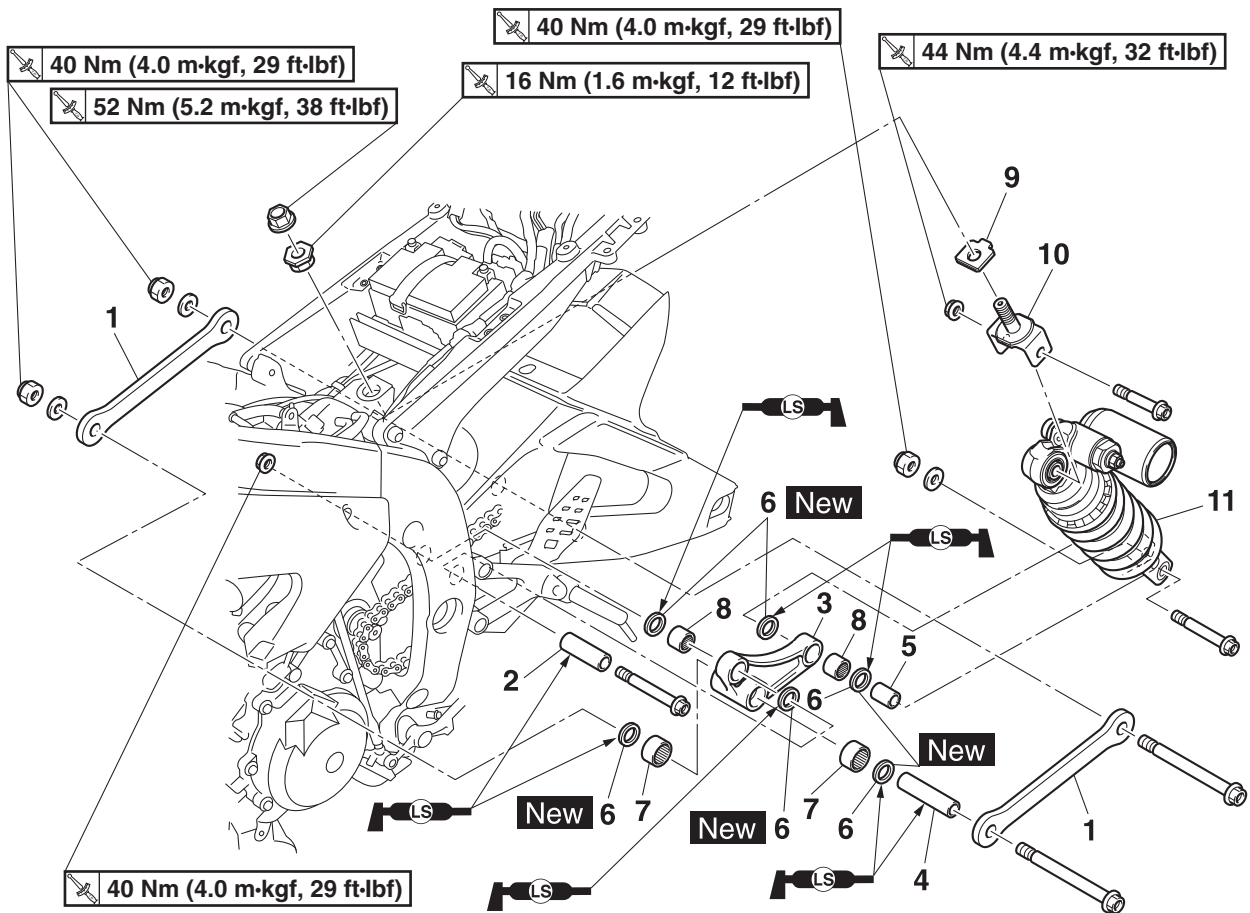
Make sure the immobilizer unit lead, main switch lead, brake hoses, throttle cables, clutch cable, and handlebar switch leads are routed properly. Refer to “CABLE ROUTING” on page 2-41.

REAR SHOCK ABSORBER ASSEMBLY

EAS20036

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Exhaust pipe assembly brackets		Refer to "ENGINE REMOVAL" on page 5-3.
	Rear wheel		Refer to "REAR WHEEL" on page 4-12.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Connecting arm	2	
2	Relay arm collar	1	
3	Relay arm	1	
4	Collar	1	
5	Collar	1	
6	Oil seal	6	
7	Bearing	2	
8	Bearing	2	
9	Washer	1	
10	Rear shock absorber assembly bracket	1	
11	Rear shock absorber assembly	1	

REAR SHOCK ABSORBER ASSEMBLY

EAS30826

HANDLING THE REAR SHOCK ABSORBER

EWA13740

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.

EAS30729

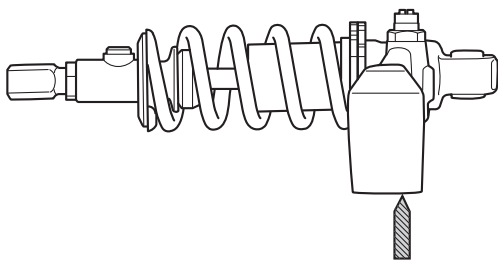
DISPOSING OF A REAR SHOCK ABSORBER

1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3 mm (0.08–0.12 in) hole through the rear shock absorber as shown.

EWA13760

WARNING

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



EAS30219

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

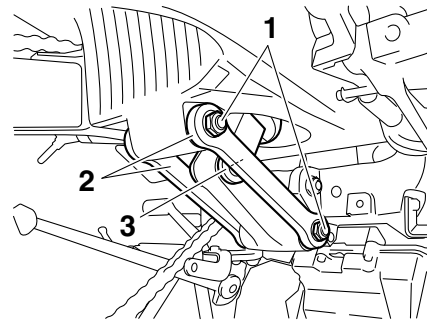
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Connecting arm bolts “1”
- Connecting arms “2”
- Rear shock absorber assembly lower bolt “3”

TIP

While removing the connecting arm bolts, hold the swingarm so that it does not drop down.

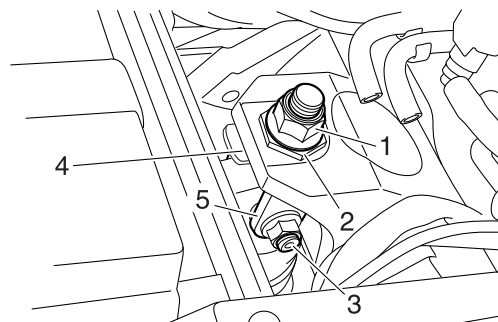


3. Remove:

- Rear shock absorber assembly bracket nut “1”
- Spacer bolt “2”
- Rear shock absorber assembly upper bolt “3”
- Washer “4”
- Rear shock absorber assembly bracket “5”
- Rear shock absorber assembly

TIP

Lower the swingarm, and then remove the rear shock absorber assembly from between the swingarm and frame.



EAS30220

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:

- Rear shock absorber rod
Bends/damage → Replace the rear shock absorber assembly.

REAR SHOCK ABSORBER ASSEMBLY

- Rear shock absorber
Gas leaks/oil leaks → Replace the rear shock absorber assembly.
- Spring
Damage/wear → Replace the rear shock absorber assembly.
- Bushing
Damage/wear → Replace.
- Collar
Damage/scratches → Replace.
- Bolts
Bends/damage/wear → Replace.

EAS30221

CHECKING THE CONNECTING ARM AND RELAY ARM

1. Check:
 - Connecting arms
 - Relay arm
Damage/wear → Replace.
2. Check:
 - Bearings
 - Oil seals
Damage/pitting → Replace.
3. Check:
 - Collars
Damage/scratches → Replace.

EAS30222

INSTALLING THE RELAY ARM

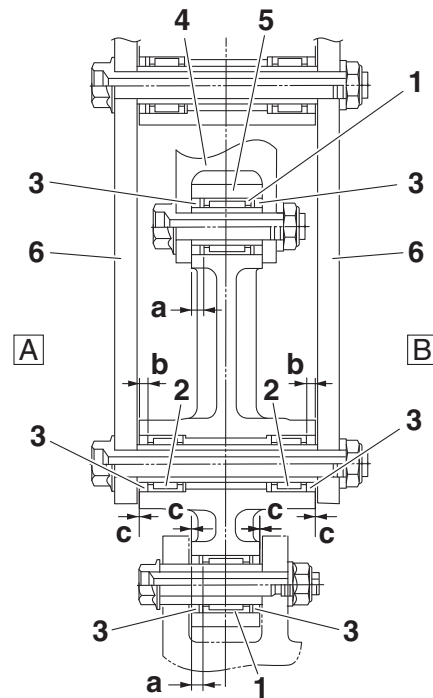
1. Lubricate:
 - Collars
 - Bearings
2. Install:
 - Bearings “1”, “2”
(to the relay arm)
 - Oil seals “3”



Installed depth of bearing “a”
4.5 mm (0.18 in)
Installed depth of bearing “b”
3.5 mm (0.14 in)
Installed depth of oil seal “c”
1.0 mm (0.04 in)

TIP

When installing the oil seals to the relay arm, face the character stamp of the oil seals outside.



4. Rear shock absorber
 5. Relay arm
 6. Connecting arms
- A. Left side
B. Right side

EAS30225

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
 - Collar
 - Bearings



Recommended lubricant
Lithium-soap-based grease

2. Tighten:
 - Relay arm nut



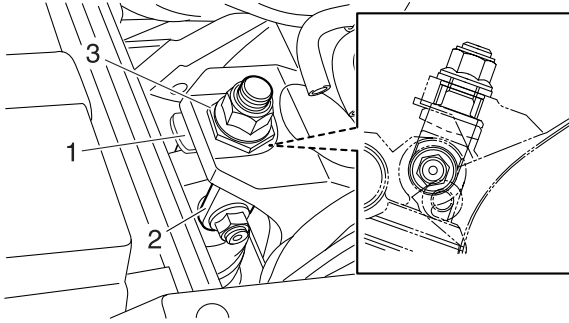
Relay arm and frame nut
40 Nm (4.0 m·kgf, 29 ft·lbf)

3. Install:
 - Rear shock absorber assembly
 - Washer “1”
 - Rear shock absorber assembly bracket “2”
 - Spacer bolt “3”

TIP

Install the washer with the brim pointing back of the vehicle and the “UP” punch mark facing up.

REAR SHOCK ABSORBER ASSEMBLY



4. Tighten:

- Spacer bolt



**Rear shock absorber assembly
spacer bolt**
16 Nm (1.6 m·kgf, 12 ft·lbf)

- Rear shock absorber assembly lower nut



**Rear shock absorber assembly
lower nut**
40 Nm (4.0 m·kgf, 29 ft·lbf)

- Rear shock absorber assembly upper nut



**Rear shock absorber assembly
upper nut**
44 Nm (4.4 m·kgf, 32 ft·lbf)

- Rear shock absorber assembly bracket nut



**Rear shock absorber assembly
bracket nut**
52 Nm (5.2 m·kgf, 38 ft·lbf)

5. Install:

- Connecting arms

TIP

When installing the connecting arms, lift up the swingarm.

6. Tighten:

- Connecting arm nuts

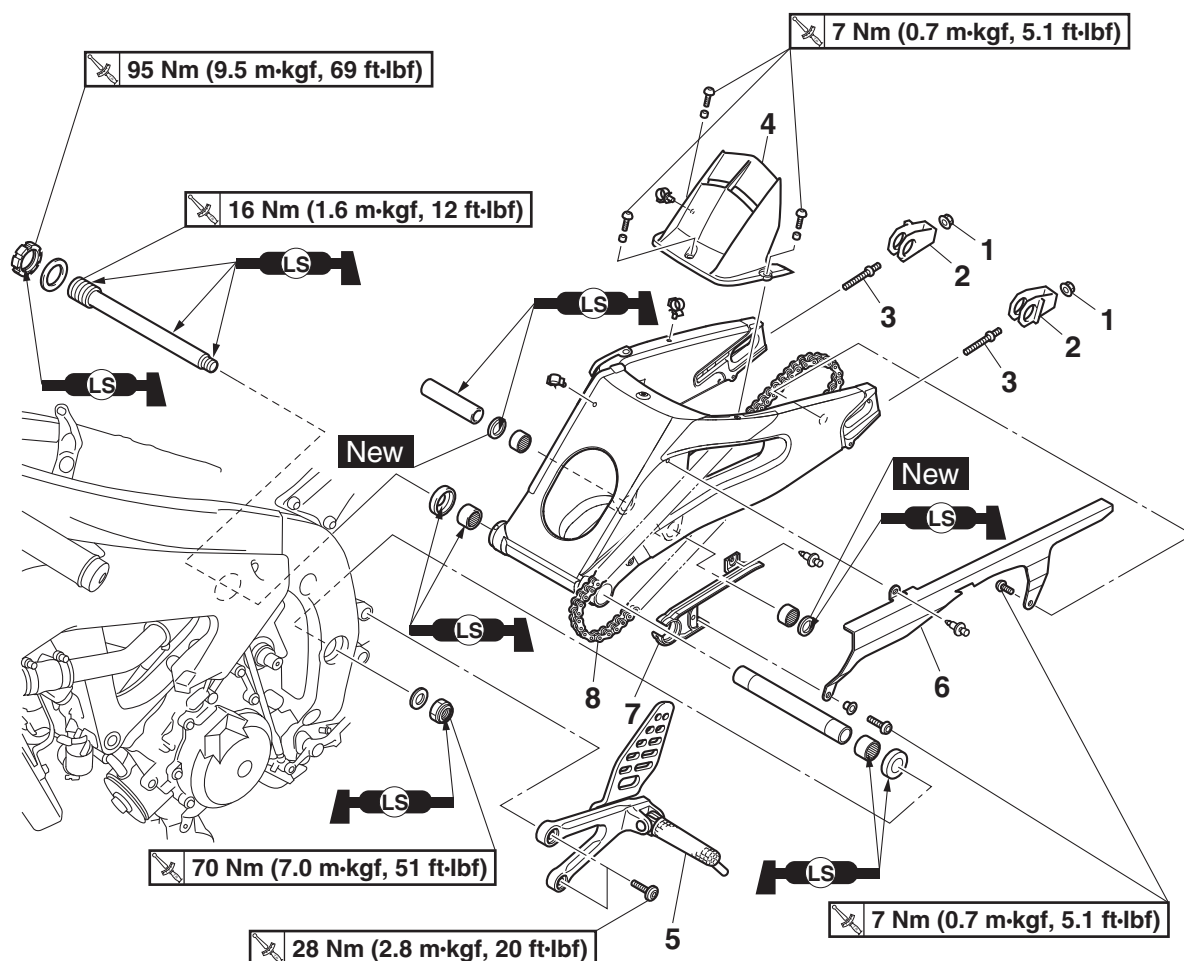


**Connecting arm and relay arm
nut**
40 Nm (4.0 m·kgf, 29 ft·lbf)
**Connecting arm and swingarm
nut**
40 Nm (4.0 m·kgf, 29 ft·lbf)

EAS20037

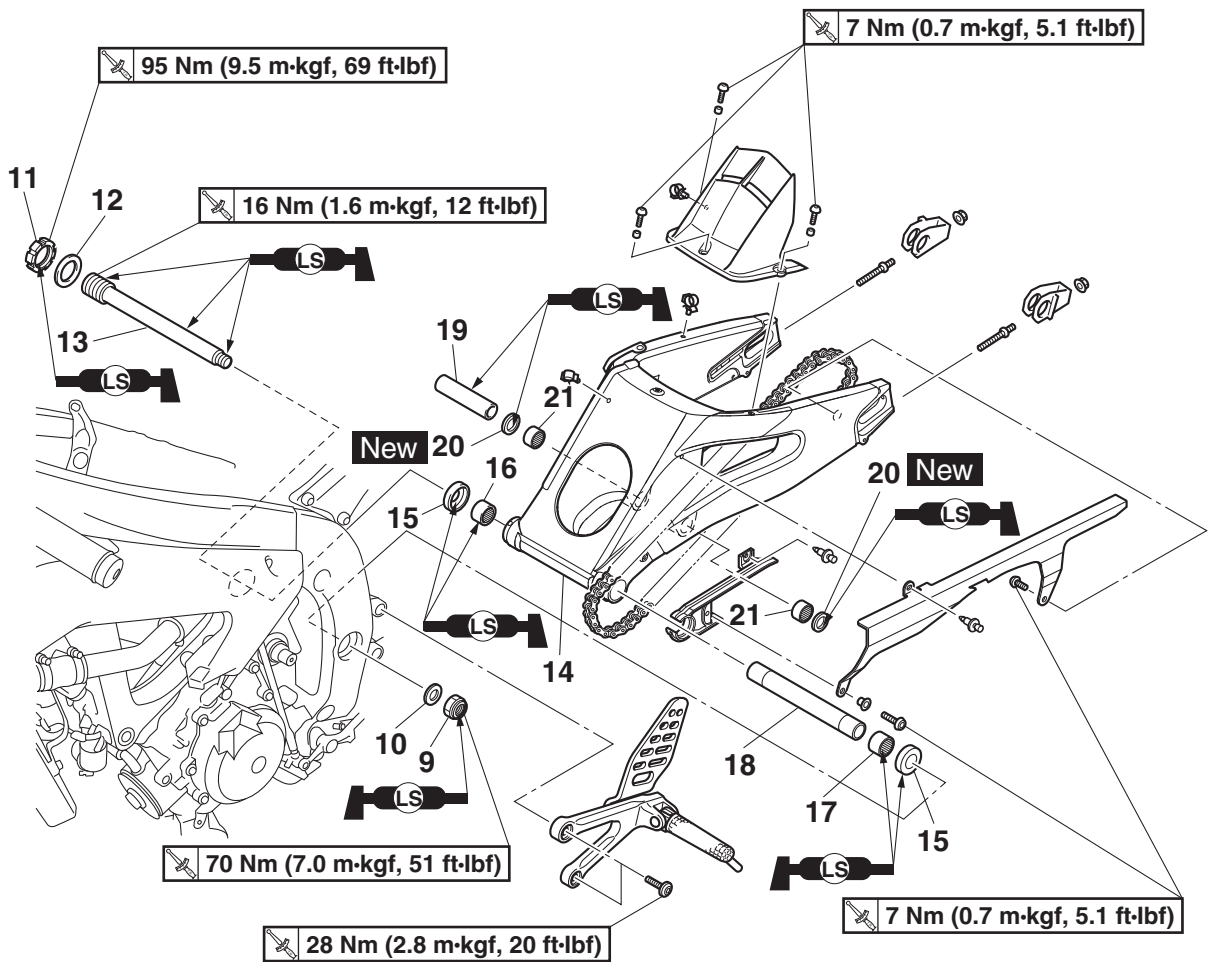
SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-12.
	Rear shock absorber		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-58.
	Drive chain guide (drive sprocket side)		Refer to "CHAIN DRIVE" on page 4-67.
1	Drive chain adjusting locknut	2	
2	Drive chain puller	2	
3	Drive chain adjusting bolt	2	
4	Rear fender	1	
5	Footrest assembly (left)	1	
6	Drive chain guard	1	
7	Drive chain guide (swingarm side)	1	
8	Drive chain	1	

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
9	Swingarm pivot shaft nut	1	
10	Washer	1	
11	Swingarm pivot shaft ring nut	1	
12	Washer	1	
13	Swingarm pivot shaft	1	
14	Swingarm	1	
15	Dust cover	2	
16	Bearing	1	
17	Bearing	1	
18	Collar	1	
19	Collar	1	
20	Oil seal	2	
21	Bearing	2	

EAS30226

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. Measure:

- Swingarm side play
- Swingarm vertical movement

- a. Measure the tightening torque of the pivot shaft nut, pivot shaft ring nut, and pivot shaft.



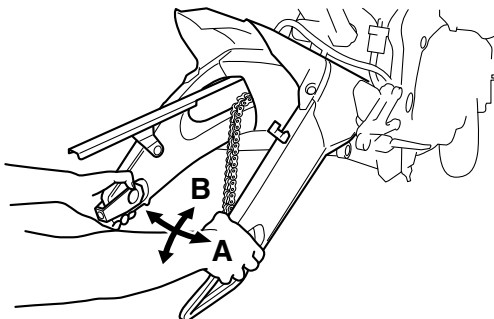
Swingarm pivot shaft nut
70 Nm (7.0 m-kgf, 51 ft-lbf)
Swingarm pivot shaft ring nut
95 Nm (9.5 m-kgf, 69 ft-lbf)
Swingarm pivot shaft
16 Nm (1.6 m-kgf, 12 ft-lbf)

- 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 collars, bearings, washers, and dust covers.



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 collars, bearings, washers, and dust covers.



3. Remove:

- Drive chain
Refer to "REMOVING THE DRIVE CHAIN" on page 4-68.

4. Remove:

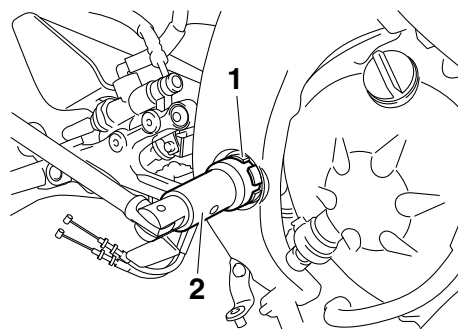
- Swingarm pivot shaft ring nut "1"

TIP

Loosen the swingarm pivot shaft ring nut with the ring nut wrench "2".



Ring nut wrench
90890-01507
Ring nut wrench
YM-01507



5. Remove:

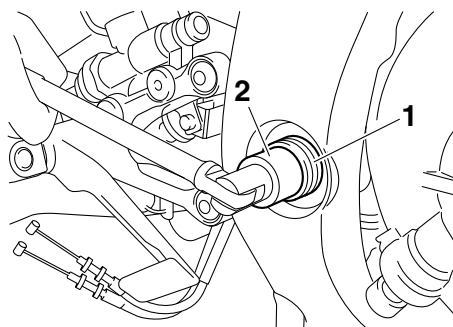
- Swingarm pivot shaft "1"

TIP

Loosen the swingarm pivot shaft with the damper rod holder (24 mm) "2".



Damper rod holder (24 mm)
90890-01328
Damper rod holder (24 mm)
YM-01328



EAS30227

CHECKING THE SWINGARM

1. Check:

- Swingarm
Bends/cracks/damage → Replace.

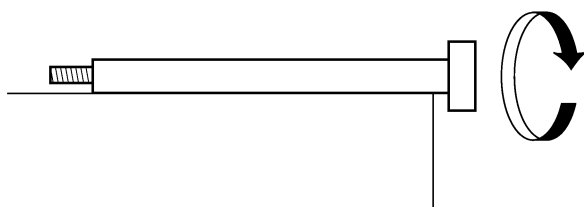
2. Check:

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

EWA13770

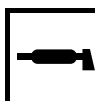
⚠ WARNING

Do not attempt to straighten a bent pivot shaft.



3. Wash:

- Pivot shaft
- Dust covers
- Collars
- Washers
- Bearings



Recommended cleaning solvent
Kerosene

4. Check:

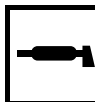
- Dust covers
- Collars
- Oil seals
- Damage/wear → Replace.
- Bearings
- Damage/pitting → Replace.

EAS30228

INSTALLING THE SWINGARM

1. Lubricate:

- Bearings
- Collars
- Dust covers
- Pivot shaft



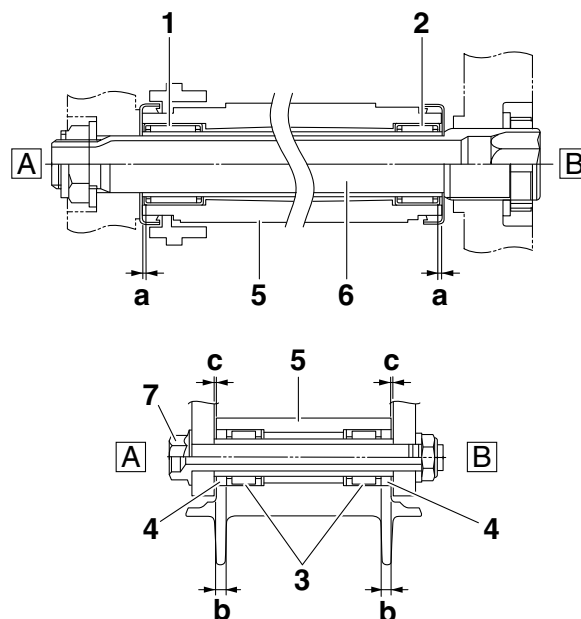
Recommended lubricant
Lithium-soap-based grease

2. Install:

- Bearing “1”
- Bearing “2”
- Bearings “3”
- Oil seals “4”



Installed depth of bearing “a”
0–1.0 mm (0–0.04 in)
Installed depth of bearing “b”
4.0 mm (0.16 in)
Installed depth of oil seal “c”
1.0 mm (0.04 in)



- 5. Swingarm
- 6. Swingarm pivot shaft
- 7. Bolt
- A. Left side
- B. Right side

3. Install:

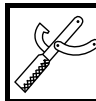
- Swingarm pivot shaft “1”



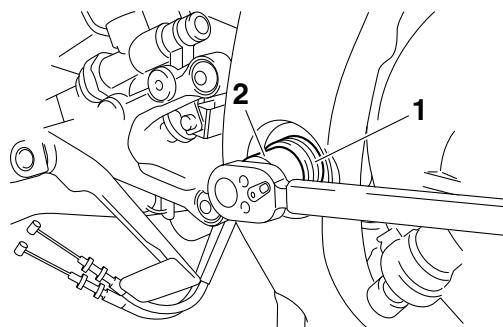
Swingarm pivot shaft
16 Nm (1.6 m·kgf, 12 ft·lbf)

TIP

Tighten the swingarm pivot shaft with the damper rod holder (24 mm) “2”.



Damper rod holder (24 mm)
90890-01328
Damper rod holder (24 mm)
YM-01328



4. Install:

- Swingarm pivot shaft ring nut “1”



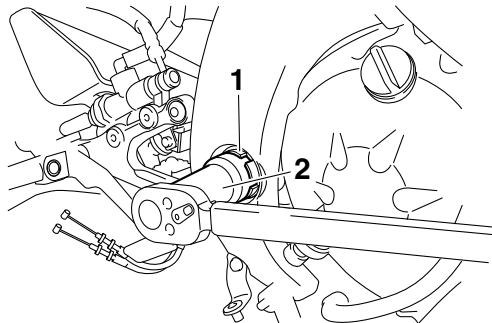
Swingarm pivot shaft ring nut
95 Nm (9.5 m·kgf, 69 ft·lbf)

TIP

- Lubricate the swingarm pivot ring nut threads and mating surfaces with lithium-soap-based grease.
- Tighten the swingarm pivot shaft ring nut with the ring nut wrench “2”.



Ring nut wrench
90890-01507
Ring nut wrench
YM-01507



5. Install:

- Swingarm pivot shaft nut



Swingarm pivot shaft nut
70 Nm (7.0 m·kgf, 51 ft·lbf)

TIP

Lubricate the swingarm pivot shaft nut threads and mating surfaces with lithium-soap-based grease.

6. Adjust:

- Drive chain slack
Refer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 3-19.

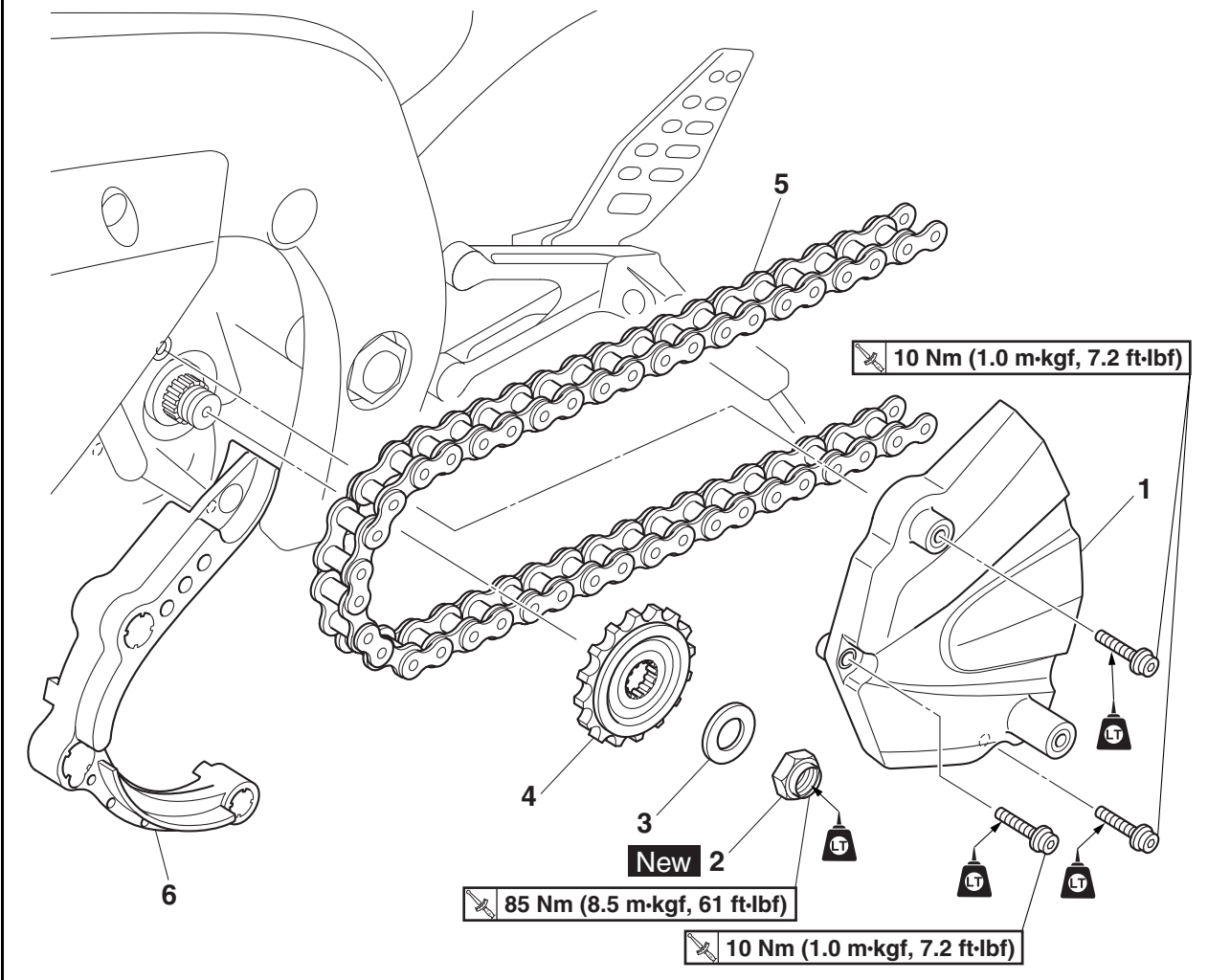


Drive chain slack (on a suitable stand)
30.0–45.0 mm (1.18–1.77 in)

EAS20038

CHAIN DRIVE

Removing the drive sprocket and drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Middle side cowling (left)		Refer to "GENERAL CHASSIS" on page 4-1.
	Bottom cowling (left)		Refer to "GENERAL CHASSIS" on page 4-1.
	Shift rod		Refer to "ENGINE REMOVAL" on page 5-3.
1	Drive sprocket cover	1	
2	Drive sprocket nut	1	
3	Washer	1	
4	Drive sprocket	1	
5	Drive chain	1	
6	Drive chain guide (drive sprocket side)	1	

EAS30229

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
(with the drive chain cutter)

TIP

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

EAS30230

CHECKING THE DRIVE CHAIN

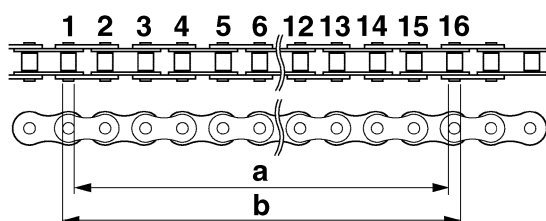
1. Measure:

- 15-link section "a" of the drive chain
Out of specification → Replace the drive chain.



15-link length limit
239.3 mm (9.42 in)

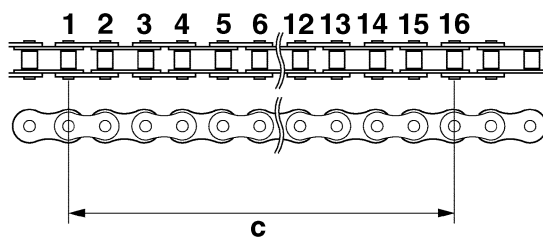
- a. Measure the length "a" between the inner sides of the pins and the length "b" between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.



- b. Calculate the length "c" of the 15-link section of the drive chain using the following formula.
Drive chain 15-link section length "c" =
(length "a" between pin inner sides + length "b" between pin outer sides)/2

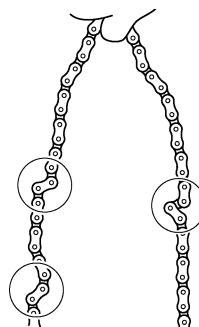
TIP

- When measuring a 15-link section of the drive chain, make sure that the drive chain is taut.
- Perform this procedure 2–3 times, at a different location each time.



2. Check:

- Drive chain
Stiffness → Clean and lubricate or replace.



3. Clean:

- Drive chain

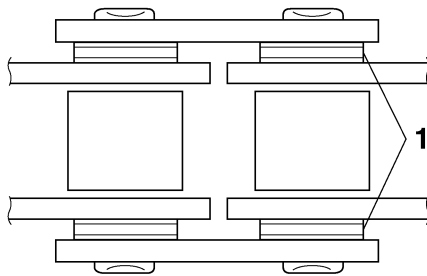
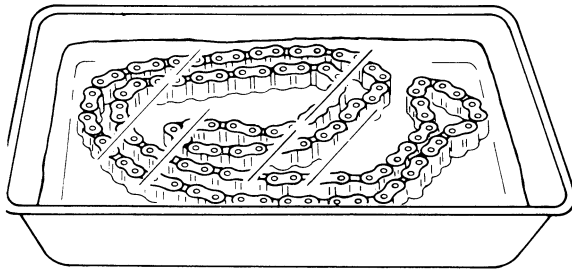


- a. Wipe the drive chain with a clean cloth.
- b. Put the drive chain in kerosene and remove any remaining dirt.
- c. Remove the drive chain from the kerosene and completely dry it.

ECA14290

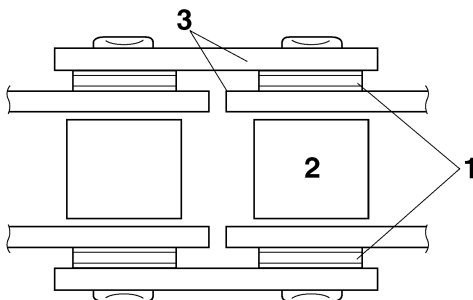
NOTICE

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



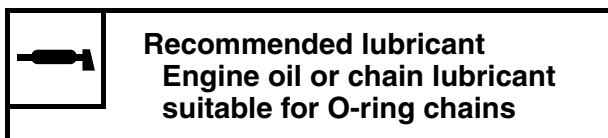
4. Check:

- 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.



5. Lubricate:

- Drive chain



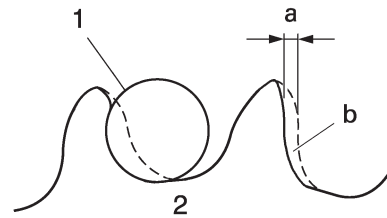
EAS30231

CHECKING THE DRIVE SPROCKET

1. Check:

- Drive sprocket
More than 1/4 tooth "a" wear → Replace the drive sprockets as a set.

Bent teeth → Replace the drive sprockets as a set.



- b. Correct
- 1. Drive chain roller
- 2. Drive sprocket

EAS30232

CHECKING THE REAR WHEEL SPROCKET

Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-15.

EAS30233

CHECKING THE REAR WHEEL DRIVE HUB

Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-15.

EAS30234

INSTALLING THE DRIVE CHAIN

- Lubricate:
 - Drive chain



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

2. Install:

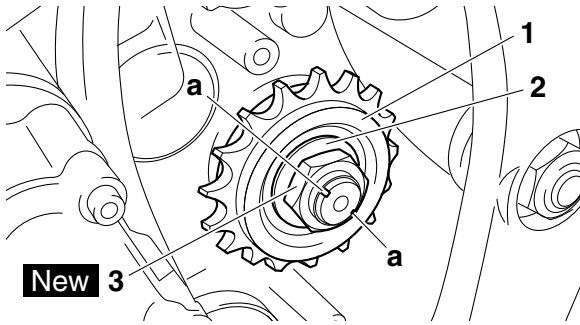
- Drive sprocket "1"
- Washer "2"
- Drive sprocket nut "3" **New**

TIP

- While applying the rear brake, tighten the drive sprocket nut.
- Stake the drive sprocket nut "3" at a cutout "a" in the drive axle.



Drive sprocket nut
85 Nm (8.5 m·kgf, 61 ft·lbf)
LOCTITE®



ENGINE

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EAS20041

ENGINE INSPECTION

EAS30249

MEASURE THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

TIP

Insufficient compression pressure will result in a loss of performance.

1. Measure:
 - Valve clearance
Out of specification → Adjust.
Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-5.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
 - Side cowling assembly
Refer to “GENERAL CHASSIS” on page 4-1.
 - Radiator
Refer to “RADIATOR” on page 6-1.
4. Remove:
 - Ignition coils
 - Spark plugs

ECA13340

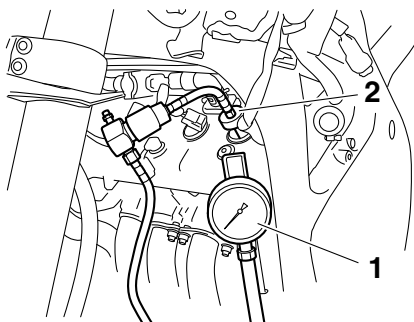
NOTICE

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

5. Install:
 - Compression gauge “1”
 - Extension “2”



Compression gauge
90890-03081
Engine compression tester
YU-33223
Extension
90890-04136



6. Measure:

- Compression pressure
Out of specification → Refer to steps (c) and (d).



Compression pressure
1392–1792 kPa/400 r/min (13.9–
17.9 kgf/cm²/400 r/min, 198.0–
254.9 psi/400 r/min)



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

EWA12940

WARNING

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

TIP

The difference in compression pressure between cylinders should not exceed 100 kPa (1 kg/cm², 14 psi).

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

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



7. Install:
 - Spark plugs
 - Ignition coils



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

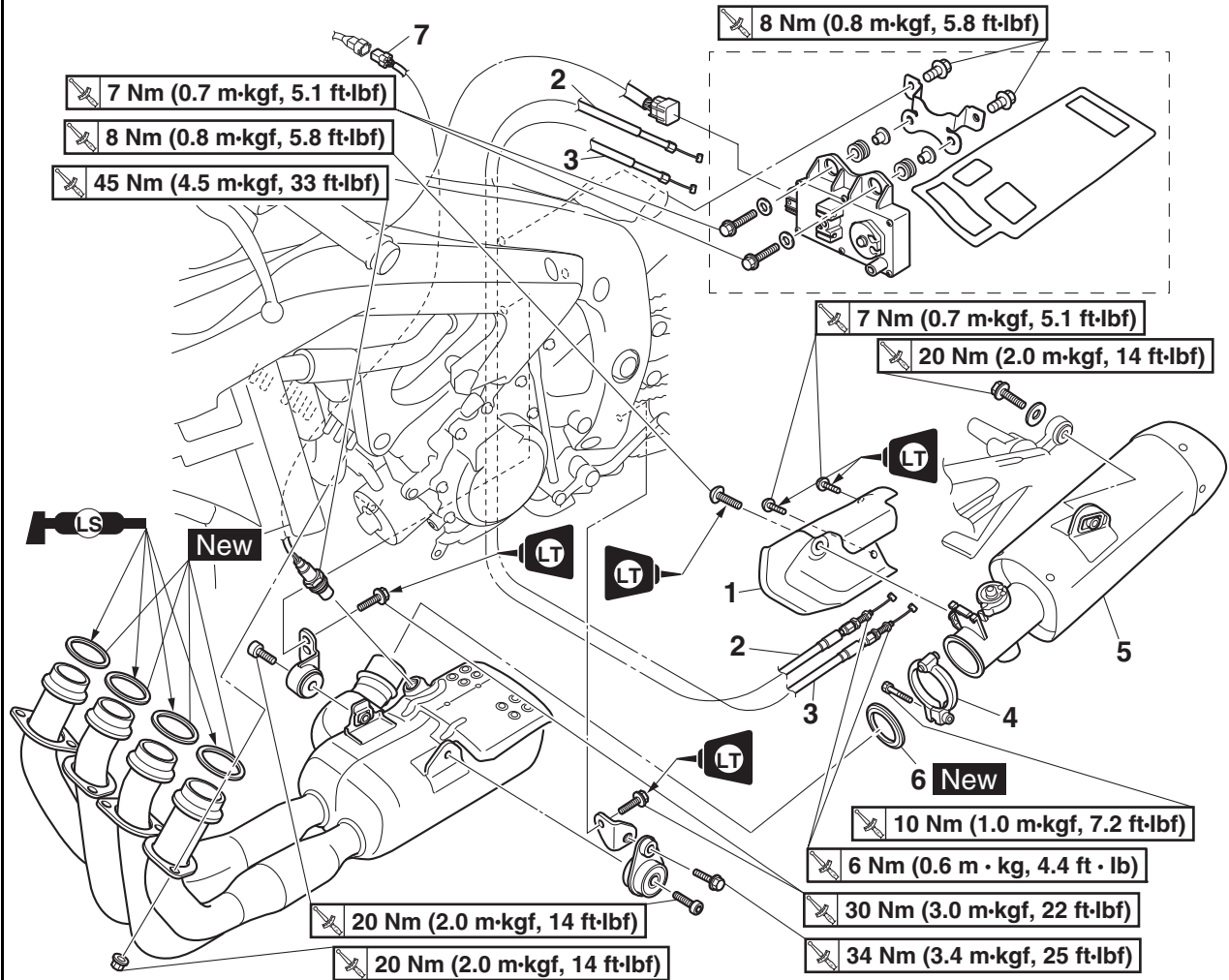
8. Install:

- Radiator
Refer to "RADIATOR" on page 6-1.
- Side cowling assembly
Refer to "GENERAL CHASSIS" on page 4-1.

EAS20042

ENGINE REMOVAL

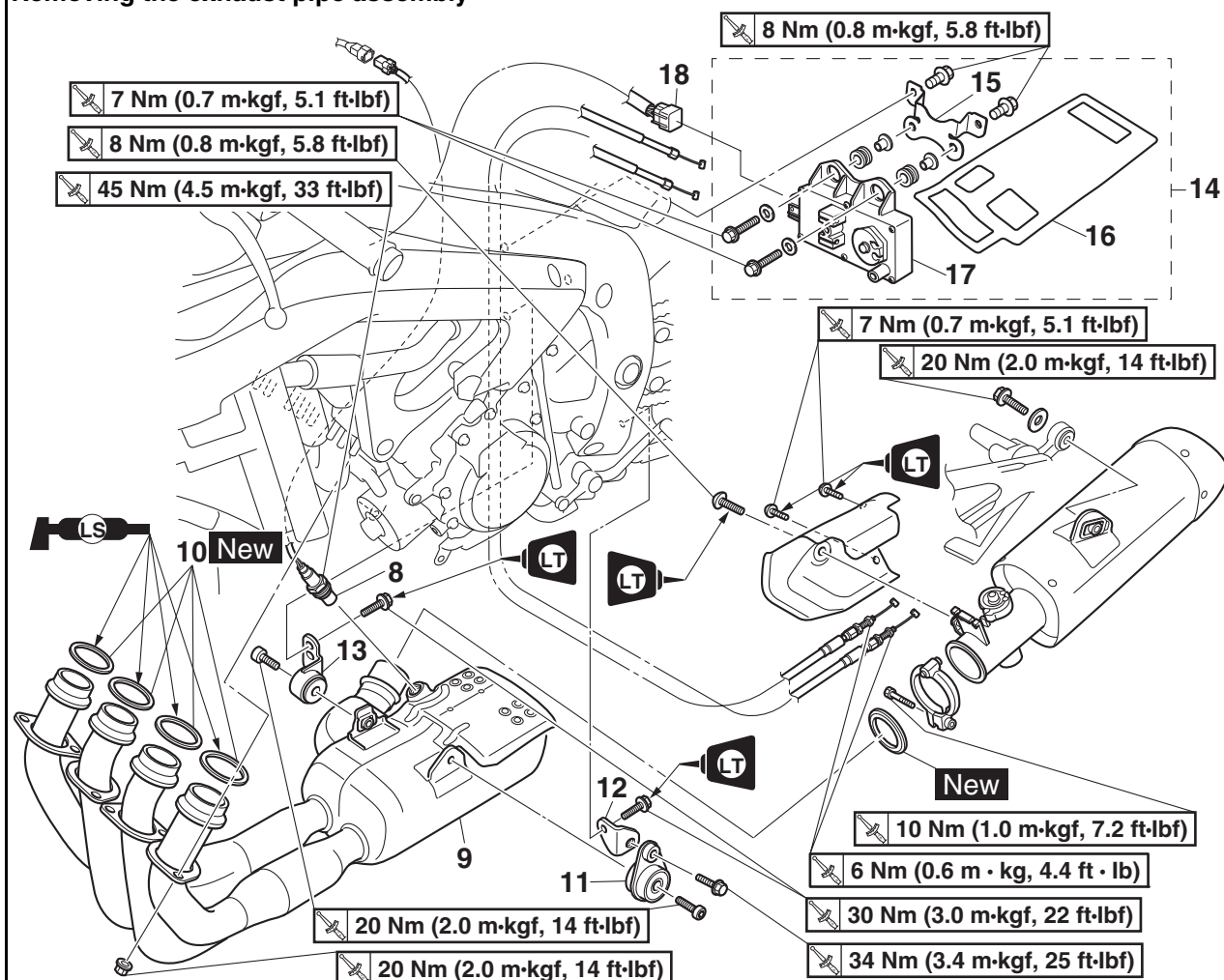
Removing the exhaust pipe assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling assembly		Refer to "GENERAL CHASSIS" on page 4-1.
	Upper side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Radiator bracket		Refer to "RADIATOR" on page 6-1.
1	EXUP valve pulley cover	1	
2	EXUP cable	1	Black adjusting bolt
3	EXUP cable	1	
4	Clamp	1	
5	Muffler	1	
6	Gasket	1	
7	O ₂ sensor coupler	1	Disconnect.

ENGINE REMOVAL

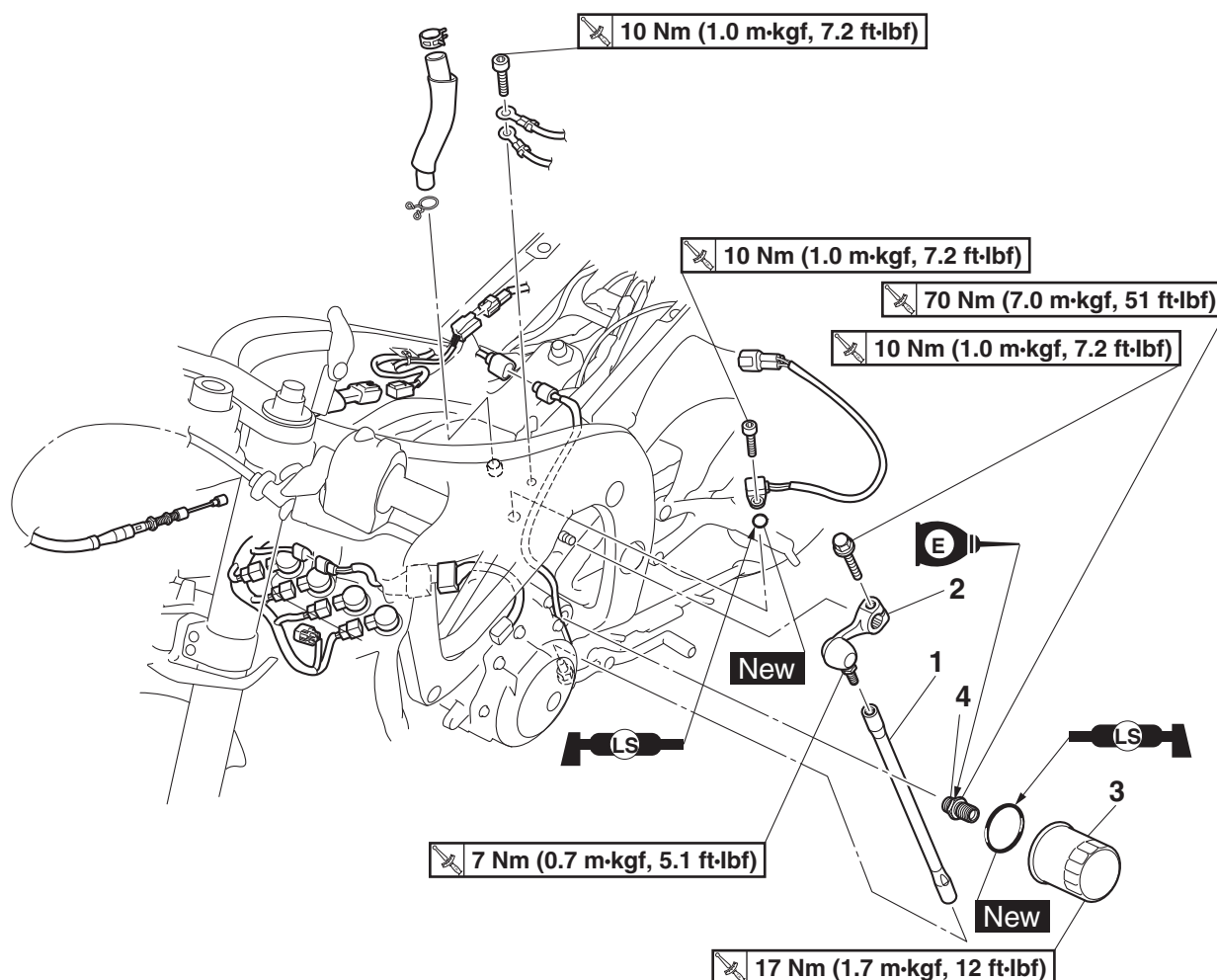
Removing the exhaust pipe assembly



Order	Job/Parts to remove	Q'ty	Remarks
8	O ₂ sensor	1	Remove the O ₂ sensor only when necessary.
9	Exhaust pipe assembly	1	
10	Gasket	4	
11	Exhaust pipe assembly bracket (left lower side)	1	
12	Exhaust pipe assembly bracket (left upper side)	1	
13	Exhaust pipe assembly bracket (right side)	1	
14	EXUP servo motor assembly	1	
15	EXUP servo motor bracket	1	
16	EXUP servo motor cover	1	
17	EXUP servo motor	1	
18	EXUP servo motor coupler	1	Disconnect.

ENGINE REMOVAL

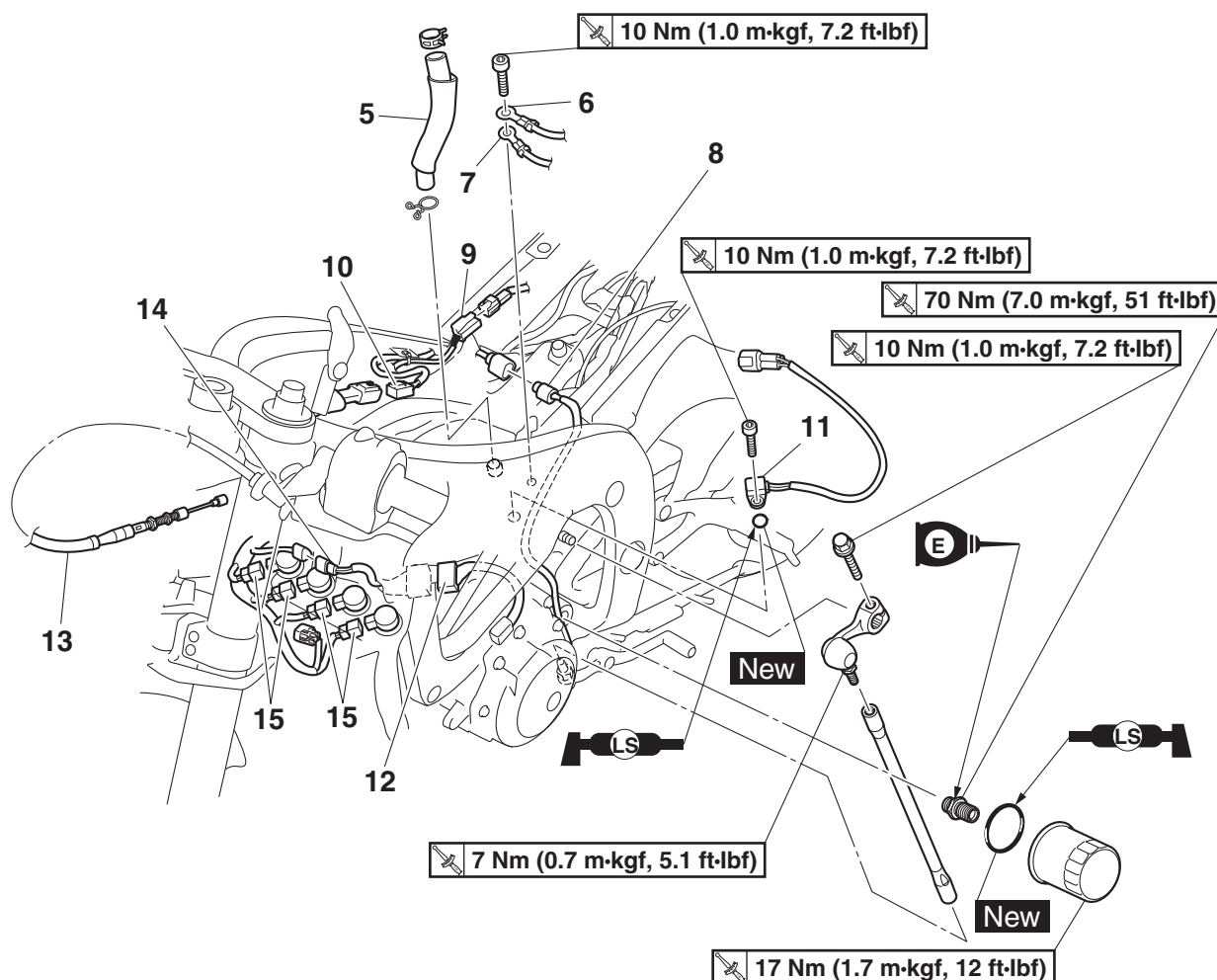
Disconnecting the leads and hoses



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 7-4.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-9.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" on page 7-15.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-35.
	Thermostat		Refer to "THERMOSTAT" on page 6-7.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Oil cooler		Refer to "OIL COOLER" on page 6-5.
	Water pump		Refer to "WATER PUMP" on page 6-9.
	Drive sprocket		Refer to "CHAIN DRIVE" on page 4-67.
1	Shift rod	1	
2	Shift arm	1	
3	Oil filter cartridge	1	
4	Oil filter cartridge bolt	1	

ENGINE REMOVAL

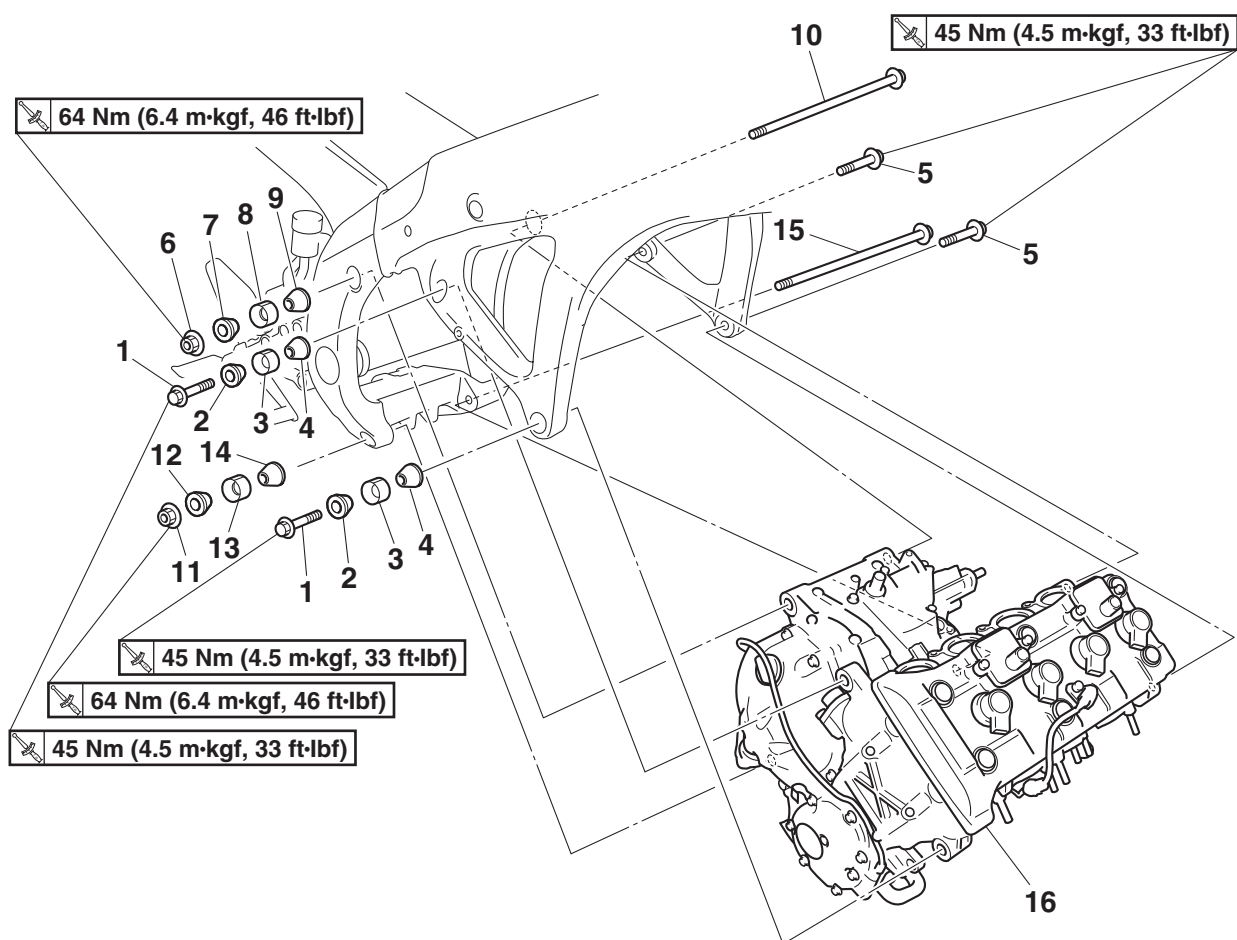
Disconnecting the leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
5	Crankcase breather hose	1	
6	Negative battery terminal	1	Disconnect.
7	Engine ground terminal	1	Disconnect.
8	Oil level switch coupler	1	Disconnect.
9	Crankshaft position sensor coupler	1	Disconnect.
10	Neutral switch coupler	1	Disconnect.
11	Speed sensor	1	
12	Stator coil assembly coupler	1	Disconnect.
13	Clutch cable	1	Disconnect.
14	Cylinder identification sensor coupler	1	Disconnect.
15	Ignition coil coupler	4	Disconnect.

ENGINE REMOVAL

Removing the engine



Order	Job/Parts to remove	Q'ty	Remarks
1	Engine mounting bolt (front right side)	2	
2	Engine mounting collar (outside)	2	
3	Engine mounting collar (center)	2	
4	Engine mounting collar (inside)	2	
5	Engine mounting bolt (front left side)	2	
6	Engine mounting nut (rear upper side)	1	
7	Engine mounting collar (outside)	1	
8	Engine mounting collar (center)	1	
9	Engine mounting collar (inside)	1	
10	Engine mounting bolt (rear upper side)	1	
11	Engine mounting nut (rear lower side)	1	
12	Engine mounting collar (outside)	1	
13	Engine mounting collar (center)	1	
14	Engine mounting collar (inside)	1	
15	Engine mounting bolt (rear lower side)	1	
16	Engine	1	

EAS30251

INSTALLING THE ENGINE

1. Install:

- Engine "1"
- Engine mounting bolt (rear lower side) "2"
- Engine mounting bolt (rear upper side) "3"
- Engine mounting collars (inside) "4"
- Engine mounting collar (center) "5"
- Engine mounting collars (outside) "6"
- Engine mounting nut (rear lower side) "7" (temporarily tighten)
- Engine mounting nut (rear upper side) "8" (temporarily tighten)
- Engine mounting bolts (front left side) "9" (temporarily tighten)
- Engine mounting collars (inside) "10"
- Engine mounting collar (center) "11"
- Engine mounting collars (outside) "12"
- Engine mounting bolts (front right side) "13" (temporarily tighten)

TIP

- Be sure to pass the drive axle through the drive chain when installing the engine "1".
- Do not fully tighten the bolts and nuts.

2. Tighten:

- Engine mounting nut (rear lower side) "7"
- Engine mounting nut (rear upper side) "8"
- Engine mounting bolts (front left side) "9"
- Engine mounting bolts (front right side) "13"



Engine mounting nut (rear lower side)

64 Nm (6.4 m·kgf, 46 ft·lbf)

Engine mounting nut (rear upper side)

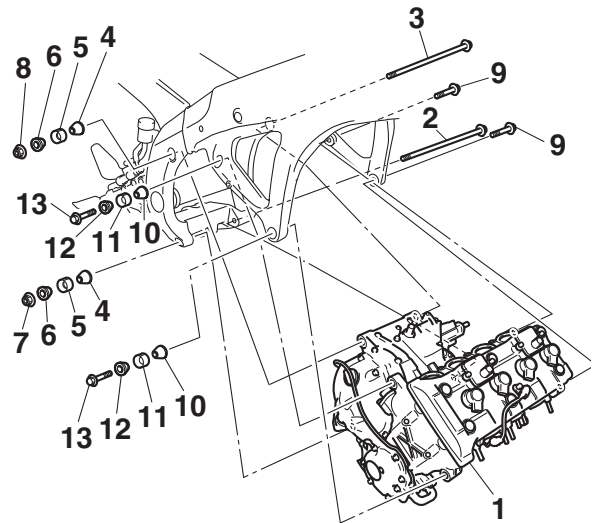
64 Nm (6.4 m·kgf, 46 ft·lbf)

Engine mounting bolt (front left side)

45 Nm (4.5 m·kgf, 33 ft·lbf)

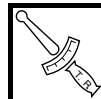
Engine mounting bolt (front right side)

45 Nm (4.5 m·kgf, 33 ft·lbf)



3. Install:

- Shift arm "1"

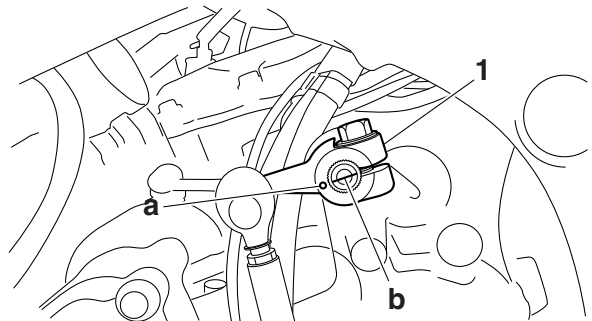


Shift arm bolt

10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

Install the shift arm "1" with its punch mark "a" aligned with the notch "b" in end of the shift shaft.



EAS31590

ADJUSTING THE SHIFT PEDAL

TIP

The shift pedal position is determined by the installed shift rod length "a".

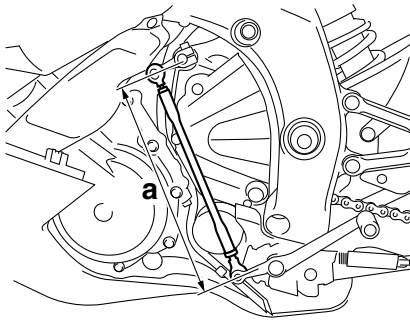
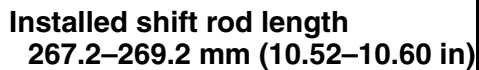
1. Remove:

- Side cowl assembly
Refer to "GENERAL CHASSIS" on page 4-1.

2. Measure:

- Installed shift rod length "a"
Incorrect → Adjust.

ENGINE REMOVAL

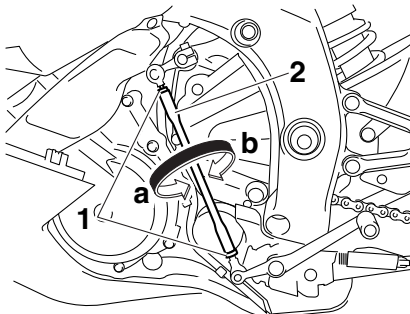


- ### 3. Adjust:
- Installed shift rod length

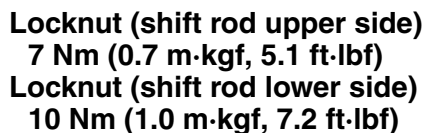
- a. Loosen both locknuts "1".
- b. Turn the shift rod "2" in direction "a" or "b" until the specified installed shift rod length is obtained.

Direction “a”
Installed shift rod length increases.

Direction “b”
Installed shift rod length decreases.



- c. Tighten both locknuts to specification.



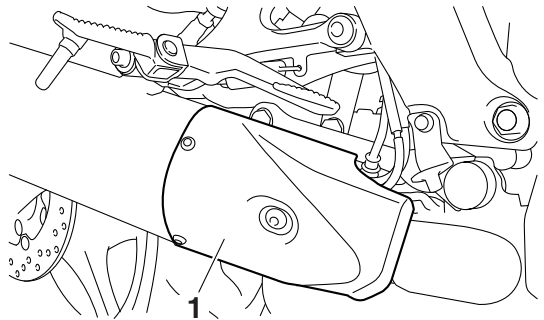
- d. Make sure the installed shift rod length is within specification.

4. Install:
- Side cowling assembly
- Refer to “GENERAL CHASSIS” on page 4-1.

EAS31788

ADJUSTING THE EXUP CABLES

1. Remove:
 - EXUP valve pulley cover “1”

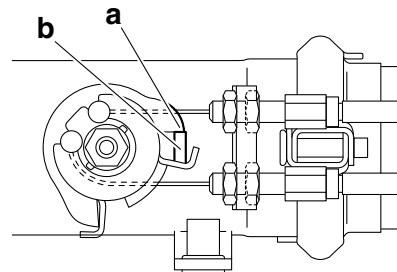


- 2. Check:
 - EXUP system operation

- a. Activate the diagnostic mode and select the diagnostic code number "53".
Refer to "FUEL INJECTION SYSTEM" on page 8-31.
- b. Set the engine stop switch to "○".
- c. Check that the EXUP valve operates properly.

TIP

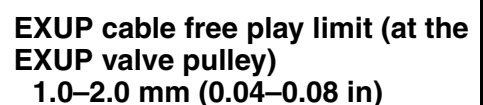
Check that the projection “a” on the EXUP valve pulley contacts the stopper “b” (fully open position). If the projection does not contact the stopper, adjust the EXUP cable free play.

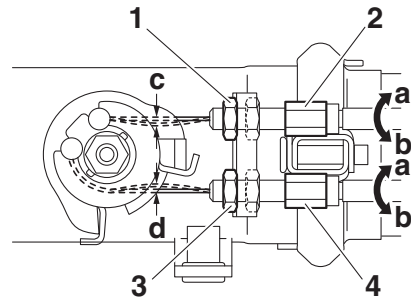


3. Check:
- EXUP cable free play (at the EXUP valve pulley) "a"
- Out of specification → Adjust.

TIP

When checking free play, use a tension gauge and apply 10 N (1.0 kgf, 2.2 lbf) to the EXUP cable.



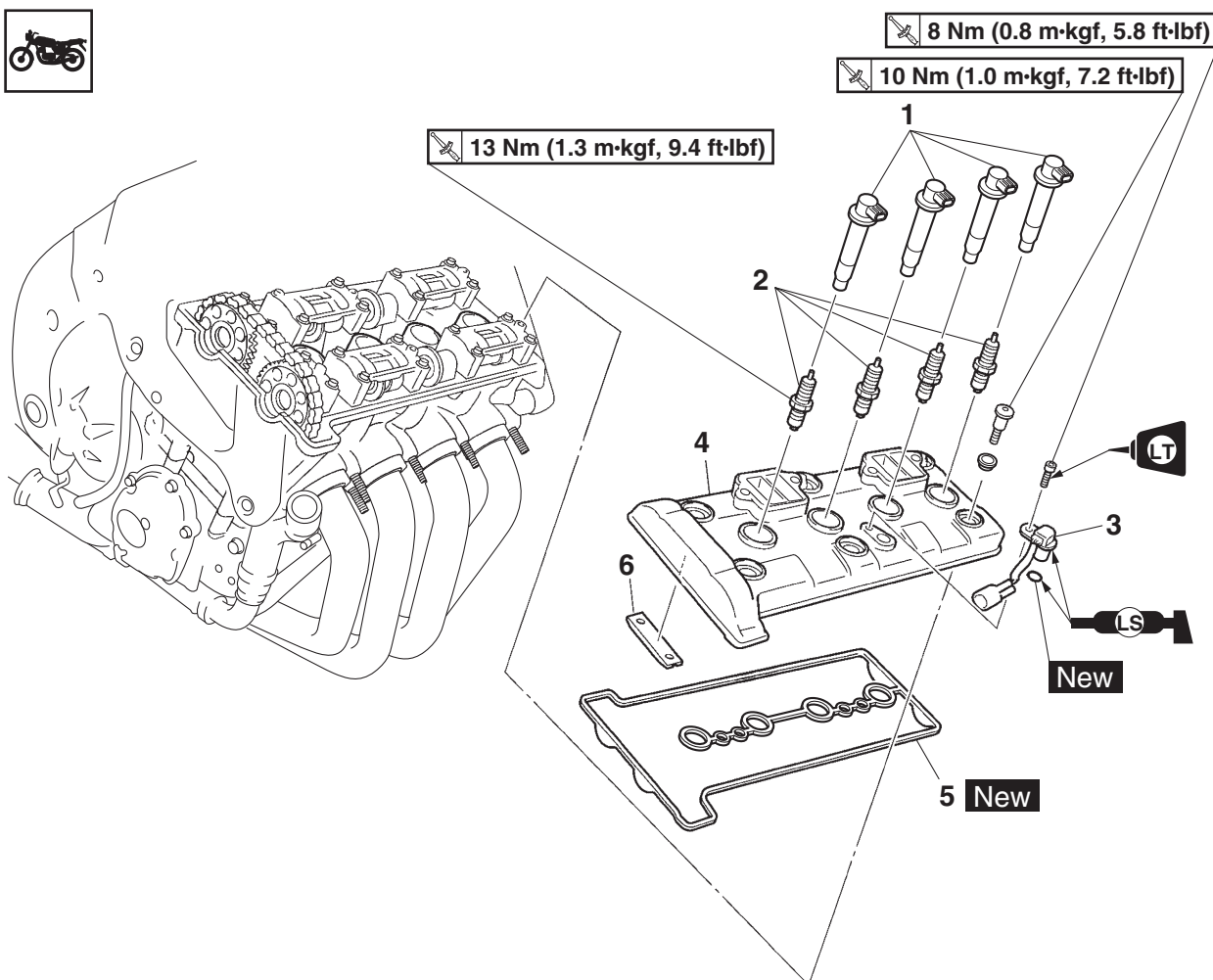


- Locknut (EXUP cable adjusting bolt)**
6 Nm (0.6 m·kgf, 4.3 ft·lbf)

EAS20043

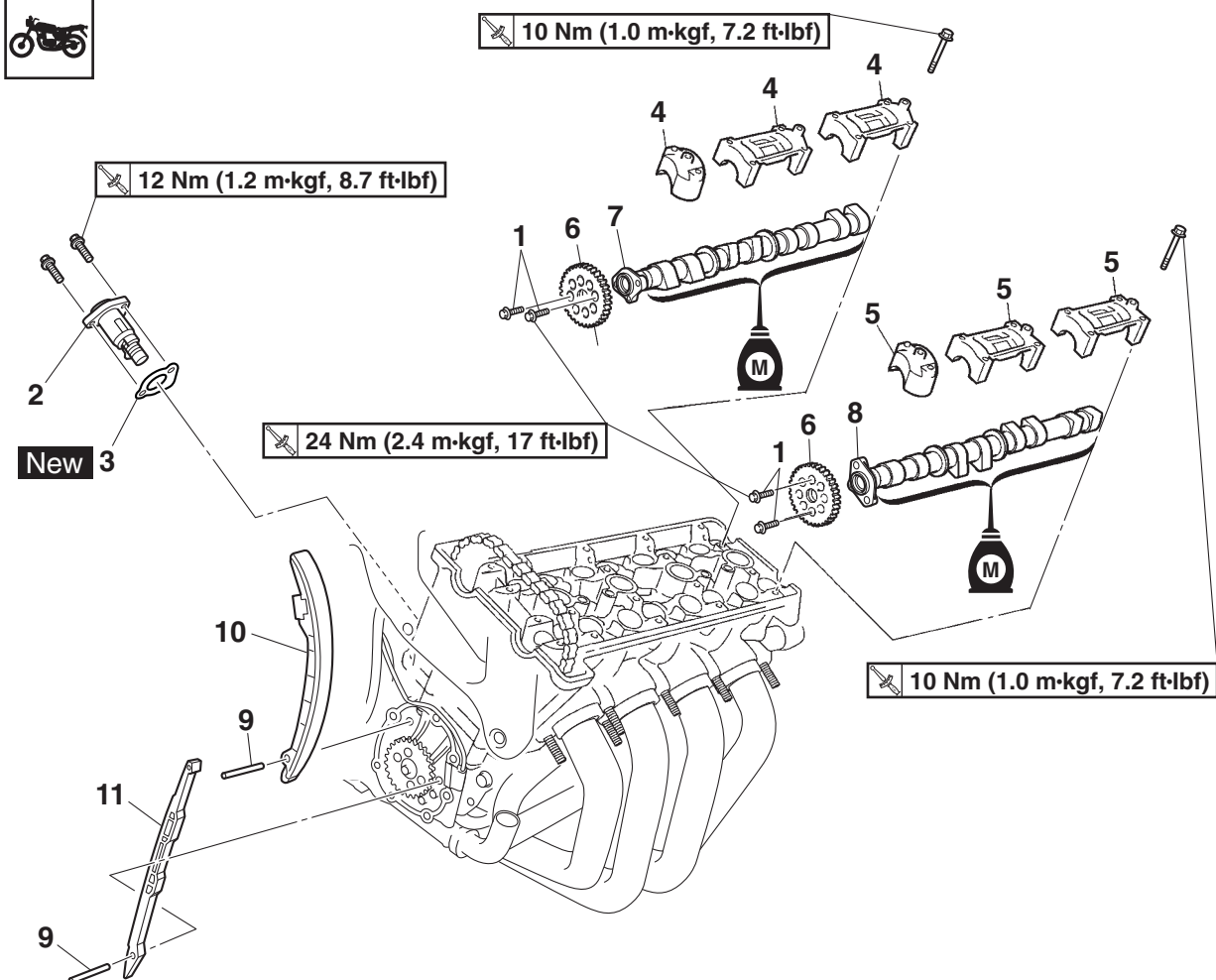
CAMSHAFTS

Removing the cylinder head cover



Order	Job/Parts to remove	Q'ty	Remarks
	Radiator		Refer to "RADIATOR" on page 6-1.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-9.
	Air cut-off valve/Reed valve assembly		Refer to "AIR INDUCTION SYSTEM" on page 7-15.
1	Ignition coil	4	
2	Spark plug	4	
3	Cylinder identification sensor	1	
4	Cylinder head cover	1	
5	Cylinder head cover gasket	1	
6	Timing chain guide (upper side)	1	

Removing the camshafts



Order	Job/Parts to remove	Q'ty	Remarks
	Pickup rotor cover		Refer to "PICKUP ROTOR" on page 5-32.
1	Camshaft sprocket bolt	4	Loosen.
2	Timing chain tensioner	1	
3	Timing chain tensioner gasket	1	
4	Intake camshaft cap	3	
5	Exhaust camshaft cap	3	
6	Camshaft sprocket	2	
7	Intake camshaft	1	
8	Exhaust camshaft	1	
9	Pin	2	
10	Timing chain guide (intake side)	1	
11	Timing chain guide (exhaust side)	1	

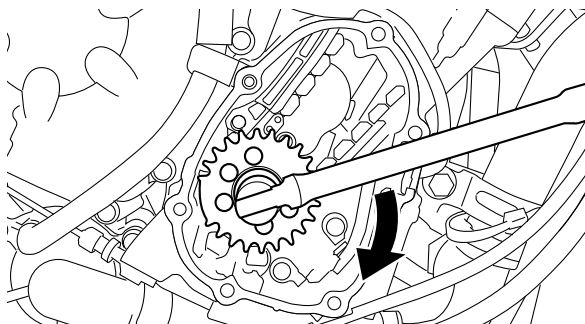
EAS30256

REMOVING THE CAMSHAFTS

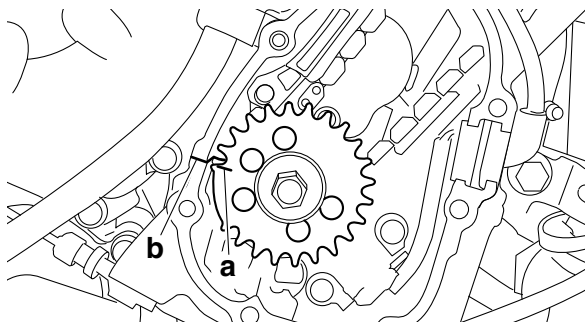
1. Remove:
 - Pickup rotor cover
 Refer to "PICKUP ROTOR" on page 5-32.
2. Align:
 - TDC mark on the pickup rotor (with the crankcase mating surface)



- a. Turn the crankshaft clockwise.

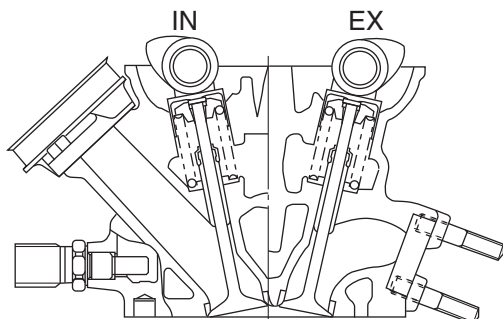


- b. When piston #1 is at TDC on the compression stroke, align the TDC mark "a" on the pickup rotor with the crankcase mating surface "b".



TIP

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

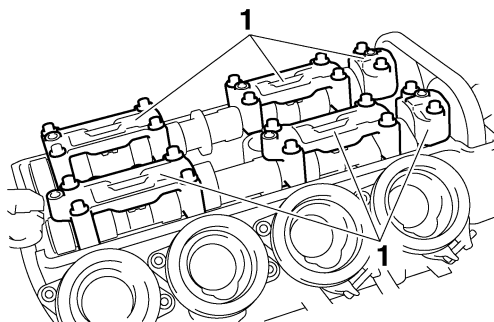


3. Remove:
 - Camshaft caps "1"

ECA13720

NOTICE

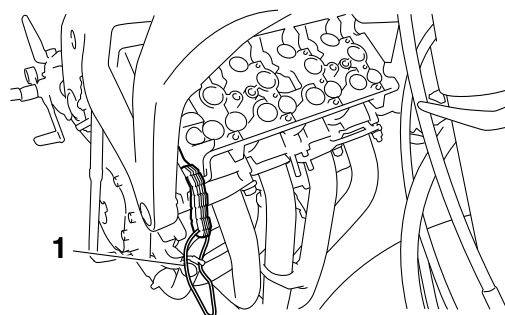
To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a criss-cross pattern, working from the outside in.



4. Remove:
 - Intake camshaft
 - Exhaust camshaft

TIP

To prevent the timing chain from falling into the crankcase, fasten it with a wire "1".



EAS30257

CHECKING THE CAMSHAFTS

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



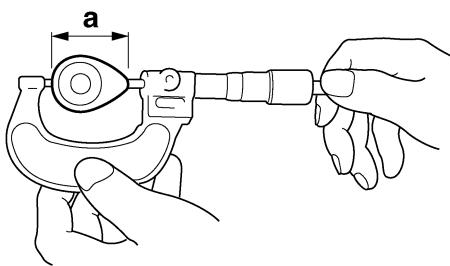
Camshaft lobe dimensions

Lobe height (Intake)
33.750–33.850 mm (1.3287–1.3327 in)

Limit
33.675 mm (1.3258 in)

Lobe height (Exhaust)
32.950–33.050 mm (1.2972–1.3012 in)

Limit
32.875 mm (1.2943 in)

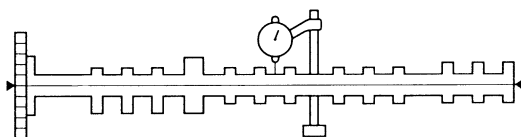


3. Measure:

- Camshaft runout
Out of specification → Replace.



Camshaft runout limit
0.030 mm (0.0012 in)



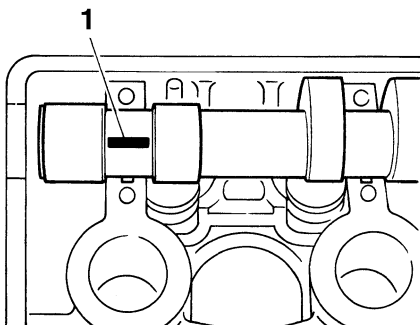
4. Measure:

- Camshaft-journal-to-camshaft-cap clearance
Out of specification → Measure the camshaft journal diameter.



Camshaft-journal-to-camshaft-cap clearance
0.028–0.062 mm (0.0011–0.0024 in)
Limit
0.080 mm (0.0032 in)

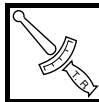
- Install the camshaft into the cylinder head (without the camshaft caps).
- Position a strip of Plastigauge® “1” onto the camshaft journal as shown.



- Install the camshaft caps.

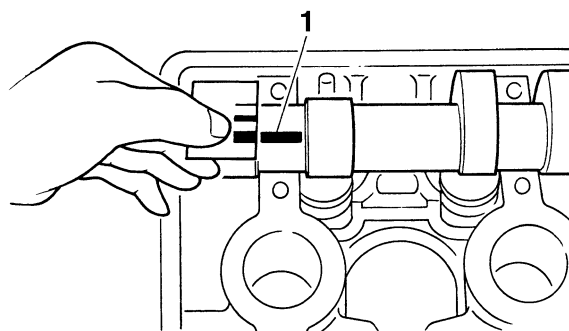
TIP

- 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 (intake and exhaust)
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

- Remove the camshaft caps and then measure the width of the Plastigauge® “1”.

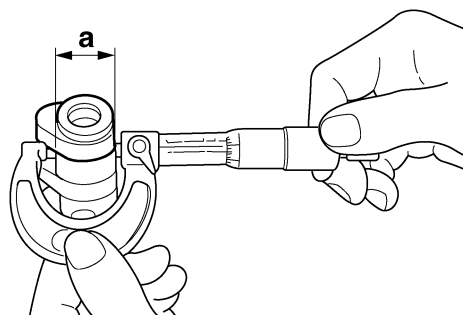


5. Measure:

- 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
22.459–22.472 mm (0.8842–0.8847 in)



EAS31784

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

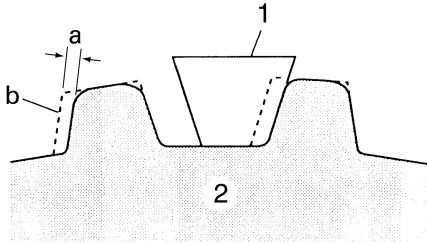
1. Check:

- Timing chain “1”
Damage/stiffness → Replace the timing chain and camshaft and camshaft sprocket as a set.

2. Check:

- Camshaft sprocket

More than 1/4 tooth wear “a” → Replace the camshaft sprocket and the timing chain as a set.



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

3. Check:

- Timing chain guide (exhaust side)
 - Timing chain guide (intake side)
 - Timing chain guide (upper side)
- Damage/wear → Replace the defective part(s).

EAS30266

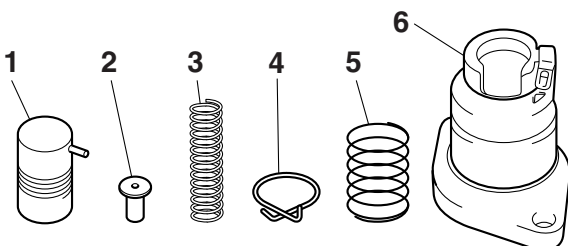
CHECKING THE TIMING CHAIN TENSIONER

1. Remove:

- Timing chain tensioner rod “1”
- Timing chain tensioner spring seat “2”
- Timing chain tensioner inner spring “3”
- Timing chain tensioner outer spring “5”
- Timing chain tensioner housing “6”

TIP

Squeeze the timing chain tensioner clip “4”, and then remove the timing chain tensioner springs and timing chain tensioner rod.



2. Check:

- Timing chain tensioner housing
 - Timing chain tensioner rod
 - Timing chain tensioner spring seat
 - Timing chain tensioner springs
- Damage/wear → Replace the as a set.

3. Assemble:

- Timing chain tensioner springs
- Timing chain tensioner spring seat

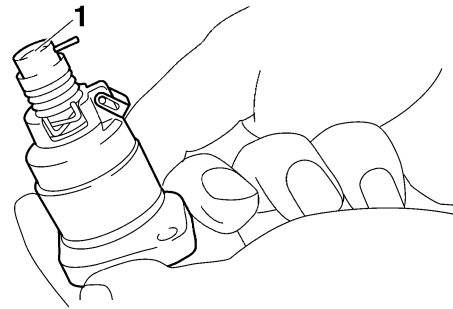
- Timing chain tensioner rod

TIP

Prior to installing the timing chain tensioner rod, drain the engine oil from the timing chain tensioner housing.



- a. Install the timing chain tensioner springs, timing chain tensioner spring seat, and timing chain tensioner rod “1”.



- b. Squeeze the timing chain tensioner clip “2”, and then push the timing chain tensioner rod “3” into the timing chain tensioner housing.

TIP

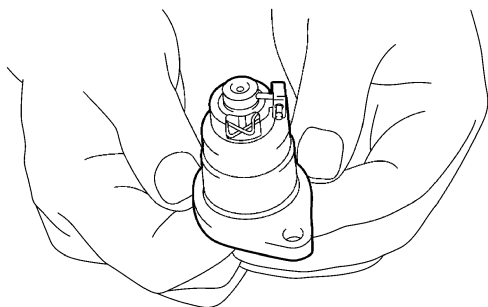
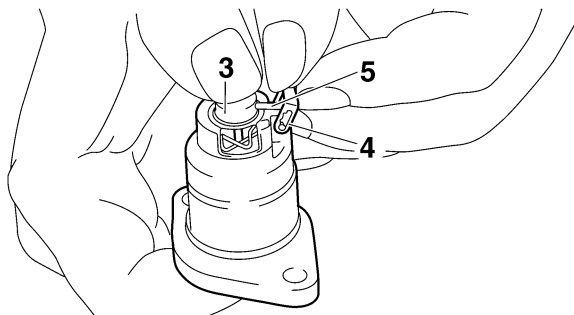
Do not release the timing chain tensioner clip while pushing the rod into the housing, otherwise the rod may be ejected.



- c. Hook the clip “4” to the timing chain tensioner rod “3”.

TIP

Hook the timing chain tensioner rod pin “5” to the center of the clip “4”. After the installation, check that the clip “4” can come off by its own weight by pushing the timing chain tensioner rod “3” at the position of installation.



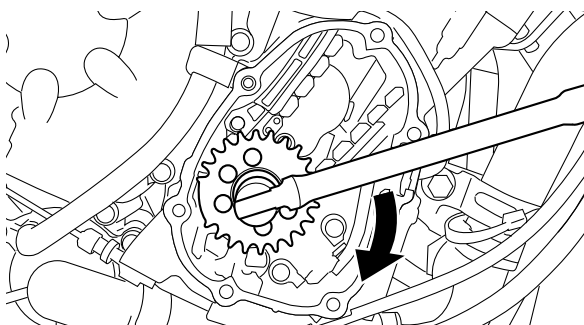
EAS30269

INSTALLING THE CAMSHAFTS

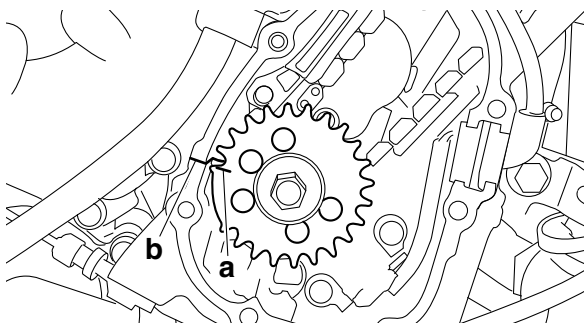
1. Align:

- TDC mark on the pickup rotor
(with the crankcase mating surface)

a. Turn the crankshaft clockwise.



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

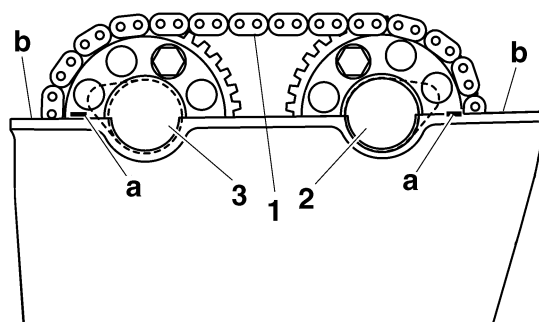


2. Install:

- Timing chain "1"
- Exhaust camshaft "2"
- Intake camshaft "3"
(with the camshaft sprockets temporarily tightened)

TIP

- Make sure the match marks "a" on the camshaft sprockets are aligned with the cylinder head edge "b".
- Be sure to install the timing chain so that the exhaust side of the chain is taut and the intake side is slack.

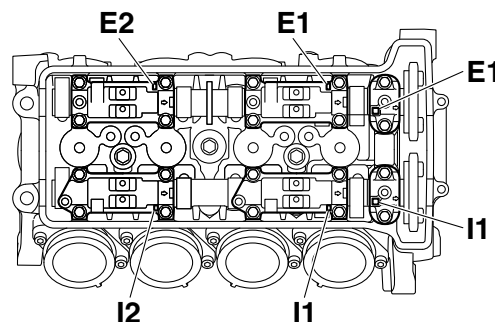


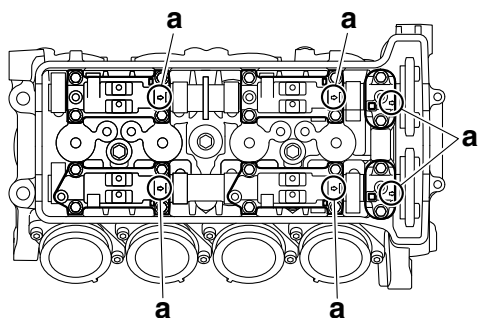
3. Install:

- Intake camshaft caps
- Exhaust camshaft caps

TIP

- Make sure each camshaft cap is installed in its original place. Refer to the identification marks as follows:
"I1", "I2": Intake
"E1", "E2": Exhaust
- Make sure the arrow mark "a" on each camshaft points towards the right side of the engine.





4. Install:

- Camshaft cap bolts



Camshaft cap bolt (intake and exhaust)
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

ECA13730

NOTICE

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

TIP

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

5. Install:

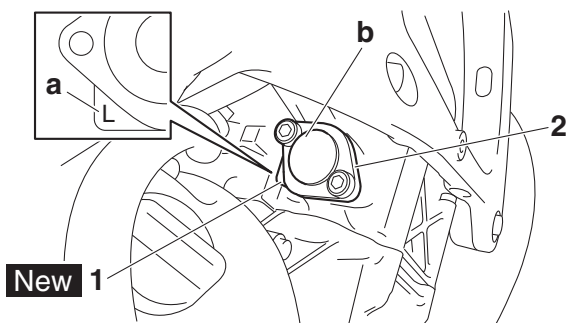
- Timing chain tensioner gasket "1" **New**
- Timing chain tensioner "2"



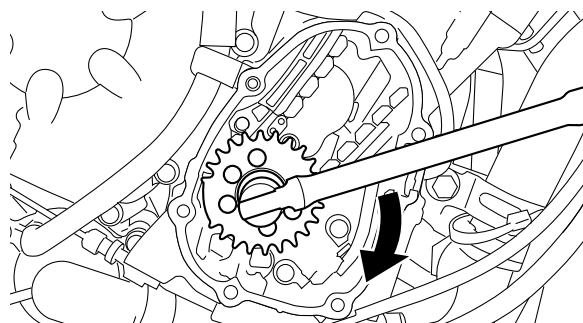
Timing chain tensioner bolt
12 Nm (1.2 m·kgf, 8.7 ft·lbf)

TIP

- Be sure to install the timing chain tensioner gasket so that its section with the "L" mark "a" is protruding from the lower left side of the timing chain tensioner.
- The punch mark "b" on the timing chain tensioner should face up.



6. Rotate the crankshaft a few times to release the timing chain tensioner rod.



TIP

If the engine is not disassembled, set the engine stop switch to "X", and then crank the engine a few times by pressing the start switch for approximately 0.5–1.0 second each time.

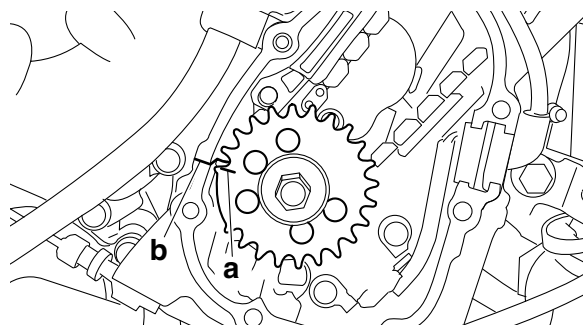
7. Check that the timing chain is taut. If the chain is slack, reinstall the timing chain tensioner.

TIP

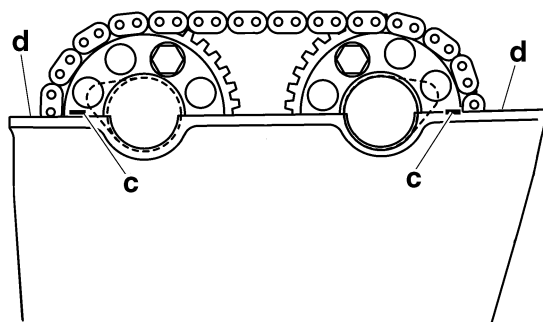
If the engine is not disassembled, start the engine and check for any abnormal noise. If any abnormal noise is heard, reinstall the timing chain tensioner.

8. Check:

- TDC mark "a"
- Make sure the TDC mark on the pickup rotor is aligned with the crankcase mating surface "b".



- Camshaft sprocket match mark "c"
- Make sure the marks on the camshaft sprockets are aligned with the edge of the cylinder head "d".
 Out of alignment → Adjust.
 Refer to the installation steps above.



9. Measure:

- Valve clearance
Out of specification → Adjust.
Refer to “ADJUSTING THE VALVE CLEAR-
ANCE” on page 3-5.

10. Install:

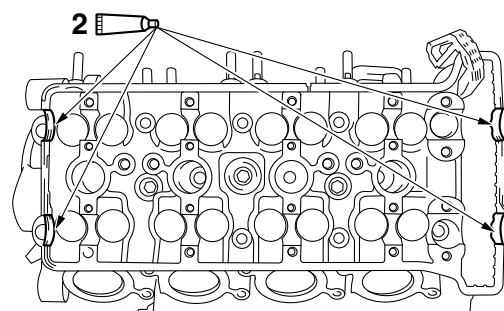
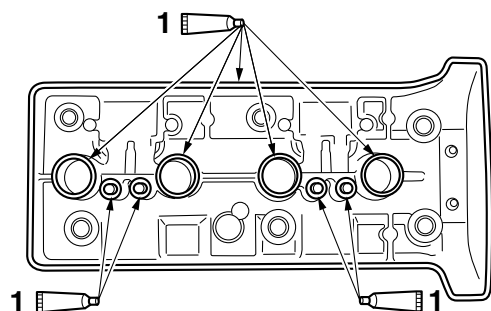
- Cylinder head cover gasket **New**
- Cylinder head cover



Cylinder head cover bolt
10 Nm (1.0 m-kgf, 7.2 ft-lbf)

TIP

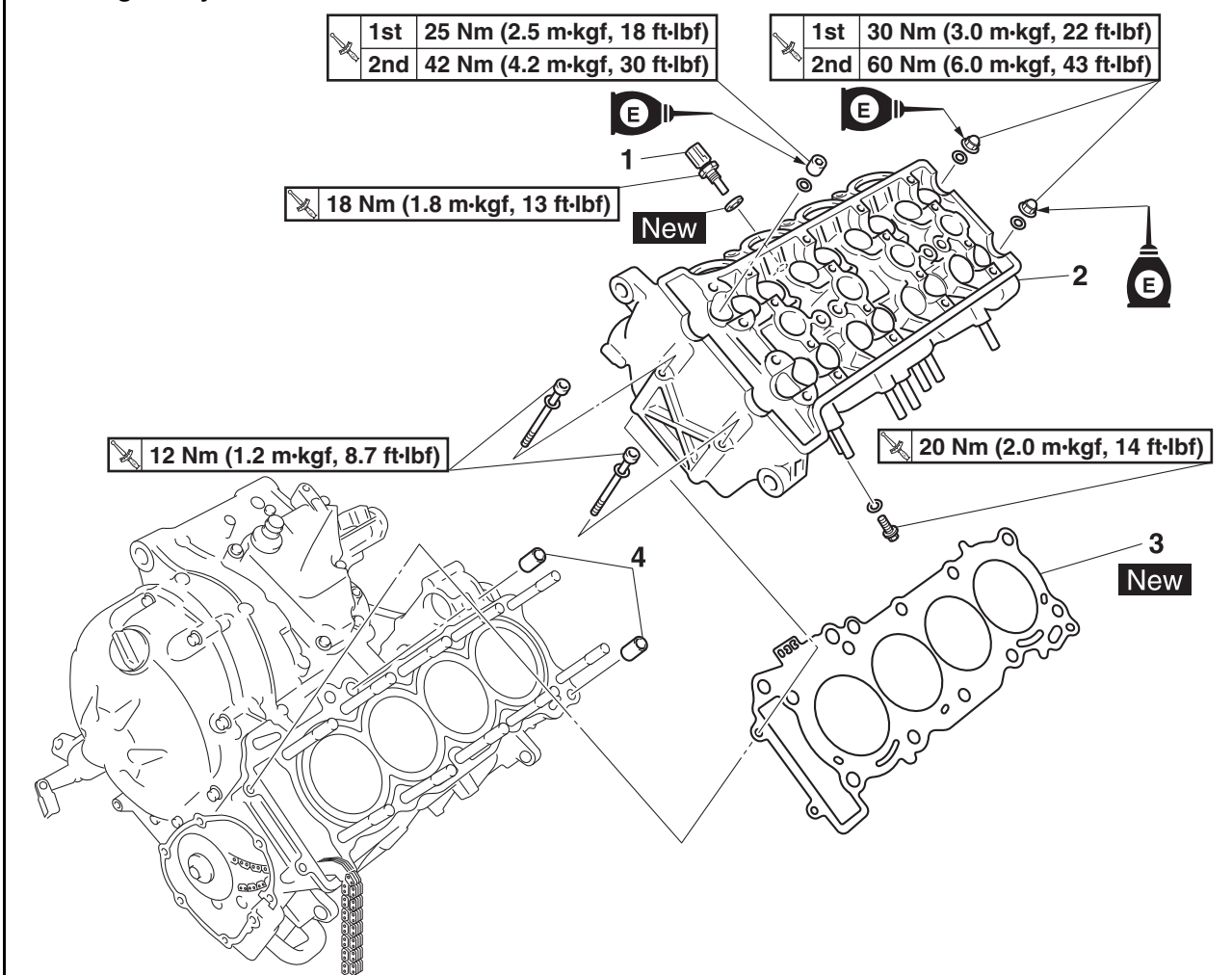
- Apply bond TB1541C “1” onto the mating surfaces of the cylinder head cover and cylinder head cover gasket.
- Apply bond TB1215B “2” onto the mating surfaces of the cylinder head cover gasket and cylinder head.
- Tighten the cylinder head cover bolts stages and in a crisscross pattern.



EAS20044

CYLINDER HEAD

Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-3.
	Camshafts		Refer to "CAMSHAFTS" on page 5-11.
1	Coolant temperature sensor	1	
2	Cylinder head	1	
3	Cylinder head gasket	1	
4	Dowel pin	2	

EAS30276

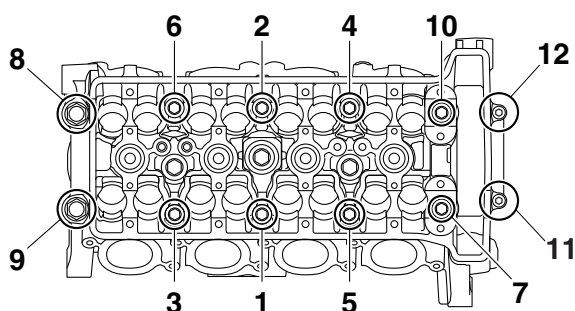
REMOVING THE CYLINDER HEAD

1. Remove:

- Cylinder head bolts
- Cylinder head nuts

TIP

- Loosen the nuts, cap nuts, and bolts in decreasing numerical order (refer to the numbers in the illustration).
- Loosen each nut 1/2 of a turn at a time. After all of the nuts are fully loosened, remove them.



EAS30277

CHECKING THE CYLINDER HEAD

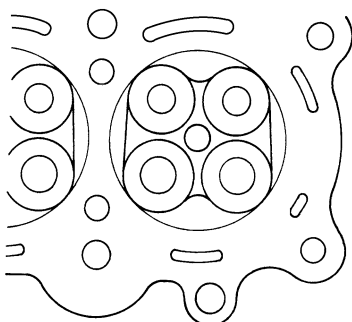
1. Eliminate:

- Combustion chamber carbon deposits (with a rounded scraper)

TIP

Do not use a sharp instrument to avoid damaging or scratching:

- Spark plug bore threads
- Valve seats



2. Check:

- Cylinder head
Damage/scratches → Replace.

TIP

Replace the titanium valves with the cylinder head.

Refer to "CHECKING THE VALVE SEATS" on page 5-25.

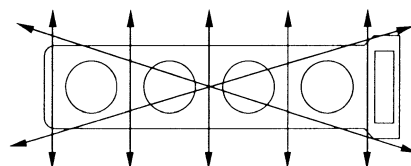
- Cylinder head water jacket
Mineral deposits/rust → Eliminate.

3. Measure:

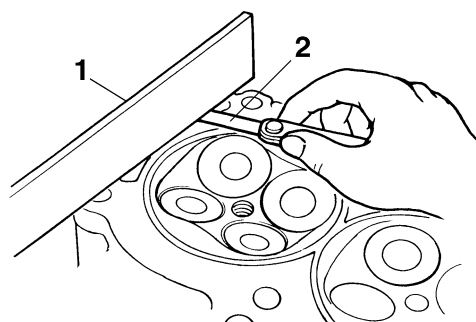
- Cylinder head warpage
Out of specification → Resurface the cylinder head.



Warpage limit
0.05 mm (0.0020 in)



- a. Place a straightedge "1" and a thickness gauge "2" across the cylinder head.



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

TIP

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

EAS30282

INSTALLING THE CYLINDER HEAD

1. Install:

- Cylinder head

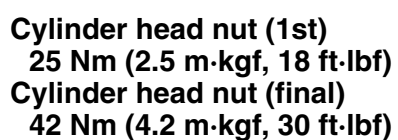
TIP

Pass the timing chain through the timing chain cavity.

2. Tighten:

- Cylinder head nuts "1"–"7", "10"

CYLINDER HEAD



-

- Cylinder head bolts “11”, “12”



- Lubricate the bolt threads and the bearing surfaces with engine oil.
- Tighten the cylinder head nuts, cap nuts, and bolts in the proper tightening sequence as shown and torque them in two stages.

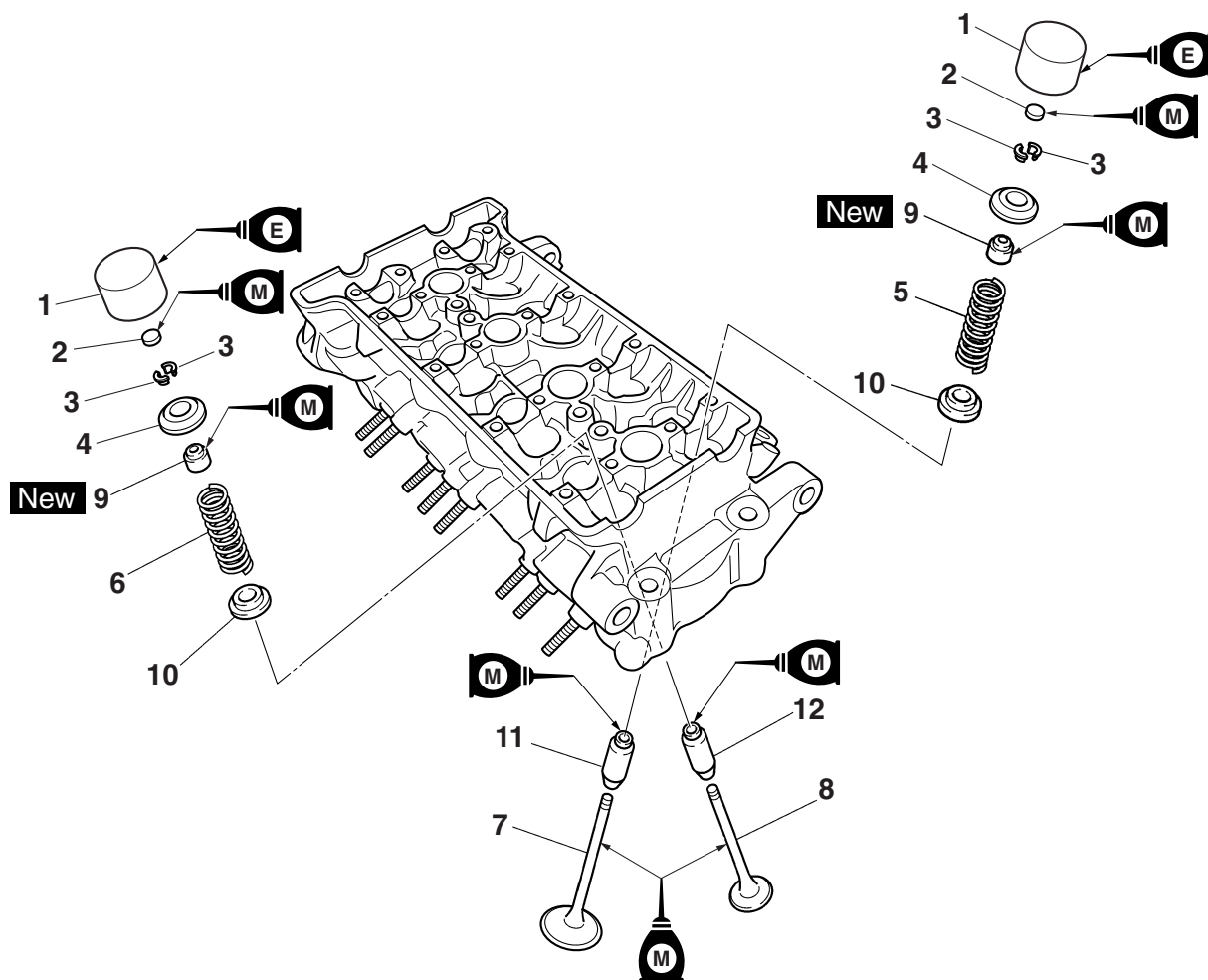


VALVES AND VALVE SPRINGS

EAS20045

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 5-19.
1	Valve lifter	16	
2	Valve pad	16	
3	Valve cotter	32	
4	Upper spring seat	16	
5	Intake valve spring	8	
6	Exhaust valve spring	8	
7	Intake valve	8	
8	Exhaust valve	8	
9	Valve stem seal	16	
10	Lower spring seat	16	
11	Intake valve guide	8	
12	Exhaust valve guide	8	

VALVES AND VALVE SPRINGS

EAS30283

REMOVING THE VALVES

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

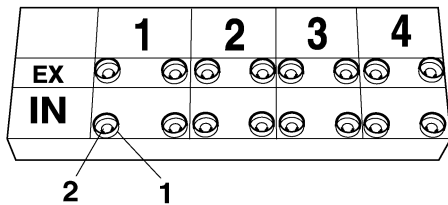
TIP

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.

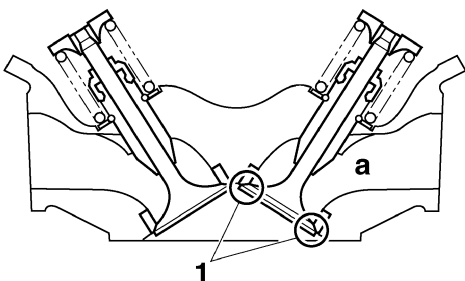


2. Check:
 - Valve sealing
Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
Refer to "CHECKING THE VALVE SEATS" on page 5-25.

- 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".



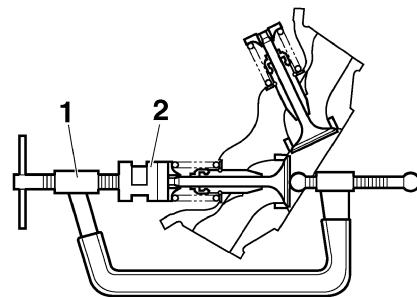
Valve spring compressor
90890-04019

Valve spring compressor
YM-04019

Valve spring compressor attach-
ment

90890-04108

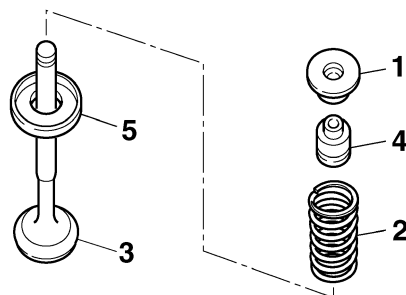
Valve spring compressor adapt-
er 22 mm
YM-04108



4. Remove:
 - Upper spring seat "1"
 - Valve spring "2"
 - Valve "3"
 - Valve stem seal "4"
 - Lower spring seat "5"

TIP

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



EAS30284

CHECKING THE VALVES AND VALVE GUIDES

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

VALVES AND VALVE SPRINGS

1. Measure:

- Valve-stem-to-valve-guide clearance
Out of specification → Replace the valve guide.

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



Valve-stem-to-valve-guide clearance (intake)

0.010–0.037 mm (0.0004–0.0015 in)

Limit

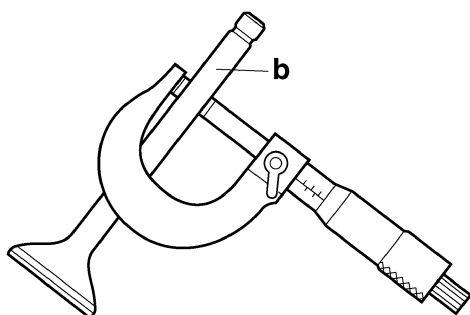
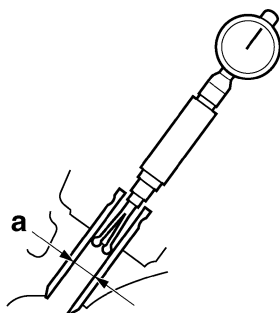
0.080 mm (0.0032 in)

Valve-stem-to-valve-guide clearance (exhaust)

0.025–0.052 mm (0.0010–0.0020 in)

Limit

0.095 mm (0.0037 in)

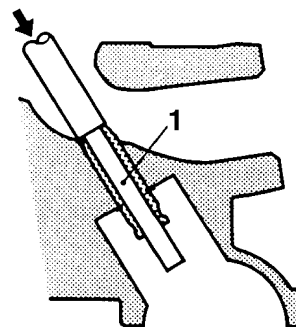


2. Replace:

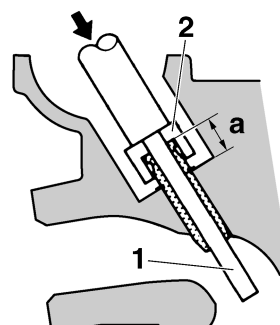
- Valve guide

TIP

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

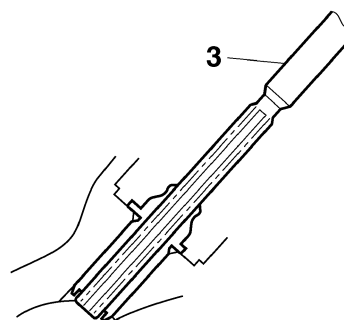


- b. Install the new valve guide with the valve guide installer "2" and valve guide remover "1".



- a. Valve guide position

- c. After installing the valve guide, bore the valve guide with the valve guide reamer "3" to obtain the proper valve-stem-to-valve-guide clearance.



TIP

After replacing the valve guide, reface the valve seat.

- a. Remove the valve guide with the valve guide remover “1”.

VALVES AND VALVE SPRINGS



Valve guide remover (ø4.5)
90890-04116
Valve guide remover (4.5 mm)
YM-04116
Valve guide installer (ø4.5)
90890-04117
Valve guide installer (4.5 mm)
YM-04117
Valve guide reamer (ø4.5)
90890-04118
Valve guide reamer (4.5 mm)
YM-04118



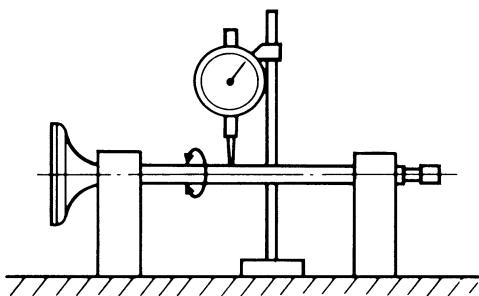
3. Eliminate:
 - Carbon deposits
(from the valve face and valve seat)
4. Check:
 - Valve face
Pitting/wear → Grind the valve face.
 - Valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
 - Valve stem runout
Out of specification → Replace the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

TIP

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



Valve stem runout
0.040 mm (0.0016 in)



EAS30285

CHECKING THE VALVE SEATS

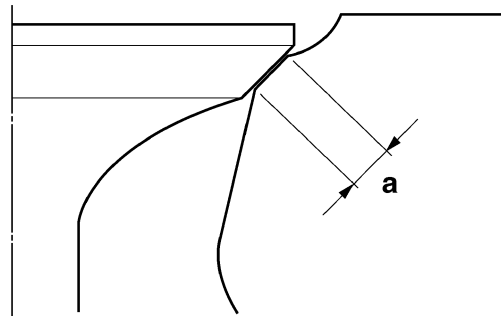
The following procedure applies to all of the valves and valve seats.

1. Eliminate:
 - Carbon deposits
(from the valve face and valve seat)

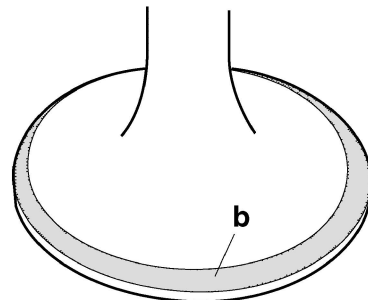
2. Check:
 - Valve seat
Pitting/wear → Replace the cylinder head.
3. Measure:
 - Valve seat width C “a”
Out of specification → Replace the cylinder head.



Valve seat contact width (intake)
1.90–2.10 mm (0.0748–0.0827 in)
Limit
1.6 mm (0.06 in)
Valve seat contact width (exhaust)
2.30–2.50 mm (0.0906–0.0984 in)
Limit
1.8 mm (0.07 in)



- a. Apply blue layout fluid “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.



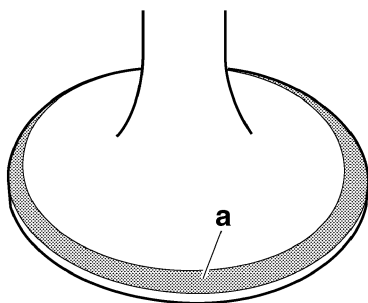
4. Lap:
 - Valve face
 - Valve seat

Titanium valves that have been used to lap the valve seats must not be used. Always replace lapped valves with new valves.

- When replacing the cylinder head, replace the valves without lapping the valve seats and valve faces.
- When replacing the valves or valve guides, use new valves to lap the valve seats, and then replace them with new valves.

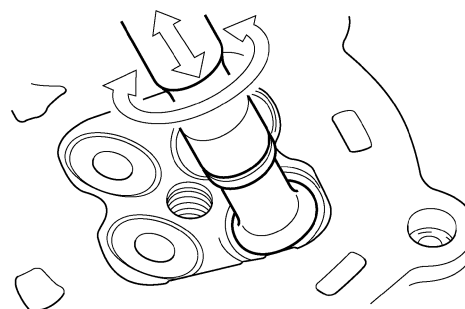
ECA13790

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

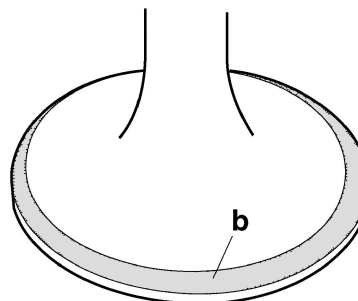


- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

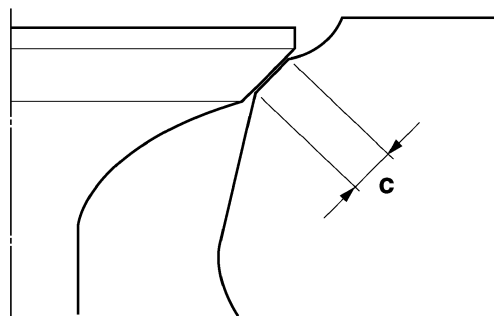
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



- 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 blue layout fluid “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.



FAS30286

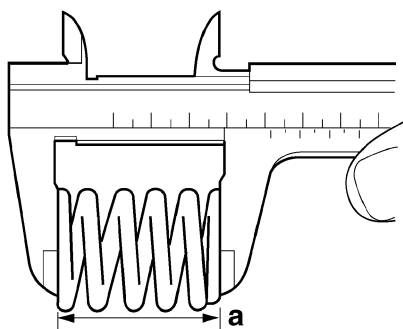
The following procedure applies to all of the valve springs.

- 5-26**

VALVES AND VALVE SPRINGS



Free length (intake)
37.47 mm (1.48 in)
Limit
35.60 mm (1.40 in)
Free length (exhaust)
37.67 mm (1.48 in)
Limit
35.79 mm (1.41 in)

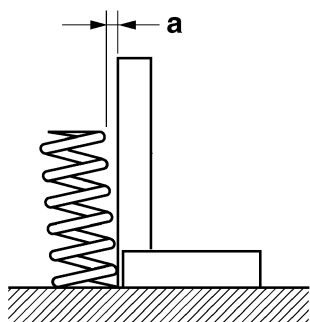


2. Measure:

- Valve spring tilt "a"
Out of specification → Replace the valve spring.



Spring tilt (intake)
1.6 mm (0.06 in)
Spring tilt (exhaust)
1.6 mm (0.06 in)



EAS30287

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.

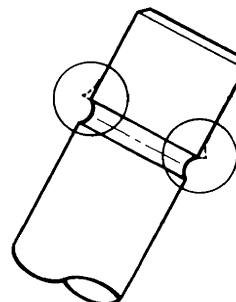
EAS30288

INSTALLING THE VALVES

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

1. Deburr:

- Valve stem end
(with an oil stone)

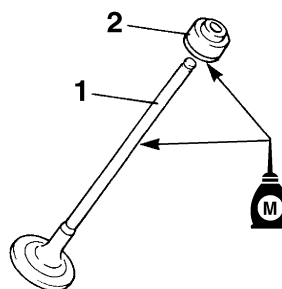


2. Lubricate:

- Valve stem "1"
- Valve stem seal "2"
(with the recommended lubricant)



Recommended lubricant
Molybdenum disulfide oil

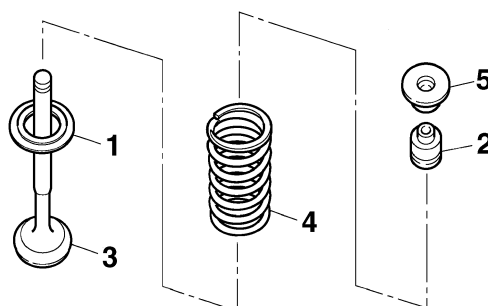


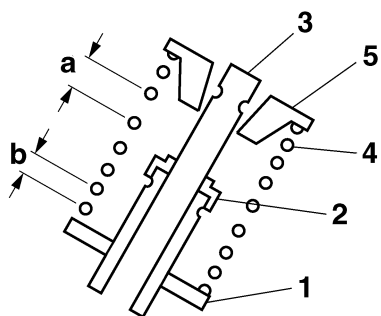
3. Install:

- Lower spring seat "1"
- Valve stem seal "2"
- Valve "3"
- Valve spring "4"
- Upper spring seat "5"
(into the cylinder head)

TIP

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





b. Smaller pitch

4. Install:

- Valve cotters

TIP

Install 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

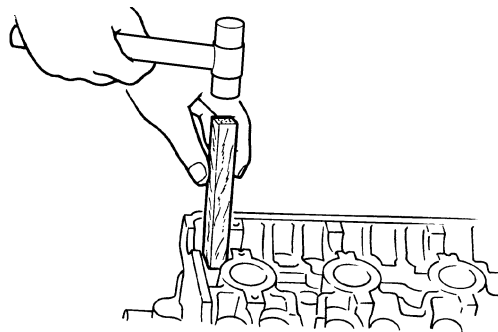
Valve spring compressor
YM-04019

Valve spring compressor attachment

90890-04108

Valve spring compressor adapter 22 mm

YM-04108



6. Lubricate:

- Valve lifter
(with the recommended lubricant)



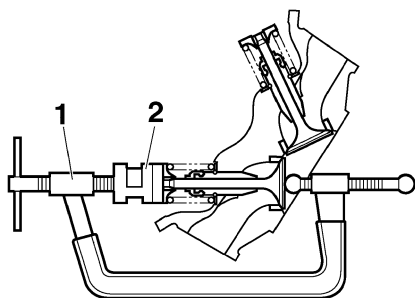
Recommended lubricant
Engine oil

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.



5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

NOTICE

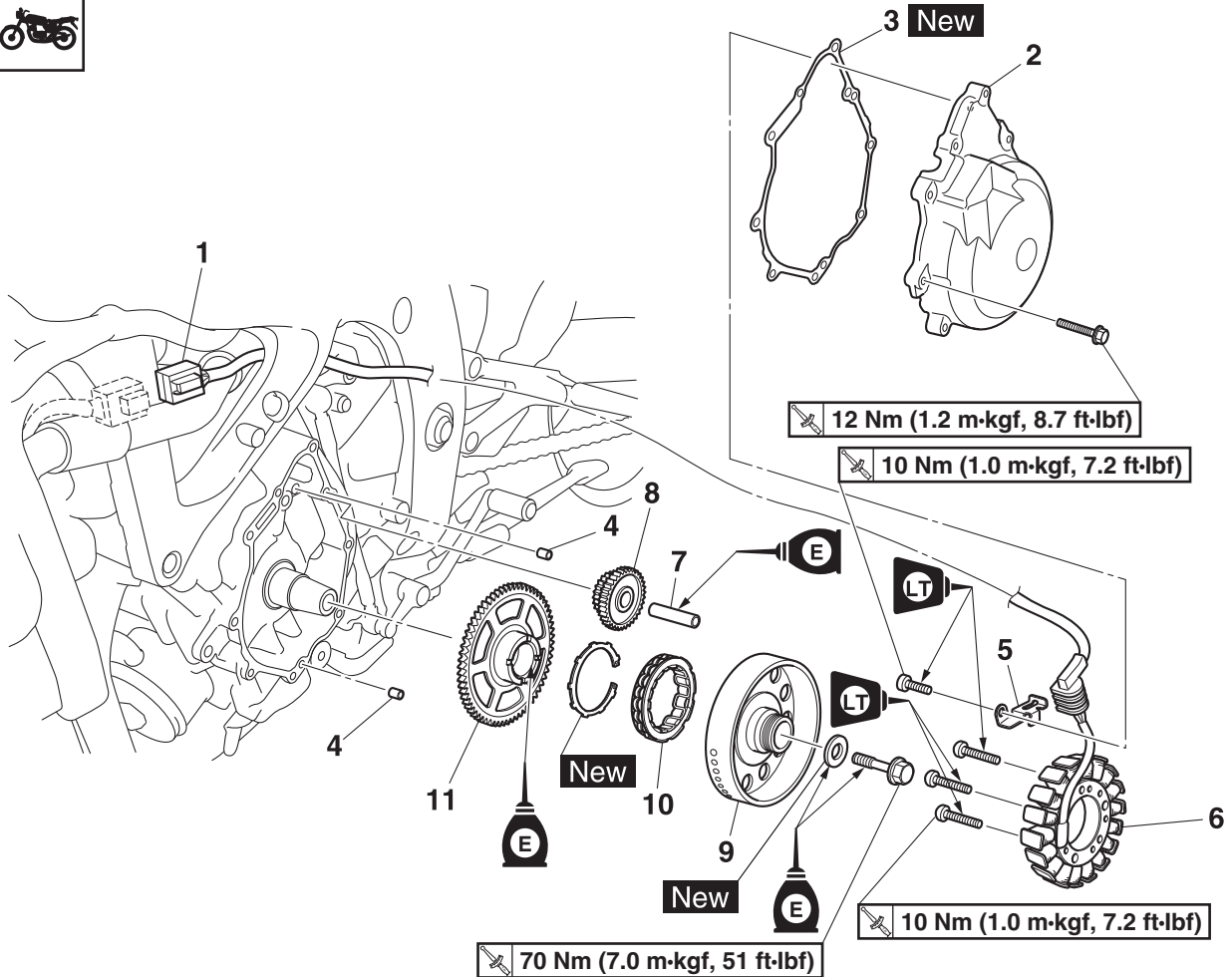
Hitting the valve tip with excessive force could damage the valve.

GENERATOR AND STARTER CLUTCH

EAS20047

GENERATOR AND STARTER CLUTCH

Removing the generator and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling assembly		Refer to "GENERAL CHASSIS" on page 4-1.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-26.
1	Stator coil assembly coupler	1	Disconnect.
2	Generator cover	1	
3	Generator cover gasket	1	
4	Dowel pin	2	
5	Stator coil assembly lead holder	1	
6	Stator coil assembly	1	
7	Starter clutch idle gear shaft	1	
8	Starter clutch idle gear	1	
9	Generator rotor	1	
10	Starter clutch	1	
11	Starter clutch gear	1	

GENERATOR AND STARTER CLUTCH

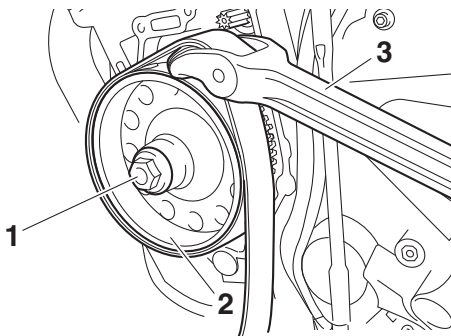
EAS30295

REMOVING THE GENERATOR

1. Remove:
 - Generator rotor bolt “1”
 - Washer

TIP

While holding the generator rotor “2” with the rotor holding tool “3”, loosen the generator rotor bolt.

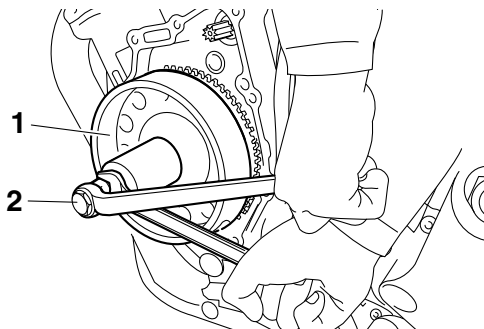
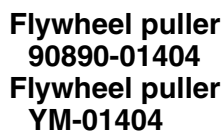


2. Remove:
 - Generator rotor “1”
(with the flywheel puller “2”)

ECA13880

NOTICE

To protect the end of the crankshaft, place an appropriate sized socket between the fly-wheel puller set center bolt and the crankshaft.



EAS30299

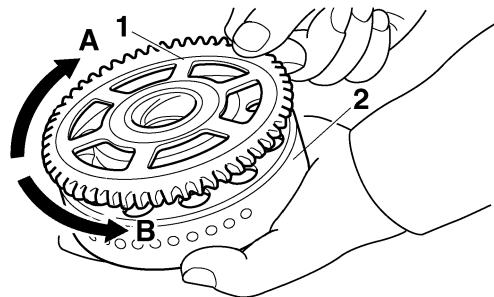
EAS30299

CHECKING THE STARTER CLUTCH

1. Check:
 - Starter clutch rollers
Damage/wear → Replace.

2. Check:
 - Starter clutch idle gear
 - Starter clutch gearBurrs/chips/roughness/wear → Replace the defective part(s).
3. Check:
 - Starter clutch gear's contacting surfacesDamage/pitting/wear → Replace the starter clutch gear.
4. Check:
 - Starter clutch operation

- Install the starter clutch gear "1" onto the generator rotor "2" and hold the generator rotor.
- When turning the starter clutch gear clockwise "A", the starter clutch and the starter clutch gear should engage, otherwise the starter clutch is faulty and must be replaced.
- When turning the starter clutch gear counter-clockwise "B", it should turn freely, otherwise the starter clutch is faulty and must be replaced.



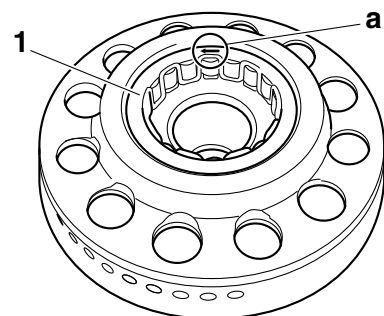
EAS30300

INSTALLING THE STARTER CLUTCH

1. Install:
 - Starter clutch “1”

TIP

Be sure to install the starter clutch so that its side with the arrow mark "a" is facing inward, away from the rotor.



GENERATOR AND STARTER CLUTCH

EAS30302

INSTALLING THE GENERATOR

1. 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.

2. Tighten:

- Generator rotor bolt “1”



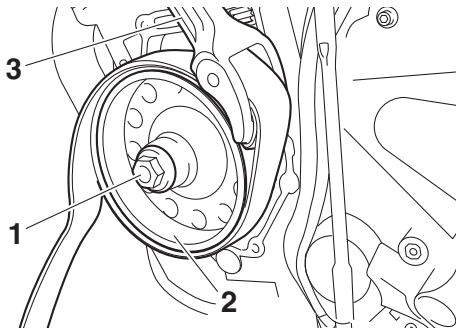
Generator rotor bolt
70 Nm (7.0 m-kgf, 51 ft-lbf)

TIP

While holding the generator rotor “2” with the rotor holding tool “3”, tighten the generator rotor bolt.



Rotor holding tool
90890-04166
YM-04166

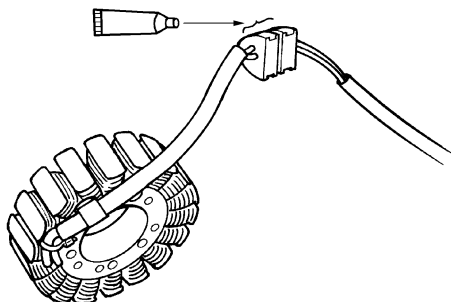


3. Apply:

- Sealant
(onto the stator coil assembly lead grommet)



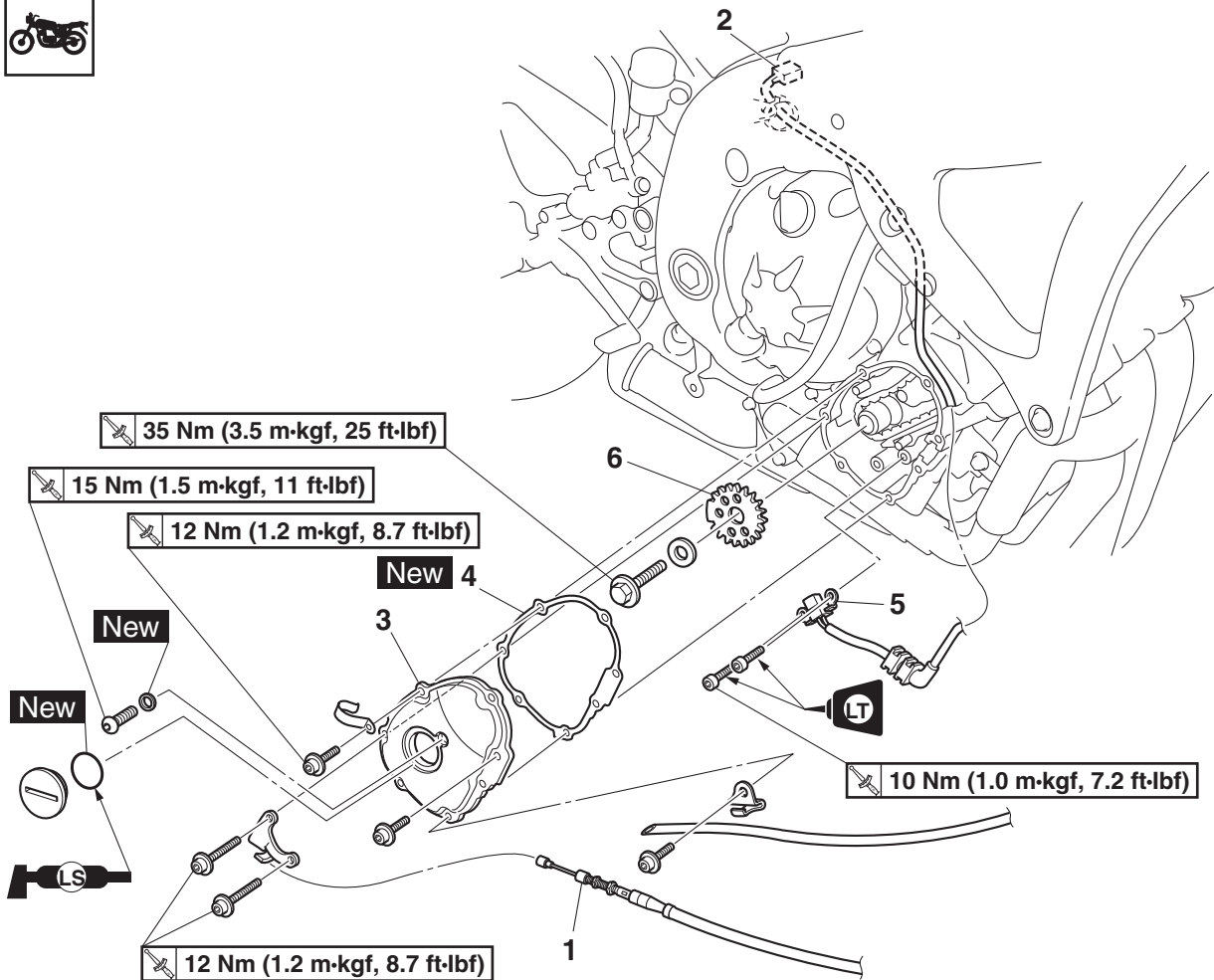
Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)



EAS20147

PICKUP ROTOR

Removing the pickup rotor



Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling assembly		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Generator cover		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-29.
1	Clutch cable	1	Disconnect.
2	Crankshaft position sensor coupler	1	Disconnect.
3	Pickup rotor cover	1	
4	Pickup rotor cover gasket	1	
5	Crankshaft position sensor	1	
6	Pickup rotor	1	

PICKUP ROTOR

EAS30873

REMOVING THE PICKUP ROTOR

1. Remove:

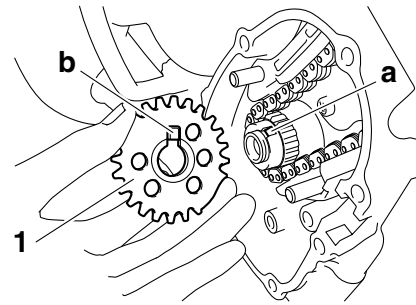
- Pickup rotor bolt "1"
- Washer
- Pickup rotor

TIP

While holding the generator rotor "2" with the rotor holding tool "3", loosen the pickup rotor bolt.



Rotor holding tool
90890-04166
YM-04166



2. Tighten:

- Pickup rotor bolt "1"



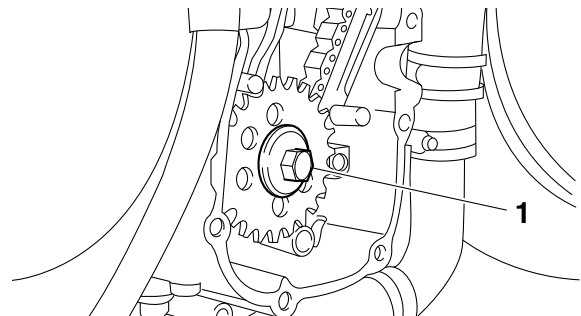
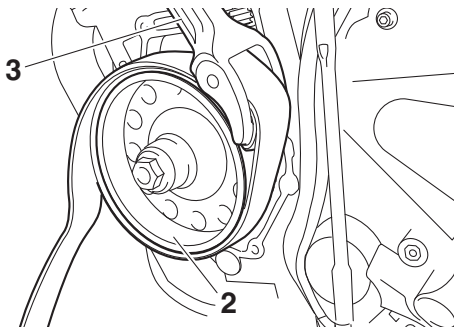
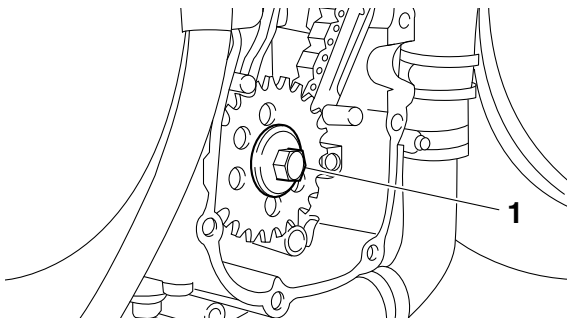
Pickup rotor bolt
35 Nm (3.5 m·kgf, 25 ft·lbf)

TIP

While holding the generator rotor "2" with the rotor holding tool "3", tighten the pickup rotor bolt.



Rotor holding tool
90890-04166
YM-04166



EAS30874

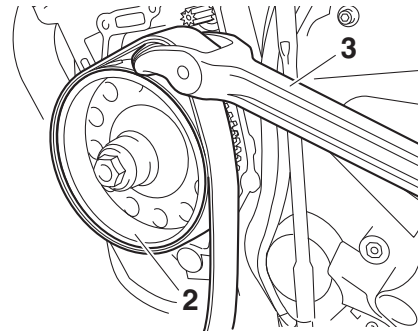
INSTALLING THE PICKUP ROTOR

1. Install:

- Pickup rotor "1"
- Washer
- Pickup rotor bolt

TIP

When installing the pickup rotor, align the groove "a" in the crankshaft with the projection "b" on the pickup rotor.

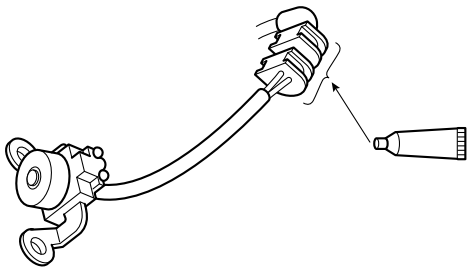


3. Apply:

- Sealant
(onto the crankshaft position sensor lead grommet)



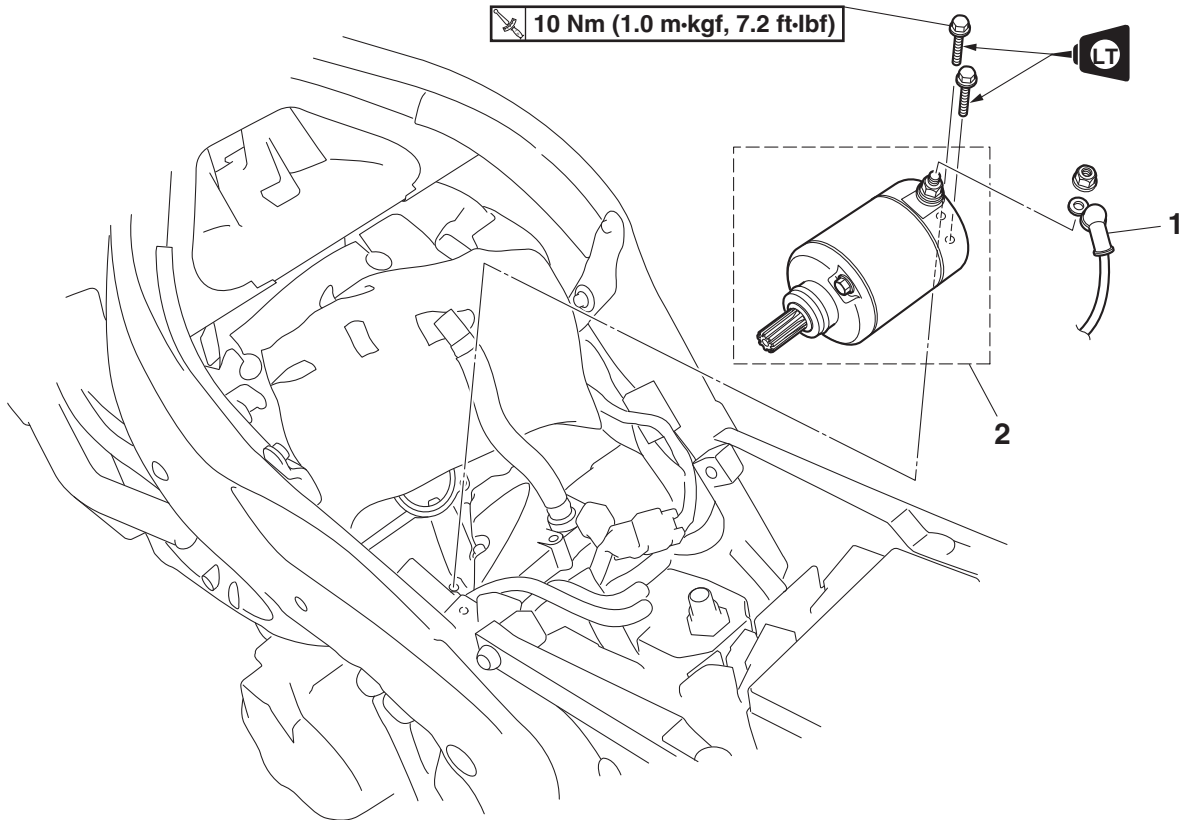
Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)



EAS20052

ELECTRIC STARTER

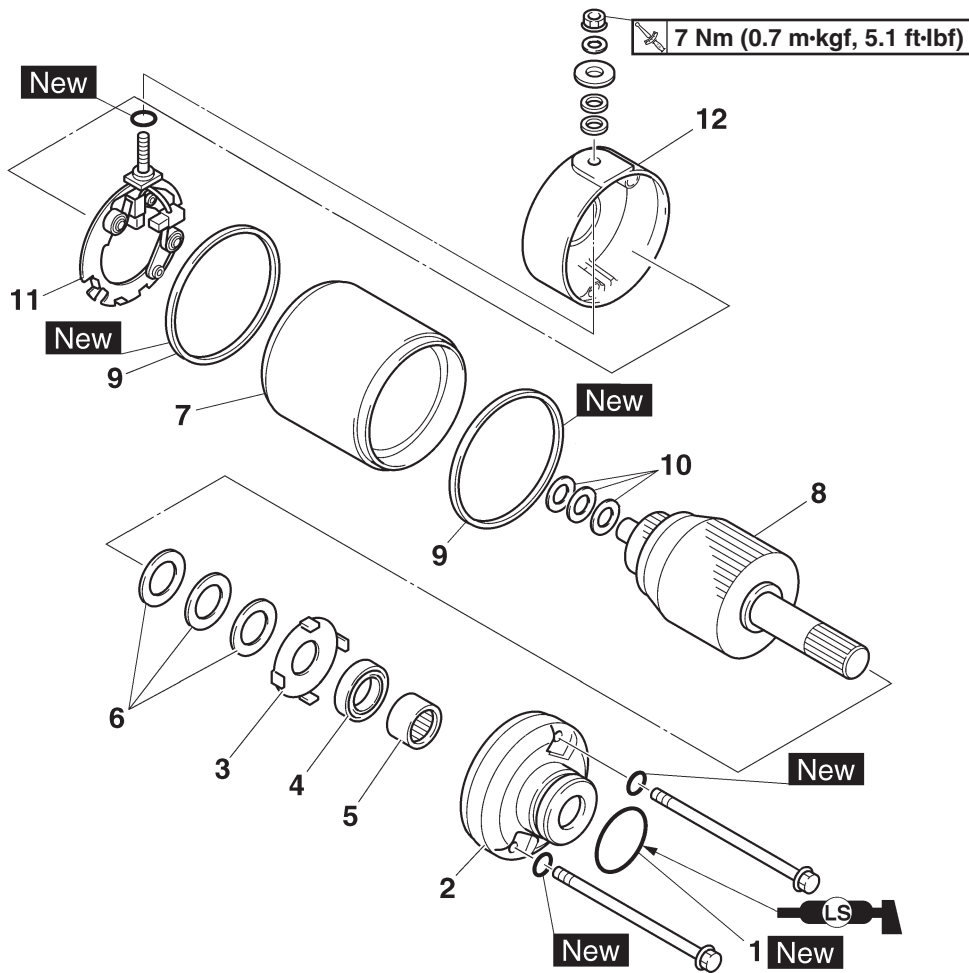
Removing the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Thermostat		Refer to "THERMOSTAT" on page 6-7.
1	Starter motor lead	1	
2	Starter motor assembly	1	

ELECTRIC STARTER

Disassembling the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
1	O-ring	1	
2	Starter motor front cover	1	
3	Lock washer	1	
4	Oil seal	1	
5	Bearing	1	
6	Washer set	1	
7	Starter motor yoke	1	
8	Armature assembly	1	
9	Gasket	2	
10	Washer set	2	
11	Brush holder (along with the brushes)	1	
12	Starter motor rear cover	1	

ELECTRIC STARTER

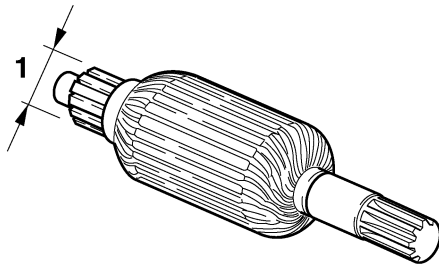
EAS30325

CHECKING THE STARTER MOTOR

1. Check:
 - Commutator
Dirt → Clean with 600 grit sandpaper.
2. Measure:
 - Commutator diameter “1”
Out of specification → Replace the starter motor.



Limit
27.0 mm (1.06 in)



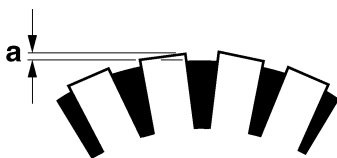
3. Measure:
 - Mica undercut “a”
Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.



Mica undercut (depth)
0.70 mm (0.03 in)

TIP

The mica of the commutator must be undercut to ensure proper operation of the commutator.



4. Measure:
 - Armature assembly resistances
Out of specification → Replace the starter motor.

- a. Measure the armature assembly resistance with the digital circuit tester.

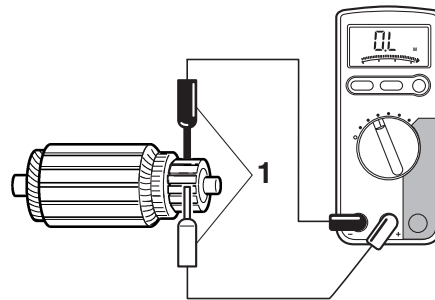


Digital circuit tester
90890-03174
Model 88 Multimeter with ta-
chometer
YU-A1927



Armature coil resistance
0.0012–0.0022 Ω

- b. If any resistance is out of specification, replace the starter motor.



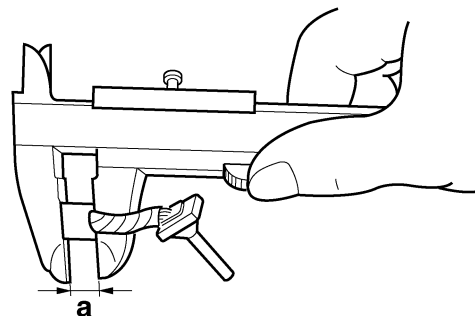
1. Armature coil resistance

5. Measure:

- Brush length “a”
Out of specification → Replace the brushes as a set.



Limit
3.50 mm (0.14 in)

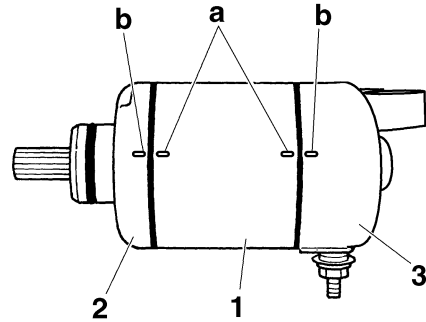
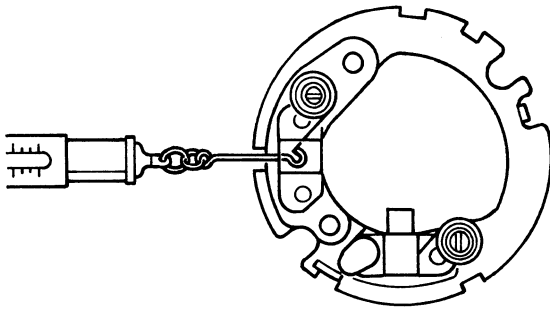


6. Measure:

- Brush spring force
Out of specification → Replace the brush springs as a set.



Brush spring force
7.16–9.52 N (730–971 gf, 25.77–
34.27 oz)



7. Check:
- Gear teeth
Damage/wear → Replace the gear.
8. Check:
- Bearing
 - Oil seal
Damage/wear → Replace the defective part(s).

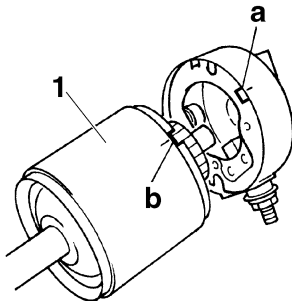
EAS30326

ASSEMBLING THE STARTER MOTOR

1. Install:
- Starter motor yoke "1"

TIP

Align the tab "a" on the brush holder with the slot "b" in the starter motor yoke.

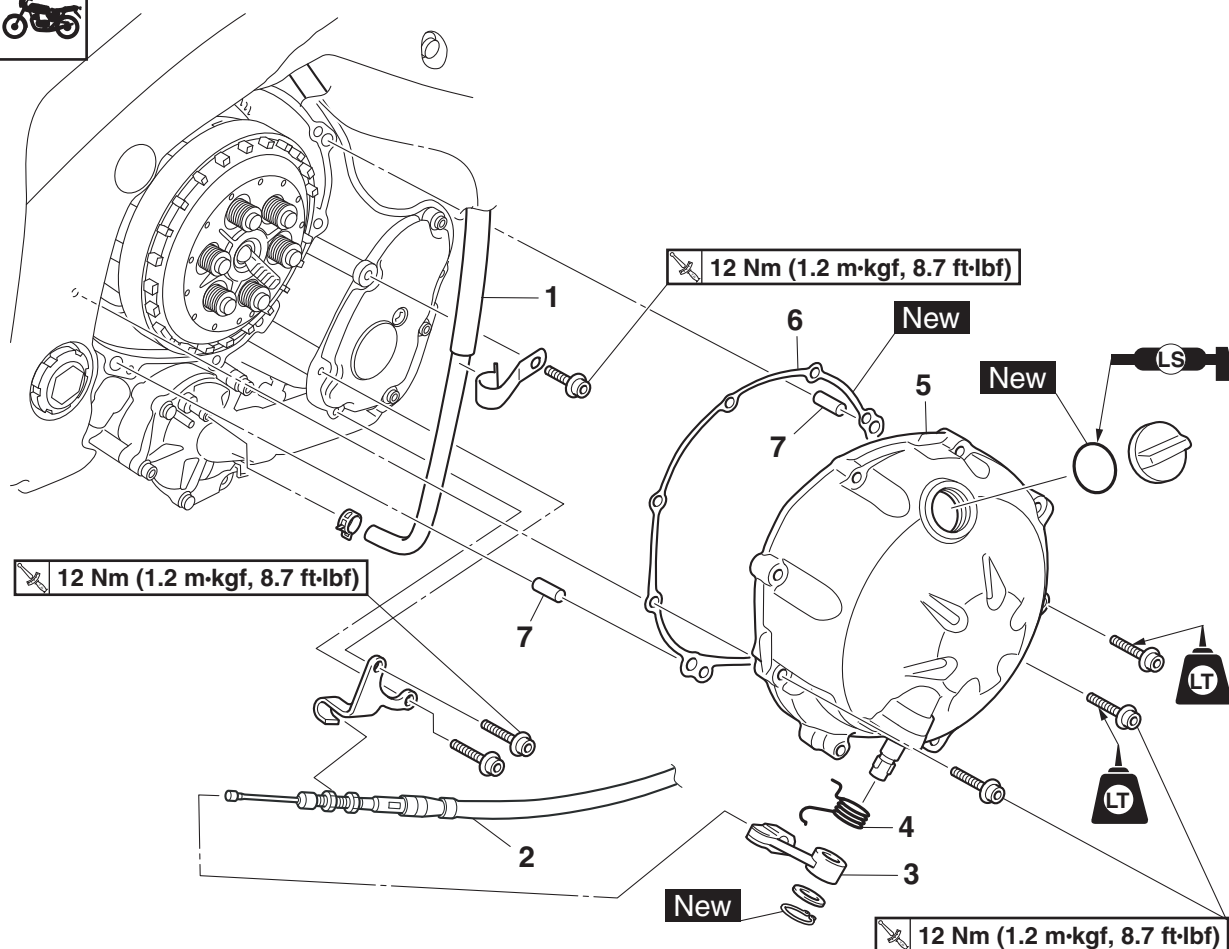


2. Install:
- Starter motor yoke "1"
 - Starter motor front cover "2"
 - Starter motor rear cover "3"

TIP

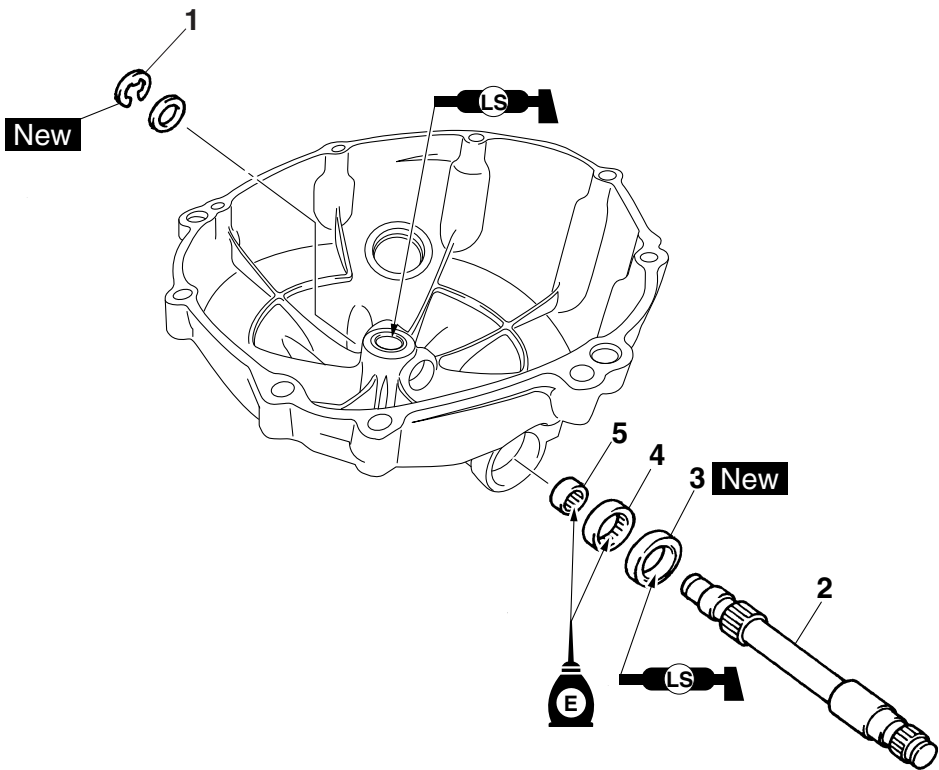
Align the match marks "a" on the starter motor yoke with the match marks "b" on the front and starter motor rear covers.

EAS20055

CLUTCH**Removing the clutch cover**

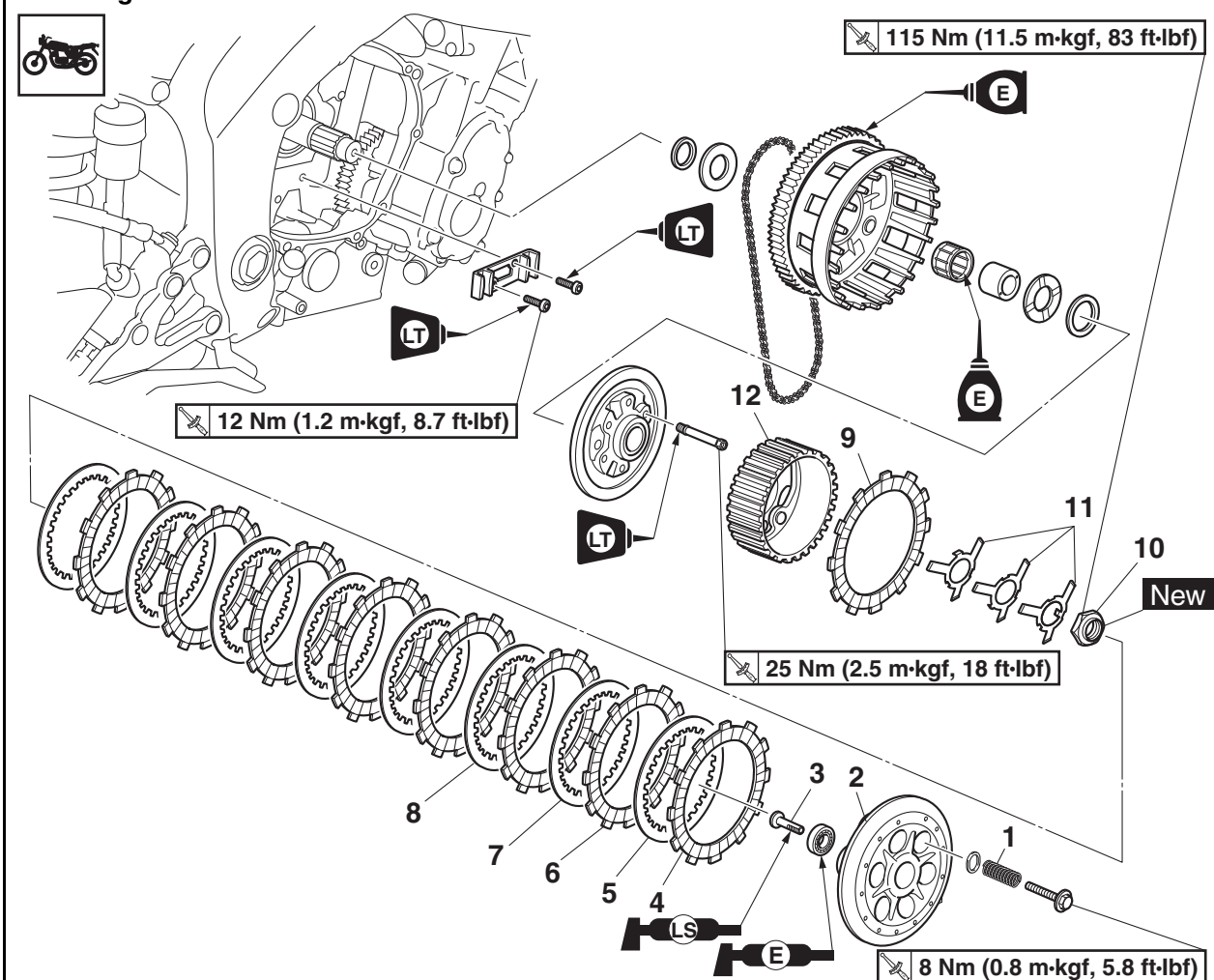
Order	Job/Parts to remove	Q'ty	Remarks
	Side cowling assembly		Refer to "GENERAL CHASSIS" on page 4-1.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-26.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-30.
1	Water pump breather hose	1	Disconnect.
2	Clutch cable	1	Disconnect.
3	Pull lever	1	
4	Pull lever spring	1	
5	Clutch cover	1	
6	Clutch cover gasket	1	
7	Dowel pin	2	

Removing the pull lever shaft



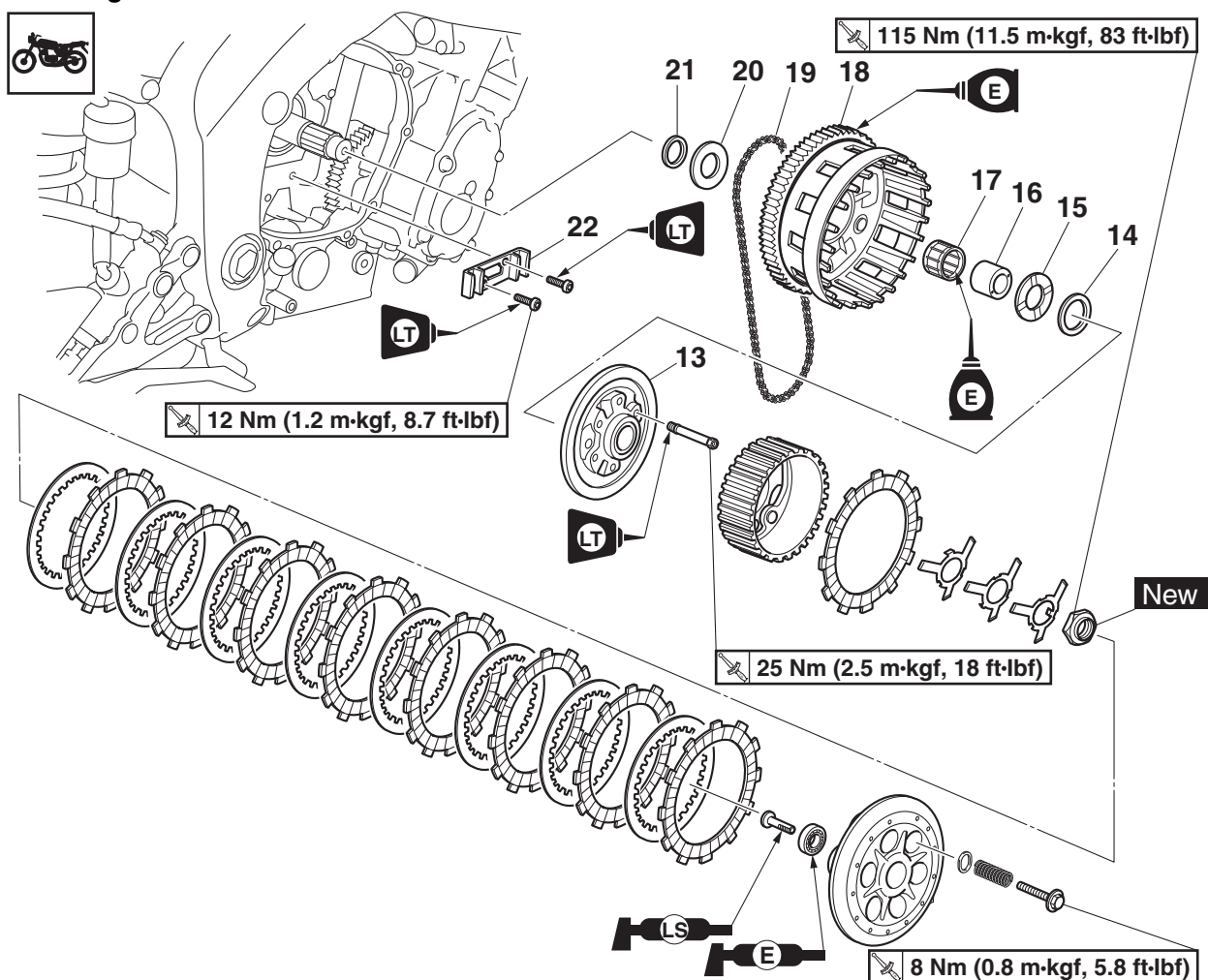
Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Pull lever shaft	1	
3	Oil seal	1	
4	Bearing	1	
5	Bearing	1	

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
	Oil strainer		Refer to "OIL PUMP" on page 5-51.
	Water pump		Refer to "WATER PUMP" on page 6-9.
1	Clutch spring	6	
2	Pressure plate	1	
3	Pull rod	1	
4	Friction plate 1	1	brown painting
5	Clutch plate 1	1	
6	Friction plate 2	7	black painting
7	Clutch plate 2	1	
8	Clutch plate 3	6	
9	Friction plate 3	1	purple painting
10	Clutch boss nut	1	
11	Spring	3	
12	Clutch boss	1	

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
13	Clutch boss plate	1	
14	Washer	1	
15	Thrust washer 1	1	
16	Spacer	1	
17	Bearing	1	
18	Clutch housing	1	
19	Oil pump drive chain	1	
20	Thrust washer 2	1	
21	Thrust washer 3	1	
22	Oil pump drive chain guide	1	

EAS30346

REMOVING THE CLUTCH

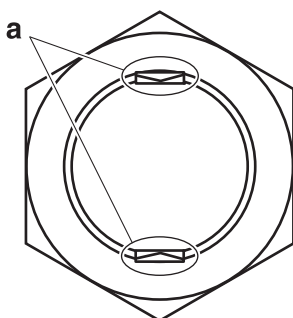
1. Remove:

- Oil strainer
Refer to "OIL PUMP" on page 5-51.
- Water pump
Refer to "WATER PUMP" on page 6-9.
- Friction plates
- Clutch plates

TIP

Be sure to mark the friction plates and clutch plates or note the position of each part so that they are installed in their original positions.

2. Straighten the clutch boss nut rib "a".



3. Loosen:

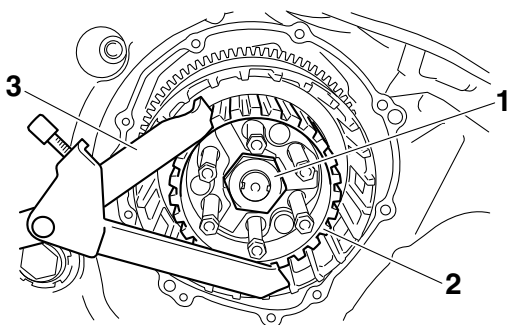
- Clutch boss nut "1"

TIP

While holding the clutch boss "2" with the universal clutch holder "3", loosen the clutch boss nut.



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

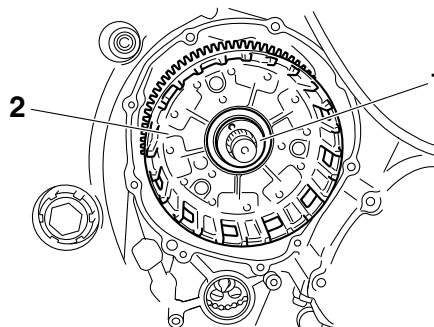


4. Remove:

- Spacer "1"
- Bearing
- Clutch housing "2"
- Oil pump drive chain

TIP

Remove the spacer and bearing from the main axle, then remove the oil pump drive chain from the oil pump driven sprocket, and then remove the clutch housing and oil pump drive chain from the main axle.



EAS30348

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:

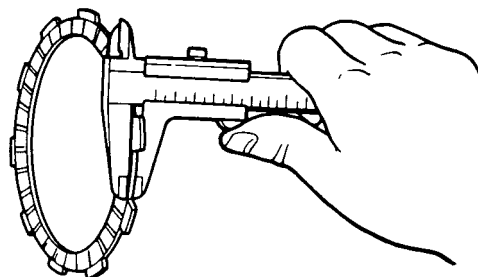
- Friction plate thickness
Out of specification → Replace the friction plates as a set.

TIP

Measure the friction plate at four places.



Friction plate thickness
2.92–3.08 mm (0.115–0.121 in)
Wear limit
2.80 mm (0.110 in)



EAS30349

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.



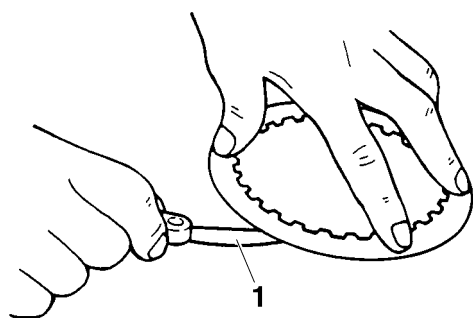
Thickness gauge
90890-03180
Feeler gauge set
YU-26900-9



Clutch plate thickness
1.90–2.10 mm (0.075–0.083 in)
Warpage limit
0.10 mm (0.004 in)

TIP

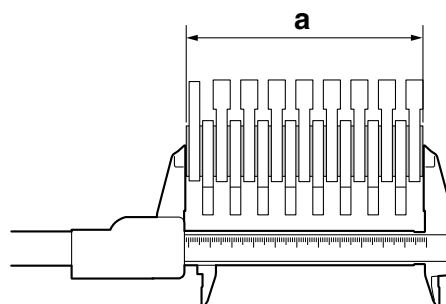
The clutch plate thickness specification listed above is for the plates with the standard thickness only. If a clutch plate with one of the other two plate thicknesses is installed, use 1.50–1.70 mm (0.059–0.067 in) or 2.20–2.40 mm (0.086–0.094 in) for the specification according to the plate.



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)



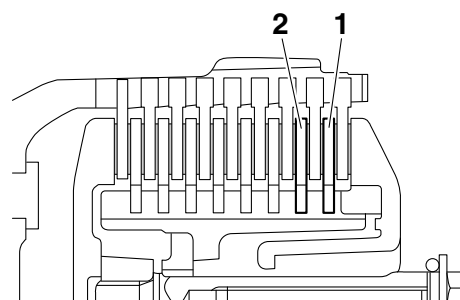
- a. Adjust the assembly width by replacing the clutch plate “1” and, if necessary, clutch plate “2”.
- b. Select the clutch plate from the following table.

Clutch plate “1”		
Part No.	Thickness	
168-16325-00	1.6 mm (0.063 in)	
3J2-16324-00	2.0 mm (0.079 in)	STD
168-16324-00	2.3 mm (0.091 in)	

Clutch plate “2”		
Part No.	Thickness	
3J2-16324-00	2.0 mm (0.079 in)	STD
168-16324-00	2.3 mm (0.091 in)	

TIP

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



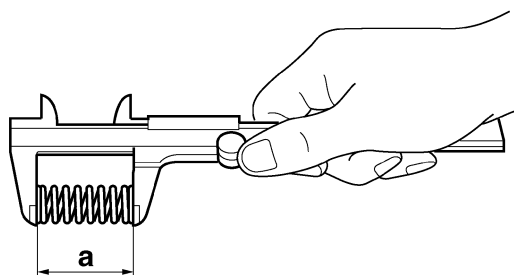
EAS30351

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
	55.00 mm (2.17 in)
	Limit
	54.00 mm (2.13 in)



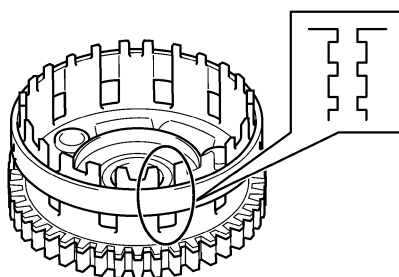
EAS30352

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.



2. Check:
 - Bearing
Damage/wear → Replace the bearing and clutch housing.

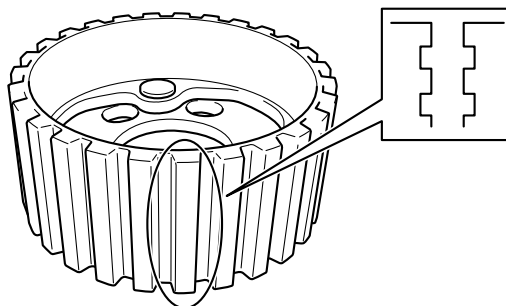
EAS30353

CHECKING THE CLUTCH BOSS

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

TIP

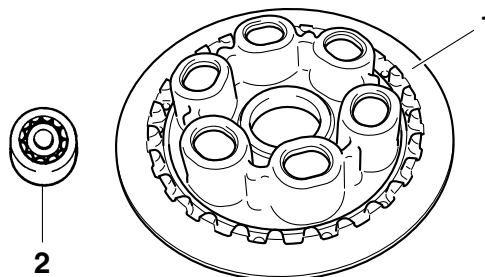
Pitting on the clutch boss splines will cause erratic clutch operation.



EAS30354

CHECKING THE PRESSURE PLATE

1. Check:
 - Pressure plate “1”
Cracks/damage → Replace.
 - Bearing “2”
Damage/wear → Replace.



EAS30356

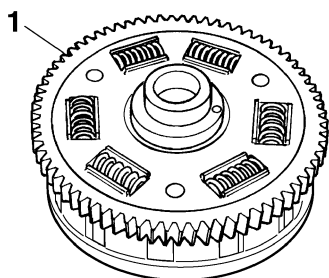
CHECKING THE PRIMARY DRIVE GEAR

1. Check:
 - Primary drive gear
Damage/wear → Replace the clutch housing and crankshaft as a set.
Excessive noise during operation → Replace the clutch housing and crankshaft as a set.

EAS30357

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.



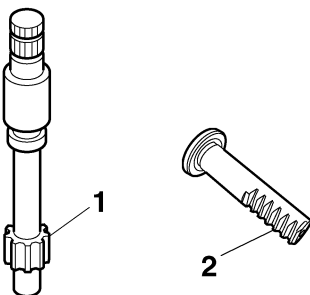
EAS30358

CHECKING THE PULL LEVER SHAFT AND PULL ROD

1. Check:

- Pull lever shaft pinion gear teeth "1"
- Pull rod teeth "2"

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



2. Check:

- Bearing

Damage/wear → Replace.

EAS31601

CHECKING THE OIL PUMP DRIVE SPROCKET AND OIL PUMP DRIVE CHAIN

1. Check:

- Oil pump drive sprocket
Cracks/damage/wear → Replace the clutch housing, oil pump drive chain, and oil pump driven sprocket as a set.

2. Check:

- Oil pump drive chain
Damage/stiffness → Replace the clutch housing, oil pump drive chain, and oil pump driven sprocket as a set.

EAS30363

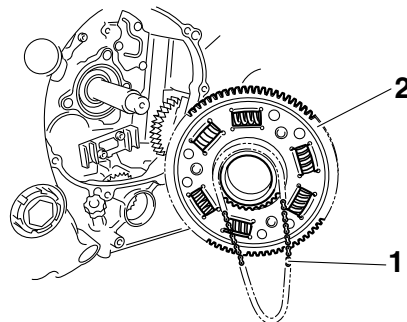
INSTALLING THE CLUTCH

1. Install:

- Oil pump drive chain "1"
- Clutch housing "2"

TIP

- Install the oil pump drive chain onto the clutch housing, and then install the chain onto the oil pump driven sprocket while installing the clutch housing onto the main axle.
- Make sure that the oil pump drive chain passes through the oil pump drive chain guide.

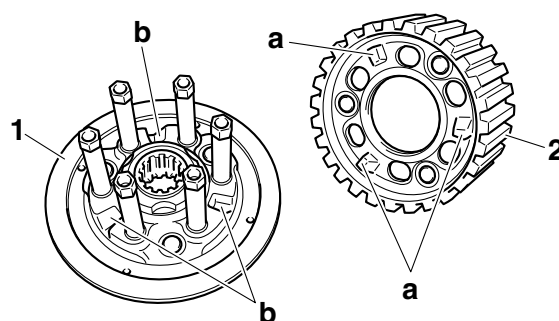


2. Install:

- Clutch boss plate "1"
- Clutch boss "2"

TIP

Fit the projections "a" on the clutch boss into the grooves "b" in the clutch boss plate.

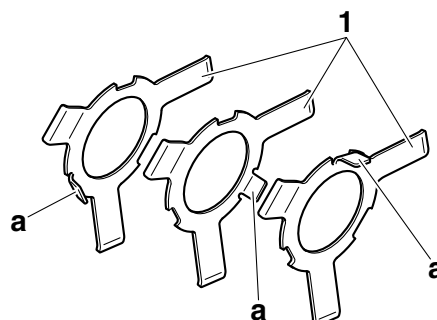


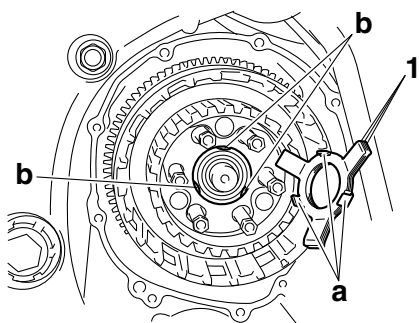
3. Install:

- Springs "1"

TIP

- Stack the springs on top of each other, making sure that the tab "a" on each spring is in a different position.
- Fit the tabs "a" on the springs into the grooves "b" in the clutch boss plate.





4. Tighten:

- Clutch boss nut “1” **New**



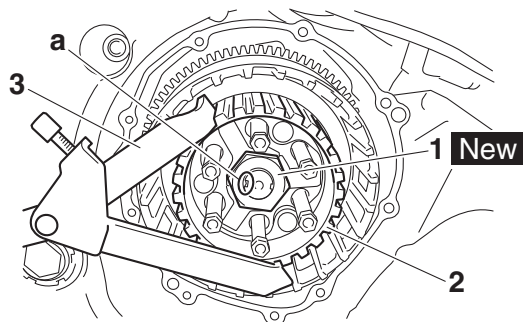
Clutch boss nut
115 Nm (11.5 m·kgf, 83 ft·lbf)

TIP

- While holding the clutch boss “2” with the universal clutch holder “3”, tighten the clutch boss nut.
- Stake the clutch boss nut at a cutout “a” in the main axle.



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



5. Lubricate:

- Friction plates
- Clutch plates
(with the recommended lubricant)



Recommended lubricant
Engine oil

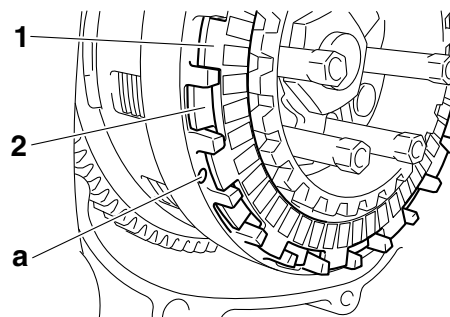
6. Install:

- 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.

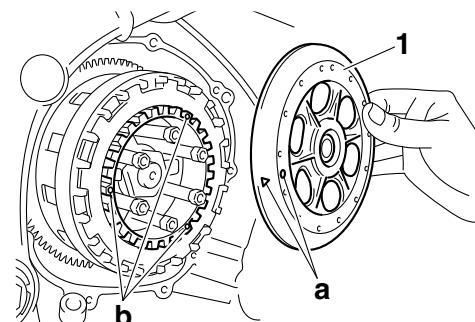


7. Install:

- Pressure plate “1”

TIP

Align the punch marks “a” in the pressure plate with one of the three punch marks “b” in the clutch boss.



8. Install:

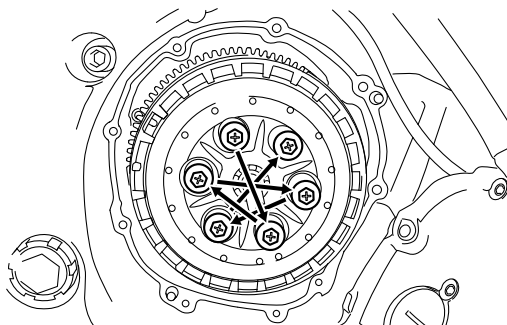
- Seat plate
- Clutch springs
- Clutch spring bolts



Clutch spring bolt
8 Nm (0.8 m·kgf, 5.8 ft·lbf)

TIP

Tighten the clutch spring bolts in stages and in a crisscross pattern.



9. Install:

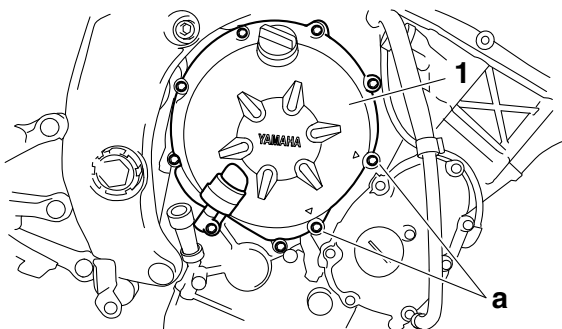
- Dowel pins
- Clutch cover gasket **New**
- Clutch cover "1"



Clutch cover bolt
12 Nm (1.2 m·kgf, 8.7 ft·lbf)

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 "a" shown in the illustration.
- Tighten the clutch cover bolts in stages and in a crisscross pattern.

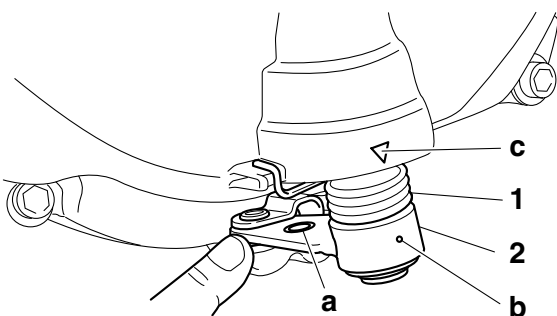


10. Install:

- Pull lever spring "1"
- Pull lever "2"
- Washer
- Circlip **New**

TIP

- Make sure that the mark "a" on the pull lever is facing up.
- When installing the pull lever, push it and check that its punch mark "b" aligns with the mark "c" on the clutch cover. Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.

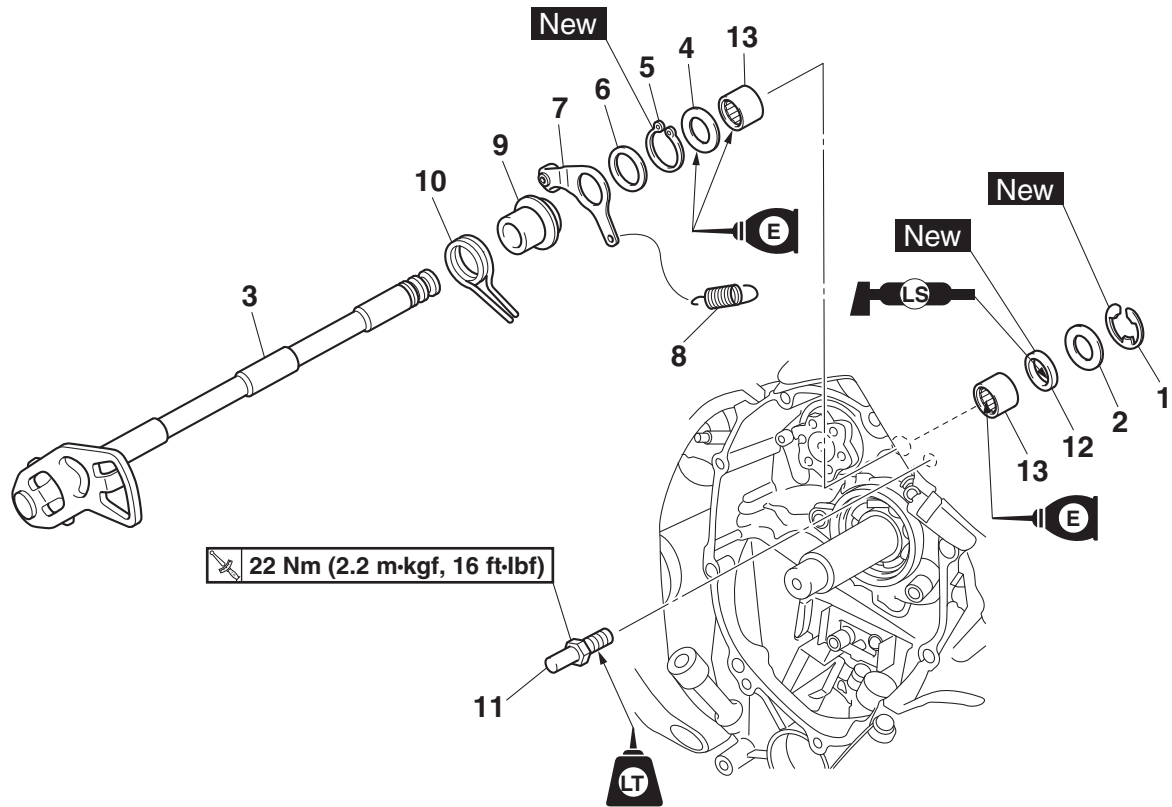


11. Adjust:

- Clutch cable free play
Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-12.

SHIFT SHAFT

Removing the shift shaft and stopper lever



Order	Job/Parts to remove	Q'ty	Remarks
	Shift arm		Refer to "ENGINE REMOVAL" on page 5-3.
	Clutch housing		Refer to "CLUTCH" on page 5-39.
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	Spacer	1	
10	Shift shaft spring	1	
11	Shift shaft spring stopper	1	
12	Oil seal	1	
13	Bearing	2	

EAS30377

CHECKING THE SHIFT SHAFT

1. Check:

- Shift shaft
Bends/damage/wear → Replace.
- Shift shaft spring
Damage/wear → Replace.

EAS30378

CHECKING THE STOPPER LEVER

1. Check:

- Stopper lever
Bends/damage → Replace.
Roller turns roughly → Replace the stopper lever.
- Stopper lever spring
Damage/wear → Replace.

EAS30381

INSTALLING THE SHIFT SHAFT

1. Install:

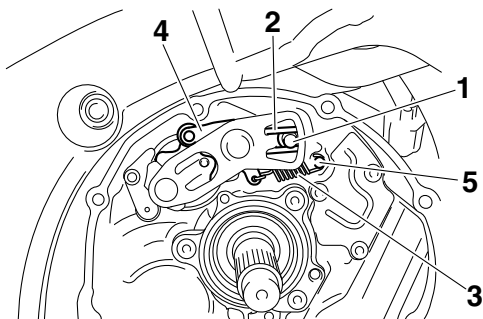
- Shift shaft spring stopper “1”
- Shift shaft assembly
- Shift shaft spring “2”



Shift shaft spring stopper
22 Nm (2.2 m·kgf, 16 ft·lbf)
LOCTITE®

TIP

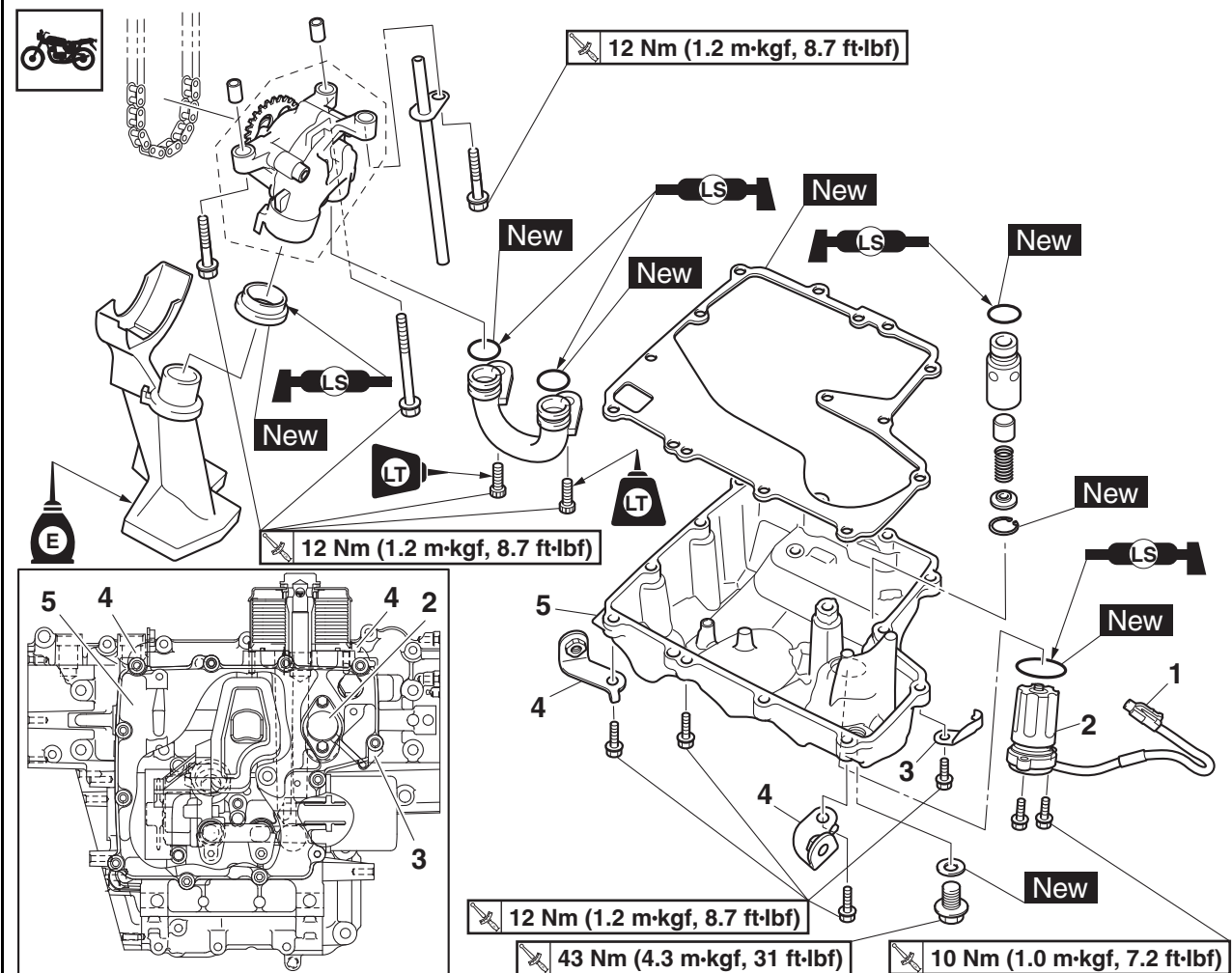
- Lubricate the oil seal lips with lithium-soap-based grease.
- Hook the end of the shift shaft spring onto the shift shaft spring stopper.
- Hook the ends of the stopper lever spring “3” onto the stopper lever “4” and the crankcase boss “5”.
- Mesh the stopper lever with the shift drum segment assembly.



EAS20054

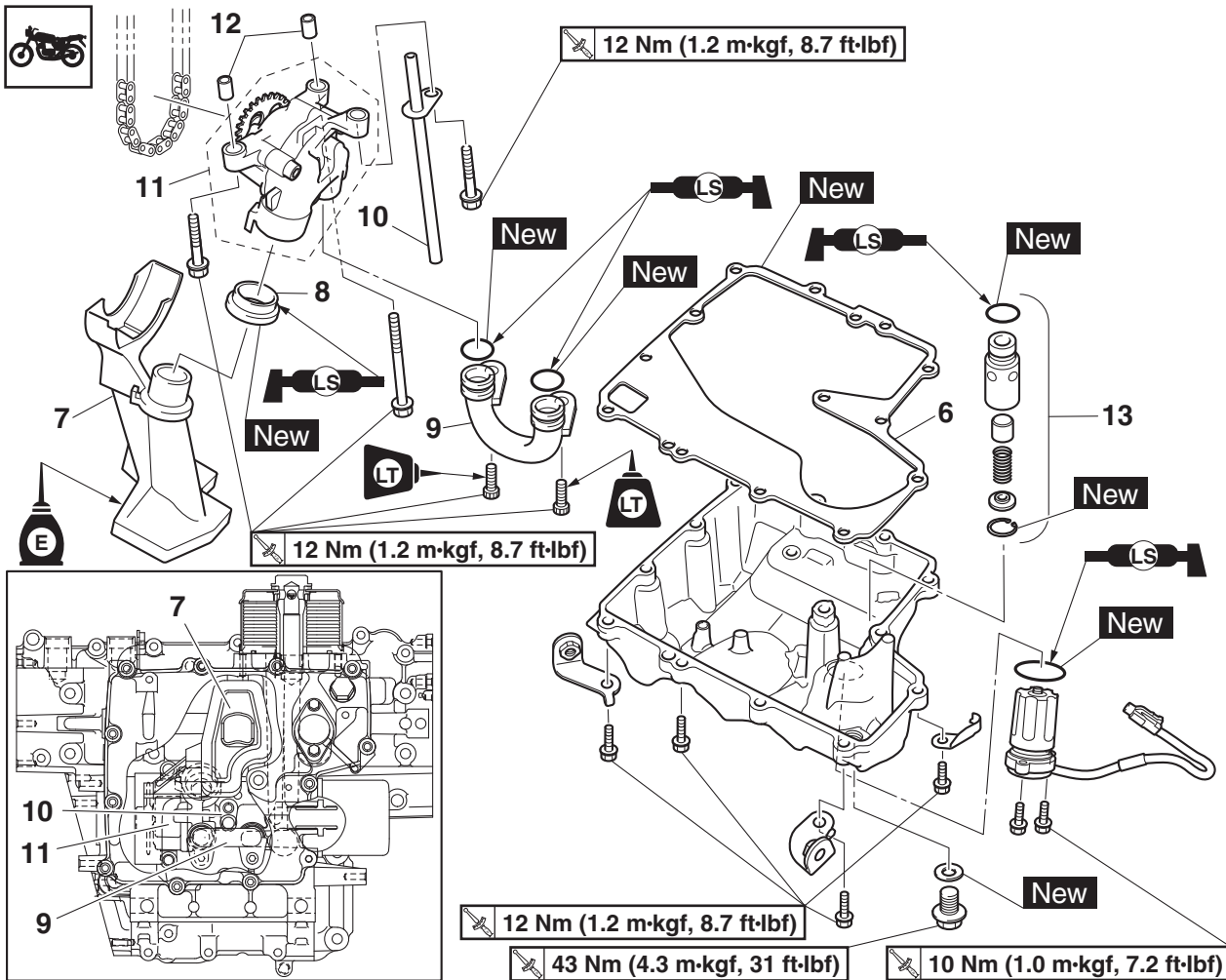
OIL PUMP

Removing the oil pan and oil pump



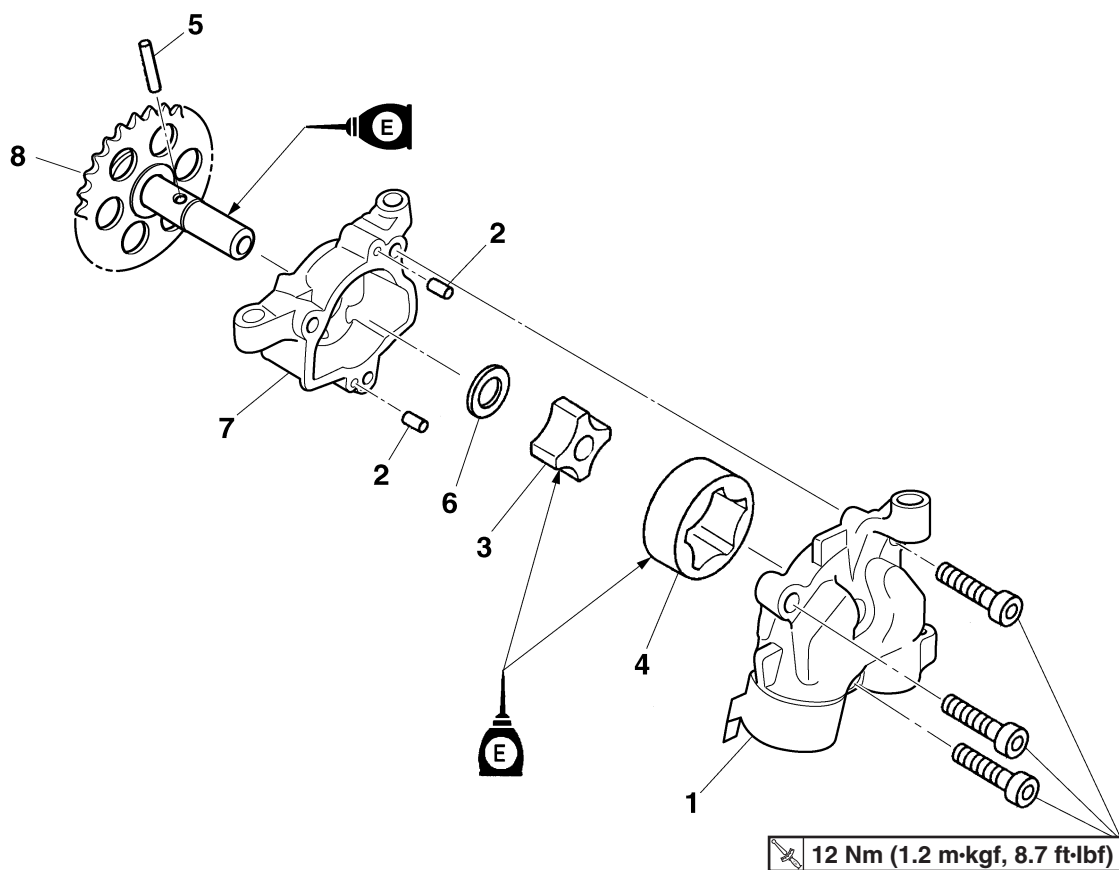
Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-26.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-30.
	Exhaust pipe assembly		Refer to "ENGINE REMOVAL" on page 5-3.
	Water pump		Refer to "WATER PUMP" on page 6-9.
	Clutch housing		Refer to "CLUTCH" on page 5-39.
1	Oil level switch coupler	1	Disconnect.
2	Oil level switch	1	
3	Oil level switch lead holder	1	
4	Bottom cowl bracket	2	
5	Oil pan	1	

Removing the oil pan and oil pump



Order	Job/Parts to remove	Q'ty	Remarks
6	Oil pan gasket	1	
7	Oil strainer	1	
8	Oil strainer gasket	1	
9	Oil pipe	1	
10	Ventilation chamber oil drain pipe	1	
11	Oil pump assembly	1	
12	Dowel pin	2	
13	Relief valve assembly	1	

Disassembling the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump housing cover	1	
2	Pin	2	
3	Oil pump inner rotor	1	
4	Oil pump outer rotor	1	
5	Pin	1	
6	Washer	1	
7	Oil pump housing	1	
8	Oil pump driven sprocket	1	

EAS30333

REMOVING THE OIL PAN

1. Remove:
 - Oil level switch lead holder
 - Bottom cowling brackets
 - Oil pan
 - Oil pan gasket

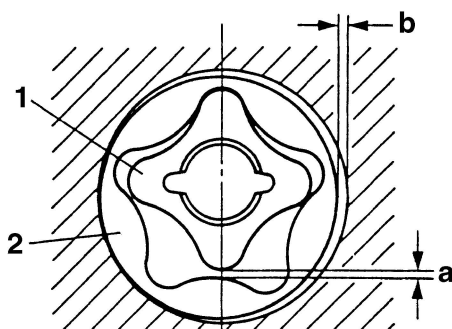
TIP

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.

EAS30337

CHECKING THE OIL PUMP

1. Check:
 - Oil pump driven sprocket
 - Oil pump housing
 - Oil pump housing cover
 Cracks/damage/wear → Replace the defective part(s).
2. Measure:
 - Inner-rotor-to-outer-rotor-tip clearance "a"
 - Outer-rotor-to-oil-pump-housing clearance "b"

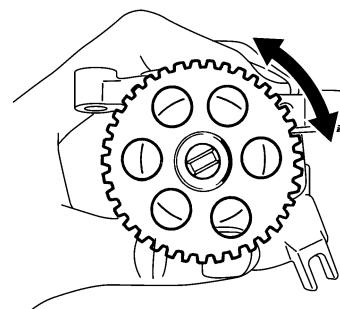


1. Inner rotor
2. Outer rotor



Inner-rotor-to-outer-rotor-tip clearance
 Below 0.120 mm (-0.0047 in)
 Limit
 0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance
 0.09–0.15 mm (0.0035–0.0059 in)
 Limit
 0.22 mm (0.0087 in)

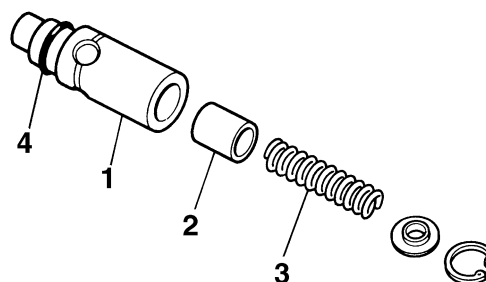
3. Check:
 - Oil pump operation
 Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



EAS30338

CHECKING THE RELIEF VALVE

1. Check:
 - Relief valve body "1"
 - Relief valve "2"
 - Spring "3"
 - O-ring "4"
 Damage/wear → Replace the defective part(s).



EAS30742

CHECKING THE OIL PIPES

The following procedure applies to all of the oil delivery pipes.

1. Check:
 - Ventilation chamber oil drain pipe
 - Oil pipe
 Damage → Replace.
 Obstruction → Wash and blow out with compressed air.

EAS30340

CHECKING THE OIL STRAINER

1. Check:
 - Oil strainer
 Damage → Replace.
 Contaminants → Clean with solvent.

EAS30342

ASSEMBLING THE OIL PUMP

1. Lubricate:
 - Inner rotor
 - Outer rotor
 - Oil pump shaft
 (with the recommended lubricant)

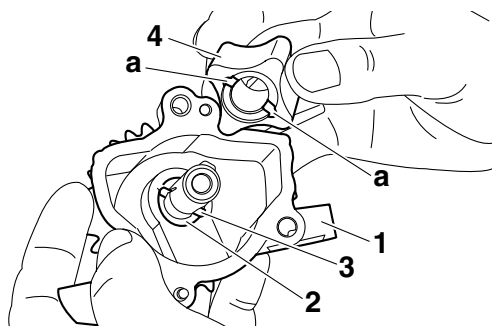
	Recommended lubricant Engine oil
---	---

2. Install:

- Oil pump driven sprocket
- Oil pump housing "1"
- Washer "2"
- Pin "3"
- Oil pump inner rotor "4"
- Oil pump outer rotor

TIP

When installing the inner rotor, align the pin "3" in the oil pump shaft with the groove "a" in the inner rotor "4".



3. Check:

- Oil pump operation
Refer to "CHECKING THE OIL PUMP" on page 5-54.

EAS30345

INSTALLING THE OIL PAN

1. Install:

- Oil pan gasket **New**
- Oil pan
- Bottom cowling brackets
- Oil level switch lead holder

	Oil pan bolt 12 Nm (1.2 m·kgf, 8.7 ft·lbf)
---	---

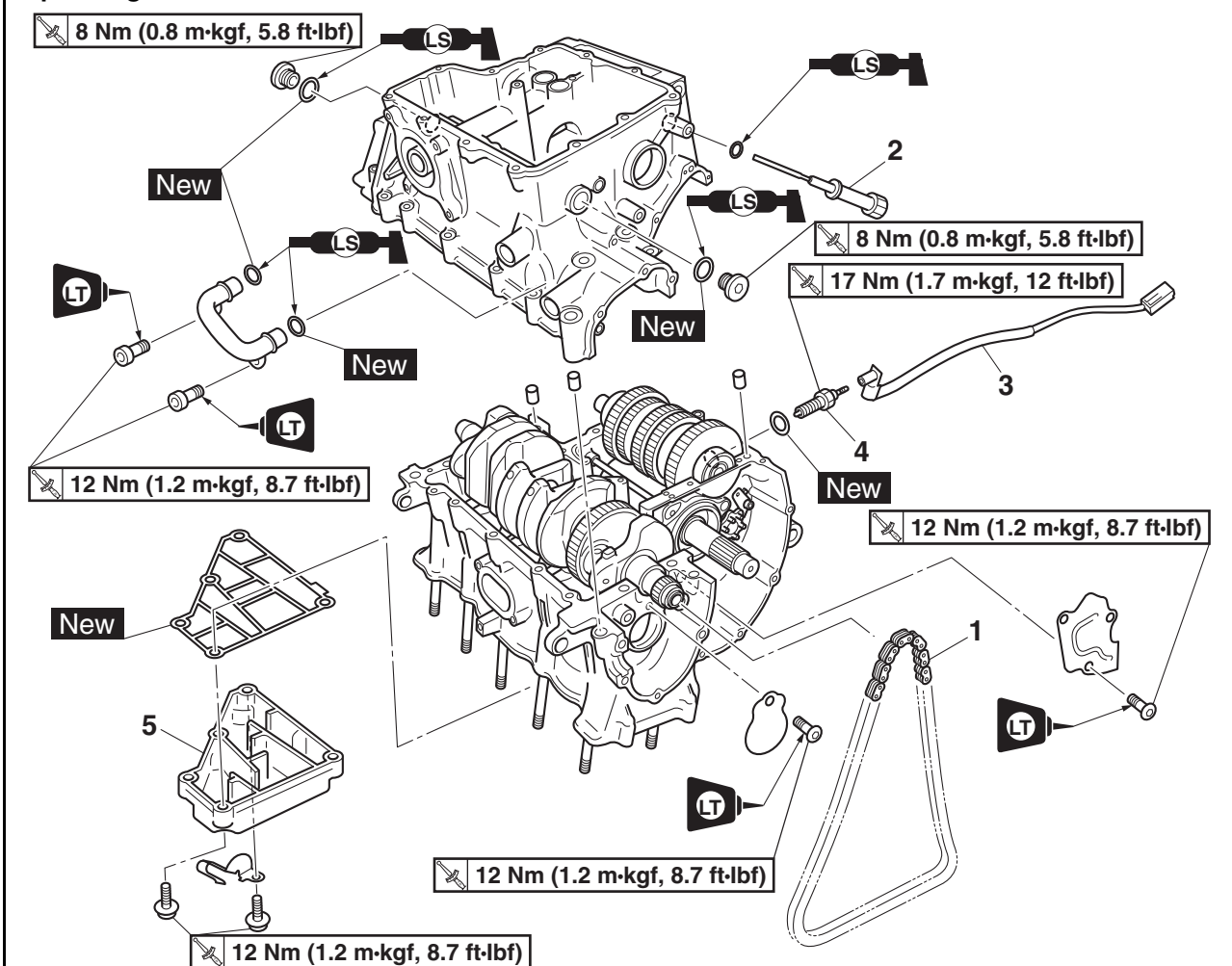
TIP

Tighten the oil pan bolts in stages and in a criss-cross pattern.

EAS20059

CRANKCASE

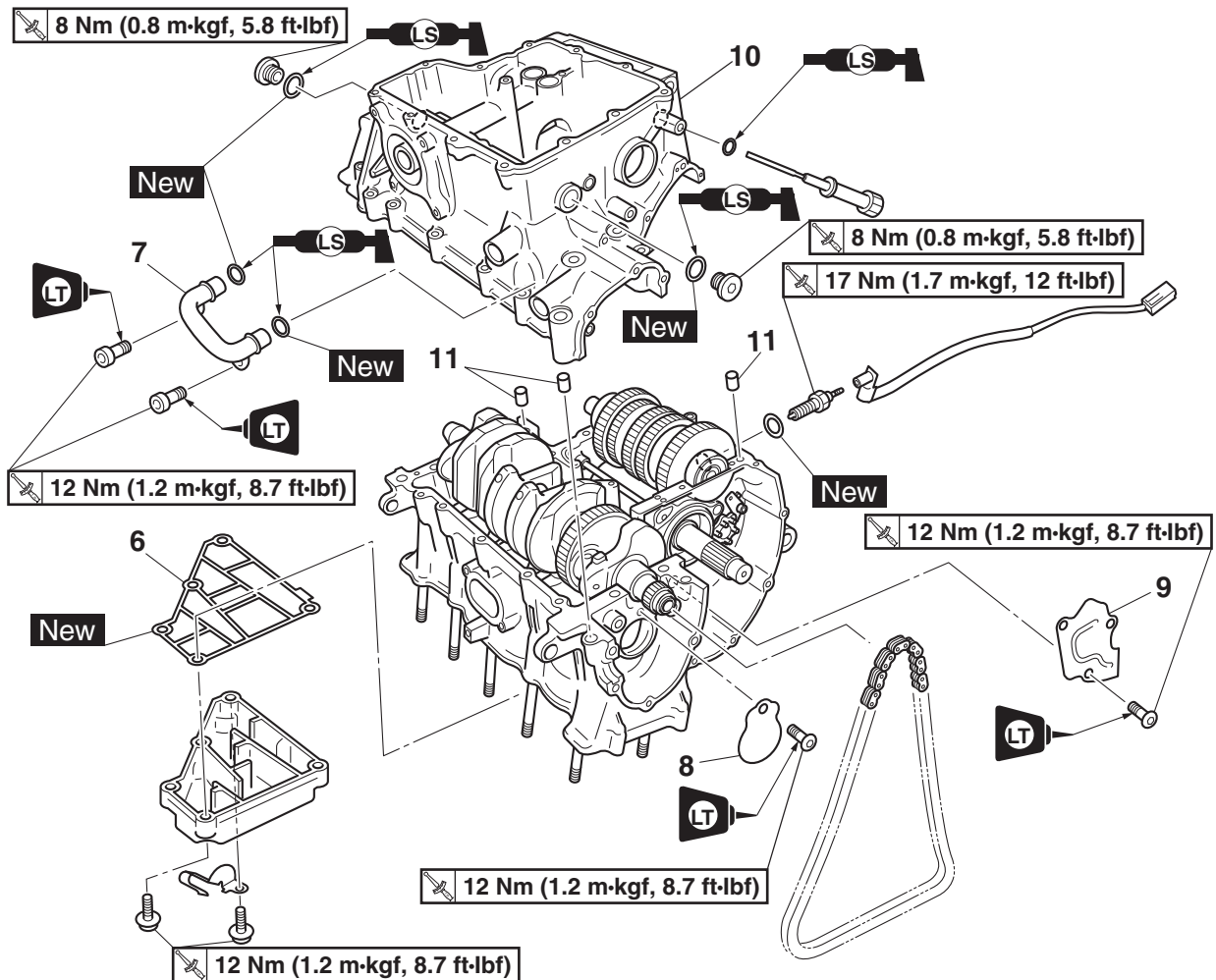
Separating the crankcase



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 5-19.
	Starter clutch		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-29.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-49.
	Pickup rotor		Refer to "PICKUP ROTOR" on page 5-32.
	Oil pump drive chain guide		Refer to "CLUTCH" on page 5-39.
	Oil pump assembly		Refer to "OIL PUMP" on page 5-51.
1	Timing chain	1	
2	Dipstick	1	
3	Neutral switch lead	1	
4	Neutral switch	1	
5	Ventilation chamber cover	1	

CRANKCASE

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
6	Ventilation chamber cover gasket	1	
7	Oil pipe	1	
8	Oil baffle plate 1	1	
9	Oil baffle plate 2	1	
10	Lower crankcase	1	
11	Dowel pin	3	

EAS30389

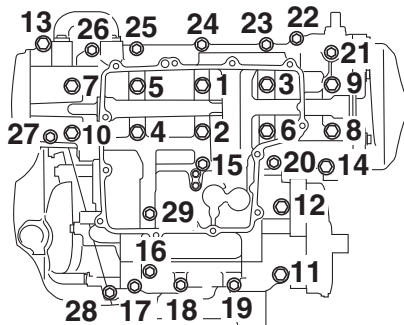
DISASSEMBLING THE CRANKCASE

1. Place the engine upside down.
2. Remove:
 - Crankcase bolts

TIP

- Loosen each bolt 1/4 of a turn at a time. After all of the bolts are fully loosened, remove them.
- Loosen the bolts in decreasing numerical order (refer to the numbers in the illustration).
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.

- M8 × 115 mm bolts: “8”, “9”
- M8 × 85 mm bolts: “1”–“7”, “10”
- M8 × 65 mm bolts: “11”, “12”
- M6 × 80 mm bolt: “29”
- M6 × 65 mm shoulder bolts: “13”, “14”
- M6 × 65 mm bolts: “16”, “20”, “21”
- M6 × 55 mm bolts: “15”, “22”–“27”
- M6 × 45 mm bolts: “17”–“19”
- M6 × 30 mm bolt: “28”



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.

EAS30390

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.

EAS30743

CHECKING THE OIL PIPE

1. Check:
 - Oil pipe
Damage → Replace.
Obstruction → Wash and blow out with compressed air.

EAS31445

CHECKING THE TIMING CHAIN

Refer to “CAMSHAFTS” on page 5-11.

EAS30397

ASSEMBLING THE CRANKCASE

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



**Recommended lubricant
Engine oil**

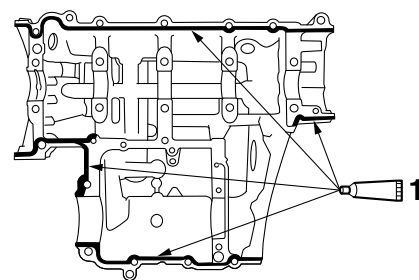
2. Apply:
 - Sealant
(onto the crankcase mating surfaces)



**Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)**

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.



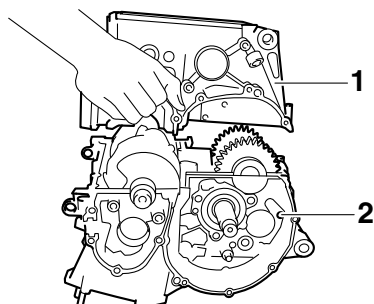
1. Three Bond No.1215®
3. Install:
 - Dowel pins
4. Set the shift drum assembly and transmission gears in the neutral position.
5. Install:
 - Lower crankcase “1”
(onto the upper crankcase “2”)

CRANKCASE

ECA13980

NOTICE

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



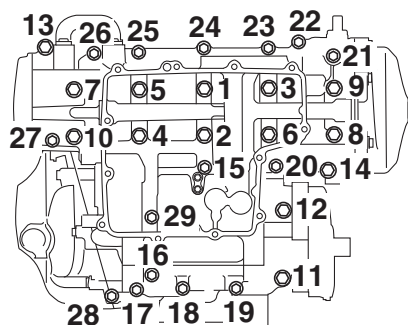
6. Install:

- Crankcase bolts

TIP

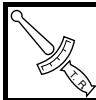
- Lubricate the bolts “1”–“10” thread part and washers with engine oil.
- Lubricate the bolts “11”–“29” thread part and mating surfaces with engine oil.
- Finger tighten the crankcase bolts.

- M8 × 115 mm bolts: “8”, “9”
- M8 × 85 mm bolts: “1”–“7”, “10”
- M8 × 65 mm bolts: “11”, “12”
- M6 × 80 mm bolt: “29”
- M6 × 65 mm shoulder bolts: “13”, “14”
- M6 × 65 mm bolts: “16”, “20”, “21”
- M6 × 55 mm bolts: “15”, “22”–“27”
- M6 × 45 mm bolts: “17”–“19”
- M6 × 30 mm bolt: “28”



7. Tighten:

- Crankcase bolts “1”–“10”



Crankcase bolt (M8 × 115 mm, M8 × 85 mm)

1st: 20 Nm (2.0 m·kgf, 14 ft·lbf)

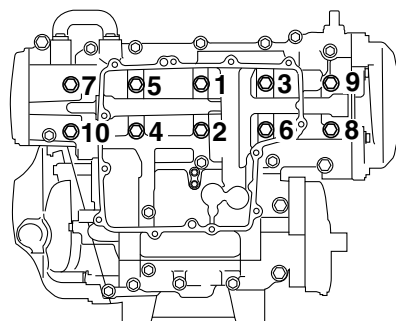
***2nd: 12 Nm (1.2 m·kgf, 8.7 ft·lbf)**

3rd: Bolt “1”–“7”, “10” +50° Bolt “8”, “9” +75°

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

TIP

- Lubricate the bolt threads and the bearing surfaces with engine oil.
- Tighten the bolts in the tightening sequence cast on the crankcase.



8. Tighten:

- Crankcase bolts “11”–“29”



Crankcase bolt (M8 × 65 mm)

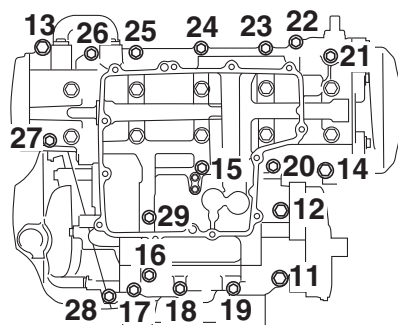
24 Nm (2.4 m·kgf, 17 ft·lbf)

Crankcase bolt (M6)

10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

- Lubricate the bolt threads and the bearing surfaces with engine oil.
- Tighten the bolts in the tightening sequence cast on the crankcase.

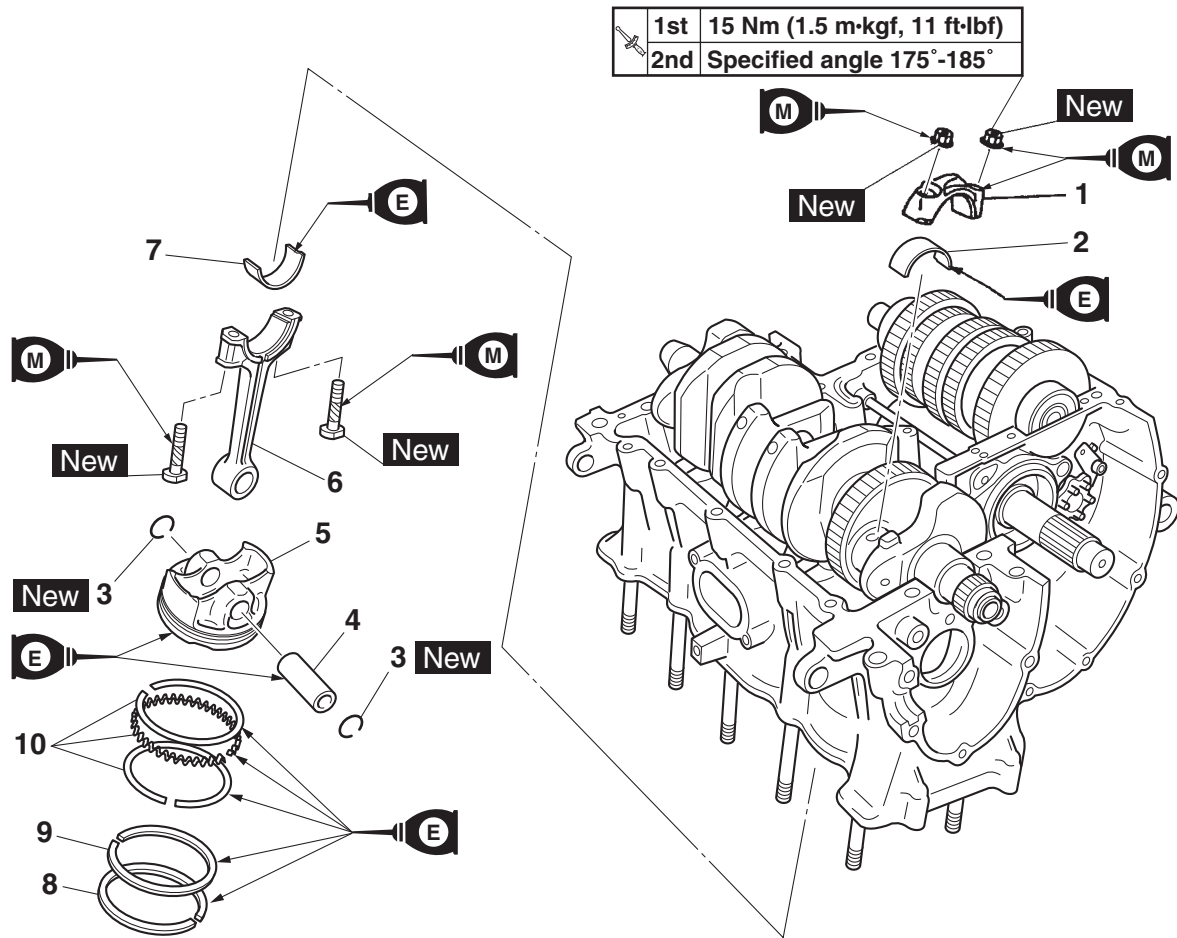


CONNECTING RODS AND PISTONS

EAS20132

CONNECTING RODS AND PISTONS

Removing the connecting rods and pistons



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-56.
1	Connecting rod cap	4	
2	Big end lower bearing	4	
3	Piston pin clip	8	
4	Piston pin	4	
5	Piston	4	
6	Connecting rod	4	
7	Big end upper bearing	4	
8	Top ring	4	
9	2nd ring	4	
10	Oil ring	4	

CONNECTING RODS AND PISTONS

EAS30745

REMOVING THE CONNECTING RODS AND PISTONS

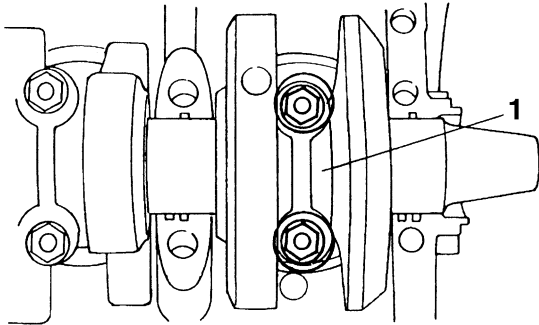
The following procedure applies to all of the connecting rods and pistons.

1. Remove:

- Connecting rod cap "1"

TIP

Identify the position of each connecting rod so that it can be reinstalled in its original place.



2. Remove:

- Big end bearings
(from the connecting rods and connecting rod caps)

TIP

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

3. Remove:

- Piston pin clips "1"
- Piston pin "2"
- Piston "3"
- Connecting rod "4"

ECA13810

NOTICE

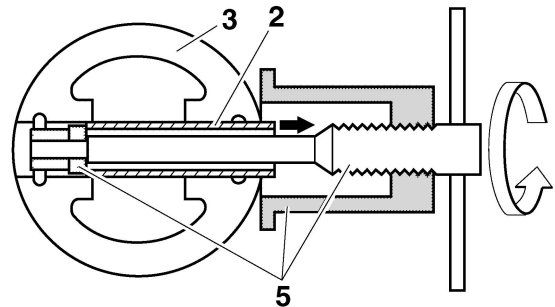
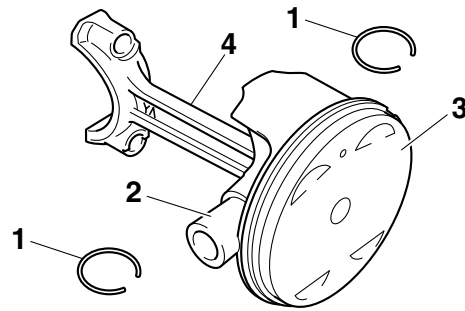
Do not use a hammer to drive the piston pin out.

TIP

- For reference during installation, put an identification mark on each piston crown.
- Before removing the piston pin, deburr the piston pin clip's groove and the piston's pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set "5".



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

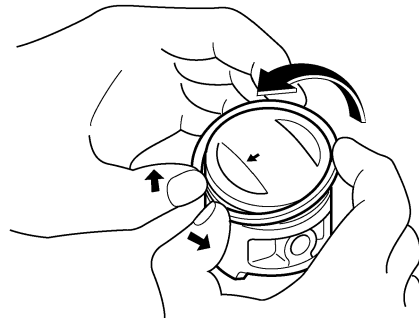


4. Remove:

- 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.



EAS30747

CHECKING THE CYLINDERS AND PISTONS

The following procedure applies to all of the cylinders and pistons.

1. Check:

- Piston wall
- Cylinder wall

Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.

2. Measure:

- Piston-to-cylinder clearance

CONNECTING RODS AND PISTONS

- 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.



Bore
67.000–67.010 mm (2.6378–
2.6382 in)

Taper limit
0.006 mm (0.0002 in)

Out of round limit
0.050 mm (0.0020 in)

"C" = maximum of $D_1, D_2, D_3, D_4, D_5, D_6$

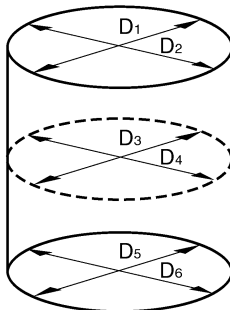
Taper (front-to-back) = maximum difference between D_1 , D_3 , D_5

Taper (side-to-side) = maximum difference between D_2 , D_4 , D_6

Out of round (top) = difference between D_1 , D_2

Out of round (middle) = difference between D_3 , D_4

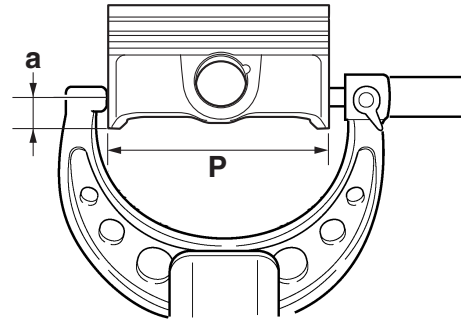
Out of round (bottom) = difference between D_5 , D_6



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



Piston Diameter
66.975–66.990 mm (2.6368–2.6374 in)



- a. 10 mm (0.39 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"



Piston-to-cylinder clearance
0.010–0.035 mm (0.0004–0.0014
in)

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

EAS30748

CHECKING THE PISTON RINGS

1. Measure:
 - Piston ring side clearance
Out of specification → Replace the piston and piston rings as a set.

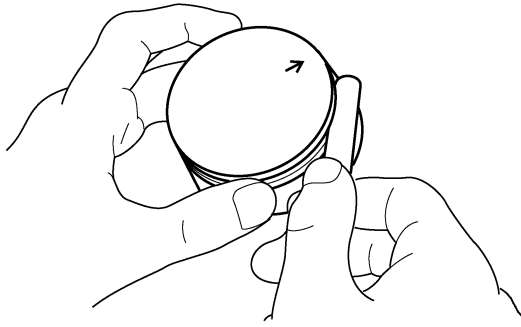
TIP

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.



Piston ring
Top ring
 Ring side clearance
 0.030–0.065 mm (0.0012–
 0.0026 in)
2nd ring
 Ring side clearance
 0.020–0.055 mm (0.0008–
 0.0022 in)

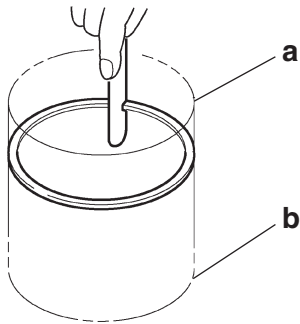
CONNECTING RODS AND PISTONS



2. Install:
- Piston ring
(into the cylinder)

TIP

Use the piston crown to level the piston ring near bottom of cylinder "a", where cylinder wear is lowest.



b. Upper of cylinder

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
Top ring
 End gap (installed)
 0.25–0.35 mm (0.0098–0.0138 in)
 Limit
 0.60 mm (0.0236 in)
2nd ring
 End gap (installed)
 0.70–0.80 mm (0.0276–0.0315 in)
 Limit
 1.15 mm (0.0453 in)

EAS30749

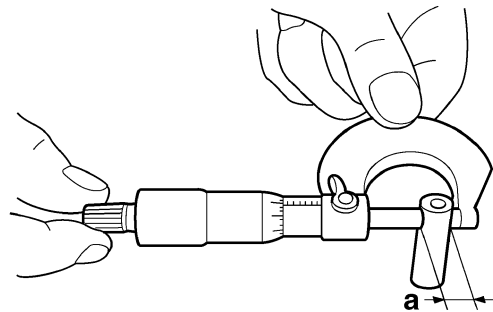
CHECKING THE PISTON PINS

The following procedure applies to all of the piston pins.

1. Check:
- Piston pin
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.
2. Measure:
- Piston pin outside diameter "a"
Out of specification → Replace the piston pin.



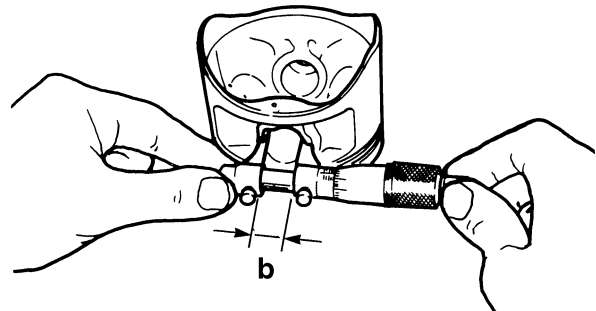
Piston pin outside diameter
 14.991–15.000 mm (0.5902–0.5906 in)
 Limit
 14.971 mm (0.5894 in)



3. Measure:
- Piston pin bore inside diameter "b"
Out of specification → Replace the piston.



Piston pin bore inside diameter
 15.002–15.013 mm (0.5906–0.5911 in)
 Limit
 15.043 mm (0.5922 in)



4. Calculate:
- Piston-pin-to-piston-pin-bore clearance
Out of specification → Replace the piston pin and piston as a set.

CONNECTING RODS AND PISTONS

- Piston-pin-to-piston-pin-bore clearance =
Piston pin bore diameter “b” -
Piston pin outside diameter “a”



Piston-pin-to-piston-pin-bore clearance

0.002–0.022 mm (0.0001–0.0009 in)

EAS30750

CHECKING THE CONNECTING RODS

1. Measure:

- Crankshaft-pin-to-big-end-bearing clearance
Out of specification → Replace the big end bearings.



Oil clearance

0.037–0.061 mm (0.0015–0.0024 in)

The following procedure applies to all of the connecting rods.

ECA13930

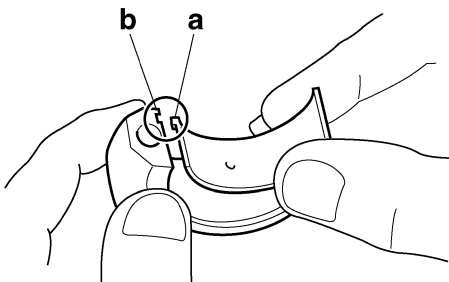
NOTICE

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

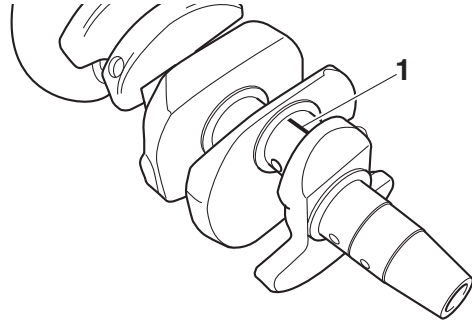
- Clean the big end bearings, crankshaft pins, and the inside of the connecting rods halves.
- Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

TIP

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



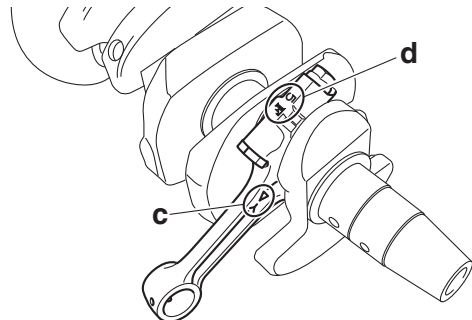
- c. Put a piece of Plastigauge® “1” on the crankshaft pin.



d. Assemble the connecting rod halves.

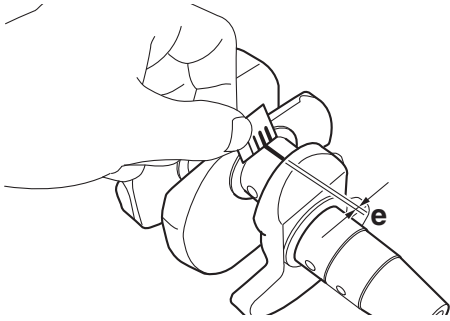
TIP

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



- e. Tighten the connecting rod nuts.
Refer to “INSTALLING THE CONNECTING RODS AND PISTONS” on page 5-65.
- f. Remove the connecting rod and big end bearings.
Refer to “REMOVING THE CONNECTING RODS AND PISTONS” on page 5-61.
- g. Measure the compressed Plastigauge® width “e” on the crankshaft pin.
If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.

CONNECTING RODS AND PISTONS

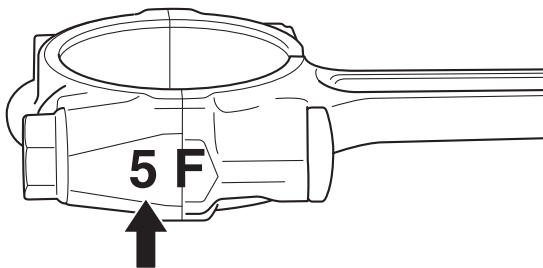
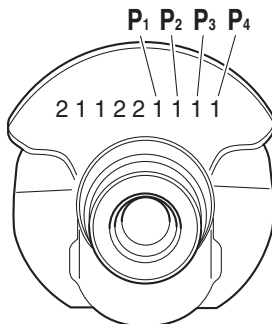
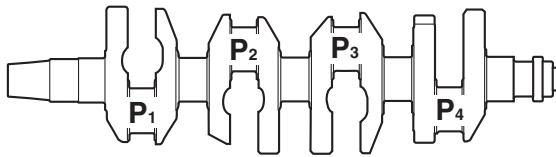


2. Select:

- Big end bearings (P_1 – P_4)

TIP

- The numbers stamped into the crankshaft web and the numbers on the connecting rods are used to determine the replacement big end bearing sizes.
- P_1 – P_4 refer to the bearings shown in the crankshaft illustration.



For example, if the connecting rod P_1 and the crankshaft web P_1 numbers are 5 and 1 respectively, then the bearing size for P_1 is:

$$\begin{aligned} &P_1 \text{ (connecting rod)} - P_1 \text{ (crankshaft)} \\ &= \\ &5 - 1 = 4 \text{ (green)} \end{aligned}$$



Bearing color code

Code 1

Blue

Code 2

Black

Code 3

Brown

Code 4

Green

EAS30751

INSTALLING THE CONNECTING RODS AND PISTONS

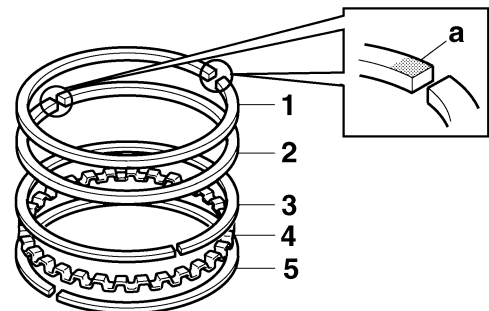
The following procedure applies to all of the pistons and connecting rods.

1. Install:

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

TIP

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



2. Install:

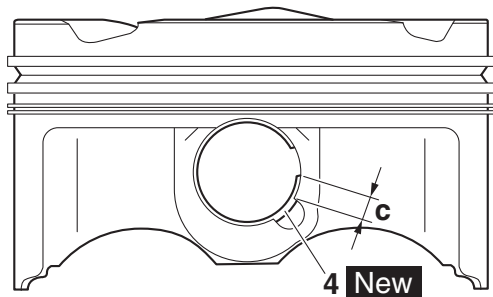
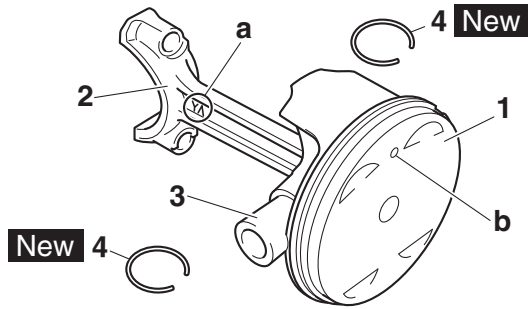
- Piston “1”
(onto the respective connecting rod “2”)
- Piston pin “3”
- Piston pin clips “4” **New**

TIP

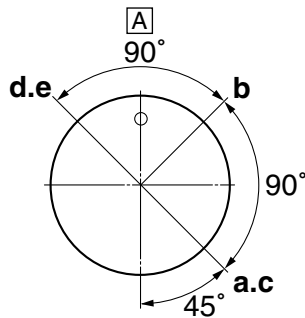
- Apply engine oil onto the piston pin.
- Make sure that the “Y” mark “a” on the connecting rod left when the punch mark “b” on the piston is pointing up. Refer to the illustration.

CONNECTING RODS AND PISTONS

- 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 (numbering order starting from the left: #1 to #4).



3. Offset:
- Piston ring end gaps

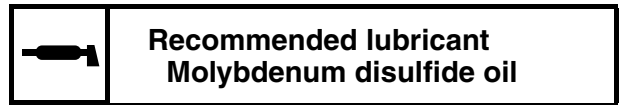


- a. Top ring
- b. Upper oil ring rail
- c. Oil ring expander
- d. 2nd ring
- e. Lower oil ring rail
- A. Exhaust side

4. Lubricate:
- Piston
 - Piston rings
 - Cylinder
- (with the recommended lubricant)



5. Lubricate:
- Bolt threads
 - Nut seats
- (with the recommended lubricant)



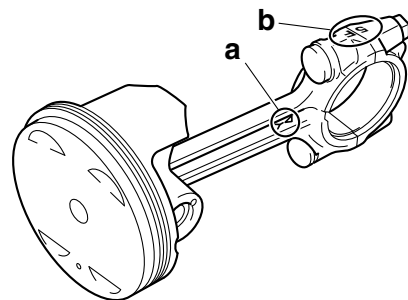
6. Lubricate:
- Crankshaft pins
 - Connecting rod big end bearing inner surface
- (with the recommended lubricant)



7. Install:
- Big end bearings
 - Connecting rod and piston assembly
 - Connecting rod cap

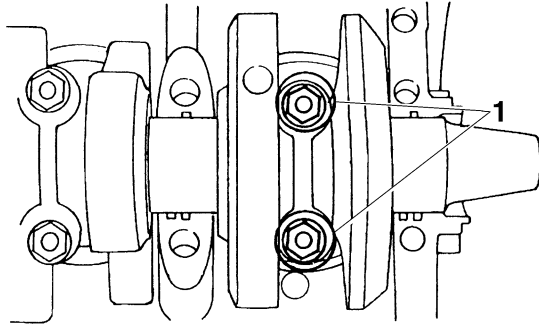
TIP

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



8. Tighten:
- Connecting rod nuts “1”

CONNECTING RODS AND PISTONS



EWA13390

⚠ WARNING

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

TIP

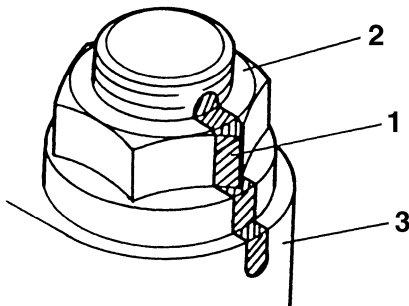
Tighten the connecting rod nuts using the following procedure.

- Tighten the connecting rod nuts with a torque wrench.



Connecting rod nut (1st)
15 Nm (1.5 m·kgf, 11 ft·lbf)

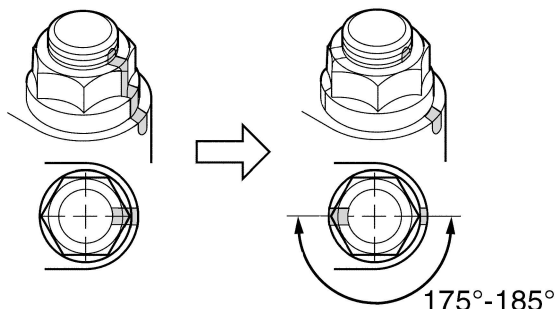
- Put a mark "1" on the corner of the connecting rod nut "2" and the connecting rod "3".



- Tighten the connecting rod nuts further to reach the specified angle 175°–185°.



Connecting rod nut (final)
Specified angle 175°–185°



EWA13400

⚠ WARNING

If the connecting rod nut is tightened more than the specified angle, do not loosen the nut and then retighten it. Instead, replace the connecting rod bolt and nut with a new one and perform the procedure again.

ECA13950

NOTICE

Do not use a torque wrench to tighten the connecting rod nut to the specified angle.

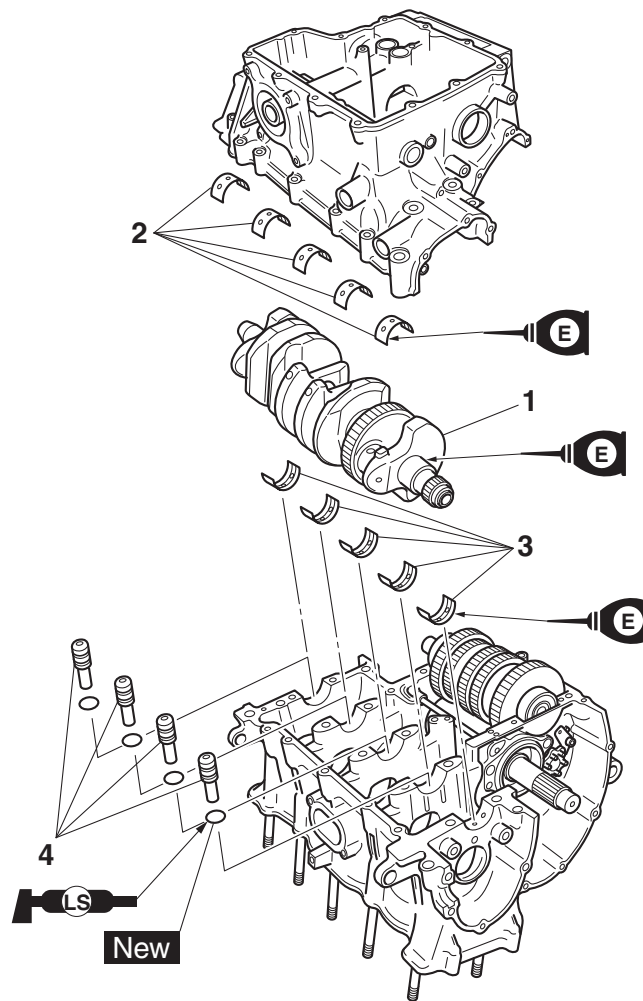
TIP

On a hexagonal nut, note that the angle from one corner to another is 60°.



CRANKSHAFT

Removing the crankshaft



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-56.
	Connecting rod caps		Refer to "CONNECTING RODS AND PISTONS" on page 5-60.
1	Crankshaft	1	
2	Crankshaft journal lower bearing	5	
3	Crankshaft journal upper bearing	5	
4	Oil nozzle	4	

EAS30419

REMOVING THE CRANKSHAFT JOURNAL BEARINGS

1. Remove:
 - Crankshaft journal lower bearings (from the lower crankcase)
 - Crankshaft journal upper bearings (from the upper crankcase)

TIP

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

EAS30837

CHECKING THE OIL NOZZLES

The following procedure applies to all of the oil nozzles.

1. Check:
 - Oil nozzle
Damage/wear → Replace the oil nozzle.
 - O-ring
Damage/wear → Replace.
 - Oil passage
Obstruction → Blow out with compressed air.

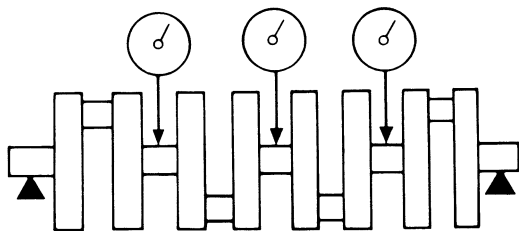
EAS30423

CHECKING THE CRANKSHAFT AND CONNECTING RODS

1. Measure:
 - Crankshaft runout
Out of specification → Replace the crankshaft.



Runout limit
0.030 mm (0.0012 in)



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
0.044–0.020 mm (0.0017–0.0008 in)

ECA13920

NOTICE

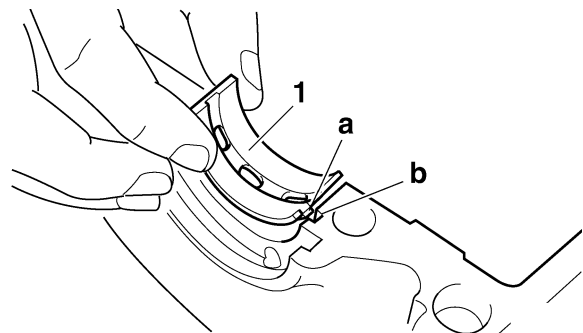
Do not interchange the crankshaft journal bearings. To obtain the correct crankshaft-journal-to-crankshaft-journal-bearing clearance and prevent engine damage, the crankshaft journal bearings must be installed in their original positions.



- 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

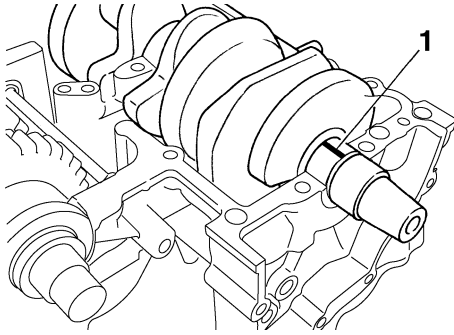
Align the projections “a” on the crankshaft journal upper bearings with the notches “b” in the upper crankcase.



- d. Put a piece of Plastigauge® “1” on each crankshaft journal.

TIP

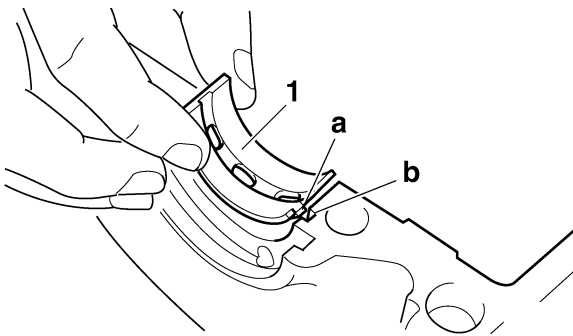
Do not put the Plastigauge® over the oil hole in the crankshaft journal.



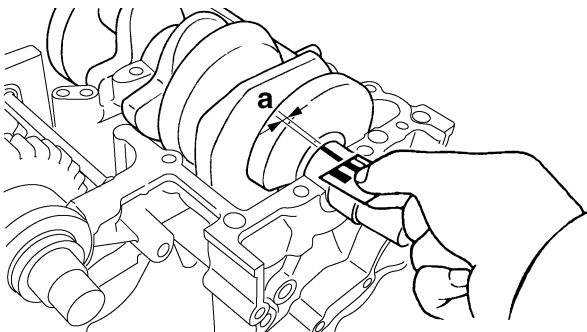
- e. Install the crankshaft journal lower bearings "1" into the lower crankcase and assemble the crankcase halves.

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 5-56.
- 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.

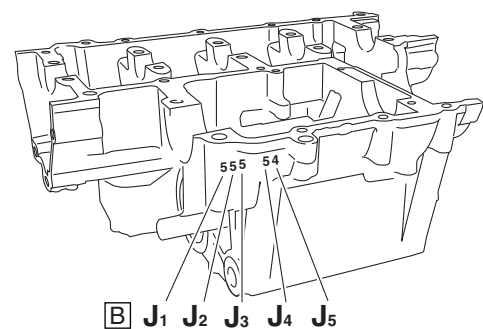
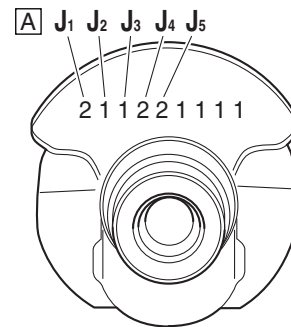
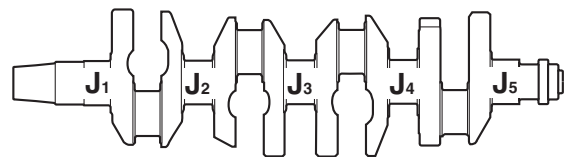


4. Select:

- 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 of crankcase are the same, only J₁ is stamped.



For example, if the crankcase J₁ and crankshaft web J₁ numbers are 6 and 2 respectively, then the bearing size for J₁ is:

$$\begin{aligned} &J_1 \text{ (crankcase)} - J_1 \text{ (crankshaft web)} - 1 \\ &= \\ &6 - 2 - 1 = 3 \text{ (brown)} \end{aligned}$$



Bearing color code

Code 0

White

Code 1

Blue

Code 2

Black

Code 3

Brown

Code 4

Green

EAS30791

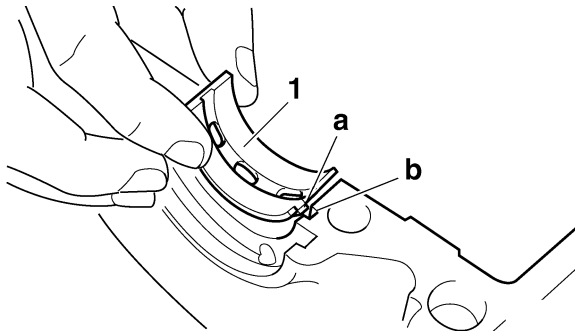
INSTALLING THE CRANKSHAFT

1. Install:

- Crankshaft journal upper bearings
(into the upper crankcase)
- Crankshaft journal lower bearings
(into the lower crankcase)

TIP

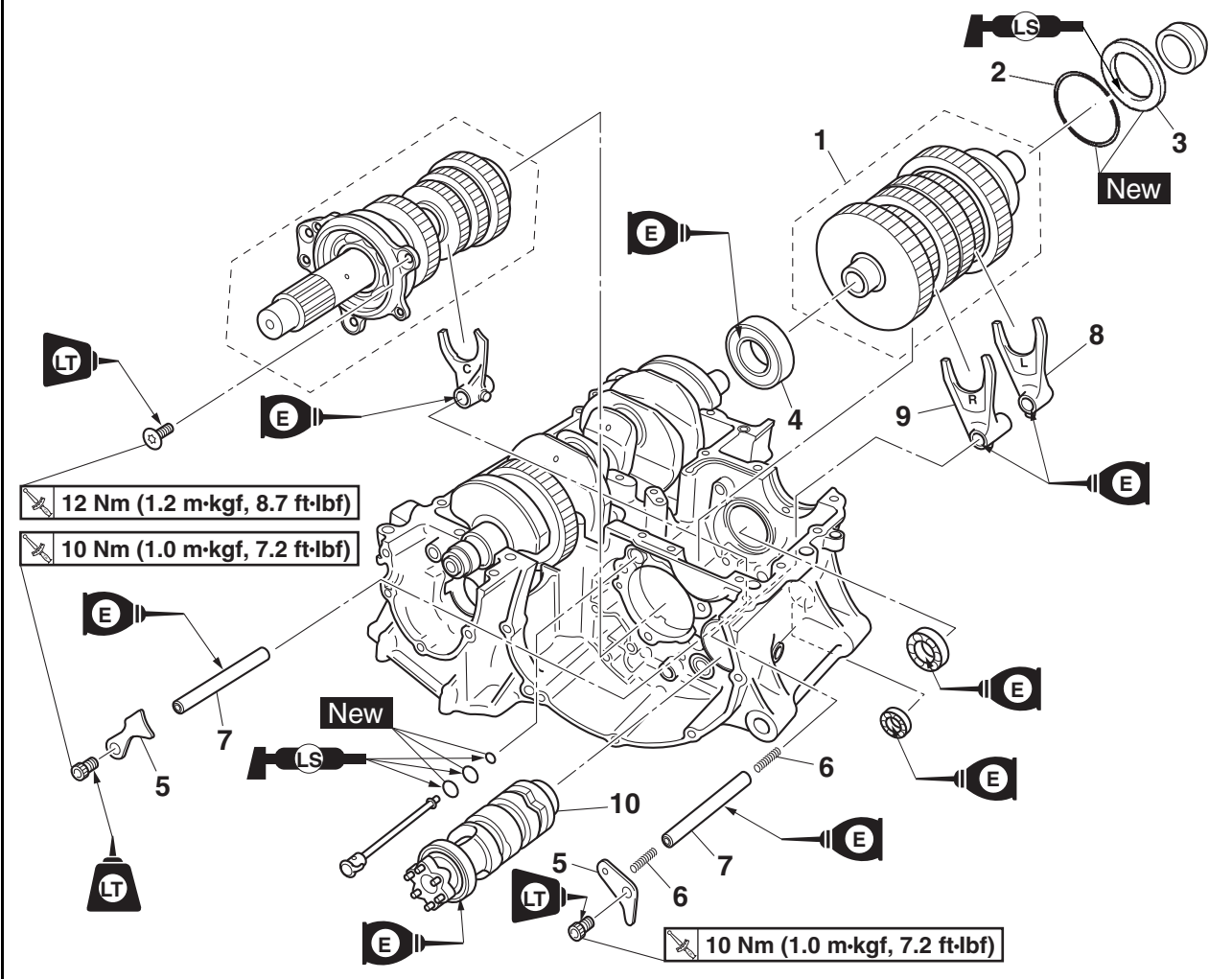
- Align the projections “a” on the crankshaft journal bearings “1” with the notches “b” in the crankcases.
- Be sure to install each crankshaft journal bearing in its original place.



EAS20062

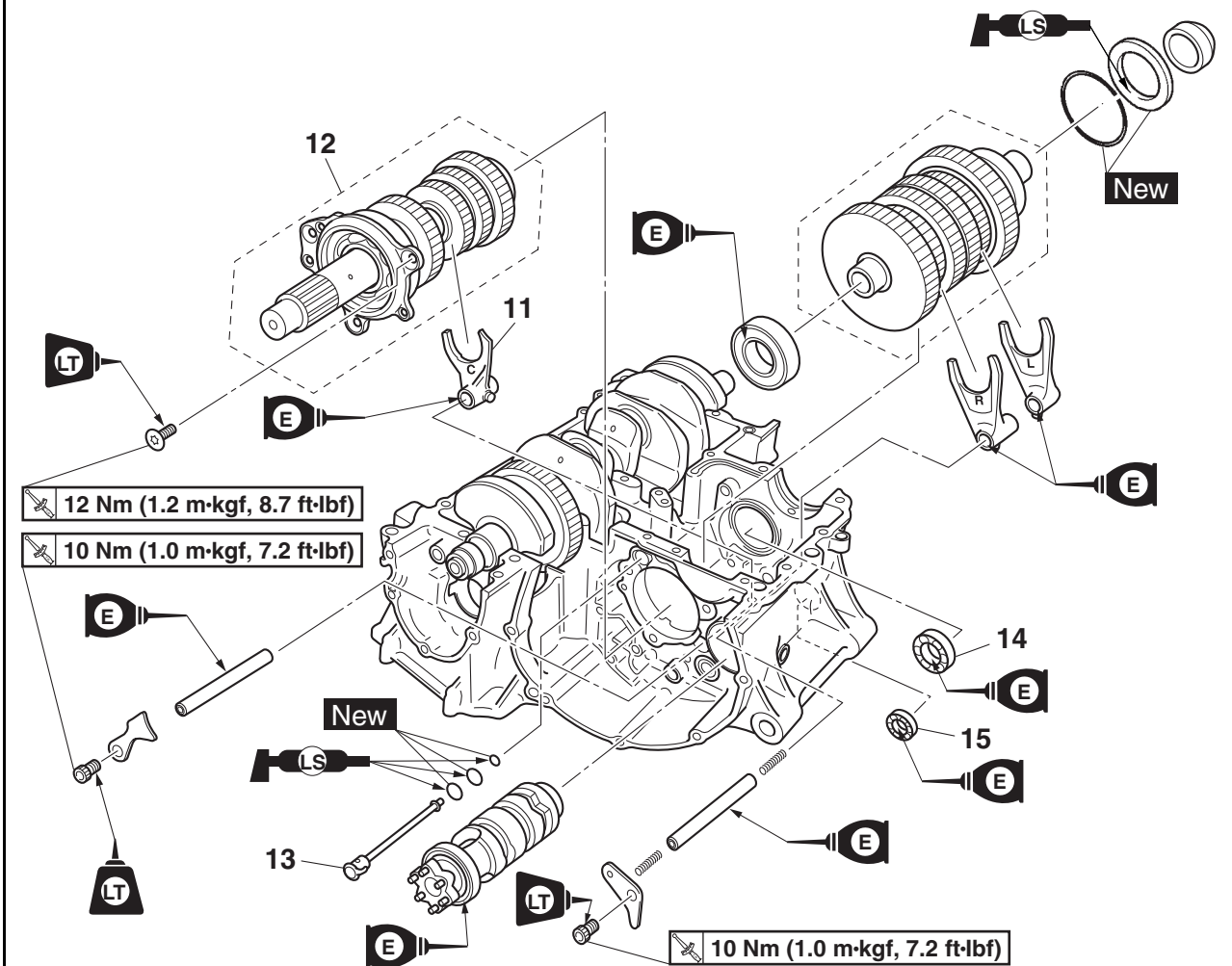
TRANSMISSION

Removing the transmission, shift drum assembly, and shift forks



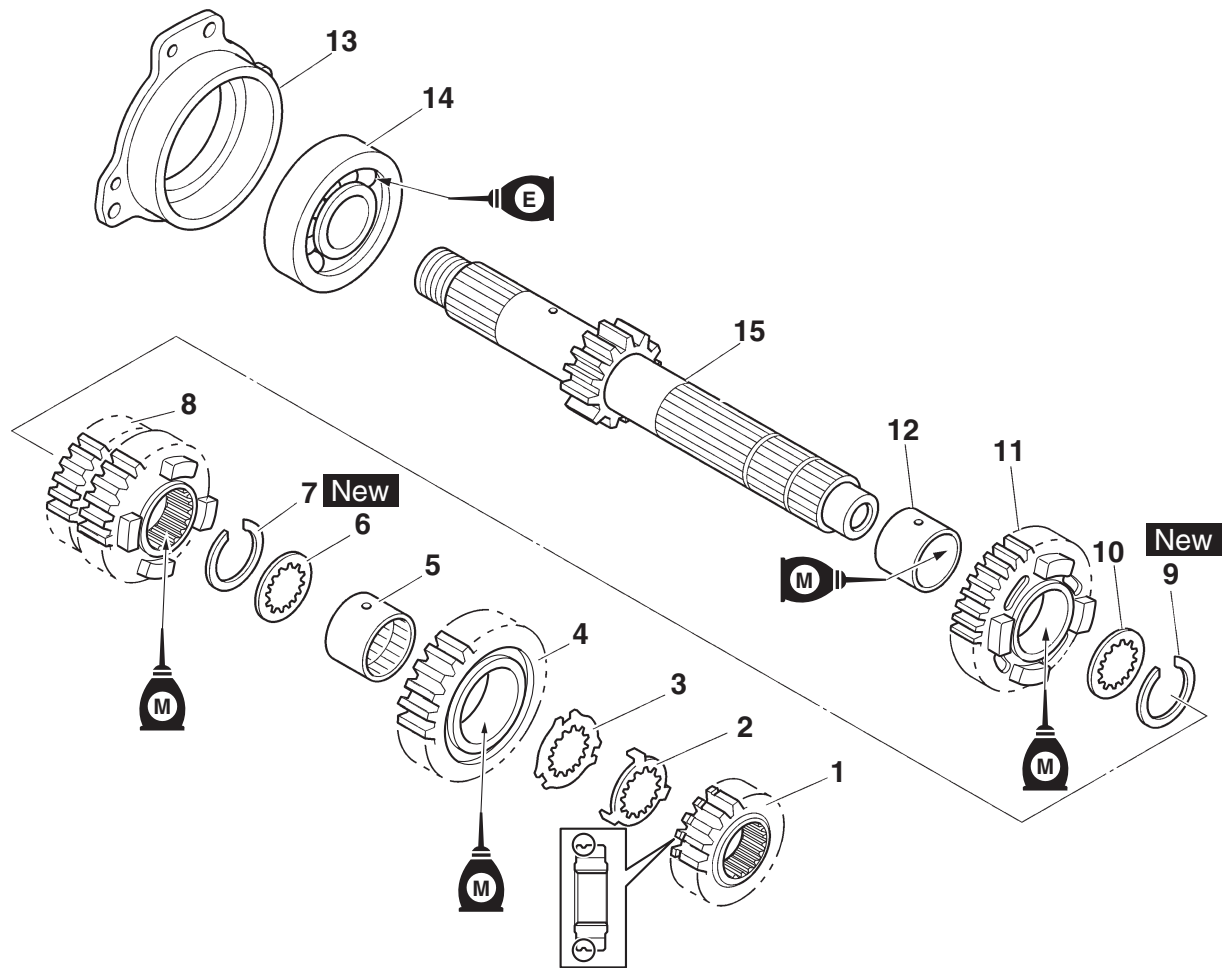
Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-56.
1	Drive axle assembly	1	
2	Circlip	1	
3	Oil seal	1	
4	Bearing	1	
5	Shift drum retainer	2	
6	Spring	2	
7	Shift fork guide bar	2	
8	Shift fork-L	1	
9	Shift fork-R	1	
10	Shift drum assembly	1	

Removing the transmission, shift drum assembly, and shift forks



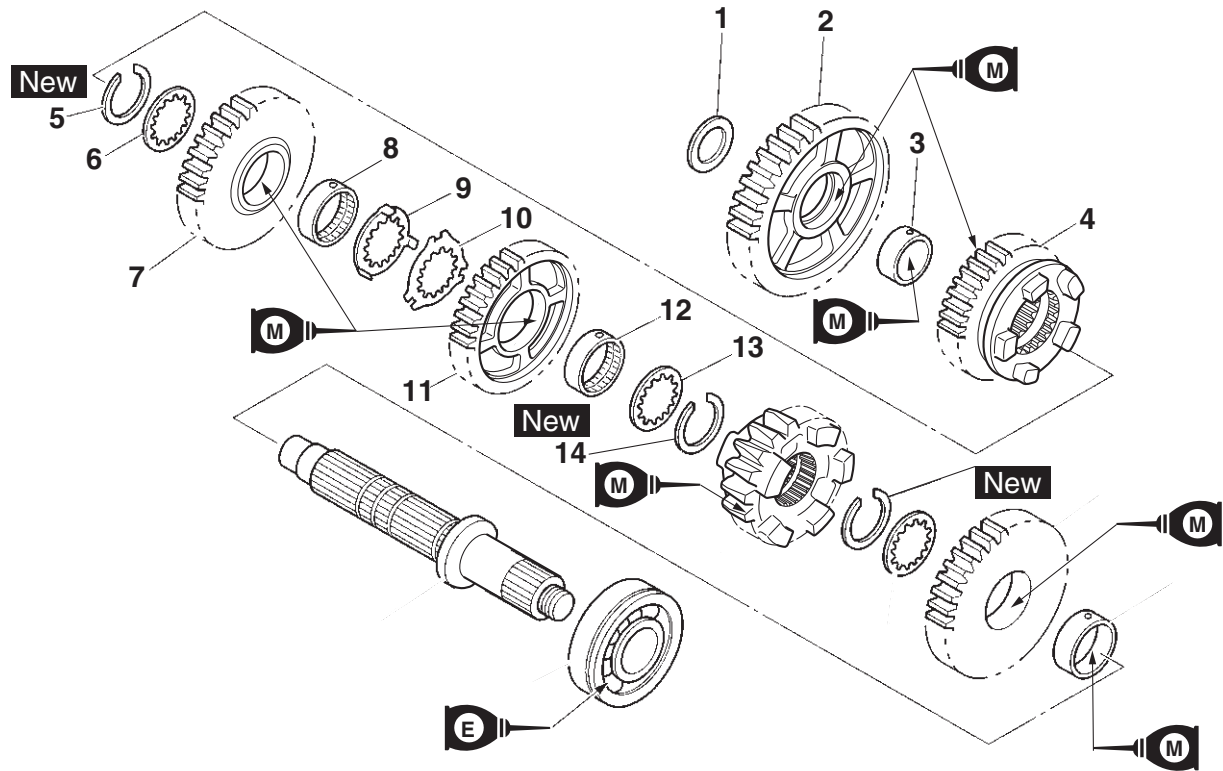
Order	Job/Parts to remove	Q'ty	Remarks
11	Shift fork-C	1	
12	Main axle assembly	1	
13	Oil pipe	1	
14	Bearing	1	
15	Bearing	1	

Disassembling the main axle assembly



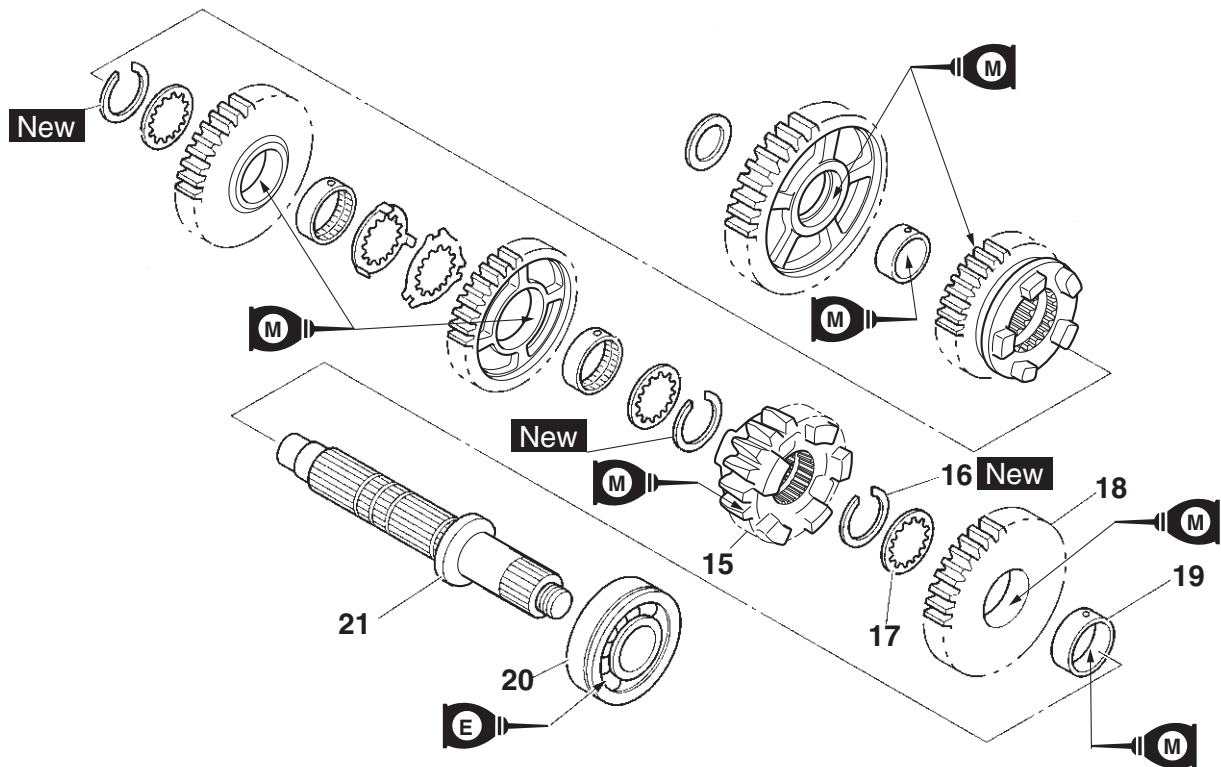
Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	
2	Toothed lock washer	1	
3	Toothed lock washer retainer	1	
4	6th pinion gear	1	
5	Collar	1	
6	Washer	1	
7	Circlip	1	
8	3rd/4th pinion gear	1	
9	Circlip	1	
10	Washer	1	
11	5th pinion gear	1	
12	Collar	1	
13	Bearing housing	1	
14	Bearing	1	
15	Main axle/1st pinion gear	1	

Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Washer	1	
2	1st wheel gear	1	
3	Collar	1	
4	5th wheel gear	1	
5	Circlip	1	
6	Washer	1	
7	3rd wheel gear	1	
8	Collar	1	
9	Toothed lock washer	1	
10	Toothed lock washer retainer	1	
11	4th wheel gear	1	
12	Collar	1	
13	Washer	1	
14	Circlip	1	

Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
15	6th wheel gear	1	
16	Circlip	1	
17	Washer	1	
18	2nd wheel gear	1	
19	Collar	1	
20	Bearing	1	
21	Drive axle	1	

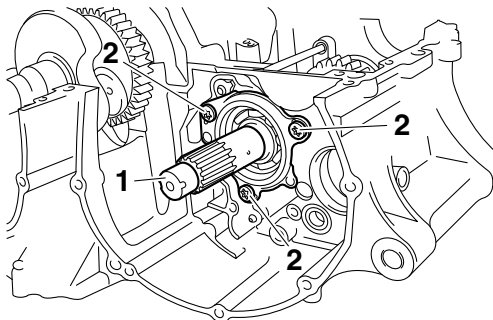
EAS30430

REMOVING THE TRANSMISSION

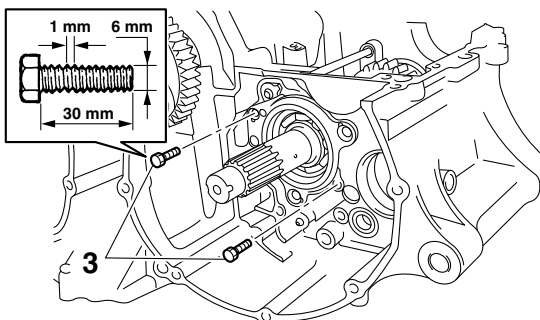
1. Remove:

- Main axle assembly "1"

a. Remove the main axle assembly bearing housing bolts "2"



b. Insert two bolts "3" of the proper size, as shown in the illustration, into the main axle assembly bearing housing.



- Tighten the bolts until they contact the crankcase surface.
- Continue tightening the bolts until the main axle assembly comes free from the upper crankcase.

EAS30431

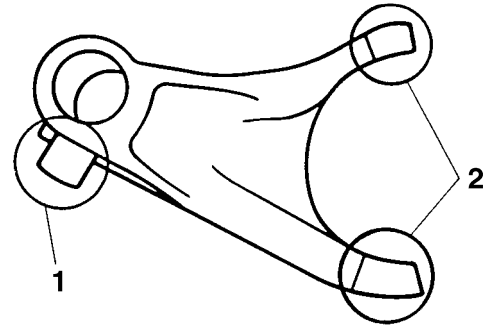
CHECKING THE SHIFT FORKS

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.



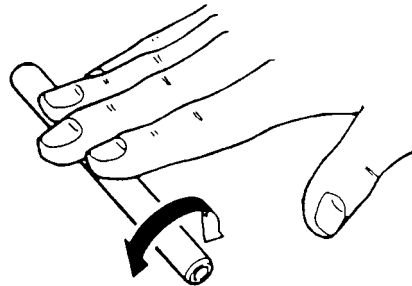
2. Check:

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

EWA12840

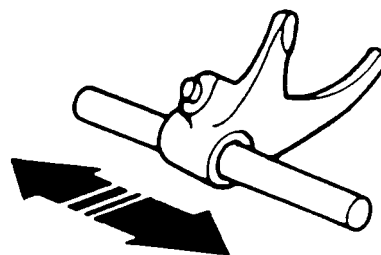
WARNING

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



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.



4. Check:

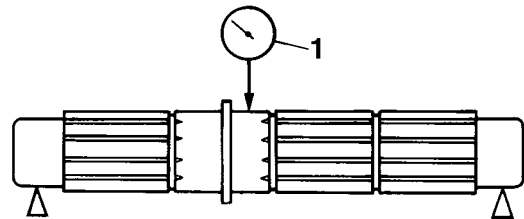
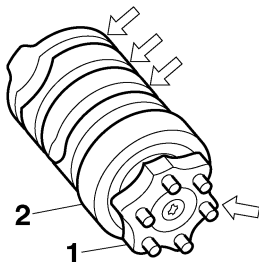
- Shift fork guide bar (for the shift fork-C) oil passage
Clogging/damage → Replace the shift fork guide bar (for the shift fork-C).

EAS30432

CHECKING THE SHIFT DRUM ASSEMBLY

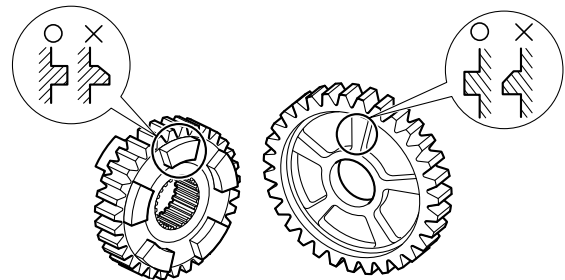
1. Check:

- 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).



EAS30433

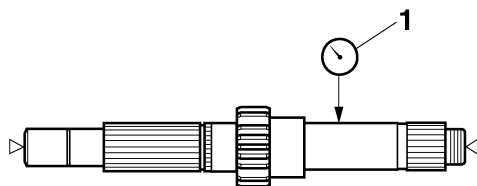
CHECKING THE TRANSMISSION

1. Measure:

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



Main axle runout limit
0.02 mm (0.0008 in)



2. Measure:

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



Drive axle runout limit
0.02 mm (0.0008 in)

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.

EAS30435

ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

1. Install:

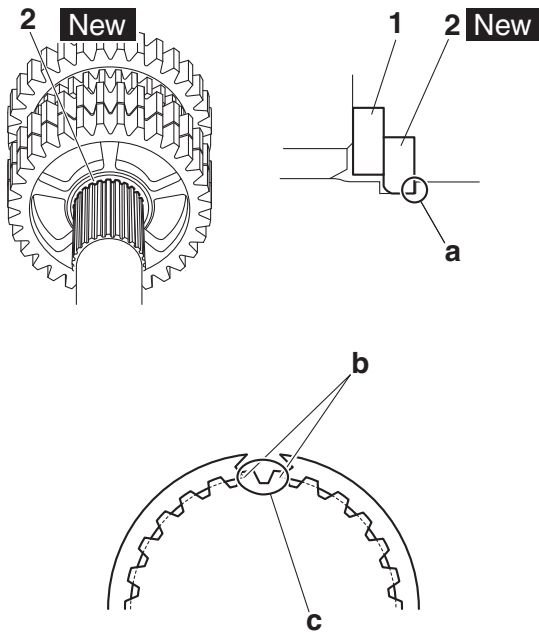
- Toothed washer “1”
- Circlip “2” **New**

TIP

- Be sure the circlip sharp-edged corner “a” is positioned opposite side to the toothed washer and gear.

TRANSMISSION

- Install the circlip so that both ends “b” rest on the sides of a spline “c” with both axles aligned.

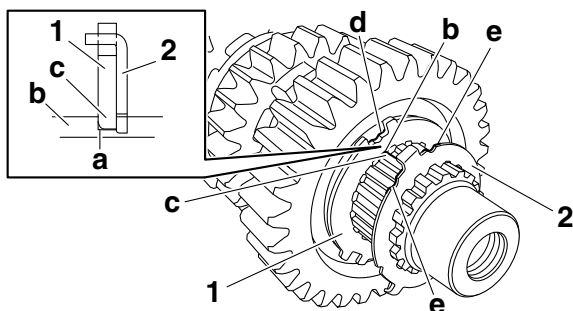


2. Install:

- 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.



EAS30438

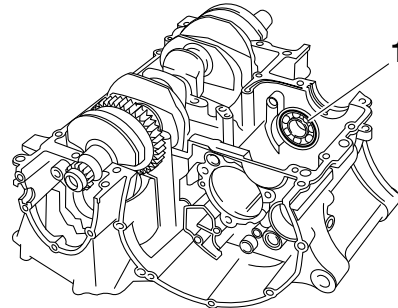
INSTALLING THE TRANSMISSION

1. Install:

- Bearing “1”

TIP

Face the seal side of the bearing to the outside and install it close to the right side end of the crankcase.

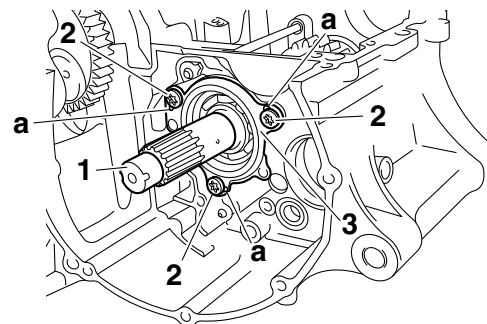


2. Install:

- Main axle assembly “1”

TIP

Stake the main axle assembly bearing housing bolts “2” at a cutout “a” in the main axle assembly bearing housing “3”.



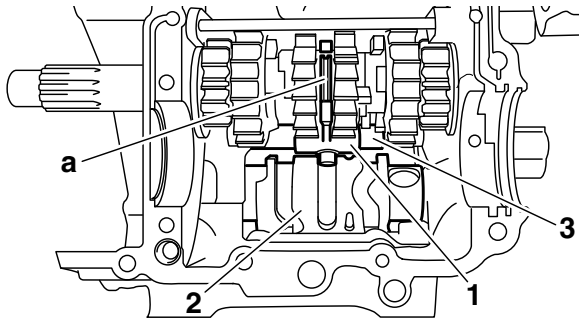
3. Install:

- Shift fork-C “1”
- Shift drum assembly “2”
- Shift fork guide bar “3”

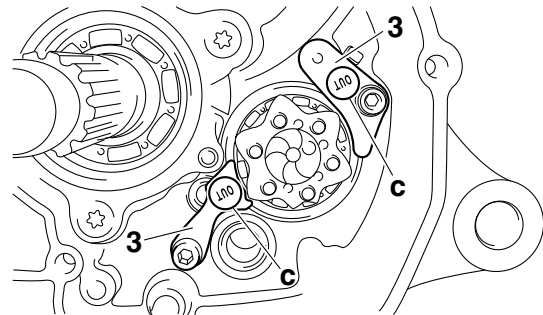
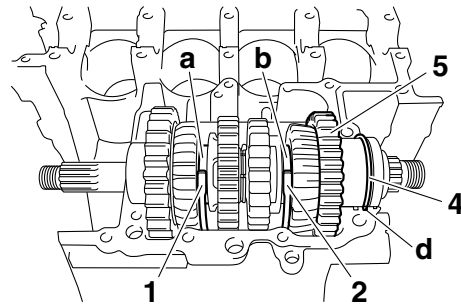
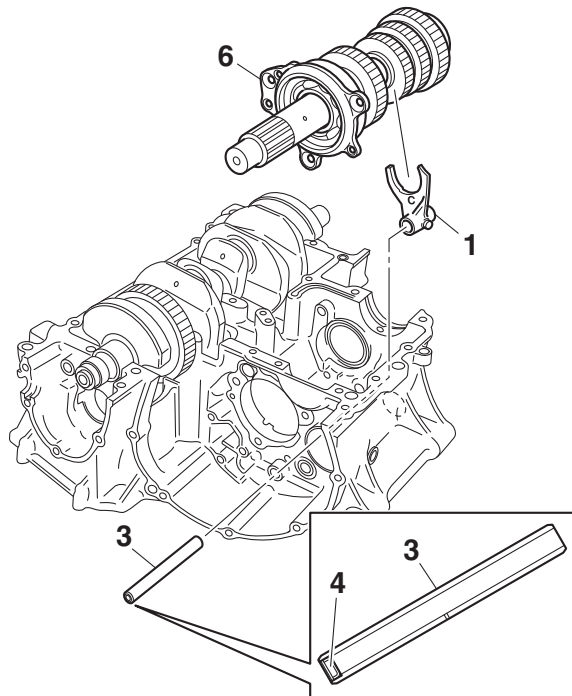
TIP

- 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.
- Install the shift fork guide bar “3” in the crankcase with the plug “4” facing in the direction shown in the illustration.

TRANSMISSION



- 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.



6. Main axle assembly

4. Install:

- Shift fork-R “1”
- Shift fork-L “2”
- Shift fork guide bar
- Springs
- Shift drum retainers “3”
- Bearing
- Oil seal
- Circlip “4”
- Drive axle assembly “5”



Shift drum retainer bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
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.

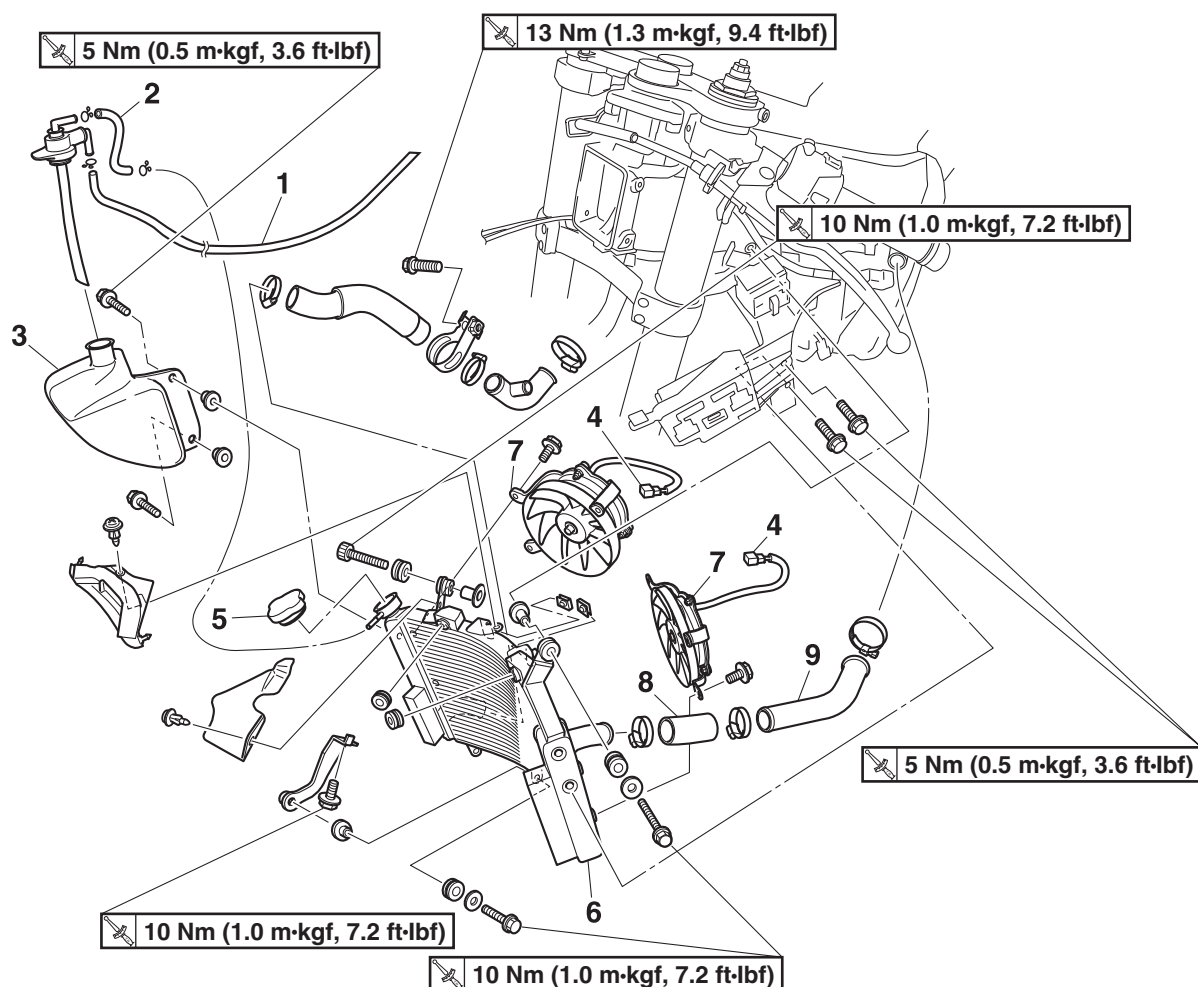
COOLING SYSTEM

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CHECKING THE OIL COOLER	6-6
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 WATER PUMP	6-9
DISASSEMBLING THE WATER PUMP.....	6-11
CHECKING THE WATER PUMP	6-11
ASSEMBLING THE WATER PUMP.....	6-11
INSTALLING THE WATER PUMP	6-12

EAS20063

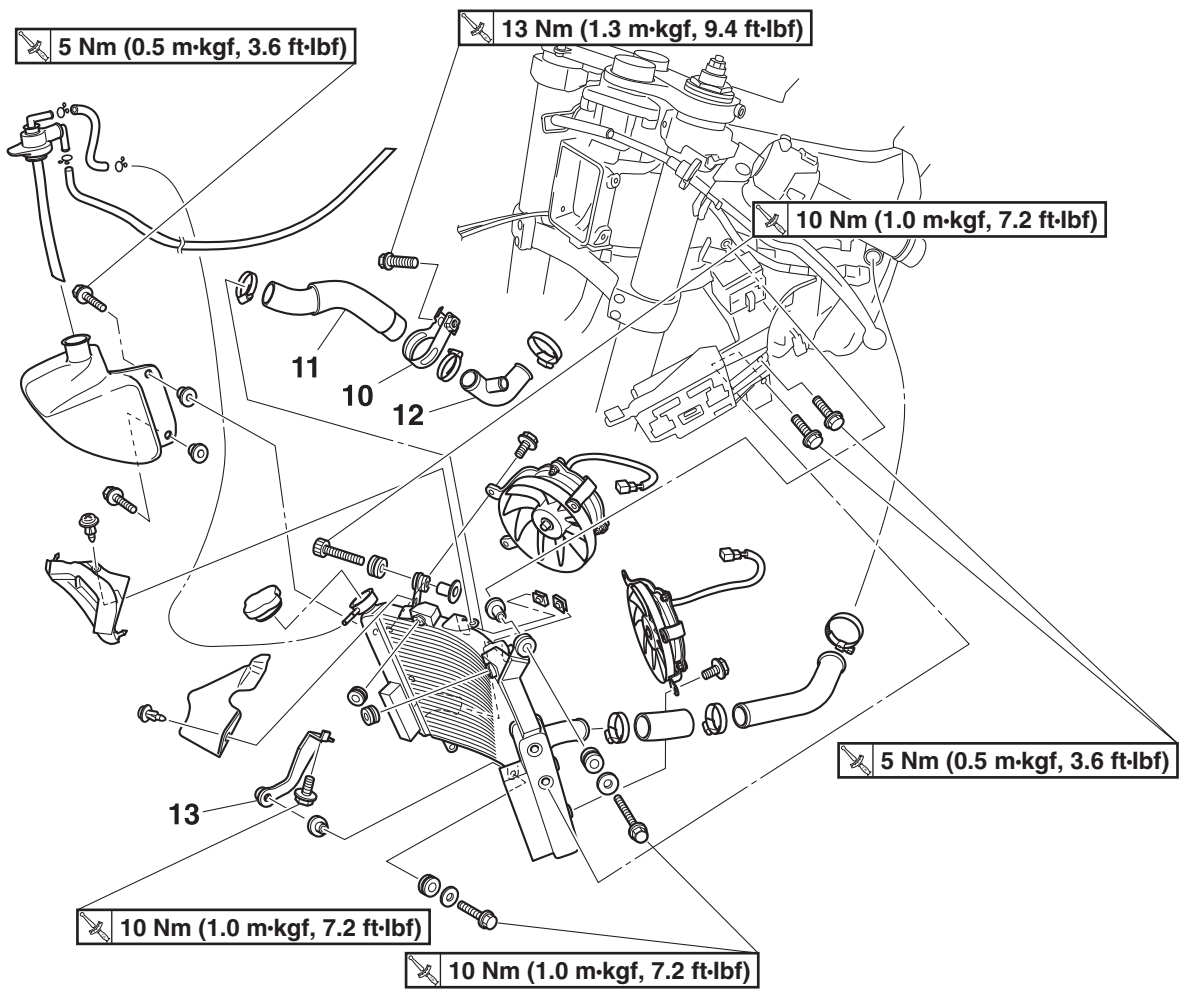
RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Lower side cowlings/Bottom cowlings		Refer to "GENERAL CHASSIS" on page 4-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-30.
1	Coolant reservoir breather hose	1	
2	Coolant reservoir hose	1	
3	Coolant reservoir	1	
4	Radiator fan motor coupler	2	Disconnect.
5	Radiator cap	1	
6	Radiator	1	
7	Radiator fan	2	
8	Radiator inlet hose	1	
9	Radiator inlet pipe	1	

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
10	Radiator outlet hose holder	1	
11	Radiator outlet hose	1	
12	Radiator outlet pipe	1	
13	Radiator bracket	1	

1. Check:

- TIP**

-

107.9–137.3 kPa (1.08–1.37 kgf/cm², 15.6–19.9 psi)

-

A line drawing of a hand pump assembly. A hand is shown operating the pump handle. A pressure gauge is mounted on the pump body. A hose is connected to the pump and leads to a nozzle. The nozzle has a trigger gun handle. The diagram is labeled with numbers 1, 2, and 3. Label 1 points to the hose. Label 2 points to the trigger gun handle. Label 3 points to the nozzle tip.

- [illegible]

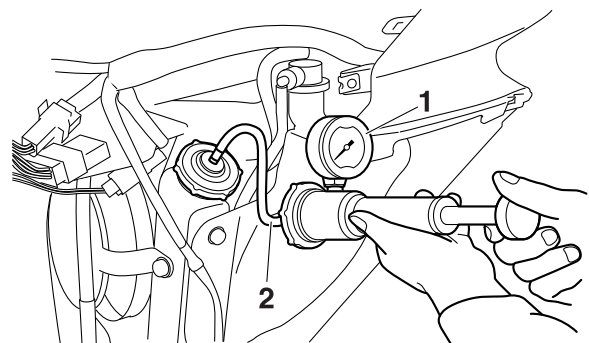
- EAS30440

1. Fill:

- ▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽

-

**Pressure tester adapter
YU-33984**



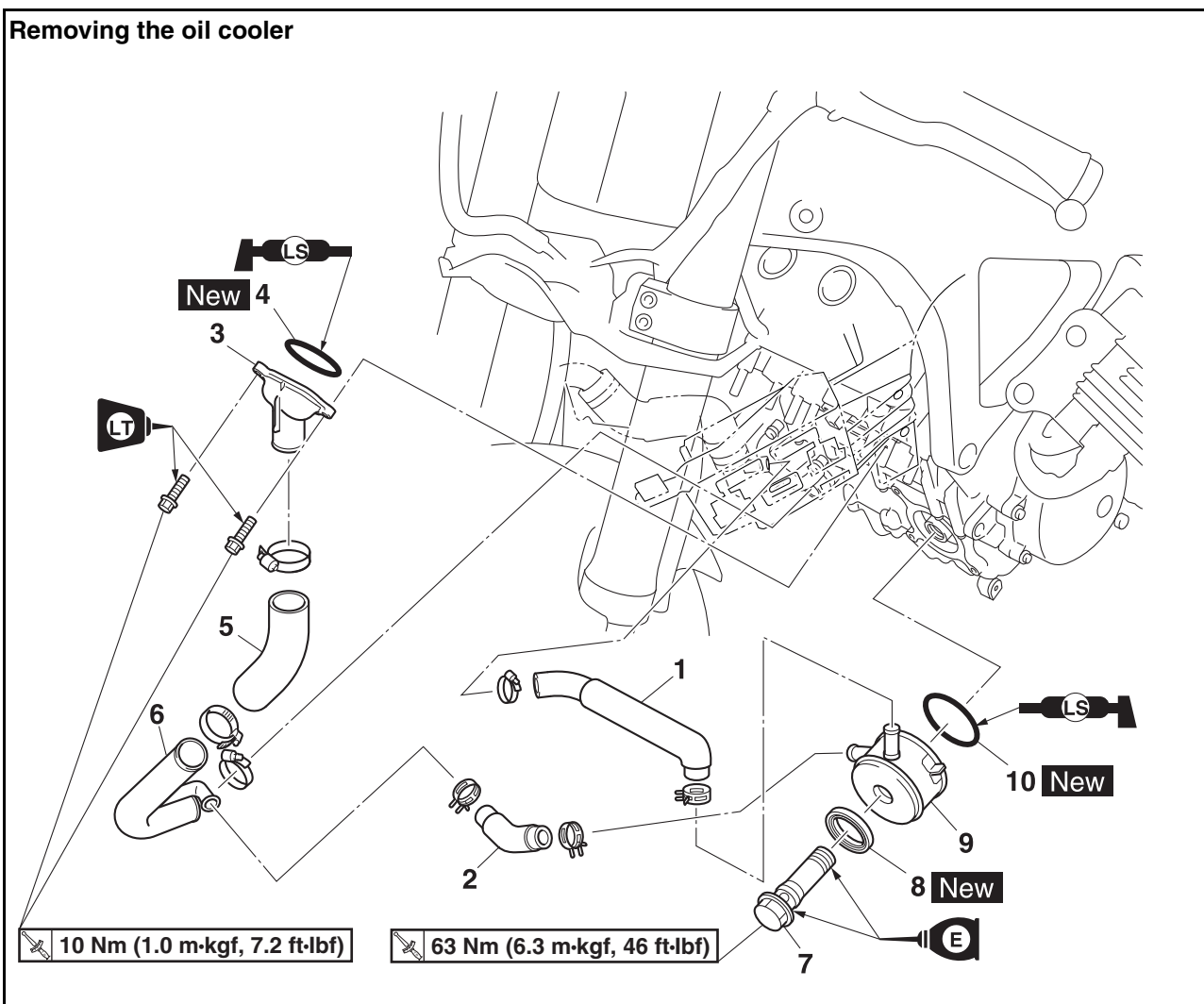
- b. Apply 100 kPa (14.50 psi) (1.0 kg/cm²) of pressure.
- c. Measure the indicated pressure with the gauge.



EAS20064

OIL COOLER

Removing the oil cooler



Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-26.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-30.
	Exhaust pipe assembly		Refer to "ENGINE REMOVAL" on page 5-3.
1	Oil cooler outlet hose	1	
2	Oil cooler inlet hose	1	
3	Water jacket joint	1	
4	O-ring	1	
5	Water jacket joint inlet hose	1	
6	Water pump outlet pipe	1	
7	Oil cooler union bolt	1	
8	Gasket	1	
9	Oil cooler	1	
10	O-ring	1	

EAS30441

CHECKING THE OIL COOLER

1. Check:
 - Oil cooler
Cracks/damage → Replace.
2. Check:
 - Oil cooler inlet hose
 - Oil cooler outlet hose
 - Water jacket joint inlet hose
Cracks/damage/wear → Replace.
3. Check:
 - Water pump outlet pipe
Damage → Replace.
Obstruction → Wash and blow out with compressed air.

- Crankcase
(with the specified amount of the recommended engine oil)
Refer to “CHANGING THE ENGINE OIL” on page 3-26.
4. Check:
 - Cooling system
Leaks → Repair or replace any faulty part.

EAS30442

INSTALLING THE OIL COOLER

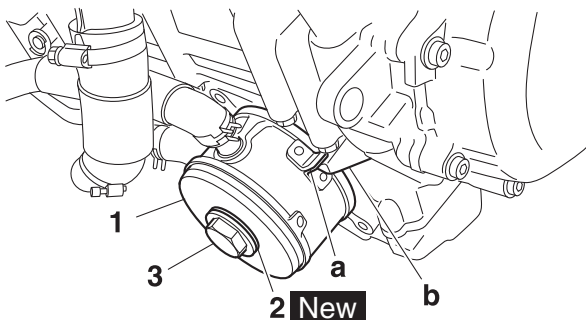
1. Clean:
 - Mating surfaces of the oil cooler and the crankcase
(with a cloth dampened with lacquer thinner)
2. Install:
 - O-ring **New**
 - Oil cooler “1”
 - Gasket “2” **New**
 - Oil cooler union bolt “3”



Oil cooler union bolt
63 Nm (6.3 m·kgf, 46 ft·lbf)

TIP

- Before installing the oil cooler, lubricate the its union bolt with a thin coat of engine oil.
- Make sure the O-ring is positioned properly.
- Make sure the projection “a” on the oil cooler touches the projection “b” on the crankcase.

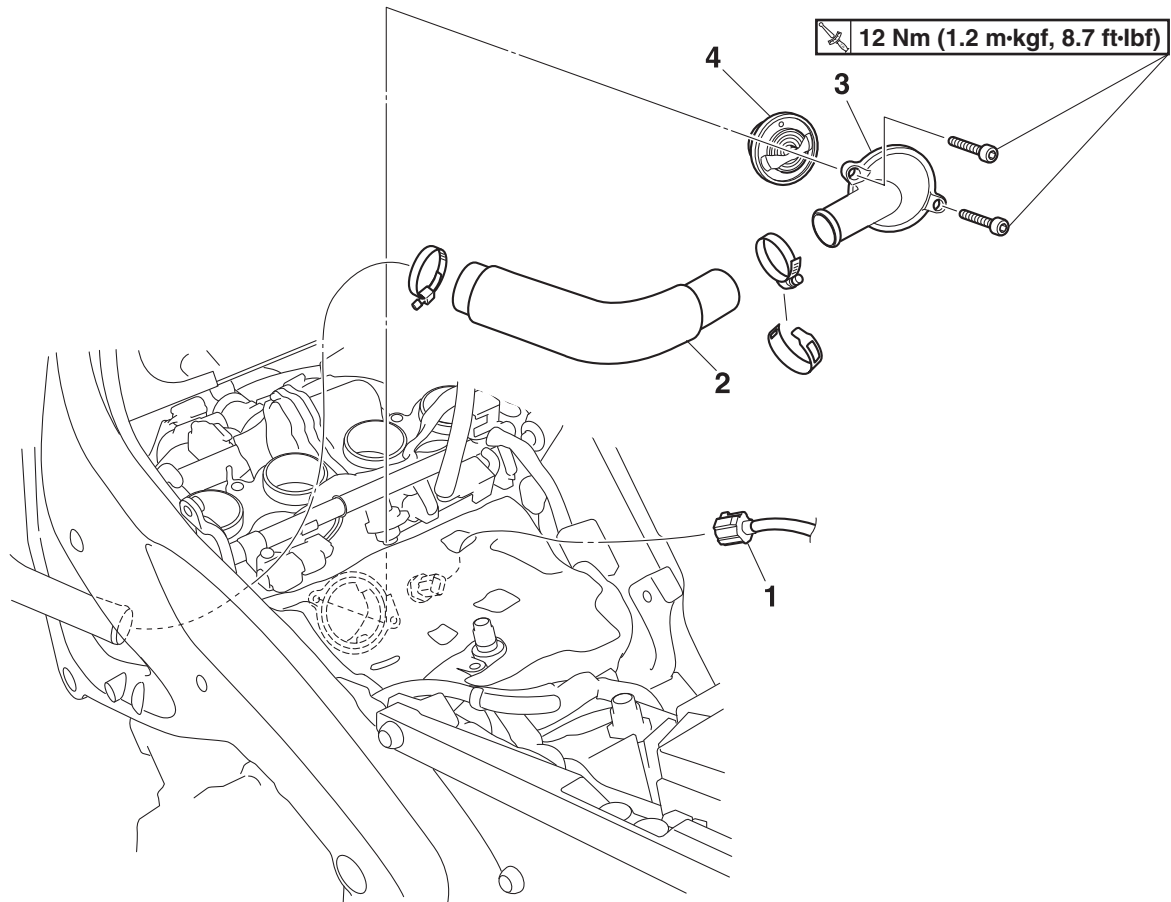


3. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-30.

EAS20065

THERMOSTAT

Removing the thermostat

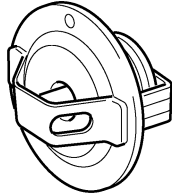


Order	Job/Parts to remove	Q'ty	Remarks
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-30.
1	Coolant temperature sensor coupler	1	Disconnect.
2	Thermostat outlet hose	1	
3	Thermostat cover	1	
4	Thermostat	1	

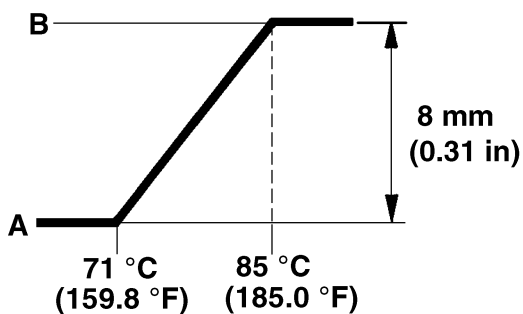
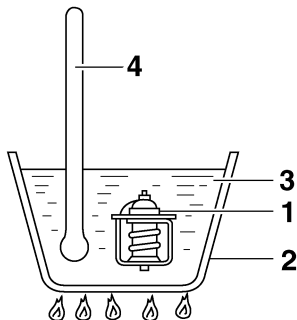
EAS30443

CHECKING THE THERMOSTAT

1. Check:
 - Thermostat
Does not open at 71–85 °C (159.8–185.0 °F)
→ Replace.



- Suspend the thermostat “1” in a container “2” filled with water.
- Slowly heat the water “3”.
- Place a thermometer “4” in the water.
- 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 cover
Cracks/damage → Replace.

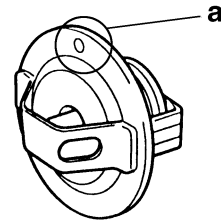
EAS30939

INSTALLING THE THERMOSTAT

1. Install:
 - Thermostat

TIP

Install the thermostat with its breather hole “a” facing up.

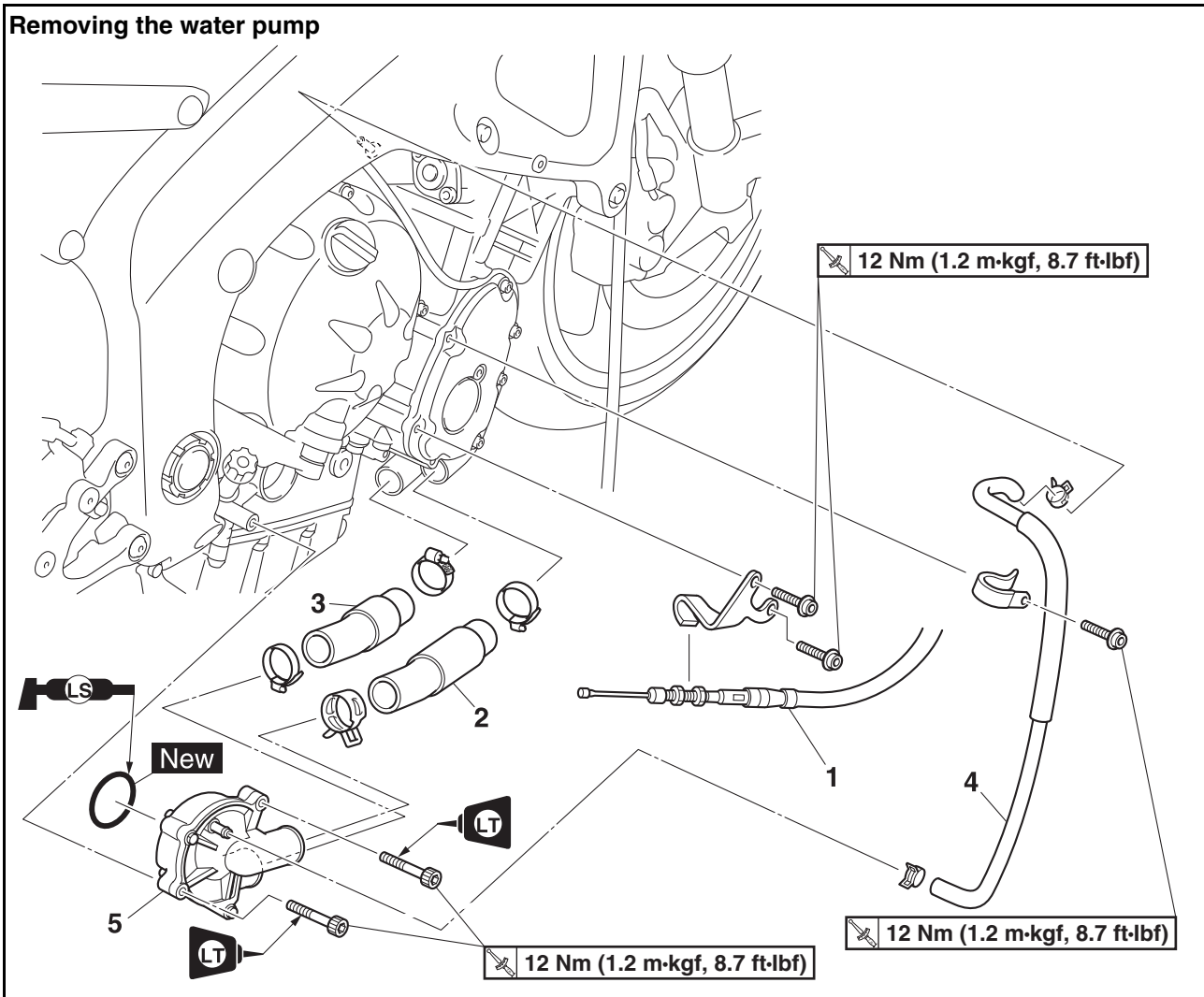


2. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-30.
3. Check:
 - Cooling system
Leaks → Repair or replace any faulty part.

EAS20066

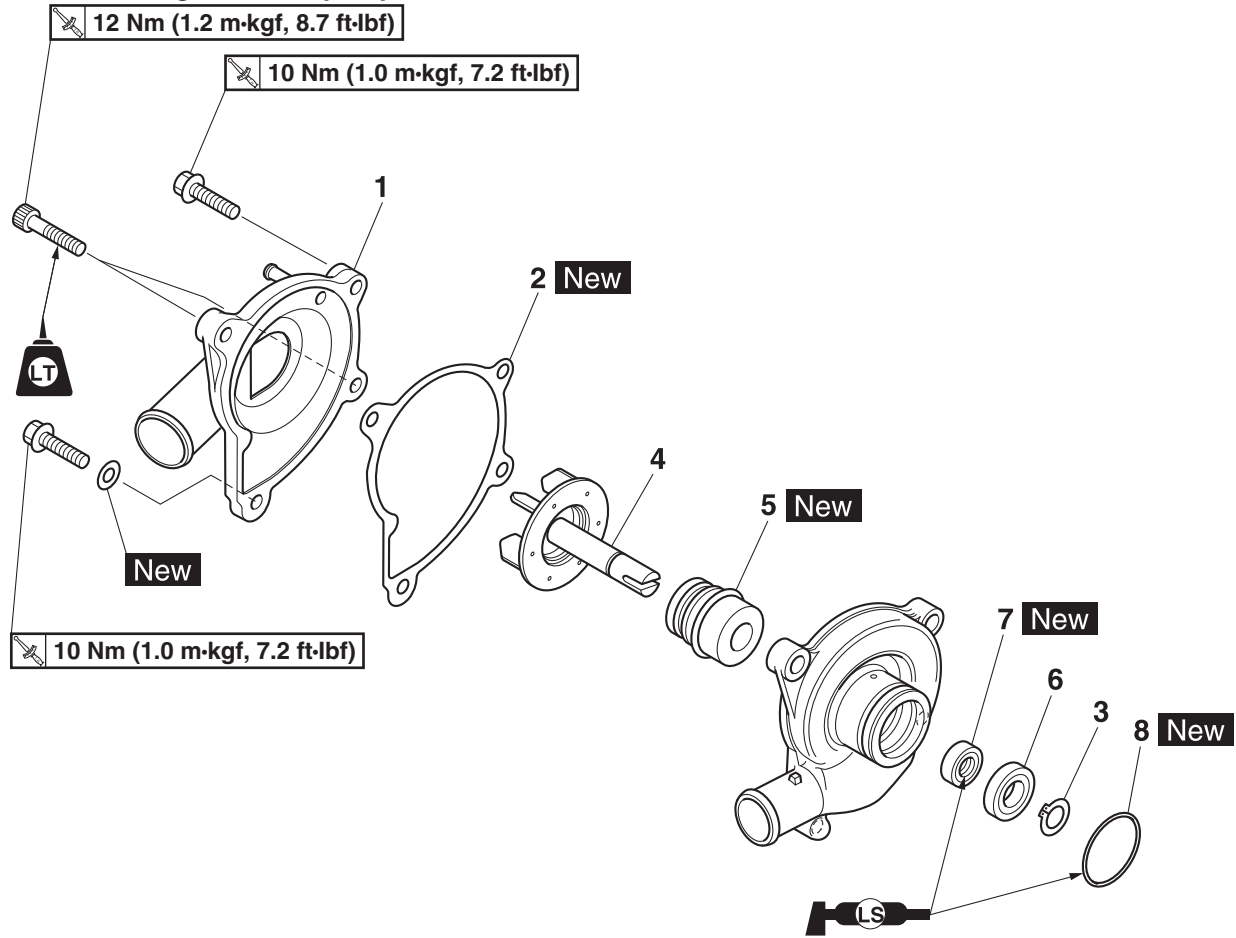
WATER PUMP

Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
			It is not necessary to remove the water pump unless the coolant level is extremely low or the coolant contains engine oil.
	Bottom cowling (right)		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-30.
1	Clutch cable	1	Disconnect.
2	Water pump inlet hose	1	
3	Water pump outlet hose	1	
4	Water pump breather hose	1	
5	Water pump assembly	1	

Disassembling the water pump



Order	Job/Parts to remove	Q'ty	Remarks
1	Water pump housing cover	1	
2	Gasket	1	
3	Circlip	1	
4	Impeller shaft (along with the impeller)	1	
5	Mechanical seal	1	
6	Bearing	1	
7	Oil seal	1	
8	O-ring	1	

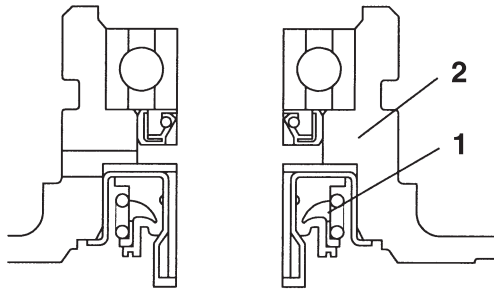
EAS30446

DISASSEMBLING THE WATER PUMP

1. Remove:
 - Circlip
 - Impeller shaft
2. Remove:
 - Mechanical seal (housing side) "1"

TIP

Remove the mechanical seal (housing side) from the outside of the water pump housing.

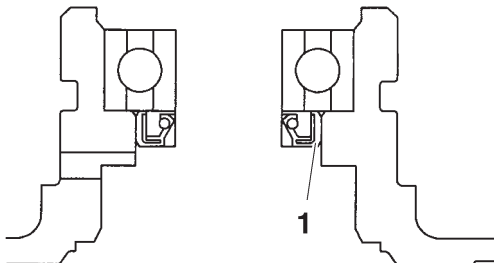


2. Water pump housing

3. Remove:
 - Oil seal "1" (with a thin, flat-head screwdriver)

TIP

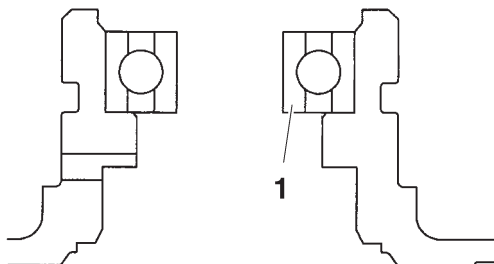
Remove the oil seal from the outside of the water pump housing.



4. Remove:
 - Bearing "1"

TIP

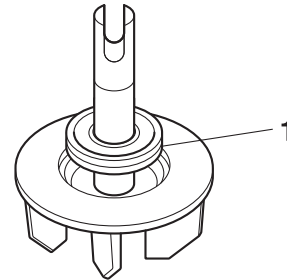
Remove the bearing from inside of the water pump housing.



5. Remove:
 - Mechanical seal (impeller side) "1" (from the impeller, with a thin, flat-head screwdriver)

TIP

Do not scratch the impeller shaft.



EAS30447

CHECKING THE WATER PUMP

1. Check:
 - Water pump housing cover
 - Water pump housing
 - Impeller shaft
 - Cracks/damage/wear → Replace.
2. Check:
 - Bearing
 - Rough movement → Replace.
3. Check:
 - Water pump inlet pipe
 - Water pump outlet hose
 - Water pump breather hose
 - Cracks/damage/wear → Replace.

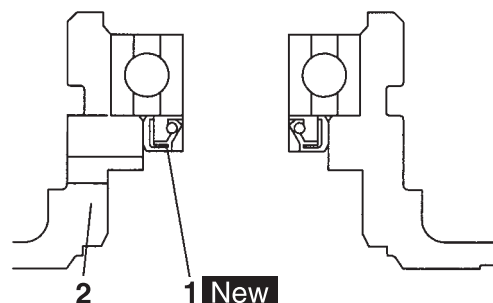
EAS30448

ASSEMBLING THE WATER PUMP

1. Install:
 - Oil seal "1" **New** (into the water pump housing "2")

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:

- Mechanical seal (housing side) “1” **New**
(into the water pump housing “2”)

ECA20330

NOTICE

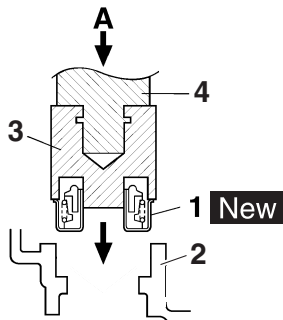
Never lubricate the mechanical seal (housing side) surface with oil or grease.

TIP

Use the special tools and a press to press the mechanical seal (housing side) straight in until it touches the water pump housing.



Mechanical seal installer
90890-04078
Water pump seal installer
YM-33221-A
Middle driven shaft bearing driver
90890-04058
Middle drive bearing installer 40 & 50 mm
YM-04058



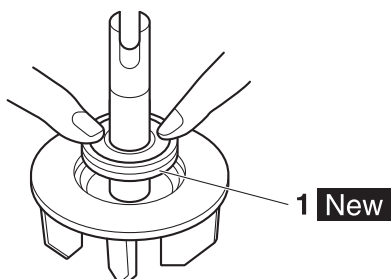
- A. Push down
- 3. Mechanical seal installer
- 4. Middle driven shaft bearing driver

3. Install:

- Mechanical seal (impeller side) “1” **New**

TIP

Before installing the mechanical seal (impeller side), apply tap water or coolant onto its outer surface.



4. Measure:

- Impeller shaft tilt
Out of specification → Repeat steps (3) and (4).

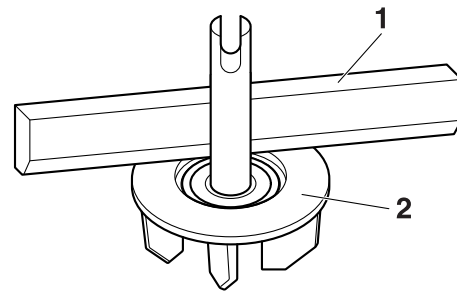
ECA20340

NOTICE

Make sure the mechanical seal (impeller side) is flush with the impeller.



Impeller shaft tilt limit
0.15 mm (0.006 in)



- 1. Straightedge
- 2. Impeller

EAS30449

INSTALLING THE WATER PUMP

1. Install:

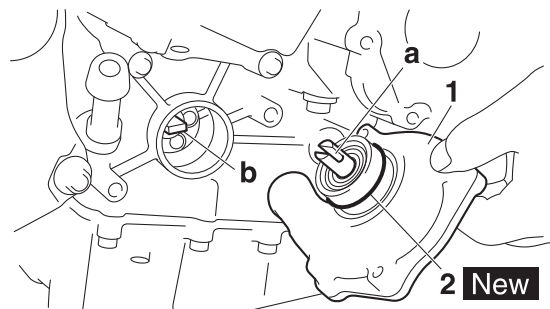
- Water pump assembly bolt “1”
- O-ring “2” **New**



Water pump assembly bolt
12 Nm (1.2 m·kgf, 8.7 ft·lbf)
LOCTITE®

TIP

- Align the slit “a” on the impeller shaft with the projection “b” on the oil pump shaft.
- Lubricate the O-ring with a thin coat of lithium-soap-based grease.



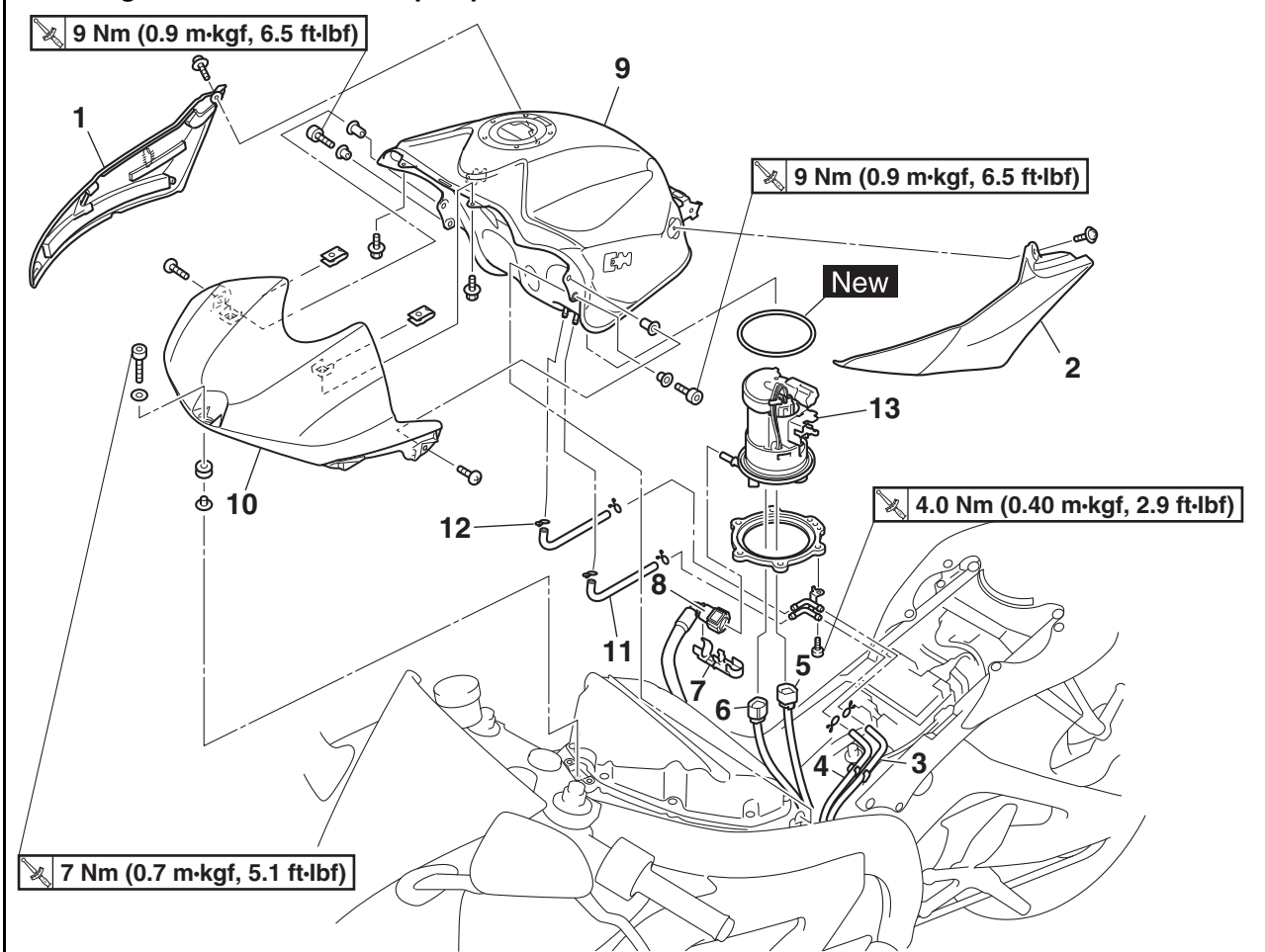
2. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-30.
3. Check:
 - Cooling system
Leaks → Repair or replace the faulty part.

FUEL SYSTEM

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FUEL TANK

Removing the fuel tank and fuel pump



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Fuel tank bracket		Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel tank cover (right)	1	
2	Fuel tank cover (left)	1	
3	Fuel tank breather hose	1	Disconnect.
4	Fuel tank overflow hose	1	Disconnect.
5	Fuel pump coupler	1	Disconnect.
6	Fuel sender coupler	1	Disconnect.
7	Fuel hose connector cover	1	
8	Fuel hose (fuel tank side)	1	Disconnect.
9	Fuel tank	1	
10	Fuel tank upper cover	1	
11	Fuel tank overflow hose (fuel tank to hose joint)	1	
12	Fuel tank breather hose (fuel tank to hose joint)	1	
13	Fuel pump	1	

EAS30450

REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
 - Fuel sender coupler
 - Fuel pump coupler
 - Fuel hose connector cover
 - Fuel hose (fuel tank side)
 - Fuel tank breather hose
 - Fuel tank overflow hose

EWA17610

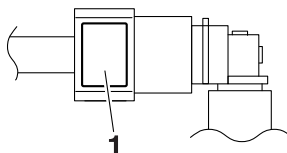


WARNING

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.

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.
- Remove the fuel hose manually without using any tools.
- Before removing the hose, place a few rags in the area under where it will be removed.



3. Remove:

- Fuel tank

TIP

- Place the fuel tank on a level surface.
- Make sure that the fuel pipe does not contact the ground; otherwise, the fuel pump could be damaged.

EAS30451

REMOVING THE FUEL PUMP

1. Remove:
 - Fuel pump

ECA14721

NOTICE

- Do not drop the fuel pump or give it a strong shock.

- Do not touch the base section of the fuel sender.

EAS30454

CHECKING THE FUEL PUMP BODY

1. Check:
 - Fuel pump body
Obstruction → Clean.
Cracks/damage → Replace fuel pump assembly.
2. Check:
 - Diaphragms and gaskets
Tears/fatigue/cracks → Replace fuel pump assembly.

EAS30455

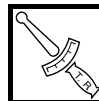
CHECKING THE FUEL PUMP OPERATION

1. Check:
 - Fuel pump operation
Refer to “CHECKING THE FUEL PUMP” on page 8-99.

EAS30456

INSTALLING THE FUEL PUMP

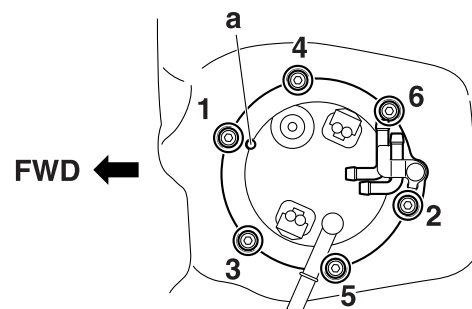
1. Tighten:
 - Fuel pump



Fuel pump bolt
4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)

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 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.

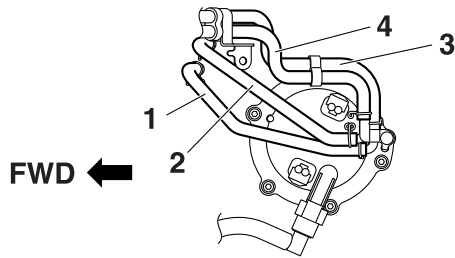


EAS30457

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)

ECA17500

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.

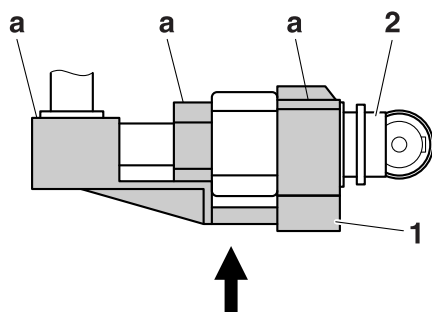
TIP

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".



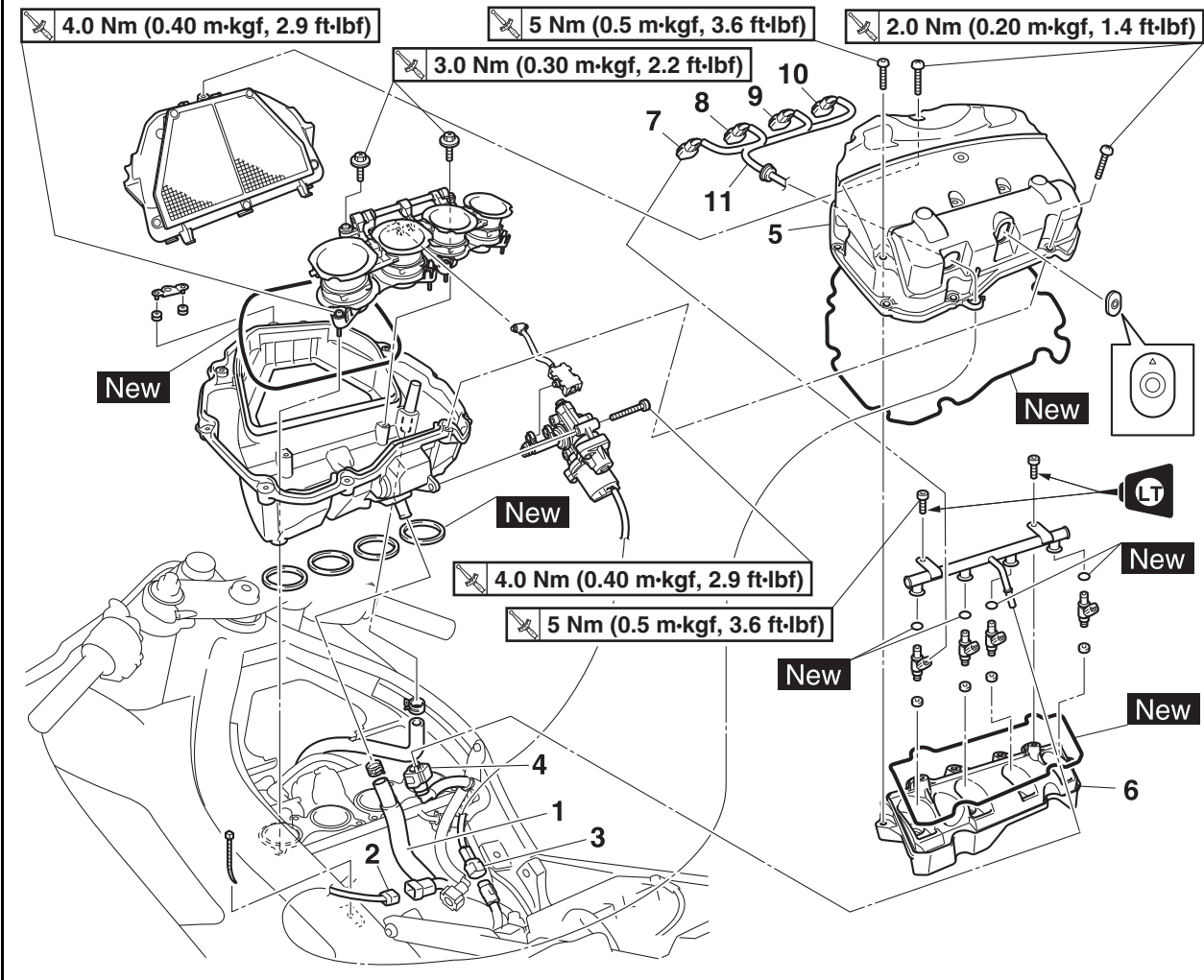
3. Connect:

- Fuel sender coupler
- Fuel pump coupler

EAS20068

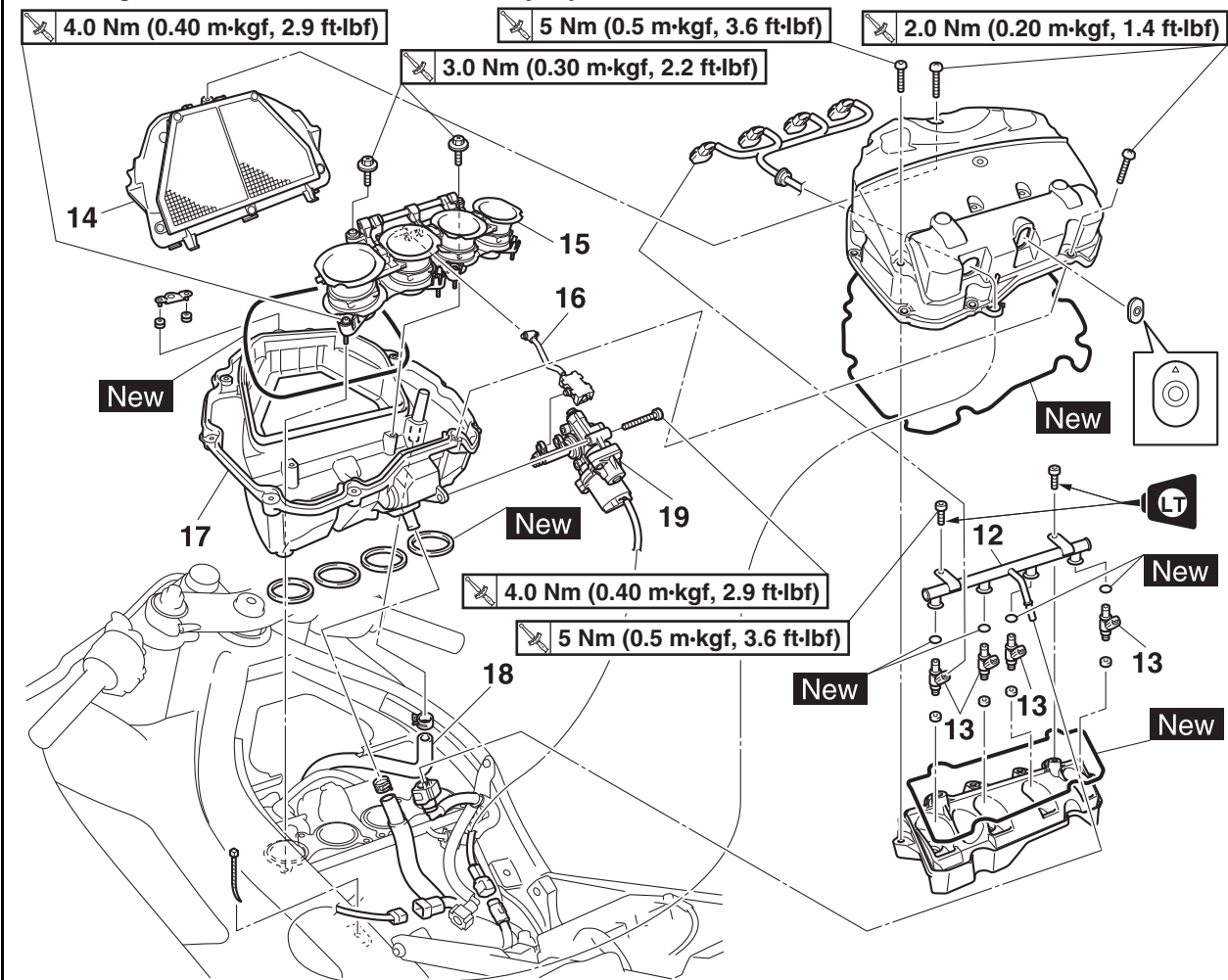
AIR FILTER CASE

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	Intake funnel servo motor coupler	1	
4	Fuel hose (secondary injector fuel rail side)	1	Disconnect.
5	Upper air filter case	1	
6	Secondary injector holder	1	
7	Cylinder-#1 secondary injector coupler	1	Disconnect.
8	Cylinder-#2 secondary injector coupler	1	Disconnect.
9	Cylinder-#3 secondary injector coupler	1	Disconnect.
10	Cylinder-#4 secondary injector coupler	1	Disconnect.
11	Sub-wire harness	1	

Removing the air filter case and secondary injectors



Order	Job/Parts to remove	Q'ty	Remarks
12	Secondary injector fuel rail	1	
13	Secondary injector	4	
14	Air filter element	1	
15	Intake funnel assembly	1	
16	Intake funnel servo motor rod assembly	1	
17	Lower air filter case	1	
18	Air induction system hose (air filter case to air cut-off valve)	1	Disconnect.
19	Intake funnel servo motor	1	

EAS30459

REMOVING THE FUEL HOSE (PRIMARY INJECTOR FUEL RAIL SIDE AND SECONDARY INJECTOR FUEL RAIL SIDE)

1. Remove:

- Fuel hose (primary injector fuel rail side and secondary injector fuel rail side)

EWA17610

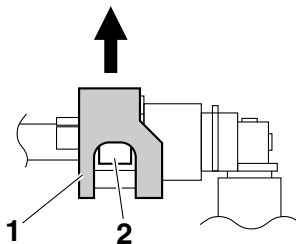


WARNING

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.

TIP

- To remove the fuel hose from the secondary injector fuel rail, slide the fuel hose connector cover "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.
- Remove the fuel hose manually without using any tools.
- Before removing the hose, place a few rags in the area under where it will be removed.



EAS31663

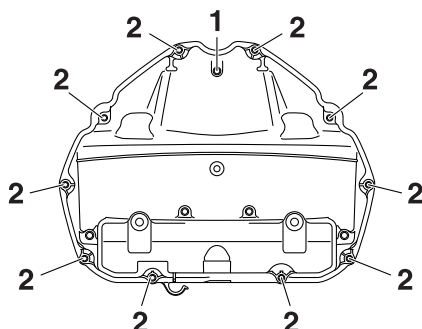
REMOVING THE AIR FILTER CASE

1. Remove:

- Upper air filter case

TIP

Loosen the upper air filter case bolts in proper sequence as shown.



EAS30462

CHECKING THE SECONDARY INJECTORS

1. Check:

- Injectors
- Damage → Replace.

EAS30461

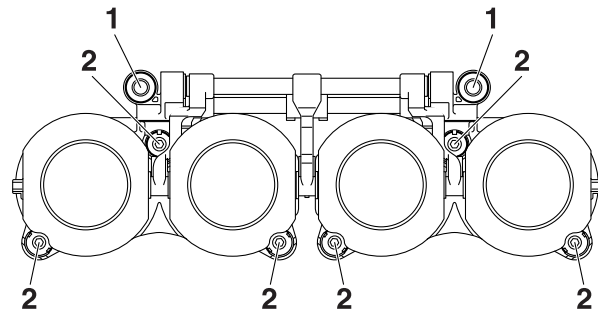
REMOVING THE INTAKE FUNNEL

1. Remove:

- Intake funnel joint bolts

TIP

Loosen the intake funnel joint bolts in proper sequence as shown.



- Intake funnel assembly
- Intake funnel servo motor rod assembly

EAS30463

CHECKING THE INTAKE FUNNEL

1. Check:

- Intake funnel servo motor rod assembly
- Damage/scratches → Replace.
- Intake funnel assembly
- Cracks/damage → Replace.

1. Check:

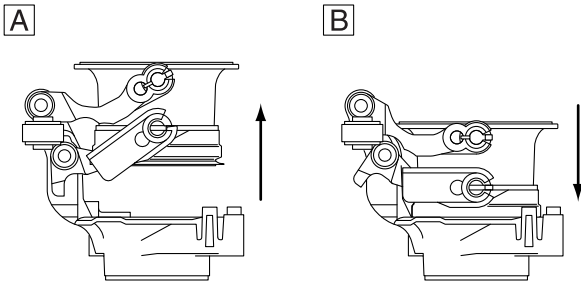
- Intake funnel movement
- Sticks → Replace the intake funnel assembly.

ECA17550

NOTICE

- Make sure that the intake funnel smoothly moves to the contacting surface between upper stopper and lower seating position when it is moved by hand.
- Make sure that the intake funnel smoothly strokes from the upper position to the seating position by its own weight.

AIR FILTER CASE



A. Upper
B. Lower

EAS30464

INSTALLING THE INTAKE FUNNEL

1. Install:

- Intake funnel servo motor rod assembly
- Intake funnel assembly
- Intake funnel joint bolts "1"

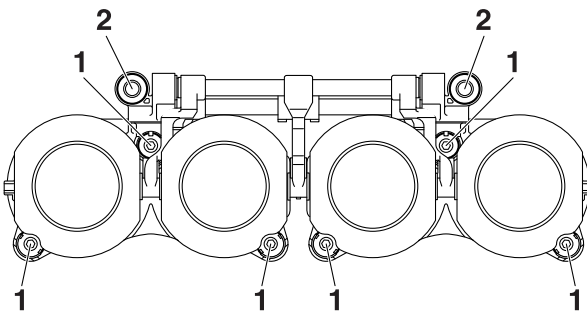


Intake funnel joint bolt 1
4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)

- Intake funnel joint bolts "2"



Intake funnel joint bolt 2
3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)



EAS30465

CHECKING THE INTAKE FUNNEL OPERATION

1. Check:

- Intake funnel operation

- Activate the diagnostic mode and select the diagnostic code number "34".
Refer to "FUEL INJECTION SYSTEM" on page 8-31.
- Set the engine stop switch to "○".
- Check that the intake funnel operate smoothly strokes from the upper position to the lower seating position.

EAS31618

INSTALLING THE AIR FILTER CASE

1. Install:

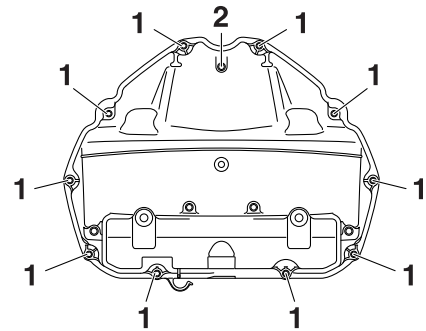
- Upper air filter case



Upper air filter case to lower air filter case bolt
2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)
Air filter bolt
2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)

TIP

Tighten the upper air filter case to lower air filter case bolts and air filter bolt in proper sequence as shown.



EAS30468

INSTALLING THE FUEL HOSE (PRIMARY INJECTOR FUEL RAIL SIDE AND SECONDARY INJECTOR FUEL RAIL SIDE)

1. Connect:

- Fuel hose (primary injector fuel rail side and secondary injector fuel rail side)

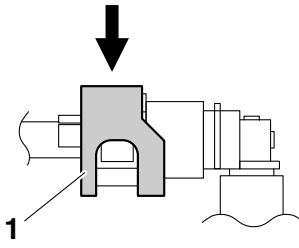
ECA17500

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

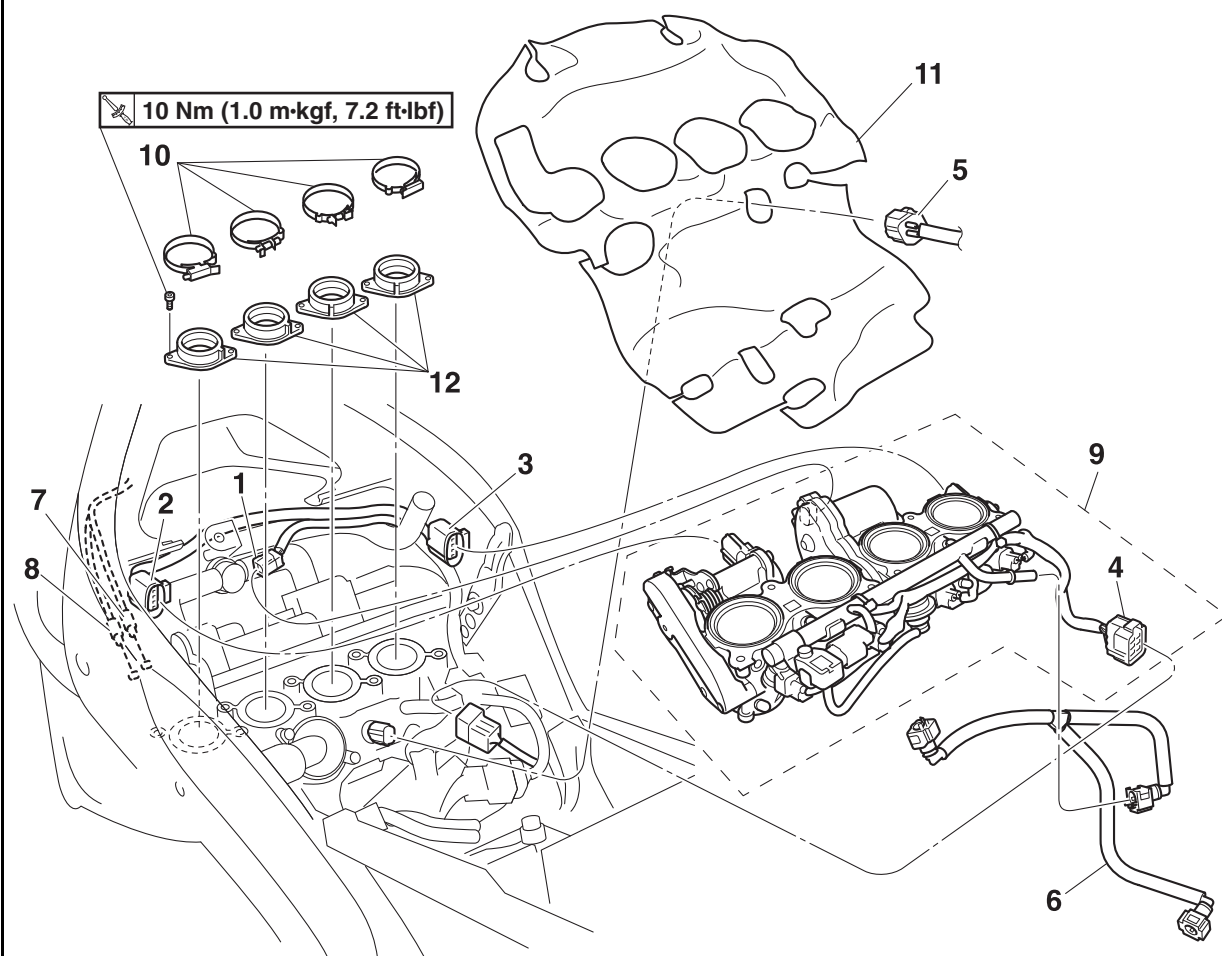
- Install the fuel hose securely onto the secondary injector fuel rail until a distinct "click" is heard.
- To install the fuel hose onto the secondary injector fuel rail, slide the fuel hose connector cover "1" on the end of the hose in the direction of the arrow shown.



EAS20070

THROTTLE BODIES

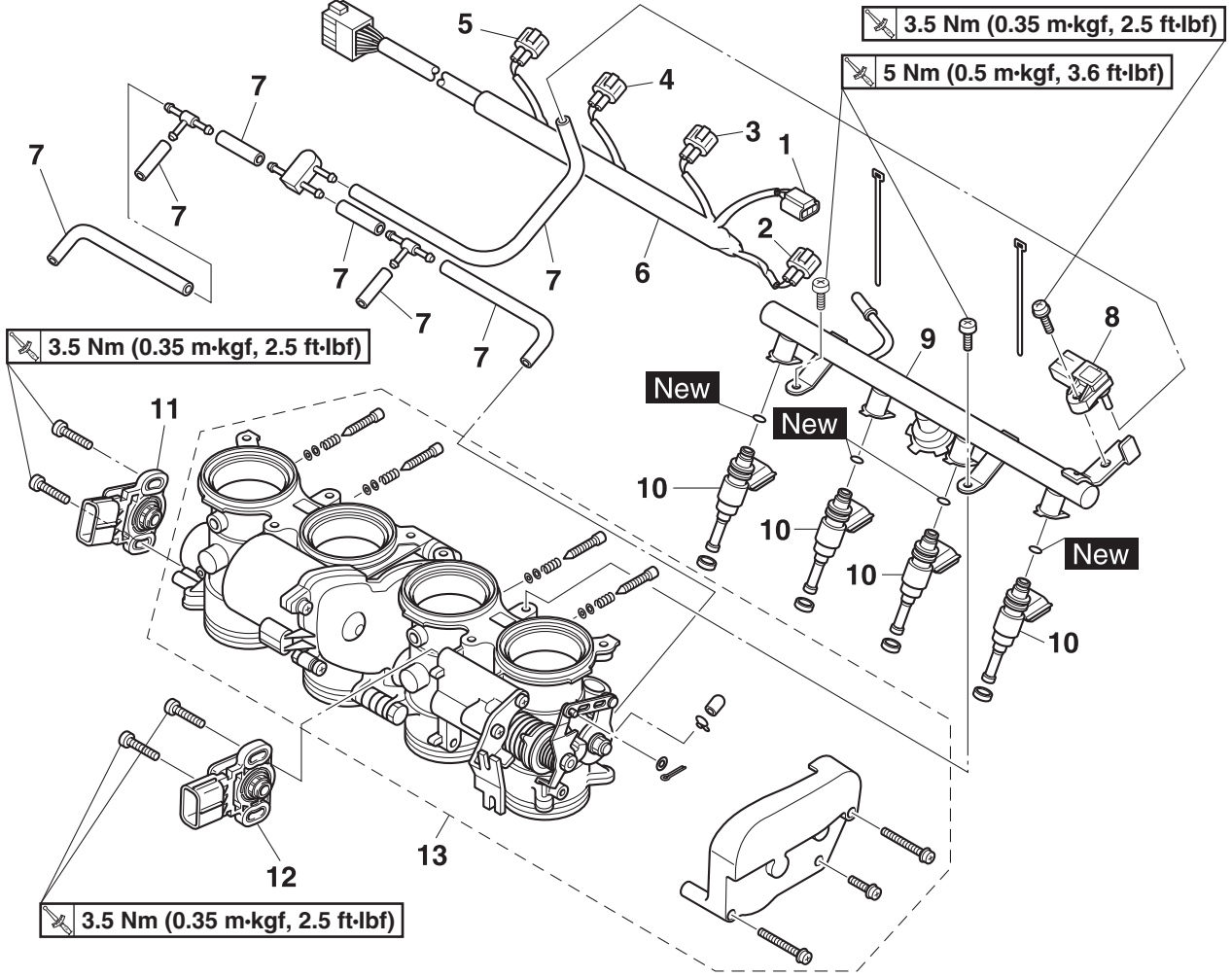
Removing the throttle body assembly



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 7-4.
	Air induction system cover		Refer to "AIR INDUCTION SYSTEM" on page 7-15.
1	Throttle servo motor coupler	1	Disconnect.
2	Throttle position sensor (for throttle cable pulley) coupler	1	Disconnect.
3	Throttle position sensor (for throttle valves) coupler	1	Disconnect.
4	Sub-wire harness coupler	1	Disconnect.
5	Coolant temperature sensor coupler	1	Disconnect.
6	Fuel hose	1	
7	Throttle cable (decelerator cable)	1	
8	Throttle cable (accelerator cable)	1	
9	Throttle body assembly	1	
10	Throttle body joint clamp	4	
11	Heat protector	1	
12	Throttle body joint	4	

THROTTLE BODIES

Removing the primary injectors



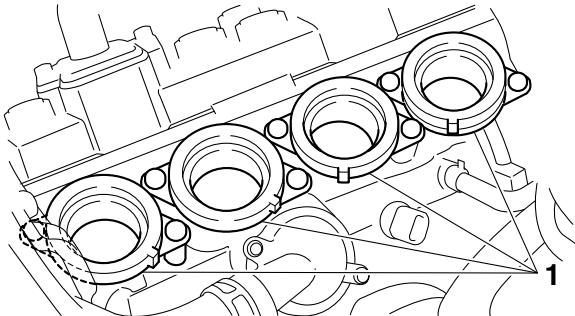
Order	Job/Parts to remove	Q'ty	Remarks
1	Intake air pressure sensor coupler	1	Disconnect.
2	Cylinder-#1 primary injector coupler	1	Disconnect.
3	Cylinder-#2 primary injector coupler	1	Disconnect.
4	Cylinder-#3 primary injector coupler	1	Disconnect.
5	Cylinder-#4 primary injector coupler	1	Disconnect.
6	Sub-wire harness	1	
7	Intake air pressure sensor hose	7	
8	Intake air pressure sensor	1	
9	Primary injector fuel rail	1	
10	Primary injector	4	
11	Throttle position sensor (for throttle valves)	1	
12	Throttle position sensor (for throttle cable pulley)	1	
13	Throttle bodies	1	

EAS30792

CHECKING THE THROTTLE BODY JOINTS

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

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 7-4.
 - Throttle body
Refer to "THROTTLE BODIES" on page 7-9.
2. Check:
 - Throttle body joints "1"
Cracks/damage → Replace.



3. Install:
 - Throttle body
Refer to "THROTTLE BODIES" on page 7-9.
 - Air filter case
Refer to "AIR FILTER CASE" on page 7-4.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS31668

CHECKING THE PRIMARY INJECTORS

1. Check:
 - Injectors
Damage → Replace.

EAS30479

CHECKING THE THROTTLE BODIES

1. Check:
 - Throttle bodies
Cracks/damage → Replace the throttle body assembly.

ECA14600

NOTICE

The throttle bodies should not be disassembled.

2. Check:
 - Fuel passages
Obstructions → Clean.

- a. Wash the throttle bodies in a petroleum-based solvent.
Do not use any caustic carburetor cleaning solution.
- b. Blow out all of the passages with compressed air.

EAS30482

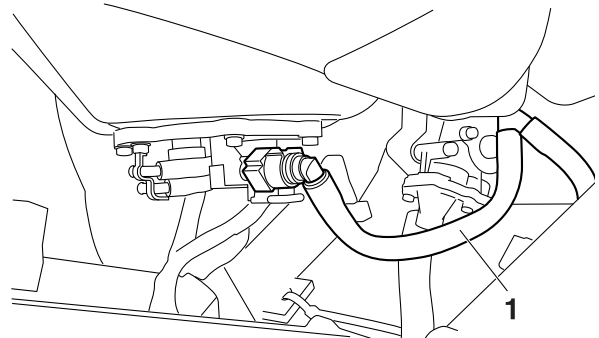
CHECKING THE FUEL PRESSURE

1. Check:
 - Fuel pressure
- a. Remove the rider seat.
Refer to "GENERAL CHASSIS" on page 4-1.
- b. Disconnect the fuel hose "1" from the fuel tank.

EWA17610

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.



- c. Connect the pressure gauge "2" and adapter "3" to the fuel hose "1".



Pressure gauge

90890-03153

Pressure gauge

YU-03153

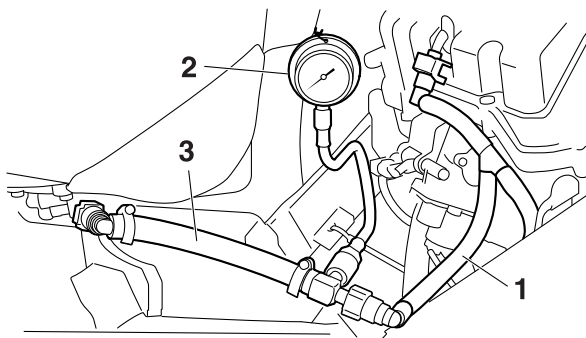
Fuel pressure adapter

90890-03176

Fuel pressure adapter

YM-03176

THROTTLE BODIES



- d. Start the engine.
- e. Measure the fuel 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.

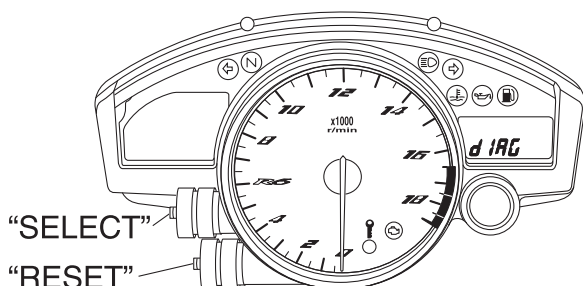
EAS30474

ADJUSTING THE THROTTLE POSITION SENSOR (FOR THROTTLE VALVES)

1. Adjust:

- Throttle position sensor angle

- a. Temporary tighten the throttle position sensor (for throttle valves).
- b. Check that the throttle valves are fully closed.
- c. Connect the throttle position sensor (for throttle valves), throttle position sensor (for throttle cable pulley) and throttle servo motor to the wire harness.
- d. Turn the main switch to “OFF” and set the engine stop switch to “ON”.
- e. Simultaneously press and hold the “SELECT” and “RESET” buttons, turn the main switch to “ON”, and continue to press the buttons for 8 seconds more.

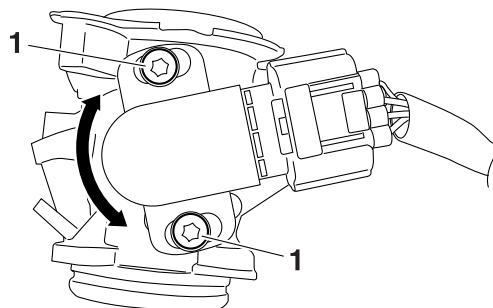


TIP

“dIAG” appears on the odometer, tripmeter and fuel reserve trip LCD.

- f. Diagnostic code 01 is selected.

- g. Adjust the position of the throttle position sensor angle so that 16 can appear in the meter.
- h. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws “1”.



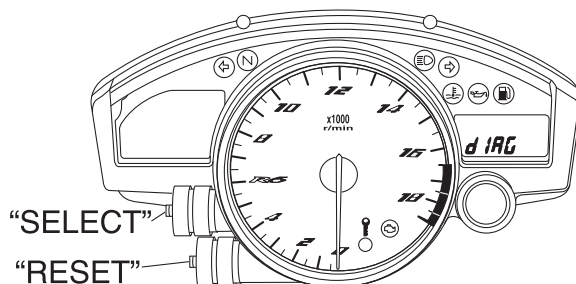
EAS30485

ADJUSTING THE THROTTLE POSITION SENSOR (FOR THROTTLE CABLE PULLEY)

1. Adjust:

- Throttle position sensor (for throttle cable pulley) angle

- a. Temporary tighten the throttle position sensor (for throttle cable pulley).
- b. Check that the throttle valves are fully closed.
- c. Connect the throttle position sensor (for throttle valves), throttle position sensor (for throttle cable pulley) and throttle servo motor to the wire harness.
- d. Turn the main switch to “OFF” and set the engine stop switch to “ON”.
- e. Simultaneously press and hold the “SELECT” and “RESET” buttons, turn the main switch to “ON”, and continue to press the buttons for 8 seconds more.

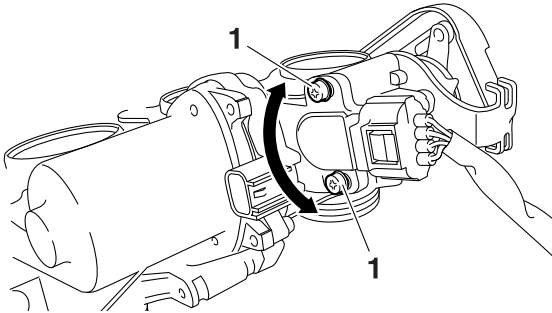


TIP

“dIAG” appears on the odometer, tripmeter and fuel reserve trip LCD.

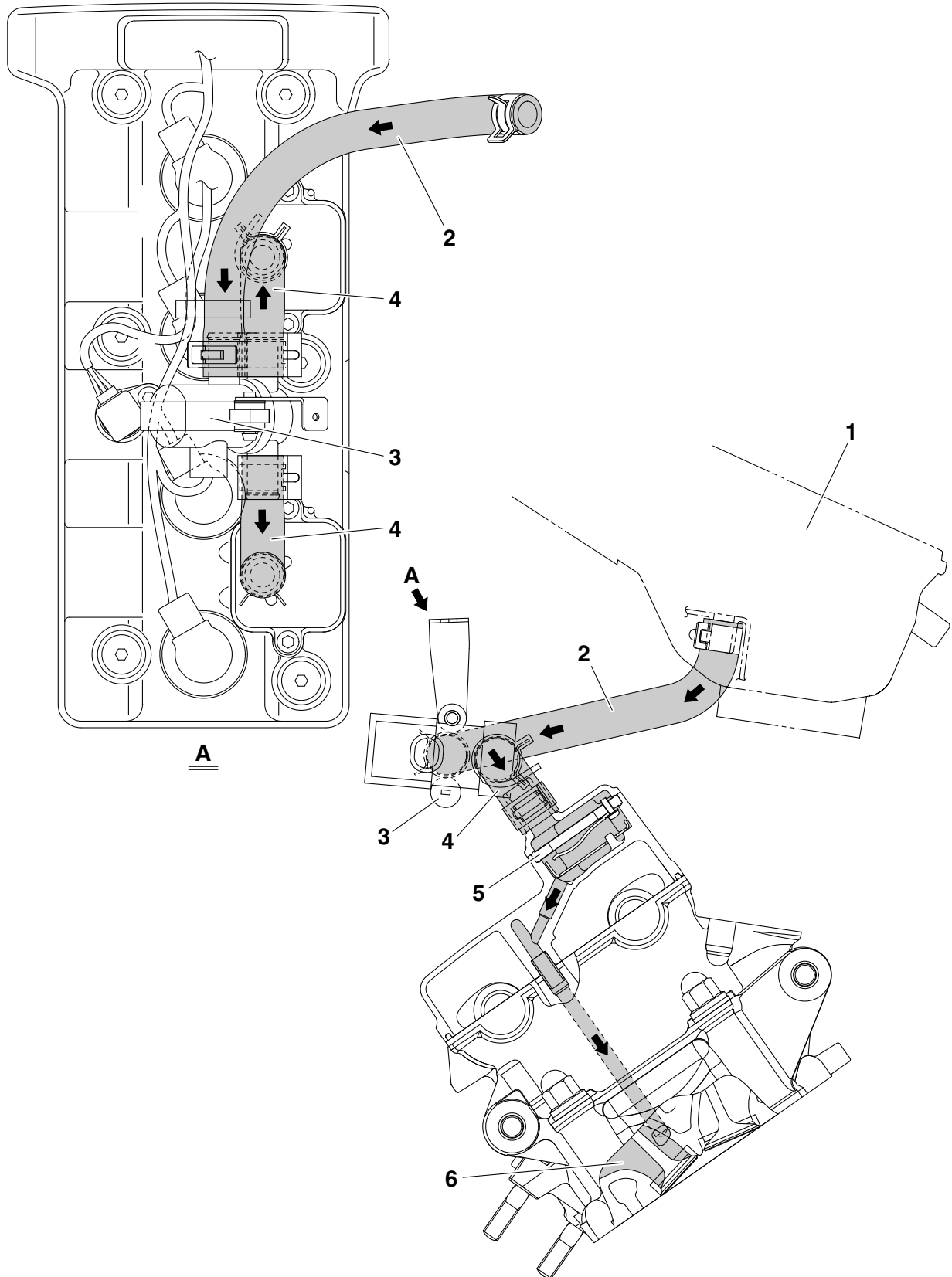
- f. Diagnostic code 14 is selected.
- g. Adjust the position of the throttle position sensor angle so that 17 can appear in the meter.

- h. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws "1".



EAS20071

AIR INDUCTION SYSTEM

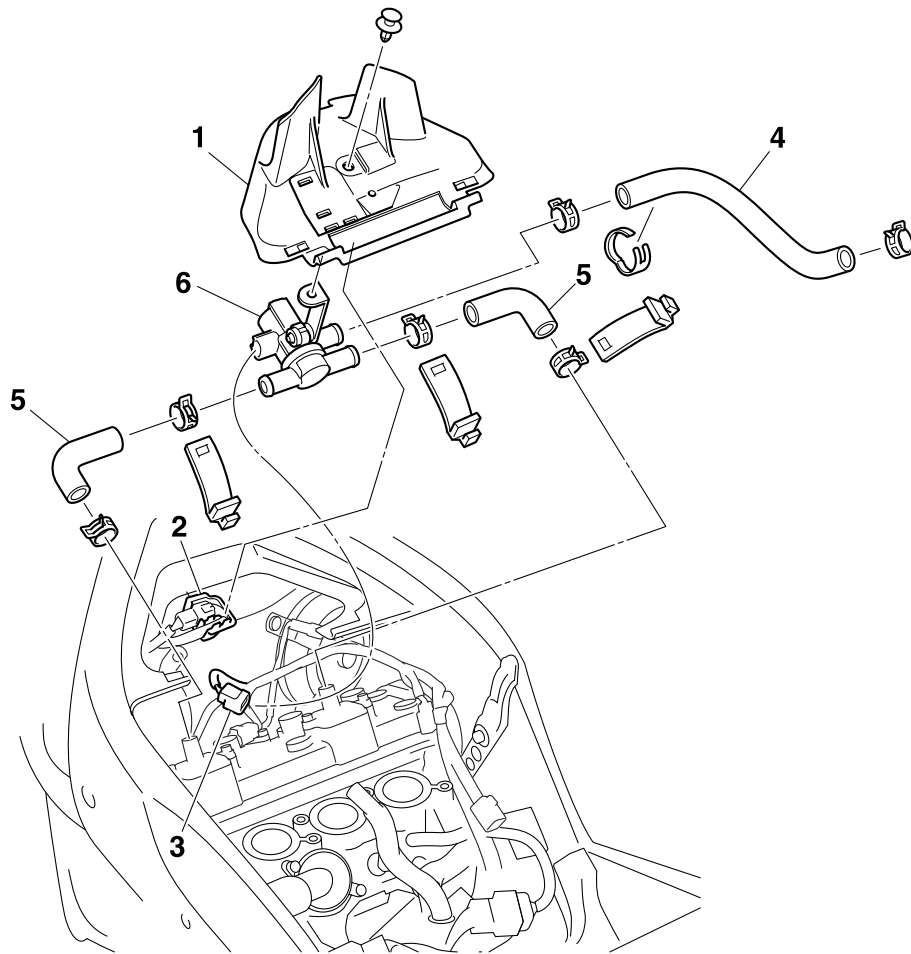


AIR INDUCTION SYSTEM

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 cylinder head cover)
5. Reed valve assembly
6. Exhaust port

AIR INDUCTION SYSTEM

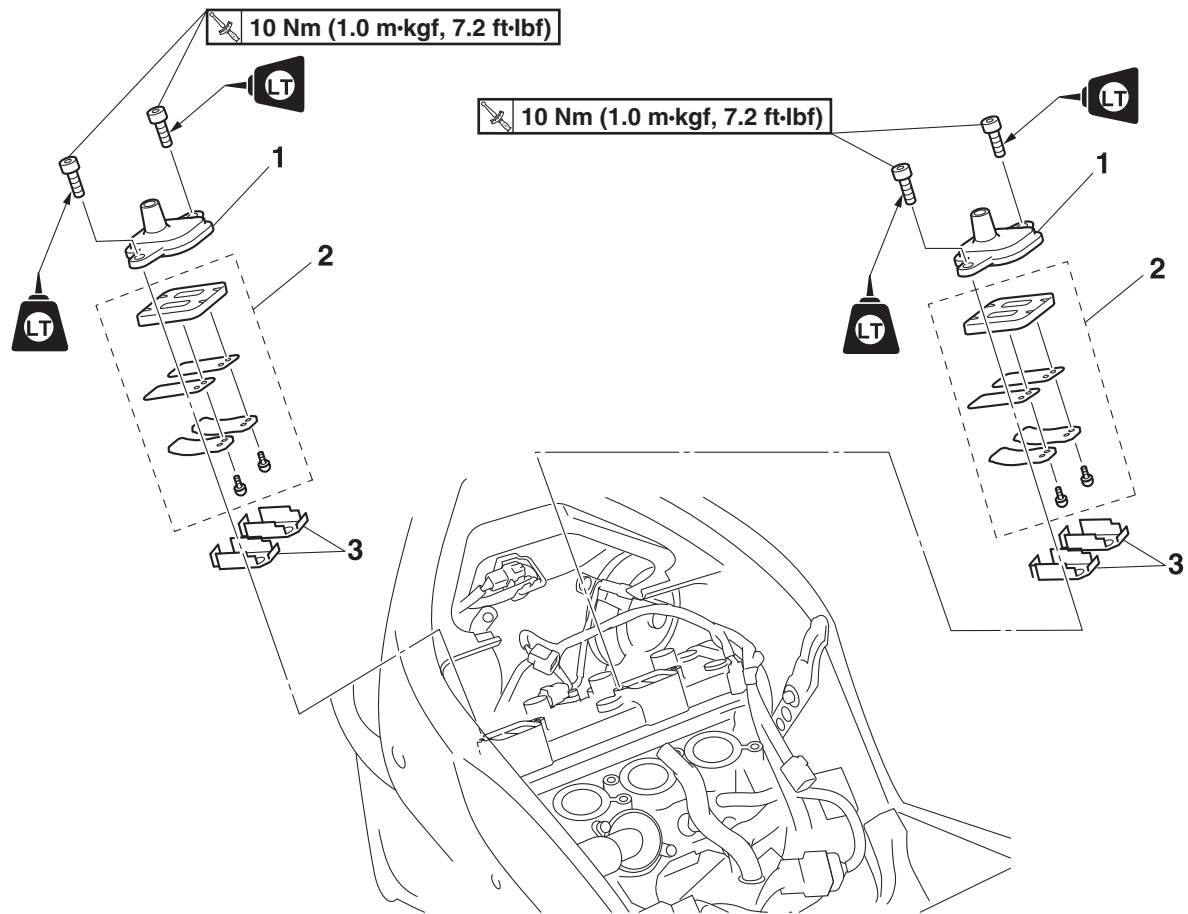
Removing the air cut-off valve



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 7-4.
1	Air induction system cover	1	
2	Immobilizer unit coupler holder	1	
3	Air induction system solenoid coupler	1	Disconnect.
4	Air induction system hose (air filter case to air cut-off valve)	1	
5	Air induction system hose (air cut-off valve to cylinder head cover)	2	
6	Air cut-off valve	1	

AIR INDUCTION SYSTEM

Removing the reed valves



Order	Job/Parts to remove	Q'ty	Remarks
1	Reed valve cover	2	
2	Reed valve assembly	2	
3	Reed valve plate	4	

EAS30488

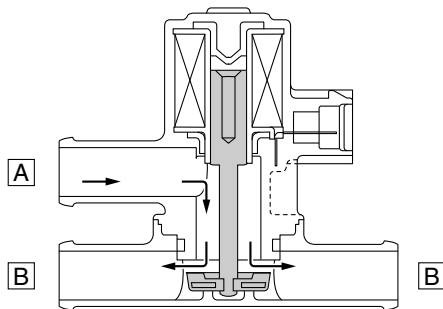
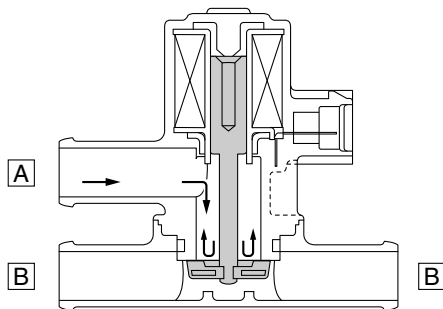
CHECKING THE AIR INDUCTION SYSTEM

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 assembly until the temperature becomes higher than the specified value.



- A. From the air filter case
- B. To the cylinder head

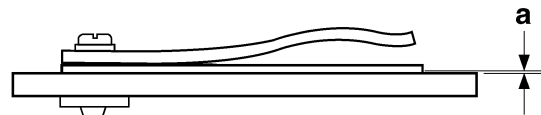
1. Check:

- Hoses
 - Loose connections → Connect properly.
 - Cracks/damage → Replace.

2. Check:

- Reed valve
- Reed valve stopper
- Reed valve seat
 - Cracks/damage → Replace the reed valve assembly.

There is a gap "a" between the reed valve and the reed valve seat → Replace the reed valve assembly.



3. Check:

- Air cut-off valve
 - Cracks/damage → Replace.

4. Check:

- Air induction system solenoid
 - Refer to "CHECKING THE AIR INDUCTION SYSTEM SOLENOID" on page 8-100.

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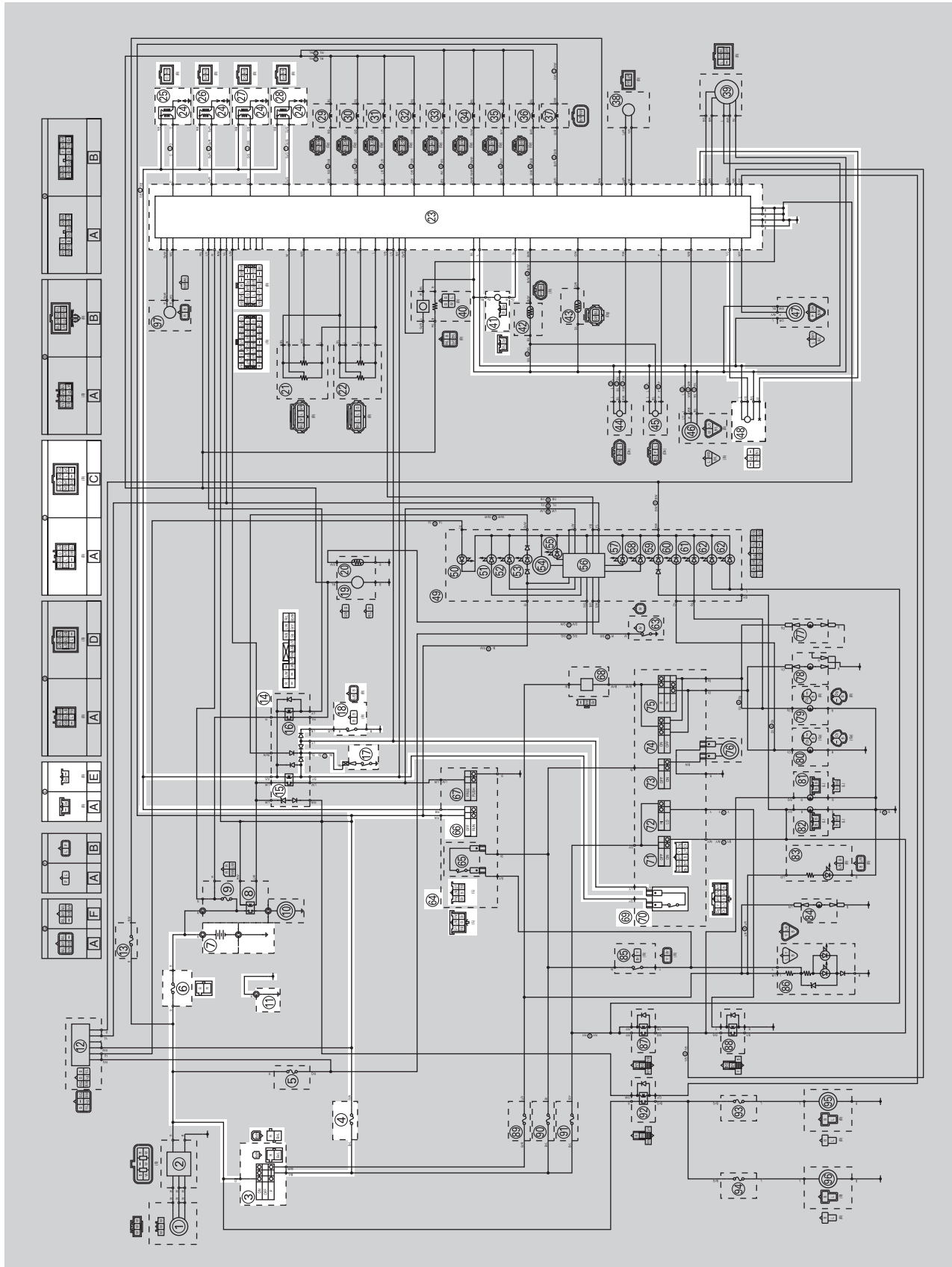
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CHECKING THE STARTER MOTOR OPERATION	8-96
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EAS20072

IGNITION SYSTEM

EAS30490

CIRCUIT DIAGRAM



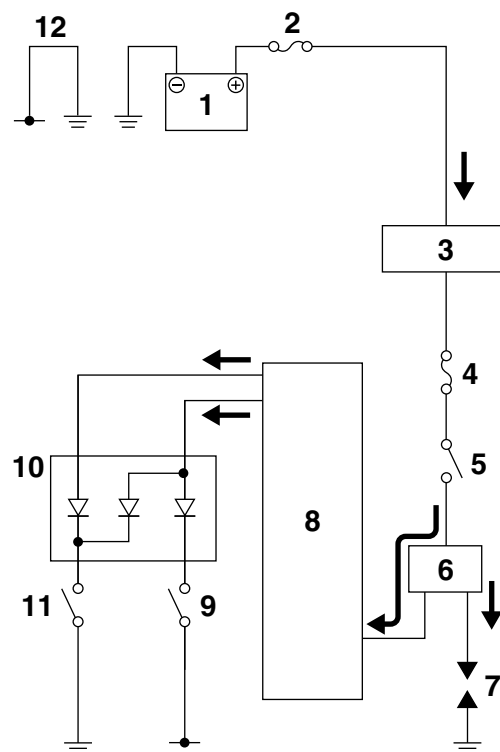
- 3. Main switch
- 4. Ignition fuse
- 6. Main fuse
- 7. Battery
- 11.Engine ground
- 14.Relay unit
- 15.Starting circuit cut-off relay
- 17.Neutral switch
- 18.Sidestand switch
- 23.ECU (Engine Control Unit)
- 24.Spark plug
- 25.Ignition coil #1
- 26.Ignition coil #2
- 27.Ignition coil #3
- 28.Ignition coil #4
- 41.Crankshaft position sensor
- 48.Lean angle sensor
- 64.Handlebar switch (right)
- 66.Engine stop switch
- 69.Handlebar switch (left)
- 70.Clutch switch
- A. Wire harness
- C. Ignition sub-wire harness
- E. Neutral switch sub-wire harness

EAS30491

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).



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. Neutral switch
12. Engine ground

EAS30492

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank
3. Air filter case
4. Side cowlings
5. Bottom cowlings

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-88.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-89.	NG →	• 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 plug(s).
OK ↓		
4. Check the ignition spark gap. Refer to "CHECKING THE IGNITION COILS" on page 8-95.	OK →	Ignition system is OK.
NG ↓		
5. Check the ignition coils. Refer to "CHECKING THE IGNITION COILS" on page 8-95.	NG →	Replace the ignition coil(s).
OK ↓		
6. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-96.	NG →	Replace the crankshaft position sensor.
OK ↓		
7. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the main switch/immobilizer unit.
OK ↓		

IGNITION SYSTEM

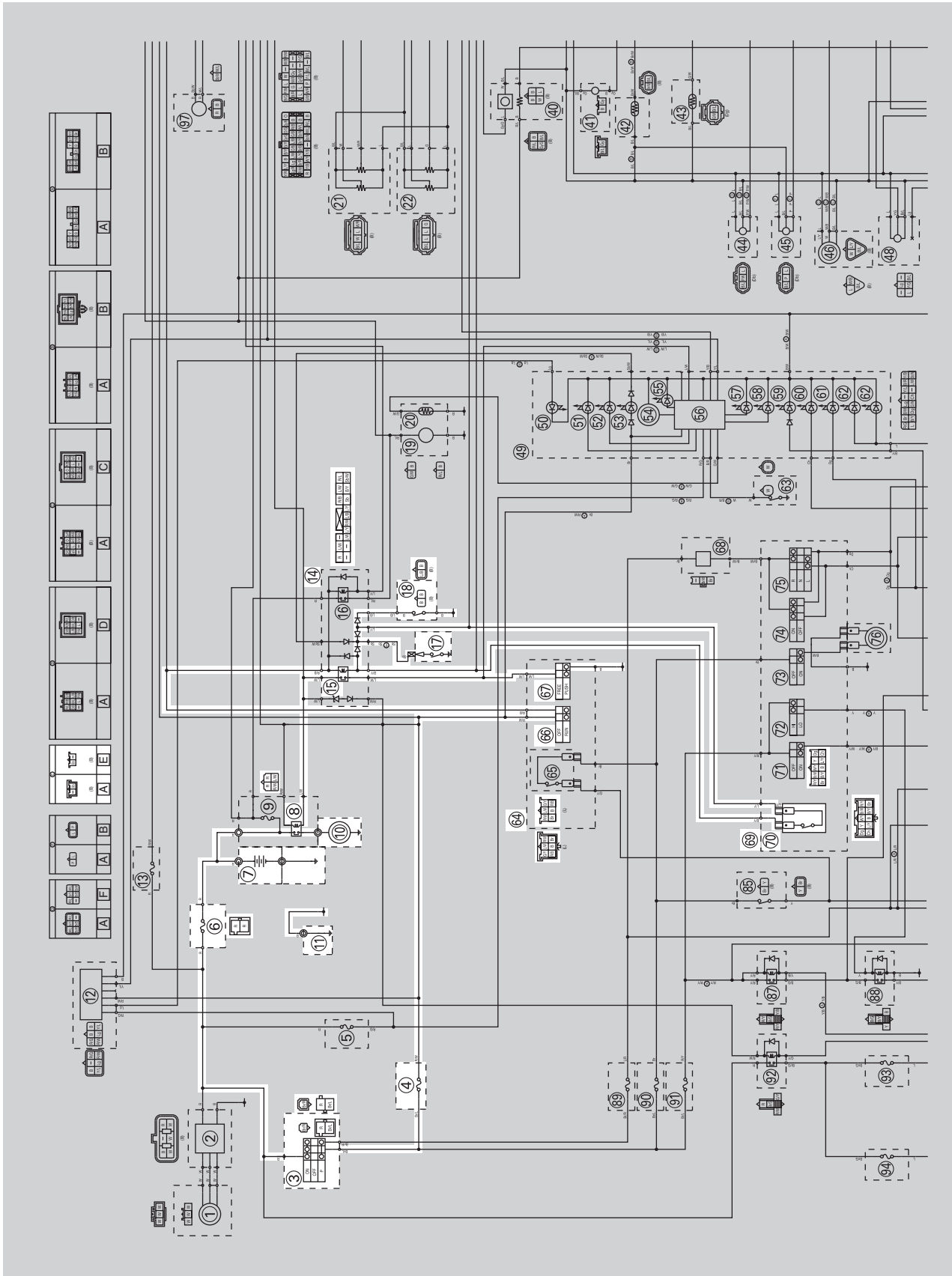
8. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	• The engine stop switch is faulty. • Replace the right handlebar switch.
OK ↓		
9. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the neutral switch.
OK ↓		
10. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the sidestand switch.
OK ↓		
11. Check the relay unit (starting circuit cut-off relay). Refer to "CHECKING THE RELAYS" on page 8-92.	NG →	Replace the relay unit.
OK ↓		
12. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-94.	NG →	Replace the relay unit.
OK ↓		
13. Check the lean angle sensor. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-96.	NG →	Replace the lean angle sensor.
OK ↓		
14. Check the entire ignition system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG →	Properly connect or replace the wiring harness.
OK ↓		
Replace the ECU.		

EAS20073

ELECTRIC STARTING SYSTEM

EAS30493

CIRCUIT DIAGRAM



ELECTRIC STARTING SYSTEM

- 3. Main switch
- 4. Ignition fuse
- 6. Main fuse
- 7. Battery
- 8. Starter relay
- 10. Starter motor
- 11. Engine ground
- 14. Relay unit
- 15. Starting circuit cut-off relay
- 17. Neutral switch
- 18. Sidestand switch
- 64. Handlebar switch (right)
- 66. Engine stop switch
- 67. Start switch
- 69. Handlebar switch (left)
- 70. Clutch switch
- A. Wire harness
- E. Neutral switch sub-wire harness

EAS30494

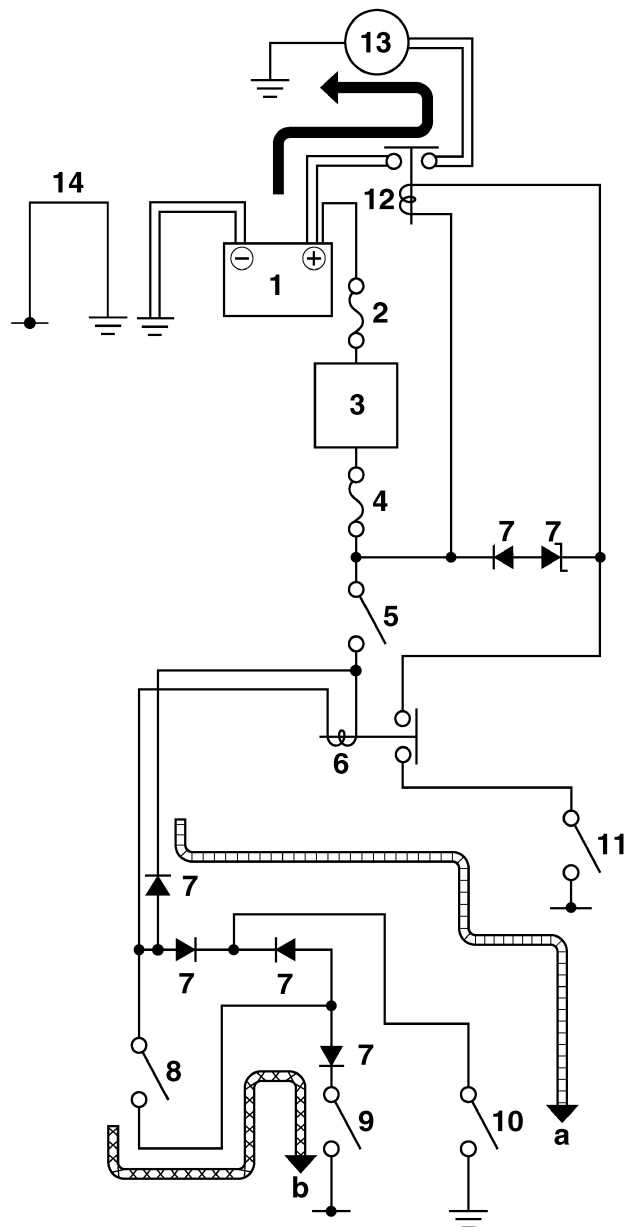
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to “○” and the main switch is set to “ON” (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cut-off relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met the starting circuit cut-off relay is closed and the engine can be started by pressing the start 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

- 12. Starter relay
- 13. Starter motor
- 14. Engine ground

- 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. Neutral switch
- 11. Start switch

ELECTRIC STARTING SYSTEM

EAS30495

TROUBLESHOOTING

The starter motor fails to turn.

TIP

- Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank
3. Air filter case
4. Side cowlings
5. Thermostat

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-88.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-89.	NG →	• 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 8-96.	OK →	Starter motor is OK. Perform the electric starting system troubleshooting, starting with step 5.
NG ↓		
4. Check the starter motor. Refer to "CHECKING THE STARTER MOTOR" on page 5-37.	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 8-92.	NG →	Replace the relay unit.
OK ↓		
6. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-94.	NG →	Replace the relay unit.
OK ↓		
7. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-92.	NG →	Replace the starter relay.
OK ↓		

ELECTRIC STARTING SYSTEM

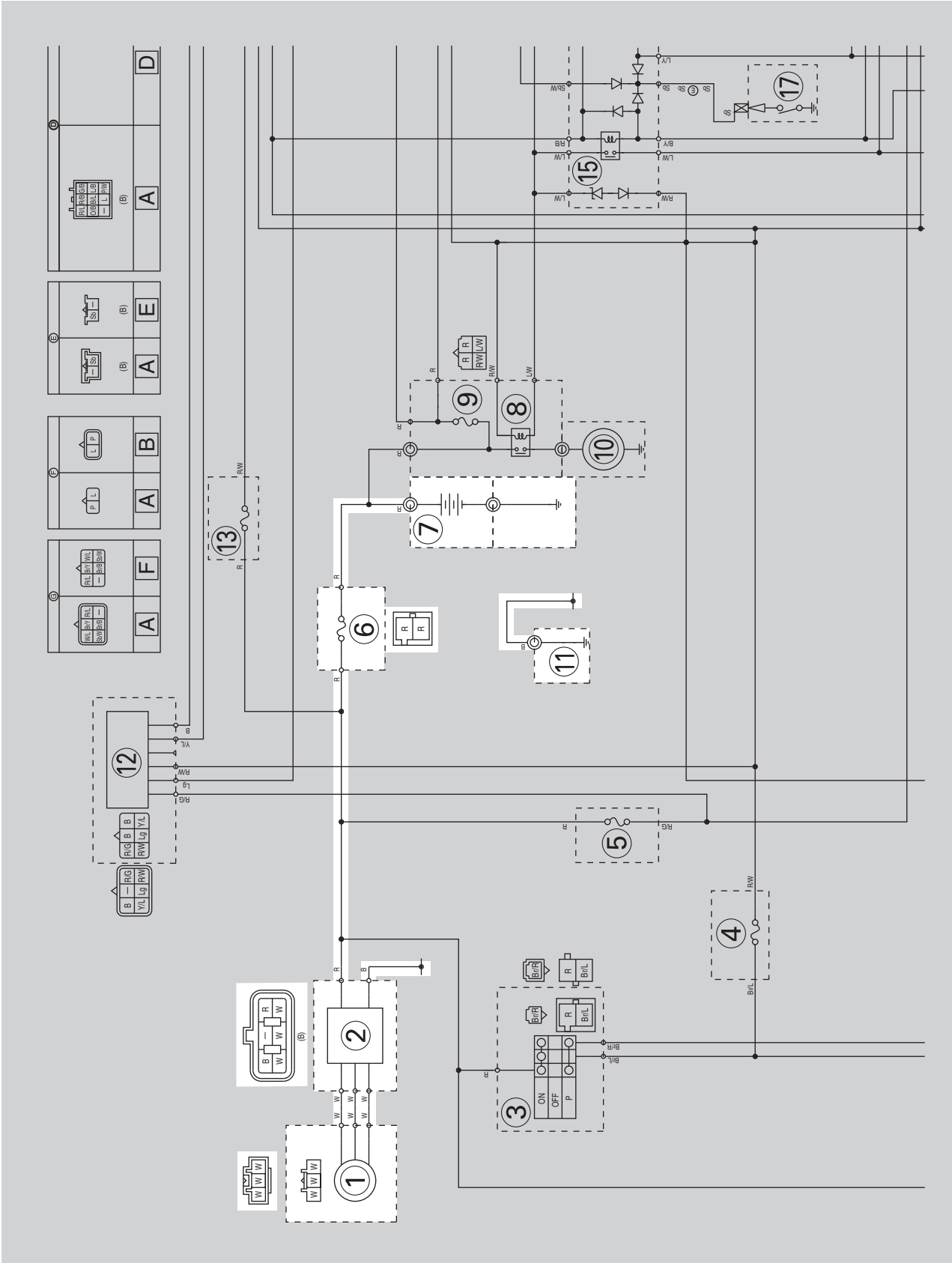
8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the main switch/immobilizer unit.
OK ↓		
9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	• The engine stop switch is faulty. • Replace the right handlebar switch.
OK ↓		
10. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the neutral switch.
OK ↓		
11. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the sidestand switch.
OK ↓		
12. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the clutch switch.
OK ↓		
13. Check the start switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	• The start switch is faulty. • Replace the right handlebar switch.
OK ↓		
14. Check the entire starting system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-7.	NG →	Properly connect or replace the wiring harness.
OK ↓		
The starting system circuit is OK.		

EAS20074

CHARGING SYSTEM

EAS30496

CIRCUIT DIAGRAM



CHARGING SYSTEM

1. AC magneto
2. Rectifier/regulator
6. Main fuse
7. Battery
- 11.Engine ground

EAS30497

TROUBLESHOOTING

The battery is not being charged.

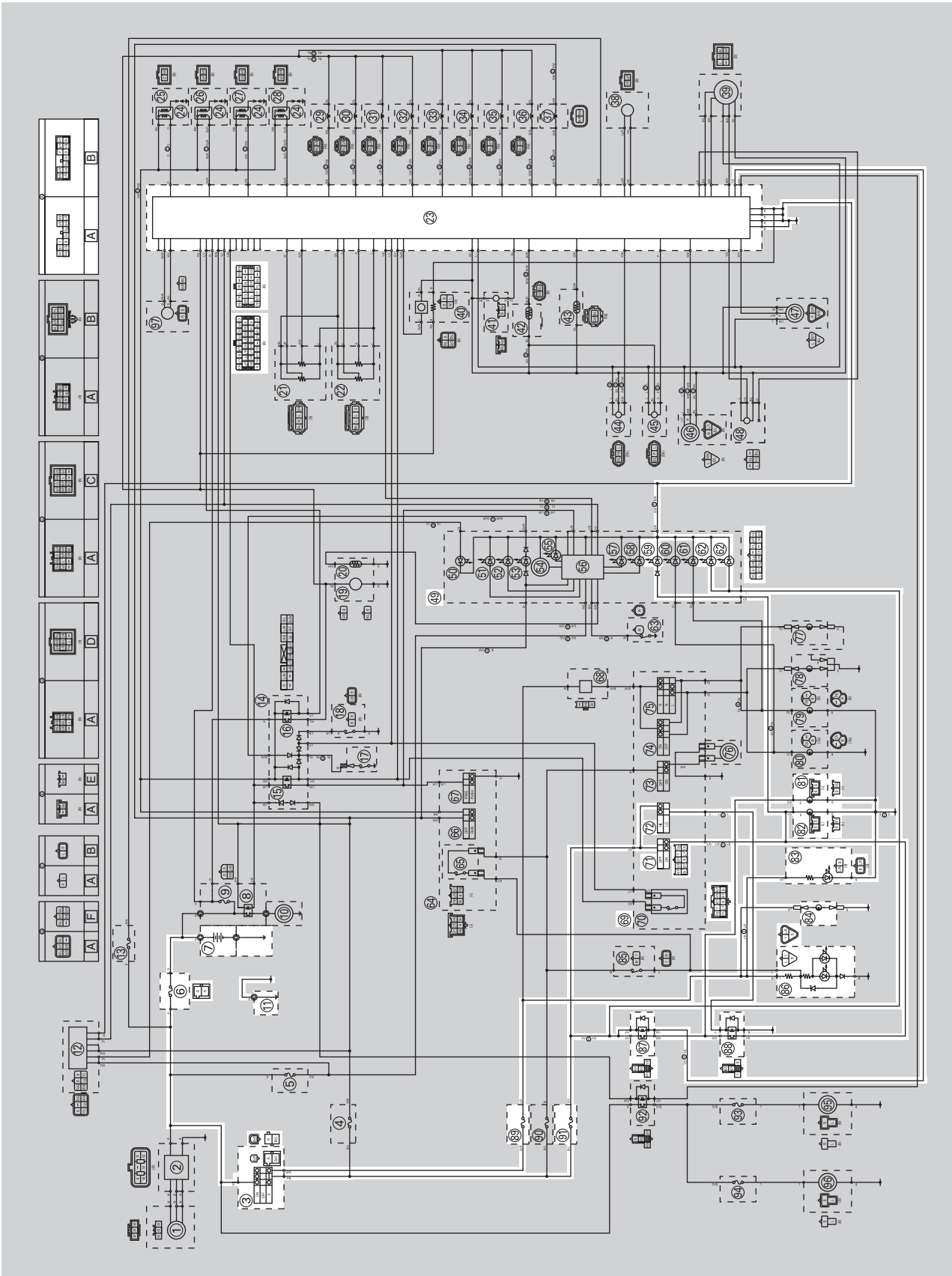
TIP

- Before troubleshooting, remove the following part(s):
 1. Rider seat
 2. Fuel tank
 3. Bottom cowlings

1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 8-88.	NG →	Replace the fuse.
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-89.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 8-97.	NG →	• Replace the stator coil assembly.
OK ↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 8-97.	NG →	Replace the rectifier/regulator.
OK ↓		
5. Check the entire charging system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-13.	NG →	Properly connect or replace the wiring harness.
OK ↓		
The charging system circuit is OK.		

EAS20075
LIGHTING SYSTEM

EAS30498
CIRCUIT DIAGRAM



- 3. Main switch
- 6. Main fuse
- 7. Battery
- 11.Engine ground
- 23.ECU (Engine Control Unit)
- 49.Meter assembly
- 59.High beam indicator light
- 62.Meter light
- 69.Handlebar switch (left)
- 71.Pass switch
- 72.Dimmer switch
- 81.Headlight (low beam)
- 82.Headlight (high beam)
- 83.Auxiliary light
- 84.License plate light
- 86.Tail/brake light
- 87.Headlight relay (on/off)
- 88.Headlight relay (dimmer)
- 89.Taillight fuse
- 91.Headlight fuse
- A. Wire harness
- B. Headlight sub-wire harness

EAS30499

TROUBLESHOOTING

Any of the following fail to light: headlight (high beam), headlight (low beam), high beam indicator light, taillight, license plate light, auxiliary light or meter light.

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank
3. Side cowlings
4. Rear cowling
5. Front cowling

1. Check the condition of each bulb and bulb socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-87.	NG →	Replace the bulb(s) and bulb socket(s).
OK ↓		
2. Check the fuses. (Main, headlight and taillight) Refer to "CHECKING THE FUSES" on page 8-88.	NG →	Replace the fuse(s).
OK ↓		
3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-89.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the main switch/immobilizer unit.
OK ↓		
5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	• The dimmer switch is faulty. • Replace the left handlebar switch.
OK ↓		
6. Check the pass switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	• The pass switch is faulty. • Replace the left handlebar switch.
OK ↓		
7. Check the headlight relay (on/off). Refer to "CHECKING THE RELAYS" on page 8-92.	NG →	Replace the headlight relay (on/off).
OK ↓		

LIGHTING SYSTEM

8. Check the headlight relay (dimmer).
Refer to "CHECKING THE RELAYS" on page 8-92.

NG →

Replace the headlight relay (dimmer).

OK ↓

9. Check the entire lighting system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-17.

NG →

Properly connect or replace the wiring harness.

OK ↓

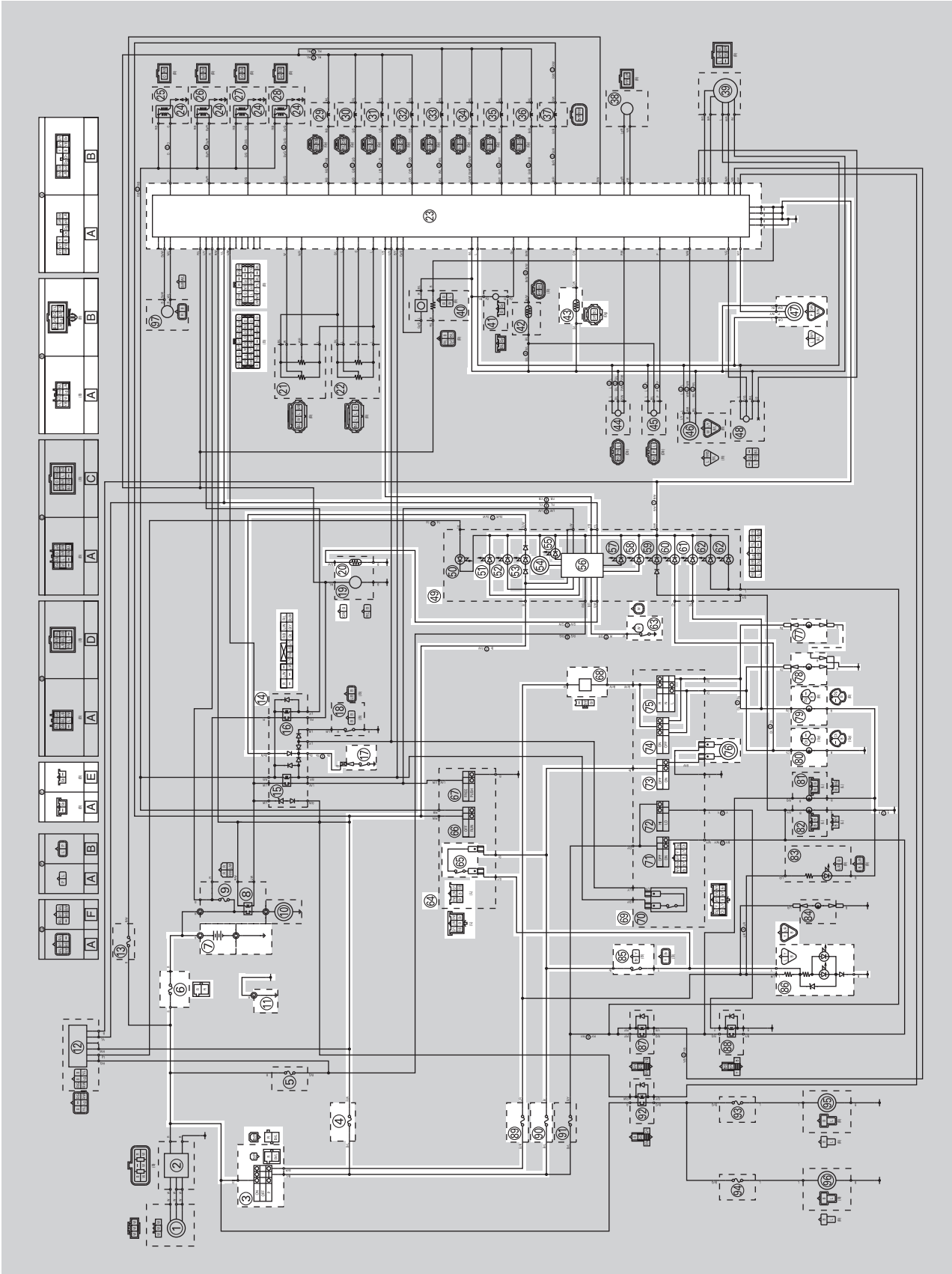
Replace the ECU, meter assembly, auxiliary light, or tail/brake light.

EAS20076

SIGNALING SYSTEM

EAS30500

CIRCUIT DIAGRAM



- 3. Main switch
- 4. Ignition fuse
- 6. Main fuse
- 7. Battery
- 11. Engine ground
- 14. Relay unit
- 17. Neutral switch
- 20. Fuel sender
- 23. ECU (Engine Control Unit)
- 43. Coolant temperature sensor
- 47. Speed sensor
- 49. Meter assembly
- 51. Fuel level warning light
- 52. Oil level warning light
- 53. Neutral indicator light
- 54. Tachometer
- 55. Shift timing indicator light
- 56. Multi-function meter
- 58. Coolant temperature warning light
- 60. Turn signal indicator light (left)
- 61. Turn signal indicator light (right)
- 63. Oil level switch
- 64. Handlebar switch (right)
- 65. Front brake light switch
- 68. Turn signal/hazard relay
- 69. Handlebar switch (left)
- 73. Horn switch
- 74. Hazard switch
- 75. Turn signal switch
- 76. Horn
- 77. Rear turn signal light (right)
- 78. Rear turn signal light (left)
- 79. Front turn signal light (right)
- 80. Front turn signal light (left)
- 85. Rear brake light switch
- 86. Tail/brake light
- 89. Taillight fuse
- 90. Signaling system fuse
- A. Wire harness
- B. Headlight sub-wire harness
- E. Neutral switch sub-wire harness

EAS30501

TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or indicator light.
- The horn fails to sound.
- The speedometer fail to operate

TIP

- Before troubleshooting, remove the following part(s):
 1. Rider seat
 2. Fuel tank
 3. Side cowlings
 4. Bottom cowlings
 5. Rear cowlings

1. Check the fuses. (Main, ignition, signaling system and taillight) Refer to "CHECKING THE FUSES" on page 8-88.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-89.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the main switch/immobilizer unit.
OK ↓		
4. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.	NG →	Properly connect or replace the wiring harness.
OK ↓		
Check the condition of each of the signaling system circuits. Refer to "Checking the signaling system".		

Checking the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-94.	NG →	• The horn switch is faulty. • Replace the left handlebar switch.
OK ↓		

SIGNALING SYSTEM

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the horn.

The tail/brake light fails to come on.

1. Check the front brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-85.

NG →

Replace the front brake light switch.

OK ↓

2. Check the rear brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-85.

NG →

Replace the rear brake light switch.

OK ↓

3. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the tail/brake light.

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 8-87.

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 8-85.

NG →

- The turn signal switch is faulty.
- Replace the left handlebar switch.

OK ↓

3. Check the hazard switch.
Refer to "CHECKING THE SWITCHES" on page 8-85.

NG →

- The hazard switch is faulty.
- Replace the left handlebar switch.

OK ↓

4. Check the turn signal/hazard relay.
Refer to "CHECKING THE TURN SIGNAL/HAZARD RELAY" on page 8-93.

NG →

Replace the turn signal/hazard relay.

OK ↓

SIGNALING SYSTEM

5. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the meter assembly.

The neutral indicator light fails to come.

1. Check the neutral switch.
Refer to "CHECKING THE SWITCHES" on page 8-85.

NG →

Replace the neutral switch.

OK ↓

2. Check the relay unit (diode).
Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-94.

NG →

Replace the relay unit.

OK ↓

3. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the meter assembly.

The oil level warning light fails to come.

1. Check the oil level switch.
Refer to "CHECKING THE OIL LEVEL SWITCH" on page 8-98.

NG →

Replace the oil level switch.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the meter assembly.

The fuel level warning light fails to come.

1. Check the fuel sender.
Refer to "CHECKING THE FUEL SENDER" on page 8-98.

NG →

Replace the fuel pump assembly.

OK ↓

SIGNALING SYSTEM

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the meter assembly.

The coolant temperature warning light fails to come.

1. Check the coolant temperature sensor.
Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-99.

NG →

Replace the coolant temperature sensor.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the ECU or meter assembly.

The speedometer fails to operate.

1. Check the speed sensor.

NG →

Replace the speed sensor.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the ECU or meter assembly.

The shift timing indicator light fails to come.

1. Check that the shift timing indicator light activation function is set correctly.
Refer to "INSTRUMENT FUNCTIONS" on page 1-6.

NG →

Set the shift timing indicator light activation function.

OK ↓

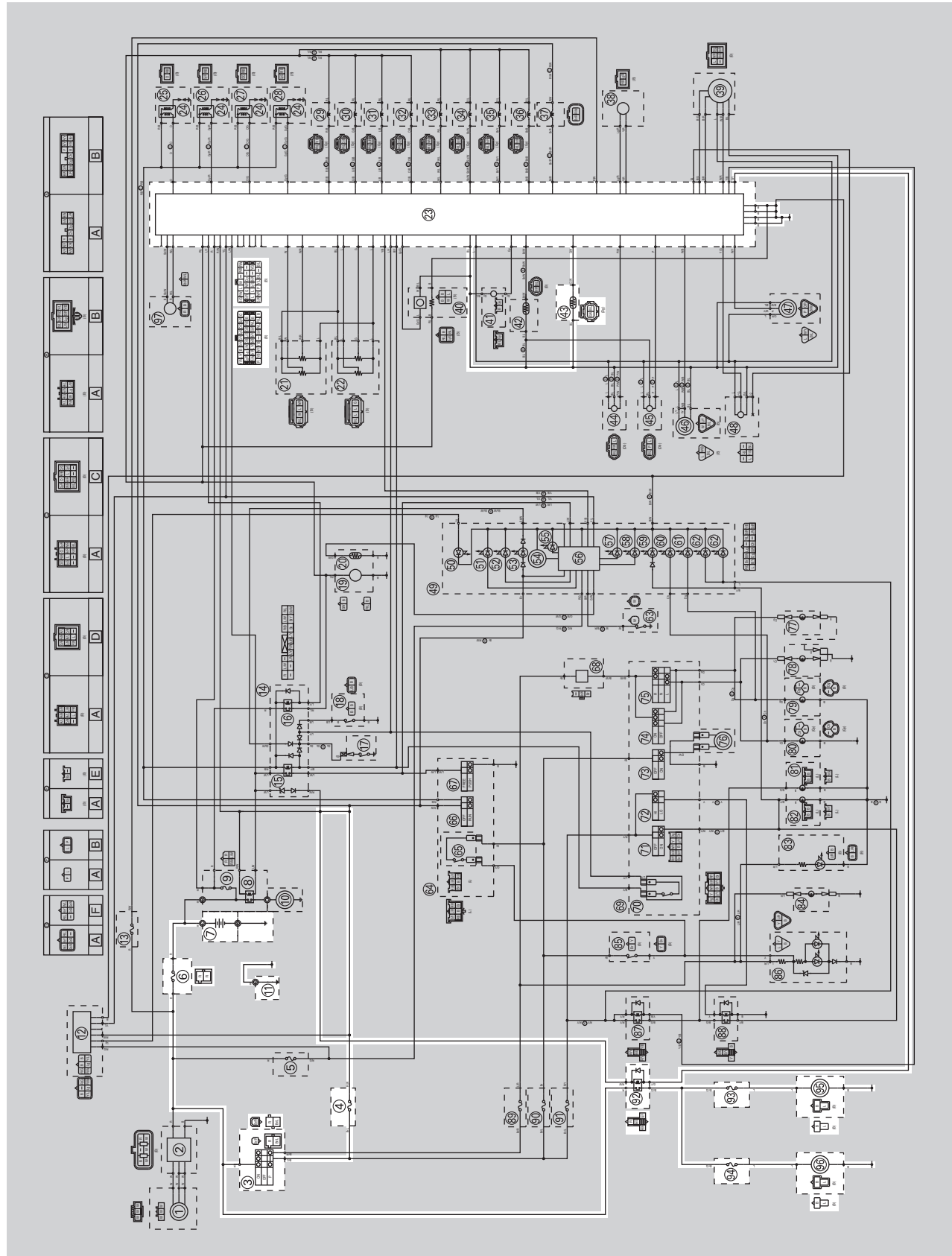
Replace the meter assembly.

EAS20077

COOLING SYSTEM

EAS30502

CIRCUIT DIAGRAM



- 3. Main switch
- 4. Ignition fuse
- 6. Main fuse
- 7. Battery
- 11.Engine ground
- 23.ECU (Engine Control Unit)
- 43.Coolant temperature sensor
- 92.Radiator fan motor relay
- 93.Radiator fan motor fuse (right)
- 94.Radiator fan motor fuse (left)
- 95.Radiator fan motor (right)
- 96.Radiator fan motor (left)

EAS30503

TROUBLESHOOTING

TIP

- Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank
3. Side cowlings

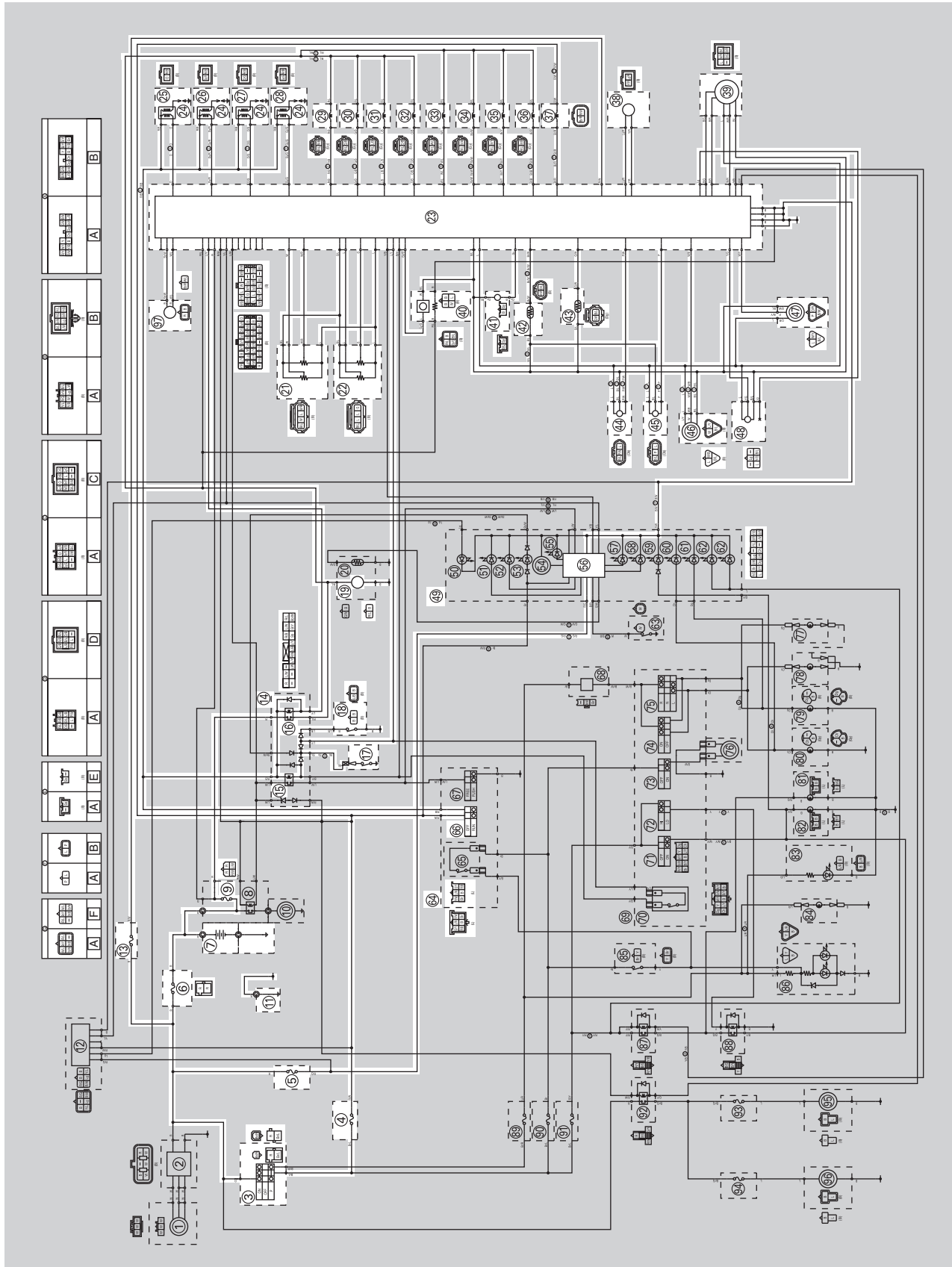
1. Check the fuses. (Main, ignition and radiator fan motor) Refer to "CHECKING THE FUSES" on page 8-88.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-89.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the main switch/immobilizer unit.
OK ↓		
4. Check the radiator fan motors. Refer to "CHECKING THE RADIATOR FAN MOTORS" on page 8-98.	NG →	Replace the radiator fan motor(s).
OK ↓		
5. Check the radiator fan motor relay. Refer to "CHECKING THE RELAYS" on page 8-92.	NG →	Replace the radiator fan motor relay.
OK ↓		
6. Check the coolant temperature. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-99.	NG →	Replace the coolant temperature sensor.
OK ↓		
7. Check the entire cooling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-27.	NG →	Properly connect or replace the wiring harness.
OK ↓		
Replace the ECU.		

EAS20078

FUEL INJECTION SYSTEM

EAS30504

CIRCUIT DIAGRAM



FUEL INJECTION SYSTEM

- 3. Main switch
- 4. Ignition fuse
- 5. Backup fuse (odometer, clock and immobilizer system)
- 6. Main fuse
- 7. Battery
- 9. Fuel injection system fuse
- 11. Engine ground
- 13. ETV fuse
- 14. Relay unit
- 15. Starting circuit cut-off relay
- 16. Fuel pump relay
- 17. Neutral switch
- 18. Sidestand switch
- 19. Fuel pump
- 21. Throttle position sensor (for throttle cable pulley)
- 22. Throttle position sensor (for throttle valves)
- 23. ECU (Engine Control Unit)
- 24. Spark plug
- 25. Ignition coil #1
- 26. Ignition coil #2
- 27. Ignition coil #3
- 28. Ignition coil #4
- 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. Air induction system solenoid
- 38. Throttle servo motor
- 39. EXUP servo motor
- 40. O₂ sensor
- 41. Crankshaft position sensor
- 42. Intake air temperature sensor
- 43. Coolant temperature sensor
- 44. Intake air pressure sensor
- 45. Atmospheric pressure sensor
- 46. Cylinder identification sensor
- 47. Speed sensor
- 48. Lean angle sensor
- 49. Meter assembly
- 56. Multi-function meter
- 64. Handlebar switch (right)
- 66. Engine stop switch
- 97. Intake funnel servo motor
- A. Wire harness
- B. Headlight sub-wire harness
- C. Ignition sub-wire harness
- D. Primary injector sub-wire harness
- E. Neutral switch sub-wire harness
- F. Secondary injector sub-wire harness

EAS30505

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 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 fuel injection system operation

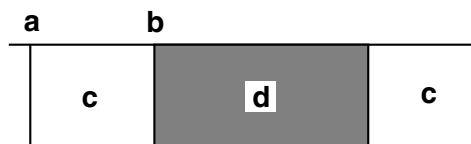
Warning light indication	ECU operation	Fuel injection operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Cannot be operated
Remains on	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	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 (memory check error)

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.



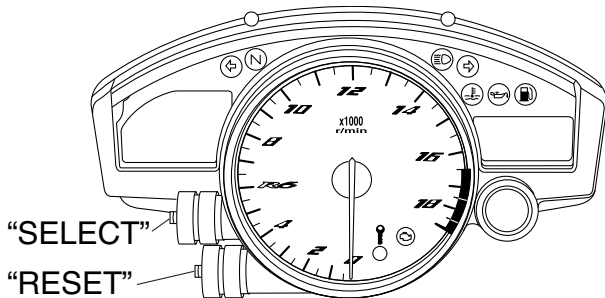
- Main switch "OFF"
- Main switch "ON"
- Engine trouble warning light off
- Engine trouble warning light on for 1.4 seconds

EAS30507

DIAGNOSTIC MODE

Setting the diagnostic mode

1. Turn the main switch to "OFF".
2. Disconnect the wire harness coupler from the fuel pump.
3. 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.



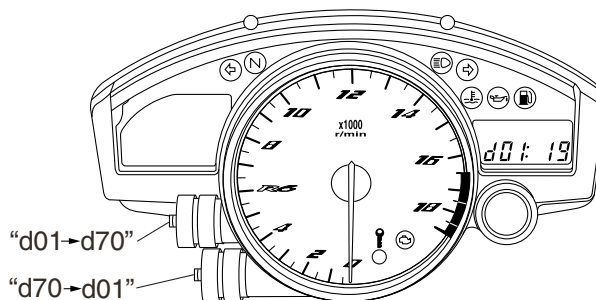
TIP

- All displays on the meter disappear except the odometer/trip meter/fuel reserve trip meter/stopwatch display.
- "dIAG" appears on the odometer/trip meter/fuel reserve trip meter/stopwatch LCD.

4. Press the "SELECT" button to select the diagnostic mode "dIAG".
5. After selecting "dIAG", simultaneously press the "SELECT" and "RESET" buttons for 2 seconds or more to activate the diagnostic mode. The diagnostic code number "d01" appears on the clock LCD.
6. Select the diagnostic code number corresponding to the fault code number by pressing the "SELECT" and "RESET" buttons.

TIP

- To decrease the selected diagnostic code number, press the "RESET" button. Press the "RESET" button for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the "SELECT" button. Press the "SELECT" button for 1 second or longer to automatically increase the diagnostic code numbers.



7. Verify the operation of the sensor or actuator.
 - Sensor operation
The data representing the operating conditions of the sensor appears on the odometer/trip meter/fuel reserve trip meter/stopwatch LCD.
 - Actuator operation
Set the engine stop switch to "○" to operate the actuator.

TIP

If the engine stop switch is set to "○", set it to "✕", and then set it to "○" again.

8. Turn the main switch to "OFF" to cancel the diagnostic mode.

EAS30508

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 have been completed, reset the meter display according to the reinstatement method.

Fault code No.:

Fault code number displayed on the meter when the engine failed to work normally.

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-5.

Fault code No. 11

Fault code No.	11		
Item	Cylinder identification sensor: no normal signals are received from the cylinder identification sensor when the engine is started or while the vehicle is being driven.		
Fail-safe system	Unable to start engine		
	Able to drive vehicle		
Diagnostic code No.	—		
Meter display	—		
Procedure	—		
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed condition of cylinder identification sensor.	Check for looseness or pinching.	Cranking the engine.
2	Connections • Cylinder identification sensor coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between the cylinder identification sensor coupler and ECU coupler. (blue—blue) (white/black—white/black) (black/blue—black/blue)	
4	Defective cylinder identification sensor.	• Replace if defective. Refer to "CHECKING THE CYLINDER IDENTIFICATION SENSOR" on page 8-100.	

FUEL INJECTION SYSTEM

Fault code No. 12

Fault code No.		12	
Item		Crankshaft position sensor: no normal signals are received from the crankshaft position sensor.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed condition of crankshaft position sensor.	Check for looseness or pinching.	Cranking the engine.
2	Connections • Crankshaft position sensor coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between the crankshaft position sensor coupler and ECU coupler. (gray–gray) (black/blue–black/blue)	
4	Defective crankshaft position sensor.	• Replace if defective. Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” on page 8-96.	

FUEL INJECTION SYSTEM

Fault code No. 13

Fault code No.		13	
Item		Intake air pressure sensor: open or short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		03	
Meter display		Displays the intake air pressure.	
Procedure		Compare the actually measured atmospheric pressure with the meter display value without cranking the engine.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections - Intake air pressure sensor coupler - Main wire harness ECU coupler	- Check the couplers for any pins that may be pulled out. - Check the locking condition of the couplers. - If there is a malfunction, repair it and connect the coupler securely.	Reinstated automatically if a normal signal is received.
2	Open or short circuit in wire harness and/or sub-wire-harness 2.	- Replace if there is an open or short circuit. - Between intake air pressure sensor coupler and ECU coupler. (black/blue–black/blue) (pink/white–pink/white) (blue–blue)	
3	Defective intake air pressure sensor.	- Execute the diagnostic mode. (Code No. 03) - Replace if defective.	

Fault code No. 14

Fault code No.		14	
Item		Intake air pressure sensor: hose system malfunction (clogged or detached hose).	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		03	
Meter display		Displays the intake air pressure.	
Procedure		Compare the actually measured atmospheric pressure with the meter display value without cranking the engine.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Intake air pressure sensor hose	- Check the intake air pressure sensor hose condition. - Repair or replace the sensor hose.	Cranking the engine.
2	Defective intake air pressure sensor.	- Execute the diagnostic mode. (Code No. 03) - Replace if defective.	

FUEL INJECTION SYSTEM

Fault code No. 15

Fault code No.		15	
Item		Throttle position sensor (for throttle valves): open or short circuit detected.	
Fail-safe system		Able/Unable to start engine	
		Able/Unable to drive vehicle	
Diagnostic code No.		01, 13	
01	Meter display	Throttle position sensor (for throttle valves) signal 1 • 12–21 (fully closed position) • 97–106 (fully opened position)	
	Procedure	• Check with throttle valves fully closed. • Check with throttle valves fully opened.	
13	Meter display	Throttle position sensor (for throttle valves) signal 2 • 9–23 (fully closed position) • 94–108 (fully open position)	
	Procedure	• Check with throttle valves fully closed. • Check with throttle valves fully opened.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed condition of throttle position sensor (for throttle valves).	• Check for looseness or pinching. • Check that the sensor is installed in the specified position.	Turning the main switch to "ON".
2	Connections • Throttle position sensor (for throttle valves) coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between throttle position sensor (for throttle valves) coupler and ECU coupler. (black/blue–black/blue) (blue–blue) (blue–blue) (green–green)	
4	Defective throttle position sensor (for throttle valves).	• Execute the diagnostic mode. (Code Nos. 01, 13) • Replace if defective.	

FUEL INJECTION SYSTEM

Fault code No. 17

Fault code No.		17	
Item		EXUP servo motor circuit: open or short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		53	
Actuation		Actuates the servo motor (turns to open side and to closed side). Illuminates the engine trouble warning light.	
Procedure		Check the operating sound.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections - EXUP servo motor coupler - Main wire harness ECU coupler	- Check the couplers for any pins that may be pulled out. - Check the locking condition of the couplers. - If there is a malfunction, repair it and connect the coupler securely.	Reinstated automatically if a normal signal is received.
2	Open or short circuit in wire harness.	- Replace if there is an open or short circuit. - Between EXUP servo motor coupler and ECU coupler. (blue–blue) (white/red–white/red) (black/blue–black/blue)	
3	Defective EXUP servo motor (potentiometer circuit).	- Execute the diagnostic mode. (Code No. 53) - Replace if defective.	

FUEL INJECTION SYSTEM

Fault code No. 18

Fault code No.		18	
Item		EXUP servo motor: EXUP servo motor is stuck.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		53	
Actuation		Actuates the servo motor (turns to open side and to closed side). Illuminates the engine trouble warning light.	
Procedure		Check the operating sound.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections - EXUP servo motor coupler - Main wire harness ECU coupler	- Check the couplers for any pins that may be pulled out. - Check the locking condition of the couplers. - If there is a malfunction, repair it and connect the coupler securely.	Turning the main switch to "ON". It takes 3 seconds at the maximum before the original state returns.
2	Open or short circuit in wire harness.	- Replace if there is an open or short circuit. - Between EXUP servo motor coupler and ECU coupler. (black/green–black/green) (black/red–black/red)	
3	Defective EXUP servo motor (potentiometer circuit).	- Execute the diagnostic mode. (Code No. 53) - Replace if defective.	
4	Defective EXUP valve, pulley, and cables.	Replace if defective.	

FUEL INJECTION SYSTEM

Fault code No. 19

Fault code No.		19	
Item		Sidestand switch: open circuit is detected in the input line from the sidestand switch to the ECU.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		20	
Meter display		Sidestand switch • ON (sidestand retracted) • OFF (sidestand extended)	
Procedure		Set ON/OFF the sidestand switch (with the transmission in gear).	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Main wire harness ECU coupler	• Execute the diagnostic mode. (Code No. 20) • Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	If the transmission is in gear, retracting the sidestand. If the transmission is in neutral, reconnecting the wiring.
2	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between ECU coupler and relay unit coupler. (blue/yellow–blue/yellow) • Between relay unit coupler and sidestand switch coupler. (blue/black–blue/black) • Between sidestand switch coupler and engine ground. (black–black)	
3	Defective sidestand switch.	• Replace if defective. Refer to “CHECKING THE SWITCHES” on page 8-85.	

FUEL INJECTION SYSTEM

Fault code No. 20

Fault code No.		20	
Item		Intake air pressure sensor or atmospheric pressure sensor: when the main switch is turned to "ON", the atmospheric pressure sensor voltage and intake air pressure sensor voltage differ greatly.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		03, 02	
03	Meter display	Displays intake air pressure.	
	Procedure	Compare the actually measured atmospheric pressure with the meter display value without cranking the engine.	
02	Meter display	Displays the atmospheric pressure.	
	Procedure	Compare the actually measured atmospheric pressure with the meter display value.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Defective intake air pressure sensor or atmospheric pressure sensor.	- Execute the diagnostic mode. (Code Nos. 03, 02) - Replace if defective.	Turning the main switch to "ON".

Fault code No. 21

Fault code No.		21	
Item		Coolant temperature sensor: open or short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		06	
Meter display		Displays the coolant temperature.	
Procedure		Compare the actually measured coolant temperature with the meter display value.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections - Coolant temperature sensor coupler - Main wire harness ECU coupler	- Check the couplers for any pins that may be pulled out. - Check the locking condition of the couplers. - If there is a malfunction, repair it and connect the coupler securely.	Reinstated automatically if a normal signal is received.
2	Open or short circuit in wire harness.	- Replace if there is an open or short circuit. - Between coolant temperature sensor coupler and ECU coupler. (green/white–green/white) (black/blue–black/blue)	
3	Defective coolant temperature sensor.	- Execute the diagnostic mode. (Code No. 66) - Replace if defective. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-99.	

FUEL INJECTION SYSTEM

Fault code No. 22

Fault code No.		22	
Item		Intake air temperature sensor: open or short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		05	
Meter display		Displays the intake air temperature.	
Procedure		Compare the actually measured intake air temperature with the meter display value.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Intake air temperature sensor coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Reinstated automatically if a normal signal is received.
2	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between intake air temperature sensor coupler and ECU coupler. (brown/white—brown/white) (black/blue—black/blue)	
3	Defective intake air temperature sensor.	• Execute the diagnostic mode. (Code No. 05) • Replace if defective. Refer to "CHECKING THE INTAKE AIR TEMPERATURE SENSOR" on page 8-101.	

FUEL INJECTION SYSTEM

Fault code No. 23

Fault code No.		23	
Item		Atmospheric pressure sensor: open or short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		02	
Meter display		Displays the atmospheric pressure.	
Procedure		Compare the actually measured atmospheric pressure with the meter display value.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Atmospheric pressure sensor coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Reinstated automatically if a normal signal is received.
2	Open or short circuit in wire harness and/or sub-wire-harness 2.	• Replace if there is an open or short circuit. • Between atmospheric pressure sensor coupler and ECU coupler. (black/blue–black/blue) (pink–pink) (blue–blue)	
3	Defective atmospheric pressure sensor.	• Execute the diagnostic mode. (Code No. 02) • Replace if defective.	

FUEL INJECTION SYSTEM

Fault code No. 24

Fault code No.		24	
Item		O ₂ sensor: no normal signals are received from the O ₂ sensor.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed state of O ₂ sensor.	Check for looseness or pinching.	Execute the diagnostic mode (Code No. 63). (Set the engine stop switch to "○".)
2	Connections • O₂ sensor coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between O₂ sensor coupler and ECU coupler. (gray/green–gray/green) (black/blue–black/blue) (black–black) (red/blue–red/blue)	
4	Continuity of wire harness.	• Refer to "THROTTLE BODIES" on page 7-9.	
5	Defective O ₂ sensor.	• Replace if defective.	

FUEL INJECTION SYSTEM

Fault code No. 30

Fault code No.		30	
Item		Latch up detected.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		08	
Meter display		Lean angle sensor output voltage • 0.4–1.4 (upright) • 3.7–4.4 (overturned)	
Procedure		Remove the lean angle sensor and incline it more than 65 degrees.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	The vehicle has overturned.	Raise the vehicle upright.	Turning the main switch to "ON" (however, the engine cannot be restarted unless the main switch is first turned to "OFF").
2	Installed state of the lean angle sensor.	Check the installed direction and condition of the sensor.	
3	Defective lean angle sensor.	• Execute the diagnostic mode. (Code No. 08) • Replace if defective. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-96.	

FUEL INJECTION SYSTEM

Fault code No. 33

Fault code No.		33	
Item		Cylinder-#1 ignition coil: open or short circuit detected in the primary lead of the cylinder-#1 ignition coil.	
Fail-safe system		Able to start engine (depending on the number of faulty cylinders)	
		Able to drive vehicle (depending on the number of faulty cylinders)	
Diagnostic code No.		30	
Actuation		Actuates the cylinder-#1 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	
Procedure		Check the spark five times. • Connect an ignition checker.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Cylinder-#1 ignition coil coupler • Main wire harness ECU coupler • Ignition sub-wire harness coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Cranking the engine. (Connect the cylinder-#1 ignition coil coupler.)
2	Open or short circuit in wire harness and/or ignition sub-wire harness.	• Replace if there is an open or short circuit. • Between cylinder-#1 ignition coil coupler and ECU coupler. (red/black–red/black) (orange–orange)	
3	Defective cylinder-#1 ignition coil.	• Execute the diagnostic mode. (Code No. 30) • Test the primary and secondary coils for continuity. • Replace if defective. Refer to “CHECKING THE IGNITION COILS” on page 8-95.	

FUEL INJECTION SYSTEM

Fault code No. 34

Fault code No.		34	
Item		Cylinder-#2 ignition coil: open or short circuit detected in the primary lead of the cylinder-#2 ignition coil.	
Fail-safe system		Able to start engine (depending on the number of faulty cylinders)	
		Able to drive vehicle (depending on the number of faulty cylinders)	
Diagnostic code No.		31	
Actuation		Actuates the cylinder-#2 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	
Procedure		Check the spark five times. • Connect an ignition checker.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Cylinder-#2 ignition coil coupler • Main wire harness ECU coupler • Ignition sub-wire harness coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Cranking the engine. (Connect the cylinder-#2 ignition coil coupler.)
2	Open or short circuit in wire harness and/or ignition sub-wire harness.	• Replace if there is an open or short circuit. • Between cylinder-#2 ignition coil coupler and ECU coupler. (red/black–red/black) (gray/red–gray/red)	
3	Defective cylinder-#2 ignition coil.	• Execute the diagnostic mode. (Code No. 31) • Test the primary and secondary coils for continuity. • Replace if defective. Refer to “CHECKING THE IGNITION COILS” on page 8-95.	

FUEL INJECTION SYSTEM

Fault code No. 35

Fault code No.		35	
Item		Cylinder-#3 ignition coil: open or short circuit detected in the primary lead of the cylinder-#3 ignition coil.	
Fail-safe system		Able to start engine (depending on the number of faulty cylinders)	
		Able to drive vehicle (depending on the number of faulty cylinders)	
Diagnostic code No.		32	
Actuation		Actuates the cylinder-#3 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	
Procedure		Check the spark five times. • Connect an ignition checker.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Cylinder-#3 ignition coil coupler • Main wire harness ECU coupler • Ignition sub-wire harness coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Cranking the engine. (Connect the cylinder-#3 ignition coil coupler.)
2	Open or short circuit in wire harness and/or ignition sub-wire harness.	• Replace if there is an open or short circuit. • Between cylinder-#3 ignition coil coupler and ECU coupler. (red/black–red/black) (orange/green–orange/green)	
3	Defective cylinder-#3 ignition coil.	• Execute the diagnostic mode. (Code No. 32) • Test the primary and secondary coils for continuity. • Replace if defective. Refer to “CHECKING THE IGNITION COILS” on page 8-95.	

FUEL INJECTION SYSTEM

Fault code No. 36

Fault code No.		36	
Item		Cylinder-#4 ignition coil: open or short circuit detected in the primary lead of the cylinder-#4 ignition coil.	
Fail-safe system		Able to start engine (depending on the number of faulty cylinders)	
		Able to drive vehicle (depending on the number of faulty cylinders)	
Diagnostic code No.		33	
Actuation		Actuates the cylinder-#4 ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	
Procedure		Check the spark five times. • Connect an ignition checker.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Cylinder-#4 ignition coil coupler • Main wire harness ECU coupler • Ignition sub-wire harness coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Cranking the engine. (Connect the cylinder-#4 ignition coil coupler.)
2	Open or short circuit in wire harness and/or ignition sub-wire harness.	• Replace if there is an open or short circuit. • Between cylinder-#4 ignition coil coupler and ECU coupler. (red/black-red/black) (gray/green-gray/green)	
3	Defective cylinder-#4 ignition coil.	• Execute the diagnostic mode. (Code No. 33) • Test the primary and secondary coils for continuity. • Replace if defective. Refer to "CHECKING THE IGNITION COILS" on page 8-95.	

FUEL INJECTION SYSTEM

Fault code No. 39

Fault code No.		39	
Item		Primary injector: open or short circuit detected.	
Fail-safe system		Able to start engine (depending on the number of faulty cylinders)	
		Able to drive vehicle (depending on the number of faulty cylinders)	
Diagnostic code No.		36, 37, 38, 39	
36	Actuation	Actuates the primary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Procedure	Check the operating sound of the primary injector #1 five times.	
37	Actuation	Actuates the primary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Procedure	Check the operating sound of the primary injector #2 five times.	
38	Actuation	Actuates the primary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Procedure	Check the operating sound of the primary injector #3 five times.	
39	Actuation	Actuates the primary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Procedure	Check the operating sound of the primary injector #4 five times.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Primary injector coupler • Main wire harness ECU coupler • Primary injector sub-wire harness coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Cranking the engine. (Connect the fuel injector couplers.)
2	Open or short circuit in wire harness and/or primary injector sub-wire harness.	• Replace if there is an open or short circuit. • Between primary injector coupler and ECU coupler. (red/blue-red/blue) #1: (red/black-red/black) #2: (green/black-green/black) #3: (blue/black-blue/black) #4: (orange/black-orange/black)	
3	Defective primary injector.	• Execute the diagnostic mode. (Code Nos. 36, 37, 38, 39) • Replace if defective. Refer to "CHECKING THE PRIMARY INJECTORS" on page 7-11.	

FUEL INJECTION SYSTEM

Fault code No. 40

Fault code No.		40	
Item		Secondary injector: open circuit detected.	
Fail-safe system		Able to start engine (depending on the number of faulty cylinders)	
		Able to drive vehicle (depending on the number of faulty cylinders)	
Diagnostic code No.		40, 41, 42, 43	
40	Actuation	Actuates the secondary injector #1 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Procedure	Check the operating sound of the secondary injector #1 five times.	
41	Actuation	Actuates the secondary injector #2 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Procedure	Check the operating sound of the secondary injector #2 five times.	
42	Actuation	Actuates the secondary injector #3 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Procedure	Check the operating sound of the secondary injector #3 five times.	
43	Actuation	Actuates the secondary injector #4 five times at one-second intervals. Illuminates the engine trouble warning light.	
	Procedure	Check the operating sound of the secondary injector #4 five times.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Secondary injector coupler • Main wire harness ECU coupler • Secondary injector sub-wire harness coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Execute the diagnostic mode (Code No. 63). (Set the engine stop switch to "○".)
2	Open or short circuit in wire harness and/or secondary injector sub-wire harness.	• Replace if there is an open or short circuit. • Between secondary injector coupler and ECU coupler. (red/blue-red/blue) #1: (white/blue-white/blue) #2: (sky blue/white-sky blue/white) #3: (brown/yellow-brown/yellow) #4: (brown/black-brown/black)	
3	Defective secondary injector.	• Execute the diagnostic mode. (Code Nos. 40, 41, 42, 43) • Replace if defective. Refer to "CHECKING THE SECONDARY INJECTORS" on page 7-6.	

FUEL INJECTION SYSTEM

Fault code No. 41

Fault code No.		41	
Item		Lean angle sensor: open or short circuit detected.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		08	
Meter display		Lean angle sensor output voltage • 0.4–1.4 (upright) • 3.7–4.4 (overturned)	
Procedure		Remove the lean angle sensor and incline it more than 65 degrees.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections - Lean angle sensor coupler - Main wire harness ECU coupler	- Check the couplers for any pins that may be pulled out. - Check the locking condition of the couplers. - If there is a malfunction, repair it and connect the coupler securely.	Reinstated automatically if a normal signal is received.
2	Open or short circuit in lead.	- Replace if there is an open or short circuit. - Between lean angle sensor coupler and ECU coupler. (blue–blue) (yellow/green–yellow/green) (black/blue–black/blue) (light green–light green)	
3	Defective lean angle sensor.	- Execute the diagnostic mode. (Code No. 08) - Replace if defective. Refer to “CHECKING THE LEAN ANGLE SENSOR” on page 8-96.	

FUEL INJECTION SYSTEM

Fault code No. 42

Fault code No.		42	
Item	A	Speed sensor: no normal signals are received from the speed sensor.	
	B	Neutral switch: open circuit is detected in the neutral switch.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		07	
Meter display		Vehicle speed pulse 0–999	
Procedure		Check that the number increases when the rear wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
A-1	Installed state of speed sensor.	Check for looseness or pinching.	Starting the engine, and activating the speed sensor by operating the vehicle.
A-2	Connections • Speed sensor coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	
A-3	Open or short circuit in lead.	• Replace if there is an open or short circuit. • Between speed sensor coupler and ECU coupler. (blue–blue) (white/yellow–white/yellow) (black/blue–black/blue)	
A-4	Defective speed sensor.	• Execute the diagnostic mode. (Code No. 07) • Replace if defective.	

FUEL INJECTION SYSTEM

Fault code No.		42	
Item	A	Speed sensor: no normal signals are received from the speed sensor.	
	B	Neutral switch: open circuit is detected in the neutral switch.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		21	
Meter display		Neutral switch • ON (neutral) • OFF (in gear)	
Procedure		Shift the transmission.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
B-1	Installed state of neutral switch.	Check for looseness or pinching.	Starting the engine, and activating the speed sensor by operating the vehicle.
B-2	Connections • Neutral switch coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	
B-3	Open circuit in neutral switch lead.	• Replace if there is an open or short circuit. • Between neutral switch coupler and relay unit coupler. (sky blue–sky blue) • Between relay unit coupler and ECU coupler. (blue/yellow–blue/yellow)	
B-4	Defective neutral switch.	• Execute the diagnostic mode. (Code No. 21) • Replace if defective. Refer to “CHECKING THE SWITCHES” on page 8-85.	
B-5	Faulty shift drum (neutral detection area).	• Replace if defective. Refer to “TRANSMISSION” on page 5-72.	

FUEL INJECTION SYSTEM

Fault code No. 43

Fault code No.		43	
Item		Fuel system voltage: power supply to the injectors and fuel pump is not normal.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		09	
Meter display		Fuel system voltage (battery voltage) Approximately 12.0	
Procedure		Set the engine stop switch to “○”, and then compare with the actually measured battery voltage. (If the battery voltage is lower, recharge the battery.)	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections - Relay unit coupler (fuel pump relay) - Main wire harness ECU coupler	- Check the couplers for any pins that may be pulled out. - Check the locking condition of the couplers. - If there is a malfunction, repair it and connect the coupler securely.	Turning the main switch to “ON” when the engine stop switch is set to “○”.
2	Open or short circuit in wire harness.	- Replace if there is an open or short circuit. - Between relay unit coupler and ECU coupler. (blue/yellow–blue/yellow) (red/blue–red/blue) - Between relay unit coupler and starter relay coupler. (red–red) - Between relay unit coupler and right handlebar switch coupler. (red/black–red/black)	
3	Malfunction or open circuit in fuel pump relay.	- Execute the diagnostic mode. (Code No. 09) - Replace if defective. - If there is no malfunction with the fuel pump relay, replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No. 44

Fault code No.		44	
Item		Error in writing the amount of CO adjustment on EEPROM: an error is detected while reading or writing on EEPROM (CO adjustment value).	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		60	
Meter display		EEPROM fault cylinder No. • 00 (no history) • 01–04: Cylinder fault code number (history exists) If more than one cylinder is defective, the display changes every two seconds to show all the detected cylinder numbers. When all cylinder numbers are shown, the display repeats.	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Malfunction in ECU.	- Set the faulty cylinder's exhaust gas volume. - Execute the diagnostic mode (Code No. 60) to check the faulty cylinder number. (If multiple cylinders are defective, the numbers of the faulty cylinders are displayed alternately at 2-second intervals.) - Execute the CO adjustment mode and set the exhaust gas volume of the faulty cylinder to "0". Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-10. - Replace ECU if it does not recover from the malfunction.	Turning the main switch to "ON". (Readjust the exhaust gas volume after it is reinstated.)

FUEL INJECTION SYSTEM

Fault code No. 46

Fault code No.		46	
Item		Vehicle system power supply (monitoring voltage): power supply is not normal.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Malfunction in rectifier/regulator	Replace if defective. Refer to “CHARGING SYSTEM” on page 8-13.	Starting the engine and operating it at idle.
2	Open or short circuit in wire harness.	Replace if there is an open or short circuit in the charging system's wiring. Refer to “CHARGING SYSTEM” on page 8-13.	

Fault code No. 50

TIP

Be sure to turn the main switch to “OFF” before replacing the ECU.

Fault code No.		50	
Item		ECU internal malfunction: ECU memory is faulty. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	
Fail-safe system		Able/Unable to start engine	
		Able/Unable to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Malfunction in ECU.	Replace the ECU.	Turning the main switch to “ON”.

FUEL INJECTION SYSTEM

Fault code No. 59

Fault code No.		59	
Item		Throttle position sensor (for throttle cable pulley): open or short circuit detected. Throttle position sensor (for throttle cable pulley): coupler connection is loose.	
Fail-safe system		Able/Unable to start engine	
		Able/Unable to drive vehicle	
Diagnostic code No.		14, 15	
14	Meter display	Throttle position sensor (for throttle cable pulley) signal 1 • 12–22 (fully closed position) • 97–107 (fully open position)	
	Procedure	• Check with throttle grip fully closed. • Check with throttle grip fully opened.	
15	Meter display	Throttle position sensor (for throttle cable pulley) signal 2 • 10–24 (fully closed position) • 95–109 (fully open position)	
	Procedure	• Check with throttle grip fully closed. • Check with throttle grip fully opened.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed state of throttle position sensor (for throttle cable pulley).	• Check for looseness or pinching. • Check that the sensor is installed in the specified position.	Turning the main switch to "ON".
2	Connections • Throttle position sensor (for throttle cable pulley) coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between throttle position sensor (for throttle cable pulley) coupler and ECU coupler. (black/blue–black/blue) (white–white) (white/red–white/red) (blue–blue)	
4	Defective throttle position sensor (for throttle cable pulley).	• Execute the diagnostic mode. (Code Nos. 14, 15) • Replace if defective.	

FUEL INJECTION SYSTEM

Fault code No. 60

Fault code No.		60	
Item		Throttle servo motor: open or short circuit detected. Motor is defective or ECU internal malfunction.	
Fail-safe system		Able/Unable to start engine	
		Able/Unable to drive vehicle	
Diagnostic code No.		01, 13	
01	Meter display	Throttle position sensor (for throttle valves) signal 1 • 12–21 (fully closed position) • 97–106 (fully open position)	
	Procedure	• Check with throttle valves fully closed. • Check with throttle valves fully opened.	
13	Meter display	Throttle position sensor (for throttle valves) signal 2 • 9–23 (fully closed position) • 94–108 (fully open position)	
	Procedure	• Check with throttle valve fully closed. • Check with throttle valve fully opened.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Blown ETV (Electrical Throttle Valve) fuse.	Checking the ETV (Electrical Throttle Valve) Fuse. Refer to "CHECKING THE FUSES" on page 8-88.	Turning the main switch to "ON".
2	Installed state of throttle position sensor (for throttle valves).	• Check for looseness or pinching. • Check that the sensor is installed in the specified position.	
3	Connections • Throttle servo motor coupler • Main wire harness ECU coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	
4	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between throttle servo motor coupler and ECU coupler. (yellow/red–yellow/red) (light green/red–light green/red)	
5	Defective throttle servo motor.	• Execute the diagnostic mode. (Code Nos. 01, 13) • Replace the throttle body assembly if defective.	
6	Malfunction in ECU.	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No. Er-1

Fault code No.		Er-1	
Item		ECU internal malfunction (output signal error): no signals are received from the ECU.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Main wire harness ECU coupler • Main wire harness meter assembly coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Turning the main switch to "ON".
2	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between meter assembly coupler and ECU coupler. (yellow/blue–yellow/blue)	
3	Malfunction in meter assembly.	Replace the meter assembly.	
4	Malfunction in ECU.	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No. Er-2

Fault code No.		Er-2	
Item		ECU internal malfunction (output signal error): no signals are received from the ECU within the specified duration.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Main wire harness ECU coupler • Main wire harness meter assembly coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Turning the main switch to "ON".
2	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between meter assembly coupler and ECU coupler. (yellow/blue–yellow/blue)	
3	Malfunction in meter assembly.	Replace the meter assembly.	
4	Malfunction in ECU.	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No. Er-3

Fault code No.		Er-3	
Item		ECU internal malfunction (output signal error): data from the ECU cannot be received correctly.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Main wire harness ECU coupler • Main wire harness meter assembly coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Turning the main switch to "ON".
2	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between meter assembly coupler and ECU coupler. (yellow/blue–yellow/blue)	
3	Malfunction in meter assembly.	Replace the meter assembly.	
4	Malfunction in ECU.	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No. Er-4

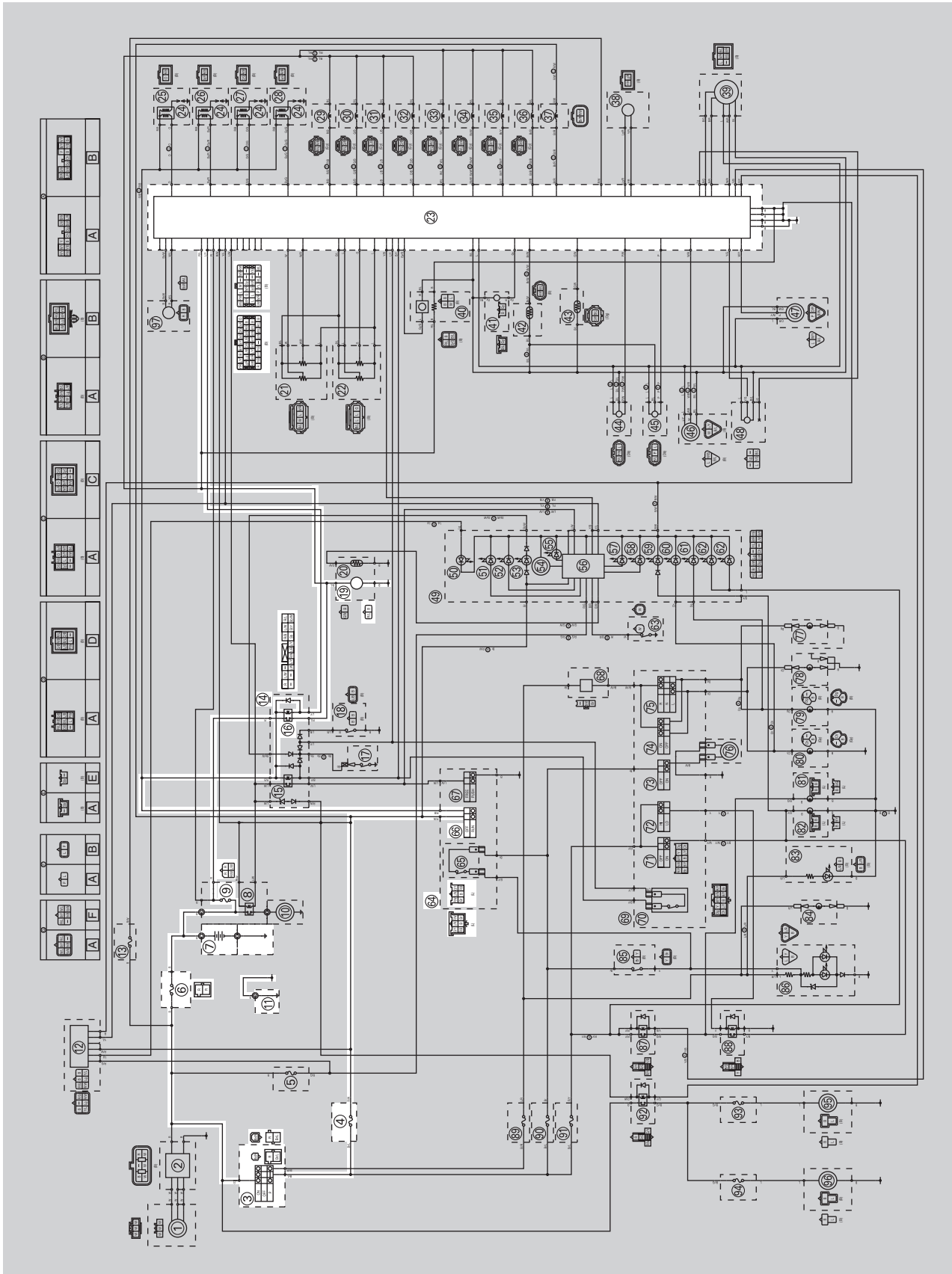
Fault code No.		Er-4	
Item		ECU internal malfunction (input signal error): non-registered data has been received from the meter.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connections • Main wire harness ECU coupler • Main wire harness meter assembly coupler	• Check the couplers for any pins that may be pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely.	Turning the main switch to "ON".
2	Open or short circuit in wire harness.	• Replace if there is an open or short circuit. • Between meter assembly coupler and ECU coupler. (yellow/blue–yellow/blue)	
3	Malfunction in meter assembly.	Replace the meter assembly.	
4	Malfunction in ECU.	Replace the ECU.	

EAS20081

FUEL PUMP SYSTEM

EAS30513

CIRCUIT DIAGRAM



- 3. Main switch
- 4. Ignition fuse
- 6. Main fuse
- 7. Battery
- 9. Fuel injection system fuse
- 11.Engine ground
- 14.Relay unit
- 16.Fuel pump relay
- 19.Fuel pump
- 23.ECU (Engine Control Unit)
- 64.Handlebar switch (right)
- 66.Engine stop switch

EAS30514

TROUBLESHOOTING

If the fuel pump fails to operate.

TIP

- Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank
3. Side cowlings

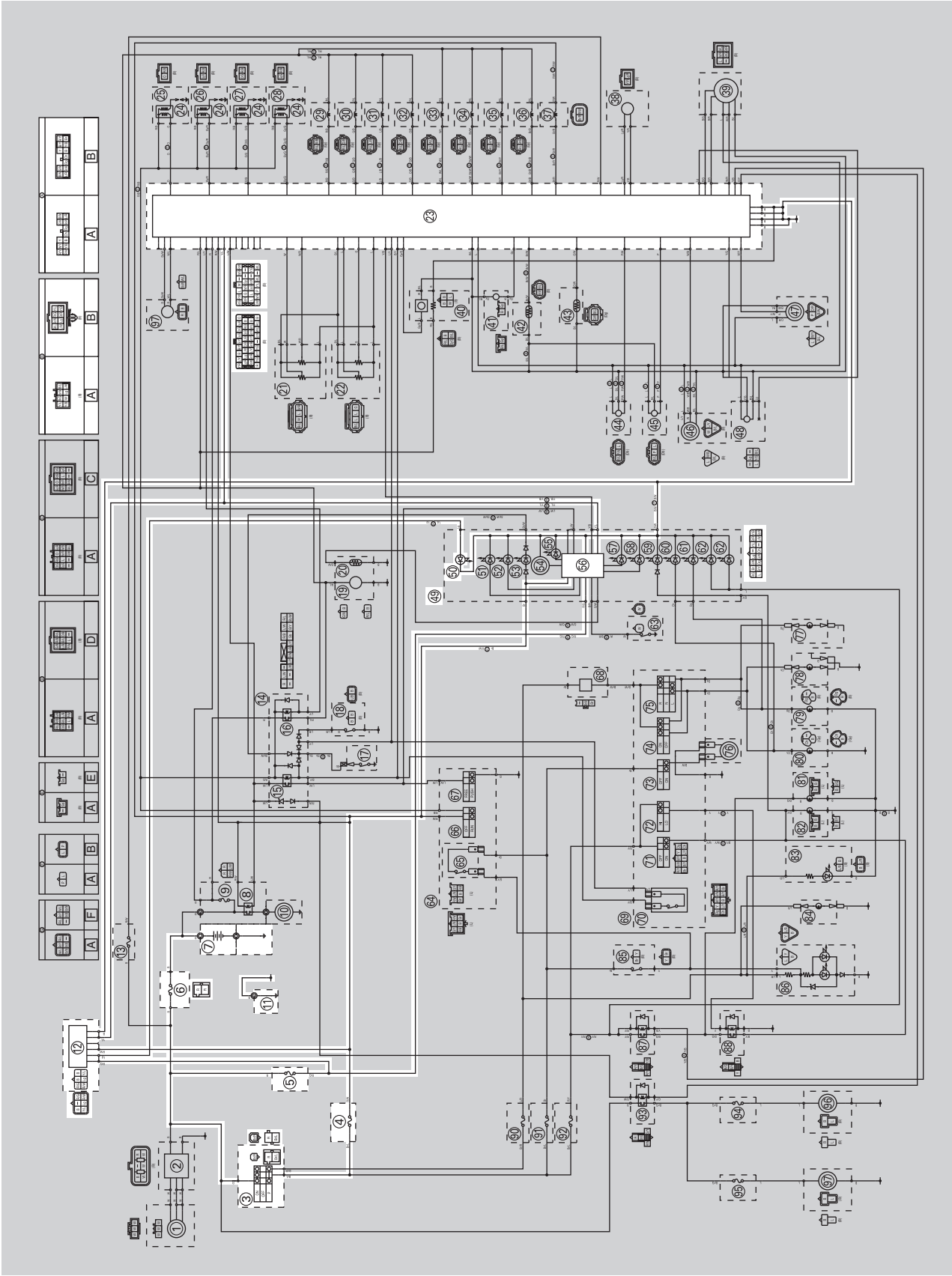
1. Check the fuses. (Main, ignition and fuel injection system) Refer to "CHECKING THE FUSES" on page 8-88.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-89.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	Replace the main switch/immobilizer unit.
OK ↓		
4. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-85.	NG →	• The engine stop switch is faulty. • Replace the right handlebar switch.
OK ↓		
5. Check the relay unit (fuel pump relay). Refer to "CHECKING THE RELAYS" on page 8-92.	NG →	Replace the relay unit.
OK ↓		
6. Check the fuel pump. Refer to "CHECKING THE FUEL PUMP" on page 8-99.	NG →	Replace the fuel pump.
OK ↓		
7. Check the entire fuel pump system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-67.	NG →	Properly connect or replace the wiring harness.
OK ↓		
Replace the ECU.		

EAS20084

IMMOBILIZER SYSTEM

EAS30519

CIRCUIT DIAGRAM



- 3. Main switch
- 4. Ignition fuse
- 5. Backup fuse (odometer, clock and immobilizer system)
- 6. Main fuse
- 7. Battery
- 11.Engine ground
- 12.Immobilizer unit
- 23.ECU (Engine Control Unit)
- 49.Meter assembly
- 50.Immobilizer system indicator light
- 56.Multi-function meter
- A. Wire harness
- B. Headlight sub-wire harness

EAS30520

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 is 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.
-

EAS30521

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.

IMMOBILIZER SYSTEM

	Parts to be replaced					Key registration re- quirement
	Main switch/immobi- lizer unit		Standard key	ECU	Accessory lock* and key	
	Main switch	Immobilizer unit				
Standard key is lost			√			New standard key
All keys have been lost (including code re-reg- istering key)	√		√	√	√	Code re-registering key and standard keys
ECU is defective				√		Code re-registering key and standard keys
Immobilizer unit is de- fective		√				Code re-registering key and standard keys
Main switch is defec- tive	√		√	√	√	Code re-registering key and standard keys
Accessory lock* is de- fective					√	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

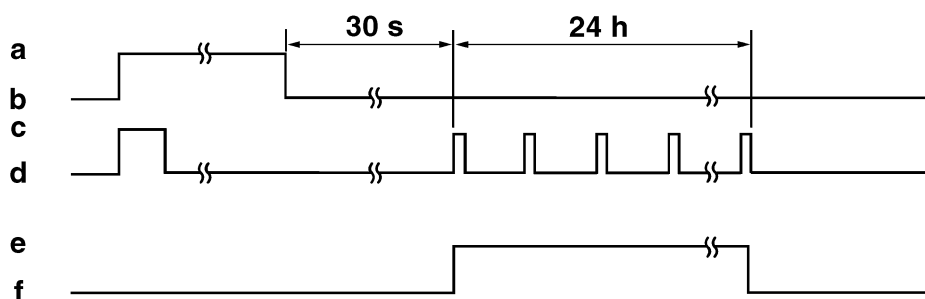
Check that the immobilizer system indicator light comes on for one second, then goes off. When the immobilizer system indicator light goes off, the code re-registering key has been registered.

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.

Standby mode



- a. Main switch “ON”
- b. Main switch “OFF”
- c. LED on
- d. LED off
- e. Standby mode 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 8-78.)

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.

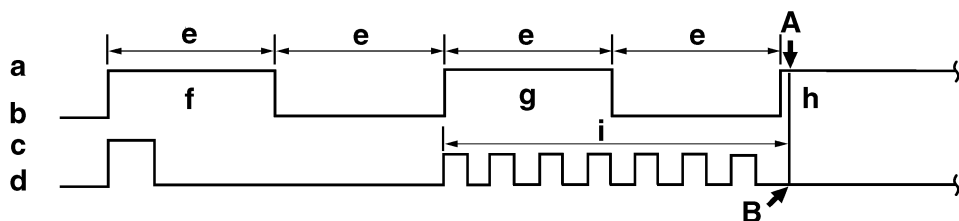
5. Turn the main switch to "ON".

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.

Standard key registration

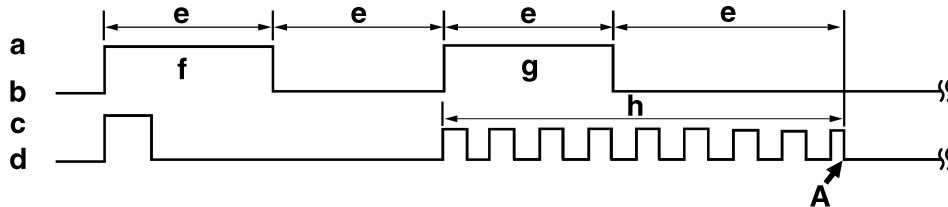


- a. Main switch "ON"
- b. Main switch "OFF"
- c. LED on
- d. LED off
- e. Less than 5.0 s
- f. Code re-registering key
- g. First standard key
- h. Second standard key
- i. Registration mode
- A. Registration of the second standard key is complete.
- B. Immobilizer system indicator light stops flashing 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.

EAS30522

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 8-88.

NG →

Replace the fuse(s).

OK ↓

2. Check the battery.
Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-89.

NG →

- Clean the battery terminals.
- Recharge or replace the battery.

OK ↓

3. Check the main switch.
Refer to "CHECKING THE SWITCHES" on page 8-85.

NG →

Replace the main switch/immobilizer unit.

OK ↓

4. Check the entire immobilizer system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-71.

NG →

Properly connect or replace the wiring harness.

OK ↓

- Check the condition each of the immobilizer system circuits.
Refer to "SELF-DIAGNOSIS FAULT CODE INDICATION" on page 8-78.

IMMOBILIZER SYSTEM

EAS30523

SELF-DIAGNOSIS FAULT CODE INDICATION

When a system malfunction occurs, the fault code number is indicated in the meter display and the immobilizer system indicator light flashes at the same time. The pattern of flashing also shows the fault code.

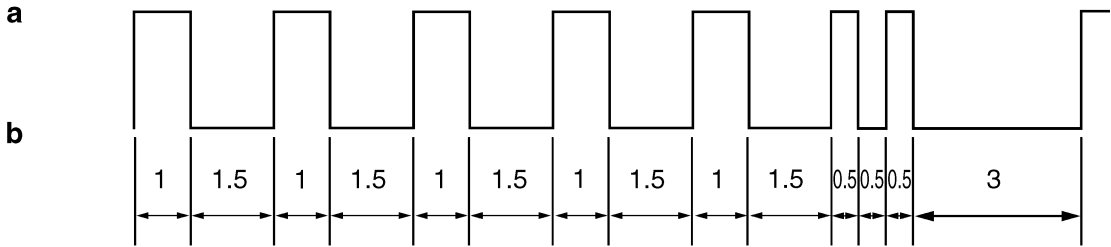
Fault code	Part	Symptom	Cause	Action
51	IMMOBILIZER UNIT	Code cannot be transmitted between the key and the immobilizer unit.	1. Radio wave interference caused by objects around the keys and antennas. 2. Immobilizer unit malfunction. 3. Key malfunction.	1. Keep magnets, metal objects, and other immobilizer 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.	1. Signal received from other transponder (failed to recognize code after ten consecutive attempts). 2. Signal received from unregistered standard key.	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.	Noise interference or disconnected lead/cable. 1. Interference due to radio wave noise. 2. Disconnected communication harness. 3. Immobilizer unit malfunction. 4. ECU malfunction.	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.	Noise interference or disconnected lead/cable. 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.)	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.
55	IMMOBILIZER UNIT	Key code registration malfunction.	Same standard key was attempted to be registered two consecutive times.	Register another standard key.
56	ECU	Unidentified code is received.	Noise interference or disconnected lead/cable.	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

Units of 10: Cycles of on for 1 second and off for 1.5 seconds.

Units of 1: Cycles of on for 0.5 second and off for 0.5 second.

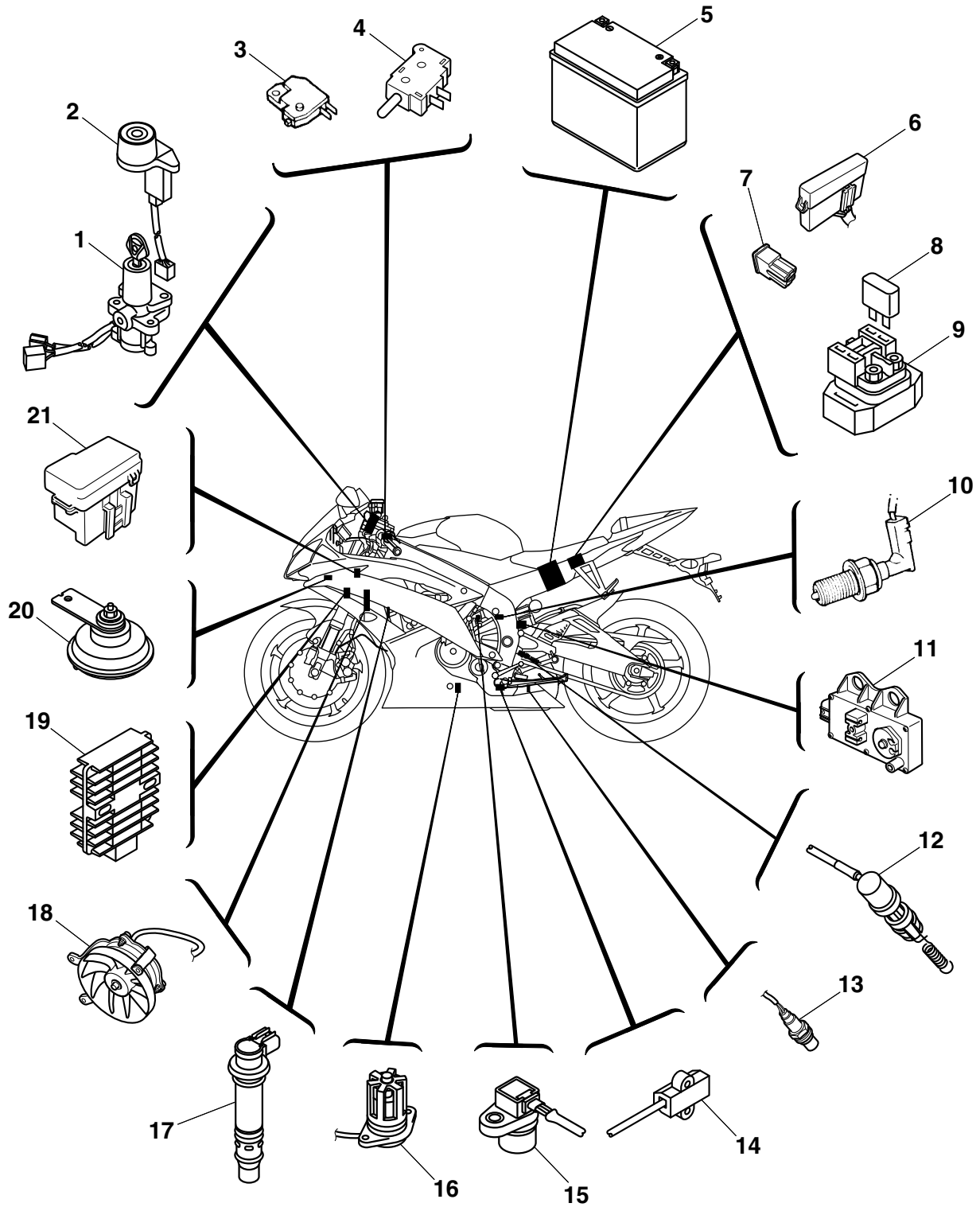
Example: fault code 52



- a. Light on
- b. Light off

EAS20089

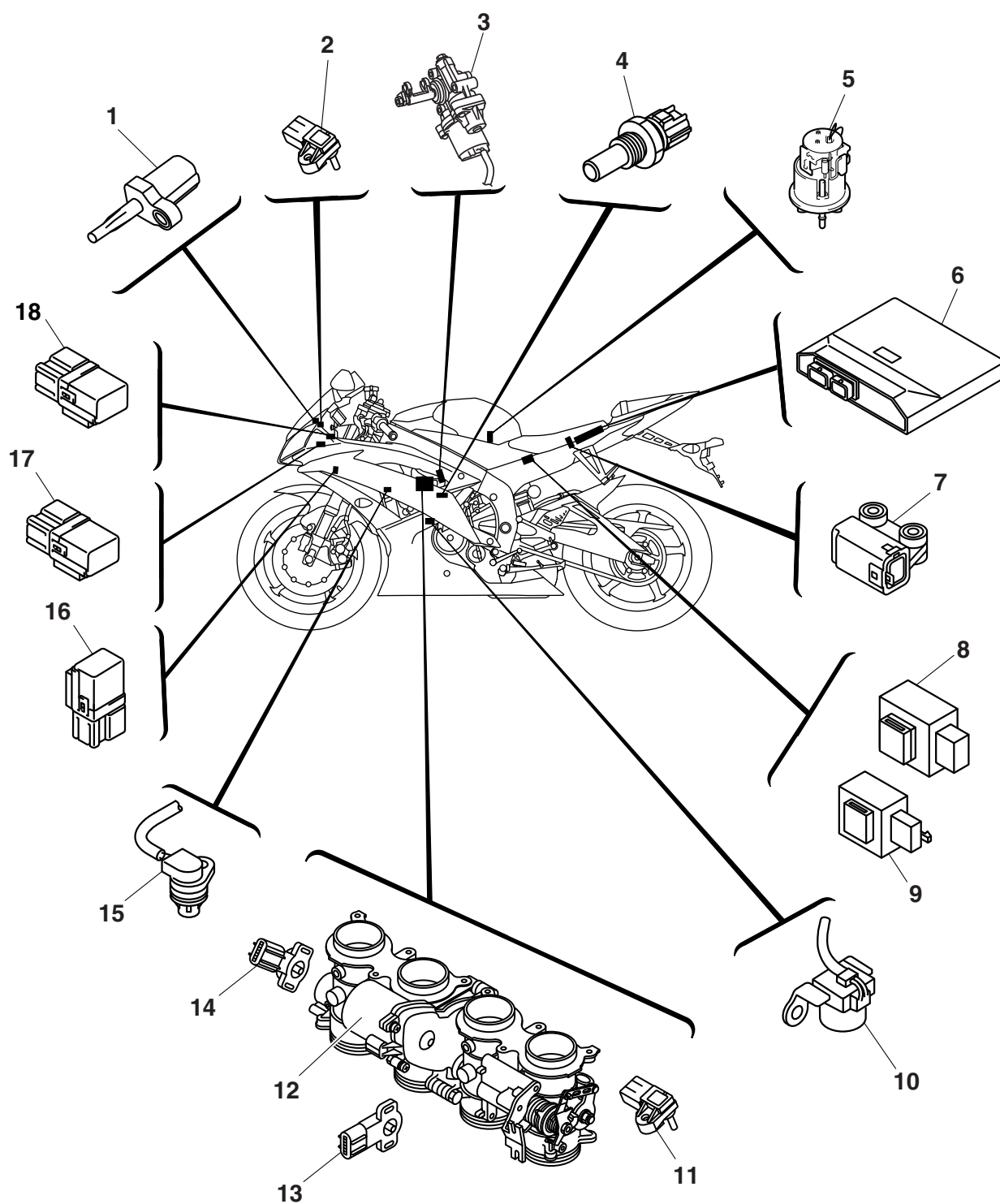
ELECTRICAL COMPONENTS



ELECTRICAL COMPONENTS

1. Main switch
2. Immobilizer unit
3. Front brake light switch
4. Clutch switch
5. Battery
6. Fuse box 1
7. Main fuse
8. Fuel injection system fuse
9. Starter relay
10. Neutral switch
11. EXUP servo motor
12. Rear brake light switch
13. O₂ sensor
14. Sidestand switch
15. Speed sensor
16. Oil level switch
17. Ignition coil
18. Radiator fan motor
19. Rectifier/regulator
20. Horn
21. Fuse box 2

ELECTRICAL COMPONENTS

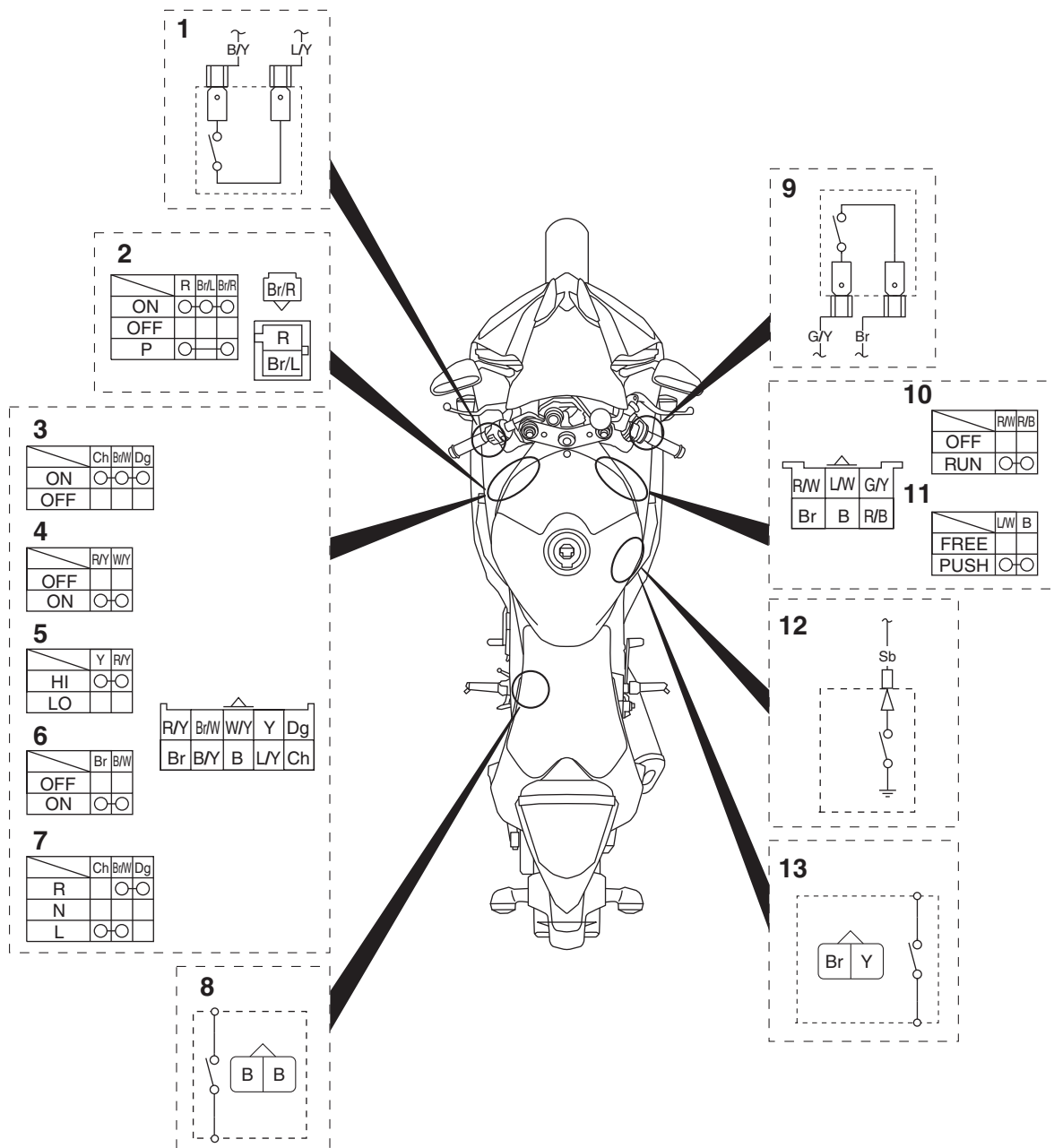


ELECTRICAL COMPONENTS

1. Intake air temperature sensor
2. Atmospheric pressure sensor
3. Intake funnel servo motor
4. Coolant temperature sensor
5. Fuel pump
6. ECU (Engine Control Unit)
7. Lean angle sensor
8. Relay unit
9. Turn signal/hazard relay
10. Crankshaft position sensor
11. Intake air pressure sensor
12. Throttle servo motor
13. Throttle position sensor (for throttle cable pulley)
14. Throttle position sensor (for throttle valves)
15. Cylinder identification sensor
16. Radiator fan motor relay
17. Headlight relay (dimmer)
18. Headlight relay (on/off)

EAS30549

CHECKING THE SWITCHES



1. Clutch switch
2. Main switch
3. Hazard switch
4. Pass switch
5. Dimmer switch
6. Horn switch
7. Turn signal switch
8. Sidestand switch
9. Front brake light switch
10. Engine stop switch
11. Start switch
12. Neutral switch
13. 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.

ECA14371

NOTICE

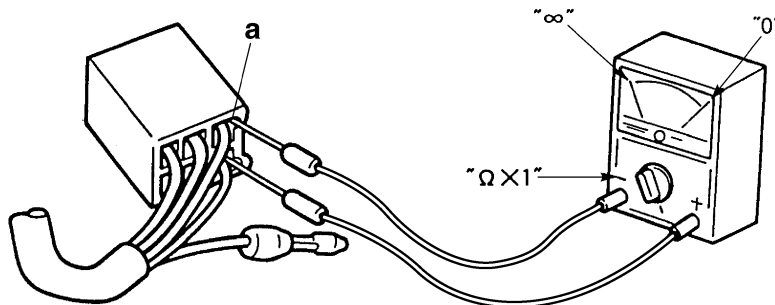
Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end “a” of the coupler, taking care not to loosen or damage the leads.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

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.



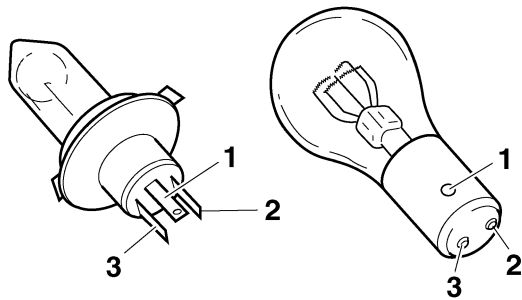
The switches and their terminal connections are illustrated as in the following example of the main switch.

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_≤”.

a	b		
	R	Br/L	Br/R
ON	○—○	○—○	○—○
OFF	○		
P _≤	○		○

R	Br/L	Br/R
---	------	------



Checking the condition of the bulb sockets

The following procedure applies to all of the bulb sockets.

1. Check:
 - Bulb socket (for continuity) (with the pocket tester)
- No continuity → Replace.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

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.

EAS30551

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
 - Upper side cowling (left)

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”.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- 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
Ignition	15 A	1
Headlight	15 A	1
Fuel injection system	15 A	1
Left radiator fan motor	15 A	1
Right radiator fan motor	15 A	1
Signaling system	10 A	1
Taillight	7.5 A	1
Backup (odometer, clock and immobilizer system)	7.5 A	1
ETV	7.5 A	1
Spare	15 A	1
Spare	15 A	1
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 electri-

cal system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

4. Install:

- Upper side cowling (left)
- Rider seat

Refer to "GENERAL CHASSIS" on page 4-1.

EAS30552

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

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

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

INTERNAL

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

ECA13661

NOTICE

- This is a VRLA (Valve Regulated Lead Acid) battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.
- Charging time, charging amperage and charging voltage for a VRLA (Valve Regulated Lead Acid) battery are different from those of conventional batteries. The VRLA (Valve Regulated Lead Acid) battery should

be charged according to the appropriate charging method. If the battery is over-charged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.

TIP

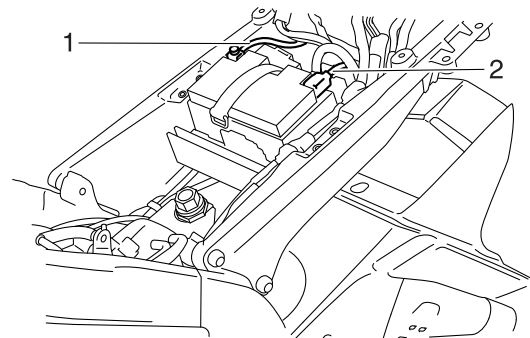
Since VRLA (Valve Regulated Lead Acid) batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
 - Rider seat
 - Fuel tank bracketRefer to “GENERAL CHASSIS” on page 4-1.
2. Disconnect:
 - Battery leads
(from the battery terminals)

ECA13640

NOTICE

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



3. Remove:
 - Battery band
 - BatteryRefer to “GENERAL CHASSIS” on page 4-1.
4. Check:
 - Battery charge

▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽▽

- a. Connect a pocket tester to the battery terminals.

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

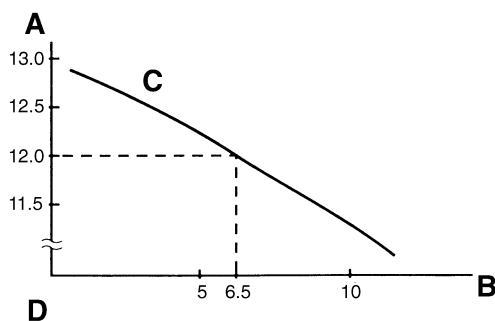
TIP

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

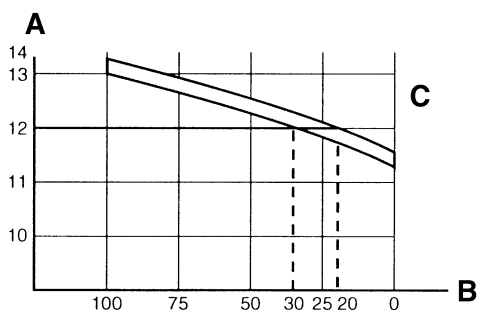
b. Check the charge of the battery, as shown in the charts and the following example.

Example

Open-circuit voltage = 12.0 V
Charging time = 6.5 hours
Charge of the battery = 20–30%



- A. Open-circuit voltage (V)
B. Charging time (hours)
C. Relationship between the open-circuit voltage and the charging time at 20 °C (68 °F)
D. These values vary with the temperature, the condition of the battery plates, and the electrolyte level.



- A. Open-circuit voltage (V)
B. Charging condition of the battery (%)
C. Ambient temperature 20 °C (68 °F)

5. Charge:

- Battery
(refer to the appropriate charging method illustration)

EWA13300



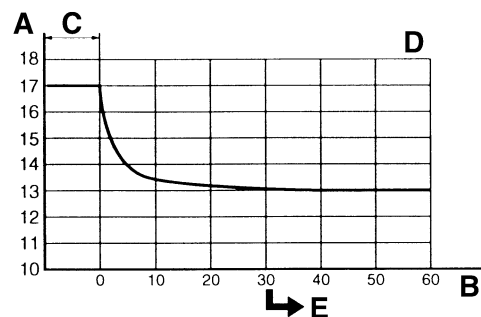
WARNING

Do not quick charge a battery.

ECA13671

NOTICE

- Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
- When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative battery lead from the battery terminal.)
- To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
- Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
- If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!
- As shown in the following illustration, the open-circuit voltage of a VRLA (Valve Regulated Lead Acid) battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.



- 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 charger 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.

- Standard charging current is reached
Battery is good.
- Standard charging current is not reached
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.

12.8 V or more --- Charging is complete.
12.7 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 MF 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.

12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

- 6. Install:

- Battery
- Battery band

Refer to "GENERAL CHASSIS" on page 4-1.

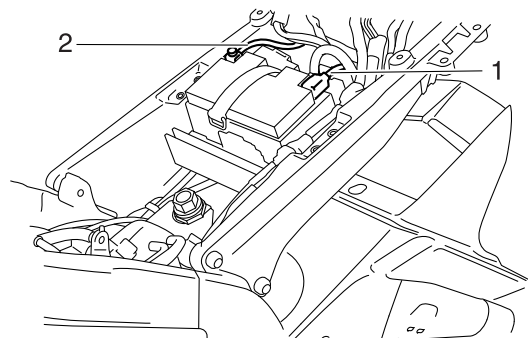
- 7. Connect:

- Battery leads
(to the battery terminals)

ECA13630

NOTICE

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



ELECTRICAL COMPONENTS

8. Check:

- Battery terminals
Dirt → Clean with a wire brush.
Loose connection → Connect properly.

9. Lubricate:

- Battery terminals



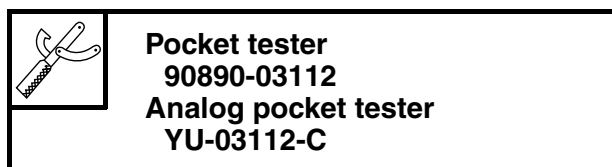
10. Install:

- Fuel tank bracket
 - Rider seat
- Refer to "GENERAL CHASSIS" on page 4-1.

EAS30553

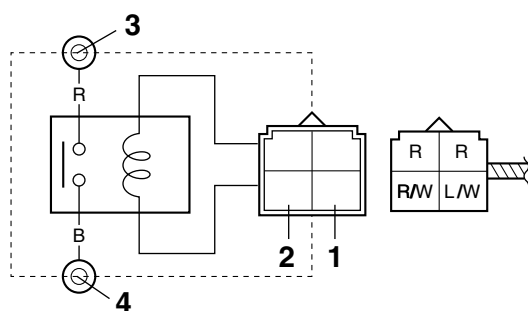
CHECKING THE RELAYS

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.

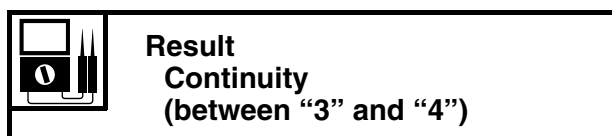


1. Disconnect the relay from the wire harness.
2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown.
Check the relay operation.
Out of specification → Replace.

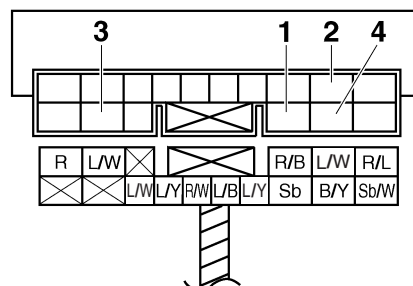
Starter relay



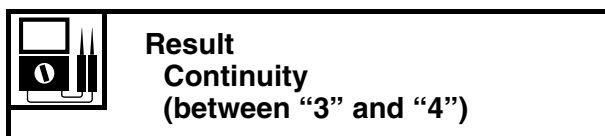
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



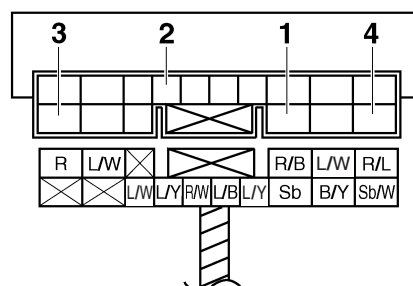
Relay unit (starting circuit cut-off relay)



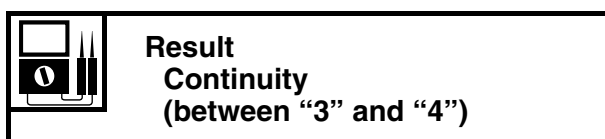
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



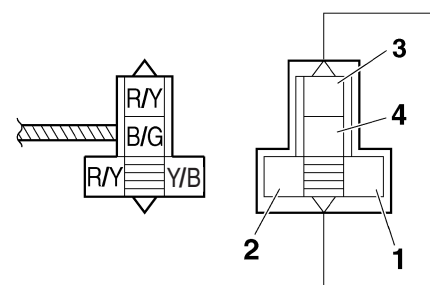
Relay unit (fuel pump relay)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

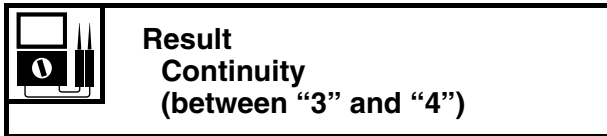


Headlight relay (on/off)

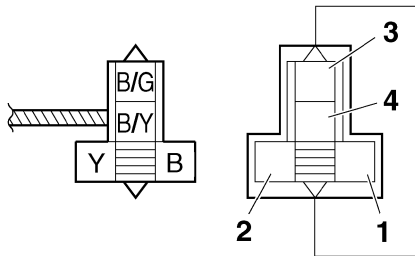


1. Positive battery terminal

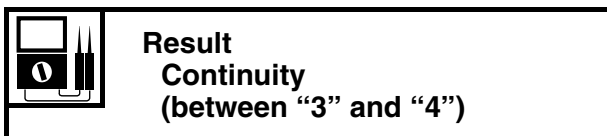
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



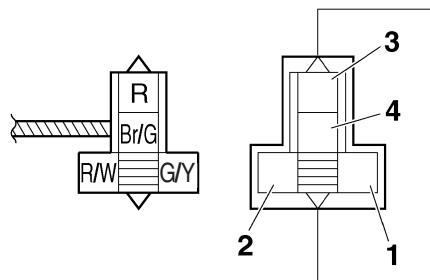
Headlight relay (dimmer)



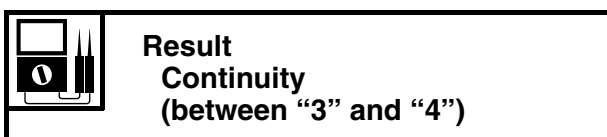
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Radiator fan motor relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

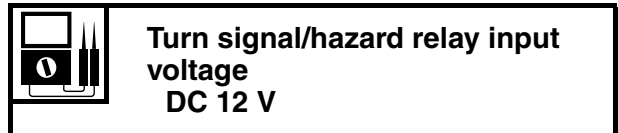


EAS30794

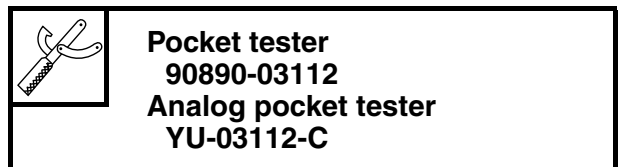
CHECKING THE TURN SIGNAL/HAZARD RELAY

1. Check:

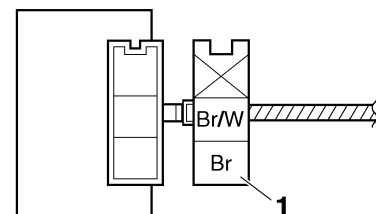
- Turn signal/hazard relay input voltage
Out of specification → The wiring circuit from the main switch to the turn signal/hazard relay coupler is faulty and must be repaired.



- a. Connect the pocket tester (DC 20 V) to the turn signal/hazard relay terminal as shown.



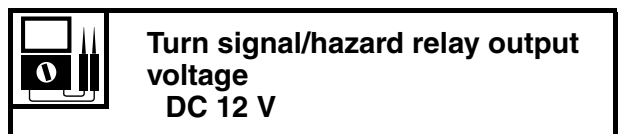
- Positive tester probe → brown “1”
- Negative tester probe → ground



- 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.

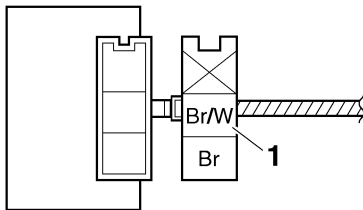


- a. Connect the pocket tester (DC 20 V) to the turn signal/hazard relay terminal as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → brown/white "1"
- Negative tester probe → ground



- Turn the main switch to "ON".
- Measure the turn signal/hazard relay output voltage.



EAS30795

CHECKING THE RELAY UNIT (DIODE)

- 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.



Continuity
Positive tester probe → sky blue "1"
Negative tester probe → black/yellow "2"

No continuity
Positive tester probe → black/yellow "2"
Negative tester probe → sky blue "1"

Continuity
Positive tester probe → sky blue "1"
Negative tester probe → blue/yellow "3"

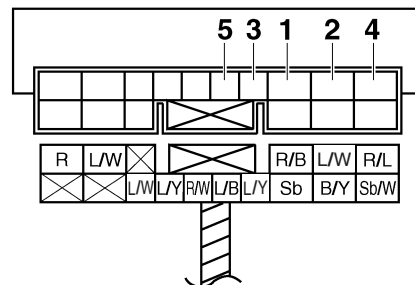
No continuity
Positive tester probe → blue/yellow "3"
Negative tester probe → sky blue "1"

Continuity
Positive tester probe → sky blue "1"
Negative tester probe → sky blue/white "4"

No continuity
Positive tester probe → sky blue/white "4"
Negative tester probe → sky blue "1"

Continuity
Positive tester probe → blue/black "5"
Negative tester probe → blue/yellow "3"

No continuity
Positive tester probe → blue/yellow "3"
Negative tester probe → blue/black "5"



- Disconnect the relay unit coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the relay unit terminal as shown.

- c. Check the relay unit (diode) for continuity.
- d. Check the relay unit (diode) for no continuity.

EAS30558

CHECKING THE IGNITION COILS

The following procedure applies to all of the ignition coils.

1. Check:
 - Primary coil resistance
Out of specification → Replace.



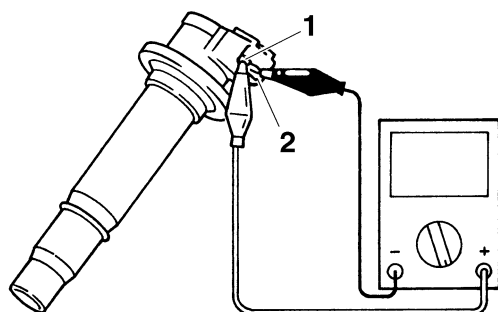
Primary coil resistance
0.85–1.15 Ω

- Remove the ignition coil from the spark plug.
- Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

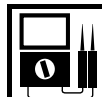
- Positive tester probe → red/black “1”
- Negative tester probe → orange or gray/red or orange/green or gray/green “2”



- c. Measure the primary coil resistance.

[illegible]

- 2. Check:
 - Secondary coil resistance
Out of specification → Replace.



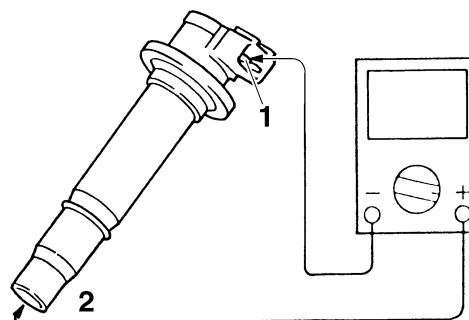
Secondary coil resistance
5.01–6.78 k Ω

- a. Connect the pocket tester ($\Omega \times 1k$) 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.

[illegible]

- Ignition spark gap “a”
Out of specification → Replace.

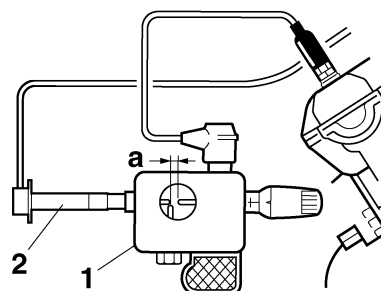


**Minimum ignition spark gap
6.0 mm (0.24 in)**

- a. Connect the ignition checker "1" as shown.



**Ignition checker
90890-06754
Oppama pet-4000 spark checker
YM-34487**



2. Ignition coil
- b. Turn the main switch to “ON” and engine stop switch to “○”.
- c. Measure the ignition spark gap “a”.

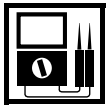
- d. Crank the engine by pushing the start switch “” and gradually increase the spark gap until a misfire occurs.



EAS30560

CHECKING THE CRANKSHAFT POSITION SENSOR

1. Disconnect:
 - Crankshaft position sensor coupler (from the wire harness)
2. Check:
 - Crankshaft position sensor resistance
Out of specification → Replace the crankshaft position sensor.



Crankshaft position sensor resistance
248–372 Ω

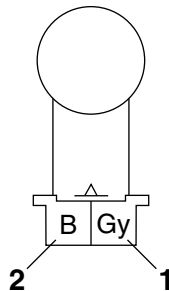


- a. Connect the pocket tester ($\Omega \times 100$) to the crankshaft position sensor coupler as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → gray “1”
- Negative tester probe → black “2”



- b. Measure the crankshaft position sensor resistance.



EAS30561

CHECKING THE LEAN ANGLE SENSOR

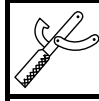
1. Remove:
 - Lean angle sensor (from the bracket)
2. Check:
 - Lean angle sensor output voltage
Out of specification → Replace.



Lean angle sensor output voltage
Operating angle
65°
Output voltage up to operating angle
0.4–1.4 V
Output voltage over operating angle
3.7–4.4 V

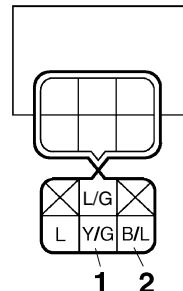
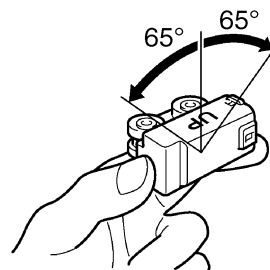


- a. Connect the lean angle sensor coupler to the lean angle sensor.
- b. Connect the pocket tester (DC 20 V) to the lean angle sensor coupler as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → yellow/green “1”
- Negative tester probe → black/blue “2”



- c. Turn the main switch to “ON”.
- d. Turn the lean angle sensor to 65°.
- e. Measure the lean angle sensor output voltage.



EAS30562

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 8-15.

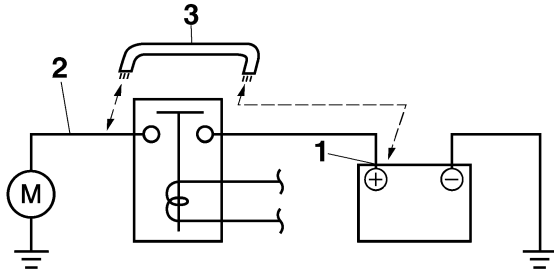


- a. Connect the positive battery terminal “1” and starter motor lead “2” with a jumper lead “3”.

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.



EAS30566

CHECKING THE STATOR COIL

1. Disconnect:
 - Stator coil coupler (from the wire harness)
2. Check:
 - Stator coil resistance
 Out of specification → Replace the stator coil.



Stator coil resistance
0.120–0.180 Ω (W-W)



- a. Connect the pocket tester ($\Omega \times 1$) to the stator coil coupler as shown.

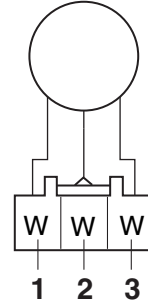


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → white “1”
- Negative tester probe → white “2”

- Positive tester probe → white “1”
- Negative tester probe → white “3”

- Positive tester probe → white “2”
- Negative tester probe → white “3”



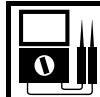
- b. Measure the stator coil resistance.



EAS30680

CHECKING THE RECTIFIER/REGULATOR

1. Check:
 - Charging voltage
 Out of specification → Replace the rectifier/regulator.



Charging voltage
14 V at 5000 r/min

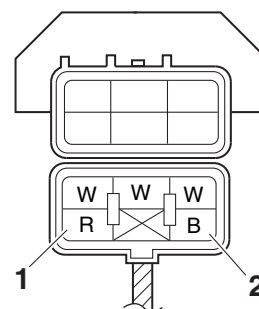


- a. Set the engine tachometer to the cylinder-#1 ignition coil.
- b. Connect the pocket tester (DC 20 V) to the rectifier/regulator coupler as shown.



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 charging voltage.



EAS30796

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 the oil level switch.



Oil level switch resistance (maximum level position)

484.0–536.0 Ω

Oil level switch resistance (minimum level position)

114.0–126.0 Ω



- a. Connect the pocket tester ($\Omega \times 100$) to the oil level switch terminal as shown.



Pocket tester
90890-03112
Analogue pocket tester
YU-03112-C

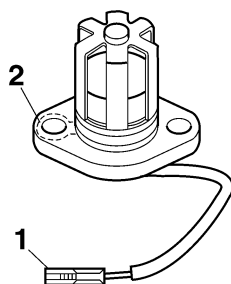
Minimum level position “A”

- Positive tester probe → connector (white) “1”
- Negative tester probe → body earth “2”

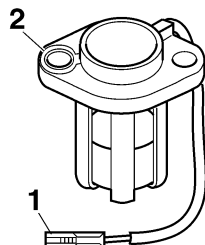
Maximum level position “B”

- Positive tester probe → connector (white) “1”
- Negative tester probe → body earth “2”

A



B



- b. Measure the oil level switch resistance.

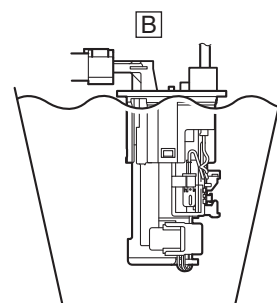
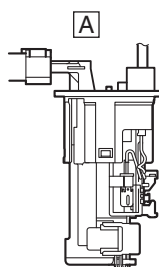


EAS30573

CHECKING THE FUEL SENDER

1. Disconnect:
 - Fuel pump coupler
(from the wire harness)
 - Fuel hose
(from the fuel tank)
2. Remove:
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
3. Remove:
 - Fuel pump
(from the fuel tank)
4. Connect:
 - Fuel pump coupler
 - Fuel hose
5. Turn the main switch to “ON”.
6. Check:
 - Fuel level warning light
Out of specification → Replace the fuel pump.

- 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



EAS30577

CHECKING THE RADIATOR FAN MOTORS

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 “1”
- Negative tester probe → black “2”

WARNING

-



The diagram shows a laboratory setup for measuring the rate of reaction. A beaker (2) contains a solution. A reaction vessel (1) is placed in the solution. A thermometer (3) is also in the solution. A voltmeter is connected to the reaction vessel (1) to measure the potential difference.

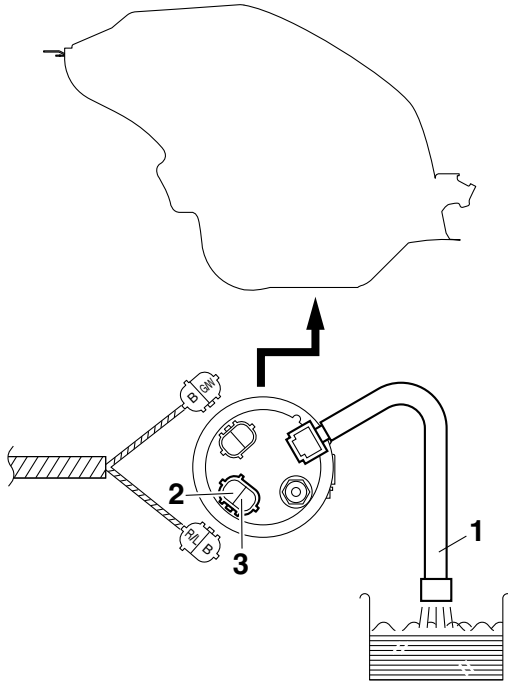
⚠ WARNING

8-99

ELECTRICAL COMPONENTS

c. Connect the battery (DC 12 V) to the fuel pump terminal as shown.

- Positive battery lead → red/blue "2"
- Negative battery lead → black "3"



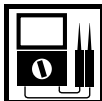
d. Check the fuel pump operation.

EAS30587

CHECKING THE AIR INDUCTION SYSTEM SOLENOID

1. Check:

- Air induction system solenoid resistance
Out of specification → Replace.



Solenoid resistance
18–22 Ω

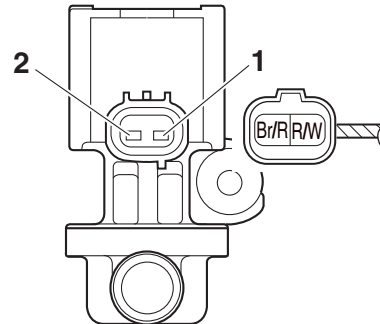
a. Disconnect the air induction system solenoid coupler from the air induction system solenoid.

b. Connect the pocket tester ($\Omega \times 1$) to the air induction system solenoid terminal as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → brown/red "1"
- Negative tester probe → red/white "2"



c. Measure the air induction system solenoid resistance.

EAS30589

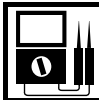
CHECKING THE CYLINDER IDENTIFICATION SENSOR

1. Remove:

- Timing plate cover

2. Check:

- Cylinder identification sensor output voltage
Out of specification → Replace.



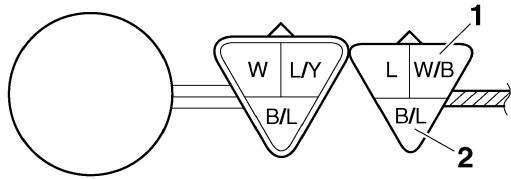
Cylinder identification sensor output voltage (ON)
5.0 V
Cylinder identification sensor output voltage (OFF)
0.0 V

a. Connect the pocket tester (DC 20 V) to the cylinder identification sensor coupler (wire harness side) as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → white/black "1"
- Negative tester probe → black/blue "2"



- Turn the main switch to "ON".
- Rotate the crankshaft.
- Measure the voltage of white/black and black/blue. Turn the crankshaft twice and check that the output voltage rises to approximately 4.8 V once.



EAS30594

CHECKING THE INTAKE AIR TEMPERATURE SENSOR

- Remove:
 - Intake air temperature sensor

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.



Intake air temperature sensor resistance
 5400.0–6600.0 Ω at 0 °C (5400.0–6600.0 Ω at 32 °F)
Intake air temperature sensor resistance
 289–391 Ω at 80 °C (289–391 Ω at 176 °F)



- Connect the pocket tester ($\Omega \times 100$) to the intake air temperature sensor terminal as shown.



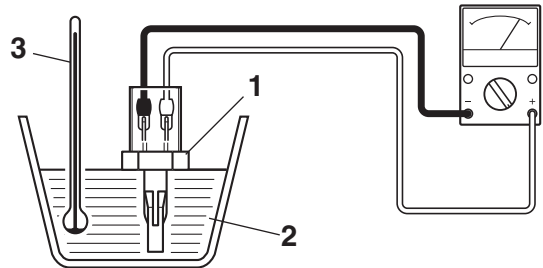
Pocket tester
 90890-03112
Analog pocket tester
 YU-03112-C

- 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.

- Place a thermometer "3" in the water.
- Slowly heat the water, then let it cool down to the specified temperature.
- Measure the intake air temperature sensor resistance.



TROUBLESHOOTING

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EAS20090

TROUBLESHOOTING

EAS30599

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.

EAS30600

STARTING FAILURES

Engine

1. Cylinder(s) and cylinder head
 - Loose spark plug
 - Loose cylinder head
 - Damaged cylinder head gasket
 - Worn or damaged cylinder
 - Incorrect valve clearance
 - Improperly sealed valve
 - Incorrect valve-to-valve-seat contact
 - Incorrect valve timing
 - Faulty valve spring
 - Seized valve
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 tank drain 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 neutral switch
 - 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

EAS30601

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

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

EAS30602

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

EAS30603

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to “Clutch drags”.

EAS30604

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

EAS30605

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

EAS30849

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

EAS30607

OVERHEATING

Engine

1. Clogged coolant passages
 - Cylinder head and piston(s)
 - Heavy carbon buildup

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
 - Oil cooler
 - Clogged or damaged oil cooler
 - Hose(s) and pipe(s)
 - Damaged hose
 - Improperly connected hose
 - Damaged pipe
 - Improperly connected pipe

Fuel system

1. 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
3. Cooling system
 - Faulty radiator fan motor relay
 - Faulty coolant temperature sensor
 - Faulty ECU

EAS30608

OVERCOOLING

Cooling system

1. Thermostat
 - Thermostat stays open

EAS30609

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

EAS30610

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

EAS30611

UNSTABLE HANDLING

Handlebars

- Bent or improperly installed right handlebar
 - Bent or improperly installed left handlebar
1. Steering head components
 - Improperly installed upper bracket
 - Improperly installed lower bracket (improperly tightened ring nut)
 - Bent steering stem
 - Damaged ball bearing or bearing race
 2. 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
 3. Swingarm
 - Worn bearing or bushing
 - Bent or damaged swingarm

Rear shock absorber assembly

- Faulty rear shock absorber spring
- Leaking oil or gas

Tire(s)

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

EAS30612

FAULTY LIGHTING OR SIGNALING SYSTEM**Headlight does not come on**

- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main switch)
- Burnt-out headlight bulb

Headlight bulb burnt out

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Headlight bulb life expired

Tail/brake light does not come on

- Wrong tail/brake light LED
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light LED

Tail/brake light bulb burnt out

- Wrong tail/brake light LED
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light LED 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 flashes 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

Turn signal flashes 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

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS20116

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS31118

SELF-DIAGNOSTIC FUNCTION TABLE

TIP

For details of the fault code, refer to "TROUBLESHOOTING METHOD" on page 8-34.

Fault code No.	Item
11	Cylinder identification sensor: no normal signals are received from the cylinder identification sensor when the engine is started or while the vehicle is being driven.
12	Crankshaft position sensor: no normal signals are received from the crankshaft position sensor.
13	Intake air pressure sensor: open or short circuit detected.
14	Intake air pressure sensor: hose system malfunction (clogged or detached hose).
15	Throttle position sensor (for throttle valves): open or short circuit detected.
17	EXUP servo motor circuit: open or short circuit detected.
18	EXUP servo motor: EXUP servo motor is stuck.
19	Sidestand switch: open circuit is detected in the input line from the sidestand switch to the ECU.
20	Intake air pressure sensor or atmospheric pressure sensor: when the main switch is turned to "ON", the atmospheric pressure sensor voltage and intake air pressure sensor voltage differ greatly.
21	Coolant temperature sensor: open or short circuit detected.
22	Intake air temperature sensor: open or short circuit detected.
23	Atmospheric pressure sensor: open or short circuit detected.
24	O ₂ sensor: no normal signal is received from the O ₂ sensor.
30	Latch up detected.
33	Cylinder-#1 ignition coil: open circuit detected in the primary lead of the cylinder-#1 ignition coil.
34	Cylinder-#2 ignition coil: open circuit detected in the primary lead of the cylinder-#2 ignition coil.
35	Cylinder-#3 ignition coil: open circuit detected in the primary lead of the cylinder-#3 ignition coil.
36	Cylinder-#4 ignition coil: open circuit detected in the primary lead of the cylinder-#4 ignition coil.
39	Primary injector: open circuit detected.
40	Secondary injector: open circuit detected.
41	Lean angle sensor: open or short circuit detected.
42	Speed sensor: no normal signals are received from the speed sensor. Neutral switch: open or short circuit detected.
43	Fuel system voltage: power supply to the injectors and the fuel pump is not normal.
44	Error in writing the amount of CO adjustment on EEPROM: an error is detected while reading or writing on EEPROM (CO adjustment value).
46	Vehicle system power supply: power supply is not normal.
50	ECU internal malfunction: ECU memory is faulty. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)
59	Throttle position sensor (for throttle cable pulley): open or short circuit detected. Throttle position sensor (for throttle cable pulley) coupler connection is loose.
60	Throttle servo motor: open or short circuit detected. Motor is defective or ECU internal malfunction.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Fault code No.	Item
70	Engine idling stop

EAS31119

COMMUNICATION ERROR WITH THE METER

TIP

For details of the fault code, refer to “TROUBLESHOOTING METHOD” on page 8-34.

Fault code No.	Item
Er-1	ECU internal malfunction (output signal error): no signals are received from the ECU.
Er-2	ECU internal malfunction (output signal error): no signals are received from the ECU within the specified duration.
Er-3	ECU internal malfunction (output signal error): data from the ECU cannot be received correctly.
Er-4	ECU internal malfunction (input signal error): non-registered data has been received from the meter.

EAS31120

DIAGNOSTIC CODE: SENSOR OPERATION TABLE

Diagnostic code No.	Item	Meter display	Procedure
01	Throttle position sensor (for throttle valves) signal 1 - Fully closed position - Fully opened position	12–21 97–106	Check with throttle valves fully closed. Check with throttle valves fully opened.
02	Atmospheric pressure	Displays the atmospheric pressure.	Compare the actually measured atmospheric pressure with the meter display value.
03	Intake air pressure	Displays intake air pressure.	Compare the actually measured atmospheric pressure with the meter display value without cranking the engine.
05	Intake air temperature	Displays the intake air temperature.	Compare the actually measured air temperature with the meter display value.
06	Coolant temperature	Displays the coolant temperature.	Compare the actually measured coolant temperature with the meter display value.
07	Vehicle speed pulse	0–999	Check that the number increases when the rear wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.
08	Lean angle sensor - Upright - Overtaken	Lean angle sensor output voltage 0.4–1.4 3.7–4.4	Remove the lean angle sensor and incline it more than 65 degrees.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Meter display	Procedure
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, recharge the battery.)
13	Throttle position sensor (for throttle valves) signal 2 • Fully closed position • Fully opened position	9–23 94–108	Check with throttle valve fully closed. Check with throttle valve fully opened.
14	Throttle position sensor (for throttle cable pulley) signal 1 • Fully closed position • Fully opened position	12–22 97–107	Check with throttle grip fully closed. Check with throttle grip fully opened.
15	Throttle position sensor (for throttle cable pulley) signal 2 • Fully closed position • Fully opened position	10–24 95–109	Check with throttle grip fully closed. Check with throttle grip fully opened.
20	Sidestand switch • Stand retracted • Stand extended	ON OFF	Set ON/OFF the sidestand switch (with the transmission in gear).
21	Neutral switch • Neutral • In gear	ON OFF	Shift the transmission.
60	EEPROM fault cylinder No. • No history • History exists	00 01-04 (fault cylinder No.) • (If more than one cylinder is defective, the display changes every two seconds to show all the detected cylinder numbers. When all cylinder numbers are shown, the display repeats.)	—

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Meter display	Procedure
61	Malfunction history code • No history • History exists	00 Fault codes 11-60 • (If more than one code number is detected, the display changes every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats.)	—
62	Malfunction history code erasure • No history • History exists	00 • 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 "X" to "O".
63	Malfunction code reinstate (for fault code No. 24 and 40 only) • No malfunction code • Malfunction code exists	00 Fault codes 24, 40 • (If more than one code number is detected, the display changes every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats.)	— To reinstate, set the engine stop switch from "X" to "O".
70	Control number	00	—

EAS31121

DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE

Diagnostic code No.	Item	Actuation	Procedure
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. • Connect an ignition checker.
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. • Connect an ignition checker.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Actuation	Procedure
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. • Connect an ignition checker.
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. • Connect an ignition checker.
34	Intake funnel	Actuates the intake funnel (up position down position for each 3 seconds). Illuminates the engine trouble warning light.	Check the operating sound of the intake funnel.
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 primary injector #1 five times.
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 primary injector #2 five times.
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 primary injector #3 five times.
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 primary injector #4 five times.
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.
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.
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.
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.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Actuation	Procedure
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.
50	Fuel injection system relay	Actuates the fuel injection system 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 injection system relay five times.
51	Radiator fan motor relay	Actuates the radiator fan motor relay five times at one-second intervals. (ON 2 seconds, OFF 3 seconds) Illuminates the engine trouble warning light.	Check the operating sound of the radiator fan motor relay five times.
52	Headlight relay	Actuates the headlight relay five times at one-second intervals. (ON 2 seconds, OFF 3 seconds) Illuminates the engine trouble warning light.	Check the operating sound of the headlight relay five times.
53	EXUP servo motor	Actuates the servo motor (turns to open side and to closed side). Illuminates the engine trouble warning light.	Check the operating sound.

WIRING DIAGRAM**YZF-R6/YZF-R6G 2016**

1. AC magneto
2. Rectifier/regulator
3. Main switch
4. Ignition fuse
5. Backup fuse (odometer, clock and immobilizer system)
6. Main fuse
7. Battery
8. Starter relay
9. Fuel injection system fuse
10. Starter motor
11. Engine ground
12. Immobilizer unit
13. ETV fuse
14. Relay unit
15. Starting circuit cut-off relay
16. Fuel pump relay
17. Neutral switch
18. Sidestand switch
19. Fuel pump
20. Fuel sender
21. Throttle position sensor (for throttle cable pulley)
22. Throttle position sensor (for throttle valves)
23. ECU (Engine Control Unit)
24. Spark plug
25. Ignition coil #1
26. Ignition coil #2
27. Ignition coil #3
28. Ignition coil #4
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. Air induction system solenoid
38. Throttle servo motor
39. EXUP servo motor
40. O₂ sensor
41. Crankshaft position sensor
42. Intake air temperature sensor
43. Coolant temperature sensor
44. Intake air pressure sensor
45. Atmospheric pressure sensor
46. Cylinder identification sensor
47. Speed sensor
48. Lean angle sensor
49. Meter assembly
50. Immobilizer system indicator light
51. Fuel level warning light
52. Oil level warning light
53. Neutral indicator light

54. Tachometer
55. Shift timing indicator light
56. Multi-function meter
57. Engine trouble warning light
58. Coolant temperature warning light
59. High beam indicator light
60. Turn signal indicator light (left)
61. Turn signal indicator light (right)
62. Meter light
63. Oil level switch
64. Handlebar switch (right)
65. Front brake light switch
66. Engine stop switch
67. Start switch
68. Turn signal/hazard relay
69. Handlebar switch (left)
70. Clutch switch
71. Pass switch
72. Dimmer switch
73. Horn switch
74. Hazard switch
75. Turn signal switch
76. Horn
77. Rear turn signal light (right)
78. Rear turn signal light (left)
79. Front turn signal light (right)
80. Front turn signal light (left)
81. Headlight (low beam)
82. Headlight (high beam)
83. Auxiliary light
84. License plate light
85. Rear brake light switch
86. Tail/brake light
87. Headlight relay (on/off)
88. Headlight relay (dimmer)
89. Taillight fuse
90. Signaling system fuse
91. Headlight fuse
92. Radiator fan motor relay
93. Radiator fan motor fuse (right)
94. Radiator fan motor fuse (left)
95. Radiator fan motor (right)
96. Radiator fan motor (left)
97. Intake funnel servo motor
- A. Wire harness
- B. Headlight sub-wire harness
- C. Ignition sub-wire harness
- D. Primary injector sub-wire harness
- E. Neutral switch sub-wire harness
- F. Secondary injector sub-wire harness

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Db	Dark blue
Dg	Dark green
G	Green
Gy	Gray
L	Blue
Lg	Light green
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/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/R	Green/Red
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
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/L	White/Blue
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red



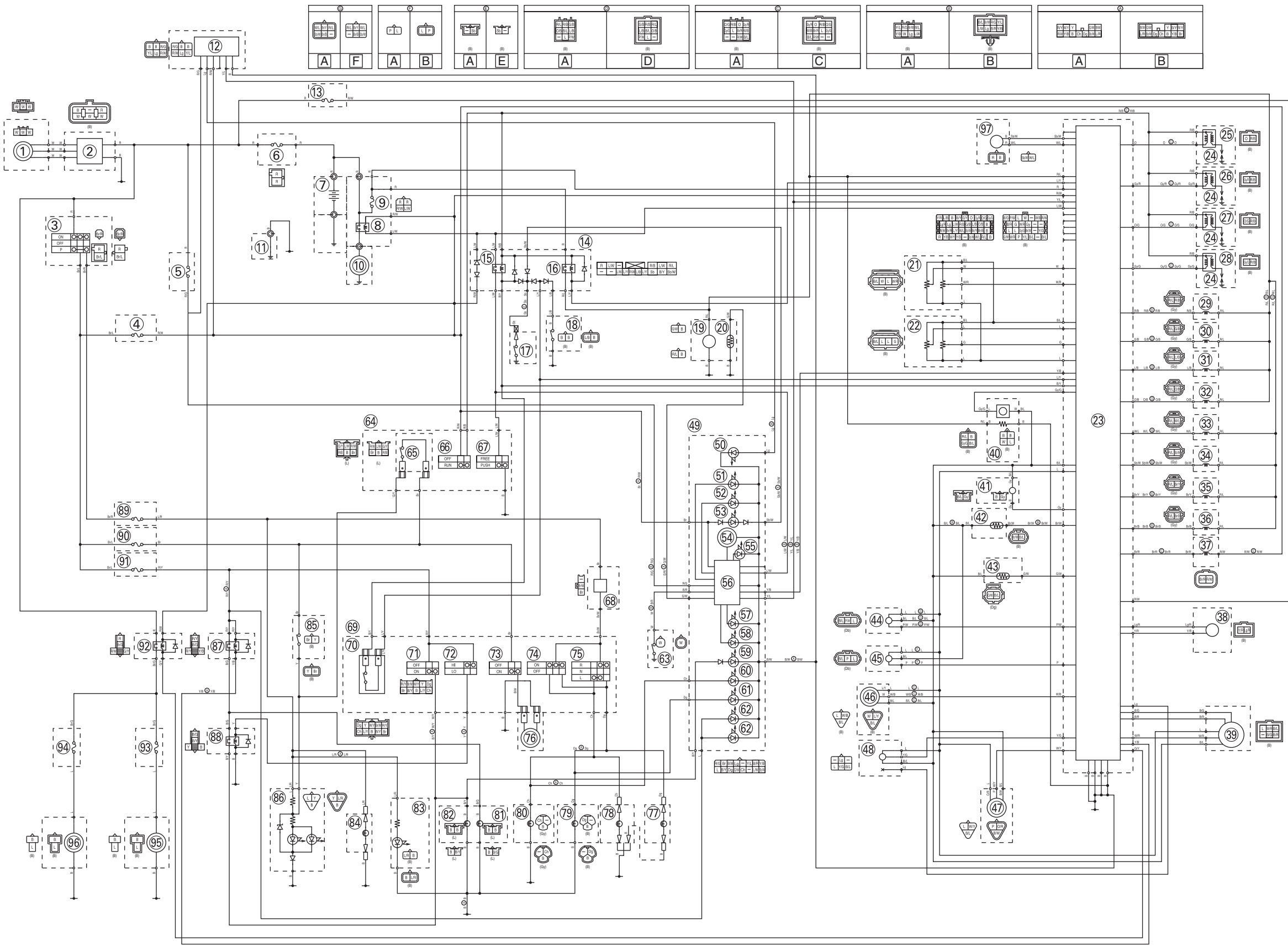
YZF-R6/YZF-R6G 2016
WIRING DIAGRAM

YZF-R6/YZF-R6G 2016
SCHÉMA DE CÂBLAGE

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SCHALTPLAN

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SCHEMA ELETTRICO

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DIAGRAMA ELÉCTRICO



YZF-R6/YZF-R6G 2016
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