

SERVICE MANUAL

YZF-R1 YZF-R1F YZF-R1M YZF-R1MF



2CR-28197-E0

EAS20002

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EAS20003

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.

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IMPORTANT MANUAL INFORMATION

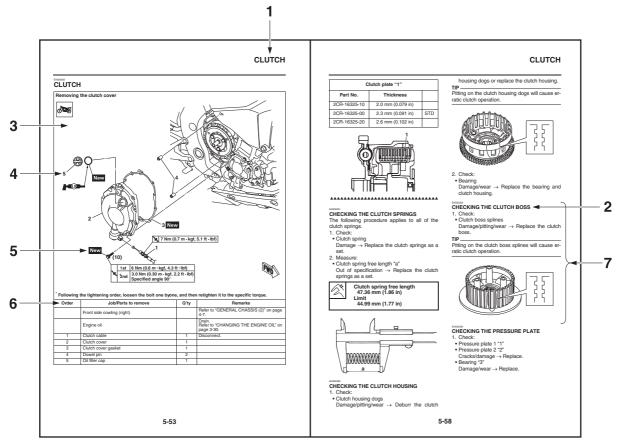
Particularly important information is distinguished in this manual by the following notations.

	This is the safety alert symbol. It is used to alert you to potential per- sonal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
	A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
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. This step explains removal and disassembly procedure only. For installation and assembly procedure, reverse the steps.
- Jobs "7" requiring more information (such as special tools and technical data) are described sequentially.



EAS20005

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
0	Serviceable with engine mounted	G	Gear oil
N	Filling fluid		Molybdenum disulfide oil
	Lubricant		Brake fluid
A REAL PROPERTY OF A REAL PROPER	Special tool		Wheel bearing grease
	Tightening torque	LS	Lithium-soap-based grease
K	Wear limit, clearance		Molybdenum disulfide grease
	Engine speed		Silicone grease
0	Electrical data		Apply locking agent (LOCTITE®).
Ē	Engine oil	New	Replace the part with a new one.
S	Silicone fluid		

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GENERAL INFORMATION

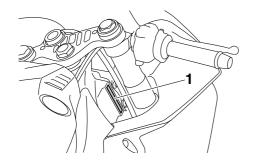
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IDENTIFICATION

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VEHICLE IDENTIFICATION NUMBER

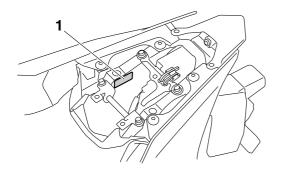
The vehicle identification number "1" is stamped into the right side of the steering head pipe.



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MODEL LABEL

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



EAS30005

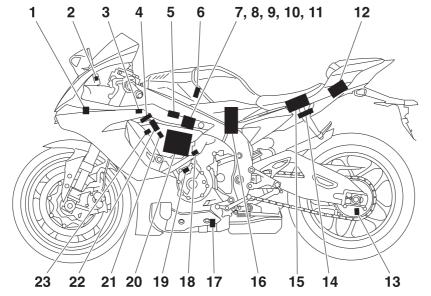
OUTLINE OF THE FI SYSTEM

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

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

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

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



- 1. Intake air temperature sensor
- 2. Engine trouble and system warning light
- 3. Atmospheric pressure sensor
- 4. Air induction system solenoid
- 5. Intake funnel servo motor
- 6. Secondary injector
- 7. Accelerator position sensor
- 8. Throttle servo motor
- 9. Intake air pressure sensor
- 10.Throttle position sensor
- 11.Primary injector
- 12.EXUP servo motor
- 13.Rear wheel sensor

- 14.IMU (Inertial Measurement Unit)
- 15.Battery
- 16.Fuel pump
- 17.02 sensor
- 18.Coolant temperature sensor
- 19. Crankshaft position sensor
- 20.ECU (Engine Control Unit)
- 21.Spark plug
- 22.Ignition coil
- 23.Cylinder identification sensor

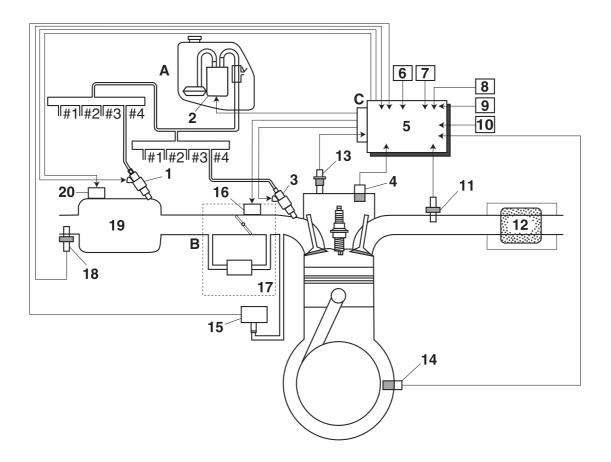
EAS30617 FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the fuel injector at a certain level. Accordingly, when the energizing signal from the ECU energizes the fuel injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remain open.

Therefore, the longer the length of time the fuel injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the fuel injector is energized (injection duration), the lesser the volume of fuel that is supplied.

The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, accelerator position sensor, coolant temperature sensor, atmospheric pressure sensor, cylinder identification sensor, IMU (Inertial Measurement Unit), crankshaft position sensor, intake air pressure sensor, intake air temperature sensor, rear wheel sensor and O_2 sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions.

Illustration is for reference only.



- 1. Secondary injector
- 2. Fuel pump
- 3. Primary injector
- 4. Cylinder identification sensor
- 5. ECU (Engine Control Unit)
- 6. Throttle position sensor
- 7. Accelerator position sensor
- 8. Rear wheel sensor
- 9. Intake air temperature sensor
- 10.IMU (Inertial Measurement Unit)
- 11.0₂ sensor
- 12.Catalytic converter
- 13.Coolant temperature sensor
- 14.Crankshaft position sensor
- 15.Intake air pressure sensor
- 16.Throttle servo motor
- 17.Throttle body
- 18. Atmospheric pressure sensor
- 19. Air filter case
- 20.Intake funnel servo motor
- A. Fuel system
- B. Air system

C. Control system

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

Aims and advantages of using YCC-T system

• Increased engine power

By shortening the air intake path, higher engine speed is possible \rightarrow Increased engine power.

Improved driveability

Air intake volume is controlled according to the operating conditions \rightarrow Improved throttle response to meet engine requirement.

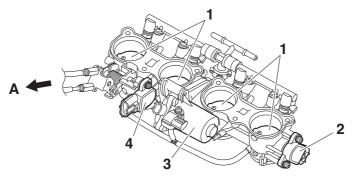
Driving force is controlled at the optimal level according to the transmission gear position and engine speed \rightarrow Improved throttle control.

• 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 valve
- 2. Throttle position sensor
- 3. Throttle servo motor
- 4. Accelerator position sensor
- A. To throttle grip

Aims and advantages of using YCC-I system

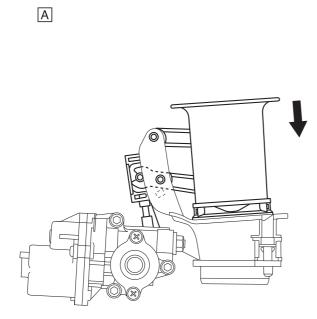
Improved power band

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

• Electronically controlled intake length

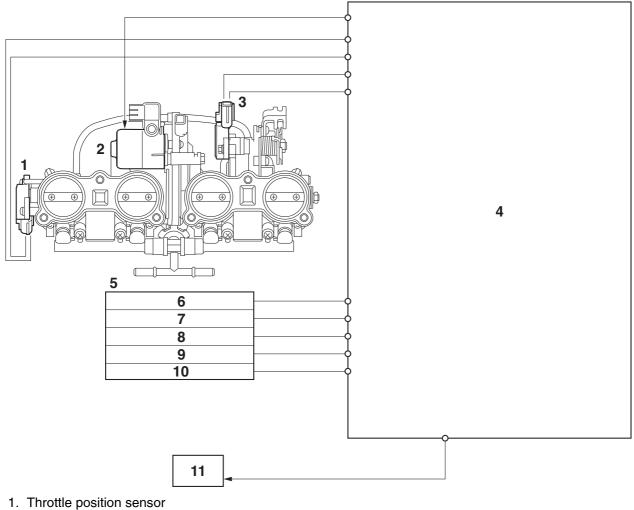
The YCC-I system consists of four lightweight plastic resin funnels, and each of these is divided into an upper and lower portion. Depending upon operating conditions, the funnels can be joined to form a single long funnel, or split to create a short funnel. This change is performed instantaneously by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

В



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

YCC-T/YCC-I system outline



- 2. Throttle servo motor
- Accelerator position sensor
- 4. ECU (Engine Control Unit)
- 5. Sensor input
- 6. Neutral switch
- 7. Crankshaft position sensor
- 8. Rear wheel sensor
- 9. Coolant temperature sensor
- 10.Atmospheric pressure sensor
- 11.Intake funnel servo motor

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ELECTRONIC CONTROL-RELATED FEATURES

Digital instrument panel with TFT liquid crystal display

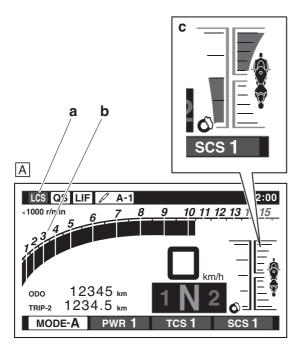
All of the instrument function displays have been concentrated into a single 4.2-inch screen that adopts a fully transmissive Thin Film Transistor (TFT) liquid crystal display.

A white background and a black background can be selected for the background illumination, and the display also features automatic brightness adjustment activated by a sensor that measures ambient light conditions.

For the display mode, there is also a choice between a "Street" mode with a priority on displaying information needed for riding on public roads, and a "Track" mode with a priority on information desired for racing or circuit riding.

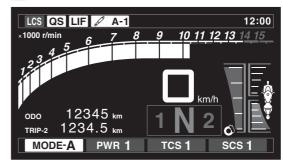
The "Street" mode features items like a gear position display, with a fade-out, fade-in type transition when the gear is shifted, and is designed to add analog elements with a natural visual appearance even though it is a fully digital display. In addition, the tachometer bar display is designed to change color with the engine's rpm range in order to give a perceptual recognition of the engine's current rpm at any given moment.

Items that can be displayed include the odometer, tripmeters, intake air temperature, coolant temperature, real-time fuel efficiency, average fuel efficiency and amount of fuel consumed.

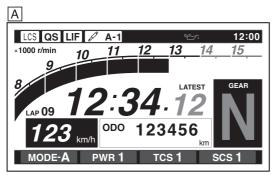


- a. Icons show whether each control function is set On or Off and the settings of the control modes
- b. The tachometer bar display changes color in mid- and high-speed ranges (rpm range change points adjustable)
- c. Acceleration, front brake pressure displays
- A. "Street" display mode (white background)
- B. "Street" display mode (black background)

В



The "Track" mode displays information needed in racing. The tachometer displays the over-8,000 rpm to redline range used most often in racing with a high degree of clarity and detail. This mode features high priority displays of lap number, lap times as well as a stopwatch function, all useful items for racing. Each display also has a memory function that enables lap-by-lap time verification for quick post-race analysis.



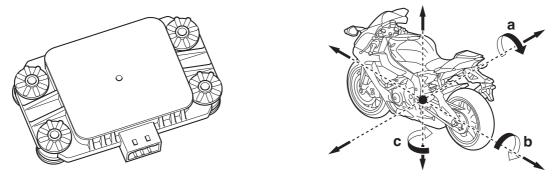
A. "Track" display mode (white background)



B. "Track" display mode (black background)

6-axis "IMU" for 3-dimensional detection of machine motion

This model adopts the 6-axis Inertial Measurement Unit (IMU). It consists of three gyro sensor (angular velocity sensor) that measures machine pitch "a", roll "b" and yaw "c", and three G-sensor (accelerometer) that measures acceleration in the forward-backward, up-down and right-left directions.



The signals from each sensor and a machine-speed sensor made it possible for high-precision detection of machine lean angle and rear wheel slide.

The information on running machine attitude provided by the IMU is sent to the engine control unit (ECU) via CAN (Controller Area Network) transmission to enable real-time calculations that are then reflected to provide optimum engine output. Engine control is conducted through the integration and adjustment of the commands from the various controls systems (TCS and the other systems explained below) to supplement the control mapping for (1) fuel injection volume, (2) ignition timing and (3) throttle valve opening.

Five control systems to effectively bring out the machine's high potential

The engine control unit (ECU) of the new model is programmed to actuate five different control systems in order to heighten competitiveness in actual race conditions.

Each of the systems is designed to let the rider adjust the level of control, or turn each system On or Off.

Timing of each control system's activation

	а	 b	 c -	- (d -	е	 f
LCS (Launch Control System)							
TCS (Traction Control System)							
SCS (Slide Control System)							
LIF (Lift Control System)							
QSS (Quick Shift System)							

- a. Start
- b. Accelerate

c. Decelerate

- d. Corner
- e. Exit
- f. Accelerate

New Traction Control System (TCS) that includes depth of banking as a parameter

A new Traction Control System (TCS) is adopted to effectively bring out the drive force potential of the rear tire during acceleration. In addition to detecting difference in speed between the front and rear wheels, the new system uses input on the degree of banking angle calculated by the IMU to adjust the degree of the TCS to an optimum level in relation to the running conditions in real-time. As the banking angle increases, the amount of TCS control also increases.

Slide Control System (SCS) for a high level of cornering performance

A Slide Control System (SCS) that functions to control engine output when a sideward slide is detected in the rear tire is adopted. It adjusts output to an optimum level based on data from the IMU when the rear tire slides and thus helps the rider focus on the race without distraction. The system supports the TCS to contribute to smoother ride characteristics.

LIFt control system (LIF) to inhibit time loss due to front-wheel lift and the like

A LIFt control system (LIF) that smoothens machine motion during starts and acceleration is adopted. When a tendency for front-wheel lift is detected by the IMU and other sensors for machine attitude, engine output is adjusted to the optimum level to compensate for it and thus assist the rider's machine control.

Launch Control System (LCS) for sharp out-of-the-hole acceleration

A Launch Control System (LCS) is adopted to help ensure smooth and swift starts off the starting grid in races. Turning on the LCS keeps engine rpm from rising above approximately 10,000 rpm even with the throttle fully open, and maintains an optimum level of engine output in conjunction with input from the TCS and LIF systems. This allows the rider to concentrate on clutch engagement and machine control to reduce stress during race starts.

Quick Shift System (QSS) for smooth up-shifting even at full throttle

A Quick Shift System (QSS) is adopted to help provide speedy upshifts. When the switch positioned on the shift lever rod detects motion in the shift lever, it adjusts engine output according to ECU calculations and instantly cancels out the drive torque of the gear engaged by the clutch dog to promote swifter shifting of gears. There is a selection of modes for this function to fit specific riding conditions or rider preferences.

Systems to control machine motion characteristics

Electronic Racing Suspension (ERS) providing integrated control of the front and rear suspensions (YZF-R1M only)

An Öhlins Electronic Racing Suspension (ERS) is adopted to further bring out performance potential in circuit riding. Taking data from the IMU and the various sensors, the system's Suspension Control Unit (SCU) makes integrated adjustments of both the front and rear suspensions' compression stroke and rebound stroke damping force based on running conditions.

With data from the various sensors, the ERS assesses the running conditions and at the same time the SCU calculates the ideal damping force for the front and rear suspensions. Signals activate the step motors built into the suspensions to operate the needles that function to adjust the damping force.

This ERS has a choice of "Automatic" and "Manual" modes. Within each of these modes there is also a selection of three running modes to make a total of six different settings to fit rider preferences or the riding environment. In addition, two of the running modes in the "Automatic" mode have fine adjustment functions for the damping force to meet the needs of a wide range of running conditions.

To further increase the latitude for damping force adjustment, the front suspension adopts separate damping force generating mechanisms for the two sides of the fork, with compression stroke damping on the left and rebound stroke damping on the right. This design also makes the unit less susceptible to fluctuations in the hydraulic fluid (oil) pressure and contributes to more stable performance in repetitious operation. In addition, it is possible to adjust compression stroke and rebound stroke damping force independently on both the front and rear suspensions. Also, spring preload is made by means of a hand-operated nut.

First ABS and Unified Brake System on a Yamaha supersport model

Both an Anti-lock Brake System (ABS), with its contribution to running performance, and Yamaha's Unified Brake System, with its capacity to inhibit unwanted machine motion during braking are adopted. Both of these systems are adopted for the first time on a Yamaha supersport model.

With the Unified Brake System, operating the front brake also generates corresponding brake pressure at the rear brake. The distribution of braking force is based on input from the IMU regarding the machine's attitude and banking angle at the time of brake application.

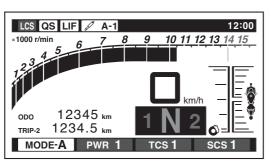
When brake force is applied to both the front brake lever and the rear brake pedal, the Unified Brake System functions to control the distribution of braking force between the two brakes, but when only the rear brake pedal is used, the system operates only the rear brake so that there is no unnatural operational feeling for the rider.

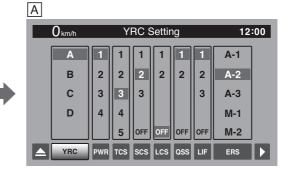
PWR for power mode selection and YAMAHA Ride Control adopted

A power mode selection system (PWR) for a choice of running modes to fit rider preferences and the riding environment, and also the YAMAHA Ride Control (YRC) system are adopted.

The PWR system consists of four different control maps to regulate throttle valve opening depending on the degree of throttle opening, thus providing the user with a selection of modes to fit his/her preferences and the riding environment. Each of the modes (1 to 4) is pre-set with recommended settings for the PWR system, but each of these control modes can be freely adjusted into new combinations based on user preferences and riding environment.

The YRC system is a memory bank for the separate setting data for each of the control setting of each running mode. This data is saved in the form of four patterns of settings designated A, B, C and D.





A. Image showing the TFT instrument panel for control mode adjustments (this image shows an example for the YZF-R1M)

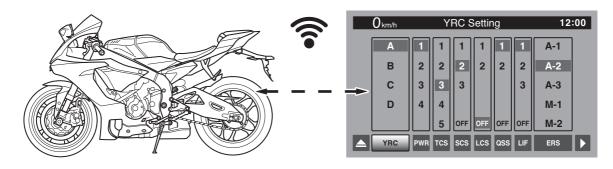
Rider-machine interface: Communication Control Unit (CCU) adopted

(standard equipment for the YZF-R1M, optional for the YZF-R1)

A Communication Control Unit (CCU) is adopted and enables checks of the various forms of machine information and simplifies the setting process in order to heighten the instrument panel's function as a rider-machine "interface." Comprised of the CCU and a GPS antenna, running data can be recorded via a data logger, and with the GPS function, the system also enables automatic lap time recording on circuit courses.

These various forms of data provide objective data to help riders improve their riding skills. Also, by downloading an app for an AndroidOS smartphone, it is also possible to create set-up data on your smartphone. Setting data created this way can then be input into the machine's system via a wireless connection.

There is also a function in the CCU that can change the A, B, C and D designations of the YRC into 4letter designations such as "Yama," "Doni," "Magn" and "Hock".



OUTLINE OF THE UBS

This model is equipped with a unified brake system (UBS) that operates the rear brake when the brake lever is squeezed.

When the brake lever is squeezed, the rear brake force is controlled electronically according to the brake lever input (hydraulic pressure) and the rear brake force is adjusted depending on the bank angle during cornering.

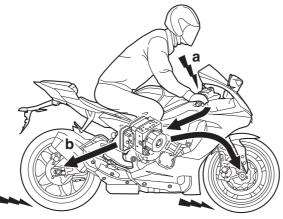
If the brake pedal is operated before the brake lever, the UBS will not operate. However, if the brake pedal is operated while the UBS is operating, the UBS will continue to operate until the brake pedal input exceeds the rear brake force generated by the UBS. Then, the rear braking will switch to rider control.

TIP -

If the brakes are operated while the vehicle is traveling at low speeds, the UBS will only generate a small brake force.

UBS operation

• Brake lever input only: Front braking and rear braking with hydraulic pump (with UBS operation) Brake lever only operated (UBS operation)

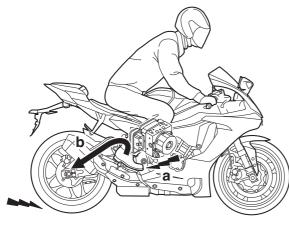


a. Input

b. Automatic pressurization (normal)

• Brake pedal input only: Rear braking (without UBS operation)

Brake pedal only operated

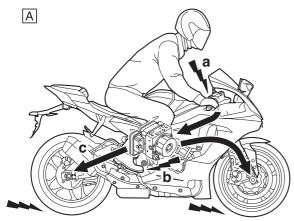


a. Input

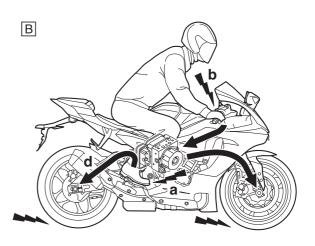
b. No automatic pressurization

• Brake lever input and brake pedal input: Front braking and rear braking (with and without UBS operation)

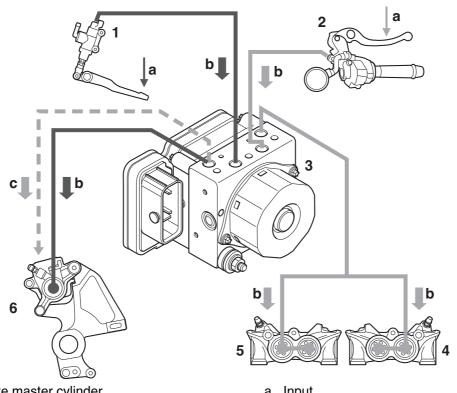
Brake lever and brake pedal both operated



- A. Brake lever is operated before brake pedal
- B. Brake pedal is operated before brake lever
- a. First input
- b. Second input
- c. Brake fluid is automatically pressurized until the second input exceeds the automatic pressurization
- d. No automatic pressurization







- 1. Rear brake master cylinder
- 2. Front brake master cylinder
- 3. Hydraulic unit assembly (ABS ECU)
- 4. Front brake caliper (right)
- 5. Front brake caliper (left)
- 6. Rear brake caliper

- a. Input
- b. Pressurization
- c. Pressurization (hydraulic pump pressurization by UBS)

When the brake lever is squeezed, the front brake master cylinder pressure sensor in the hydraulic unit detects the hydraulic pressure. The ABS ECU calculates the appropriate rear brake force according to the detected hydraulic pressure and sends a signal to the rear brake hydraulic pump. The hydraulic pump pressurizes the rear brake caliper using electronic control to operate the rear brake.

TIP

- If the brake pedal is depressed while the brake lever is being squeezed, the brake pedal may feel hard due to the operation of the UBS, but this does not indicate a malfunction.
- If the rider squeezes the brake lever while resting their foot on the brake pedal, a vibration can be felt at the brake pedal due to the operation of the UBS, but this does not indicate a malfunction.

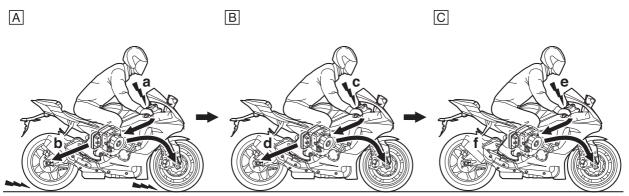
ECA19610 NOTICE

- The UBS does not operate before the vehicle starts off.
- If the vehicle is stopped by operating the brake lever only, the brake force due to the operation of the UBS will be maintained while the brake lever is squeezed. However, if the brake lever is released, then squeezed again, the UBS will not operate.

ECA19620 NOTICE

- The unified brake system is a system to assist the brake operation. However, both the brake lever and the brake pedal must be operated for maximum braking effect.
- Because the balance between the front brake calipers and the rear brake caliper in the unified brake system is determined electronically, be sure to use the specified brake pads.
- Each set of brake pads should be checked individually and replaced if necessary.

When vehicle is stopped using brake lever only



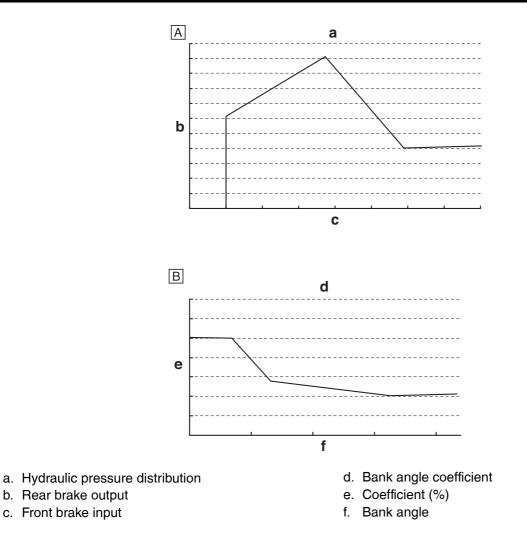
- A. Deceleration
- B. Vehicle stopped
- C. Brake lever released, then squeezed again, after vehicle stops
- a. Input

- b. Automatic pressurization
- c. Input maintained
- d. Pressurization maintained
- e. Brake lever released, then squeezed again
- f. No automatic pressurization

UBS hydraulic pressure map

The appropriate hydraulic pressure is distributed according to the load being carried by the vehicle. See figure "A".

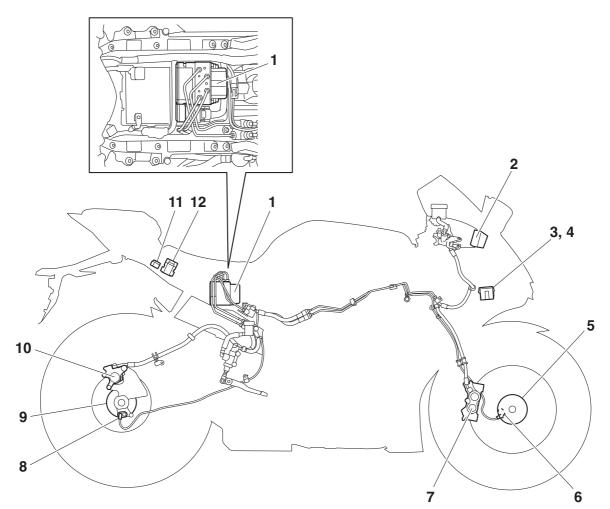
The coefficient is set according to the vehicle speed when the brake input starts and remains constant until the brake input stops. When the brakes are operated continuously to slow the vehicle, the coefficient (UBS brake force) does not decrease together with the vehicle speed. See figure "B".



EAS30683 OUTLINE OF THE ABS

- 1. This model is equipped with the latest, advanced type of ABS, which has improved feeling during operation and smoother braking than previous ABS brakes. The ABS ECU detects the hydraulic pressure using the pressure sensors and controls the pressure linearly using continuously variable adjustments to obtain the appropriate pressure when the wheels have a tendency to lock or according to the operation input (hydraulic pressure) from the brake lever or brake pedal.
- 2. If the wheels have a tendency to lock during brake lever input, brake pedal input, or UBS control, the ABS will operate.
- 3. The hydraulic unit assembly, which is the main component of the ABS, is centrally located on the vehicle to increase mass centralization.

ABS layout



- 1. Hydraulic unit assembly
- 2. ABS warning light
- 3. ABS ECU fuse
- 4. ABS solenoid fuse
- 5. Front wheel sensor rotor
- 6. Front wheel sensor

- 7. Front brake caliper
- 8. Rear wheel sensor
- 9. Rear wheel sensor rotor
- 10.Rear brake caliper
- 11. Yamaha diagnostic tool coupler
- 12.ABS motor fuse

Useful terms

- Wheel speed:
- The rotation speed of the front and rear wheels.
- Chassis speed:
 - The speed of the chassis.

When the brakes are applied, wheel speed and chassis speed are reduced. However, the chassis travels forward by its inertia even though the wheel speed is reduced.

• Brake force:

The force applied by braking to reduce the wheel speed.

• Wheel lock:

A condition that occurs when the rotation of one or both of the wheels has stopped, but the vehicle continues to travel.

• Side force:

The force on the tires which supports the vehicle when cornering.

Slip ratio:

When the brakes are applied, slipping occurs between the tires and the road surface. This causes a difference between the wheel speed and the chassis speed.

Slip ratio is the value that shows the rate of wheel slippage and is defined by the following formula. Slip ratio = (Chassis speed – Wheel speed)/Chassis speed \times 100 (%)

0 %: There is no slipping between the wheel and the road surface. The chassis speed is equal to the wheel speed.

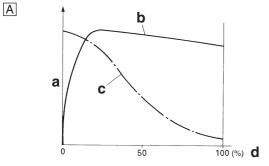
100 %: The wheel speed is "0", but the chassis is moving (i.e., wheel lock).

Brake force and vehicle stability

When the brake pressure is increased, wheel speed is reduced. Slipping occurs between the tire and the road surface and brake force is generated. The limit of this brake force is determined by the friction force between the tire and the road surface and is closely related to wheel slippage. Wheel slippage is represented by the slip ratio.

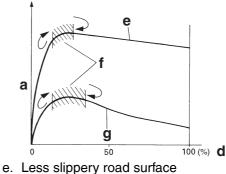
Side force is also closely related to wheel slippage. See figure "A". If the brakes are applied while keeping the proper slip ratio, it is possible to obtain the maximum brake force without losing much side force. ABS allows full use of the tires' capabilities even on slippery road surfaces or less slippery road surfaces. See figure "B".

В



- a. Friction force between the tire and road surface
- b. Brake force
- c. Side force
- d. Slip ratio

Wheel slip and hydraulic control

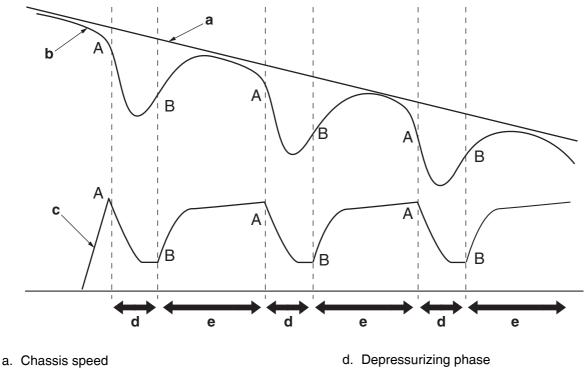


- f. Controlling zone
- g. Slippery road surface

The ABS ECU calculates the wheel speed of each wheel according to the rotation signal received from the front and rear wheel sensors. In addition, the ABS ECU calculates the vehicle chassis speed and the rate of speed reduction based on the wheel speed values.

The difference between the chassis speed and the wheel speed calculated in the slip ratio formula is equal to the wheel slip. When the wheel speed is suddenly reduced, the wheel has a tendency to lock. When the wheel slip and the wheel speed reduction rate exceed the preset values, the ABS ECU determines that the wheel has a tendency to lock.

If the slip is large and the wheel has a tendency to lock (point "A" in the following figure), the ABS ECU reduces the hydraulic pressure in the brake caliper. Once the ABS ECU determines that the tendency of the wheel to lock has diminished after the hydraulic pressure is reduced, it increases the hydraulic pressure (point "B" in the following figure). The hydraulic pressure is initially increased quickly, and then it is increased gradually.



- b. Wheel speed
- c. Brake force

ABS operation and vehicle control

If the ABS starts operating, there is a tendency of the wheel to lock, and the vehicle is approaching the limit of control. To make the rider aware of this condition, the ABS has been designed to generate a reaction-force pulsating action in the brake lever and brake pedal independently.

e. Pressurizing phase

TIP -

When the ABS is activated, a pulsating action may be felt at the brake lever or brake pedal, but this does not indicate a malfunction.

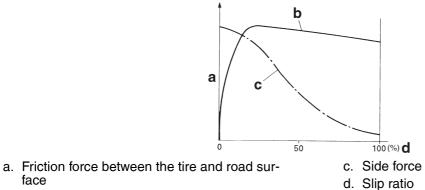
The higher the side force on a tire, the less traction there is available for braking. This is true whether the vehicle is equipped with ABS or not. Therefore, sudden braking while cornering is not recommended. Excessive side force, which ABS cannot prevent, could cause the tire to slip sideways.

WARNING

The braking of the vehicle, even in the worst case, is principally executed when the vehicle is advancing straight ahead. During a turn, sudden braking is liable to cause a loss of traction of the tires. Even in vehicles equipped with ABS, overturning of the vehicle cannot be prevented if it is braked suddenly.

The ABS functions to prevent the tendency of the wheel to lock by controlling the hydraulic pressure. However, if there is a tendency of the wheel to lock on a slippery road surface, due to engine braking, the ABS may not be able to prevent the wheel from locking.

The ABS controls only the tendency of the wheel to lock caused by applying the brakes. The ABS cannot prevent wheel lock on slippery surfaces, such as ice, when it is caused by engine braking, even if the ABS is operating.



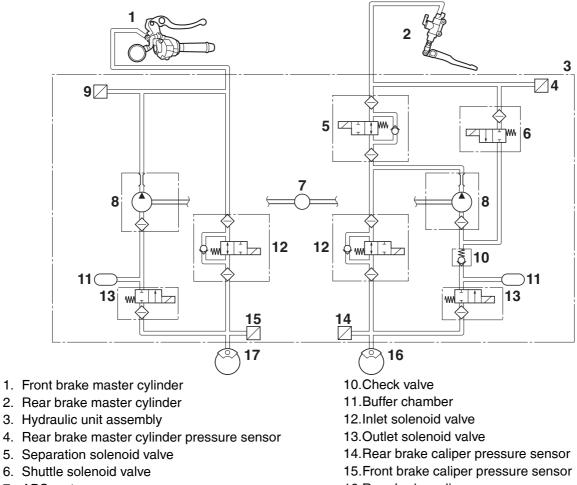
b. Brake force

Electronic ABS features

The Yamaha ABS (Anti-lock Brake System) has been developed with the most advanced electronic technology.

The ABS also includes a highly developed self-diagnosis function. The ABS has been designed to operate as a conventional brake system if the ABS malfunctions. Also, there may be little or no additional rear brake force provided by the UBS. If the UBS does not operate, the front and rear brakes will operate independently according to the rider input, and the respective brake force will be the same as during normal braking. When the brake lever is squeezed, only the front brakes will operate and when the brake pedal is depressed, only the rear brake will operate.

ABS block diagram



- 7. ABS motor
- 8. Hydraulic pump
- 9. Front brake master cylinder pressure sensor
- 16.Rear brake caliper
- 17.Front brake calipers

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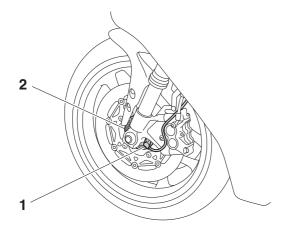
ABS COMPONENT FUNCTIONS

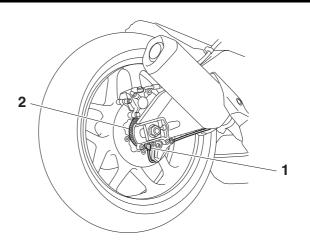
Wheel sensors and wheel sensor rotors

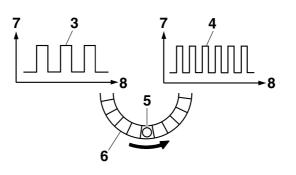
Wheel sensors "1" detect the wheel speed and transmit the rotation signal to the ABS ECU.

Each wheel sensor is composed of a permanent magnet and a hall IC. The sensor rotors "2" rotate with the wheels. The sensor rotors "2" have 40 slots and are installed close to the wheel sensors. As the sensor rotor rotates, the hall element in the hall IC installed in the wheel sensor generates pulses. The pulse frequency, which is proportional to the magnetic flux density, is converted into a wave in the hall IC so that it can be output.

The ABS ECU calculates the wheel rotation speed by detecting the pulse frequency.







6. Wheel sensor rotor

7. Voltage

8. Time

- 3. At low speed
- 4. At high speed
- 5. Wheel sensor

ABS warning light

The ABS warning light "1" comes on to warn the rider if a malfunction in the ABS occurs.

When the main switch is turned to "ON", the ABS warning light comes on during the ABS self-diagnosis to check the electrical circuit of the light. If there are no problems detected during the ABS self-diagnosis, the ABS warning light goes off when the vehicle is ridden at a speed of approximately 5 km/h (3 mph).

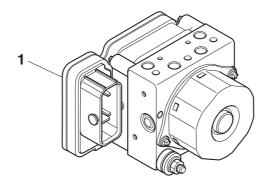
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If the rear wheel is raced with the vehicle on a suitable stand, the ABS warning light may come on. If this occurs, turn the main switch to "OFF", then back to "ON". The ABS operation is normal if the ABS warning light goes off after the vehicle starts off.



Hydraulic unit assembly

The hydraulic unit assembly "1" is composed of hydraulic control valves (outlet solenoid valves, inlet solenoid valves, a shuttle solenoid valve, and a separation solenoid valve), buffer chambers, hydraulic pumps, an ABS motor, hydraulic pressure sensors (front brake master cylinder pressure sensor, front brake caliper pressure sensor, rear brake master cylinder pressure sensor, and rear brake caliper pressure sensor), and an ABS ECU. The hydraulic unit adjusts the front and rear wheel hydraulic pressure to control the wheel speed according to signals transmitted from the ABS ECU.



Hydraulic control valve

There are four types of hydraulic control valves: inlet solenoid valve, outlet solenoid valve, shuttle solenoid valve, and separation solenoid valve. The electromagnetic force generated in the inlet solenoid valve varies proportionally with the duty cycle control voltage that is supplied to it. Since this voltage is continuously variable, the solenoid valve moves smoothly and the hydraulic pressure is adjusted linearly.

1. Inlet solenoid valve

This valve is open during normal braking and UBS operation.

The valve opens and closes during ABS operation to adjust the hydraulic pressure input from the brake lever or brake pedal.

2. Outlet solenoid valve

This valve is closed during normal braking and UBS operation.

The valve opens during ABS operation to reduce the hydraulic pressure.

3. Separation solenoid valve

This value is open when the brake pedal is depressed, but the value opens and closes during UBS operation to adjust the hydraulic pressure.

The valve opens if the ABS operates when the brake pedal is depressed, but the valve opens and closes to adjust the hydraulic pressure if the ABS operates during UBS operation.

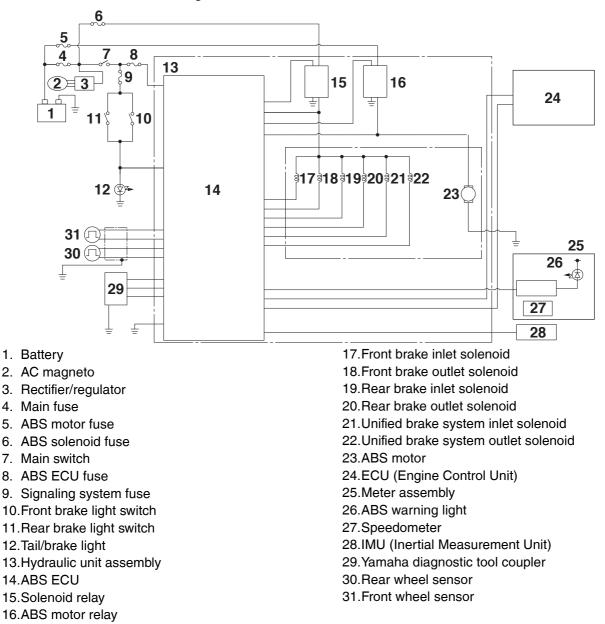
4. Shuttle solenoid valve

This value is closed when the brake pedal is depressed, but the value opens during UBS operation to pressurize the rear brake caliper.

The valve closes if the ABS operates when the brake pedal is depressed, but the valve opens and closes to adjust the hydraulic pressure if the ABS operates during UBS operation.

ABS ECU

The ABS ECU is integrated with the hydraulic unit to achieve a compact and lightweight design. As shown in the following block diagram, the ABS ECU receives wheel sensor signals from the front and rear wheels and also receives signals from other monitor circuits.



The necessary actions are confirmed using the monitor circuit and control signals are transmitted to the hydraulic unit assembly.

ABS control operation

The ABS control operation performed in the ABS ECU is divided into the following two parts.

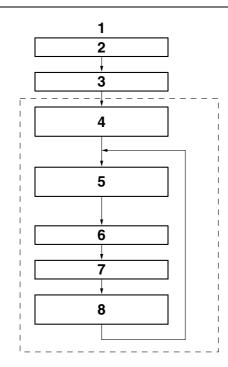
- Hydraulic control
- Self-diagnosis

When a malfunction is detected in the ABS, a fault code is stored in the memory of the ABS ECU for easy problem identification and troubleshooting.

TIP -

• Some types of malfunctions are not recorded in the memory of the ABS ECU (e.g., a blown ABS solenoid fuse).

• The ABS performs a self-diagnosis test for a few seconds each time the vehicle first starts off after the main switch was turned on. During this test, a "clicking" noise can be heard from under the seat, and if the brake lever or brake pedal is even slightly operated, a vibration can be felt at the lever and pedal, but these do not indicate a malfunction.



- 1. Software operation flow
- 2. Main switch "ON"
- 3. Initialize
- 4. Self-diagnosis (when static)

- 5. Self-diagnosis (when riding)
- 6. Receive signals
- 7. Control operation
- 8. Depressurize/pressurize

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UBS AND ABS OPERATION

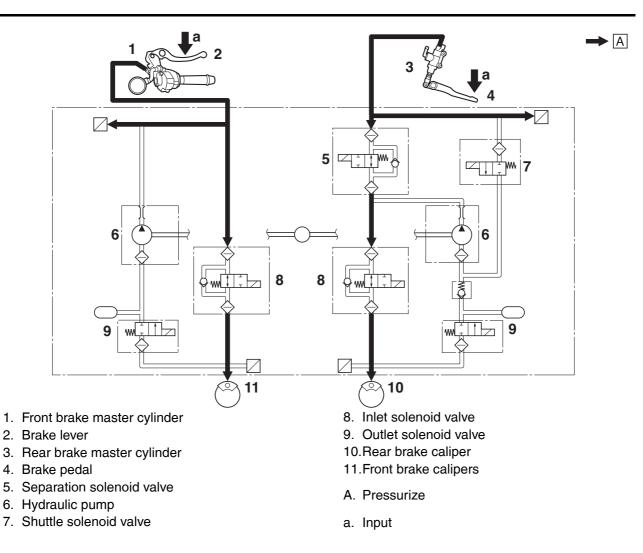
The ABS hydraulic circuit consists of two systems: one for the front wheel and one for the rear wheel.

Normal braking (ABS not activated and UBS not activated)

Front brakes:

When the ABS is not activated, the inlet solenoid valve is open and the outlet solenoid valve is closed because a control signal has not been transmitted from the ABS ECU. Therefore, when the brake lever is squeezed, the hydraulic pressure in the front brake master cylinder increases and the brake fluid is sent to the front brake calipers. At this time, the hydraulic pump check valve is closed. The front brake master cylinder directly pressurizes the front brake calipers during normal braking. When the brake lever is released, the brake fluid in the front brake calipers returns to the front brake master cylinder. Rear brake:

When the ABS is not activated, the inlet solenoid valve and separation solenoid valve are open and the outlet solenoid valve and shuttle solenoid valve are closed because a control signal has not been transmitted from the ABS ECU. Therefore, when the brake pedal is depressed, the hydraulic pressure in the rear brake master cylinder increases and the brake fluid is sent to the rear brake caliper. At this time, the hydraulic pump check valve is closed. The rear brake master cylinder directly pressurizes the rear brake caliper during normal braking. When the brake pedal is released, the brake fluid in the rear brake caliper returns to the rear brake master cylinder.



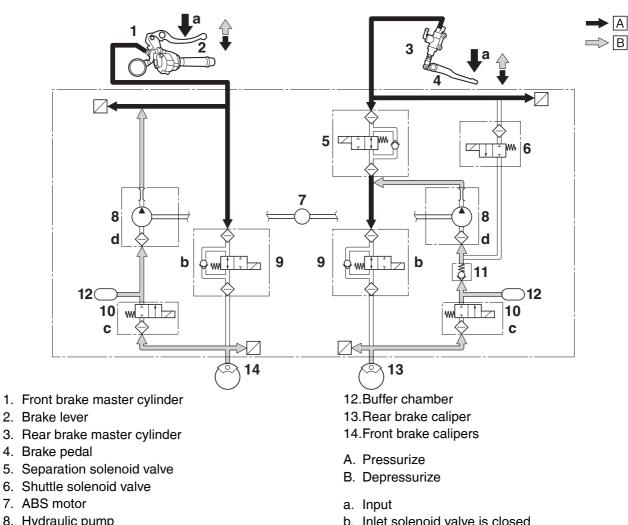
Emergency braking (ABS activated and UBS not activated)

Depressurizing phase:

When the front wheel (or the rear wheel) is about to lock, the outlet solenoid valve is opened by the "depressurization" signal transmitted from the ABS ECU. When this occurs, the inlet solenoid valve closes the brake line from the brake master cylinder. Because the outlet solenoid valve is open, the brake fluid is sent to the buffer chamber. As a result, the hydraulic pressure in the brake caliper is reduced. The brake fluid stored in the buffer chamber is pumped back to the brake master cylinder by the hydraulic pump linked to the ABS motor.

Pressurizing phase:

The outlet solenoid valve is closed by the "pressurization" signal transmitted from the ABS ECU. At this time, the ABS ECU controls the opening of the inlet solenoid valve. As the inlet solenoid valve opens, the brake line from the brake master cylinder opens, allowing the brake fluid to be sent to the brake caliper.



- 8. Hydraulic pump
- 9. Inlet solenoid valve
- 10.Outlet solenoid valve
- 11.Check valve

UBS (ABS not activated and UBS activated)

Brake lever input only

Front brakes:

When the ABS is not activated, the inlet solenoid valve is open and the outlet solenoid valve is closed because a control signal has not been transmitted from the ABS ECU. Therefore, when the brake lever is squeezed, the hydraulic pressure in the front brake master cylinder increases and the brake fluid is sent to the front brake calipers. At this time, the hydraulic pump check valve is closed. The front brake master cylinder directly pressurizes the front brake calipers during normal braking. When the brake lever is released, the brake fluid in the front brake calipers returns to the front brake master cylinder. Rear brake:

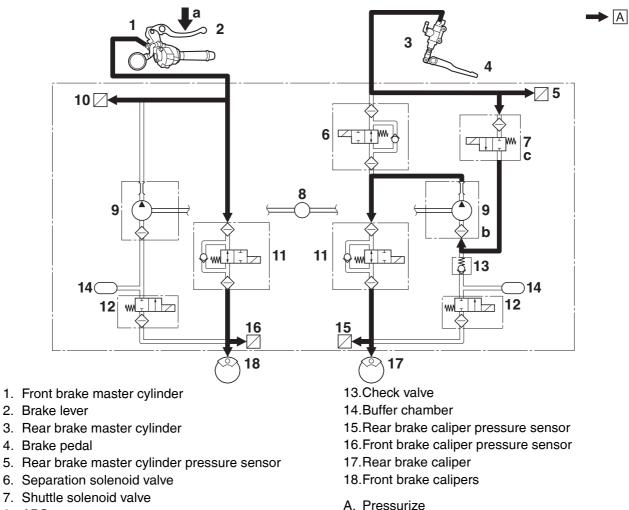
c. Outlet solenoid valve is open

d. Hydraulic pump is operating

When the brake lever is squeezed, the ABS ECU detects the hydraulic pressure using the front brake master cylinder pressure sensor and operates the hydraulic pump. At this time, the ABS is not activated, the inlet solenoid valve is open, and the outlet solenoid valve is closed because a control signal has not been transmitted from the ABS ECU. The shuttle solenoid valve opens and closes according to the UBS control signals from the ABS ECU. The hydraulic pump draws in the brake fluid from the rear brake master cylinder and automatically pressurizes the rear brake caliper.

If the brake pedal is depressed, the UBS automatic pressurization stops. The ABS ECU detects and controls the hydraulic pressure in the rear brake caliper using the front brake master cylinder pressure

sensor, front brake caliper pressure sensor, rear brake master cylinder pressure sensor, and rear brake caliper pressure sensor.



a. Input

b. Hydraulic pump is operating

c. Shuttle solenoid valve is open

- 8. ABS motor
- 9. Hydraulic pump
- 10. Front brake master cylinder pressure sensor
- 11.Inlet solenoid valve
- 12.Outlet solenoid valve

UBS (ABS activated and UBS activated)

Brake lever input only

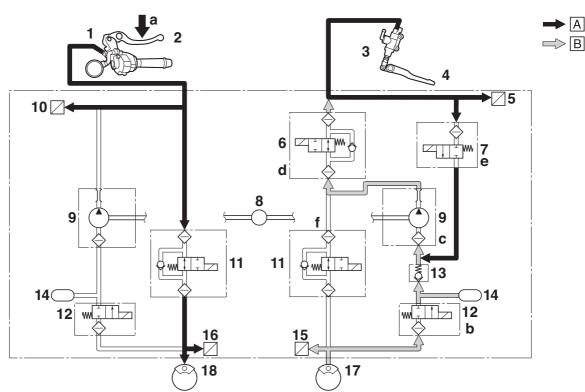
Front brakes:

Refer to "Emergency braking (ABS activated and UBS not activated)". Rear brake:

When the rear wheel is about to lock, the outlet solenoid valve is opened by the "depressurization" signal transmitted from the ABS ECU. When this occurs, the inlet solenoid valve closes the brake line from the rear brake master cylinder. Because the outlet solenoid valve is open, the brake fluid is sent to the buffer chamber. As a result, the hydraulic pressure in the rear brake caliper is reduced.

In order to control the hydraulic pressure at the pressure required for UBS control at this time, the hydraulic pressure is detected using the rear brake master cylinder pressure sensor and rear brake caliper pressure sensor, and the separation solenoid valve and shuttle solenoid valve open and close.

The brake fluid stored in the buffer chamber is pumped back to the rear brake master cylinder by the hydraulic pump linked to the ABS motor.



- 1. Front brake master cylinder
- 2. Brake lever
- 3. Rear brake master cylinder
- 4. Brake pedal
- 5. Rear brake master cylinder pressure sensor
- 6. Separation solenoid valve
- 7. Shuttle solenoid valve
- 8. ABS motor
- 9. Hydraulic pump
- 10. Front brake master cylinder pressure sensor
- 11.Inlet solenoid valve
- 12.Outlet solenoid valve
- 13.Check valve
- 14.Buffer chamber

- 15.Rear brake caliper pressure sensor
- 16. Front brake caliper pressure sensor
- 17.Rear brake caliper
- 18. Front brake calipers
- A. Pressurize
- B. Depressurize
- a. Input
- b. Outlet solenoid valve is open
- c. Hydraulic pump is operating
- d. Separation solenoid valve is open or closed
- e. Shuttle solenoid valve is open or closed
- f. Inlet solenoid valve is closed

EAS30712

ABS WARNING LIGHT AND OPERATION

ABS warning light

- If the ABS warning light comes on while riding, stop the vehicle, and then turn the main switch to "OFF", then back to "ON". The ABS operation is normal if the ABS warning light comes on, then goes off.
- If the rear wheel is raced with the vehicle on a suitable stand, the ABS warning light may come on. If this occurs, turn the main switch to "OFF", then back to "ON". The ABS operation is normal if the ABS warning light comes on, then goes off.
- The ABS operation is normal if the ABS warning light flashes.
- Even if the ABS warning light remains on and does not go off, or if it comes on after riding, conventional braking performance of the vehicle is maintained.

ABS AND UBS FUNCTION

A WARNING

- When hydraulic control is performed by the ABS, the brake system alerts the rider that the wheels have a tendency to lock by generating a reaction-force pulsating action in the brake lever or brake pedal. When the ABS is activated, the grip between the road surface and tires is close to the limit. The ABS cannot prevent wheel lock* on slippery surfaces, such as ice, when it is caused by engine braking, even if the ABS is activated.
- The ABS and UBS is not designed to shorten the braking distance or improve the cornering performance.
- Depending on the road conditions, the braking distance may be longer compared to that of vehicles not equipped with ABS. Therefore, ride at a safe speed and keep a safe distance between yourself and other vehicles.
- The braking of the vehicle, even in the worst case, is principally executed when the vehicle is advancing straight ahead. During a turn, sudden braking is liable to cause a loss of traction of the tires. Even vehicles equipped with ABS cannot be prevented from falling over if braked suddenly.
- The ABS and UBS do not work when the main switch is set to "OFF". The conventional braking function can be used.

* Wheel lock: A condition that occurs when the rotation of one or both of the wheels has stopped, but the vehicle continues to travel.

EAS31706

ABS - Anti-lock Brake System

ABS ECU - Anti-lock Brake System Electronic Control Unit

- CCU Communication Control Unit
- ECU Engine Control Unit
- ERS Electronic Racing Suspension
- GPS Global Positioning System
- IMU Inertial Measurement Unit
- LCS Launch Control System
- LIF Lift Control System
- PWR Power delivery mode
- QSS Quick Shift System
- SC Stability Control
- SCS Slide Control System
- SCU Suspension Control Unit
- TCS Traction Control System
- UBS Unified Brake System
- YRC Yamaha Ride Control

EAS31707

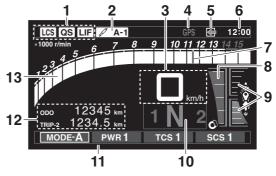
The display has two different main screen display modes, STREET MODE and TRACK MODE. Most of the functions are viewable in either mode, but the layout differs slightly. The following items can be found on the display.

- Speedometer
- Tachometer
- Information display
- Transmission gear display
- Front brake pressure indicator
- Acceleration indicator
- YRC setting display MODE/PWR/TCS/SCS
- YRC setting display LCS/QS/LIF
- ERS indicator (ERS-equipped models)
- GPS indicator (CCU-equipped models)
- Clock
- Revolution peak hold indicator
- Lap timer
- Oil pressure warning icon
- Coolant temperature warning icon
- Error mode "Err"

TIP -

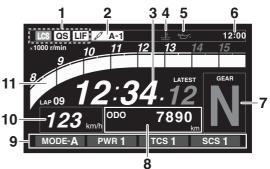
This model uses a thin-film-transistor liquid-crystal display (TFT LCD) for good contrast and readability in various lighting conditions. However, due to the nature of this technology, it is normal for a small number of pixels to be inactive.

STREET MODE



- 1. YRC items LCS/QS/LIF
- 2. ERS indicator (YZF-R1M)
- 3. Speedometer
- 4. GPS indicator (CCU-equipped models)
- 5. Logging indicator (CCU-equipped models)
- 6. Clock
- 7. Revolution peak hold indicator
- 8. Front brake pressure indicator
- 9. Acceleration indicator
- 10. Transmission gear display
- 11.YRC items MODE/PWR/TCS/SCS
- 12.Information display
- 13. Tachometer

TRACK MODE



- 1. YRC items LCS/QS/LIF
- 2. ERS indicator (YZF-R1M)
- 3. Lap timer
- 4. Coolant temperature warning ". 1."
- 5. Oil pressure warning "
- 6. Clock
- 7. Transmission gear display
- 8. Information display
- 9. YRC items MODE/PWR/TCS/SCS
- 10.Speedometer
- 11.Tachometer

Speedometer

The speedometer shows the vehicle's traveling speed. For certain markets, the display can be switched between kilometers and miles. (Refer

to "Unit" on page 1-41.)

Tachometer

The tachometer shows the engine speed, as measured by the rotational velocity of the crankshaft, in revolutions per minute (r/min). When the vehicle is first powered on, the tachometer will sweep across the r/min range and then return to zero.

TIP _

- In TRACK MODE, the tachometer starts at 8000 r/min.
- In STREET MODE, the tachometer can be color-adjusted and has a revolution peak hold indicator which can be turned on or off.

ECA19660

Do not operate the engine in the tachometer red zone.

Information display

This section of the main screen is used to show additional riding related information such as air and coolant temperature readings, tripmeters, and fuel consumption statistics. The information display items can be set into four groups via the MENU screen.

The information display items are:

- A.TEMP: air temperature
- C.TEMP: coolant temperature
- TRIP-1: tripmeter 1
- TRIP-2: tripmeter 2
- F-TRIP: fuel tripmeter

ODO: odometer

FUEL CON: the amount of fuel consumed FUEL AVG: average fuel consumption

CRNT FUEL: current fuel consumption

TIP -

- F-TRIP appears automatically when the fuel tank reserve level has been reached and begins recording distance travelled from that point.
- After refueling and travelling some distance, F-TRIP will automatically disappear.
- In TRACK MODE, information display items FASTEST (fastest lap time) and AVERAGE (average lap time) are also available.

TRIP-1, TRIP-2, F-TRIP, FUEL CON, and FUEL AVE items can be individually reset.

[To reset information display items]

- 1. Use the wheel switch to scroll through the display items until the item you want to reset appears.
- 2. Short push the wheel switch and the item will

flash for five seconds. (For STREET MODE, if both items are resettable items, the top item will flash first. Scroll down to select the bottom item.)

3. While the item is flashing, press and hold the wheel switch for one second.

Transmission gear display

This shows which gear the transmission is in. This model has 6 gears and a neutral position. The neutral position is indicated by the neutral indicator light " \mathbf{N} " and by the transmission gear display " \mathbf{N} ".

Front brake pressure indicator

This shows how much braking power is being applied to the front brakes.

Acceleration indicator

This shows the vehicle's forward acceleration and deceleration forces.

Revolution peak hold indicator

This small bar momentarily appears within the tachometer to mark the most recent peak r/min speed of the engine.

YRC items MODE/PWR/TCS/SCS

The current MODE (YRC mode) and its related PWR, TCS and SCS settings are shown here.

The individual settings for YRC items PWR, TCS, SCS, LCS, QSS and LIF can be organized into four groups and set independently for each group. These groups of settings are the YRC modes MODE-A, MODE-B, MODE-C, and MODE-D. Use the mode switch to change YRC modes or make YRC item setting changes from the main screen.

TIP __

The YRC modes come preset from the factory for different riding conditions. When using the factory presets, the suggested YRC modes are as follows.

- MODE-A is suitable for track riding.
- MODE-B is a softer track-riding setting.
- MODE-C is suitable for street riding.
- MODE-D is suitable for touring or rainy weather.

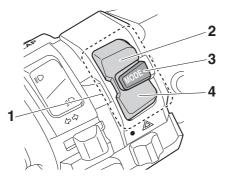
EWA18210

Stop the vehicle before making any setting changes. Changing settings while riding can distract the operator and increase the risk of an accident.

[To change YRC modes or make setting changes]

1. Push the mode switch center button to scroll

left to right and highlight the item you want to adjust.



- 1. Mode switch "MODE"
- 2. Up button
- 3. Center button
- 4. Down button
- 2. Use the mode switch up button or down button to change the selected item value (vertical scrolling is not possible).

TIP -

- When the vehicle is in motion, YRC items MODE, TCS, and SCS cannot be adjusted.
- When the throttle grip is being turned PWR cannot be adjusted.
- When YRC items MODE/PWR/TCS/SCS cannot be adjusted, the respective YRC item box changes to white.
- To turn off the traction control system select TCS with the center button, then push and hold the up button until TCS OFF is displayed. To turn TCS back on, select TCS OFF and then press the down button (TCS will return to its previous setting).
- Turning off the traction control system will turn off the SCS, LCS, and LIF systems for all YRC modes.

YRC items LCS/QS/LIF

The on/off status of YRC items LCS, QSS, and LIF is shown here. When any of these systems are registered (not set to OFF) for the currently selected YRC mode, its respective icon will appear.

When LCS is registered for the currently selected YRC mode, its icon will be grey. To activate the launch control system, press and hold the center button until the LCS icon stops flashing and turns white.

TIP -

LCS, QSS, and LIF system setting levels can only be adjusted from the MENU screen.

ERS indicator (YZF-R1M)

This icon shows the current ERS mode. (Refer to "YRC Setting" on page 1-37 and "ERS (YZF-R1M)" on page 1-39 to change the registered ERS mode or adjust ERS setting levels.)

TIP -

The ERS indicator will flash should the SCU need to be reset, but this does not indicate a malfunction.

- The suspension will remain fixed at its most recent settings until the SCU is reset.
- To reset the SCU, stop the vehicle and turn the key to "OFF" then "ON".

GPS indicator (CCU-equipped models)

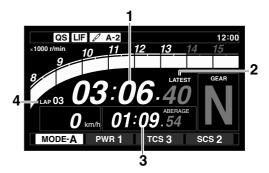
This icon comes on when a GPS unit is synched with your vehicle.

Logging indicator (CCU-equipped models)

This icon comes on when vehicle data is being recorded via the logging function.

Lap timer

This stopwatch function measures and records up to forty laps. On the main screen, the lap timer shows the current lap time and lap number (indicated by the LAP mark). Use the PASS-ING/LAP switch to mark lap times. When a lap is completed, the lap timer will show the latest lap time (marked by the LATEST indicator) for five seconds.



- 1. Lap time
- 2. Latest lap time indicator "LATEST"
- 3. Information display item
- 4. Lap number

[To use the lap timer]

- 1. Short push the wheel switch. The information display item will flash for five seconds.
- 2. While the information display item is flashing, rotate the wheel switch upward. The lap timer will flash for five seconds.
- 3. While the lap timer is flashing, long push the wheel switch to activate the lap timer or stop the lap timer.

4. When the lap timer has been activated, press the PASSING/LAP switch to start the lap timer.

TIP -

- Set the information display to FASTEST or AV-ERAGE for additional lap time information.
- Accessing the MENU screen will automatically stop the lap timer.
- Whenever the lap timer is stopped, the current lap will not be recorded.
- The lap time record can be viewed and reset from the MENU screen.

Oil pressure warning

This icon, along with the oil pressure and coolant warning light, comes on when the engine oil pressure is low. When the key is first turned to ON, engine oil pressure has yet to build, so this icon will come on and stay on until the engine has been started.

NOTICE

If the warning light comes on when the engine is running, stop the engine immediately and check oil level. If the oil level is below the minimum level, add sufficient oil of the recommended type to raise it up to the correct level. If the oil pressure warning light remains on even if the oil level is correct, immediately turn the engine off and check the vehicle.

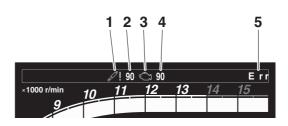
Coolant temperature warning

This icon comes on if the coolant temperature reaches 117 °C (242 °F) or higher. Stop the vehicle and turn off the engine. Allow the engine to cool.

NOTICE

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

Error mode



- 2. SCU error code
- 3. Engine trouble warning " 📇 "
- 4. ECU error code
- 5. Error mode warning "Err"

When an error is detected, the top portion of the main screen will switch to error mode. The following error-related warning icons and error codes will then be viewable.

- SCU trouble warning icon
- SCU error code
- Engine trouble warning icon
- ECU error code

SCU trouble warning (YZF-R1M)

The SCU trouble warning icon appears if a problem is detected by the suspension control unit and an SCU error code will be shown. Note the number and then, check the electronically adjustable suspension system. (Refer to "ELEC-TRONICALLY ADJUSTABLE SUSPENSION SYSTEM (for YZF-R1M)" on page 8-153.)

Engine trouble warning

The engine trouble warning icon appears if a problem is detected by the engine control unit and an ECU error code will be shown. Note the number and then, check the fuel injection system. (Refer to "FUEL INJECTION SYSTEM" on page 8-45.)

TIP____

If the display indicates error code 52, or if you have trouble starting the engine with a standard key, this could be caused by transponder interference. If this occurs, try the following.

- 1. Make sure there are no other immobilizer keys, or other devices which transmit electrical signals, close to the main switch.
- 2. Use the code re-registering key to start the engine.
- 3. If the engine starts, turn it off, and try starting the engine with the standard keys.

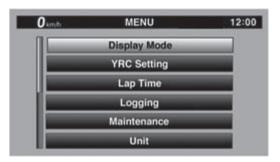
 If one or both of the standard keys do not start the engine, re-register the standard keys. If the display indicates any fault codes, note the code number, and then check the vehicle. (Refer to "FUEL INJECTION SYSTEM" on page 8-45 and "IMMOBILIZER SYSTEM" on page 8-109.)

NOTICE

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

EAS31708

MENU SCREEN



The MENU screen contains the following setting modules. Select a module to make related setting changes. Although some settings can be changed or reset via the main screen, the MENU screen offers access to all display and control settings.

Display	Description
"Display Mode"	Switch the main screen dis- play between street and track modes.
"YRC Setting"	Adjust YRC settings (all mod- els) and ERS settings (YZF- R1M).
"Lap Time"	View and reset lap times.
"Logging"	Turn vehicle information log- ging function on/off (CCU- equipped models).
"Maintenance"	View and reset three mainte- nance item intervals.
"Unit"	Set fuel consumption and dis- tance units.
"Wallpaper"	Set background colors.
"Shift Indicator"	Turn the shift indicator on/off and adjust tachometer set- tings.

"Display Setting"	Set the multi-function display window items.
"Brightness"	Adjust screen brightness.
"Clock"	Adjust the clock.
"All Reset"	Return all settings to factory default settings.

MENU access and operation

The following wheel switch operations are common operations for accessing, selecting, and moving within the MENU screen and its modules.

Long push - press and hold the wheel switch for one second to access the MENU screen or exit MENU entirely.

Select - rotate the wheel switch up or down to highlight the desired module or setting item and then short push the wheel switch (briefly press the wheel switch inward) to confirm the selection.

Triangle mark - certain setting screens have an upward pointing triangle mark item. Select the triangle mark to exit that screen and move back one screen (or long push the wheel switch to exit MENU entirely).

TIP -

Should vehicle motion be detected, the screen will automatically exit MENU and change to the main screen.

"Display Mode"

There are two main screen display modes, STREET MODE and TRACK MODE.

[To set the main screen display mode]

1. Long push the wheel switch to enter the MENU screen.



2. Select "Display Mode".



3. Select STREET MODE or TRACK MODE (or select the triangle mark to exit).



4. Long push the wheel switch to exit the MENU screen or use the wheel switch to select another module.

"YRC Setting"

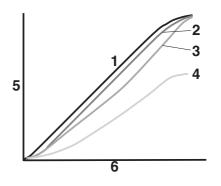
This module allows you to customize the four YRC modes MODE-A, MODE-B, MODE-C, MODE-D by adjusting the setting levels (or on/off status as applicable) of YRC items PWR, TCS, SCS, LCS, QSS, and LIF. For YZF-R1M, you can select the ERS mode to be associated with each YRC mode, and also adjust the setting levels of the ERS modes.

TIP

- TCS has 9 setting levels and ERS has 6 modes.
- Whenever there are more selections (setting levels or modes) available than can be shown on the screen at one time, a scroll bar will appear to notify you that additional selections are available by scrolling.

PWR

Select PWR-1 for the most aggressive throttle response, PWR-2 and PWR-3 for smoother throttle grip/engine response, and use PWR-4 for rainy days or whenever less engine power is desirable.



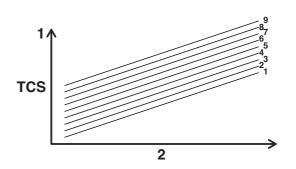
- 1. PWR-1
- 2. PWR-2
- 3. PWR-3
- 4. PWR-4
- 5. Throttle valve opening
- 6. Throttle grip operation

TCS

This model uses a variable traction control system. For each setting level, the further the vehicle is leaned over, the greater the amount of traction control (system intervention) is applied. There are 9 setting levels available. Setting level 1 applies the least amount of overall system intervention, while setting level 9 applies the greatest amount of overall traction control.

TIP

- TCS can only be turned on or off via the main screen using the mode switch.
- When TCS has been turned off, TCS, SCS, LCS, and LIF will be set to OFF and cannot be adjusted. When TCS is turned on again, these related-traction control functions will return to their previous setting levels.

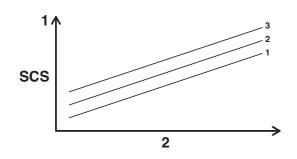


- 1. System intervention
- 2. Lean angle

SCS

SCS can be set to OFF, 1, 2, and 3. OFF turns the slide control system off, setting level 1 provides the least amount of system intervention, and setting level 3 provides the greatest amount

of system intervention.



- 1. System intervention
- 2. Sideward slide

LCS

LCS can be set to 1, 2, or OFF. Setting level 2 more strongly controls power engine output, while setting level 1 applies less system intervention. OFF disables the LCS function from the selected YRC mode (the LCS icon will not appear and the launch control function cannot be activated).

When LCS has been set to level 1 or 2 for the selected YRC mode, the LCS indicator on the main screen will appear in a grey color to indicate that LCS is available. When the launch control system has been activated (made ready for use via the mode switch), the LCS indicator will turn white.

TIP

LCS works in conjunction with the LIF system. LCS cannot be used if LIF is turned off.

QSS

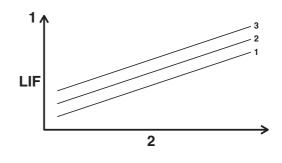
QSS can be set to 1, 2, or OFF. Setting level 1 gives the fastest shifts, while setting level 2 gives slightly smoother shifts. OFF turns the system off entirely, and the clutch lever must then be used when making upshifts.

TIP -

Turning the QSS on or off does not affect any other systems nor is QSS affected by the settings of any other system.

LIF

LIF can be set to 1, 2, 3, or OFF. Setting level 3 most strongly reduces wheel lift, and setting level 1 provides the least amount of system intervention. OFF turns LIF off and LCS will be disabled for the selected YRC mode.



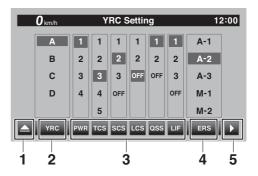
- 1. System intervention
- 2. Wheel lift

[To customize a YRC mode or adjust a YRC item]

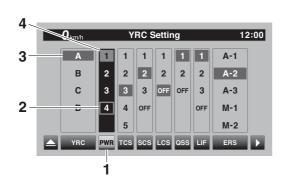
1. From the MENU screen, select "YRC Setting".

0 km/h	MENU	12:00
	Display Mode	
	YRC Setting	
	Lap Time	
	Logging	
	Maintenance	
	Unit	

2. The "YRC Setting" screen is displayed, and the YRC mode box "YRC" is highlighted. Short push the wheel switch to enter the box and then select the YRC mode; A, B, C, D, that you want to adjust.



- 1. Triangle mark
- 2. YRC mode box
- 3. YRC item
- 4. ERS mode (YZF-R1M)
- 5. To ERS menu (YZF-R1M)
- Select the YRC item; PWR, TCS, SCS, LCS, QSS, LIF, or ERS (YZF-R1M) that you want to adjust.



- 1. YRC item
- 2. Current level setting
- 3. YRC mode
- 4. Factory preset level

TIP -

- When a YRC item is selected, the current setting level is indicated by a blue-framed square and the factory preset level is indicated in a grey box.
- Factory preset levels vary depending on the selected YRC mode.
- To customize other YRC modes or adjust individual YRC items, repeat from step 2. When finished, select the triangle mark on the far left to return to the MENU screen; or for YZF-R1M, select the "▶" mark to fine tune the ERS mode settings.

ERS (YZF-R1M)

There are three automatic setting modes; A-1, A-2, and A-3. A-3 is fixed and cannot be adjusted. A-1 and A-2 can be adjusted to within a -5 to +5 offset of their factory preset settings.

There are three manual setting modes; M-1, M-2, and M-3. When a manual mode is selected, the SCU does not actively adjust the suspension compression and rebound damping forces. Manual mode suspension settings are adjustable to 32 levels.

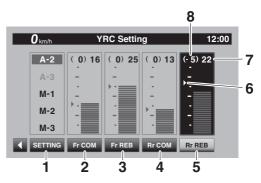
TIP -

- A-1 and M-1 are preset for track use with racing slick tires.
- A-2 and M-2 are preset for track use with street tires.
- A-3 and M-3 are preset for street use with street tires.
- Spring preload is manually adjusted. (Refer to "ADJUSTING THE PRELOAD OF THE FRONT FORK LEGS (for YZF-R1M)" on page 3-24.)

[To adjust the ERS mode settings]



- 1. To ERS menu
- Select the "▶" mark located to the right of ERS.
- The display will change to the front and rear suspension setting screen and the ERS mode selection box "SETTING" is highlighted. Short push the wheel switch to enter the box and select the ERS mode A-1, A-2, M-1, M-2, M-3 that you want to adjust.



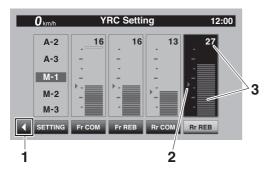
- 1. ERS mode selection box "SETTING"
- 2. Front compression damping force
- 3. Front rebound damping force
- 4. Rear compression damping force
- 5. Rear rebound damping force
- 6. Factory preset level
- 7. Current level setting
- 8. Offset level
- 3. Select the suspension item, Fr COM, Fr REB, Rr COM, Rr REB, that you want to adjust.

TIP -

- To decrease the damping force and soften the suspension, increase the setting level.
- To increase the damping force and harden the suspension, decrease the setting level.
- For A-1 and A-2, a number indicated in () means how many levels are changed from its factory preset level.
- When a suspension setting item in A-1 or A-2 is offset, the same suspension item will be similarly offset in the other automatic mode (offset

values for the same item are automatically linked).

- M-1, M-2, M-3 are not linked and can be independently set.
- To adjust other ERS mode suspension settings, repeat from step 2. When finished, select the "◀" mark located on the left to return to the main "YRC Setting" menu.



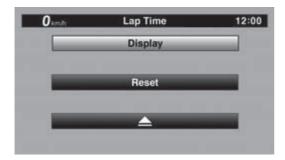
- 1. To YRC Setting menu
- 2. Factory preset level
- 3. Current level setting

"Lap Time"

This module allows you to view and delete the lap time record. The fastest lap and the average lap time stored in the lap time record are displayed at the top of the screen. Use the wheel switch to scroll and see all lap times. The top three fastest laps will be highlighted in silver. Up to 40 laps can be stored in memory. If more than 40 laps are recorded, the oldest laps (starting from lap 1) will be overwritten.

This module has two options.

"Display" allows you to view the lap time record. "Reset" allows you to delete the lap time record data.



Use the wheel switch to select "Display" and view the lap record.

- 0	O kmith	Lap Time	12:00
1	FASTEST / LA	AP 12 02:34	1.56
2	AVERAGE	02:53	3.00
3	LAP 1	02:54	.56
	LAP 2	02:55	5.20
	LAP 3	02:56	6.04
	LAP 4	02:56	5.80

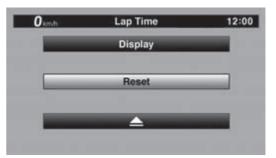
- 1. Fastest lap
- 2. Average lap time
- 3. Lap time record

[To reset the lap time record data]

1. When "Lap Time" is selected, both "Display" and "Reset" are displayed.

0 km/h	Lap Time	12:00
	Display	
-	Reset	-
	A	_

2. Select "Reset".



3. Select YES to delete all lap time data. (Select NO to exit and return to the previous screen without resetting the lap record.)

O km/h	Lap Time	12:00
	Reset ?	
	NO	
	YES	

"Logging" (for CCU-equipped models)

Vehicle and riding information can be recorded (logged) and this data can be accessed with a smart device. (Refer to "CONNECTING TO THE CCU (for YZF-R1M)" on page 4-5.)

[To start and stop logging]

1. From the MENU screen, select "Logging".



TIP

If a CCU is not installed or the CCU is not properly connected, then the "Logging" module cannot be selected.

2. Select START to start logging.



- 1. Logging indicator
- 3. To stop the "Logging" function, select STOP or turn the vehicle off.



"Maintenance"

This function allows you to record distance traveled between engine oil changes (use the OIL item), and for two other items of your choice (use INTERVAL 1 and INTERVAL 2).

[To reset a maintenance item]

1. From the MENU screen, select "Maintenance".

0 inth	MENU	12:00
	Display Mode	
	YRC Setting	
	Lap Time	
	Logging	
	Maintenance	_
	Unit	

2. Select the item you want to reset.

OIL	123456 km
NTERVAL 1	123456 km
INTERVAL 2	123456 km
1	

3. Long push the wheel switch to reset the item.

O km/h	Maintenanc	e	12:00
OIL		000000 km	
INTERVAL 1		123456 km	
INTERVAL 2		123456 km	
		_	

TIP _

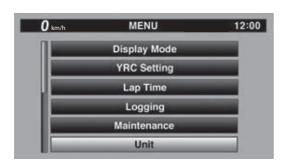
Maintenance item names cannot be changed.

"Unit"

This module allows you to set the fuel consumption units, and for certain markets, the display can be switched between kilometers and miles. When using kilometers, the fuel consumption units can be changed between km/L or L/100km. When using miles, MPG will be available.

[To set the distance or fuel consumption units]

1. From the MENU screen, select "Unit".



2. "km or mile" and "km/L or L/100km" are displayed.



TIP -

For markets with kilometer-based models, only "km/L or L/100km" is displayed.

3. Select the distance or consumption unit item you want to adjust.



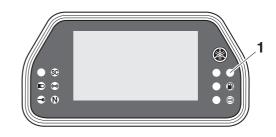
4. Select the units you want to use.



5. Select the triangle symbol to exit. "Wallpaper"

This module allows you to individually set the

STREET MODE and TRACK MODE display background colors to black or white for both day and night settings. A photo sensor equipped in the instrument panel detects lighting conditions and will automatically change the display between its day and night settings. The photo sensor also controls a subtle automatic brightness adjustment function within both day and night modes to suit ambient light conditions.



1. Photo sensor

[To set the wallpaper]

1. From the MENU screen, select "Wallpaper".



- 2. Select the mode you want to adjust (select DAY for daytime display settings or NIGHT for nighttime display settings).
- 3. Select the background color (select BLACK for a black background or WHITE for a white background).



- 4. Select the triangle symbol to exit.
- 5. To set another background color, repeat from step 2 or select the triangle symbol to exit this

module.



"Shift indicator"

The shift indicator module contains the following items.

Display	Description
"Shift IND Set- ting"	Set the shift indicator pattern to "ON", "Flash", or "OFF" and adjust at what r/min the indi- cator will come on and go off.
"Shift IND Bright- ness"	Adjust the brightness of the shift indicator.
"Tach IND Set- ting"	Set the tachometer color dis- play to "ON" or "OFF" and adjust at what r/min the tachometer will be green and orange.
"Peak Rev IND Setting"	Set the tachometer peak rev indicator to "ON" or "OFF".

[To make setting changes]

1. Select "Shift IND Setting".



2. Select "IND Mode".



3. Select "ON" to have the indicator light steadily, "OFF" to turn the indicator off, or "Flash" to have the shift indicator flash when the indicator start threshold has been reached.

0 kmb	Shif	t Indica	tor		12:00
1000 simis	10 11	12	13	14	15
8		Shift INI	D Settir	ng	
/	IND Mo	ode		ON	1
	IND Sta	art	100	00 r/min	
	IND Ste	op	150	00 r/min]
		-	-		

4. Select "IND Start".



5. Rotate the wheel switch to adjust the r/min at which the shift timing indicator light will come on. "IND Start" operational range is 8000–14800 r/min.



6. Select "IND Stop" then rotate the wheel switch to adjust the r/min at which the shift timing indicator will go off. "IND Stop" operational range is 8500–15000 r/min.

TIP -

The blue area on the tachometer indicates the currently set operational range of the shift indicator light.

"Shift IND Brightness"

The shift timing indicator light has six brightness levels.



Select "Shift IND Brightness", then use the wheel switch to adjust the setting. Short push the wheel switch to confirm the setting and exit.

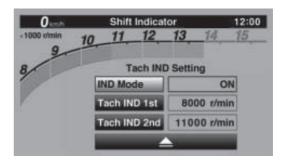


"Tach IND Setting"

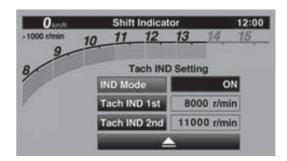
This function allows you to turn the tachometer color display on or off. When turned off, the tachometer will display all r/min levels below the red zone in black or white (depending on wallpaper settings). When turned on, the mid and midto-high r/min zones can be set to come on in green and then orange colors.



1. Select "Tach IND Setting".



2. Select "IND Mode".



- 3. Select ON to turn the tachometer color display mode on (or select OFF to turn this function off).
- 4. Select "Tach IND 1st" to set the green zone starting r/min.

Oimh	Shift Indicat	lor	12:0
- 1000 r/min	10 11 12	13 14	15
8	Tach INI) Setting	
	IND Mode	C	N
	Tach IND 1st	8000 r/m	in
	Tach IND 2nd	11000 r/m	in
	1	N	

5. Set the starting r/min by rotating and then short pushing the wheel switch. All r/min above this value up to the "Tach IND 2nd" setting value (or the 14000 r/min red zone), will be displayed in green.

O km/h	Shift Indicator				12:00	
- 1000 r/min	10	0 11 12 13		13	_14_	15
8		т	ach INE) Settin	ng	
		IND Mode Tach IND 1st			ON	1
				8000 r/min		
		Tach IND 2nd		110	00 r/min	
			1	1		

TIP -

Green bar start setting range: 8000-10000 r/min.

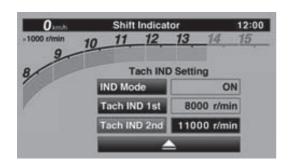
6. Select "Tach IND 2nd".



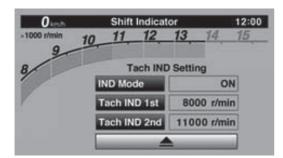
7. Set the orange color starting r/min by rotating and then short pushing the wheel switch. All r/min above this figure until the 14000 r/min red zone, will be displayed in orange.

TIP

Orange bar start setting range: 8000-14000 r/min.



8. Select the triangle symbol to exit.



"Peak Rev IND Setting"

This module allows you to turn the revolution peak hold indicator on or off.

1. Select "Peak Rev IND Setting".

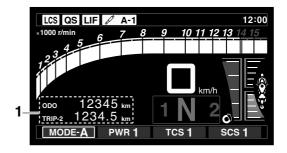


 Select "IND Mode" and then select ON (to turn on the indicator) or OFF (to turn off the indicator).

0 km/h	Shift Indicator	12:0
	Peak Rev IND Setting	
IND Mod	le 📃	ON
101		
-		_
-		

3. Select the triangle symbol to exit. "Display Setting"

This module allows you to set how the information display items (like TRIP-1, ODO, C. TEMP, etc.) are grouped on the main screen. There are four display groups.



1. Information display item (STREET MODE)



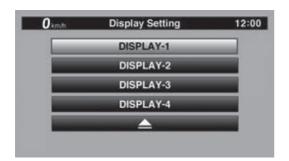
1. Information display item (TRACK MODE)

[To set the display groups]

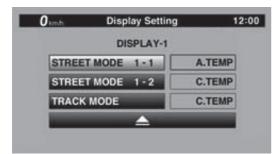
1. Select "Display Setting".



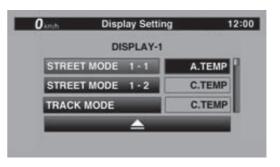
2. DISPLAY-1, DISPLAY-2, DISPLAY-3 and DISPLAY-4 are displayed.



3. For example, let's select DISPLAY-1. STREET MODE 1-1, STREET MODE 1-2, and TRACK MODE are displayed.



4. Select STREET MODE 1-1.



5. Select the desired information display item with the wheel switch.

TIP

The information display items which can be selected are: A.TEMP: air temperature C.TEMP: coolant temperature TRIP-1: tripmeter 1 TRIP-2: tripmeter 2 ODO: odometer FUEL CON: the amount of fuel consumed FUEL AVG: average fuel consumption CRNT FUEL: current fuel consumption

6. Select STREET MODE 1-2 or TRACK MODE to set the remaining DISPLAY-1 group items.

	DI	SPLAY-1	
STREE	T MODE	1-1	A.TEMP
STREE	T MODE	1-2	C.TEMP
TRACK	MODE		C.TEMP

7. Select the triangle symbol to exit. To set the other display groups, repeat from step 3.

"Brightness"

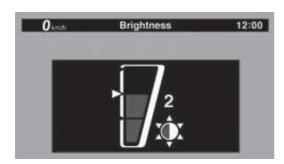
This function allows you to adjust the general brightness level of the display screen.

[To set the brightness]

1. Select "Brightness".



2. Select the desired brightness level by rotating the wheel switch, and then short push the wheel switch to fix the setting.



"Clock"

The clock uses a 12-hour system. [To set the clock]

1. From the MENU screen, select "Clock".



2. When "Clock" is selected, the hours figure will be highlighted.



3. Set the hour by rotating and then short push the wheel switch.



4. The minutes figure will become highlighted.



5. Set the minutes figure by rotating and then short push the wheel switch.



6. Short push the wheel switch again to exit and go back to the MENU screen.

"All Reset"

This function resets everything, except the odometer and clock, to its factory preset or default setting.

Select YES to reset all items. After selecting YES, all items will be reset and the screen will automatically return to the MENU screen.

IMPORTANT INFORMATION

EAS30006

EAS20000

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 1-56.

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

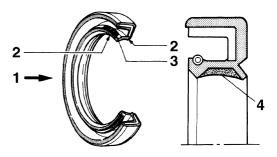
REPLACEMENT PARTS

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.

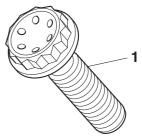


- 1. Oil
- 2. Lip
- 3. Spring
- 4. Grease

EAS31626

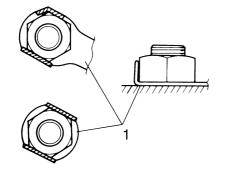
ALUMINUM BOLTS

The aluminum bolt "1" is used for securing the crankcase breather cover, clutch cover, generator cover, timing chain cover, and oil pan. Be sure to replace the aluminum bolt with a new one after removing it.



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.



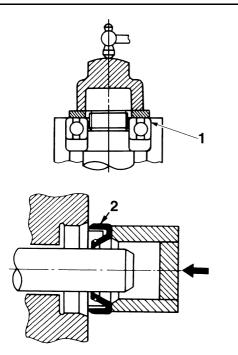
EAS30010

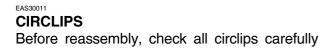
BEARINGS AND OIL SEALS

Install bearings "1" and oil seals "2" so that the manufacturer 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.

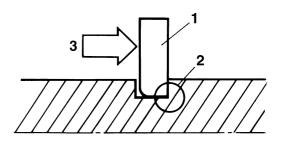
NOTICE

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





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.



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.

BASIC SERVICE INFORMATION

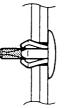
QUICK FASTENERS Rivet type

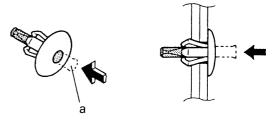
- 1. Remove:
- Quick fastener

TIP —

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







Screw type

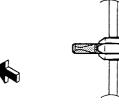
- 1. Remove:
- Quick fastener

TIP __

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





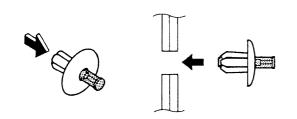


2. Install:

Quick fastener

TIP -

To install the quick fastener, 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 "a" in with a screwdriver. Make sure that the pin is flush with the fastener's head.





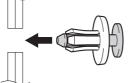


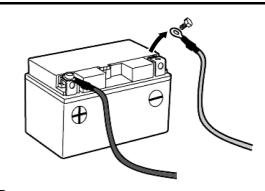
- 2. Install:
- Quick fastener
- TIP _____

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

BASIC SERVICE INFORMATION

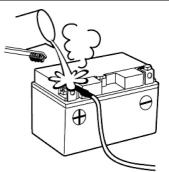






TIP

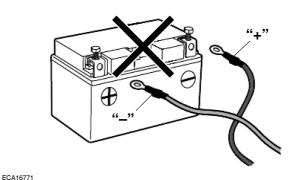
If a battery lead is difficult to disconnect due to rust on the battery terminal, remove the rust using hot water.



NOTICE

ECA16760

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



NOTICE

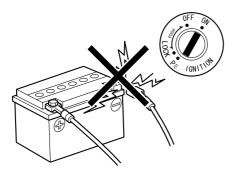
When connecting the battery leads to the battery, be sure to connect the positive battery lead first, then the negative battery lead. If the negative battery lead is connected first and a tool or similar item contacts the vehicle while the positive battery lead is being connected, a spark could be generated,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



ELECTRICAL SYSTEM Electrical parts handling ECA16600

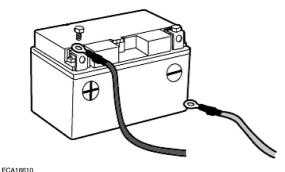
NOTICE

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



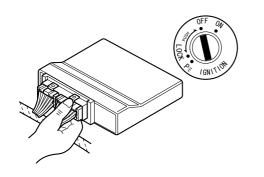
ECA16751 NOTICE

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.



NOTICE

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



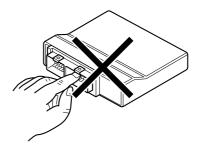
NOTICE

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



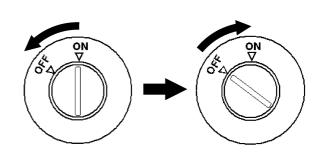
NOTICE

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.



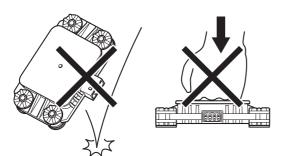
TIP_

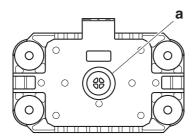
When resetting the ECU by turning the main switch to "OFF", be sure to wait approximately 5 seconds before turning the main switch back to "ON".



ECA22611 NOTICE

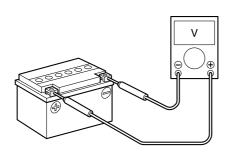
- Do not perform angle adjustment of the IMU and battery box by pinching the washer and related parts.
- When installing the IMU, apply a thin coat of silicone grease onto the washer where contacting the IMU grommet.
- When installing the IMU, use only a genuine bolt and washer, and tighten the bolt to the specified torque.
- Pay attention not to expose the IMU to strong shocks, such as striking or dropping it.
- Do not place any foreign objects in and around the battery box.
- Do not obstruct breather opening "a" of the IMU.
- Do not clean the breather opening and do not blow it with compressed air.
- When replacing the collar or grommet, replace all four collars and grommets.





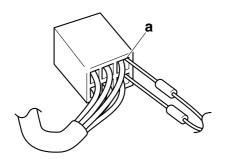
Checking the electrical system

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



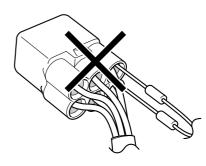
ECA14371 NOTICE

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

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.



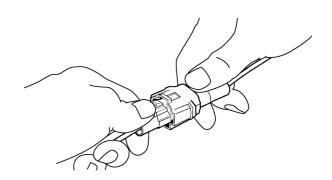
Checking the connections

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

- 1. Disconnect:
 - Lead
 - Coupler
- Connector

ECA16780

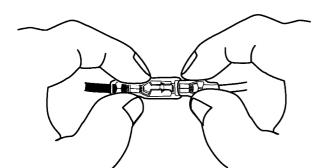
- When disconnecting a coupler, release the coupler lock, hold both sections of the coupler securely, and then disconnect the coupler.
- There are many types of coupler locks; therefore, be sure to check the type of coupler lock before disconnecting the coupler.



ECA16790

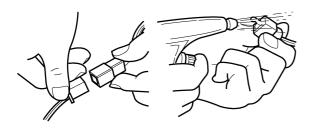
When disconnecting a connector, do not pull the leads. Hold both sections of the connector securely, and then disconnect the connector.

BASIC SERVICE INFORMATION



- 2. Check:
- Lead
- Coupler
- Connector
- Moisture \rightarrow Dry with an air blower.

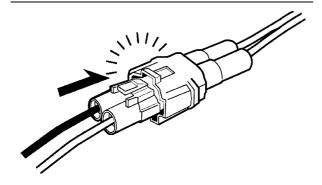
Rust/stains \rightarrow Connect and disconnect several times.

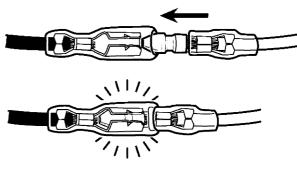


- 3. Connect:
 - Lead
 - Coupler
 - Connector

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.





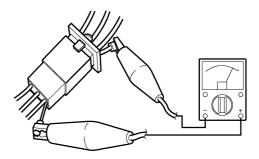
- 4. Check:
 - Continuity
 (with the peaket to
 - (with the pocket tester)

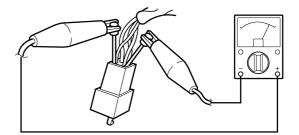
A STATE

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

TIP -

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





- 5. Check:
- Resistance

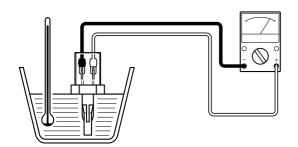


Pocket tester 90890-03112 Analog pocket tester YU-03112-C TIP -

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.



Intake air temperature sensor resistance 5.40–6.60 k Ω at 0 °C (32 °F) 290–390 Ω at 80 °C (176 °F)



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
Valve spring compressor attachment 90890-01243 Valve spring compressor adapter (26 mm) YM-01253-1	ø26	5-28, 5-34
Ring nut wrench 90890-01268 Spanner wrench YU-01268	R22 R38	4-102
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304	5-73
Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A	90890-01325 638	6-2, 6-3
	YU-24460-A	

Tool name/Tool No.	Illustration	Reference pages
Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984	90890-01352 041 028 028	6-2, 6-3
	YU-33984	
Damper rod holder (22 mm) 90890-01365		4-113, 4-115
Crankshaft protector 90890-01382 Crankshaft protector YM-01382	ø16.8	5-36
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472	R20 R20	3-21, 4-102
Flywheel puller 90890-01404 Flywheel puller YM-01404	M35×P1.5	5-36
Oil filter wrench 90890-01426 Oil filter wrench YU-38411	64.2	3-30
Rod holder 90890-01434 Damper rod holder double ended YM-01434	11.5	4-81, 4-87

Tool name/Tool No.	Illustration	Reference pages
Rod puller attachment (M10) 90890-01436 Universal damping rod bleeding tool set YM-A8703	90890-01436	4-85, 4-87
	YM-A8703	
Rod puller 90890-01437 Universal damping rod bleeding tool set YM-A8703	90890-01437	4-85, 4-87
	YM-A8703	
Fork spring compressor 90890-01441 Fork spring compressor YM-01441		4-81, 4-87
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-85, 4-95, 4-96
Pivot shaft wrench 90890-01485 Frame mount insert wrench YM-01485	5	5-7
Damper rod holder 90890-01504 Damper rod holder YM-01504	Ø 037	4-93, 4-95

Tool name/Tool No.	Illustration	Reference pages
Damper rod holder 90890-01506 Damper rod holder YM-01506	030	4-82, 4-84
Ring nut wrench 90890-01507 Ring nut wrench YM-01507	042.0	4-113, 4-115
Drive chain cut & rivet tool 90890-01550 Drive chain cut & rivet tool YM-01550		4-117, 4-119
Wheel bearing ring nut tool 90890-01574 YM-01574		4-38, 4-39
Front fork cap bolt wrench 42mm 90890-01575 YM-01575	042	4-92, 4-93, 4-98
Front fork rod puller M7x0.75 90890-01576 YM-01576	M7×0.75	4-96, 4-97
Sheave holder 90890-01701 Primary clutch holder YS-01880-A	C C C C C C C C C C C C C C C C C C C	5-39, 5-40

Tool name/Tool No.	Illustration	Reference pages
Compression gauge 90890-03081 Engine compression tester YU-33223	90890-03081	5-1
	YU-33223	
Vacuum gauge 90890-03094 Vacuummate YU-44456	90890-03094	3-9
	YU-44456	
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-54, 8-179, 8-180, 8-184, 8-185, 8-186, 8-187, 8-188, 8-190, 8-191, 8-192, 8-194, 8-195, 8-196
Oil pressure gauge set 90890-03120	A CONTRACT OF CONTRACT.	3-31
Pressure gauge 90890-03153 Pressure gauge YU-03153	the state of the s	7-14, 7-15
Carburetor angle driver 2 90890-03173		3-10

Tool name/Tool No.	Illustration	Reference pages
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		5-43, 8-188, 8-189, 8-193, 8-194
Fuel pressure adapter 90890-03176 Fuel pressure adapter YM-03176		7-15
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-6, 3-7, 4-33, 4-42, 5-24, 5-57
Test harness S– pressure sensor (3P) 90890-03207 Test harness S– pressure sensor (3P) YU-03207		8-193, 8-194
Test harness– speed sensor (3P) 90890-03208 Test harness– speed sensor (3P) YU-03208		8-194
Fuel injector pressure adapter 90890-03210 Fuel injector pressure adapter YU-03210		7-14
Yamaha diagnostic tool 90890-03239	UNAMAA UNAMAA UNAMAA UNAMAA	3-12, 4-71, 4-72, 8-53, 8-131, 8-150
Valve spring compressor 90890-04019 Valve spring compressor YM-04019	0	5-17, 5-20, 5-28, 5-34
Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 & 50 mm YM-04058	ø40	6-12

Tool name/Tool No.	Illustration	Reference pages
Universal clutch holder 90890-04086 Universal clutch holder YM-91042	90890-04086 <u>M8×P1.25</u> 30 119 156	5-56, 5-60
	YM-91042	
Valve guide remover (ø5) 90890-04097 Valve guide remover (5.0 mm) YM-04097	05 1 1	5-30
Valve guide installer (ø5) 90890-04098 Valve guide installer (5.0 mm) YM-04098	05	5-30
Valve guide reamer (ø5) 90890-04099 Valve guide reamer (5.0 mm) YM-04099	05	5-30
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-30
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117	04.5 08.3 010	5-30
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118		5-30

Tool name/Tool No.	Illustration	Reference pages
Mechanical seal installer 90890-04132 Water pump seal installer YM-33221-A	ø27.5 014	6-12
15mm pin type rotor holding tool 90890-04171 YM-04171		5-36, 5-37
Piston pin clip insertion tool 90890-04173 YM-04173		5-80
Piston pin clip installer tool 90890-04174 YM-04174		5-81
Piston pin clip rotation tool 90890-04175 YM-04175		5-72
Oil pressure gauge joint 18mm 90890-04176 YU-04176	018	3-31
Ignition checker 90890-06754 Oppama pet–4000 spark checker YM-34487		8-186
Vacuum/pressure pump gauge set 90890-06945 Pressure/ vacuum tester YB-35956-B		4-22

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Yamaha bond No. 1215 90890-85505 (Three bond No.1215®)	and the second sec	5-37, 5-67

SPECIFICATIONS

GENERAL SPECIFICATIONS	2-1
ENGINE SPECIFICATIONS	2-2
CHASSIS SPECIFICATIONS	2-7
ELECTRICAL SPECIFICATIONS	2-11
TIGHTENING TORQUES GENERAL TIGHTENING TORQUE SPECIFICATIONS ENGINE TIGHTENING TORQUES CHASSIS TIGHTENING TORQUES	2-14 2-15
LUBRICATION POINTS AND LUBRICANT TYPES ENGINE CHASSIS	2-27
LUBRICATION SYSTEM CHART AND DIAGRAMS ENGINE OIL LUBRICATION CHART LUBRICATION DIAGRAMS	2-31
COOLING SYSTEM DIAGRAMS	2-47
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GENERAL SPECIFICATIONS

Model	
Model	YZF-R1 2CR1 (AUS)(AUT)(BEL)(CHE)(CYP) (CZE)(DEU)(DNK)(ESP)(FIN)(FRA)(GBR) (GRC)(HRV)(HUN)(IRL)(ISR)(ITA)(NLD)(NOR) (POL)(PRT)(SVK)(SVN)(SWE)(TUR) YZF-R1 2CR2 (BEL)(FRA) YZF-R1 2CR6 (AUS) YZF-R1M 2KS1 (AUS)(AUT)(BEL)(CHE)(CYP) (CZE)(DEU)(DNK)(ESP)(FIN)(FRA)(GBR) (GRC)(HRV)(HUN)(IRL)(ISR)(ITA)(NLD)(NOR) (POL)(PRT)(SVK)(SVN)(SWE)(TUR) YZF-R1M 2KS2 (BEL)(FRA) YZF-R1M 2KS6 (AUS) YZF-R1M 2KS7 (RUS)
Dimensions	
Overall length	2055 mm (80.9 in)
Overall width	690 mm (27.2 in)
Overall height	1150 mm (45.3 in)
Seat height	YZF-R1 855 mm (33.7 in)
	YZF-R1M 860 mm (33.9 in)
Wheelbase	1405 mm (55.3 in)
Ground clearance	130 mm (5.12 in)
Minimum turning radius	3300 mm (129.9 in)
Weight	
Curb weight	YZF-R1 199 kg (439 lb)
-	YZF-R1M 200 kg (441 lb)
Maximum load	188 kg (414 lb)

EAS20014 ENGINE SPECIFICATIONS

Engine	
Engine type	Liquid cooled 4-stroke, DOHC
Displacement	998 cm ³
Cylinder arrangement	Inline 4-cylinder
Bore \times stroke	79.0 × 50.9 mm (3.11 × 2.00 in)
Compression ratio	13.0 : 1
Standard compression pressure (at sea level)	1450 kPa/250 r/min (14.5 kgf/cm²/250 r/min, 206.2 psi/250 r/min)
Minimum-maximum	1260–1630 kPa/250 r/min (12.6–16.3 kgf/cm²/250 r/min, 179.2–231.8 psi/250 r/min)
Starting system	Electric starter
Fuel	
Recommended fuel	YZF-R1M Unleaded gasoline only. Minimum re- search octane number 95 (RUS)
Recommended fuel	YZF-R1 Premium unleaded gasoline (Gasohol (E10) acceptable)
	YZF-R1M Premium unleaded gasoline (Gaso- hol (E10) acceptable) (AUS)(EUR)(ISR)
Fuel tank capacity	17.0 L (4.49 US gal, 3.74 Imp.gal)
Fuel reserve amount	3.0 L (0.79 US gal, 0.66 Imp.gal)
Engine oil	
Recommended brand	YAMALUBE
Type	Full synthetic SAE 10W-40 or 15W-50
Recommended engine oil grade	API service SG type or higher, JASO standard
necommended engine on grade	MA
Lubrication system	Wet sump
Engine oil quantity	
Quantity (disassembled)	4.90 L (5.18 US qt, 4.31 Imp.qt)
Without oil filter cartridge replacement	3.90 L (4.12 US qt, 3.43 Imp.qt)
With oil filter cartridge replacement	4.10 L (4.33 US qt, 3.61 Imp.qt)
Oil filter	
Oil filter type	Cartridge
Oil pump	
Oil pump type	Trochoid
Outer-rotor-to-oil-pump-housing clearance	0.09–0.15 mm (0.0035–0.0059 in)
Limit	0.22 mm (0.0087 in)
Oil-pump-housing-to-inner-and-outer-rotor	0.06–0.11 mm (0.0024–0.0043 in)
clearance	, , ,
Limit	0.18 mm (0.0071 in)
Oil pressure	220.0 kPa/5000 r/min@80 °C (31.9 psi/5000 r/min@176 °F)
Bypass valve opening pressure	80.0–120.0 kPa (0.80–1.20 kgf/cm ² , 11.6–17.4 psi)
Relief valve operating pressure	720.0–860.0 kPa (7.20–8.60 kgf/cm², 104.4– 124.7 psi)
Cooling system	
Coolant quantity	
Radiator (including all routes)	2.25 L (2.38 US qt, 1.98 Imp.qt)

Coolant reservoir (up to the maximum level mark)	0.25 L (0.26 US qt, 0.22 Imp.qt)
Radiator cap opening pressure	107.9–137.3 kPa (1.08–1.37 kgf/cm², 15.6–19.9 psi)
Thermostat	
Valve opening temperature	71.0 °C (159.80 °F)
Valve full open temperature	85.0 °C (185.00 °F)
Valve lift (full open)	8.0 mm (0.31 in)
Radiator core	
Width	383.0 mm (15.08 in)
Height	235.2 mm (9.26 in)
Depth	22.0 mm (0.87 in)
Water pump	
Water pump type	Single suction centrifugal pump
Reduction ratio	67/41 × 33/28 (1.926)
Impeller shaft tilt limit	0.15 mm (0.006 in)
Spark plug(s)	
Manufacturer/model	NGK/LMAR9E-J
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
Cylinder head	
Combustion chamber volume	14.90–15.30 cm³ (0.91–0.93 cu.in)
Warpage limit	0.10 mm (0.0039 in)
Camshaft	
Drive system	Chain drive (right)
Camshaft cap inside diameter	25.500–25.521 mm (1.0039–1.0048 in)
Camshaft journal diameter	25.459–25.472 mm (1.0023–1.0028 in)
Camshaft-journal-to-camshaft-cap clearance Camshaft lobe dimensions	0.028–0.062 mm (0.0011–0.0024 in)
Lobe height (Intake)	35.210–35.310 mm (1.3862–1.3902 in)
Limit	35.160 mm (1.3842 in)
Base circle diameter (Intake)	28.150–28.250 mm (1.1083–1.1122 in)
Limit	28.100 mm (1.1063 in)
Lobe height (Exhaust)	34.220–35.220 mm (1.3472–1.3866 in)
Limit Reas sizes dispector (Exhaust)	34.170 mm (1.3453 in)
Base circle diameter (Exhaust)	28.090–28.190 mm (1.1059–1.1098 in)
Limit Camshaft runout limit	28.040 mm (1.1039 in)
	0.050 mm (0.0020 in)
Rocker arm/rocker arm shaft	
Rocker arm inside diameter	7.987–8.002 mm (0.3144–0.3150 in)
Limit	8.017 mm (0.3156 in)
Rocker arm shaft outside diameter	7.967–7.979 mm (0.3137–0.3141 in)
Limit	7.936 mm (0.3124 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.008–0.035 mm (0.0003–0.0014 in)
Limit	0.080 mm (0.0032 in)
Valve, valve seat, valve guide	
Valve clearance (cold)	
Intake	0.09–0.17 mm (0.0035–0.0067 in)
Exhaust	0.18–0.23 mm (0.0071–0.0091 in)
Valve dimensions	
Valve head diameter (intake)	32.90–33.10 mm (1.2953–1.3031 in)

Valve head diameter (exhaust)	26.40–26.60 mm (1.0394–1.0472 in)
Valve seat contact width (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)
Valve seat contact width (exhaust)	1.10–1.30 mm (0.0433–0.0512 in)
Limit	1.8 mm (0.07 in)
Valve stem diameter (intake)	4.975–4.990 mm (0.1959–0.1965 in)
Limit	4.960 mm (0.1953 in)
Valve stem diameter (exhaust)	4.460–4.475 mm (0.1756–0.1762 in)
Limit	4.425 mm (0.1742 in)
Valve guide inside diameter (intake)	5.000–5.012 mm (0.1969–0.1973 in)
Limit	5.050 mm (0.1988 in)
Valve guide inside diameter (exhaust)	4.500–4.512 mm (0.1772–0.1776 in)
Limit	4.550 mm (0.1791 in)
Valve-stem-to-valve-guide clearance (intake)	0.010–0.037 mm (0.0004–0.0015 in)
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (ex-	0.025–0.052 mm (0.0010–0.0020 in)
haust)	
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.010 mm (0.0004 in)
Valve spring	
Free length (intake)	40.67 mm (1.60 in)
Limit	38.64 mm (1.52 in)
Free length (exhaust)	42.37 mm (1.67 in)
Limit	40.25 mm (1.58 in)
Installed length (intake)	35.40 mm (1.39 in)
Installed length (exhaust)	36.60 mm (1.44 in)
Installed compression spring force (intake)	171.40–197.20 N (17.48–20.11 kgf, 38.53–
	44.33 lbf)
Installed compression spring force (exhaust)	198.80–228.80 N (20.27–23.33 kgf, 44.69–
	51.43 lbf)
Spring tilt (intake)	1.8 mm (0.07 in)
Spring tilt (exhaust)	1.8 mm (0.07 in)
Winding direction (intake)	Clockwise
Winding direction (exhaust)	Clockwise
Cylinder	
Bore	79.000–79.010 mm (3.1102–3.1106 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.050 mm (0.0020 in)
Piston	
Piston-to-cylinder clearance	0.006–0.049 mm (0.0002–0.0019 in)
Diameter	78.961–79.994 mm (3.1087–3.1494 in)
Measuring point (from piston skirt bottom)	8.0 mm (0.31 in)
Offset	0.10 mm (0.0039 in)
Piston pin bore inside diameter	17.002–17.013 mm (0.6694–0.6698 in)
Limit	17.043 mm (0.6710 in)
Piston pin outside diameter	16.991–17.000 mm (0.6689–0.6693 in)
Limit	16.971 mm (0.6681 in)
Piston-pin-to-piston-pin-bore clearance	0.002–0.022 mm (0.0001–0.0009 in)
Limit	0.072 mm (0.0028 in)
Piston ring Top ring	

Top ring

Ring type	Barrel
End gap (installed)	0.15–0.25 mm (0.0059–0.0098 in)
Limit	0.50 mm (0.0197 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
Limit	0.115 mm (0.0045 in)
2nd ring	
Ring type	Taper
End gap (installed)	0.65–0.80 mm (0.0256–0.0315 in)
Limit	1.15 mm (0.0453 in)
Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)
Limit	0.115 mm (0.0045 in)
Oil ring	
End gap (installed)	0.10–0.35 mm (0.0039–0.0138 in)
Connecting rod	
Oil clearance	0.033–0.057 mm (0.0013–0.0022 in)
Limit	0.09 mm (0.0035 in)
Bearing color code	1. Blue 2. Black 3. Brown 4. Green 5. Yellow 6.
5	Pink
Crankshaft	
Runout limit	0.030 mm (0.0012 in)
Big end side clearance	0.150–0.272 mm (0.0059–0.0107 in)
Journal oil clearance	0.027–0.045 mm (0.0011–0.0018 in)
Bearing color code	1.Blue 2.Black 3.Brown 4.Green 5.Yellow 6.Pink
3	7.Red
Balancer	
Balancer shaft runout limit	0.030 mm (0.0012 in)
Balancer shaft journal to balancer shaft bear-	0.028–0.046 mm (0.0011–0.0018 in)
ing clearance	
Bearing color code	0.White 1.Blue 2.Black 3.Brown 4.Green 5.Yel-
	low 6.Pink
Clutch	
Clutch type	Wet, multiple-disc
Clutch release method	Outer pull, rack and pinion pull
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Friction plate thickness	2.72–2.88 mm (0.107–0.113 in)
Wear limit	2.62 mm (0.103 in)
Plate quantity	10 pcs
Clutch plate 1 thickness	2.46–2.74 mm (0.097–0.108 in)
Plate quantity	1 pcs
Warpage limit	0.10 mm (0.004 in)
Clutch plate 2 thickness	2.18–2.42 mm (0.086–0.095 in)
Plate quantity	8 pcs
Warpage limit	0.10 mm (0.004 in)
Clutch spring free length	47.36 mm (1.86 in)
Limit	44.99 mm (1.77 in)
Spring quantity	3 pcs
Transmission	
Transmission type	Constant mesh 6-speed
Primary reduction ratio	1.634 (67/41)
Secondary reduction ratio	2.563 (41/16)
Final drive	Chain
~	2-5
	=:)

Operation	Left foot operation
Gear ratio	•
1st	2.600 (39/15)
2nd	2.176 (37/17)
3rd	1.842 (35/19)
4th	1.579 (30/19)
5th	1.381 (29/21)
6th	1.250 (30/24)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)
Shifting mechanism	
Shift fork guide bar bending limit	0.100 mm (0.0039 in)
Shift fork thickness (L, C)	5.79–5.87 mm (0.2280–0.2311 in)
Shift fork thickness (R)	5.76–5.89 mm (0.2268–0.2319 in)
Installed shift rod length	258.5–260.5 mm (10.18–10.26 in)
Air filter	
Air filter element	Oil-coated paper element
Fuel pump	
Pump type	Electrical
Maximum consumption amperage	5.2 A
Fuel injector	
Model/quantity	297500-0640/4(Pri) , 297500-1640/4(2nd)
Resistance	12.0 Ω@20 °C (68 °F)
Throttle body	
Type/quantity	45EIDW/1
ID mark	2CR1 00
Throttle position sensor	
Resistance	1.40–2.60 kΩ
Output voltage (at idle)	0.63–0.73 V
Accelerator position sensor	1 10 0 00 10
Resistance	1.40–2.60 kΩ
Output voltage	0.63–0.73 V
Idling condition	
Engine idling speed	1200–1400 r/min
CO%	1.0-4.0 %
Intake vacuum	26.0 kPa (195 mmHg, 7.7 inHg)
Water temperature	90.0–110.0 °C (194.00–230.00 °F)
Oil temperature	65.0–85.0 °C (149.00–185.00 °F)
Fuel line pressure at idling	300–390 kPa (3.0–3.9 kgf/cm ² , 43.5–56.6 psi)
Throttle grip free play	3.0–5.0 mm (0.12–0.20 in)
Air induction system	0.4 mm (0.02 in)
Reed valve bending limit	0.4 mm (0.02 in)
Solenoid resistance	18–22 Ω

CHASSIS SPECIFICATIONS	
Chassis	
Frame type	Diamond
Caster angle	24.00 °
Trail	102 mm (4.0 in)
Front wheel	
Wheel type	Cast wheel
Rim size	17M/C x MT3.50
Rim material	Magnesium
Wheel travel	120 mm (4.7 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Rear wheel	
Wheel type	Cast wheel
Rim size	17M/C x MT6.00
Rim material	Magnesium
Wheel travel	120 mm (4.7 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Front tire	
Туре	Tubeless
Size	120/70 ZR17M/C (58W)
Manufacturer/model	YZF-R1
	BRIDGESTONE/BATTLAX RACING STREET
	RS10F G or PIRELLI/DIABLO SUPERCORSA
	SP
	YZF-R1M
	BRIDGESTONE/BATTLAX RACING STREET
	RS10F G
Wear limit (front)	1.5 mm (0.06 in) (AUS)
	1.6 mm (0.06 in) (EUR)(ISR)(RUS)
Rear tire	
Туре	Tubeless
Size	YZF-R1 190/55 ZR17M/C (75W)
	YZF-R1M 200/55 ZR17M/C (78W)
Manufacturer/model	YZF-R1
	BRIDGESTONE/BATTLAX RACING STREET
	RS10R G or PIRELLI/DIABLO SUPERCORSA
	SP
	YZF-R1M
	BRIDGESTONE/BATTLAX RACING STREET
	RS10R G
Maar limit (rear)	
Wear limit (rear)	1.5 mm (0.06 in) (AUS) 1.6 mm (0.06 in) (EUR)(ISR)(RUS)
Tire air pressure (measured on cold tires)	
Loading condition	0–90 kg (0–198 lb)
Front	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	
	290 kPa (2.90 kgf/cm², 42 psi)
Loading condition	90–188 kg (198–414 lb)

CHASSIS SPECIFICATIONS

Front	250 kPa (2.50 kgf/cm², 36 psi)
Rear	290 kPa (2.90 kgf/cm², 42 psi)
High-speed riding	
Front	250 kPa (2.50 kgf/cm², 36 psi)
Rear	290 kPa (2.90 kgf/cm², 42 psi)
Front brake	
Туре	Dual disc brake
Operation	Right hand operation
Front disc brake	
Disc outside diameter × thickness	320.0 × 5.0 mm (12.60 × 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 (inner)	4.5 mm (0.18 in)
Limit	0.5 mm (0.02 in)
Brake pad lining thickness (outer)	4.5 mm (0.18 in)
Limit	0.5 mm (0.02 in)
Master cylinder inside diameter	15.87 mm (0.62 in)
Caliper cylinder inside diameter	30.23 mm (1.19 in)
Caliper cylinder inside diameter	27.00 mm (1.06 in)
Specified brake fluid	DOT 4
Rear brake	
Туре	Single disc brake
Operation	Right foot operation
Rear disc brake	
Disc outside diameter × thickness	220.0 × 5.0 mm (8.66 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	4.5 mm (0.18 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	4.5 mm (0.18 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	30.23 mm (1.19 in)
Specified brake fluid	DOT 4
Steering	
Center to lock angle (left)	28.0 °
Center to lock angle (right)	28.0 °
Front suspension	
Туре	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	120.0 mm (4.72 in)
Fork spring free length	YZF-R1 217.5 mm (8.56 in)
	YZF-R1M 260.0 mm (10.24 in)
Collar length	YZF-R1M 138.8 mm (5.46 in)
Spring rate K1	YZF-R1 18.12 N/mm (1.85 kgf/mm, 103.47
	lbf/in)
	YZF-R1M 21.00 N/mm (2.14 kgf/mm, 119.91
	YZF-R1M 21.00 N/mm (2.14 kgf/mm, 119.91 lbf/in) 0.0–120.0 mm (0.00–4.72 in)

CHASSIS SPECIFICATIONS

Inner tube outer diameter	43.0 mm (1.69 in)
Inner tube bending limit	0.2 mm (0.01 in)
Recommended oil	YZF-R1 Suspension oil M1 or equivalent
	YZF-R1M Suspension oil M1 or Ohlins R&T 43
Quantity	YZF-R1 368.0 cm ³ (12.44 US oz, 12.98 lmp.oz
	YZF-R1M 405.0 cm ³ (13.69 US oz, 14.28
	Imp.oz)
Level	YZF-R1 114.0 mm (4.49 in)
	YZF-R1M 220.0 mm (8.66 in)
Spring preload adjusting positions	
Minimum	YZF-R1 0 turn(s) in [*]
	YZF-R1M 0 turn(s) in [*]
Standard	YZF-R1 9 turn(s) in [*]
Standard	YZF-R1M 5 turn(s) in [*]
Maximum	
Maximum	YZF-R1 15 turn(s) in
	YZF-R1M 15 turn(s) in
	*With the adjusting nut fully turned out
Rebound damping adjusting positions	*
Minimum	YZF-R1 14 click(s) out
	YZF-R1M ERS
Standard	YZF-R1 7 click(s) out [*]
	YZF-R1M ERS
Maximum	YZF-R1 0 click(s) out [*]
	YZF-R1M ERS
	*With the adjusting bolt fully turned in
Compression damping adjusting positions	
Minimum	YZF-R1 23 click(s) out [*]
	YZF-R1M ERS
Standard	YZF-R1 17 click(s) out [*]
	YZF-R1M ERS
Maximum	YZF-R1 0 click(s) out [*]
Maximum	YZF-R1M ERS
	*With the adjusting bolt fully turned in
ear suspension	
Туре	Swingarm (link suspension)
Spring/shock absorber type	Coil spring/gas-oil damper
B I I I I I I I I I I	
Rear shock absorber assembly travel	60.0 mm (2.36 in)
2	
Spring installed length	YZF-R1 149.5 mm (5.89 in)
Spring installed length	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in)
2	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62
Spring installed length	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in)
Spring installed length	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90
Spring installed length Spring rate K1	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90 Ibf/in)
Spring installed length Spring rate K1 Spring stroke K1	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90 Ibf/in) 0.0–60.0 mm (0.00–2.36 in)
Spring installed length Spring rate K1	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90 Ibf/in) 0.0–60.0 mm (0.00–2.36 in) YZF-R1 980 kPa (9.8 kgf/cm ² , 139.4 psi)
Spring installed length Spring rate K1 Spring stroke K1 Enclosed gas/air pressure (STD)	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90 Ibf/in) 0.0–60.0 mm (0.00–2.36 in)
Spring installed length Spring rate K1 Spring stroke K1 Enclosed gas/air pressure (STD) Spring preload adjusting positions	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90 Ibf/in) 0.0–60.0 mm (0.00–2.36 in) YZF-R1 980 kPa (9.8 kgf/cm ² , 139.4 psi) YZF-R1M 600 kPa (6.0 kgf/cm ² , 85.3 psi)
Spring installed length Spring rate K1 Spring stroke K1	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90 Ibf/in) 0.0–60.0 mm (0.00–2.36 in) YZF-R1 980 kPa (9.8 kgf/cm², 139.4 psi) YZF-R1M 600 kPa (6.0 kgf/cm², 85.3 psi) YZF-R1 77.5 mm (3.05 in)
Spring installed length Spring rate K1 Spring stroke K1 Enclosed gas/air pressure (STD) Spring preload adjusting positions Minimum	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90 Ibf/in) 0.0–60.0 mm (0.00–2.36 in) YZF-R1 980 kPa (9.8 kgf/cm ² , 139.4 psi) YZF-R1M 600 kPa (6.0 kgf/cm ² , 85.3 psi) YZF-R1 77.5 mm (3.05 in) YZF-R1M 0.0 mm (0.00 in)
Spring installed length Spring rate K1 Spring stroke K1 Enclosed gas/air pressure (STD) Spring preload adjusting positions	YZF-R1 149.5 mm (5.89 in) YZF-R1M 145.0 mm (5.71 in) YZF-R1 88.20 N/mm (8.99 kgf/mm, 503.62 Ibf/in) YZF-R1M 90.00 N/mm (9.18 kgf/mm, 513.90 Ibf/in) 0.0–60.0 mm (0.00–2.36 in) YZF-R1 980 kPa (9.8 kgf/cm², 139.4 psi) YZF-R1M 600 kPa (6.0 kgf/cm², 85.3 psi) YZF-R1 77.5 mm (3.05 in)

Maximum	YZF-R1 85.5 mm (3.37 in)
	YZF-R1M 9.0 mm (0.35 in)
Rebound damping adjusting positions	
Minimum	YZF-R1 23 click(s) out [*]
	YZF-R1M ERS
Standard	YZF-R1 12 click(s) out [*]
	YZF-R1M ERS
Maximum	YZF-R1 0 click(s) out [*]
	YZF-R1M ERS
	*With the adjusting screw fully turned in
Compression damping setting (for fast compre	ession damping)
Minimum	YZF-R1 5.5 turn(s) out
Standard	YZF-R1 3 turn(s) out*
Maximum	YZF-R1 0 turn(s) out*
	*With the adjusting bolt fully turned in
Compression damping setting (for slow compr	ression damping)
Minimum	YZF-R1 18 click(s) out [*]
	YZF-R1M ERS
Standard	YZF-R1 10 click(s) out [*]
	YZF-R1M ERS
Maximum	YZF-R1 0 click(s) out [*]
	YZF-R1M ERS
	*With the adjusting screw fully turned in
Drive chain	
Size/manufacturer	525VAZ/DAIDO
Number of links	114
Drive chain slack	25.0–35.0 mm (0.98–1.38 in)

Drive chain slack 15-link length limit

25.0-35.0 mm (0.98-1.38 in) 239.3 mm (9.42 in)

EAS20016 ELECTRICAL SPECIFICATIONS	
Voltage System voltage	12 V
Ignition system Ignition system Ignition timing (B.T.D.C.)	TCI 5.0 °/1300 r/min
Engine control unit Model/manufacturer	YZF-R1 TBDFK1/DENSO (AUS)(AUT)(BEL) (CHE)(CYP)(CZE)(DEU)(DNK)(ESP)(FIN) (FRA)(GBR)(GRC)(HRV)(HUN)(IRL)(ISR)(ITA) (NLD)(NOR)(POL)(PRT)(SVK)(SVN)(SWE) (TUR) YZF-R1 TBDFR8/DENSO (BEL)(FRA) YZF-R1M TBDFK1/DENSO (AUS)(AUT)(BEL) (CHE)(CYP)(CZE)(DEU)(DNK)(ESP)(FIN) (FRA)(GBR)(GRC)(HRV)(HUN)(IRL)(ISR)(ITA) (NLD)(NOR)(POL)(PRT)(RUS)(SVK)(SVN) (SWE)(TUR) YZF-R1M TBDFR8/DENSO (BEL)(FRA)
TCI Pickup coil resistance	189–231 Ω (Gy-B)
Ignition coil Minimum ignition spark gap Primary coil resistance Secondary coil resistance	6.0 mm (0.24 in) 0.85–1.15 Ω 8.50–11.50 kΩ
AC magneto Standard output Stator coil resistance	14.0 V, 26.3 A@5000 r/min 0.112–0.168 Ω (W-W)
Rectifier/regulator Regulator type Regulated voltage (DC) Rectifier capacity	Semi conductor-short circuit 14.3–14.7 V 35.0 A
Battery Model Voltage, capacity Specific gravity Manufacturer Ten hour rate charging current	YTZ7S(F) 12 V, 6.0 Ah 1.310 GS YUASA 0.60 A
Bulb voltage, wattage × quantity Headlight Auxiliary light Tail/brake light Front turn signal light Rear turn signal light License plate light Meter lighting	LED LED LED LED LED LED LED

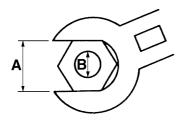
Indicator light	
Neutral indicator light	LED
Turn signal indicator light	LED
High beam indicator light	LED
Fuel level warning light	LED
Engine trouble and system warning light	LED
ABS warning light	LED
Oil pressure and coolant temperature warning	LED
light	
Immobilizer system indicator light	LED
Shift timing indicator light	LED
Stability control indicator light	LED
Starter motor	
Power output	0.75 kW
Armature coil resistance	0.0120–0.0140 Ω
Brush overall length	9.0 mm (0.35 in)
Limit	5.50 mm (0.22 in)
Brush spring force	4.80–7.20 N (489–734 gf, 17.28–25.92 oz)
Mica undercut (depth)	2.40 mm (0.09 in)
Starter relay	
Amperage	180.0 A
Coil resistance	4.18–4.62 Ω
Horn	
Horn type	Plane
Quantity	1
Maximum amperage	3.0 A
Coil resistance	1.07–1.11 Ω
Solenoid	
Steering damper solenoid resistance	49.82–56.18 Ω
Intake solenoid resistance	42.00–48.00 Ω
Fuel injection sensor	
Crankshaft position sensor resistance	189–231 Ω
Cylinder identification sensor output voltage	0.8 V
(ON)	
Cylinder identification sensor output voltage (OFF)	4.8 V
Intake air pressure sensor output voltage	3.57–3.71 V@101.3 kPa (3.57–3.71 V@1.01
	kgf/cm ² , 3.57–3.71 V@14.7 psi)
Intake air temperature sensor resistance	209–390 Ω@80 °C (176 °F)
Atmospheric pressure sensor output voltage	3.57–3.71 V@101.3 kPa (3.57–3.71 V@1.01
	kgf/cm², 3.57–3.71 V@14.7 psi)
Coolant temperature sensor resistance	2517–2777 Ω@20 °C (68 °F)
Coolant temperature sensor resistance	210–221 Ω@100 °C (212 °F)
Fuses	
Main fuse	50.0 A
Headlight fuse	7.5 A
Signaling system fuse	7.5 A
Ignition fuse	15.0 A
Radiator fan motor fuse	10.0 A × 1, 15.0 A x 1
Hazard 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			

EAS30016 ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Spark plug	M10	4	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Spark plug (new)	M10	4	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Exhaust pipe nut	M8	8	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust pipe joint bolt	M8	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust chamber bolt	M8	3	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Muffler bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Muffler joint bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
EXUP cable locknut	M6	2	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
EXUP valve pulley cover bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil filter cartridge	M20	1	17 Nm (1.7 m·kgf, 12 ft·lbf)	
Engine oil drain bolt	M14	1	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Oil pressure switch joint bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Coolant reservoir bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Clutch cable locknut	M8	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Throttle cable locknut (handlebar side)	M6	1	4.3 Nm (0.43 m·kgf, 3.1 ft·lbf)	
Throttle cable locknut (throttle body side)	M6	2	4.5 Nm (0.45 m·kgf, 3.3 ft·lbf)	
Water pump drain bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Water pump air bleed bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Camshaft cap bolt	M6	20	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	-E
Camshaft cap bolt (new)	M6	20	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Engine mounting adjust bolt	M18	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Engine mounting nut	M12	2	56 Nm (5.6 m·kgf, 41 ft·lbf)	
Engine mounting bolt	M12	2	70 Nm (7.0 m·kgf, 51 ft·lbf)	
Rocker arm shaft bolt	M5	4	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	-16
Straight plug (rocker arm shaft)	M12	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Timing chain tensioner bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Timing mark accessing bolt	M8	1	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Crankshaft end cover	M27	1	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Cylinder head cover bolt	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Generator rotor bolt	M10	1	85 Nm (8.5 m·kgf, 61 ft·lbf)	-6
Starter clutch holder bolt	M6	3	14 Nm (1.4 m·kgf, 10 ft·lbf)	-6
Oil pump bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil pump housing bolt	M6	4	10 Nm (1.0 m⋅kgf, 7.2 ft⋅lbf)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Oil pump drive chain guide bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Oil pipe 1 bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Oil strainer bolt	M6	3	10 Nm (1.0 m⋅kgf, 7.2 ft⋅lbf)	-6
Relief valve assembly bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Oil delivery pipe 2 bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Clutch boss nut	M20	1	125 Nm (12.5 m·kgf, 90 ft·lbf)	- E
Clutch spring bolt	M6	3	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)	-6
Oil pressure switch	PT1/8	1	13 Nm (1.3 m⋅kgf, 9.4 ft⋅lbf)	Three Bond No. 1215B®
Oil pressure switch lead bolt	M4	1	1.8 Nm (0.18 m·kgf, 1.3 ft·lbf)	
Gear position sensor bolt	M5	2	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	-6
Connecting rod bolt	M9	8	See TIP.	
Oil delivery pipe 3 bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Main axle bearing housing bolt	M6	3	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	-6
Shift drum retainer bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Oil cooler bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Radiator bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Thermostat housing cover nut	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Fuel pump bolt	M5	4	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Intake funnel assembly bolt	M6	6	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Fuel rail screw (secondary injector)	M5	4	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Air filter case cover screw	M5	10	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Fuel rail screw (throttle body)	M5	4	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Throttle position sensor bolt	M5	2	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Accelerator position sensor screw	M5	2	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Reed valve cover bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Coolant temperature sensor	M10	1	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Muffler protector bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
EXUP servo motor cover screw	M5	2	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	ļ
EXUP servo motor bolt	M6	2	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
EXUP servo motor bracket bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
O ₂ sensor	M12	2	25 Nm (2.5 m·kgf, 18 ft·lbf)	
Starter motor lead bolt	M6	1	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Cylinder identification sensor bolt	M6	1	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	-6

Item	Thread size	Q'ty	Tightening torque	Remarks
Timing chain cover bolt	M6	5	See TIP.	
Timing chain sprocket bolt	M12	1	72 Nm (7.2 m·kgf, 52 ft·lbf)	-Œ
Oil pipe 3 bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-0
Oil pipe 2 bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Cylinder head bolt	M9	10	See TIP.	• ©
Cylinder head bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Generator cover bolt	M6	8	See TIP.	
Stator coil bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-0
Crankshaft position sensor bolt	M5	2	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	-6
Stator coil lead holder bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-@
Starter motor bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Starter motor assembly bolt	M5	2	4.5 Nm (0.45 m·kgf, 3.3 ft·lbf)	
Oil pan bolt	M6	12	See TIP.	
Baffle plate bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-0
Clutch cover bolt	M6	10	See TIP.	
Clutch cover damper plate bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-0
Crankcase breather cover bolt	M6	8	See TIP.	
Oil filter cartridge union bolt	M20	1	70 Nm (7.0 m·kgf, 51 ft·lbf)	-C
Neutral switch	M10	1	17 Nm (1.7 m·kgf, 12 ft·lbf)	
Clutch cable holder bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Damper plate bolt (upper crankcase)	M6	4	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	ģ
Crankcase bolt	M9	10	See TIP.	l=100 mm (3.94 in) →∎€
Crankcase bolt	M8	8	See TIP.	l=58 mm (2.28 in) →€
Crankcase bolt	M8	2	See TIP.	l=60 mm (2.36 in) →∎€
Crankcase bolt	M6	2	See TIP.	l=65 mm (2.56 in) →∎€
Crankcase bolt	M6	1	See TIP.	l=70 mm (2.76 in) →∎€
Crankcase bolt	M6	6	See TIP.	l=60 mm (2.36 in) →■€

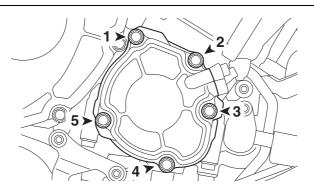
TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Crankcase bolt	M6	4	See TIP.	l=50 mm (1.97 in) - ⊸€
Crankcase bolt	M6	2	See TIP.	l=50 mm (1.97 in) <i>-</i> ₪
Crankcase bolt	M6	5	See TIP.	l=40 mm (1.57 in) →€
Plug (oil gallery)	M20	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Plug bolt (balancer shaft end)	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil nozzle bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	9
Oil nozzle 2	M8	5	3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)	
Oil baffle plate bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	9
Radiator fan bolt	M6	6	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Oil cooler hose bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	9
Thermostat assembly bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Water pump assembly bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Water pump pipe bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Water pump inlet pipe bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Water pump outlet pipe	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil cooler stay bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Water pump housing cover bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Front fuel tank bolt	M6	2	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Rear fuel tank bolt	M6	1	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Fuel tank cap bolt	M5	4	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Intake funnel servo motor bolt	M5	3	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	-6
Throttle body joint clamp screw	M5	4	3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)	
Throttle body joint bolt	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-6
Cross bar bolt	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Intake air pressure sensor screw	M5	1	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Atmospheric pressure sensor bolt	M4	1	0.3 Nm (0.03 m·kgf, 0.22 ft·lbf)	
Air filter case duct bolt	M6	1	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	

TIP -

Timing chain cover bolt

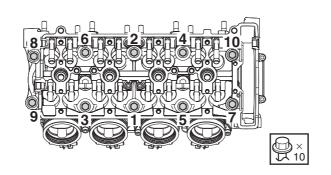
- 1. Tighten the bolts to 6 Nm (0.6 m·kgf, 4.3 ft·lbf) with a torque wrench following the tightening order.
- 2. Perform the following procedure to all the bolts one by one in the tightening sequence as shown in the illustration.
 - a. Loosen the bolt.
 - b. Tighten the bolt to 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) with a torque wrench.
 - c. Tighten the bolt further to reach the specified angle 90°.



TIP -

Cylinder head bolt

- 1. Tighten the bolts to 10 Nm (1.0 m·kgf, 7.2 ft·lbf) with a torque wrench following the tightening order.
- 2. Tighten the bolts to 25 Nm (2.5 m kgf, 18 ft lbf) with a torque wrench following the tightening order.
- 3. Tighten the bolts to 45 Nm (4.5 m kgf, 33 ft lbf) with a torque wrench following the tightening order.
- 4. Perform the following procedure to all the bolts one by one in the tightening sequence as shown in the illustration.
 - a. Loosen the bolt.
 - b. Tighten the bolt to 15 Nm (1.5 m·kgf, 11 ft·lbf) with a torque wrench.
 - c. Tighten the bolt further to reach the specified angle 160°.

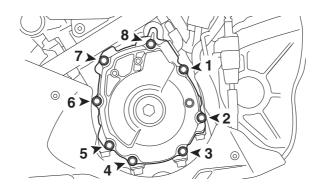


TIP __

Generator cover bolt

- 1. Tighten the bolts to 6 Nm (0.6 m·kgf, 4.3 ft·lbf) with a torque wrench following the tightening order.
- 2. Perform the following procedure to all the bolts one by one in the tightening sequence as shown in the illustration.
 - a. Loosen the bolt.
 - b. Tighten the bolt to 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) with a torque wrench.
 - c. Tighten the bolt further to reach the specified angle 90° .

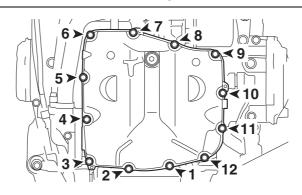
TIGHTENING TORQUES



TIP _

Oil pan bolt

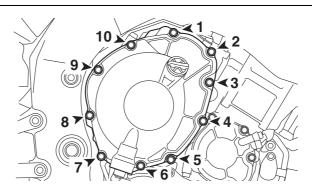
- 1. Tighten the bolts to 6 Nm (0.6 m·kgf, 4.3 ft·lbf) with a torque wrench following the tightening order.
- 2. Perform the following procedure to all the bolts one by one in the tightening sequence as shown in the illustration.
 - a. Loosen the bolt.
 - b. Tighten the bolt to 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) with a torque wrench.
 - c. Tighten the bolt further to reach the specified angle 90°.



TIP -

Clutch cover bolt

- 1. Tighten the bolts to 6 Nm (0.6 m·kgf, 4.3 ft·lbf) with a torque wrench following the tightening order.
- 2. Perform the following procedure to all the bolts one by one in the tightening sequence as shown in the illustration.
 - a. Loosen the bolt.
 - b. Tighten the bolt to 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) with a torque wrench.
 - c. Tighten the bolt further to reach the specified angle 90°.

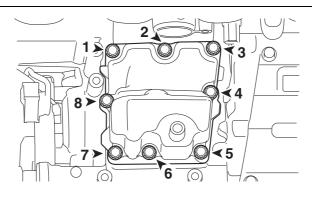


TIP -

Crankcase breather cover bolt

1. Tighten the bolts to 6 Nm (0.6 m·kgf, 4.3 ft·lbf) with a torque wrench following the tightening order.

- 2. Perform the following procedure to all the bolts one by one in the tightening sequence as shown in the illustration.
 - a. Loosen the bolt.
 - b. Tighten the bolt to 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) with a torque wrench.
 - c. Tighten the bolt further to reach the specified angle 90°.

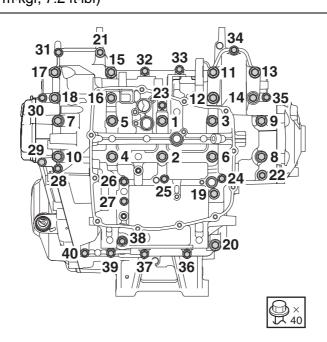


TIP -

Crankcase bolt

Tighten the crankcase bolts "1"–"40" in the proper tightening sequence as follows.

- 1. Tighten the crankcase bolts "1"-"10" to 20 Nm (2.0 m·kgf, 14 ft·lbf).
- 2. Loosen and retighten the crankcase bolts "1"-"10" to 15 Nm (1.5 m·kgf, 11 ft·lbf) in the proper tightening sequence.
- 3. Tighten the crankcase bolts "1"-"10" further to reach the specified angle 75° in the proper tightening sequence.
- 4. Tighten the crankcase bolts "11"-"40".
 - "11"-"20": 24 Nm (2.4 m·kgf, 17 ft·lbf) "21"-"40": 10 Nm (1.0 m·kgf, 7.2 ft·lbf)



TIP -

Connecting rod bolt

- 1. Tighten the connecting rod bolts to 25 Nm (2.5 m·kgf, 18 ft·lbf).
- Tighten the connecting rod bolts further to reach the specified angle 175°–185° with torque wrench, and then confirm that the torque value is within the range of 40 Nm (4.0 m·kgf, 29 ft·lbf) to 85 Nm (8.5 m·kgf, 61 ft·lbf) with keeping the torque wrench 175°–185°.

EAS30017 CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Rear brake master cylinder lock nut	M8	1	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Front brake master cylinder bleed screw	M8	1	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Brake caliper bleed screw	M8	3	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Rear wheel axle nut	M24	1	190 Nm (19 m·kgf, 137 ft·lbf)	
Chain puller adjusting bolt locknut	M8	2	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Shift rod locknut	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
IMU bolt	M4	4	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Passenger seat cover bolt (for YZF- R1M)	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front side cowling bolt (for YZF- R1M)	M6	2	9 Nm (0.9 m⋅kgf, 6.5 ft⋅lbf)	
Front panel bolt (left)	M5	1	3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)	
Front panel bolt (right)	M5	1	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Side cover bolt	M5	3	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Windshield assembly bolt	M5	2	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Rearview mirror nut	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Wheel sensor rotor bolt	M5	10	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	-0
Front brake disc bolt	M6	10	17 Nm (1.7 m·kgf, 12 ft·lbf)	-0
Front wheel axle nut	M24	1	115 Nm (11.5 m·kgf, 83 ft·lbf)	
Front wheel sensor bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front wheel sensor protector bolt (for YZF-R1M)	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front brake caliper bolt	M10	4	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Front brake hose holder bolt	M6	2	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Front wheel axle pinch bolt	M8	4	21 Nm (2.1 m·kgf, 15 ft·lbf)	See TIP.
Rear wheel sprocket nut	M10	5	100 Nm (10 m·kgf, 72 ft·lbf)	
Wheel bearing ring nut	M64	1	80 Nm (8.0 m·kgf, 58 ft·lbf)	- € Left thread
Rear brake disc bolt	M8	5	30 Nm (3.0 m·kgf, 22 ft·lbf)	-6
Rear brake caliper bolt (front)	M12	1	27 Nm (2.7 m·kgf, 20 ft·lbf)	
Rear brake caliper bolt (rear)	M8	1	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	-49
Rear wheel sensor protector bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear wheel sensor bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front brake master cylinder holder bolt	M6	2	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Front brake hose union bolt	M10	5	32 Nm (3.2 m·kgf, 23 ft·lbf)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Rear brake pad retaining bolt	M10	1	17 Nm (1.7 m·kgf, 12 ft·lbf)	
Rear brake caliper screw plug	M10	1	2.5 Nm (0.25 m·kgf, 1.8 ft·lbf)	
Rear brake hose union bolt	M10	1	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Hydraulic unit assembly nut	M6	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Hydraulic unit brake pipe flare nut	M10	8	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Steering stem nut	M28	1	115 Nm (11.5 m·kgf, 83 ft·lbf)	
Upper bracket pinch bolt	M8	2	26 Nm (2.6 m·kgf, 19 ft·lbf)	
Handlebar bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Handlebar pinch bolt	M8	2	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Throttle cable housing bolt	M5	2	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Grip end bolt	M6	2	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Handlebar switch screw	M5	4	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Clutch lever holder pinch bolt	M6	1	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	
Front fork damper rod assembly (for YZF-R1)	M34	2	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Front fork cap bolt locknut (for YZF-R1)	M10	2	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Lower bracket pinch bolt	M8	4	23 Nm (2.3 m·kgf, 17 ft·lbf)	See TIP.
Front fork cap bolt (for YZF-R1)	M46	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Front fork damper rod assembly (for YZF-R1M)	M32	2	68 Nm (6.8 m·kgf, 49 ft·lbf)	
Front fork cap bolt locknut (for YZF- R1M)	M12	2	19 Nm (1.9 m·kgf, 14 ft·lbf)	
Front fork cap bolt (for YZF-R1M)	M47	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Relay arm nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Rear shock absorber assembly upper nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Connecting arm lower nut	M12	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Rear shock absorber assembly lower nut	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Connecting arm upper nut	M12	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Pivot shaft ring nut	M30	1	65 Nm (6.5 m·kgf, 47 ft·lbf)	
Pivot shaft	M30	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Pivot shaft nut	M20	1	105 Nm (10.5 m·kgf, 76 ft·lbf)	
Shift rod joint bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	-D
Shift switch locknut	M6	1	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)	
Drive sprocket nut	M22	1	125 Nm (12.5 m·kgf, 90 ft·lbf)	-C

ltem	Thread size	Q'ty	Tightening torque	Remarks
Spring preload adjusting ring locknut (for YZF-R1)	M50	1	25 Nm (2.5 m·kgf, 18 ft·lbf)	
Spring preload adjusting ring locknut (for YZF-R1M)	M48	1	25 Nm (2.5 m·kgf, 18 ft·lbf)	
Lower ring nut	M30	1	See TIP.	
Battery bolt	M5	2	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Rider seat bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Battery cover bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear side cover bolt	M6	6	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Seat lock bracket bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Tail/brake light bracket bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Mudguard assembly bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	-15
License plate light screw	M5	2	3.8 Nm (0.38 m⋅kgf, 2.8 ft⋅lbf)	
Rear reflector nut	M5	1	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
CCU bracket bolt (for YZF-R1M)	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Cushion nut	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel tank front cover bolt	M6	1	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Fuel tank front cover screw	M5	2	0.4 Nm (0.04 m·kgf, 0.29 ft·lbf)	
Fuel tank cover bolt	M5	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Bottom cowling bolt (for YZF-R1)	M6	2	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Front side cowling bracket bolt	M6	4	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
ECU cover bolt	M5	1	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Side cover bracket bolt	M6	5	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front panel bracket screw	M5	4	1.8 Nm (0.18 m·kgf, 1.3 ft·lbf)	
Front muffler protector bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	-6
Front muffler protector bracket bolt	M6	4	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Storage compartment bolt	M5	3	3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)	
Rectifier/regulator bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Electrical components tray bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Windshield screw	M5	4	0.4 Nm (0.04 m·kgf, 0.29 ft·lbf)	
Front cowling assembly bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Headlight bolt	M5	5	4.3 Nm (0.43 m·kgf, 3.1 ft·lbf)	
Auxiliary light screw	M5	6	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Meter assembly screw	M5	3	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Front cowling screw	M5	4	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Air intake duct bolt	M6	4	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	-6
Intake air temperature sensor screw	M5	1	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Surge tank screw	M5	1	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Intake solenoid screw	M5	1	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Reflector nut (for AUS (2CR6, 2KS6) /RUS)	M6	2	3.8 Nm (0.38 m⋅kgf, 2.8 ft⋅lbf)	
Front wheel sensor lead holder bolt (for YZF-R1)	M6	1	7 Nm (0.7 m⋅kgf, 5.1 ft⋅lbf)	
Rear wheel drive hub bolt	M10	5	105 Nm (10.5 m·kgf, 76 ft·lbf)	ġ
Brake disc carrier bolt	M8	5	28 Nm (2.8 m·kgf, 20 ft·lbf)	-15
Brake fluid reservoir cap (front)	M52	1	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Brake fluid reservoir cap (rear)	M33	1	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Brake fluid reservoir cap stopper screw	M4	1	1.2 Nm (0.12 m·kgf, 0.87 ft·lbf)	
Front brake light switch screw	M4	1	1.2 Nm (0.12 m·kgf, 0.87 ft·lbf)	
Front brake lever pivot bolt	M6	1	1.0 Nm (0.10 m·kgf, 0.72 ft·lbf)	
Front brake lever nut	M6	1	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Brake fluid reservoir bolt (front)	M5	1	2.5 Nm (0.25 m·kgf, 1.8 ft·lbf)	
Brake fluid reservoir bolt (rear)	M5	1	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Brake fluid reservoir bracket bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Footrest plate bolt (front)	M6	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Footrest plate bolt (rear)	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Brake hose joint bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel tank bracket bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear brake hose bracket bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front fender bolt	M6	4	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Steering damper solenoid bolt	M8	1	23 Nm (2.3 m·kgf, 17 ft·lbf)	-15
Steering damper solenoid nut	M8	1	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Horn bracket bolt	M6	2	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	
Horn bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front brake hose clamp bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear fender bolt	M6	2	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)	
Rear wheel sensor lead hook bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear brake hose holder bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Drive chain guide bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear wheel sensor lead cover bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Drive sprocket cover bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	

TIP -

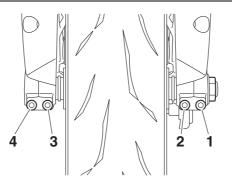
Lower ring nut

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

TIP

Front wheel axle pinch bolt

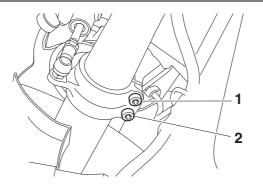
- 1. Tighten the pinch bolt "2", pinch bolt "1", and pinch bolt "2" to 21 Nm (2.1 m kgf, 15 ft lbf) in this order.
- 2. Check that the right end of the front axle is flush with the front fork. If necessary, manually push the front axle or lightly tap it with a soft hammer until its end is flush with 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.
- 3. Tighten the pinch bolt "4", pinch bolt "3", and pinch bolt "4" to 21 Nm (2.1 m·kgf, 15 ft·lbf) in this order.



TIP -

Lower bracket pinch bolt

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



LUBRICATION POINTS AND LUBRICANT TYPES

EAS30018 ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Coolant hose insertion part	Water or
Bearings	-IC
Rocker arm shaft outer surface	-(E
Camshaft lobes and journals (intake and exhaust)	
Valve stem seal (installed on valve guide)	-6
Valve pad	
Valve stems and stem ends (intake and exhaust)	
Crankshaft big ends	- E
Piston surfaces	(E)
Piston pins	–E
Crankshaft journals	–E
Balancer shaft journals	-Œ
Generator rotor bolt thread and washer	-IC
Timing chain sprocket bolt	–E
Coolant pipe O-ring	Water or
Oil pump rotors (inner and outer)	
Oil filter cartridge union bolt	-IC
Plug (oil gallery) O-ring	Water or
Crankcase bolt O-ring	-IC
Timing chain cover oil seal outer surface	
Starter clutch idle gear inner surface and end	-IC
Starter clutch outer assembly	-(E
Starter clutch gear	-(E
Primary driven gear end	- E
Clutch pull rod	-43-4
Clutch housing thrust plate	
Clutch boss nut and conical washer	C
Oil pump drive sprocket inner surface	C
Oil pump drive sprocket collar inner surface	- E

LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Oil pump drive sprocket washer	(E)
Clutch housing assembly washer	- E
Transmission gears (wheel and pinion) and collar	
Transmission gears inner surface (shift fork contact parts)	
Drive sprocket nut and washer	
Shift drum assembly	
Shift forks and shift fork guide bars	-E
Shift shaft washer	-E
Shift shaft moving surface	-E
Crankcase mating surface	Yamaha bond No. 1215 (Three bond No. 1215®)
Stator coil assembly lead grommet	Yamaha bond No. 1215 (Three bond No. 1215®)
Cylinder head cover mating surface	Three Bond No. 1541C®

EAS30019 CHASSIS

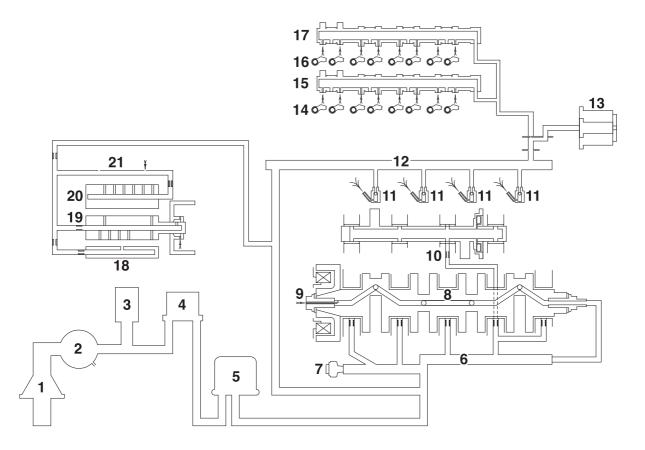
Lubrication point	Lubricant
Steering bearings, seal lip and ball race lip	
Tube guide (throttle grip) inner surface and throttle cables	LS
Brake lever pivot bolt and metal-to-metal moving parts	- (S)-
Clutch lever pivot bolt, metal-to-metal moving parts and clutch cable end	LS
Engine mounting bolt (rear side)	
Collar outer surface (Relay arm, connecting arm, rear shock absorber assembly (lower side))	
Pivot shaft	
Swingarm pivot bearing (right side) inner surface	LS
Swingarm dust cover lip, swingarm pivot ends	
Swingarm pivot bushing ends	
Oil seal inner lip (Relay arm, connecting arm, rear shock absorber assembly (lower side))	
Seat lock assembly metal-to-metal moving parts	
Sidestand pivoting point and metal-to-metal moving parts	
Sidestand switch contact point	
Sidestand hook and spring contact point	
Shift rod joint moving parts	
Front wheel oil seal (left and right)	

LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Front wheel axle nut mating surface	
Rear wheel oil seal	
Rear wheel drive hub oil seal	
Rear wheel drive hub mating surface	
Rear wheel drive hub and rear wheel mating surfaces	
IMU washer (grommet side)	
Brake caliper piston seal	(BF
Master cylinder inside	(BF
Brake caliper piston dust seal	
Rear brake caliper bolts	
Front brake disc and front wheel corner	Three Bond No. 1215B®
Between wheel bearing ring nut and rear wheel surface	Three Bond No. 1215B®

LUBRICATION SYSTEM CHART AND DIAGRAMS

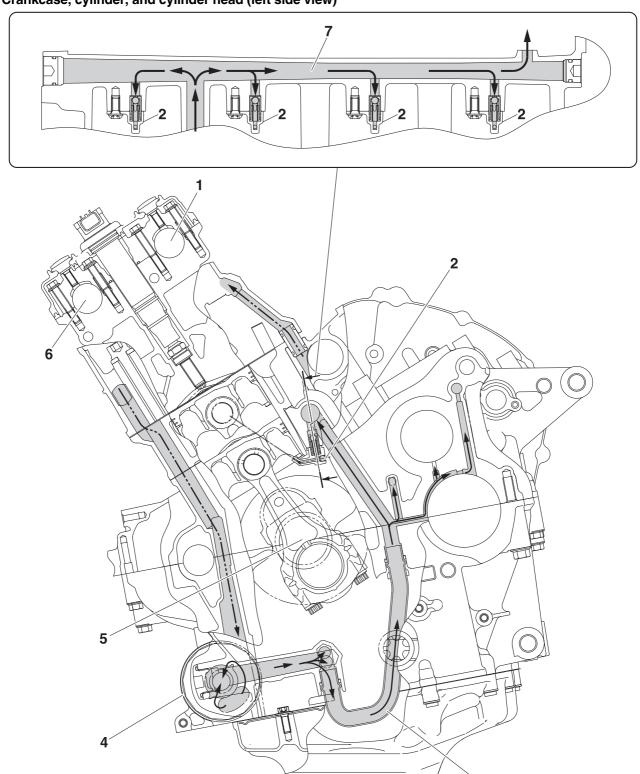
EAS30020 ENGINE OIL LUBRICATION CHART



- 1. Oil strainer
- 2. Oil pump
- 3. Relief valve
- 4. Oil cooler
- 5. Oil filter cartridge
- 6. Main gallery
- 7. Oil pressure switch
- 8. Crankshaft
- 9. Generator rotor
- 10.Balancer shaft
- 11.Oil nozzle
- 12.Sub gallery
- 13. Timing chain tensioner
- 14.Intake rocker arm
- 15.Intake camshaft
- 16.Exhaust rocker arm
- 17.Exhaust camshaft
- 18.Shift fork guide bar (upper)
- 19.Main axle
- 20.Drive axle
- 21. Mission shower

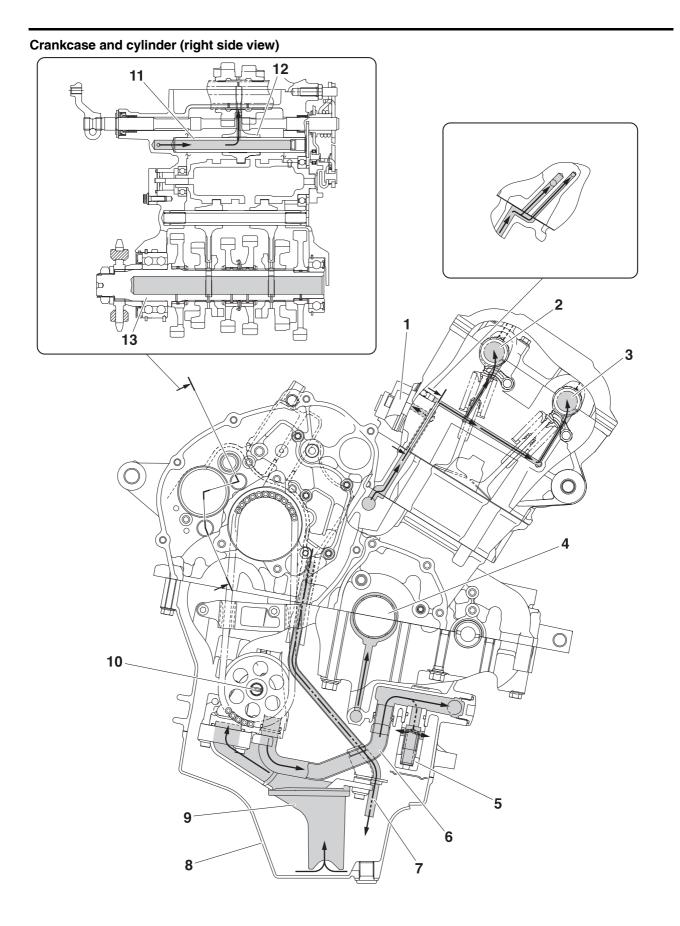
LUBRICATION DIAGRAMS

Crankcase, cylinder, and cylinder head (left side view)

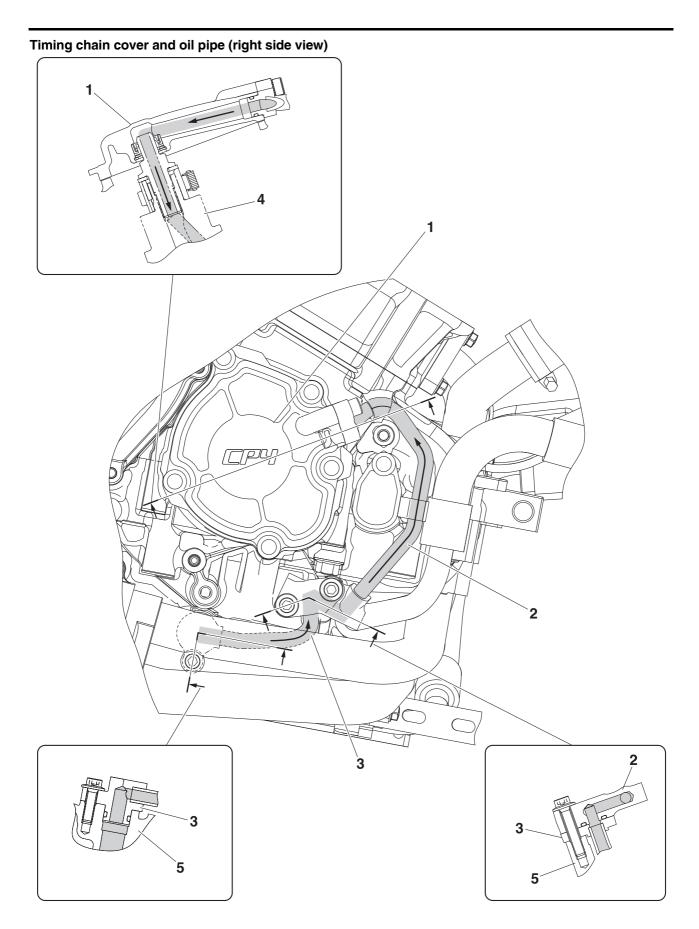


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- 1. Intake camshaft
- 2. Oil nozzle
- 3. Oil delivery pipe 2
- 4. Oil filter cartridge
- 5. Crankshaft
- 6. Exhaust camshaft
- 7. Sub gallery

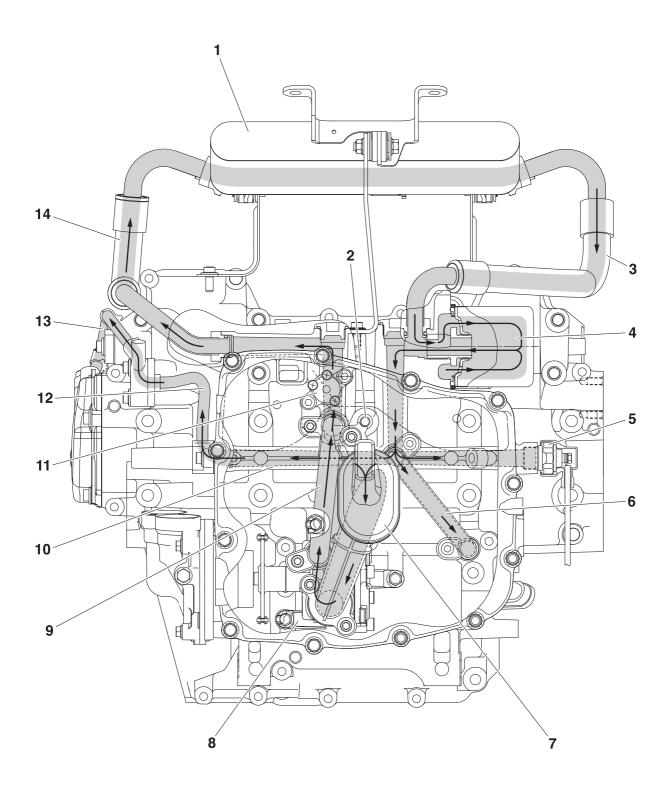


- 1. Timing chain tensioner
- 2. Intake camshaft
- 3. Exhaust camshaft
- 4. Crankshaft
- 5. Relief valve
- 6. Oil pipe 1
- 7. Oil delivery pipe 1
- 8. Oil pan
- 9. Oil strainer
- 10.Oil pump
- 11.Shift fork guide bar
- 12.Shift fork-C
- 13.Drive axle



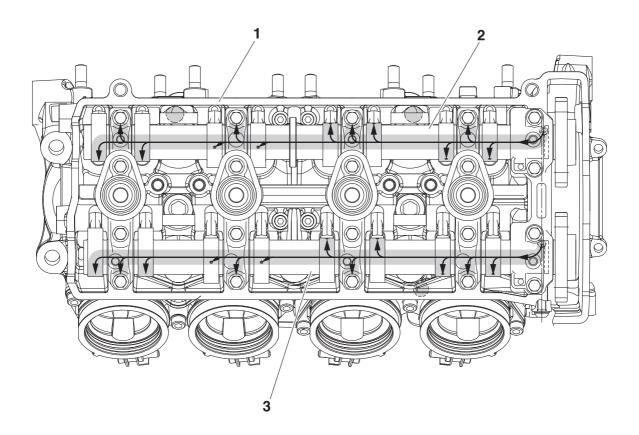
- 1. Timing chain cover
- 2. Oil pipe 3
- Oil pipe 2
 Crankshaft
- 5. Crankcase

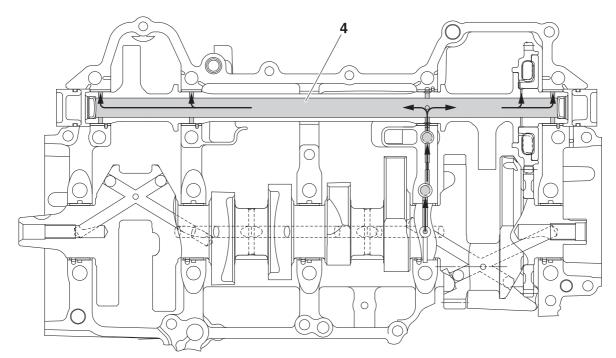
Oil pump and oil cooler (bottom view)



- 1. Oil cooler
- 2. Oil delivery pipe 1
- 3. Oil cooler outlet hose
- 4. Oil filter cartridge
- 5. Oil pressure switch
- 6. Oil delivery pipe 2
- 7. Oil strainer
- 8. Oil pump
- 9. Oil pipe 1
- 10.Main gallery
- 11.Relief valve
- 12.0il pipe 2
- 13.Oil pipe 3
- 14.Oil cooler inlet hose

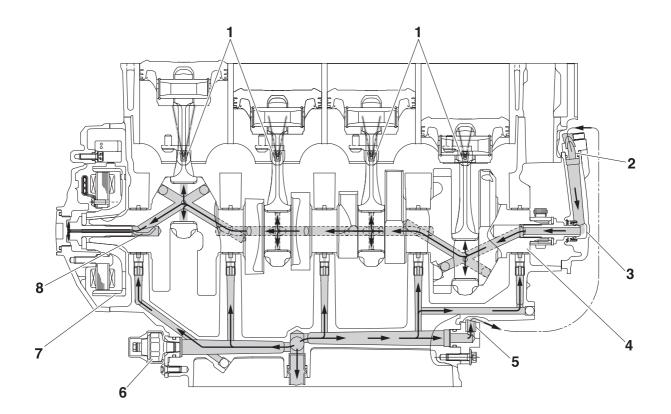
Camshaft and balancer shaft (top view)





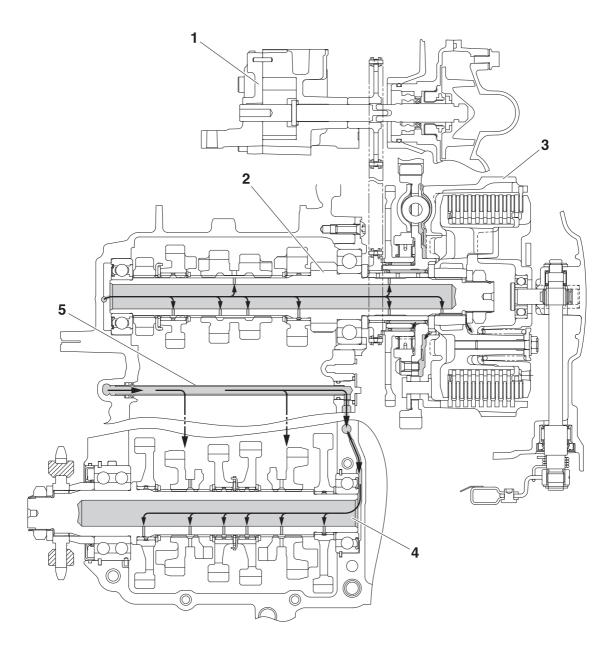
- 1. Cylinder head
- 2. Exhaust camshaft
- 3. Intake camshaft
- 4. Balancer shaft

Crankshaft (rear view)



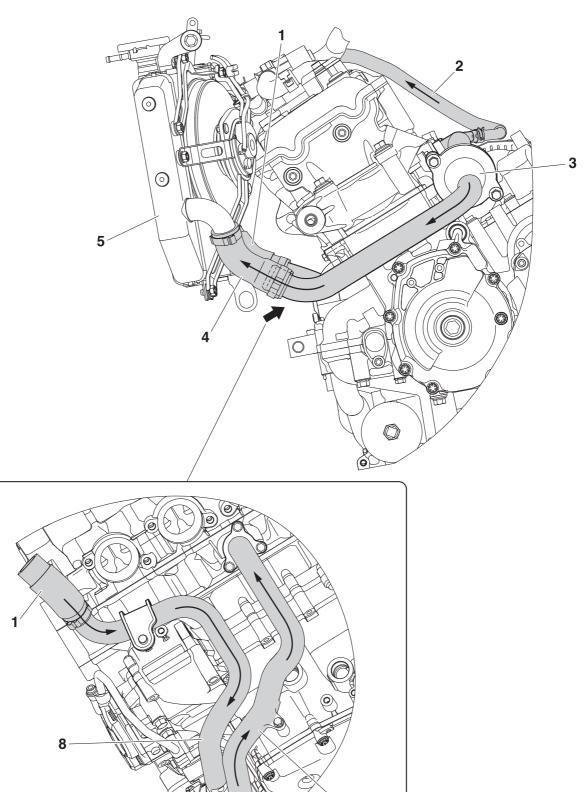
- 1. Oil nozzle
- 2. Oil pipe 3
- 3. Timing chain cover
- 4. Crankshaft
- 5. Oil pipe 2
- 6. Oil pressure switch
- 7. Generator rotor
- 8. Shaft

Crankshaft and transmission (top view)



- 1. Oil pump
- 2. Main axle
- 3. Clutch housing
- 4. Drive axle
- 5. Oil delivery pipe 3

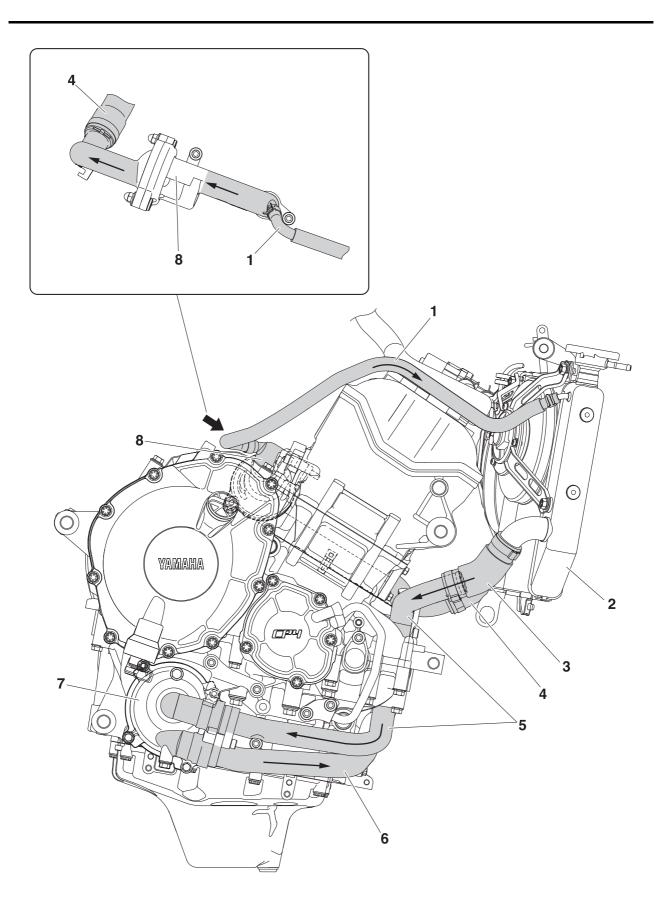
COOLING SYSTEM DIAGRAMS



7

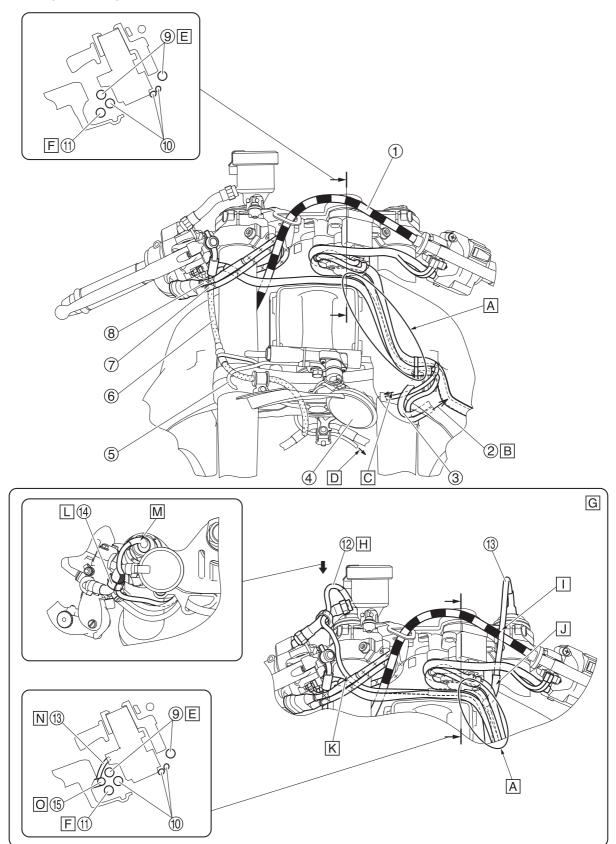
6

- 1. Radiator outlet hose
- 2. Cooling system air bleed hose
- 3. Thermostat assembly
- 4. Radiator inlet hose
- 5. Radiator
- 6. Water pump outlet pipe
- 7. Water pump
- 8. Water pump inlet pipe



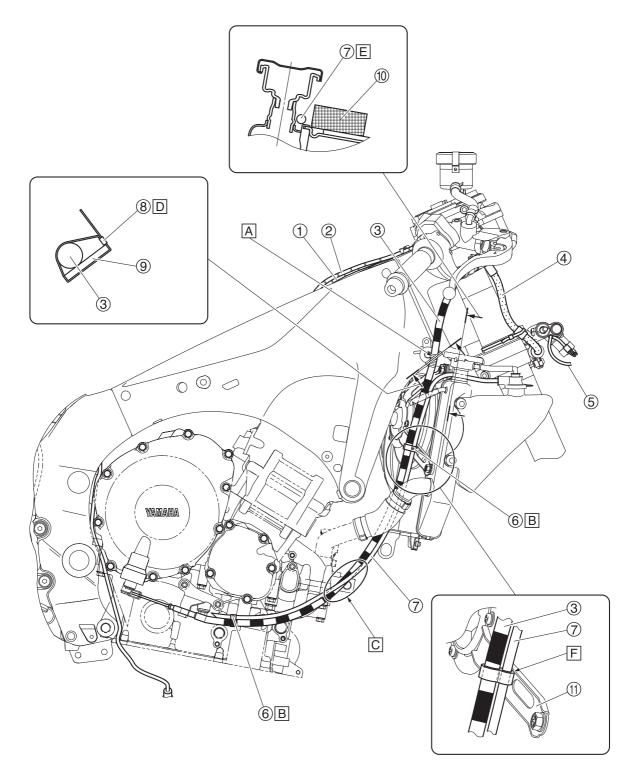
- 1. Cooling system air bleed hose
- 2. Radiator
- 3. Radiator outlet hose
- 4. Radiator inlet hose
- 5. Water pump inlet pipe
- 6. Water pump outlet pipe
- 7. Water pump
- 8. Thermostat assembly

Handlebar (front view)



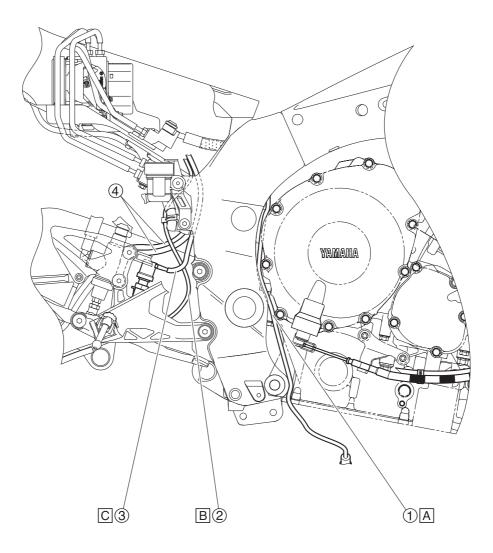
- 1. Clutch cable
- 2. Immobilizer unit lead
- 3. Intake solenoid vacuum hose
- 4. Horn
- 5. Steering damper solenoid lead
- 6. Front brake hose
- 7. Throttle cable (decelerator cable)
- 8. Throttle cable (accelerator cable)
- 9. Left handlebar switch lead
- 10.Main switch lead
- 11.Right handlebar switch lead
- 12. Front fork stepping motor sub-lead (right)
- 13. Front fork stepping motor sub-lead (left)
- 14.Clamp
- 15.Sub-wire harness
- A. Make sure that each lead is not overlapped.
- B. Connect the immobilizer unit lead above the cylinder head cover.
- C. To horn
- D. To front wheel sensor
- E. Route the left handlebar switch lead over the main switch lead and right handlebar switch lead.
- F. Route the right handlebar switch lead to the rear of the main switch lead.
- G. For YZF-R1M
- H. The front fork stepping motor sub-lead (right) has the corrugated tube installed at the base of the area where the sub-wire harness branches out.
- I. Route the front fork stepping motor sub-lead (left) to the front of the clutch cable.
- J. Route the front fork stepping motor sub-lead (left) over the left handlebar switch lead, right handlebar switch lead, and main switch lead.
- K. Route the front fork stepping motor sub-lead (right) over the throttle cables.
- L. Fasten the front fork stepping motor sub-lead (right) at the lower edge of the black tape, and the brake fluid reservoir hose at the straight section with the clamp. Face the opening of the clamp downward.
- M. Connect the front fork stepping motor coupler, and then slide the waterproof cover over until it contacts the front fork cap bolt.
- N. Route the front fork stepping motor sub-lead (left) above the leads and in front of the vehicle, and then connect it to the front fork cap bolt.
- O. Route the sub-wire harness to the rear of the left handlebar switch lead and main switch lead.

Clutch cable (right side view)

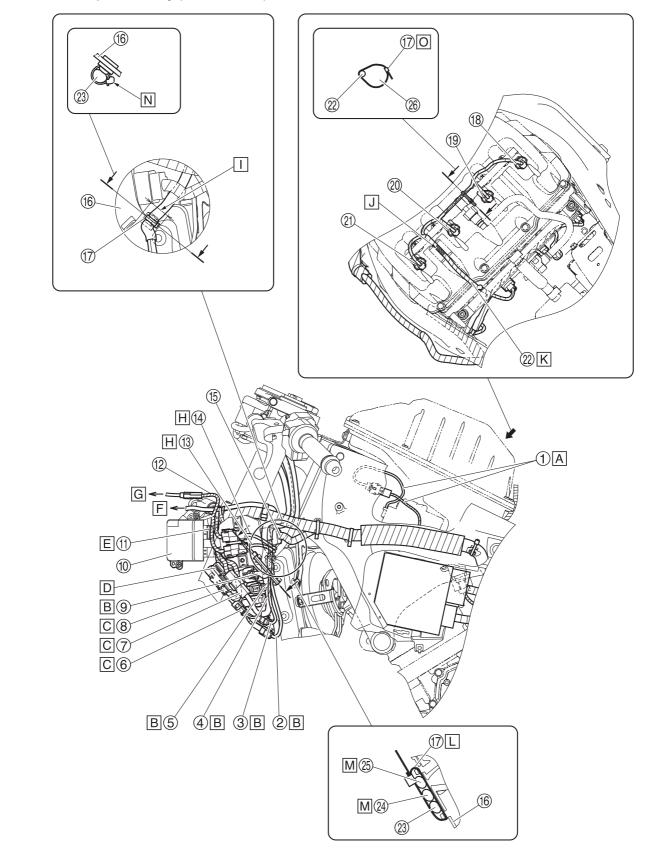


- 1. Throttle cable (accelerator cable)
- 2. Throttle cable (decelerator cable)
- 3. Clutch cable
- 4. Front brake hose
- 5. Steering damper solenoid lead
- 6. Clamp
- 7. Coolant reservoir breather hose
- 8. Plastic locking tie
- 9. Radiator stay
- 10.Damper
- 11.Radiator bracket
- A. Fasten the clutch cable at the positioning tape and the radiator stay with the plastic locking tie.
- B. Fasten the coolant reservoir breather hose at the painted section and the clutch cable with the clamp.
- C. Cross the coolant reservoir breather hose so that it is on the outside of the clutch cable.
- D. Point the end of the plastic locking tie outward.
- E. Route the coolant reservoir breather hose between the damper and coolant filler hole.
- F. Make sure that the end of the clamp contacts the radiator bracket as shown in the illustration.

O₂ sensor lead (right side view)



- 1. O₂ sensor lead
- 2. Rear wheel sensor lead
- 3. Rear brake light switch lead
- 4. EXUP cable
- A. Push in the O_2 sensor lead from the outside until it reaches the alignment surface of the clutch cover.
- B. Route the rear wheel sensor lead to the outside of the EXUP cables.
- C. Route the rear brake light switch lead to the outside of the rear wheel sensor lead.



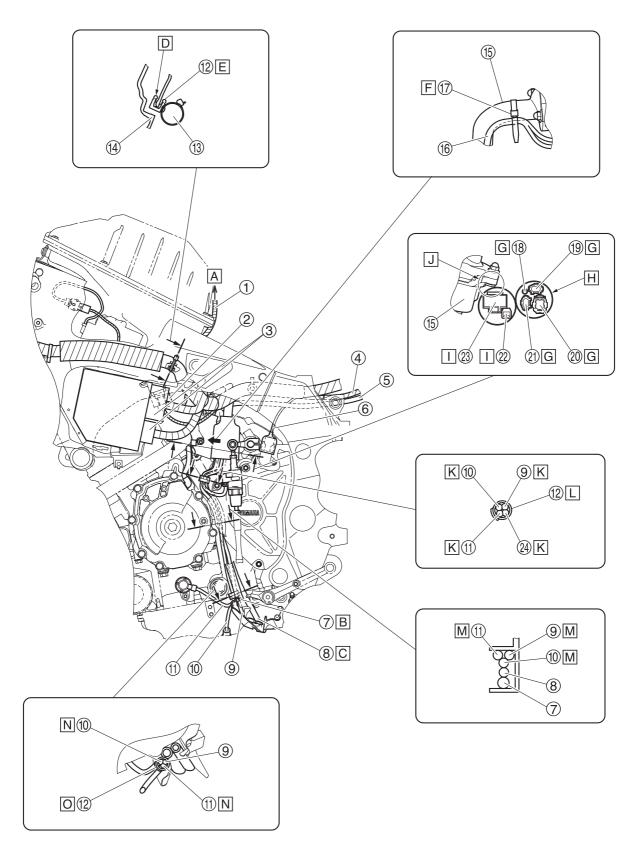
Electrical components tray (left side view)

- 1. Intake funnel servo motor lead
- 2. Right handlebar switch lead (non-waterproof 2-pole)
- 3. Left handlebar switch lead (non-waterproof 4-pole)
- 4. Right handlebar switch lead (non-waterproof 6-pole)
- 5. Right handlebar switch lead (waterproof 4pole)
- 6. Main switch lead (1-pole)
- 7. Main switch lead (2-pole)
- 8. Radiator fan motor relay lead
- 9. Left handlebar switch lead (waterproof 10pole)
- 10.Headlight control unit
- 11.Headlight control unit lead
- 12. Turn signal light lead (left)
- 13.Radiator fan motor lead (right) (black)
- 14.Radiator fan motor lead (left) (white)
- 15.Rectifier/regulator lead
- 16.Electrical components tray
- 17. Plastic locking tie
- 18.Secondary injector #4
- 19.Secondary injector #3
- 20.Secondary injector #2
- 21.Secondary injector #1
- 22.Secondary injector lead
- 23.Right handlebar switch lead
- 24.Left handlebar switch lead
- 25.Main switch lead
- 26.Fuel rail
- A. Connect the intake funnel servo motor lead on top of the frame, and then place it between the air filter case and frame.
- B. Route the leads (main harness side) from front of the rib "D" on the electrical components tray to the inside. Connect the leads to the wire harness, and then fasten the coupler to the electrical components tray.
- C. Route the radiator fan motor relay lead and main switch lead (2-pole) to the rear of the rib "D" on the electrical components tray. Route the main switch lead (1-pole) from front of the rib "D" on the electrical components tray to the inside.
- D. Rib on the electrical components tray
- E. Connect the headlight control unit lead at the top to the headlight control unit.
- F. To intake solenoid
- G. To front left turn signal light
- H. The radiator fan motor couplers may be installed to the electrical components tray in any order.
 Route the radiator fan motor lead to the rear

of the main switch lead and left handlebar switch lead as shown in the illustration.

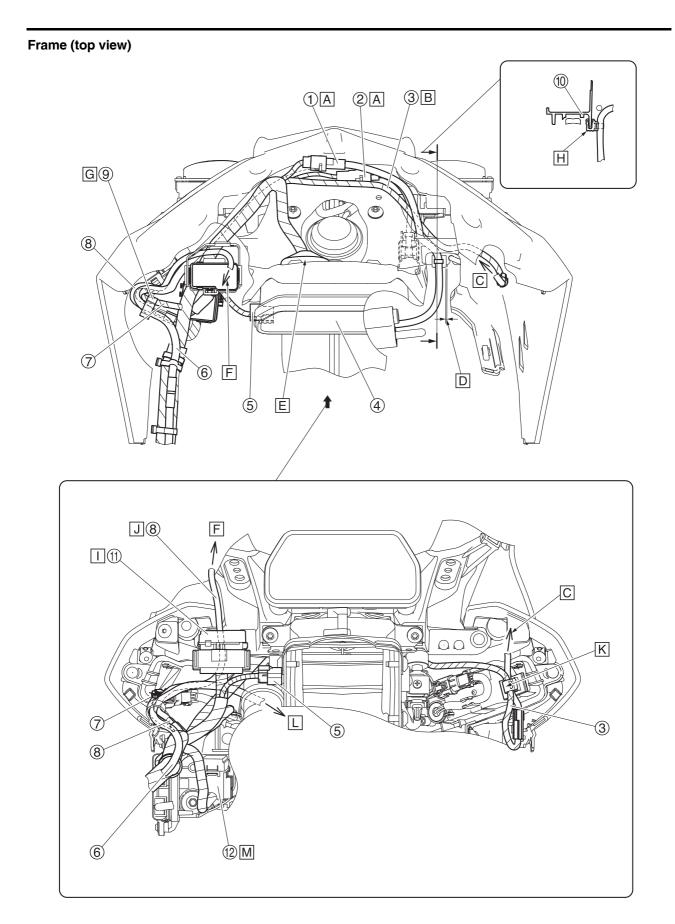
- I. When installing the plastic locking tie to the electrical components tray, position it in the center within the range shown in the illustration.
- J. Fit the secondary injector lead at the white tape between the ribs of the air filter case.
- K. Route the secondary injector lead between the air filter case and cross bar.
- L. Fasten the leads along the electrical components tray with the plastic locking tie so that they do not overlap one another. Face the buckle of the plastic locking tie upward. Do not cut off the excess end of the plastic locking tie.
- M. The left handlebar switch lead and main switch lead may be routed in any order.
- N. Fasten the right handlebar switch lead and electrical components tray with the plastic locking tie. Face the buckle of the plastic locking tie rearward, and then cut off the excess end of the tie to 5 mm (0.2 in) or less.
- O. Fasten the injector lead and fuel rail with the plastic locking tie. Point the end of the plastic locking tie rearward. Do not cut off the excess end of the plastic locking tie.

ECU (Engine Control Unit) (left side view)



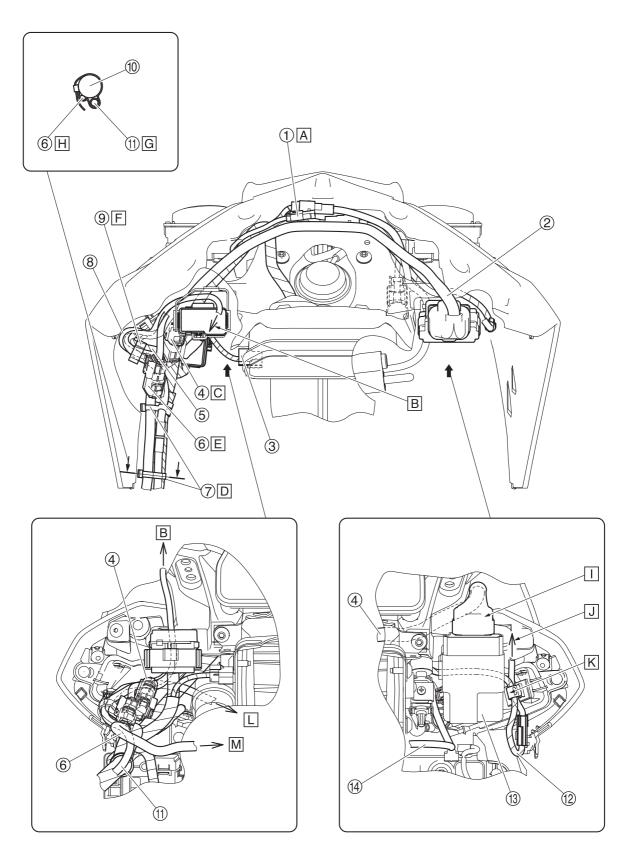
- 1. Secondary injector lead
- 2. Throttle position sensor coupler
- 3. ECU (engine control unit) coupler
- 4. Engine ground lead
- 5. Starter motor lead
- 6. Gear position sensor lead
- 7. Fuel tank drain hose
- 8. Fuel tank breather hose
- 9. Sidestand switch lead
- 10.O₂ sensor lead (left)
- 11.Oil pressure switch lead
- 12.Clamp
- 13.Wire harness
- 14.Frame
- 15. Thermostat assembly
- 16.Stator coil assembly lead
- 17.Plastic locking tie
- 18.Oil pressure switch connector
- 19.Sidestand switch coupler (black)
- 20.O₂ sensor coupler
- 21.Shift switch coupler (white)
- 22.Crankshaft position sensor coupler
- 23.Stator coil coupler
- 24.Shift switch lead
- A. To secondary injector
- B. Route the fuel tank drain hose through the guide of the cover and position it in front of the fuel tank breather hose. Align the paint mark on the fuel tank drain hose to the guide area of the cover.
- C. Match the length of the fuel tank breather hose coming out of the guide to the length of the fuel tank drain hose.
- D. Insert the clamp into the frame hole.
- E. Fasten the wire harness with the clamp. Face the buckle of the clamp upward, and then cut off the excess end of the tie to 5 mm (0.2 in) or less.
- F. Fasten the straight portion of the thermostat assembly and stator coil assembly lead with the plastic locking tie. Point the end of the plastic locking tie rearward and diagonally downward. Do not cut off the excess end of the plastic locking tie.
- G. The oil pressure switch connector, sidestand switch coupler, shift switch coupler, and O₂ sensor coupler may be positioned in any order.
- H. Place the coupler cover to the rear of the coupler cover (stator coil side).
- I. The stator coil coupler and crankshaft position sensor coupler may be positioned in any order.
- J. Position the coupler cover (stator coil coupler, crankshaft position sensor coupler) to the inside of the thermostat assembly as shown in the illustration.

- K. The sidestand switch lead, O₂ sensor lead, oil pressure switch lead and shift switch lead may be routed in any order.
- L. Fasten the sidestand switch lead, O₂ sensor lead, oil pressure switch lead, shift switch lead with the clamp. Install the clamp between the coupler cover and drive sprocket cover. The opening of the clamp may be facing in any direction.
- M. The oil pressure switch lead, sidestand switch lead and left O₂ sensor lead may be routed in any order.
- N. The left O₂ sensor lead and oil pressure switch lead may be routed in any order.
- O. Fasten the sidestand switch lead, left ${\rm O}_2$ sensor lead and oil pressure switch lead with the clamp.

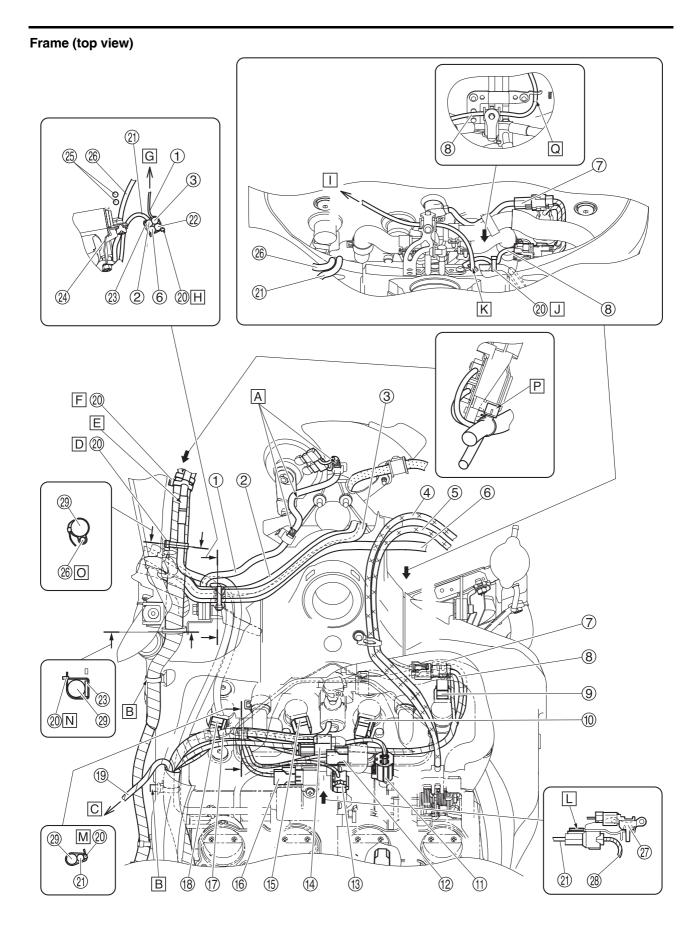


- 1. Steering damper solenoid lead
- 2. Intake solenoid lead (sub-wire harness)
- 3. Front turn signal light lead (right)
- 4. Meter assembly
- 5. Intake air temperature sensor lead
- 6. Intake solenoid vacuum hose
- 7. Auxiliary light lead
- 8. Front turn signal light lead (left)
- 9. Clamp
- 10.Headlight assembly
- 11.Fuse box 1
- 12.Fuse box 2
- A. Place the steering damper solenoid lead and intake solenoid lead in the gap between the front cowling and front cowling assembly stay.
- B. Make sure that the front right turn signal light lead is not placed in the gap between the front cowling and front cowling assembly stay.
- C. To front right turn signal light
- D. Install the clamp on the steering damper solenoid lead to the end of the R section of the slit used for connecting the lead in the headlight assembly.
- E. Install the meter assembly coupler and coupler cover securely to the meter assembly. Make sure that the edges of the coupler cover are not rolled up.
- F. To front left turn signal light
- G. Fasten the intake solenoid vacuum hose, front left turn signal light lead, and auxiliary light lead at the outside of the fuse box 1 with the clamp.
- H. Face the clamp on the steering damper solenoid lead downward, and then insert the clamp until it contacts the rib of the headlight assembly.
- I. Install the rubber clamp to the fuse box 1, and then insert until it contacts the projection on the bracket.
- J. Route the front left turn signal light lead to the front of the fuse box 1.
- K. Connect the front right turn signal light coupler, and then fasten the front left turn signal light leads with the clamp. The leads may be positioned in any order within the clamp.
- L. To intake solenoid
- M. Insert the fuse box 2 into the rib of the headlight cover.

Frame (top view) (for YZF-R1M)

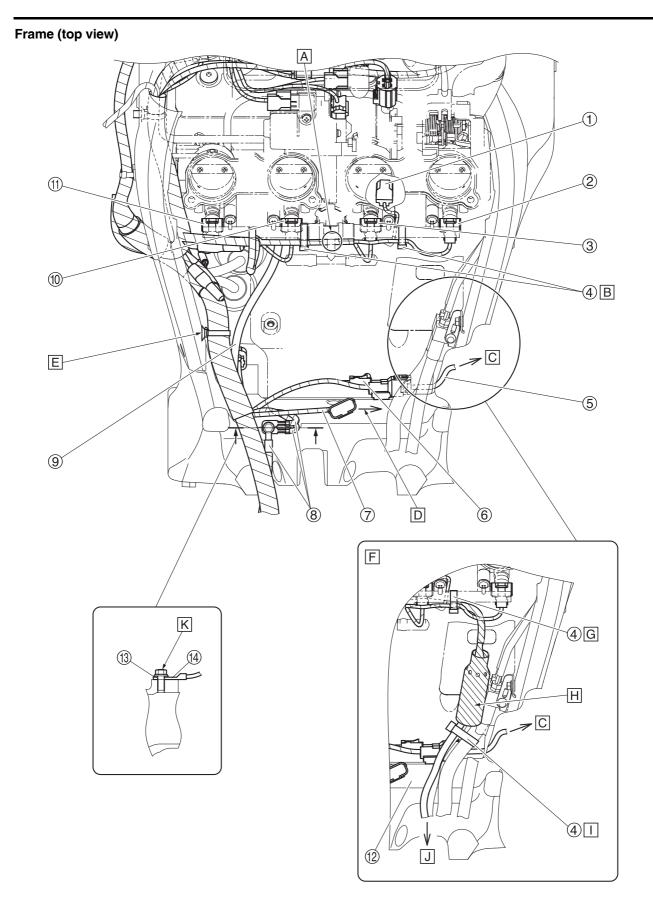


- 1. Steering damper solenoid coupler (OHLINS: OPTION)
- 2. SCU lead (sub-wire harness)
- 3. Intake air temperature sensor
- Sub-wire harness (SCU, steering damper solenoid, sub-wire harness)
- 5. Auxiliary light lead
- 6. Sub-wire harness (front fork stepping motor)
- 7. Plastic locking tie
- 8. Front turn signal light lead (left)
- 9. Clamp
- 10.Wire harness
- 11.Intake solenoid vacuum hose
- 12. Front turn signal light lead (right)
- 13.SCU (Suspension Control Unit)
- 14. Steering damper solenoid lead
- A. The steering damper solenoid coupler (OHLINS: OPTION) may be positioned in any place.
- B. To front left turn signal light
- C. Route the sub-wire harness (SCU, steering damper solenoid, sub-wire harness) to the left side of the fuse box 1, and then connect to the wire harness.
- D. Fasten the sub-wire harness and intake solenoid vacuum hose with the plastic locking tie. Make sure that the end of the plastic locking tie does not protrude above the intake solenoid vacuum hose.
- E. Connect the coupler of the sub-wire harness (front fork stepping motor) to the coupler of the sub-wire harness (SCU, steering damper solenoid, sub-wire harness).
- F. Fasten the intake solenoid vacuum hose, front left turn signal light lead, and auxiliary light lead at the outside of the fuse box 1 with the clamp.
- G. Fasten the intake solenoid vacuum hose onto the wire harness with the plastic locking tie. Face the buckle of the plastic locking tie outward. (2 locations)
- H. Place the sub-wire harness to the outside of the intake solenoid vacuum hose, and then fasten it with the plastic locking tie.
- I. Install the SCU coupler and coupler cover securely to the SCU. Make sure that the edges of the coupler cover are not rolled up.
- J. To front right turn signal light
- K. Connect the front right turn signal light coupler, and then fasten the front right turn signal light leads with the clamp. The leads may be positioned in any order within the clamp.
- L. To intake solenoid
- M. To front fork

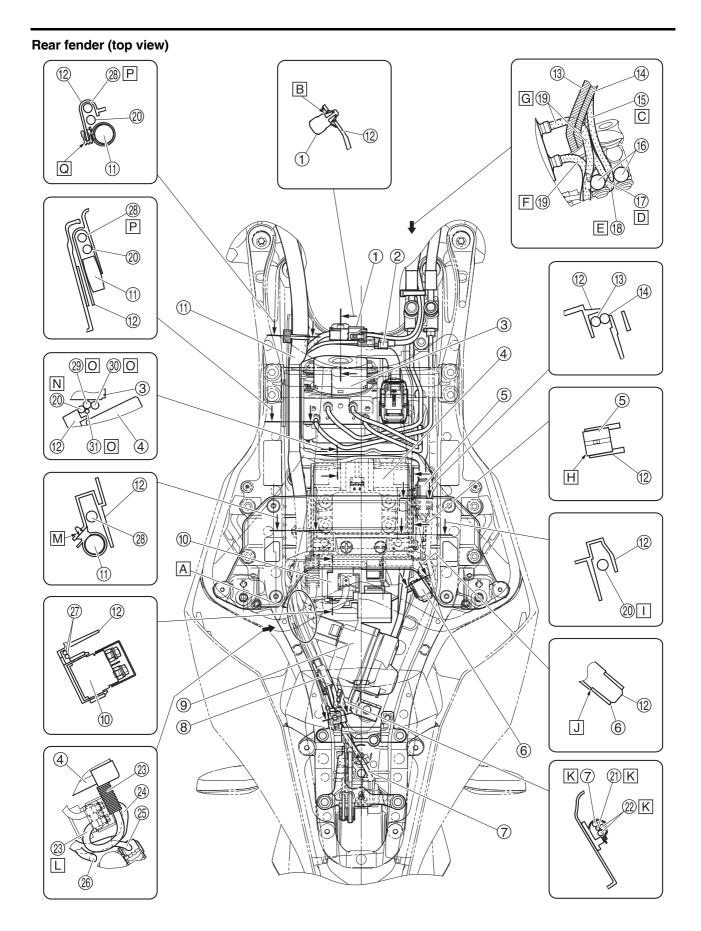


- 1. Horn lead
- 2. Main switch lead
- 3. Left handlebar switch lead
- 4. Throttle cable (accelerator cable)
- 5. Throttle cable (decelerator cable)
- 6. Right handlebar switch lead
- 7. Cylinder identification sensor lead
- 8. Front wheel sensor lead
- 9. Ignition coil #4 coupler
- 10. Ignition coil #3 coupler
- 11.Accelerator position sensor coupler
- 12.Atmospheric pressure sensor coupler
- 13. Throttle servo motor coupler
- 14. Immobilizer unit coupler
- 15.Ignition coil #2 coupler
- 16.Intake air pressure sensor coupler
- 17.Air induction system solenoid lead
- 18.Ignition coil #1 coupler
- 19.Intake funnel servo motor lead
- 20.Plastic locking tie
- 21.Immobilizer unit lead
- 22.Sub-wire harness (for YZF-R1M)
- 23.Guide
- 24.Radiator bracket
- 25.Radiator fan motor lead
- 26.Intake solenoid vacuum hose
- 27.Atmospheric pressure sensor
- 28.Immobilizer unit lead (wire harness)
- 29.Wire harness
- A. Fasten the horn lead at the positioning tape with the lower bracket cover clamp as shown in the illustration. Route the excess portion of the horn lead (between the positioning tapes) to the outside of the rib on the lower bracket cover.
- B. Insert the wire harness clamp into the hole in the frame.
- C. To intake funnel servo motor
- D. Fasten the intake solenoid vacuum hose with the plastic locking tie using the front position of the quick fastener as a guide. Make sure that the end of the plastic locking tie does not protrude above the intake solenoid vacuum hose.
- E. When connecting the intake solenoid vacuum hose, may apply lubrication (water, soapy water, silicone fluid, or ethanol) to the hose.
- F. Fasten the intake solenoid vacuum hose with the plastic locking tie using the rear position of the wire harness clamp as a guide. Make sure that the end of the plastic locking tie does not protrude above the intake solenoid vacuum hose.
- G. To horn

- H. Fasten the leads (right handlebar switch lead (blue), left handlebar switch lead (gray), main switch lead (white), sub-wire harness (for YZF-R1M) (white)) at the positioning tape on the guide with the plastic locking tie. Cut off the excess end of the tie to 5 mm (0.2 in) or less.
- I. To front wheel sensor
- J. Fasten the front wheel sensor lead to the end of the R section of the brake pipe with the plastic locking tie as shown in the illustration. Cut off the excess end of the plastic locking tie to 5 mm (0.2 in) or less. The buckle of the plastic locking tie may be facing in any direction.
- K. Route the wheel sensor lead through the claw of the bracket.
- L. Connect the immobilizer unit coupler, and then install it to the stay.
- M. Fasten the immobilizer unit lead and wire harness with the plastic locking tie. Align the plastic locking tie with the white tape. Point the end of the plastic locking tie forward. Do not cut off the excess end of the plastic locking tie.
- N. Fasten the wire harness to the guide with the plastic locking tie. The buckle of the plastic locking tie may be facing in any direction. Cut off the excess end of the tie to 5 mm (0.2 in) or less.
- O. Fasten the intake solenoid vacuum hose onto the wire harness with the plastic locking tie. Face the buckle of the plastic locking tie outward. (2 locations)
- P. Insert the wire harness clamp until it contacts the claw of the electrical components tray.
- Q. Fasten the front wheel sensor lead at the positioning tape with the clamp as shown in the illustration.



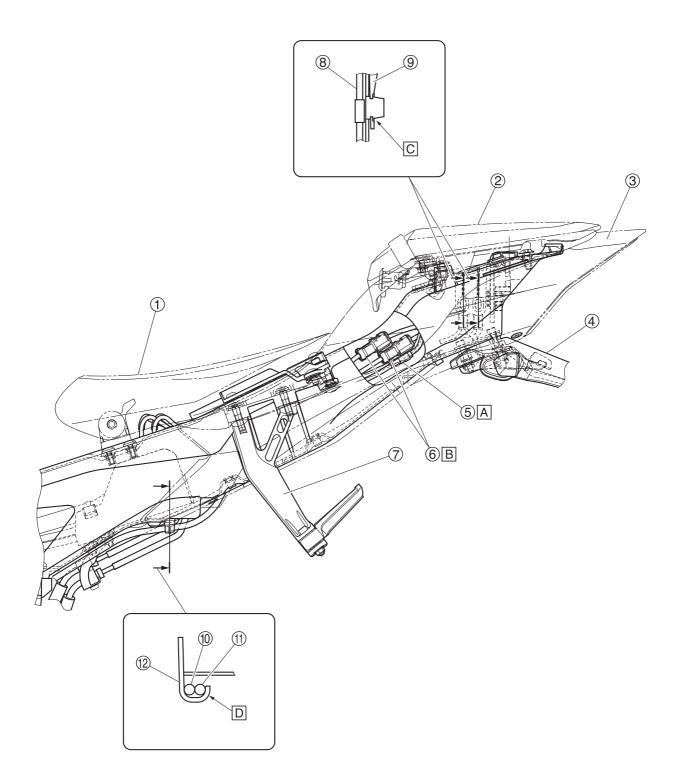
- 1. Coolant temperature sensor coupler
- 2. Primary injector #4
- 3. Primary injector #3
- 4. Plastic locking tie
- 5. O₂ sensor lead
- 6. Neutral switch lead
- 7. Fuel pump lead
- 8. Engine ground lead
- 9. Starter motor lead
- 10. Primary injector #2
- 11.Primary injector #1
- 12.Frame
- 13.Round terminal
- 14.Combination terminal
- A. Route the injector lead under the injector joint.
- B. Fasten the wire harness and fuel rail with the plastic locking tie. Point the end of the plastic locking tie downward. Do not cut off the excess end of the plastic locking tie.
- C. To O₂ sensor
- D. To fuel pump
- E. Insert the wire harness clamp into the frame hole.
- F. For YZF-R1M
- G. Fasten the primary injector #4 lead and rear shock absorber assembly stepping motor lead to the fuel rail with the plastic locking tie. Point the end of the plastic locking tie downward. Do not cut off the excess end of the plastic locking tie.
- H. Connect the rear shock absorber assembly stepping motor leads according to those with identification tape (yellow) and those without identification tape, and then cover the coupler with the coupler cover.
- Fasten the bottom side of the brake hose and rear shock absorber assembly stepping motor leads with the plastic locking tie. Position the plastic locking tie between the front of the frame and rear end of the coupler cover. Point the end of the plastic locking tie downward. Do not cut off the excess end of the plastic locking tie.
- J. To rear shock absorber assembly
- K. Fasten the engine ground leads with the bolt so that the crimped section of the terminal is facing upward.



- 1. Rear wheel sensor coupler
- 2. Rear brake light switch coupler
- 3. Hydraulic unit
- 4. Battery
- 5. Joint coupler
- 6. Yamaha diagnostic tool coupler
- 7. Tail/brake light lead
- 8. Rear turn signal light coupler
- 9. EXUP servo motor
- 10.Starter relay
- 11.Wire harness
- 12.Battery box
- 13.EXUP cable 2
- 14.EXUP cable 1
- 15.Rear brake light switch lead
- 16.Brake hose
- 17.Plastic locking tie
- 18.Rear wheel sensor lead
- 19.Rear shock absorber assembly stepping motor lead (for YZF-R1M)
- 20.Negative battery lead
- 21.License plate light lead
- 22.Rear turn signal light lead
- 23. Positive battery lead
- 24.Starter relay lead
- 25.EXUP servo motor lead
- 26.Relay unit lead
- 27.Main fuse lead
- 28.Starter relay lead
- 29. Yamaha diagnostic tool coupler lead
- 30. Joint coupler lead
- 31.IMU lead
- A. The rear turn signal light leads, license plate light lead, and tail/brake light lead may be routed in any order.
- B. Insert the rear wheel sensor coupler into the hole in the battery box.
- C. Route the rear brake light switch lead to the outside of the EXUP cable 2, and between the brake hoses.
- D. Fasten the rear wheel sensor lead and rear brake light switch lead to the brake hose with the plastic locking tie. Point the end of the plastic locking tie downward.
- E. Route the rear wheel sensor lead to the outside of the EXUP cable 1, and between the brake hoses.
- F. Route the rear shock absorber assembly stepping motor lead to the inside of the brake hose. (for YZF-R1M)
- G. Route the rear shock absorber assembly stepping motor lead to the outside of the EXUP cable 1, and inside of the brake hose.
- H. Insert the joint coupler until it contacts the battery box as shown in the illustration.

- I. Route the negative battery lead through the inside of the rib.
- J. Insert the Yamaha diagnostic tool coupler until it contacts the battery box as shown in the illustration.
- K. The tail/brake light lead, license plate light lead and rear turn signal light leads may be routed in any order.
- L. Route the positive battery lead over the EXUP servo motor lead, starter relay lead, and relay unit lead.
- M. Insert the clamp into the hole in the battery box.
- N. Route the negative battery lead under the joint coupler lead, Yamaha diagnostic tool coupler lead, and IMU lead.
- O. The joint coupler lead, Yamaha diagnostic tool coupler lead, and IMU lead may be routed in any order.
- P. Route the starter relay lead under the wire harness and negative battery lead.
- Q. Install the clamp to the rib.

Rear fender (left side view)

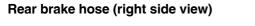


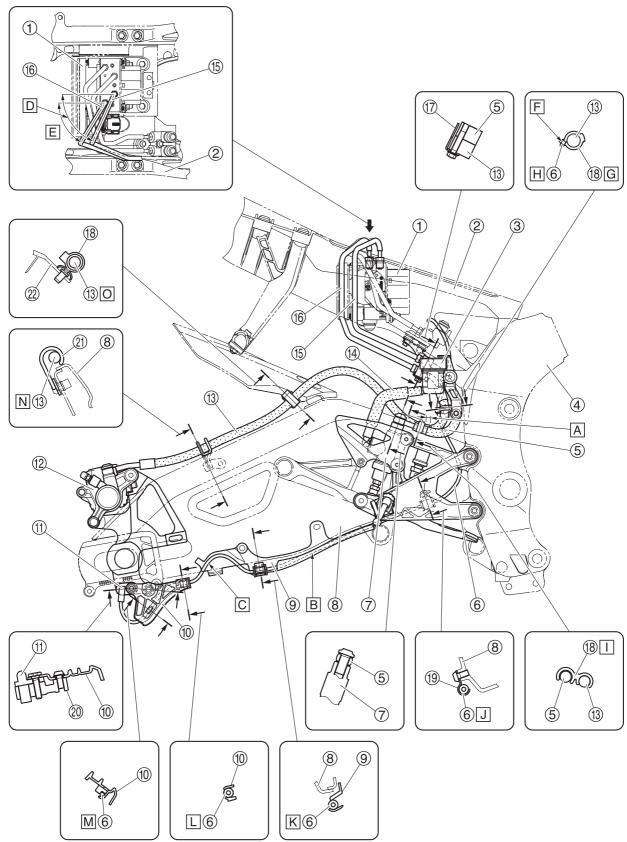
- 1. Rider seat
- 2. Passenger seat
- 3. Tail/brake light
- 4. Mudguard assembly
- 5. License plate light coupler
- 6. Rear turn signal light coupler
- 7. Passenger footrest
- 8. Rear turn signal light lead
- 9. Tail/brake light bracket
- 10.EXUP cable 1
- 11.EXUP cable 2
- 12.Battery box
- A. Connect the license plate light lead. Route the license plate light lead under the rear turn signal light coupler.
- B. Rear left turn signal light: Connect the black couplers

Rear right turn signal light: Connect the white couplers

The rear left turn signal light coupler and rear right turn signal light coupler may be positioned in any order.

- C. Insert the clamp on the rear turn signal light lead into the hole in the tail/brake light bracket. The installation position of the rear turn signal light leads may be placed in any order.
- D. Make sure that the EXUP cables are routed to the hook-shaped part of the battery box.



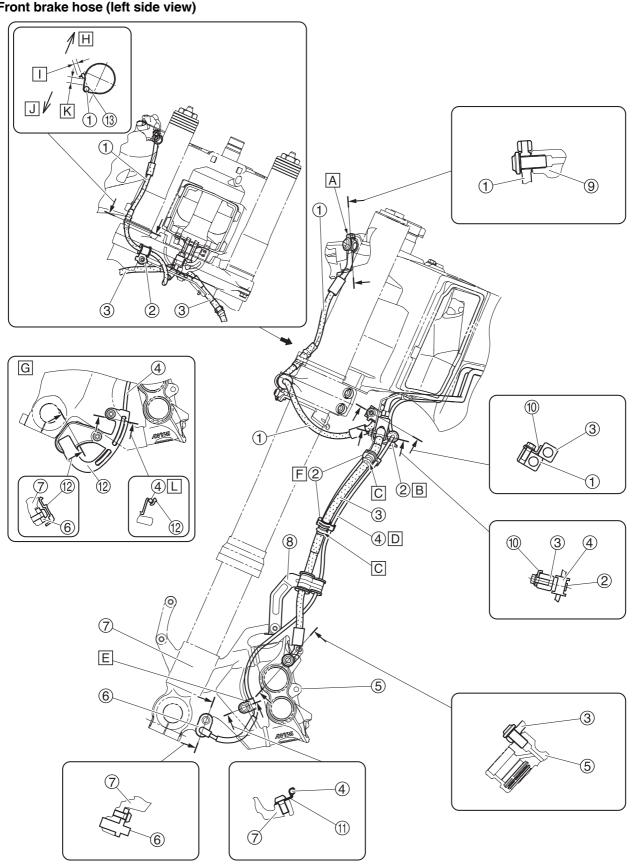


- 1. Hydraulic unit
- 2. Rear frame
- 3. Brake fluid reservoir
- 4. Frame
- 5. Brake hose (rear brake master cylinder to hydraulic unit)
- 6. Rear wheel sensor lead
- 7. Rear brake master cylinder
- 8. Swingarm assembly
- 9. Rear wheel sensor lead cover
- 10.Rear wheel sensor protector
- 11.Rear wheel sensor
- 12.Rear brake caliper
- 13.Brake hose (hydraulic unit to rear brake caliper)
- 14.Brake fluid reservoir hose
- 15.Hydraulic unit brake pipe (rear brake master cylinder to hydraulic unit)
- 16.Hydraulic unit brake pipe (hydraulic unit to rear brake caliper)
- 17.Rear brake hose bracket
- 18.Clamp
- 19.Hook
- 20.Brake caliper bracket
- 21.Rear brake hose holder
- 22.Rear fender
- A. Install the clamp 0–10 mm (0–0.39 in) from the slit of the brake hose protector.
- B. Make sure that the rear wheel sensor lead does not protrude from the rear wheel sensor lead cover.
- C. Route the rear wheel sensor lead between the swing arm assembly and rear wheel sensor lead cover.
- D. 65.4°
- E. 58.6°
- F. Position the rear wheel sensor lead at the back.
- G. Install the clamp at a position 0–10 mm (0– 0.39 in) from the top edge of the brake hose protector.
- H. Fasten the rear wheel sensor lead at under the white tape with the clamp.
- I. Fasten the brake hose (rear brake master cylinder to hydraulic unit) at the metal fitting with large inner diameter side of the clamp.
- J. Install the grommet of the rear wheel sensor lead securely to the hook.
 When installing the grommet on the rear wheel sensor lead, may apply silicone fluid or soapy water to the grommet.
- K. Install the grommet of the rear wheel sensor lead securely to the claw of the rear wheel sensor lead cover.
 When installing the grommet on the rear wheel sensor lead, may apply silicone fluid or soapy water to the grommet.

L. Install the grommet of the rear wheel sensor lead securely to the rear wheel sensor protector. When installing the grommet on the rear

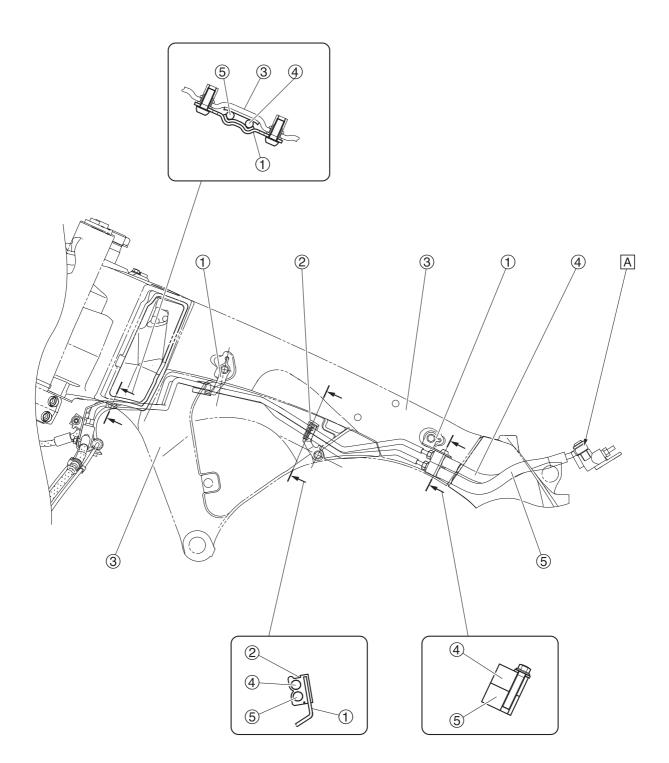
wheel sensor lead, may apply silicone fluid or soapy water to the grommet.

- M. Install the rear wheel sensor lead securely to the claw of the rear wheel sensor protector.
- N. Route the brake hose between the rear brake hose holder and swing arm assembly.
- O. Fasten the brake hose with the clamp.

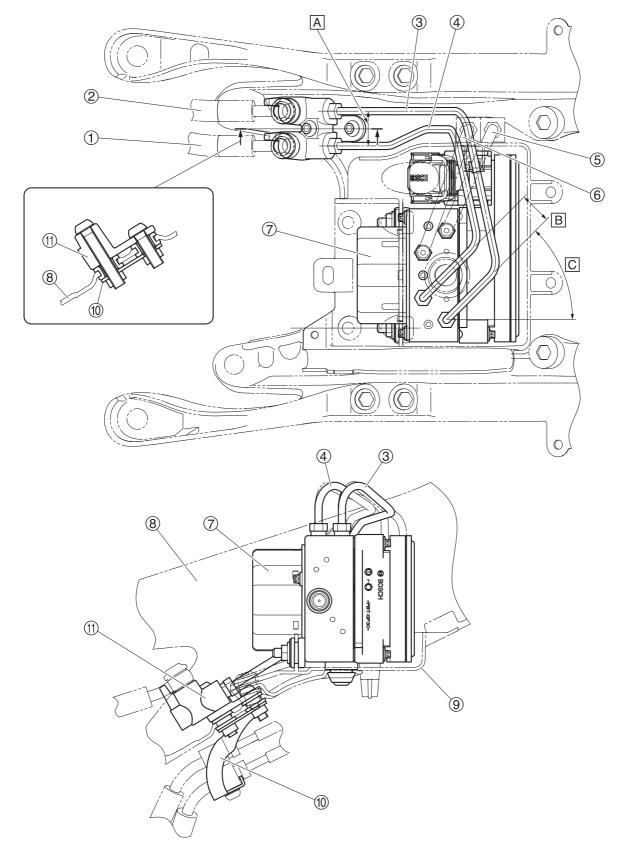


- 1. Brake hose (front brake master cylinder to hydraulic unit)
- 2. Clamp
- 3. Brake hose (hydraulic unit to front brake calipers)
- 4. Front wheel sensor lead
- 5. Front brake caliper
- 6. Front wheel sensor
- 7. Front fork
- 8. Front brake hose holder
- 9. Front brake master cylinder
- 10.Front brake hose bracket
- 11.Front wheel sensor lead holder
- 12.Front wheel sensor protector
- 13.Plastic locking tie
- A. When installing the brake hose onto the master cylinder, make sure the projection on the brake hose touches the projection on the master cylinder.
- B. Install the clamp with the opening facing forward.
- C. Install the clamp to the top side of the rim on the brake hose.
- D. Route the front wheel sensor lead along the brake hose (left) without any slack.
- E. Fasten the front wheel sensor lead at the white tape with the holder.
- F. Install the clamp to the brake hose at the tube section.
- G. For YZF-R1M
- H. Rear side of the vehicle
- I. Cut off the excess end of the plastic locking tie to 5 mm (0.2 in) or less. The end of the plastic locking tie may be pointing in any direction.
- J. Front side of the vehicle
- K. Position the buckle of the plastic locking tie 10 mm (0.39 in) or more from the brake hose.
- L. Route the front wheel sensor lead through the guide of the front wheel sensor protector.

Front brake hose (left side view)



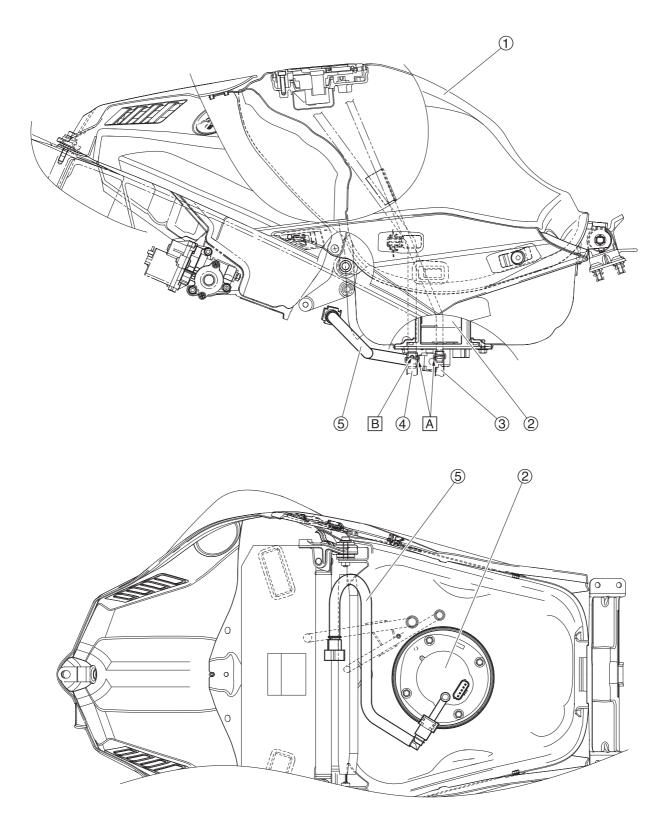
- 1. Brake hose bracket
- 2. Clamp
- 3. Frame
- 4. Brake hose (hydraulic unit to front brake calipers)
- 5. Brake hose (front brake master cylinder to hydraulic unit)
- A. Install the brake hose (front brake master cylinder to the hydraulic unit) so that it is on the inside relative to the brake hose (hydraulic unit to the front brake caliper). There is an identifying white paint mark on the upper surface of the pipe of the brake hose (front brake master cylinder to the hydraulic unit).



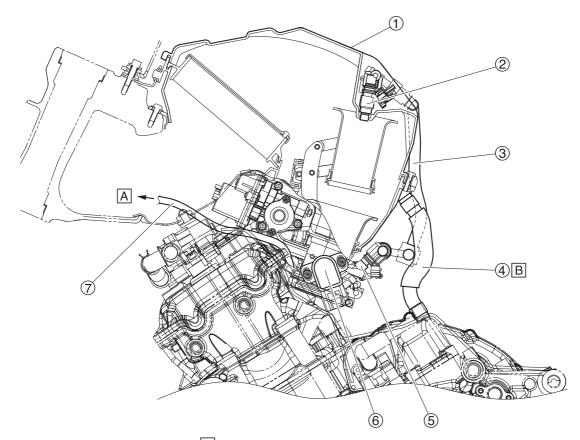
Hydraulic unit assembly (top and left side view)

- 1. Brake hose (front brake master cylinder to hydraulic unit)
- 2. Brake hose (hydraulic unit to front brake calipers)
- 3. Hydraulic unit brake pipe (hydraulic unit to front brake calipers)
- 4. Hydraulic unit brake pipe (front brake master cylinder to hydraulic unit)
- 5. Hydraulic unit brake pipe (hydraulic unit to rear brake caliper)
- 6. Hydraulic unit brake pipe (rear brake master cylinder to hydraulic unit)
- 7. Hydraulic unit
- 8. Rear frame
- Battery box
- 10.Rear brake hose bracket
- 11.Brake hose joint
- A. 23 mm (0.91 in)
- B. 21.2 mm (0.83 in) Install the hydraulic unit brake pipe (front brake master cylinder to the hydraulic unit) and the hydraulic unit brake pipe (hydraulic unit to the front brake caliper) so that they are parallel to each other.
- C. 45°

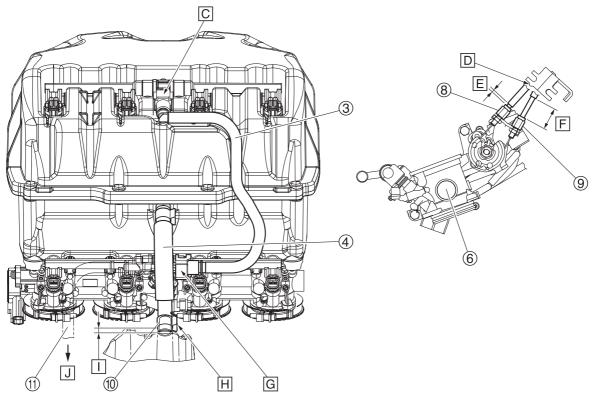
Fuel tank (top and left side view)



- 1. Fuel tank
- 2. Fuel pump
- 3. Fuel tank breather hose
- 4. Fuel tank drain hose
- 5. Fuel hose (fuel tank to fuel rail)
- A. Point the end of the clamp outward.
- B. Install the fuel tank drain hose with its white paint mark facing outward.

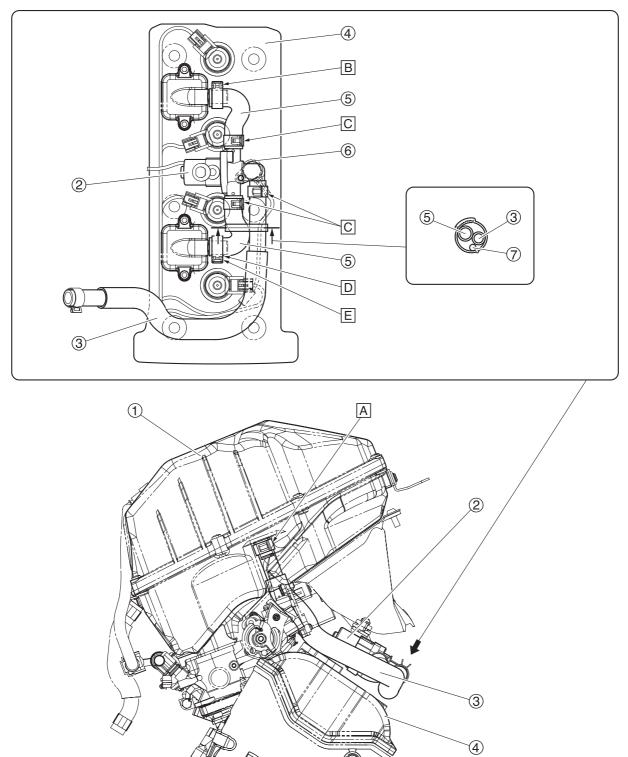


Air filter case and throttle bodies (top and left side view)



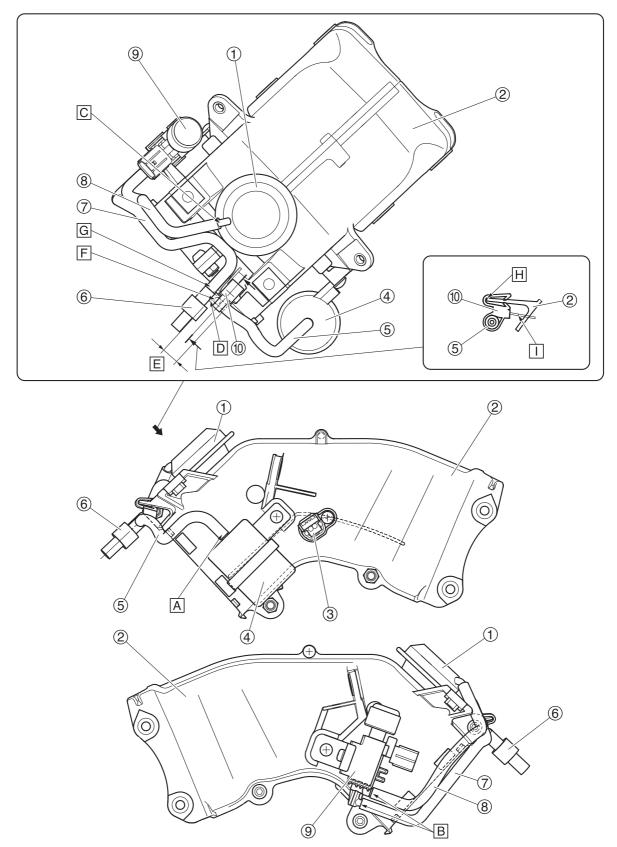
- 1. Air filter case
- 2. Secondary injector
- 3. Fuel hose (fuel rail to fuel rail)
- 4. Crankcase breather hose
- 5. Primary injector
- 6. Throttle body assembly
- 7. Intake solenoid vacuum hose (throttle body to one-way valve)
- 8. Throttle cable (accelerator cable)
- 9. Throttle cable (decelerator cable)
- 10.Clamp
- 11. Fuel hose (fuel pump to fuel rail)
- A. To one-way valve (Intake solenoid)
- B. When installing the crankcase breather hose, may apply silicone fluid to the crankcase breather hose.
- C. Connector color: Black
- D. Projection on the throttle cable bracket (accelerator cable side)
- E. 5 mm (0.2 in) or less
- F. Protector position: 26 mm (1.02 in)
- G. Connector color: Orange
- H. Point the end of the clamp to the right.
- I. Install the clamp so that the bottom edge of the clamp is 0–5 mm (0–0.2 in) from the hose end.
- J. To fuel pump

Air cut-off valve (right side view)

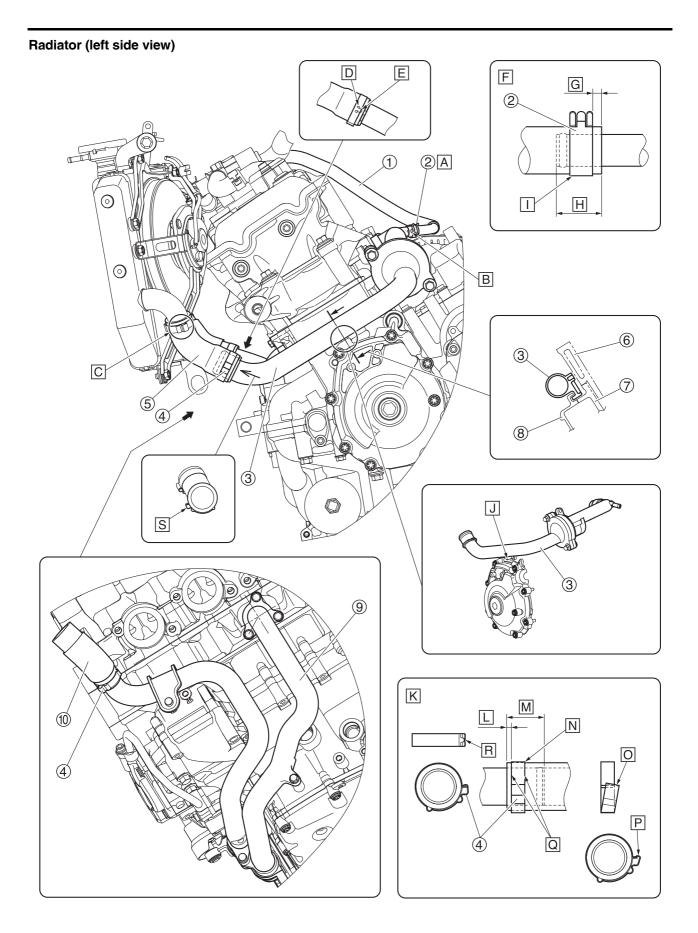


- 1. Air filter case
- 2. Air cut-off valve
- 3. Air induction system hose (air filter case to air cut-off valve)
- 4. Cylinder head cover
- 5. Air induction system hose (air cut-off valve to reed valve cover)
- 6. Cylinder identification sensor
- 7. Cylinder identification sensor lead
- A. Point the end of the clamp to the right. Install the air induction system hose with its white paint mark facing outward. Make sure that the clamp is not installed on the flange of the hose fitting of the air filter case. When installing the air induction system hose, may apply silicone fluid or water to the air induction system hose.
- B. Point the end of the clamp to the left.
- C. Point the end of the clamp upward.
- D. Insert the air induction system hose until it contacts the reed valve cover. Make sure that the clamp is not installed on the flange of the hose fitting of the reed valve cover.
- E. Point the end of the clamp to the right.

Air duct (left and right side view)

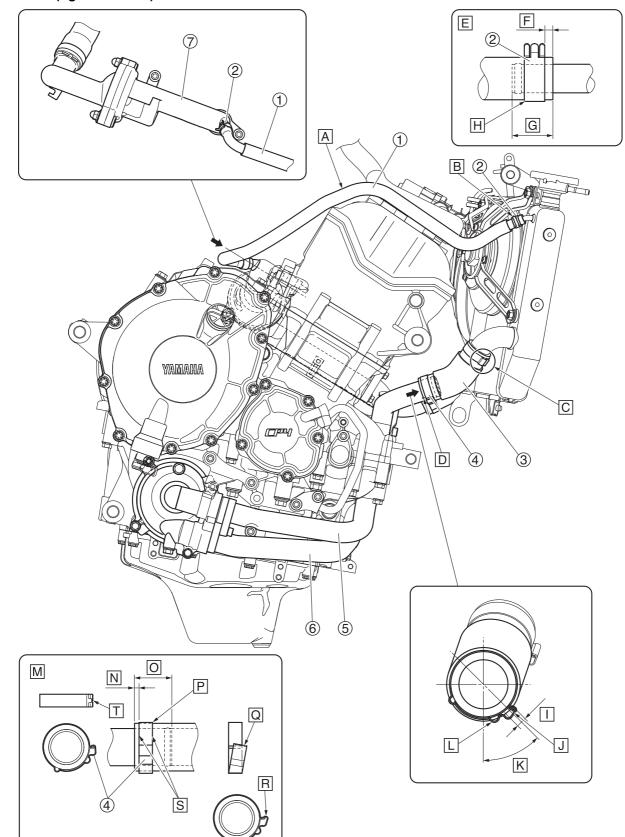


- 1. Air intake duct valve
- 2. Air intake duct
- 3. Intake air temperature sensor
- 4. Surge tank
- 5. Surge tank hose
- 6. One-way valve
- 7. Intake solenoid vacuum hose (one-way valve to intake solenoid)
- 8. Intake solenoid vacuum hose (intake solenoid to air intake duct valve)
- 9. Intake solenoid
- 10.Clamp
- A. Insert the surge tank hose up to the end of the surge tank.
- B. Insert the intake solenoid vacuum hoses up the end of the intake solenoid.
- C. Insert the intake solenoid vacuum hose up to the end of the R section of the air intake duct valve pipe.
- D. Insert the surge tank hose up to the end of the one-way valve.
- E. Install the clamp at a position within the 13 mm (0.51 in) range from the end of the one-way valve.
- F. Install the surge tank hose with its white paint mark facing upward.
- G. Install the intake solenoid vacuum hose up to the end of the one-way valve.
- H. Install the clamp up to the end of the rib of the air intake duct.
- I. Cut off the band of the clamp to 5 mm (0.2 in) or less.



- 1. Cooling system air bleed hose
- 2. Clamp
- 3. Thermostat assembly
- 4. Hose clamp
- 5. Radiator inlet hose
- 6. Cylinder
- 7. Crankcase
- 8. Generator cover
- 9. Water pump outlet pipe
- 10.Radiator outlet hose
- A. Point the end of the clamp toward the white paint mark on the cooling system air bleed hose. Make sure that the clamp is not installed on the flange of the hose fitting of the thermostat assembly.
- B. Align the white paint mark on the cooling system air bleed hose with the projection on the thermostat assembly. Insert the cooling system air bleed hose until it contacts the projection on the thermostat assembly.
- C. Align the white paint mark on the radiator inlet hose, projection on the radiator, and opening of the hose clamp. Install the radiator inlet hose up to the center of the projection on the radiator.
- D. Oval shaped projection on the hose clamp (2 locations)
- E. Align the yellow paint mark on the radiator inlet hose with the projection on the thermostat assembly and oval shaped projections on the hose clamp. Insert the radiator inlet hose until it contacts the projection on the thermostat assembly.
- F. Clamp installation details
- G. 2 mm (0.08 in) or more
- H. Installed length: 20 mm (0.79 in)
- I. Make sure that the clamp is not installed on the flange of the hose fitting of the thermostat assembly.
- J. When installing the thermostat assembly, make sure that the claw on the thermostat assembly engage the recess on the generator cover.
- K. Hose clamp installation details
- L. 3 mm (0.12 in) or more
- M. Plug-in length
- N. Make sure that the hose clamp is not installed on the flange of the hose fitting of the thermostat assembly.
- O. Make sure that the hose clamp is not installed in a slanted position as shown in the illustration.
- P. Make sure to hook the end of the hose clamp securely onto the projection on the hose clamp. (not like as shown in the illustration)
- Q. Install the hose clamp so that both ends are parallel to each other.
- R. Make sure that the projection on the center of the hose clamp contacts with the cut out in the end of the hose clamp.

S. Face the opening of the hose clamp to the left.



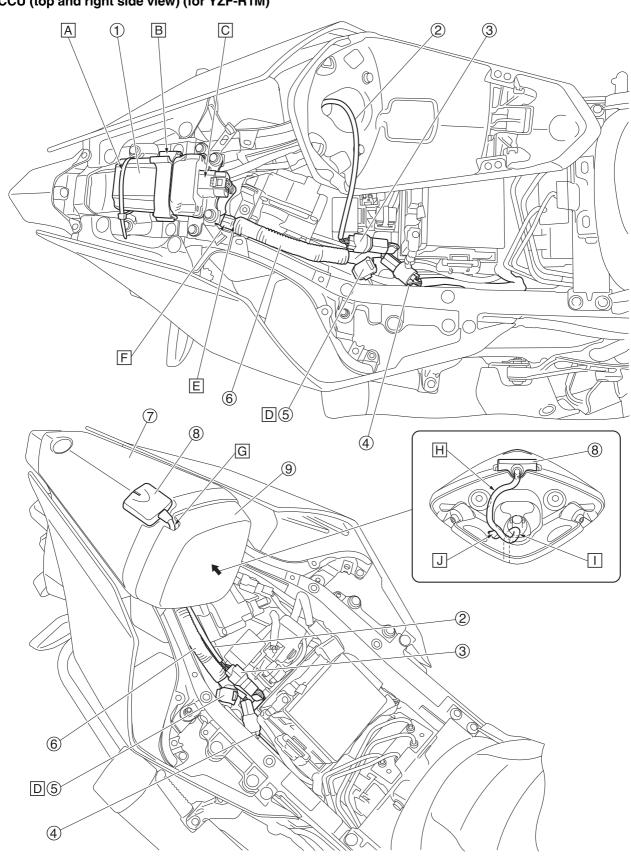
Radiator (right side view)

- 1. Cooling system air bleed hose
- 2. Clamp
- 3. Radiator outlet hose
- 4. Hose clamp
- 5. Water pump inlet pipe
- 6. Water pump outlet pipe
- 7. Thermostat assembly
- A. Route the cooling system air bleed hose outside to the air induction system hose.
- B. Install the clamp with the end pointing to the right. Make sure that the clamp is not installed on the flange of the hose fitting of the radiator hose.
- C. Align the white paint mark on the radiator outlet hose, projection on the radiator, and opening of the hose clamp. Install the radiator outlet hose up to the center of the projection on the radiator.
- D. Align the yellow paint mark on the radiator outlet hose with the black paint mark on the water pump inlet pipe and the opening of the hose clamp. Insert the radiator outlet hose up to the center of the black paint mark on the water pump inlet pipe.
- E. Clamp installation details
- F. 2 mm (0.08 in) or more
- G. Installed length: 20 mm (0.79 in)
- H. Make sure that the clamp is not installed on the flange of the hose fitting.
- I. Yellow paint mark on the radiator outlet hose
- J. Hose clamp opening
- K. 45°
- L. Point the projections (2 locations) on the hose clamp downward.
- M. Hose clamp installation details
- N. 3 mm (0.12 in) or more
- O. Plug-in length
- P. Make sure that the hose clamp is not installed on the flange of the hose fitting of the water pump inlet pipe.
- Q. Make sure that the hose clamp is not installed in a slanted position as shown in the illustration.
- R. Make sure to hook the end of the hose clamp securely onto the projection on the hose clamp. (not like as shown illustration)
- S. Install the hose clamp so that both ends are parallel to each other.
- T. Make sure that the projection on the center of the hose clamp contacts with the cut out in the end of the hose clamp.

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Muffler (top and left side view)

- 1. Exhaust chamber
- 2. EXUP valve pulley cover
- 3. Muffler
- 4. EXUP servo motor
- 5. EXUP cable 2
- 6. EXUP cable 1
- A. EXUP cable securing location



- 1. CCU (Communication Control Unit)
- 2. GPS unit lead
- 3. GPS unit coupler
- 4. Yamaha diagnostic tool coupler (wire harness)
- 5. Yamaha diagnostic tool coupler (sub-wire harness)
- 6. Sub-wire harness
- 7. Passenger seat cover
- 8. GPS unit
- 9. Cushion
- A. Fasten the CCU and CCU bracket with the plastic locking tie.
- B. Fasten the CCU and CCU bracket with the band.
- C. Connect the CCU coupler (sub-wire harness) to the CCU.
- D. Insert the Yamaha diagnostic tool coupler until it contacts the battery box.
- E. Align the end of the corrugate tube with the end of the clamp.
- F. Fasten the sub-wire harness to the rear frame with the clamp.
- G. Route the GPS unit lead between the passenger seat cover and the cushion.
- H. Route the GPS unit lead as shown in the illustration.
- I. Route the GPS unit lead to the inside of the vehicle through the hole in the passenger seat cover.
- J. Fasten the GPS unit lead with the clamp on the passenger seat cover.

PERIODIC CHECKS AND ADJUSTMENTS

PERIODIC MAINTENANCE	
	-
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CHECKING THE FUEL LINE (Secondary injector)	
CHECKING THE SPARK PLUGS	
ADJUSTING THE VALVE CLEARANCE	
CHECKING THE ENGINE IDLING SPEED	
SYNCHRONIZING THE THROTTLE BODIES	
CHECKING THE THROTTLE BODY JOINTS	
CHECKING THE CRANKCASE BREATHER HOSE	
CHECKING THE EXHAUST SYSTEM	
ADJUSTING THE EXHAUST GAS VOLUME	
CHECKING THE AIR INDUCTION SYSTEM	
REPLACING THE AIR FILTER ELEMENT	
ADJUSTING THE CLUTCH LEVER FREE PLAY	-
CHECKING THE BRAKE OPERATION	
CHECKING THE BRAKE FLUID LEVEL	-
ADJUSTING THE FRONT DISC BRAKE	
CHECKING THE FRONT BRAKE PADS	
ADJUSTING THE REAR DISC BRAKE	
CHECKING THE REAR BRAKE PADS	
CHECKING THE FRONT BRAKE HOSES	
CHECKING THE FRONT BRAKE HOSES	
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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.

TIP -

EAS30614

- 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.

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

			CHECK OR MAINTENANCE		ANNUAL				
NO.		ITEM	JOB	1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	CHECK
1	*	Fuel line	 Check fuel hoses for cracks or damage. 		\checkmark	\checkmark	\checkmark	\checkmark	
2	*	Spark plugs	Check condition.Clean and regap.		\checkmark		\checkmark		
			Replace.			\checkmark		\checkmark	
3	*	Valves	Check valve clearance.Adjust.	Every 40000 km (24000 mi)					
4	*	Fuel injection sys- tem	Adjust synchronization.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
5	*	Muffler and exhaust pipe	 Check the screw clamp(s) for looseness. 	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
6	*	Air induction sys- tem	 Check the air cut-off valve, reed valve, and hose for dam- age. Replace any damaged parts if necessary. 		\checkmark	V	V	V	V

EAS30615

GENERAL MAINTENANCE AND LUBRICATION CHART

			CHECK OR MAINTENANCE		ODOI	METER REA	DING		ANNUAL
NO.	0.	ITEM	JOB	1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	CHECK
1	*	Air filter element	Replace.						
2		Clutch	Check operation.Adjust.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
3	*	Front brake	Check operation, fluid level and vehicle for fluid leakage.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
			Replace brake pads.	Whenever worn to the limit					
4	*	Rear brake	Check operation, fluid level and vehicle for fluid leakage.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
			Replace brake pads.		V	Whenever wo	orn to the lim	it	

			CHECK OR MAINTENANCE	ODOMETER READING					ANNUAL	
NC	Э.	ITEM	JOB	1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	CHECK	
5	*	Brake hoses	 Check for cracks or damage. Check for correct routing and clamping. 		\checkmark	\checkmark	\checkmark	\checkmark		
			Replace.			Every	4 years			
6	*	Brake fluid	Replace.	Every 2 years						
7	*	Wheels	 Check runout and for dam- age. 		\checkmark	\checkmark	\checkmark	\checkmark		
8	*	Tires	 Check tread depth and for damage. Replace if necessary. Check air pressure. Correct if necessary. 		V	V	V	V		
9	*	Wheel bearings	 Check bearings for loose- ness or damage. 		\checkmark	\checkmark	\checkmark	\checkmark		
10	*	Swingarm	 Check operation and for excessive play. 		V	\checkmark	\checkmark	\checkmark		
		Omigani	 Lubricate with lithium-soap- based grease. 		E	very 50000 l	km (30000 m	ni)		
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 rain or riding in wet areas					ling in the	
12	*	Steering bearings	Check bearing play and steer- ing for roughness.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		
12		Steering bearings	 Lubricate with lithium-soap- based grease. 	Every 20000 km (12000 mi)						
13	*	Steering damper	 Check operation and for oil leakage. 		\checkmark	\checkmark	\checkmark	\checkmark		
14	*	Chassis fasteners	 Make sure that all nuts, bolts and screws are properly tight- ened. 		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
15		Brake lever pivot shaft	 Lubricate with silicone grease. 		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
16		Brake pedal pivot shaft	 Lubricate with lithium-soap- based grease. 		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
17		Clutch lever pivot shaft	 Lubricate with lithium-soap- based grease. 		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
18		Shift pedal pivot shaft	 Lubricate with lithium-soap- based grease. 		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
19		Sidestand	 Check operation. Lubricate with lithium-soap- based grease. 		\checkmark	\checkmark	\checkmark	\checkmark		
20	*	Sidestand switch	Check operation.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		
21	*	Front fork	 Check operation and for oil leakage. 		\checkmark	\checkmark	\checkmark	\checkmark		
22	*	Shock absorber assembly	 Check operation and shock absorber for oil leakage. 			\checkmark	\checkmark	\checkmark		
23	*	Rear suspension relay arm and connecting arm pivoting points	Check operation.		\checkmark	\checkmark	\checkmark	V		
24		Engine oil	 Change. Check oil level and vehicle for oil leakage. 	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		

NO.				ODOMETER READING						
		ITEM	CHECK OR MAINTENANCE JOB				10000 km (6000 mi)	20000 km (12000 mi)	0000 km 30000 km 4000 2000 mi) (18000 mi) (2400	
25		Engine oil filter cartridge	Replace.	\checkmark		\checkmark		\checkmark		
26	*	Cooling system	Check coolant level and vehi- cle for coolant leakage.		\checkmark	\checkmark	\checkmark	\checkmark		
			Change coolant.	Every 3 years						
27	*	EXUP system	 Check operation, cable free play and pulley position. 	\checkmark		\checkmark		\checkmark		
28	*	Front and rear brake switches	Check operation.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		
29		Moving parts and cables	Lubricate.		\checkmark	\checkmark	\checkmark	\checkmark		
30	*	Throttle grip	 Check operation. Check throttle grip free play, and adjust if necessary. Lubricate cable and grip housing. 		\checkmark	\checkmark	V	V	V	
31	*	Lights, signals and switches	Check operation.Adjust headlight beam.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	

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 rear brake master cylinder, the internal components of the front brake master cylinder, the brake calipers, and change the brake fluid.
- Replace the brake hoses every four years and if cracked, damaged, partly blacked surface on the brake hose.

CHECKING THE FUEL LINE (Primary injector)

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

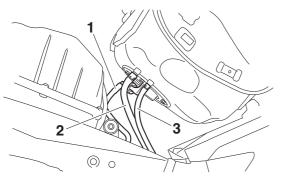
- 1. Remove:
- Rider seat Refer to "GENERAL CHASSIS (1)" on page
- 4-1. • Fuel tank cover
- Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Fuel tank Refer to "FUEL TANK" on page 7-1.
- 2. Check:
 - Fuel hose "1"
 - Fuel tank drain hose "2"
 - Fuel tank breather hose "3"
- Cracks/damage \rightarrow Replace. Loose connection \rightarrow Connect properly.

NOTICE

Make sure the fuel tank breather hose is routed correctly.

TIP -

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



- 3. Install:
- Fuel tank

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

- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.

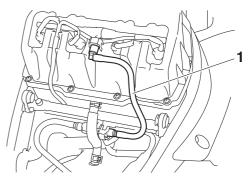
CHECKING THE FUEL LINE (Secondary injector)

- 1. Remove:
 - Rider seat
 - Refer to "GENERAL CHASSIS (1)" on page

- 4-1.
- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Fuel tank Refer to "FUEL TANK" on page 7-1.
- 2. Check:
 - Fuel hose "1"
 Cracks/damage → Replace.
 Loose connection → Connect properly.

TIP -

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



- 3. Install:
 - Fuel tank Refer to "FUEL TANK" on page 7-1.
 - Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.

CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

1. Remove:

EAS30620

- Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Fuel tank
- Refer to "FUEL TANK" on page 7-1.
- Air filter case Refer to "AIR FILTER CASE" on page 7-4.
- Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-19.
- 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/LMAR9E-J

4. Check:

• Electrode "1" Damage/wear \rightarrow Replace the spark plug.

Insulator "2"
 Abnormal color → Replace the spark plug.
 Normal color is medium-to-light tan.

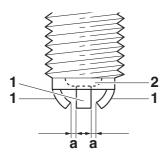
- 5. Clean:
 - Spark plug

(with a spark plug cleaner or wire brush) 6. Measure:

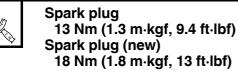
 Spark plug gap "a" (with a wire thickness gauge) Out of specification → Regap.



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



- 7. Install:
- Spark plugs
- Ignition coils



TIP

- Before installing the spark plug, clean the spark plug and gasket surface.
- If the spark plug is a new one, tighten it to 18

Nm (1.8 m·kgf, 13 ft·lbf).

- 8. Install:
 - Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-19.
 - Air filter case Refer to "AIR FILTER CASE" on page 7-4.
 - Fuel tank

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

- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

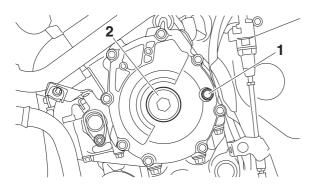
TIP _

EAS30622

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.
- 1. Remove:
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
 - Fuel tank cover/Front side cowling/Front panel/Side cover bracket Refer to "GENERAL CHASSIS (2)" on page 4-7.
 - Fuel tank

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

- Air filter case Refer to "GENERAL CHASSIS (3)" on page 4-17.
- Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-19.
- Radiator
 - Refer to "RADIATOR" on page 6-1.
- 2. Remove:
 - Ignition coils
 - Spark plugs
 - Cylinder head cover
 - Cylinder head cover gasket Refer to "CAMSHAFTS" on page 5-9.
- 3. Remove:
 - Timing mark accessing bolt "1"
 - Crankshaft end cover "2"



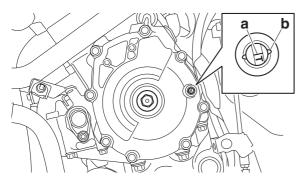
- 4. Measure:
 - Valve clearance

Out of specification \rightarrow Adjust.

Valve clearance (cold) Intake 0.09–0.17 mm (0.0035–0.0067 in) Exhaust 0.18–0.23 mm (0.0071–0.0091 in)

.....

- a. Turn the crankshaft counterclockwise.
- b. When piston #1 is at TDC on the compression stroke, align the TDC mark "a" on the generator rotor with the generator rotor cover slot "b".



TIP

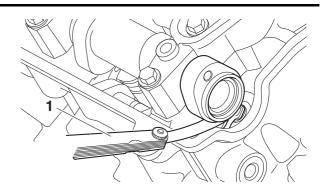
TDC on the compression stroke can be found when the camshaft lobes are turned away from each other.

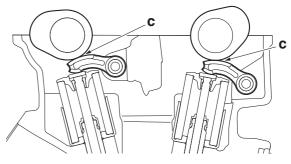
c. Measure the valve clearance #1 with a thickness gauge "1".

TIP -

Measure the valve clearance between the cam lobe and rocker arm "c".



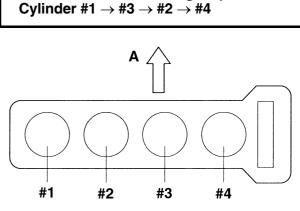




TIP

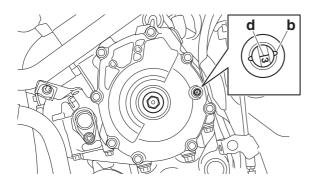
- If the valve clearance is incorrect, record the measured reading.
- Measure the valve clearance in the following sequence.

Valve clearance measuring sequence



A. Front

- d. Turn the crankshaft counterclockwise.
- e. When piston #3 is at TDC on the compression stroke, align the TDC mark "d" on the generator rotor with the generator rotor cover slot "b".

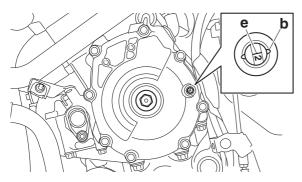


f. Measure the valve clearance #3 with a thickness gauge.



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

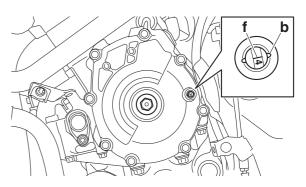
- g. Turn the crankshaft counterclockwise.
- h. When piston #2 is at TDC on the compression stroke, align the TDC mark "e" on the generator rotor with the generator rotor cover slot "b".



i. Measure the valve clearance #2 with a thickness gauge.



- j. Turn the crankshaft counterclockwise.
- k. When piston #4 is at TDC on the compression stroke, align the TDC mark "f" on the generator rotor with the generator rotor cover slot "b".

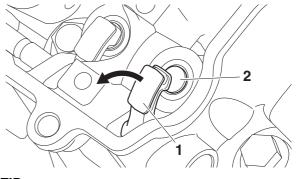


I. Measure the valve clearance #4 with a thickness gauge.



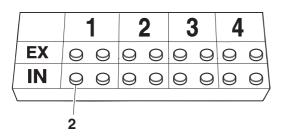
- 5. Remove:
- Camshaft
- TIP _____
- Refer to "CAMSHAFTS" on page 5-9.
- When removing the timing chain and camshafts, fasten the timing chain with a wire to retrieve it if it falls into the crankcase.
- 6. Adjust:
 - Valve clearance

a. Pull the rocker arm "1" up, and then remove the valve pad "2".



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 pad "2" so that they can be installed in the correct place.



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

Example:

Specified valve clearance = 0.09-0.17 mm (0.004-0.007 in)

Measured valve clearance = 0.20 mm (0.008)in)

0.20 mm (0.008 in)-0.17 mm (0.007 in) = 0.03 mm (0.001 in)

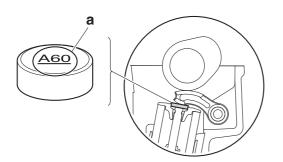
c. Check the thickness of the current valve pad. TIP_

- The letter and number "a" marked on the valve pad indicate the valve pad thickness.
- The letter A marked on the valve pad indicates 1 mm (0.04 in), while B indicates 2 mm (0.08 in).
- The number marked on the valve pad indicates hundredths of millimeters.

Example:

If the valve pad is marked "A60", the pad thickness is 1.60 mm (0.063 in).

If the valve pad is marked "B30", the pad thickness is 2.30 mm (0.091 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:

1.60 mm (0.063 in) + 0.03 mm (0.001 in) =1.63 mm (0.064 in)

The valve pad number is A63.

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

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

TIP_

Refer to the following table for the available valve pads.

Valve pad range	No. A60–A99, B00–B40
Valve pad thickness	1.60–2.40 mm (0.0630–0.0944 in)
Available valve pads	17 thicknesses in 0.05 mm (0.002 in) incre- ments

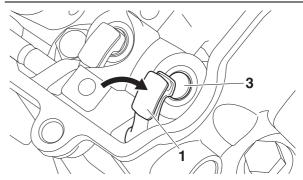
Example:

Valve pad number = A63Rounded value = A65

- New valve pad number = A65
- f. Install the new valve pad "3" and then, push the rocker arm "1" down.

TIP.

- Lubricate the valve pad with molybdenum disulfide oil.
- Install the valve pad in the correct place.



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



Camshaft cap bolt 8 Nm (0.8 m·kgf, 5.8 ft·lbf) Camshaft cap bolt (new) 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP.

- Refer to "CAMSHAFTS" on page 5-9.
- · Lubricate the camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.

- Align the camshaft sprocket marks with the cylinder head surface.
- If the camshaft cap bolt is a new one, it is not necessary to apply engine oil onto the mating surface and threads of the bolt.
- If the camshaft cap bolt is a new one, tighten it to 10 Nm (1.0 m·kgf, 7.2 ft·lbf).
- Turn the crankshaft counterclockwise several full turns to seat the parts.

h. Measure the valve clearance again.

- i. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.
- 7. Install:
- All removed parts

TIP -

For installation, reverse the removal procedure.

EAS31017

CHECKING THE ENGINE IDLING SPEED

Prior to checking the engine idling speed, the throttle body synchronization should be adjusted properly, the air filter element should be clean, and the engine should have adequate compression.

- 1. Start the engine and let it warm up for several minutes.
- 2. Check:
 - Engine idling speed

Out of specification \rightarrow Go to next step.

Engine idling speed 1200–1400 r/min

- 3. Check:
- ISC (Idle Speed Control) learning value "00" or "01" → Check the intake system.
 "02" → Clean the throttle bodies. Refer to "CHECKING AND CLEANING THE THROTTLE BODIES" on page 7-12.

- a. Connect the Yamaha diagnostic tool.
 Use the diagnostic code number "67".
 Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.
- b. Check the ISC (Idle Speed Control) leaning value.

SYNCHRONIZING THE THROTTLE BODIES

Before synchronizing the throttle bodies, check the following items:

- Valve clearance
- Spark plugs

EAS30707

- Air filter element
- Throttle body joints
- Fuel hose
- Exhaust system
- Breather hoses

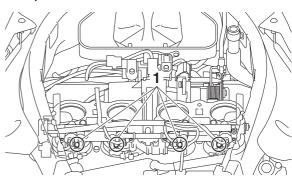
Checking the throttle body synchronization

1. Stand the vehicle on a level surface.

TIP_

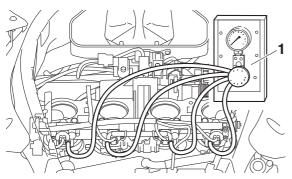
Place the vehicle on a suitable stand.

- 2. Remove:
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
 - Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
 - Fuel tank Refer to "FUEL TANK" on page 7-1.
 - Air filter case
 - Refer to "AIR FILTER CASE" on page 7-4.
- 3. Remove:
- Caps "1"



- 4. Install:
- Vacuum gauge "1"





- 5. Install:
- Air filter case
- Refer to "AIR FILTER CASE" on page 7-4. • Fuel tank

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

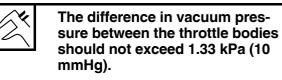
- 6. Check:
- Throttle body synchronization

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



Engine idling speed 1200–1400 r/min

b. Check the vacuum pressure.



If out of specification \rightarrow Adjust the throttle body synchronization.

Adjusting the throttle body synchronization 1. Adjust:

• Throttle body synchronization

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



Engine idling speed 1200–1400 r/min

 b. Using the throttle body that has the bypass air screw "1" with a white paint mark as the standard, adjust the other throttle bodies by turning its bypass air screw in or out.

NOTICE

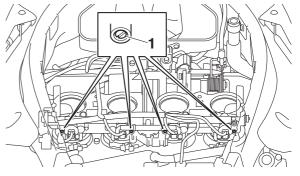
Do not turn the bypass air screw (white paint mark) of the throttle body that is the standard. Otherwise, the engine may run roughly

at idle and the throttle bodies may not operate properly.

TIP -

- Turn the bypass air screw using the carburetor angle driver.
- After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.
- If a bypass air screw was removed, turn the screw in fully and be sure to synchronize the throttle bodies.
- If the throttle body synchronization can not be adjusted using the bypass air screw, clean or replace the throttle bodies.
- The difference in vacuum pressure between the throttle bodies should not exceed 1.33 kPa (10 mmHg).

Carburetor angle driver 2 90890-03173



- 2. Stop the engine and remove the measuring equipment.
- 3. Install:
- Caps
- 4. Install:
 - Air filter case
 - Refer to "AIR FILTER CASE" on page 7-4. • Fuel tank
 - Refer to "FUEL TANK" on page 7-1.
 - Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- 5. Adjust:
 - Throttle grip free play Refer to "CHECKING THE THROTTLE GRIP" on page 3-36.

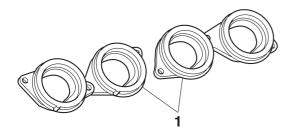
1 the

Throttle grip free play

3.0–5.0 mm (0.12–0.20 in)

CHECKING THE THROTTLE BODY JOINTS 1. Remove:

- Throttle bodies
- Refer to "THROTTLE BODIES" on page 7-9. 2. Check:
- Throttle body joints "1" Cracks/damage → Replace.



3. Install:

• Throttle bodies

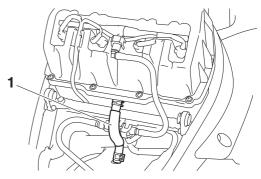
Refer to "THROTTLE BODIES" on page 7-9.

CHECKING THE CRANKCASE BREATHER HOSE

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

ECA13450

Make sure the crankcase breather hose is routed correctly.



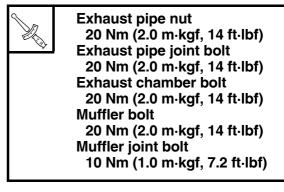
- 3. Install:
- Fuel tank

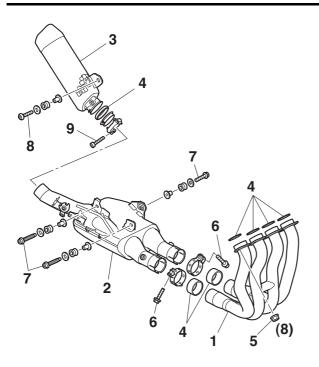
Refer to "FUEL TANK" on page 7-1.

- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30625 CHECKING THE EXHAUST SYSTEM

- 1. Check:
 - Exhaust pipe "1"
 - Exhaust chamber "2"
 - Muffler "3"
 - Cracks/damage \rightarrow Replace.
 - Gasket "4" Exhaust gas leaks \rightarrow Replace.
- 2. Check:
 - Tightening torque
 - Exhaust pipe nut "5"
 - Exhaust pipe joint bolt "6"
 - Exhaust chamber bolt "7"
 - Muffler bolt "8"
 - Muffler joint bolt "9"





EAS30799

ADJUSTING THE EXHAUST GAS VOLUME TIP

- Be sure to set the CO density level to standard, and then adjust the exhaust gas volume.
- To adjust the exhaust gas volume, use the CO adjustment mode of the Yamaha diagnostic tool. For more information, refer to the operation manual of the Yamaha diagnostic tool.
- 1. Connect the Yamaha diagnostic tool to the coupler. For information about connecting the Yamaha diagnostic tool, refer to "YAMAHA DIAGNOSTIC TOOL" on page 8-52

Yamaha diagnostic tool 90890-03239

EAS30627

CHECKING THE AIR INDUCTION SYSTEM

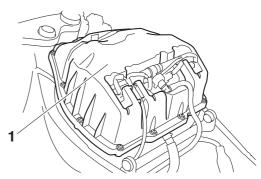
Refer to "AIR INDUCTION SYSTEM" on page 7-19.

EAS30628

REPLACING THE AIR FILTER ELEMENT

- 1. Remove:
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Fuel tank Refer to "FUEL TANK" on page 7-1.

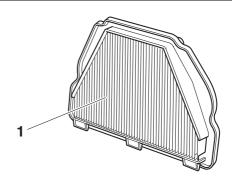
- 2. Remove:
- Air filter case cover "1"



- 3. Check:
 - Air filter element "1"
 - Air filter seal
 - Damage \rightarrow Replace.

TIP

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



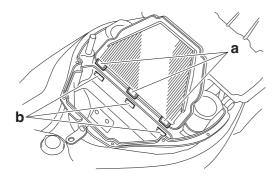
- 4. Install:
- Air filter element
- Air filter case cover

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.

TIP

- Align projections "a" of the air filter element to the slots "b" of the air filter case and install.
- When installing the air filter element into the air filter case, make sure that the sealing surfaces are aligned to prevent any air leaks.



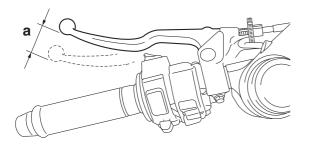
- 5. Install:
- Fuel tank
 Befer to "FLIF
- Refer to "FUEL TANK" on page 7-1.
 Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.

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)

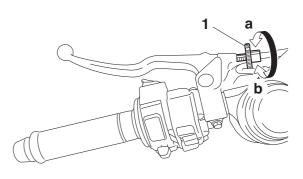


- 2. Adjust:
 - Clutch lever free play

Handlebar side

a. 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.



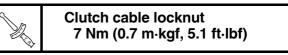
Engine side

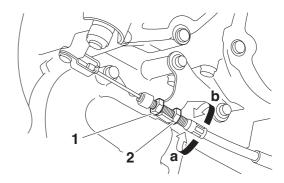
- Remove the right front side cowling.
 Refer to "GENERAL CHASSIS (2)" on page 4-7.
- b. Loosen the locknut "1".
- c. Turn the adjusting nut "2" in direction "a" or "b" until the specified clutch lever free play is obtained.

Direction "a"

Clutch lever free play is increased. Direction "b" Clutch lever free play is decreased.

d. Tighten the locknut "1".





 e. Install the right front side cowling. Refer to "GENERAL CHASSIS (2)" on page 4-7.

CHECKING THE BRAKE OPERATION

1. Check:

EAS20801

Brake operation
 Brake not working properly → Check the brake system.
 Befor to "EPONT REAKE" on page 4.42 and

Refer to "FRONT BRAKE" on page 4-43 and "REAR BRAKE" on page 4-55.

TIP -

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

EAS30632

CHECKING THE BRAKE FLUID LEVEL

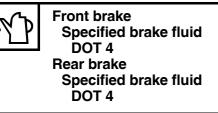
1. Stand the vehicle on a level surface.

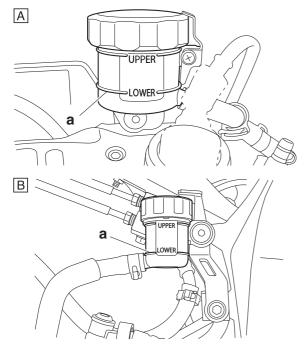
- TIP -
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.

2. Check:

Brake fluid level

Below the minimum level mark "a" \rightarrow Add the specified brake fluid to the proper level.





A. Front brake

B. Rear brake

WARNING

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

ECA13540

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.

EAS30630

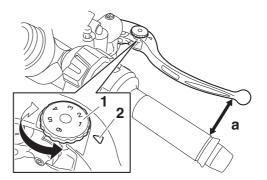
ADJUSTING THE FRONT DISC BRAKE

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

TIP -

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

Position #1 Distance "a" is the largest. Position #6 Distance "a" is the smallest.



WARNING

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

ECA13490

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

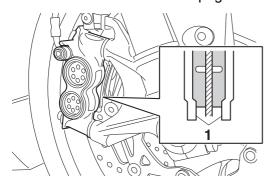
EAS30633

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

- 1. Operate the brake.
- 2. Check:
- Front brake pad

Wear indicators "1" almost touch the brake disc \rightarrow Replace the brake pads as a set. Refer to "FRONT BRAKE" on page 4-43.



EAS30631

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.

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 master cylinder lock nut

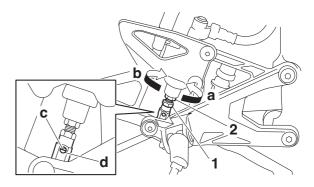
16 Nm (1.6 m·kgf, 12 ft·lbf)

WARNING

A soft or spongy feeling in the brake pedal can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance.

ECA13510 NOTICE

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 3-36.

EAS30634

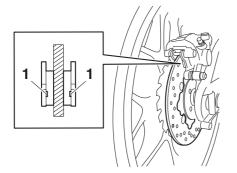
CHECKING THE REAR BRAKE PADS

The following procedure applies to all of the brake pads.

- 1. Operate the brake.
- 2. Check:
 - Rear brake pad

Wear indicator grooves "1" almost disappeared \rightarrow Replace the brake pads as a set.

Refer to "REAR BRAKE" on page 4-55.



EAS30635

CHECKING THE FRONT BRAKE HOSES

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

- 1. Check:
 - Brake hose
 - Cracks/damage/wear \rightarrow Replace.
- 2. Check:
 - Brake hose surface
 - Partly blackened surface on the brake hose \rightarrow Replace.
- 3. Check:
- Brake hose holder
 - Loose \rightarrow Tighten the holder bolt.
- 4. Hold the vehicle upright and apply the brake several times.
- 5. Check:
- Brake hose

Brake fluid leakage \rightarrow Replace the damaged hose.

Refer to "FRONT BRAKE" on page 4-43.

EAS30636

CHECKING THE REAR BRAKE HOSE

- 1. Check:
- Brake hose
 - Cracks/damage/wear \rightarrow Replace.
- 2. Check:
- Brake hose holder
 Loose Connection → Tighten the holder bolt.
- Hold the vehicle upright and apply the rear brake several times.
- 4. Check:
- Brake hose

Brake fluid leakage \rightarrow Replace the damaged hose.

Refer to "REAR BRAKE" on page 4-55.

BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)

EWA14000 WARNING

Always bleed the brake system when the brake related parts are removed.

NOTICE

ECA22640

EV630803

- Bleed the brake system in the following order.
- 1st step: Front brake master cylinder
- 2nd step: Front brake calipers
- 3rd step: Rear brake caliper

EWA16530

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

TIP -

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

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

- A. Front brake master cylinder
- B. Front brake caliper (left/right)
- C. Rear brake caliper
- d. Place the other end of the hose into a container.
- e. Slowly apply the brake several times.
- f. Fully squeeze the brake lever or fully depress the brake pedal and hold it in position.
- g. Loosen the bleed screw.

TIP -

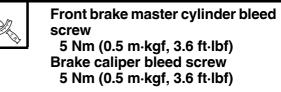
Loosening the bleed screw will release the pressure and cause the brake lever to contact the throttle grip or the brake pedal to fully extend.

- 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.
- Check the operation of the hydraulic unit. Refer to "HYDRAULIC UNIT OPERATION TEST" on page 4-70.

ECA17061

Make sure that the main switch is turned to "OFF" before checking the operation of the hydraulic unit.

- k. After operating the ABS, repeat steps (e) to (i), and then fill the brake fluid reservoir to the proper level with the specified brake fluid.
- I. Tighten the bleed screw to specification.



m. Fill the brake fluid reservoir to the proper level with the specified brake fluid. Refer to "CHECKING THE BRAKE FLUID

LEVEL" on page 3-14.

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

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

- 1. Check:
- Wheel

Damage/out-of-round \rightarrow Replace.

Never attempt to make any repairs to the wheel.

TIP -

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

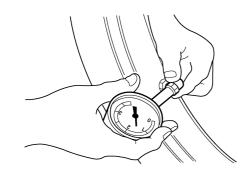
EAS31429

CHECKING THE TIRES

The following procedure applies to both of the tires.

- 1. Check:
 - Tire pressure

Out of specification \rightarrow Regulate.



- The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.
- The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.
- Operation of an overloaded vehicle could cause tire damage, an accident or an injury. NEVER OVERLOAD THE VEHICLE.

1 the second sec	Tire air pressure (measured on cold tires)
<u> </u>	Loading condition
	0–90 kg (0–198 lb)
	Front
	250 kPa (2.50 kgf/cm ² , 36 psi)
	Rear
	290 kPa (2.90 kgf/cm ² , 42 psi)
	Loading condition
	90–188 kg (198–414 lb)
	Front
	250 kPa (2.50 kgf/cm ² , 36 psi)
	Rear
	290 kPa (2.90 kgf/cm², 42 psi)
	High-speed riding
	Front
	_250 kPa (2.50 kgf/cm², 36 psi)
	Rear
	290 kPa (2.90 kgf/cm², 42 psi)
	Maximum load
	188 kg (414 lb)
*Total	weight of rider, passenger, cargo
and a	ccessories
L	

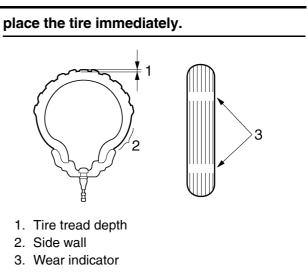
2. Check:

Tire surfaces

 $\label{eq:def-Damage} \text{Damage/wear} \rightarrow \text{Replace the tire}.$

EWA13190 WARNING

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





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.





Rear tire

Size YZF-R1 190/55 ZR17M/C (75W) YZF-R1M 200/55 ZR17M/C (78W) Manufacturer/model YZF-R1 BRIDGESTONE/BATTLAX RAC-ING STREET RS10R G or PIREL-LI/DIABLO SUPERCORSA SP YZF-R1M BRIDGESTONE/BATTLAX RAC-ING STREET RS10R G

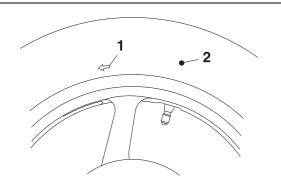
EWA13210 WARNING

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 4-27 and "CHECKING THE REAR WHEEL" on page 4-38.

EAS30802

CHECKING THE SWINGARM OPERATION

- 1. Check:
- Swingarm operation Swingarm not working properly → Check the swingarm. Refer to "SWINGARM" on page 4-112.

- 2. Check:
 - Swingarm excessive play Refer to "SWINGARM" on page 4-112.

EAS30643

LUBRICATING THE SWINGARM PIVOT

- 1. Lubricate:
 - Oil seals
 - Collars

Recommended lubricant Lithium-soap-based grease

Refer to "INSTALLING THE SWINGARM" on page 4-114.

EAS30644

ADJUSTING THE DRIVE CHAIN SLACK

NOTICE

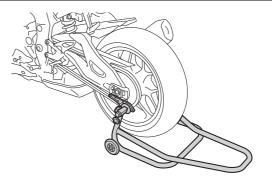
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

1. Stand the vehicle on a level surface.

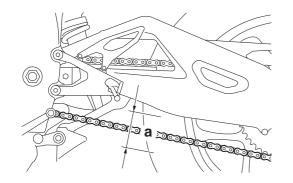
Securely support the vehicle so that there is no danger of it falling over.

TIP -

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



- 2. Shift the transmission into the neutral position.
- 3. Check:
 - Drive chain slack "a" Out of specification → Adjust.



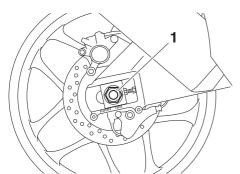
() the

Drive chain slack 25.0–35.0 mm (0.98–1.38 in)

ECA20870

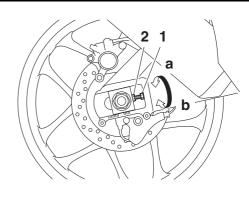
Improper drive chain slack will overload the engine as well as other vital parts of the motorcycle and can lead to chain slippage or breakage. If the drive chain slack is more than the specified limit, the chain can damage the frame, swingarm, and other parts. To prevent this from occurring, keep the drive chain slack within the specified limits.

- 4. Loosen:
- Wheel axle nut "1"



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

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



TIP

EV630803

- To maintain the proper wheel alignment, adjust both sides evenly.
- There should be no clearance between the adjusting block and adjusting bolt.

c. Tighten the wheel axle nut to specification.

Rear wheel axle nut 190 Nm (19 m·kgf, 137 ft·lbf)

d. Tighten the locknuts to specification.

Chain puller adjusting bolt locknut 16 Nm (1.6 m·kgf, 12 ft·lbf)

......

LUBRICATING THE DRIVE CHAIN

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

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

Recommended lubricant Chain lubricant suitable for Oring chains

EAS30645 CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

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

TIP -

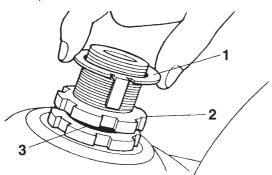
Place the vehicle on a suitable stand so that the front wheel is elevated.

- 2. Check:
- Steering head

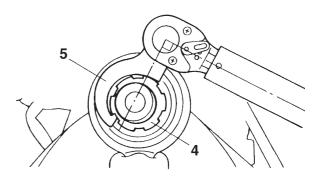
Grasp the bottom of the front fork legs and gently rock the front fork. Blinding/looseness \rightarrow Adjust the steering head.

- 3. Remove:
- Upper bracket
- 4. Adjust:
- Steering head

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



- b. Loosen the lower ring nut "4" and then tighten it to specification with a steering nut wrench "5".
- TIP -
- Set the torque wrench at a right angle to the steering nut wrench.
- Move the steering to the left and right a couple of times to check that it moves smoothly.



Steer 908 Exha

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

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

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

Do not overtighten the lower ring nut.



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

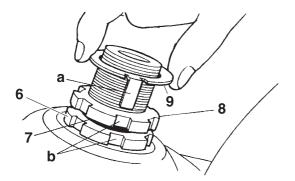
d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.

Refer to "STEERING HEAD" on page 4-100.

- e. Install the rubber washer "7".
- f. Install the upper ring nut "8".
- g. Finger tighten the upper ring nut, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
- h. Install the lock washer "9".

TIP -

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



- 5. Install:
 - Upper bracket

Refer to "HANDLEBARS" on page 4-74.

- LUBRICATING THE STEERING HEAD
- 1. Lubricate:
 - Upper bearing
- Lower bearing
- Bearing race

Recommended lubricant Lithium-soap-based grease

EAS31634

CHECKING THE STEERING DAMPER

Refer to "CHECKING THE STEERING DAMP-ER" on page 4-103.

EAS31186

CHECKING THE CHASSIS FASTENERS

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

Refer to "CHASSIS TIGHTENING TORQUES" on page 2-22.

EAS30804

LUBRICATING THE BRAKE LEVER

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



EAS30805

Recommended lubricant Silicone grease

LUBRICATING THE CLUTCH LEVER

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

Recommended lubricant Lithium-soap-based grease



EAS30649

LUBRICATING THE PEDAL

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



Recommended lubricant Lithium-soap-based grease

EAS30650

EAS30651

CHECKING THE SIDESTAND

- 1. Check:
 - Sidestand operation

Check that the sidestand moves smoothly. Rough movement \rightarrow Repair or replace.

LUBRICATING THE SIDESTAND

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



Recommended lubricant Lithium-soap-based grease

EAS30652

CHECKING THE SIDESTAND SWITCH

Refer to "ELECTRICAL COMPONENTS" on page 8-173.

EAS30653

EWA13120

CHECKING THE FRONT FORK

1. Stand the vehicle on a level surface.

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

- 2. Check:
- Inner tube

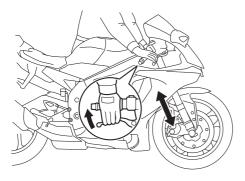
Damage/scratches \rightarrow Replace.

- Front fork leg
 Oil leaks between inner tube and outer tube
 → Replace the oil seal.
- 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 \rightarrow Repair.

Refer to "FRONT FORK (for YZF-R1)" on page 4-79 or refer to "FRONT FORK (for YZF-R1M)" on page 4-90.



EAS30806

ADJUSTING THE FRONT FORK LEGS (for YZF-R1)

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

WARNING

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

Spring preload

WARNING

Always adjust both front fork legs evenly. Uneven adjustment can result in poor handling and loss of stability.

ECA13590

Never go beyond the maximum or minimum adjustment positions.

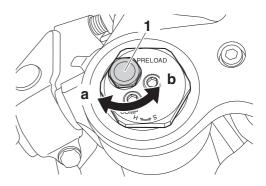
- 1. Adjust:
- Spring preload

a. Turn the adjusting nut "1" in direction "a" or "b".

Direction "a"

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

Spring preload adjusting positions Minimum (soft) 0 turn(s) in direction "a"* Standard 9 turn(s) in direction "a"* Maximum (hard) 15 turn(s) in direction "a"* * With the adjusting nut fully turned in direction "b"



Rebound damping

ECA13590

Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
 - Rebound damping

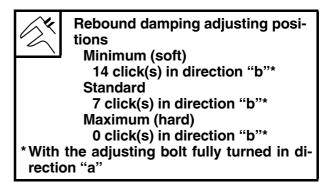
a. Turn the adjusting bolt "1" in direction "a" or "b".

Direction "a"

Rebound damping is increased (suspension is harder).

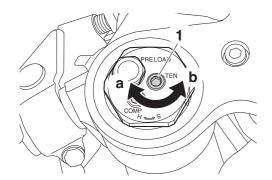
Direction "b"

Rebound damping is decreased (suspension is softer).



TIP -

Although the total number of clicks of a damping force adjusting mechanism may not exactly match the above specifications due to small differences in production, the actual number of clicks always represents the entire adjusting range. To obtain a precise adjustment, it would be advisable to check the number of clicks of each damping force adjusting mechanism and to modify the specifications as necessary.



Compression damping

NOTICE

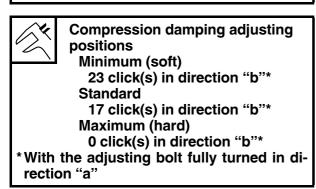
Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
 - Compression damping

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

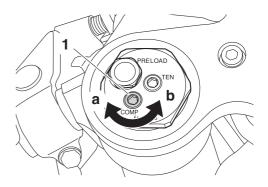
Direction "a"

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



TIP -

Although the total number of clicks of a damping force adjusting mechanism may not exactly match the above specifications due to small differences in production, the actual number of clicks always represents the entire adjusting range. To obtain a precise adjustment, it would be advisable to check the number of clicks of each damping force adjusting mechanism and to modify the specifications as necessary.



EAS31635

ADJUSTING THE PRELOAD OF THE FRONT FORK LEGS (for YZF-R1M)

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

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

Spring preload

WARNING

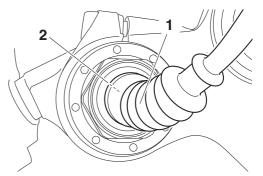
Always adjust both front fork legs evenly. Uneven adjustment can result in poor handling and loss of stability.

ECA13590

Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
- Spring preload

- a. Turn the main switch to "OFF".
- b. Slide the rubber cover "1" back at each coupler.
- c. Disconnect the coupler "2" on each front fork.



d. Turn the adjusting bolt "3" in direction "a" or "b".

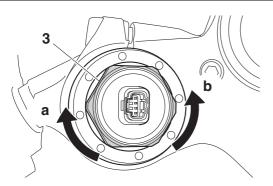
Direction "a"

Spring preload is increased (suspension is harder).

Direction "b"

Spring preload is decreased (suspension is softer).

Spring preload adjusting positions Minimum (soft) 0 turn(s) in direction "a"* Standard 5 turn(s) in direction "a"* Maximum (hard) 15 turn(s) in direction "a"* * With the adjusting nut fully turned in direction "b"



- e. Connect the coupler on each fork.
- f. Slide the rubber cover to the original position.

EAS30941

ADJUSTING THE DAMPING FORCE OF THE FRONT FORK LEGS AND REAR SHOCK ABSORBER ASSEMBLY (for YZF-R1M)

There are three automatic setting modes; A-1, A-2, and A-3. A-3 is fixed and cannot be adjusted. A-1 and A-2 can be adjusted to within a -5 to +5 offset of their factory preset settings.

There are three manual setting modes; M-1, M-2, and M-3. When a manual mode is selected, the SCU does not actively adjust the suspension compression and rebound damping forces. Manual mode suspension settings are adjustable to 32 levels.

TIP -

- A-1 and M-1 are preset for track use with racing slick tires.
- A-2 and M-2 are preset for track use with street tires.
- A-3 and M-3 are preset for street use with street tires.

- 1. Adjust:
- Damping force

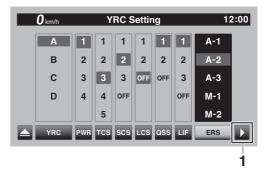
- a. Turn the main switch to "ON".
- b. Long push the wheel switch to enter the MENU screen.

0 km/h	MENU	12:0
	Display Mode	
	YRC Setting	
	Lap Time	
	Logging	
	Maintenance	
	Unit	

c. Select "YRC Setting".

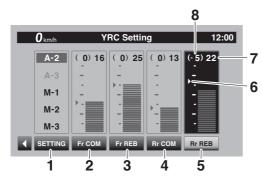


d. Select the "▶" mark located to the right of ERS.



1. To ERS menu

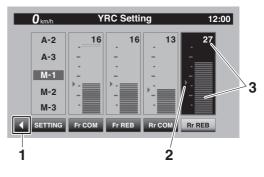
e. The display will change to the front and rear suspension setting screen and the ERS mode selection box "SETTING" is highlighted. Short push the wheel switch to enter the box and select the ERS mode A-1, A-2, M-1, M-2, M-3 that you want to adjust.



- 1. ERS mode selection box "SETTING"
- 2. Front compression damping force
- 3. Front rebound damping force
- 4. Rear compression damping force
- 5. Rear rebound damping force
- 6. Factory preset level
- 7. Current level setting
- 8. Offset level
- f. Select the suspension item, Fr COM, Fr REB, Rr COM, Rr REB, that you want to adjust.

TIP -

- To decrease the damping force and soften the suspension, increase the setting level.
- To increase the damping force and harden the suspension, decrease the setting level.
- For A-1 and A-2, a number indicated in () means how many levels are changed from its factory preset level.
- When a suspension setting item in A-1 or A-2 is offset, the same suspension item will be similarly offset in the other automatic mode (offset values for the same item are automatically linked).
- M-1, M-2, M-3 are not linked and can be independently set.
- g. To adjust other ERS mode suspension settings, repeat from step two. When finished, select the "◀" mark located on the left to return to the main "YRC Setting" menu.



- 1. To YRC Setting menu
- 2. Factory preset level
- 3. Current level setting

EAS30808

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

Refer to "CHECKING THE REAR SHOCK AB-SORBER ASSEMBLY" on page 4-109.

EAS30655

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY (for YZF-R1)

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

Spring preload

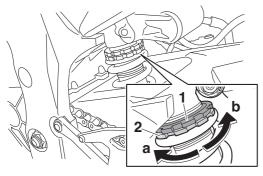
ECA13590

Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
 - Spring preload

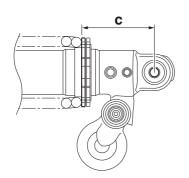
- a. Loosen the locknut "1".
- b. Adjust the spring preload with the special wrench included in the owner's tool kit.
- c. Turn the adjusting ring "2" in direction "a" or "b".

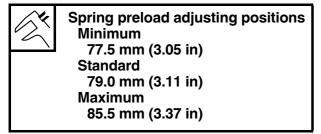
Direction "a" Spring preload is increased (suspension is harder). Direction "b" Spring preload is decreased (suspension is softer).



TIP

The spring preload setting is determined by measuring distance "c". The longer distance "c" is, the higher the spring preload; the shorter distance "c" is, the lower the spring preload.





d. Tighten the locknut to the specified torque.



Spring preload adjusting ring locknut (for YZF-R1) 25 Nm (2.5 m·kgf, 18 ft·lbf)

Rebound damping

NOTICE

Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
 - Rebound damping

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

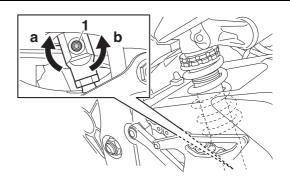
Direction "a"

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

Rebound damping adjusting positions Minimum (soft) 23 click(s) in direction "b"^{*} Standard 12 click(s) in direction "b"^{*} Maximum (hard) 0 click(s) in direction "b"^{*} * With the adjusting screw fully turned in direction "a"

TIP

To obtain a precise adjustment, it is advisable to check the actual total number of clicks of the damping force adjusting mechanism. This adjustment range may not exactly match the specifications listed due to small differences in production.



Compression damping (for fast compression damping)

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:

• Compression damping (for fast compression damping)

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

Direction "a"

Compression damping is increased (suspension is harder).

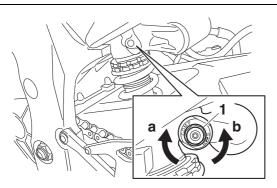
Direction "b"

Compression damping is decreased (suspension is softer).

Compression damping setting (for fast compression damping) Minimum (soft) 5.5 turn(s) in direction "b"* Standard 3 turn(s) in direction "b"^{*} Maximum (hard) 0 turn(s) in direction "b"* *With the adjusting bolt fully turned in direction "a"

TIP

To obtain a precise adjustment, it is advisable to check the actual total number of turns of the damping force adjusting mechanism. This adjustment range may not exactly match the specifications listed due to small differences in production.



Compression damping (for slow compression damping) ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

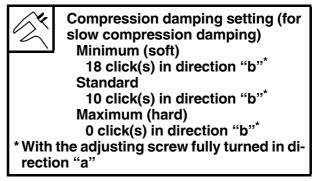
- 1. Adjust:
- Compression damping (for slow compression damping)

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

Direction "a"

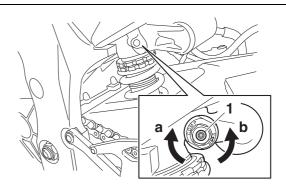
Compression damping is increased (suspension is harder). Direction "b" Compression damping is decreased

(suspension is softer).



TIP

To obtain a precise adjustment, it is advisable to check the actual total number of clicks of the damping force adjusting mechanism. This adjustment range may not exactly match the specifications listed due to small differences in production.



EAS30043 ADJUSTING THE PRELOAD OF THE REAR SHOCK ABSORBER ASSEMBLY (for YZF-R1M) EWA13120

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

Spring preload

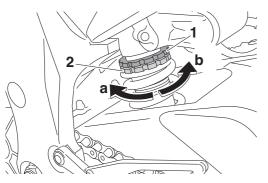
ECA13590 NOTICE

Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
 - Spring preload

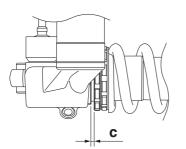
- a. Loosen the locknut "1".
- b. Adjust the spring preload with the special wrench included in the owner's tool kit.
- c. Turn the adjusting ring "2" in direction "a" or "b".

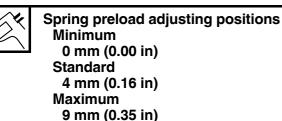
Direction "a" Spring preload is increased (suspension is harder). Direction "b" Spring preload is decreased (suspension is softer).



TIP

The spring preload setting is determined by measuring distance "c". The longer distance "c" is, the higher the spring preload; the shorter distance "c" is, the lower the spring preload.





d. Tighten the locknut to the specified torque.



Spring preload adjusting ring locknut (for YZF-R1M) 25 Nm (2.5 m·kgf, 18 ft·lbf)

EAS30809

CHECKING THE CONNECTING ARM AND RELAY ARM

Refer to "CHECKING THE CONNECTING ARM AND RELAY ARM" on page 4-109.

EAS30656

CHECKING THE ENGINE OIL LEVEL

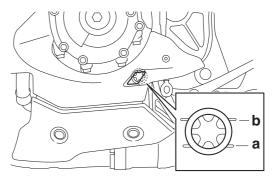
1. Stand the vehicle on a level surface.

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. 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 \rightarrow Add the recommended engine oil to the proper level.



Recommended brand YAMALUBE Type Full synthetic SAE 10W-40 or 15W-50 Recommended engine oil grade API service SG type or higher, JASO standard MA

ECA13361

- 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.

TIP -

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

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

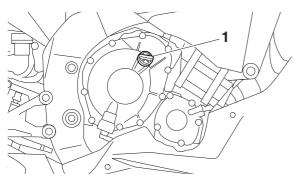
TIP_

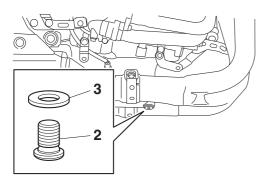
Before checking the engine oil level, wait a few minutes until the oil has settled.

EAS30657

CHANGING THE ENGINE OIL

- 1. Start the engine, warm it up for several minutes, and then turn it off.
- 2. Place a container under the engine oil drain bolt.
- 3. Remove:
 - Engine oil filler cap "1"
- Engine oil drain bolt "2"
- Gasket "3"





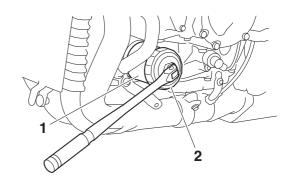
- 4. Drain:
- Engine oil (completely from the crankcase)
- If the oil filter cartridge is also to be replaced, perform the following procedure.

•••••

- Remove the left front side cowling.
 Refer to "GENERAL CHASSIS (2)" on page 4-7
- b. Remove the oil filter cartridge "1" with an oil filter wrench "2".



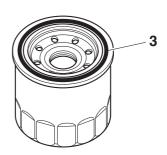
Oil filter wrench 90890-01426 Oil filter wrench YU-38411



c. Lubricate the O-ring "3" of the new oil filter cartridge with a thin coat of lithium-soapbased grease.

NOTICE

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



d. 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)

 e. Install the left front side cowling. Refer to "GENERAL CHASSIS (2)" on page 4-7

- 6. Install:
 - Engine oil drain bolt
 - (along with the gasket New)



Engine oil drain bolt 23 Nm (2.3 m·kgf, 17 ft·lbf)

7. Fill:

Crankcase

mended engine oil)



Engine oil quantity Quantity (disassembled) 4.90 L (5.18 US qt, 4.31 lmp.qt) Without oil filter cartridge replacement 3.90 L (4.12 US qt, 3.43 lmp.qt) With oil filter cartridge replacement 4.10 L (4.33 US qt, 3.61 lmp.qt)

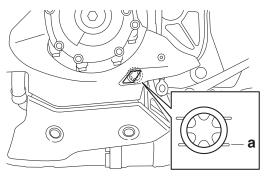
8. Install:

- Engine oil filler cap (along with the O-ring New)
- 9. Start the engine, warm it up for several minutes, and then turn it off.
- 10.Check:
 - Engine
 - (for engine oil leaks)
- 11.Check:
- Engine oil level Refer to "CHECKING THE ENGINE OIL LEVEL" on page 3-29.

MEASURING THE ENGINE OIL PRESSURE

- 1. Check:
- Engine oil level

Below the minimum level mark "a" \rightarrow Add the recommended engine oil to the proper level.



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

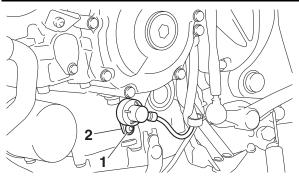
ECA13410 NOTICE

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:
- Front side cowling (left)
- 4. Remove:
 - Oil pressure switch joint bolt "1"

• Oil pressure switch joint (with the oil pressure switch) "2"

The engine, muffler and engine oil are extremely hot.

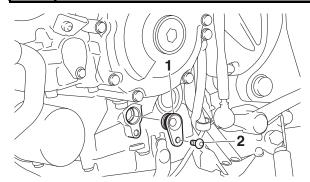


- 5. Install:
 - Oil pressure gauge joint 18 mm "1"
 - Oil pressure switch joint bolt "2"



Oil pressure gauge joint 18 mm 90890-04176 YU-04176

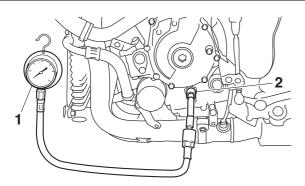
Oil pressure switch joint bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)



- 6. Install:
 - Oil pressure gauge "1"
 - Adapter C "2"



Oil pressure gauge set 90890-03120



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

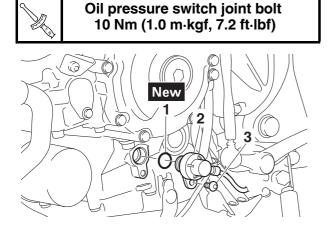


Oil pressure 220.0 kPa/5000 r/min@80 °C (31.9 psi/5000 r/min@176 °F)

Out of specification \rightarrow Check.

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

- 8. Remove:
 - Oil pressure gauge
 - Adapter C
 - Oil pressure switch joint bolt
 - Oil pressure switch joint (with the O-ring)
- 9. Install:
 - O-ring "1" New
 - Oil pressure switch joint (with the oil pressure switch) "2"
 - Oil pressure switch joint bolt "3"



CHECKING THE COOLANT LEVEL

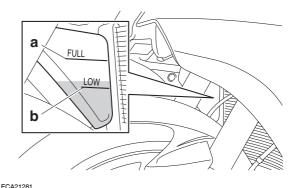
- 1. Stand the vehicle on a level surface.
- IP ____

EAS20811

- 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 \rightarrow Add the recommended coolant to the proper level.



NOTICE

- Adding water instead of coolant dilutes the antifreeze concentration 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 -

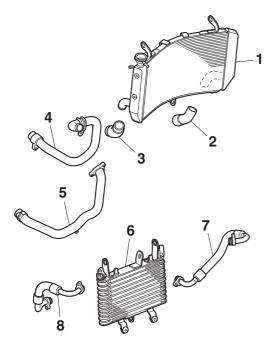
Before checking the coolant level, wait a few minutes until it settles.

CHECKING THE COOLING SYSTEM

- 1. Check:
- Radiator "1"
- Radiator inlet hose "2"
- Radiator outlet hose "3"
- Water pump inlet pipe "4"
- Water pump outlet pipe "5"
- Oil cooler "6"
- Oil cooler outlet hose "7"
- Oil cooler inlet hose "8"

Cracks/damage \rightarrow Replace.

Refer to "RADIATOR" on page 6-1, "OIL COOLER" on page 6-4, "THERMOSTAT" on page 6-6 and "WATER PUMP" on page 6-9.



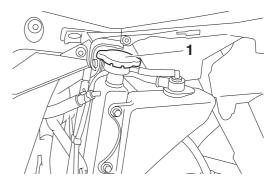
EAS30813

CHANGING THE COOLANT

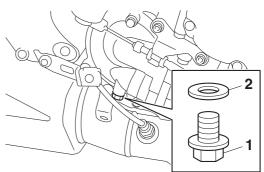
- 1. Remove:
 - Front side cowling (right)
 - Front muffler protector (right) Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Radiator cap "1"

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:

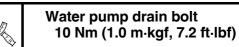
Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, press down on the radiator cap and turn it counterclockwise to remove.



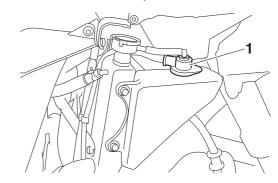
- 2. Remove:
- Water pump drain bolt "1"
- Copper washer "2"



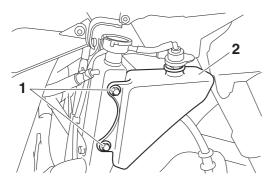
- 3. Drain:
 - Coolant
 - (from the engine and radiator)
- 4. Install:
- Water pump drain bolt
- Copper washer New



- 5. Remove:
 - Coolant reservoir cap "1"



- 6. Remove:
 - Coolant reservoir bolt "1"
 - Coolant reservoir "2"



- 7. Drain:
- Coolant

(from the coolant reservoir) 8. Install:

- Coolant reservoir
- Coolant reservoir bolt



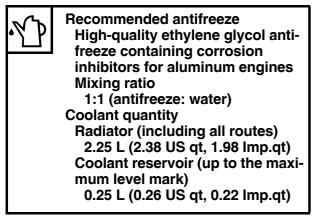
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

Coolant reservoir bolt

9. Fill:

Cooling system

(with the specified amount of the recommended coolant)



Handling notes for coolant

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

- 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.

ECA21291

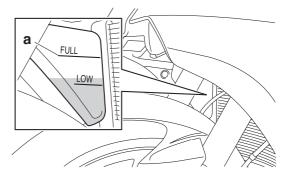
Adding water instead of coolant dilutes the

antifreeze concentration of the coolant. If water is used instead of coolant; check, and if necessary, correct the antifreeze concentration of the coolant.

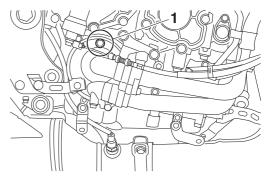
- Use only distilled water. However, if distilled water is not available, soft water may be used.
- If coolant comes into contact with painted surfaces, immediately wash them with water.
- Do not mix different types of antifreeze.

10.Fill:

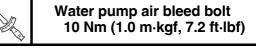
 Coolant reservoir (with the recommended coolant to the maximum level mark "a")



- 11.Install:
- Coolant reservoir cap
- 12.Loosen the water pump air bleed bolt "1" to allow any trapped air to escape from the water pump.



13. When coolant begins to flow out, tighten the water pump air bleed bolt to the specified torque.



- 14.Pour the specified coolant into the radiator until it is full.
- 15.Install:
 - Radiator cap
- 16.Start the engine, warm it up for several min-

utes, and then turn it off. 17.Check:

• Coolant level Refer to "CHECKING THE COOLANT LEV-EL" on page 3-32.

TIP __

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

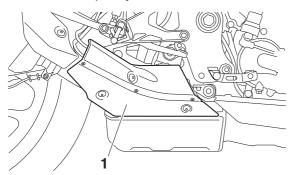
18.Install:

- Front muffler protector (right)
- Front side cowling (right) Refer to "GENERAL CHASSIS (2)" on page 4-7.

EAS31389

ADJUSTING THE EXUP CABLES

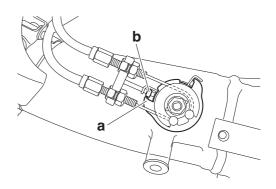
- 1. Remove:
- EXUP valve pulley cover "1"



- 2. Check:
- EXUP system operation
- ****
- a. Activate the diagnostic mode and select the diagnostic code number "53".
 Refer to "FUEL INJECTION SYSTEM" on page 8-45.
- b. Set the start/engine stop switch to " $_{\bigcirc}$ ".
- 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. Adjust:

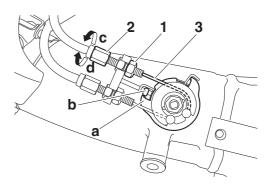
• EXUP cable free play

- a. Turn the main switch to "ON".
- b. Loosen the locknut "1".
- c. Turn the adjusting nut "2" in direction "c" or "d" until the projection "a" on the EXUP valve pulley slightly contacts the stopper "b" and make sure the EXUP cable (black metal) "3" is not slack.

Direction "c" Free play is increased. Direction "d" Free play is decreased.

d. Tighten the locknut "1" to specification.

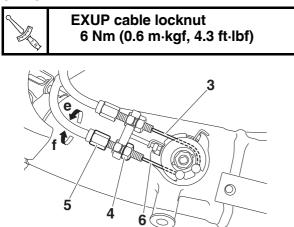
EXUP cable locknut 6 Nm (0.6 m·kgf, 4.3 ft·lbf)



- e. Loosen the locknut "4".
- f. Turn the adjusting nut "5" in direction "e" or "f" until the tension of the EXUP cable (white metal) "6" is the same as that of the EXUP cable (black metal) "3".

Direction "e" Free play is increased. Direction "f" Free play is decreased.

g. Tighten the locknut "4" to specification.



- 4. Install:
- EXUP valve pulley cover



EXUP valve pulley cover bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

CHECKING THE FRONT BRAKE LIGHT SWITCH

Refer to "ELECTRICAL COMPONENTS" on page 8-173.

EAS31146

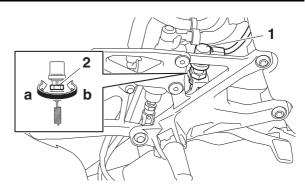
ADJUSTING THE REAR BRAKE LIGHT SWITCH

TIP -

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

- 1. Check:
 - Rear brake light operation timing Incorrect → Adjust.
- 2. Adjust:
- Rear brake light operation timing
- a. Hold the main body "1" of the rear brake light
- a. Hold the main body "1" of the rear brake light switch so that it does not rotate and turn the adjusting nut "2" in direction "a" or "b" until the rear brake light comes on at the proper time.

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



CHECKING AND LUBRICATING THE CABLES

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

WARNING

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

- 1. Check:
 - Outer cable
 - Damage \rightarrow Replace.
- 2. Check:

Cable operation

Rough movement \rightarrow Lubricate.

Recommended lubricant Engine oil or a suitable cable lubricant

TIP

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

CHECKING THE THROTTLE GRIP

- 1. Check:
- Throttle cables Damage/deterioration \rightarrow Replace.
- Throttle cable installation Incorrect → Reinstall the throttle cables. Refer to "HANDLEBARS" on page 4-74.
- 2. Check:
 - Throttle grip movement Rough movement → Lubricate or replace the defective part(s).

Recommended lubricant Suitable cable lubricant

TIP -

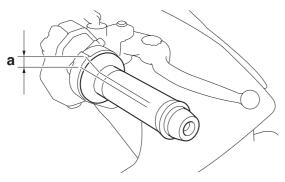
With the engine stopped, turn the throttle grip slowly and release it. Make sure that the throttle grip turns smoothly and returns properly when released.

Repeat this check with the handlebar turned all the way to the left and right.

- 3. Check:
 - Throttle grip free play "a" Out of specification → Adjust.



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



4. Adjust:

• Throttle grip free play

TIP -

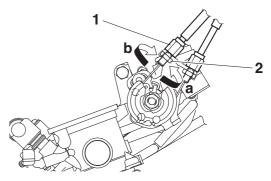
Prior to adjusting the throttle grip free play, throttle body synchronization should be adjusted properly.

Throttle body side

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

Direction "a"

Throttle grip free play is increased. Direction "b" Throttle grip free play is decreased.



c. Tighten the locknut.

Throttle cable locknut (throttle body side) 4.5 Nm (0.45 m·kgf, 3.3 ft·lbf)

TIP

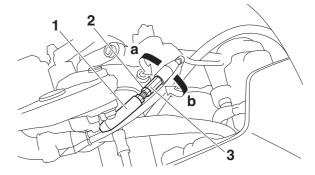
If the specified throttle grip free play cannot be obtained on the throttle body side of the cable, use the adjusting nut on the handlebar side.



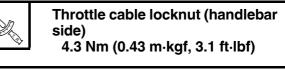
Handlebar side

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

Direction "a" Throttle grip free play is increased. Direction "b" Throttle grip free play is decreased.



d. Tighten the locknut.



e. Slide the rubber cover to its original position.

Make sure that the adjusting nut is covered com-

pletely by the rubber cover.

EAS30816

CHECKING AND CHARGING THE BATTERY

Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181.

EAS30662

CHECKING THE FUSES

Refer to "CHECKING THE FUSES" on page 8-180.

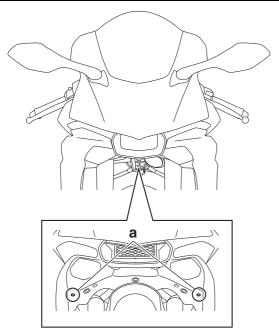
EAS30664

ADJUSTING THE HEADLIGHT BEAMS

- 1. Adjust:
- Headlight beam (vertically)
- ****

TIP -

To adjust the headlight beam (vertically), insert a crosshead screwdriver into the holes "a" in the headlight cover and turn the adjusting screw.



a. Turn the adjusting screws "1" in direction "b" or "c".

Direction "b" Headlight beam is raised. Direction "c" Headlight beam is lowered.

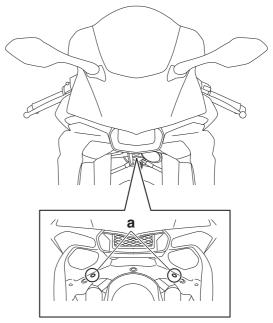


2. Adjust:

• Headlight beam (horizontally)

TIP_____

To adjust the headlight beam (horizontally), insert a crosshead screwdriver into the holes "a" in the headlight cover and turn the adjusting screw.



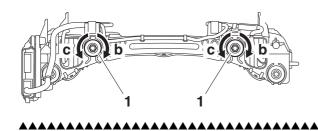
a. Turn the adjusting screws "1" in direction "b" or "c".

Left headlight

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

Right headlight

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



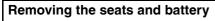
CHASSIS

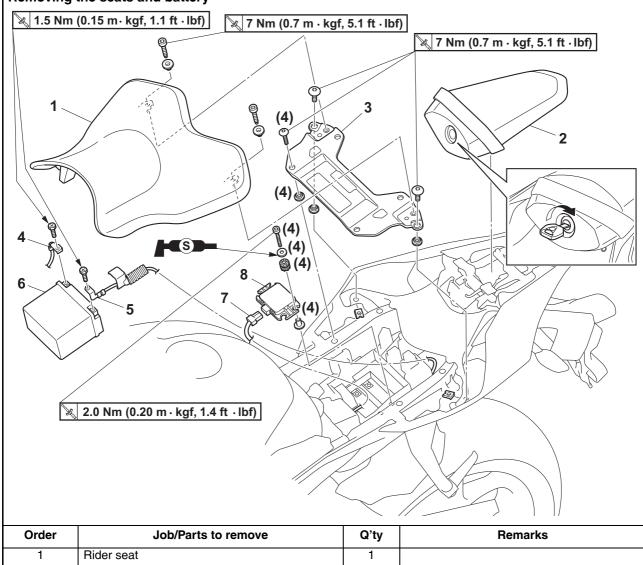
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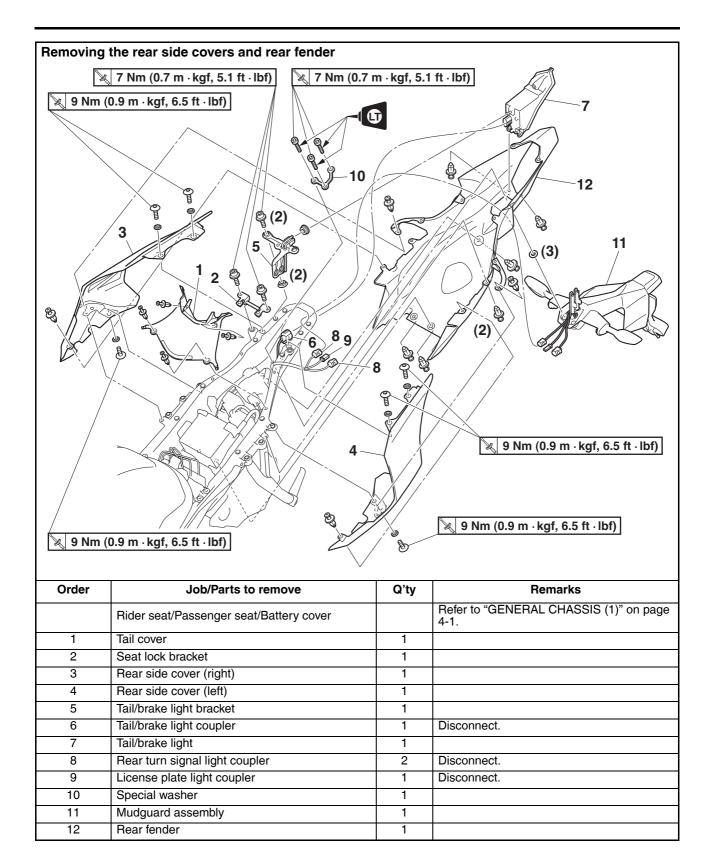
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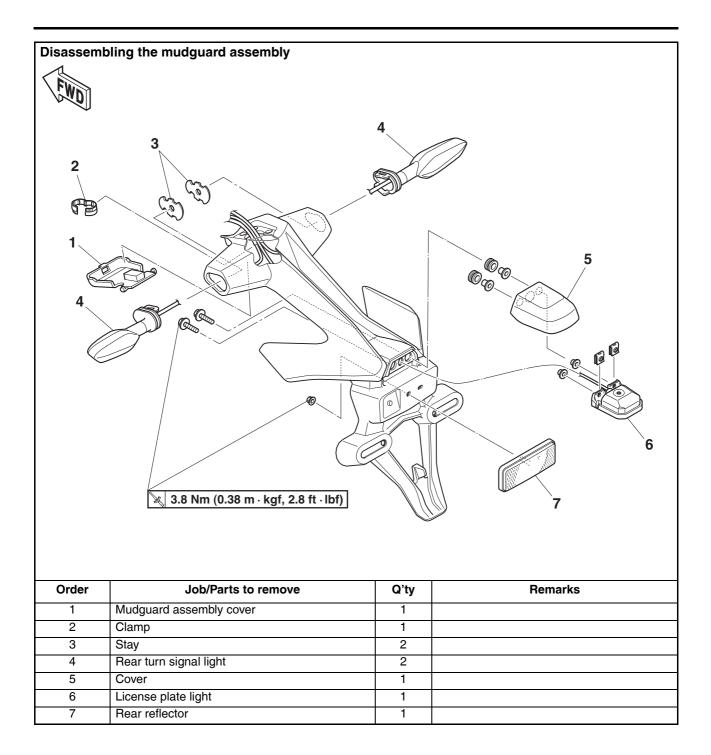
GENERAL CHASSIS (1)

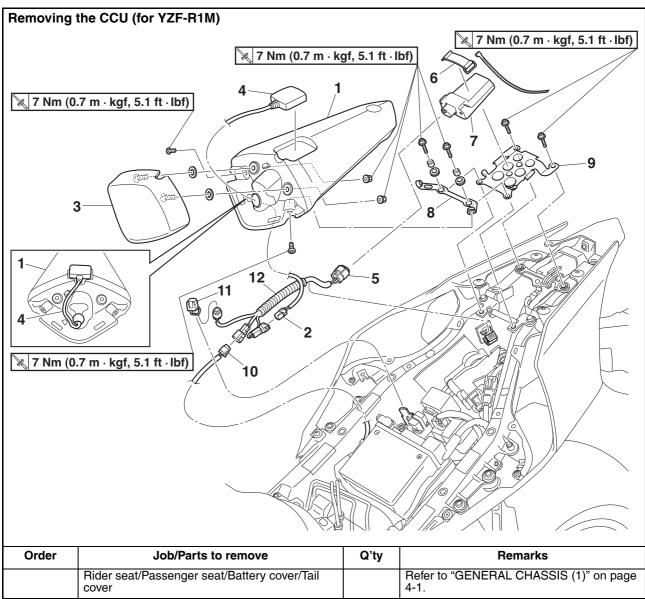




Order	Job/Parts to remove	Q'ty	Remarks
1	Rider seat	1	
2	Passenger seat	1	
3	Battery cover	1	
4	Negative battery lead	1	Disconnect.
5	Positive battery lead	1	Disconnect.
6	Battery	1	
7	IMU coupler	1	
8	IMU (Inertial Measurement Unit)	1	







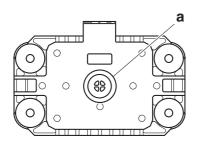
order		Gity	i iciliai ko
	Rider seat/Passenger seat/Battery cover/Tail cover		Refer to "GENERAL CHASSIS (1)" on page 4-1.
1	Passenger seat cover	1	
2	GPS unit coupler	1	Disconnect.
3	Cushion	1	
4	GPS unit	1	
5	CCU coupler (sub-wire harness)	1	Disconnect.
6	Band	1	
7	CCU (Communication Control Unit)	1	
8	CCU bracket 1	1	
9	CCU bracket 2	1	
10	Yamaha diagnostic tool coupler (wire harness)	1	Disconnect.
11	Protective cap	1	
12	Sub-wire harness	1	

GENERAL CHASSIS (1)

EAS31636 INSTALLING THE IMU ECA22611

NOTICE

- Do not perform angle adjustment of the IMU and battery box by pinching the washer and related parts.
- When installing the IMU, apply a thin coat of silicone grease onto the washer where contacting the IMU grommet.
- When installing the IMU, use only a genuine bolt and washer, and tighten the bolt to the specified torque.
- Pay attention not to expose the IMU to strong shocks, such as striking or dropping it.
- Do not place any foreign objects in and around the battery box.
- Do not obstruct breather opening "a" of the IMU.
- Do not clean the breather opening and do not blow it with compressed air.
- When replacing the collar or grommet, replace all four collars and grommets.



- 1. Install:
- IMU (Inertial Measurement Unit) "1"

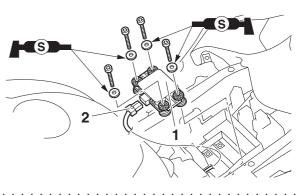
- a. Connect the IMU coupler "2" to the IMU.
- b. Install the IMU "1", washers and IMU bolts, and then tighten the bolts to specification.

TIP -

Apply a thin coat of silicone grease onto the washers where contacting the grommets.

Recommended lubricant Silicone grease

IMU bolt 2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)



EAS31676

CONNECTING TO THE CCU (for YZF-R1M)

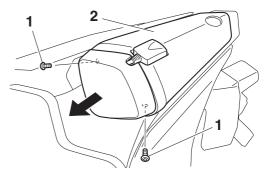
The CCU (Communication Control Unit) connects to the vehicle's CAN (Controller Area Network) and has a GPS receiver to enable the recording of vehicle and riding data. (Refer to "MENU SCREEN" on page 1-36.) Logging data and YRC setting data can be accessed when a smartphone, tablet, or laptop computer is connected to the CCU wireless network.

TIP -

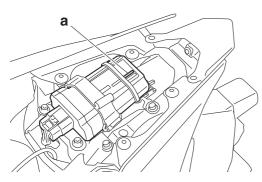
From the Google© application store, download the "Y-TRAC" application to make use of the logging data and the "YRC Setting" application to remotely adjust the YRC settings.

- 1. Connect:
- CCU wireless network

a. Remove the bolts "1" and then remove the passenger seat cover assembly "2" as shown.



b. Note down the CCU serial number "a".



- c. Turn the main switch to "ON" and approach the vehicle with a wireless capable smartphone, tablet, or laptop computer.
- d. Connect to the wireless network "Yamaha Motor Network" by inputting the CCU serial number as the password.

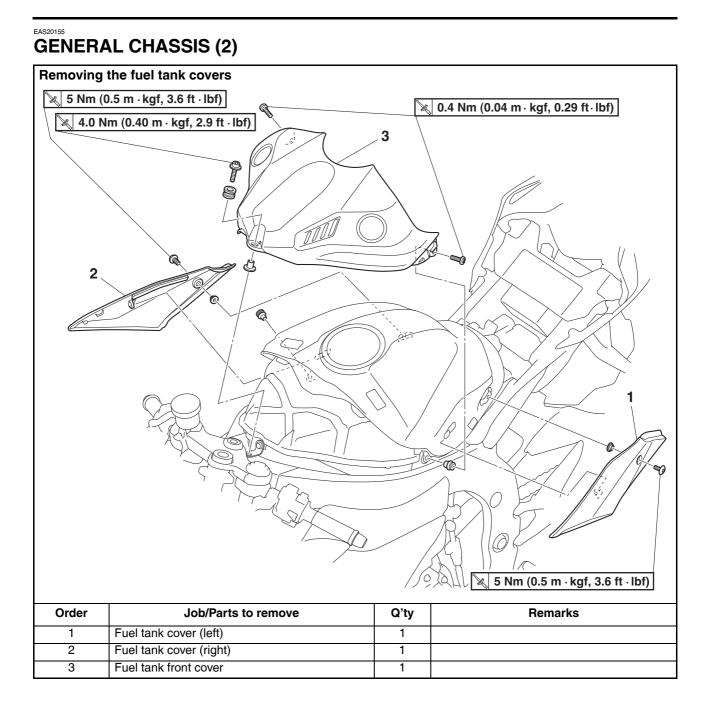
TIP -

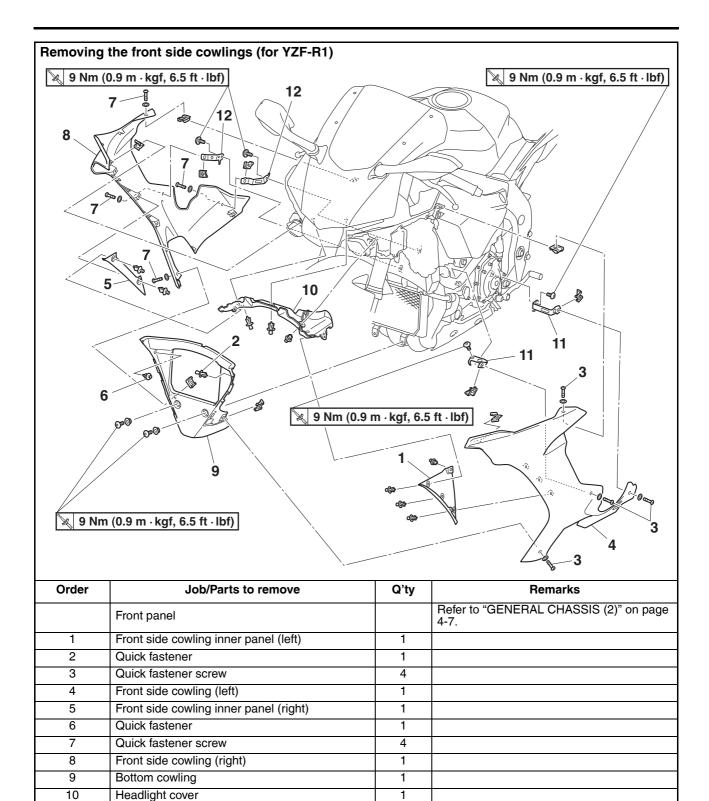
Since all CCU-equipped models put out a similarly named wireless network, have only one vehicle turned on at a time to avoid confusion.

e. Install the passenger seat cover assembly to the original position, and then install the bolts.

Mar North Contraction of the second s	

Passenger seat cover bolt (for YZF-R1M) 7 Nm (0.7 m·kgf, 5.1 ft·lbf)





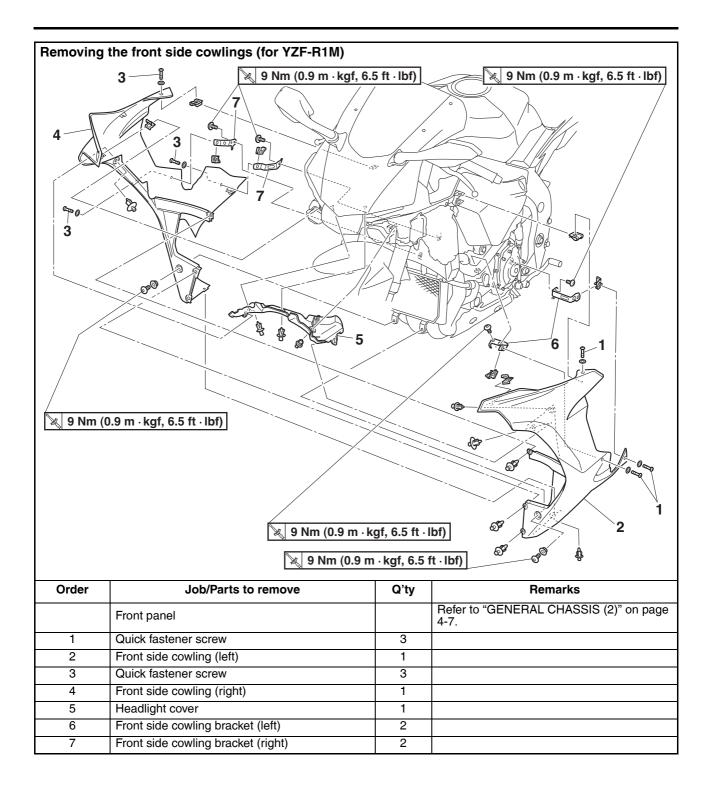
2

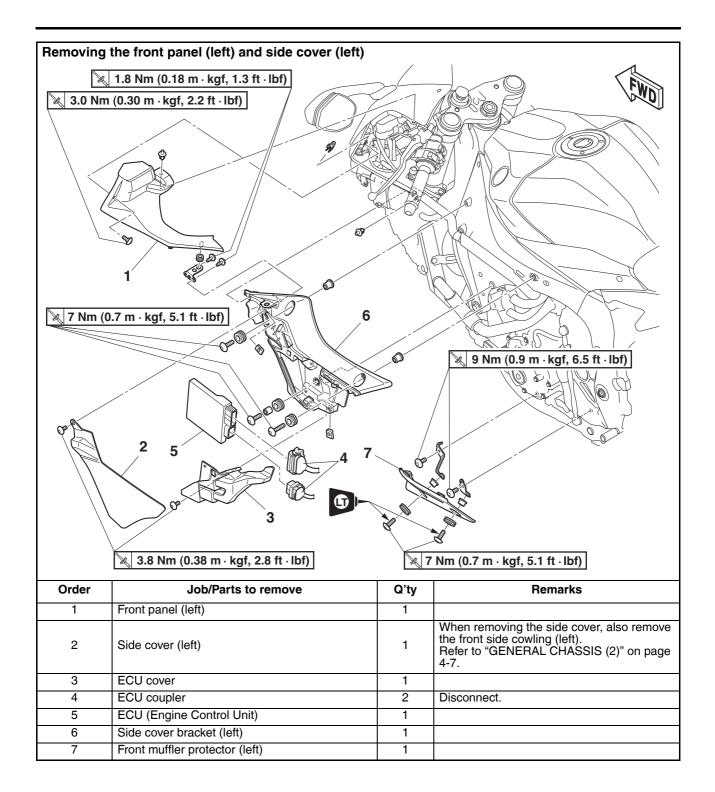
2

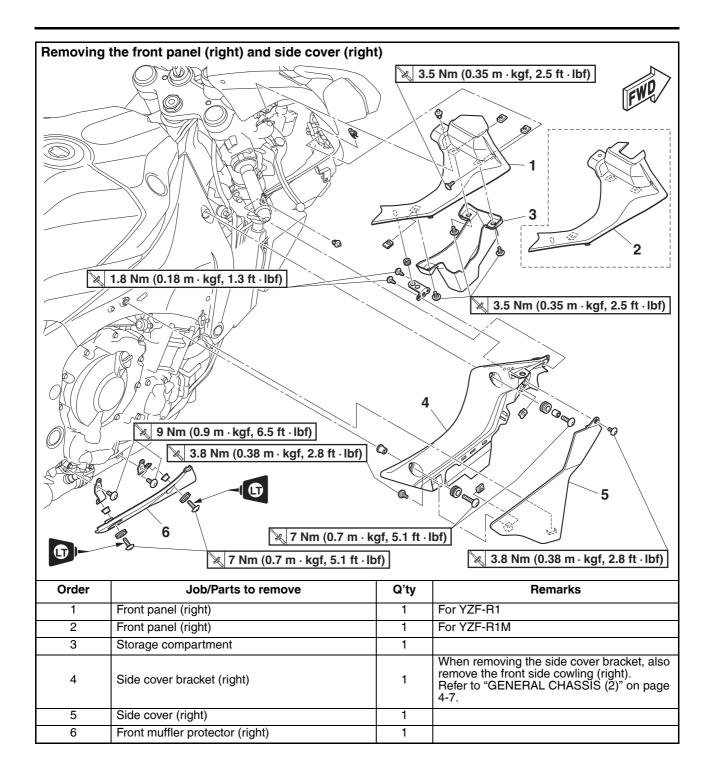
Front side cowling bracket (left)

Front side cowling bracket (right)

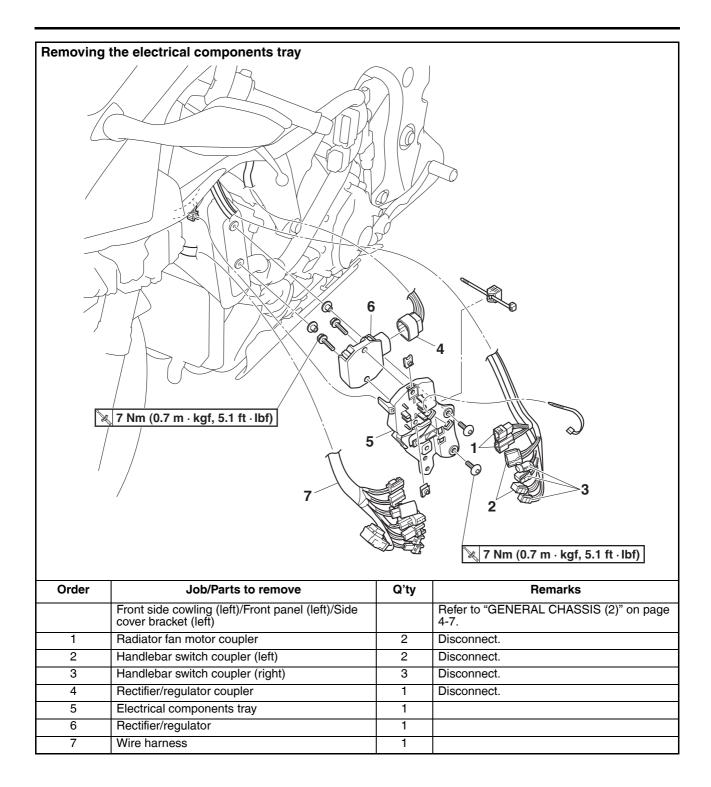
11 12







GENERAL CHASSIS (2)

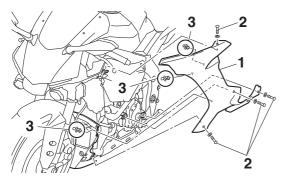


REMOVING THE FRONT SIDE COWLINGS (for YZF-R1)

1. Remove:

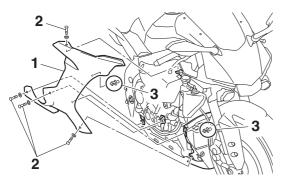
EAS31391

- Front side cowling (left) "1"
- *****
- a. Remove the quick fastener screws "2" and the quick fasteners "3".
- b. Remove the left front side cowling by pulling it forward.



- 2. Remove:
- Front side cowling (right) "1"

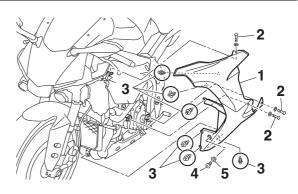
- a. Remove the quick fastener screws "2" and the quick fasteners "3".
- b. Remove the right front side cowling by pulling it forward.



EAS31637

REMOVING THE FRONT SIDE COWLINGS (for YZF-R1M)

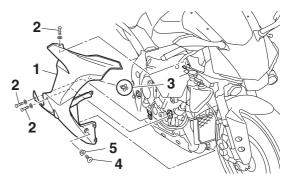
- 1. Remove:
- Front side cowling (left) "1"
- a Domovo the guidy featoper earouse "0" gui
- a. Remove the quick fastener screws "2", quick fasteners "3", bolt "4" and the collar "5".
- b. Remove the left front side cowling by pulling it forward.



2. Remove:

• Front side cowling (right) "1"

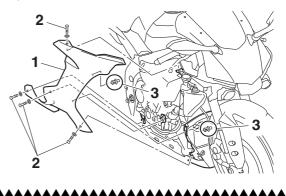
- a. Remove the quick fastener screws "2", quick fastener "3", bolt "4" and the collar "5".
- b. Remove the right front side cowling by pulling it forward.



EAS31382

INSTALLING THE FRONT SIDE COWLINGS (for YZF-R1)

- 1. Install:
- Front side cowling (right) "1"
- *****
- a. Install the right front side cowling.
- b. Install the quick fastener screws "2" and the quick fasteners "3".

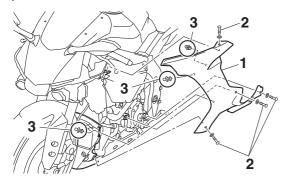


4-13

2. Install:

• Front side cowling (left) "1"

- a. Install the left front side cowling.
- b. Install the quick fastener screws "2" and the quick fasteners "3".



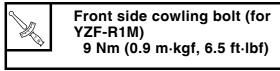
EAS31638

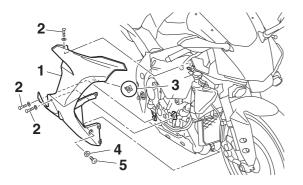
INSTALLING THE FRONT SIDE COWLINGS (for YZF-R1M)

1. Install:

• Front side cowling (right) "1"

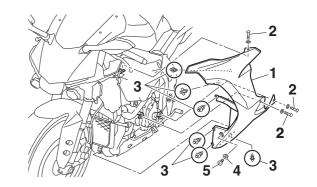
- a. Install the right front side cowling.
- b. Install the quick fastener screws "2", quick fastener "3", collar "4" and the bolt "5".





- 2. Install:
- Front side cowling (left) "1"
- ****
- a. Install the left front side cowling.
- b. Install the quick fastener screws "2", quick fasteners "3", collar "4" and the bolt "5".

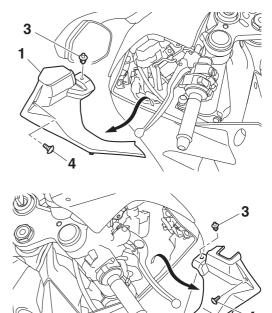
Front side cowling bolt (for YZF-R1M) 9 Nm (0.9 m·kgf, 6.5 ft·lbf)



EAS31639

- REMOVING THE FRONT PANELS
- 1. Remove:
 - Front panel (left) "1"
 - Front panel (right) "2"

a. Remove the quick fastener "3" and bolt "4", and then pull the panel off.



.....

INSTALLING THE FRONT PANELS

EAS31640

- 1. Install:
 - Front panel (left) "1"
- Front panel (right) "2"

GENERAL CHASSIS (2)

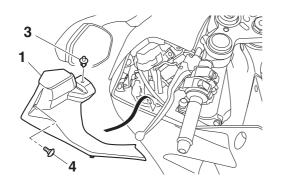
- a. Install the front panel.
- TIP -

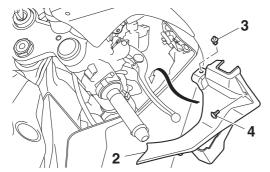
Insert projection on the front panel into grommet.

b. Install the quick fastener "3" and bolt "4", and then tighten the bolt to specification.



Front panel bolt (left) 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) Front panel bolt (right) 3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)



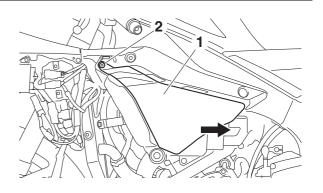


EAS31519

REMOVING THE SIDE COVER (left)

- 1. Remove:
- Front side cowling (left)
- 2. Remove:
 - Side cover (left) "1"

- a. Remove the side cover bolt "2".
- b. Remove the side cover "1" by sliding it rearward.

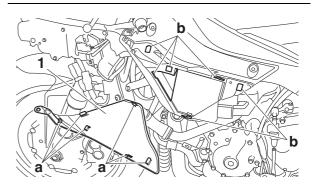


EAS31520 INSTALLING THE SIDE COVER (left)

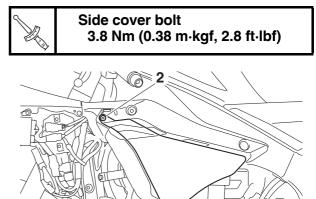
- 1. Install:
- Side cover (left) "1"

- a. Install the side cover "1".
- TIP _____

Insert projections "a" on the side cover into slots "b".



b. Install the side cover bolt "2", and then tighten the bolt to specification.



2. Install:

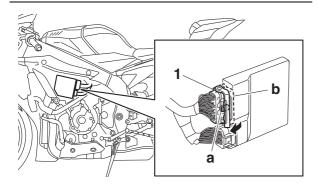
• Front side cowling (left)

REMOVING THE ECU (Engine Control Unit)

- 1. Disconnect:
- ECU coupler "1"

TIP —

While pushing the portion "a" of the ECU coupler, move the lock lever "b" in the direction of the arrow shown to disconnect the coupler.



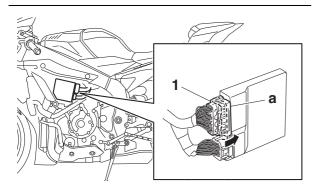
EAS31642

INSTALLING THE ECU (Engine Control Unit) 1. Connect:

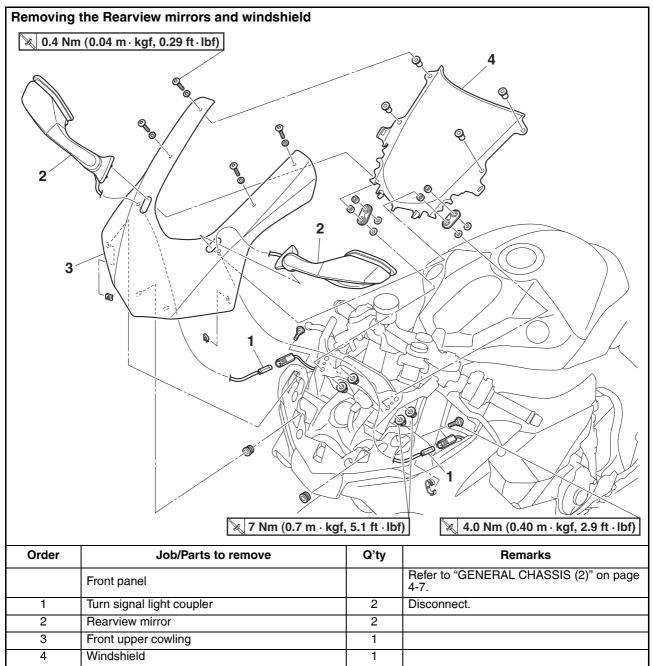
ECU coupler "1"

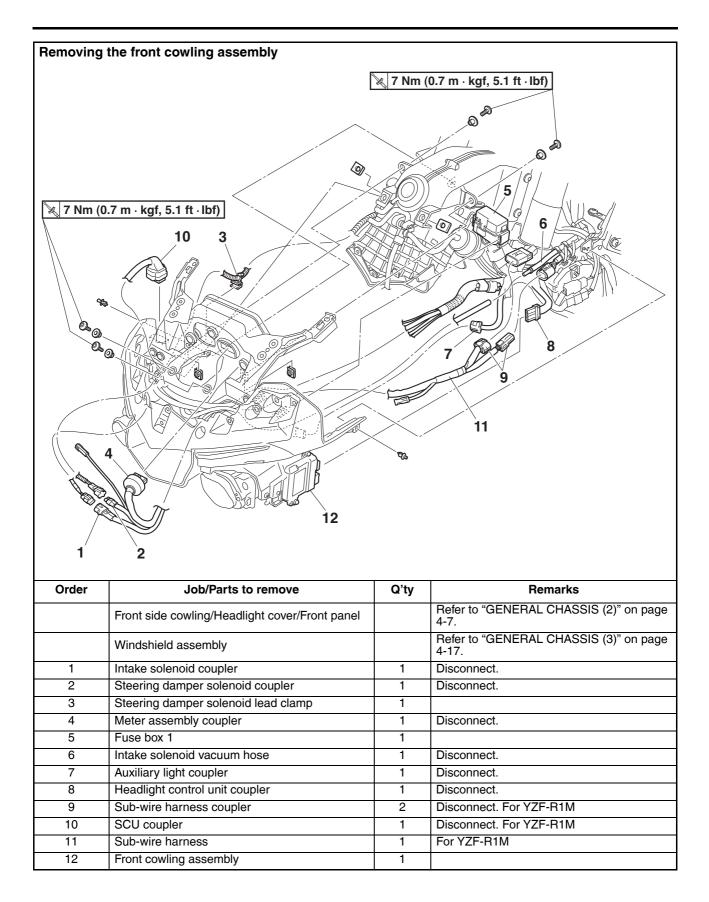
TIP_

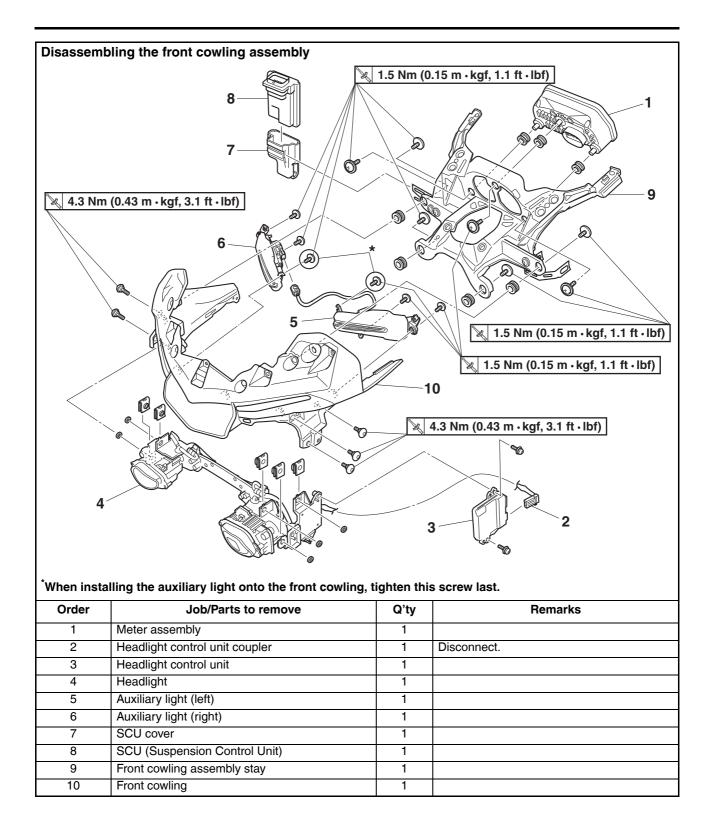
Connect the ECU coupler, and then push the lock lever "a" of the coupler in the direction of the arrow shown.

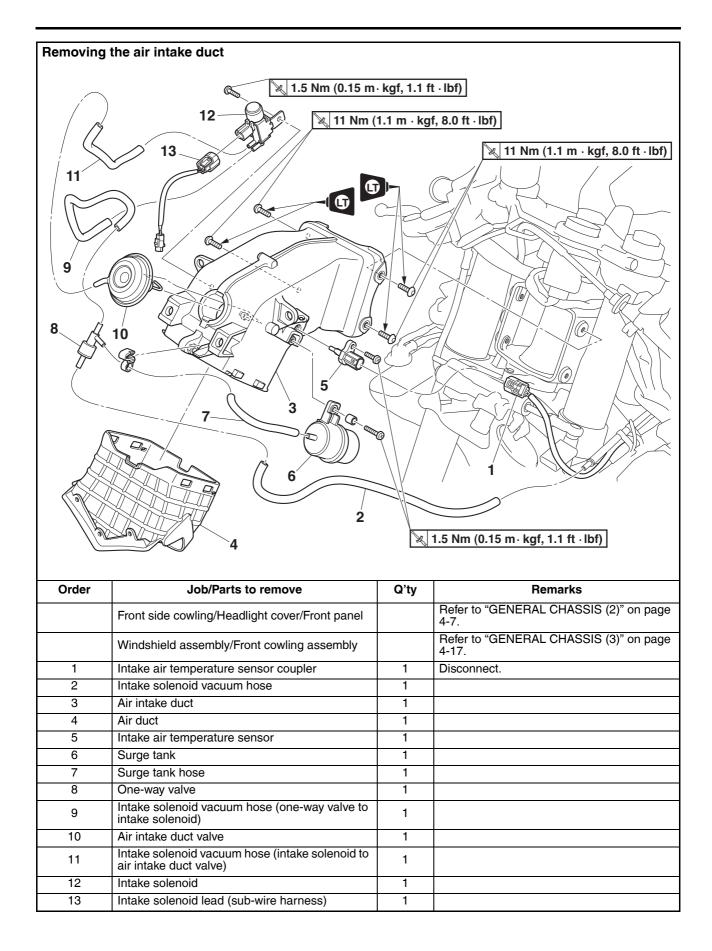


GENERAL CHASSIS (3)









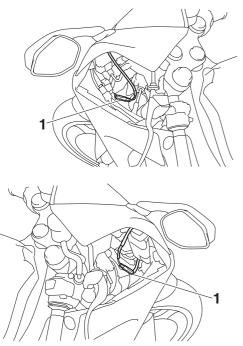
REMOVING THE WINDSHIELD ASSEMBLY

1. Remove:

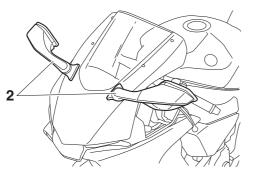
EAS31643

- Front side panel (left)
- Front side panel (right) Refer to "GENERAL CHASSIS (2)" on page 4-7.
- 2. Remove:
- Windshield assembly

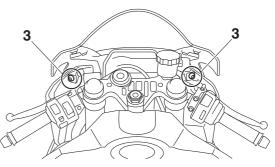
a. Disconnect the turn signal light couplers "1".



b. Remove the rearview mirror nuts, and then remove the rearview mirrors "2".



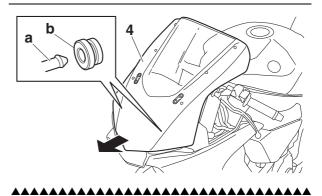
c. Remove the windshield assembly bolts "3".



d. Remove the windshield assembly "4".

TIP

Remove projections "a" on the windshield assembly from grommets "b".



EAS31644

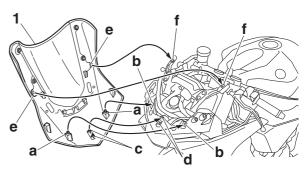
INSTALLING THE WINDSHIELD ASSEMBLY 1. Install:

• Windshield assembly

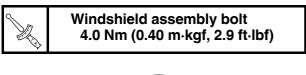
a. Install the windshield assembly "1".

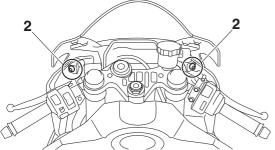
TIP —

- Insert projections "a" on the windshield assembly into grommets "b".
- Insert projections "c" on the windshield assembly into holes "d".
- Insert slots "e" in the windshield assembly into projections "f" on the stay.

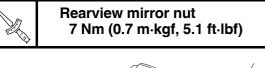


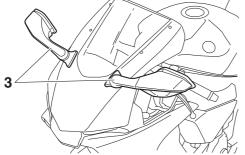
b. Install the windshield assembly bolts "2", and then tighten the bolts to specification.



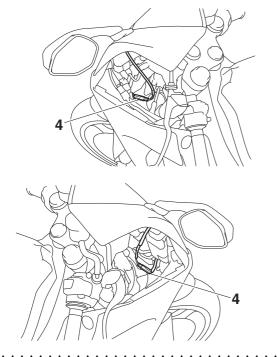


c. Install the rearview mirrors "3" and rearview mirror nuts, and then tighten the nuts to specification.





d. Connect the turn signal light couplers "4".



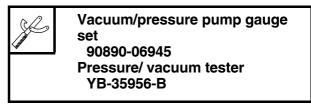
2. Install:

• Front side panel (right) Refer to "GENERAL CHASSIS (2)" on page 4-7.

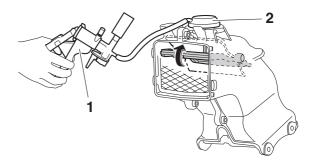
CHECKING THE AIR INTAKE DUCT VALVE

- 1. Check:
 - Air intake duct valve operation

a. Connect the vacuum/pressure pump gauge set "1" to the air intake duct valve "2".



b. Check that the air intake duct valve operates when vacuum pressure is applied to the valve using the vacuum/pressure pump gauge set. Faulty → Replace the air intake duct valve.



EAS31646

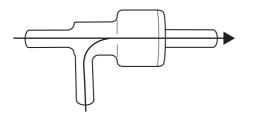
CHECKING THE VACUUM LINE

- 1. Check:
 - Hoses
 Loose connections → Connect properly.
 Cracks/damage → Replace.
- 2. Check:
 - Surge tank Cracks/damage → Replace.
- 3. Check:
 - One-way valve
 - Cracks/damage/faulty \rightarrow Replace.

TIP —

Check that air flows smoothly only in the direction of the arrow shown in the illustration.

GENERAL CHASSIS (3)

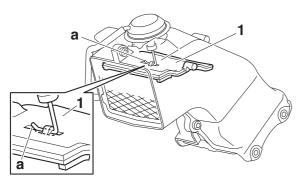


- 4. Check:
- Intake solenoid Damage \rightarrow Replace.
- 5. Check:
- Intake solenoid resistance Refer to "CHECKING THE INTAKE SOLE-NOID" on page 8-195.
- 6. Check:
 - Surge tank Cracks/damage \rightarrow Replace.

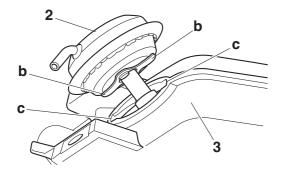
INSTALLING THE AIR INTAKE DUCT VALVE 1. Install:

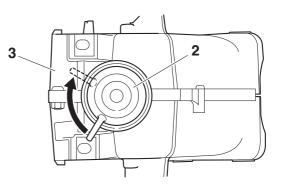
Air intake duct valve

a. Hook the end of the shaft "a" onto the plate "1" as shown.

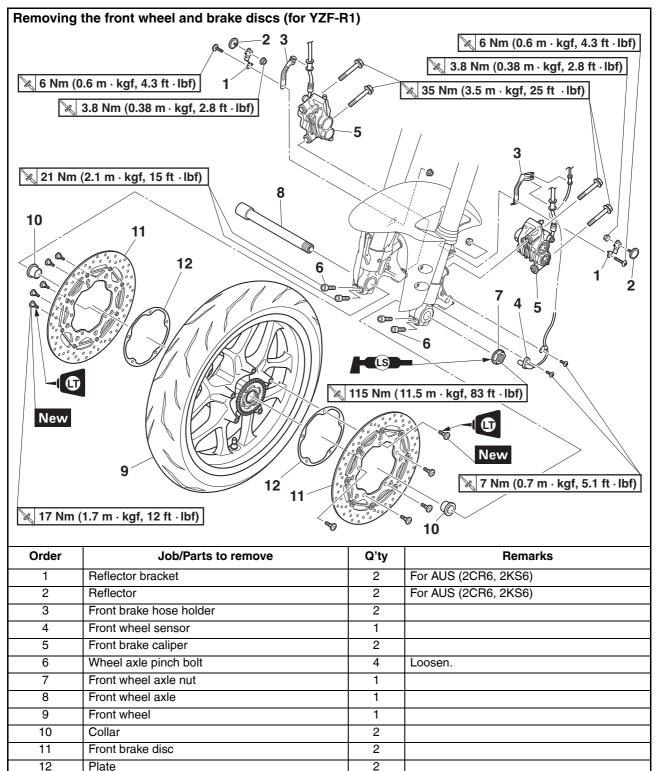


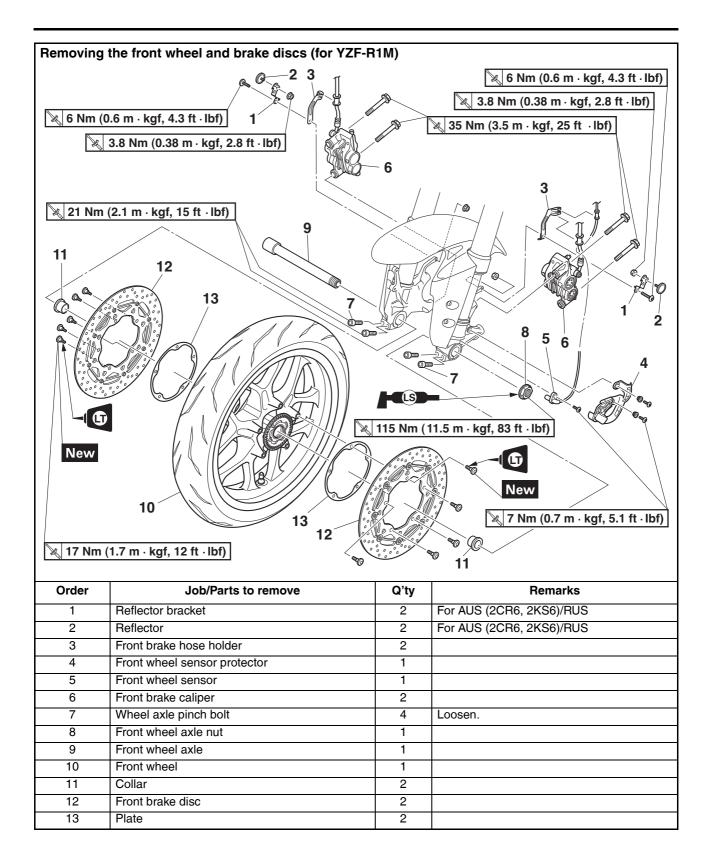
b. Align the tabs "b" on the air intake duct valve "2" with the cutouts "c" in the air intake duct "3", and then turn the air intake duct valve 90° clockwise.



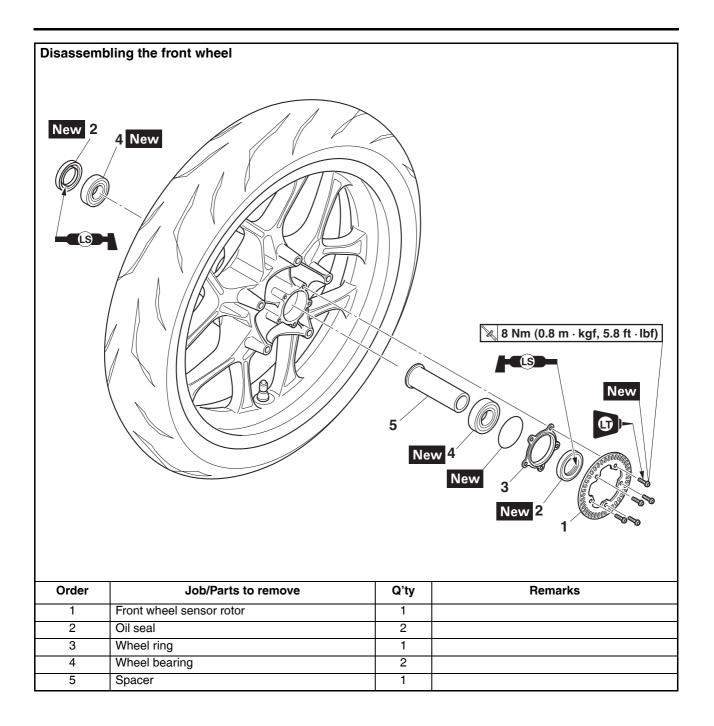


FRONT WHEEL





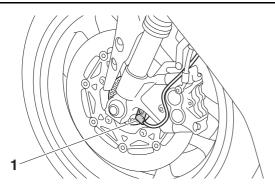
FRONT WHEEL



EAS30145 REMOVING THE FRONT WHEEL

NOTICE

Keep magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the front wheel sensor "1", otherwise the wheel sensor may be damaged, resulting in improper performance of the ABS.



1. Stand the vehicle on a level surface.

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

- 2. Remove:
 - Front brake caliper (left)
 - Front brake caliper (right)
 - Front wheel sensor

ECA21440

- Do not apply the brake lever when removing the brake calipers.
- Be sure not to contact the sensor electrode to any metal part when removing the front wheel sensor from the sensor housing.

3. Elevate:

• Front wheel

TIP -

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

- 4. Loosen:
 - Wheel axle pinch bolt
- 5. Remove:
 - Front wheel axle
 - Front wheel

EAS30146

DISASSEMBLING THE FRONT WHEEL

NOTICE

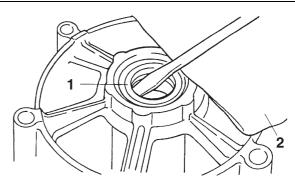
• Do not drop the wheel sensor rotor or subject it to shocks.

- If any solvent gets on the wheel sensor rotor, wipe it off immediately.
- 1. Remove:
- Oil seals
- Wheel bearings

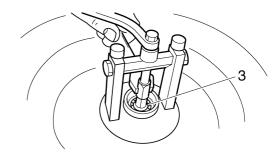
- a. Clean the surface of the front wheel hub.
- b. Remove the oil seals "1" with a flat-head screwdriver.

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 \rightarrow Replace.

WARNING

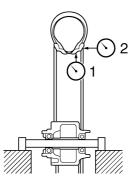
Do not attempt to straighten a bent wheel axle.



- 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"

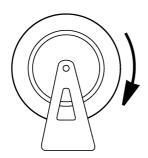
Over the specified limits \rightarrow Replace.

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 \rightarrow Replace.



ASSEMBLING THE FRONT WHEEL

NOTICE

- Do not drop the wheel sensor rotor or subject it to shocks.
- If any solvent gets on the wheel sensor rotor, wipe it off immediately.
- 1. Install:
 - Wheel bearings New
- Oil seals New
- ****

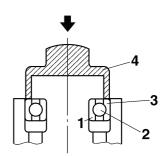
a. Install the new wheel bearing (right side).

NOTICE

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

TIP _

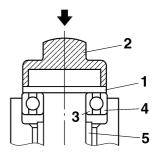
Use a socket "4" that matches the diameter of the wheel bearing outer race.



- b. Install the spacer.
- c. Install the new wheel bearing (left side).

TIP -

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



d. Install the new oil seals.

- 2. Install:
- Front wheel sensor rotor



Wheel sensor rotor bolt 8 Nm (0.8 m·kgf, 5.8 ft·lbf) LOCTITE®

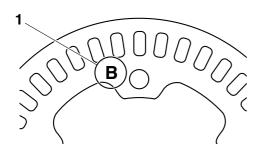
ECA17200

NOTICE

Replace the wheel sensor rotor bolts with new ones.

TIP -

Install the wheel sensor rotor with the stamped mark "1" facing outward.



- 3. Measure:
 - Wheel sensor rotor runout Out of specification → Correct the wheel sensor rotor runout or replace the wheel sensor

rotor. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.



Wheel sensor rotor runout limit 0.25 mm (0.01 in)

EAS30155

MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR ECA21070

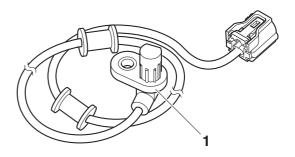
NOTICE

- Handle the ABS components with care since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.
- The front wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.
- Keep any type of magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the front wheel sensor or front wheel sensor rotor.

• Do not drop or shock the wheel sensor or the wheel sensor rotor.

1. Check:

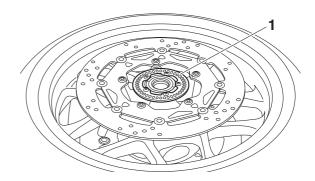
 Front wheel sensor "1" Cracks/bends/distortion → Replace. Iron powder/dust → Clean.



- 2. Check:
- Front wheel sensor rotor "1" Cracks/damage/scratches → Replace the front wheel sensor rotor. Iron powder/dust/solvent → Clean.

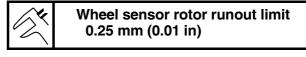
TIP -

- The wheel sensor rotor is installed on the inner side of the wheel hub.
- When cleaning the wheel sensor rotor, be careful not to damage the surface of the sensor rotor.



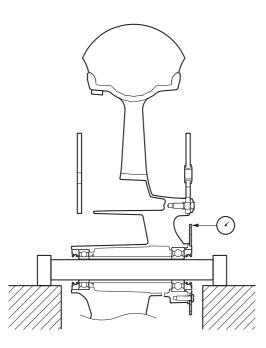
- 3. Measure:
 - Wheel sensor rotor runout

Out of specification \rightarrow Clean the installation surface of the wheel sensor rotor and correct the wheel sensor rotor runout, or replace the wheel sensor rotor.



•••••

- a. Hold the dial gauge at a right angle against the wheel sensor rotor surface.
- b. Measure the wheel sensor rotor runout.



c. If the runout is above specification, remove the sensor rotor from the wheel, rotate it by two or three bolt holes, and then install it.



Wheel sensor rotor bolt 8 Nm (0.8 m·kgf, 5.8 ft·lbf) LOCTITE®

ECA17200

Replace the wheel sensor rotor bolts with new ones.

d. If the runout is still above specification, replace the wheel sensor rotor.

EAS30152

ADJUSTING THE FRONT WHEEL STATIC BALANCE

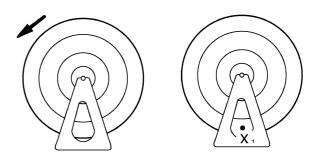
TIP ____

- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.
- Be sure to use stick-on type balancing weights.
- 1. Remove:
- Balancing weight(s)
- 2. Find:
 - Front wheel's heavy spot

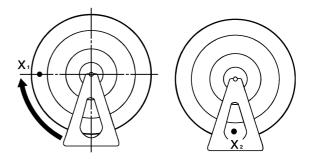
TIP -

Place the front wheel on a suitable balancing stand.

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



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



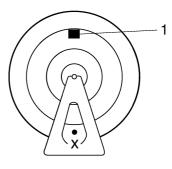
- f. Repeat steps (c) through (e) several times until all the marks come to rest at the same spot.
- g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

- 3. Adjust:
- Front wheel static balance

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

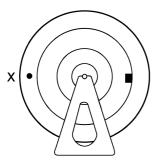
TIP _

Start with the lightest weight.



FRONT WHEEL

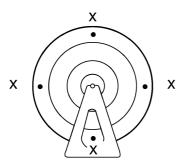
b. Turn the front wheel 90° so that the heavy spot is positioned as shown.



- 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.

EAS30154 INSTALLING THE FRONT WHEEL (DISC BRAKE)

- 1. Install:
- Plate
- Front brake discs



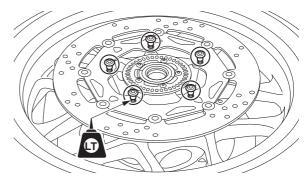
Front brake disc bolt 17 Nm (1.7 m·kgf, 12 ft·lbf) LOCTITE®

ECA19150

Replace the brake disc bolts with new ones.

TIP

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

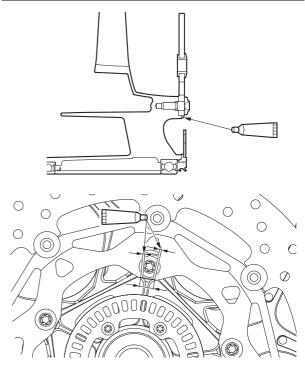




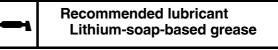
Sealant

TIP-

Apply Three Bond No. 1215B® onto the corner of brake disc and wheel.



- 3. Check:
 - Front brake discs Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-48.
- 4. Lubricate:
 - Oil seal lips



- 5. Install:
 - Collar
 - Front wheel
 - Front wheel axle
 - Front wheel axle nut

TIP -

Apply lithium soap-based grease onto the mat-

ing surface of the front wheel axle nut.

- 6. Tighten:
 - Front wheel axle nut



FCA14140

Front wheel axle nut 115 Nm (11.5 m·kgf, 83 ft·lbf)

NOTICE

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

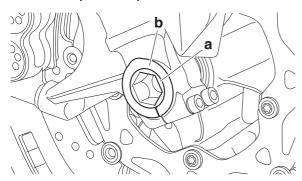
- 7. Tighten:
- Front wheel axle pinch bolt

a. Tighten the pinch bolt "2", pinch bolt "1", and pinch bolt "2" to the specified torque in this order.



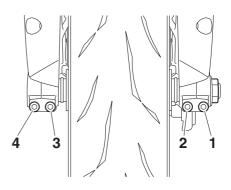
Front wheel axle pinch bolt 21 Nm (2.1 m·kgf, 15 ft·lbf)

b. Check that the right end "a" of the front axle is flush with the front fork "b". 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.



c. Tighten the pinch bolt "4", pinch bolt "3", and pinch bolt "4" to the specified torque in this order.

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



8. Install:

- Front wheel sensor
- Front wheel sensor protector (for YZF-R1M)

Front wheel sensor bolt 7 Nm (0.7 m·kgf, 5.1 ft·lbf) Front wheel sensor protector bolt (for YZF-R1M) 7 Nm (0.7 m·kgf, 5.1 ft·lbf)

ECA21020

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

TIP -

- When installing the front wheel sensor, check the front wheel sensor lead for twists.
- To route the front wheel sensor lead, refer to "CABLE ROUTING" on page 2-51.

9. Measure:

• Distance "a"

(between the wheel sensor rotor "1" and front wheel sensor "2")

Out of specification \rightarrow Check the wheel bearing for looseness, and the front wheel sensor and sensor rotor installation conditions (warpage caused by overtorque, wrong installation direction, rotor decentering, LOC-TITE® on the mounting surface of the rotor, deformation caused by an impact during service and caught foreign materials). If there is any defective part, repair or replace the defective part.

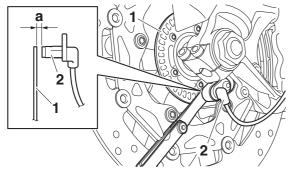


Distance "a" (between the front wheel sensor rotor and front wheel sensor) 0.9–1.7 mm (0.035–0.067 in) (for YZF-R1) 1.1–1.9 mm (0.043–0.075 in) (for YZF-R1M)

TIP _

Measure the distance between the front wheel sensor rotor and front wheel sensor in several places in one rotation of the front wheel. Do not turn the front wheel while the thickness gauge is installed. This may damage the front wheel sensor rotor and the front wheel sensor.





10.Install:

- Front brake calipers
- Front brake hose holder

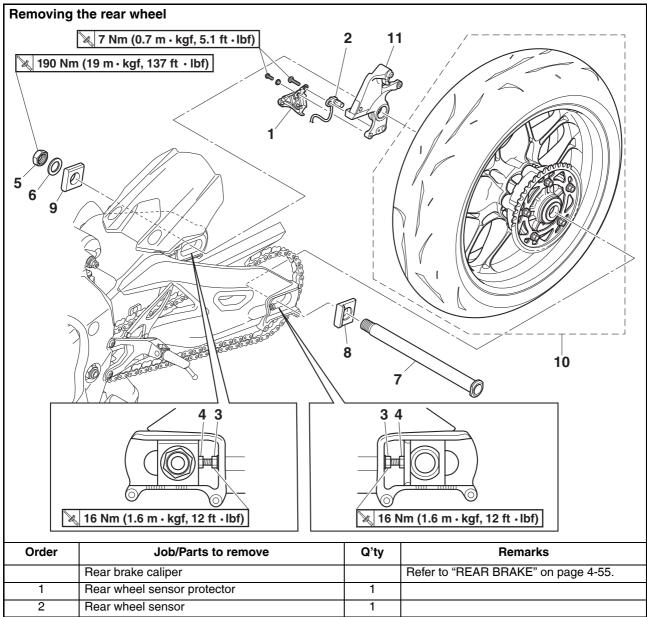


Front brake caliper bolt 35 Nm (3.5 m·kgf, 25 ft·lbf) Front brake hose holder bolt 6 Nm (0.6 m·kgf, 4.3 ft·lbf)

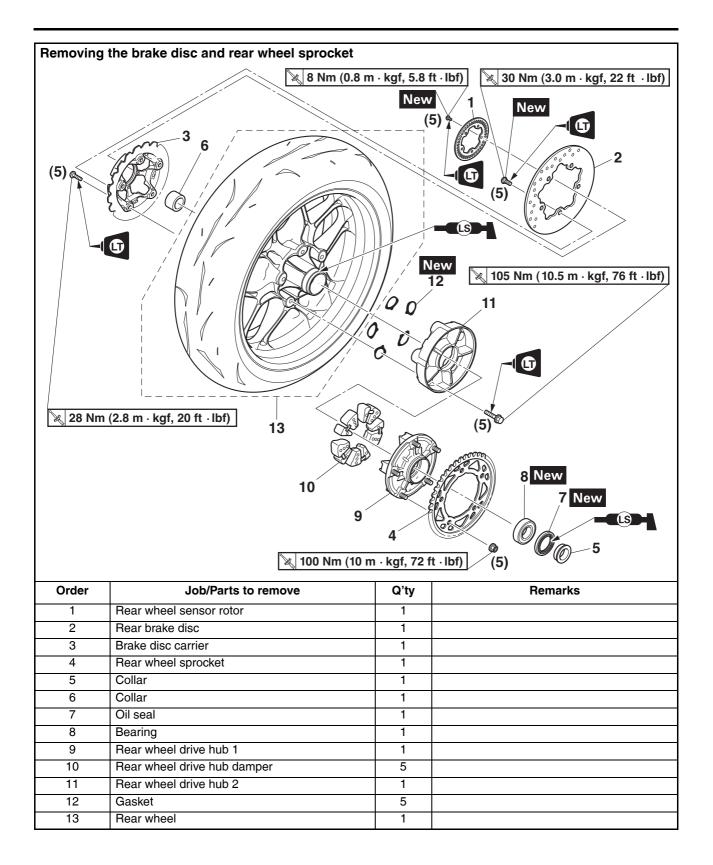
EWA13500 WARNING

Make sure the brake hose is routed properly.

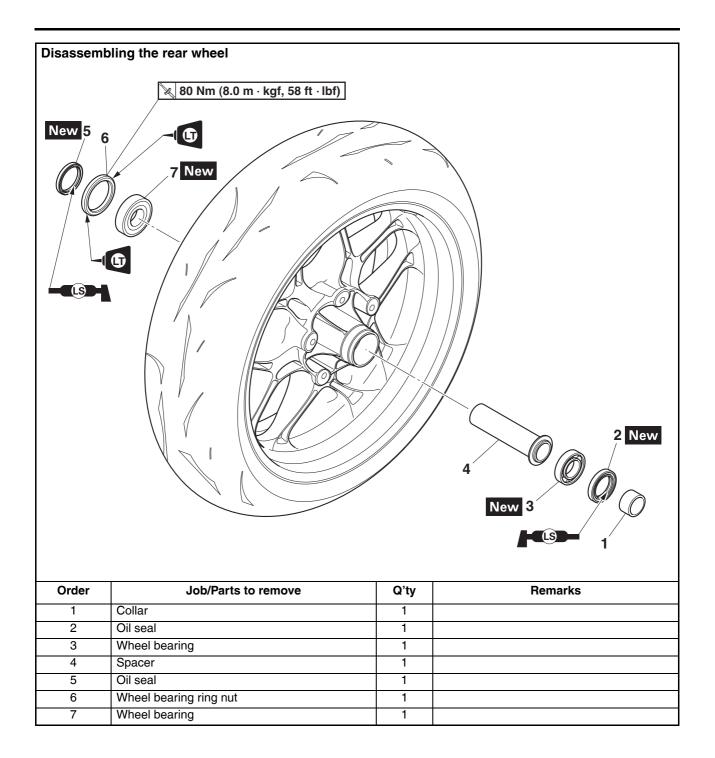
REAR WHEEL



			1 5
1	Rear wheel sensor protector	1	
2	Rear wheel sensor	1	
3	Locknut	2	Loosen.
4	Adjusting bolt	2	Loosen.
5	Rear wheel axle nut	1	
6	Washer	1	
7	Rear wheel axle	1	
8	Adjusting block (left)	1	
9	Adjusting block (right)	1	
10	Rear wheel	1	
11	Brake caliper bracket	1	



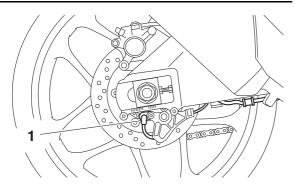
REAR WHEEL



REMOVING THE REAR WHEEL

NOTICE

Keep magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the rear wheel sensor "1", otherwise the wheel sensor may be damaged, resulting in improper performance of the ABS.

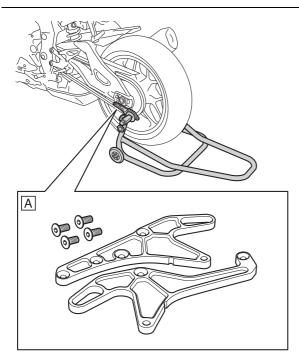


1. Stand the vehicle on a level surface.

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.

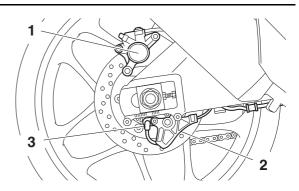


 Recommended tool Tool No.:2CR-271A0-00 Tool name:STAND HOOK M1 Type

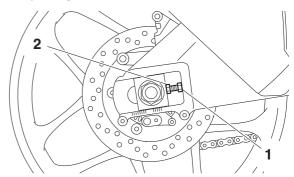
- 2. Remove:
 - Rear brake caliper "1"
 - Rear wheel sensor protector "2"
- Rear wheel sensor "3" ECA21040

NOTICE

- Do not depress the brake pedal when removing the brake caliper.
- Be sure not to contact the sensor electrode to any metal part when removing the rear wheel sensor from the rear brake caliper bracket.



- 3. Loosen:
 - Locknuts "1"
- Adjusting bolts "2"



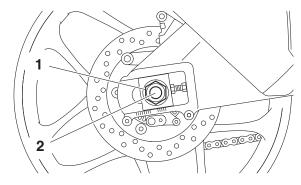
- 4. Remove:
- Rear wheel axle nut "1"
- Washer
- Rear wheel axle "2"
- Rear wheel
- Brake caliper bracket

NOTICE

Be sure to remove the rear wheel sensor before removing the brake caliper bracket, otherwise the sensor could be damaged.

TIP

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



EAS30158

DISASSEMBLING THE REAR WHEEL

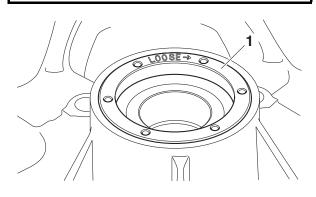
NOTICE

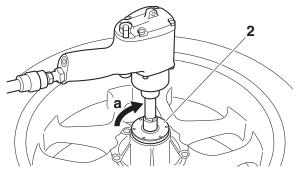
- Do not drop the wheel sensor rotor or subject it to shocks.
- If any solvent gets on the wheel sensor rotor, wipe it off immediately.
- 1. Remove:
- Wheel bearing ring nut "1"

TIP

Use the wheel bearing ring nut tool "2" to remove the wheel bearing ring nut by turning it clockwise "a".

> Wheel bearing ring nut tool 90890-01574 YM-01574





- 2. Remove:
- Oil seal

• Wheel bearings Refer to "DISASSEMBLING THE FRONT WHEEL" on page 4-27.

EAS30159

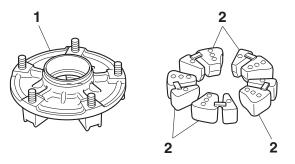
CHECKING THE REAR WHEEL

- 1. Check:
- Wheel axle
- Wheel bearings
- Oil seals Refer to "CHECKING THE FRONT WHEEL" on page 4-27.
- 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 4-27.

EAS30160

CHECKING THE REAR WHEEL DRIVE HUB

- 1. Check:
- Rear wheel drive hub "1" Cracks/damage \rightarrow Replace.
- Rear wheel drive hub dampers "2" Damage/wear → Replace.



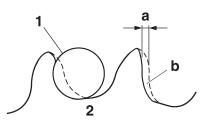
CHECKING AND REPLACING THE REAR WHEEL SPROCKET

1. Check:

• Rear wheel sprocket

More than 1/4 tooth "a" wear \rightarrow Replace the drive sprocket, the rear wheel sprocket and the drive chain as a set.

Bent teeth \rightarrow Replace the drive sprocket, the rear wheel sprocket and the drive chain as a set.



- b. Correct
- 1. Drive chain roller
- 2. Rear wheel sprocket
- 2. Replace:
 - Rear wheel sprocket

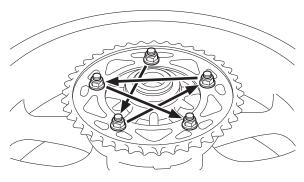
•••••••••••••••••••••••

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

Rear wheel sprocket nut 100 Nm (10 m·kgf, 72 ft·lbf)

TIP

Tighten the rear wheel sprocket nuts in stages and in a crisscross pattern.



EAS30163

ASSEMBLING THE REAR WHEEL

NOTICE

- Do not drop the wheel sensor rotor or subject it to shocks.
- If any solvent gets on the wheel sensor rotor, wipe it off immediately.
- 1. Install:
- Wheel bearings New

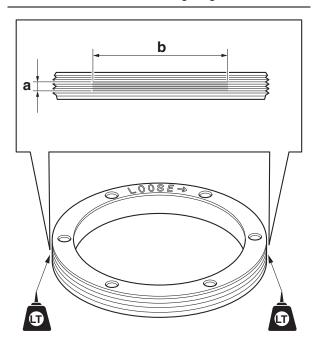
Oil seal New

Refer to "ASSEMBLING THE FRONT WHEEL" on page 4-28.

- 2. Install:
 - Wheel bearing ring nut

TIP -

Apply locking agent (LOCTITE®) onto the two symmetric places on the circumference of the threads of the wheel bearing ring nut.



- a. Width: two grooves of the threaded portion
- b. Length: more than 40 mm (1.57 in)
- 3. Tighten:
- Wheel bearing ring nut "1"

TIP -

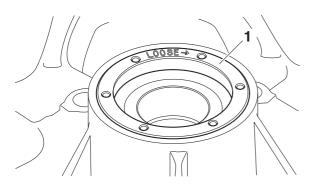
Use the wheel bearing ring nut tool "2" to tighten the wheel bearing ring nut by turning it counterclockwise "a".

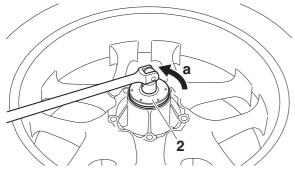


Wheel bearing ring nut tool 90890-01574 YM-01574



Wheel bearing ring nut 80 Nm (8.0 m·kgf, 58 ft·lbf) LOCTITE®



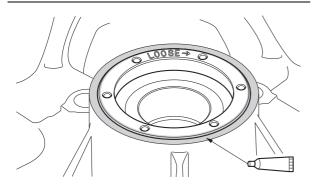


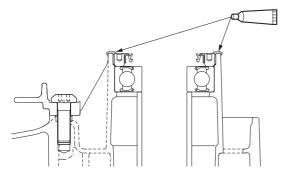
4. Apply:

Sealant

TIP

Apply Three Bond No. 1215B® between the wheel bearing ring nut and the wheel surface.





EAS30167

MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR ECA21000

NOTICE

• Handle the ABS components with care

since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.

- The rear wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.
- Keep any type of magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the rear wheel sensor or rear wheel sensor rotor.
- Do not drop or shock the wheel sensor or the wheel sensor rotor.
- 1. Check:
 - Rear wheel sensor Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.
- 2. Check:
- Rear wheel sensor rotor Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.
- 3. Measure:
 - Wheel sensor rotor runout Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.

EAS30164

ADJUSTING THE REAR WHEEL STATIC BALANCE

TIP —

- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and rear wheel drive hub installed.
- Be sure to use stick-on type balancing weights.
- 1. Adjust:
- Rear wheel static balance Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-30.

INSTALLING THE REAR WHEEL (DISC BRAKE)

- 1. Install:
 - Rear brake disc



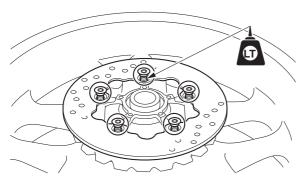
Rear brake disc bolt 30 Nm (3.0 m·kgf, 22 ft·lbf) LOCTITE®

ECA19150 NOTICE

Replace the brake disc bolts with new ones.

TIP

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



- 2. Check:
- Rear brake disc Refer to "CHECKING THE REAR BRAKE DISC" on page 4-59.
- 3. Lubricate:
- Oil seal lips

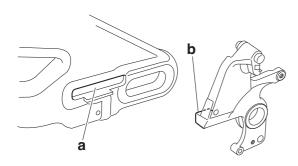


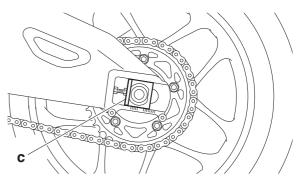
Recommended lubricant Lithium-soap-based grease

- 4. Install:
 - Collars
 - Brake caliper bracket
 - Rear wheel
 - Adjusting blocks
 - Rear wheel axle
 - Washer
 - Rear wheel axle nut

TIP_

- Do not install the brake caliper.
- Align the slot "a" in the swingarm with the projection "b" of the brake caliper bracket.
- Install the adjusting block so that projection "c" faces to the front of the vehicle.



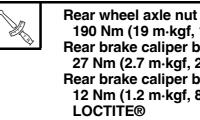


- 5. Install:
- Rear brake caliper
- Rear brake caliper bolts
- 6. Adjust:
 - Drive chain slack Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-19.



Drive chain slack 25.0-35.0 mm (0.98-1.38 in)

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



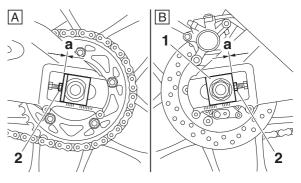
190 Nm (19 m·kgf, 137 ft·lbf) Rear brake caliper bolt (front) 27 Nm (2.7 m·kgf, 20 ft·lbf) Rear brake caliper bolt (rear) 12 Nm (1.2 m·kgf, 8.7 ft·lbf) LOCTITE®

EWA13500

Make sure the brake hose is routed properly.

TIP

When tightening the wheel axle nut, there should be no clearance "a" between the adjusting block "1" and adjusting bolt "2".



A. Left side B. Right side

4-41

REAR WHEEL

8. Install:

- Rear wheel sensor
- Rear wheel sensor protector



Rear wheel sensor bolt 7 Nm (0.7 m·kgf, 5.1 ft·lbf) Rear wheel sensor protector bolt

7 Nm (0.7 m·kgf, 5.1 ft·lbf)

NOTICE

ECA21080

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

TIP -

When installing the rear wheel sensor, check the rear wheel sensor lead for twists.

9. Measure:

• Distance "a"

(between the wheel sensor rotor "1" and rear wheel sensor "2")

Out of specification \rightarrow Check the wheel bearing for looseness, and the rear wheel sensor and sensor rotor installation conditions (warpage caused by overtorque, wrong installation direction, rotor decentering, LOC-TITE® on the mounting surface of the rotor, deformation caused by an impact during service and caught foreign materials). If there is any defective part, repair or replace the defective part.



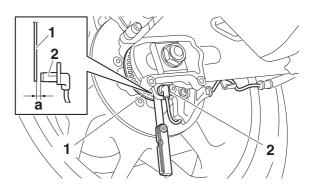
Distance "a" (between the rear wheel sensor rotor and rear wheel sensor) 1.3–2.1 mm (0.051–0.083 in)

TIP -

Measure the distance between the rear wheel sensor rotor and rear wheel sensor in several places in one rotation of the rear wheel. Do not turn the rear wheel while the thickness gauge is installed. This may damage the rear wheel sensor rotor and the rear wheel sensor.



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



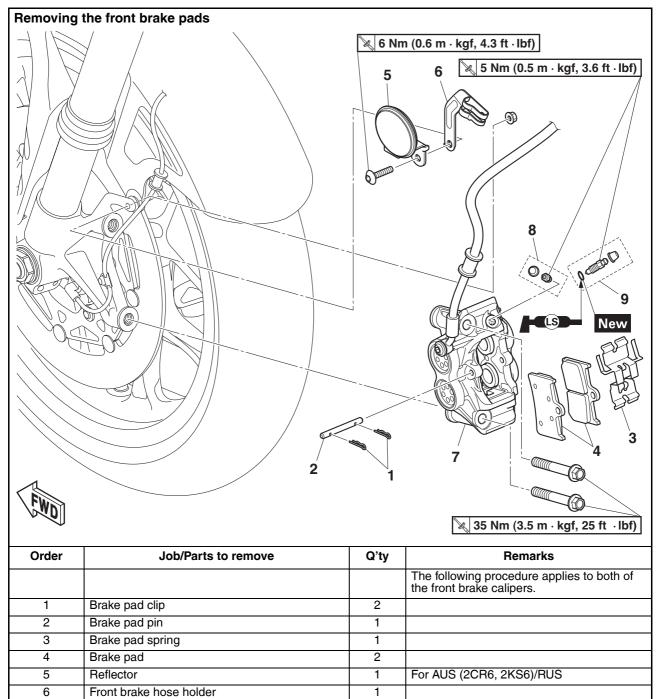
FRONT BRAKE

7

8 9 Front brake caliper

Bleed screw

Bleed screw

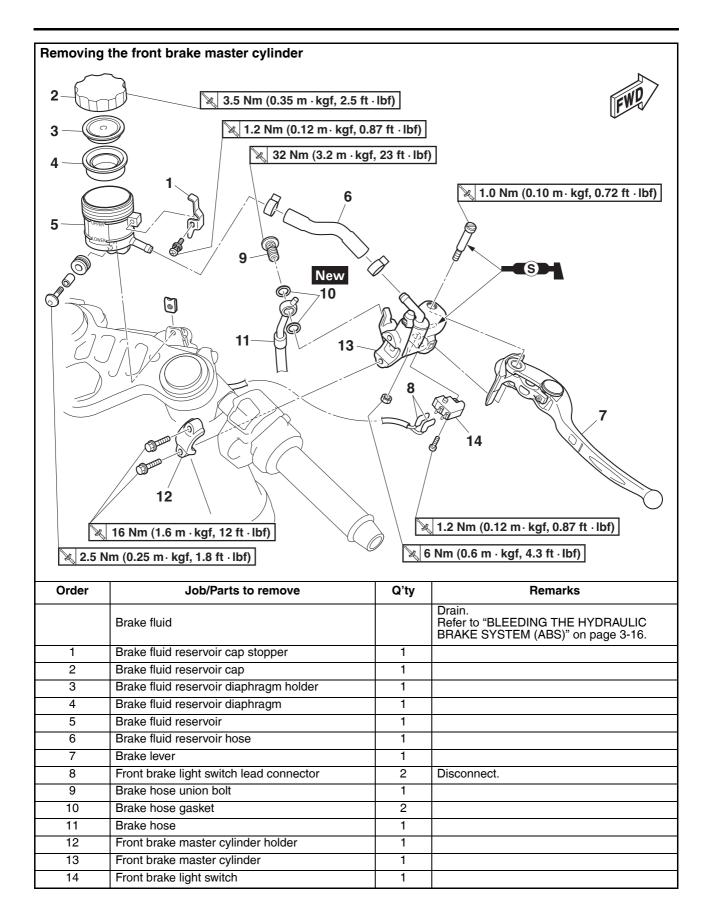


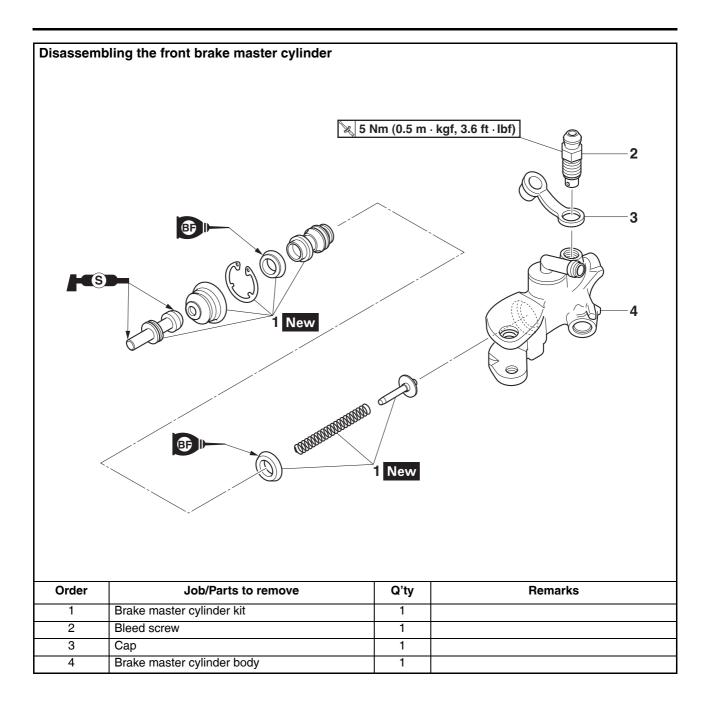
1

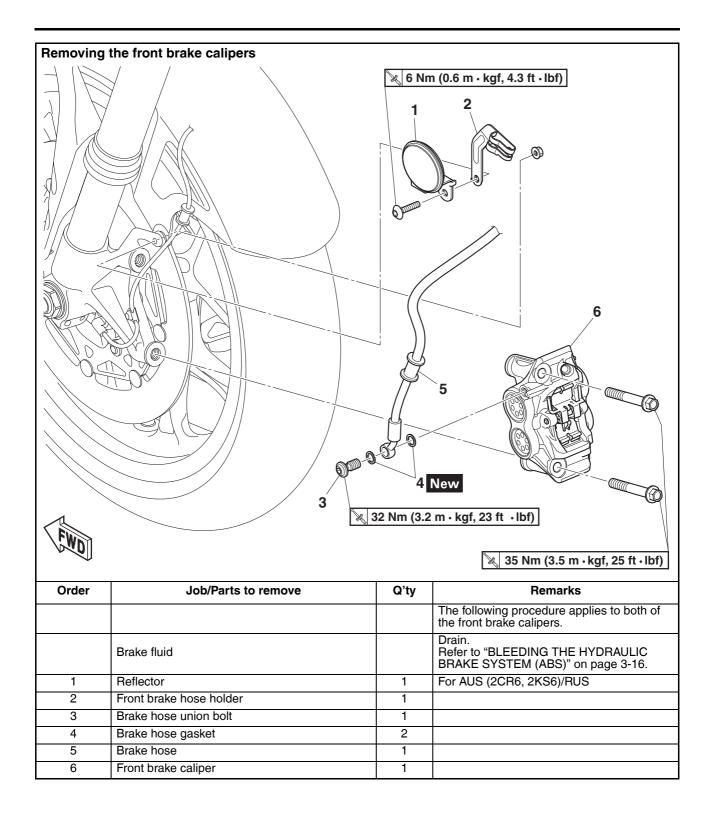
1

1

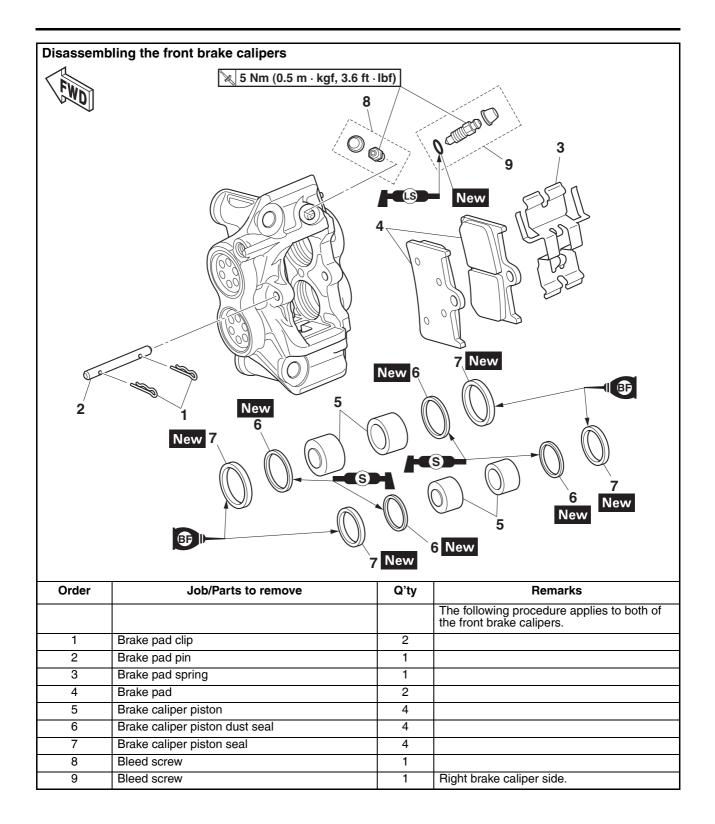
Right brake caliper side.







FRONT BRAKE



EAS30168 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.

EAS30169

CHECKING THE FRONT BRAKE DISCS

The following procedure applies to both brake discs.

- 1. Remove:
- Front wheel
- Refer to "FRONT WHEEL" on page 4-24. 2. Check:
- Front brake disc Damage/galling → Replace.
- 3. Measure:
 - Brake disc runout

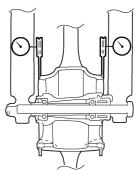
Out of specification \rightarrow Correct the brake disc runout or replace the brake disc.



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

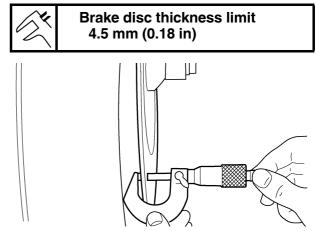
- a. Place the vehicle on a suitable stand so that the front wheel is elevated.
- b. Before measuring the brake disc runout, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- c. Remove the brake caliper.

- d. Hold the dial gauge at a right angle against the brake disc surface.
- e. Measure the runout 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 \rightarrow Replace.



- 5. Adjust:
 - Brake disc runout

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



Front brake disc bolt 17 Nm (1.7 m·kgf, 12 ft·lbf) LOCTITE®

ECA19150

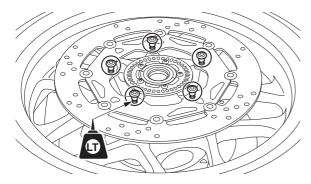
NOTICE

Replace the brake disc bolts with new ones.

TIP

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

FRONT BRAKE



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

- 6. Install:
- Front wheel

Refer to "FRONT WHEEL" on page 4-24.

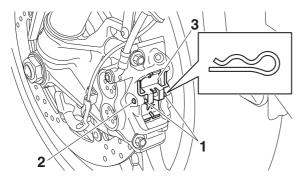
REPLACING THE FRONT BRAKE PADS

The following procedure applies to both brake calipers.

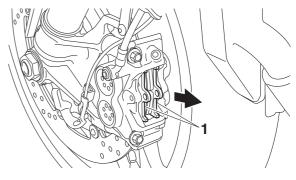
TIP -

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

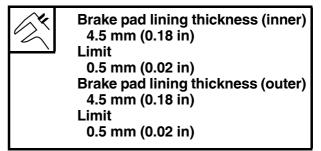
- 1. Remove:
- Brake pad clips "1"
- Brake pad pin "2"
- Brake pad spring "3"



- 2. Remove:
- Brake pads "1"



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





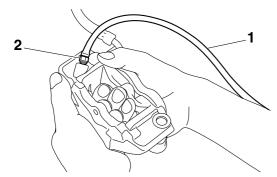
- 4. Remove:
 - Brake caliper
- 5. Install:
- Brake pads
- Brake pad spring

TIP -

Always install new brake pads and new 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.

FRONT BRAKE



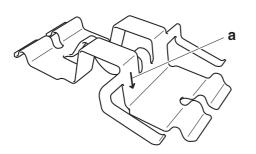
c. Tighten the bleed screw.



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

d. Install the brake pads and brake pad spring.

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



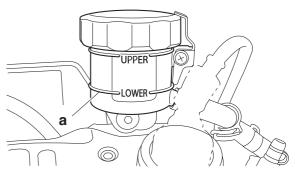
6. Install:

- Brake pad pin
- Brake pad clips
- Front brake caliper

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

- 7. Check:
- Brake fluid level

Below the minimum level mark "a" \rightarrow Add the specified brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.



8. Check:

 Brake lever operation Soft or spongy feeling → Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.

EAS30171

REMOVING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

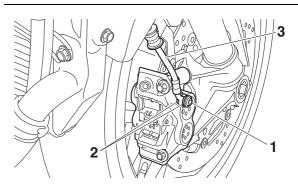
TIP _____

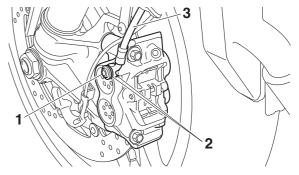
Before removing the brake caliper, drain the brake fluid from the entire brake system.

- 1. Remove:
- Brake hose union bolts "1"
- Brake hose gaskets "2"
- Brake hoses "3"

TIP

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





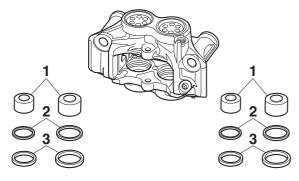
DISASSEMBLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

1. Remove:

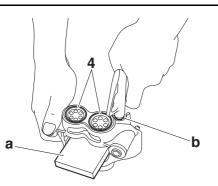
EAS20172

- Brake caliper pistons "1"
- Brake caliper piston dust seals "2"
- Brake caliper piston seals "3"



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

- Never try to pry out the brake caliper pistons.
- Do not loosen the bolts "4".



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

EAS30173

CHECKING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

Recommended brake component replacement schedule

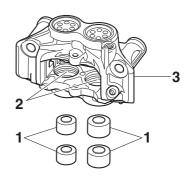
•		
Brake pads	If necessary	
Piston seals	Every two years	
Piston dust seals	Every two years	
Brake hoses	Every four years	
Brake fluid	Every two years and whenever the brake is disassembled	

1. Check:

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

WARNING

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



ASSEMBLING THE FRONT BRAKE CALIPERS

- 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.

·M

E4S30175

Specified brake fluid DOT 4

INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

1. Install:

- Front brake caliper "1" (temporarily)
- Brake hose gaskets New
- Brake hoses "2"
- Brake hose union bolts "3"



32 Nm (3.2 m·kgf, 23 ft·lbf)

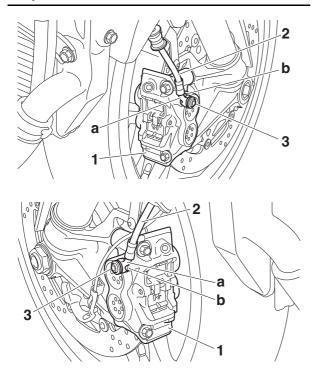
WARNING

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

Front brake hose union bolt

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:
 - 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 4-49.

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



Specified brake fluid DOT 4

WAT3090 WARNING

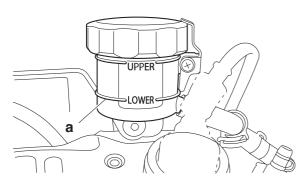
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

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 (ABS)" on page 3-16.
- 6. Check:
 - Brake fluid level

Below the minimum level mark "a" \rightarrow Add the specified brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.



7. Check:

• Brake lever operation

Soft or spongy feeling \rightarrow Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.

EAS30179

REMOVING THE FRONT BRAKE MASTER CYLINDER

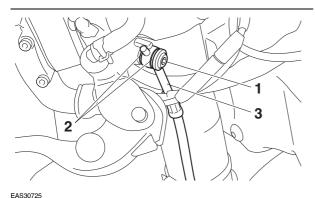
TIP _

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

- 1. Disconnect:
 - Brake light switch connectors (from the front brake light switch)
- 2. Remove:
 - Brake hose union bolt "1"
 - Brake hose gaskets "2"
 - Brake hose "3"

TIP -

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

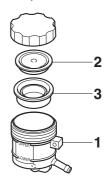


CHECKING THE FRONT BRAKE MASTER CYLINDER

- 1. Check:
- Brake master cylinder Damage/scratches/wear → Replace.
- Brake fluid delivery passages

(brake master cylinder body) Obstruction \rightarrow Blow out with compressed air.

- 2. Check:
 - Brake master cylinder kit Damage/scratches/wear \rightarrow Replace.
- 3. Check:
 - Brake fluid reservoir "1"
 - Brake fluid reservoir diaphragm holder "2" Cracks/damage \rightarrow Replace.
 - Brake fluid reservoir diaphragm "3" Damage/wear → Replace.



- 4. Check:
 - Brake hoses Cracks/damage/wear \rightarrow Replace.

EAS30181

ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

WARNING

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

Specified brake fluid DOT 4

EAS30182

INSTALLING THE FRONT BRAKE MASTER CYLINDER

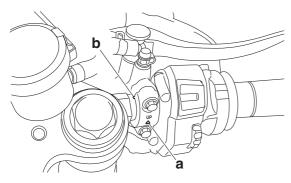
- 1. Install:
- Front brake master cylinder
- Front brake master cylinder holder

Front brake master cylinder holder bolt 16 Nm (1.6 m·kgf, 12 ft·lbf)

TIP

- Install the front brake master cylinder holder with the "UP" mark "a" facing up.
- Align the end of the front brake master cylinder

with the punch mark "b" on the handlebar.First, tighten the upper bolt, then the lower bolt.



- 2. Install:
 - Brake hose gaskets New
 - Brake hose
- Brake hose union bolt



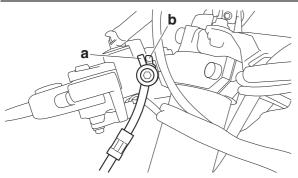
Front brake hose union bolt 32 Nm (3.2 m·kgf, 23 ft·lbf)

WARNING

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

TIP

- When installing the brake hose onto the master cylinder, make sure the projection "a" on the brake hose touches the projection "b" on the master cylinder.
- While holding the brake hose, tighten the union bolt as shown.
- Turn the handlebars to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.



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

Specified brake fluid DOT 4

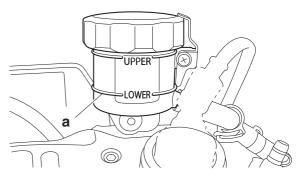
WARNING

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

ECA13540

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

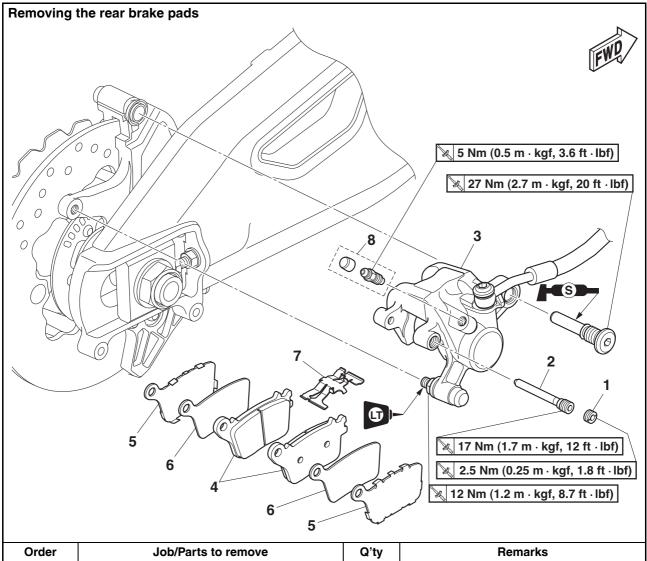
- 4. Bleed:
 - Brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.
- 5. Check:
 - Brake fluid level Below the minimum level mark "a" → Add the specified brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.



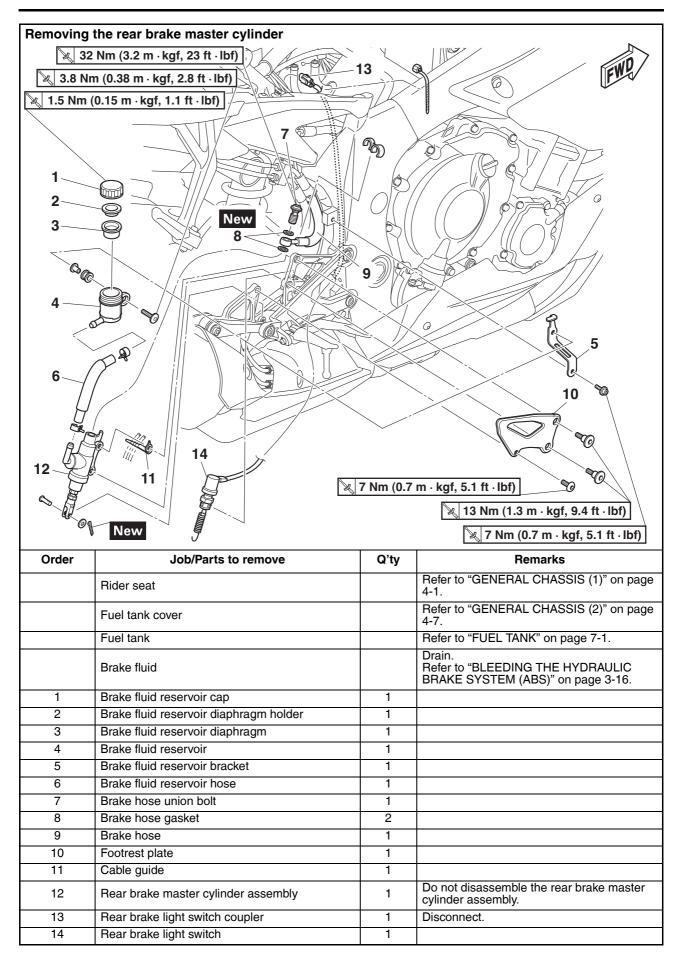
6. Check:

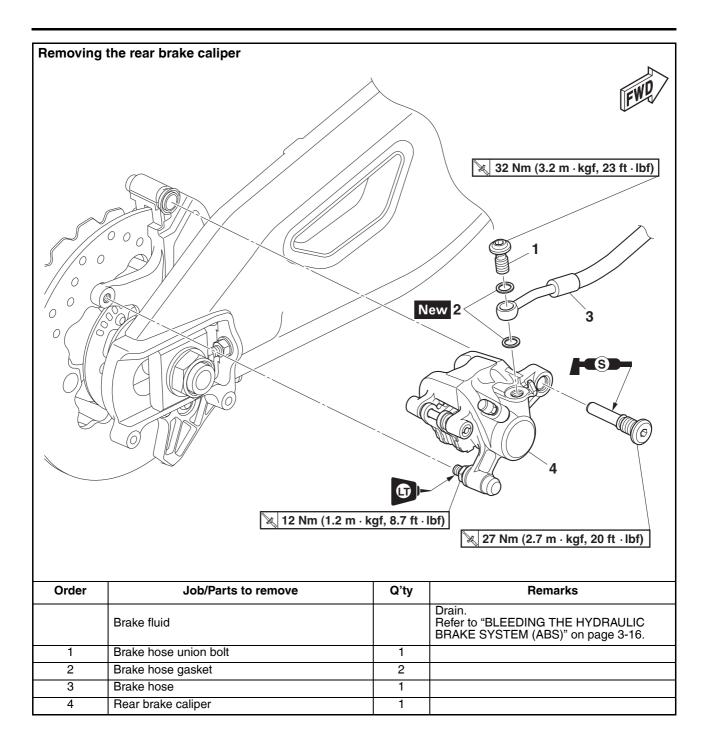
 Brake lever operation Soft or spongy feeling → Bleed the brake system.

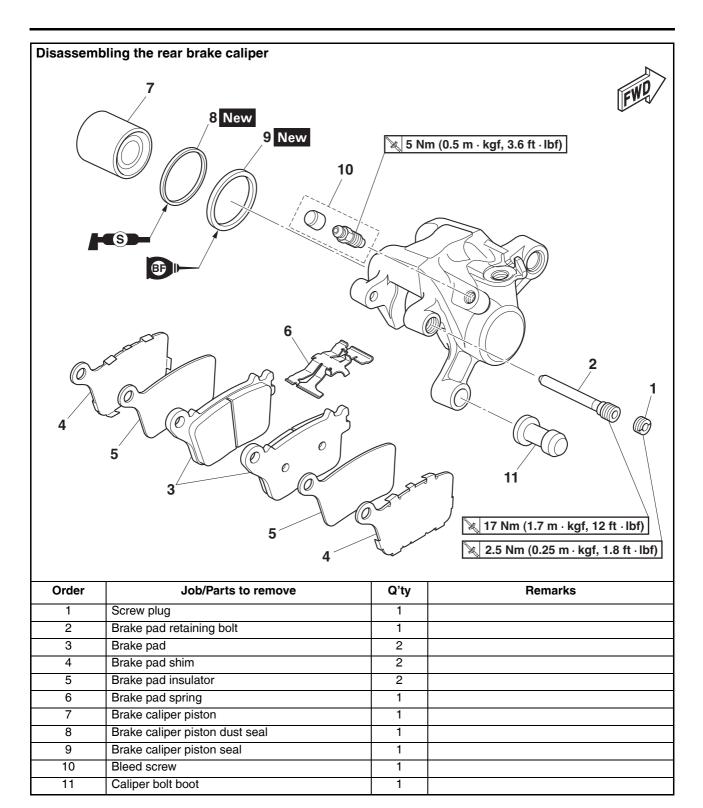
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.



Order	Job/Parts to remove	Q'ty	Remarks
1	Screw plug	1	
2	Brake pad retaining bolt	1	
3	Rear brake caliper	1	
4	Brake pad	2	
5	Brake pad shim	2	
6	Brake pad insulator	2	
7	Brake pad spring	1	
8	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 4-34. 2. Check:

- Rear brake disc Damage/galling \rightarrow Replace.
- 3. Measure:
- Brake disc runout

Out of specification \rightarrow Correct the brake disc runout or replace the brake disc. Refer to "CHECKING THE FRONT BRAKE

DISCS" on page 4-48.



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 \rightarrow Replace.

Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-48.



Brake disc thickness limit 4.5 mm (0.18 in)

5. Adjust:

• Brake disc runout Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-48.



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

6. Install:

Rear wheel

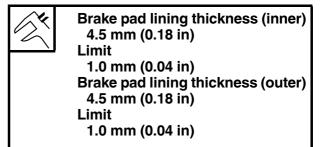
Refer to "REAR WHEEL" on page 4-34.

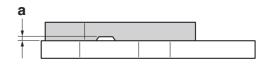
REPLACING THE REAR BRAKE PADS

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 \rightarrow Replace the brake pads as a set.



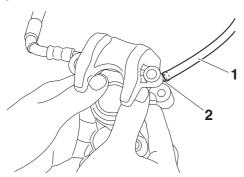


- 2. Install:
 - Brake pad insulators
 - Brake pad shims (onto the brake pads)
 - Brake pad spring (into the rear brake caliper)
 - Brake pads

TIP_

Always install new brake pads, brake pad insulators, brake pad shims, and 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 5 Nm (0.5 m·kgf, 3.6 ft·lbf)

d. Install the brake pad insulators and brake pad shims onto each brake pads.

TIP

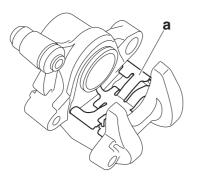
Apply silicone grease between the brake pad insulator and brake pad shim.

ECA14150 NOTICE

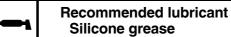
- Do not allow grease to contact the brake pads.
- Remove any excess grease.

e. Install the brake pads and brake pad spring. TIP.

The longer tangs "a" of the brake pad spring must point in the direction of the brake caliper piston.



- 3. Lubricate:
- Rear brake caliper bolts

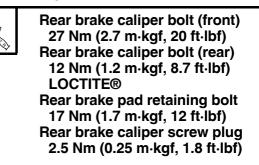


Silicone grease

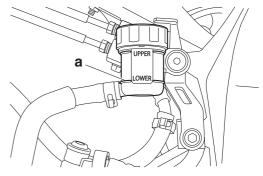
NOTICE

ECA14150

- Do not allow grease to contact the brake pads.
- Remove any excess grease.
- 4. Install:
 - Rear brake caliper
 - Brake pad retaining bolts
 - Screw plug



- 5. Check:
 - Brake fluid level Below the minimum level mark "a" \rightarrow Add the specified brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.



- 6. Check:
 - Brake pedal operation Soft or spongy feeling \rightarrow Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.

EAS30186

REMOVING THE REAR BRAKE CALIPER TIP_

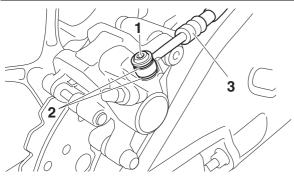
Before disassembling the brake caliper, drain

the brake fluid from the entire brake system.

- 1. Remove:
 - Brake hose union bolt "1"
 - Brake hose gaskets "2"
 - Brake hose "3"

TIP _

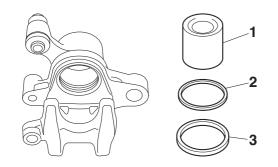
Put the end of the brake hose into a container and pump out the brake fluid carefully.



EAS30187

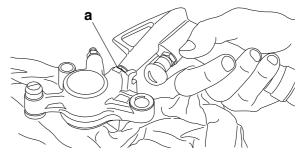
DISASSEMBLING THE REAR BRAKE CALIPER

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



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

- 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 dust seal and brake caliper piston seal.

EAS30188

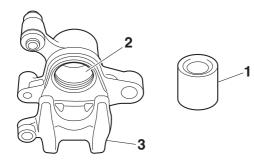
CHECKING THE REAR BRAKE CALIPER

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

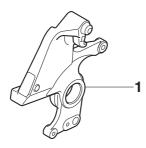
- 1. Check:
- Brake caliper piston "1" Rust/scratches/wear → Replace the brake caliper piston.
- Brake caliper cylinder "2"
 Scratches/wear → Replace the brake caliper assembly.
- Brake caliper body "3" Cracks/damage → Replace the brake caliper assembly.
- Brake fluid delivery passages (brake caliper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

EWA13601

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



- 2. Check:
- Rear brake caliper bracket "1" Cracks/damage → Replace.
 Refer to "REAR WHEEL" on page 4-34.



EAS30189

ASSEMBLING THE REAR BRAKE CALIPER

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



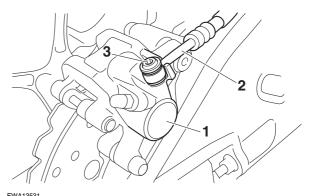
Specified brake fluid DOT 4

EAS30190

INSTALLING THE REAR BRAKE CALIPER 1. Install:

- Rear brake caliper "1" (temporarily)
- Brake hose gaskets New
- Brake hose "2"
- Brake hose union bolt "3"

Rear brake hose union bolt 32 Nm (3.2 m·kgf, 23 ft·lbf)

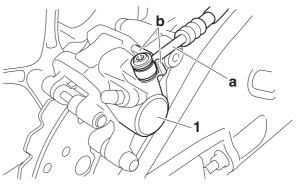


WARNING

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

ECA19080

When installing the brake hose onto the brake caliper "1", make sure the brake pipe "a" passes between the projections "b" on the brake caliper.



- 2. Remove:
- Rear brake caliper
- 3. Install:
 - Brake pad insulators
 - Brake pad shims (onto the brake pads)
 - Brake pad spring (into the rear brake caliper)
 - Brake pads
 - Rear brake caliper Refer to "REPLACING THE REAR BRAKE PADS" on page 4-59.



- 4. Fill:
 - Brake fluid reservoir

(with the specified amount of the specified brake fluid)

·Ŋ

Specified brake fluid DOT 4

WARNING

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

ECA13540

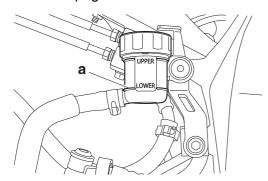
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

- 5. Bleed:
 - Brake system

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.

- 6. Check:
 - Brake fluid level

Below the minimum level mark "a" \rightarrow Add the specified brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.



- 7. Check:
 - Brake pedal operation
 Soft or spongy feeling → Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.

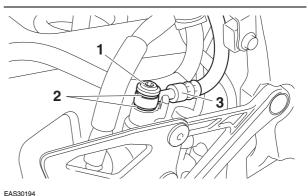
REMOVING THE REAR BRAKE MASTER CYLINDER

- 1. Remove:
 - Brake hose union bolt "1"
 - Brake hose gaskets "2"
- Brake hose "3"

TIP -

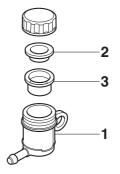
EAS20102

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



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 fluid reservoir "1"
- Brake fluid reservoir diaphragm holder "2" Cracks/damage \rightarrow Replace.
- Brake fluid reservoir diaphragm "3" Damage/wear → Replace.



- 3. Check:
 - Brake hose
- Brake fluid reservoir hose Cracks/damage/wear → Replace.

EAS31743 THE REAR BRAKE MASTER CYLINDER ECA23000

NOTICE

Do not disassemble the rear brake master cylinder. If the master cylinder malfunctions, replace the rear brake master cylinder assembly.

EAS30196

INSTALLING THE REAR BRAKE MASTER CYLINDER

- 1. Install:
 - Brake hose gaskets New
 - Brake hose
- Brake fluid reservoir hose
- Brake hose union bolt



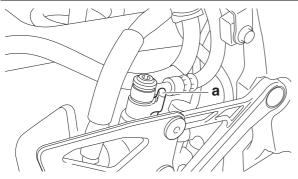
Rear brake hose union bolt

32 Nm (3.2 m·kgf, 23 ft·lbf)

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

ECA14160

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

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.

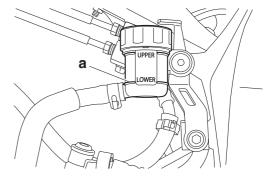
• When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

ECA13540

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 (ABS)" on page 3-16.
- 4. Check:
- Brake fluid level

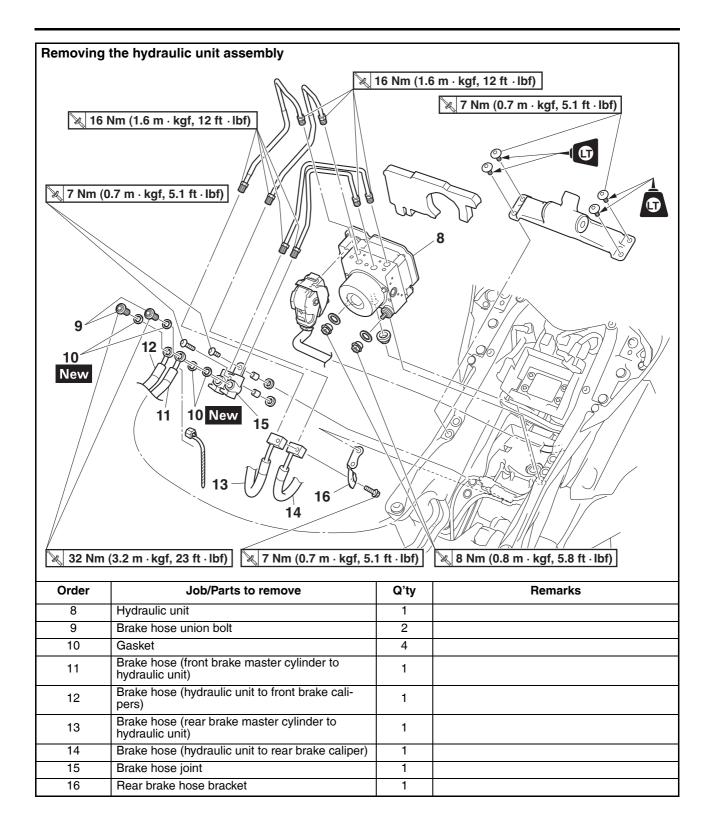
Below the minimum level mark "a" \rightarrow Add the specified brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.



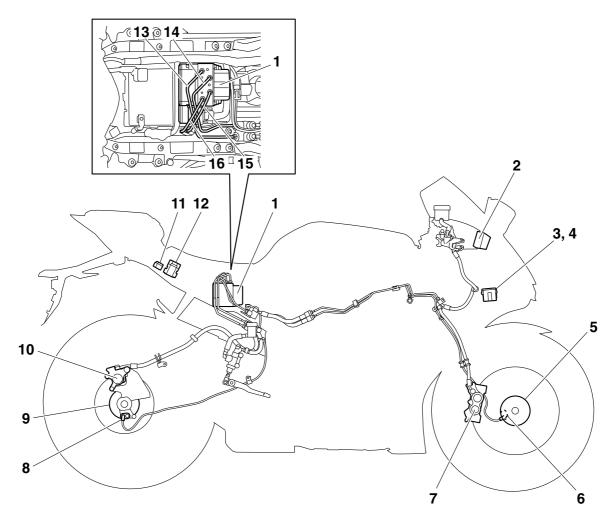
- 5. Adjust:
 - Brake pedal position Refer to "ADJUSTING THE REAR DISC BRAKE" on page 3-15.
- 6. Adjust:
 - Rear brake light operation timing Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-36.

EAS20032 ABS (Anti-lock Brake System) Removing the hydraulic unit assembly 🔀 16 Nm (1.6 m · kgf, 12 ft · lbf) 5 🔀 7 Nm (0.7 m · kgf, 5.1 ft · lbf) 🔀 16 Nm (1.6 m · kgf, 12 ft · lbf) 7 2 Q 🍾 7 Nm (0.7 m · kgf, 5.1 ft · lbf) 6 Q G Q 300) 5), (0 0 Ø Ø 3 Om . I Ò New O. 9 2) 9 New 32 Nm (3.2 m · kgf, 23 ft · lbf) X

Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Battery cover/Battery		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.
1	Fuel tank bracket	1	
2	Damper	1	
3	ABS ECU coupler	1	Disconnect.
4	Hydraulic unit brake pipe (rear brake master cyl- inder to hydraulic unit)	1	
5	Hydraulic unit brake pipe (hydraulic unit to rear brake caliper)	1	
6	Hydraulic unit brake pipe (front brake master cylinder to hydraulic unit)	1	
7	Hydraulic unit brake pipe (hydraulic unit to front brake calipers)	1	



ABS COMPONENTS CHART



- 1. Hydraulic unit assembly
- 2. ABS warning light
- 3. ABS ECU fuse
- 4. ABS solenoid fuse
- 5. Front wheel sensor rotor
- 6. Front wheel sensor
- 7. Front brake caliper
- 8. Rear wheel sensor
- 9. Rear wheel sensor rotor
- 10.Rear brake caliper
- 11. Yamaha diagnostic tool coupler
- 12.ABS motor fuse
- 13.Hydraulic unit brake pipe (hydraulic unit to front brake calipers)
- 14. Hydraulic unit brake pipe (front brake master cylinder to hydraulic unit)
- 15. Hydraulic unit brake pipe (rear brake master cylinder to hydraulic unit)
- 16.Hydraulic unit brake pipe (hydraulic unit to rear brake caliper)

EAS30197 REMOVING THE HYDRAULIC UNIT ASSEMBLY

NOTICE

Unless necessary, avoid removing and installing the brake pipes of the hydraulic unit assembly.

EWA13930 WARNING

Refill with the same type of brake fluid that is already in the system. Mixing fluids may result in a harmful chemical reaction, leading to poor braking performance.

ECA19790 NOTICE

- Handle the ABS components with care since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.
- Do not set the main switch to "ON" when removing the hydraulic unit assembly.
- Do not clean with compressed air.
- Do not reuse the brake fluid.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Do not allow any brake fluid to contact the couplers. Brake fluid may damage the couplers and cause bad contacts.
- If the brake pipe flare nuts for the hydraulic unit assembly have been removed, be sure to tighten them to the specified torque and bleed the brake system.
- 1. Disconnect:
- ABS ECU coupler "1"

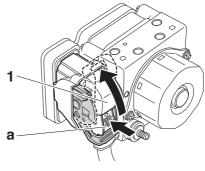
TIP -

While pushing the portion "a" of the ABS ECU coupler, pull the lock lever up to release the lock.

NOTICE

ECA20080

Do not use a tool to disconnect the ABS ECU coupler.



- 2. Remove:
- Brake hoses
- Brake pipes
- TIP_
- Do not operate the brake lever and brake pedal while removing the brake hoses and brake pipes.
- Do not bend the brake pipe when loosening the brake pipe flare nuts.

ECA19800

- When removing the brake hoses and brake pipes, cover the area around the hydraulic unit assembly to catch any spilt brake fluid. Do not allow the brake fluid to contact other parts.
- Before disconnecting the brake pipes from the hydraulic unit assembly, do not lift up or move the brake pipes.
- 3. Remove:
- Hydraulic unit assembly "1"

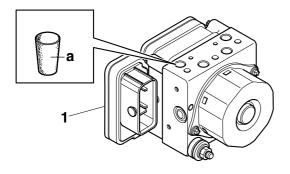
TIP —

To avoid brake fluid leakage and to prevent foreign materials from entering the hydraulic unit assembly, insert a rubber plug "a" or a bolt (M10 \times 1.00) into each flare nut hole.

ECA19810 NOTICE

When using a bolt, do not tighten the bolt until the bolt head touches the hydraulic unit. Otherwise, the brake pipe seating surface could be deformed.

ABS (Anti-lock Brake System)



EAS30198

CHECKING THE HYDRAULIC UNIT ASSEMBLY

- 1. Check:
- Hydraulic unit assembly

Cracks/damage \rightarrow Replace the hydraulic unit assembly and the brake pipes that are connected to the assembly as a set.

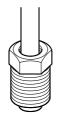
EAS30199

CHECKING THE BRAKE PIPES

The following procedure applies to all of the brake pipes.

- 1. Check:
- Brake pipe end (flare nut)

Damage \rightarrow Replace the hydraulic unit assembly, brake pipes, and related parts as a set.



EAS30200

INSTALLING THE HYDRAULIC UNIT ASSEMBLY

1. Install:

Hydraulic unit assembly

ECA18260

Do not remove the rubber plugs or bolts (M10 \times 1.0) installed in the flare nut holes before installing the hydraulic unit assembly.

TIP -

Do not allow any foreign materials to enter the hydraulic unit assembly or the brake hoses or brake pipes when installing the hydraulic unit assembly.

Q.

Hydraulic unit assembly nut 8 Nm (0.8 m·kgf, 5.8 ft·lbf)

2. Remove:

- Rubber plugs or bolts (M10 \times 1.0)
- 3. Install:
- Hydraulic unit brake pipe
- 4. Tighten:
 - Hydraulic unit brake pipe flare nuts



Hydraulic unit brake pipe flare nut 16 Nm (1.6 m·kgf, 12 ft·lbf)

ECA19820

If the brake pipe flare nut does not turn easily, replace the hydraulic unit assembly, brake pipes, and related parts as a set.

TIP -

Do not bend the brake pipe when tightening the brake pipe flare nuts.

- 5. Install:
 - Gaskets New
 - Brake hose union bolts
 - Brake hoses "1"



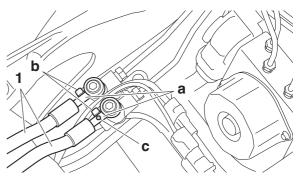
Front brake hose union bolt 32 Nm (3.2 m·kgf, 23 ft·lbf)

NOTICE

When installing each brake hose onto the hydraulic unit brake pipe joint, make sure that the brake pipe "a" touches the projection "b" on the joint.

TIP

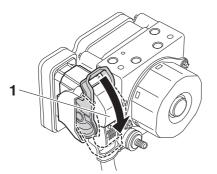
There is an identifying white paint mark "c" on the upper surface of the pipe of the brake hose (front brake master cylinder to the hydraulic unit).



6. Connect:ABS ECU coupler "1"

TIP -

Push the lock lever down until a click is heard, making sure that the ABS ECU coupler is installed securely.



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



Specified brake fluid DOT 4

WARNING

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

ECA13540

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

- 8. Bleed:
- Brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-16.
- Check the operation of the hydraulic unit according to the brake lever and the brake pedal response. (Refer to "HYDRAULIC UNIT OPERATION TEST" on page 4-70.)

NOTICE

Always check the operation of the hydraulic

unit according to the brake lever and the brake pedal response.

- 10.Delete the fault codes. (Refer to "[B-3] DE-LETING THE FAULT CODES" on page 8-150.)
- 11.Perform a trial run. (Refer to "CHECKING THE ABS WARNING LIGHT" on page 4-73.)

EAS30201 HYDRAULIC UNIT OPERATION TEST

The reaction-force pulsating action generated in the brake lever and brake pedal when the ABS is activated can be tested when the vehicle is stopped.

The hydraulic unit operation can be tested using the following two methods.

- Brake line routing confirmation: this test checks the function of the ABS after the system was disassembled, adjusted, or serviced.
- ABS reaction-force confirmation: this test generates the same reaction-force pulsating action that is generated in the brake lever and brake pedal when the ABS is activated.

Brake line routing confirmation

WARNING

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

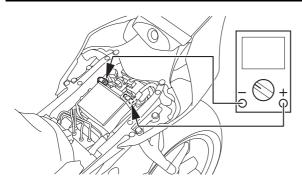
TIP -

- For the brake line routing confirmation, use the diagnosis mode of the Yamaha diagnostic tool.
- Before performing the brake line routing confirmation, make sure that no malfunctions have been detected in the ABS ECU and that the wheels are not rotating.
- 1. Place the vehicle on a suitable stand.
- 2. Turn the main switch to "OFF".
- 3. Remove:
 - Passenger seat/Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- 4. Check:
 - Battery voltage Lower than 12.8 V → Charge or replace the battery.

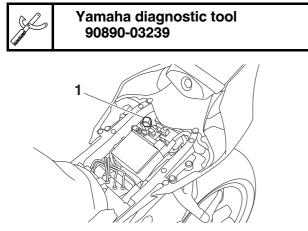
Battery voltageHigher than 12.8 V

TIP -

If the battery voltage is lower than 12.8 V, charge the battery, and then perform brake line routing confirmation.



5. Removing the protective cap "1", and then connect the Yamaha diagnostic tool to the Yamaha diagnostic tool coupler (4P).



- 6. Start the Yamaha diagnostic tool and display the diagnosis mode screen.
- 7. Select code No. 2, "Brake line routing confirmation".
- 8. Click "Action" "1", and then operate the brake lever "2" and brake pedal "3" simultaneously.

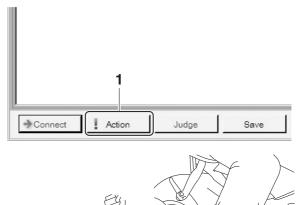
TIP -

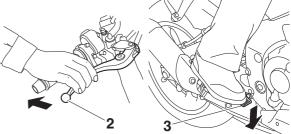
- The hydraulic unit operates 1 second after the brake lever and brake pedal are operated simultaneously and continues for approximately 5 seconds.
- The operation of the hydraulic unit can be confirmed using the indicator.

On: The hydraulic unit is operating.

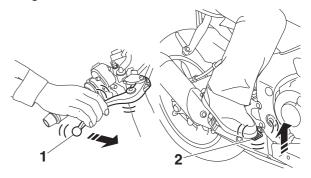
Flashing: The conditions for operating the hydraulic unit have not been met.

Off: The brake lever and brake pedal are not being operated.





- 9. Check:
 - Hydraulic unit operation Click "Action", a single pulse will be generated in the brake lever "1", brake pedal "2", and again in the brake lever "1", in this order.



TIP

"ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.

ECA17371 NOTICE

- Check that the pulse is felt in the brake lever, brake pedal, and again in the brake lever, in this order.
- If the pulse is felt in the brake pedal before it is felt in the brake lever, check that the brake hoses and brake pipes are connected correctly to the hydraulic unit assembly.
- If the pulse is hardly felt in either the brake lever or brake pedal, check that the brake hoses and brake pipes are connected correctly to the hydraulic unit assembly.

ABS (Anti-lock Brake System)

10.If the operation of the hydraulic unit is normal, delete all of the fault codes.

ABS reaction-force confirmation

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

TIP -

- For the ABS reaction-force confirmation, use the diagnosis mode of the Yamaha diagnostic tool. For more information, refer to the operation manual of the Yamaha diagnostic tool.
- Before performing the ABS reaction-force confirmation, make sure that no malfunctions have been detected in the ABS ECU and that the wheels are not rotating.
- 1. Place the vehicle on a suitable stand.
- 2. Turn the main switch to "OFF".
- 3. Remove:
- Passenger seat/Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- 4. Check:
 - Battery voltage

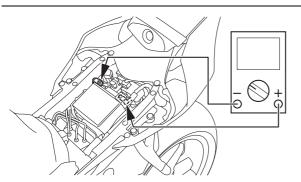
Lower than 12.8 V \rightarrow Charge or replace the battery.

о III В

Battery voltage Higher than 12.8 V

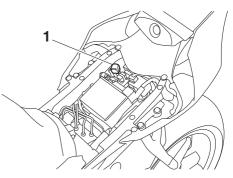
TIP -

If the battery voltage is lower than 12.8 V, charge the battery, and then perform ABS reactionforce confirmation.



5. Removing the protective cap "1", and then connect the Yamaha diagnostic tool to the Yamaha diagnostic tool coupler (4P).





- 6. Start the Yamaha diagnostic tool and display the diagnosis mode screen.
- 7. Select code No. 1, "ABS reaction-force confirmation".
- 8. Click "Action" "1", and then operate the brake lever "2" and brake pedal "3" simultaneously.

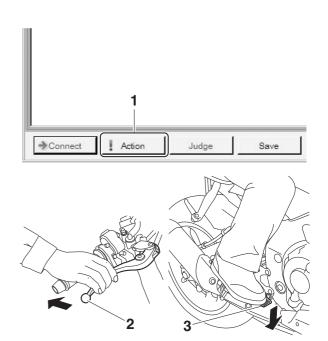
TIP __

- The hydraulic unit operates 1 second after the brake lever and brake pedal are operated simultaneously and continues for approximately 5 seconds.
- The operation of the hydraulic unit can be confirmed using the indicator.

On: The hydraulic unit is operating.

Flashing: The conditions for operating the hydraulic unit have not been met.

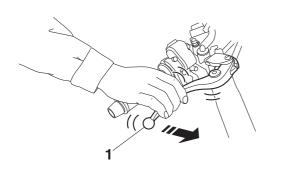
Off: The brake lever and brake pedal are not being operated.



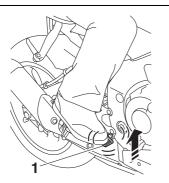
9. A reaction-force pulsating action is generated in the brake lever "1" and continues for a few seconds.

TIP -

- The reaction-force pulsating action consists of quick pulses.
- Be sure to continue operating the brake lever and brake pedal even after the pulsating action has stopped.
- "ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.



- 10.After the pulsating action has stopped in the brake lever, it is generated in the brake pedal "1" and continues for a few seconds.
- TIP -
- The reaction-force pulsating action consists of quick pulses.
- Be sure to continue operating the brake lever and brake pedal even after the pulsating action has stopped.
- "ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.



- 11.After the pulsating action has stopped in the brake pedal, it is generated in the brake lever and continues for a few seconds.
- TIP -
- The reaction-force pulsating action consists of quick pulses.
- "ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.

ECA17371 **NOTICE**

- Check that the pulse is felt in the brake lever, brake pedal, and again in the brake lever, in this order.
- If the pulse is felt in the brake pedal before it is felt in the brake lever, check that the brake hoses and brake pipes are connected correctly to the hydraulic unit assembly.
- If the pulse is hardly felt in either the brake lever or brake pedal, check that the brake hoses and brake pipes are connected correctly to the hydraulic unit assembly.

12.Turn the main switch to "OFF".

- 13.Remove the Yamaha diagnostic tool coupler from the Yamaha diagnostic tool coupler, and then install the protective cap.
- 14. Turn the main switch to "ON".
- 15.Set the start/engine stop switch to " \bigcirc ".
- 16.Check for brake fluid leakage around the hydraulic unit.

Brake fluid leakage \rightarrow Replace the hydraulic unit, brake pipes, and related parts as a set.

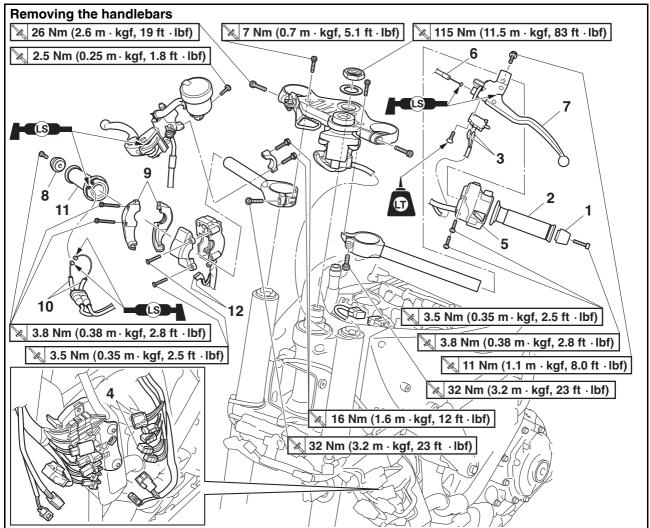
17.If the operation of the hydraulic unit is normal, delete all of the fault codes.

EAS30202

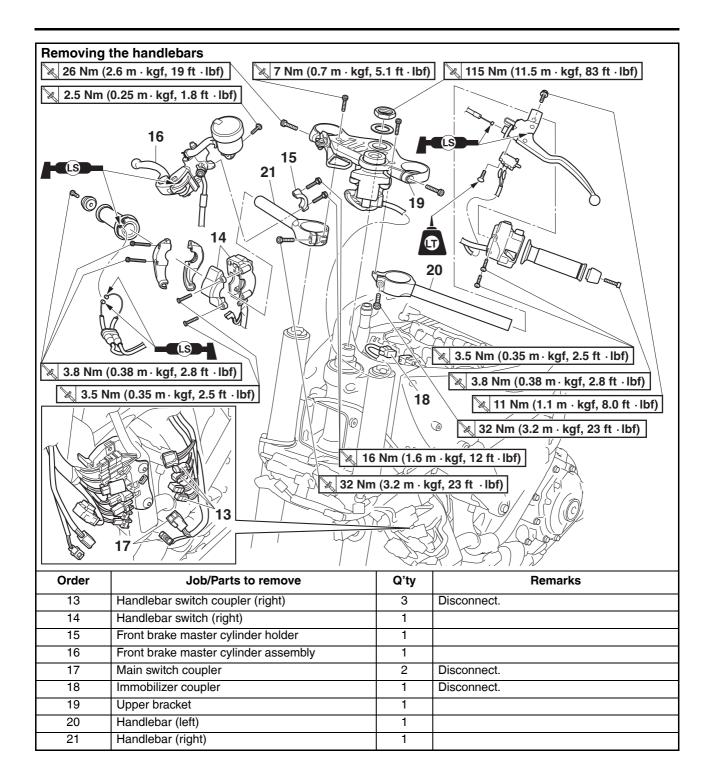
CHECKING THE ABS WARNING LIGHT

After all checks and servicing are completed, ensure that the ABS warning light goes off by walking the vehicle at a speed of faster than 5 km/h (3.1 mi/h) or performing a trial run.

EAS20033 HANDLEBARS



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover/Front side cowling (left)/Front panel (left)/Side cover bracket (left)		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
1	Grip end (left)	1	
2	Handlebar grip	1	
3	Clutch switch connector	2	Disconnect.
4	Handlebar switch coupler (left)	2	Disconnect.
5	Handlebar switch (left)	1	
6	Clutch cable	1	Disconnect.
7	Clutch lever holder	1	
8	Grip end (right)	1	
9	Throttle cable housing	2	
10	Throttle cable	2	Disconnect.
11	Throttle grip	1	
12	Front brake light switch connector	2	Disconnect.



EAS30203 REMOVING THE HANDLEBARS

1. Stand the vehicle on a level surface.

WARNING

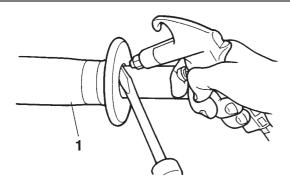
Securely support the vehicle so that there is no danger of it falling over.

2. Remove:

• Handlebar grip "1"

TIP -

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

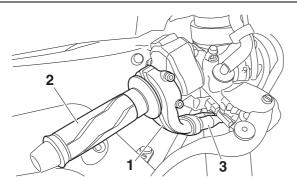


3. Remove:

- Throttle cable housings "1"
- Throttle grip "2"

TIP -

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



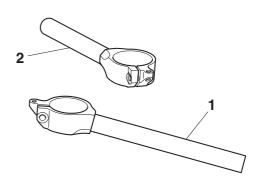
EAS30204

CHECKING THE HANDLEBARS

- 1. Check:
- Handlebar (left) "1"
- Handlebar (right) "2" Bends/cracks/damage \rightarrow Replace.

EWA13690

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



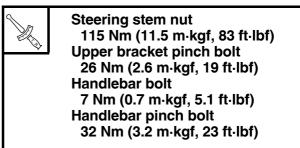
EAS30205 INSTALLING THE HANDLEBARS

1. Stand the vehicle on a level surface.

WARNING

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

- 2. Install:
 - Handlebar (left)
 - Handlebar (right)
 - Upper bracket



3. Install:

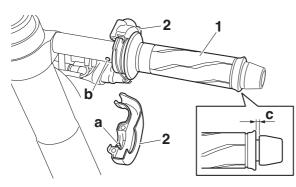
- Throttle grip "1"
- Throttle cables
- Throttle cable housings "2"
- Grip end



Throttle cable housing bolt 3.8 Nm (0.38 m·kgf, 2.8 ft·lbf) Grip end bolt 3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)

TIP -

- Align the projection "a" on the throttle cable housing with the hole "b" in the handlebar.
- There should be 1–3 mm (0.04–0.12 in) of clearance "c" between the throttle grip and the grip end.



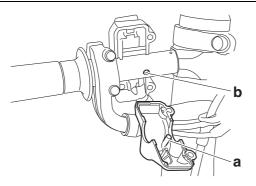
- 4. Install:
- Handlebar switch screw (right)



Handlebar switch screw 3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)

TIP -

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



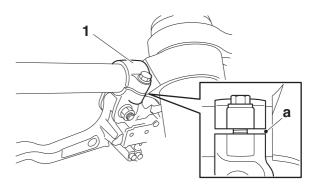
- 5. Install:
 - Front brake master cylinder assembly Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER" on page 4-53.
- 6. Install:
- Clutch lever holder "1"
- Clutch cable



Clutch lever holder pinch bolt 11 Nm (1.1 m·kgf, 8.0 ft·lbf)

TIP -

Align the center of slit on the clutch lever holder with the punch mark "a" on the handlebar.



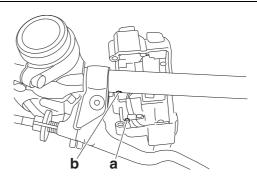
- 7. Install:
- Handlebar switch screw (left)



Handlebar switch screw 3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)

TIP -

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



- 8. Install:
- Handlebar grip "1"
- Grip end "2"



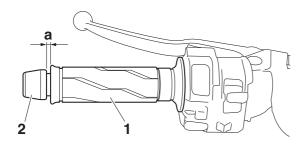
Grip end bolt 3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)

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

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. Adjust:
 - Throttle grip free play Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-13.



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

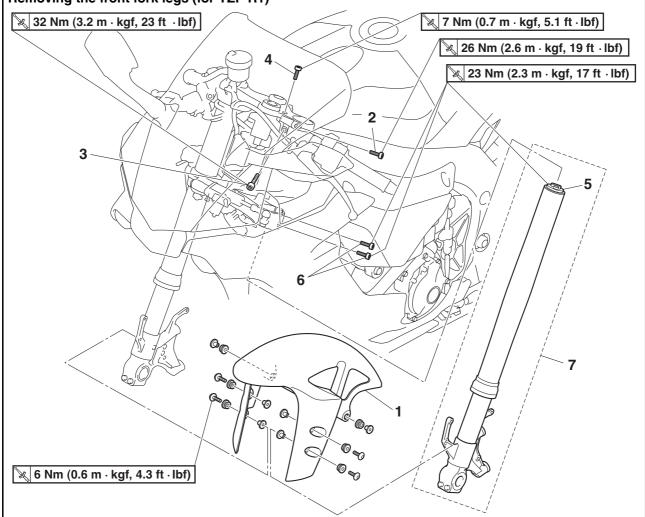
10.Adjust:

• Clutch lever free play Refer to "CHECKING THE THROTTLE GRIP" on page 3-36.

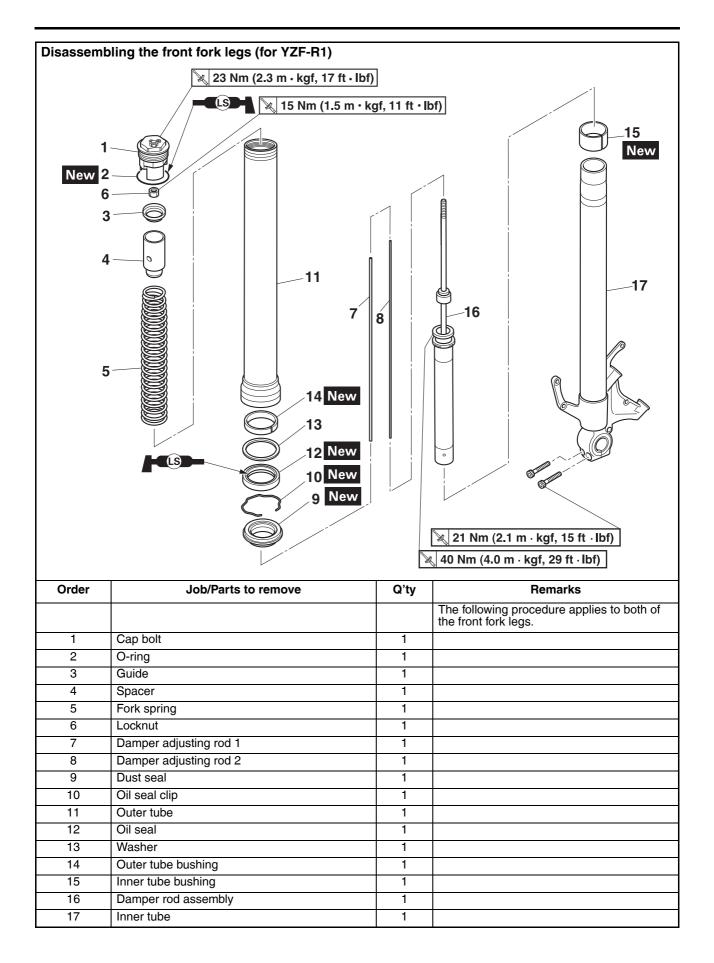


Clutch lever free play 10.0–15.0 mm (0.39–0.59 in)

Removing the front fork legs (for YZF-R1)



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Front wheel		Refer to "FRONT WHEEL" on page 4-24.
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	



REMOVING THE FRONT FORK LEGS (for YZF-R1)

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

1. Stand the vehicle on a level surface.

WARNING

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

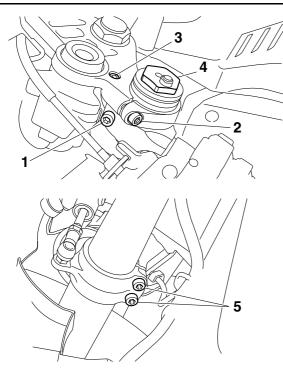
TIP -

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

- 2. Remove:
 - Front brake caliper Refer to "FRONT BRAKE" on page 4-43.
 - Front wheel Refer to "FRONT WHEEL" on page 4-24.
- 3. Loosen:
 - Handlebar pinch bolt "1"
 - Upper bracket pinch bolt "2"
 - Handlebar bolt "3"
 - Cap bolt "4"
 - Lower bracket pinch bolts "5"

WARNING

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



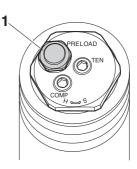
4. Remove:

Front fork leg

DISASSEMBLING THE FRONT FORK LEGS (for YZF-R1)

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

1. Turn the spring preload adjusting nut "1" counterclockwise until it stops.



2. Remove:

EAS30207

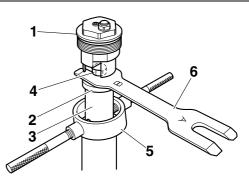
- Cap bolt "1"
 - (from the damper rod assembly)
- Guide "2"
- Spacer "3"
- Locknut "4"

- a. Press down on the spacer with the fork spring compressor "5".
- b. Install the rod holder "6" between the locknut "4" and the guide "2".

Damper rod holder double ended YM-01434
--

TIP _

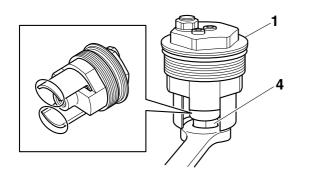
Use the side of the rod holder that is marked "B".



c. Hold the cap bolt "1" and loosen the locknut "4".

ECA17390

When loosening the nut, be sure not to break the projections on the cap bolt collar of the cap bolt.

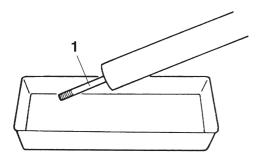


- d. Remove the cap bolt and guide.
- e. Remove the rod holder and fork spring compressor.
- f. Remove the spacer and locknut.

- 3. Drain:
- Fork oil

TIP -

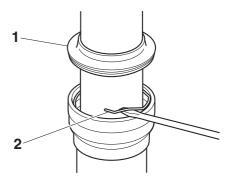
Stroke the damper rod assembly "1" several times while draining the fork oil.



- 4. Remove:
 - Dust seal "1"
 - Oil seal clip "2" (with a flat-head screwdriver)

ECA19100

Do not scratch the outer tube.

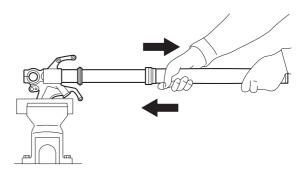


- 5. Remove:
- Outer tube

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

NOTICE

Excessive force will damage the bushings. Damaged bushings must be replaced.



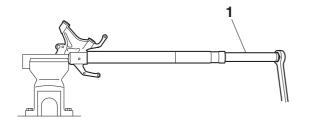
- 6. Remove:
- Damper rod assembly

TIP _

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



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



EAS30208

CHECKING THE FRONT FORK LEGS (for YZF-R1)

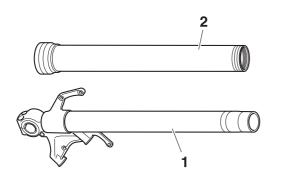
The following procedure applies to both of the front fork legs.

- 1. Check:
 - Inner tube "1"
 - Outer tube "2"

Bends/damage/scratches \rightarrow Replace.

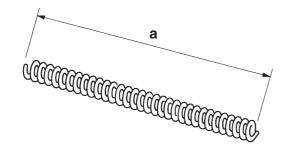
A WARNING

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.





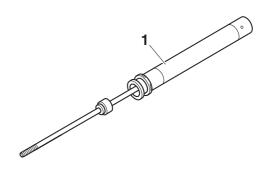
- 3. Check:
- Damper rod "1"

Damage/wear \rightarrow Replace.

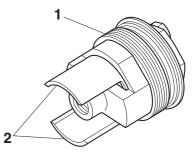
Obstruction \rightarrow Blow out all of the oil passages with compressed air.

NOTICE

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



- 4. Check:
- Cap bolt "1"
- Cap bolt collar projection "2" Cracks/damage → Replace.



EAS30209

ASSEMBLING THE FRONT FORK LEGS (for YZF-R1)

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

- Note that the amount of the fork oil is different in the left and right front fork legs. Make sure to fill each of the left and right front fork legs with the specified amount of the fork oil.
- If both front fork legs are not filled with the specified amount of the fork oil, it may cause poor handling and a loss of stability.

TIP -

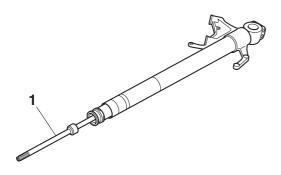
• When assembling the front fork leg, be sure to

replace the following parts:

- -Inner tube bushing
- -Outer tube bushing
- -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"

NOTICE

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



- 2. Tighten:
- Damper rod assembly



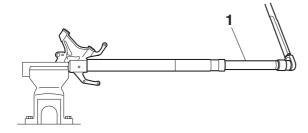
Front fork damper rod assembly (for YZF-R1) 40 Nm (4.0 m·kgf, 29 ft·lbf)

TIP

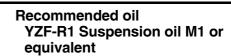
Tighten the damper rod assembly with the damper rod holder "1".



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



- 3. Lubricate:
- Inner tube's outer surface



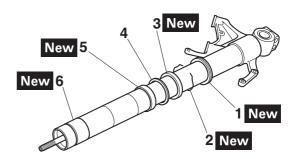
- 4. Install:
- Dust seal "1" New
- Oil seal clip "2" New
- Oil seal "3" New
- Washer "4"
- Outer tube bushing "5" New
- Inner tube bushing "6" New

ECA19170

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

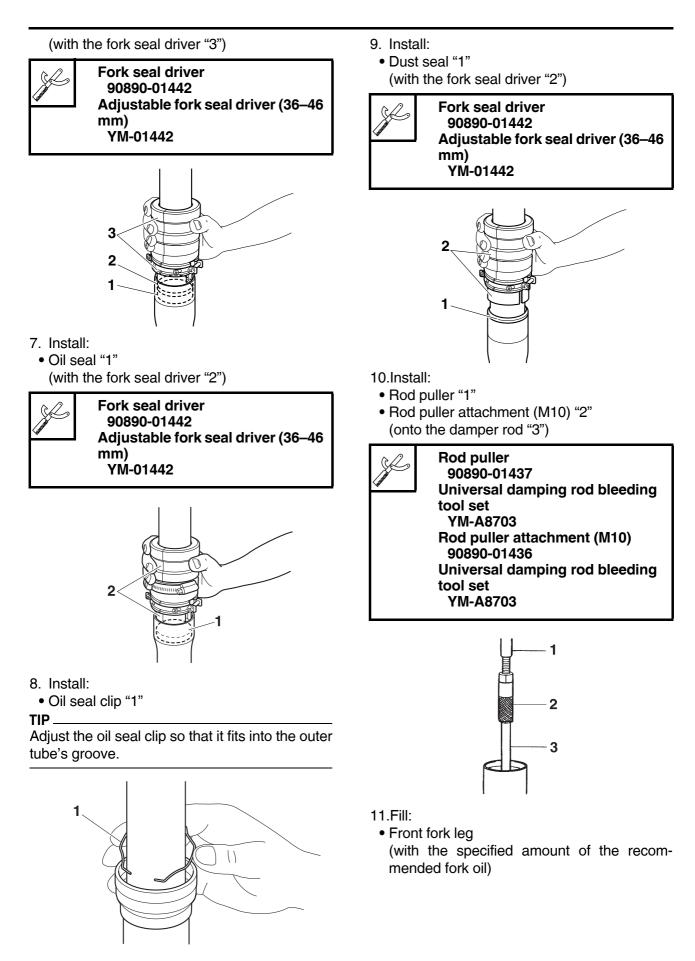
TIP -

- 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:
- Outer tube bushing "1"
- Washer "2"



·YP

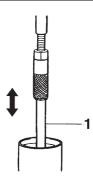
Recommended oil YZF-R1 Suspension oil M1 or equivalent Quantity YZF-R1 368.0 cm³ (12.44 US oz, 12.98 Imp.oz)

ECA14230

- 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:

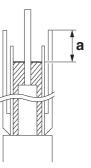
• Front fork leg oil level "a"

(from the top of the outer tube, with the outer tube fully compressed and without the fork spring)

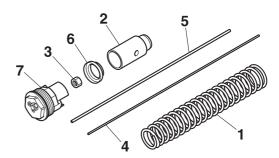
Out of specification \rightarrow Correct.



Level YZF-R1 114.0 mm (4.49 in)



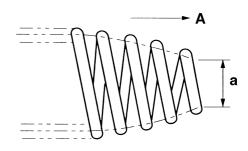
- 15.Install:
 - Fork spring "1"
- Spacer "2"
- Locknut "3"
- Damper adjusting rod 2 "4"
- Damper adjusting rod 1 "5"
- Guide "6"
- Cap bolt "7" (along with the O-ring <u>New</u>)



- a. Remove the rod puller and rod puller attachment.
- b. Install the fork spring.

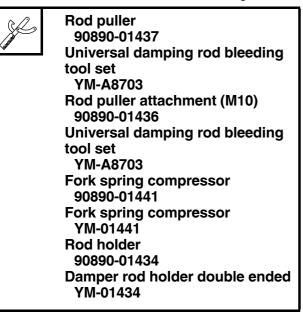
TIP -

Install the fork spring with the smaller diameter "a" facing up "A".



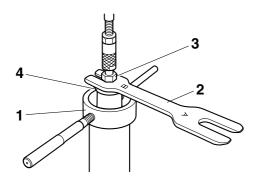
- c. Install the locknut all the way onto the damper rod assembly.
- d. Install the rod puller and rod puller attachment.
- e. Install the spacer and guide.

- f. Install the fork spring compressor.
- g. Press down on the spacer with the fork spring compressor "1".
- h. Pull up the rod puller and install the rod holder "2" between the locknut "3" and the guide "4".



TIP

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



- i. Remove the rod puller and rod puller attachment.
- j. Install the damper adjusting rods and cap bolt, and then finger tighten the cap bolt.

Always use a new cap bolt O-ring.

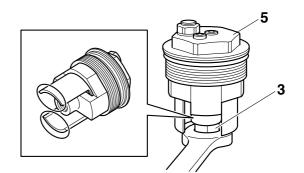
k. Hold the cap bolt "5" and tighten the locknut "3" to specification.

ECA17390

When loosening the nut, be sure not to break the projections on the cap bolt collar of the cap bolt.



Front fork cap bolt locknut (for YZF-R1) 15 Nm (1.5 m·kgf, 11 ft·lbf)



I. Remove the rod holder and fork spring compressor.

16.Install:

- Cap bolt
- (to the outer tube)

TIP

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

INSTALLING THE FRONT FORK LEGS (for YZF-R1)

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

- 1. Install:
- Front fork leg

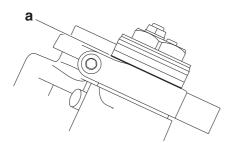
Temporarily tighten the upper and lower bracket pinch bolts.

Make sure the brake hoses are routed properly.

TIP

EWA13680

Align the outer tube with the position "a" as shown in the illustration.



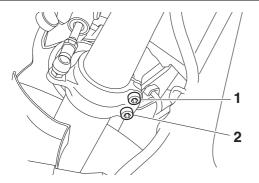
- 2. Tighten:
- Lower bracket pinch bolts "1" and "2"



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" \rightarrow pinch bolt "2" \rightarrow pinch bolt "1" \rightarrow pinch bolt "2".



- 3. Tighten:
- Cap bolt "1"

Front fork cap bolt (for YZF-R1) 23 Nm (2.3 m·kgf, 17 ft·lbf)

• Handlebar bolt "2"



7 Nm (0.7 m⋅kgf, 5.1 ft⋅lbf)

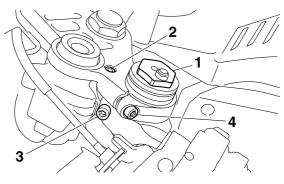
Handlebar bolt

• Handlebar pinch bolt "3"

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

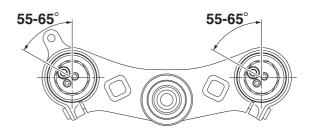
• Upper bracket pinch bolt "4"

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



TIP.

When installing the front fork legs, make sure that the spring preload adjusting nuts are positioned at the angles shown in the illustration.



- 4. Check:
 - Cable routing

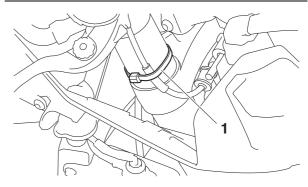
TIP _

Make sure the brake hose, throttle cables, clutch cable, and handlebar switch leads are routed properly. Refer to "CABLE ROUTING" on page 2-51.

- 5. Install:
- Plastic locking tie "1"

TIP -

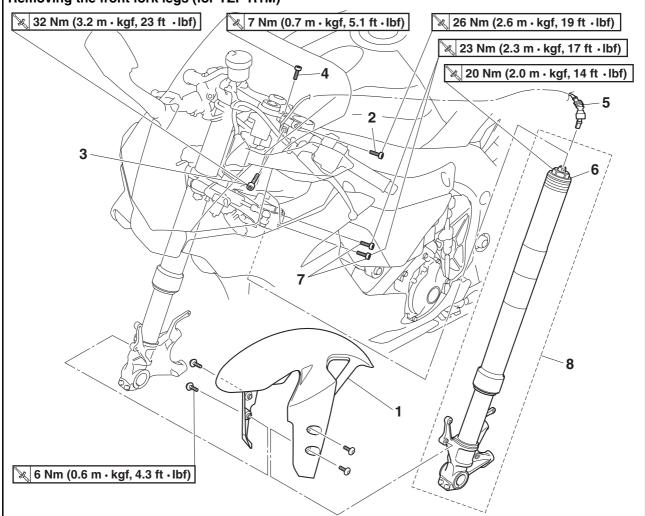
Fasten the front brake hose to the right front fork leg with the plastic locking tie.



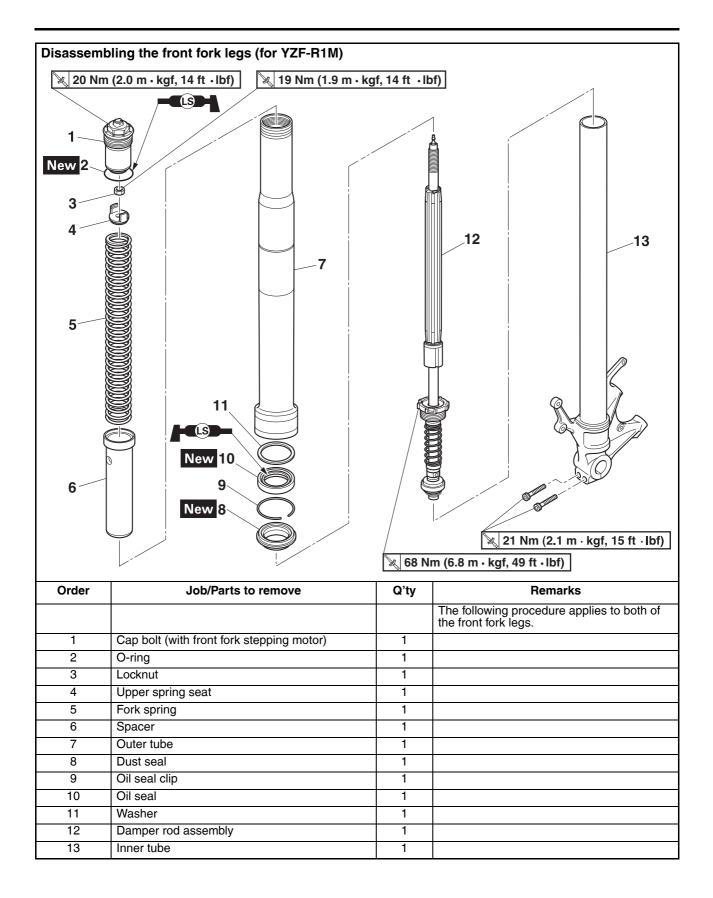
- 6. Adjust:
 - Spring preload
- Rebound damping
- Compression damping

Refer to "ADJUSTING THE FRONT FORK LEGS (for YZF-R1)" on page 3-23.

Removing the front fork legs (for YZF-R1M)



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Front wheel		Refer to "FRONT WHEEL" on page 4-24.
1	Front fender	1	
2	Upper bracket pinch bolt	1	Loosen.
3	Handlebar pinch bolt	1	Loosen.
4	Handlebar bolt	1	Loosen.
5	Front fork stepping motor coupler	1	Disconnect.
6	Cap bolt (with front fork stepping motor)	1	Loosen.
7	Lower bracket pinch bolt	2	Loosen.
8	Front fork leg	1	



REMOVING THE FRONT FORK LEGS (for YZF-R1M)

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

1. Stand the vehicle on a level surface.

WARNING

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

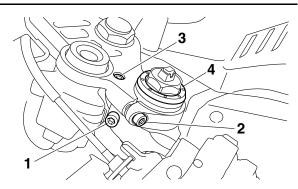
TIP -

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

- 2. Remove:
 - Front brake caliper Refer to "FRONT BRAKE" on page 4-43.
 - Front wheel Refer to "FRONT WHEEL" on page 4-24.
- 3. Disconnect:
 - Front fork stepping motor coupler
- 4. Loosen:
 - Handlebar pinch bolt "1"
 - Upper bracket pinch bolt "2"
 - Handlebar bolt "3"
 - Cap bolt "4"
 - Lower bracket pinch bolts "5"

WARNING

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

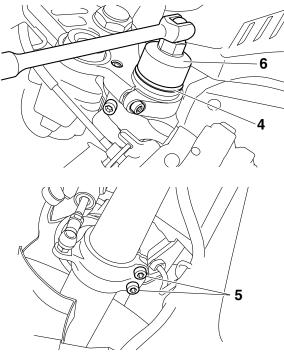


TIP

Loosen the cap bolt "4" using the front fork cap bolt wrench "6".



Front fork cap bolt wrench 42mm 90890-01575 YM-01575



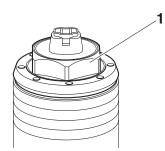
- 5. Remove:
 - Front fork leg

EAS31649

DISASSEMBLING THE FRONT FORK LEGS (for YZF-R1M)

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

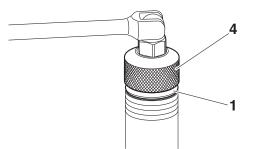
1. Turn the spring preload adjusting bolt "1" counterclockwise until it stops.



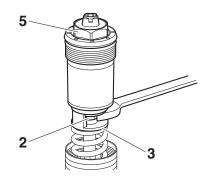
- 2. Remove:
- Cap bolt "1"
 - (from the damper rod assembly)
- Locknut "2"
- Upper spring seat "3"
- ****
- a. Loosen the cap bolt "1" using the front fork cap bolt wrench "4" and then remove it from the outer tube.



Front fork cap bolt wrench 42mm 90890-01575 YM-01575



b. Hold the spring preload adjusting bolt "5" and loosen the locknut.

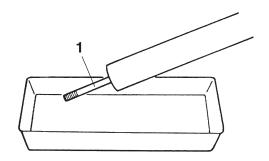


c. Remove the cap bolt, locknut and upper spring seat.

- 3. Drain:
- Fork oil

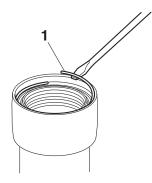
TIP -

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



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

- Oil seal
- Washer



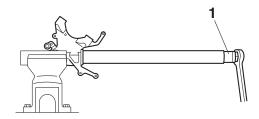
- 6. Remove:
- Damper rod assembly

TIP -

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



Damper rod holder 90890-01504 Damper rod holder YM-01504



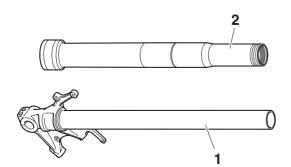


CHECKING THE FRONT FORK LEGS (for YZF-R1M)

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

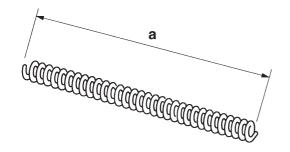
- 1. Check:
 - Inner tube "1"
- Outer tube "2"
- Bends/damage/scratches \rightarrow Replace.

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.



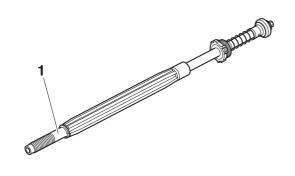


- 3. Check:
- Damper rod "1"
- Damage/wear \rightarrow Replace.

Obstruction \rightarrow Blow out all of the oil passages with compressed air.

ECA19110

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



4. Check:

• Cap bolt "1"

Cracks/damage \rightarrow Replace.



EAS31651

ASSEMBLING THE FRONT FORK LEGS (for YZF-R1M)

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

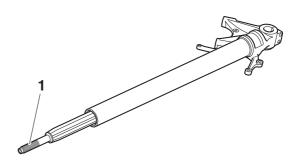
- Note that the amount of the fork oil is different in the left and right front fork legs. Make sure to fill each of the left and right front fork legs with the specified amount of the fork oil.
- If both front fork legs are not filled with the specified amount of the fork oil, it may cause poor handling and a loss of stability.

TIP

- When assembling the front fork leg, be sure to replace the following parts:
 - –Oil seal
 - -Dust seal
 - -O-ring
- Before assembling the front fork leg, make sure all of the components are clean.
- 1. Install:
 - Damper rod assembly "1"

ECA22560

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



- 2. Tighten:
- Damper rod assembly



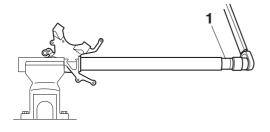
Front fork damper rod assembly (for YZF-R1M) 68 Nm (6.8 m·kgf, 49 ft·lbf)

TIP -

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



Damper rod holder 90890-01504 Damper rod holder YM-01504



- 3. Lubricate:
- Inner tube's outer surface



Recommended oil YZF-R1M Suspension oil M1 or Ohlins R&T 43

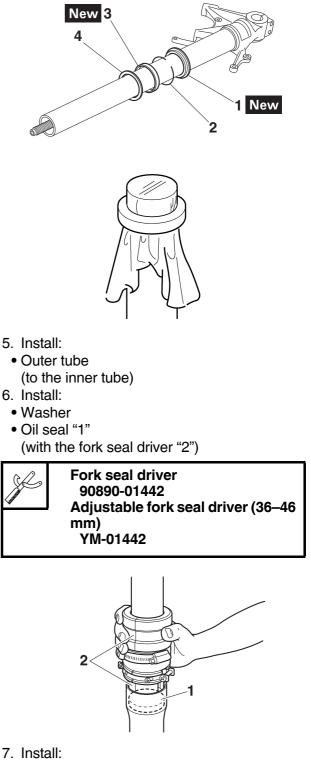
- 4. Install:
 - Dust seal "1" New
 Oil seal clip "2"
- Oil seal "3" New
- Washer "4"

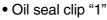
ECA19170 NOTICE

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

TIP

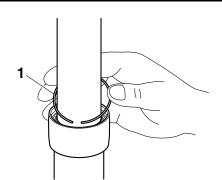
- Before installing the oil seal, lubricate its lips with lithium-soap-based grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag to protect the oil seal during installation.





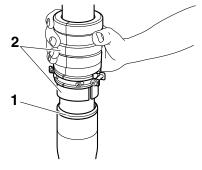
TIP_

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 "2")

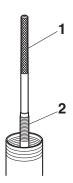




- 9. Install:
- Rod puller "1" (onto the damper rod "2")



Front fork rod puller M7x0.75 90890-01576 YM-01576



- 10.Fill:
 - Front fork leg

(with the specified amount of the recommended fork oil)

Recommended oil

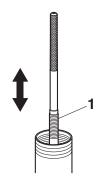
YZF-R1M Suspension oil M1 or Ohlins R&T 43 Quantity YZF-R1M 405.0 cm³ (13.69 US oz, 14.28 Imp.oz)

ECA14230

- Be sure to use the recommended fork oil. Other oils may have an adverse effect on front fork performance.
- When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.
- 11.After filling the front fork leg, slowly stroke the damper rod "1" up and down (at least ten times) to distribute the fork oil.



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



12.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.

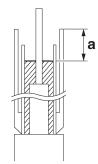
13.Measure:

• Front fork leg oil level "a"

(from the top of the outer tube, with the outer tube fully compressed and without the fork spring)

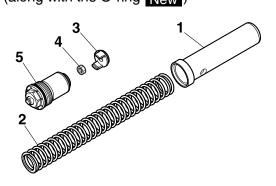
Out of specification \rightarrow Correct.





14.Install:

- Spacer "1"
- Fork spring "2"
- Upper spring seat "3"
- Locknut "4"
- Cap bolt "5" (along with the O-ring New)

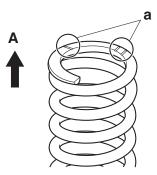


a. Install the rod puller.

b. Install the spacer and fork spring.

TIP -

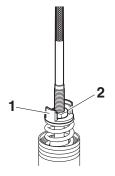
Install the fork spring with the marks "a" facing up "A".



- c. Install the upper spring seat "1".
- d. Install the locknut "2" all the way onto the damper rod assembly.



Front fork rod puller M7x0.75 90890-01576 YM-01576



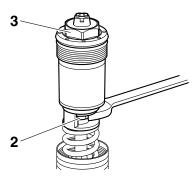
- e. Remove the rod puller.
- f. Install the cap bolt completely, and then finger tighten the cap bolt.

Always use a new cap bolt O-ring.

g. Hold the spring preload adjusting bolt "3" and tighten the locknut "2" to specification.



Front fork cap bolt locknut (for YZF-R1M) 19 Nm (1.9 m·kgf, 14 ft·lbf)



.....

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

TIP

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

EAS31652

INSTALLING THE FRONT FORK LEGS (for YZF-R1M)

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

- 1. Install:
 - Front fork leg

Temporarily tighten the upper and lower

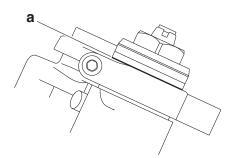
bracket pinch bolts.

WARNING

Make sure the brake hoses are routed properly.

TIP -

Align the outer tube with the position "a" as shown in the illustration.



2. Tighten:

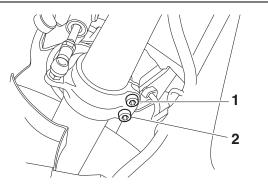
• Lower bracket pinch bolts "1" and "2"



Lower bracket pinch bolt 23 Nm (2.3 m·kgf, 17 ft·lbf)

TIP

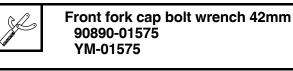
Tighten each bolt to 23 Nm (2.3 m·kgf, 17 ft·lbf) in the order pinch bolt "1" \rightarrow pinch bolt "2" \rightarrow pinch bolt "1" \rightarrow pinch bolt "2".



- 3. Tighten:
- Cap bolt "1"

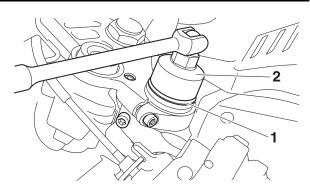
TIP

Tighten the cap bolt "1" using the front fork cap bolt wrench "2".

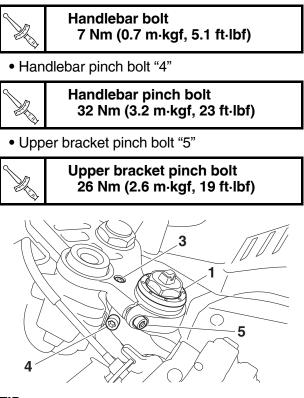




Front fork cap bolt (for YZF-R1M) 20 Nm (2.0 m·kgf, 14 ft·lbf)

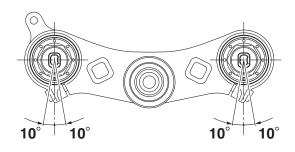


• Handlebar bolt "3"



TIP

When installing the front fork legs, make sure that the front fork stepping motor couplers are positioned at the angles shown in the illustration.



- 4. Check:
- Cable routing

TIP ____

Make sure the brake hose, throttle cables, clutch

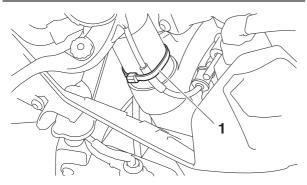
cable, and handlebar switch leads are routed properly. Refer to "CABLE ROUTING" on page 2-51.

5. Install:

• Plastic locking tie "1"

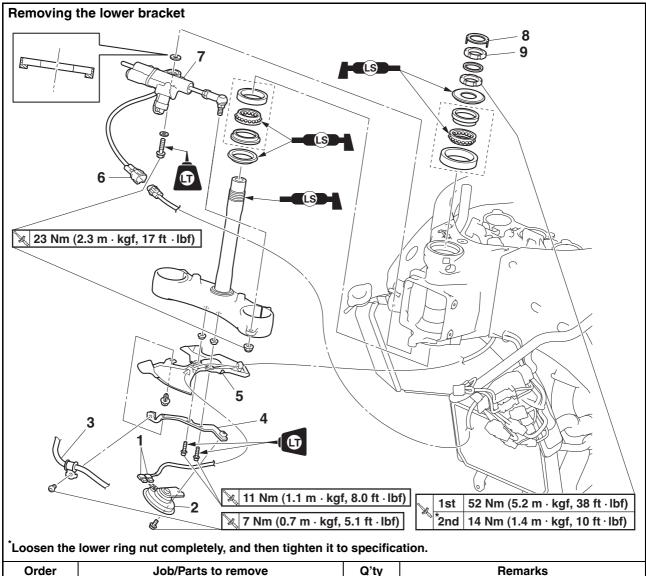
TIP __

Fasten the front brake hose to the right front fork leg with the plastic locking tie.

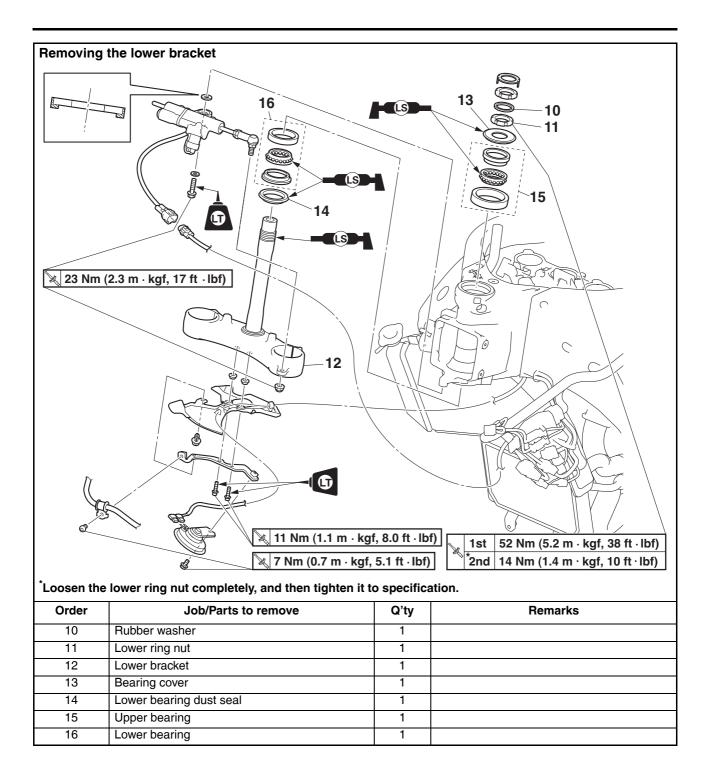


- 6. Adjust:
 - Spring preload
 - Rebound damping
 - Compression damping Refer to "ADJUSTING THE PRELOAD OF THE FRONT FORK LEGS (for YZF-R1M)" on page 3-24 and "ADJUSTING THE DAMP-ING FORCE OF THE FRONT FORK LEGS AND REAR SHOCK ABSORBER ASSEM-BLY (for YZF-R1M)" on page 3-25.

STEERING HEAD



Order	Job/Parts to remove	Q'ty	Remarks
	Front cowling assembly/Air intake duct		Refer to "GENERAL CHASSIS (3)" on page 4-17.
	Front wheel		Refer to "FRONT WHEEL" on page 4-24.
	Front fork legs		Refer to "FRONT FORK (for YZF-R1)" on page 4-79 or refer to "FRONT FORK (for YZF-R1M)" on page 4-90.
	Upper bracket/Handlebars		Refer to "HANDLEBARS" on page 4-74.
1	Horn connector	2	Disconnect.
2	Horn	1	
3	Front brake hose	1	
4	Horn bracket	1	
5	Lower bracket cover	1	
6	Steering damper solenoid coupler	1	Disconnect.
7	Steering damper solenoid	1	
8	Lock washer	1	
9	Upper ring nut	1	



REMOVING THE LOWER BRACKET

1. Stand the vehicle on a level surface.

EWA13120

EAS20212

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

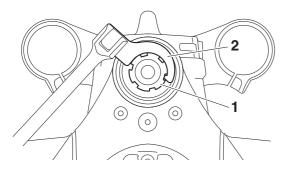
- 2. Remove:
 - Upper ring nut
 - Rubber washer
 - Lower ring nut "1"
 - Lower bracket
- EWA13730

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

TIP

- Hold the lower ring nut with steering nut wrench, and then remove the upper ring nut with the ring nut wrench.
- Remove the lower ring nut with the steering nut wrench "2".





EAS30214 CHECKING THE STEERING HEAD

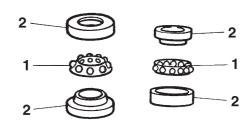
- 1. Wash:
- Bearing
- Bearing race



Recommended cleaning solvent Kerosene

- 2. Check:
 - Bearing "1"
 - Bearing race "2"

Damage/pitting \rightarrow Replace the bearings and bearing races as a set.



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

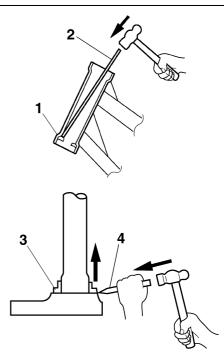
ECA14270

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.
- Whenever the steering head is disassembled, replace the dust seal.



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

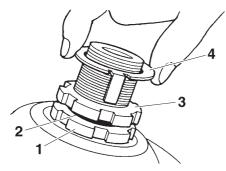
EAS30216 INSTALLING THE STEERING HEAD

- 1. Lubricate:
 - Upper bearing
 - Lower bearing



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 3-21.



- 3. Install:
 - Upper bracket
 - Steering stem nut

Refer to "HANDLEBARS" on page 4-74.

TIP -

Temporarily tighten the steering stem nut.

4. Install:

• Front fork legs

Refer to "FRONT FORK (for YZF-R1)" on page 4-79 or refer to "FRONT FORK (for YZF-R1M)" on page 4-90.

TIP -

Temporarily tighten the upper and lower bracket pinch bolts.

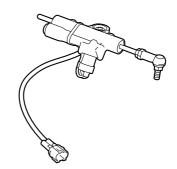
EAS30215

CHECKING THE STEERING DAMPER

- 1. Check:
 - Steering damper body Damage/oil leaks → Replace the steering

damper assembly.

- Steering damper rod Bends/scratch → Replace the steering damper assembly.
- Bearing
 - Damage/pitting \rightarrow Replace the steering damper assembly.

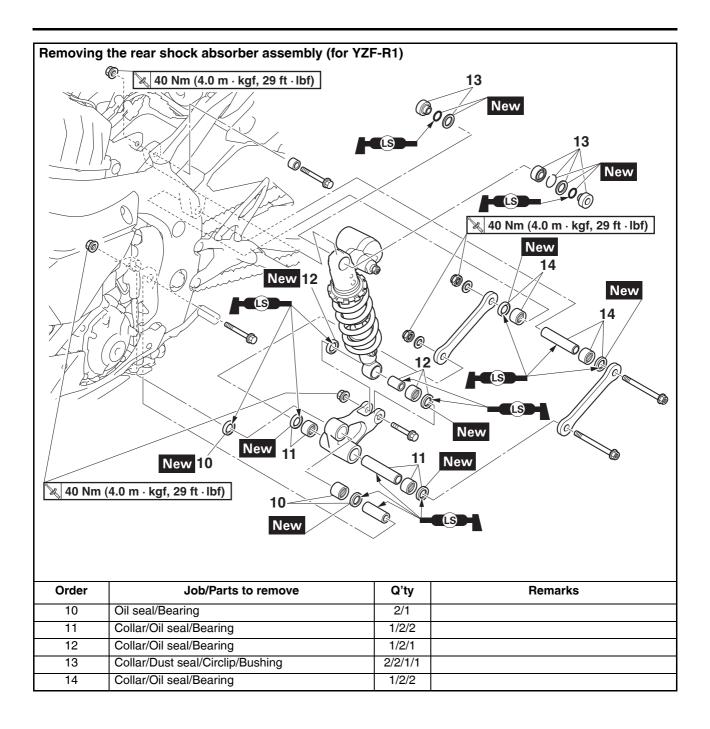


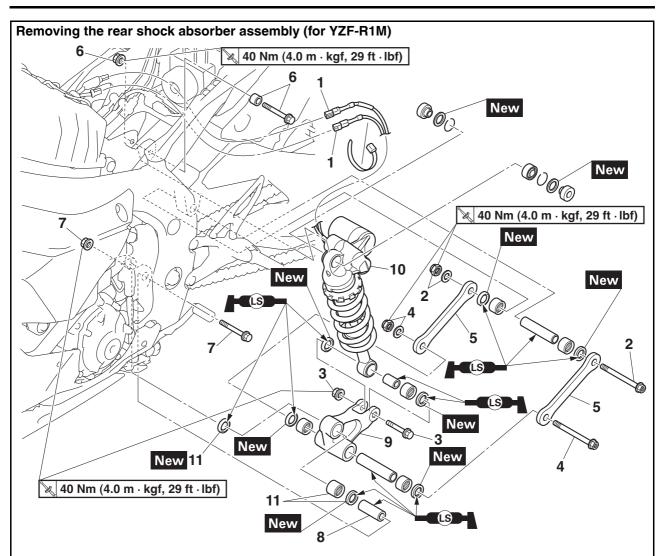
REAR SHOCK ABSORBER ASSEMBLY Removing the rear shock absorber assembly (for YZF-R1) 5 C 🔌 40 Nm (4.0 m · kgf, 29 ft · lbf) *o*o New LS 00000 New 🔌 40 Nm (4.0 m · kgf, 29 ft · lbf) 6 9 New 16 New Øe New 1 ſQ. 'Ŕ© LS 3 7 6 To Ci LS LS Δ Ċ 2 New (0 New New New 3 0_ę 🔌 40 Nm (4.0 m · kgf, 29 ft · lbf) LS New 7

EAS20036

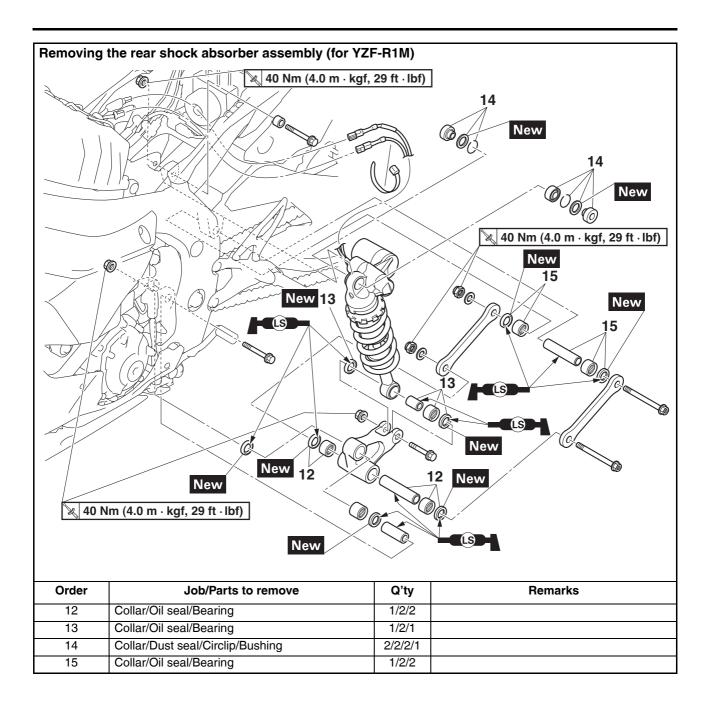
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-55.
	Rear wheel		Refer to "REAR WHEEL" on page 4-34.
1	Connecting arm upper nut/Washer/Bolt	1/1/1	
2	Rear shock absorber assembly lower nut/Bolt	1/1	
3	Connecting arm lower nut/Washer/Bolt	1/1/1	
4	Connecting arm	2	
5	Rear shock absorber assembly upper nut/Col- lar/Bolt	1/1/1	
6	Relay arm nut/Bolt	1/1	
7	Collar	1	
8	Relay arm	1	
9	Rear shock absorber assembly	1	

4-104





Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-55.
	Rear wheel		Refer to "REAR WHEEL" on page 4-34.
1	Rear shock absorber assembly stepping motor coupler	2	Disconnect.
2	Connecting arm upper nut/Washer/Bolt	1/1/1	
3	Rear shock absorber assembly lower nut/Bolt	1/1	
4	Connecting arm lower nut/Washer/Bolt	1/1/1	
5	Connecting arm	2	
6	Rear shock absorber assembly upper nut/Col- lar/Bolt	1/1/1	
7	Relay arm nut/Bolt	1/1	
8	Collar	1	
9	Relay arm	1	
10	Rear shock absorber assembly	1	
11	Oil seal/Bearing	2/1	



EAS30826 HANDLING THE REAR SHOCK ABSORBER EWA13740

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.

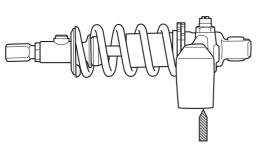
EAS30729

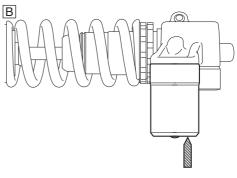
DISPOSING OF A REAR SHOCK ABSORBER

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.

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







A. YZF-R1 B. YZF-R1M

EAS30219

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

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

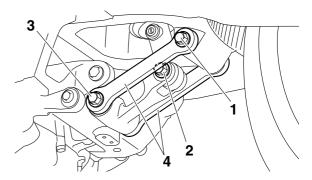
TIP

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

- 2. Remove:
 - Connecting arm upper nut
 - Connecting arm upper bolt "1"
 - Rear shock absorber assembly lower nut
 - Rear shock absorber assembly lower bolt "2"
 - Connecting arm lower nut
 - Connecting arm lower bolt "3"
- Connecting arm "4"

TIP -

When removing the bolt, hold the swingarm so that it does not drop down.



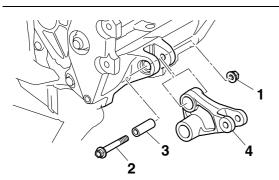
- 3. Remove:
- Rear shock absorber assembly upper nut
- Rear shock absorber assembly upper bolt
- 4. Remove:
 - Relay arm nut "1"
 - Relay arm bolt "2"

REAR SHOCK ABSORBER ASSEMBLY

- Collar "3"
- Relay arm "4"

TIP_

Pull out the collar "3" from the left side of the vehicle.



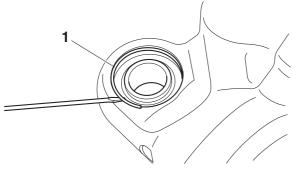
- 5. Remove:
 - Rear shock absorber assembly

EAS31653

DISASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY

- 1. Remove:
- Collar
- Dust seal
- 2. Remove:
- Circlip "1"

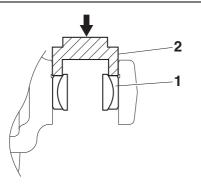
(with a flat-head screwdriver)



- 3. Remove:
- Bushing "1"

TIP -

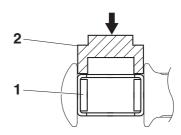
Remove the bushing with a socket "2" that matches its outside diameter.



- 4. Remove:
- Oil seal
- Bearing "1"

TIP _

Remove the bearing with a socket "2" that matches its outside diameter.

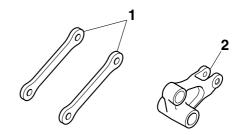


CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

- 1. Check:
 - Rear shock absorber rod Bends/damage → Replace the rear shock absorber assembly.
 - Rear shock absorber assembly Gas leaks/oil leaks → Replace the rear shock absorber assembly.
 - Spring
 - Bushings
 - Damage/wear \rightarrow Replace the bushings.
 - Bolts Bends/damage/wear \rightarrow Replace.

CHECKING THE CONNECTING ARM AND RELAY ARM

- 1. Check:
 - Connecting arms "1"
 - Relay arm "2" Damage/wear → Replace.



- 2. Check:
 - Bearings
 - Oil seals

4-109

Damage/pitting \rightarrow Replace.

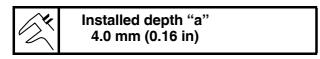
- 3. Check:
 - Collars Damage/scratches → Replace.

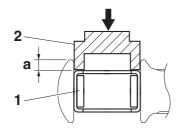
ASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY

- 1. Install:
 - Bearing "1"
 - Oil seal New

TIP __

Install the bearing with a socket "2" that matches its outside diameter.





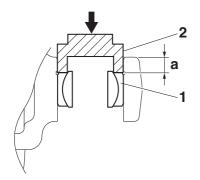
- 2. Install:
 - Bushing "1"
 - Circlip New (for YZF-R1)
 - Circlip (for YZF-R1M)
 - Dust seal New

TIP

Install the bushing with a socket "2" that matches its outside diameter.



Installed depth "a" YZF-R1 6.0 mm (0.24 in) YZF-R1M 3.0 mm (0.12 in)



INSTALLING THE RELAY ARM

- 1. Lubricate:
 - Collars
 - Oil seals



EAS30333

Recommended lubricant Lithium-soap-based grease

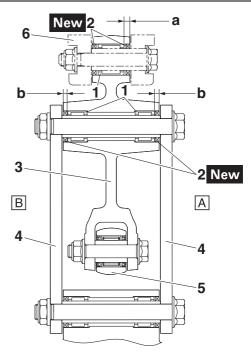
- 2. Install:
- Bearings "1" (to the relay arm)
- Oil seals "2" <u>New</u> (to the relay arm)



Installed depth "a" 4.5 mm (0.18 in) Installed depth "b" 3.5 mm (0.14 in)

TIP -

- When installing the oil seals "2" to the relay arm, face the character stamp of the oil seals outside.
- Press in the oil seal so it does not protrude from the end surface of the relay arm.



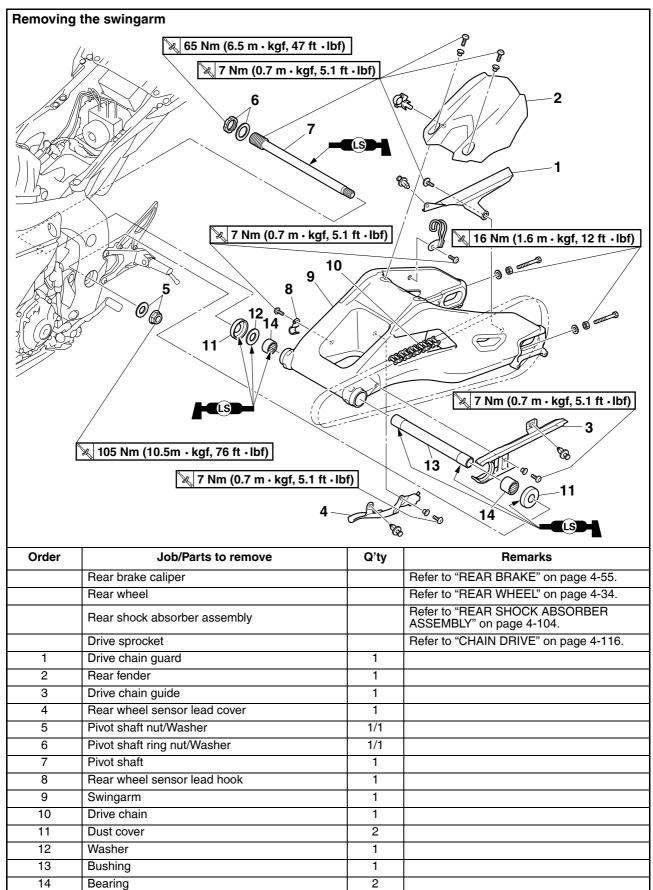
- 3. Relay arm
- 4. Connecting arm
- 5. Rear shock absorber assembly
- 6. Frame
- A. Left side
- B. Right side

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

- 1. Install:
- Rear shock absorber assembly
- Relay arm
- Connecting arm
- TIP -
- Install the rear shock absorber assembly upper bolt, relay arm bolt, connecting arm lower bolt and connecting arm upper bolt from the left.
- When installing the rear shock absorber assembly, lift up the swingarm.
- 2. Tighten:
 - Relay arm nut
 - Rear shock absorber assembly upper nut
 - Connecting arm lower nut
 - Rear shock absorber assembly lower nut
 - Connecting arm upper nut

Relay arm nut 40 Nm (4.0 m·kgf, 29 ft·lbf) Rear shock absorber assembly upper nut 40 Nm (4.0 m·kgf, 29 ft·lbf) Connecting arm lower nut 40 Nm (4.0 m·kgf, 29 ft·lbf) Rear shock absorber assembly lower nut 40 Nm (4.0 m·kgf, 29 ft·lbf) Connecting arm upper nut 40 Nm (4.0 m·kgf, 29 ft·lbf)

EAS20037 SWINGARM



EAS30226 REMOVING THE SWINGARM

1. Stand the vehicle on a level surface.

WARNING

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

TIP -

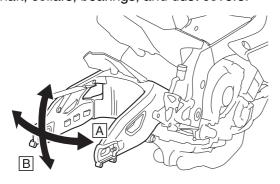
Place the vehicle on a suitable stand so that the rear wheel is elevated.

- 2. Remove:
 - Rear shock absorber assembly Refer to "REAR SHOCK ABSORBER AS-SEMBLY" on page 4-104.
- 3. Measure:
 - Swingarm side play
 - Swingarm vertical movement

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

Pivot shaft nut 105 Nm (10.5 m·kgf, 76 ft·lbf) Pivot shaft ring nut 65 Nm (6.5 m·kgf, 47 ft·lbf) Pivot shaft 7 Nm (0.7 m·kgf, 5.1 ft·lbf)

- b. Check the swingarm side play "A" by moving the swingarm from side to side.
 If the swingarm has side-to-side play, check the collars, bearings, and dust covers.
- c. Check the swingarm vertical movement "B" by moving the swingarm up and down.
 If the swingarm vertical movement is not smooth or if there is binding, check the pivot shaft, collars, bearings, and dust covers.



- 4. Remove:
- Drive chain

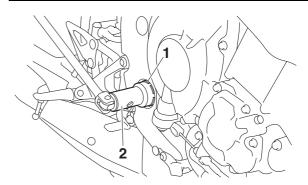
Refer to "REMOVING THE DRIVE CHAIN" on page 4-117.

- 5. Remove:
- Pivot shaft nut
- Pivot shaft ring nut "1"

TIP -

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

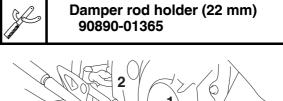


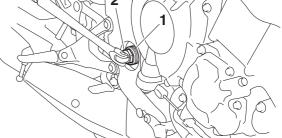


- 6. Remove:
- Pivot shaft "1"

TIP _

Loosen the pivot shaft with the damper rod holder (22 mm) "2".





- 7. Remove:
- Swingarm

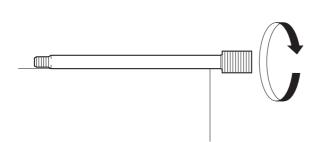
EAS30227

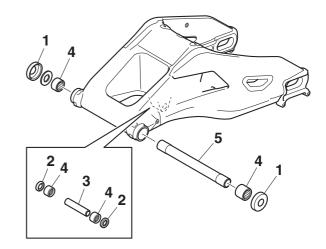
CHECKING THE SWINGARM

- 1. Check:
 - Swingarm Bends/cracks/damage \rightarrow 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
 - Collar
 - Bushing
 - Washer

Recommended cleaning solvent Kerosene

- 4. Check:
- Dust covers "1"
- Oil seals "2"
- Damage/wear → Replace. • Collar "3"
- Damage/scratches \rightarrow Replace.
- Bearings "4" Damage/pitting \rightarrow Replace.
- Bushing "5" Damage/pitting \rightarrow Replace.

EAS30228 INSTALLING THE SWINGARM

- 1. Lubricate:
 - Dust covers
 - Pivot shaft
 - Oil seals
 - Collar
 - Bushing

- Install:
 Bearings "1"
 - (to the swingarm)
 - Oil seals "2" <u>New</u> (to the swingarm)

In (In

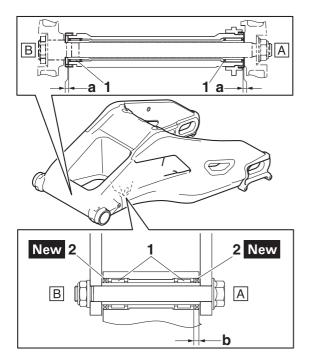
Installed depth "a" 0–1.0 mm (0–0.04 in) Installed depth "b" 4.0 mm (0.16 in)

Recommended lubricant

Lithium-soap-based grease

TIP_

- When installing the oil seals to the swingarm, face the character stamp of the oil seals outside.
- Press in the oil seal so it does not protrude from the end surface of the swingarm.



- A. Left side
- B. Right side
- 3. Install:
 - Swingarm
 - Pivot shaft "1"

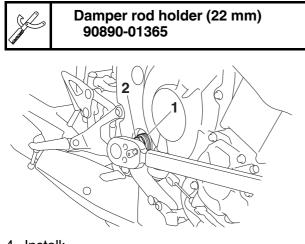


Pivot shaft

7 Nm (0.7 m·kgf, 5.1 ft·lbf)

TIP -

Tighten the pivot shaft with the damper rod holder (22 mm) "2".



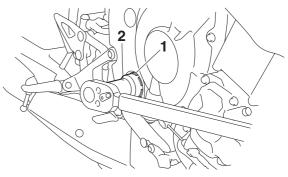
- 4. Install:
 - Pivot shaft ring nut "1"

Pivot shaft ring nut 65 Nm (6.5 m·kgf, 47 ft·lbf)

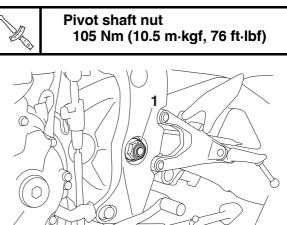
TIP __

Tighten the pivot shaft ring nut with the ring nut wrench "2".





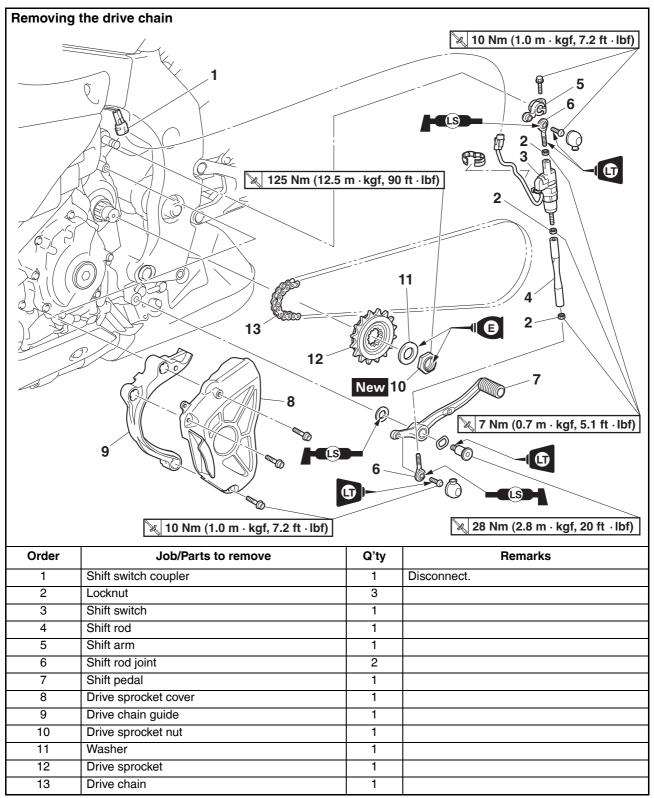
- 5. Install:
- Pivot shaft nut "1"



- 6. Install:
 - Drive chain Refer to "INSTALLING THE DRIVE CHAIN" on page 4-119.
 - Rear shock absorber assembly Refer to "REAR SHOCK ABSORBER AS-SEMBLY" on page 4-104
 - Rear wheel
 - Refer to "REAR WHEEL" on page 4-34.
- 7. Adjust:
 - Drive chain slack Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-19.



CHAIN DRIVE



REMOVING THE DRIVE CHAIN

1. Stand the vehicle on a level surface. EWA13120

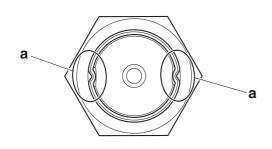
Securely support the vehicle so that there is no danger of it falling over.

TIP.

EAS30330

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

2. Straighten the drive sprocket nut rib "a".



- 3. Remove:
- Drive chain

ECA17410 NOTICE

Be sure to put on safety goggles when working.

TIP

Cut the drive chain with the drive chain cut & rivet tool.



Drive chain cut & rivet tool 90890-01550 Drive chain cut & rivet tool YM-01550

E4530230

CHECKING THE DRIVE CHAIN

- 1. Measure:
- 15-link section "a" of the drive chain Out of specification \rightarrow Replace the drive chain.



15-link length limit 239.3 mm (9.42 in)

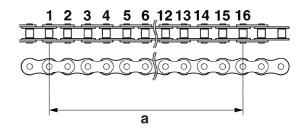
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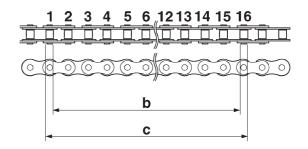
- a. Measure the length "b" between the inner sides of the pins and the length "c" between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.
- b. Calculate the length "a" of the 15-link section of the drive chain using the following formula.

Drive chain 15-link section length "a" = (length "b" between pin inner sides + length "c" between pin outer sides)/2

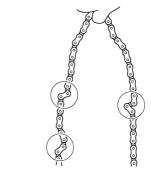
TIP_

- 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 \rightarrow Clean and lubricate or replace.

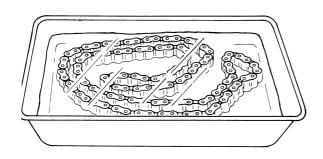


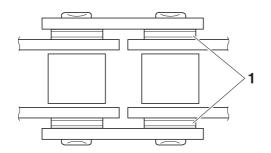
- 3. Clean:
 - Drive chain

- 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.

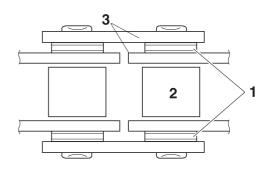
NOTICE

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

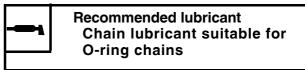




- 4. Check:
- O-rings "1"
- Damage → Replace the drive chain. • Drive chain rollers "2"
 - Damage/wear \rightarrow Replace the drive chain.
- Drive chain side plates "3" Damage/wear/cracks → Replace the drive chain.



- 5. Lubricate:
- Drive chain



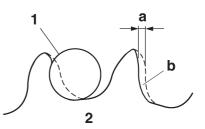
EAS30231

CHECKING THE DRIVE SPROCKET

- 1. Check:
- Drive sprocket

More than 1/4 tooth "a" wear \rightarrow Replace the drive sprocket, the rear wheel sprocket and the drive chain as a set.

Bent teeth \rightarrow Replace the drive sprocket, the rear wheel sprocket and the drive chain as a set.



- b. Correct
- 1. Drive chain roller
- 2. Drive sprocket
- FAS30232

CHECKING THE REAR WHEEL SPROCKET

Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-38.

CHECKING THE REAR WHEEL DRIVE HUB Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-38.

EAS30234 INSTALLING THE DRIVE CHAIN

- 1. Install:
- Drive chain

ECA17410

Be sure to put on safety goggles when working.

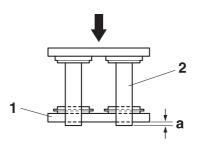
TIP -

Install the drive chain joint with the drive chain cut & rivet tool.

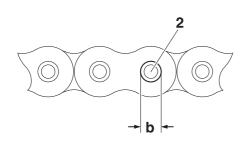


Drive chain cut & rivet tool 90890-01550 Drive chain cut & rivet tool YM-01550

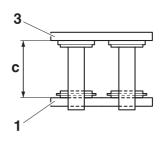
a. When press fitting the connecting plate "1", make sure the space "a" between the end of the connecting pin "2" and the connecting plate is 1.2–1.4 mm (0.05–0.06 in).



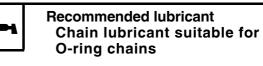
b. After riveting, make sure the diameter between the edges "b" of the connecting pin "2" is 5.7–6.0 mm (0.22–0.24 in).



c. After riveting, make sure the space "c", which is inside of the connecting link "3" and inside of the connecting plate "1", is 14.35–14.55 mm (0.565–0.573 in).



- 2. Lubricate:
 - Drive chain



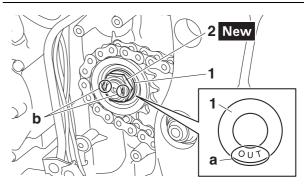
- 3. Install:
 - Drive sprocket
- Washer "1"
- Drive sprocket nut "2" New



Drive sprocket nut 125 Nm (12.5 m·kgf, 90 ft·lbf)

TIP -

- While applying the rear brake, tighten the drive sprocket nut.
- Install washer "1" with the "OUT" mark "a" facing out.
- Stake the drive sprocket nut "2" at cutouts "b" in the drive axle.



4. Install:

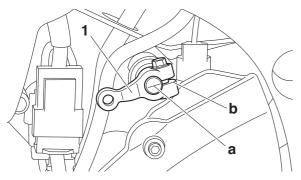
• Shift arm "1"

TIP ____

Before installing, make sure to align the mark "a" of the shift shaft with the slot "b" of the shift arm.

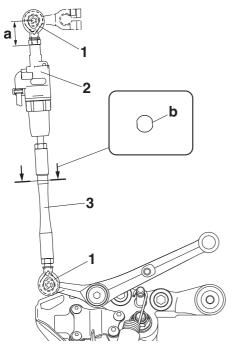


Shift arm bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)



- 5. Install:
- Shift rod joint "1"
- Shift switch "2"
- Shift rod "3"
- TIP.
- Install the shift rod joint and shift switch in the direction shown in the illustration.
- The allowable twist of the shift rod joint and shift switch is ±5°.
- Install the shift rod so that the side "b" faces upward as shown in the illustration.

Shift rod joint bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE® Shift switch locknut 7 Nm (0.7 m·kgf, 5.1 ft·lbf)



- a. 24 mm (0.94 in)
- 6. Adjust:
 - Installed shift rod length Refer to "ADJUSTING THE SHIFT PEDAL"

- on page 4-120.
- 7. Adjust:
 - Drive chain slack Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-19.



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.

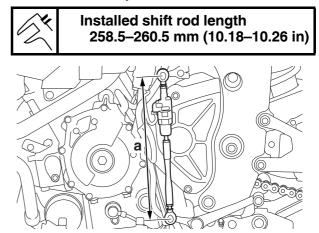
EAS31729

ADJUSTING THE SHIFT PEDAL

TIP

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

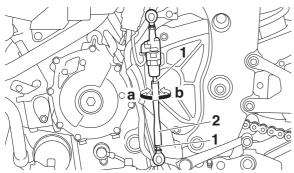
- 1. Measure:
- Installed shift rod length "a" Incorrect \rightarrow Adjust.



- 2. Adjust:
 - Installed shift rod length

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

Direction "a" Installed shift rod length increases. **Direction "b"** Installed shift rod length decreases.



c. Tighten both locknuts.

TIP -

Be sure to place the shift rod joints in parallel. The allowable twist of the shift rod joints is $\pm 5^{\circ}$.



Shift rod locknut 7 Nm (0.7 m·kgf, 5.1 ft·lbf)

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

ENGINE

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ENGINE INSPECTION

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 CLEAR-ANCE" on page 3-5.
- 2. Start the engine, warm it up for several minutes, and then turn it off.
- 3. Remove:
- Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Fuel tank Refer to "FUEL TANK" on page 7-1.
- Air filter case Refer to "AIR FILTER CASE" on page 7-4.
- Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-19.
- Ignition coils
- Spark plugs

Refer to "CAMSHAFTS" on page 5-9.

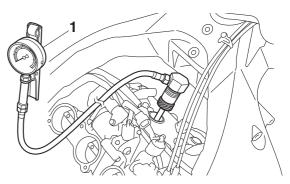
NOTICE

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.

- 4. Install:
 - Compression gauge "1"



Compression gauge 90890-03081 Engine compression tester YU-33223



- 5. Measure:
- Compression pressure

Out of specification \rightarrow Refer to steps (c) and (d).

A.	Standard compression pressure (at sea level) 1450 kPa/250 r/min (14.5 kgf/cm ² /250 r/min, 206.2 psi/250 r/min) Minimum–maximum 1260–1630 kPa/250 r/min (12.6– 16.3 kgf/cm ² /250 r/min, 179.2–
	16.3 kgf/cm²/250 r/min, 179.2– 231.8 psi/250 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.

WARNING

To prevent sparking the plug, remove all ignition coil couplers and fuel injector couplers before cranking the engine.

TIP -

The difference in compression pressure between cylinders should not exceed 100 kPa (1 kgf/cm², 15 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 \rightarrow 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 \rightarrow Repair.	
Same as without oil	Piston, valves, cylinder head gasket possibly defective \rightarrow Repair.	

6. Install:

Spark plugs



Spark plug 13 Nm (1.3 m·kgf, 9.4 ft·lbf) Spark plug (new) 18 Nm (1.8 m·kgf, 13 ft·lbf)

TIP.

- Before installing the spark plug, clean the spark plug and gasket surface.
- If the spark plug is a new one, tighten it to 18 Nm (1.8 m·kgf, 13 ft·lbf).

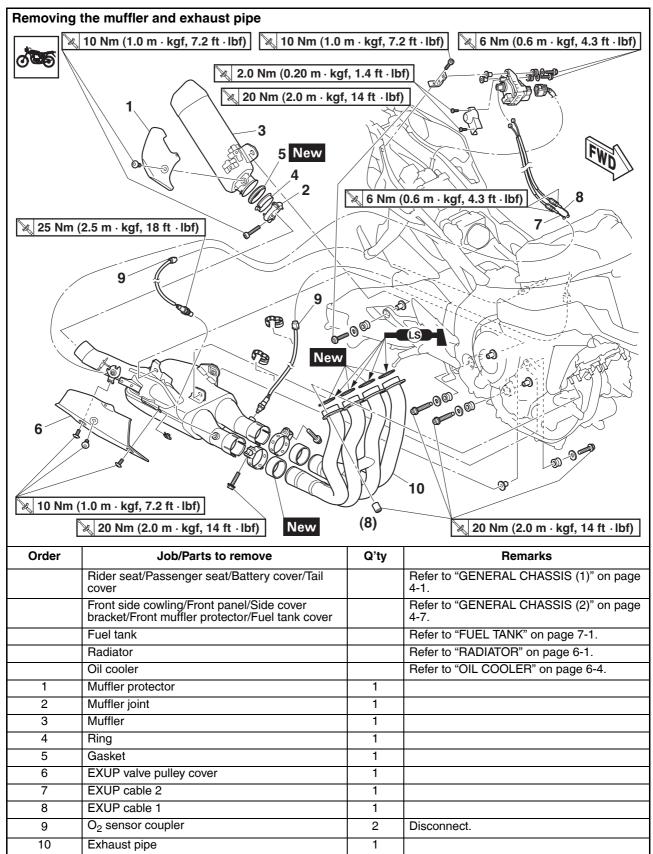
7. Install:

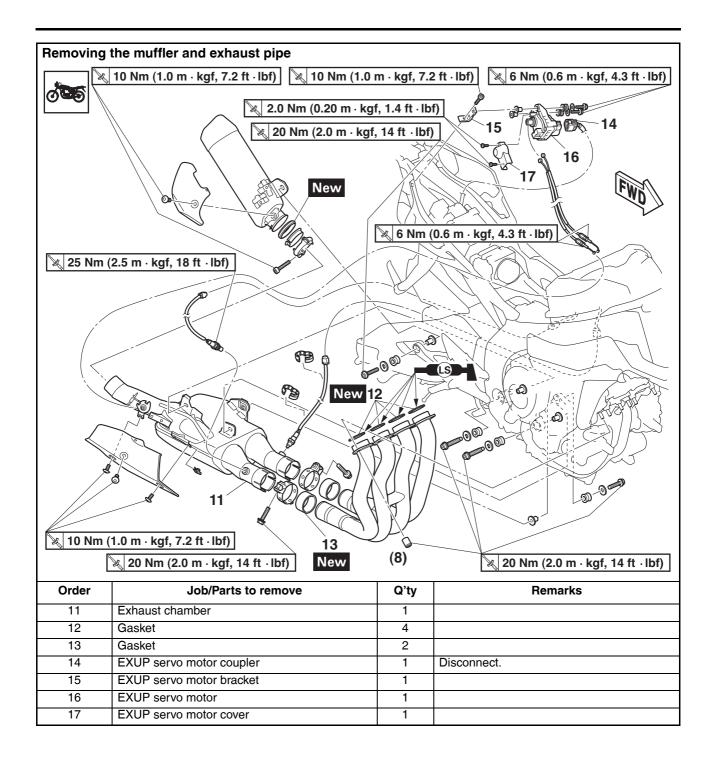
- Ignition coils Refer to "CAMSHAFTS" on page 5-9.
- Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-19.
- Air filter case Refer to "AIR FILTER CASE" on page 7-4.
- Fuel tank Refer to "FUEL TANK" on page 7-1.

• Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.

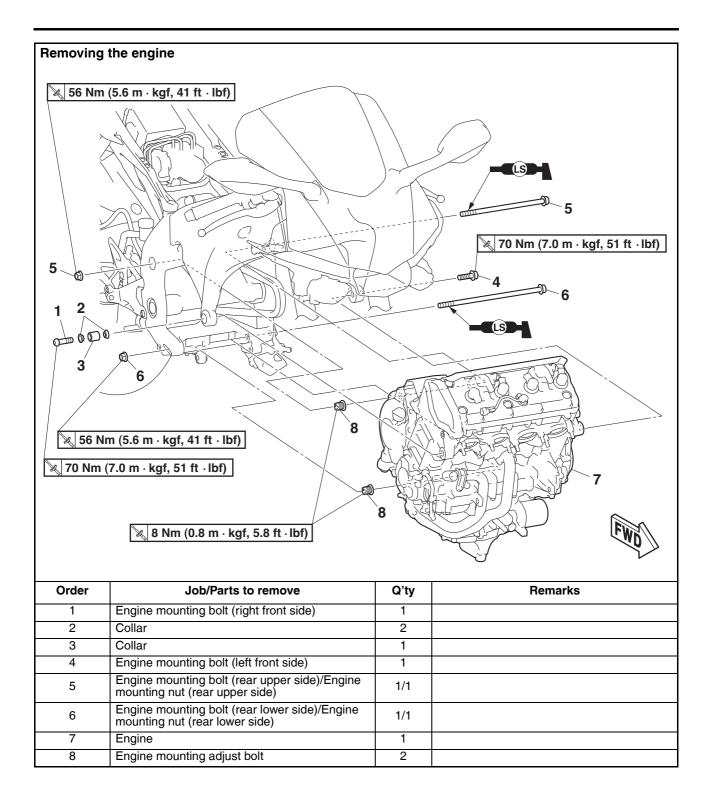
• Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.

ENGINE REMOVAL





Disconnecting the leads and hoses			
7 3.5 Nm (0.35 m·kgf, 2.5 tf · lbf) 9 3 9 3 0 8 0 7 Nm (0.7 m·kgf, 5.1 tf · lbf) 6 5 1 1			
Order	Job/Parts to remove	Q'ty	Remarks
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
	Air filter case duct/Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" on page 7-19.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-9.
	Thermostat assembly		Refer to "THERMOSTAT" on page 6-6.
	Shift rod/Drive sprocket		Refer to "CHAIN DRIVE" on page 4-116.
1	Clutch cable	1	Disconnect.
2	Starter motor lead	1	Disconnect.
3	Cylinder identification sensor coupler	1	Disconnect.
4	Ignition coil coupler	4	Disconnect.
5	Coolant temperature sensor coupler	1	Disconnect.
6	Neutral switch connector	1	Disconnect.
7	Stator coil coupler	1	Disconnect.
8	Crankshaft position sensor coupler	1	Disconnect.
9	Oil pressure switch connector	1	Disconnect.
10	Gear position sensor coupler	1	Disconnect.
	acai position sonsoi coupier	1	Diodonnioot.



REMOVING THE ENGINE

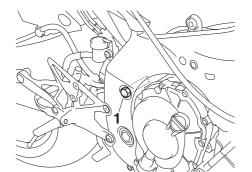
- 1. Loosen:
- Engine mounting adjust bolt

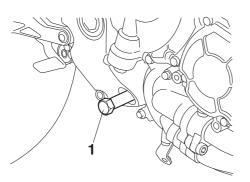
TIP —

Loosen the engine mounting adjust bolt with the pivot shaft wrench "1".



Pivot shaft wrench 90890-01485 Frame mount insert wrench YM-01485





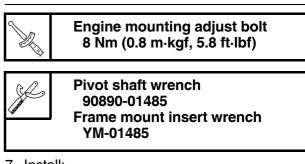
EAS30251

INSTALLING THE ENGINE

- 1. Install:
 - Engine mounting adjust bolt "1" (temporarily tighten)
- 2. Install:
- Engine
- 3. Install:
 - Engine mounting bolt (rear lower side) "2"
- Engine mounting bolt (rear upper side) "3" 4. Install:
- Engine mounting bolt (left front side) "4" (temporarily tighten)
- 5. Install:
 - Collar "5"
 - Collar "6"
 - Engine mounting bolt (right front side) "7" (temporarily tighten)
- 6. Tighten:
 - Engine mounting adjust bolt "1"

TIP —

- Tighten the engine mounting adjust bolt to specification with the pivot shaft wrench.
- Make sure that the flange on the engine mounting adjust bolt contacts the engine.



- 7. Install:
 - Engine mounting nut (rear lower side) "8"
- Engine mounting nut (rear upper side) "9"
- 8. Tighten:
 - Engine mounting nut (rear lower side) "8"

Engine mounting nut



9. Tighten:

• Engine mounting nut (rear upper side) "9"



Engine mounting nut 56 Nm (5.6 m·kgf, 41 ft·lbf)

56 Nm (5.6 m·kgf, 41 ft·lbf)

10.Tighten:

• Engine mounting bolt (left front side) "4"

Engine mounting bolt



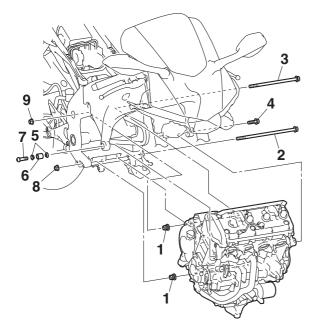
11.Tighten:

• Engine mounting bolt (right front side) "7"



Engine mounting bolt 70 Nm (7.0 m·kgf, 51 ft·lbf)

70 Nm (7.0 m·kgf, 51 ft·lbf)



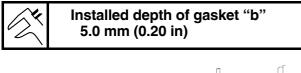
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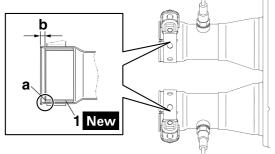
INSTALLING THE EXHAUST PIPE AND MUFFLER

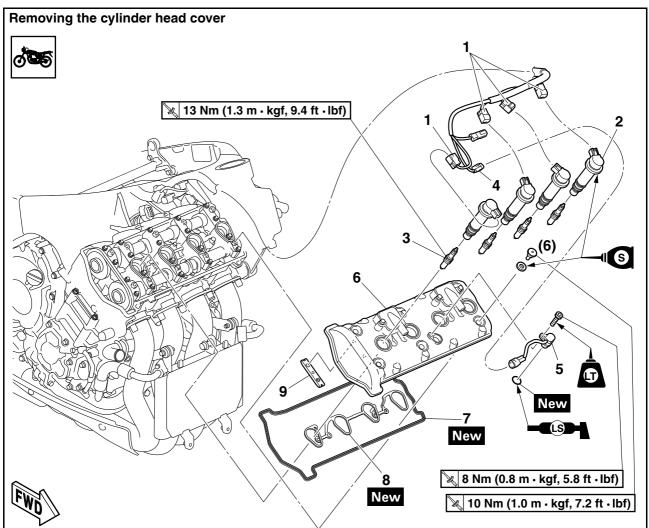
- 1. Install:
 - Exhaust pipe
 - Gasket "1" New (to exhaust chamber)
- Muffler

TIP __

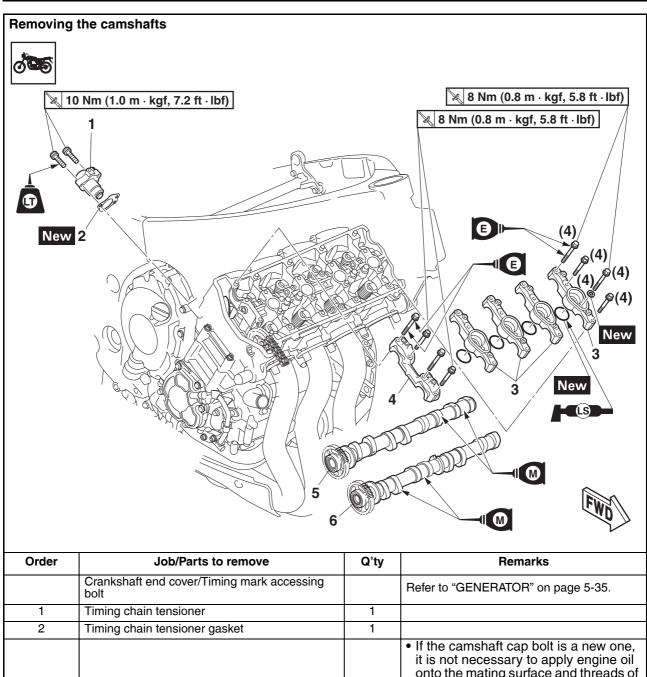
When installing the gasket, install it so that the chamfered side "a" of the gasket faces the exhaust pipe side as shown in the illustration.



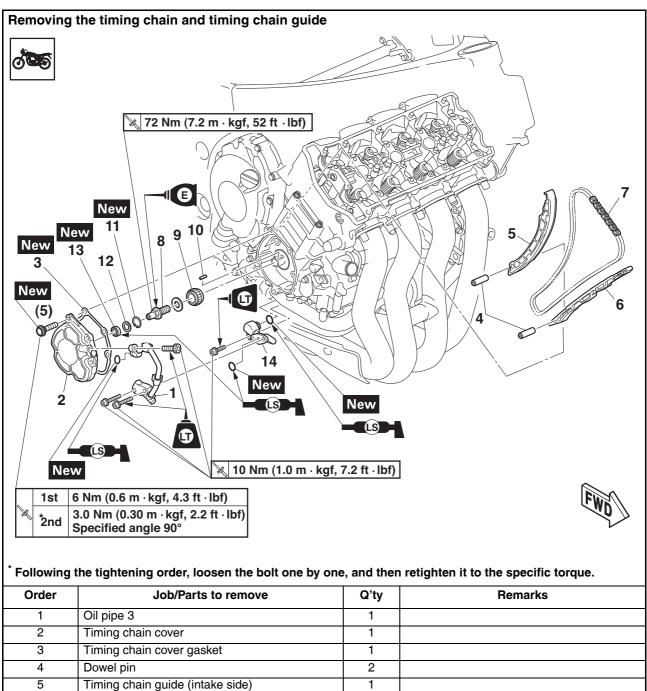




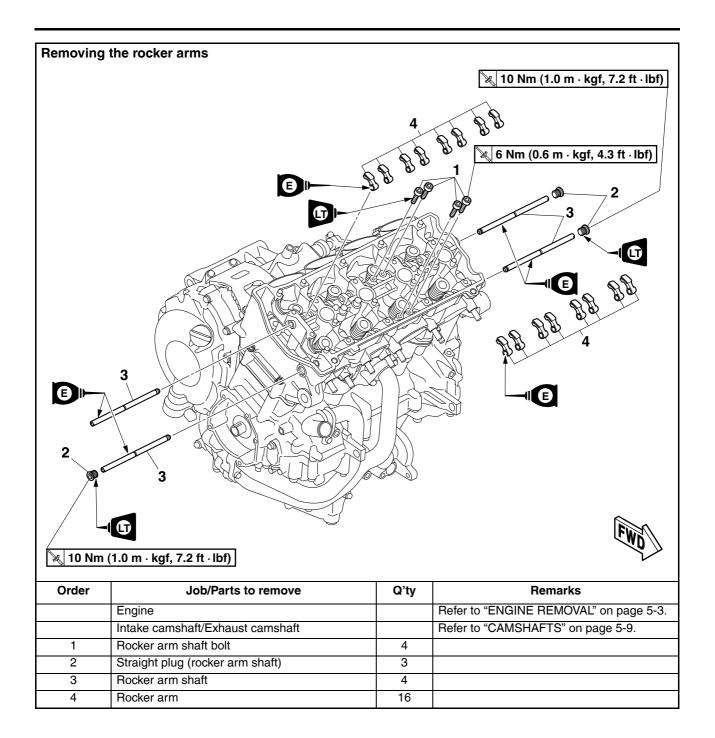
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front side cowling/Front panel/Side cover bracket/Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" on page 7-19.
1	Ignition coil coupler	4	Disconnect.
2	Ignition coil	4	
3	Spark plug	4	If the spark plug is a new one, tighten it to 18 Nm (1.8 m·kgf, 13 ft·lbf).
4	Cylinder identification sensor coupler	1	Disconnect.
5	Cylinder identification sensor	1	
6	Cylinder head cover	1	
7	Cylinder head cover gasket	1	
8	Cylinder head cover gasket	1	
9	Timing chain guide (top side)	1	



3	Camshaft cap 1	4	 It is not necessary to apply engine oil onto the mating surface and threads of the bolt. If the camshaft cap bolt is a new one, tighten it to 10 Nm (1.0 m·kgf, 7.2 ft·lbf).
4	Camshaft cap 2	1	 If the camshaft cap bolt is a new one, it is not necessary to apply engine oil onto the mating surface and threads of the bolt. If the camshaft cap bolt is a new one, tighten it to 10 Nm (1.0 m·kgf, 7.2 ft·lbf).
5	Intake camshaft	1	
6	Exhaust camshaft	1	

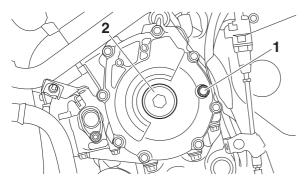


	Dowerpin	2	
5	Timing chain guide (intake side)	1	
6	Timing chain guide (exhaust side)	1	
7	Timing chain	1	
8	Timing chain sprocket bolt	1	
9	Timing chain sprocket	1	
10	Straight key	1	
11	Circlip	1	
12	Washer	1	
13	Oil seal	1	
14	Oil pipe 2	1	When removing the oil pipe 2, also remove the water pump inlet pipe. Refer to "WATER PUMP" on page 6-9.



EAS30256 REMOVING THE CAMSHAFTS

- 1. Remove:
 - Timing mark accessing bolt "1"
 - Crankshaft end cover "2"



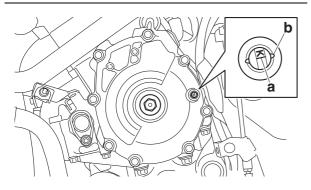
- 2. Align:
- Mark "a" on the generator rotor (with the generator rotor cover slot "b")

•••••••••••••••••••••••

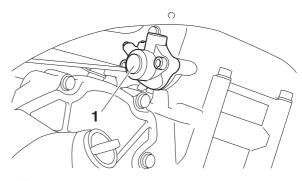
- a. Turn the crankshaft counterclockwise.
- b. When piston #1 is at BTDC105° on the compression stroke, align the BTDC105° mark "a" on the generator rotor with the generator rotor cover slot "b".

TIP

BTDC105° on the compression stroke can be found when the camshaft lobes are turned away from each other.



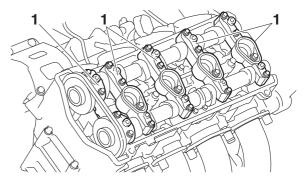
- 3. Remove:
 - Timing chain tensioner "1"
 - Timing chain tensioner gasket



- 4. Remove:
- Camshaft cap "1"

NOTICE

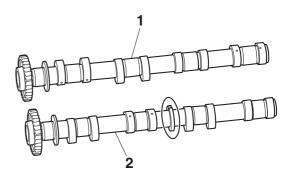
To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a crisscross pattern, working from the outside in.

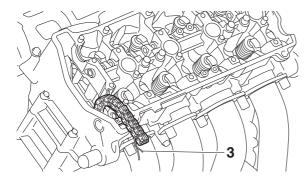


- 5. Remove:
- Intake camshaft "1"
- Exhaust camshaft "2"

TIP _

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

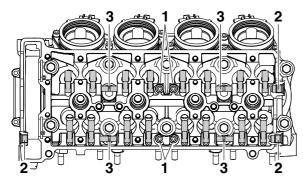




EAS31655

REMOVING THE ROCKER ARMS AND ROCKER ARM SHAFTS

- 1. Remove:
 - Rocker arm shaft bolt "1"
 - Straight plug "2"
 - Rocker arm shaft "3"
- Rocker arm



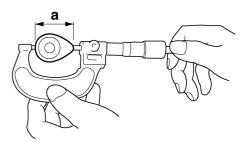
CHECKING THE CAMSHAFTS

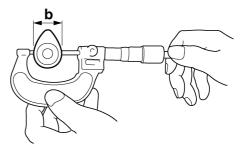
1. Check:

 Camshaft lobes Blue discoloration/pitting/scratches → Replace the camshaft.

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

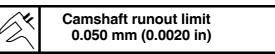
- Camshaft lobe dimensions Lobe height (Intake) 35.210-35.310 mm (1.3862-1.3902 in) Limit 35.160 mm (1.3842 in) Base circle diameter (Intake) 28.150-28.250 mm (1.1083-1.1122 in) Limit 28.100 mm (1.1063 in) Lobe height (Exhaust) 34.220-35.220 mm (1.3472-1.3866 in) Limit 34.170 mm (1.3453 in) Base circle diameter (Exhaust) 28.090-28.190 mm (1.1059-1.1098 in) Limit
 - 28.040 mm (1.1039 in)

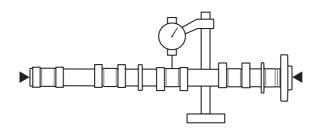




- 3. Measure:
 - Camshaft runout

Out of specification \rightarrow Replace.



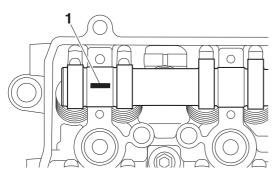


- 4. Measure:
 - Camshaft-journal-to-camshaft-cap clearance Out of specification \rightarrow Measure the camshaft journal diameter.



Camshaft-journal-to-camshaftcap clearance 0.028-0.062 mm (0.0011-0.0024 in)

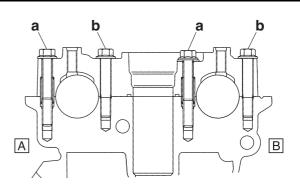
- a. Install the camshaft into the cylinder head (without the camshaft caps).
- b. Position strip of Plastigauge® "1" onto the camshaft journal as shown.



c. Install the dowel pins and camshaft caps. ECA23010

NOTICE

There are two kinds of camshaft cap bolts with different lengths. Be sure to install each bolt onto the correct position.



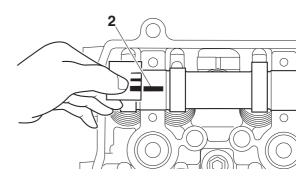
- a. Camshaft cap bolt (black): 40 mm (1.57 in)
- b. Camshaft cap bolt (silver): 35 mm (1.38 in)
- A. Intake side
- B. Exhaust side

TIP.

- If the camshaft cap bolt is a new one, it is not necessary to apply engine oil onto the mating surface and threads of the bolt.
- If the camshaft cap bolt is a new one, tighten it to 10 Nm (1.0 m·kgf, 7.2 ft·lbf).
- 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 8 Nm (0.8 m·kgf, 5.8 ft·lbf) Camshaft cap bolt (new) 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

d. Remove the camshaft caps and then measure the width of the Plastigauge® "2".



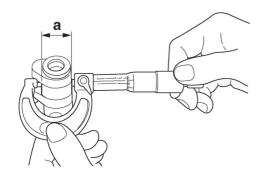
....

- 5. Measure:
 - · Camshaft journal diameter "a"

Out of specification \rightarrow Replace the camshaft. Within specification \rightarrow Replace the cylinder head and the camshaft caps as a set.

- Contraction of the second se

Camshaft journal diameter 25.459–25.472 mm (1.0023– 1.0028 in)

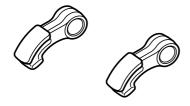


EAS30259

CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

The following procedure applies to all of the rocker arms and rocker arm shafts.

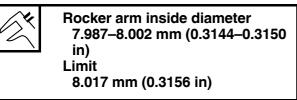
- 1. Check:
 - Rocker arm Damage/wear \rightarrow Replace.

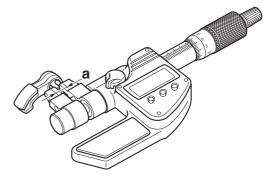


- 2. Check:
 - Rocker arm shaft

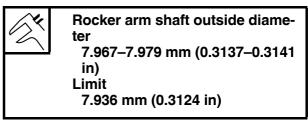
Blue discoloration/excessive wear/pitting/scratches \rightarrow Replace or check the lubrication system.

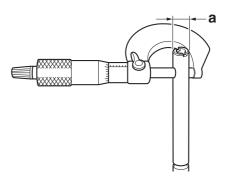
- 3. Measure:
 - Rocker arm inside diameter "a" Out of specification → Replace.





- 4. Measure:
- Rocker arm shaft outside diameter "a" Out of specification → Replace.



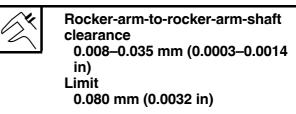


- 5. Calculate:
- Rocker-arm-to-rocker-arm-shaft clearance

TIP __

Calculate the clearance by subtracting the rocker er arm shaft outside diameter from the rocker arm inside diameter.

Out of specification \rightarrow Replace.



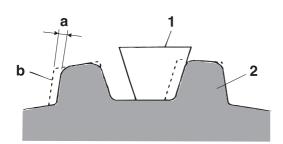
EAS30258

CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET

- 1. Check:
- Timing chain 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" \rightarrow Replace the camshaft sprockets and the timing chain as a set.

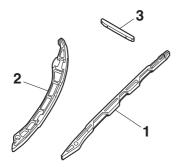


- a. 1/4 tooth
- b. Correct
- 1. Timing chain
- 2. Camshaft sprocket

CHECKING THE TIMING CHAIN GUIDES

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

- 1. Check:
 - Timing chain guide (exhaust side) "1"
 - Timing chain guide (intake side) "2"
 - Timing chain guide (top side) "3"
 - Damage/wear \rightarrow Replace the defective part(s).



EAS30266

CHECKING THE TIMING CHAIN TENSIONER

- 1. Check:
- Timing chain tensioner
 - Cracks/damage/rough movement \rightarrow Replace.

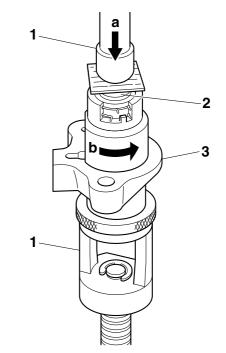
a. Using the valve spring compressor "1", push and insert timing chain tensioner rod "2" into the timing chain tensioner housing.

TIP.

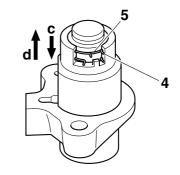
Push the timing chain tensioner rod in direction

"a", and turn the timing chain tensioner body "3" in direction "b" until it stops.





- b. Keep pressing the timing chain tensioner rod, mount clip "4" into groove "5", and lock the timing chain tensioner rod.
- c. Push the timing chain tensioner rod in direction "c".
- d. Make sure that the timing chain tensioner rod can smoothly move out from the timing chain tensioner housing in direction "d". If not smooth, replace the timing chain tensioner assembly.



ASSEMBLING THE TIMING CHAIN COVER

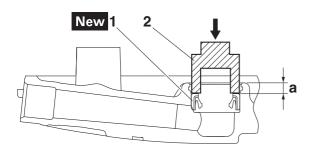
- 1. Install:
- Oil seal "1" New

TIP —

EAS31744

Install the oil seal with a socket "2" that matches its outside diameter.





- 2. Install:
- Washer
- Circlip New

EAS31657

INSTALLING THE ROCKER ARMS AND ROCKER ARM SHAFTS

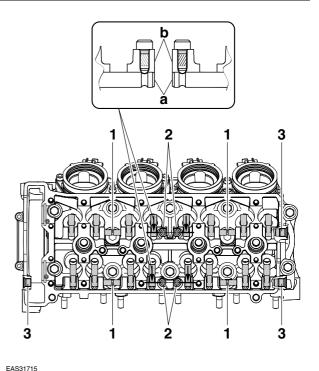
- 1. Install:
 - Rocker arm
 - Rocker arm shaft "1"
 - Rocker arm shaft bolt "2"
 - Straight plug "3"

TIP -

- Align the end surface "a" of the rocker arm shaft with the surface "b" of the cylinder head.
- After installing the rocker arm shaft bolt, make sure that the rocker arm shaft turns smoothly.

Rocker arm shaft bolt

6 Nm (0.6 m·kgf, 4.3 ft·lbf) LOCTITE® Straight plug (rocker arm shaft) 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®



INSTALLING THE TIMING CHAIN COVER

- 1. Install:
 - Timing chain cover
 - Timing chain cover bolt New
- 2. Tighten:
 - Timing chain cover bolt

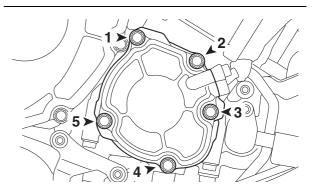


Timing chain cover bolt 1st: 6 Nm (0.6 m·kgf, 4.3 ft·lbf) ^{*}2nd: 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) Specified angle 90°

Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque and the specific angle.

TIP

Tighten the timing chain cover bolts in the tightening sequence as shown.

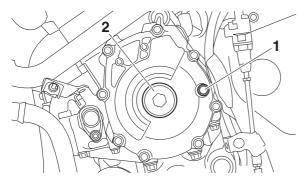


INSTALLING THE CAMSHAFTS

1. Remove:

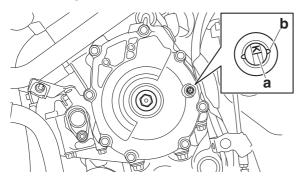
EAS30360

- Timing mark accessing bolt "1"
- Crankshaft end cover "2"



- 2. Align:
- Mark "a" on the generator rotor (with the generator rotor cover slot "b")

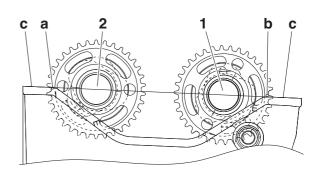
- a. Turn the crankshaft counterclockwise.
- b. When piston #1 is at BTDC105°, align the BTDC105° mark "a" on the generator rotor with the generator rotor cover slot "b".



- 3. Install:
- Exhaust camshaft "1"
- Intake camshaft "2"

TIP

- Hang the timing chain on the sprocket from the exhaust camshaft to the intake camshaft.
- The intake camshaft sprocket timing mark "a" and exhaust camshaft sprocket timing mark "b" should align with the cylinder head surface "c".
- Check the timing mark position of the camshaft sprocket using a mirror.
- The timing chain (exhaust side) should be stretched and the timing chain (intake side) should be sagged.

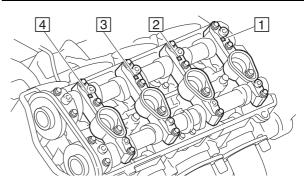


- 4. Install:
- Camshaft cap

TIP -

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

- "1": camshaft cap mark for cylinder #1
- "2": camshaft cap mark for cylinder #2
- "3": camshaft cap mark for cylinder #3
- "4": camshaft cap mark for cylinder #4



- 5. Tighten:
- · Camshaft cap bolts



Camshaft cap bolt 8 Nm (0.8 m·kgf, 5.8 ft·lbf) Camshaft cap bolt (new) 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP -

- If the camshaft cap bolt is a new one, it is not necessary to apply engine oil onto the mating surface and threads of the bolt.
- If the camshaft cap bolt is a new one, tighten it to 10 Nm (1.0 m·kgf, 7.2 ft·lbf).
- Tighten the camshaft cap bolts in stages and in a crisscross pattern, working from the inner caps out.

ECA17430

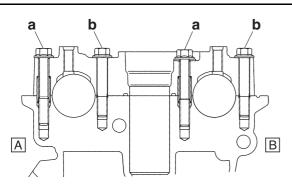
- Lubricate the camshaft cap bolts with the engine oil.
- The camshaft cap bolts must be tightened

evenly or damage to the cylinder head, camshaft caps, and camshafts will result.

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

ECA23010

There are two kinds of camshaft cap bolts with different lengths. Be sure to install each bolt onto the correct position.



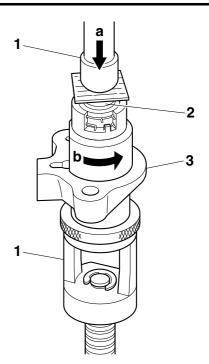
- a. Camshaft cap bolt (black): 40 mm (1.57 in)
- b. Camshaft cap bolt (silver): 35 mm (1.38 in)
- A. Intake side
- B. Exhaust side
- 6. Install:
 - Timing chain tensioner
 - Timing chain tensioner gasket New
- *****
- a. Using the valve spring compressor "1", push and insert timing chain tensioner rod "2" into the timing chain tensioner housing.

TIP -

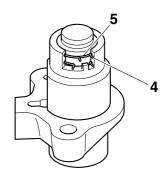
Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "3" in direction "b" until it stops.



Valve spring compressor 90890-04019 Valve spring compressor YM-04019



b. Keep pressing the timing chain tensioner rod, mount clip "4" into groove "5", and lock the timing chain tensioner rod.



c. In the status of step (b), install the rod assembly in the cylinder block.

TIP -

Always use a new gasket.



Timing chain tensioner bolt 10 Nm (1.0 m⋅kgf, 7.2 ft⋅lbf) LOCTITE®

d. Unlock the timing chain tensioner by turning the crankshaft clockwise, and tension the timing chain.

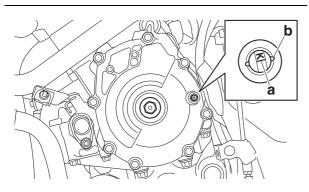
- 7. Turn:
 - Crankshaft (several turns counterclockwise)
- 8. Check:
- Mark "a"
 - Make sure the mark "a" on the generator rotor

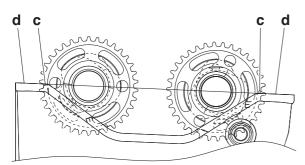
is aligned with the generator rotor cover slot "b".

 Camshaft sprocket timing mark "c" Make sure the punch mark "c" on the camshaft sprocket is aligned with the cylinder head mating surface "d".
 Out of alignment → Adjust.
 Refer to the installation steps above.

TIP_

Check the timing mark position of the camshaft sprocket using a mirror.





9. Measure:

 Valve clearance Out of specification → Adjust. Refer to "ADJUSTING THE VALVE CLEAR-ANCE" on page 3-5.

10.Install:

• Timing mark accessing bolt "1"

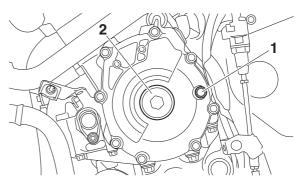


Timing mark accessing bolt 15 Nm (1.5 m·kgf, 11 ft·lbf)

• Crankshaft end cover "2"



Crankshaft end cover 15 Nm (1.5 m·kgf, 11 ft·lbf)



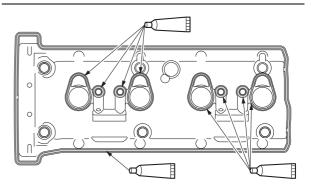
- 11.Install:
 - Timing chain guide (top side)
- Cylinder head cover gasket "1" New
- Cylinder head cover gasket "2" New
- Cylinder head cover

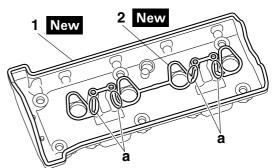


Cylinder head cover bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP -

- Apply Three Bond No.1541C® onto the mating surfaces of the cylinder head cover and cylinder head cover gasket.
- After installing the cylinder head cover gasket "2" to the cylinder head cover, cut off the "a" section.





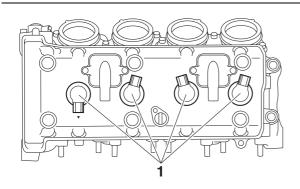
- 12.Install:
 - Spark plugs
 - Ignition coils "1"



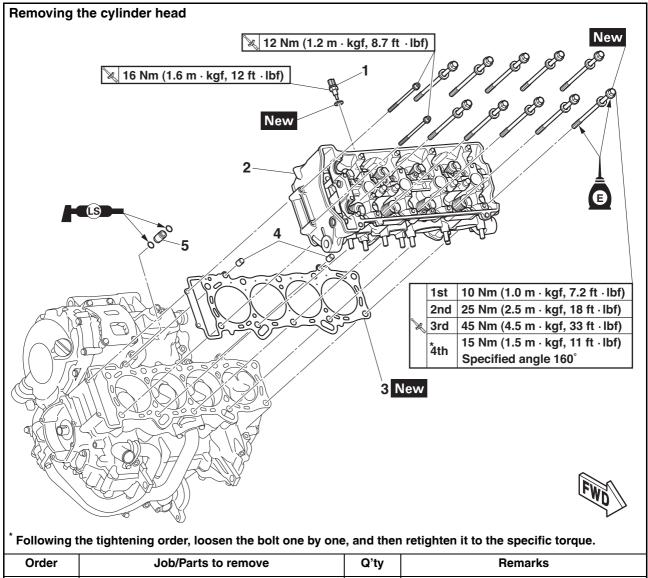
Spark plug 13 Nm (1.3 m·kgf, 9.4 ft·lbf) Spark plug (new) 18 Nm (1.8 m·kgf, 13 ft·lbf)

TIP -

- Before installing the spark plug, clean the spark plug and gasket surface.
- If the spark plug is a new one, tighten it to 18 Nm (1.8 m·kgf, 13 ft·lbf).
- Install the ignition coils "1" in the direction shown in the illustration.



CYLINDER HEAD



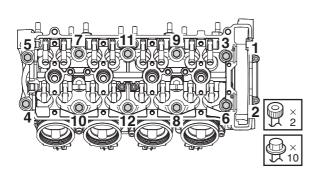
oraci		~ .,	riemanio
	Engine		Refer to "ENGINE REMOVAL" on page 5-3.
	Intake camshaft/Exhaust camshaft		Refer to "CAMSHAFTS" on page 5-9.
1	Coolant temperature sensor	1	
2	Cylinder head	1	
3	Cylinder head gasket	1	
4	Dowel pin	2	
5	Oil delivery pipe	1	

EAS30276 REMOVING THE CYLINDER HEAD

- 1. Remove:
 - Intake camshaft
 - Exhaust camshaft Refer to "REMOVING THE CAMSHAFTS" on page 5-13.
- 2. Remove:
 - Cylinder head bolt (M6) (\times 2)
 - Cylinder head bolt (M9) (\times 10)

TIP -

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



EAS30277

CHECKING THE CYLINDER HEAD

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

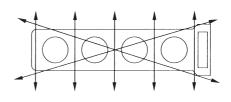
TIP -

Do not use a sharp instrument to avoid damaging or scratching:

- Spark plug bore threads
- Valve seats
- 2. Check:
 - Cylinder head Damage/scratches → Replace.
 - Cylinder head water jacket Mineral deposits/rust → Eliminate.
- 3. Measure:
- Cylinder head warpage Out of specification → Resurface the cylinder head.



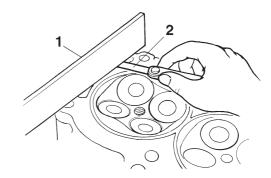
Warpage limit 0.10 mm (0.0039 in)



•••••

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.

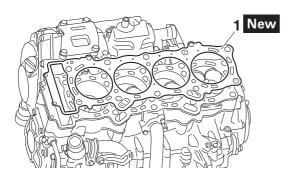
TIP -

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

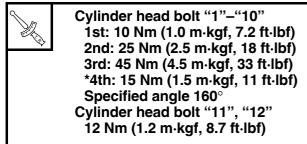
EAS30282

INSTALLING THE CYLINDER HEAD

- 1. Install:
 - Cylinder head gasket "1" New
 - Dowel pins



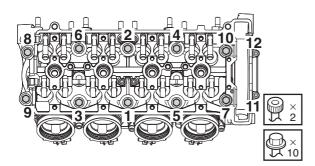
- 2. Install:
- Cylinder head
- Cylinder head bolt (M6) (× 2)
- Cylinder head bolt (M9) (× 10) New
- TIP -
- Pass the timing chain through the timing chain cavity.
- Lubricate the cylinder head bolt (M9) thread and mating surface with engine oil.
- 3. Tighten:
- Cylinder head bolt "1"-"10"
- Cylinder head bolt "11", "12"



* Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque and the specific angle.

TIP -

Tighten the cylinder head bolts in the tightening sequence as shown and torque them in 4 stages.

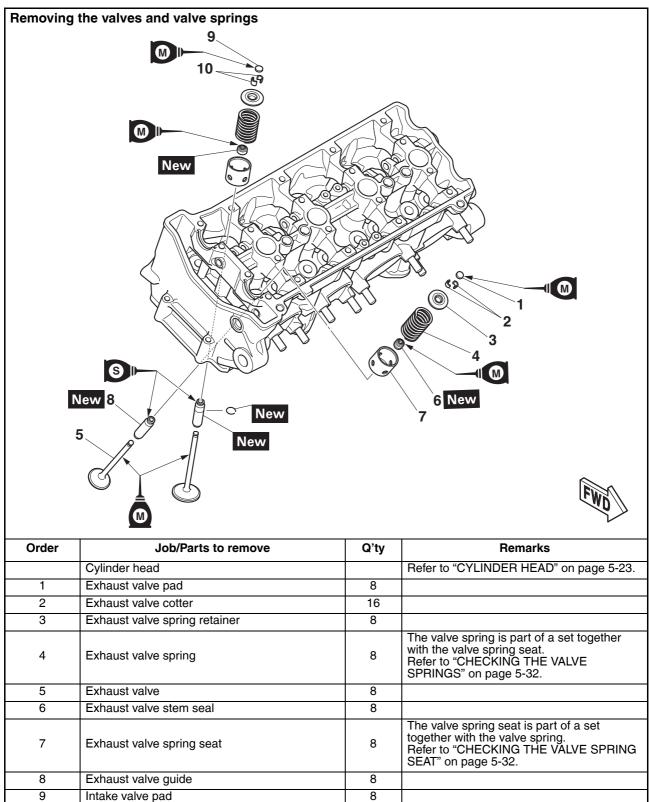


- 4. Install:
- Exhaust camshaft
- Intake camshaft

VALVES AND VALVE SPRINGS

10

Intake valve cotter



16

Removing the valves and valve springs				
11 12 12 14 15 14 15 16 10 16 17 10 17 10 17 10 17 10 10 10 10 10 10 10 10 10 10				
Order	Job/Parts to remove	Q'ty	Remarks	
11	Intake valve spring retainer	8		
12	Intake valve spring	8	The valve spring is part of a set together with the valve spring seat. Refer to "CHECKING THE VALVE SPRINGS" on page 5-32.	
13	Intake valve	8		
14	Intake valve stem seal	8		
15	Intake valve spring seat	8	The valve spring seat is part of a set together with the valve spring. Refer to "CHECKING THE VALVE SPRING SEAT" on page 5-32.	
	a			
16 17	Circlip Intake valve guide	8 8		

EAS30283 REMOVING THE VALVES

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

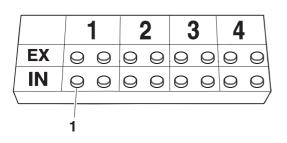
TIP -

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 pad "1"

TIP -

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

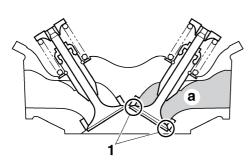


- 2. Check:
 - Valve sealing Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
 Refer to "CHECKING THE VALVE SEATS" on page 5-30.

- 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:

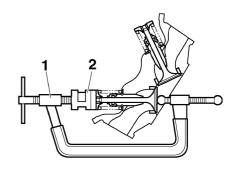
Valve cotters

TIP -

Remove the valve cotters by compressing the valve spring with the valve spring compressor

"1" and the valve spring compressor attachment "2".

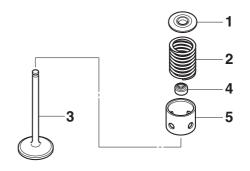
Valve spring compressor 90890-04019 Valve spring compressor YM-04019 Valve spring compressor attachment 90890-01243 Valve spring compressor adapter (26 mm) YM-01253-1



- 4. Remove:
 - Valve spring retainer "1"
 - Valve spring "2"
 - Valve "3"
 - Valve stem seal "4"
- Valve spring seat "5"

TIP -

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



EAS30284

CHECKING THE VALVES AND VALVE GUIDES

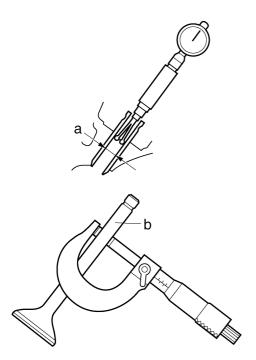
The following procedure applies to all of the valves and valve guides.

- 1. Measure:
- Valve-stem-to-valve-guide clearance
- Out of specification \rightarrow Replace the valve guide.

VALVES AND VALVE SPRINGS

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

N.	Valve-stem-to-valve-guide clear- ance (intake)
N	0.010–0.037 mm (0.0004–0.0015
	in)
	Limit
	0.080 mm (0.0032 in)
	Valve-stem-to-valve-guide clear-
	ance (exhaust)
	0.025–0.052 mm (0.0010–0.0020
	in)
	Limit
	0.100 mm (0.0039 in)

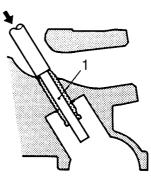


- 2. Replace:
- Valve guide

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.

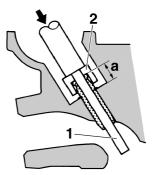
a. Remove the valve guide with the valve guide remover "1".



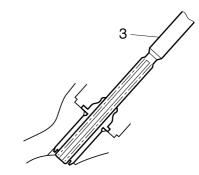
b. Install the new valve guide with the valve guide installer "2" and valve guide remover "1".



Valve guide position (intake) 12.0–12.4 mm (0.47–0.49 in) Valve guide position (exhaust) 17.5–17.9 mm (0.69–0.70 in)



- 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.





After replacing the valve guide, reface the valve seat.

VALVES AND VALVE SPRINGS



Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116 Valve guide remover (ø5) 90890-04097 Valve guide remover (5.0 mm) YM-04097 Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117 Valve guide installer (ø5) 90890-04098 Valve guide installer (5.0 mm) YM-04098 Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118 Valve guide reamer (ø5) 90890-04099 Valve guide reamer (5.0 mm) YM-04099

- 3. Eliminate:
 - Carbon deposits (from the valve face and valve seat)
- 4. Check:
 - Valve face

Pitting/wear → Grind the valve face.
Valve stem end

Mushroom shape or diameter larger than the body of the valve stem \rightarrow Replace the valve.

- 5. Measure:
 - Valve stem runout

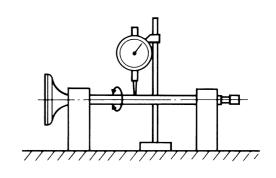
Out of specification \rightarrow Replace the valve.

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 0.010 mm (0.0004 in)

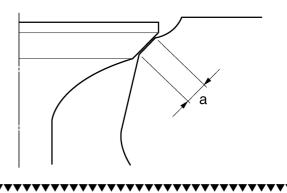


EAS30285

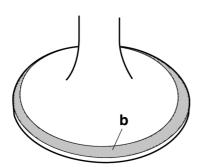
CHECKING THE VALVE SEATS

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 \rightarrow Replace the cylinder head.
- 3. Measure:
 - Valve seat contact width "a" Out of specification → Replace the cylinder head.
 - Valve seat contact width (intake) 0.90–1.10 mm (0.0354–0.0433 in) Limit 1.6 mm (0.06 in) Valve seat contact width (exhaust) 1.10–1.30 mm (0.0433–0.0512 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 contact width.

TIP __

Where the valve seat and valve face contacted one another, the blue layout fluid will have been removed.

- 4. Lap:
 - Valve face
- Valve seat
- TIP __

ECA22580

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

NOTICE

This model uses titanium intake valves. Titanium valves that have been used to lap the valve seats must not be used. Always replace lapped valves with new valves.

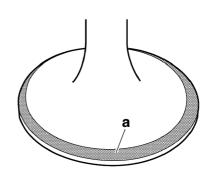
TIP -

- When replacing the intake valves, replace the intake valves without lapping the valve seats and valve faces.
- When replacing the cylinder head or intake valve guides, use new valves to lap the valve seats, and then replace them with new intake valves.

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

NOTICE

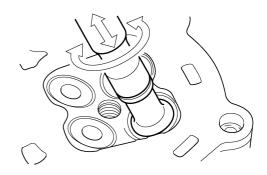
Do not let the lapping compound enter the gap between the valve stem and the valve guide.



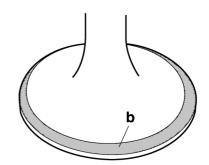
- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

TIP -

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



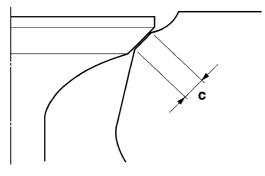
- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply blue layout fluid "b" onto the valve face.



- 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 contact width "c" again. If the valve seat width is out of specifi-

VALVES AND VALVE SPRINGS

cation, reface and lap the valve seat.



EAS30286

CHECKING THE VALVE SPRINGS

NOTICE

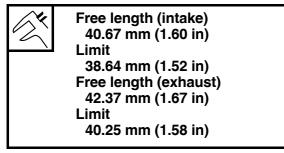
The valve spring and valve spring seat constitute a set to maintain high precision.

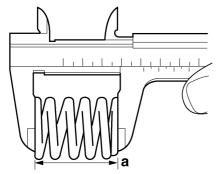
- If either the valve spring or valve spring seat needs replacing, be sure to replace the valve spring and valve spring seat as a set.
- When installing the valve spring and valve spring seat, be sure to install them onto their original positions.

The following procedure applies to all of the valve springs.

- 1. Measure:
 - Valve spring free length "a"

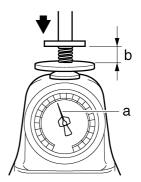
Out of specification \rightarrow Replace the valve spring and valve spring seat as a set.



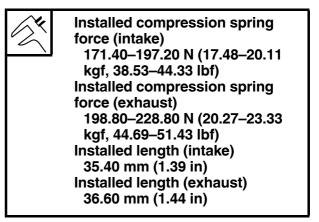


- 2. Measure:
 - Compressed valve spring force "a" Out of specification \rightarrow Replace the valve

spring and valve spring seat as a set.

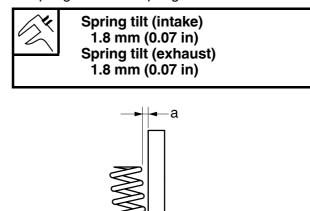


b. Installed length



3. Measure:

 Valve spring tilt "a" Out of specification → Replace the valve spring and valve spring seat as a set.



EAS31716

CHECKING THE VALVE SPRING SEAT

The valve spring and valve spring seat constitute a set to maintain high precision.

• If either the valve spring or valve spring seat needs replacing, be sure to replace the

VALVES AND VALVE SPRINGS

valve spring and valve spring seat as a set. • When installing the valve spring and valve

spring seat, be sure to install them onto their original positions.

The following procedure applies to all of the valve lifters.

- 1. Check:
- Valve spring seat

Damage/scratches \rightarrow Replace the valve spring seat and valve spring as a set.

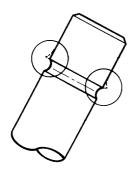


EAS30288

INSTALLING THE VALVES

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

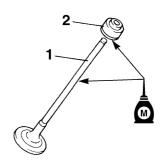
- 1. Deburr:
 - Valve stem end (with an oil stone)



- 2. Lubricate:
 - Valve stem "1"
 - Valve stem seal "2"

(with the recommended lubricant)

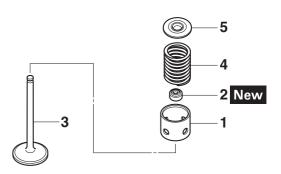
Recommended lubricant Molybdenum disulfide oil

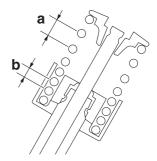


- 3. Install:
- Valve spring seat "1"
- Valve stem seal "2" New
- Valve "3"
- Valve spring "4"
- Valve spring retainer "5" (into the cylinder head)

TIP -

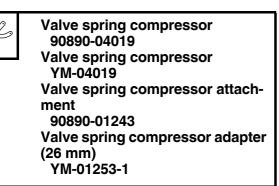
- Make sure each valve is installed in its original place.
- Install the valve springs with the larger pitch "a" facing up.

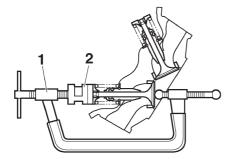




- b. Smaller pitch
- 4. Install:
- Valve cotters
- TIP ___

Install the valve cotters by compressing the valve spring with the valve spring compressor "1" and the valve spring compressor attachment "2".

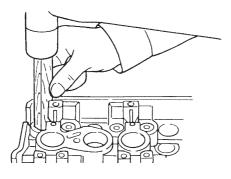




5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

Hitting the valve tip with excessive force could damage the valve.



- 6. Lubricate:
 - Valve pad

(with the recommended lubricant)



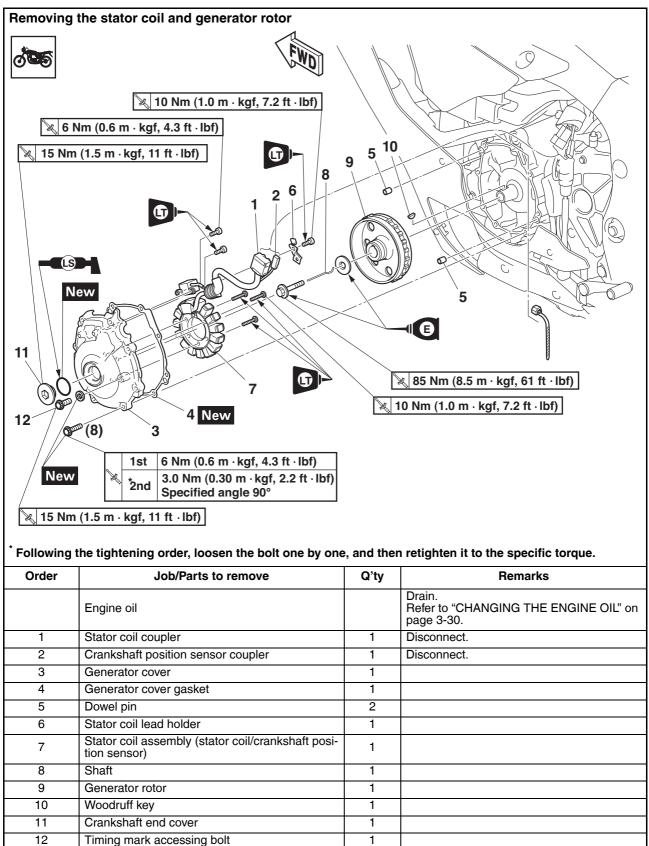
- 7. Install:
- Valve pad

TIP -

Each valve pad must be reinstalled in its original position.

GENERATOR

GENERATOR



REMOVING THE GENERATOR

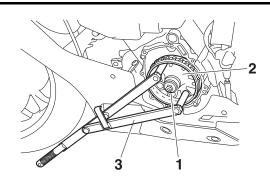
- 1. Remove:
 - Generator rotor bolt "1"
 - Washer

TIP _

While holding the generator rotor "2" with the rotor holding tool "3", loosen the generator rotor bolt.



15mm pin type rotor holding tool 90890-04171 YM-04171



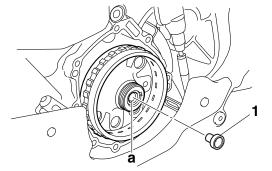
2. Install:

• Crankshaft protector "1"

TIP -

Install the crankshaft protector to the hole "a" of the crankshaft.





- 3. Remove:
 - Generator rotor "1"
 - (with the flywheel puller "2")

Woodruff key

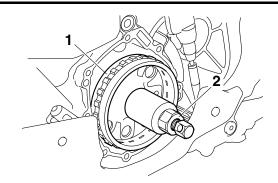
TIP -

Install the flywheel puller to the generator rotor.



90890-01404 Flywheel puller YM-01404

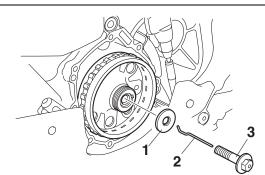
Flywheel puller



- EAS30830 INSTALLING THE GENERATOR
- 1. Install:
 - Woodruff key
 - Generator rotor
 - Washer "1"
 - Shaft "2"
- Generator rotor bolt "3"

TIP -

- Clean the tapered portion of the crankshaft and the generator rotor hub.
- When installing the generator rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft.
- Lubricate the washer with engine oil.
- Install the shaft to the hole of the generator rotor bolt.
- Lubricate the generator rotor bolt threads and washer mating surfaces with engine oil.



- 2. Tighten:
- Generator rotor bolt "1"



Generator rotor bolt 85 Nm (8.5 m·kgf, 61 ft·lbf)

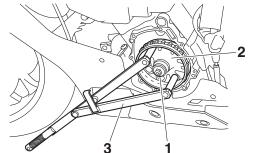
TIP

While holding the generator rotor "2" with the rotor holding tool "3", tighten the generator rotor

GENERATOR

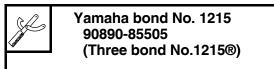
bolt.

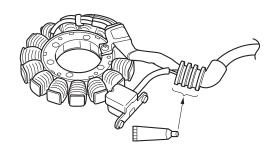




- 3. Apply:
- Sealant

(onto the stator coil assembly lead grommet)





- 4. Install:
 - Generator cover gasket New
 - Generator cover
 - Generator cover bolt New

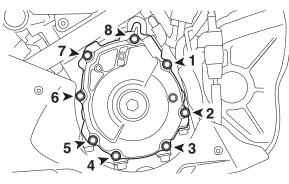


Generator cover bolt 1st: 6 Nm (0.6 m·kgf, 4.3 ft·lbf) ^{*}2nd: 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) Specified angle 90°

Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque and the specific angle.

TIP -

Tighten the generator cover bolts in the tightening sequence as shown.

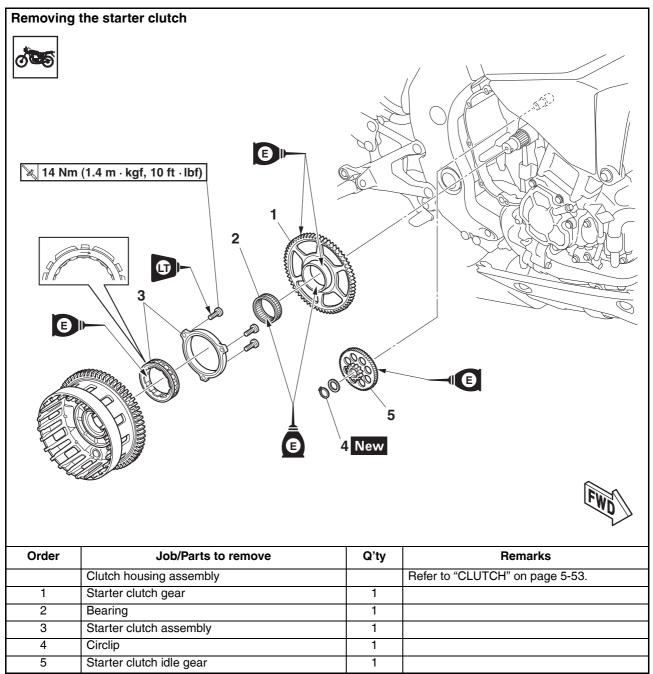


- 5. Connect:
- Stator coil coupler
- Crankshaft position sensor coupler

TIP -

To route the stator coil lead, refer to "CABLE ROUTING" on page 2-51.

STARTER CLUTCH



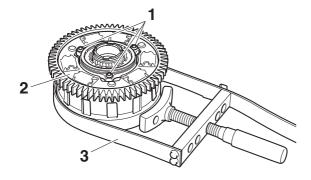
REMOVING THE STARTER CLUTCH

- 1. Remove:
- Starter clutch bolt "1"
- TIP —

EAS30305

- While holding the clutch housing assembly "2" with the sheave holder "3", remove the starter clutch bolt.
- Fix the flat surface of the clutch housing assembly with the sheave holder.

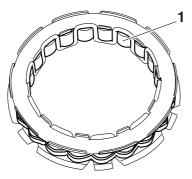




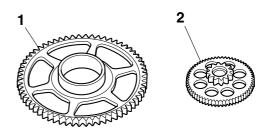
CHECKING THE STARTER CLUTCH

EAS30306

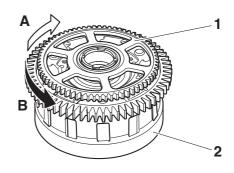
- 1. Check:
- Starter clutch rollers "1" Damage/wear \rightarrow Replace.



- 2. Check:
 - Starter clutch gear "1"
 - Starter clutch idle gear "2" Burrs/chips/roughness/wear → Replace the defective part(s).



- 3. Check:
- Starter clutch gear's contacting surfaces Damage/pitting/wear → Replace the starter clutch gear.
- 4. Check:
- Starter clutch operation
- *****
- a. Install the starter clutch gear "1" onto the clutch housing assembly "2" and hold the clutch housing assembly.
- b. 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.
- c. When turning the starter clutch gear counterclockwise "B", it should turn freely, otherwise the starter clutch is faulty and must be replaced.



EAS30309

INSTALLING THE STARTER CLUTCH 1. Install:

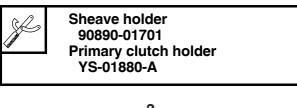
- Starter clutch
- Starter clutch

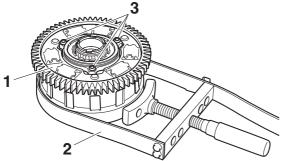
Starter clutch holder bolt 14 Nm (1.4 m·kgf, 10 ft·lbf) LOCTITE®

TIP

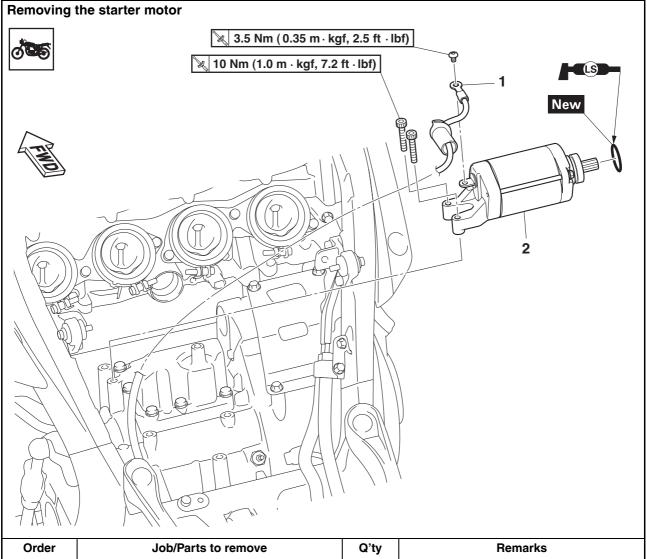
 Install the starter clutch so that the side of the starter clutch roller assembly with the arrow mark is toward the clutch housing.

- While holding the clutch housing assembly "1" with the sheave holder "2", tighten the starter clutch holder bolt "3".
- Fix the flat surface of the clutch housing assembly with the sheave holder.

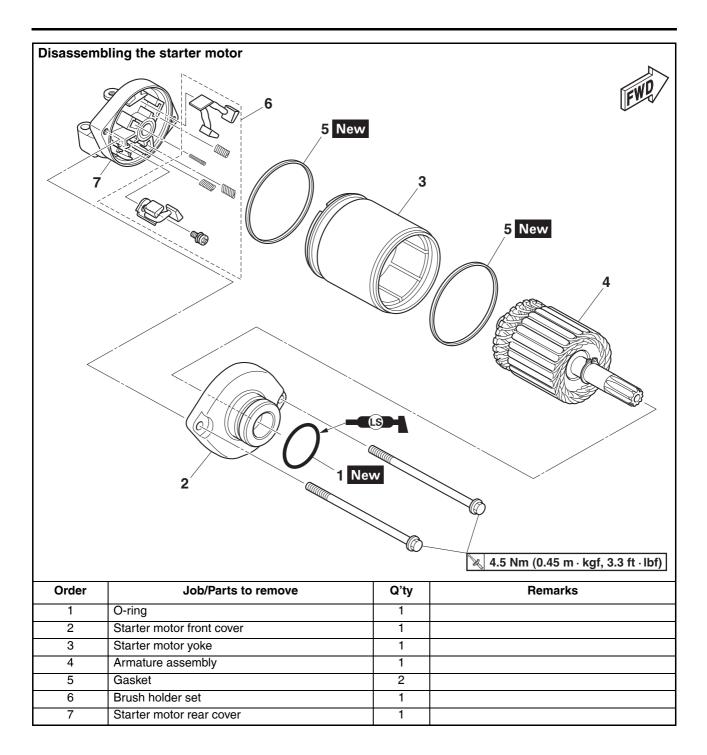




ELECTRIC STARTER



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-9.
1	Starter motor lead	1	Disconnect.
2	Starter motor	1	



ELECTRIC STARTER

CHECKING THE STARTER MOTOR

- 1. Check:
- Commutator Dirt \rightarrow Clean with 600 grit sandpaper.
- 2. Measure:
 - Mica undercut "a"

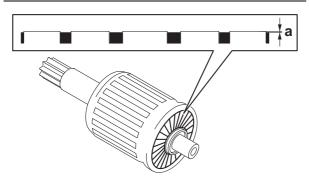
Out of specification \rightarrow Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

- Contraction of the second se

Mica undercut (depth) 2.40 mm (0.09 in)

TIP

The mica of the commutator must be undercut to ensure proper operation of the commutator.



3. Measure:

0

 Armature assembly resistances (commutator and insulation)

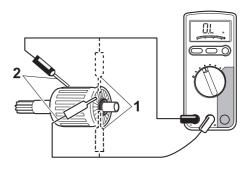
Out of specification \rightarrow Replace the starter motor.

a. Measure the armature assembly resistances with the digital circuit tester.



Armature coil resistance 0.0120–0.0140 Ω Insulation resistance Above 1 MΩ at 20 °C (68 °F)

b. If any resistance is out of specification, replace the starter motor.

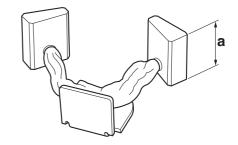


- 1. Commutator resistance
- 2. Insulation resistance

- 4. Measure:
 - Brush length "a"
 Out of specification → Replace the brush holder set.



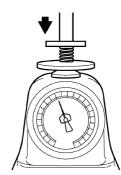
Brush overall length 9.0 mm (0.35 in) Limit 5.50 mm (0.22 in)



- 5. Measure:
 - Brush spring force Out of specification → Replace the brush holder set.



Brush spring force 4.80–7.20 N (489–734 gf, 17.28– 25.92 oz)



6. Check:

Gear teeth

Damage/wear \rightarrow Replace the starter motor.

- 7. Check:
 - Bearing
 - Oil seal

 $\label{eq:def-Damage} \mbox{Damage/wear} \rightarrow \mbox{Replace the starter motor} front cover.$

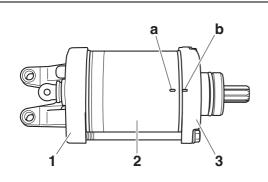
EAS30326

ASSEMBLING THE STARTER MOTOR

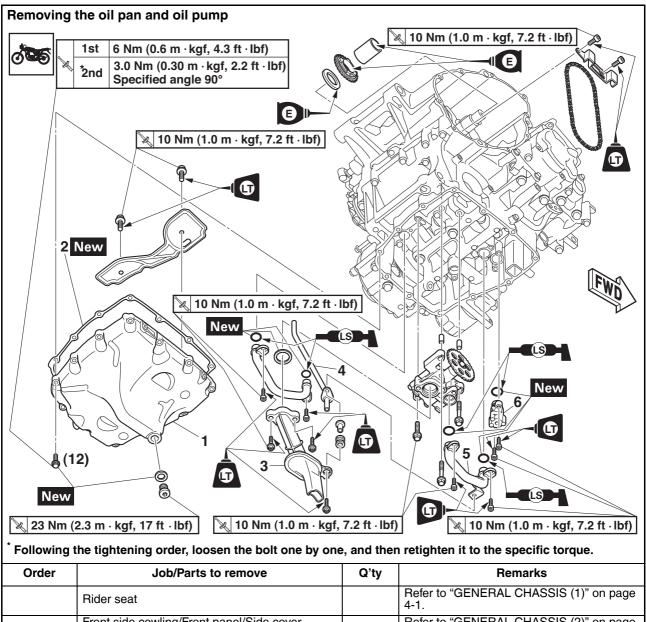
- 1. Install:
 - Starter motor rear cover "1"
 - Starter motor yoke "2"
 - Starter motor front cover "3"

TIP -

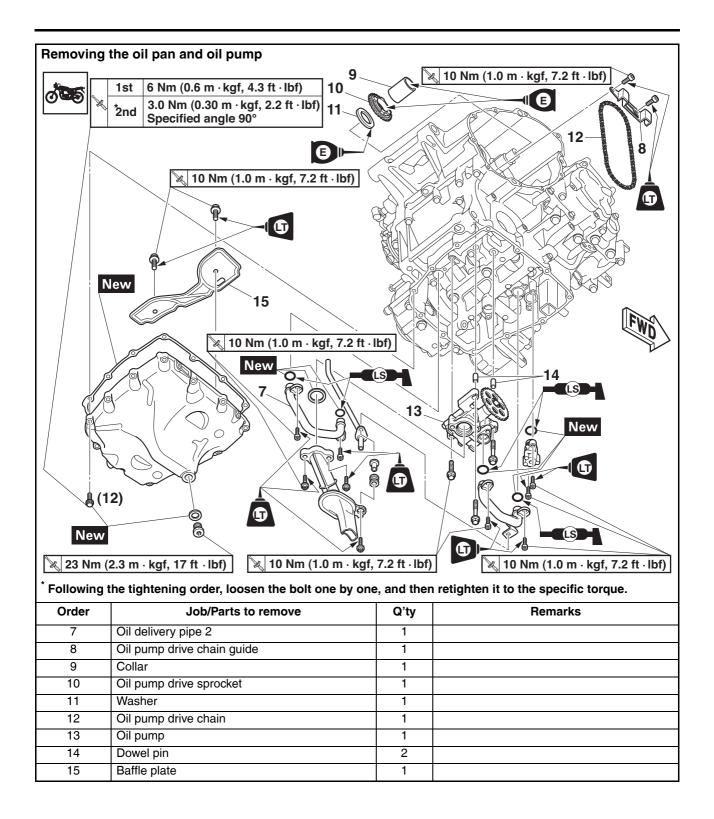
Align the match mark "a" on the starter motor yoke with the match mark "b" on the starter motor front cover.

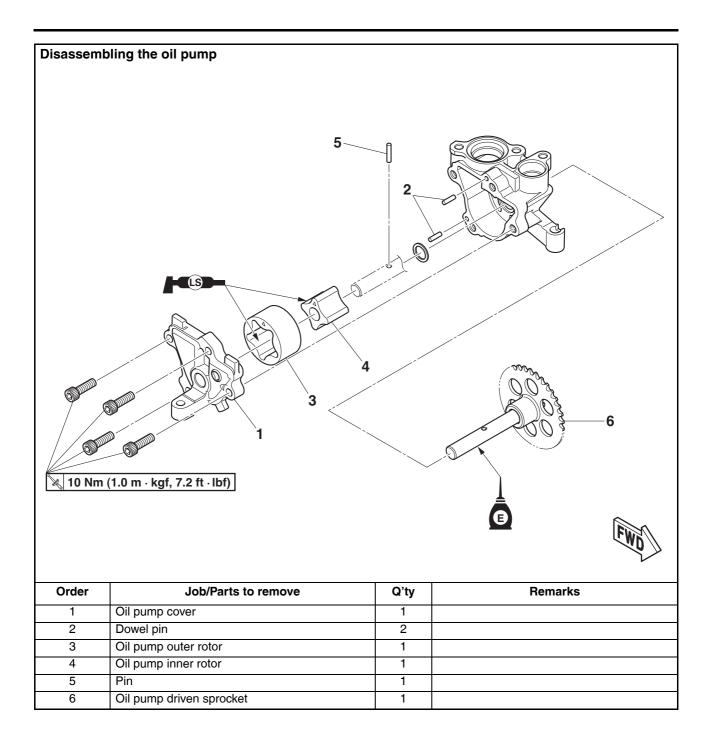


OIL PUMP



	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front side cowling/Front panel/Side cover bracket/Front muffler protector/Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-30.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Oil cooler		Refer to "OIL COOLER" on page 6-4.
	Exhaust pipe/Muffler		Refer to "ENGINE REMOVAL" on page 5-3.
1	Oil pan	1	
2	Oil pan gasket	1	
3	Oil strainer	1	
4	Oil delivery pipe 1	1	
5	Oil pipe 1	1	
6	Relief valve assembly	1	



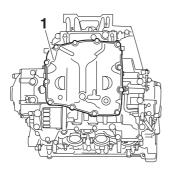


EAS30333 REMOVING THE OIL PAN

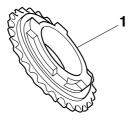
- 1. Remove:
 - Oil pan "1"
 - Gasket
 - Dowel pins

TIP —

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



- EAS300396 CHECKING THE SPROCKET AND CHAIN
- 1. Check:
- Oil pump drive sprocket "1" Cracks/damage/wear → Replace.



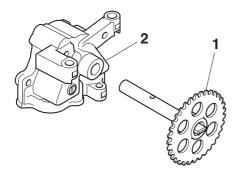
- 2. Check:
- Oil pump drive chain "1"

Damage/stiffness \rightarrow Replace the oil pump drive chain and oil pump drive sprocket as a set.



EAS30337 CHECKING THE OIL PUMP

- 1. Check:
 - Oil pump driven sprocket "1" Cracks/damage/wear \rightarrow Replace.
 - Oil pump housing "2" Cracks/damage/wear \rightarrow Replace.



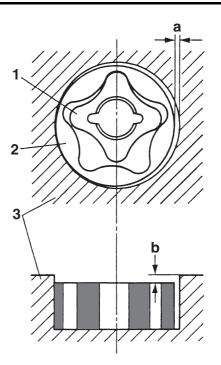
2. Measure:

Δ

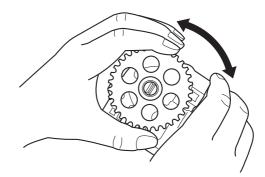
- Outer-rotor-to-oil-pump-housing clearance "a"
- Oil-pump-housing-to-inner-rotor-and-outerrotor clearance "b"

Out of specification \rightarrow Replace the defective part(s).

Outer-rotor-to-oil-pump-housing clearance 0.09–0.15 mm (0.0035–0.0059 in) Limit 0.22 mm (0.0087 in) Oil-pump-housing-to-inner-andouter-rotor clearance 0.06–0.11 mm (0.0024–0.0043 in) Limit 0.18 mm (0.0071 in)

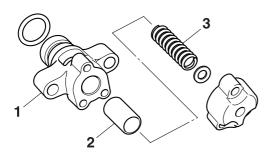


- 1. Inner rotor
- 2. Outer rotor
- 3. Oil pump housing
- 3. Check:
 - Oil pump operation Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



EAS30338

- CHECKING THE RELIEF VALVE 1. Check:
 - Relief valve body "1"
 - Relief valve "2"
 - Spring "3"
 - Damage/wear → Replace the defective part(s).



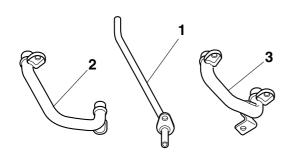
EAS30339

CHECKING THE OIL DELIVERY PIPES

The following procedure applies to all of the oil delivery pipes.

- 1. Check:
 - Oil delivery pipe 1 "1"
 - Oil delivery pipe 2 "2"
 - Oil pipe 1 "3"
 - Damage \rightarrow Replace.

Obstruction \rightarrow Wash and blow out with compressed air.

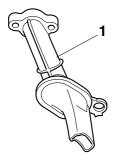


EAS30340

CHECKING THE OIL STRAINER

- 1. Check:
 - Oil strainer "1" Damage \rightarrow Replace.

 $\label{eq:contaminants} \textbf{Contaminants} \rightarrow \textbf{Clean with solvent}.$



EAS30342

ASSEMBLING THE OIL PUMP

- 1. Lubricate:
- Inner rotor
- Outer rotor

- Oil pump shaft
 - (with the recommended lubricant)



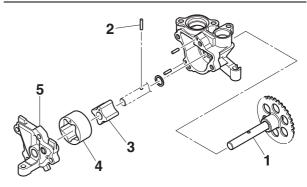
- 2. Install:
 - Oil pump driven sprocket "1"
- Pin "2"
- Inner rotor "3"
- Outer rotor "4"
- Oil pump cover "5"
- Oil pump housing bolt



Oil pump housing bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

When installing the inner rotor, align the pin "2" in the oil pump shaft with the groove in the inner rotor "3".



3. Check:

• Oil pump operation Refer to "CHECKING THE OIL PUMP" on page 5-49.

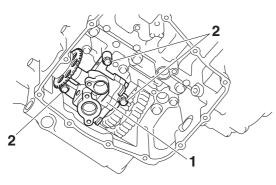
EAS30343

INSTALLING THE OIL PUMP

- 1. Install:
 - Dowel pin
 - Oil pump "1"
 - Oil pump bolt "2"



Oil pump bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)



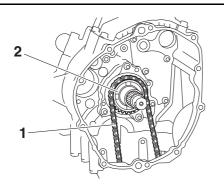
- 2. Install:
- Washer
- Oil pump drive chain "1"
- Oil pump drive sprocket "2"
- Collar

TIP.

Install the oil pump drive chain "1" onto the oil pump drive sprocket "2".

ECA22830 NOTICE

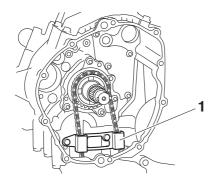
After installing the oil pump drive chain and drive sprocket, make sure the oil pump turns smoothly.



- 3. Install:
- Oil pump drive chain guide "1"



Oil pump drive chain quide bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®



- 4. Install:
- O-ring New
- Oil pipe 1 "1"



10 Nm (1.0 m·kgf, 7.2 ft·lbf)

- O-ring New
- Oil delivery pipe 1 "2"
- Oil strainer "3"

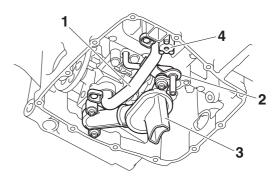


Oil strainer bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) **LOCTITE®**

- O-ring New
- Relief valve assembly "4"



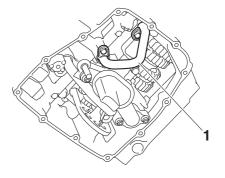
Relief valve assembly bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) **LOCTITE®**



- 5. Install:
- O-ring New
- Oil delivery pipe 2 "1"



Oil delivery pipe 2 bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®



EAS30345

- 1. Install:
- Oil pan gasket New
- Oil pan
- Oil pan bolt New
- 2. Tighten:
- Oil pan bolt

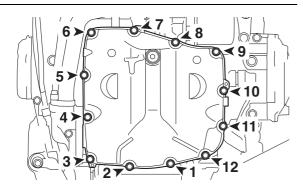


Oil pan bolt 1st: 6 Nm (0.6 m·kgf, 4.3 ft·lbf) *2nd: 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) Specified angle 90°

Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque and the specific angle.

TIP -

Tighten the oil pan bolts in the tightening sequence as shown.



- 3. Install:
- Engine oil drain bolt
- Gasket New



Engine oil drain bolt 23 Nm (2.3 m·kgf, 17 ft·lbf)

CLUTCH

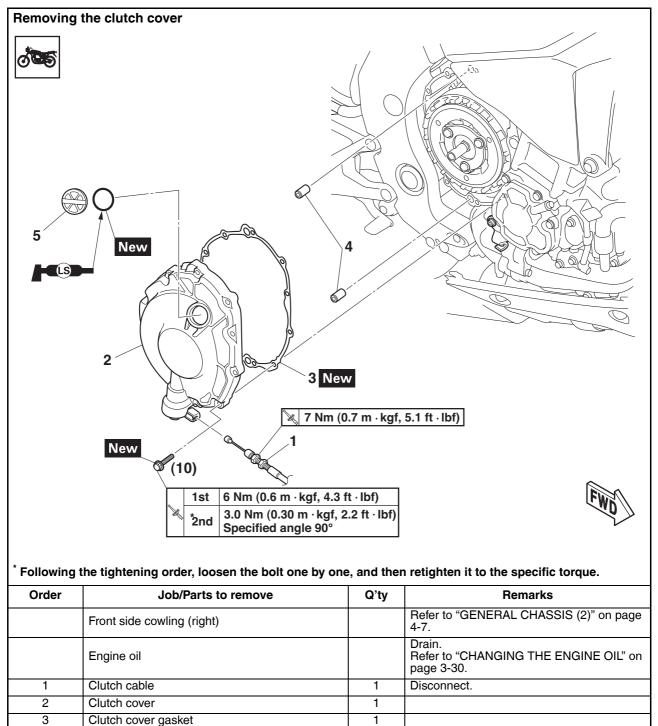
EAS20055 **CLUTCH**

4

5

Dowel pin

Oil filler cap

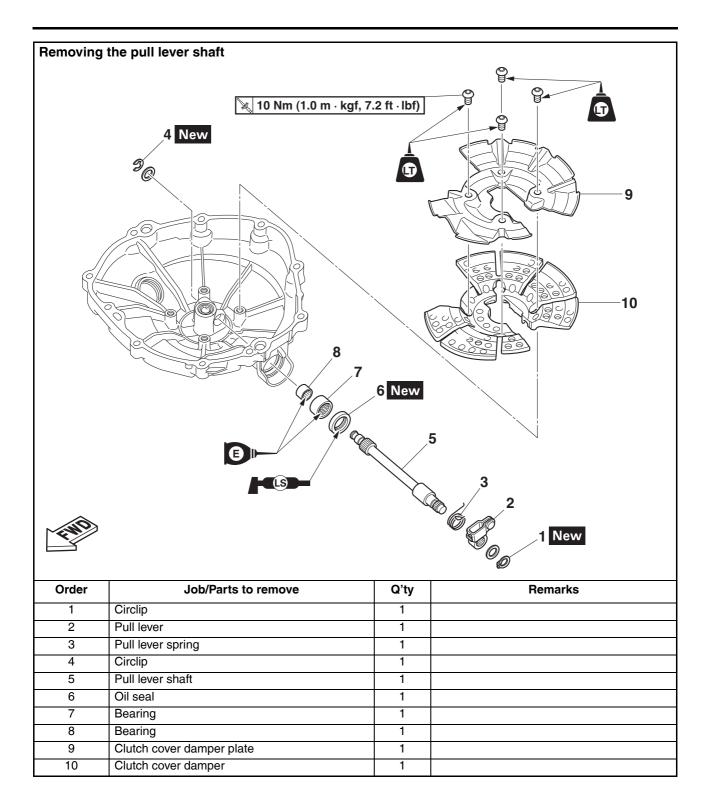


1

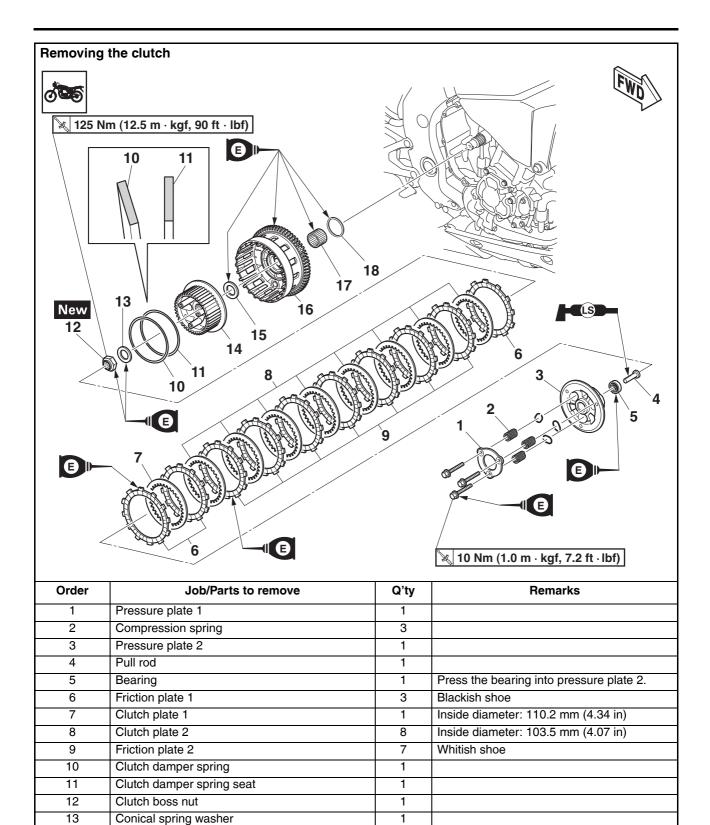
2

1

CLUTCH



CLUTCH



1

1

1

1

1

Clutch boss

Thrust plate

Bearing

Washer

Clutch housing assembly

14

15

16

17

18

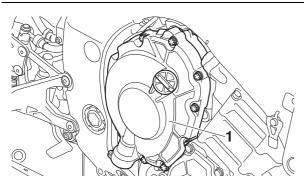
REMOVING THE CLUTCH

- 1. Remove:
 - Clutch cover "1"
- Gasket

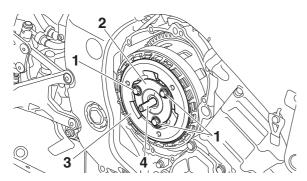
TIP _

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.

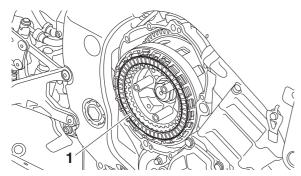
After all of the bolts are fully loosened, remove them.



- 2. Remove:
 - Compression spring bolts "1"
 - Pressure plate 1 "2"
 - Compression springs
 - Pressure plate 2 "3"
 - Pull rod "4"

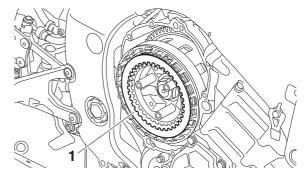


- 3. Remove:
- Friction plates 1 "1"

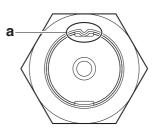


- 4. Remove:
- Clutch plate 1 "1"
- Clutch plates 2

- Friction plates 2
- Clutch damper spring
- Clutch damper spring seat



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

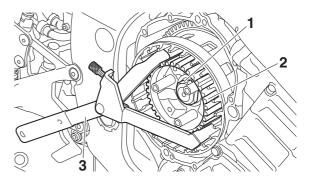


- 6. Loosen:
- Clutch boss nut "1"

TIP _

- While holding the clutch boss "2" with the universal clutch holder "3", loosen the clutch boss nut.
- Do not use an impact wrench for removing the clutch boss nut.





- 7. Remove:
 - Clutch boss nut
 - Conical spring washer
 - Clutch boss

CLUTCH

- Thrust plate
- Clutch housing assembly
- Bearing
- Washer

EAS30348 CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

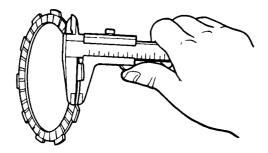
- 1. Check:
- Friction plate 1 (blackish shoe)
- Friction plate 2 (whitish shoe)
- Damage/wear \rightarrow Replace the friction plates as a set.
- 2. Measure:
 - Friction plate thickness Out of specification → Replace the friction plates as a set.

TIP -

Measure the friction plate at four places.



Friction plate thickness 2.72–2.88 mm (0.107–0.113 in) Wear limit 2.62 mm (0.103 in)



EAS30349

CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

- 1. Check:
- Clutch plate

 $\mbox{Damage} \rightarrow \mbox{Replace}$ the clutch plates as a set.

- 2. Measure:
- Clutch plate warpage

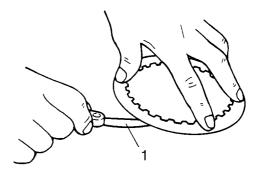
(with a surface plate and thickness gauge "1") Out of specification \rightarrow Replace the clutch plates as a set.



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

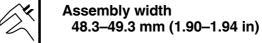


Clutch plate 1 thickness 2.46–2.74 mm (0.097–0.108 in) Warpage limit 0.10 mm (0.004 in) Clutch plate 2 thickness 2.18–2.42 mm (0.086–0.095 in) Warpage limit 0.10 mm (0.004 in)



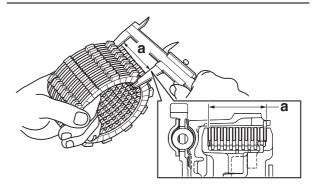
- 3. Measure:
 - Assembly width "a" of the friction plates and clutch plates

Out of specification \rightarrow Adjust.



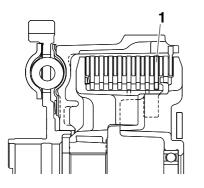
TIP

- Perform the thickness measurement without applying the oil.
- This step should be performed only if the friction plates and clutch plates were replaced.
- To measure the total width of the friction plates and clutch plates, combine 10 friction plates and 9 clutch plates as shown.



- a. Assembly width adjusted by clutch plate "1".
- b. Select the clutch plate from the following table.

Clutch plate "1"				
Part No. Thickness				
2CR-16325-10	2.0 mm (0.079 in)			
2CR-16325-00	2.3 mm (0.091 in)	STD		
2CR-16325-20	2.6 mm (0.102 in)			



EAS30351

CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

- 1. Check:
 - Clutch spring

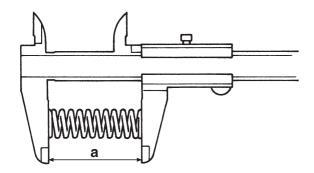
Damage \rightarrow Replace the clutch springs as a set.

- 2. Measure:
 - Clutch spring free length "a"

Out of specification \rightarrow Replace the clutch springs as a set.



Clutch spring free length 47.36 mm (1.86 in) Limit 44.99 mm (1.77 in)



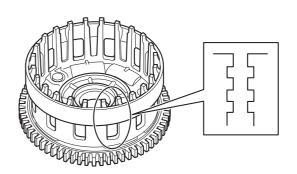
EAS30352

CHECKING THE CLUTCH HOUSING

1. Check:

• Clutch housing dogs Damage/pitting/wear \rightarrow Deburr the clutch housing dogs or replace the clutch housing.

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



- 2. Check:
 - Bearing Damage/wear → Replace the bearing and clutch housing.

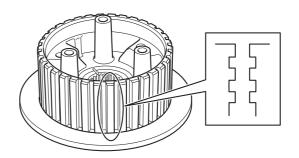
CHECKING THE CLUTCH BOSS

- 1. Check:
 - Clutch boss splines

Damage/pitting/wear \rightarrow Replace the clutch boss.

TIP_

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



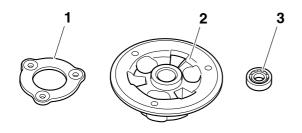
CHECKING THE PRESSURE PLATE

1. Check:

EAS30354

- Pressure plate 1 "1"
- Pressure plate 2 "2"
 Cracks/damage → Replace.
- Bearing "3" Damage/wear \rightarrow Replace.

CLUTCH



EAS30356

CHECKING THE PRIMARY DRIVE GEAR 1. Check:

Primary drive gear

Damage/wear \rightarrow Replace the crankshaft and clutch housing as a set.

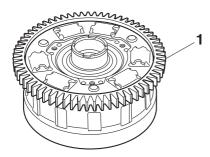
Excessive noise during operation \rightarrow Replace the crankshaft and clutch housing as a set.

EAS30357

CHECKING THE PRIMARY DRIVEN GEAR

- 1. Check:
 - Primary driven gear "1" Damage/wear → Replace the clutch housing and crankshaft as a set.

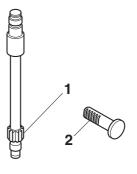
Excessive noise during operation \rightarrow Replace the clutch housing and crankshaft as a set.



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 as a set.



- 2. Check:
 - Pull rod bearing Damage/wear → Replace.

EAS30363

INSTALLING THE CLUTCH

After assembling the clutch assembly, the noise like a dry-type clutch might occur with the gear position in neutral and half clutch. This is due to the clutch dragging by engine oil when assembled. The pressure plate makes chattering by the clutch dragging and noise occurs between pressure plate cam and clutch boss cam. This noise will disappeared after riding few mileage as engine oil between clutch plate and friction plate will be reduced to optimum condition by clutch operation.

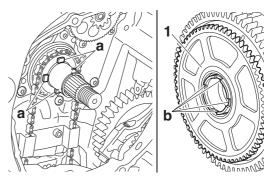
- 1. Install:
- Washer
- Bearing
- Clutch housing assembly "1"

ECA22570

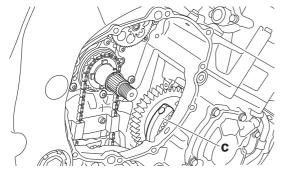
Make sure to fit the projections "a" of the oil pump drive sprocket to the concave "b" of the clutch housing assembly.

TIP

When installing the clutch housing assembly, turn the crankshaft so that the crankshaft web "c" cannot be seen.



CLUTCH



- 2. Install:
 - Thrust plate
 - Clutch boss "1"
 - Conical spring washer "2"
 - Clutch boss nut "3" New

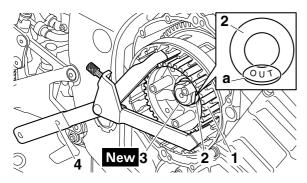


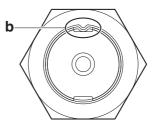
Clutch boss nut 125 Nm (12.5 m·kgf, 90 ft·lbf)

TIP.

- Install the conical spring washer on the main axle with the "OUT" mark "a" facing away from the vehicle.
- While holding the clutch boss "1" with the universal clutch holder "4", tighten the clutch boss nut.
- Do not use an impact wrench for installing the clutch boss nut.
- Stake the clutch boss nut at cutouts "b" in the main axle.







- 3. Lubricate:
 - Friction plates
 - Clutch plates

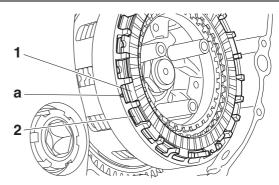
(with the recommended lubricant)

Recommended lubricant Engine oil

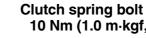
- 4. Install:
 - Clutch damper spring seat
 - Clutch damper spring
 - Friction plates 1
 - Clutch plates 2
 - Friction plates 2
 - Clutch plate 1

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.



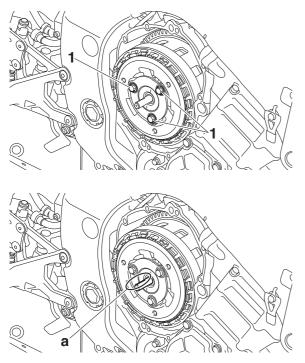
- 5. Install:
- Pull rod
- Pressure plate 2
- Clutch springs
- Pressure plate 1
- Clutch spring bolts "1"



10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP -

- Tighten the clutch spring bolts in stages and in a crisscross pattern.
- Apply lithium-soap-based grease onto the pull rod.
- Position the pull rod so that the teeth "a" face towards the rear of the vehicle. Then, install the clutch cover.



- 6. Install:
 - Dowel pins
 - Clutch cover gasket New
 - Clutch cover
 - Clutch cover bolt New
- 7. Tighten:
 - Clutch cover bolt



Clutch cover bolt 1st: 6 Nm (0.6 m·kgf, 4.3 ft·lbf) ^{*}2nd: 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf) Specified angle 90°

Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque and the specific angle.

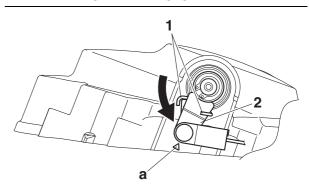
TIP -

Tighten the clutch cover bolts in the tightening sequence as shown.

- 8. Install:
 - Pull lever spring "1"
 - Pull lever "2"
 - Washer
 - Circlip New

TIP —

- The end of the pull lever should be closest to the clutch cover match mark "a" when there is no free play of the pull lever.
- Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.

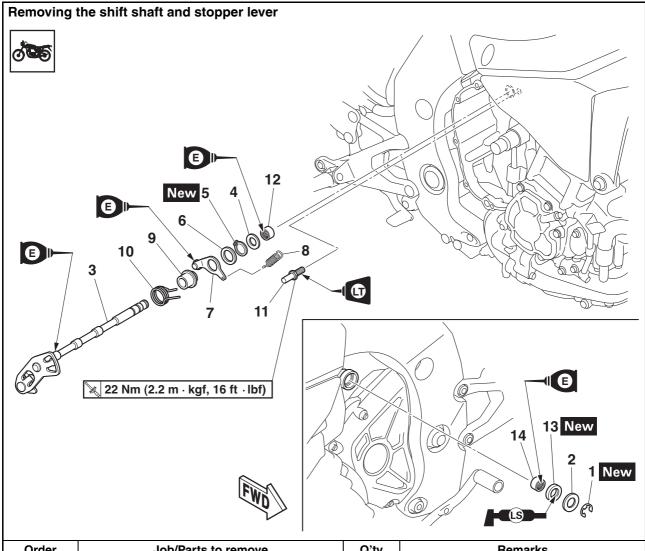


- 9. Adjust:
- Clutch lever free play Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-13.



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

EAS20057 SHIFT SHAFT

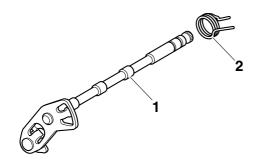


Order	Job/Parts to remove	Q'ty	Remarks
	Clutch assembly		Refer to "CLUTCH" on page 5-53.
	Shift arm		Refer to "CHAIN DRIVE" on page 4-116.
1	Circlip	1	
2	Washer	1	
3	Shift shaft	1	
4	Washer	1	
5	Circlip	1	
6	Washer	1	
7	Stopper lever	1	
8	Stopper lever spring	1	
9	Collar	1	
10	Shift shaft spring	1	
11	Shift shaft spring stopper	1	
12	Bearing	1	
13	Oil seal	1	
14	Bearing	1	

SHIFT SHAFT

EAS30377 CHECKING THE SHIFT SHAFT

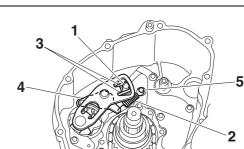
- 1. Check:
 - Shift shaft "1" Bends/damage/wear \rightarrow Replace.
 - Shift shaft spring "2"
 - Collar Damage/wear → Replace.



EAS30378

CHECKING THE STOPPER LEVER

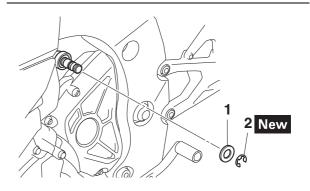
- 1. Check:
- Stopper lever "1" Bends/damage → Replace.
 Roller turns roughly → Replace the stopper lever.



- 2. Install:
- Bearing
- Oil seal New

ment assembly.

- Washer "1"
- Circlip "2" New
- TIP —
- Lubricate the oil seal lips with lithium-soapbased grease.
- Lubricate the outer periphery of the oil seal with the silicone fluid.





EAS30381

INSTALLING THE SHIFT SHAFT

- 1. Install:
 - Shift shaft spring stopper "1"
 - Shift shaft assembly
 - Stopper lever spring "2"

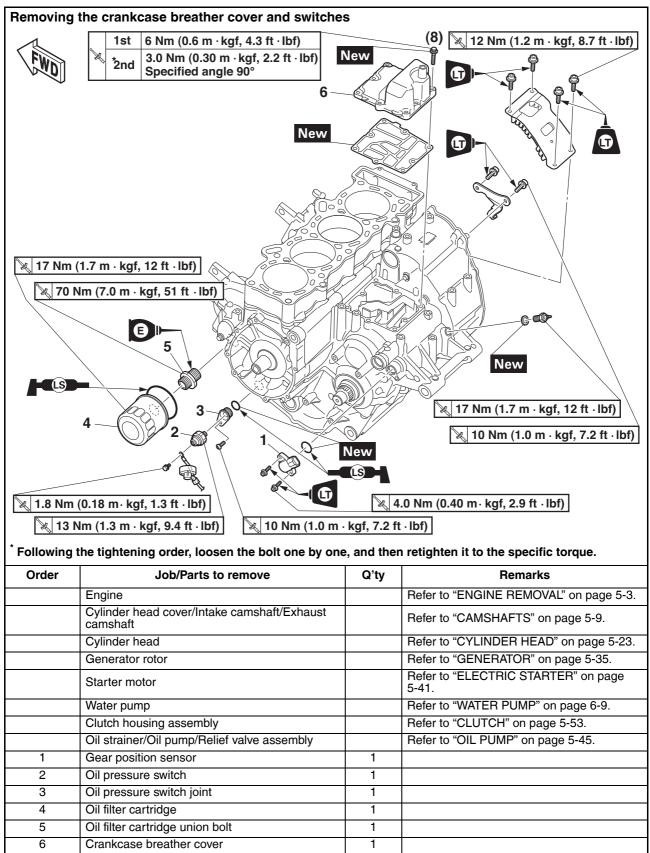


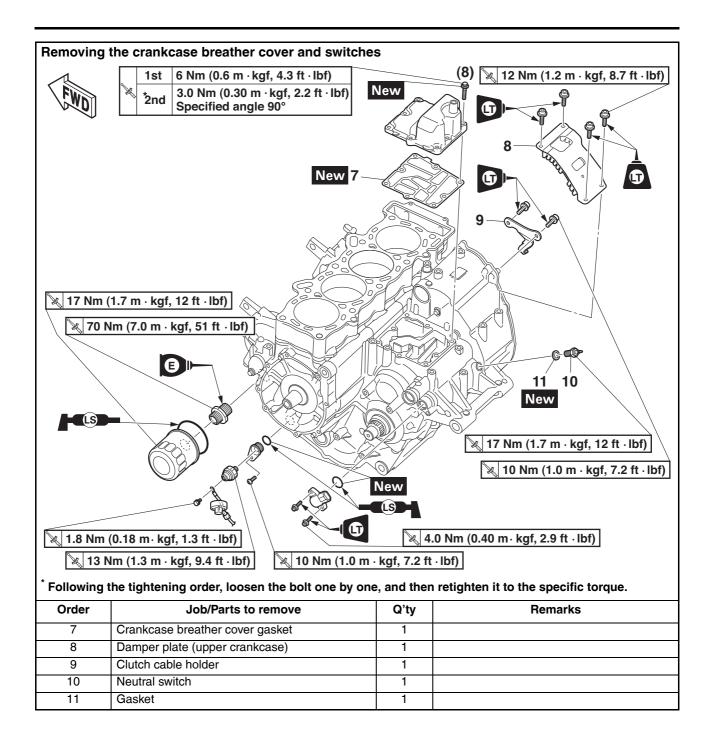
Shift shaft spring stopper 22 Nm (2.2 m⋅kgf, 16 ft⋅lbf) LOCTITE®

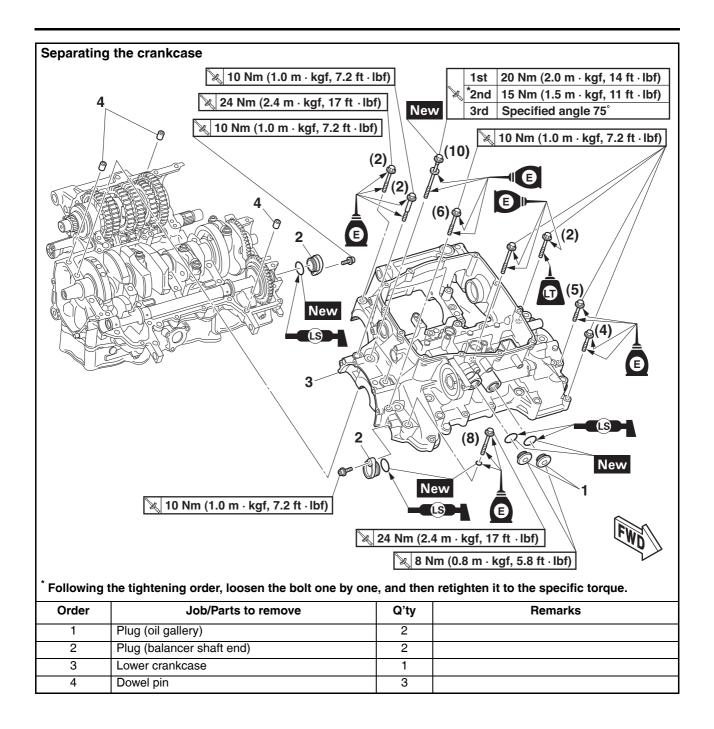
TIP

- Hook the end of the shift shaft spring "3" onto the shift shaft spring stopper "1".
- Hook the ends of the stopper lever spring "2" onto the stopper lever "4" and the crankcase boss "5".
- Mesh the stopper lever with the shift drum seg-

CRANKCASE







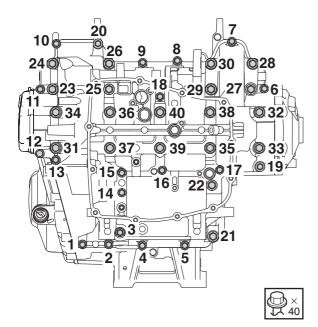
DISASSEMBLING THE CRANKCASE

- 1. Place the engine upside down.
- 2. Remove:
- Crankcase bolt (× 40)

TIP _

EAS30390

- Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.
- Loosen the bolts in the proper sequence as shown.
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.



- 3. Remove:
- Lower crankcase

NOTICE

Tap on one side of the crankcase with a softface hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

- 4. Remove:
- Dowel pins
- 5. Remove:
 - Crankshaft journal lower bearing
 - Balancer shaft journal bearing (from the lower crankcase)

TIP

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

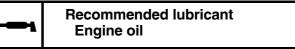
CHECKING THE CRANKCASE

- 1. Thoroughly wash the crankcase halves in a mild solvent.
- 2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
- 3. Check:

EAS30300

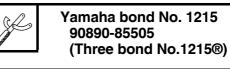
- Crankcase
 - Cracks/damage \rightarrow Replace.
- Oil delivery passages Obstruction \rightarrow Blow out with compressed air.

- ASSEMBLING THE CRANKCASE
- 1. Lubricate:
- Crankshaft journal bearing inner surface (with the recommended lubricant)



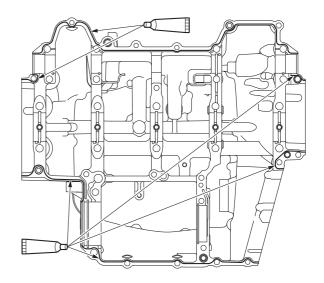
- 2. Apply:
- Sealant

(onto the crankcase mating surfaces)



TIP

Do not allow any sealant to come into contact with the oil gallery or crankshaft journal bearings, or balancer shaft journal bearings.



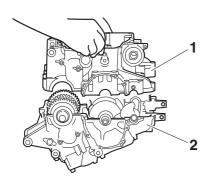
- 3. Install:
 - Dowel pins

- 4. Set the shift drum assembly and transmission gears in the neutral position.
- 5. Install:
 - Lower crankcase "1"
 (opto the upper crankcase)

(onto the upper crankcase "2")

ECA13980

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

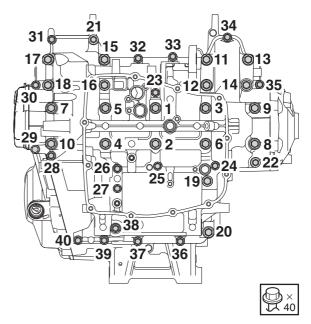


6. Install:

• Crankcase bolt (× 40)

TIP -

- Lubricate the bolts "1"-"10" thread, mating surfaces and washers with engine oil.
- Lubricate the bolts "11"–"18" thread, mating surfaces and O-rings with engine oil.
- Lubricate the bolts "19"–"27", "29"–"39" thread and mating surfaces with engine oil.
- Lubricate the bolts "28", "40" mating surfaces with engine oil.
- Apply the bolts "28", "40" thread with LOC-TITE®.
 - M9 \times 100 mm (3.94 in) bolts with washers: "1"–"10" \fbox{New}
 - M8 \times 58 mm (2.28 in) bolts with new O-rings: "11"–"18"
 - M8 × 60 mm (2.36 in) bolts: "19", "20"
 - M6 × 65 mm (2.56 in) bolts: "21", "22"
 - M6 × 70 mm (2.76 in) bolt: "23"
 - M6 × 60 mm (2.36 in) bolts: "24"–"27", "35", "38"
 - M6 × 50 mm (1.97 in) bolts: "31"–"34"
 - M6 × 50 mm (1.97 in) bolts (LOCTITE®): "28", "40"
 - M6 × 40 mm (1.57 in) bolts: "29", "30", "36", "37", "39"



- 7. Tighten:
- Crankcase bolts "1"-"10"



WA16610

Crankcase bolts "1"–"10" 1st: 20 Nm (2.0 m·kgf, 14 ft·lbf) *2nd: 15 Nm (1.5 m·kgf, 11 ft·lbf) 3rd: Specified angle 75°

Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque.

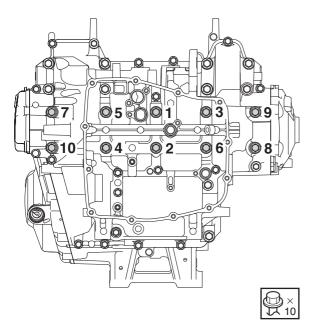
If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

ECA20890

Do not use a torque wrench to tighten the bolt to the specified angle.

TIP -

Tighten the bolts in the tightening sequence cast on the crankcase.



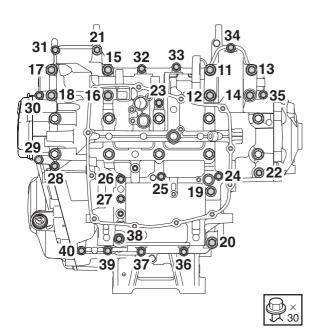
- 8. Tighten:
- Crankcase bolts "11"-"40"



Crankcase bolts "11"–"20" 24 Nm (2.4 m·kgf, 17 ft·lbf) Crankcase bolts "21"–"40" 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

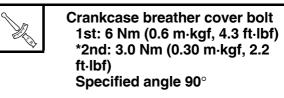
TIP -

Tighten the bolts "11"–"18" in the tightening sequence cast on the crankcase.



INSTALLING THE CRANKCASE BREATHER COVER

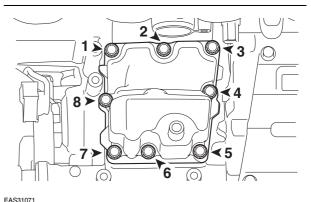
- 1. Install:
 - Crankcase breather cover
 - Crankcase breather cover bolt New
- 2. Tighten:
 - Crankcase breather cover bolt



Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque and the specific angle.

TIP -

Tighten the crankcase breather cover bolts in the tightening sequence as shown.



INSTALLING THE OIL PRESSURE SWITCH

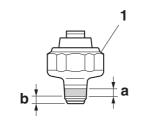
- 1. Install:
- Oil pressure switch "1"
- Oil pressure switch lead "2"

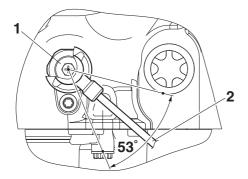


Oil pressure switch 13 Nm (1.3 m·kgf, 9.4 ft·lbf) Oil pressure switch lead bolt 1.8 Nm (0.18 m·kgf, 1.3 ft·lbf)

TIP

- Apply Three Bond No. 1215B® to the threads "a" of the oil pressure switch. However, do not apply Three Bond No. 1215B® to the portion "b" of the oil pressure switch.
- Install the oil pressure switch lead so that it is routed within the range shown in the illustration.





EAS31658

INSTALLING THE GEAR POSITION SENSOR

NOTICE

To prevent damage to the gear position sensor, keep magnets (including any pickup tool with a magnet, magnetized screwdrivers, etc.) away from the gear position sensor.

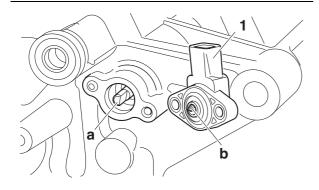
- 1. Install:
 - O-ring New
 - Gear position sensor "1"



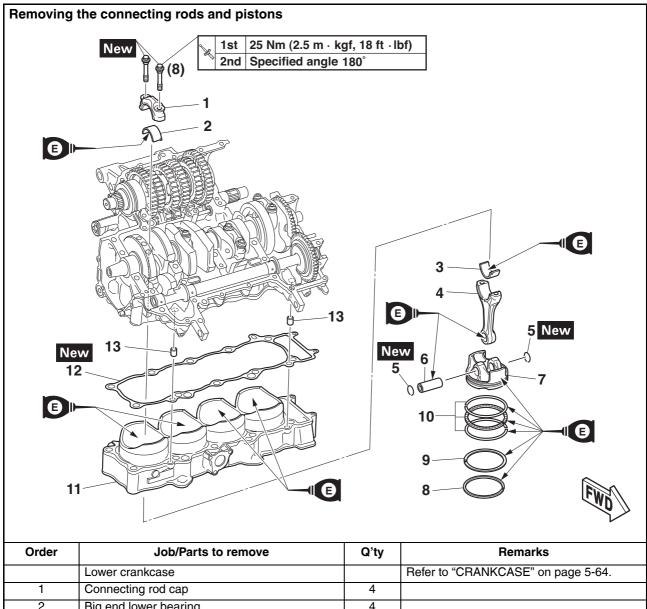
Gear position sensor bolt 4.0 Nm (0.40 m·kgf, 2.9 ft·lbf) LOCTITE®

TIP -

- Lubricate the O-ring with lithium-soap-based grease.
- Fit the end "a" of the shift drum assembly into the opening "b" in the gear position sensor "1".



CONNECTING RODS AND PISTONS



	Lower crankcase		Refer to "CRANKCASE" on page 5-64.
1	Connecting rod cap	4	
2	Big end lower bearing	4	
3	Big end upper bearing	4	
4	Connecting rod	4	
5	Piston pin clip	8	
6	Piston pin	4	
7	Piston	4	
8	Top ring	4	
9	2nd ring	4	
10	Oil ring	4	
11	Cylinder	1	
12	Cylinder gasket	1	
13	Dowel pin	2	

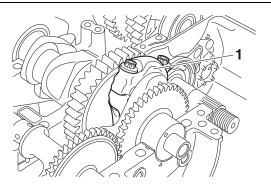
REMOVING THE CONNECTING RODS AND PISTONS

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

- 1. Remove:
 - Connecting rod cap "1"
- Connecting rod
- Big end bearings

TIP -

- Identify the position of each big end bearing so that it can be reinstalled in its original place.
- After removing the connecting rods and connecting rod caps, care should be taken not to damage the mating surfaces of the connecting rods and connecting rod caps.

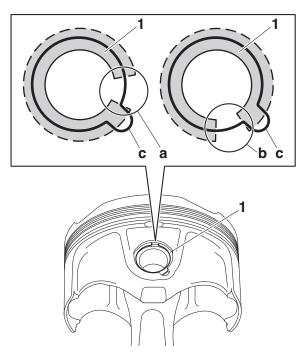


- 2. Remove:
 - Piston pin clip "1"

a. Make sure that the piston pin clip ends are in either the "a" or "b" position in relation to the cutout "c".

TIP -

If the piston pin clip ends are not positioned at "a" or "b", adjust the piston pin clip ends position by following steps (b) to (c).

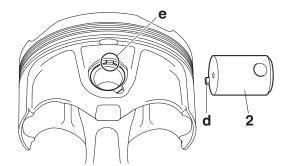


b. Install the piston pin clip rotation tool "2" to the piston pin clip.

TIP _

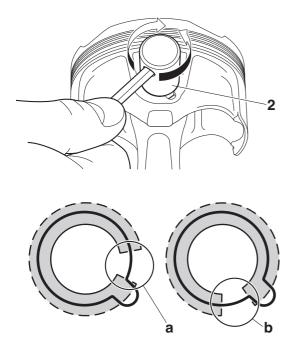
When installing the piston pin clip rotation tool, align the projection "d" on the piston pin clip rotation tool with the clip ends "e".

Piston pin clip rotation tool 90890-04175 YM-04175



c. Turn the piston pin clip rotation tool "2" so that the piston pin clip ends are positioned at "a" or "b".

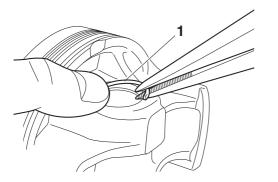
CONNECTING RODS AND PISTONS



d. Remove the piston pin clip "1" using longnose pliers or a similar tool.

TIP -

When removing the piston pin clip, hold the piston pin clip in place with your fingers because it can easily spring.



- 3. Remove:
- Piston pin "1"
- Piston "2"
- ECA13810

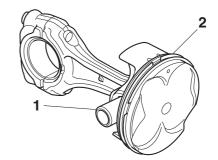
Do not use a hammer to drive the piston pin out.

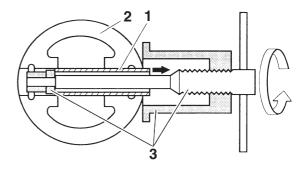
TIP -

- For reference during installation, put identification marks on the piston crown.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are deburred and the piston

pin is still difficult to remove, remove it with the piston pin puller set "3".

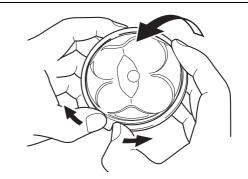
Piston pin puller set 90890-01304 Piston pin puller YU-01304





- 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.



CHECKING THE CYLINDER AND PISTON

- 1. Check:
 - Piston wall
- Cylinder wall
 - Vertical scratches \rightarrow Replace the cylinder

block, and replace the pistons and piston rings as a set.

- 2. Measure:
 - Piston-to-cylinder clearance

a. Measure cylinder bore "C" with the cylinder bore gauge.

TIP -

Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

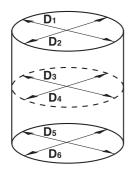


Bore 79.000–79.010 mm (3.1102– 3.1106 in) Taper limit 0.050 mm (0.0020 in) Out of round limit 0.050 mm (0.0020 in)

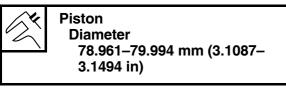
"C" = average of D₁, D₂, D₃, D₄, D₅, D₆

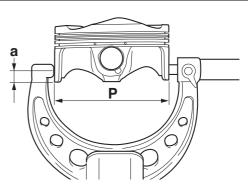
Taper (front-to-back) = maximum difference between D_1 , D_3 , D_5 Taper (side-to-side) = maximum difference between D_2 , D_4 , D_6

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, replace the cylinder, and replace the piston and piston rings as a set.
- c. Measure piston skirt diameter "P" with the micrometer.





- a. 8.0 mm (0.31 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 0.006–0.049 mm (0.0002–0.0019 in)

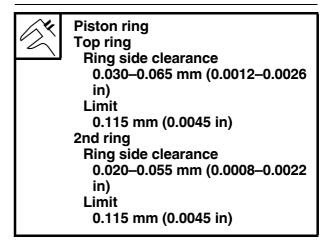
f. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.

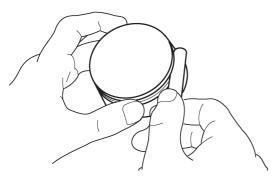
CHECKING THE PISTON RINGS

- 1. Measure:
 - Piston ring side clearance
 - Out of specification \rightarrow 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.





- 2. Install:
 - Piston ring
 - (into the cylinder)

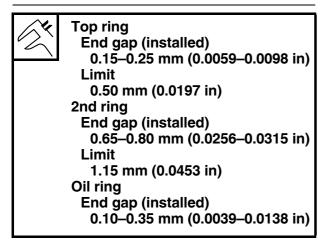
TIP -

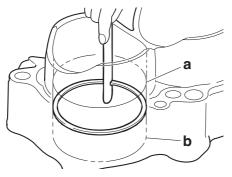
Use the piston crown to level the piston ring near bottom of cylinder "a", where cylinder wear is lowest.

- 3. Measure:
- Piston ring end gap Out of specification
 - Out of specification \rightarrow 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.





b. Upper of cylinder

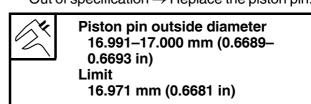
CHECKING THE PISTON PIN

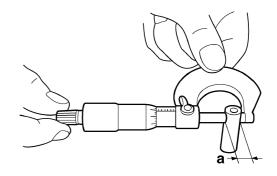
The following procedure applies to all of the piston pins.

1. Measure:

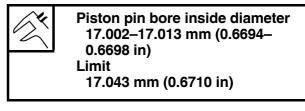
EAS20740

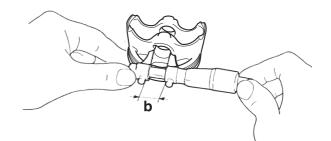
Piston pin outside diameter "a"
 Out of specification → Replace the piston pin.





- 2. Measure:
 - Piston pin bore inside diameter "b"
 Out of specification → Replace the piston.





- 3. Calculate:
- Piston-pin-to-piston-pin-bore clearance Out of specification → Replace the piston pin and piston as a set.

Piston-pin-to-piston-pin-bore clearance = Piston pin bore inside diameter "b" - Piston pin outside diameter "a"



Piston-pin-to-piston-pin-bore clearance 0.002–0.022 mm (0.0001–0.0009 in) Limit

0.072 mm (0.0028 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 0.033–0.057 mm (0.0013–0.0022 in)

The following procedure applies to all of the connecting rods.

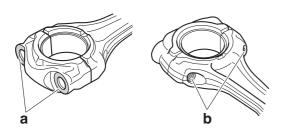
NOTICE

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.

a. Clean the big end bearings, crankshaft pins, and the connecting rods with oil cleaner.

TIP -

When cleaning the connection rod, clean the bearing surface "a" of the connecting rod bolt and threads "b".

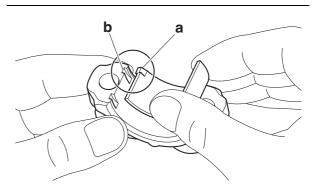


- b. Wait five minutes to dry the remaining oil cleaner component.
- c. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

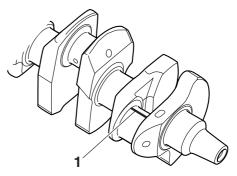
TIP -

Align the projections "a" on the big end bearings

with the notches "b" in the connecting rod and connecting rod cap.



d. Put a piece of Plastigauge® "1" on the crankshaft pin.



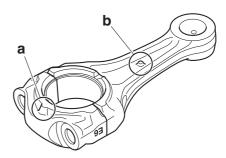
e. Assemble the connecting rod halves.

NOTICE

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

TIP -

- Install the new connecting rod bolt without cleaning and without any oil.
- Make sure that the projection "a" on the connecting rod cap faces the same direction as the "Y" or "o" mark "b" on the connecting rod.
- After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.



CONNECTING RODS AND PISTONS

TIP -

Install by carrying out the following procedures in order to assemble in the most suitable condition.

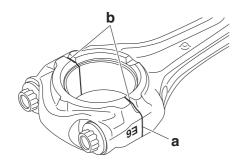
f. Tighten the connecting rod bolt while checking that the sections shown "a" and "b" are flush with each other by touching the surface.



Connecting rod bolt 30 Nm (3.0 m·kgf, 22 ft·lbf)

TIP

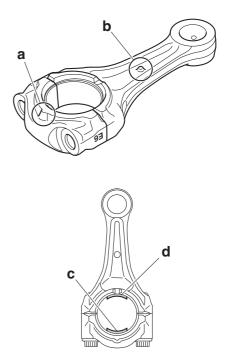
To install the connecting rod cap, care should be taken not to install it at an angle and the position should not be out of alignment.



- a. Side machined face
- b. Thrusting faces
- g. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

TIP _

- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Make sure that the projection "a" on the connecting rod cap faces the same direction as the "Y" or "o" mark "b" on the connecting rod.
- Make sure the "Y" or "o" marks "b" on the connecting rods face towards the left side of the crankshaft.
- Install the connecting rod so that the Plastigauge® is in position "c" or "d".

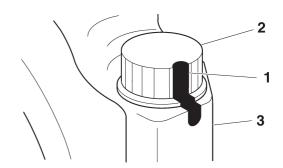


h. Tighten the connecting rod bolts with a torque wrench.



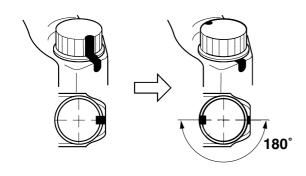
Connecting rod bolt (1st) 25 Nm (2.5 m·kgf, 18 ft·lbf)

i. Put a mark "1" on the corner of the connecting rod bolt "2" and the connecting rod cap "3".



j. Tighten the connecting rod bolts further to reach the specified angle 175°–185° with torque wrench, and then confirm that the torque value is within the range of 40 Nm (4.0 m·kgf, 29 ft·lbf) to 85 Nm (8.5 m·kgf, 61 ft·lbf) with keeping the torque wrench 175°–185°. If torque is out of range, replace the connecting rod bolt to new one and repeat from step h.

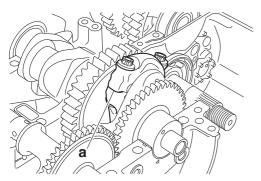
> Connecting rod bolt (final) Specified angle 175°–185°



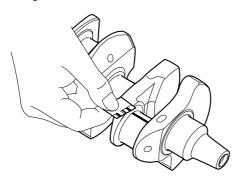
WARNING

If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

k. After the installation, check that the section shown "a" is flush with each other by touching the surface.



- I. Remove the connecting rod and big end bearings.
- m. Measure the compressed Plastigauge® width on the crankshaft pin. If the crankshaftpin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



2. Select:

- Big end bearings (P₁–P₄)
- TIP -
- The numbers "A" stamped into the crankshaft

web and the numbers "1" on the connecting rods are used to determine the replacement big end bearings sizes.

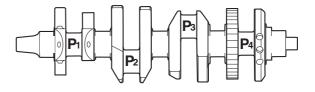
• "P₁"-"P₄" refer to the bearings shown in the crankshaft illustration.

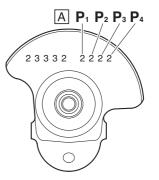
For example, if the connecting rod " P_1 " and the crankshaft web " P_1 " numbers are 6 and 2 respectively, then the bearing size for " P_1 " is:

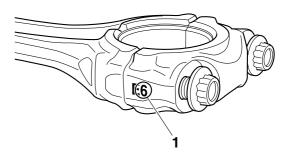
"P₁" (connecting rod) - "P₁" (crankshaft) = 6 - 2 = 4 (green)



Bearing color code 1. Blue 2. Black 3. Brown 4. Green 5. Yellow 6. Pink







EAS30751 INSTALLING THE CONNECTING ROD AND PISTON

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

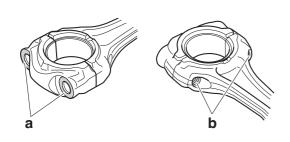
1. Install:

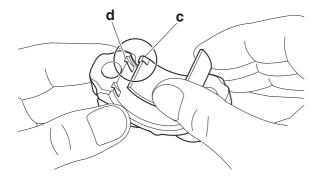
• Big end bearings

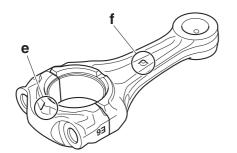
 Connecting rod cap (onto the connecting rod)

TIP

- Clean the big end bearings, crankshaft pins, and the connecting rods with oil cleaner, and then wait five minutes to dry the remaining oil cleaner component.
- When cleaning the connection rod, clean the bearing surface "a" of the connecting rod bolt and threads "b".
- Be sure to reinstall each big end bearing in its original place.
- Align the projections "c" on the big end bearings with the notches "d" in the connecting rods and connecting rod caps.
- Make sure that the projection "e" on the connecting rod cap faces the same direction as the "Y" or "o" mark "f" on the connecting rod.







- 2. Tighten:
- Connecting rod bolts New

NOTICE

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

TIP

- Install by carrying out the following procedures in order to assemble in the most suitable condition.
- Install the new connecting rod bolt without cleaning and without any oil.

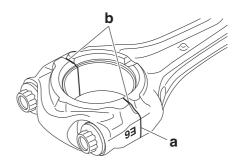
- a. Replace the connecting rod bolts with new ones.
- b. After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.
- c. Tighten the connecting rod bolt while checking that the sections shown "a" and "b" are flush with each other by touching the surface.



Connecting rod bolt 30 Nm (3.0 m·kgf, 22 ft·lbf)

TIP

To install the connecting rod cap, care should be taken not to install it at an angle and the position should not be out of alignment.



- a. Side machined face
- b. Thrusting faces
- d. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

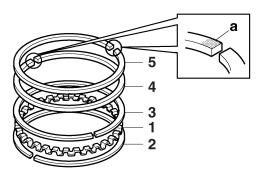
- 3. Install:
 - Oil ring expander "1"
 - Lower oil ring rail "2"
 - Upper oil ring rail "3"

CONNECTING RODS AND PISTONS

- 2nd ring "4"
- Top ring "5"
- (into the piston)

TIP -

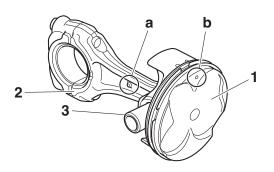
Be sure to install the piston rings so that the manufacturer's marks or numbers "a" face up.



- 4. Install:
 - Piston "1"
 - (onto the respective connecting rod "2")
- Piston pin "3"

TIP _

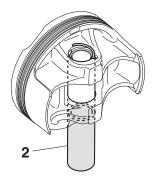
- Apply engine oil onto the piston pin.
- Make sure that the "Y" or "o" mark "a" on the connecting rod faces left when the punch mark "b" on the piston is pointing up as shown.
- Reinstall each piston into its original cylinder.



- 5. Install:
- Piston pin clip "1" New
- *****
- a. Install the piston pin clip "1" in the piston as shown in the illustration.

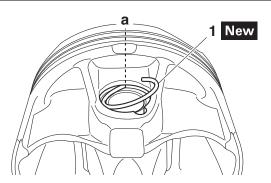
TIP

When installing the first piston pin clip, place other piston pin "2" under the piston pin as shown in the illustration.



TIP

Align the piston pin clip end with the position "a".

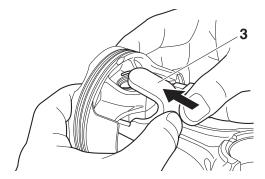


b. Push the piston pin clip insertion tool "3" in the direction as shown in the illustration and place the piston pin clip into the piston pin bore.

TIP -

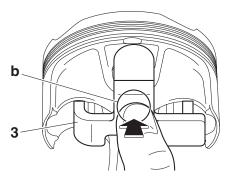
Push in the piston pin clip insertion tool while holding it parallel with the upper surface of the piston and rear surface of the piston pin clip insertion tool.



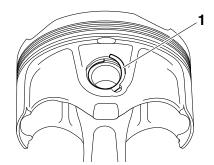


c. Install the piston pin clip to the piston by pressing the portion "b" on the piston pin clip insertion tool "3" in the direction shown in the illustration.

CONNECTING RODS AND PISTONS



d. Make sure the piston pin clip "1" is positioned as shown in the illustration.

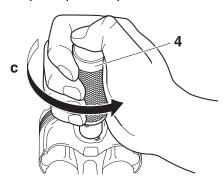


e. Install the piston pin clip installer tool "4" onto the piston.

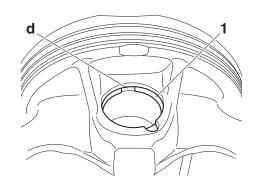


Piston pin clip installer tool 90890-04174 YM-04174

f. While holding the piston clip installer tool, turn it counterclockwise "c", to completely install the piston pin clip in the piston.



g. Make sure that the piston pin clip "1" is in the groove "d".



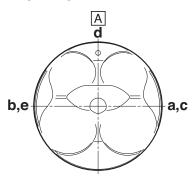
- 6. Lubricate:
- Piston
- Piston rings
- Cylinder (with the recommended lubricant)



Engine oil

Recommended lubricant

- 7. Offset:
- Piston ring end gaps



- a. Top ring
- b. 2nd ring
- c. Upper oil ring rail
- d. Oil ring expander
- e. Lower oil ring rail
- A. Exhaust side
- 8. Lubricate:
 - Crankshaft pins
 - Connecting rod big end bearing inner surface and side surface

(with the recommended lubricant)



9. Install:

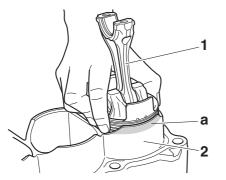
• Piston assemblies "1" (into the cylinder "2")

TIP_

• While holding the piston rings with the hand, in-

stall the piston assembly into the cylinder from underneath.

• Install the piston assembly into the cylinder so that the piston ring end gap is aligned with the cylinder skirt "a".

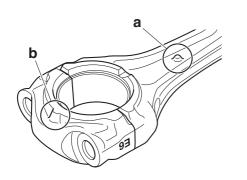


10.Install:

- Cylinder gasket New
- Dowel pins
- Cylinder assembly
- Connecting rod caps
- Connecting rod bolts

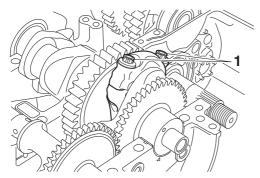
TIP -

- Make sure the "Y" or "o" marks "a" on the connecting rods face towards the left side of the crankshaft.
- Make sure that the projection "b" on the connecting rod cap faces the same direction as the "Y" or "o" mark "a" on the connecting rod.



11.Tighten:

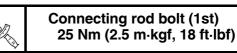
• Connecting rod bolts "1"



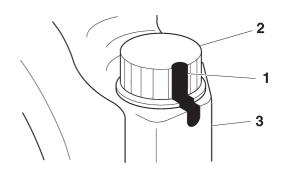
TIP_____

Tighten the connecting rod bolts using the following procedure.

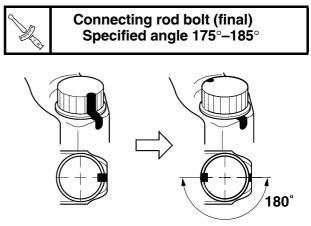
a. Tighten the connecting rod bolts with a torque wrench.



b. Put a mark "1" on the corner of the connecting rod bolt "2" and the connecting rod cap "3".



c. Tighten the connecting rod bolts further to reach the specified angle 175°–185° with torque wrench, and then confirm that the torque value is within the range of 40 Nm (4.0 m·kgf, 29 ft·lbf) to 85 Nm (8.5 m·kgf, 61 ft·lbf) with keeping the torque wrench 175°–185°. If torque is out of range, replace the connecting rod bolt to new one and repeat from step a.



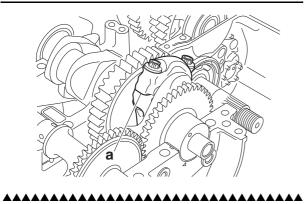
WARNING

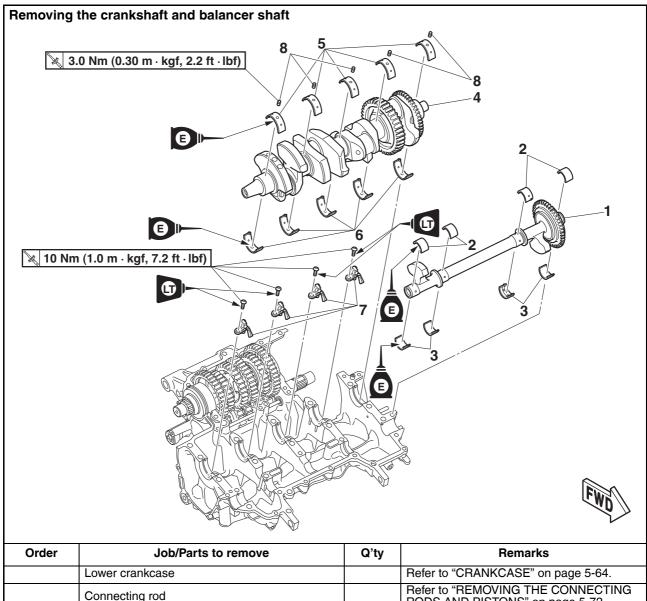
If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

d. After the installation, check that the section shown "a" is flush with each other by touching the surface.

WARNING

If the connecting rod and cap are not flush with each other, remove the connecting rod bolts and big end bearing and restart from step (1). In this case, make sure to replace the connecting rod bolts.





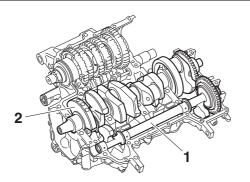
	Lower crankcase		Refer to "CRANKCASE" on page 5-64.
	Connecting rod		Refer to "REMOVING THE CONNECTING RODS AND PISTONS" on page 5-72.
1	Balancer shaft	1	
2	Balancer shaft journal lower bearing	4	
3	Balancer shaft journal upper bearing	4	
4	Crankshaft	1	
5	Crankshaft journal lower bearing	5	
6	Crankshaft journal upper bearing	5	
7	Oil nozzle 1	4	
8	Oil nozzle 2	5	

REMOVING THE CRANKSHAFT AND BALANCER SHAFT

- 1. Remove:
 - Balancer shaft "1"
 - Balancer shaft journal bearing
 - Crankshaft assembly "2"
 - Crankshaft journal bearings

TIP -

Identify the position of each balancer shaft journal bearings and crankshaft journal bearings so that it can be reinstalled in its original place.



EAS31174

CHECKING THE OIL NOZZLES

The following procedure applies to all of the oil nozzles.

- 1. Check:
 - Oil nozzle 1 "1"
 - Oil nozzle 2 "2"
 - Damage/wear \rightarrow Replace the oil nozzle.
 - Oil passage

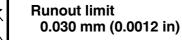
Obstruction \rightarrow Blow out with compressed air.



EAS31075

CHECKING THE CRANKSHAFT

- 1. Measure:
 - Crankshaft runout Out of specification → Replace the crankshaft.



- 2. Check:
 - Crankshaft journal surfaces
- Crankshaft pin surfaces Scratches/wear \rightarrow Replace the crankshaft.
- Bearing surfaces Scratches/wear → Replace the crankshaft journal bearing.
- 3. Measure:
- Crankshaft-journal-to-crankshaft-journalbearing clearance
 Out of specification → Replace the crank-

shaft journal bearings.



Journal oil clearance 0.027–0.045 mm (0.0011–0.0018 in)

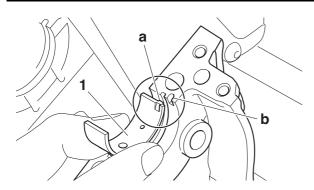
NOTICE

Do not interchange the crankshaft journal bearings. To obtain the correct crankshaftjournal-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 -

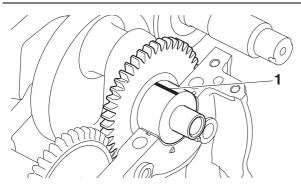
Align the projections "a" on the crankshaft journal upper bearings with the notches "b" in the upper crankcase.



d. Put a piece of Plastigauge® "1" on each crankshaft journal.

TIP -

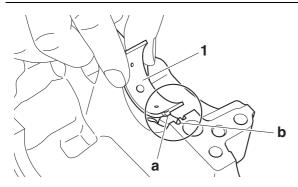
Do not put the Plastigauge® over the oil hole in the crankshaft journal.



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

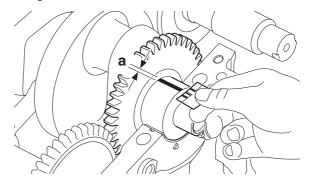
TIP.

- 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 5-64.
- 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)

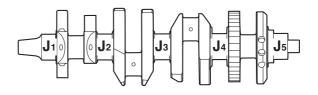
TIP -

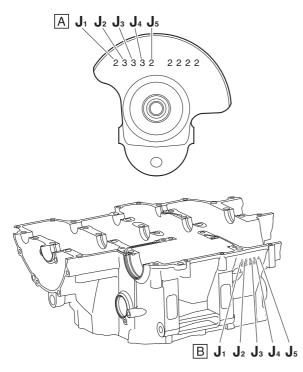
- The numbers "A" stamped into the crankshaft web and the numbers "B" stamped into the lower crankcase are used to determine the replacement crankshaft journal bearing sizes.
- "J₁"–"J₅" refer to the bearings shown in the crankshaft and lower crankcase illustration.
- If "J₁"-"J₅" are the same, use the same size for all of the bearings.

For example, if the crankcase " J_1 " and crankshaft web " J_1 " numbers are 5 and 2 respectively, then the bearing size for " J_1 " is:

"J₁" (crankcase) - "J₁" (crankshaft web) + 4 = 5 - 2 + 4 = 7 (red)

> Bearing color code 1.Blue 2.Black 3.Brown 4.Green 5.Yellow 6.Pink 7.Red

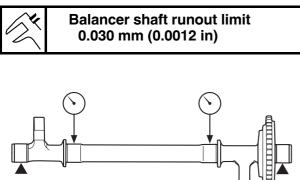




EAS31076

CHECKING THE BALANCER SHAFT 1. Measure:

 Balancer shaft runout Out of specification → Replace the balancer shaft.



- 2. Check:
 - Balancer shaft journal surfaces
 Scratches/wear → Replace the balancer shaft.
 - Bearing surfaces
 Scratches/wear → Replace the balancer shaft journal bearing.
- 3. Measure:
- Balancer shaft journal-to-balancer shaft journal bearing clearance
 Out of specification → Replace the balancer shaft journal bearings.

K.

Balancer shaft journal to balancer shaft bearing clearance 0.028–0.046 mm (0.0011–0.0018 in)

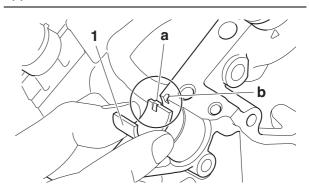
NOTICE

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

- a. Clean the balancer shaft journal bearings, balancer shaft journals, and bearing portions of the crankcase.
- b. Place the upper crankcase upside down on a bench.
- c. Install the balancer shaft journal upper bearings "1" and the balancer shaft into the upper crankcase.

TIP _

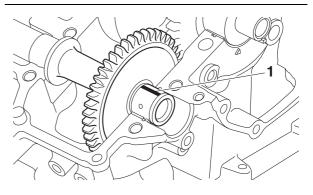
Align the projections "a" on the balancer shaft journal upper bearings with the notches "b" in the upper crankcase.



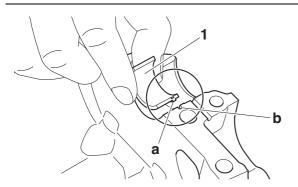
d. Put a piece of Plastigauge® "1" on each balancer shaft journal.

TIP -

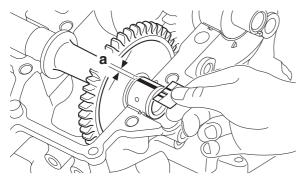
Do not put the Plastigauge® over the oil hole in the balancer shaft journal.



- e. Install the balancer shaft journal lower bearings "1" into the lower crankcase and assemble the crankcase halves.
- TIP -
- Align the projections "a" of the balancer shaft journal lower bearings with the notches "b" in the crankcase.
- Do not move the balancer shaft 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 5-64.
- g. Remove the lower crankcase and the balancer shaft journal lower bearings.
- h. Measure the compressed Plastigauge® width "a" on each balancer shaft journal. If the balancer shaft-journal-to-balancer shaft-journal-bearing clearance is out of specification, select replacement balancer shaft journal bearings.

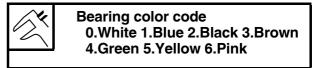


- 4. Select:
- Balancer shaft journal bearing (J₁–J₄)
- TIP
- The numbers "A" stamped into the balancer shaft web and the numbers "B" stamped into the lower crankcase are used to determine the replacement balancer shaft journal bearing sizes.
- "J₁"–"J₄" refer to the bearings shown in the balancer shaft and lower crankcase illustration.

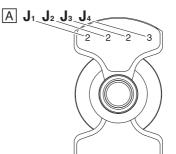
• If "J₁"-"J₄" are the same, use the same size for all of the bearings.

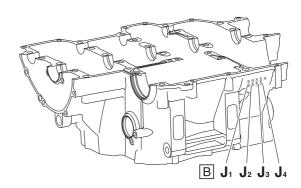
For example, if the crankcase " J_1 " and balancer shaft web " J_1 " numbers are 6 and 2 respectively, then the bearing size for " J_1 " is:

" J_1 " (crankcase) - " J_1 " (balancer shaft web) - 1 = 6 - 2 - 1 = 3 (brown)







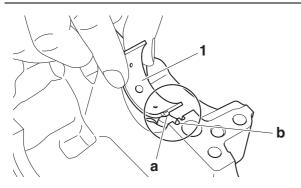


EAS31077 INSTALLING THE CRANKSHAFT

- 1. Install:
 - Crankshaft journal upper bearings (into the upper crankcase)
 - Crankshaft journal lower bearings (into the lower crankcase)
 - Crankshaft

TIP -

- Align the projections "a" on the crankshaft journal bearings "1" with the notches "b" in the crankcase.
- Be sure to install each crankshaft journal bearings in its original place.



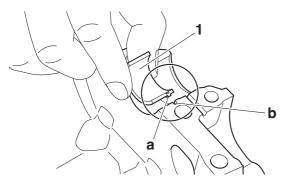
EAS31172

INSTALLING THE BALANCER ASSEMBLY

- 1. Install:
 - Balancer shaft journal upper bearings (into the upper crankcase)
 - Balancer shaft journal lower bearings (into the lower crankcase)

TIP

- Align the projections "a" on the balancer shaft journal bearings "1" with the notches "b" in the crankcases.
- Be sure to install each balancer shaft journal bearing in its original place.

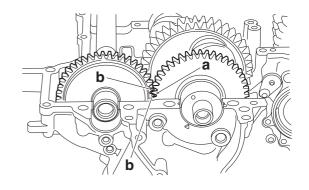


2. Install:

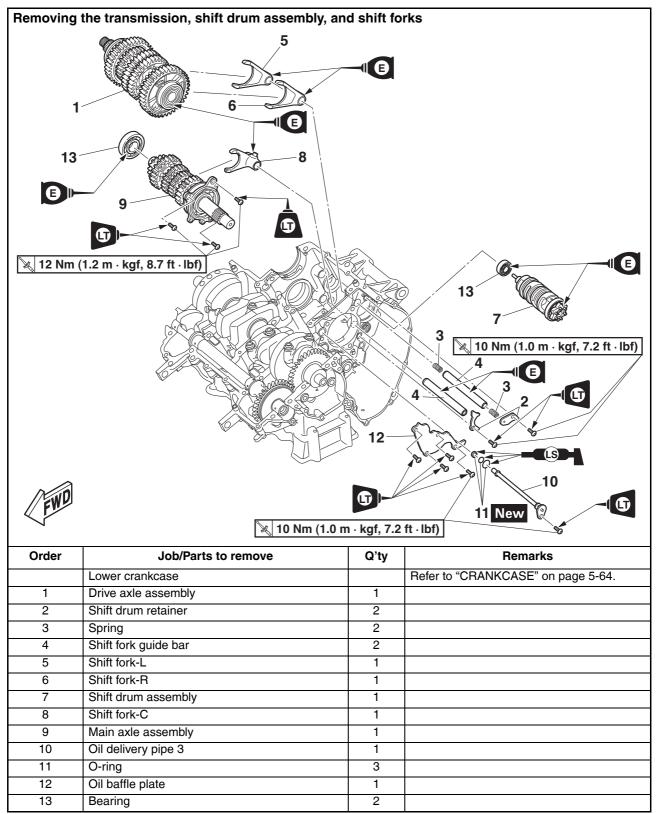
Balancer shaft

TIP -

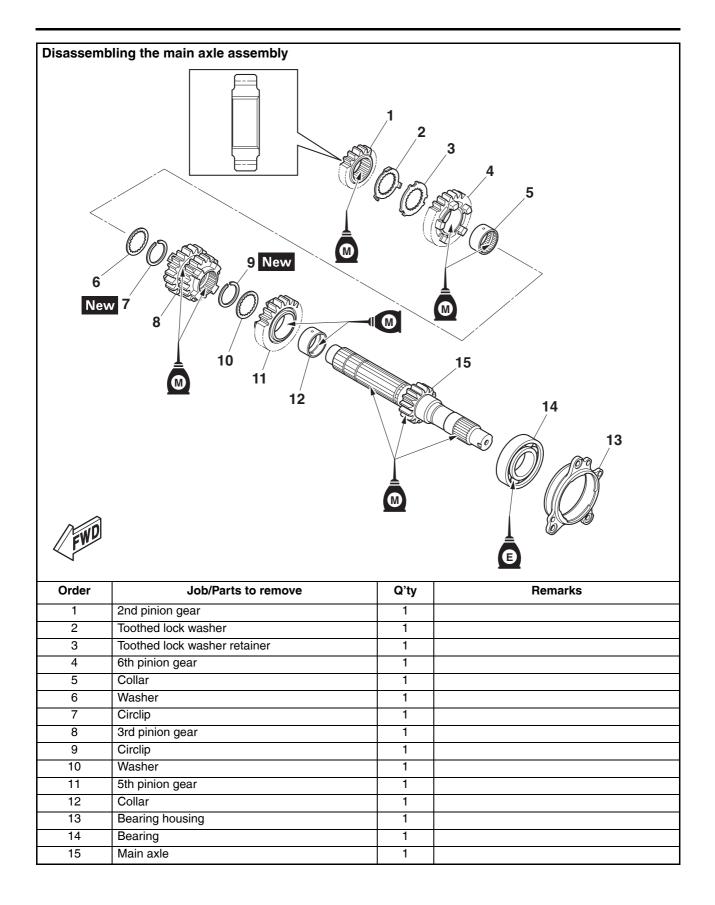
Install by aligning the crankshaft match mark "a" and the balancer shaft match marks "b".



TRANSMISSION



TRANSMISSION



Disassem	bling the drive axle assembly		
FWD			18 New 18 New 17 17 17 17 17 17 17 17 17 17
Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Bearing	1	
3	Washer	1	
4	1st wheel gear	1	
5	Collar	1	
6	5th wheel gear	1	
7	Circlip	1	
8	Washer	1	
9	3rd wheel gear	1	
10	Collar	1	
11	Toothed lock washer	1	
12	Toothed lock washer retainer	1	
13	4th wheel gear	1	
14	Collar	1	
15	Washer	1	
16	Circlip	1	
17	6th wheel gear	1	
18	Circlip	1	

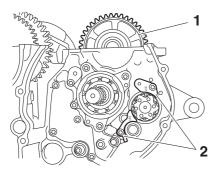
TRANSMISSION

Disassemb	bling the drive axle assembly		
EWD	22 23 New 25 New 24 New		21 20 19 New 0 0 0 0 0 0 0 0 0 0 0 0 0
Order	Job/Parts to remove	Q'ty	Remarks
19	Washer	1	
20	2nd wheel gear	1	
21	Collar	1	
22	Collar	1	
23	Oil seal	1	
24	Circlip	1	
25	Bearing	1	
26	Drive axle	1	

TRANSMISSION

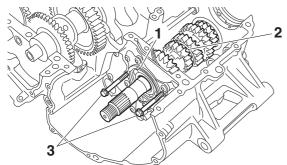
EAS30430 REMOVING THE TRANSMISSION

- 1. Remove:
 - Drive axle assembly "1"
 - Shift drum retainers "2"
 - Shift fork guide bars
 - Shift fork-L
 - Shift fork-R
 - Shift drum assembly
 - Shift fork-C



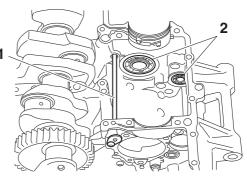
- 2. Remove:
 - Bearing housing "1"
 - Main axle assembly "2"

a. Insert two bolts "3" of the proper size, as shown in the illustration, into the main axle assembly bearing housing.



- b. Tighten the bolts until they contact the crankcase surface.
- c. Continue tightening the bolts until the main axle assembly comes free from the upper crankcase.

- 3. Remove:
 - Oil delivery pipe 3 "1"
 - Bearings "2"

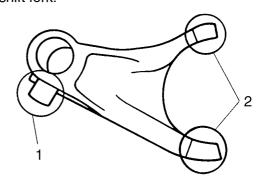


EAS30431

CHECKING THE SHIFT FORKS

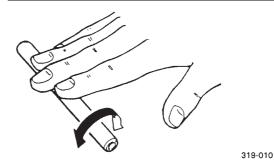
The following procedure applies to all of the shift forks.

- 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.

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



- 3. Check:
 - Shift fork movement

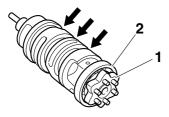
 (along the shift fork guide bar)
 Rough movement → Replace the shift forks
 and shift fork guide bar as a set.



319-011

EAS30432 CHECKING THE SHIFT DRUM ASSEMBLY

- 1. Check:
- Shift drum groove
- Damage/scratches/wear \rightarrow Replace the shift drum assembly.
- Shift drum segment "1" Damage/wear \rightarrow Replace the shift drum assembly.
- Shift drum bearing "2" Damage/pitting \rightarrow Replace the shift drum assembly.



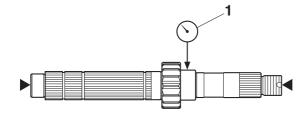
EAS30433

CHECKING THE TRANSMISSION

- 1. Measure:
 - Main axle runout (with a centering device and dial gauge "1") Out of specification \rightarrow Replace the main axle.



Main axle runout limit 0.08 mm (0.0032 in)

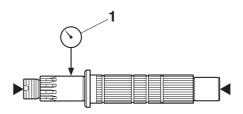


- 2. Measure:
 - Drive axle runout (with a centering device and dial gauge "1")

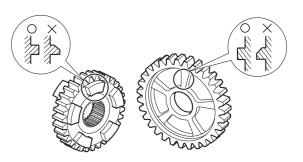
Out of specification \rightarrow Replace the drive axle.



Drive axle runout limit 0.08 mm (0.0032 in)



- 3. Check:
- Transmission gears Blue discoloration/pitting/wear \rightarrow Replace the defective gear(s).
- Transmission gear dogs Cracks/damage/rounded edges \rightarrow Replace the defective gear(s).



- 4. Check:
- Transmission gear engagement (each pinion gear to its respective wheel gear)

Incorrect \rightarrow Reassemble the transmission axle assemblies.

- 5. Check:
 - Transmission gear movement Rough movement \rightarrow Replace the defective part(s).
- 6. Check:
 - Circlips

Bends/damage/looseness \rightarrow Replace.

EAS30435

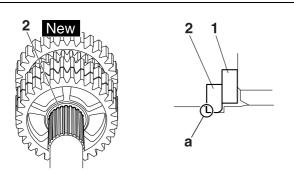
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

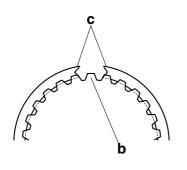
- 1. Install:
 - Toothed washer "1"
 - Circlip "2" New

TRANSMISSION

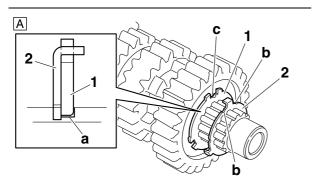
TIP -

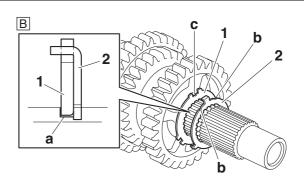
- Be sure the circlip sharp-edged corner "a" is positioned opposite side to the toothed washer and gear.
- Install the circlip so that a spline "b" is in the center of the gap between the circlip ends "c" as shown.





- 2. Install:
 - Toothed lock washer retainer "1"
- Toothed lock washer "2"
- TIP -
- With the toothed lock washer retainer in the groove "a" in the axle, align the projection on the retainer with an axle spline, and then install the toothed lock washer.
- Be sure to align the projection on the toothed lock washer that is between the alignment marks "b" with the alignment mark "c" on the retainer.





- A. Main axle
- B. Drive axle

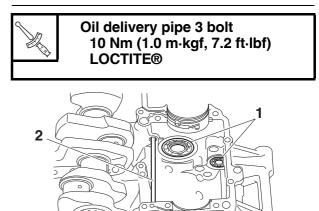
EAS30438

INSTALLING THE TRANSMISSION

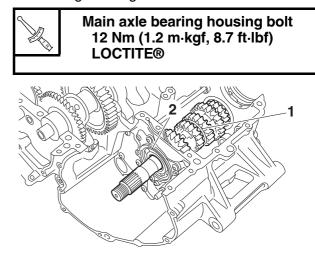
- 1. Install:
 - Bearings "1"
 - Oil delivery pipe 3 "2"

TIP

Face the seal side of bearing to the outside.



- 2. Install:
 - Main axle assembly "1"
- Bearing housing "2"



5-96

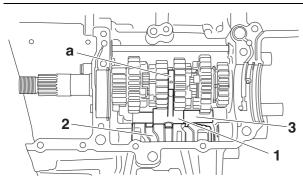
TRANSMISSION

3. Install:

- Shift fork-C "1"
- Shift drum assembly "2"
- Shift fork guide bar "3"

TIP

- The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: "R", "C", "L".
- · Carefully position the shift forks so that they are installed correctly into the transmission gears.
- Install shift fork-C into the groove "a" in the 3rd pinion gear on the main axle.



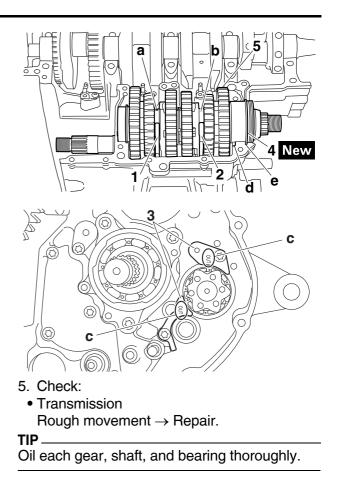
- 4. Install:
 - Shift fork-R "1"
 - Shift fork-L "2"
 - Shift fork guide bar
 - Shift drum retainers "3"
 - Bearing
 - Oil seal New

 - Circlip "4" New
 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.
- Install the shift drum retainer with its "OUT" mark "c" facing outward.
- Make sure that the projection "d" on the drive axle assembly is inserted into the slot in the crankcase.
- Make sure that the drive axle bearing circlip "4" is inserted into the groove "e" in the upper crankcase.



COOLING SYSTEM

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EAS20063

8

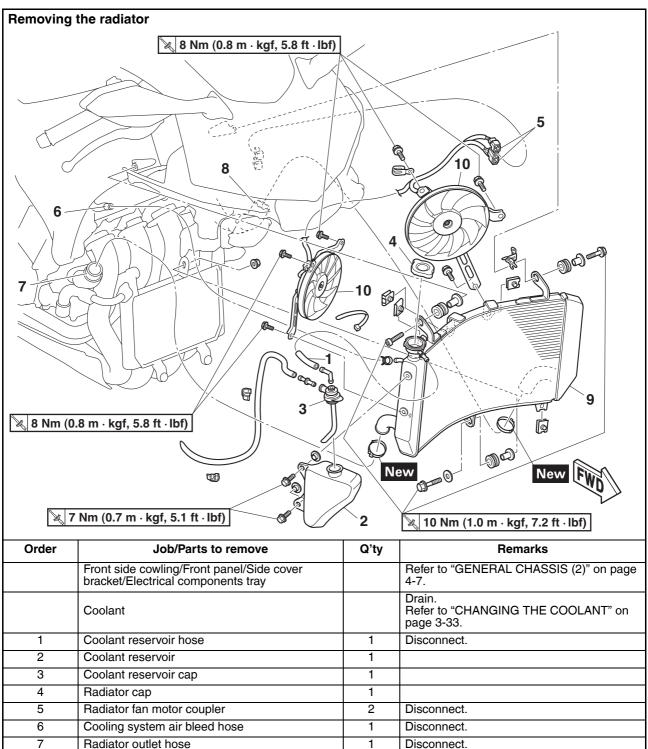
9

10

Radiator inlet hose

Radiator

Radiator fan



Disconnect.

1

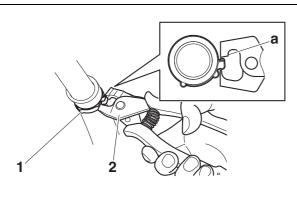
1

2

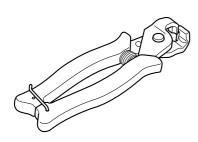
RADIATOR

EAS31659 REMOVING THE RADIATOR

- 1. Remove:
- Hose clamp (Clic-R) "1"
- TIP —
- Remove the hose clamp using the hose clamp pliers "2".
- When removing the hose clamp, make sure that the thick tip "a" of the hose clamp pliers is directed as shown in the illustration.







- A. Hose clamp pliers
- 2. Disconnect:
 - Radiator inlet hose
 - Radiator outlet hose
- 3. Remove:
 - Radiator

EAS30439

CHECKING THE RADIATOR

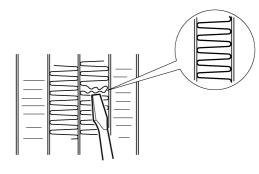
- 1. Check:
 - Radiator fins
 - Obstruction \rightarrow Clean.

Apply compressed air to the rear of the radiator.

Damage \rightarrow Repair or replace.

TIP -

Straighten any flattened fins with a thin, flat-head screwdriver.

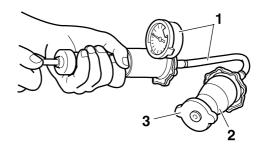


- 2. Check:
- Radiator hoses
- Cracks/damage \rightarrow Replace.
- 3. Measure:
- Radiator cap opening pressure Below the specified pressure → Replace the radiator cap.



Radiator cap opening pressure 107.9–137.3 kPa (1.08–1.37 kgf/cm², 15.6–19.9 psi)

- a. Install the radiator cap tester "1" and radiator cap tester adapter "2" to the radiator cap "3".
- Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984



- b. Apply the specified pressure for ten seconds and make sure there is no drop in pressure.
- ****
- 4. Check:
 - Radiator fan Damage \rightarrow Replace. Malfunction \rightarrow Check and repair. Refer to "COOLING SYSTEM" on page 8-39.

INSTALLING THE RADIATOR

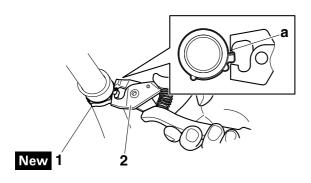
1. Install:

EAS30440

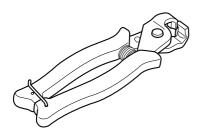
- Radiator
- 2. Connect:
 - Radiator inlet hose
 - Radiator outlet hose
- 3. Install:
 - Hose clamp (Clic-R) "1" New

TIP -

- Install the hose clamp using the hose clamp pliers "2".
- When installing the hose clamp, make sure that the thin tip "a" of the hose clamp pliers is directed as shown in the illustration.
- For more information about installing the hose, refer to "CABLE ROUTING" on page 2-51.



Α



A. Hose clamp pliers

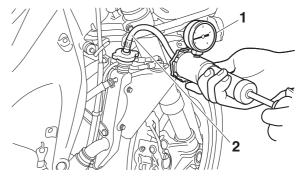
- 4. Fill:
 - Cooling system (with the specified amount of the recommended coolant) Refer to "CHANGING THE COOLANT" on page 3-33.
- 5. Check:
- Cooling system Leaks \rightarrow Repair or replace any faulty part.

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a. Attach the radiator cap tester "1" and radiator cap tester adapter "2" to the radiator.



Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984

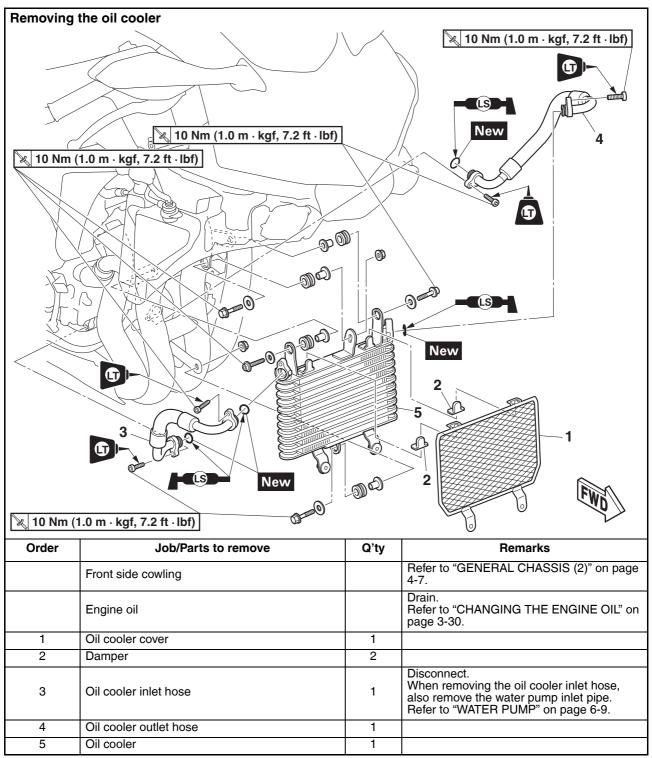


- Apply 137.3 kPa (1.37 kgf/cm², 19.9 psi) of pressure.
- c. Measure the indicated pressure with the gauge.

- 6. Measure:
 - Radiator cap opening pressure Below the specified pressure → Replace the radiator cap.

Refer to "CHECKING THE RADIATOR" on page 6-2.

OIL COOLER



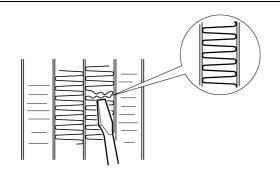
CHECKING THE OIL COOLER

- 1. Check:
 - Oil cooler Cracks/damage \rightarrow Replace.
 - Oil cooler fins
 Obstruction → Clean.
 Apply compressed air to the rear of the oil cooler.

 $\mathsf{Damage} \to \mathsf{Repair} \text{ or replace}.$

TIP -

Straighten any flattened fins with a thin, flat-head screwdriver.



2. Check:

- Oil cooler inlet hose
- Oil cooler outlet hose Cracks/damage/wear → Replace.

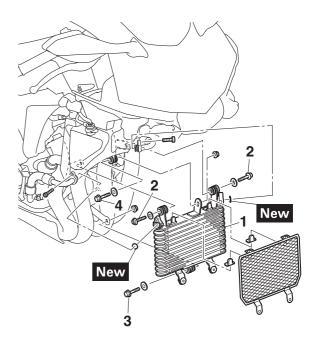
EAS30442

INSTALLING THE OIL COOLER

- 1. Install:
- Oil cooler "1"
- O-ring New
- Oil cooler bolt (upper) "2"
- Oil cooler bolt (lower) "3"
- Radiator bolt "4"

TIP -

Apply lithium-soap-based grease to the O-ring.



- 2. Tighten:
- Oil cooler bolt (upper) "2"



Oil cooler bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

- 3. Tighten:
 - Oil cooler bolt (lower) "3"



Oil cooler bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

- 4. Tighten:
- Radiator bolt "4"



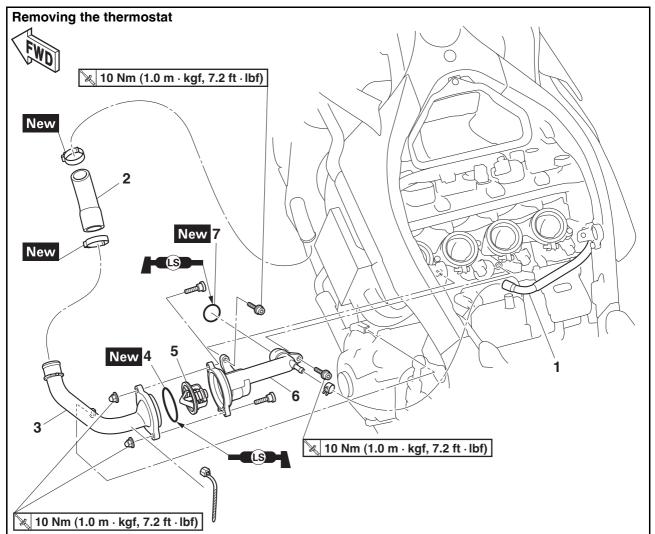
Radiator bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

5. Fill:

 Crankcase (with the specified amount of the recommended engine oil) Refer to "CHANGING THE ENGINE OIL" on page 3-30.

- 6. Measure:
 - Engine oil pressure Refer to "MEASURING THE ENGINE OIL PRESSURE" on page 3-31.

THERMOSTAT



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front side cowling/Front panel/Side cover bracket/Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-4.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-9.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-33.
1	Cooling system air bleed hose	1	Disconnect.
2	Radiator inlet hose	1	
3	Thermostat housing cover	1	
4	O-ring	1	
5	Thermostat	1	
6	Thermostat housing	1	
7	O-ring	1	

REMOVING THE THERMOSTAT ASSEMBLY

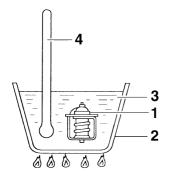
- 1. Remove:
 - Hose clamp (Clic-R) Refer to "REMOVING THE RADIATOR" on page 6-2.
- Radiator inlet hose
- 2. Remove:
 - Thermostat assembly

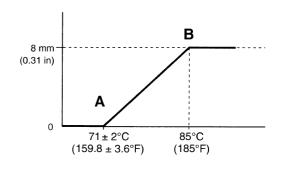
EAS30443 CHECKING THE THERMOSTAT

- 1. Check:
- Thermostat Does not open at 69–73 °C (156–163 °F) → Replace.



- a. Suspend the thermostat "1" in a container "2" filled with water.
- b. Slowly heat the water "3".
- c. Place a thermometer "4" in the water.
- d. While stirring the water, observe the thermostat and thermometer's indicated temperature.





- A. Fully closed
- B. Fully open

TIP -

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

- 2. Check:
- Thermostat housing
- Thermostat housing cover Cracks/damage → Replace.

EAS30444

ASSEMBLING THE THERMOSTAT ASSEMBLY

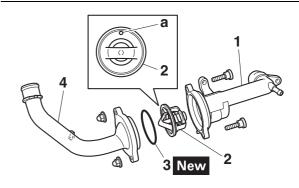
- 1. Install:
 - Thermostat housing "1"
 - Thermostat "2"
 - O-ring "3" New
 - Thermostat housing cover "4"



Thermostat housing cover nut 10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

Install the thermostat with its breather hole "a" facing up.



INSTALLING THE THERMOSTAT ASSEMBLY

- 1. Install:
- Thermostat assembly

2. Install:

- Radiator inlet hose
- Hose clamp (Clic-R) <u>New</u> Refer to "INSTALLING THE RADIATOR" on page 6-3.

TIP ___

For more information about installing the hose, refer to "CABLE ROUTING" on page 2-51.

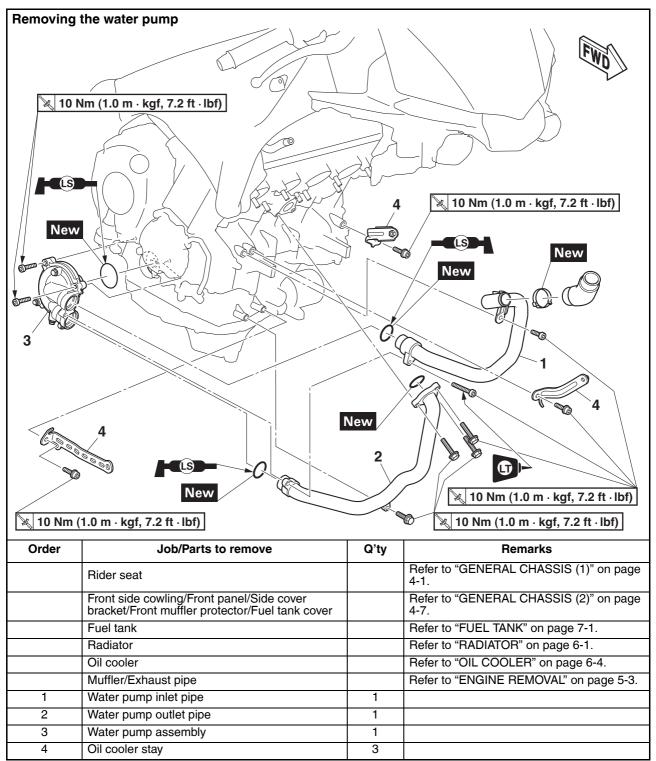
3. Fill:

 Cooling system (with the specified amount of the recommended coolant) Refer to "CHANGING THE COOLANT" on page 3-33.

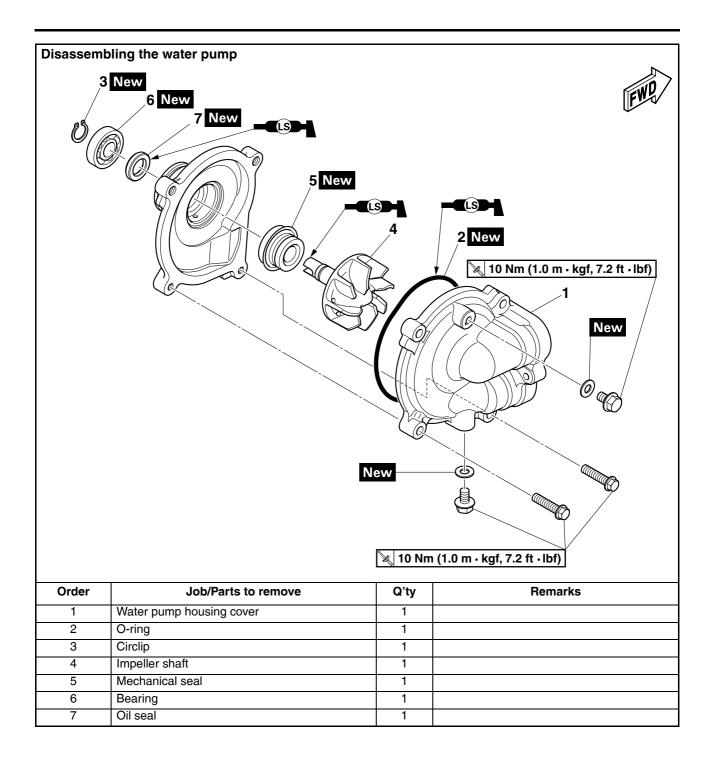
- 4. Check:
 - Cooling system
 Leaks → Repair or replace any faulty part.
 Refer to "INSTALLING THE RADIATOR" on page 6-3.
- 5. Measure:
 - Radiator cap opening pressure Below the specified pressure → Replace the radiator cap.
 Befor to "CHECKING THE BADIATOR" on

Refer to "CHECKING THE RADIATOR" on page 6-2.

WATER PUMP



WATER PUMP

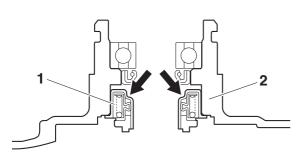


EAS30446 DISASSEMBLING THE WATER PUMP

- 1. Remove:
- Mechanical seal (housing side) "1"

TIP —

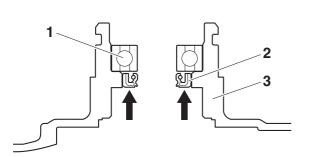
Remove the mechanical seal (housing side) from the inside of the water pump housing "2".



- 2. Remove:
- Bearing "1"
- Oil seal "2"

TIP -

Remove the oil seal and bearing from the outside of the water pump housing "3".

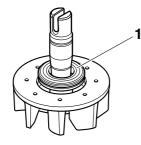


3. Remove:

 Mechanical seal (impeller side) "1" (from the impeller, with a thin, flat-head screwdriver)

TIP -

Do not scratch the impeller shaft.

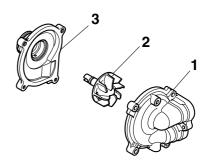


CHECKING THE WATER PUMP

1. Check:

EAS30447

- Water pump housing cover "1"
- Impeller shaft "2" Cracks/damage/wear \rightarrow Replace.
- Water pump housing "3" Cracks/damage/wear → Replace the water pump assembly.

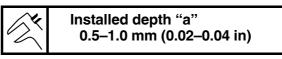


- 2. Check:
- Bearing
 - Rough movement \rightarrow Replace.
- 3. Check:
 - Water pump inlet pipe
 - Water pump outlet pipe Cracks/damage/wear \rightarrow Replace.

EAS30448 ASSEMBLING THE WATER PUMP

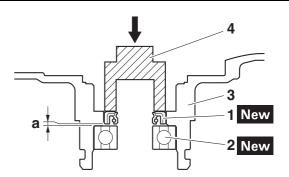
1. Install:

- Oil seal "1" New
- Bearing "2" New
 - (into the water pump housing "3")



TIP

Install the oil seal with a socket "4" that matches its outside diameter.



- 2. Install:
 - Mechanical seal (housing side) "1" New

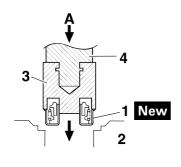
NOTICE

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.

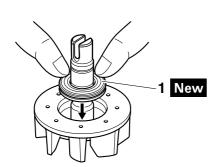
and the second s	Mechanical seal installer 90890-04132 Water pump seal installer YM-33221-A Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 &
	•
	50 mm
	YM-04058



- 2. Water pump housing
- 3. Mechanical seal installer
- 4. Middle driven shaft bearing driver
- A. Push down
- 3. Install:

Mechanical seal (impeller side) "1" New

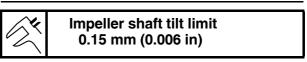
- TIP -
- Before installing the mechanical seal (impeller side), apply tap water or coolant onto its outer surface.
- If the top of the mechanical seal is dirty, clean it.

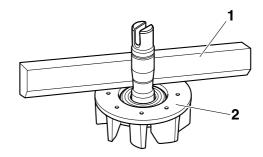


- 4. Measure:
- Impeller shaft tilt
 Out of specification → Repeat steps (3) and (4).

ECA20340

Make sure the mechanical seal (impeller side) is flush with the impeller.





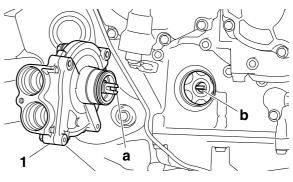
- 1. Straightedge
- 2. Impeller

EAS30449 INSTALLING THE WATER PUMP

- 1. Install:
- Water pump assembly "1"

TIP -

Align the slit "a" on the impeller shaft with the projection "b" on the oil pump driven sprocket.



- 2. Fill:
- Cooling system

(with the specified amount of the recommended coolant)

Refer to "CHANGING THE COOLANT" on page 3-33.

- 3. Check:
- Cooling system

 $\text{Leaks} \rightarrow \text{Repair}$ or replace the faulty part.

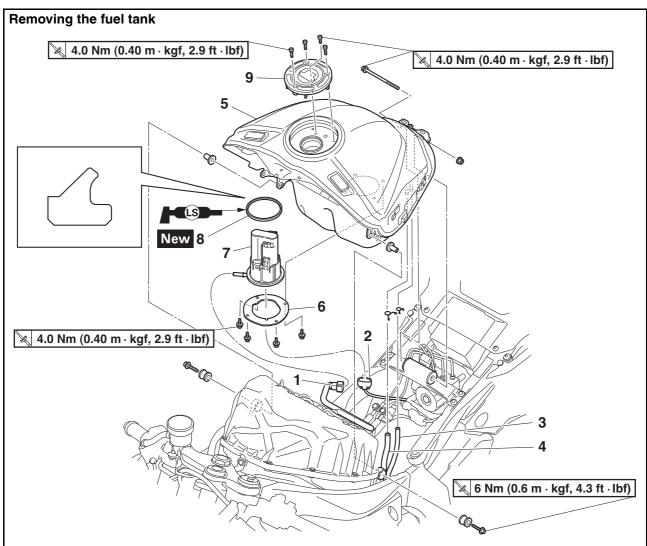
4. Measure:

 Radiator cap opening pressure Below the specified pressure → Replace the radiator cap.
 Refer to "CHECKING THE RADIATOR" on page 6-2.

FUEL SYSTEM

REMOVING THE FUEL TANK 7-2 REMOVING THE FUEL PUMP 7-2 CHECKING THE FUEL PUMP BODY 7-2 CHECKING THE FUEL PUMP OPERATION 7-2 INSTALLING THE FUEL PUMP 7-3 INSTALLING THE FUEL PUMP 7-3 INSTALLING THE FUEL TANK 7-3 AIR FILTER CASE 7-4 CHECKING THE SECONDARY INJECTORS (BEFORE REMOVING) 7-5 REMOVING THE FUEL HOSE (PRIMARY INJECTOR JOINT SIDE) 7-5 AND SECONDARY INJECTORS 7-5 REMOVING THE AIR FILTER CASE 7-6 CHECKING THE INTAKE FUNNEL ASSEMBLY 7-6 CHECKING THE INTAKE FUNNEL AND AIR FILTER CASE 7-7 INSTALLING THE INTAKE FUNNEL AND AIR FILTER CASE 7-7 INSTALLING THE INTAKE FUNNEL AND AIR FILTER CASE 7-7 INSTALLING THE AIR FILTER CASE COVER 7-8 INSTALLING THE AIR FILTER CASE COVER 7-7 INSTALLING THE PRIMARY INJECTORS (BEFORE REMOVING) 7-12 REMOVING THE PRIMARY INJECTORS 7-12 ND SECONDARY IN	FUEL TANK	7-1
CHECKING THE FUEL PUMP BODY	REMOVING THE FUEL TANK	7-2
CHECKING THE FUEL PUMP OPERATION		
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FUEL TANK



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
1	Fuel hose connector	1	Disconnect.
2	Fuel pump coupler	1	Disconnect.
3	Fuel tank breather hose	1	Disconnect.
4	Fuel tank drain hose	1	Disconnect.
5	Fuel tank	1	
6	Fuel pump bracket	1	
7	Fuel pump	1	
8	Fuel pump gasket	1	
9	Fuel tank cap	1	

7-1

REMOVING THE FUEL TANK

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

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

- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- 3. Disconnect:
 - Fuel hose (fuel tank side)
 - Fuel pump coupler
 - Fuel tank drain hose
 - Fuel tank breather hose

WARNING

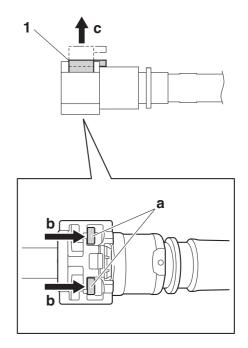
Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

ECA17490 **NOTICE**

Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.

TIP -

- While pushing the ends "a" of the fuel hose connector cover "1" in direction "b", slide the fuel hose connector cover in direction "c", and then remove the hose from the fuel pump.
- Before removing the hose, place a few rags in the area under where it will be removed.
- It is prohibited to wear the cotton work gloves or equivalent coverings.



- 4. Remove:
- Fuel tank

TIP -

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

REMOVING THE FUEL PUMP

- 1. Remove:
- Fuel pump

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.

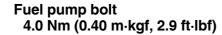
EAS30455

CHECKING THE FUEL PUMP OPERATION

- 1. Check:
- Fuel pump operation Refer to "CHECKING THE FUEL PRES-SURE" on page 7-15.

EAS30456 INSTALLING THE FUEL PUMP

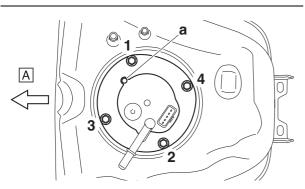
- 1. Install:
 - Fuel pump gasket New
 - Fuel pump
 - Fuel pump bracket
 - Fuel pump bolts



TIP -

X

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Install the fuel pump gasket so that the lip side turns to the inside of the fuel tank.
- Install the fuel pump as shown in the illustration.
- Align the projection "a" on the fuel pump with the slot in the fuel pump bracket.
- Tighten the fuel pump bolts in the proper tightening sequence as shown.



A. Forward

EAS30457

INSTALLING THE FUEL TANK

- 1. Install:
- Fuel tank
- Rear fuel tank bolt
- Fuel tank nut

TIP -

Temporarily tighten the rear fuel tank bolt.

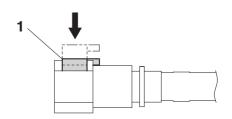
- 2. Connect:
- Fuel hose (fuel tank side)

NOTICE

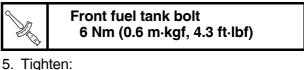
When installing the fuel hose, make sure that it is securely connected, and that the fuel hose connector cover on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.

TIP _

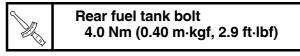
- Install the fuel hose onto the fuel pump securely, and slide the fuel hose connector cover "1" in the direction shown in the illustration.
- It is prohibited to wear the cotton work gloves or equivalent coverings.



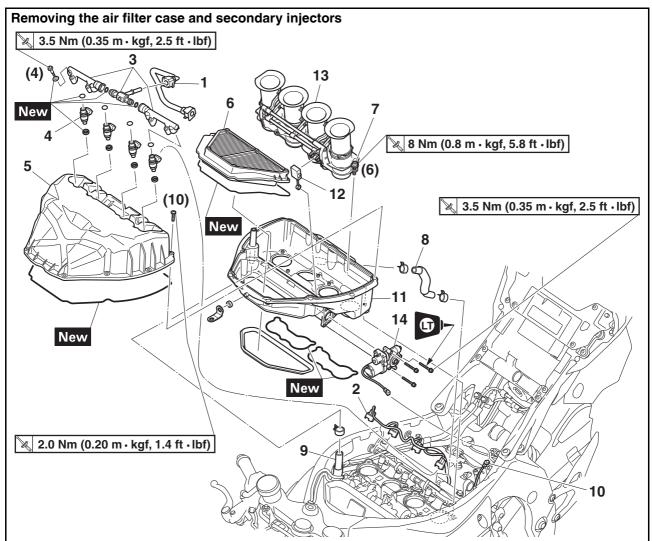
- 3. Connect:
 - Fuel tank breather hose
 - Fuel tank drain hose
- Fuel pump coupler
- 4. Tighten:
 - Front fuel tank bolt



Rear fuel tank bolt



AIR FILTER CASE



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Fuel hose (secondary injector fuel rail side)	1	Disconnect.
2	Secondary injector coupler	4	Disconnect.
3	Fuel rail/Secondary injector joint	2/1	
4	Secondary injector	4	
5	Air filter case cover	1	
6	Air filter element	1	
7	Intake funnel assembly bolt	6	Loosen.
8	Crankcase breather hose	1	Disconnect.
9	Air induction system hose	1	Disconnect.
10	Intake funnel servo motor coupler	1	Disconnect.
11	Air filter case	1	
12	Intake funnel servo motor rod assembly	1	
13	Intake funnel assembly	1	
14	Intake funnel servo motor	1	

CHECKING THE SECONDARY INJECTORS (BEFORE REMOVING)

1. Check:

EAS20459

Injectors

Use the diagnostic code numbers "40"—"43". Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.

EAS30459

REMOVING THE FUEL HOSE (PRIMARY INJECTOR JOINT SIDE AND SECONDARY INJECTOR JOINT SIDE)

- 1. Remove:
- Fuel hose (primary injector joint side and secondary injector joint side)

WARNING

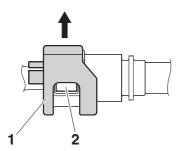
Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

ECA17490 **NOTICE**

Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.

TIP -

- To remove the fuel hose from the secondary injector joint, slide the fuel hose connector 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.
- Before removing the hose, place a few rags in the area under where it will be removed.



EAS30460

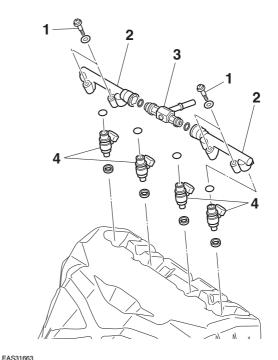
REMOVING THE SECONDARY INJECTORS

A WARNING

• Check the injectors in a well-ventilated area free of combustible materials. Make sure

that there is no smoking or use of electric tools in the vicinity of the injectors.

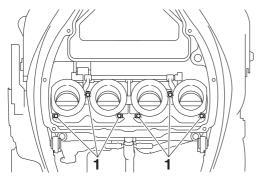
- Be careful when disconnecting the fuel hose. Any remaining pressure in the fuel hose may cause the fuel to spray out. Place a container or rag under the hose to catch any fuel that spills. Always clean up any spilt fuel immediately.
- Turn the main switch to "OFF" and disconnect the negative battery lead from the battery terminal before removing the injectors.
- 1. Remove:
- Fuel tank
- Fuel hose
 - Refer to "REMOVING THE FUEL TANK" on page 7-2.
- 2. Remove:
- Fuel rail screw "1"
- Fuel rail "2"
- Secondary injector joint "3"
- Secondary injector "4"



REMOVING THE AIR FILTER CASE

- 1. Remove:
- Air filter case cover
- 2. Loosen:
 - Intake funnel assembly bolt "1"

AIR FILTER CASE



- 3. Disconnect:
 - Crankcase breather hose
 - Air induction system hose
 - Intake funnel servo motor coupler
- 4. Remove:
 - Air filter case

EAS30461

REMOVING THE INTAKE FUNNEL ASSEMBLY

- 1. Remove:
 - Intake funnel servo motor rod assembly
- Intake funnel servo motor
- 2. Remove:
- Intake funnel assembly

ECA17530

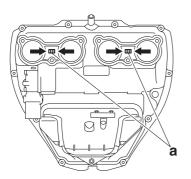
Do not disassemble the intake funnel assembly.

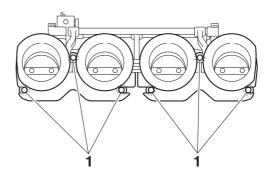
a. Keep the two tabs "a" pushed in the direction shown in the illustration and separate the intake funnel assembly from air filter case.

NOTICE

ECA22590

Do not remove the bolts "1" from the intake funnel joint.





EAS30462

CHECKING THE SECONDARY INJECTORS

- 1. Check:
 - Injectors

Obstruction \rightarrow Replace and check the fuel pump/fuel supply system. Deposit \rightarrow Replace.

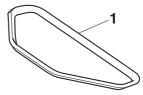
Damage \rightarrow Replace.

- 2. Check:
 - Injector resistance Refer to "CHECKING THE FUEL INJEC-TORS" on page 8-196.

EAS31664

CHECKING THE AIR FILTER CASE SEAL

- 1. Check:
- Air filter case seal "1" Damage → Replace.

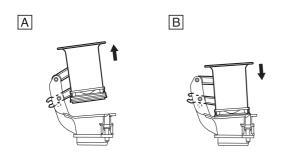


CHECKING THE INTAKE FUNNEL

- 1. Check:
- Intake funnel servo motor rod assembly Damage/scratches → Replace.
- Intake funnel assembly
- Cracks/damage \rightarrow Replace.
- 2. Check:
 - Intake funnel movement
 Sticks → Replace the intake funnel assembly.

ECA17550

- 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.



- A. Upper
- B. Lower

EAS31665

INSTALLING THE INTAKE FUNNEL AND AIR FILTER CASE

- 1. Install:
 - Intake funnel servo motor
 - Intake funnel servo motor rod assembly
 - Air filter case
 - Intake funnel assembly
 - Intake funnel assembly bolt

Intake funnel assembly bolt 8 Nm (0.8 m·kgf, 5.8 ft·lbf)

EAS30465

CHECKING THE INTAKE FUNNEL OPERATION

- 1. Check:
- Intake funnel servo motor operation

 Activate the diagnostic mode and select the diagnostic code number "34".
 Refer to "SELF-DIAGNOSTIC FUNCTION

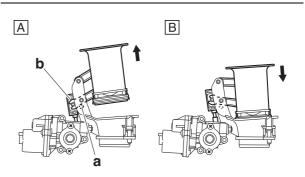
AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.

- b. Set the start/engine stop switch to " \bigcirc ".
- c. Check that the stopper lever "a" contacts the lever "b" (figure "A").
- d. Check that the intake funnel seal mates with the fixed intake funnel (figure "B").

TIP -

The intake funnels should move smoothly and

should not make any unusual sound.



- A. Upper
- B. Lower

EAS30466

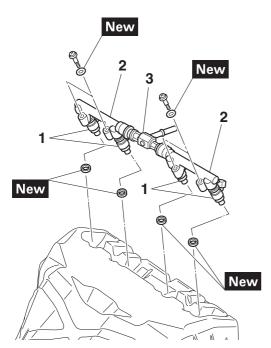
INSTALLING THE SECONDARY INJECTORS

NOTICE

- Always use new O-rings.
- When installing the injectors, do not allow any foreign material to enter or adhere to the injectors, fuel rails, or O-rings.
- Be careful not to twist or pinch the O-rings when installing the injectors.
- When installing the injector, install it at the same position as the removed cylinder.
- If an injector is subject to strong shocks or excessive force, replace it.
- If installing the original fuel rail and bolts, remove the white paint marks using a cleaning solvent. Otherwise, paint chips on the bolt seats could prevent the bolts from being tightened to the specified torque.
- 1. Install a new seal onto the end of each injector.
- 2. Install the injectors "1" to the fuel rails "2".
- 3. Install the secondary injector joint "3", making sure to install them in the correct direction.
- 4. Install the injector assemblies to the air filter case cover.

Fuel rail screw (secondary injector)

3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)



5. Check the injector pressure after the injectors are installed.

Refer to "CHECKING THE INJECTOR PRESSURE" on page 7-14.

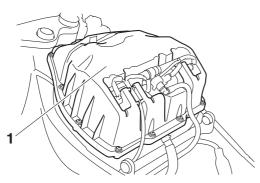
EAS31731

INSTALLING THE AIR FILTER CASE COVER 1. Install:

Air filter case cover "1"



Air filter case cover screw 2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)



EAS30468

INSTALLING THE FUEL HOSE (PRIMARY INJECTOR JOINT SIDE AND SECONDARY INJECTOR JOINT SIDE)

- 1. Connect:
- Fuel hose (primary injector joint side and secondary injector joint side)

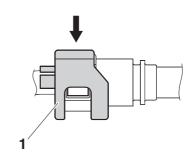
NOTICE

When installing the fuel hose, make sure that it is securely connected, and that the fuel

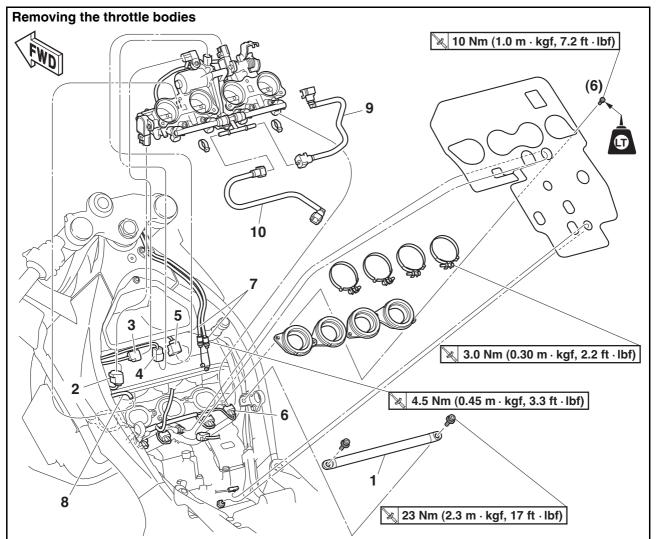
hose connector cover on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.

TIP -

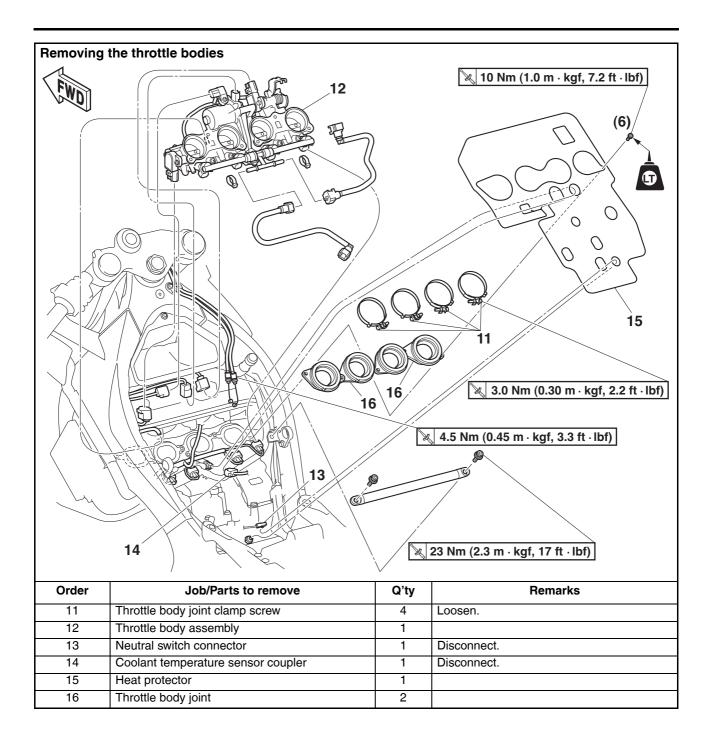
- Install the fuel hose securely onto the secondary injector joint until a distinct "click" is heard.
- To install the fuel hose onto the secondary injector joint, slide the fuel hose connector cover "1" on the end of the hose in the direction of the arrow shown.

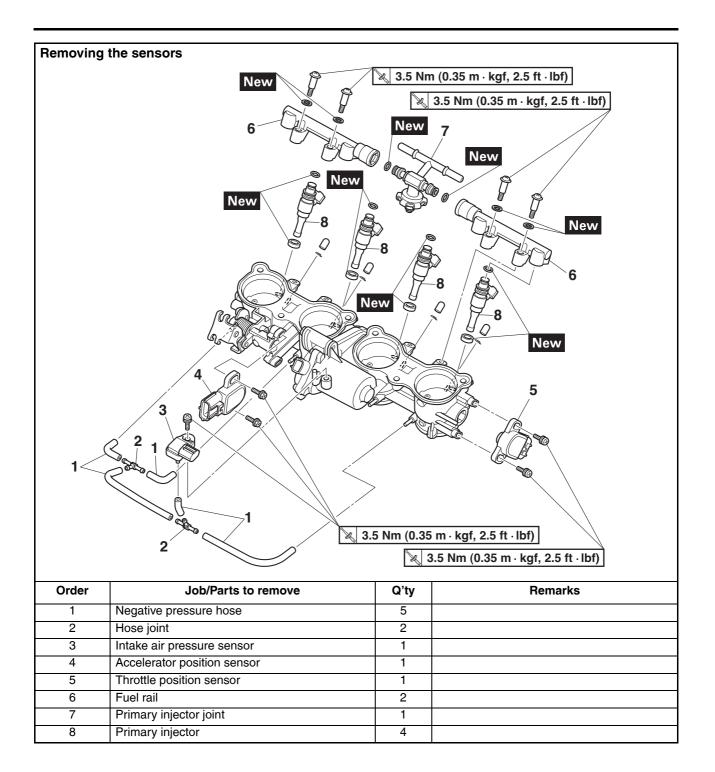


THROTTLE BODIES



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front side cowling/Front panel/Side cover bracket/Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "GENERAL CHASSIS (3)" on page 4-17.
1	Cross bar	1	
2	Throttle position sensor coupler	1	Disconnect.
3	Intake air pressure sensor coupler	1	Disconnect.
4	Throttle servo motor coupler	1	Disconnect.
5	Accelerator position sensor coupler	1	Disconnect.
6	Primary injector coupler	4	Disconnect.
7	Throttle cable	2	Disconnect.
8	Intake solenoid vacuum hose	1	Disconnect.
9	Fuel hose (throttle body to secondary injector)	1	
10	Fuel hose (fuel tank to throttle body)	1	





CHECKING THE PRIMARY INJECTORS (BEFORE REMOVING)

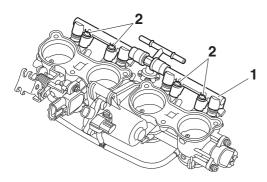
- 1. Check:
 - Injectors

Use the diagnostic code numbers "36"—"39". Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.

EAS31667

REMOVING THE PRIMARY INJECTORS

- Check the injectors in a well-ventilated area free of combustible materials. Make sure that there is no smoking or use of electric tools in the vicinity of the injectors.
- Be careful when disconnecting the fuel hose. Any remaining pressure in the fuel hose may cause the fuel to spray out. Place a container or rag under the hose to catch any fuel that spills. Always clean up any spilt fuel immediately.
- Turn the main switch to "OFF" and disconnect the negative battery lead from the battery terminal before removing the injectors.
- 1. Remove:
- Fuel rail "1"
- ****
- a. Remove the fuel rail screws "2".



EAS31668

CHECKING THE PRIMARY INJECTORS

- 1. Check:
- Injectors

Obstruction \rightarrow Replace and check the fuel pump/fuel supply system. Deposit \rightarrow Replace.

- Damage \rightarrow Replace.
- 2. Check:
 - Injector resistance Refer to "CHECKING THE FUEL INJEC-

TORS" on page 8-196.

EAS30769

CHECKING AND CLEANING THE THROTTLE BODIES

TIP -

Clean the throttle bodies only if they cannot be synchronized using the bypass air screws. Before cleaning the throttle bodies, check the following items:

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

WARNING

If the throttle bodies are subjected to strong shocks or dropped during cleaning, replace them as a set.

- 1. Check:
 - Throttle bodies

Cracks/damage \rightarrow Replace the throttle bodies as a set.

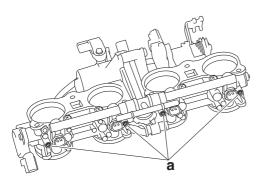
- 2. Clean:
- Throttle bodies

NOTICE

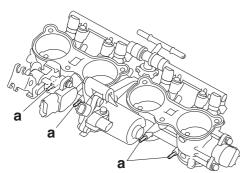
- Observe the following precautions; otherwise, the throttle bodies may not operate properly.
- Do not subject the throttle bodies to excessive force.
- Clean the throttle bodies in the recommended cleaning solvent.
- Do not use any caustic carburetor cleaning solution.
- Do not apply cleaning solvent directly to any plastic parts, sensors, or seals.
- Be careful not to remove the white paint mark that identifies the standard throttle body.
- Do not turn the bypass air screws "a"; otherwise, the throttle body synchronization will be affected.



Recommended cleaning solvent Yamaha Oil & Brake Cleaner



- a. Place the throttle bodies on a flat surface with the air filter case side facing up.
- b. Install the caps (895-14169-00) onto the hose fittings "a".



c. Hold the throttle valves in the open position.

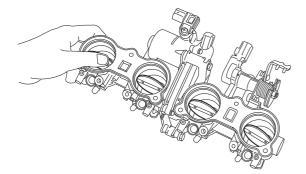
WARNING

When cleaning the throttle bodies, be careful not to injure yourself on the throttle valves or other components of the throttle bodies.

NOTICE

ECA20380

- Do not open the throttle valves by supplying electrical power to the throttle bodies.
- Do not use tools to open the throttle valves or to keep them in the open position.
- Do not open the throttle valves quickly.



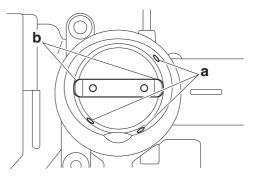
d. Apply the recommended cleaning solvent to the throttle valves and the inside of the throttle bodies to remove any carbon deposits.

TIP __

- Do not allow any cleaning solvent to enter the opening for the injectors.
- Do not apply any cleaning solvent to the portions of the throttle valve shafts between the throttle bodies.
- e. Remove the carbon deposits from the inside of each throttle body in a downward direction, from the air filter case side of the throttle body to the engine side.

NOTICE

- Do not use a tool, such as a wire brush, to remove the carbon deposits; otherwise, the inside of the throttle bodies may be damaged.
- Do not allow carbon deposits or other foreign materials to enter any of the passages in each throttle body or in the space between the throttle valve shaft and the throttle body.
- f. After removing the carbon deposits, clean the inside of the throttle bodies with the recommended cleaning solvent, and then dry the throttle bodies using compressed air.
- g. Make sure that there are no carbon deposits or other foreign materials in any of the passages "a" in each throttle body or in the space "b" between the throttle valve shaft and the throttle body.



- 3. Install the throttle bodies.
- 4. Reset:
- ISC (Idle Speed Control) learning values Use the diagnostic code number "67". Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.
- 5. Adjust:
 - Throttle bodies synchronizing Out of specification → Replace the throttle

bodies.

Refer to "SYNCHRONIZING THE THROT-TLE BODIES" on page 3-9.

EAS31160

REPLACING THE THROTTLE BODIES

- 1. Remove the throttle bodies from the vehicle.
- Install a new throttle bodies to the vehicle.
 Reset:
- ISC (Idle Speed Control) learning values Use the diagnostic code number "67". Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.
- 4. Adjust:
 - Throttle bodies synchronizing Refer to "SYNCHRONIZING THE THROT-TLE BODIES" on page 3-9.
- 5. Place the vehicle on a suitable stand so that the rear wheel is elevated.
- 6. Check:
- Engine idling speed Start the engine, warm it up, and then measure the engine idling speed.

(~)

Engine idling speed 1200–1400 r/min

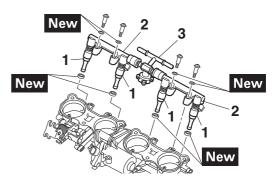
EAS31669 INSTALLING THE PRIMARY INJECTORS ECA21550

NOTICE

- Always use new O-rings.
- When installing the injectors, do not allow any foreign material to enter or adhere to the injectors, fuel rails, or O-rings.
- Be careful not to twist or pinch the O-rings when installing the injectors.
- When installing the injector, install it at the same position as the removed cylinder.
- If an injector is subject to strong shocks or excessive force, replace it.
- If installing the original fuel rail and bolts, remove the white paint marks using a cleaning solvent. Otherwise, paint chips on the bolt seats could prevent the bolts from being tightened to the specified torque.
- 1. Install a new seal onto the end of each injector.
- 2. Install the injectors "1" to the fuel rails "2".
- 3. Install the primary injector joint "3", making sure to install them in the correct direction.
- 4. Install the injector assemblies to the throttle bodies.



Fuel rail screw (throttle body) 3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)

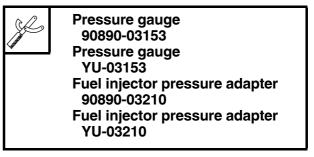


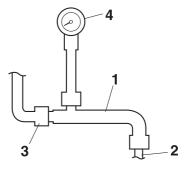
 Check the injector pressure after the injectors are installed.
 Refer to "CHECKING THE INJECTOR PRESSURE" on page 7-14.

EAS30481

CHECKING THE INJECTOR PRESSURE

- After installing the injectors, perform the following steps to check the injector pressure.
- Do not allow any foreign materials to enter the fuel lines.
- 1. Check:
 - Injector pressure
- ****
- a. Connect the fuel injector pressure adapter "1" to the injector joint "2", and then connect an air compressor "3" to the adapter.
- b. Connect the pressure gauge "4" to the fuel injector pressure adapter "1".





- c. Close the valve on the injector pressure adapter.
- d. Apply air pressure with the air compressor.
- e. Open the valve on the injector pressure adapter until the specified pressure is reached.



Specified air pressure 490 kPa (5.0 kgf/cm², 71.1 psi)

ECA17600

Never exceed the specified air pressure or damage could occur.

- f. Close the valve on the injector pressure adapter.
- g. Check that the specified air pressure is held at least one minute.

Pressure drops \rightarrow Check the pressure gauge and adapter.

Check the seals and O-rings and then reinstall.

Out of specification \rightarrow Replace the fuel injectors.

EAS30482

CHECKING THE FUEL PRESSURE

- 1. Remove:
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- 2. Check:
 - Fuel pressure

- a. Remove the fuel tank bolts and hold up the fuel tank.
- b. Disconnect the fuel hose "1" from the fuel pump.

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

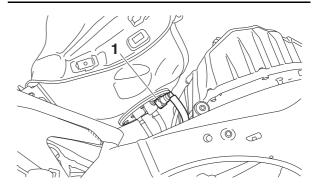
WARNING

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 hose.

ECA17490

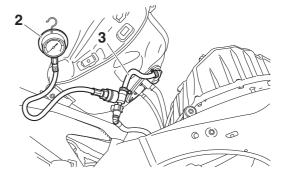
Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with

tools.

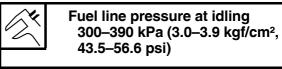


c. Connect the pressure gauge "2" and fuel pressure adapter "3" to the fuel hose.





- d. Start the engine.
- e. Measure the fuel pressure. Faulty \rightarrow Replace the fuel pump.



- 3. Install:
 - Fuel tank
 - Refer to "FUEL TANK" on page 7-1.
 - Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.

ADJUSTING THE THROTTLE POSITION SENSOR

WARNING

- Handle the throttle position sensor with special care.
- Never subject the throttle position sensor to strong shocks. If the throttle position sensor is dropped, replace it.
- 1. Check:
- Throttle position sensor Refer to "CHECKING THE THROTTLE PO-SITION SENSOR" on page 8-191.
- 2. Adjust:
- Throttle position sensor angle

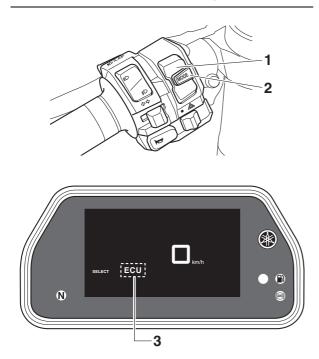
TIP _

Before adjusting the throttle position sensor, the throttle bodies must be removed.

- a. Temporary tighten the throttle position sensor.
- b. Check that the throttle valves are fully closed.
- c. Connect the throttle position sensor to the wire harness.
- d. Turn the main switch to "OFF".
- e. Simultaneously press and hold the up button "1" and center button "2", turn the main switch to "ON", and continue to press the buttons for 8 seconds more.



"ECU" "3" appears on the display.

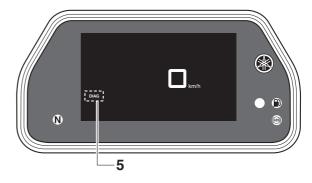


f. Press the up button "1" or down button "4" to select ECU in the display, and then simultaneously press the up button "1" and center button "2" for 2 seconds or more.

TIP

"DIAG" "5" appears on the display.

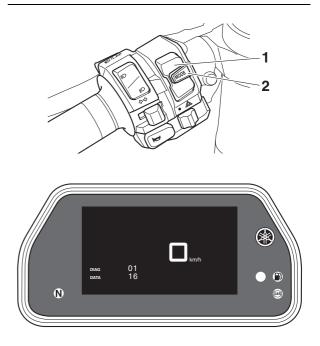




g. Simultaneously press the up button "1" and center button "2" for 2 seconds or more.

TIP -

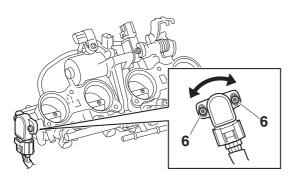
The diagnostic code number "01" appears on the display.



- h. Diagnostic code number "01" is selected.
- i. Adjust the position of the throttle position sensor angle so that 11–21 can appear in the meter right display.
- After adjusting the throttle position sensor angle, tighten the throttle position sensor bolt "6".



Throttle position sensor bolt 3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)



EAS30486

ADJUSTING THE ACCELERATOR POSITION SENSOR

- Handle the accelerator position sensor with special care.
- Never subject the accelerator position sensor to strong shocks. If the accelerator position sensor is dropped, replace it.
- 1. Check:
- Accelerator position sensor Refer to "CHECKING THE ACCELERATOR POSITION SENSOR" on page 8-191.
- 2. Adjust:
- Accelerator position sensor angle

TIP __

Before adjusting the accelerator position sensor, the throttle bodies must be removed.

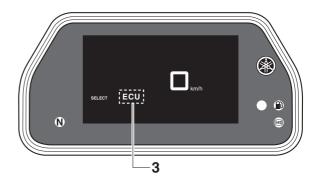
- a. Temporary tighten the accelerator position sensor.
- b. Check that the throttle valves are fully closed.
- c. Connect the accelerator position sensor to the wire harness.
- d. Connect the throttle cables to the throttle bodies.
- e. Turn the main switch to "OFF".
- f. Simultaneously press and hold the up button "1" and center button "2", turn the main switch

to "ON", and continue to press the buttons for 8 seconds more.

TIP ____

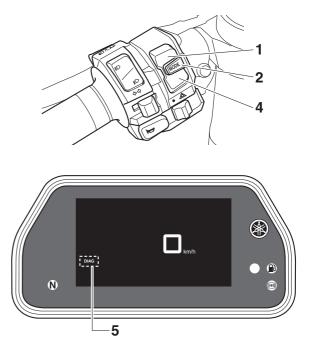
"ECU" "3" appears on the display.





g. Press the up button "1" or down button "4" to select ECU in the display, and then simultaneously press the up button "1" and center button "2" for 2 seconds or more.



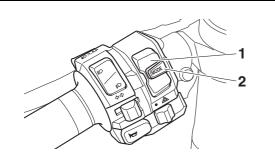


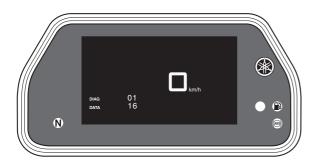
h. Simultaneously press the up button "1" and

center button "2" for 2 seconds or more.

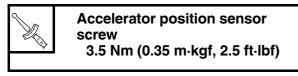
TIP -

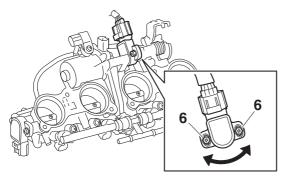
The diagnostic code number "01" appears on the display.





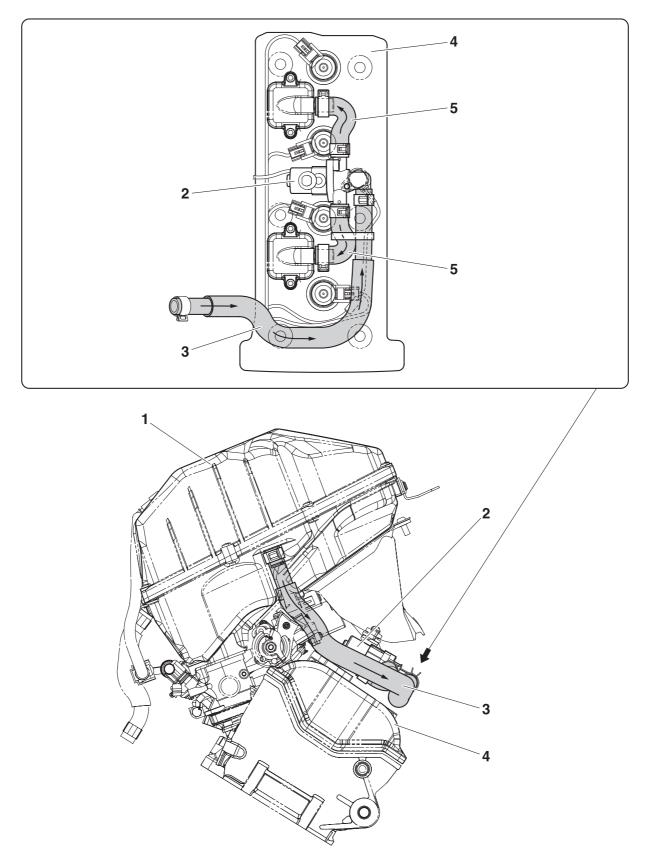
- i. Diagnostic code number "14" is selected.
- j. Turn the throttle grip to the fully closed position.
- k. Adjust the position of the accelerator position sensor angle so that 12–22 can appear in the meter.
- I. After adjusting the accelerator position sensor angle, tighten the accelerator position sensor screws "6".



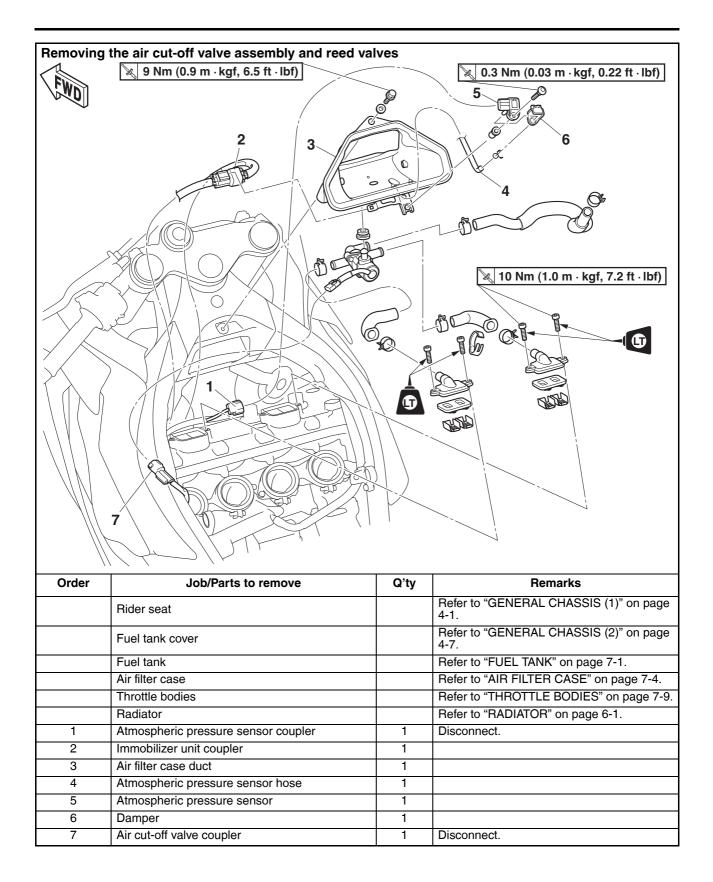


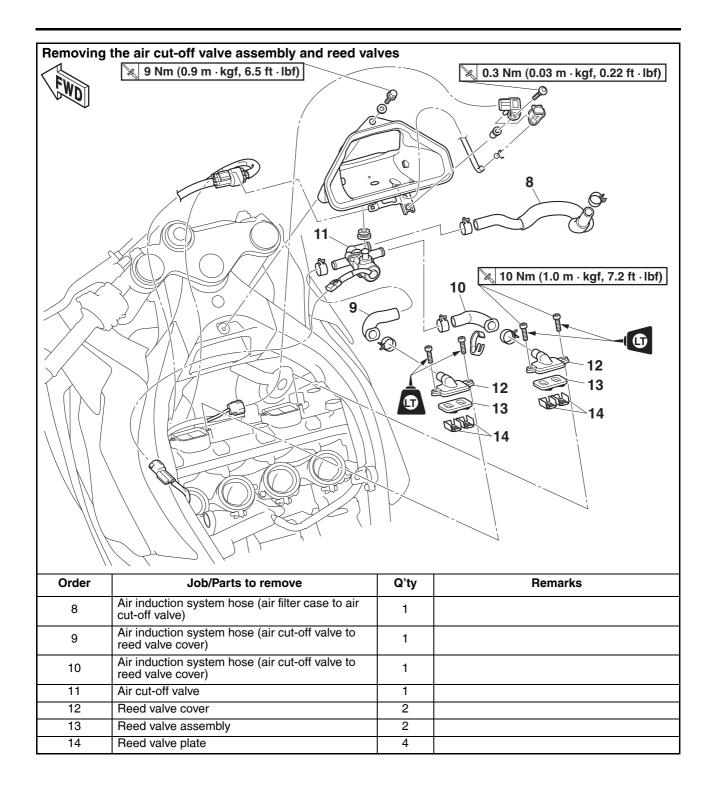
- m. Turn the throttle grip to the fully open position.
- n. Check the meter display value. If the meter display value is not 97–107, adjust the accelerator position sensor angle.

- o. Select the diagnostic code number "15".
- p. Turn the throttle grip to the fully closed position.
- q. Check the meter display value. If the meter display value is not 10–24, adjust the accelerator position sensor angle.
- r. Turn the throttle grip to the fully open position.
- s. Check the meter display value. If the meter display value is not 95–109, adjust the accelerator position sensor angle.
- t. Repeat steps (i) to (s) until the meter display values are within the specified ranges.
- u. If the meter display values are not within the specified ranges after repeating steps (i) to (s) several times, replace the accelerator position sensor.



- 1. Air filter case
- 2. Air cut-off valve
- 3. Air induction system hose (air filter case to air cut-off valve)
- 4. Cylinder head cover
- 5. Air induction system hose (air cut-off valve to reed valve cover)





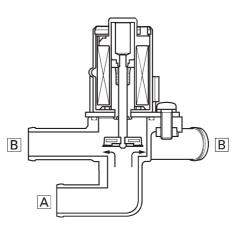
EAS30488

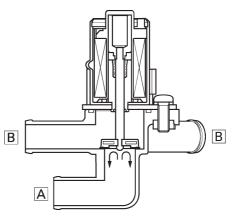
CHECKING THE AIR INDUCTION SYSTEM Air injection

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 until the temperature becomes higher than the specified value.



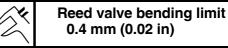


- A. From the air filter case
- B. To the cylinder head
- 1. Check:
- Hoses

Loose connections \rightarrow Connect properly. Cracks/damage \rightarrow Replace.

- 2. Check:
- Reed valve
- Reed valve stopper
- Reed valve seat Cracks/damage → Replace the reed valve assembly.
- 3. Measure:
- Reed valve bending limit "a"

Out of specification \rightarrow Replace the reed valve assembly.



- 3. Install:
 - Reed valve cover



Reed valve cover bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf) LOCTITE®

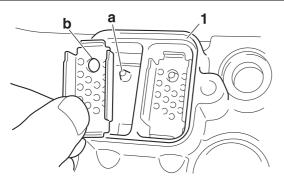
- 4. Check:
- Air cut-off valve Cracks/damage → Replace.
- 5. Check:
 - Air induction system solenoid Refer to "CHECKING THE AIR INDUCTION SYSTEM SOLENOID" on page 8-192.

INSTALLING THE AIR INDUCTION SYSTEM 1. Install:

• Reed valve plate

TIP _

Align the projection "a" on the cylinder head cover "1" with the hole "b" in the reed valve plate.



- 2. Install:
- Reed valve assembly

TIP -

Install the reed valve assembly so that the open side turns to the exhaust side of the engine.



A. Exhaust side

ELECTRICAL SYSTEM

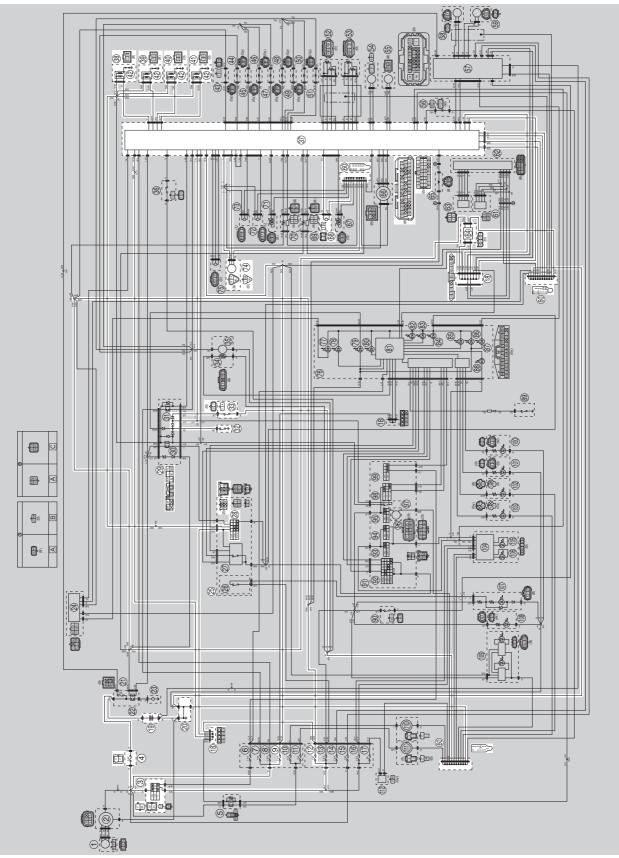
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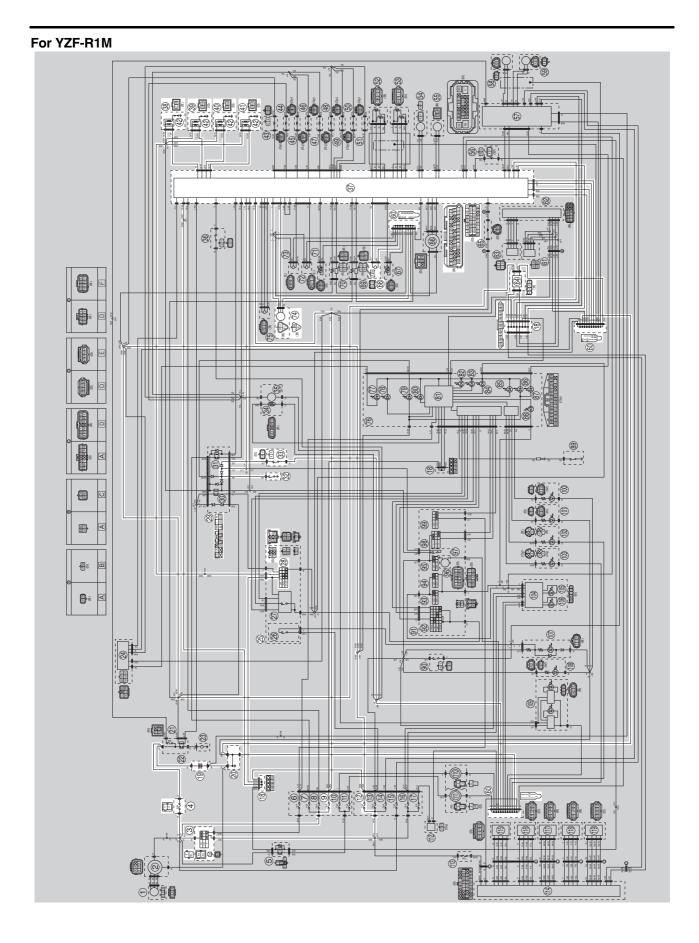
IGNITION SYSTEM

CIRCUIT DIAGRAM For YZF-R1



3. Main switch 4. Main fuse 9. Backup fuse 12.Ignition fuse 18. Joint coupler 19.Battery 20.Engine ground 25.Handlebar switch (right) 28.Start/engine stop switch 29.Relay unit 32.Neutral switch 33. Sidestand switch 37.ECU (Engine Control Unit) 38.Ignition coil #1 39.Ignition coil #2 40.Ignition coil #3 41.Ignition coil #4 42.Spark plug 60. Joint connector 64.IMU (Inertial Measurement Unit) 68.Crankshaft position sensor 74.Cylinder identification sensor

IGNITION SYSTEM



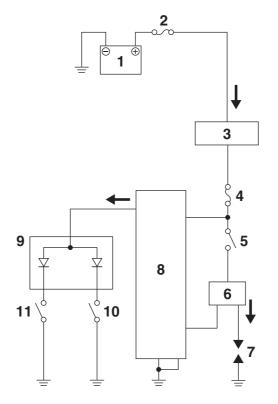
3. Main switch 4. Main fuse 9. Backup fuse 12.Ignition fuse 18. Joint coupler 19.Battery 20.Engine ground 25.Handlebar switch (right) 28.Start/engine stop switch 29.Relay unit 32.Neutral switch 33. Sidestand switch 37.ECU (Engine Control Unit) 38.Ignition coil #1 39.Ignition coil #2 40.Ignition coil #3 41.Ignition coil #4 42.Spark plug 60. Joint connector 64.IMU (Inertial Measurement Unit) 68.Crankshaft position sensor 74.Cylinder identification sensor

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 ECU does not flow to the ignition coils or fuel injectors when the neutral switch or sidestand switch is open. However, the engine continues to run under the following conditions:

- The transmission is in gear (the neutral switch is open) and the sidestand is up (the sidestand switch circuit is closed).
- The transmission is in neutral (the neutral switch is closed) and the sidestand is down (the sidestand switch circuit is open).

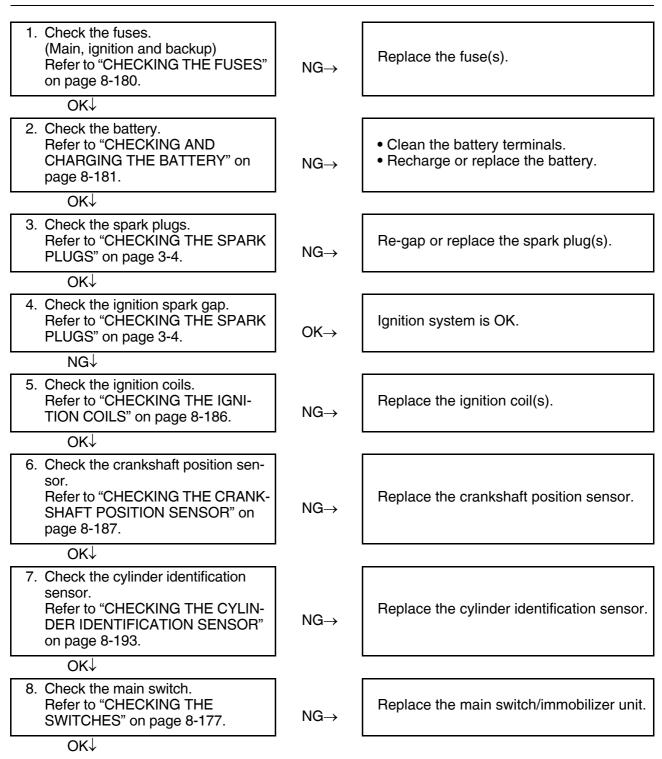


- 1. Battery
- 2. Main fuse
- 3. Main switch
- 4. Ignition fuse
- 5. Start/engine stop switch
- 6. Ignition coil
- 7. Spark plug
- 8. ECU (Engine Control Unit)
- 9. Relay unit (diode)
- 10.Sidestand switch
- 11.Neutral switch

EAS30492 TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

- Before troubleshooting, remove the following part(s):
- 1. Front side cowling/Front panel
- 2. Rider seat
- 3. Fuel tank cover
- 4. Fuel tank
- 5. Air filter case

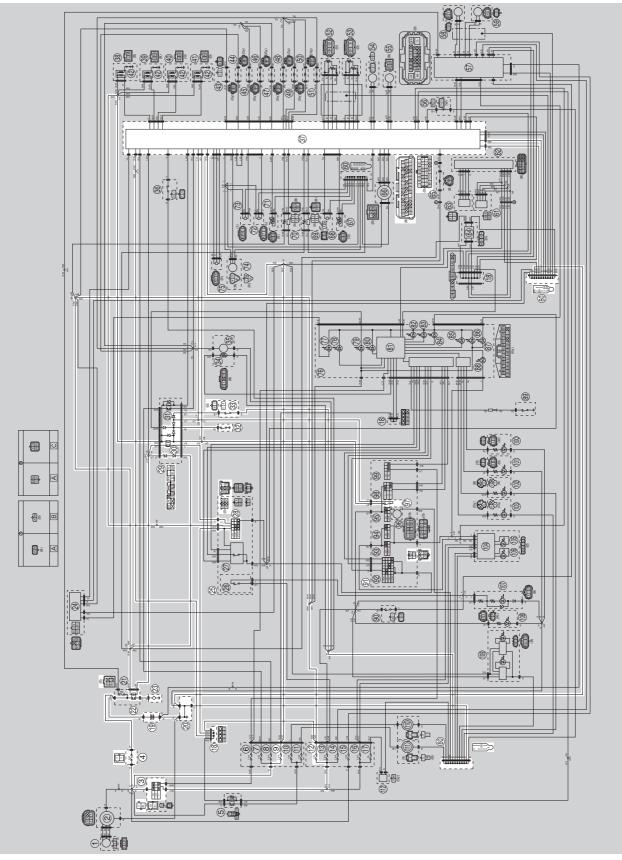


IGNITION SYSTEM

9. Check the start/engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	$NG \rightarrow$	Replace the right handlebar switch.
OK↓		
10.Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the neutral switch.
OK↓		
11.Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the sidestand switch.
OK↓		
12.Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-185.	NG→	Replace the relay unit.
OK↓		
13.Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the ignition sys- tem's wiring.
ОК↓	1	
Replace the ECU or IMU. Refer to "REPLACING THE ECU (En- gine Control Unit)" on page 8-180.		

ELECTRIC STARTING SYSTEM

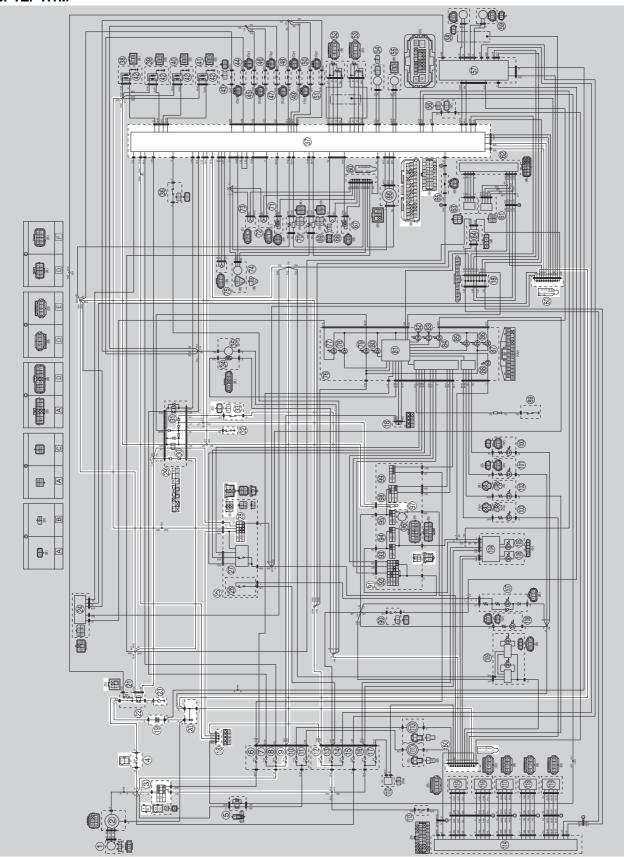
CIRCUIT DIAGRAM For YZF-R1



- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 22.Starter relay
- 23.Starter motor
- 25.Handlebar switch (right)
- 28.Start/engine stop switch
- 29.Relay unit
- 30.Starting circuit cut-off relay
- 32.Neutral switch
- 33.Sidestand switch
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 91.Handlebar switch (left)
- 97.Clutch switch

For YZF-R1M

ELECTRIC STARTING SYSTEM



- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 22.Starter relay
- 23.Starter motor
- 25.Handlebar switch (right)
- 28.Start/engine stop switch
- 29.Relay unit
- 30. Starting circuit cut-off relay
- 32.Neutral switch
- 33.Sidestand switch
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 91.Handlebar switch (left)
- 97.Clutch switch

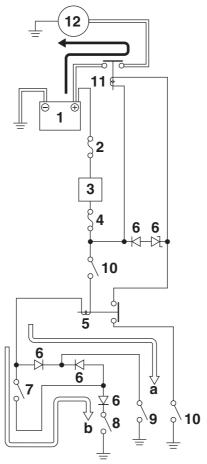
EAS30494

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the main switch is turned to "ON" and the " \circledast " side of the start/engine stop switch is pushed, 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 "(s)" side of the start/engine stop switch.



- a. WHEN THE TRANSMISSION IS IN NEU-TRAL
- b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HAN-DLEBAR
- 1. Battery
- 2. Main fuse
- 3. Main switch
- 4. Ignition fuse
- 5. Starting circuit cut-off relay
- 6. Relay unit (diode)
- 7. Clutch switch
- 8. Sidestand switch
- 9. Neutral switch
- 10.Start/engine stop switch

11.Starter relay 12.Starter motor

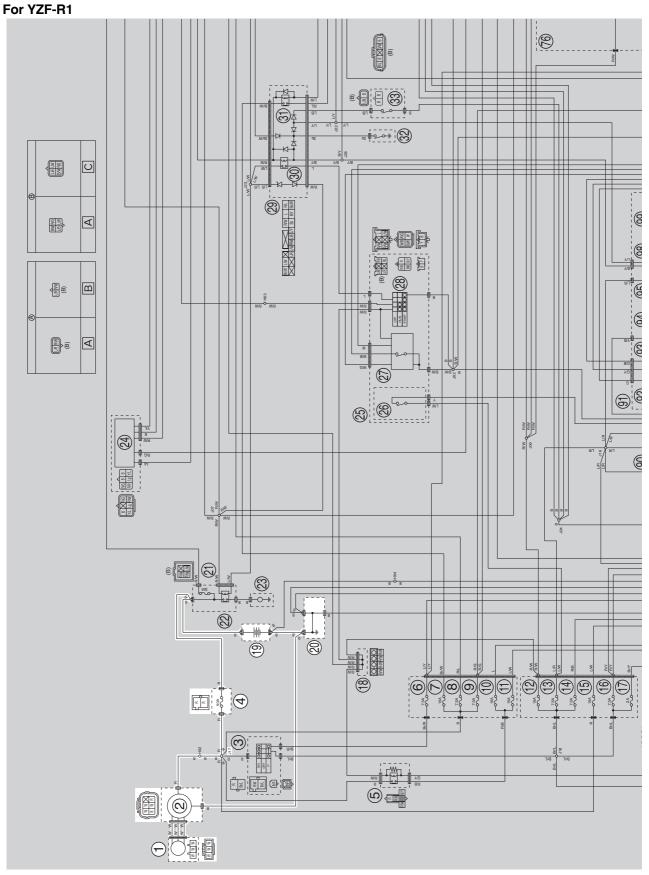
EAS30405 TROUBLESHOOTING The starter motor fails to turn. TIP. • Before troubleshooting, remove the following part(s): 1. Front side cowling/Front panel/Side cover 2. Rider seat 3. Fuel tank cover 4. Fuel tank 5. Air filter case 6. Throttle bodies 1. Check the fuses. (Main, ignition and backup) Replace the fuse(s). Refer to "CHECKING THE FUSES" NG→ on page 8-180. OK↓ Check the battery. Refer to "CHECKING AND • Clean the battery terminals. CHARGING THE BATTERY" on Recharge or replace the battery. NG→ page 8-181. OK↓ 3. Check the starter motor operation. Starter motor is OK. Perform the electric Refer to "CHECKING THE STARTstarting system troubleshooting, starting ER MOTOR OPERATION" on page OK→ with step 5. 8-187. NG↓ 4. Check the starter motor. Refer to "CHECKING THE START-Repair or replace the starter motor. NG→ ER MOTOR" on page 5-43. OK↓ 5. Check the relay unit (starting circuit cut-off relav). Replace the relay unit. Refer to "CHECKING THE RE-NG→ LAYS" on page 8-184. OK↓ 6. Check the relay unit (diode). Refer to "CHECKING THE RELAY Replace the relay unit. $NG \rightarrow$ UNIT (DIODE)" on page 8-185. OK↓ 7. Check the starter relay. Refer to "CHECKING THE RE-Replace the starter relay. $NG \rightarrow$ LAYS" on page 8-184. OK↓ 8. Check the main switch. Replace the main switch/immobilizer unit. Refer to "CHECKING THE $NG \rightarrow$ SWITCHES" on page 8-177. OK↓

ELECTRIC STARTING SYSTEM

 Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-177. 	NG→	Replace the neutral switch.
OK↓		
10.Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	$NG \rightarrow$	Replace the sidestand switch.
OK↓		
11.Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the clutch switch.
OK↓		
12.Check the start/engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	$NG \rightarrow$	Replace the right handlebar switch.
OK↓		
13.Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-9.	NG→	Properly connect or repair the starting sys- tem's wiring.
OK↓		
Replace the ECU. Refer to "REPLACING THE ECU (En- gine Control Unit)" on page 8-180.		

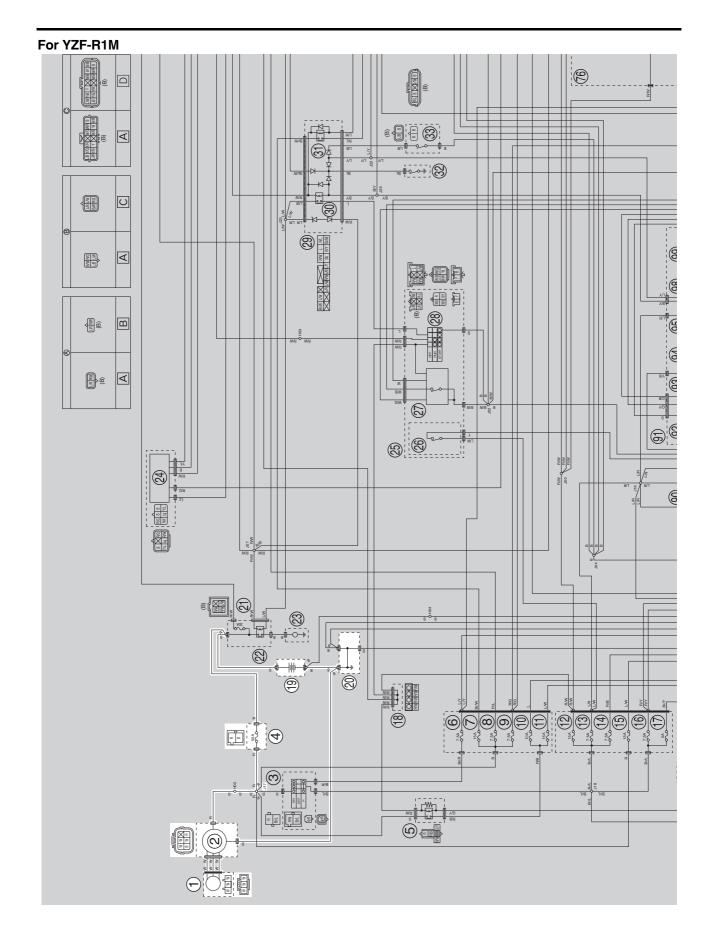
CHARGING SYSTEM

EAS30496 CIRCUIT DIAGRAM



1. AC magneto

- 2. Rectifier/regulator
- 4. Main fuse
- 19.Battery
- 20.Engine ground



1. AC magneto

- 2. Rectifier/regulator
- 4. Main fuse
- 19.Battery
- 20.Engine ground

EAS30497

TROUBLESHOOTING

The battery is not being charged.

TIP -

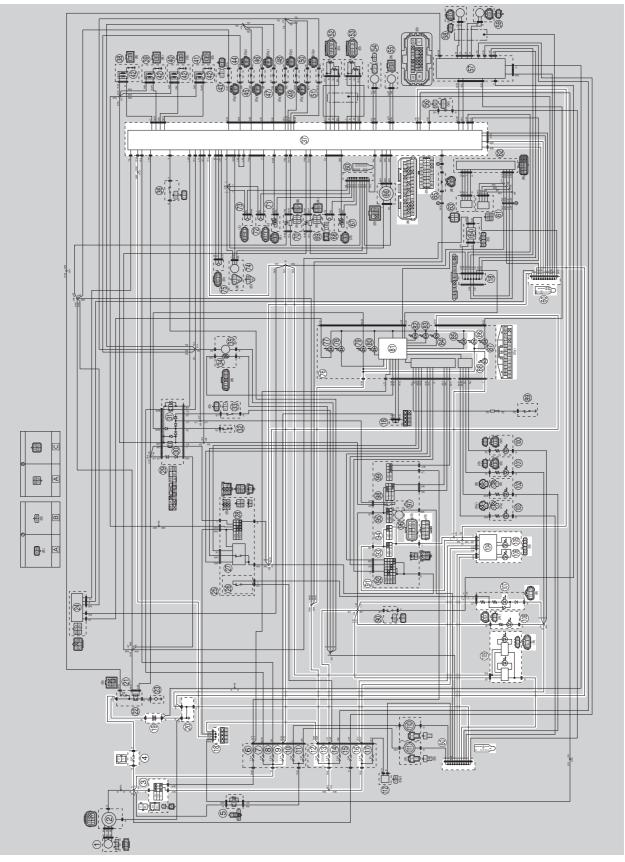
- Before troubleshooting, remove the following part(s):
- 1. Front side cowling/Front panel/Side cover bracket/Electrical components tray
- 2. Rider seat

1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 8-180.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181.	NG→	 Clean the battery terminals. Recharge or replace the battery.
ОК↓		
3. Check the stator coil. Refer to "CHECKING THE STA- TOR COIL" on page 8-187.	NG→	Replace the stator coil assembly.
ОК↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTI- FIER/REGULATOR" on page 8-188.	NG→	Replace the rectifier/regulator.
ОК↓		
 Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-17. 	NG→	Properly connect or repair the charging system's wiring.
OK↓		
The charging system circuit is OK.		

CHARGING SYSTEM

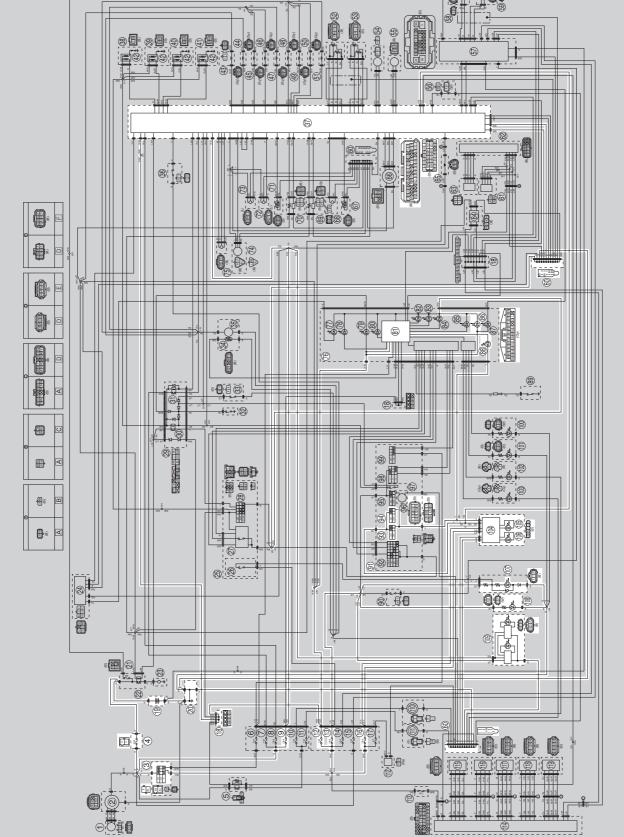
LIGHTING SYSTEM

CIRCUIT DIAGRAM For YZF-R1



3. Main switch 4. Main fuse 9. Backup fuse 12.Ignition fuse 13.Signaling system fuse 16.Headlight fuse 18. Joint coupler 19.Battery 20.Engine ground 37.ECU (Engine Control Unit) 60. Joint connector 76.Meter assembly 81.Multi-function meter 86.Meter light 88. High beam indicator light 91.Handlebar switch (left) 93.Pass/LAP switch 94.Dimmer switch 104.Headlight control unit 105.Headlight (high beam) 106.Headlight (low beam) 107.Tail/brake light 108.License plate light 109. Auxiliary light





3. Main switch 4. Main fuse 9. Backup fuse 12.Ignition fuse 13.Signaling system fuse 16.Headlight fuse 18. Joint coupler 19.Battery 20.Engine ground 37.ECU (Engine Control Unit) 60. Joint connector 76.Meter assembly 81.Multi-function meter 86.Meter light 88. High beam indicator light 91.Handlebar switch (left) 93.Pass/LAP switch 94.Dimmer switch 104.Headlight control unit 105.Headlight (high beam) 106.Headlight (low beam) 107.Tail/brake light 108.License plate light 109. Auxiliary light

EAS30499 TROUBLESHOOTING

Any of the following fail to light: headlight, auxiliary light, high beam indicator light, tail/brake light, license plate light or meter light.

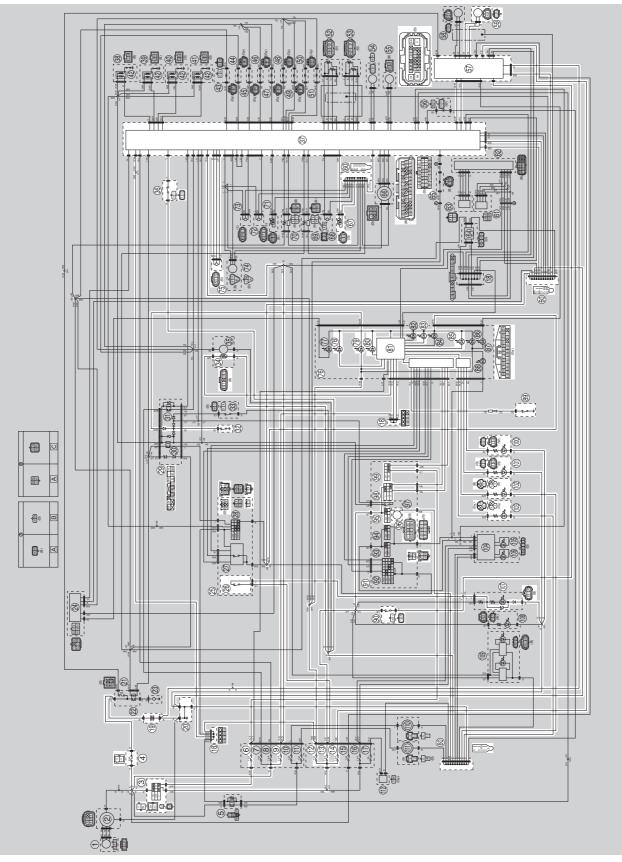
TIP -

- Before troubleshooting, remove the following part(s):
- 1. Front side cowling/Front panel/Side cover
- 2. Passenger seat/Rider seat/Tail cover/Rear side cover
- 3. Headlight assembly

1. Check the fuses.		
(Main, headlight, backup, ignition and signaling system)		Replace the fuse(s).
Refer to "CHECKING THE FUSES" on page 8-180.	NG→	
OK↓		
 Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181. 	NG→	 Clean the battery terminals. Recharge or replace the battery.
ОК↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the main switch/immobilizer unit.
OK↓		
4. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG o	The dimmer switch is faulty. Replace the left handlebar switch.
OK↓		
5. Check the pass/LAP switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	The pass/LAP switch is faulty. Replace the left handlebar switch.
OK↓		
6. Check the entire lighting system's wiring.		Properly connect or repair the lighting sys-
Refer to "CIRCUIT DIAGRAM" on page 8-23.	$NG \rightarrow$	tem's wiring.
OK↓		
Replace the ECU, meter assembly, headlight assembly, tail/brake light, li-		
cense plate light or auxiliary light. Refer to "REPLACING THE ECU (En-		
gine Control Unit)" on page 8-180.		

EAS20076 SIGNALING SYSTEM

CIRCUIT DIAGRAM For YZF-R1



3. Main switch 4. Main fuse 6. Hazard lighting fuse 9. Backup fuse 12.Ignition fuse 13.Signaling system fuse 14.ABS ECU fuse 18. Joint coupler 19.Battery 20. Engine ground 25.Handlebar switch (right) 26. Front brake light switch 29.Relay unit 32.Neutral switch 34. Fuel sender 36.Shift switch 37.ECU (Engine Control Unit) 57.ABS ECU (Electronic Control Unit) 59.Rear wheel sensor 60. Joint connector 67.Coolant temperature sensor 75.Gear position sensor 76.Meter assembly 78. Fuel level warning light 79.Neutral indicator light 80.Shift timing indicator light 81.Multi-function meter 83.Oil pressure and coolant temperature warning light 85. Turn signal indicator light 89.Oil pressure switch 90.Rear brake light switch 91.Handlebar switch (left) 95.Horn switch 96.Horn 98. Turn signal switch 99.Hazard switch 100.Rear turn signal light (right) 101.Rear turn signal light (left) 102.Front turn signal light (right) 103.Front turn signal light (left) 107.Tail/brake light

For YZF-R1M 6 0 0 10 Orto ATL LAN 6 10 8 O I ACCENTER IN I ACCENTER IN I ACCENTER OF IN ® 100 6 Ľ 8 Ø 0 200 - 200 - 200 - 200 6 лШ 8 9-00 10-00 8 • **-**₫ <u>.</u> e **1 †**∞→ (2) * **60** Ð 000 6 ₽ ≤ . 6 **1**0 Óð 01 10 10 10 10 10 10 8 48 ₿® ⊞ ⊞ 3 8 9 N TANK 8 60 **†**00 Ų 1 L 3 •***** ∔©∔. <u>¦_©⊐</u>¦⊕ 0 0.0. -----₿ P P P er er ern ern ern ern v v væ væ ve væ 00 00 00 00 v v ve ve ve vo vo vo 0; 0; 0;0 0;0 0;0 0;0 0;0 0;0 Ť DAT DAY

3. Main switch 4. Main fuse 6. Hazard lighting fuse 9. Backup fuse 12.Ignition fuse 13.Signaling system fuse 14.ABS ECU fuse 18. Joint coupler 19.Battery 20. Engine ground 25.Handlebar switch (right) 26. Front brake light switch 29.Relay unit 32.Neutral switch 34. Fuel sender 36.Shift switch 37.ECU (Engine Control Unit) 57.ABS ECU (Electronic Control Unit) 59.Rear wheel sensor 60. Joint connector 67.Coolant temperature sensor 75.Gear position sensor 76.Meter assembly 78. Fuel level warning light 79.Neutral indicator light 80.Shift timing indicator light 81.Multi-function meter 83.Oil pressure and coolant temperature warning light 85. Turn signal indicator light 89.Oil pressure switch 90.Rear brake light switch 91.Handlebar switch (left) 95.Horn switch 96.Horn 98. Turn signal switch 99.Hazard switch 100.Rear turn signal light (right) 101.Rear turn signal light (left) 102.Front turn signal light (right) 103.Front turn signal light (left) 107.Tail/brake light

EAS30501

TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or an indicator light.
- The horn fails to sound.
- The speedometer fails to operate.

TIP ____

- Before troubleshooting, remove the following part(s):
- 1. Front side cowling/Front panel/Side cover
- 2. Passenger seat/Rider seat/Tail cover/Rear side cover
- 3. Fuel tank cover
- 4. Fuel tank
- 5. Air filter case
- 6. Throttle bodies
- 7. Drive sprocket cover

 Check the fuses. (Main, ignition, signaling system, backup, ABS control unit and haz- ard lighting) Refer to "CHECKING THE FUSES" on page 8-180. 	NG→	Replace the fuse(s).
OK↓	_	
 Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181. 	NG→	 Clean the battery terminals. Recharge or replace the battery.
OK↓	1	
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the main switch/immobilizer unit.
OK↓	4	
 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29. 	NG→	Properly connect or repair the signaling system's wiring.
OK↓	1	
Check the condition of each of the sig- naling system circuits. Refer to "Checking the signaling sys- tem".		
Checking the signaling system The horn fails to sound.		
1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the left handlebar switch.
OK↓	I	

 Check the horn. Refer to "CHECKING THE HORN" on page 8-189. 	NG→	Replace the horn.
OK↓		
 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29. 	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
This circuit is OK.		
The tail/brake light fails to come on.		
1. Check the front brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	$NG \rightarrow$	Replace the front brake light switch.
OK↓		
2. Check the rear brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the rear brake light switch.
OK↓		
 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29. 	NG→	Properly connect or repair the signaling system's wiring.
ОК↓		
Replace the tail/brake light.		
The turn signal light, turn signal indicator	light or both f	fail to blink.
1. Check the turn signal switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the left handlebar switch.
ОК↓		
2. Check the hazard switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the left handlebar switch.
ОК↓		
 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29. 	NG→	Properly connect or repair the signaling system's wiring.
ОК↓		
Replace the meter assembly or turn signal light.		

The neutral indicator light fails to come on. 1. Check the neutral switch. **Refer to "CHECKING THE** Replace the neutral switch. $NG \rightarrow$ SWITCHES" on page 8-177. OK↓ 2. Check the relay unit (diode). **Refer to "CHECKING THE RELAY** Replace the relay unit. $NG \rightarrow$ UNIT (DIODE)" on page 8-185. OK↓ 3. Check the entire signaling system's Properly connect or repair the signaling wiring. Refer to "CIRCUIT DIAGRAM" on system's wiring. $NG \rightarrow$ page 8-29. OK↓ Replace the meter assembly.

The oil pressure and coolant temperature warning light fails to come on when the main switch is set to "ON".

 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29. 	NG o	Properly connect or replace the wiring har- ness.	
OK↓			
2. Disconnect the oil pressure switch lead from the oil pressure switch, and then check whether the oil pres- sure and coolant temperature warn- ing light comes on when the lead is connected to the engine ground.	NG→	Replace the meter assembly.	
OK↓			
Replace the oil pressure switch.			
The oil pressure and coolant temperature warning light remains on after the engine is started.			
 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on 	NG→	Properly connect or replace the wiring har- ness.	

 page 8-29.

 OK↓

 2. Measure the engine oil pressure.

 Refer to "MEASURING THE EN

 GINE OIL PRESSURE" on page

 3-31.

 OK↓

 Replace the oil pressure switch.

The fuel level warning light fails to come of	<u>on.</u>				
1. Check the fuel sender. Refer to "CHECKING THE FUEL SENDER" on page 8-189.	NG→	Replace the fuel pump assembly.			
OK↓					
 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29. 	NG→	Properly connect or repair the signaling system's wiring.			
ОК↓					
Replace the meter assembly.					
The oil pressure and coolant temperature	warning ligh	t fails to come on.			
 Check the coolant temperature sen- sor. Refer to "CHECKING THE COOL- ANT TEMPERATURE SENSOR" on page 8-190. 	NG ightarrow	Replace the coolant temperature sensor.			
OK↓					
 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29. 	NG→	Properly connect or replace the wiring har- ness.			
OK↓					
Replace the ECU or meter assembly. Refer to "REPLACING THE ECU (En- gine Control Unit)" on page 8-180.					
QSS (Quick Shift System) does not operative	ate.				
1. Check that the engine trouble and system warning light does not come on.	NG→	Repair the faulty parts.			
ОК↓					
2. Check that the QSS is working un- der normal QSS operating condi- tions.	NG→	Check the QSS operating conditions ex- plained in the owner's manual and operate the QSS accordingly.			
OK↓					
3. Make sure that the QSS is effective. (Check whether the "QS" icon is dis- played at the top of the meter.)	NG→	Activate the QSS. (Set the QSS to a set- ting other than "OFF".)			
OK↓					
4. Check that the shift switch coupler is connected.	$NG \rightarrow$	Connect the shift switch coupler.			
ОК↓					

5. Check the shift switch. Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-7 and "CHECKING THE SWITCHES" on page 8-177.	$NG \rightarrow$	Replace the shift switch.
OK↓		
6. Check the neutral switch. Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-7 and "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the neutral switch.
OK↓		
 Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29. 	NG→	Properly connect or repair the signaling system's wiring.
ОК↓		
Replace the ECU. Refer to "REPLACING THE ECU (En- gine Control Unit)" on page 8-180.		
The speedometer fails to operate.		
1. Check the rear wheel sensor. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-40.	NG→	Replace the rear wheel sensor.
ОК↓		
 Check the entire wheel sensor wir- ing. Refer to TIP. 	NG→	Properly connect or repair the wheel sen- sor wiring.
OK↓		
Replace the hydraulic unit assembly, ECU, meter assembly. Refer to "REPLACING THE ECU (En- gine Control Unit)" on page 8-180.		
TIP		

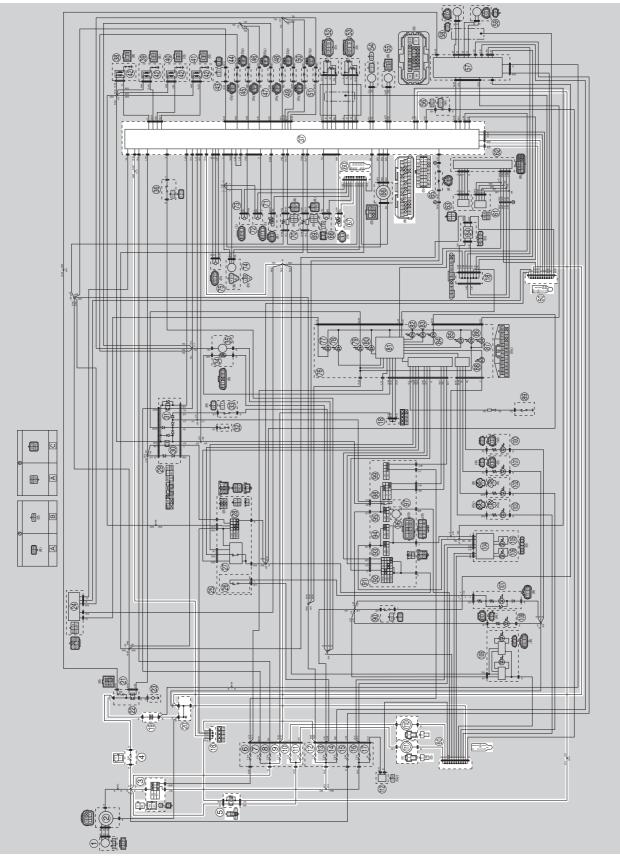
TIP -

Repair or replace if there is an open or short circuit.

- Between rear wheel sensor coupler and ABS ECU coupler. (white–white) (black–black)
 Between ABS ECU coupler and ECU coupler.
- Between ABS ECU coupler and ECU coupler (gray/black–gray/black) (white/blue–white/blue)
- Between joint coupler and ECU coupler. (blue/white–blue/white) (blue/black–blue/black)
- Between joint coupler and meter assembly coupler. (blue/white-blue/white) (blue/black-blue/black)

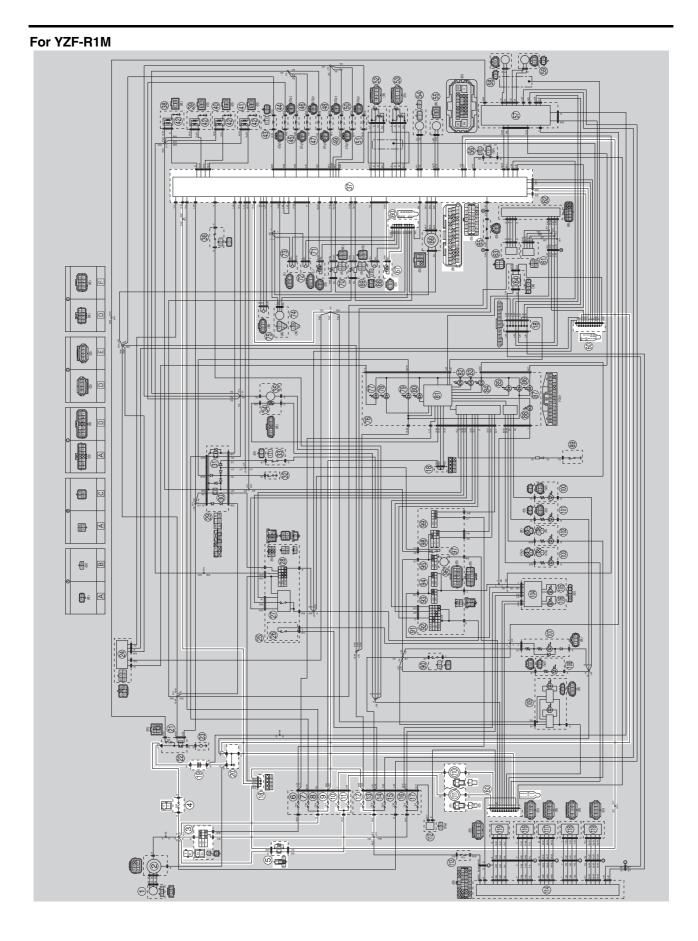
COOLING SYSTEM

CIRCUIT DIAGRAM For YZF-R1



- 3. Main switch
- 4. Main fuse
- 5. Radiator fan motor relay
- 9. Backup fuse
- 10.Radiator fan motor fuse (right)
- 11.Radiator fan motor fuse (left)
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 67.Coolant temperature sensor
- 110.Radiator fan motor (right)
- 111.Radiator fan motor (left)

COOLING SYSTEM

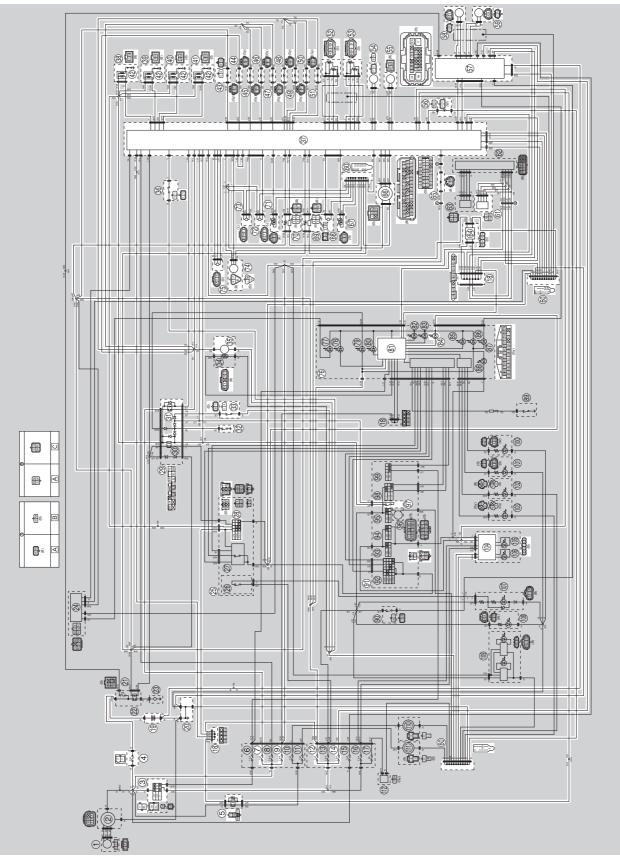


- 3. Main switch
- 4. Main fuse
- 5. Radiator fan motor relay
- 9. Backup fuse
- 10.Radiator fan motor fuse (right)
- 11.Radiator fan motor fuse (left)
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 67.Coolant temperature sensor
- 110.Radiator fan motor (right)
- 111.Radiator fan motor (left)

EAS30503 TROUBLESHOOTING TIP		
 Before troubleshooting, remove the follow 1. Front side cowling/Front panel/Side cow 2. Rider seat 3. Fuel tank cover 4. Fuel tank 5. Air filter case 6. Throttle bodies 	•••••••••••••••••••••••••••••••••••••••	lectrical components tray
 Check the fuses. (Main, ignition, backup and radiator fan motor) Refer to "CHECKING THE FUSES" on page 8-180. 	NG→	Replace the fuse(s).
OK↓		
 Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181. 	NG→	 Clean the battery terminals. Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	$NG \rightarrow$	Replace the main switch/immobilizer unit.
OK↓		
4. Check the radiator fan motor. Refer to "CHECKING THE RADIA- TOR FAN MOTORS" on page 8-190.	NG→	Replace the radiator fan motor.
OK↓		
5. Check the radiator fan motor relay. Refer to "CHECKING THE RE- LAYS" on page 8-184.	NG→	Replace the radiator fan motor relay.
OK↓		
 Check the coolant temperature sensor. Refer to "CHECKING THE COOL- ANT TEMPERATURE SENSOR" on page 8-190. 	NG→	Replace the coolant temperature sensor.
OK↓		
 Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-39. 	NG→	Properly connect or repair the cooling sys- tem's wiring.
OK↓		
Replace the ECU. Refer to "REPLACING THE ECU (En- gine Control Unit)" on page 8-180.		

FUEL INJECTION SYSTEM

CIRCUIT DIAGRAM For YZF-R1

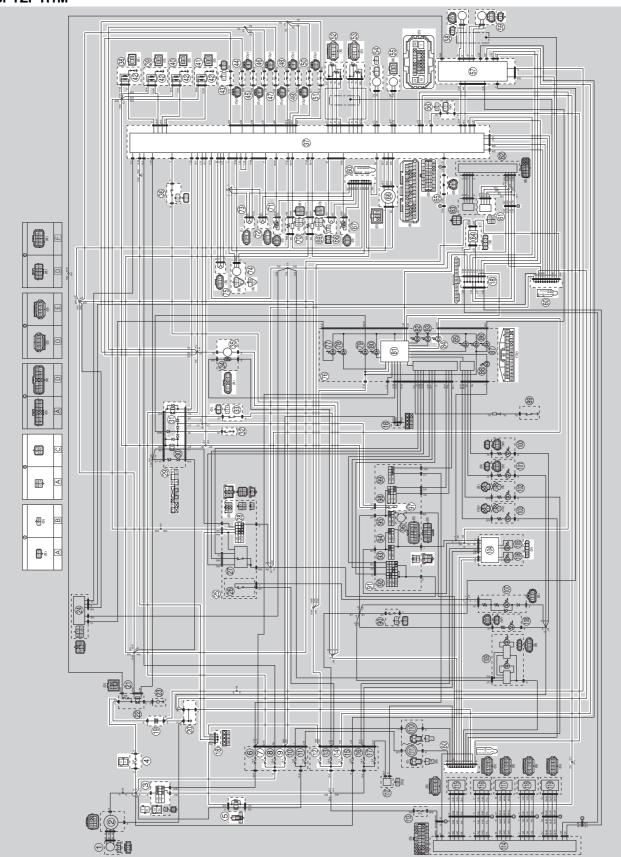


FUEL INJECTION SYSTEM

3. Main switch 4. Main fuse 5. Radiator fan motor relay 7. Fuel injection system fuse 9. Backup fuse 12. Ignition fuse 14.ABS ECU fuse 18. Joint coupler 19.Battery 20.Engine ground 25.Handlebar switch (right) 28.Start/engine stop switch 29.Relay unit 31. Fuel pump relay 32.Neutral switch 33.Sidestand switch 35.Fuel pump 36.Shift switch 37.ECU (Engine Control Unit) 38. Ignition coil #1 39. Ignition coil #2 40.Ignition coil #3 41.Ignition coil #4 42.Spark plug 43.Air induction system solenoid 44.Primary injector #1 45.Primary injector #2 46.Primary injector #3 47.Primary injector #4 48.Secondary injector #1 49.Secondary injector #2 50.Secondary injector #3 51.Secondary injector #4 52. Accelerator position sensor 53. Throttle position sensor 54.Intake funnel servo motor 55.Throttle servo motor 56. Steering damper solenoid 57.ABS ECU (Electronic Control Unit) 58. Front wheel sensor 59.Rear wheel sensor 60. Joint connector 61. Yamaha diagnostic tool coupler 64.IMU (Inertial Measurement Unit) 65.Intake solenoid 66.EXUP servo motor 67.Coolant temperature sensor 68.Crankshaft position sensor 69.O₂ sensor 2 (right side) 70.O₂ sensor 1 (left side) 71.Intake air temperature sensor 72. Atmospheric pressure sensor 73.Intake air pressure sensor

- 74.Cylinder identification sensor
- 75.Gear position sensor
- 76.Meter assembly
- 81.Multi-function meter
- 84. Engine trouble and system warning light
- 91.Handlebar switch (left)
- 97.Clutch switch
- 104.Headlight control unit
- A. Wire harness
- B. Sub-wire harness (intake solenoid)
- C. Sub-wire harness (Yamaha diagnostic tool coupler)

For YZF-R1M



FUEL INJECTION SYSTEM

3. Main switch 4. Main fuse 5. Radiator fan motor relay 7. Fuel injection system fuse 9. Backup fuse 12. Ignition fuse 14.ABS ECU fuse 18. Joint coupler 19.Battery 20.Engine ground 25.Handlebar switch (right) 28.Start/engine stop switch 29.Relay unit 31. Fuel pump relay 32.Neutral switch 33.Sidestand switch 35.Fuel pump 36.Shift switch 37.ECU (Engine Control Unit) 38. Ignition coil #1 39. Ignition coil #2 40.Ignition coil #3 41.Ignition coil #4 42.Spark plug 43.Air induction system solenoid 44.Primary injector #1 45. Primary injector #2 46.Primary injector #3 47.Primary injector #4 48.Secondary injector #1 49.Secondary injector #2 50.Secondary injector #3 51.Secondary injector #4 52. Accelerator position sensor 53. Throttle position sensor 54.Intake funnel servo motor 55.Throttle servo motor 56. Steering damper solenoid 57.ABS ECU (Electronic Control Unit) 58.Front wheel sensor 59.Rear wheel sensor 60. Joint connector 61. Yamaha diagnostic tool coupler 64.IMU (Inertial Measurement Unit) 65.Intake solenoid 66.EXUP servo motor 67.Coolant temperature sensor 68.Crankshaft position sensor 69.O₂ sensor 2 (right side) 70.O₂ sensor 1 (left side) 71.Intake air temperature sensor 72. Atmospheric pressure sensor 73.Intake air pressure sensor

- 74.Cylinder identification sensor
- 75.Gear position sensor
- 76.Meter assembly
- 81.Multi-function meter
- 84. Engine trouble and system warning light
- 91.Handlebar switch (left)
- 97.Clutch switch
- 104.Headlight control unit
- A. Wire harness
- B. Sub-wire harness (intake solenoid)
- C. Sub-wire harness (Yamaha diagnostic tool coupler, CCU, GPS unit)

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 and system warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code number is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning, the engine trouble and system warning light flashes and the engine trouble warning icon on LCD comes on while the "(a)" side of the start/engine stop 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 and system warning light.
- After the engine has been stopped, the lowest fault code number appears on the meter display. Once a fault code has been displayed, it remains stored in the memory of the ECU until it is deleted.

Engine trouble and system 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 accor- dance with the descrip- tion of the malfunction	Can or cannot be oper- ated depending on the fault code

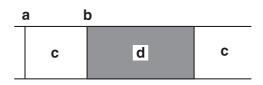
* The warning light flashes when any one of the following conditions is present and the "(a)" side of the start/engine stop switch is pushed:

12:	Crankshaft position sensor	41:	IMU (Inertial Measurement Unit) (open or short circuit)
19:	Sidestand switch (open circuit in the wire to the ECU)	50:	ECU internal malfunction (faulty ECU memory)
20.	IMU (Inertial Measurement Unit)		

30: (latch up detected)

Checking the engine trouble and system warning light

The engine trouble and system warning light comes on for around 4 seconds after the main switch has been set to "ON" and it comes on while the "" side of the start/engine stop switch is being pushed. If the warning light does not come on under these conditions, the warning light (LED) may be defective.



- a. Main switch "OFF"
- b. Main switch "ON"
- c. Engine trouble and system warning light off
- d. Engine trouble and system warning light on for around 4 seconds

ECU detects an abnormal signal from a sensor

If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble and system warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue operating or stop operating, depending on the conditions.

TROUBLESHOOTING METHOD (ECU)

TIP -

If there is a malfunction in the fuel injection system, the engine trouble and system warning light "1" will come on, and a fault code number "2" will be displayed. If there are malfunctions in other systems, refer to the troubleshooting sections for the systems indicated by the warning indicators.



The engine operation is not normal and the engine trouble and system warning light comes on.

- 1. Check:
- Fault code number

- a. Check the fault code number displayed on the meter.
- b. Identify the faulty system with the fault code number.
- c. Identify the probable cause of the malfunction.

2. Check and repair the probable cause of the malfunction.

Fault code No.	No fault code No.
Check and repair. Refer to "TROUBLESHOOTING DETAILS (ECU)" on page 8-54. Monitor the operation of the sensors and actuators in the diagnostic mode. Refer to "TROUBLESHOOT- ING DETAILS (ECU)" on page 8-54 and "SELF- DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.	Check and repair.

3. Perform the reinstatement action for the fuel injection system.

Refer to "Confirmation of service completion" in the appropriate table in "TROUBLESHOOTING DE-TAILS (ECU)" on page 8-54.

4. Set the main switch to "OFF", then to "ON" again, and then check that no fault code number is displayed.

TIP

If another fault code number is displayed, repeat steps (1) to (4) until no fault code number is displayed.

5. Erase the malfunction history in the diagnostic mode (code No.62). Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.

TIP -

Setting the main switch to "OFF" will not erase the malfunction history.

The engine operation is not normal, but the engine trouble and system warning light does not come on.

1. Check the operation of the following sensors and actuators in the diagnostic mode. Refer to "TROU-BLESHOOTING DETAILS (ECU)" on page 8-54.

1: Throttle position sensor signal 1 (throttle angle) 13: Throttle position sensor signal 2 (throttle angle) 14: Accelerator position sensor signal 1 (throttle angle) 15: Accelerator position sensor signal 2 (throttle angle) 30: Cylinder-#1 ignition coil 31: Cylinder-#2 ignition coil 32: Cylinder-#3 ignition coil 33: Cylinder-#4 ignition coil 36: Primary injector #1 37: Primary injector #2 38: Primary injector #3 39: Primary injector #4 40: Secondary injector #1 41: Secondary injector #2 42: Secondary injector #3 43: Secondary injector #4 48: Air induction system solenoid

If a malfunction is detected in the sensors or actuators, repair or replace all faulty parts.

If no malfunction is detected in the sensors and actuators, check and repair the inner parts of the engine.

EAS30507

DIAGNOSTIC MODE (ECU)

Setting the diagnostic mode

- 1. Turn the main switch to "OFF".
- 2. Disconnect the wire harness coupler from the fuel pump.
- 3. Simultaneously press and hold the up button "1" and center button "2", turn the main switch to "ON", and continue to press the buttons for 8 seconds or more.

TIP

"ECU" appears on the display.

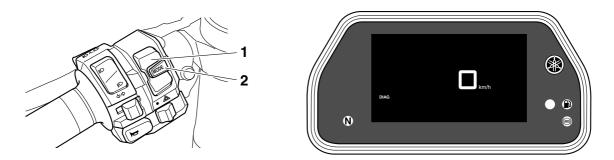
4. Simultaneously press the up button and center button for 2 seconds or more.





5. While "DIAG" is displayed on the display, simultaneously press the up button "1" and center button "2" for 2 seconds or more.

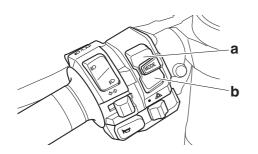
FUEL INJECTION SYSTEM

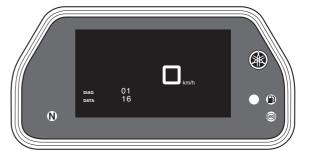


6. Select the diagnostic code number corresponding to the fault code number by pressing the up button or down button.

TIP -

- To decrease the selected diagnostic code number, press the down button. Press the down button for 1 second or more to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the up button. Press the up button for 1 second or more to automatically increase the diagnostic code numbers.





- a. Diagnostic code number increases.
- b. Diagnostic code number decreases.
- 7. Check the operation of the sensor or actuator.
 - Sensor operation

The data representing the operating conditions of the sensor appears on the display.

- Actuator operation
 - To operate the actuator, set the start/engine stop switch from " \bigotimes " to " \bigcirc ".
- 8. Turn the main switch to "OFF" to cancel the diagnostic mode.

TIP _

Information about each diagnostic code number is organized in this manual as follows:

- If a diagnostic code number has a corresponding fault code number, the information is shown in "TROUBLESHOOTING DETAILS (ECU)". (Refer to "TROUBLESHOOTING DETAILS (ECU)" on page 8-54.)
- If a diagnostic code number does not have a corresponding fault code number, the information is shown in "DIAGNOSTIC CODE TABLE". (Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAG-NOSTIC CODE TABLE (ECU)" on page 9-5 and "SELF-DIAGNOSTIC FUNCTION AND DIAGNOS-TIC CODE TABLE (SCU) (for YZF-R1M)" on page 9-12.)

9. Connect the wire harness coupler to the fuel pump.

EAS30951

YAMAHA DIAGNOSTIC TOOL

This model uses the Yamaha diagnostic tool to identify malfunctions.

For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.

Yamaha diagnostic tool 90890-03239

Features of the Yamaha diagnostic tool

You can use the Yamaha diagnostic tool to identify malfunctions quicker than with conventionalmethods.

By connecting the adapter interface, which is connected to the USB port of a computer, to a vehicle's ECU using the communication cable, you can display information that is necessary for identifying malfunctions and for maintenance to display on the computer. The displayed information includes the sensor output data and information recorded in the ECU.

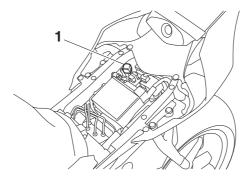
Functions of the Yamaha diagnostic tool

Fault diagnosis mode:	Fault codes recorded on the ECU are read, and the contents are dis- played. The freeze frame data (FFD) is the operation data when a malfunction was detected. This data can be used to identify when the malfunction occurred and check the engine conditions and running conditions when it occurred.
Function diagnostic mode:	Check the operation of the output value of each sensor and actuator.
Inspection mode:	Determine whether each sensor or actuator is functioning properly.
CO adjustment mode:	Adjust the concentration of CO admissions during idling.
Monitoring mode:	Displays a graph of sensor output values for actual operating condi- tions.
Logging mode:	Records and saves the sensor output value in actual driving conditions.
View log:	Displays the logging data.
ECU rewrite:	If necessary, the ECU is rewritten using ECU rewrite data provided by Yamaha. Ignition timing adjustment, etc. cannot be changed from the vehicle's original state.

However, the diagnostic tool cannot be used to freely change the basic vehicle functions, such as adjusting the ignition timing.

Connecting the Yamaha diagnostic tool

Remove the protective cap "1", and then connect the Yamaha diagnostic tool to the coupler.



TIP -

When the Yamaha diagnostic tool is connected to the vehicle, the operation of the multi-function meter and indicators will be different from the normal operation.

EAS30508

TROUBLESHOOTING DETAILS (ECU)

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 "DIAGNOSTIC MODE (ECU)" on page 8-51.

Fault	code No.	8			
Item		Gear position sensor: open or short circuit detected.			
Fail-safe system		Able	to start engine		
		Able	to drive vehicle		
Diagn	nostic code No.	—			
Meter	^r display	—			
Proce	edure	—			
Item	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion	
1	Connection of throttle position sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between gear position sensor coupler and ECU coupler. green–green white–white blue/red–blue/red	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	Installed condition of gear posi- tion sensor. Check for looseness or pinch- ing.		Improperly installed sensor → Reinstall or adjust the sensor. Refer to "INSTALLING THE GEAR POSITION SENSOR" on page 5-70.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Display of each gear position on the meter		Make sure that the position of each gear is correctly displayed on the meter. If incorrect \rightarrow Replace the gear position sensor.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.	

Fault code No.		8		
Item		Gear position sensor: open or short circuit detected.		
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault code No.		11				
ltem	Item Fail-safe system		Cylinder identification sensor: no normal signals are received from the cylinder identification sensor.			
Fail-s			le to start engine			
		Able	to drive vehicle			
Diagn	nostic code No.	—				
Meter	[,] display	—				
Proce	edure	—				
ltem	Probable cause of malfunction and che	ck	Maintenance job	Confirmation of service com- pletion		
1	Connection of cylinder ider cation sensor coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between cylinder identification sensor coupler and ECU cou- pler. white/black–white/black blue–blue Between cylinder identification sensor coupler and joint con- nector. black/blue–black/blue Between joint connector and ECU coupler. black/blue–black/blue	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Installed condition of cylinder identification sensor. Check for looseness or pinch- ing.		Improperly installed sensor → Reinstall or replace the sensor.	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		

			inder identification sensor: no normal signals are received from cylinder identification sensor.	
5	Defective cylinder identifica sensor.	sensor. Refer to INDER I SOR" or	e cylinder identification "CHECKING THE CYL- DENTIFICATION SEN- page 8-193. if defective.	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.
6	Malfunction in ECU.	Refer to	the ECU. "REPLACING THE ngine Control Unit)" on 180.	

Fault code No. Item		12 Crankshaft position sensor: no normal signals are received from the crankshaft position sensor.			
		Unab	le to drive vehicle		
Diagn	nostic code No.	—			
Meter	[,] display	—			
Proce	edure	—			
ltem	Probable cause of malfunction and chee	:k	Maintenance job	Confirmation of service com- pletion	
1	Connection of crankshaft posi- tion sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected → Con- nect the coupler securely or replace the wire harness.	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between crankshaft position sensor coupler and ECU cou- pler. gray–gray Between crankshaft position sensor coupler and joint con- nector. black/blue–black/blue Between joint connector and ECU coupler. black/blue–black/blue	Crank the engine. Fault code number is not dis- played → Service is finished. Fault code number is displayed → Go to item 4.	

Fault	Fault code No.		12			
Item		Crankshaft position sensor: no normal signals are received from the crankshaft position sensor.				
4	Installed condition of crank position sensor. Check for looseness or pin ing. Check the gap (0.8 mm (0.0 between the crankshaft pos sensor and the generator re	ch- 3 in)) sition	Improperly installed sensor → Reinstall or replace the sensor. Refer to "GENERATOR" on page 5-35.	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Defective crankshaft position sensor.		Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-187. Replace if defective.	Crank the engine. Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.		
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

Fault code No.		13				
Item		Intake air pressure sensor: open or short circuit detected.				
Fail-s	afe system	Able	to start engine			
		Able	to drive vehicle			
Diagn	nostic code No.	03				
Meter	^r display	Displa	ays the intake air pressure.			
Proce	Procedure		Operate the throttle while pushing the "(a)" side of the start/engine stop switch. (If the display value changes, the performance is OK.)			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion		
1	Connection of intake air pres- sure sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		

Fault code No. 13				
Item Intake		e air pressure sensor: open or short circuit detected.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between intake air pressure sensor coupler and ECU cou- pler. pink/white–pink/white blue–blue Between intake air pressure sensor coupler and joint con- nector. black/blue–black/blue Between joint connector and ECU coupler. black/blue–black/blue	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.
4	Installed condition of intake air pressure sensor. Check for looseness or pinch- ing.		Improperly installed sensor \rightarrow Reinstall or replace the sensor.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.
5	Defective intake air pressu sensor.	re	Execute the diagnostic mode. (Code No. 03) When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. At sea level: Approx. 101 kPa (757.6 mmHg, 29.8 inHg) 1000 m (3300 ft) above sea level: Approx. 90 kPa (675.1 mmHg, 26.6 inHg) 2000 m (6700 ft) above sea level: Approx. 80 kPa (600.0 mmHg, 23.6 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg) When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking. \rightarrow Check the intake air pressure sensor. Replace if defective. Refer to "CHECKING THE INTAKE AIR PRESSURE SEN- SOR" on page 8-194.	Turn the main switch to "ON". Fault code number is not dis- played → Service is finished. Fault code number is displayed → Go to item 6.
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	

TIP _____

If fault code numbers "13" and "14" are both indicated, take the actions specified for fault code number "13" first.

Fault code No.		14			
Item		Intake air pressure sensor: hose system malfunction (clogged or detached hose).			
Fail-s	afe system	Able	to start engine		
		Able	to drive vehicle		
Diagn	ostic code No.	03			
Meter	display	Displa	ays the intake air pressure.		
Proce	edure	Opera switcl	ate the throttle while pushing the " n. (If the display value changes, th	(≆)" side of the start/engine stop e performance is OK.)	
ltem	Probable cause of malfunction and check	:k	Maintenance job	Confirmation of service com- pletion	
1	Condition of intake air pressure sensor hose. Check the intake air pressure sensor hose condition.		Clogged or detached hose → Repair or replace the sensor hose.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2			Execute the diagnostic mode. (Code No. 03) When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. At sea level: Approx. 101 kPa (757.6 mmHg, 29.8 inHg) 1000 m (3300 ft) above sea level: Approx. 90 kPa (675.1 mmHg, 26.6 inHg) 2000 m (6700 ft) above sea level: Approx. 80 kPa (600.0 mmHg, 23.6 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg) When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking. \rightarrow Check the intake air pressure sensor. Replace if defective. Refer to "CHECKING THE INTAKE AIR PRESSURE SEN- SOR" on page 8-194.		

TIP -

If fault code numbers "13" and "14" are both indicated, take the actions specified for fault code number "13" first.

Fourt	code No.	15				
	code no.	-				
Item T		Thro	Throttle position sensor: open or short circuit detected.			
Fail-safe system		Able/	Able/Unable to start engine			
		Able/	Unable to drive vehicle			
Diagn	ostic code No.	01, 1	3			
01	Meter display	• 11–	tle position sensor signal 1 21 (fully closed position) 106 (fully open position)			
	Procedure		eck with throttle valves fully closed. eck with throttle valves fully open.			
13	Meter display	• 9–2	tle position sensor signal 2 3 (fully closed position) 108 (fully open position)			
	Procedure		eck with throttle valves fully closed. eck with throttle valves fully open.			
Item	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion		
1	Connection of throttle position sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between throttle position sensor coupler and ECU coupler. black/green–black/green white–white black–black blue–blue	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Installed condition of throttle position sensor. Check for looseness or pinch- ing.		Improperly installed sensor → Reinstall or adjust the sensor. Refer to "ADJUSTING THE THROTTLE POSITION SEN- SOR" on page 7-16.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Throttle position sensor reatance.	sis-	Measure the throttle position sensor resistance. black/green-blue Refer to "CHECKING THE THROTTLE POSITION SEN- SOR" on page 8-191.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.		

Faul	t code No.	15
Item		Throttle position sensor: open or short circuit detected.
6	Defective throttle position s	 Sen- Check throttle position sensor signal 1. Execute the diagnostic mode. (Code No. 01) When the throttle valves are fully closed: A value of 11–21 is indicated. When throttle valves are fully open: A value of 96–106 is indicated. Check throttle position sensor signal 2. Execute the diagnostic mode. (Code No. 13) When the throttle valves are fully closed: A value of 9–23 is indicated. When the throttle valves are fully open: A value of 94–108 is indicated. An indicated value is out of the specified range → Replace the throttle position sensor.
7	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.

Fault	code No.	17			
Item		EXU	o servo motor: open or short cir	cuit detected.	
Fail-s	afe system	Able	to start engine		
		Able	to drive vehicle		
Diagn	nostic code No.	53			
Actua	Actuation		After the EXUP is fully closed, it stops at the opening base position (inter- mediate position). This operation takes approximately 3 seconds during which time the warning light comes on.		
Proce	edure	Check the operating sound.			
Item	Probable cause of malfunction and chec	:k	Maintenance job	Confirmation of service com- pletion	
1	Connection of EXUP servo motor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	

Fault	Fault code No. 17			
Item		EXU	o servo motor: open or short cir	cuit detected.
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between EXUP servo motor coupler and ECU coupler. blue-blue white/yellow-white/yellow Between EXUP servo motor coupler and joint connector. black/blue-black/blue Between joint connector and ECU coupler. black/blue-black/blue	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.
4	Defective EXUP servo mot	or.	Execute the diagnostic mode. (Code No. 53) Check the operating sound of the motor. Replace if defective.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	

TIP _____

If fault code numbers "17" and "18" are both indicated, take the actions specified for fault code number "17" first.

Fault cod	de No.	18				
Item		EXUF	servo motor: stuck EXUP serve	o motor is detected.		
Fail-safe	system	Able	to start engine			
		Able to drive vehicle				
Diagnos	Diagnostic code No.		53			
Actuation		After the EXUP is fully closed, it stops at the opening base position (inter- mediate position). This operation takes approximately 3 seconds during which time the warning light comes on.				
Procedure		Check the operating sound.				
Item	Probable cause of malfunction and check	k	Maintenance job	Confirmation of service com- pletion		

Fault	Fault code No.					
Item		EXU	EXUP servo motor: stuck EXUP servo motor is detected.			
1	Connection of EXUP servo motor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between EXUP servo motor coupler and ECU coupler. black/green–black/green black/red–black/red	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Defective EXUP servo motor.		Disconnect the cables and exe- cute the diagnostic code. (Code No. 53) Check the operating sound of the motor. Replace if defective.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Defective EXUP valve, pulley, and cables.		Turn the EXUP valve manually with the cables disconnected. Replace if defective.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.		
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

TIP _

If fault code numbers "17" and "18" are both indicated, take the actions specified for fault code number "17" first.

Fault code No.	19
Item	Sidestand switch: a break or disconnection of the blue/yellow lead of the ECU is detected.
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	Extend and retract the sidestand (with the transmission in gear).

Fault	code No.	19			
Item			Sidestand switch: a break or disconnection of the blue/yellow lead of the ECU is detected.		
Item	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service com- pletion	
1	Connection of sidestand switch coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3	Connection of relay unit coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between relay unit coupler and ECU coupler. blue/yellow-blue/yellow Between relay unit coupler and sidestand switch coupler. blue/black-blue/black	Turn the main switch to "ON", and then extend and retract the sidestand. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Defective sidestand switch.		Execute the diagnostic mode. (Code No. 20) Shift the transmission into gear. Sidestand retracted: "ON" Sidestand extended: "OFF" Replace if defective.	Turn the main switch to "ON", and then extend and retract the sidestand. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.	
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault code No.	20
Item	Intake air pressure sensor or atmospheric pressure sensor: when the main switch is turned to "ON", the Intake air pressure sensor voltage and atmospheric pressure sensor voltage differ greatly.
Fail-safe system	Able to start engine
	Able to drive vehicle
Diagnostic code No.	03, 02

Fault code No.		20			
Item	Item		Intake air pressure sensor or atmospheric pressure sensor: when the main switch is turned to "ON", the Intake air pressure sensor voltage and atmospheric pressure sensor voltage differ greatly.		
03	Meter display	Displ	ays the intake air pressure.		
	Procedure	Oper switc	ate the throttle while pushing the " h. (If the display value changes, th	(s)" side of the start/engine stop e performance is OK.)	
02	Meter display	Displ	ays the atmospheric pressure.		
	Procedure		pare the actually measured atmosp ay value.	pheric pressure with the meter	
Item	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion	
1	Defective Intake air pressure sensor.		Execute the diagnostic mode. (Code No. 03) When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. 0 m above sea level: Approx. 101 kPa (757.6 mmHg, 29.8 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg) Displayed value is incorrect → Check the Intake air pressure sensor. Replace if defective. Refer to "CHECKING THE INTAKE AIR PRESSURE SEN- SOR" on page 8-194.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2	Defective atmospheric pressure sensor.		Execute the diagnostic mode. (Code No. 02) When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. 0 m above sea level: Approx. 101 kPa (757.6 mmHg, 29.8 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg) Displayed value is incorrect → Check the atmospheric pres- sure sensor. Replace if defective. Refer to "CHECKING THE ATMOSPHERIC PRESSURE SENSOR" on page 8-193.	Turn the main switch to "ON". Fault code number is not dis- played → Service is finished. Fault code number is displayed → Go to item 3.	
3	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault	code No.	21				
Item	Item		Coolant temperature sensor: open or short circuit detected.			
Fail-s	afe system	Able	to start engine			
		Able	to drive vehicle			
Diagn	ostic code No.	06				
Meter	⁻ display	Displa	ays the coolant temperature.			
Proce	edure	Comp play v	pare the actually measured coolan value.	t temperature with the meter dis-		
Item	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion		
1	Connection of coolant tempera- ture sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between coolant temperature sensor coupler and ECU cou- pler. green/white–green/white Between coolant temperature sensor coupler and joint con- nector. black/blue–black/blue Between joint connector and ECU coupler. black/blue–black/blue	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Installed condition of coolant temperature sensor. Check for looseness or pinch- ing.		Improperly installed sensor \rightarrow Reinstall or replace the sensor.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		

Faul	t code No.	21
Item		Coolant temperature sensor: open or short circuit detected.
5	Defective coolant temperations sensor.	 Execute the diagnostic mode. (Code No. 06) When engine is cold: Displayed temperature is close to the ambient temperature. The displayed temperature is not close to the ambient temper- ature → Check the coolant tem- perature sensor. Replace if defective. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-190. Turn the main switch to "ON". Fault code number is not dis- played → Service is finished. Fault code number is displayed → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.

Fault	Fault code No.				
Item	Item Intak		ke air temperature sensor: open or short circuit detected.		
Fail-s	afe system	Able	to start engine		
		Able	to drive vehicle		
Diagn	nostic code No.	05			
Meter	r display	Displa	ays the air temperature.		
Proce	edure	Comp value	pare the actually measured air tem	perature with the meter display	
Item	n Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion	
1	Connection of intake air temper- ature sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2	. ,		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	

Fault	code No.	22			
Item		Intake air temperature sensor: open or short circuit detec	take air temperature sensor: open or short circuit detected.		
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.Turn the main switch Fault code number is played → Service is to played → Service is to played.Between intake air temperature sensor coupler and ECU cou- pler.Turn the main switch Fault code number is played → Service is to Fault code number is → Go to item 4.Between intake air temperature sensor coupler and joint con- nector.→ Go to item 4.black/blue–black/blue Between joint connector and ECU coupler. black/blue–black/blueTurn the main switch Fault code number is played → Service is to Fault code number is played → Service is to played → Service is to to played → Service is to to played → Service is to to played → Service is to played → Service is to to played → Service is to played → Service is to to played → Service is to played → Service i	not dis- finished.		
4	Installed condition of intake temperature sensor. Check for looseness or pin ing.	Reinstall or replace the sensor. Fault code number is	not dis- finished.		
5	Defective intake air temper ture sensor.	 Execute the diagnostic mode. (Code No. 05) When engine is cold: Displayed temperature is close to the ambient temperature. The displayed temperature is not close to the ambient temper- ature. → Check the intake air temperature sensor. Replace if defective. Refer to "CHECKING THE INTAKE AIR TEMPERATURE SENSOR" on page 8-194. Turn the main switch Fault code number is played → Service is to Fault code number is of code number is → Go to item 6. 	not dis- finished.		
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

Fault	code No.	23			
Item		Atmo	Atmospheric pressure sensor: open or short circuit detected.		
Fail-safe system		Able t	to start engine		
		Able to drive vehicle			
Diagnostic code No. 02		02			
Meter	display	Displays the atmospheric pressure.			
			pare the actually measured atmosp ay value.	pheric pressure with the meter	
ltem	Probable cause of malfunction and che	ck	Maintenance job	Confirmation of service com- pletion	

Fault	code No.	23			
Item	Item		Atmospheric pressure sensor: open or short circuit detected.		
1	Connection of atmospheric pressure sensor coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between atmospheric pressure sensor coupler and ECU cou- pler. pink-pink blue-blue Between atmospheric pressure sensor coupler and joint con- nector. black/blue-black/blue Between joint connector and ECU coupler. black/blue-black/blue	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	Installed condition of atmo- spheric pressure sensor. Check for looseness or pin ing.		Improperly installed sensor \rightarrow Reinstall or replace the sensor.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Defective atmospheric pressure sensor.		Execute the diagnostic mode. (Code No. 02) When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. At sea level: Approx. 101 kPa (757.6 mmHg, 29.8 inHg) 1000 m (3300 ft) above sea level: Approx. 90 kPa (675.1 mmHg, 26.6 inHg) 2000 m (6700 ft) above sea level: Approx. 80 kPa (600.0 mmHg, 23.6 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg) Displayed value is incorrect → Check the atmospheric pres- sure sensor. Replace if defective. Refer to "CHECKING THE ATMOSPHERIC PRESSURE SENSOR" on page 8-193.	Turn the main switch to "ON". Fault code number is not dis- played → Service is finished. Fault code number is displayed → Go to item 6.	

Fault code No.		23		
Item /		Atmo	Atmospheric pressure sensor: open or short circuit detected.	
6	Malfunction in ECU.	·	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	

Fault	Fault code No. Item		24 O ₂ sensor 1: no normal signals are received from the O ₂ sensor 1.			
Item						
Fail-s	afe system	Able	to start engine			
		Able	to drive vehicle			
Diagn	nostic code No.	_				
Meter	[,] display					
Proce	edure					
Item	Probable cause of malfunction and chee	:k	Maintenance job	Confirmation of service com- pletion		
1	Installed condition of O ₂ sensor 1.		Improperly installed sensor → Reinstall or replace the sensor.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of O_2 sensor 1 coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Connection of wire harnes ECU coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		

Fault	code No.	24		
Item		O_2 sensor 1: no normal signals are received from the O_2 sensor 1.		
4	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between O2 sensor 1 coupler and ECU coupler. gray/green-gray/green pink/black-pink/black Between O2 sensor 1 coupler and joint connector. black/blue-black/blue red/white-red/white Between joint connector and ECU coupler. black/blue-black/blue Between joint connector and ECU coupler. black/blue-black/blue Between joint connector and ECU coupler. black/blue-black/blue Between joint connector and fuse box. red/white-red/white	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Check fuel pressure.	Refer to "CHECKING THE FUEL PRESSURE" on page 7-15.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.	
6	Defective O ₂ sensor 1.	Check the O ₂ sensor 1. Replace if defective. Refer to "ENGINE REMOVAL" on page 5-3.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 7.	
7	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault code No.	30	30		
Item	Latch	n up detected.		
Fail-safe system	Unab	le to start engine		
	Unab	Unable to drive vehicle		
Diagnostic code No.	17	17		
Meter display	• 0-5	 Displays the bank angle in increments of 5° 0-5° (vehicle is vertical) Less than 30° (when the sidestand is used) 		
Procedure	Chec playe	Check that $0-5^{\circ}$ is displayed when the vehicle is vertical and that the displayed value increases as the vehicle continues to incline.		
Item Probable of malfunction		Maintenance job	Confirmation of service com- pletion	

Fault	code No.	30	
Item		Latch up detected.	
1	The vehicle has overturned	I. Raise the vehicle upright.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.
2	Installed condition of IMU.	Check the installed direction and condition of the sensor. Check the grommet for cracks.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.
3	Defective IMU.	Execute the diagnostic mode. (Code No. 17) Check that 0–5° is displayed when the vehicle is vertical and that the displayed value increases as the vehicle contin- ues to incline. Replace if defective.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.
4	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	

Fault	code No.	33			
Item	Item Cyli mar		Cylinder-#1 ignition coil: open or short circuit detected in the pri- mary lead of the cylinder-#1 ignition coil.		
Fail-s	afe system	Able	to start engine (depending on the	number of faulty cylinders)	
		Able	to drive vehicle (depending on the	number of faulty cylinders)	
Diagn	nostic code No.	30			
Actua	Actuation Actual		Actuates the cylinder-#1 ignition coil five times at one-second intervals. Illuminates the engine trouble and system warning light.		
Proce	edure	Check that a spark is generated five times. • Connect an ignition checker.			
Item	Probable cause of malfunction and chec	:k	Maintenance job	Confirmation of service com- pletion	
1	Connection of cylinder-#1 i tion coil coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	

Fault	code No.	33			
ltem			ylinder-#1 ignition coil: open or short circuit detected in the pri- ary lead of the cylinder-#1 ignition coil.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between cylinder-#1 ignition coil coupler and ECU coupler. orange–orange	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	Installed condition of cylind ignition coil. Check for looseness or pin ing.		Improperly installed ignition coil \rightarrow Reinstall or replace the ignition coil.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Defective cylinder-#1 ignition coil.		Measure the primary coil resis- tance of the cylinder-#1 ignition coil. Replace if out of specification. Refer to "CHECKING THE IGNITION COILS" on page 8-186.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.	
6	Malfunction in ECU.		Execute the diagnostic mode. (Code No. 30) No spark \rightarrow Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault c	code No.	34			
ltem		Cylinder-#2 ignition coil: open or short circuit detected in the pri- mary lead of the cylinder-#2 ignition coil.			
Fail-sa	afe system	Able t	to start engine (depending on the	number of faulty cylinders)	
		Able t	Able to drive vehicle (depending on the number of faulty cylinders)		
Diagnostic code No. 31					
Actuat	tion	Actua Illumi	Actuates the cylinder-#2 ignition coil five times at one-second intervals. Illuminates the engine trouble and system warning light.		
			k that a spark is generated five tim nnect an ignition checker.	ies.	
ltem	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service com- pletion	

Fault	code No.	34				
Item		Cylin mary	Cylinder-#2 ignition coil: open or short circuit detected in the pri- mary lead of the cylinder-#2 ignition coil.			
1	Connection of cylinder-#2 igni- tion coil coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between cylinder-#2 ignition coil coupler and ECU coupler. gray/red–gray/red	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Installed condition of cylinder-#2 ignition coil. Check for looseness or pinch- ing.		Improperly installed ignition coil → Reinstall or replace the igni- tion coil.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Defective cylinder-#2 ignition coil.		Measure the primary coil resis- tance of the cylinder-#2 ignition coil. Replace if out of specification. Refer to "CHECKING THE IGNITION COILS" on page 8-186.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.		
6	Malfunction in ECU.		Execute the diagnostic mode. (Code No. 31) No spark → Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

Fault code No.	35			
Item	Cylinder-#3 ignition coil: open or short circuit detected in the pri mary 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 and system warning light.			

Fault	Fault code No.		35			
Item	Item		Cylinder-#3 ignition coil: open or short circuit detected in the pri- mary lead of the cylinder-#3 ignition coil.			
Proce	dure		k that a spark is generated five tim mect an ignition checker.	es.		
Item	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service com- pletion		
1	Connection of cylinder-#3 i tion coil coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between cylinder-#3 ignition coil coupler and ECU coupler. orange/green–orange/green	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Installed condition of cylind ignition coil. Check for looseness or pin ing.		Improperly installed ignition coil \rightarrow Reinstall or replace the ignition coil.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Defective cylinder-#3 ignition coil.		Measure the primary coil resis- tance of the cylinder-#3 ignition coil. Replace if out of specification. Refer to "CHECKING THE IGNITION COILS" on page 8-186.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.		
6	Malfunction in ECU.		Execute the diagnostic mode. (Code No. 32) No spark → Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

Fault code No.	36
Item	Cylinder-#4 ignition coil: open or short circuit detected in the pri- mary 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)

Fault	Fault code No.		36			
Item	Item		Cylinder-#4 ignition coil: open or short circuit detected in the pri- mary lead of the cylinder-#4 ignition coil.			
Diagn	ostic code No.	33				
Actua	tion		ates the cylinder-#4 ignition coil five nates the engine trouble and syste			
Proce	dure	Chec • Cor	k that a spark is generated five tim nect an ignition checker.	ies.		
Item	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service com- pletion		
1	Connection of cylinder-#4 igni- tion coil coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between cylinder-#4 ignition coil coupler and ECU coupler. gray/green–gray/green	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Installed condition of cylinder-#4 ignition coil. Check for looseness or pinch- ing.		Improperly installed ignition coil \rightarrow Reinstall or replace the ignition coil.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Defective cylinder-#4 ignition coil.		Measure the primary coil resis- tance of the cylinder-#4 ignition coil. Replace if out of specification. Refer to "CHECKING THE IGNITION COILS" on page 8-186.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.		
6	Malfunction in ECU.		Execute the diagnostic mode. (Code No. 33) No spark → Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

Fault code No.		39				
ltem		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)		
Diagr	nostic code No.	36, 3 ⁻	7, 38, 39			
36	Actuation	Actua Illumi	ates primary injector #1 five times a nates the engine trouble and syste	at one-second intervals. em warning light.		
	Procedure		k that primary injector #1 is actuat tting sound.	ed five times by listening for the		
37	Actuation		ates primary injector #2 five times a nates the engine trouble and syste			
	Procedure		k that primary injector #2 is actuat ating sound.	ed five times by listening for the		
38	Actuation	Actua Illumi	ates primary injector #3 five times a nates the engine trouble and syste	at one-second intervals. em warning light.		
	Procedure		k that primary injector #3 is actuat ating sound.	actuated five times by listening for the		
39	Actuation	Actuates primary injector #4 five times at one-second intervals. Illuminates the engine trouble and system warning light.				
	Procedure	Chec opera	Check that primary injector #4 is actuated five times by listening for the operating sound.			
Item	Probable cause of malfunction and chee	:k	Maintenance job	Confirmation of service com- pletion		
1	Identify the malfunctioning pri- mary injector.		Execute the diagnostic mode. (Code No. 36, 37, 38, 39) Identify the primary injector that does not produce an operating sound. Perform the following proce- dures for the defective primary injector. Refer to "CHECKING THE FUEL INJECTORS" on page 8-196.			
2	Connection of primary injector coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 36, 37, 38, 39) No operating sound \rightarrow Go to item 3. Operating sound \rightarrow Go to item 8.		
3			Measure the primary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-196.	Execute the diagnostic mode. (Code No. 36, 37, 38, 39) No operating sound \rightarrow Go to item 4. Operating sound \rightarrow Go to item 8.		

Fault code No.		39		
Item		Prima	ary injector: open or short circu	it detected.
4	Connection of wire harness ECU coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 36, 37, 38, 39) No operating sound \rightarrow Go to item 5. Operating sound \rightarrow Go to item 8.
5	Connection of sub-wire has ness coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected → Con- nect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 36, 37, 38, 39) No operating sound \rightarrow Go to item 6. Operating sound \rightarrow Go to item 8.
6	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between primary injector cou- pler and ECU coupler. Primary injector #1 red/black-red/black red/blue-red/blue Primary injector #2 green/black-green/black red/blue-red/blue Primary injector #3 blue/black-blue/black red/blue-red/blue Primary injector #4 orange/black-orange/black red/blue-red/blue	Execute the diagnostic mode. (Code No. 36, 37, 38, 39) No operating sound \rightarrow Go to item 7. Operating sound \rightarrow Go to item 8.
7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	
8	Delete the fault code.			Start the engine and let it idle for approximately 5 seconds. Check that the fault code num- ber is not displayed.

Fault code No.		40
Item		Secondary 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)
Diag	nostic code No.	40, 41, 42, 43
40 Actuation		Actuates secondary injector #1 five times at one-second intervals. Illuminates the engine trouble and system warning light.
	Procedure	Check that secondary injector #1 is actuated five times by listening for the operating sound.

Fault	code No.	40				
Item	Item		Secondary injector: open or short circuit detected.			
41	Actuation	Actua Illumi	ctuates secondary injector #2 five times at one-second intervals. Iuminates the engine trouble and system warning light.			
	Procedure		k that secondary injector #2 is actu perating sound.	uated five times by listening for		
42	Actuation		ates secondary injector #3 five time nates the engine trouble and syste			
	Procedure		k that secondary injector #3 is actu perating sound.	uated five times by listening for		
43	Actuation	Actua Illumi	ates secondary injector #4 five time nates the engine trouble and syste	es at one-second intervals. em warning light.		
	Procedure	Chec the o	k that secondary injector #4 is actu perating sound.	uated five times by listening for		
Item	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion		
1	Identify the malfunctioning sec- ondary injector.		Execute the diagnostic mode. (Code No. 40, 41, 42, 43) Identify the secondary injector that does not produce an oper- ating sound. Perform the following proce- dures for the defective second- ary injector. Refer to "CHECKING THE FUEL INJECTORS" on page 8-196.			
2	Connection of secondary injec- tor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 40, 41, 42, 43) No operating sound \rightarrow Go to item 3. Operating sound \rightarrow Go to item 8.		
3	Defective secondary injector.		Measure the secondary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-196.	Execute the diagnostic mode. (Code No. 40, 41, 42, 43) No operating sound \rightarrow Go to item 4. Operating sound \rightarrow Go to item 8.		
4	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 40, 41, 42, 43) No operating sound \rightarrow Go to item 5. Operating sound \rightarrow Go to item 8.		
5	Connection of sub-wire ha ness coupler. Check the locking conditio the coupler. Disconnect the coupler and check the pins (bent or broch terminals and locking cond of the pins).	n of d oken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 40, 41, 42, 43) No operating sound \rightarrow Go to item 6. Operating sound \rightarrow Go to item 8.		

Fault	code No.	40		
Item		Secondary injector: open or short cir	rcuit detected.	
6	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between secondary injector coupler and ECU coupler. Secondary injector #1 white/blue–white/blue red/blue–red/blue Secondary injector #2 sky blue/white–sky blue/white red/blue–red/blue Secondary injector #3 brown/yellow–brown/yellow red/blue–red/blue Secondary injector #4 brown/black–brown/black red/blue–red/blue	Execute the diagnostic mode. (Code No. 40, 41, 42, 43) No operating sound \rightarrow Go to item 7. Operating sound \rightarrow Go to item 8.	
7	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		
8	Delete the fault code.		Start the engine and let it idle for approximately 5 seconds. Check that the fault code num- ber is not displayed.	

Fault code No. 4		41			
Item		IMU (Inertial Measurement Unit): no normal signals are received from the IMU (Inertial Measurement Unit).			
Fail-s	afe system	Unab	le to start engine		
		Unab	le to drive vehicle		
Diagn	nostic code No.	17			
Meter display		Displays the bank angle in increments of 5° • 0–5° (vehicle is vertical) • Less than 30° (when the sidestand is used)			
Proce	edure	Check that $0-5^{\circ}$ is displayed when the vehicle is vertical and that the displayed value increases as the vehicle continues to incline.			
ltem	Probable cause of malfunction and check	:k	Maintenance job	Confirmation of service com- pletion	
1	Connection of IMU coupler Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	

Fault	Fault code No.41				
ltem		IMU from	(Inertial Measurement Unit): no normal signals are received the IMU (Inertial Measurement Unit).		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between IMU coupler and joint connector. blue/white–blue/white blue/black–blue/black Between joint connector and ECU coupler. blue/white–blue/white blue/black–blue/black	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	Installed condition of IMU.		Check the installed direction and condition of the sensor. Check the grommet for cracks.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Defective IMU.		Execute the diagnostic mode. (Code No. 17) Check that 0–5° is displayed when the vehicle is vertical and that the displayed value increases as the vehicle contin- ues to incline. Replace if defective.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.	
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault code No.	42	
		Rear wheel sensor: no normal signals are received from the rear wheel sensor.
Item	B Neutral switch: open or short circuit is detected.	
		Clutch switch: open or short circuit is detected.
Fail-safe system	Able to start engine	
	At	le to drive vehicle
Diagnostic code No.	07	
Meter display	Rear wheel speed pulse 0–999	
Procedure		neck that the number increases when the rear wheel is rotated. The mber is cumulative and does not reset each time the wheel is stopped.

Fault	code No.	42	2		
		A		ear wheel sensor: no normal sig heel sensor.	nals are received from the rear
Item		В	Ne	eutral switch: open or short circ	uit is detected.
		С	CI	lutch switch: open or short circu	uit is detected.
Item	Probable cause of malfunction and check	ck		Maintenance job	Confirmation of service com- pletion
A-1	Locate the malfunction.			Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases.	Value does not increase \rightarrow Go to item A-2.
			Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF"	Incorrect indication → Go to item B-2 for the neutral switch.	
				When the transmission is in gear with the clutch lever squeezed and the sidestand retracted: "ON"	Incorrect indication \rightarrow Go to item C-2 for the clutch switch.
A-2	Connection of rear wheel sen- sor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		f	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item A-8 and delete the fault code. Value does not increase \rightarrow Go to item A-3.
A-3	Connection of ABS ECU cou- pler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item A-8 and delete the fault code. Value does not increase \rightarrow Go to item A-4.	
A-4	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item A-8 and delete the fault code. Value does not increase \rightarrow Go to item A-5.	

Fault	code No.	42	2		
			Rear wheel sensor: no normal signals are received from the rear wheel sensor.		
Item		В	Neutral switch: open or short circ	uit is detected.	
		С	Clutch switch: open or short circu	it is detected.	
A-5	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between rear wheel sensor cou- pler and ABS ECU coupler. black–black white–white Between ABS ECU coupler and ECU coupler. white/blue–white/blue	Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item A-8 and delete the fault code. Value does not increase \rightarrow Go to item A-6.	
A-6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item A-8 and delete the fault code. Value does not increase \rightarrow Go to item A-7.	
A-7	Malfunction in ABS ECU.		Replace the ABS ECU.	Go to item A-8 and delete the fault code.	
A-8	Delete the fault code.			Turn the main switch to "ON", and then rotate the rear wheel by hand. Start the engine, and input the vehicle speed signals by operat- ing the vehicle at 20 to 30 km/h (19 mi/h). The fault code can also be deleted by activating the diag- nostic mode and selecting diag- nostic code number "63".	

Fault	code No.	42			
			Rear wheel sensor: no normal sig wheel sensor.	nals are received from the rear	
ltem		в	Neutral switch: open or short circ	uit is detected.	
			Clutch switch: open or short circuit is detected.		
Fail-sa	afe system	Able to start engine			
		Abl	e to drive vehicle		
Diagn	ostic code No.	21			
Meter display Neutral • "ON" (when th • "OFF" (when		utral DN" (when the transmission is in neu DFF" (when the transmission is in ge	tral) ar or the clutch lever released)		
Procedure		Shift the transmission.			
Item	tem Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion	

Fault	code No.	42		
			Rear wheel sensor: no normal sig wheel sensor.	nals are received from the rear
Item		В	Neutral switch: open or short circ	uit is detected.
		С	Clutch switch: open or short circu	uit is detected.
B-1	Locate the malfunction.		Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases.	Value does not increase \rightarrow Go to item A-2 for the rear wheel sensor.
			Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF"	Incorrect indication \rightarrow Go to item B-2.
			When the transmission is in gear with the clutch lever squeezed and the sidestand is retracted: "ON"	Incorrect indication \rightarrow Go to item C-2 for the clutch switch.
B-2	Connection of neutral switch coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		1	Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF" Correct indication \rightarrow Go to item B-9. Incorrect indication \rightarrow Go to item B-3.
B-3	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		1	Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF" Correct indication \rightarrow Go to item B-9. Incorrect indication \rightarrow Go to item B-4.
B-4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between relay unit coupler and neutral switch coupler. sky blue–sky blue Between relay unit coupler and ECU coupler. black/yellow–black/yellow	Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF" Correct indication \rightarrow Go to item B-9. Incorrect indication \rightarrow Go to item B-5.

Fault	code No.	42		
		A	Rear wheel sensor: no normal sig wheel sensor.	nals are received from the rear
Item		В	Neutral switch: open or short circ	uit is detected.
		С	Clutch switch: open or short circu	iit is detected.
B-5	Defective relay unit.		Check the relay unit. Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-185.	Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF" Correct indication \rightarrow Go to item B-9. Incorrect indication \rightarrow Go to item B-6.
B-6	Defective neutral switch.		Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF" Correct indication \rightarrow Go to item B-9. Incorrect indication \rightarrow Go to item B-7.
B-7	Faulty shift drum (neutral d tion area).	lete	c- Malfunction → Replace the shift drum. Refer to "TRANSMISSION" on page 5-90.	Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF" Correct indication \rightarrow Go to item B-9. Incorrect indication \rightarrow Go to item B-8.
B-8	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	
B-9	Delete the fault code.			Turn the main switch to "ON", and then rotate the rear wheel by hand. Start the engine, and input the vehicle speed signals by operat- ing the vehicle at 20 to 30 km/h (19 mi/h). The fault code can also be delete by activating the diagnos- tic mode and selecting diagnos- tic code number "63".

Fault	code No.	42					
		A	Rear wheel sensor: no normal sig wheel sensor.	nals are received from the rear			
ltem	Item		B Neutral switch: open or short circuit is detected.				
		С	Clutch switch: open or short circu	uit is detected.			
Fail-s	afe system	Ab	le to start engine				
		Ab	le to drive vehicle				
Diagr	nostic code No.	21					
	r display	• " 8 • "	utch switch ON" (when the clutch lever is squeez and when the sidestand is retracted) OFF" (when the clutch lever is squee and when the sidestand is extended)	zed with the transmission in gear			
Proce	edure	Op	perate the transmission, clutch lever,				
ltem	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion			
C-1	Locate the malfunction.		Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases.	Value does not increase \rightarrow Go to item A-2 for the rear wheel sensor.			
			Execute the diagnostic mode. (Code No. 21) When the transmission is in neutral: "ON" When the transmission is in gear with the clutch lever released: "OFF"	Incorrect indication \rightarrow Go to item B-2 for the neutral switch.			
			When the transmission is in gear with the clutch lever squeezed and the sidestand retracted: "ON"	Incorrect indication \rightarrow Go to item C-2.			
C-2	Clutch lever adjustment.		Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-13.	Execute the diagnostic mode. (Code No. 21) When the clutch lever is released with the transmission in gear and when the sidestand is retracted: "OFF" When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted: "ON" Correct indication \rightarrow Go to item C-8. Incorrect indication \rightarrow Go to item C-3.			

Fault	code No.	42		
		A	Rear wheel sensor: no normal sig wheel sensor.	nals are received from the rear
Item		в	Neutral switch: open or short circ	uit is detected.
		С	Clutch switch: open or short circu	iit is detected.
C-3	Connection of clutch switch con- nector. Check the locking condition of the connector. Disconnect the connector and check the pins (bent or broken terminals and locking condition of the pins).		nect the connector securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 21) When the clutch lever is released with the transmission in gear and when the sidestand is retracted: "OFF" When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted: "ON" Correct indication \rightarrow Go to item C-8. Incorrect indication \rightarrow Go to item C-4.
C-4	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).			Execute the diagnostic mode. (Code No. 21) When the clutch lever is released with the transmission in gear and when the sidestand is retracted: "OFF" When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted: "ON" Correct indication \rightarrow Go to item C-8. Incorrect indication \rightarrow Go to item C-5.
C-5	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between ECU coupler and left handlebar switch coupler. black/yellow–black/yellow blue/yellow–blue/yellow	Execute the diagnostic mode. (Code No. 21) When the clutch lever is released with the transmission in gear and when the sidestand is retracted: "OFF" When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted: "ON" Correct indication \rightarrow Go to item C-8. Incorrect indication \rightarrow Go to item C-6.
C-6	Defective clutch switch.		Check the clutch switch. Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-177.	Execute the diagnostic mode. (Code No. 21) When the clutch lever is released with the transmission in gear and when the sidestand is retracted: "OFF" When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted: "ON" Correct indication \rightarrow Go to item C-8. Incorrect indication \rightarrow Go to item C-7.

Fault code No. 42					
		A	Rear wheel sensor: no normal sig wheel sensor.	nals are received from the rear	
ltem		в	8 Neutral switch: open or short circuit is detected.		
		С	Clutch switch: open or short circu	uit is detected.	
C-7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		
C-8	Delete the fault code.			Turn the main switch to "ON", and then rotate the rear wheel by hand. Start the engine, and input the vehicle speed signals by operat- ing the vehicle at 20 to 30 km/h (19 mi/h). The fault code can also be delete by activating the diagnos- tic mode and selecting diagnos- tic code number "63".	

Fault	code No.	43			
ltem			system voltage: incorrect voltag uel pump.	ge supplied to the fuel injector	
Fail-s	afe system	Able	to start engine		
		Able	to drive vehicle		
Diagr	nostic code No.	09, 5	0		
09			system voltage (battery voltage) oximately 12.0		
	Procedure	meas	tet the start/engine stop switch to ", and then compare the actually neasured battery voltage with the meter display value. (If the actually neasured battery voltage is low, recharge the battery.)		
50	Actuation		Actuates the relay unit five times at one-second intervals. Illuminates the engine trouble and system warning light.		
	Procedure	Chec ing so	k that the relay unit is actuated five bund.	e times by listening for the operat-	
Item	Probable cause of malfunction and chec	:k	Maintenance job	Confirmation of service com- pletion	
1	Connection of relay unit co Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	

Fault	code No.	43				
Item		Fuel and f	uel system voltage: incorrect voltage supplied to the fuel injector nd fuel pump.			
2	Connection of wire harness ECU coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between battery and fuse box (fuel injection system fuse). red–red Between fuse box (fuel injection system fuse) and relay unit cou- pler. brown/white–brown/white Between relay unit coupler and ECU coupler. red/blue–red/blue blue/white–blue/white	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Defective relay unit.		Execute the diagnostic mode. (Code No. 50) No operating sound \rightarrow Replace the relay unit.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Defective relay unit.		Execute the diagnostic mode. (Code No. 09) Fuel system voltage is below 3 $V \rightarrow$ Replace the relay unit.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.		
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

Fault code No.	44
Item	EEPROM fault code number: an error is detected while reading or writing on EEPROM.
Fail-safe system	Able/Unable to start engine
	Able/Unable to drive vehicle
Diagnostic code No.	60
Meter display	 EEPROM fault code display 00 (no history) 01-04: Cylinder fault code number (history exists) If more than one cylinder is defective, the display switches every two seconds to show the cylinder fault code numbers of all defective cylin- ders in a repeating cycle. 11: Data error for ISC (Idle Speed Control) learning values (history exists)

Fault	code No.	44			
Item			EPROM fault code number: an error is detected while reading or rriting on EEPROM.		
Proce	edure	—			
Item	Probable cause of malfunction and chec	:k	Maintenance job	Confirmation of service com- pletion	
1	Locate the malfunction.		Execute the diagnostic mode. (Code No. 60) 00: Go to item 6. 01: Go to item 2. 02: Go to item 3. 03: Go to item 4. 04: Go to item 5. 11: Go to item 6.		
2	"01" is indicated in diagnos mode (code No. 60). EEPF data error for adjustment o concentration of cylinder #	ROM f CO	Change the CO concentration of cylinder #1, and rewrite in EEPROM. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-12. After this adjustment is made, the memory is not recovered when the main switch is turned to "OFF". \rightarrow Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Repeat item 1. If the same number is indicated, go to item 7.	
3	"02" is indicated in diagnos mode (code No. 60). EEPF data error for adjustment o concentration of cylinder #	ROM f CO	Change the CO concentration of cylinder #2, and rewrite in EEPROM. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-12. After this adjustment is made, the memory is not recovered when the main switch is turned to "OFF". \rightarrow Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Repeat item 1. If the same number is indicated, go to item 7.	
4	"03" is indicated in diagnos mode (code No. 60). EEPF data error for adjustment o concentration of cylinder #	ROM of CO	Change the CO concentration of cylinder #3, and rewrite in EEPROM. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-12. After this adjustment is made, the memory is not recovered when the main switch is turned to "OFF". \rightarrow Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Repeat item 1. If the same number is indicated, go to item 7.	

Fault	Fault code No.44				
			PROM fault code number: an error is detected while reading or ting on EEPROM.		
5	"04" is indicated in diagnos mode (code No. 60). EEPF data error for adjustment o concentration of cylinder #	ROM f CO	Change the CO concentration of cylinder #4, and rewrite in EEPROM. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-12. After this adjustment is made, the memory is not recovered when the main switch is turned to "OFF". \rightarrow Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Repeat item 1. If the same number is indicated, go to item 7.	
6	"11" is indicated in diagnos mode (code No. 60). EEPF data error for ISC (Idle Spe Control) learning values.	ROM	Turn the main switch to "OFF".	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Repeat item 1. If the same number is indicated, go to item 7.	
7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault code No.		45			
Item			Malfunction in ECU internal circuit (power source self cut off does not work)		
Fail-s	afe system	Able/	Unable to start engine		
		Able/	Unable to drive vehicle		
Diagn	nostic code No.	—			
Meter	^r display	—			
Proce	edure	—			
Item	Probable cause of malfunction and chee	k	Maintenance job	Confirmation of service com- pletion	
1	Connection of battery leads. Check the battery lead connec- tions (e.g. loose bolt).		Improperly connected \rightarrow Connect the battery lead securely or replace the battery lead.	5 seconds after turning the main switch from "ON" to "OFF", turn the switch to "ON" again. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2	2 Connection of starter relay cou- pler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	5 seconds after turning the main switch from "ON" to "OFF", turn the switch to "ON" again. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	

Fault	code No.	45		
Item		Malfunction in ECU internal circuit (power source self cut off does not work)		
3	Condition of backup fuse. Check the backup fuse.	Backup fuse blown→ Replace the fuse or replace the wire har- ness.	5 seconds after turning the main switch from "ON" to "OFF", turn the switch to "ON" again. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between battery and fuse box (backup fuse). red-red Between fuse box (backup fuse) and ECU coupler. red/green-red/green Between main switch and fuse box (ignition fuse). brown/blue-brown/blue Between fuse box (ignition fuse) and ECU coupler. red/white-red/white	5 seconds after turning the main switch from "ON" to "OFF", turn the switch to "ON" again. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault code No. 4		46		
Item		Char	ging voltage is abnormal.	
Fail-s	afe system	Able	to start engine	
		Able	to drive vehicle	
Diagr	nostic code No.	—		
Meter	r display	—		
Proce	edure	—		
ltem	n Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion
1	Malfunction in charging sys	stem.	Check the charging system. Refer to "CHARGING SYSTEM" on page 8-17. Defective rectifier/regulator or AC magneto \rightarrow Replace. Defective connection in the charging system circuit \rightarrow Prop- erly connect or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Repeat the maintenance job.

Fault code No.		50	50			
Item			Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter display.)			
Fail-s	Fail-safe system		Unable to start engine			
		Able/Unable to drive vehicle				
Diagn	Diagnostic code No.		—			
Meter	display	—				
Proce	edure					
Item	Item Probable cause of malfunction and chec		Maintenance job	Confirmation of service com- pletion		
1	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	Turn the main switch to "ON". Check that the fault code num- ber is not displayed.		

Fault code No.		59				
Item		Acce	Accelerator position sensor: open or short circuit detected.			
Fail-s	Fail-safe system		Unable to start engine			
		Able/	Unable to drive vehicle			
Diagr	nostic code No.	14, 1	5			
14	Meter display	• 12-	lerator position sensor signal 1 22 (fully closed position) 107 (fully open position)			
	Procedure	• Che • Che	eck with throttle grip in fully closed eck with throttle grip in fully open p	position. osition.		
15	15 Meter display		Accelerator position sensor signal 2 • 10–24 (fully closed position) • 95–109 (fully open position)			
	Procedure	• Che • Che	eck with throttle grip in fully closed eck with throttle grip in fully open p	h throttle grip in fully closed position. h throttle grip in fully open position.		
ltem	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion		
1	Connection of accelerator posi- tion sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		

Fault	code No.	59			
Item Ac		Acce	elerator position sensor: open or short circuit detected.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between accelerator position sensor coupler and ECU cou- pler. black/blue-black/blue white-white black-black blue/yellow-blue/yellow	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	Installed condition of accel tor position sensor. Check for looseness or pin ing.		Improperly installed sensor → Reinstall or adjust the sensor. Refer to "ADJUSTING THE ACCELERATOR POSITION SENSOR" on page 7-17.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Accelerator position senso resistance.	r	Measure the accelerator posi- tion sensor resistance. blue/yellow-black/blue Refer to "CHECKING THE ACCELERATOR POSITION SENSOR" on page 8-191.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.	
6	Defective accelerator posit sensor.	ion	Check accelerator position sen- sor signal 1. Execute the diagnostic mode. (Code No. 14) When the throttle grip is fully closed: A value of 12–22 is indicated. When the throttle grip is fully open: A value of 97–107 is indicated. Check accelerator position sen- sor signal 2. Execute the diagnostic mode. (Code No. 15) When the throttle grip is fully closed: A value of 10–24 is indicated. When the throttle grip is fully closed: A value of 95–109 is indicated. An indicated value is out of the specified range → Replace the accelerator position sensor.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 7.	
7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault code No.	60
Item	YCC-T drive system: malfunction detected.
Fail-safe system	Able/Unable to start engine
	Able/Unable to drive vehicle
Diagnostic code No.	—

Fault	code No.	60			
ltem	Item Y		CC-T drive system: malfunction detected.		
Meter display					
Proce	edure	—			
Item	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion	
1	Connection of throttle serv motor coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.	
2	Connection of wire harness ECU coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3	Check the electronic throttl valve fuse.	le	Abnormality \rightarrow Replace the electronic throttle valve fuse.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between throttle servo motor coupler and ECU coupler. yellow/red–yellow/red light green/red–light green/red Between ECU coupler and fuse box (electronic throttle valve fuse). red/blue–red/blue	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.	
5	Defective throttle servo mo	otor.	Check the throttle servo motor. Replace the throttle bodies if defective. Refer to "CHECKING THE THROTTLE SERVO MOTOR" on page 8-192.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.	
6	Defective throttle bodies.		Check the throttle bodies. Replace if defective. Refer to "CHECKING THE THROTTLE SERVO MOTOR" on page 8-192.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 7.	
7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault	code No.	66				
ltem		Steering damper solenoid: open or short circuit detected.				
Fail-s	afe system	Able	Able to start engine			
		Able	to drive vehicle			
Diagn	ostic code No.	47				
Actua	ition	is on. Wher noid i Wher	n the start/engine stop switch is "O	FF", the steering damper sole-		
Proce	dure	Chec	k the operation of the damper.			
ltem	Probable cause of malfunction and check	ck	Maintenance job	Confirmation of service com- pletion		
1	Connection of steering damper solenoid coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between steering damper sole- noid coupler and ECU coupler. yellow/black–yellow/black Between steering damper sole- noid coupler and ground. black–black	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Defective steering damper sole- noid.		Check the steering damper solenoid. Replace if defective. Refer to "CHECKING THE STEERING DAMPER SOLE- NOID" on page 8-195.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

Fault	Fault code No.		68				
Item		O_2 sensor 2: no normal signals are received from the O_2 sensor 2.					
Fail-s	Fail-safe system		Able to start engine				
		Able	to drive vehicle				
Diagr	nostic code No.						
Meter	^r display	_					
Proce	edure						
ltem	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion			
1	Installed condition of O ₂ sensor 2.		Improperly installed sensor → Reinstall or replace the sensor.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.			
2	Connection of O_2 sensor 2 coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.			
3	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected → Con- nect the coupler securely or replace the wire harness.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.			
4	Wire harness continuity.		Open or short circuit \rightarrow Replace the wire harness. Between O_2 sensor 2 coupler and ECU coupler. gray/yellow–gray/yellow pink/white–pink/white Between O_2 sensor 2 coupler and joint connector. black/blue–black/blue Between joint connector and ECU coupler. black/blue–black/blue Between O_2 sensor 2 coupler and fuse box. red/white–red/white	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.			
5	Check fuel pressure.		Refer to "CHECKING THE FUEL PRESSURE" on page 7-15.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.			

Fault code No.		68				
Item	1	O ₂ sensor 2: no normal signals are	received from the O_2 sensor 2.			
6 Defective O ₂ sensor 2.		Check the O ₂ sensor 2. Replace if defective. Refer to "ENGINE REMOVAL" on page 5-3.	Start the engine, warm it up, and then race it, or execute the diagnostic mode. (Code No. 63) Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 7.			
7	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.				

Fault code No.69		69	69			
ltem			t wheel sensor: no normal signa el sensor.	Is are received from the front		
Fail-s	afe system	Able	to start engine			
		Able	to drive vehicle			
Diagn	ostic code No.	16				
Meter	display	Front 0–99	wheel speed pulse 9			
Proce	dure		k that the number increases when per is cumulative and does not rese			
Item	Probable cause of malfunction and chec	:k	Maintenance job	Confirmation of service com- pletion		
1	Locate the malfunction.		If the ABS warning light is on, refer to "BASIC INSTRUC- TIONS FOR TROUBLESHOOT- ING" on page 8-128. If the ABS warning light is off, perform the following procedure. Execute the diagnostic mode. (Code No. 16) Rotate the front wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item 9 and delete the fault code. Value does not increase \rightarrow Go to item 2.			
2	Connection of front wheel sen- sor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 16) Rotate the front wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item 9 and delete the fault code. Value does not increase \rightarrow Go to item 3.		

Fault	code No.	69				
Item			Front wheel sensor: no normal signals are received from the front wheel sensor.			
3	Connection of ABS ECU co pler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or bro terminals and locking cond of the pins).	n of d ken	Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 16) Rotate the front wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item 9 and delete the fault code. Value does not increase \rightarrow Go to item 4.		
4	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 16) Rotate the front wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item 9 and delete the fault code. Value does not increase \rightarrow Go to item 5.		
5	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between front wheel sensor coupler and ABS ECU coupler. black–black white–white Between ABS ECU coupler and ECU coupler. gray/black–gray/black	Execute the diagnostic mode. (Code No. 16) Rotate the front wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item 9 and delete the fault code. Value does not increase \rightarrow Go to item 6.		
6	Defective front wheel sensor.		Improperly installed sensor → Reinstall or replace the sensor.	Execute the diagnostic mode. (Code No. 16) Rotate the front wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item 9 and delete the fault code. Value does not increase \rightarrow Go to item 7.		
7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.	Execute the diagnostic mode. (Code No. 16) Rotate the front wheel by hand and check that the indicated value increases. Value increases \rightarrow Go to item 9 and delete the fault code. Value does not increase \rightarrow Go to item 8.		
8	Malfunction in ABS ECU.		Replace the ABS ECU.	Go to item 9.		
9	Delete the fault code.			Start the engine, and input the vehicle speed signals by operat- ing the vehicle at 20 to 30 km/h (19 mi/h). The fault code can also be deleted by activating the diag- nostic mode and selecting diag- nostic code number "63".		

Fault	Fault code No. Item		89 (Yamaha diagnostic tool) Err (multi-function meter display)			
ltem			Multi-function meter: signals cannot be transmitted between the ECU and the multi-function meter.			
Fail-s	afe system	Able	to start engine			
		Able	to drive vehicle			
Diagn	ostic code No.	—				
Meter	display					
Proce	edure					
ltem	Probable cause of malfunction and chee	c k	Maintenance job	Confirmation of service com- pletion		
1	Connection of meter assembly coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between ECU coupler and joint coupler. blue/white–blue/white blue/black–blue/black Between joint coupler and meter assembly coupler. blue/white–blue/white blue/black–blue/black	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Defective meter assembly.		Replace the meter assembly.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

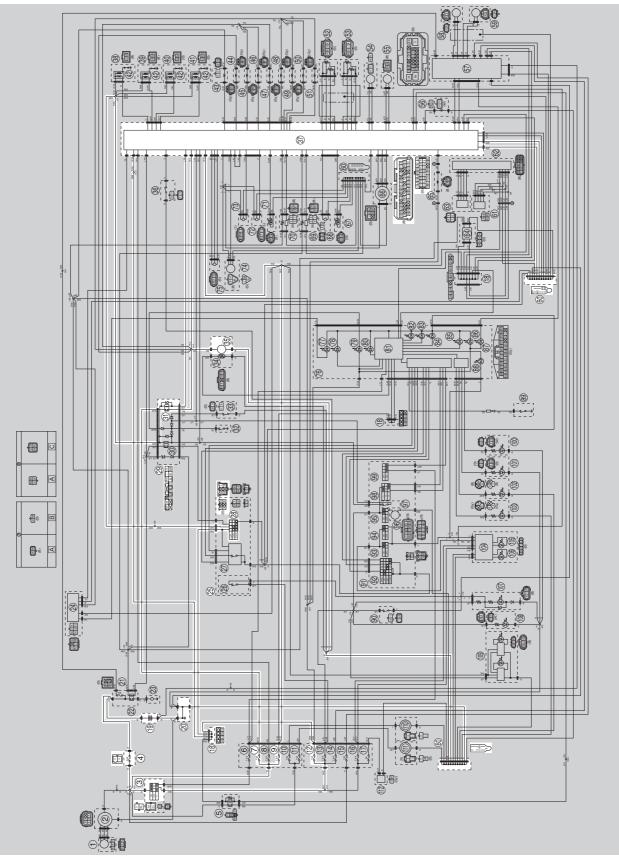
Fault code No. 89 (Yamaha diagnostic tool)

Fault	code No.	98				
ltem	Item		The ECU cannot receive fault signals from the IMU, or it cannot receive normal signals.			
Fail-s	afe system	Able/	Unable to start engine			
		Able/	Unable to drive vehicle			
Diagn	ostic code No.	—				
Meter	display	—				
Proce	edure	—				
ltem	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion		
1	Connection of IMU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.		
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between ECU coupler and joint coupler. blue/white-blue/white blue/black-black/blue Between joint coupler and IMU coupler. blue/white-blue/white blue/black-black/blue	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.		
4	Installed condition of IMU.		Check the installed direction and condition of the sensor. Check the grommet for cracks.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.		
5	Defective IMU.		Replace the IMU.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.		
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.			

Fault	Fault code No.		99				
ltem		No signal exchange between ECU and IMU.					
Fail-s	Fail-safe system		le to start engine				
		Able/	Unable to drive vehicle				
Diagn	nostic code No.	—					
Meter	[,] display	—					
Proce	edure						
ltem	Probable cause of malfunction and chee	ck	Maintenance job	Confirmation of service com- pletion			
1	Connection of IMU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 2.			
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.			
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between ECU coupler and joint coupler. blue/white-blue/white blue/black-black/blue Between joint coupler and IMU coupler. blue/white-blue/white blue/black-black/blue	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.			
4	Defective IMU.		Replace the IMU.	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 5.			
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.				

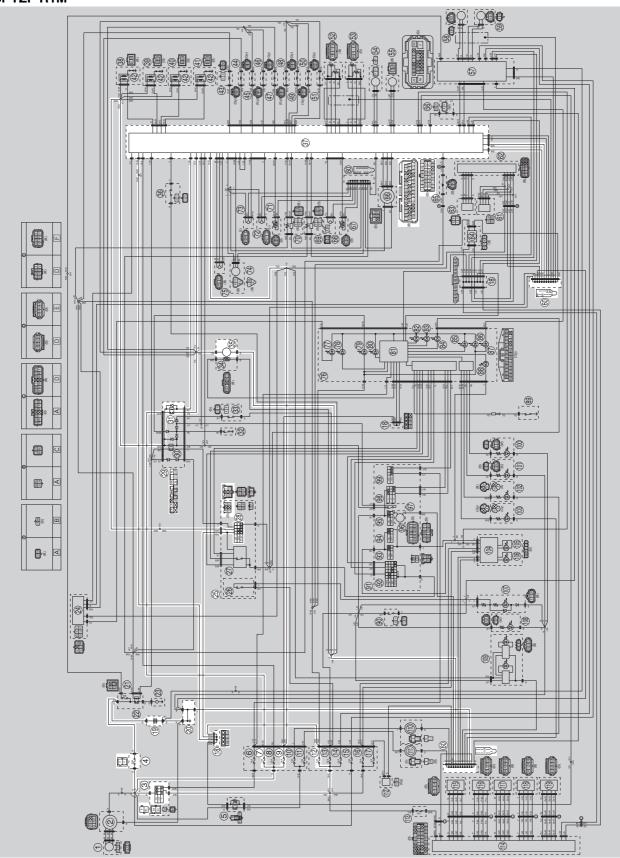
FUEL PUMP SYSTEM

CIRCUIT DIAGRAM For YZF-R1



- 3. Main switch
- 4. Main fuse
- 7. Fuel injection system fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 25.Handlebar switch (right)
- 28.Start/engine stop switch
- 29.Relay unit
- 31. Fuel pump relay
- 35.Fuel pump
- 37.ECU (Engine Control Unit)
- 60. Joint connector

For YZF-R1M

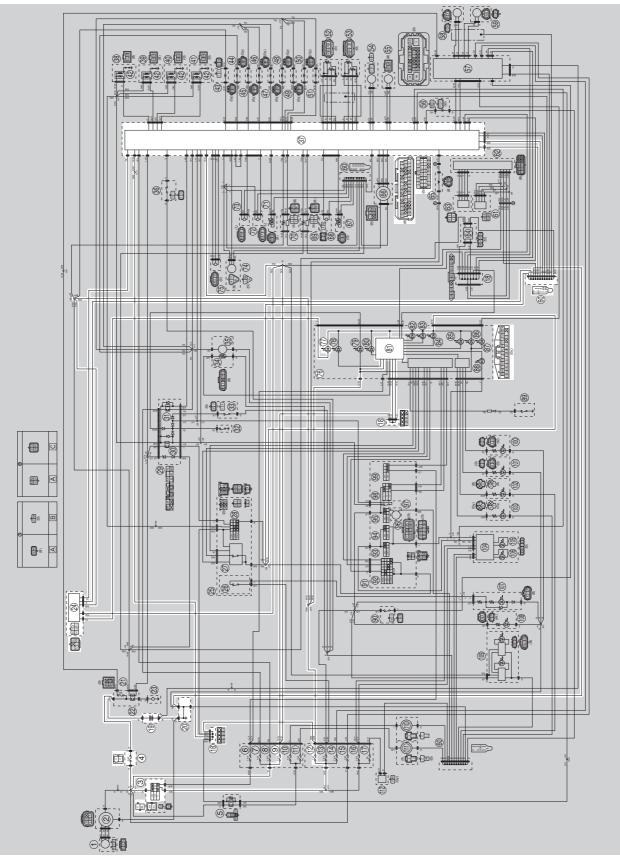


- 3. Main switch
- 4. Main fuse
- 7. Fuel injection system fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 25.Handlebar switch (right)
- 28.Start/engine stop switch
- 29.Relay unit
- 31. Fuel pump relay
- 35.Fuel pump
- 37.ECU (Engine Control Unit)
- 60. Joint connector

TROUBLESHOOTING If the fuel pump fails to operate.		
 TIP	wing part(s):	
 Check the fuses. (Main, ignition, backup and fuel in- jection system) Refer to "CHECKING THE FUSES" on page 8-180. 	NG o	Replace the fuse(s).
OK↓		
 Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181. 	NG→	 Clean the battery terminals. Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the main switch/immobilizer unit.
OK↓		
4. Check the start/engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the right handlebar switch.
OK↓		
 Check the relay unit (fuel pump re- lay). Refer to "CHECKING THE RE- LAYS" on page 8-184. 	NG→	Replace the relay unit.
OK↓		
6. Check the fuel pump. Refer to "CHECKING THE FUEL PUMP OPERATION" on page 7-2.	NG→	Replace the fuel pump.
OK↓		
 Check the entire fuel pump sys- tem's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-103. 	NG→	Properly connect or repair the fuel pump system's wiring.
OK↓		
Replace the ECU. Refer to "REPLACING THE ECU (En- gine Control Unit)" on page 8-180.		

EAS20084

CIRCUIT DIAGRAM For YZF-R1



- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 24.Immobilizer unit
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 76.Meter assembly
- 77.Immobilizer system indicator light
- 81.Multi-function meter

For YZF-R1M Ļ ĥ 6 0 00 0/0 1/W 6 10 8 C) proceeding to a proceeding of the proceeding of th ® 100 8 B Ľ 8 Ø -88-0 8 P.8 D.C. 7878 6 ЛШ 8 •**---**7 e **-**+---- \B N Ð •**()** 8 ₽ ≤ 6 **1**0 ÓÒ 10 8 48 ₿® 3 9 8 NA NA ģ 8. 60 80 . 18 ¢!0 ¥ ð L 3 •**•** + (3) + . _____ (2) 6 6 Ø ₿ e e e P P P 41 14 1411 1411 1411 1411 1411 1411 v v væ væ ve væ 00 00 00 00 00 v v ve ve ve ve 05 05 048 048 048 048 040 040 Ť 0 0

IMMOBILIZER SYSTEM

- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 24.Immobilizer unit
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 76.Meter assembly
- 77.Immobilizer system indicator light
- 81.Multi-function meter

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 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 NOTICE.)

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 submerse 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

PARTS 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.

		Part				
		n switch/ bilizer unit	Standard key	ECU	Accessory lock* and key	Key registration requirement
	Main switch	Immobilizer unit				
Standard key is lost			\checkmark			New standard key
All keys have been lost (including code re-reg- istering key)		\checkmark	\checkmark	\checkmark	V	Code re-registering key and standard keys
ECU is defective						Code re-registering key and standard keys
Immobilizer unit is defective		\checkmark				Code re-registering key and standard keys
Main switch is defective			\checkmark		V	Code re-registering key and standard keys
Accessory lock* is defective					V	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.

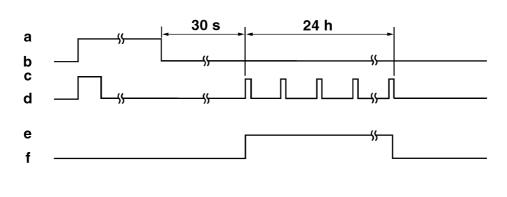
2. Check that the engine can be started.

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 8-117).

- 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

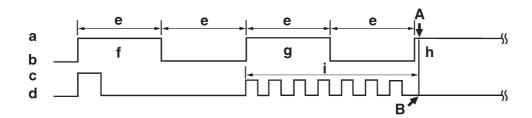
If he immobilizer system indicator light stops flashing 5 seconds after the first standard key is registered, the registration mode is deactivated. If this occurs, the second standard key cannot be registered, and steps 2 to 4 need to be repeated to register both standard keys.

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



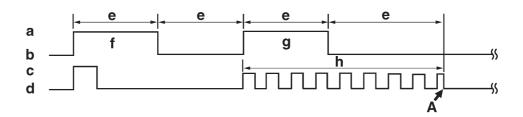
- a. Main switch "ON"
- b. Main switch "OFF"
- c. LED on
- d. LED off
- e. Less than 5.0 s
- f. Code re-registering key
- g. First standard key

- h. Second standard key
- 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.

 Check the fuses. (Main, ignition, and backup) Refer to "CHECKING THE FUSES" on page 8-180. 	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181.	NG→	 Clean the battery terminals. Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the main switch/immobilizer unit.
OK↓		
 Check the entire immobilizer system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-109. 	NG→	Properly connect or repair the immobilizer system wiring.
ОК↓		
 Check the condition of the each immobilizer system circuits. Refer to "SELF-DIAGNOSIS FAULT CODE INDICATION" on page 8-117. 		

EAS30523

SELF-DIAGNOSIS FAULT CODE INDICATION When a system malfunction occurs, the fault code number is indicated in the meter display and the im-

mobilizer system indicator light flashes at the same time. The pattern of flashing also shows the fault code.

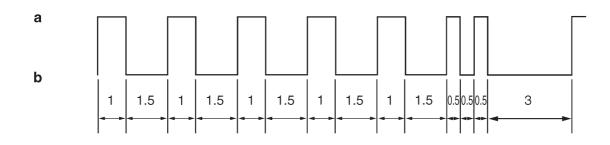
Fault code	Part	Symptom	Cause	Action
51	IMMOBILIZER UNIT	Code cannot be trans- mitted between the key and the immobi- lizer unit.	 Radio wave interference caused by objects around the keys and antennas. Immobilizer unit malfunction. Key malfunction. 	 Keep magnets, metal objects, and other immobilizer system keys away from the keys and antennas. Replace the main switch/immobi- lizer unit. Replace the key.
52	IMMOBILIZER UNIT	Codes between the key and immobilizer unit do not match.	 Signal received from other transponder (failed to recognize code after ten consecu- tive attempts). Signal received from unregistered standard key. 	 Place the immobilizer unit at least 50 mm away from the transponder of other vehicles. Register the standard key.

IMMOBILIZER SYSTEM

Fault code	Part	Symptom	Cause	Action
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. 	 Check the wire harness and con- nector. Replace the main switch/immobi- lizer unit. Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.
54	IMMOBILIZER UNIT	Codes transmitted between the ECU and the immobilizer unit do not match.	 Noise interference or disconnected lead/cable. Interference due to radio wave noise. Disconnected communication harness. Immobilizer unit malfunction. ECU failure. (The ECU or immobilizer unit was replaced with a used unit from another vehicle.) 	 Register the code re-registering key. Check the wire harness and con- nector. Replace the main switch/immobi- lizer unit. Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.
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 dis- connected lead/cable.	 Check the wire harness and con- nector. Replace the main switch/immobi- lizer unit. Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.

Immobilizer system indicator light fault code indication Digit of 10 : Cycles of 1 sec. ON and 1.5 sec. OFF.

Digit of 10 : Cycles of 1 sec. ON and 1.5 sec. OFF. Digit of 1 : Cycles of 0.5 sec. ON and 0.5 sec. OFF. Example: fault code 52

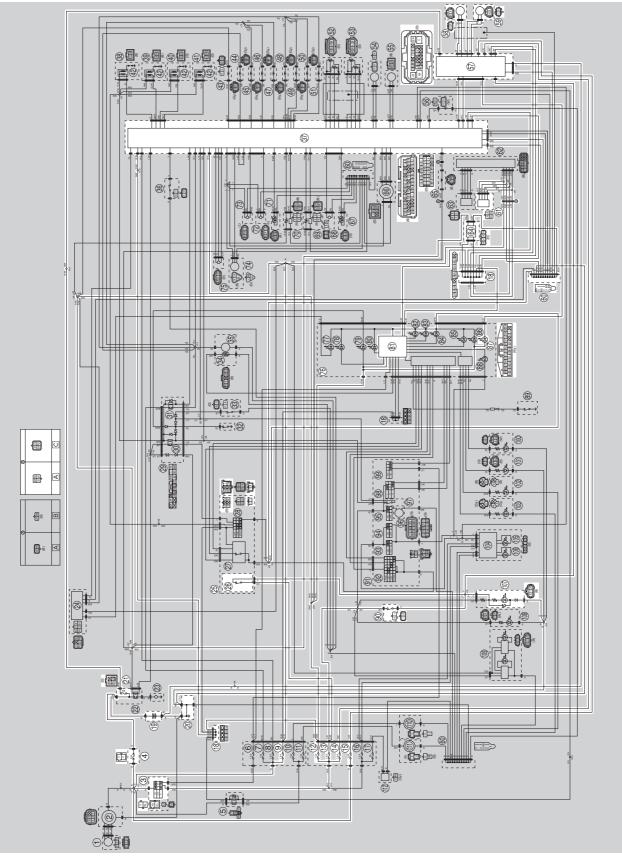


a. Light on

b. Light off

ABS (Anti-lock Brake System)

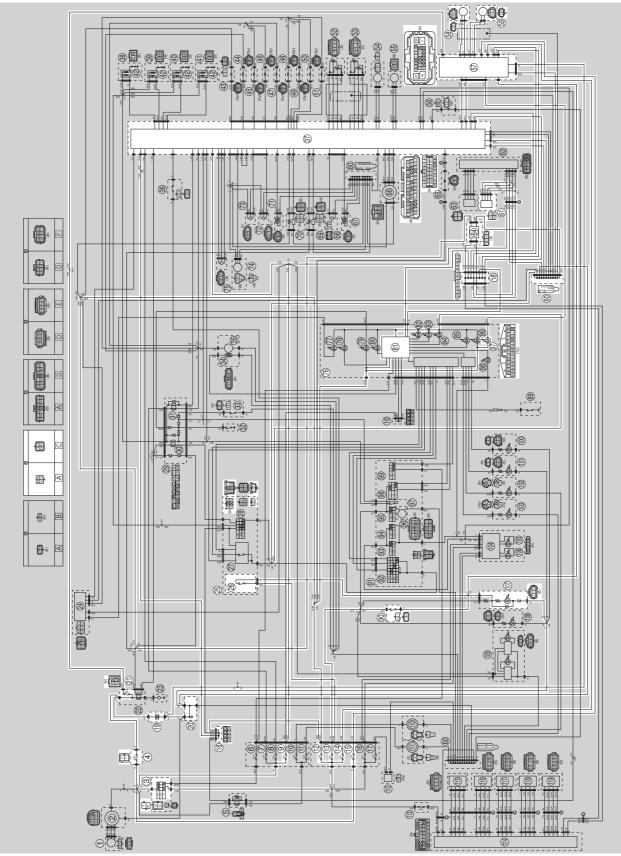
CIRCUIT DIAGRAM For YZF-R1



- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 13.Signaling system fuse
- 14.ABS ECU fuse
- 15.ABS solenoid fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground 21.ABS motor fuse
- 21.ADS motor ruse
- 25.Handlebar switch (right) 26.Front brake light switch
- 37.ECU (Engine Control Unit)
- 57.ABS ECU (Electronic Control Unit)
- 58.Front wheel sensor
- 59.Rear wheel sensor
- 60.Joint connector
- 61. Yamaha diagnostic tool coupler
- 64.IMU (Inertial Measurement Unit)
- 76.Meter assembly
- 81.Multi-function meter
- 87.ABS warning light
- 90.Rear brake light switch
- 107.Tail/brake light
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler)

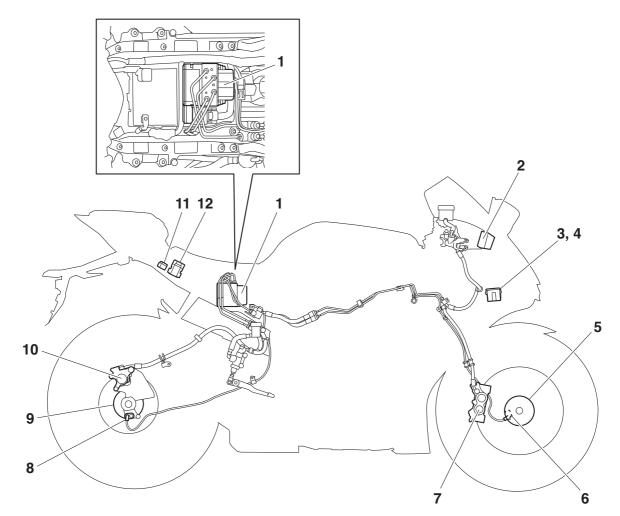


ABS (Anti-lock Brake System)



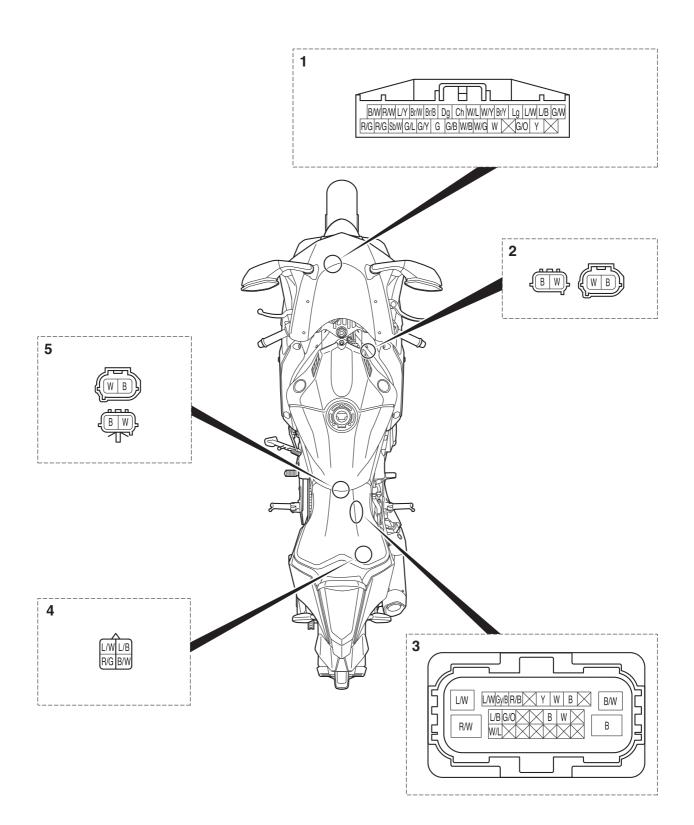
- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12. Ignition fuse
- 13.Signaling system fuse
- 14.ABS ECU fuse
- 15.ABS solenoid fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 21.ABS motor fuse
- 25.Handlebar switch (right)
- 26.Front brake light switch
- 37.ECU (Engine Control Unit)
- 57.ABS ECU (Electronic Control Unit)
- 58.Front wheel sensor
- 59.Rear wheel sensor
- 60. Joint connector
- 61. Yamaha diagnostic tool coupler
- 64.IMU (Inertial Measurement Unit)
- 76.Meter assembly
- 81.Multi-function meter
- 87.ABS warning light
- 90.Rear brake light switch
- 107.Tail/brake light
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler, CCU, GPS unit)

ABS COMPONENTS CHART



- 1. Hydraulic unit assembly
- 2. ABS warning light
- 3. ABS ECU fuse
- 4. ABS solenoid fuse
- 5. Front wheel sensor rotor
- 6. Front wheel sensor
- 7. Front brake caliper
- 8. Rear wheel sensor
- 9. Rear wheel sensor rotor
- 10.Rear brake caliper
- 11. Yamaha diagnostic tool coupler
- 12.ABS motor fuse

EAS30844 ABS COUPLER LOCATION CHART



- 1. Meter assembly coupler
- 2. Front wheel sensor coupler
- 3. ABS ECU coupler
- 4. Yamaha diagnostic tool coupler
- 5. Rear wheel sensor coupler

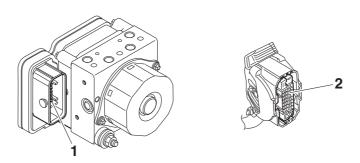
MAINTENANCE OF THE ABS ECU Checking the ABS ECU

1. Check:

- Terminals "1" of the ABS ECU
 Cracks/damages → Replace the hydraulic unit assembly, brake hoses, and brake pipes that are connected to the assembly as a set.
- Terminals "2" of the ABS ECU coupler Connection defective, contaminated, come-off → Correct or clean.

TIP -

If the ABS ECU coupler is clogged with mud or dirt, clean with compressed air.



EAS30528

ABS TROUBLESHOOTING OUTLINE

This section describes the troubleshooting for the ABS in detail. Read this service manual carefully and make sure you fully understand the information provided before repairing any malfunctions or performing service.

The ABS ECU (Electronic Control Unit) has a self-diagnosis function. When failures occur in the system, the ABS warning light on the meter assembly indicates a malfunction.

The following troubleshooting describes the problem identification and service method using the Yamaha diagnostic tool. For information about using the Yamaha diagnostic tool, refer to "[B-2] DIAG-NOSIS USING THE FAULT CODES" on page 8-131. For troubleshooting items other than the following items, follow the normal service method.

WARNING

When maintenance or checks have been performed on components related to the ABS, be sure to perform a final check before delivering the vehicle to the customer.

ABS operation when the ABS warning light comes on

- 1. The ABS warning light remains on \rightarrow ABS operates as a normal brake system.
- A malfunction was detected using the ABS self-diagnosis function.
- The ABS self-diagnosis has not been completed.
 The ABS self-diagnosis starts when the main switch is turned to "ON" and finishes when the vehicle has traveled at a speed of approximately 5 km/h (3 mi/h).
- 2. The ABS warning light comes on after the engine starts, and then goes off when the vehicle starts moving (traveling at a speed of approximately 5 km/h (3 mi/h)). → ABS operation is normal.
- 3. The ABS warning light flashes \rightarrow ABS operation is normal.
- Refer to "BASIC INSTRUCTIONS FOR TROUBLESHOOTING" on page 8-128.

Self-diagnosis and servicing

The ABS ECU has a self-diagnosis function. By utilizing this function, quick problem identification and service are possible. Previous malfunctions can be checked since the ABS ECU also stores the malfunction history.

The fault codes recorded in the ABS ECU can be checked using the Yamaha diagnostic tool. When the service is finished, check the normal operation of the vehicle, and then delete the fault code(s). For in-

formation about deleting the fault codes, refer to "[B-3] DELETING THE FAULT CODES" on page 8-150. By deleting the fault codes stored in the ABS ECU memory, it is possible to pursue the cause correctly if another malfunction occurs.

TIP -

The ABS performs a self-diagnosis test for a few seconds each time the vehicle first starts off after the main switch was turned to "ON". During this test, a "clicking" noise can be heard from under the seat, and if the brake lever or brake pedal are even slightly applied, a vibration can be felt at the lever and pedal, but these do not indicate a malfunction.

Self-diagnosis using the ABS ECU

The ABS ECU performs a static check of the entire system when the main switch is turned to "ON". It also checks for malfunctions while the vehicle is ridden. Since all malfunctions are recorded after they are detected, it is possible to check the recorded malfunction data by utilizing the Yamaha diagnostic tool when the ABS ECU has entered the self-diagnosis mode.

Special precautions for handling and servicing a vehicle equipped with ABS

NOTICE

Care should be taken not to damage components by subjecting them to shocks or pulling on them with too much force since the ABS components are precisely adjusted.

- The ABS ECU and hydraulic unit are united assemblies and cannot be disassembled.
- The malfunction history is stored in the memory of the ABS ECU. Delete the fault codes when the service is finished. (This is because the past fault codes will be displayed again if another malfunction occurs.)

EAS30529

BASIC INSTRUCTIONS FOR TROUBLESHOOTING

 Perform the troubleshooting [A]→[B]→[C] in order. Be sure to follow the order since a wrong diagnosis could result if the steps are followed in a different order or omitted.

Use sufficiently charged regular batteries only.

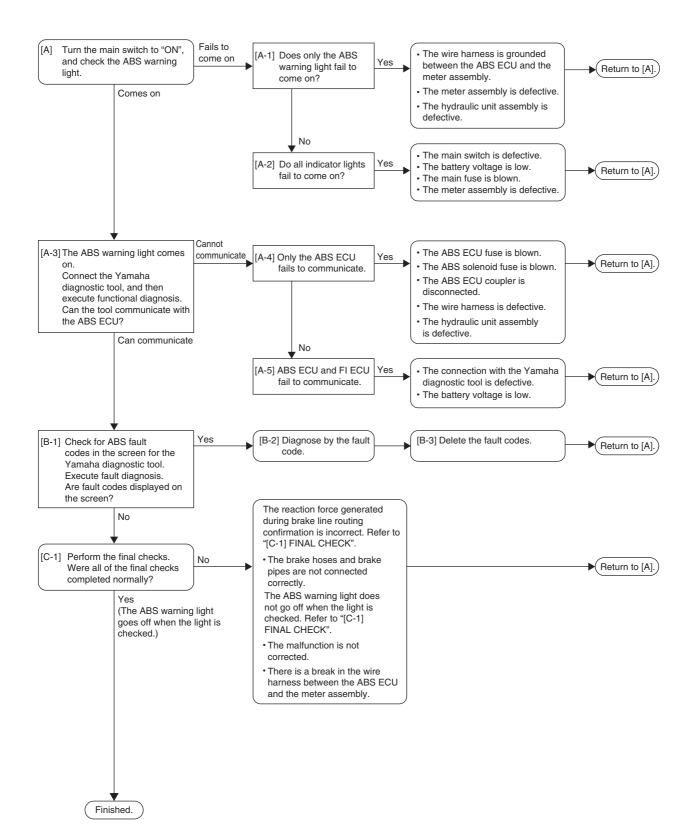
[A] Malfunction check using the ABS warning light

[B] Use the Yamaha diagnostic tool and determine the location of the malfunction and the cause from the recorded fault code.

Determine the cause of the malfunction from the condition and place where the malfunction occurred. [C] Servicing the ABS

Execute the final check after disassembly and assembly.

EAS30530 BASIC PROCESS FOR TROUBLESHOOTING



WARNING

When maintenance or checks have been performed on components related to the ABS, be sure to perform a final check before delivering the vehicle to the customer.

EAS30531

[A] CHECKING THE ABS WARNING LIGHT

Turn the main switch to "ON". (Do not start the engine.)

- 1. The ABS warning light does not come on.
- Only the ABS warning light fails to come on. [A-1]
- The ABS warning light and all other indicator lights fail to come on. [A-2]
- 2. The ABS warning light comes on. [A-3]

[A-1] ONLY THE ABS WARNING LIGHT FAILS TO COME ON

- 1. Check for a short circuit to the ground between the green/orange terminal of the ABS ECU coupler and green/orange terminal of the meter assembly.
- If there is short circuit to the ground, the wire harness is defective. Replace the wire harness.
- 2. Disconnect the ABS ECU coupler and check that the ABS warning light comes on when the main switch is turned to "ON".
- If the ABS warning light does not come on, the meter assembly circuit (including the ABS warning light [LED]) is defective. Replace the meter assembly.
- If the ABS warning light comes on, the ABS ECU is defective. Replace the hydraulic unit assembly.

EAS30533

[A-2] THE ABS WARNING LIGHT AND OTHER INDICATOR LIGHTS FAIL TO COME ON 1. Main switch

- Check the main switch for continuity.
 - Refer to "CHECKING THE SWITCHES" on page 8-177.
- If there is no continuity, replace the main switch/immobilizer unit.
- 2. Battery
 - Check the condition of the battery.

Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181.

- If the battery is defective, clean the battery terminals and recharge it, or replace the battery.
- 3. Main fuse
 - Check the fuse for continuity.
 - Refer to "CHECKING THE FUSES" on page 8-180.
 - If the main fuse is blown, replace the fuse.
- 4. Circuit
 - Check the meter assembly circuit.

Refer to "CIRCUIT DIAGRAM" on page 8-119.

• If the meter assembly circuit is open, replace the wire harness.

EAS31162

[A-3] THE ABS WARNING LIGHT COMES ON

Connect the Yamaha diagnostic tool to the Yamaha diagnostic tool coupler and execute functional diagnosis. (For information about how to execute functional diagnosis, refer to the operation manual that is included with the tool.)

Check that communication with the ABS ECU is possible.

- Only the ABS ECU fails to communicate. [A-4]
- ABS ECU and FI ECU fail to communicate. [A-5]
- Communication is possible with the ABS ECU. [B-1] (The ABS is displayed on the select unit screen.)

[A-4] ONLY THE ABS ECU FAILS TO COMMUNICATE

1. ABS ECU fuse

EAS21162

- Check the ABS ECU fuse for continuity. Refer to "CHECKING THE FUSES" on page 8-180.
- If the ABS ECU fuse is blown, replace the fuse.
- 2. ABS ECU coupler
- Check that the ABS ECU coupler is connected properly.
 For information about connecting the ABS ECU coupler properly, refer to "INSTALLING THE HY-DRAULIC UNIT ASSEMBLY" on page 4-69.
- 3. Wire harness
- Open circuit between the main switch and the ABS ECU, or between the ABS ECU and the ground. Check for continuity between brown/blue terminal of the main switch coupler and red/black terminal of the ABS ECU coupler.

Check for continuity between black terminal of the ABS ECU coupler and the ground.

If there is no continuity, the wire harness is defective. Replace the wire harness.

• Open circuit in the wire harness between the ABS ECU coupler and the Yamaha diagnostic tool coupler.

Check for continuity between blue/white terminal of the ABS ECU coupler and blue/white terminal of the Yamaha diagnostic tool coupler. (CANH)

Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the Yamaha diagnostic tool coupler. (CANL)

4. ABS ECU malfunction

Replace the hydraulic unit assembly.

EAS31164

[A-5] ABS ECU AND FI ECU FAIL TO COMMUNICATE

- 1. Yamaha diagnostic tool
- Check that the Yamaha diagnostic tool is properly connected.
- 2. Wire harness
 - Open circuit in the wire harness between the ABS ECU coupler and the Yamaha diagnostic tool coupler.

Check for continuity between blue/white terminal of the ABS ECU coupler and blue/white terminal of the Yamaha diagnostic tool coupler. (CANH)

Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the Yamaha diagnostic tool coupler. (CANL)

EAS31165

[B-1] MALFUNCTION ARE CURRENTLY DETECTED

When the Yamaha diagnostic tool is connected to the Yamaha diagnostic tool coupler, the fault codes will be displayed on the computer screen.

• A fault code is displayed. [B-2]

• A fault code is not displayed. [C-1]

EAS31166 [B-2] DIAGNOSIS USING THE FAULT CODES

This model uses the Yamaha diagnostic tool to identify malfunctions.

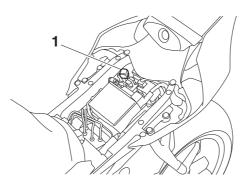
For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.



Connecting the Yamaha diagnostic tool

Removing the rider seat. Refer to "GENERAL CHASSIS (1)" on page 4-1.

Removing the protective cap "1", and then connect the Yamaha diagnostic tool to the coupler.

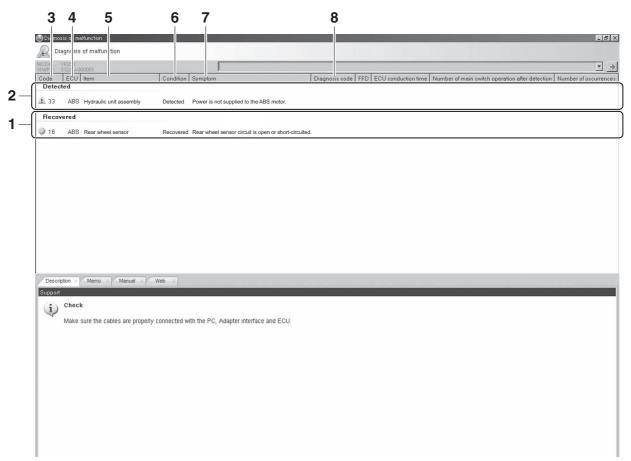


Details about the displayed fault codes are shown in the following chart. Refer to this chart and check the vehicle.

Once all the work is complete, delete the fault codes. [B-3]

- When the Yamaha diagnostic tool is connected to the vehicle, the operation of the multi-function meter and indicators will be different from the normal operation.
- Check the inspection points after terminating the connection with the Yamaha diagnostic tool and turning the main switch off.

Operation of the Yamaha diagnostic tool (Fault diagnosis mode) Malfunction results are displayed in the top part of the window area.

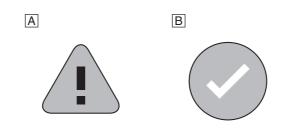


1. Recovered

The item list of the malfunction detected in the past (already recovered) are displayed.

- 2. Detected
 - The item list of the malfunction currently occurred are displayed.
- 3. Code

The following icons and the fault code numbers for the detected malfunctions are displayed.



A. Detected malfunction

B. Recovered malfunction

4. ECU

The types of the control units are displayed.

(e.g., FI, ABS)

5. Item

The item names of the detected malfunction are displayed.

6. Condition

The current conditions are displayed. (Detected/Recovered)

7. Symptom

The symptoms of the detected malfunction are displayed.

8. Diagnosis code

The diagnosis codes related to the detected malfunction are displayed.

Fault code table

TIP -

Record all of the fault codes displayed and inspect the check points.

Fault code No.	Item	Symptom	Check point
11	Front wheel sensor (intermit- tent pulses or no pulses)	Front wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	 Foreign material adhered around the front wheel sen- sor Incorrect installation of the front wheel Defective sensor rotor or incorrect installation of the rotor Defective front wheel sen- sor or incorrect installation of the sensor
12	Rear wheel sensor (intermit- tent pulses or no pulses)	Rear wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	 Foreign material adhered around the rear wheel sen- sor Incorrect installation of the rear wheel Defective sensor rotor or incorrect installation of the rotor Defective rear wheel sen- sor or incorrect installation of the sensor

Fault code No.	Item	Symptom	Check point
13* 26*	Front wheel sensor (abnor- mal pulse period)	Front wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	 Foreign material adhered around the front wheel sen- sor Incorrect installation of the front wheel Defective sensor rotor or incorrect installation of the rotor Defective front wheel sen- sor or incorrect installation of the sensor
14* 27*	Rear wheel sensor (abnor- mal pulse period)	Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	 Foreign material adhered around the rear wheel sen- sor Incorrect installation of the rear wheel Defective sensor rotor or incorrect installation of the rotor Defective rear wheel sen- sor or incorrect installation of the sensor
15	Front wheel sensor (open or short circuit)	Open or short circuit is detected in the front wheel sensor.	 Defective coupler between the front wheel sensor and the hydraulic unit assembly Open or short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly Defective front wheel sen- sor or hydraulic unit assembly
16	Rear wheel sensor (open or short circuit)	Open or short circuit is detected in the rear wheel sensor.	 Defective coupler between the rear wheel sensor and the hydraulic unit assembly Open or short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly Defective rear wheel sen- sor or hydraulic unit assembly
21	Hydraulic unit assembly (defective solenoid drive cir- cuit)	Solenoid drive circuit in the hydraulic unit assembly is open or short-circuited.	 Defective hydraulic unit assembly
31	Hydraulic unit assembly (defective ABS solenoid power circuit)	Power is not supplied to the solenoid circuit in the hydraulic unit assembly.	 Blown ABS solenoid fuse Defective coupler between the battery and the hydrau- lic unit assembly Open or short circuit in the wire harness between the battery and the hydraulic unit assembly Defective hydraulic unit assembly

Fault code No.	Item	Symptom	Check point
33	Hydraulic unit assembly (abnormal ABS motor power supply)	Power is not supplied to the motor circuit in the hydraulic unit assembly.	 Blown ABS motor fuse Defective coupler between the battery and the hydrau- lic unit assembly Open or short circuit in the wire harness between the battery and the hydraulic unit assembly Defective hydraulic unit assembly
34	Hydraulic unit assembly (short circuit in ABS motor power supply circuit)	Short circuit is detected in the motor power supply cir- cuit in the hydraulic unit assembly.	 Defective hydraulic unit assembly
41	Front wheel ABS (intermit- tent wheel speed pulses or incorrect depressurization)	 Pulses from the front wheel sensor are received inter- mittently while the vehicle is traveling. Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydrau- lic pressure. 	 Incorrect installation of the front wheel sensor Incorrect rotation of the front wheel Front brake dragging Defective hydraulic unit assembly
42	Rear wheel ABS (intermit- tent wheel speed pulses or incorrect depressurization)	 Pulses from the rear wheel sensor are received inter- mittently while the vehicle is traveling. Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydrau- lic pressure. 	 Incorrect installation of the rear wheel sensor Incorrect rotation of the rear wheel Rear brake dragging Defective hydraulic unit assembly
43* 45*	Front wheel sensor (missing pulses)	Front wheel sensor signal is not received properly. (Miss- ing pulses are detected in the signal while the vehicle is traveling.)	 Foreign material adhered around the front wheel sen- sor Incorrect installation of the front wheel Defective sensor rotor or incorrect installation of the rotor Defective front wheel sen- sor or incorrect installation of the sensor
44* 46*	Rear wheel sensor (missing pulses)	Rear wheel sensor signal is not received properly. (Miss- ing pulses are detected in the signal while the vehicle is traveling.)	 Foreign material adhered around the rear wheel sen- sor Incorrect installation of the rear wheel Defective sensor rotor or incorrect installation of the rotor Defective rear wheel sen- sor or incorrect installation of the sensor
51	Vehicle system power supply (voltage of ABS ECU power supply is high)	Power voltage supplied to the ABS ECU in the hydrau- lic unit assembly is too high.	 Defective battery Disconnected battery terminal Defective charging system

Fault code No.	Item	Symptom	Check point
53	Vehicle system power supply (voltage of ABS ECU power supply is low)	Power voltage supplied to the ABS ECU in the hydrau- lic unit assembly is too low.	 Defective battery Defective coupler between the battery and the hydrau- lic unit assembly Open or short circuit in the wire harness between the battery and the hydraulic unit assembly Defective charging system
55	Hydraulic unit assembly (defective ABS ECU)	Abnormal data is detected in the hydraulic unit assembly.	 Defective hydraulic unit assembly
56	Hydraulic unit assembly (internal circuit abnormal)	Abnormality detected in of hydraulic unit assembly.	 Defective hydraulic unit assembly
57	Vehicle CAN communication line or power source of vehi- cle system	Short-circuit in CAN commu- nication line or the voltage that supplies the hydraulic unit assembly is too low.	 Short-circuit in CAN communication line Defective battery Defective coupler between battery and hydraulic unit assembly Wire harness between battery and hydraulic unit is interrupted or has short-circuited Defective charging system
62	Power supply voltage failure in pressure sensor	Abnormality detected in pressure sensor power sup- ply circuit of hydraulic unit assembly.	 Defective hydraulic unit assembly
63	Defective front pressure sen- sor	Abnormality detected in pressure sensor circuit at front master cylinder side of hydraulic unit assembly.	 Defective front brake line Defective hydraulic unit assembly
64	Defective rear pressure sen- sor	Abnormality detected in pressure sensor circuit at rear master cylinder side of hydraulic unit assembly.	 Defective rear brake line Defective hydraulic unit assembly
68	Hydraulic unit assembly (Defective front pressure sensor)	Abnormality detected in pressure sensor circuit at front caliper side of hydrau- lic unit assembly.	In case of electrical interlock- ing brake • Defective front brake line • Defective hydraulic unit assembly
69	Hydraulic unit assembly (Defective rear pressure sen- sor)	Abnormality detected in pressure sensor circuit of hydraulic unit assembly.	 Defective rear brake line Defective hydraulic unit assembly
89	CAN communication (between meter assembly and hydraulic unit assembly)	Transmitted data from the meter cannot be normally received.	 Defective coupler between meter assembly and hydraulic unit assembly Harness is broken or short- circuit between meter assembly and hydraulic unit assembly Defective meter assembly Defective hydraulic unit assembly

Fault code No.	Item	Symptom	Check point
90	CAN communication (between FI ECU and hydraulic unit assembly)	Transmitted data from the FI ECU cannot be normally received.	 Defective coupler between FI ECU and hydraulic unit assembly Harness is broken or short- circuit between FI ECU and hydraulic unit assembly Defective FI ECU Defective hydraulic unit assembly
91	CAN communication (between IMU and hydraulic unit assembly)	Transmitted data from the IMU cannot be normally received.	 Defective coupler between IMU and hydraulic unit assembly Harness is broken or short- circuit between IMU and hydraulic unit assembly Defective IMU Defective hydraulic unit assembly

*The fault code number varies according to the vehicle conditions. Fault code No. 11

Fault code No.		11	
Item		Front wheel se	ensor (intermittent pulses or no pulses)
Sympt	tom	Front wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	
Order	Item/components and pr	obable cause	Check or maintenance job
1	Foreign material adhered around the front wheel sensor		Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel		Check the components for looseness, distortion, and bends. Refer to "CHECKING THE FRONT WHEEL" on page 4-27.
3	Defective sensor rotor or incorrect instal- lation of the rotor		Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.
4	Defective front wheel sensor or incorrect installation of the sensor		Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.

TIP _____

If the rear wheel continues to turn for more than 20 seconds after the front wheel has stopped, this will be recorded.

Fault code No.		12	
ltem		Rear wheel see	nsor (intermittent pulses or no pulses)
Sympt	tom	Rear wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	
Order	Item/components and pr	obable cause	Check or maintenance job
1	Foreign material adhered around the rear wheel sensor		Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the rear wheel		Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-38.
3	Defective sensor rotor or incorrect instal- lation of the rotor		Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-40.
4	Defective rear wheel sensor or incorrect installation of the sensor		Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-40.

Fault code No. 13, 26

Fault o	code No.	13 26	
Item		Front wheel se	ensor (abnormal pulse period)
Sympt	tom	Front wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	
Order	Item/components and pi	obable cause	Check or maintenance job
1	Foreign material adhered around the front wheel sensor		Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel		Check the components for looseness, distortion, and bends. Refer to "CHECKING THE FRONT WHEEL" on page 4-27.
3	Defective sensor rotor or incorrect instal- lation of the rotor		Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.
4	Defective front wheel sensor or incorrect installation of the sensor		Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.

TIP -

• If the front brake ABS operates continuously for 20 seconds or more, fault code No. 26 will be recorded. If the front brake ABS operates continuously for 36 seconds or more, fault code No. 13 will be recorded.

• Vehicle possibly ridden on uneven roads.

Fault o	ault code No. 14, 27				
Fault code No.		14 27			
Item		Rear wheel sensor (abnormal pulse period)			
Symp	tom	Rear wheel sensor signal is not received properly. (The pulse peries abnormal while the vehicle is traveling.)			
Order	Item/components and pr	obable cause	Check or maintenance job		
1	Foreign material adhered around the rear wheel sensor		Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.		
2	Incorrect installation of the rear wheel		Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-38.		
3	Defective sensor rotor or incorrect instal- lation of the rotor		Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-40.		
4	Defective rear wheel sensor or incorrect installation of the sensor		Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-40.		

TIP —

• If the rear brake ABS operates continuously for 20 seconds or more, fault code No. 27 will be recorded. If the rear brake ABS operates continuously for 36 seconds or more, fault code No. 14 will be recorded.

• Vehicle possibly ridden on uneven roads.

Fault code No.		15	
ltem		Front wheel sensor (open or short circuit)	
Symptom		Open or short circuit is detected in the front wheel sensor.	
Order	r Item/components and probable cause		Check or maintenance job
1	Defective coupler between the front wheel sensor and the hydraulic unit assembly		 Check the coupler for any pins that may be pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP

Fault code No.		15	
Item		Front wheel se	ensor (open or short circuit)
Sympt	tom	Open or short	circuit is detected in the front wheel sensor.
Order	Item/components and pi	obable cause	Check or maintenance job
2	Open or short circuit in the between the front wheel s hydraulic unit assembly		 Check for continuity between the white terminal "1" and the white terminal "4" and between the black terminal "2" and the black terminal "5". If there is no continuity, the wire harness is defective. Replace the wire harness. Check that there is no short circuit between the white terminal "1" and the black terminal "2" and between the white terminal "1" and the black terminal "2" and between the white terminal "1" and the black terminal "2" and between the white terminal "1" and the black terminal "2" and between the white terminal "4" and the black terminal "5". If there is short circuit, the wire harness is defective. Replace the wire harness. Check that there is no short circuit between the black/white terminal "3" and the white terminal "4" and between the black/white terminal "3" and the white terminal "4" and between the black/white terminal "3" and the black terminal "5". If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit the terminal "5". If there is short circuit the terminal "5".
3	Defective front wheel sens unit assembly	sor or hydraulic	If the above items were performed and no malfunctions were found, the wheel sensor or hydraulic unit assembly is defective. Replace the wheel sensor or hydraulic unit assembly. Refer to "FRONT WHEEL" on page 4-24 and "ABS (Anti-lock Brake System)" on page 4-65.

Fault code No.		16	
		Rear wheel sensor (open or short circuit)	
Symptom		Open or short circuit is detected in the rear wheel sensor.	
Order	r Item/components and probable cause		Check or maintenance job
1	Defective coupler between the rear wheel sensor and the hydraulic unit assembly		 Check the coupler for any pins that may be pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP

Fault o	code No.	16		
Item		Rear wheel se	Rear wheel sensor (open or short circuit)	
Sympt	tom	Open or short	circuit is detected in the rear wheel sensor.	
Order	Item/components and pi	obable cause	Check or maintenance job	
2	Open or short circuit in the between the rear wheel se hydraulic unit assembly	e wire harness ensor and the	 Check for continuity between the white terminal "1" and the white terminal "4" and between the black terminal "2" and the black terminal "5". If there is no continuity, the wire harness is defective. Replace the wire harness. Check that there is no short circuit between the white terminal "1" and the black terminal "2" and between the white terminal "1" and the black terminal "2" and between the white terminal "1" and the black terminal "2" and between the white terminal "1" and the black terminal "2" and between the white terminal "1" and the black terminal "2" and between the white terminal "4" and the black terminal "5". If there is short circuit, the wire harness is defective. Replace the wire harness. Check that there is no short circuit between the black/white terminal "3" and the white terminal "4" and between the black/white terminal "3" and the black terminal "5". If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit, the wire harness is defective. Replace the wire harness. If there is short circuit the terminal "5". If there is short circuit the terminal "5". 	
3	Defective rear wheel sens unit assembly	or or hydraulic	If the above items were performed and no malfunctions were found, the wheel sensor or hydraulic unit assembly is defective. Replace the wheel sensor or hydraulic unit assembly. Refer to "REAR WHEEL" on page 4-34 and "ABS (Anti- lock Brake System)" on page 4-65.	

Fault code No.		21	
Item		Hydraulic unit assembly (defective solenoid drive circuit)	
Symptom		Solenoid drive circuit in the hydraulic unit assembly is open or short-circuited.	
Order	Item/components and probable cause		Check or maintenance job
1	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.

Fault o	code No.	31		
ltem		Hydraulic unit assembly (defective ABS solenoid power circuit)		
Sympt	tom	Power is not sa assembly.	Power is not supplied to the solenoid circuit in the hydraulic unit assembly.	
Order	Item/components and p	robable cause	Check or maintenance job	
1	Blown ABS solenoid fuse		Check the ABS solenoid fuse. If the ABS solenoid fuse is blown, replace the fuse and check the wire harness. Refer to "CHECKING THE FUSES" on page 8-180.	
2	Defective coupler between the battery and the hydraulic unit assembly		 Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP	
			Turn the main switch to "OFF" before disconnecting or connecting a coupler.	
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly		 Replace if there is an open or short circuit. Between ABS ECU coupler and ABS solenoid fuse. (blue/white-blue/white) 	
4	Defective hydraulic unit assembly		If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.	

Fault code No.		33		
Item		Hydraulic unit	Hydraulic unit assembly (abnormal ABS motor power supply)	
Sympt	tom	Power is not s assembly.	Power is not supplied to the motor circuit in the hydraulic unit assembly.	
Order	Item/components and pi	obable cause	Check or maintenance job	
1	Blown ABS motor fuse		Check the ABS motor fuse. If the ABS motor fuse is blown, replace the fuse and check the wire harness. Refer to "CHECKING THE FUSES" on page 8-180.	
2	Defective coupler between the battery and the hydraulic unit assembly		 Check the coupler for any pins that may be pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP	
			connecting a coupler.	
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly		 Replace if there is an open or short circuit. Between ABS ECU coupler and starter relay coupler (ABS motor fuse). (red/white–red/white) Between ABS ECU coupler and ground. (black–black) 	
4	Defective hydraulic unit assembly		If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.	

Fault o	code No.	34	
Item		Hydraulic unit assembly (short circuit in ABS motor power supply circuit)	
Symptom		Short circuit is detected in the motor power supply circuit in the hydraulic unit assembly.	
Order	Item/components and probable cause		Check or maintenance job
1	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.

Fault o	code No.	41		
Item		Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)		
Symptom		 Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure. 		
Order	Item/components and p	robable cause	Check or maintenance job	
1	Incorrect installation of the front wheel sensor		Check the components for looseness, distortion, and bends. Refer to "CHECKING THE FRONT WHEEL" on page 4-27.	
2	Incorrect rotation of the front wheel		Check that there is no brake disc drag on the front wheel and make sure that it rotates smoothly. Refer to "CHECKING THE FRONT WHEEL" on page 4-27 and "CHECKING THE FRONT BRAKE DISCS" on page 4-48.	
3	Front brake dragging		Check that the brake fluid pressure is correctly transmit- ted to the brake caliper when the brake lever is operated and that the pressure decreases when the lever is released. Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-48.	
4	Defective hydraulic unit assembly		If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.	

Fault code No. Item		42	
		Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	
		 Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure. 	
Order	Item/components and pi	obable cause	Check or maintenance job
1	Incorrect installation of the rear wheel sensor		Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-38.
2	Incorrect rotation of the rear wheel		Check that there is no brake disc drag on the wheel and make sure that it rotates smoothly. Refer to "CHECKING THE REAR WHEEL" on page 4-38.
3	Rear brake dragging		Check that the brake fluid pressure is correctly transmit- ted to the brake caliper when the brake pedal is oper- ated and that the pressure decreases when the pedal is released. Refer to "CHECKING THE REAR BRAKE DISC" on page 4-59.
4	Defective hydraulic unit assembly		If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.

Fault code No. 43, 45

Fault o	code No.	43 45			
Item		Front wheel se	Front wheel sensor (missing pulses)		
Sympt	tom	Front wheel se are detected in	ensor signal is not received properly. (Missing pulses In the signal while the vehicle is traveling.)		
Order	Item/components and p	robable cause	Check or maintenance job		
1	Foreign material adhered around the front wheel sensor		Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.		
2	Incorrect installation of the front wheel		Check the components for looseness, distortion, and bends. Refer to "CHECKING THE FRONT WHEEL" on page 4-27.		
3	Defective sensor rotor or incorrect instal- lation of the rotor		Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.		
4	Defective front wheel sensor or incorrect installation of the sensor		Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-29.		

TIP ___

After the fault code No. 45 is recorded, fault code No. 43 will be recorded if a certain speed and time are exceeded.

Fault code No. 44, 46

Fault o	code No.	44 46			
Item		Rear wheel see	Rear wheel sensor (missing pulses)		
Sympt	tom	Rear wheel set are detected in	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)		
Order	Item/components and pi	robable cause	Check or maintenance job		
1	Foreign material adhered around the rear wheel sensor		Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.		
2	Incorrect installation of the rear wheel		Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-38.		
3	Defective sensor rotor or incorrect instal- lation of the rotor		Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-40.		
4	Defective rear wheel sensor or incorrect installation of the sensor		Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-40.		

TIP _____

After the fault code No. 46 is recorded, fault code No. 44 will be recorded if a certain speed and time are exceeded.

Fault code No.		51	
Item		Vehicle system power supply (voltage of ABS ECU power supply is high)	
Symptom		Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too high.	
Order	Item/components and probable cause		Check or maintenance job
1	Defective battery		Recharge or replace the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181.
2	Disconnected battery terminal		Check the connection. Replace or reconnect the termi- nal if necessary.
3	Defective charging system		Check the charging system. Refer to "CHARGING SYSTEM" on page 8-17.

Fault o	code No.	53	
ltem		Vehicle system power supply (voltage of ABS ECU power supply is low)	
Sympt	tom	Power voltage bly is too low.	supplied to the ABS ECU in the hydraulic unit assem-
Order	Item/components and probable cause		Check or maintenance job
1	Defective battery		Recharge or replace the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181.
2	Defective coupler between the battery and the hydraulic unit assembly		 Check the coupler for any pins that may be pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP
			Turn the main switch to "OFF" before disconnecting or connecting a coupler.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly		 Replace if there is an open or short circuit. Between ABS ECU coupler and ABS ECU fuse. (red/black–red/black)
4	Defective charging system		Check the charging system. Refer to "CHARGING SYSTEM" on page 8-17.

Fault code No. 55

Fault code No.		55	
Item		Hydraulic unit assembly (defective ABS ECU)	
Symptom		Abnormal data is detected in the hydraulic unit assembly.	
Order	Item/components and probable cause		Check or maintenance job
1	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.

Fault code No.		56	
Item		Hydraulic unit assembly (abnormal internal circuit)	
Sympt	tom	Abnormality detected in internal circuit of hydraulic unit assembly.	
Order	Item/components and probable cause		Check or maintenance job
1	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.

Fault code No. 57 Item Vehicle CAN communication line or power source of vehicle system Short-circuit in CAN communication line or the voltage that sup-Symptom plies the hydraulic unit assembly is too low. Order Item/components and probable cause Check or maintenance job 1 Short-circuit in CAN communication line Replace if there is an open or short circuit. Between ABS ECU coupler and joint coupler. (blue/white-blue/white) (blue/black-black/blue) • Between joint coupler and ECU coupler. (blue/white-blue/white) (blue/black-black/blue) 2 Defective battery Recharge or replace the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181. 3 Defective coupler between the battery • Check the coupler for any pins that may be pulled out. and the hydraulic unit assembly Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP -Turn the main switch to "OFF" before disconnecting or connecting a coupler. 4 Open or short circuit in the wire harness Replace if there is an open or short circuit. • Between ABS ECU coupler and starter relay coupler between the battery and the hydraulic unit (ABS motor fuse). assembly (red/white-red/white) Between ABS ECU coupler and ABS solenoid fuse. (blue/white-blue/white) 5 Defective charging system Check the charging system. Refer to "CHARGING SYSTEM" on page 8-17.

Fault code No. 62

Fault code No.		62	
Item		Power supply voltage failure in pressure sensor	
Symptom		Abnormality detected in pressure sensor power source circuit of hydraulic unit assembly.	
Order	Item/components and probable cause		Check or maintenance job
1	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.

Fault code No.		63	
Item		Defective front pressure sensor	
Symptom		Abnormality de inder side of h	etected in pressure sensor circuit at front master cyl- ydraulic unit assembly.
Order	Item/components and probable cause		Check or maintenance job
1	Defective front brake line		Check the front brake line, and if there is bending or blocking, replace the front brake line.
2	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.

Fault code No. 64

Fault code No.		64		
Item		Defective rear pressure sensor		
Symptom		Abnormality d inder side of h	letected in pressure sensor circuit at rear master cyl- nydraulic unit assembly.	
Order	Item/components and probable cause		Check or maintenance job	
1	Defective rear brake line		Check the rear brake line, and if there is bending or blocking, replace the rear brake line.	
2	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.	

Fault code No. 68

Fault o	code No.	68		
Item		Defective hydraulic unit assembly (defective front pressure sensor)		
Symptom		Abnormality de of hydraulic ur	ormality detected in pressure sensor circuit at front caliper side ydraulic unit assembly.	
Order	Item/components and probable cause		Check or maintenance job	
1	Defective front brake line		Check the front brake line and if there is bending or blocking, replace the front brake line.	
2	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.	

Fault code No.		69	
ltem		Defective hydraulic unit assembly (defective rear pressure sensor)	
Sympt	tom	Abnormality de assembly.	etected in pressure sensor circuit of hydraulic unit
Order	Item/components and probable cause		Check or maintenance job
1	Defective rear brake line		Check the rear brake line, and if there is bending or blocking, replace the rear brake line.

Fault code No.		69	
Item		Defective hydraulic unit assembly (defective rear pressure sensor)	
Sympt	tom	Abnormality detected in pressure sensor circuit of hydraulic unit assembly.	
Order	Item/components and probable cause		Check or maintenance job
2	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.

Fault o	code No.	89		
ltem		CAN communi assembly)	unication (between meter assembly and hydraulic unit	
Sympt	tom	Transmitted da received.	ata from the meter assembly cannot be normally	
Order	Item/components and p	robable cause	Check or maintenance job	
1	Defective coupler between the meter assembly and the hydraulic unit assembly		 Check the coupler for any pins that may be pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP	
2	Open or short circuit in the wire harness between the meter assembly and the hydraulic unit assembly		 Replace if there is an open or short circuit. Between meter assembly and joint coupler. (blue/white-blue/white) (blue/black-black/blue) Between joint coupler and ABS ECU coupler. (blue/white-blue/white) (blue/black-black/blue) 	
3	Defective meter assembly		Replace the meter assembly.	
4	Defective hydraulic unit as	sembly	Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.	

Fault o	code No.	90		
Item		CAN communication (between FI ECU and hydraulic unit assembly)		
Sympt	tom	Transmitted da	itted data from the FI ECU cannot be normally received.	
Order	Item/components and probable cause		Check or maintenance job	
1	Defective coupler betweer and the hydraulic unit ass	ו the FI ECU embly	 Check the coupler for any pins that may be pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP	

Item		90		
		CAN communication (between FI ECU and hydraulic unit assembly)		
		Transmitted da	Transmitted data from the FI ECU cannot be normally received.	
Order	Item/components and probable cause		Check or maintenance job	
2	Open or short circuit in the wire harness between the FI ECU and the hydraulic unit assembly		 Replace if there is an open or short circuit. Between FI ECU and joint coupler. (blue/white–blue/white) (blue/black–black/blue) Between joint coupler and ABS ECU coupler. (blue/white–blue/white) (blue/black–black/blue) 	
3	Defective FI ECU		Replace the FI ECU.	
4	Defective hydraulic unit as	sembly	Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.	

Fault o	code No.	91		
ltem		CAN communi	CAN communication (between IMU and hydraulic unit assembly)	
Sympt	tom	Transmitted da	ata from the IMU cannot be normally received.	
Order	Item/components and pr	obable cause	Check or maintenance job	
1	Defective coupler between the IMU and the hydraulic unit assembly		 Check the coupler for any pins that may be pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. TIP	
			Turn the main switch to "OFF" before disconnecting or connecting a coupler.	
2	Open or short circuit in the wire harness between the IMU and the hydraulic unit assembly		Replace if there is an open or short circuit. • Between IMU and joint coupler. (blue/white–blue/white) (blue/black–black/blue) • Between joint coupler and ABS ECU coupler. (blue/white–blue/white) (blue/black–black/blue)	
3	Defective IMU		Replace the IMU.	
4	Defective hydraulic unit as	sembly	Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-65.	

EAS31167

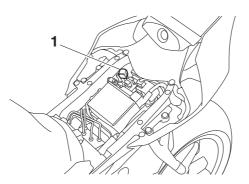
[B-3] DELETING THE FAULT CODES

To delete the fault codes, use the Yamaha diagnostic tool. For information about deleting the fault codes, refer to the operation manual of the Yamaha diagnostic tool. Check that all the displayed fault codes are deleted.



Connecting the Yamaha diagnostic tool

Remove the protective cap "1", and then connect the Yamaha diagnostic tool to the coupler.



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[C-1] FINAL CHECK

Check all the following items to complete the inspection.

If the process is not completed properly, start again from the beginning.

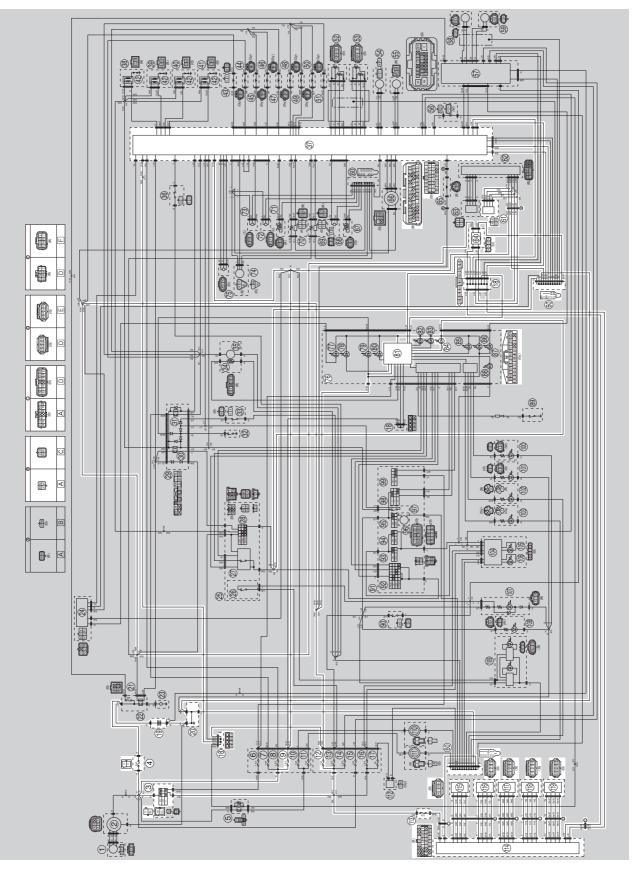
Checking procedures

- 1. Check the brake fluid level in the brake master cylinder reservoir and brake fluid reservoir. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.
- Check the wheel sensors for proper installation. Refer to "INSTALLING THE FRONT WHEEL (DISC BRAKE)" on page 4-31 and "INSTALLING THE REAR WHEEL (DISC BRAKE)" on page 4-40.
- 3. Perform brake line routing confirmation. Refer to "HYDRAULIC UNIT OPERATION TEST" on page 4-70. If it does not have reaction-force properly, the brake hose is not properly routed or connected.
- 4. Delete the fault codes. Refer to "[B-3] DELETING THE FAULT CODES" on page 8-150.
- 5. Checking the ABS warning light. Refer to "CHECKING THE ABS WARNING LIGHT" on page 4-73. If the ABS warning light does not turn off, the possible causes are following:
 - The problem is not solved.
 - Open circuit between the ABS ECU and the meter assembly. Check for continuity between green/orange terminal of the ABS ECU coupler and green/orange terminal of the meter assembly coupler.
- Malfunction in the meter assembly circuit.
- Malfunction in the ABS warning light circuit in the hydraulic unit assembly.

ELECTRONICALLY ADJUSTABLE SUSPENSION SYSTEM (for YZF-R1M)

EAS31009

FAS20168



- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20.Engine ground
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 61. Yamaha diagnostic tool coupler
- 64.IMU (Inertial Measurement Unit)
- 76.Meter assembly
- 81.Multi-function meter
- 84. Engine trouble and system warning light
- 113.SCU fuse
- 114.SCU (Suspension Control Unit)
- 115.Front fork stepping motor (left)
- 116.Front fork stepping motor (right)
- 117.Rear shock absorber assembly stepping motor (compression damping)
- 118.Rear shock absorber assembly stepping motor (rebound damping)
- 119.Steering damper solenoid (OPTION)
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler, CCU, GPS unit)
- D. Sub-wire harness (SCU, steering damper solenoid, sub-wire harness)
- E. Sub-wire harness (damper solenoid)
- F. Sub-wire harness (front fork stepping motor)

MAINTENANCE OF THE SCU (Suspension Control Unit) Checking the SCU (Suspension Control Unit)

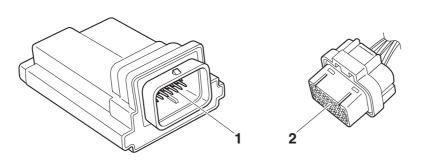
1. Check:

EAS31010

- Terminals "1" of the SCU
 - $\label{eq:cracks} {\sf Cracks} / {\sf damages} \to {\sf Replace} \ {\sf the} \ {\sf SCU}.$
- Terminals "2" of the SCU couplers
- Connection defective, contaminated, come-off \rightarrow Replace or clean.

TIP -

If the SCU couplers are clogged with mud or dirt, clean with compressed air.



EAS31011

SCU (Suspension Control Unit) SELF-DIAGNOSTIC FUNCTION

The SCU is equipped with a self-diagnostic function in order to ensure that the electronically adjustable suspension system is operating normally. If this function detects a malfunction in the electronically adjustable suspension system, it immediately operates the system under substitute characteristics and lights the engine trouble and system 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 SCU. After the engine has been stopped, the fault code number appears on the display. If there is more than one fault code number, the numbers are displayed in numerical order starting with the lowest number. Once a fault code has been displayed, it remains stored in the memory of the SCU until it is deleted.

Checking the engine trouble and system warning light

The engine trouble and system warning light come on for 2.0 seconds after the main switch has been turned to "ON". If the engine trouble and system warning light does not come on under this condition, the lights (LED) may be defective.

SCU detects an abnormal signal from a sensor

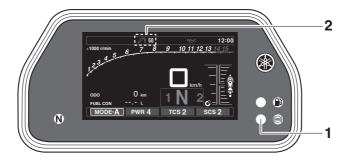
If the SCU detects an abnormal signal from a sensor while the vehicle is being driven, the SCU illuminates the engine trouble and system warning light and provides the electronically adjustable suspension system with alternate operating instructions that are appropriate for the type of malfunction. When an abnormal signal is received from a sensor, the SCU processes the specified values that are programmed for each sensor in order to provide the electronically adjustable suspension system with alternate operating instructions that enable the system to continue operating or stop operating, depending on the conditions.

EAS31012

TROUBLESHOOTING METHOD (SCU)

TIP -

If there is a malfunction in the electronically adjustable suspension system, the engine trouble and system warning light "1" will come on, and a fault code number "2" will be displayed.



The engine trouble and system warning light comes on.

- 1. Check:
- Fault code number

- a. Check the fault code number displayed on the display.
- b. Identify the faulty system with the fault code number.

- Check and repair the probable cause of the malfunction. Refer to "TROUBLESHOOTING DETAILS (SCU)" on page 8-156 and "SELF-DIAGNOSTIC FUNC-TION AND DIAGNOSTIC CODE TABLE (SCU) (for YZF-R1M)" on page 9-12.
- Perform the reinstatement action for the electronically adjustable suspension system. Refer to "Confirmation of service completion" in the appropriate table in "TROUBLESHOOTING DE-TAILS (SCU)" on page 8-156.
- 4. Turn the main switch to "OFF" and back to "ON", then check that no fault code number is displayed. **TIP**______

If another fault code number is displayed, repeat steps (1) to (4) until no fault code number is displayed.

EAS31013

BASIC INSTRUCTIONS FOR DIAGNOSTIC FUNCTION

Use the Yamaha diagnostic tool and determine the location of the malfunction and the cause from the recorded fault code. Refer to "YAMAHA DIAGNOSTIC TOOL" on page 8-52.

EAS31014

TROUBLESHOOTING DETAILS (SCU)

This section describes the measures per fault code number displayed on the display. Check and service the items or components that are the probable cause of the malfunction following the order given. After the check and service of the malfunctioning part has been completed, reset the display according to the "Confirmation of service completion".

Fault code No.:

Fault code number displayed on the display when the electronically adjustable suspension system failed to work normally.

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "YAMAHA DIAG-NOSTIC TOOL" on page 8-52.

Fault code No.	7
Item	Abnormal ABS
Fail-safe system	Able to start engine
	Able to drive vehicle
Diagnostic code No.	—

Fault code No.		7			
Item		Abno	rmal ABS		
Indica	ted	—			
Procee	dure	—			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion	
1	Abnormal ABS		Check the items of fault codes No. 62 and 63 for the ABS. Refer to "[B-2] DIAGNOSIS USING THE FAULT CODES" on page 8-131.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Refer to the item corresponding to the fault code.	

Fault o	Fault code No.		9		
Item	Item		Abnormal CAN communication (between ECU and SCU)		
Fail-sa	afe system	Able t	o start engine		
		Able t	o drive vehicle		
Diagno	ostic code No.	—			
Indica	ted	—			
Proce	dure	—			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion	
1	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 2.	
2	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between SCU coupler and joint coupler. blue/white-blue/white blue/black-blue/black Between the joint coupler and ECU coupler. blue/white-blue/white blue/black-blue/black	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 3.	
3	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-180.		

Fault code No. 10

Fault code No.		10			
Item	Item Ab		Abnormal CAN communication (between ABS ECU and SCU)		
Fail-sa	afe system	Able t	o start engine		
		Able t	o drive vehicle		
Diagn	ostic code No.	—			
Indica	ted	—			
Proce	dure	—			
ltem	Probable cause of malfunction and che		Maintenance job	Confirmation of service com- pletion	
1	Connection of ABS ECU cou- pler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 2.	
2	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between SCU coupler and joint coupler. blue/white–blue/white blue/black–blue/black Between the joint coupler and ABS ECU coupler. blue/white–blue/white blue/black–blue/black	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 3.	
3	Malfunction in ABS ECU.		Replace the hydraulic unit assembly.		

Fault	code No.	42				
ltem		Abno	rmal rear wheel sensor			
Fail-sa	afe system	Able t	o start engine			
		Able t	o drive vehicle			
Diagn	ostic code No.	—				
Indica	Indicated		—			
Proce	dure	—				
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion		
1	Abnormal rear wheel sens	sor	Check the item of fault code No. 42 for the ECU. Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOS- TIC CODE TABLE (ECU)" on page 9-5.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Refer to the item corresponding to fault code.		

Fault code No. 44

Fault code No. 44		44			
ltem	Item At		rmal SCU EEPROM		
Fail-sa	afe system	Able t	o start engine		
		Able t	o drive vehicle		
Diagn	ostic code No.	—			
Indica	Indicated –		_		
Proce	Procedure				
ltem	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion	
1	Confirmation after correction of abnormality		Turn the main switch to "OFF" and back to "ON".	Check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 2.	
2	Malfunction in SCU.		Replace the SCU.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished.	

Fault code No. 46

Fault code No.		46			
ltem		Abno	rmal SCU power supply voltage		
Fail-sa	afe system	Able t	o start engine		
		Able t	o drive vehicle		
Diagn	ostic code No.	09			
Indica	Indicated		Displays the SCU power supply voltage. Approximately 12.0 V		
Proce	dure	Check the displayed SCU power supply voltage.			
ltem	Probable cause of malfunction and che		Maintenance job	Confirmation of service com- pletion	
1	Malfunction in charging system.		Check the charging system. Refer to "CHARGING SYS- TEM" on page 8-17. Defective rectifier/regulator or AC magneto \rightarrow Replace. Defective connection in the charging system circuit \rightarrow Prop- erly connect or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Repeat the maintenance job.	

Fault code No.	50
Item	Abnormality inside SCU
Fail-safe system	Able to start engine
	Able to drive vehicle

Fault code No.		50				
Item	Item		Abnormality inside SCU			
Diagn	Diagnostic code No.		—			
Indica	Indicated		_			
Proce	Procedure		_			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion		
1	Malfunction in SCU.		Replace the SCU.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished.		

Fault code No.		66			
Item	Item S		Steering damper stepping motor (manufactured by Öhlins: optional): open circuit or short-circuit detected.		
Fail-sa	afe system	Able t	o start engine		
		Able t	o drive vehicle		
Diagn	ostic code No.	—			
Indica	ted	—			
Proce	dure	—			
Item	Probable cause of malfunction and che		Maintenance job	Confirmation of service com- pletion	
1	Connection of stepping motor coupler. Check the locking condition of the coupler. • Steering damper Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 2.	
2	Connection of wire harness SCU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3			Improperly connected → Con- nect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	

Fault	code No.	66		
Item		Steering damper stepping motor (manufactured by Öhlins: optional): open circuit or short-circuit detected.		
4	Wire harness continuity.	Open circuit → Replace the wire harness. Turn the main switch to "OFF" and back to "ON". • Between SCU coupler and stepping motor. gray-gray gray/black-gray/red gray/red-gray/red gray/green-gray/green Turn the main switch to "OFF" and back to "ON". • Between stepping motor for the main symptotic is finished. Fault code number is displayed → Service is finished. • Between-gray/green Short-circuit → Replace the wire harness. • Between stepping motor "1" and power ground "2". gray-black • Between stepping motor "2". gray-black gray/lack-black gray/red-black gray/red-black • Go to item 5. • Between stepping motor "1" and power battery "3". gray-brown/white gray/black-black gray/lack-brown/white gray/green-brown/white gray/green-brown/white gray/green-brown/white gray/green-brown/white gray/black-brown/white gray-brown/white gray-brown/white gray-brown/white gray-brown/white gray-brown/white gray-brown/black-brown/black-brown/black-brown/black-brown/black-brown/black-bro		

Fault o	code No.	66
Item		Steering damper stepping motor (manufactured by Öhlins: optional): open circuit or short-circuit detected.
5	Malfunction in stepping m	tor. Stepping motor confirmation steps: a. Connect the pocket tester (Ω \times 10) to the stepping motor. • Positive tester probe "1" • Negative tester probe "2" A. Stepping motor coupler B. Connection wiring diagram b. Measure the resistance of the stepping motor between "1" and "2". Specified resistance: 14.8– 18.2 Ω (When the motor is cold at 20 °C (68 °F)) Out of specification \rightarrow Go to step (e). c. Connect the pocket tester (Ω \times 10) to the stepping motor. • Positive tester probe "4" d. Measure the resistance of the stepping motor between "3" and "4". Specified resistance: 14.8– 18.2 Ω (When the motor is cold at 20 °C (68 °F)) Out of specification \rightarrow Go to step (e). e. Stepping motor is defective \rightarrow Replace. Replace the SCU. Turn the main switch to "OFF"
-		and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Refer to the item corresponding to the fault code.

Fault code No.	89 (or "Err" is displayed)
Item	Abnormal CAN communication (between meter assembly and SCU)
Fail-safe system	Able to start engine
	Able to drive vehicle

		89 (or "Err" is displayed)		
		Abno	Abnormal CAN communication (between meter assembly and SCU)	
Diagn	Diagnostic code No.			
Indica	ted	—		
Proce	dure			
Item	Item Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion
1	Connection of meter assembly coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected → Con- nect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 2.
2	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between SCU coupler and joint coupler. blue/white–blue/white blue/black–blue/black Between the joint coupler and meter assembly coupler. blue/white–blue/white blue/black–blue/black	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 3.
3	Malfunction in meter assembly.		Replace the meter assembly.	

Fault code No.		93			
Item		Stepping motor: open or short circuit detected.			
Fail-safe system		Able to start engine			
		Able to drive vehicle			
Diagn	ostic code No.	—			
Meter	display	—			
Proce	dure	—			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion	
1	Connection of stepping motor coupler. Check the locking condition of the coupler. • Left front fork stepping motor • Rear shock absorber assem- bly stepping motor (× 2) Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 2.	

Fault code No.93		93			
Item		Stepp	Stepping motor: open or short circuit detected.		
2	Connection of SCU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 3.	
3	Connection of front fork step- ping motor sub-lead coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected → Con- nect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON". Fault code number is not dis- played \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 4.	
4	ping motor sub-lead coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition		 Open circuit → Replace the wire harness. Between SCU coupler and left front fork stepping motor. green–green green/black–green/black green/red–green/blue Between SCU coupler and right front fork stepping motor. pink–pink pink/black–pink/black pink/white–pink/blue Between SCU coupler and rear shock absorber assembly stepping motor (compression damping). white–white/green–white/green Between SCU coupler and rear shock absorber assembly stepping motor (compression damping). white/black–white/green–white/green Between SCU coupler and rear shock absorber assembly stepping motor (rebound damping). white/green–white/green Between SCU coupler and rear shock absorber assembly stepping motor (rebound damping). yellow–yellow yellow/green–yellow/green Between left front fork stepping motor "1" and power ground "2". green–black green/black–black Between right front fork stepping motor "3" and power ground "2". pink–black Between right front fork stepping motor "3" and power ground "2". pink–black Between right front fork stepping motor "3" and power ground "2". pink–black Between right front fork stepping motor "3" and power ground "2". pink–black Between right front fork stepping motor "3" and power ground "2". pink–black 	Turn the main switch to "OFF" and back to "ON". Fault code number is not dis- played → Service is finished. Fault code number is displayed → Go to item 5.	

Fault code	e No.	93		
Item		Stepping motor: open or short circuit detected.		
4 Win	ire harness continuity.	 Between rear shock absorber assembly stepping motor (compression damping) "4" and power ground "2". white-black white/red-black white/red-black white/red-black white/green-black Between rear shock absorber assembly stepping motor (rebound damping) "5" and power ground "2". yellow/black-black yellow/green-black yellow/green-black yellow/green-black yellow/ablack-black yellow/ablack-black yellow/ablack-black syellow/black-brown/white green/black-brown/white green/black-brown/white green/black-brown/white green/black-brown/white green/black-brown/white pink/black-brown/white pink/black-brown/white bink/blue-brown/white Between rear shock absorber assembly stepping motor "3" and power battery "6". white-brown/white white/green-brown/white white/green-brown/white green/black-brown/white green/black-brown/white green/black-brown/white bink/blue-brown/white Between rear shock absorber assembly stepping motor "6". white-brown/white white/green-brown/white white/green-brown/white white/green-brown/white green/black-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white yellow/black-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white yellow/black-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white yellow/black-brown/white yellow/black-brown/white yellow/black-brown/white white/green-brown/white white/green-brown/white yellow/black-brown/white white/green-brown/white white/green-brown/white yellow/black-brown/white yellow/black-brown/wh		

Fault code No.		93			
Item	Item		epping motor: open or short circuit detected.		
5	Malfunction in stepping motor.		 Stepping motor confirmation steps: a. Connect the pocket tester (Ω × 10) to the stepping motor. Positive tester probe "1" Negative tester probe "2" 	Turn the main switch to "ON". Fault code number is not displayed \rightarrow Service is finished. Fault code number is displayed \rightarrow Go to item 6.	
			$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		
			 A. Stepping motor coupler B. Connection wiring diagram b. Measure the resistance of the stepping motor between "1" and "2". Specified resistance: 14.8– 18.2 Ω (When the motor is cold at 20 °C (68 °F)) Out of specification → Go to step (e). c. Connect the pocket tester (Ω × 10) to the stepping motor. Positive tester probe "3" Negative tester probe "4" d. Measure the resistance of the stepping motor between "3" and "4". Specified resistance: 14.8– 18.2 Ω (When the motor is cold at 20 °C (68 °F)) Out of specification → Go to step (e). e. Stepping motor is defective → Replace. Refer to "FRONT FORK (for YZF-R1M)" on page 4-90, "REAR SHOCK ABSORBER ASSEMBLY" on page 4-104. 		
6	Malfunction in SCU.		Replace the SCU.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Refer to the item corresponding to fault code.	

Fault code No. 98

Fault code No.		98			
Item		Abnormal IMU			
Fail-safe system		Able/Unable to start engine			
		Able/Unable to drive vehicle			
Diagnostic code No.		—			
Indicated		—			
Procedure		—			
Item	m Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion	
1	Abnormal IMU		Check the item of fault code No. 98 for the ECU. Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOS- TIC CODE TABLE (ECU)" on page 9-5.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Refer to the item corresponding to fault code.	

Fault code No.		99			
Item		Abnormal CAN communication (between IMU and SCU)			
Fail-sa	afe system	Able to start engine			
		Able to drive vehicle			
Diagn	ostic code No.	—			
Indica	ted	—			
Proce	dure	—			
ltem	Probable cause of malfunction and check		Maintenance job	Confirmation of service com- pletion	
1	Connection of IMU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected \rightarrow Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 2.	
2	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between SCU coupler and joint coupler. blue/white–blue/white blue/black–blue/black Between the joint coupler and IMU coupler. blue/white–blue/white blue/black–blue/black	Turn the main switch to "OFF" and back to "ON" and check the warning light. The warning light does not come on \rightarrow Service is finished. The warning light comes on \rightarrow Go to item 3.	
3	Malfunction in IMU.		Replace the IMU.		

ELECTRONICALLY ADJUSTABLE SUSPENSION SYSTEM (for YZF-R1M)

Fault code No. —

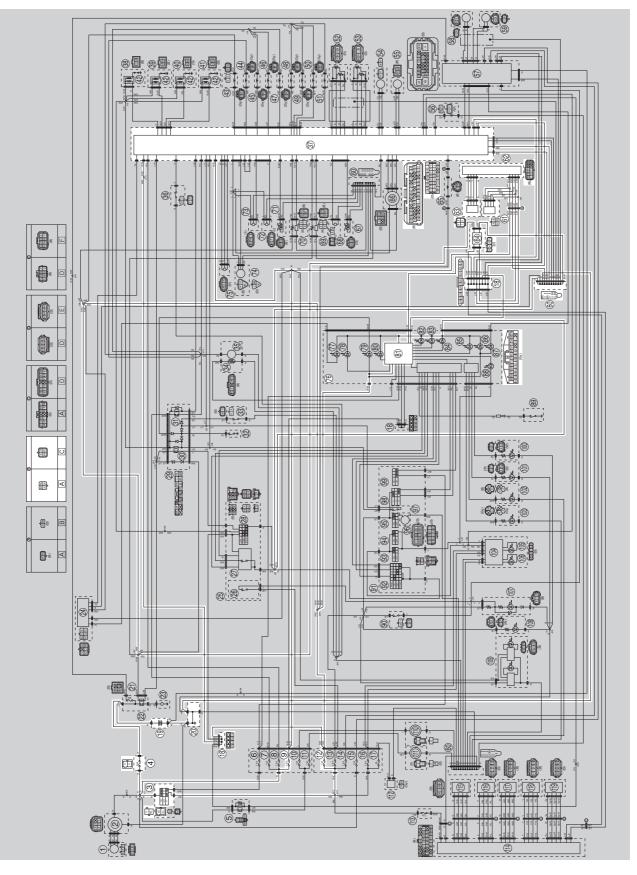
Fault	code No.	ERS icon blinks			
Item		Zero point adjustment of damping force adjustment system was not performed.			
Fail-safe system		Unable to start engine			
		Able/Unable to drive vehicle			
Diagnostic code No.		—			
Indicated		_			
Procedure		—			
ltem	Probable cause of malfunction and che		Maintenance job	Confirmation of service com- pletion	
1	Zero point adjustment of c ing force adjustment syste was not performed.		Turn the main switch to "OFF" and back to "ON" with the vehi- cle stopped.	Check the ERS icon. The ERS icon does not blink \rightarrow Service is finished	

TIP —

If any other fault codes of the SCU and ECU are displayed, repair the faults first.

COMMUNICATION CONTROL SYSTEM (for YZF-R1M)

EAS31671 CIRCUIT DIAGRAM



- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18.Joint coupler
- 19.Battery
- 20.Engine ground
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 61. Yamaha diagnostic tool coupler
- 62.CCU (Communication Control Unit)
- 63.GPS unit
- 64.IMU (Inertial Measurement Unit)
- 76.Meter assembly
- 81.Multi-function meter
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler, CCU, GPS unit)

COMMUNICATION CONTROL SYSTEM (for YZF-R1M)

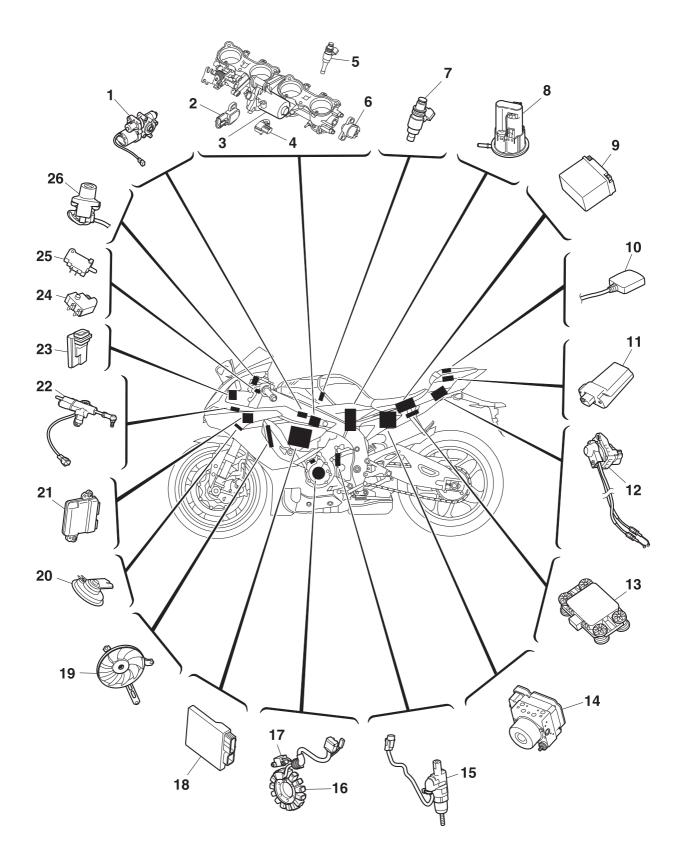
EAS31672

TROUBLESHOOTING

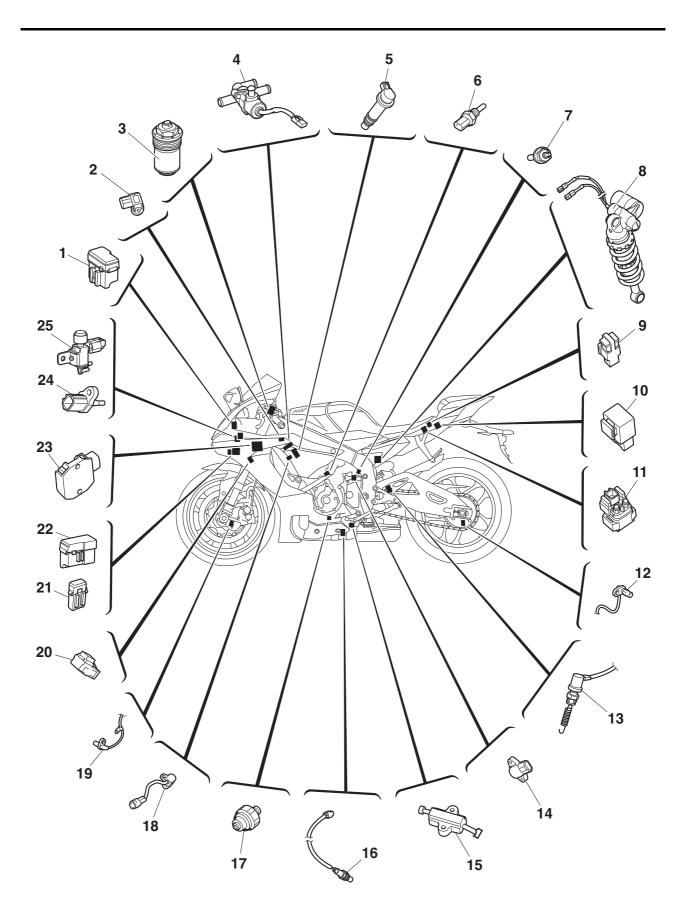
The communication control system failed to function.

- Before troubleshooting, remove the following part(s):
- 1. Front side cowling/Front panel/Side cover
- 2. Rider seat/Passenger seat/Battery cover/Tail cover

1. Check the fuses. (Main, ignition and backup) Refer to "CHECKING THE FUSES" on page 8-180.	NG o	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-181.	NG→	 Clean the battery terminals. Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-177.	NG→	Replace the main switch/immobilizer unit.
OK↓		
 Check the entire communication control system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-169. 	NG→	Properly connect or repair the communi- cation control system's wiring.
OK↓		
Replace the ECU, CCU, GPS unit, IMU or meter assembly. Refer to "REPLACING THE ECU (En- gine Control Unit)" on page 8-180.		

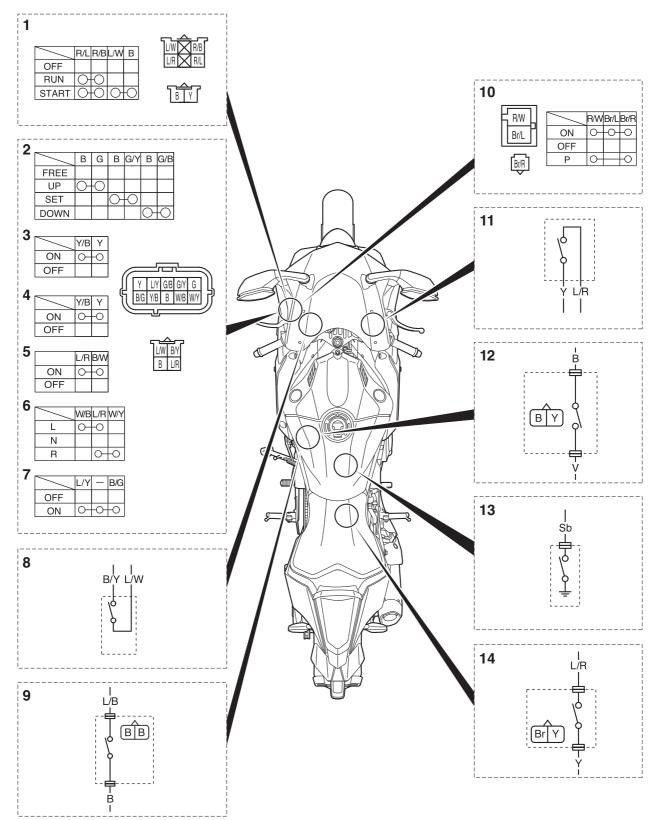


- 1. Intake funnel servo motor
- 2. Accelerator position sensor
- 3. Throttle servo motor
- 4. Intake air pressure sensor
- 5. Primary injector
- 6. Throttle position sensor
- 7. Secondary injector
- 8. Fuel pump
- 9. Battery
- 10.GPS unit (for YZF-R1M)
- 11.CCU (Communication Control Unit) (for YZF-R1M)
- 12.EXUP servo motor
- 13.IMU (Inertial Measurement Unit)
- 14.Hydraulic unit assembly
- 15.Shift switch
- 16.Stator coil
- 17.Crankshaft position sensor
- 18.ECU (Engine Control Unit)
- 19.Radiator fan motor
- 20.Horn
- 21.Headlight control unit
- 22. Steering damper solenoid
- 23.SCU (Suspension Control Unit) (for YZF-R1M)
- 24.Front brake light switch
- 25.Clutch switch
- 26.Main switch/Immobilizer unit



- 1. Fuse box 1
- 2. Atmospheric pressure sensor
- 3. Front fork stepping motor (for YZF-R1M)
- 4. Air induction system solenoid
- 5. Ignition coil
- 6. Coolant temperature sensor
- 7. Neutral switch
- 8. Rear shock absorber assembly stepping motor (for YZF-R1M)
- 9. Main fuse
- 10.Relay unit
- 11.Starter relay
- 12.Rear wheel sensor
- 13.Rear brake light switch
- 14.Gear position sensor
- 15.Sidestand switch
- 16.O₂ sensor
- 17.Oil pressure switch
- 18.Cylinder identification sensor
- 19. Front wheel sensor
- 20.Radiator fan motor relay
- 21.Fuse box 3 (SCU fuse) (for YZF-R1M)
- 22.Fuse box 2
- 23.Rectifier/regulator
- 24.Intake air temperature sensor
- 25.Intake solenoid

EAS30549 CHECKING THE SWITCHES



- 1. Start/engine stop switch
- 2. Mode switch
- 3. Pass/LAP switch
- 4. Dimmer switch
- 5. Horn switch
- 6. Turn signal switch
- 7. Hazard switch
- 8. Clutch switch
- 9. Sidestand switch
- 10.Main switch
- 11.Front brake light switch
- 12.Shift switch
- 13.Neutral switch
- 14.Rear brake light switch

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.

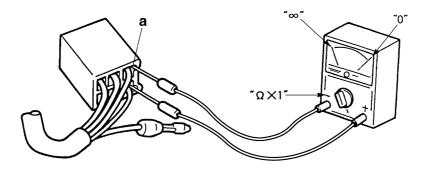
NOTICE

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.



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.



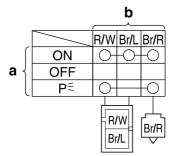
The switches and their terminal connections are illustrated as in the following example of the main switch.

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 indicated by "O____O".

There is continuity between red/white, brown/blue and brown/red when the switch is set to "ON".

There is continuity between red/white and brown/red when the switch is set to " $_{P \in }$ ".



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:
 - Passenger seat/Rider seat Refer to "GENERAL CHASSIS (1)" 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 " $\Omega \times 1$ ".



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	50.0 A	1
Headlight	7.5 A	1
Signaling system	7.5 A	1
Ignition	15.0 A	1
Radiator fan motor (left)	15.0 A	1
Radiator fan motor (right)	10.0 A	1
Hazard	7.5 A	1
Fuel injection system	15.0 A	1

Fuses	Amperage rating	Q'ty
ABS motor	30.0 A	1
ABS ECU	7.5 A	1
ABS solenoid	15.0 A	1
Auxiliary	2.0 A	1
Backup	7.5 A	1
Electronic throttle valve	7.5 A	1
SCU (for YZF-R1M)	7.5 A	1
Spare	30.0 A	1
Spare	15.0 A	1
Spare	10.0 A	1
Spare	7.5 A	1
Spare	2.0 A	1

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

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

EAS31006

REPLACING THE ECU (Engine Control Unit)

- 1. Turn the main switch to "OFF".
- 2. Replace the ECU (Engine Control Unit).
- 3. Clean the throttle bodies and reset the ISC (Idle Speed Control) learning value. Refer to "CHECKING AND CLEANING THE THROTTLE BODIES" on page 7-12.
- 4. Check:
 - Engine idling speed Start the engine, warm it up, and then measure the engine idling speed.

Engine idling speed 1200–1400 r/min

EAS30552

CHECKING AND CHARGING THE BATTERY

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 guantities 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 overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.

ECA22960 NOTICE

Use only the specified genuine YAMAHA battery. Using a different battery may cause the

IMU to fail and the engine to stall.

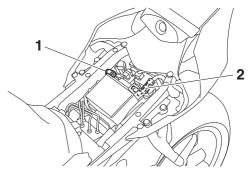
TIP

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/Battery cover Refer to "GENERAL CHASSIS (1)" 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".



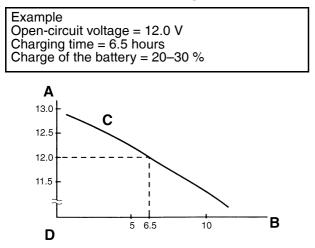
- 3. Remove:
 - Battery Refer to "GENERAL CHASSIS (1)" on page 4-1.
- 4. Check:
 - Battery charge

- a. Connect a pocket tester to the battery terminals.
- Positive tester probe
- positive battery terminal
- Negative tester probe negative battery terminal

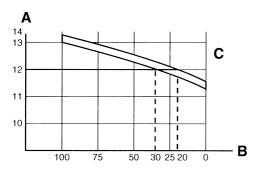
TIP

- The charge state of a 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.



- 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)

WARNING

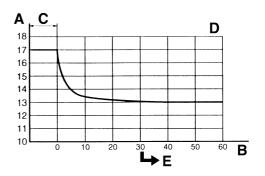
Do not quick charge a battery.

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 to 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 VRLA (Valve Regulated Lead Acid) battery. A variable voltage charger is recommended.

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

TIP -

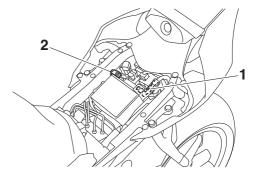
- Set the charging time at 20 hours (maximum).
- e. Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.8 V or more --- Charging is complete. 12.7 V or less --- Recharging is required. Under 12.0 V --- Replace the battery.

- 6. Install:Battery
 - Refer to "GENERAL CHASSIS (1)" on page 4-1.
- 7. Connect:
 - Battery leads
- (to the battery terminals)

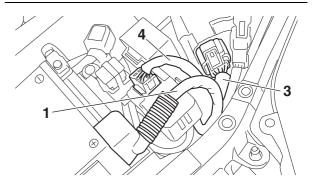
NOTICE

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



TIP_

Route the positive battery lead "1" to the outside of the EXUP servo motor lead "3" and starter relay lead "4".



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

Recommended lubricant Dielectric grease

10.Install:

• Battery cover/Rider seat

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

EAS30553

CHECKING THE RELAYS

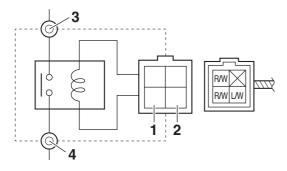
Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.



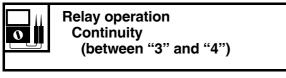
Pocket tester 90890-03112 Analog pocket tester YU-03112-C

- 1. Disconnect the relay from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the relay terminal as shown. Check the relay operation. Out of specification → Replace.

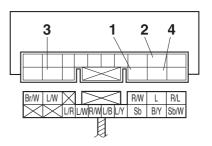
Starter relay



- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



Relay unit (starting circuit cut-off relay)

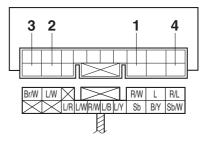


- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



Result Continuity (between "3" and "4")

Relay unit (fuel pump relay)



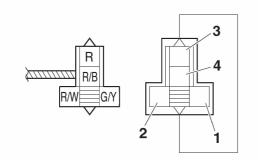
- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



Result Continuity

(between "3" and "4")

Radiator fan motor relay



- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



EAS30795

Result Continuity (between "3" and "4")

CHECKING THE RELAY UNIT (DIODE)

- 1. Check:
- Relay unit (diode) Out of specification → Replace.



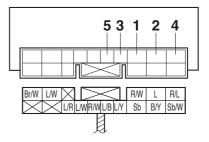
Pocket tester 90890-03112 Analog pocket tester YU-03112-C

TIP -

The pocket tester or the analog pocket tester readings are shown in the following table.

0

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"



- a. Disconnect the relay unit coupler from the wire harness.
- b. 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.



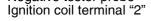
Primary coil resistance 0.85–1.15 Ω

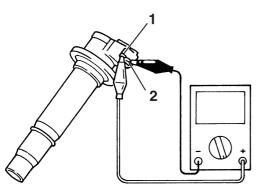
- a. Disconnect the ignition coil coupler from the ignition coil.
- b. Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.



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

- Positive tester probe
- Ignition coil terminal "1"
- Negative tester probe
 Ignition coil terminal "0"





c. Measure the primary coil resistance.

- 2. Check:
 - Secondary coil resistance
 - Out of specification \rightarrow Replace.



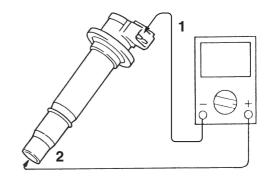
Secondary coil resistance 8.50–11.50 k Ω

a. Connect the pocket tester ($\Omega \times 1$ k) to the ignition coil as shown.



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

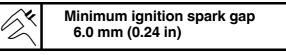
- Negative tester probe
- Ignition coil terminal "1"
- Positive tester probe Spark plug terminal "2"



b. Measure the secondary coil resistance.

EAS30556 CHECKING THE IGNITION SPARK GAP

- 1. Check:
 - Ignition spark gap Out of specification → Perform the ignition system troubleshooting, starting with step 5. Refer to "TROUBLESHOOTING" on page 8-6.



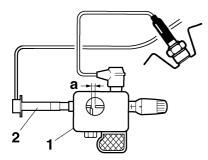
TIP -

If the ignition spark gap is within specification, the ignition system circuit is operating normally.

a. Remove the ignition coil from the spark plug.b. Connect the ignition checker "1" as shown.



Ignition checker 90890-06754 Oppama pet–4000 spark checker YM-34487



- 2. Ignition coil
- c. Turn the main switch to "ON".
- d. Measure the ignition spark gap "a".
- e. Crank the engine by pushing the "(s)" side of the start/engine stop 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.



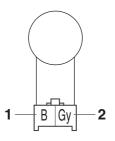
Crankshaft position sensor resistance 189–231 Ω

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
- black "1'
- Negative tester probe
- gray "2"



b. Measure the crankshaft position sensor resistance.

EAS30562

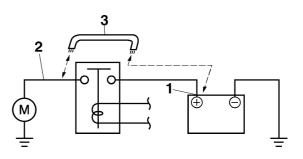
CHECKING THE STARTER MOTOR OPERATION

- 1. Check:
- Starter motor operation
 - Does not operate \rightarrow Perform the electric starting system troubleshooting, starting with step 4.

Refer to "TROUBLESHOOTING" on page 8-14.

a. Connect the positive battery terminal "1" and starter motor lead "2" with a jumper lead "3".

- 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.

CHECKING THE STATOR COIL

1. Disconnect:

EAS30566

• Stator coil coupler

(from the wire harness)

- 2. Check:
- Stator coil resistance
 Out of specification → Replace the stator coil.



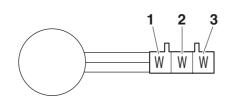
Stator coil resistance 0.112–0.168 Ω (W-W)

a. Connect the digital circuit tester to the stator coil coupler as shown.



Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927

- 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

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CHECKING THE RECTIFIER/REGULATOR 1. Check:

 Rectifier/regulator input voltage Out of specification → Correct the stator coil condition.

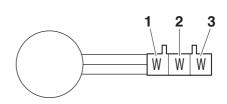
Refer to "CHECKING THE STATOR COIL" on page 8-187.

Rectifier/regulator input voltage above 14 V at 5000 r/min

a. Connect the pocket tester (AC 20 V) to the rectifier/regulator 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. Start the engine and let it run at approximately 5000 r/min.
- c. Measure the rectifier/regulator input voltage.
- *****
- 2. Check:
- Rectifier/regulator output voltage Out of specification → Replace the rectifier/regulator.



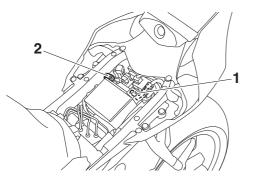
Regulated voltage (DC) 14.3–14.7 V

a. Connect the pocket tester (DC 20 V) to the battery as shown.



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

 Positive tester probe positive battery terminal "1" Negative tester probe negative battery terminal "2"



- b. Start the engine and let it run at approximately 5000 r/min.
- c. Measure the charging voltage.



EAS30569

- **CHECKING THE HORN**
- 1. Check:
 - Horn resistance
 - Out of specification \rightarrow Replace.

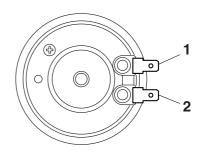
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Horn **Coil resistance 1.07–1.11** Ω

- a. Disconnect the horn leads from the horn terminals.
- b. Connect the digital circuit tester to the horn terminals.

Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe Horn terminal "1"
- Negative tester probe Horn terminal "2

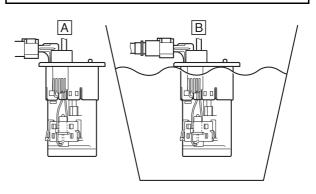


c. Measure the horn resistance.

- 2. Check:
 - Horn sound Faulty sound \rightarrow Replace.

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 \rightarrow Replace the fuel pump.
- Fuel pump is atmosphere "A"
- → Fuel level warning light is come on
 Fuel pump is soaked in fuel "B"
- \rightarrow Fuel level warning light is goes off



CHECKING THE FUEL LEVEL WARNING LIGHT

This model is equipped with a self-diagnosis device for the fuel level detection circuit.

1. Check:

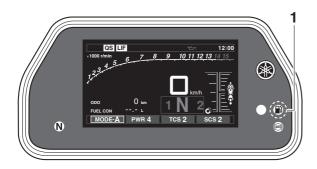
EAS20574

- Fuel level warning light "1"
- (Turn the main switch to "ON".)

Warning light comes on for a few seconds, then goes off \rightarrow Warning light is OK.

Warning light does not come on \rightarrow Replace the meter assembly.

Warning light flashes eight times, then goes off for 3 seconds in a repeated cycle (mal-function detected in fuel sender) \rightarrow Replace the fuel pump assembly.

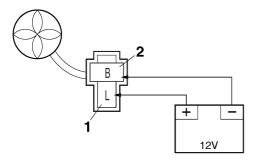


CHECKING THE RADIATOR FAN MOTORS 1. Check:

EAS30577

• Radiator fan motor Faulty/rough movement \rightarrow 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"



c. Measure the radiator fan motor movement.

CHECKING THE COOLANT TEMPERATURE SENSOR

1. Remove:

EWA14130

 Coolant temperature sensor Refer to "CYLINDER HEAD" on page 5-23.

- Handle the coolant temperature sensor with special care.
- Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.

2. Check:

 Coolant temperature sensor resistance Out of specification → Replace.



Coolant temperature sensor resistance $2517-2777 \Omega@20 \ ^{\circ}C \ (68 \ ^{\circ}F)$ Coolant temperature sensor resistance $210-221 \ \Omega@100 \ ^{\circ}C \ (212 \ ^{\circ}F)$

a. Connect the pocket tester ($\Omega \times 1 \text{ k/}\Omega \times 100$) to the coolant temperature sensor as shown.



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

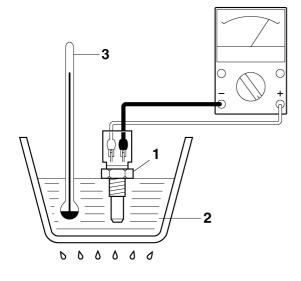
b. Immerse the coolant temperature sensor "1" in a container filled with coolant "2".

TIP

Make sure the coolant temperature sensor terminals do not get wet.

c. Place a thermometer "3" in the coolant.

a. Connect the pocket tester ($\Omega \times 1$ k) to the throttle position sensor terminals as shown.



- d. Heat the coolant or let it cool down to the specified temperatures.
- e. Measure the coolant temperature sensor resistance.

- 3. Install:
- Coolant temperature sensor



Coolant temperature sensor 16 Nm (1.6 m·kgf, 12 ft·lbf)

EAS30581

CHECKING THE THROTTLE POSITION SENSOR

- 1. Remove:
 - Throttle position sensor
 - (from the throttle body)

ECA17540

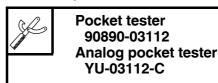
- Handle the throttle position sensor with special care.
- Never subject the throttle position sensor to strong shocks. If the throttle position sensor is dropped, replace it.

2. Check:

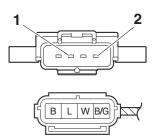
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 Throttle position sensor maximum resistance Out of specification → Replace the throttle position sensor.

Resistance 1.40–2.60 kΩ



- Positive tester probe
- blue "1"
- Negative tester probe black/green "2"
- blablygreen



b. Measure the throttle position sensor maximum resistance.

- 3. Install:
- Throttle position sensor

TIP _

When installing the throttle position sensor, adjust its angle properly. Refer to "ADJUSTING THE THROTTLE POSITION SENSOR" on page 7-16.

EAS30582

CHECKING THE ACCELERATOR POSITION SENSOR

- 1. Remove:
- Accelerator position sensor (from the throttle body)

WARNING

- Handle the accelerator position sensor with special care.
- Never subject the accelerator position sensor to strong shocks. If the accelerator position sensor is dropped, replace it.

2. Check:

Accelerator position sensor maximum resistance

Out of specification \rightarrow Replace the accelerator position sensor.

Resistance 1.40-2.60 kΩ

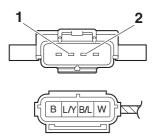
•••••

a. Connect the pocket tester ($\Omega \times 1$ k) to the accelerator position sensor terminals as shown.



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

- Positive tester probe
- blue/yellow "1"Negative tester probe
- Negative tester proble black/blue "2"



b. Measure the accelerator position sensor maximum resistance.

- 3. Install:
- Accelerator position sensor
- TIP -

When installing the accelerator position sensor, adjust its angle properly. Refer to "ADJUSTING THE ACCELERATOR POSITION SENSOR" on page 7-17.

EAS30592

CHECKING THE THROTTLE SERVO MOTOR 1. Remove:

Air filter case

Refer to "AIR FILTER CASE" on page 7-4.

- 2. Check:
 - Throttle valve operation Throttle valves do not fully close → Replace the throttle bodies.

a. Connect two C-size batteries to the throttle servo motor terminals "1" as shown.

ECA17660

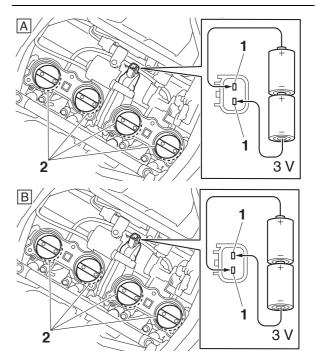
NOTICE

Do not use a 12 V battery to operate the throt-

tle servo motor.

TIP

Do not use old batteries to operate the throttle servo motor.



- A. Check that the throttle valves "2" open.
- B. Check that the throttle valves "2" fully close.

CHECKING THE AIR INDUCTION SYSTEM SOLENOID

- 1. Check:
- Air induction system solenoid resistance Out of specification → Replace.

0

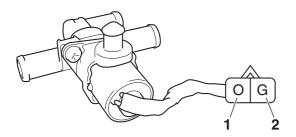
Solenoid resistance 18–22 Ω

- Remove 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
- orange "1' Negative tester probe green "2'



c. Measure the air induction system solenoid resistance.

EAS30588

CHECKING THE ATMOSPHERIC PRESSURE SENSOR

- 1. Check:
 - Atmospheric pressure sensor output voltage Out of specification \rightarrow Replace.



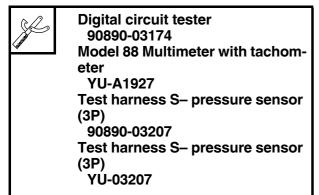
Atmospheric pressure sensor output voltage 3.57-3.71 V@101.3 kPa (3.57-3.71 V@1.01 kgf/cm², 3.57-3.71 V@14.7 psi)

a. Connect the test harness S- pressure sensor (3P) "1" to the atmospheric pressure sensor and wire harness as shown.

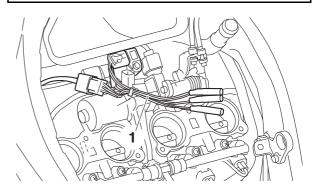
EC420920 NOTICE

Pay attention to the installing direction of the test harness S- pressure sensor (3P) coupler.

b. Connect the digital circuit tester (DCV) to the test harness S- pressure sensor (3P).



- Positive tester probe
- pink (wire harness color)
- Negative tester probe
- black/blue (wire harness color)



- c. Set the main switch to "ON".
- d. Measure the atmospheric pressure sensor output voltage.

EAS30589 **CHECKING THE CYLINDER IDENTIFICATION SENSOR**

- 1. Remove:
 - Fuel tank Refer to "FUEL TANK" on page 7-1.
 - Air filter case Refer to "AIR FILTER CASE" on page 7-4.
- Air filter case duct Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-19.
- 2. Check:
- Cylinder identification sensor output voltage Out of specification \rightarrow Replace.

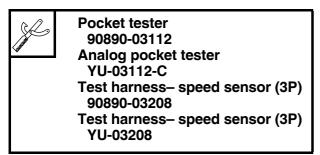


Cylinder identification sensor output voltage (ON) 0.8 V Cylinder identification sensor output voltage (OFF)

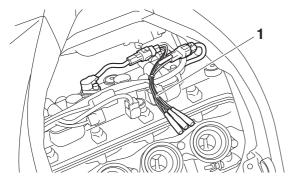
......

4.8 V

- a. Connect the test harness-speed sensor (3P) "1" to the rear speed sensor coupler and wire harness as shown.
- b. Connect the pocket tester (DC 20 V) to the test harness- speed sensor (3P).



Positive tester probe white/black (wire harness color)
Negative tester probe black/blue (wire harness color)



- c. Turn the main switch to "ON".
- d. Rotate the crankshaft.
- e. Measure the voltage. With each full rotation of the crankshaft, the voltage reading should cycle from 0.8 V to 4.8 V to 0.8 V to 4.8 V.

....

EAS30593

CHECKING THE INTAKE AIR PRESSURE SENSOR

- 1. Check:
 - Intake air pressure sensor output voltage Out of specification → Replace.



Intake air pressure sensor output voltage 3.57–3.71 V@101.3 kPa (3.57– 3.71 V@1.01 kgf/cm², 3.57–3.71

•••••

V@14.7 psi)

 a. Connect the test harness S– pressure sensor (3P) "1" to the intake air pressure sensor and wire harness as shown.

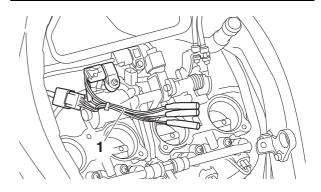
NOTICE

Pay attention to the installing direction of the test harness S– pressure sensor (3P) coupler.

b. Connect the digital circuit tester (DCV) to the

test harness S- pressure sensor (3P).

- Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927 Test harness S- pressure sensor (3P) 90890-03207 Test harness S- pressure sensor (3P) YU-03207
- Positive tester probe
- pink/white (wire harness color)
- Negative tester probe
- black/blue (wire harness color)



- c. Set the main switch to "ON".
- d. Measure the intake air pressure sensor output voltage.

EWA14110

CHECKING THE INTAKE AIR TEMPERATURE SENSOR

- 1. Remove:
- Intake air temperature sensor

- 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.

2. Check:

 Intake air temperature sensor resistance Out of specification → Replace.



EAS30594

a. Connect the pocket tester ($\Omega \times 100$) to the intake air temperature sensor terminal as shown.

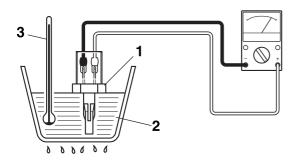


Pocket tester 90890-03112 Analog pocket tester YU-03112-C

- b. Immerse the intake air temperature sensor "1" in a container filled with water "2".
- TIP

Make sure that the intake air temperature sensor terminals do not get wet.

c. Place a thermometer "3" in the water.



- d. Slowly heat the water, then let it cool down to the specified temperature.
- e. Measure the intake air temperature sensor resistance.

- 3. Install:
 - Intake air temperature sensor

EAS31087 CHECKING THE INTAKE SOLENOID

- 1. Check:
- Intake solenoid resistance Out of specification → Replace.

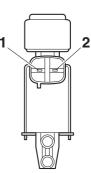


Intake solenoid resistance 42.00–48.00 Ω

- a. Disconnect the intake solenoid coupler from the intake solenoid.
- b. Connect the pocket tester ($\Omega \times 10$) to the intake solenoid terminal as shown.

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

- Positive tester probe
 - Solenoid terminal "1" Negative tester probe
 - Solenoid terminal "2"



- c. Measure the intake solenoid resistance.
- _____

CHECKING THE STEERING DAMPER SOLENOID

1. Remove:

EAS30509

- Front upper cowling Refer to "GENERAL CHASSIS (3)" on page 4-17.
- 2. Check:
 - Steering damper solenoid resistance Out of specification → Replace the steering damper assembly.

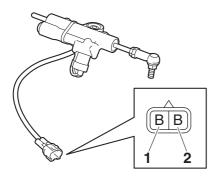
Steering damper solenoid resistance 49.82–56.18 Ω

- a. Disconnect the steering damper lead coupler from wire harness.
- b. Connect the pocket tester ($\Omega \times 10$) to the steering damper lead coupler.



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

- Positive tester probe
 - black "1" Negative tester probe
- black "2"



c. Measure the steering damper solenoid resistance.

EAS3068

CHECKING THE FUEL INJECTORS

The following procedure applies to all of the fuel injectors.

- 1. Remove:
 - Fuel injector Refer to "THROTTLE BODIES" on page 7-9 or "AIR FILTER CASE" on page 7-4.
- 2. Check:
 - Fuel injector resistance Out of specification \rightarrow Replace the fuel injector.



Fuel injector Resistance

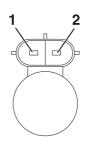
12.0 Ω@20 °C (68 °F)

- a. Disconnect the fuel injector coupler from the fuel injector.
- b. Connect the pocket tester ($\Omega \times 10$) to the fuel injector coupler as shown.



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

- Positive tester probe
- Injector terminal "1"
- Négative tester probe
- Injector terminal "2"



c. Measure the fuel injector resistance.

EAS31673

CHECKING THE WHEEL SWITCH

- 1. Check:
 - Wheel switch "1" output voltage Out of specification \rightarrow Replace the right handlebar switch.

......................

a. Connect the pocket tester (DC 20 V) to the right handlebar switch coupler as shown.



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

- Positive tester probe
- white/green "2'
- Negative tester probe black/yellow "3"
- b. Turn the main switch to "ON".
- c. When turning the wheel switch in direction "a" and "b", check that the output voltage is within the specified values.



Output voltage reading cycle More than 5 V to less than 0.5 V then back to more than 5 V to less than 0.5 V

d. Connect the pocket tester (DC 20 V) to the right handlebar switch coupler as shown.



90890-03112 Analog pocket tester YU-03112-C

- Positive tester probe
- white/black "4'
- Negative tester probe black/yellow "3"
- e. When turning the wheel switch in direction

"a", check that the output voltage is within the specified values.

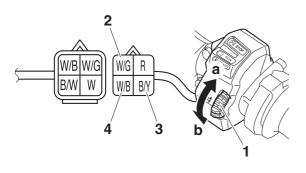


Output voltage More than 5 V

f. When turning the wheel switch in direction "b", check that the output voltage is within the specified values.



Output voltage Less than 0.5 V



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EVENT CODE TABLE	(3
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TROUBLESHOOTING

TROUBLESHOOTING

EAS30599

GENERAL INFORMATION

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(s)
- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Improperly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve
- 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 cap breather hose
 - Deteriorated or contaminated fuel
- Clogged or damaged fuel hose
- 2. Fuel pump
 - Faulty fuel pump
 - Faulty relay unit (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
 - Broken generator rotor woodruff key
- 6. Switches and wiring
- Faulty main switch
- Faulty start/engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty sidestand switch
- Faulty clutch switch
- Improperly grounded circuit
- Loose connections
- 7. Starting system
 - Faulty starter motor
 - Faulty starter relay
 - Faulty relay unit (starting circuit cut-off relay)
 - Faulty starter clutch

EAS30601

INCORRECT ENGINE IDLING SPEED Engine

- 1. Cylinder(s) and cylinder head(s)
- 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 grip 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
- Broken generator rotor woodruff key

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-I

Fuel system

- 1. Throttle body (-ies)
- Faulty throttle body
- Faulty YCC-T
- 2. 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

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
 - Broken 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(s) 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
- 4. Thermostat
 - Thermostat stays closed
- 5. Oil cooler
- Clogged or damaged oil cooler
- 6. 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

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

• Faulty front fork stepping motor (for YZF-R1M)

EAS30611

UNSTABLE HANDLING Handlebar

Bent or improperly installed handlebar
 Stoering head components

Steering head components

- Improperly installed upper bracket
- Improperly installed lower bracket (improperly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork leg(s)

- Uneven oil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Broken fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Swingarm

- Worn bearing or bushing
- Bent or damaged swingarm

Rear shock absorber assembly

- Faulty rear shock absorber spring
- Leaking oil or gas
- Faulty rear suspension stepping motor (for YZF-R1M)

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

- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Faulty headlight assembly
- Tail/brake light does not come on
- Faulty brake light switch
- Too many electrical accessories

• Incorrect connection

• Faulty tail/brake light assembly

Turn signal does not come on

- Faulty turn signal switch
- Faulty meter assembly
- Faulty turn signal light
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

Turn signal blinks slowly

- Faulty meter assembly
- Faulty main switch
- Faulty turn signal switch
- Turn signal remains lit
- Faulty meter assembly

Turn signal blinks quickly

• Faulty meter assembly

Horn does not sound

- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

EAS30848

TROUBLESHOOTING AT THE ABS WARNING LIGHT

Refer to "BASIC PROCESS FOR TROUBLE-SHOOTING" on page 8-129.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)

If there is a malfunction in the fuel injection system, the engine trouble and system warning light "1" will come on, and a fault code number "2" will be displayed. If there are malfunctions in other systems, refer to the troubleshooting sections for the systems indicated by the warning indicators.



SELF-DIAGNOSTIC FUNCTION TABLE

For details of the fault code, refer to "TROUBLESHOOTING METHOD (ECU)" on page 8-50.

Fault code No.	Item
8	Gear position sensor: open or short circuit detected.
11	Cylinder identification sensor: no normal signals are received from the cylinder identification sensor.
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: open or short circuit detected.
17	EXUP servo motor: open or short circuit detected.
18	EXUP servo motor: stuck EXUP servo motor is detected.
19	Sidestand switch: a break or disconnection of the blue/yellow lead of the ECU is detected.
20	Intake air pressure sensor or atmospheric pressure sensor: when the main switch is turned to "ON", the intake air pressure sensor voltage and atmospheric 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 1: no normal signals are received from the O_2 sensor 1.
30	Latch up detected.
33	Cylinder-#1 ignition coil: open or short circuit detected in the primary lead of the cylinder-#1 ignition coil.
34	Cylinder-#2 ignition coil: open or short circuit detected in the primary lead of the cylinder-#2 ignition coil.

Fault code No.	Item	
35	Cylinder-#3 ignition coil: open or short circuit detected in the primary lead of the cylinder-#3 ignition coil.	
36	Cylinder-#4 ignition coil: open or short circuit detected in the primary lead of the cylinder-#4 ignition coil.	
39	Primary injector: open or short circuit detected.	
40	Secondary injector: open or short circuit detected.	
41	IMU (Inertial Measurement Unit): no normal signals are received from the IMU (Inertial Measurement Unit).	
	Rear wheel sensor: no normal signals are received from the rear wheel sensor.	
42	Neutral switch: open or short circuit is detected.	
	Clutch switch: open or short circuit is detected.	
43	Fuel system voltage: incorrect voltage supplied to the fuel injector and fuel pump.	
44	EEPROM fault code number: an error is detected while reading or writing on EEPROM.	
45	Malfunction in ECU internal circuit (power source self cut off does not work)	
46	Charging voltage is abnormal.	
50	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter display.)	
51	Immobilizer unit: Code cannot be transmitted between the key and the immobilizer unit.	
52	Immobilizer unit: Codes between the key and immobilizer unit do not match.	
53	Immobilizer unit: Codes cannot be transmitted between the ECU and the immobilizer unit.	
54	Immobilizer unit: Codes transmitted between the ECU and the immobilizer unit do not match.	
55	Immobilizer unit: Key code registration malfunction.	
56	ECU: Unidentified code is received.	
59	Accelerator position sensor: open or short circuit detected.	
60	YCC-T drive system: malfunction detected.	
66	Steering damper solenoid: open or short circuit detected.	
68	O_2 sensor 2: no normal signals are received from the O_2 sensor 2.	
69	Front wheel sensor: no normal signals are received from the front wheel sensor.	
70	Engine idling stop	
98	The ECU cannot receive fault signals from the IMU, or it cannot receive normal signals.	
99	No signal exchange between ECU and IMU.	

EAS31056

COMMUNICATION ERROR WITH THE METER

For details of the fault code, refer to "TROUBLESHOOTING METHOD (ECU)" on page 8-50.

Fault code No.	Item
89 (Yamaha diagnostic tool) Err (multi-function meter dis- play)	Multi-function meter: signals cannot be transmitted between the ECU and the multi-function meter.

EAS31057

DIAGNOSTIC CODE: SENSOR OPERATION TABLE

Diagnostic code No.	Item	Meter display	Procedure
01	Throttle position sensor sig- nal 1		
	Fully closed position	11–21	Check with throttle valves fully closed.
	Fully open position	96–106	Check with throttle valves fully open.
02	Atmospheric pressure	Displays the atmospheric pressure.	Compare the actually mea- sured atmospheric pressure with the meter display value.
03	Intake air pressure	Displays the intake air pres- sure.	Operate the throttle while pushing the "()" side of the start/engine stop switch. (If the display value changes, the performance is OK.)
05	Air temperature	Displays the air temperature.	Compare the actually mea- sured air temperature with the meter display value.
06	plays temperature closer to sur		Compare the actually mea- sured coolant temperature with the meter display value.
07	Rear wheel vehicle speed pulses	Rear wheel 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.
09	Fuel system voltage (battery voltage)	Fuel system voltage Approximately 12.0	Set the start/engine stop switch to "O", and then com- pare the actually measured battery voltage with the meter display value. (If the actually measured battery voltage is low, recharge the battery.)
13	Throttle position sensor sig- nal 2		
	Fully closed position	9–23	Check with throttle valves fully closed.
	Fully open position	94–108	Check with throttle valves fully open.
14	Accelerator position sensor signal 1		
	Fully closed position	12–22	Check with throttle grip fully closed position.
	Fully open position	97–107	Check with throttle grip fully open position.

Diagnostic code No.	Item	Meter display	Procedure
15	Accelerator position sensor signal 2		
	Fully closed position	10–24	Check with throttle grip fully closed position.
	Fully open position	95–109	Check with throttle grip fully open position.
16	Front wheel vehicle speed pulses	Front wheel speed pulse 0–999	Check that the number increases when the front wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.
17	Bank angle display	Displays the bank angle increments of 5° • 0–5° (vehicle is vertical) • Less than 30° (when the sidestand is used)	Check that 0–5° is displayed when the vehicle is vertical and that the displayed value increases as the vehicle con- tinues to incline.
20	Sidestand switch		Extend and retract the sides- tand (with the transmission in
	 Sidestand retracted 	ON	gear).
	Sidestand extended	OFF	
21	Neutral switch and clutch switch		Operate the transmission, clutch lever, and sidestand.
	 Transmission is in neutral 	ON	
	• Transmission is in gear or the clutch lever released	OFF	
	• Clutch lever is squeezed with the transmission in gear and when the sides- tand is retracted	ON	
	• Clutch lever is squeezed with the transmission in gear and when the sides- tand is extended	OFF	
60	EEPROM fault code display		—
	No history	00 • No malfunctions detected (If the self-diagnosis fault code 44 is indicated, the ECU is defective.)	
	• History exists	 01–04 (Cylinder fault code) (If more than one cylinder is defective, the display alternates every two seconds to show all the detected cylinder numbers. When all cylinder numbers are shown, the display repeats the same process.) 11 (Data error for ISC (Idle Speed Control) learning values) 	

Diagnostic code No.	Item	Meter display	Procedure
61	Malfunction history code display		—
	No history	00	
	• History exists	 Fault codes 8–99 (If more than one code number is detected, the display alternates every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.) 	
62	Malfunction history code era- sure		
	No history	00	—
	• History exists	• 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 start/engine stop switch from " \mathfrak{A} " to " \cap ".
63	Malfunction code reinstate- ment (for fault code No. 24, 40, 42, 68, 69 only)		
	No malfunction code	00	_
	Malfunction code exists	 Fault code 24, 40, 42, 68, 69 (If more than one code number is detected, the display alternates every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.) 	To reinstate, set the start/engine stop switch from "⊠" to "∩".
67	ISC (Idle Speed Control) learning condition display ISC (Idle Speed Control) learning data erasure	00 ISC (Idle Speed Control) learning data has been erased. 01 It is not necessary to erase the ISC (Idle Speed Control) learning data. 02 It is necessary to erase the ISC (Idle Speed Control) learning data.	To erase the ISC (Idle Speed Control) learning data, set the start/engine stop switch from "⊠" to "∩" 3 times in 5 seconds.
70	Control number 0–254 [-] —		—
86	Shift switch		Check the switch condition
	 Shift pedal up position 	ON	by operating the shift pedal.
	• Other position than the shift pedal up position	OFF	

EAS31058 DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE

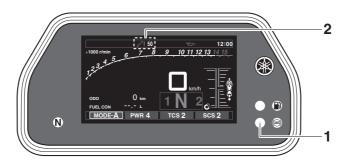
Diagnostic code No.	Item	Actuation	Procedure
30	Cylinder-#1 ignition coil	Actuates the cylinder-#1 igni- tion coil five times at one- second intervals. Illuminates the engine trou- ble and system warning light.	Check that a spark is generated five times.Connect an ignition checker.
31	Cylinder-#2 ignition coil	Actuates the cylinder-#2 igni- tion coil five times at one- second intervals. Illuminates the engine trou- ble and system warning light.	Check that a spark is generated five times.Connect an ignition checker.
32	Cylinder-#3 ignition coil	Actuates the cylinder-#3 igni- tion coil five times at one- second intervals. Illuminates the engine trou- ble and system warning light.	Check that a spark is generated five times.Connect an ignition checker.
33	Cylinder-#4 ignition coil	Actuates the cylinder-#4 igni- tion coil five times at one- second intervals. Illuminates the engine trou- ble and system warning light.	Check that a spark is generated five times.Connect an ignition checker.
34	Intake funnel servo motor	Actuates the intake funnels (up position down, position for each six seconds). Illuminates the engine trou- ble and system warning light.	Check the operating of the intake funnel servo motor.
36	Primary injector #1	Actuates the primary injec- tor #1 five times at one-sec- ond intervals. Illuminates the engine trou- ble and system warning light.	Check that primary injector #1 is actuated five times by listening for the operating sound.
37	Primary injector #2	Actuates the primary injec- tor #2 five times at one-sec- ond intervals. Illuminates the engine trou- ble and system warning light.	Check that primary injector #2 is actuated five times by listening for the operating sound.
38	Primary injector #3	Actuates the primary injec- tor #3 five times at one-sec- ond intervals. Illuminates the engine trou- ble and system warning light.	Check that primary injector #3 is actuated five times by listening for the operating sound.
39	Primary injector #4	Actuates the primary injec- tor #4 five times at one-sec- ond intervals. Illuminates the engine trou- ble and system warning light.	Check that primary injector #4 is actuated five times by listening for the operating sound.
40	Secondary injector #1	Actuates the secondary injector #1 five times at one- second intervals. Illuminates the engine trou- ble and system warning light.	Check that secondary injec- tor #1 is actuated five times by listening for the operating sound.
41	Secondary injector #2	Actuates the secondary injector #2 five times at one- second intervals. Illuminates the engine trou- ble and system warning light.	Check that secondary injec- tor #2 is actuated five times by listening for the operating sound.

Diagnostic code No.	Item	Actuation	Procedure
42	Secondary injector #3	Actuates the secondary injector #3 five times at one- second intervals. Illuminates the engine trou- ble and system warning light.	Check that secondary injec- tor #3 is actuated five times by listening for the operating sound.
43	Secondary injector #4	Actuates the secondary injector #4 five times at one- second intervals. Illuminates the engine trou- ble and system warning light.	Check that secondary injec- tor #4 is actuated five times by listening for the operating sound.
47	Steering damper solenoid	When the start/engine stop switch is "ON", the steering damper solenoid is on. When the start/engine stop switch is "OFF", the steering damper solenoid is off. When the steering damper solenoid is on, illuminates the engine trouble and sys- tem warning light.	Check the operating of the steering damper.
48	Air induction system sole- noid	Actuates the air induction system solenoid five times at one-second intervals. Illuminates the engine trou- ble and system warning light.	Check that the air induction system solenoid is actuated five times by listening for the operating sound.
49	Intake solenoid	Actuates fuel intake sole- noid five times at one-sec- ond intervals. Illuminates the engine trou- ble and system warning light.	Check that intake solenoid is actuated five times by listen- ing for the operating sound.
50	Relay unit	Actuates the relay unit five times at one-second inter- vals. Illuminates the engine trou- ble and system warning light.	Check that the relay unit is actuated five times by listen- ing for the operating sound.
51	Radiator fan motor relay	Actuates the radiator fan motor relay five times at five- second intervals. Illuminates the engine trouble and sys- tem warning light.	Check that the radiator fan motor relay is actuated five times by listening for the operating sound.
52	Headlight	Actuates the headlight five times at five-second inter- vals. Illuminates the engine trouble and system warning light.	Check that the headlight comes on five times.
53	EXUP servo motor	After the EXUP is fully closed, it stops at the open- ing base position (intermedi- ate position). This operation takes approxi- mately three seconds during which time the engine trou- ble and system warning light comes on.	Check the operating sound.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (SCU) (for YZF-R1M)

TIP -

If there is a malfunction in the electronically adjustable suspension system, the engine trouble and system warning light "1" will come on, and a fault code number "2" will be displayed.



EAS30963

SELF-DIAGNOSTIC FUNCTION TABLE

TIP -

For details of the fault code, refer to "TROUBLESHOOTING METHOD (SCU)" on page 8-155.

Fault code No.	Item
7	Abnormal ABS
9	Abnormal CAN communication (between ECU and SCU)
10	Abnormal CAN communication (between ABS ECU and SCU)
42	Abnormal rear wheel sensor
44	Abnormal SCU EEPROM
46	Abnormal SCU power supply voltage
50	Abnormality inside SCU
66	Steering damper stepping motor (manufactured by Öhlins: optional): open circuit or short-cir- cuit detected.
89 (or "Err" is displayed)	Abnormal CAN communication (between meter assembly and SCU)
93	Stepping motor: open or short circuit detected.
98	Abnormal IMU
99	Abnormal CAN communication (between IMU and SCU)
ERS icon blinks	Zero point adjustment of damping force adjustment system was not performed.

EAS31059

DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Indicated	Procedure
09	Monitor voltage	Displays the SCU power supply voltage. Approximately 12.0 V	Check the displayed SCU power supply voltage.

EVENT CODE TABLE

TIP _

The event code numbers listed below cannot be displayed on the meter. To display the event code numbers, use the Yamaha diagnostic tool.

No.	Item	Symptom	Possible causes	Note
192	Intake air pres- sure sensor	Brief abnormality detected in the intake air pressure sensor	Same as fault code 13	Perform the inspection items listed for fault code No. 13.
193	Throttle position sensor	Brief abnormality detected in the throt- tle position sensor	Same as fault code 15	Perform the inspection items listed for fault code No. 15.
194	EXUP servo motor circuit	Brief abnormality detected in EXUP servo motor circuit	Same as fault code 17	Perform the inspection items listed for fault code 17.
195	Sidestand switch	Brief abnormality detected in the ECU (blue/yellow) input line	Same as fault code 19	Perform the inspection items listed for fault code No. 19.
196	Coolant tempera- ture sensor	Brief abnormality detected a in the coolant temperature sensor	Same as fault code 21	Perform the inspection items listed for fault code No. 21.
197	Intake air temper- ature sensor	Brief abnormality detected in the intake air temperature sen- sor	Same as fault code 22	Perform the inspection items listed for fault code No. 22.
198	Atmospheric pressure sensor	Brief abnormality detected in atmo- spheric pressure sen- sor	Same as fault code 23	Perform the inspection items listed for fault code 23.
207	Accelerator posi- tion sensor	Brief abnormality detected in the accel- erator position sensor	Same as fault code 59	Perform the inspection items listed for fault code No. 59.
220	Gear position sensor	Brief abnormality detected in the gear position sensor	Same as fault code 8	Perform the inspection items listed for fault code 8.
240	O ₂ sensor (Stuck at the upper limit for adjustment)	During O ₂ feedback, the adjustment is maintained at the upper limit	 Open or short circuit in the wire harness between the sensor and ECU Drop in fuel pressure Clogged fuel injector Fault in sensor Malfunction in ECU Malfunction in the fuel injection system 	 If a fault code is occurring, respond to that first. * Rarely, Code 240 occurs even when the system is functioning properly.
241	O ₂ sensor (Stuck at the lower limit for adjustment)	During O ₂ feedback, the adjustment is maintained at the lower limit	 Open or short circuit in the wire harness between the sensor and ECU Drop in fuel pressure Clogged fuel injector Fault in sensor Malfunction in ECU Malfunction in the fuel injection system 	 If a fault code is occurring, respond to that first. * Rarely, Code 241 occurs even when the system is functioning properly.

EVENT CODE TABLE

No.	Item	Symptom	Possible causes	Note
242	ISC (Stuck at the upper limit for adjustment)	During idling, the adjustment is main- tained at the upper limit	 Idling engine speed is slow Clogged throttle body Poorly adjusted throt- tle cable Poorly adjusted clutch cable Malfunction in the fuel injection system Dirty or worn spark plug Malfunction in the battery Malfunction in ECU 	 Implement diagnosis mode D67, and check the ISC maintenance request. If a fault code is occur- ring, respond to that first. * Rarely, Code 242 occurs even when the system is functioning properly.
243	ISC (Stuck at the lower limit for adjustment)	During idling, the adjustment is main- tained at the lower limit	 Idling engine speed is fast Poorly adjusted throt-tle cable Poorly adjusted clutch cable Malfunction in the fuel injection system Dirty or worn spark plug Malfunction in the battery Malfunction in ECU 	 If a fault code is occurring, respond to that first. * Rarely, Code 243 occurs even when the system is functioning properly.
244	Poor start- ing/inability to start	Poor starting/inability to start detected	 No gasoline Malfunction in the fuel injection system Dirty or worn spark plug Malfunction in the battery Malfunction in ECU 	 If a fault code is occurring, respond to that first. * Rarely, Code 244 occurs even when the system is functioning properly.
245	Engine stop	Engine stop detected	 No gasoline Poorly adjusted throt- tle cable Poorly adjusted clutch cable Malfunction in the fuel injection system Dirty or worn spark plug Malfunction in the battery Malfunction in ECU 	 If a fault code is occurring, respond to that first. * Rarely, Code 245 occurs even when the system is functioning properly.

WIRING DIAGRAM

YZF-R1/YZF-R1F 2015

- 1. AC magneto
- 2. Rectifier/regulator
- 3. Main switch
- 4. Main fuse
- 5. Radiator fan motor relay
- 6. Hazard lighting fuse
- 7. Fuel injection system fuse
- 8. Electric throttle valve fuse
- 9. Backup fuse
- 10. Radiator fan motor fuse (right)
- 11. Radiator fan motor fuse (left)
- 12. Ignition fuse
- 13. Signaling system fuse
- 14. ABS ECU fuse
- 15. ABS solenoid fuse
- 16. Headlight fuse
- 17. Auxiliary fuse
- 18. Joint coupler
- 19. Battery
- 20. Engine ground
- 21. ABS motor fuse
- 22. Starter relay
- 23. Starter motor
- 24. Immobilizer unit
- 25. Handlebar switch (right)
- 26. Front brake light switch
- 27. Wheel switch
- 28. Start/engine stop switch
- 29. Relay unit
- 30. Starting circuit cut-off relay
- 31. Fuel pump relay
- 32. Neutral switch
- 33. Sidestand switch
- 34. Fuel sender
- 35. Fuel pump
- 36. Shift switch
- 37. ECU (Engine Control Unit)
- 38. Ignition coil #1
- 39. Ignition coil #2
- 40. Ignition coil #3
- 41. Ignition coil #4
- 42. Spark plug
- 43. Air induction system solenoid
- 44. Primary injector #1
- 45. Primary injector #2
- 46. Primary injector #3
- 47. Primary injector #4
- 48. Secondary injector #1
- 49. Secondary injector #2
- 50. Secondary injector #3
- 51. Secondary injector #4
- 52. Accelerator position sensor
- 53. Throttle position sensor
- 54. Intake funnel servo motor
- 55. Throttle servo motor
- 56. Steering damper solenoid
- 57. ABS ECU (Electronic Control

- Unit)
- 58. Front wheel sensor
- 59. Rear wheel sensor
- 60. Joint connector
- 61. Yamaha diagnostic tool coupler

111.Radiator fan motor (left)

B. Sub-wire harness (intake sole-

C. Sub-wire harness (Yamaha di-

agnostic tool coupler)

112.Auxiliary DC outlet

A. Wire harness

noid)

- 62. CCU (Communication Control Unit) (OPTION)
- 63. GPS unit (OPTION)
- 64. IMU (Inertial Measurement Unit)
- 65. Intake solenoid
- 66. EXUP servo motor
- 67. Coolant temperature sensor
- 68. Crankshaft position sensor
- $69.O_2$ sensor 2 (right side)
- $70.O_2$ sensor 1 (left side)
- 71. Intake air temperature sensor
- 72. Atmospheric pressure sensor
- 72. Autospheric pressure senso
- 73. Intake air pressure sensor
- 74. Cylinder identification sensor
- 75. Gear position sensor
- 76. Meter assembly
- 77. Immobilizer system indicator light
- 78. Fuel level warning light
- 79. Neutral indicator light
- 80. Shift timing indicator light
- 81. Multi-function meter
- 82. Stability control indicator light
- 83. Oil pressure and coolant temperature warning light
- 84. Engine trouble and system warning light
- 85. Turn signal indicator light
- 86. Meter light
- 87. ABS warning light
- 88. High beam indicator light
- 89. Oil pressure switch
- 90. Rear brake light switch
- 91. Handlebar switch (left)
- 92. Mode switch
- 93. Pass/LAP switch
- 94. Dimmer switch
- 95. Horn switch

97. Clutch switch

99. Hazard switch

98. Turn signal switch

100.Rear turn signal light (right)

102.Front turn signal light (right)

103.Front turn signal light (left)

104.Headlight control unit

105.Headlight (high beam)

106.Headlight (low beam)

110.Radiator fan motor (right)

107.Tail/brake light

109.Auxiliary light

108.License plate light

101.Rear turn signal light (left)

96. Horn

YZF-R1M/YZF-R1MF 2015

- 1. AC magneto
- 2. Rectifier/regulator
- 3. Main switch
- 4. Main fuse
- 5. Radiator fan motor relay
- 6. Hazard lighting fuse
- 7. Fuel injection system fuse
- 8. Electric throttle valve fuse
- 9. Backup fuse
- 10. Radiator fan motor fuse (right)
- 11. Radiator fan motor fuse (left)
- 12. Ignition fuse
- 13. Signaling system fuse
- 14. ABS ECU fuse
- 15. ABS solenoid fuse
- 16. Headlight fuse
- 17. Auxiliary fuse
- 18. Joint coupler
- 19. Battery
- 20. Engine ground
- 21. ABS motor fuse
- 22. Starter relay
- 23. Starter motor
- 24. Immobilizer unit
- 25. Handlebar switch (right)
- 26. Front brake light switch
- 27. Wheel switch
- 28. Start/engine stop switch
- 29. Relay unit
- 30. Starting circuit cut-off relay
- 31. Fuel pump relay
- 32. Neutral switch
- 33. Sidestand switch
- 34. Fuel sender
- 35. Fuel pump
- 36. Shift switch
- 37. ECU (Engine Control Unit) 38. Ignition coil #1
- 38. Ignition coll #1
- 39. Ignition coil #2
- 40. Ignition coil #3
- 41. Ignition coil #4
- 42. Spark plug
- 43. Air induction system solenoid
- 44. Primary injector #1
- 45. Primary injector #2
- 46. Primary injector #3
- 47. Primary injector #4
- 48. Secondary injector #1
- 49. Secondary injector #2
- 50. Secondary injector #3
- 51. Secondary injector #4
- 52. Accelerator position sensor
- 53. Throttle position sensor
- 54. Intake funnel servo motor
- 55. Throttle servo motor
- 56. Steering damper solenoid
- 57. ABS ECU (Electronic Control Unit)
- 58. Front wheel sensor

- 59. Rear wheel sensor
- 60. Joint connector
- 61. Yamaha diagnostic tool coupler

113.SCU fuse

Unit)

(right)

sion damping)

damping)

(OPTION)

A. Wire harness

GPS unit)

harness)

lenoid)

noid)

114.SCU (Suspension Control

116.Front fork stepping motor

115.Front fork stepping motor (left)

117.Rear shock absorber assem-

118.Rear shock absorber assem-

119.Steering damper solenoid

bly stepping motor (rebound

B. Sub-wire harness (intake sole-

C. Sub-wire harness (Yamaha di-

agnostic tool coupler, CCU,

D. Sub-wire harness (SCU, steer-

E. Sub-wire harness (damper so-

F. Sub-wire harness (front fork

stepping motor)

ing damper solenoid, sub-wire

bly stepping motor (compres-

- 62. CCU (Communication Control
- Unit) 63. GPS unit
- 64. IMU (Inertial Measurement Unit)
- 65. Intake solenoid
- 66. EXUP servo motor
- 67. Coolant temperature sensor
- 68. Crankshaft position sensor
- 69. O₂ sensor 2 (right side)
- 70. O₂ sensor 1 (left side)
- 71. Intake air temperature sensor
- 72. Atmospheric pressure sensor
- 73. Intake air pressure sensor
- 74. Cylinder identification sensor
- 75. Gear position sensor
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- 78. Fuel level warning light
- 79. Neutral indicator light
- 80. Shift timing indicator light
- 81. Multi-function meter
- 82. Stability control indicator light
- 83. Oil pressure and coolant temperature warning light
- 84. Engine trouble and system warning light
- 85. Turn signal indicator light
- 86. Meter light
- 87. ABS warning light
- 88. High beam indicator light
- 89. Oil pressure switch
- 90. Rear brake light switch
- 91. Handlebar switch (left)
- 92. Mode switch
- 93. Pass/LAP switch
- 94. Dimmer switch
- 95. Horn switch
- 96. Horn
- 97. Clutch switch

99. Hazard switch

98. Turn signal switch

100.Rear turn signal light (right)

102.Front turn signal light (right)

103.Front turn signal light (left)

104.Headlight control unit

105.Headlight (high beam)

106.Headlight (low beam) 107.Tail/brake light

110.Radiator fan motor (right) 111.Radiator fan motor (left)

108.License plate light

112.Auxiliary DC outlet

109.Auxiliary light

101.Rear turn signal light (left)

EAS30613 COLOR CODE			
В	Black		
Br	Brown		
Ch	Chocolate		
Dg G	Dark green		
	Green		
Gy L	Gray		
	Blue		
Lg O	Light green		
P	Orange Pink		
r R	Red		
n Sb			
V	Sky blue		
W	Violet White		
Y	Yellow		
r B/G	Black/Green		
B/L B/D	Black/Blue Black/Red		
B/R	Black/White		
B/W	Black/Yellow		
B/Y Br/B	Brown/Black		
Br/L	Brown/Blue		
Br/R	Brown/Red		
	Brown/White		
Br/W			
Br/Y	Brown/Yellow Green/Black		
G/B G/L	Green/Blue		
G/O	Green/Orange		
G/R	Green/Red		
G/W	Green/White		
G/Y	Green/Yellow		
Gy/B	Gray/Black		
Gy/G	Gray/Green		
Gy/R	Gray/Red		
Gy/Y	Gray/Yellow		
L/B	Blue/Black		
L/G	Blue/Green		
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/L	Pink/Blue		
P/W	Pink/White		
R/B	Red/Black		
R/G	Red/Green		
R/L	Red/Blue		
R/W	Red/White		
R/Y	Red/Yellow		
Sb/W	Sky blue/White		
W/B	White/Black		
W/G	White/Green		
W/L	White/Blue		
W/R	White/Red		
W/Y	White/Yellow		
Y/B	Yellow/Black		

Y/G Y/L Y/R

Yellow/Green Yellow/Blue Yellow/Red

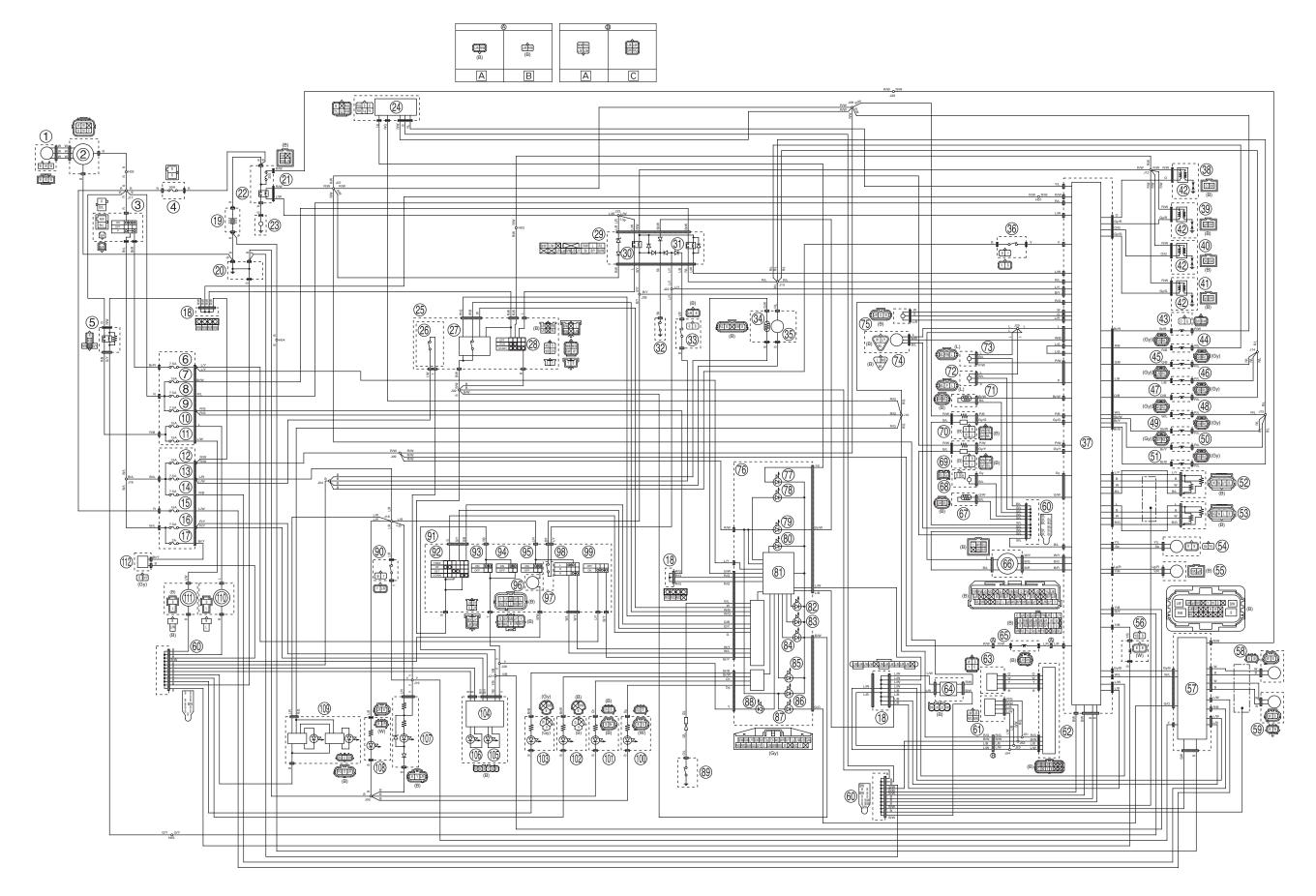


YZF-R1/YZF-R1F 2015 WIRING DIAGRAM

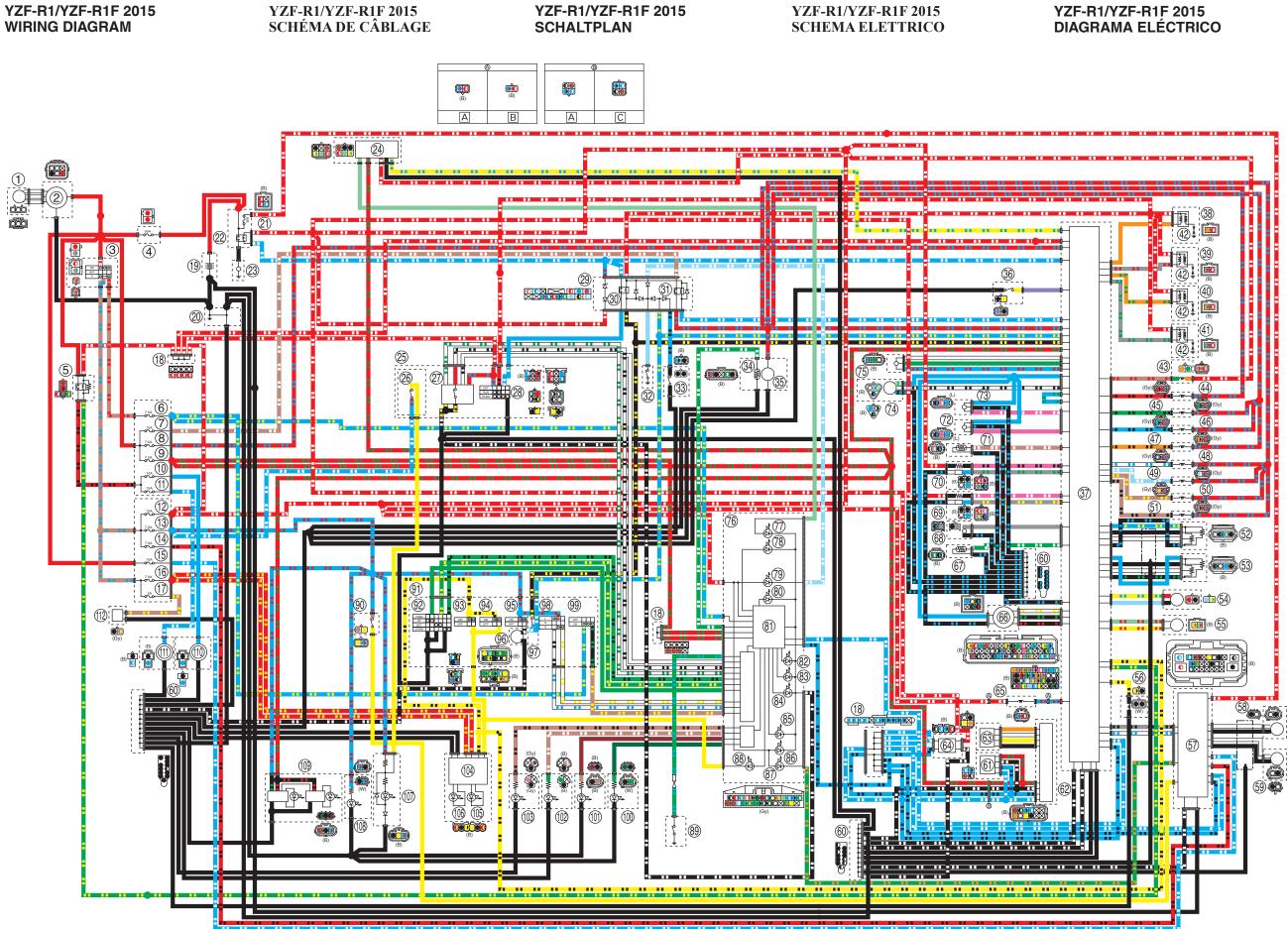
YZF-R1/YZF-R1F 2015 SCHÉMA DE CÂBLAGE

YZF-R1/YZF-R1F 2015 **SCHALTPLAN**

YZF-R1/YZF-R1F 2015 SCHEMA ELETTRICO



YZF-R1/YZF-R1F 2015 **DIAGRAMA ELÉCTRICO**

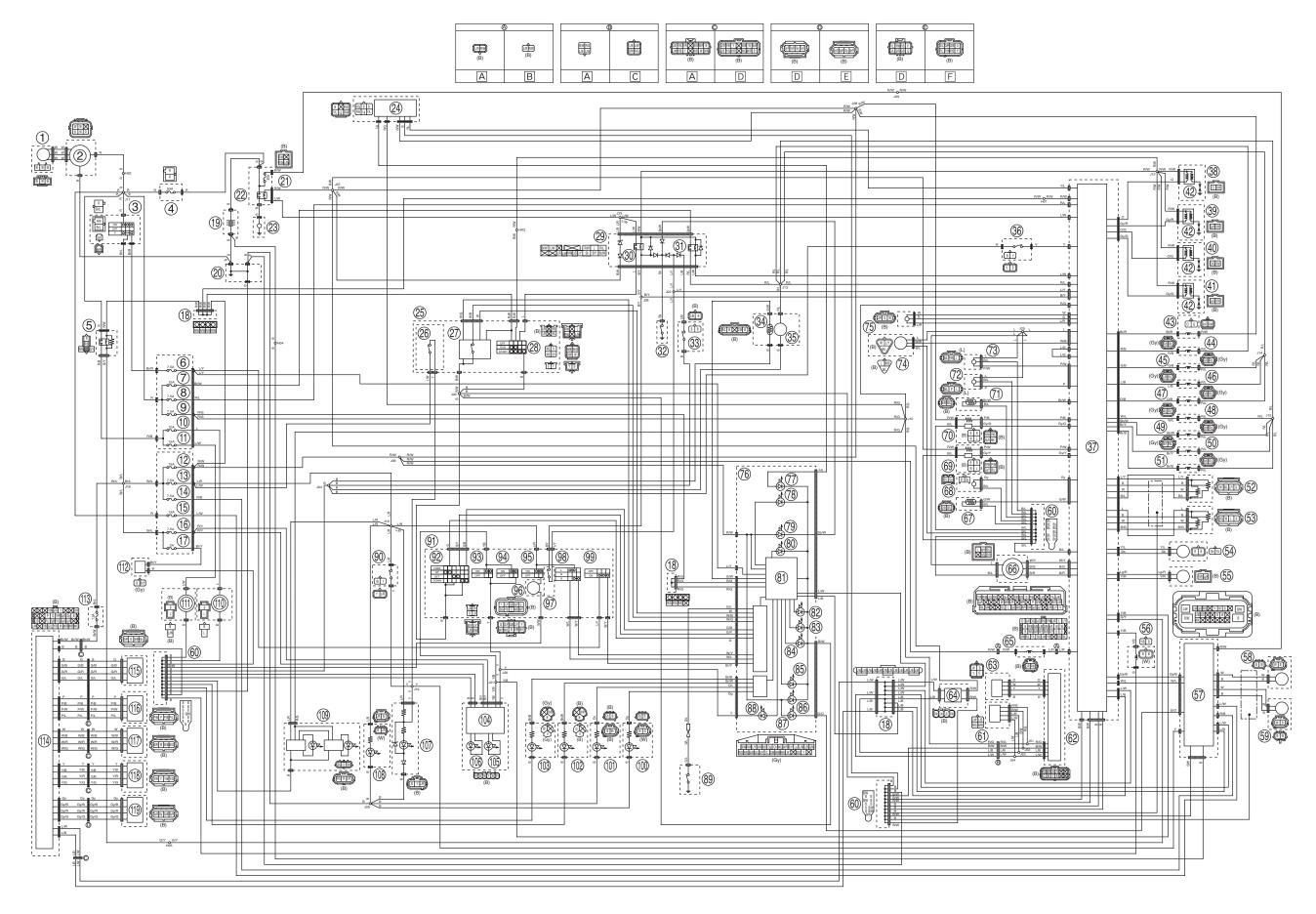


YZF-R1M/YZF-R1MF 2015 WIRING DIAGRAM

YZF-R1M/YZF-R1MF 2015 SCHÉMA DE CÂBLAGE

YZF-R1M/YZF-R1MF 2015 **SCHALTPLAN**

YZF-R1M/YZF-R1MF 2015 **SCHEMA ELETTRICO**



YZF-R1M/YZF-R1MF 2015 **DIAGRAMA ELÉCTRICO**

