

SERVICE MANUAL

YZF-R1 YZF-R1M

> YZF-R1 YZF-R1H YZF-R1M YZF-R1MH

YZF-R1/YZF-R1H
YZF-R1M/YZF-R1MH
SERVICE MANUAL
©2017 by Yamaha Motor Co., Ltd.
First edition, February 2017
All rights reserved.
Any reproduction or unauthorized use without the written permission of Yamaha Motor Co., Ltd. is expressly prohibited.

IMPORTANT

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

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

TIP -

Designs and specifications are subject to change without notice.

FAS3000

IMPORTANT MANUAL INFORMATION

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

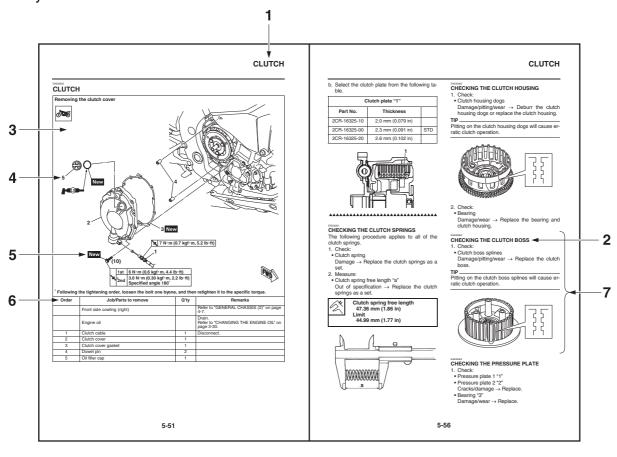
· an action of the contract of					
\triangle	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.				
▲ WARNING	A WARNING indicates a hazardous situation which, if not avoided,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

FAS2000

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.



SYMBOLS

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

TIF

The following symbols are not relevant to every vehicle.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
0000	Serviceable with engine mounted	<u> </u>	Gear oil
	Filling fluid		Molybdenum disulfide oil
_	Lubricant	BF	Brake fluid
	Special tool	B	Wheel bearing grease
	Tightening torque	— (s)	Lithium-soap-based grease
	Wear limit, clearance		Molybdenum disulfide grease
	Engine speed	S	Silicone grease
	Electrical data	<u>L</u>	Apply locking agent (LOCTITE®).
Ē	Engine oil	New	Replace the part with a new one.
<u> </u>	Silicone fluid		

TABLE OF CONTENTS

GENERAL INFORMATION	1
SPECIFICATIONS	2
PERIODIC CHECKS AND ADJUSTMENTS	3
CHASSIS	4
ENGINE	5
COOLING SYSTEM	6
FUEL SYSTEM	7
ELECTRICAL SYSTEM	8
TROUBLESHOOTING	9

GENERAL INFORMATION

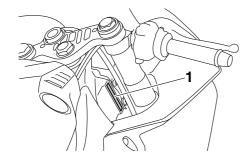
IDENTIFICATION	
VEHICLE IDENTIFICATION NUMBER	1-1
MODEL LABEL	1-1
FEATURES	1-2
YCC-T (Yamaha Chip Controlled Throttle)/YCC-I (Yamaha Chip	
Controlled Intake)	
ELECTRONIC CONTROL-RELATED FEATURES	1-5
OUTLINE OF THE UBS	
OUTLINE OF THE ABS	
ABS COMPONENT FUNCTIONS	
UBS AND ABS OPERATION	1-24
ABS WARNING LIGHT AND OPERATION	1-28
ABS AND UBS FUNCTION	1-28
GLOSSARY	1-29
DISPLAY	1-29
MENU SCREEN	1-33
IMPORTANT INFORMATION	1-45
PREPARATION FOR REMOVAL AND DISASSEMBLY	1-45
REPLACEMENT PARTS	
GASKETS, OIL SEALS AND O-RINGS	
ALUMINUM BOLTS	
LOCK WASHERS/PLATES AND COTTER PINS	1-46
BEARINGS AND OIL SEALS	
CIRCLIPS	1-46
RUBBER PARTS	1-46
BASIC SERVICE INFORMATION	
QUICK FASTENERS	
ELECTRICAL SYSTEM	1-48
SPECIAL TOOLS	1-53

IDENTIFICATION

EAS30002

VEHICLE IDENTIFICATION NUMBER

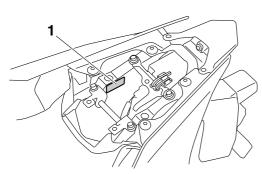
The vehicle identification number "1" is stamped into the right side of the steering head pipe.



EAS30003

MODEL LABEL

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



FEATURES

EAS3071

YCC-T (Yamaha Chip Controlled Throttle)/YCC-I (Yamaha Chip Controlled Intake)

Mechanism characteristics

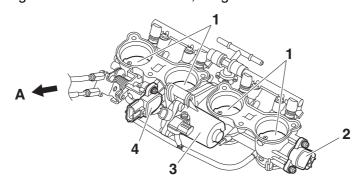
Yamaha developed the YCC-T and YCC-I system employing the most advanced electronic control technologies. Electronic control throttle systems have been used on automobiles, but Yamaha has developed a faster, more compact system specifically for the needs of a sports motorcycle. The Yamaha-developed system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

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

The 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

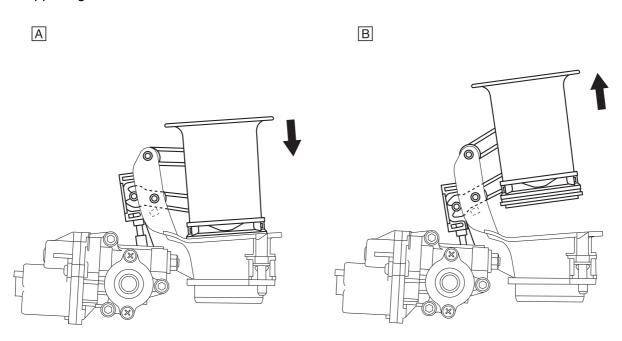
- Increased engine power
 - By shortening the air intake path, higher engine speed is possible \rightarrow Increased engine power.
- Improved driveability
 - Air intake volume is controlled according to the operating conditions \rightarrow Improved throttle response to meet engine requirement.
 - Driving 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 \rightarrow 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

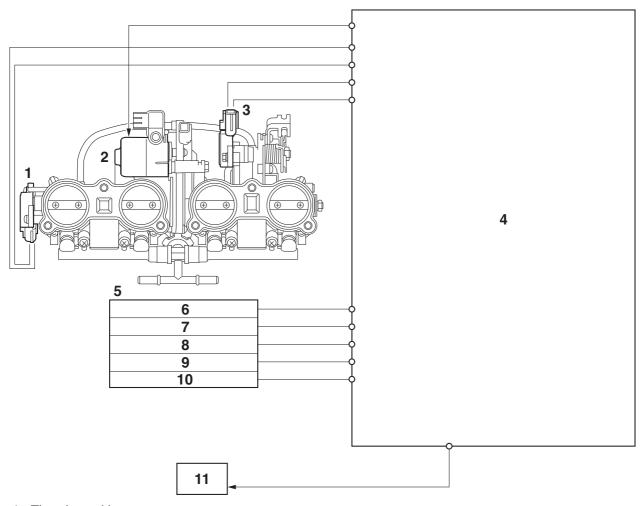
Aims and advantages of using YCC-I system

- 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.



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

YCC-T/YCC-I system outline



- 1. Throttle position sensor
- 2. Throttle servo motor
- 3. 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

FAS31625

ELECTRONIC CONTROL-RELATED FEATURES

Digital instrument panel with TFT liquid crystal display

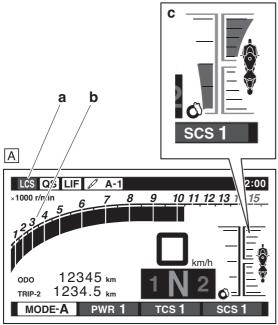
All of the instrument function displays have been concentrated into a single 4.2-inch screen that adopts a fully transmissive Thin Film Transistor (TFT) liquid crystal display.

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.

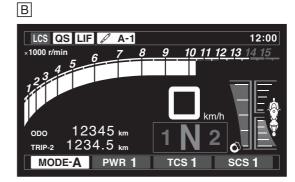
For the display mode, there is also a choice between a "Street" mode with a priority on displaying information needed for riding on public roads, and a "Track" mode with a priority on information desired for racing or circuit riding.

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.

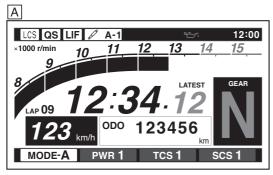
Items that can be displayed include the odometer, tripmeters, intake air temperature, coolant temperature, real-time fuel efficiency, average fuel efficiency and amount of fuel consumed.



- Icons show whether each control function is set On or Off and the settings of the control modes
- 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)



The "Track" mode displays information needed in racing. The tachometer displays the over-8000 r/min 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.



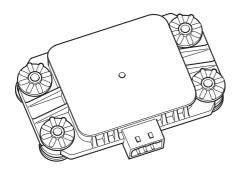
A. "Track" display mode (white background)

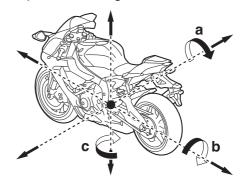


B. "Track" display mode (black background)

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	<u></u> 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 10000 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.

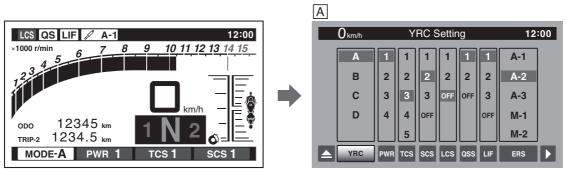
When brake force is applied to both the front brake lever and the rear brake pedal, the Unified Brake System functions to control the distribution of braking force between the two brakes, but when only the rear brake pedal is used, the system operates only the rear brake so that there is no unnatural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

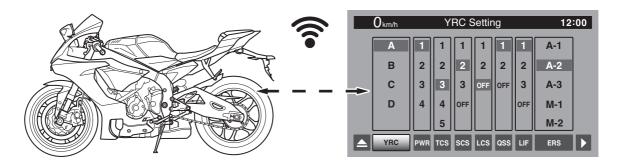
Rider-machine interface: Communication Control Unit (CCU) adopted

(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 4-letter 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.

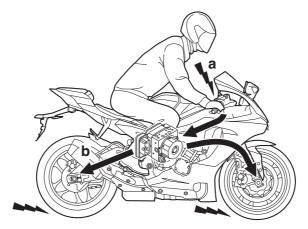
TIP_

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

UBS operation

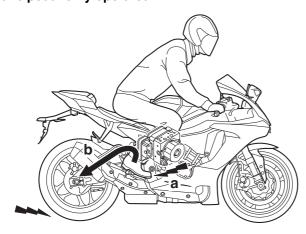
• Brake lever input only: Front braking and rear braking with hydraulic pump (with UBS operation)

Brake lever only operated (UBS operation)



a. Input

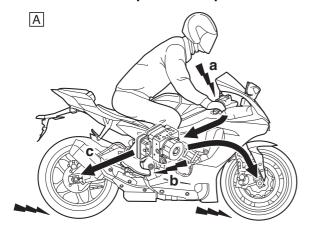
- b. Automatic pressurization (normal)
- Brake pedal input only: Rear braking (without UBS operation)
 Brake pedal only operated



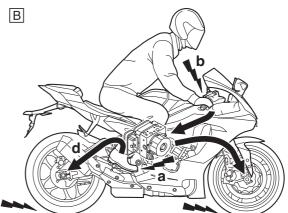
a. Input

- 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

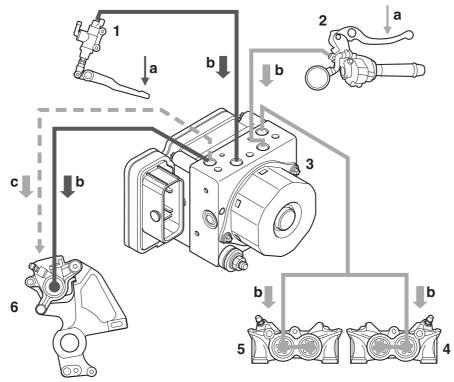


- A. Brake lever is operated before brake pedal
- B. Brake pedal is operated before brake lever
- a. First input
- b. Second input



- c. Brake fluid is automatically pressurized until the second input exceeds the automatic pressurization
- d. No automatic pressurization

UBS diagram



- 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

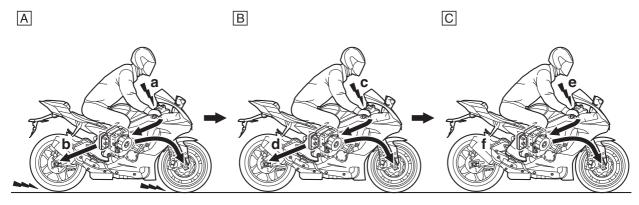
- The UBS does not operate before the vehicle starts off.
- If the vehicle is stopped by operating the brake lever only, the brake force due to the operation of the UBS will be maintained while the brake lever is squeezed. However, if the brake lever is released, then squeezed again, the UBS will not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

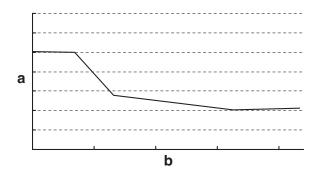
When vehicle is stopped using brake lever only



- 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

UBS with ABS provide optimum brake force to front and rear brakes. IMU send vehicle position signal and ABS-ECU controls rear brake force distribution.



a. Rear brake force

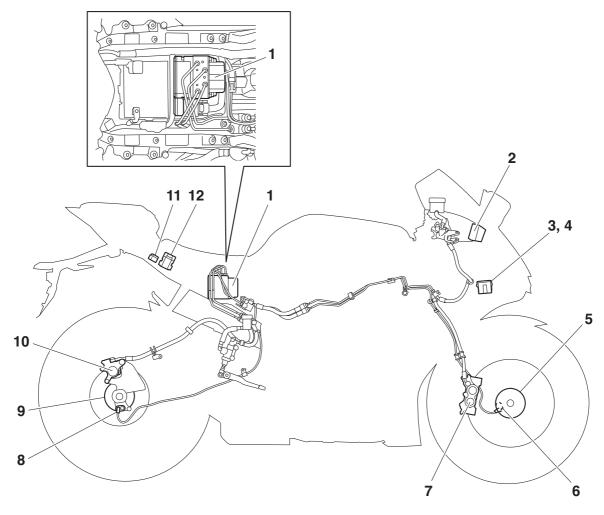
b. Bank angle

Rear brake force is reduced when lean angle becomes deep steep.

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.

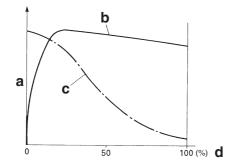
100 %: The wheel speed is "0", but the chassis is moving (i.e., wheel lock).

Brake force and vehicle stability

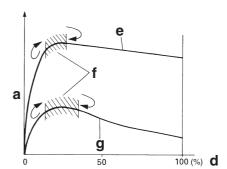
When the brake pressure is increased, wheel speed is reduced. Slipping occurs between the tire and the road surface and brake force is generated. The limit of this brake force is determined by the friction force between the tire and the road surface and is closely related to wheel slippage. Wheel slippage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



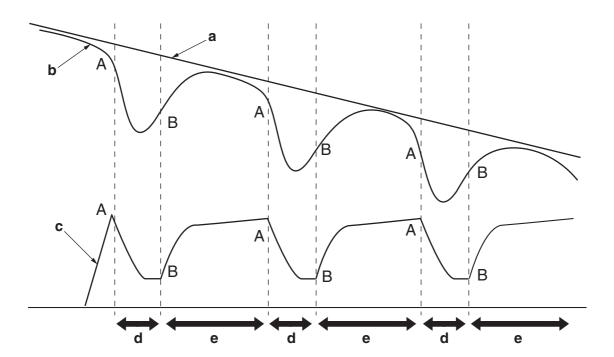
- a. Friction force between the tire and road surface
- b. Brake force
- c. Side force
- d. Slip ratio
- e. Less slippery road surface
- f. Controlling zone
- g. Slippery road surface

Wheel slip and hydraulic control

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.



- a. Chassis speed
- b. Wheel speed
- c. Brake force
- d. Depressurizing phase
- e. Pressurizing phase

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.

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.

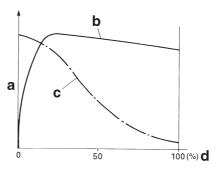
WARNING

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.

WARNING

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.



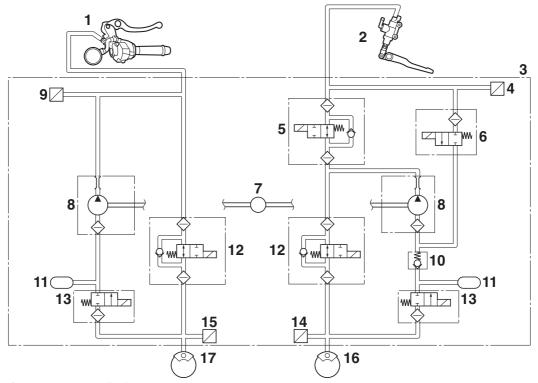
- a. Friction force between the tire and road surface
- b. Brake force
- c. Side force
- d. Slip ratio

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



- 1. Front brake master cylinder
- 2. Rear brake master cylinder
- 3. Hydraulic unit assembly
- 4. Rear brake master cylinder pressure sensor
- 5. Separation solenoid valve
- 6. Shuttle solenoid valve
- 7. ABS motor
- 8. Hydraulic pump
- 9. Front brake master cylinder pressure sensor
- 10.Check valve
- 11.Buffer chamber
- 12.Inlet solenoid valve
- 13.Outlet solenoid valve
- 14. Rear brake caliper pressure sensor
- 15. Front brake caliper pressure sensor
- 16. Rear brake caliper
- 17. Front brake calipers

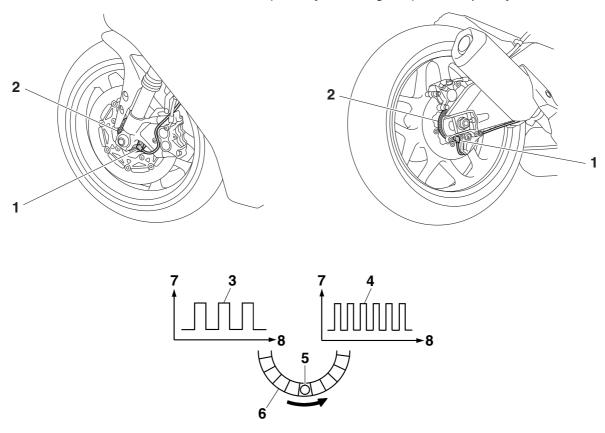
ABS COMPONENT FUNCTIONS

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.



- 3. At low speed
- 4. At high speed
- 5. Wheel sensor
- 6. Wheel sensor rotor
- 7. Voltage
- 8. Time

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).

ECA25450

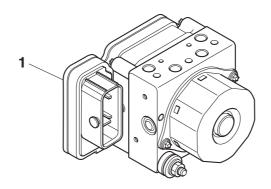
NOTICE

If the rear wheel is raced with the vehicle on a maintenance 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 valve is open when the brake pedal is depressed, but the valve 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.

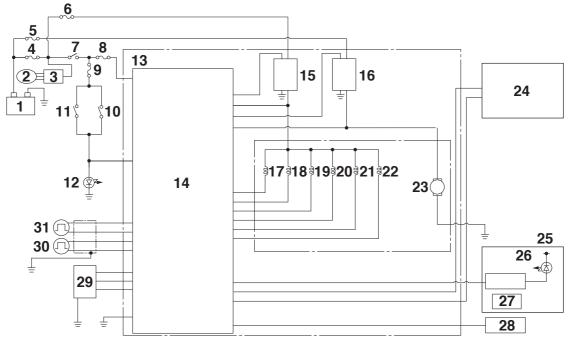
4. Shuttle solenoid valve

This valve is closed when the brake pedal is depressed, but the valve 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.



- 1. Battery
- 2. AC magneto
- 3. Rectifier/regulator
- 4. Main fuse
- 5. ABS motor fuse
- 6. ABS solenoid fuse
- 7. Main switch
- 8. ABS ECU fuse
- 9. Signaling system fuse
- 10. Front brake light switch
- 11.Rear brake light switch
- 12. Tail/brake light
- 13. Hydraulic unit assembly
- 14.ABS ECU
- 15. Solenoid relay
- 16.ABS motor relay

- 17. Front brake inlet solenoid
- 18. Front brake outlet solenoid
- 19.Rear brake inlet solenoid
- 20. Rear brake outlet solenoid
- 21. Unified brake system inlet solenoid
- 22. Unified brake system outlet solenoid
- 23.ABS motor
- 24.ECU (Engine Control Unit)
- 25.Meter assembly
- 26.ABS warning light
- 27.Speedometer
- 28.IMU (Inertial Measurement Unit)
- 29. Yamaha diagnostic tool coupler
- 30.Rear wheel sensor
- 31.Front wheel sensor

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

ABS control operation

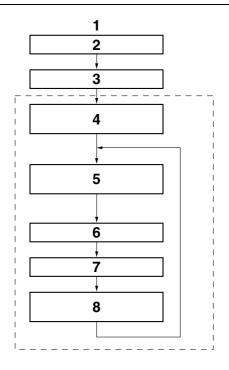
The ABS control operation performed in the ABS ECU is divided into the following two parts.

- 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

EV6308E4

UBS AND ABS OPERATION

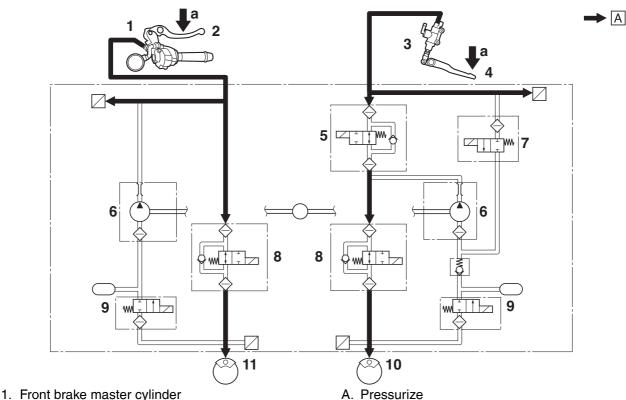
The ABS hydraulic circuit consists of two systems: one for the front wheel and one for the rear wheel.

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.



a. Input

- 2. Brake lever
- 3. Rear brake master cylinder
- 4. Brake pedal
- 5. Separation solenoid valve
- 6. Hydraulic pump
- 7. Shuttle solenoid valve
- 8. Inlet solenoid valve
- 9. Outlet solenoid valve
- 10.Rear brake caliper
- 11. Front brake calipers

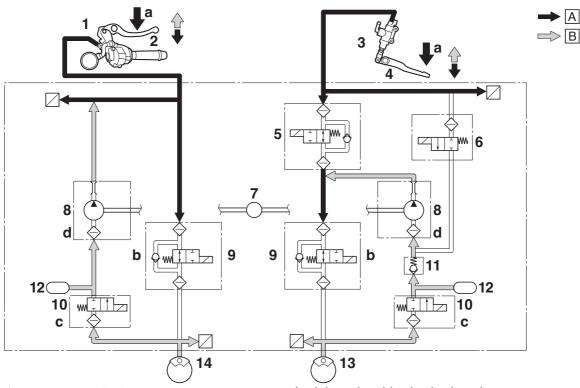
Emergency braking (ABS activated and UBS not activated)

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.



- 1. Front brake master cylinder
- 2. Brake lever
- 3. Rear brake master cylinder
- 4. Brake pedal
- 5. Separation solenoid valve
- 6. Shuttle solenoid valve
- 7. ABS motor
- 8. Hydraulic pump
- 9. Inlet solenoid valve
- 10.Outlet solenoid valve
- 11.Check valve
- 12.Buffer chamber
- 13. Rear brake caliper
- 14. Front brake calipers
- A. Pressurize
- B. Depressurize
- a. Input

- b. Inlet solenoid valve is closed
- c. Outlet solenoid valve is open
- d. Hydraulic pump is operating

UBS (ABS not activated and UBS activated)

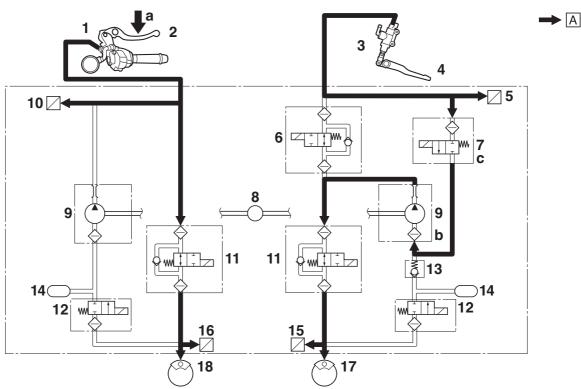
Brake lever input only

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:

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.



- 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
- a. Input
- b. Hydraulic pump is operating
- c. Shuttle solenoid valve is open

UBS (ABS activated and UBS activated)

Brake lever input only

Front brakes:

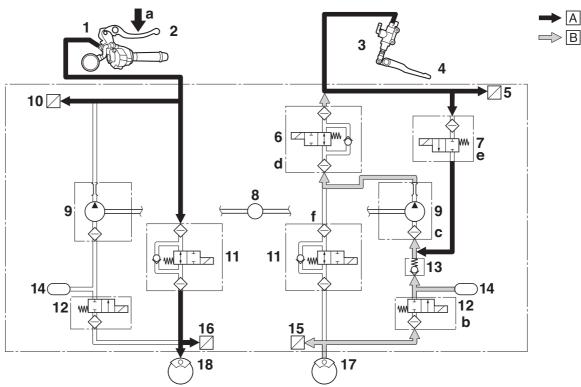
Refer to "Emergency braking (ABS activated and UBS not activated)".

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

EAS3071

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 maintenance 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.

EAS30983

ABS AND UBS FUNCTION

EWA1726

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

GLOSSARY

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

DISPLAY

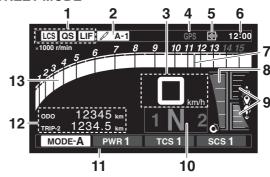
The display has two different main screen display modes, STREET MODE and TRACK MODE. Most of the functions are viewable in either mode, but the layout differs slightly. The following items can be found on the display.

- 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
- Various warning icons
- Error mode warning "Err"

TIP -

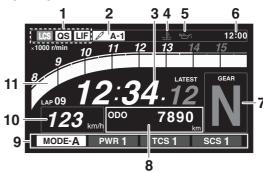
This model uses a thin-film-transistor liquid-crystal display (TFT LCD) for good contrast and readability in various lighting conditions. However, due to the nature of this technology, it is normal for a small number of pixels to be inactive.

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)
- 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 "...."
- 5. Oil pressure warning "
- 6. Clock
- 7. Transmission gear display
- 8. Information display
- 9. YRC items MODE/PWR/TCS/SCS
- 10.Speedometer
- 11.Tachometer

EWA18210

WARNING

Stop the vehicle before making any setting changes. Changing settings while riding can

distract the operator and increase the risk of an accident.

Speedometer

The speedometer shows the vehicle's traveling speed.

TIP_

The display can be switched between kilometers and miles. (Refer to "Unit" on page 1-38.)

Tachometer

The tachometer shows the engine speed, as measured by the rotational velocity of the crankshaft, in revolutions per minute (r/min).

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

NOTICE

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

- ODO will lock at 999999 and cannot be reset.
- TRIP-1 and TRIP-2 will reset to 0 and begin counting again after 9999.9 has been reached.
- When the fuel tank reserve level has been reached, F-TRIP appears automatically and begins recording distance traveled from that point.
- After refueling and traveling some distance, F-TRIP will automatically disappear.
- Refer to "Unit" on page 1-38 to change the fuel consumption units.

 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]

- Use the wheel switch to scroll through the display items until the item you want to reset appears.
- 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 "N" and by the transmission gear display "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 engine speed.

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

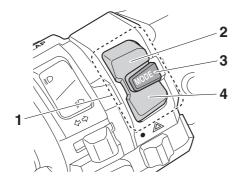
The YRC modes come preset from the factory for different riding conditions. When using the factory presets, the suggested YRC modes are as follows.

- 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 weath-

er.

[To change YRC modes or make setting changes]

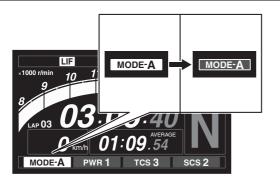
 Push the mode switch center button to scroll left to right and highlight the item you want to adjust.



- 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_

- Under certain conditions, such as when the vehicle is in motion, the throttle grip is turned, excessive wheel slip is detected, etc., certain YRC items cannot be adjusted.
- When a YRC item is highlighted but cannot be adjusted, the YRC item box will return to black.



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).

TIP -

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 1-34 and "ERS (YZF-R1M)" on page 1-36 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)

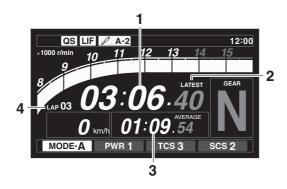
This icon comes on when vehicle data is being recorded via the logging function.

Clock

The clock uses a 12-hour time system.

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/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

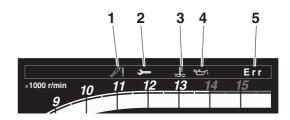
[To use the lap timer]

- 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 Pass/LAP switch to start the lap timer.

TIP -

- The engine must be running to use the lap timer
- 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.

Warning icons



- 1. SCU trouble warning " / I"
- 2. Steering damper warning "→"
- 3. Coolant temperature warning "....."
- 4. Oil pressure warning "
- 5. Error mode warning "Err"

When an error is detected, the following error-related warning icons will then be viewable.

- SCU trouble warning icon
- Steering damper warning icon
- Coolant temperature warning icon
- Oil pressure warning icon

SCU trouble warning (YZF-R1M)

The SCU trouble warning icon appears if a problem is detected in the front or rear suspension.

Steering damper warning

The steering damper warning icon appears if a problem is detected in the steering damper.

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.

ECA10022

NOTICE

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

Oil pressure warning

This icon 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.

ECA22790

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, im-

mediately turn the engine off and check the vehicle.

Error mode warning

When an internal error occurs (e.g., communication with a system controller has been cut off), the error mode warning will appear as follows.

"Err" and "→" indicates an ECU error.

"Err" and " / j " indicates an SCU error.

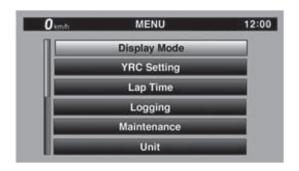
"Err" only indicates an HCU (hydraulic control unit) error.

TIP.

Depending on the nature of the error, the display may not function properly and YRC settings may be impossible to change. Additionally, ABS and UBS may not function properly. Use extra care when braking and check the vehicle immediately.

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 display between street and track modes.
"YRC Setting"	Adjust YRC settings (all models) 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 maintenance item intervals.
"Unit"	Set fuel consumption and distance units.

"Wallpaper"	Set background colors.
"Shift Indicator"	Turn the shift indicator on/off and adjust tachometer settings.
"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]

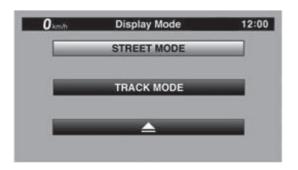
1. Long push the wheel switch to enter the MENU screen.



2. Select "Display Mode".



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



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

"YRC Setting"

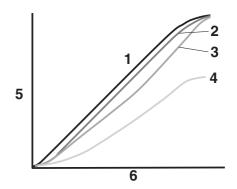
This module allows you to customize the four YRC modes MODE-A, MODE-B, MODE-C, MODE-D by adjusting the setting levels (or on/off status as applicable) of YRC items PWR, TCS, SCS, LCS, QSS, and LIF. For YZF-R1M, you can select the ERS mode to be associated with each YRC mode, and also adjust the setting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



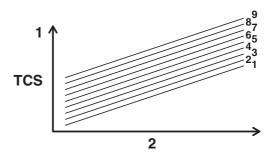
- 1. PWR 1
- 2. PWR 2
- 3. PWR 3
- 4. PWR 4
- 5. Throttle valve opening
- 6. Throttle grip operation

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.

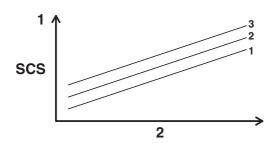


- 1. System intervention
- 2. Lean angle

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.

TIF

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

OSS

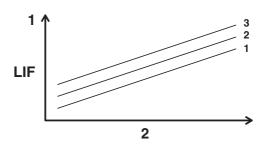
QSS can be set to 1, 2, or OFF. Setting level 1 gives the fastest shifts, while setting level 2 gives slightly smoother shifts. OFF turns the system off entirely, and the clutch lever must then be used when making upshifts.

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

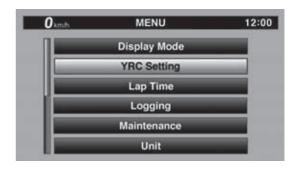
LIF can be set to 1, 2, 3, or OFF. Setting level 3 most strongly reduces wheel lift, and setting level 1 provides the least amount of system intervention. OFF turns LIF off and LCS will be disabled for the selected YRC mode.



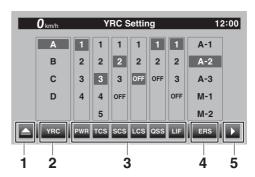
- 1. System intervention
- 2. Wheel lift

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

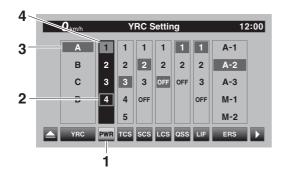
1. From the MENU screen, select "YRC Setting".



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)
- 3. 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.
- 4. 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)

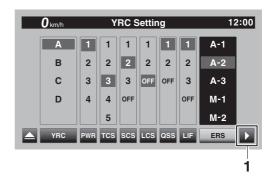
There are three automatic setting modes; A-1, A-2, and A-3. A-3 is fixed and cannot be adjusted. A-1 and A-2 can be adjusted to within a -5 to +5 offset of their factory preset settings.

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.

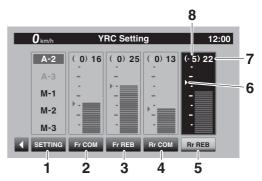
TIP

- 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.
- 2. 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.



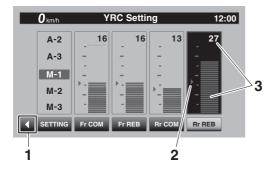
- 1. ERS mode selection box "SETTING"
- 2. Front compression damping force
- 3. Front rebound damping force
- 4. Rear compression damping force
- 5. Rear rebound damping force
- 6. Factory preset level
- 7. Current level setting
- 8. Offset level
- 3. Select the suspension item, Fr COM, Fr REB, Rr COM,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



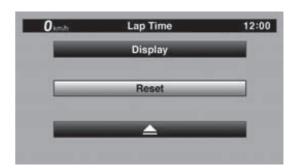
- 1. Fastest lap
- 2. Average lap time
- 3. Lap time record

[To reset the lap time record data]

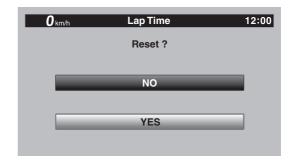
1. When "Lap Time" is selected, both "Display" and "Reset" are displayed.



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.)



"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".



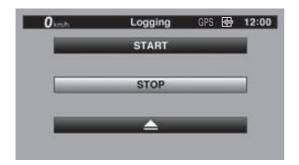
TIP.

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.

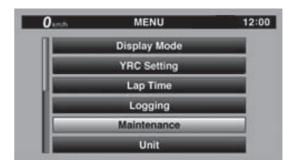


"Maintenance"

This module 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]

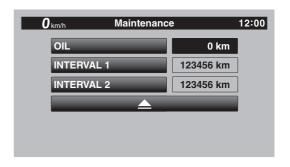
1. From the MENU screen, select "Maintenance".



2. Select the item you want to reset.



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



TIP

Maintenance item names cannot be changed.

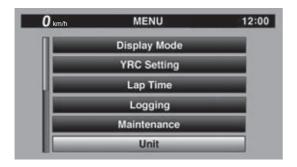
"Unit"

This module allows you to switch the display between kilometers and miles.

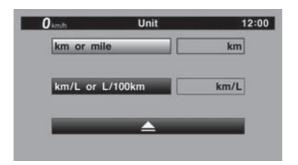
When using kilometers, the fuel consumption units can be changed between km/L or L/100km. When using miles, MPG will be available.

[To set the distance or fuel consumption units]

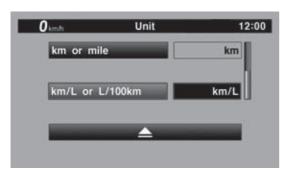
1. From the MENU screen, select "Unit".



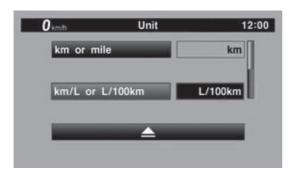
2. "km or mile" and "km/L or L/100km" are displayed.



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.



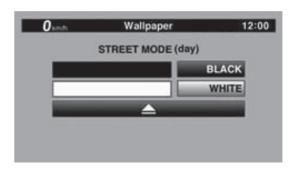
1. Photo sensor

[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.



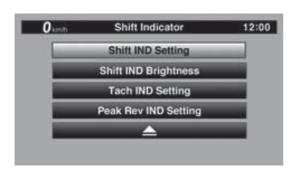
"Shift indicator"

The shift indicator module contains the following items.

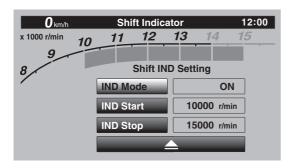
Display	Description
"Shift IND Set- ting"	Set the shift indicator pattern to "ON", "Flash", or "OFF" and adjust at what r/min the indi- cator will come on and go off.
"Shift IND Bright- ness"	Adjust the brightness of the shift indicator.
"Tach IND Set- ting"	Set the tachometer color display to "ON" or "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]

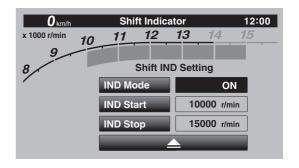
1. Select "Shift IND Setting".



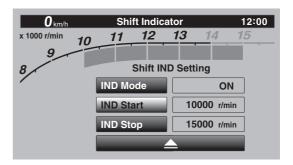
2. Select "IND Mode".



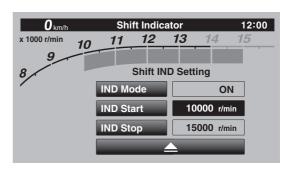
3. Select "ON" to have the indicator light steadily, "OFF" to turn the indicator off, or "Flash" to have the shift indicator flash when the indicator start threshold has been reached.



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.



 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

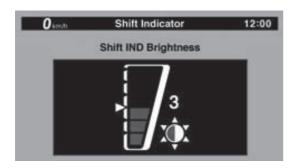
The blue area on the tachometer indicates the currently set operational range of the shift indicator light.

"Shift IND Brightness"

The shift timing indicator light has six brightness levels.

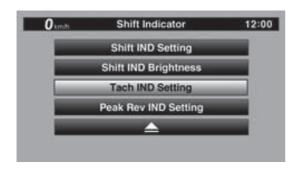


Select "Shift IND Brightness", then use the wheel switch to adjust the setting. Short push the wheel switch to confirm the setting and exit.

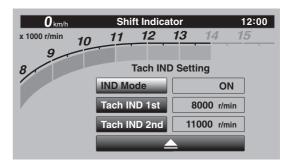


"Tach IND Setting"

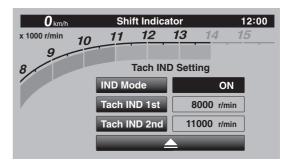
This module allows you to turn the tachometer color display on or off. When turned off, the tachometer will display all r/min levels below the red zone in black or white (depending on wallpaper settings). When turned on, the mid and midto-high r/min zones can be set to come on in green and then orange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



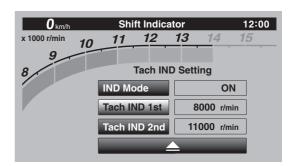
1. Select "Tach IND Setting".



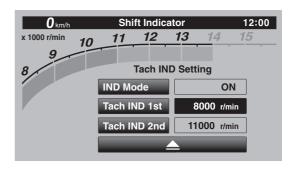
2. Select "IND Mode".



- 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.



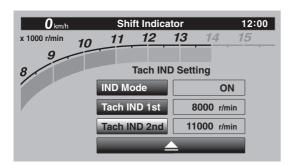
5. Set the starting r/min by rotating and then short pushing the wheel switch. All r/min above this value up to the "Tach IND 2nd" setting value (or the 14000 r/min red zone), will be displayed in green.



TIP -

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

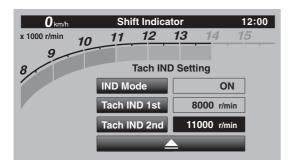
6. Select "Tach IND 2nd".



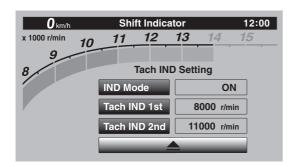
7. Set the orange color starting r/min by rotating and then short pushing the wheel switch. All r/min above this figure until the 14000 r/min red zone, will be displayed in orange.

TIP

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



8. Select the triangle symbol to exit.



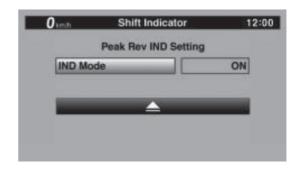
"Peak Rev IND Setting"

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

1. Select "Peak Rev IND Setting".



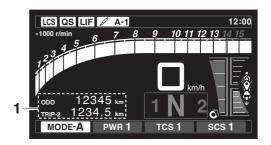
Select "IND Mode" and then select ON (to turn on the indicator) or OFF (to turn off the indicator).



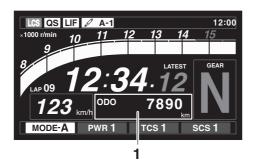
3. Select the triangle symbol to exit.

"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)

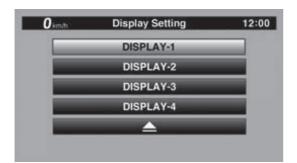


1. Information display item (TRACK MODE)

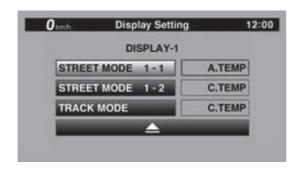
[To set the display groups]

1. Select "Display Setting".

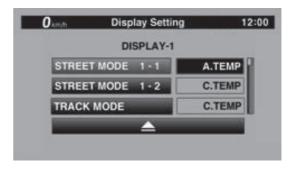




- 2. DISPLAY-1, DISPLAY-2, DISPLAY-3 and DISPLAY-4 are displayed.
- 3. For example, let's select DISPLAY-1. STREET MODE 1-1, STREET MODE 1-2, and TRACK MODE are displayed.



4. Select STREET MODE 1-1.



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

TIP

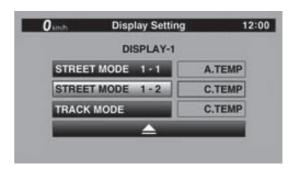
The information display items which can be selected are:

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

TRIP-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

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



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

"Brightness"

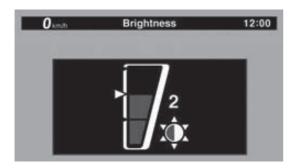
This module allows you to adjust the general brightness level of the display screen.

[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"

This module allows you to set the clock.

[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 module 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.

EAS20009

IMPORTANT INFORMATION

EAS30006

PREPARATION FOR REMOVAL AND DISASSEMBLY

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



- 2. Use only the proper tools and cleaning equipment.
 - Refer to "SPECIAL TOOLS" on page 1-53.
- 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.

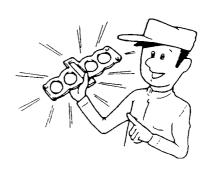


- 4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
- 5. Keep all parts away from any source of fire.

EAS30007

REPLACEMENT PARTS

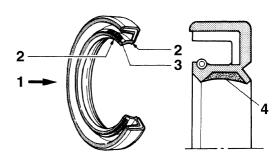
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



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.



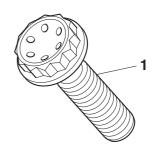
- 1. Oil
- 2. Lip
- 3. Spring
- 4. Grease

FAS31626

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.

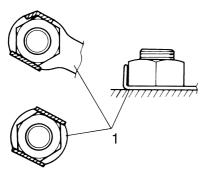


IMPORTANT INFORMATION

EAS30009

LOCK WASHERS/PLATES AND COTTER PINS

After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS30010

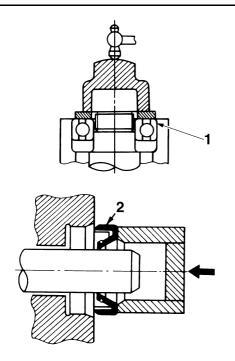
BEARINGS AND OIL SEALS

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

ECA13300

NOTICE

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

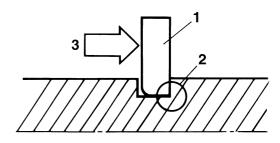


EAS30011

CIRCLIPS

Before reassembly, check all circlips carefully

and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip "1", make sure the sharp-edged corner "2" is positioned opposite the thrust "3" that the circlip receives.



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.

EAS20010

BASIC SERVICE INFORMATION

EAS30013

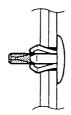
QUICK FASTENERS Rivet type

- 1. Remove:
 - Quick fastener

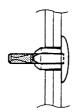
TIP_

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







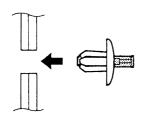


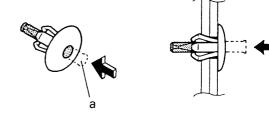
- 2. Install:
 - Quick fastener

TIP

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







Screw type

- 1. Remove:
 - Quick fastener

TIP

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





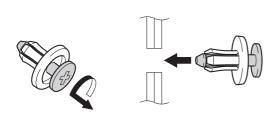


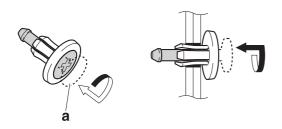


- 2. Install:
 - Quick fastener

TIP_

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





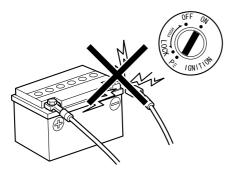
EAS30014

ELECTRICAL SYSTEM Electrical parts handling

ECA16600

NOTICE

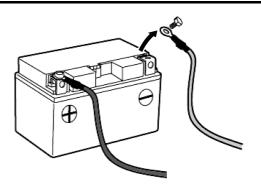
Never disconnect a battery lead while the engine is running; otherwise, the electrical components could be damaged.



ECA16751

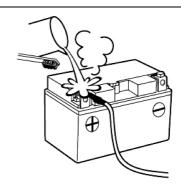
NOTICE

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



TIP

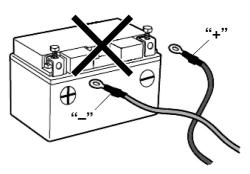
If a battery lead is difficult to disconnect due to rust on the battery terminal, remove the rust using hot water.



ECA16760

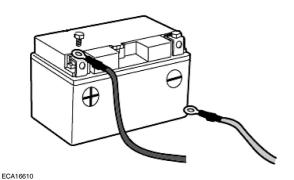
NOTICE

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



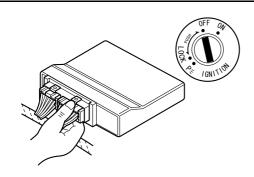
NOTICE

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.



NOTICE

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



NOTICE

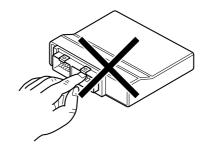
Handle electrical components with special care, and do not subject them to strong shocks.



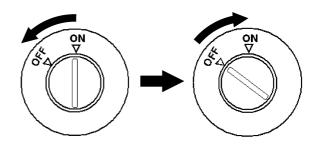
ECA16630

NOTICE

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



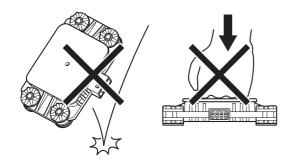
When resetting the ECU by turning the main switch to "OFF", be sure to wait approximately 5 seconds before turning the main switch back to "ON".

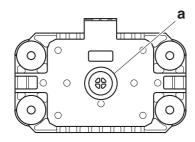


ECA22611

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.

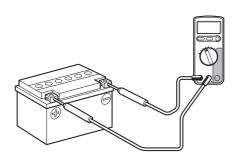




Checking the electrical system

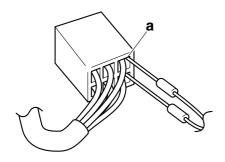
TIP

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



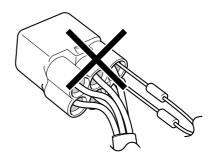
NOTICE

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.



NOTICE

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



Checking the connections

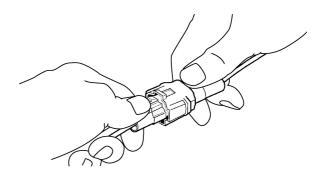
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

- 1. Disconnect:
 - Lead
 - Coupler
 - Connector

CA16780

NOTICE

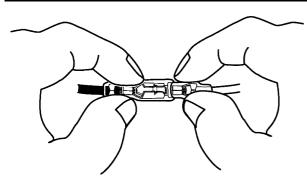
- When disconnecting a coupler, release the coupler lock, hold both sections of the coupler securely, and then disconnect the coupler.
- There are many types of coupler locks; therefore, be sure to check the type of coupler lock before disconnecting the coupler.



ECA16790

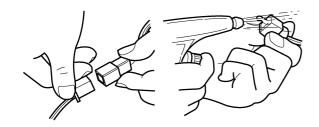
NOTICE

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



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

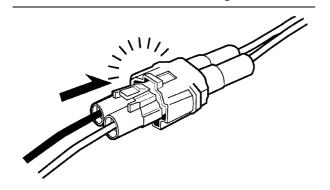
 Rust/stains → Connect and disconnect several times.

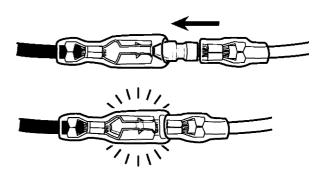


- 3. Connect:
 - Lead
 - Coupler
 - Connector

TID

- 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.





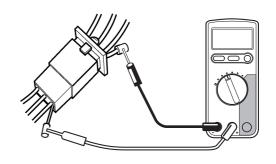
- 4. Check:
 - Continuity (with the digital circuit tester)

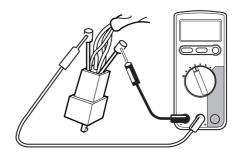


Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

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



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

TIP_

The resistance values shown were obtained at the standard measuring temperature of 20 $^{\circ}$ C (68 $^{\circ}$ F). If the measuring temperature is not 20 $^{\circ}$ C (68 $^{\circ}$ F), the specified measuring conditions will be shown.

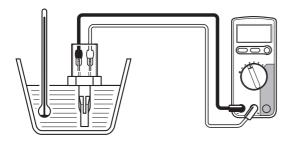


Intake air temperature sensor resistance

5400–6600 Ω at 0 °C (5400–6600 Ω at 32 °F)

Intake air temperature sensor resistance

289–391 Ω at 80 °C (289–391 Ω at 176 °F)



EAS20012

SPECIAL TOOLS

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

TIP -

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

Tool name/Tool No.	Illustration	Reference pages
Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927		1-51, 1-52, 5-42, 8-231, 8-232, 8-236, 8-237, 8-238, 8-239, 8-240, 8-242, 8-243, 8-244, 8-245, 8-246
Yamaha diagnostic tool USB 90890-03256	YDT 4	3-4, 3-13, 4-72, 4-73, 8-50, 8-175, 8-193
Yamaha diagnostic tool (A/I) 90890-03254	OYAMAHA OYAMAHA	3-4, 3-13, 4-72, 4-73, 8-50, 8-175, 8-193
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-7, 3-8, 4-34, 4-43, 5-24, 5-55
Vacuum gauge 90890-03094 Vacuummate YU-44456	90890-03094	3-10
	YU-44456	
Carburetor angle driver 2 90890-03173		3-11

Tool name/Tool No.	Illustration	Reference pages
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472	R20	3-21, 4-103
Oil filter wrench 90890-01426 Oil filter wrench YU-38411	64.2	3-30
Oil pressure gauge joint 18 mm 90890-04176 YU-04176	Ø18	3-31
Oil pressure gauge set 90890-03120		3-31
Vacuum/pressure pump gauge set 90890-06945 Pressure/ vacuum tester YB-35956-B		4-23
Wheel bearing ring nut tool 90890-01574 YM-01574		4-39, 4-40
Fork spring compressor 90890-01441 Fork spring compressor YM-01441	ø55	4-82, 4-88
Rod holder 90890-01434 Damper rod holder double ended YM-01434	11.	4-82, 4-88

Tool name/Tool No.	Illustration	Reference pages
Damper rod holder (ø30) 90890-01506 Damper rod holder YM-01506	Ø30	4-83, 4-85
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-86, 4-96, 4-97
Rod puller 90890-01437 Universal damping rod bleeding tool set YM-A8703	90890-01437 YM-A8703	4-86, 4-88
Rod puller attachment (M10) 90890-01436 Universal damping rod bleeding tool set YM-A8703	90890-01436 YM-A8703	4-86, 4-88
Front fork cap bolt wrench 42mm 90890-01575 YM-01575	042	4-93, 4-94, 4-99
Damper rod holder (ø37) 90890-01504 Damper rod holder YM-01504	037	4-94, 4-96

Tool name/Tool No.	Illustration	Reference pages
Front fork rod puller M7x0.75 90890-01576 YM-01576	M7×0.75	4-97, 4-98
Ring nut wrench 90890-01268 Spanner wrench YU-01268	R22	4-103
Ring nut wrench 90890-01507 Ring nut wrench YM-01507	Ø42.0	4-114, 4-116
Damper rod holder (ø22) 90890-01365		4-114, 4-116
Drive chain cut & rivet tool 90890-01550 Drive chain cut & rivet tool YM-01550		4-119, 4-121
Compression gauge 90890-03081 Engine compression tester YU-33223	90890-03081 YU-33223	5-1
Pivot shaft wrench 90890-01485 Frame mount insert wrench YM-01485		5-7

		Deference
Tool name/Tool No.	Illustration	Reference pages
Valve spring compressor 90890-04019 Valve spring compressor YM-04019	931\ C EDE	5-17, 5-20, 5-28, 5-33
Valve spring compressor attachment 90890-01243 Valve spring compressor adapter (26 mm) YM-01253-1	ø26 P	5-28, 5-33
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-30
Valve guide remover (ø5) 90890-04097 Valve guide remover (5.0 mm) YM-04097	05	5-30
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117	Ø4.5 Ø10	5-30
Valve guide installer (ø5) 90890-04098 Valve guide installer (5.0 mm) YM-04098	05 0	5-30
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118		5-30
Valve guide reamer (ø5) 90890-04099 Valve guide reamer (5.0 mm) YM-04099	05	5-30

Tool name/Tool No.	Illustration	Reference pages
15mm pin type rotor holding tool 90890-04171 YM-04171		5-35, 5-36
Crankshaft protector 90890-01382 Crankshaft protector YM-01382	ø16.8	5-35
Flywheel puller 90890-01404 Flywheel puller YM-01404	M35×P1.5	5-35
Yamaha bond No. 1215 90890-85505 (Three bond No.1215®)		5-36, 5-65
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-38, 5-39
Universal clutch holder 90890-04086 Universal clutch holder YM-91042	90890-04086 M8×P1.25 30 119 156	5-54, 5-58
	YM-91042	
Piston pin clip rotation tool 90890-04175 YM-04175	00	5-70

Tool name/Tool No.	Illustration	Reference pages
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304 M6×P1.0	5-71
	YU-01304	
Piston pin clip insertion tool 90890-04173 YM-04173		5-78
Piston pin clip installer tool 90890-04174 YM-04174		5-79
Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A	90890-01325	6-2, 6-3
	YU-24460-A	
Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984	90890-01352 031.4 038	6-2, 6-3
	YU-33984	

Tool name/Tool No.	Illustration	Reference pages
Mechanical seal installer 90890-04132 Water pump seal installer YM-33221-A	ø27.5 014	6-12
Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 & 50 mm YM-04058	ø40 Ø40	6-12
Pressure gauge 90890-03153 Pressure gauge YU-03153	The state of the s	7-16, 7-17
Fuel injector pressure adapter 90890-03210 Fuel injector pressure adapter YU-03210		7-16
Fuel pressure adapter 90890-03176 Fuel pressure adapter YM-03176		7-17
OBD/ GST Leadwire kit 90890-03249		8-50
Ignition checker 90890-06754 Oppama pet–4000 spark checker YM-34487		8-238
Test harness– speed sensor (3P) 90890-03208 Test harness– speed sensor (3P) YU-03208		8-243

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	2-13 2-14
LUBRICATION POINTS AND LUBRICANT TYPESENGINECHASSIS	2-17
LUBRICATION SYSTEM CHART AND DIAGRAMSENGINE OIL LUBRICATION CHARTLUBRICATION DIAGRAMS	2-21
COOLING SYSTEM DIAGRAMS	2-37
CABLE ROUTING	2-41

GENERAL SPECIFICATIONS

GENERAL SPECIFICATIONS	
Model	
Model	2KSF (YZF-R1M_EUR/TUR)
	2KSK (YZF-R1MH)
	2KSL (YZF-R1M_RUS)
	BX41 (YZF-R1)
	BX45 (YZF-R1H)
Dimensions	
Overall length	2055 mm (80.9 in)
Overall width	690 mm (27.2 in)
Overall height	1150 mm (45.3 in)
Wheelbase	1405 mm (55.3 in)
Ground clearance	130 mm (5.12 in)
Minimum turning radius	3.3 m (10.83 ft)
Weight	
Curb weight	200 kg (441 lb) (YZF-R1, YZF-R1H)
	201 kg (443 lb) (YZF-R1M, YZF-R1MH)
Loading	
Maximum load	187 kg (412 lb)
Riding capacity	2 person

ENGINE SPECIFICATIONS			
Engine			
Combustion cycle	4-stroke		
Cooling system	Liquid cooled		
Valve train	DOHC		
Displacement	998 cm ³		
Cylinder arrangement	Inline		
Number of cylinders	4-cylinder		
Bore × stroke	79.0 × 50.9 mm (3.11 × 2.00 in)		
Compression ratio	13.0 : 1		
Compression pressure	1261–1624 kPa/250 r/min (12.6–16.2		
Compression processio	kgf/cm²/250 r/min, 179.4–231.0 psi/250 r/min)		
Starting system	Electric starter		
Fuel			
Recommended fuel	Premium unleaded gasoline (Gasohol [E10] ac-		
necommended idei	ceptable) (YZF-R1, YZF-R1H, YZF-		
	R1M EUR/TUR, YZF-R1MH)		
	Unleaded gasoline only. Minimum research oc-		
	tane number 95 (YZF-R1M_RUS)		
Fuel tank capacity	17 L (4.5 US gal, 3.7 Imp.gal)		
Fuel reserve amount	3.0 L (0.79 US gal, 0.66 Imp.gal)		
	0.0 L (0.70 00 gai, 0.00 imp.gai)		
Engine oil	VANALLIDE		
Recommended brand	YAMALUBE		
Type	Full synthetic		
SAE viscosity grades	10W-40, 15W-50		
Recommended engine oil grade	API service SG type or higher, JASO standard		
Lubrication quaters	MA		
Lubrication system	Wet sump		
Engine oil quantity	0.001 (4.40110 -+ 0.401		
Oil change	3.90 L (4.12 US qt, 3.43 Imp.qt)		
With oil filter removal	4.10 L (4.33 US qt, 3.61 Imp.qt)		
Quantity (disassembled)	4.90 L (5.18 US qt, 4.31 Imp.qt)		
Oil filter			
Oil filter type	Cartridge		
Oil pump			
Inner-rotor-to-outer-rotor-tip clearance	0.000-0.012 mm (0.0000-0.0005 in)		
Limit	0.14 mm (0.0055 in)		
Outer-rotor-to-oil-pump-housing clearance	0.09–0.15 mm (0.0035–0.0059 in)		
Limit	0.22 mm (0.0087 in)		
Oil-pump-housing-to-inner-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 (2.20 kgf/cm²/5000 r/min,		
	31.9 psi/5000 r/min)		
Relief valve operating pressure	790.0 kPa (7.90 kgf/cm², 114.6 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 valve opening pressure	107.9–137.3 kPa (1.08–1.37 kgf/cm², 15.6–19.9 psi)		
Thermostat			
Valve opening temperature	69.0-73.0 °C (156.20-163.40 °F)		
Valve full open temperature	85.0 °C (185.00 °F)		
Valve lift (full open)	8.0 mm (0.31 in)		
Water pump			
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			
Warpage limit	0.10 mm (0.0039 in)		
Camshaft			
Camshaft cap inside diameter	25.500-25.521 mm (1.0039-1.0048 in)		
Camshaft journal diameter	25.459-25.472 mm (1.0023-1.0028 in)		
Camshaft-journal-to-camshaft-cap clearance	0.028-0.062 mm (0.0011-0.0024 in)		
Limit	0.080 mm (0.0032 in)		
Camshaft lobe dimensions			
Lobe height (Intake)	35.169-35.269 mm (1.3846-1.3885 in)		
Limit	35.160 mm (1.3842 in)		
Lobe height (Exhaust)	34.672–34.772 mm (1.3650–1.3690 in)		
Limit	34.170 mm (1.3453 in)		
Camshaft runout limit	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)		
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 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)		
Valve guide inside diameter (exhaust)	4.500–4.512 mm (0.1772–0.1776 in)		
Valve-stem-to-valve-guide clearance (in-	0.010–0.037 mm (0.0004–0.0015 in)		
take)	0.000 (0.0000)		
Limit	0.080 mm (0.0032 in)		

Valve-stem-to-valve-guide clearance (exhaust)	0.025-0.052 mm (0.0010-0.0020 in)		
Limit	0.100 mm (0.0039 in)		
Valve stem runout	0.010 mm (0.0004 in)		
Valve spring			
Inner spring			
Free length (intake)	34.52 mm (1.36 in)		
Limit	32.79 mm (1.29 in)		
Free length (exhaust)	36.94 mm (1.45 in)		
Limit	35.09 mm (1.38 in)		
Outer spring	,		
Free length (intake)	35.72 mm (1.41 in)		
Limit	33.93 mm (1.34 in)		
Free length (exhaust)	36.85 mm (1.45 in)		
Limit	35.01 mm (1.38 in)		
Cylinder			
Bore	79.000-79.010 mm (3.1102-3.1106 in)		
Wear limit	79.060 mm (3.1126 in)		
	,,		
Piston Diameter	78 055_78 070 mm (2 1005_2 1000 in)		
	78.955–78.970 mm (3.1085–3.1090 in) 8.0 mm (0.31 in)		
Measuring point (from piston skirt bottom) Piston-to-cylinder clearance	0.006–0.049 mm (0.0002–0.0019 in)		
Piston pin bore inside diameter	17.002–17.013 mm (0.6694–0.6698 in)		
Limit	17.002=17.013 fillif (0.0094=0.0098 lif) 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)		
	0.002 0.022 (0.0001 0.0000)		
Piston ring			
Top ring	Damel		
Ring type	Barrel		
End gap limit	0.50 mm (0.0197 in) 0.030–0.065 mm (0.0012–0.0026 in)		
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)		
Side clearance limit	0.115 mm (0.0045 in)		
2nd ring	Tonor		
Ring type	Taper 1.15 mm (0.0453 in)		
End gap limit Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)		
Side clearance	0.020-0.033 Hill (0.0008-0.0022 HI) 0.115 mm (0.0045 in)		
	0.113 11111 (0.0043 111)		
Connecting rod			
Oil clearance	0.033–0.057 mm (0.0013–0.0022 in)		
Bearing color code			
Code 1	Blue		
Code 2	Black		
Code 3	Brown		
Code 4	Green		
Code 5	Yellow		
Code 6	Pink		
Crankshaft			
Runout limit	0.030 mm (0.0012 in)		
Journal oil clearance	0.027-0.045 mm (0.0011-0.0018 in)		

Bearing color code	
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green
Code 5	Yellow
Code 6	Pink
Code 7	Red
Balancer	
Balancer shaft runout limit	0.030 mm (0.0012 in)
Bearing color code	·
Code 0	White
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green
Code 5	Yellow
Code 6	Pink
Balancer shaft journal to balancer shaft bear-	0.028–0.046 mm (0.0011–0.0018 in)
ing clearance	0.020-0.040 mm (0.0011-0.0016 m)
Clutch	Makana Rala P
Clutch type	Wet, multiple-disc
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Assembly width	48.3–49.3 mm (1.90–1.94 in)
Friction plate 1 thickness	2.72–2.88 mm (0.107–0.113 in)
Wear limit	2.62 mm (0.103 in)
Plate quantity	3 pcs
Friction plate 2 thickness	2.72–2.88 mm (0.107–0.113 in)
Wear limit	2.62 mm (0.103 in)
Plate quantity	7 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	7 pcs
Warpage limit	0.10 mm (0.004 in)
Plate quantity	1 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
Drivetrain	• **
Primary reduction ratio	1.634 (67/41)
•	· · · · · · · · · · · · · · · · · · ·
Transmission type	Constant mesh 6-speed
Gear ratio	0.000 (00/45)
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)

0.08 mm (0.0032 in)			
0.08 mm (0.0032 in) 2.563 (41/16) Chain			
			258.5–260.5 mm (10.18–10.26 in)
Oil-coated paper element			
Electrical			
5.2 A			
12.0 Ω			
2CR4 10			
1.20–2.80 kΩ			
1.08–2.52 kΩ			
1200–1400 r/min			
Inactive			
Inactive			
Sampling port on the exhaust pipe			
90–110 °C (194–230 °F)			
26.0 kPa (195 mmHg, 7.7 inHg)			
1.3 kPa (10 mmHg, 0.4 inHg)			
1.0–4.0 %			
300-390 kPa (3.0-3.9 kgf/cm², 43.5-56.6 psi)			
3.0–5.0 mm (0.12–0.20 in)			
18–22 Ω			

EAS20015			
CHASSIS SPECIFICATIONS			
Chassis			
Frame type	Diamond		
Caster angle	24.0 °		
Trail	102 mm (4.0 in)		
Front wheel			
Wheel type	Cast wheel		
Rim size	17M/C x MT3.50		
Rim material	Magnesium		
Radial wheel runout limit	1.0 mm (0.04 in)		
Lateral wheel runout limit	1.0 mm (0.04 in)		
Wheel axle bending limit	0.40 mm (0.02 in)		
Rear wheel			
Wheel type	Cast wheel		
Rim size	17M/C x MT6.00		
Rim material Radial wheel runout limit	Magnesium		
Lateral wheel runout limit	1.0 mm (0.04 in) 1.0 mm (0.04 in)		
Wheel axle bending limit	0.40 mm (0.02 in)		
	0.40 11111 (0.02 111)		
Front tire	Tobalese		
Type	Tubeless		
Size Manufacturer/model	120/70 ZR17MC (58W) BRIDGESTONE/BATTLAX RACING STREET		
Manufacturer/model	RS10F		
Do an time	110101		
Rear tire Type	Tubeless		
Size	190/55 ZR17M/C (75W) (YZF-R1, YZF-R1H)		
GIZC	200/55 ZR17M/C (78W) (YZF-R1M, YZF-		
	R1MH)		
Manufacturer/model	BRIDGESTONE/BATTLAX RACING STREET		
	RS10R		
Tire air pressure (measured on cold tires)			
Front	250 kPa (2.50 kgf/cm ² , 36 psi)		
Rear	290 kPa (2.90 kgf/cm², 42 psi)		
Brake			
Unified brake system			
Operation	Activated by front brake		
Front brake	•		
Type	Hydraulic dual disc brake		
Disc outside diameter × thickness	$320.0 \times 5.0 \text{ mm} (12.60 \times 0.20 \text{ in})$		
Brake disc thickness limit	4.5 mm (0.18 in)		
Brake disc runout limit (as measured on	0.10 mm (0.0039 in)		
wheel)	, , , ,		
Brake pad lining thickness	4.5 mm (0.18 in)		
Limit	0.8 mm (0.03 in)		
Master cylinder inside diameter	15.87 mm (0.62 in)		
Caliper cylinder inside diameter (Left)	30.23 mm, 27.00 mm (1.19 in, 1.06 in)		
Caliper cylinder inside diameter (Right)	30.23 mm, 27.00 mm (1.19 in, 1.06 in)		

Specified brake fluid	DOT 4
Rear brake	
Type	Hydraulic single disc brake
Disc outside diameter × thickness	220.0 × 5.0 mm (8.66 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059 in)
Brake pad lining thickness	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
Front suspension	
Type	Telescopic fork
Spring	Coil spring
Shock absorber	Hydraulic damper
Fork spring free length	217.5 mm (8.56 in) (YZF-R1, YZF-R1H)
	260.0 mm (10.24 in) (YZF-R1M, YZF-R1MH)
Limit	213.1 mm (8.39 in) (YZF-R1, YZF-R1H)
	254.8 mm (10.03 in) (YZF-R1M, YZF-R1MH)
Recommended oil	Ohlins R&T 43 (YZF-R1M, YZF-R1MH)
	Yamaha Suspension Oil 01 (YZF-R1, YZF-R1H)
Quantity (left)	368.0 cm ³ (12.44 US oz, 12.98 lmp.oz) (YZF-
	R1, YZF-R1H)
	405.0 cm ³ (13.69 US oz, 14.28 Imp.oz) (YZF-
	R1M, YZF-R1MH)
Quantity (right)	368.0 cm ³ (12.44 US oz, 12.98 Imp.oz) (YZF-
, (ag)	R1, YZF-R1H)
	405.0 cm ³ (13.69 US oz, 14.28 Imp.oz) (YZF-
	R1M, YZF-R1MH)
Level (left)	114 mm (4.5 in) (YZF-R1, YZF-R1H)
	220 mm (8.7 in) (YZF-R1M, YZF-R1MH)
Level (right)	114 mm (4.5 in) (YZF-R1, YZF-R1H)
=0.0. (g)	220 mm (8.7 in) (YZF-R1M, YZF-R1MH)
Spring preload	,
Adjusting system	Mechanical adjustable type
Unit for adjustment	Turn
Adjustment value (Soft)	0
Adjustment value (STD)	5 (YZF-R1M, YZF-R1MH)
,	9 (YZF-R1, YZF-R1H)
Adjustment value (Hard)	15
Rebound damping	
Adjusting system	Electronically adjustable type (YZF-R1M, YZF-
rajasang system	R1MH)
	Mechanical adjustable type (YZF-R1, YZF-R1H)
Unit for adjustment	Click (YZF-R1, YZF-R1H)
Adjustment value from the start position	14 (YZF-R1, YZF-R1H)
(Soft)	(12: 11:, 12: 11:11)
Adjustment value from the start position	7 (YZF-R1, YZF-R1H)
(STD)	. (,
Adjustment value from the start position	1 (YZF-R1, YZF-R1H)

Compression damping Adjusting system Electronically adjustable type (YZF-R1M, YZF-R1MH) Mechanical adjustable type (YZF-R1, YZF-R1H) Unit for compression damping adjustment Click (YZF-R1, YZF-R1H) Adjustment value from the start position 23 (YZF-R1, YZF-R1H) (Soft) Adjustment value from the start position 17 (YZF-R1, YZF-R1H) (STD) Adjustment value from the start position 1 (YZF-R1, YZF-R1H) (Hard) Rear suspension Type Swingarm (link suspension) Spring Coil spring Shock absorber Gas-hydraulic damper Spring preload Adjusting system Mechanical adjustable type Adjustment value (Soft) 0.0 mm (0.00 in) (YZF-R1M, YZF-R1MH) 77.5 mm (3.05 in) (YZF-R1, YZF-R1H) 4.0 mm (0.16 in) (YZF-R1M, YZF-R1MH) Adjustment value (STD) 79.0 mm (3.11 in) (YZF-R1, YZF-R1H) 85.5 mm (3.37 in) (YZF-R1, YZF-R1H) Adjustment value (Hard) 9.0 mm (0.35 in) (YZF-R1M, YZF-R1MH) Rebound damping Adjusting system Electronically adjustable type (YZF-R1M, YZF-R1MH) Mechanical adjustable type (YZF-R1, YZF-R1H) Unit for adjustment Click (YZF-R1, YZF-R1H) Adjustment value from the start position 23 (YZF-R1, YZF-R1H) (Soft) Adjustment value from the start position 12 (YZF-R1, YZF-R1H) (STD) Adjustment value from the start position 1 (YZF-R1, YZF-R1H) (Hard) Compression damping Adjusting system Electronically adjustable type (YZF-R1M, YZF-R1MH) Mechanical adjustable type (YZF-R1, YZF-R1H) Fast compression damping Unit for adjustment Turn (YZF-R1, YZF-R1H) 5.5 (YZF-R1, YZF-R1H) Adjustment value from the start position (Soft) Adjustment value from the start position 3 (YZF-R1, YZF-R1H) (STD) Adjustment value from the start position 0 (YZF-R1, YZF-R1H) (Hard) Slow compression damping Unit for adjustment Click (YZF-R1, YZF-R1H) Adjustment value from the start position 18 (YZF-R1, YZF-R1H) Adjustment value from the start position 10 (YZF-R1, YZF-R1H)

(STD)

Adjustment value from the start position (Hard)	1 (YZF-R1, YZF-R1H)
Drive chain	
Size	525VZ
Chain type	Sealed type
Number of links	114
Drive chain slack (side stand)	25.0-35.0 mm (0.98-1.38 in)
Drive chain slack (Maintenance stand)	25.0-35.0 mm (0.98-1.38 in)
15-link length limit	239.3 mm (9.42 in)

ELECTRICAL SPECIFICATIONS

ELECTRICAL SPECIFICATIONS	
Voltage System voltage	12 V
Ignition system Ignition system Advancer type Ignition timing (B.T.D.C.)	TCI Digital 5.0 °/1300 r/min
Engine control unit Model	TBDFZ4
Ignition coil Primary coil resistance Secondary coil resistance	0.85–1.15 Ω 8.50–11.50 kΩ
Charging system Charging system Standard output Standard output Stator coil resistance	AC magneto 14.0 V, 26.2 A at 5000 r/min 14.0 V, 368 W at 5000 r/min 0.112–0.168 Ω
Rectifier/regulator Regulator type Regulated voltage (DC) Rectifier capacity (DC)	Three-phase 14.3–14.7 V 35.0 A
Battery Model Voltage, capacity	YTZ7S 12 V, 6.0 Ah (10 HR)
Bulb wattage Headlight Brake/tail light Front turn signal light Rear turn signal light Auxiliary light License plate light Meter lighting	LED LED LED LED LED LED LED LED
Indicator light Neutral indicator light Stability control indicator light Oil pressure and coolant temperature warning	LED LED LED
light High beam indicator light Turn signal indicator light Fuel level warning light Engine trouble warning light ABS warning light Steering damper and suspension warning	LED LED LED LED LED LED
light Immobilizer system indicator light Shift timing indicator light	LED LED

ELECTRICAL SPECIFICATIONS

0.75 kW		
0.0115–0.0140 Ω		
9.0 mm (0.35 in)		
5.50 mm (0.22 in)		
4.80-7.20 N (489-734 gf, 17.28-25.92 oz)		
106.6 mm (4.20 in)		
105.6 mm (4.16 in)		
2.40 mm (0.09 in)		
49.82–56.18 Ω		
42.00–48.00 $Ω$		
189–231 Ω		
4.8 V		
0.8 V		
5400–6600 Ω at 0 °C (5400–6600 Ω at 32 °F)		
289–391 Ω at 80 °C (289–391 Ω at 176 °F)		
2512–2777 Ω at 20 °C (2512–2777 Ω at 68 °F)		
210–220 Ω at 100 °C (210–220 Ω at 212 °F)		
50.0 A		
7.5 A		
7.5 A		
15.0 A		
15.0 A		
10.0 A		
7.5 A		
7.5 A		
7.5 A (YZF-R1M, YZF-R1MH)		
15.0 A		
30.0 A		
15.0 A		
2.0 A		
7.5 A		
7.5 A		

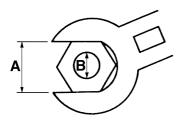
EAS20017

TIGHTENING TORQUES

EAS3001

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			
A (liat)	D (BOIL)	N∙m	kgf⋅m	lb∙ft	
10 mm	6 mm	6	0.6	4.4	
12 mm	8 mm	15	1.5	11	
14 mm	10 mm	30	3.0	22	
17 mm	12 mm	55	5.5	41	
19 mm	14 mm	85	8.5	63	
22 mm	16 mm	130	13	96	

EAS30016

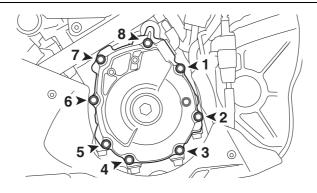
ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Exhaust pipe nut	M8	8	20 N·m (2.0 kgf·m, 15 lb·ft)	
Muffler protector bolt	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
EXUP valve pulley cover bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Spark plug	M10	4	13 N·m (1.3 kgf·m, 9.6 lb·ft)	
Spark plug (new)	M10	4	18 N·m (1.8 kgf·m, 13 lb·ft)	
Cylinder head cover bolt	M6	6	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Generator rotor bolt	M10	1	85 N·m (8.5 kgf·m, 63 lb·ft)	⊸ (E)
Generator cover bolt	M6	8	See TIP.	
Clutch boss nut	M20	1	125 N·m (12.5 kgf·m, 92 lb·ft)	Stake. ⊸©
Clutch spring bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Clutch cover bolt	M6	10	See TIP.	
Oil filter cartridge	M20	1	17 N·m (1.7 kgf·m, 13 lb·ft)	
Oil filter cartridge union bolt	M20	1	70 N·m (7.0 kgf·m, 52 lb·ft)	⊸ €
Water pump drain bolt	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Engine oil drain bolt	M14	1	23 N·m (2.3 kgf·m, 17 lb·ft)	

TIP -

Generator cover bolt

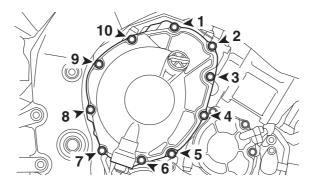
- 1. Tighten the bolts to 6 N·m (0.6 kgf·m, 4.4 lb·ft) with a torque wrench following the tightening order.
- 2. Perform the following procedure to all the bolts one by one in the tightening sequence as shown in the illustration.
 - a. Loosen the bolt.
 - b. Tighten the bolt to 3.0 N·m (0.30 kgf·m, 2.2 lb·ft) 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 N·m (0.6 kgf·m, 4.4 lb·ft) 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 N·m (0.30 kgf·m, 2.2 lb·ft) with a torque wrench.
 - c. Tighten the bolt further to reach the specified angle 180°.



EAS30017

CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Front wheel axle nut	M24	1	115 N·m (11.5 kgf·m, 85 lb·ft)	
Front wheel axle pinch bolt	M8	4	21 N·m (2.1 kgf·m, 15 lb·ft)	See TIP.
Rear wheel sprocket nut	M10	5	100 N·m (10 kgf·m, 74 lb·ft)	
Rear wheel axle nut	M24	1	190 N·m (19 kgf·m, 140 lb·ft)	
Rear brake caliper bolt (front)	M12	1	27 N·m (2.7 kgf·m, 20 lb·ft)	
Rear brake caliper bolt (rear)	M8	1	12 N·m (1.2 kgf·m, 8.9 lb·ft)	- (G)
Brake caliper bleed screw	M8	3	5 N·m (0.5 kgf·m, 3.7 lb·ft)	
Front brake caliper bolt	M10	4	35 N·m (3.5 kgf·m, 26 lb·ft)	
Handlebar bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Handlebar pinch bolt	M8	2	32 N·m (3.2 kgf·m, 24 lb·ft)	
Clutch cable locknut	M8	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Lower bracket pinch bolt	M8	4	23 N·m (2.3 kgf·m, 17 lb·ft)	See TIP.
Upper bracket pinch bolt	M8	2	26 N·m (2.6 kgf·m, 19 lb·ft)	
Lower ring nut	M30	1	See TIP.	
Drive sprocket nut	M22	1	140 N·m (14 kgf·m, 103 lb·ft)	Stake.
Rear frame bolt	M10	4	37 N·m (3.7 kgf·m, 27 lb·ft)	

TIGHTENING TORQUES

TIP_

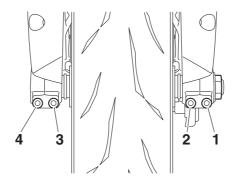
Lower ring nut

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

TIP

Front wheel axle pinch bolt

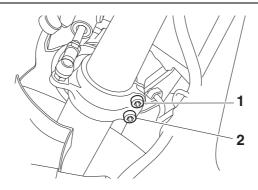
- 1. Tighten the pinch bolt "2", pinch bolt "1", and pinch bolt "2" to 21 N·m (2.1 kgf·m, 15 lb·ft) in this order.
- 2. Check that the right end of the front axle is flush with the front fork. If necessary, manually push the front axle or lightly tap it with a soft hammer until its end is flush with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



TIP -

Lower bracket pinch bolt

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



FAS2001

LUBRICATION POINTS AND LUBRICANT TYPES

EAS30018

ENGINE

O-rings Coolant hose insertion part Water or S Bearings Rocker arm shaft outer surface Camshaft lobes and journals (intake and exhaust) Valve stem seal (installed on valve guide) Valve pad Valve stems and stem ends (intake and exhaust) Crankshaft big ends Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch gear Primary driven gear end Clutch housing thrust plate Clutch boss nut and conical washer Cil pump drive sprocket inner surface Clutch boss nut and conical washer Cil pump drive sprocket inner surface	Lubrication point	Lubricant
Coolant hose insertion part Bearings Rocker arm shaft outer surface Camshaft lobes and journals (intake and exhaust) Valve stem seal (installed on valve guide) Valve pad Valve stems and stem ends (intake and exhaust) Crankshaft big ends Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or — ③ Oil pump rotors (inner and outer) Oil gallery) O-ring Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch outer assembly Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch boss nut and conical washer Gl pump drive sprocket inner surface Clutch boss nut and conical washer Gl pump drive sprocket inner surface Gl pump drive sprocket inner surface	Oil seal lips	-(3)
Bearings Rocker arm shaft outer surface Camshaft lobes and journals (intake and exhaust) Valve stem seal (installed on valve guide) Valve pad Valve stems and stem ends (intake and exhaust) Crankshaft big ends Piston surfaces Piston prins Crankshaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or -3 Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Crankcase bolt O-ring Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch boss nut and conical washer Oil pump drive sprocket inner surface Clutch boss nut and conical washer Oil pump drive sprocket inner surface Oil pump drive sprocket inner surface	O-rings	- (s)-
Rocker arm shaft outer surface Camshaft lobes and journals (intake and exhaust) Valve stem seal (installed on valve guide) Valve pad Valve stems and stem ends (intake and exhaust) Crankshaft big ends Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or -© Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Water or -© Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch outer assembly Starter clutch outer assembly Clutch housing thrust plate Clutch boss nut and conical washer Clutch boss nut and conical washer Cil pump drive sprocket inner surface Clutch boss nut and conical washer	Coolant hose insertion part	Water or ⊸
Camshaft lobes and journals (intake and exhaust) Valve stem seal (installed on valve guide) Valve stems and stem ends (intake and exhaust) Crankshaft big ends Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or -© Oil pump rotors (inner and outer) Oil gillery) O-ring Water or -© Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch outer assembly Clutch bousing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Bearings	⊸ €
Valve stem seal (installed on valve guide) Valve pad Valve stems and stem ends (intake and exhaust) Crankshaft big ends Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or - © Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Water or - © Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch boss nut and conical washer Oil pump drive sprocket inner surface Clutch boss nut and conical washer	Rocker arm shaft outer surface	⊸ €
Valve pad Valve stems and stem ends (intake and exhaust) Crankshaft big ends Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or I was an outer) Oil pump rotors (inner and outer) Oil giller cartridge union bolt Plug (oil gallery) O-ring Water or I was an outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface Oil pump drive sprocket inner surface	Camshaft lobes and journals (intake and exhaust)	→®
Valve stems and stem ends (intake and exhaust) Crankshaft big ends Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or — © Oil pump rotors (inner and outer) Oil gilter cartridge union bolt Plug (oil gallery) O-ring Water or — © Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface Oil pump drive sprocket inner surface	Valve stem seal (installed on valve guide)	⊸©
Crankshaft big ends Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or - © Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Water or - © Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch outer assembly Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface Gli pump drive sprocket inner surface	Valve pad	⊸ Ø
Piston surfaces Piston pins Crankshaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or -6 Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Water or -6 Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface Gli pump drive sprocket inner surface	Valve stems and stem ends (intake and exhaust)	⊸ Ø
Piston pins Crankshaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or I water	Crankshaft big ends	⊸ €
Crankshaft journals Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or G Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Water or G Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Piston surfaces	⊸ €
Balancer shaft journals Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or — © Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Water or — © Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface Oil pump drive sprocket inner surface	Piston pins	⊸€
Generator rotor bolt thread and washer Timing chain sprocket bolt Coolant pipe O-ring Water or G Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Crankshaft journals	⊸ €
Timing chain sprocket bolt Coolant pipe O-ring Water or - S Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Water or - S Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Balancer shaft journals	⊸€
Coolant pipe O-ring Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface Water or — Water or — Starter or — Water or — Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Generator rotor bolt thread and washer	⊸ €
Oil pump rotors (inner and outer) Oil filter cartridge union bolt Plug (oil gallery) O-ring Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Timing chain sprocket bolt	⊸€
Oil filter cartridge union bolt Plug (oil gallery) O-ring Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface Water or — ⑤ Water or — ⑥ Cancel of a conical washer — ⑥ Oil pump drive sprocket inner surface	Coolant pipe O-ring	Water or ⊸
Plug (oil gallery) O-ring Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface Water or — E Water or — E Clutch outer or — Clutch idle gear inner surface ———————————————————————————————————	Oil pump rotors (inner and outer)	- (3)-
Crankcase bolt O-ring Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Oil filter cartridge union bolt	⊸ €
Timing chain cover oil seal outer surface Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Plug (oil gallery) O-ring	Water or ⊸
Starter clutch idle gear inner surface and end Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Crankcase bolt O-ring	⊸ €
Starter clutch outer assembly Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Timing chain cover oil seal outer surface	-C9-
Starter clutch gear Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Starter clutch idle gear inner surface and end	⊸ €
Primary driven gear end Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Starter clutch outer assembly	⊸ €
Clutch pull rod Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface	Starter clutch gear	⊸ €
Clutch housing thrust plate Clutch boss nut and conical washer Oil pump drive sprocket inner surface —	Primary driven gear end	⊸ €
Clutch boss nut and conical washer Oil pump drive sprocket inner surface — ©	Clutch pull rod	-0-
Oil pump drive sprocket inner surface	Clutch housing thrust plate	⊸€
	Clutch boss nut and conical washer	⊸€
Oil pump drive sprocket collar inner surface	Oil pump drive sprocket inner surface	⊸ €
	Oil pump drive sprocket collar inner surface	⊸ €

Lubrication point	Lubricant
Oil pump drive sprocket washer	⊸ €
Clutch housing assembly washer	⊸ €
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	⊸ €
Shift shaft washer	⊸ €
Shift shaft moving surface	⊸ €
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	
Brake lever pivot bolt and metal-to-metal moving parts	
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	
Swingarm dust cover lip, swingarm pivot ends	
Swingarm pivot bushing ends	— LS
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)	— LS

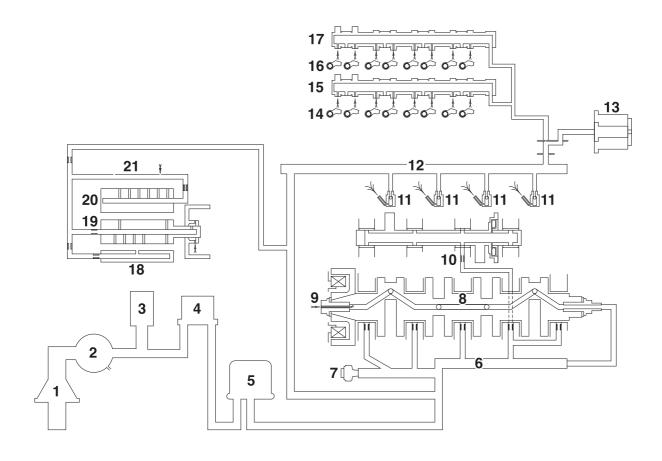
Lubrication point	Lubricant
Front wheel axle nut mating surface	
Rear wheel oil seal	-C S - 1
Rear wheel drive hub oil seal	-C
Rear wheel drive hub mating surface	-C9-
Rear wheel drive hub and rear wheel mating surfaces	-C
IMU washer (grommet side)	-©
Brake caliper piston seal	⊸ ®
Master cylinder inside	⊸ ®
Brake caliper piston dust seal	-©H
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®

EAS20019

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS30020

ENGINE OIL LUBRICATION CHART

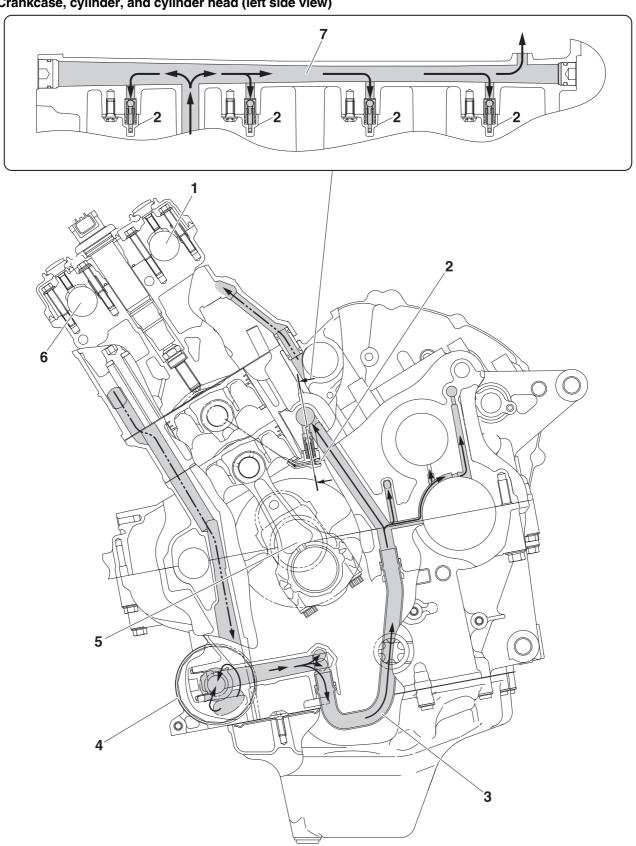


- 1. Oil strainer
- 2. Oil pump
- 3. Relief valve
- 4. Oil cooler
- 5. Oil filter cartridge
- 6. Main gallery
- 7. Oil pressure switch
- 8. Crankshaft
- 9. Generator rotor
- 10.Balancer shaft
- 11.Oil nozzle
- 12.Sub gallery
- 13. Timing chain tensioner
- 14.Intake rocker arm
- 15.Intake camshaft
- 16.Exhaust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

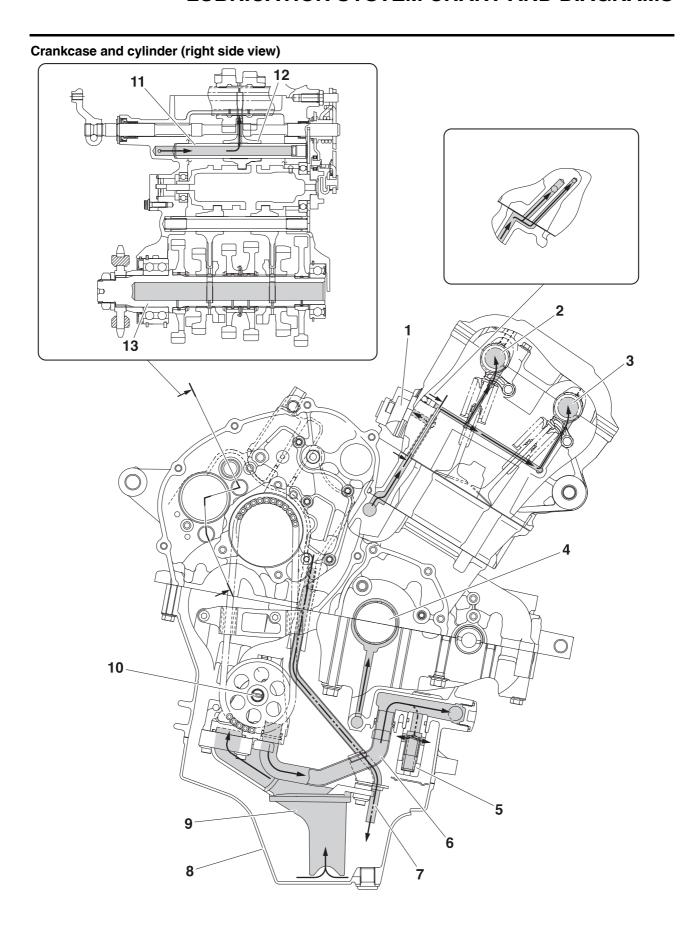
EAS30021

LUBRICATION DIAGRAMS

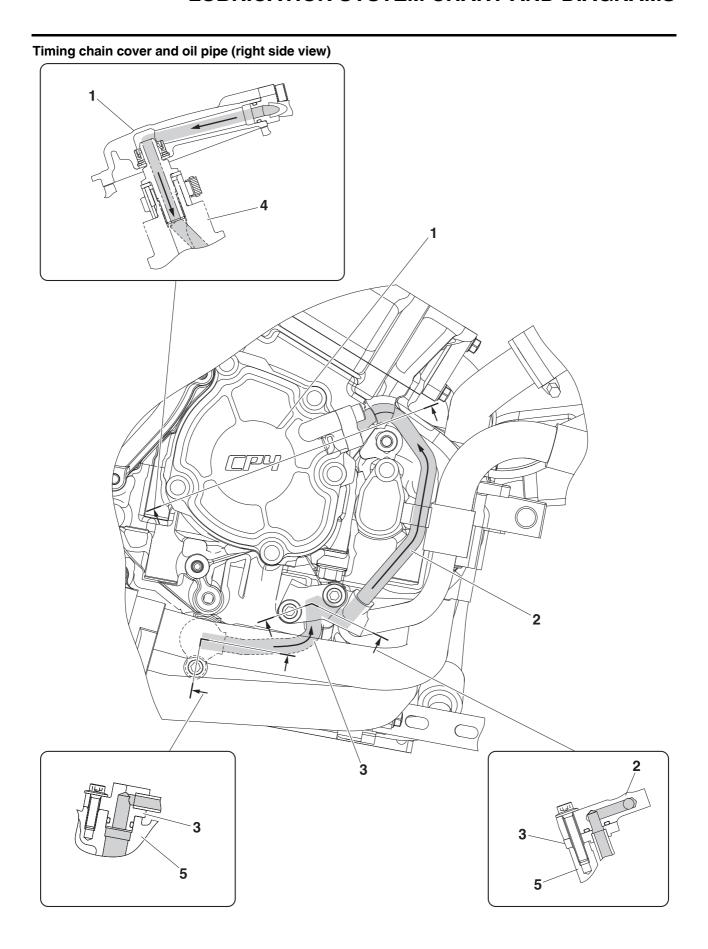
Crankcase, cylinder, and cylinder head (left side view)



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

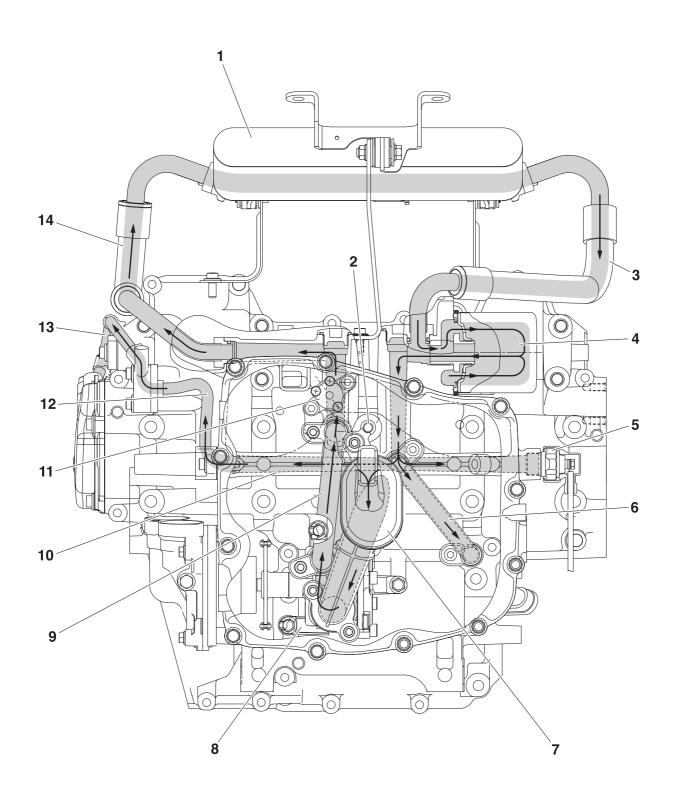


- 1. Timing chain tensioner
- 2. Intake camshaft
- 3. Exhaust camshaft
- 4. Crankshaft
- 5. Relief valve
- 6. Oil pipe 1
- 7. Oil delivery pipe 1
- 8. Oil pan
- 9. Oil strainer
- 10.Oil pump
- 11.Shift fork guide bar
- 12.Shift fork-C
- 13.Drive axle



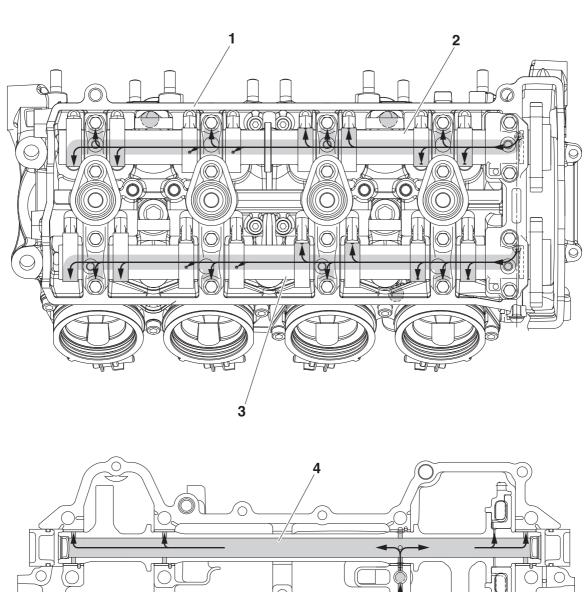
- 1. Timing chain cover
- 2. Oil pipe 3
- 3. Oil pipe 24. Crankshaft
- 5. Crankcase

Oil pump and oil cooler (bottom view)



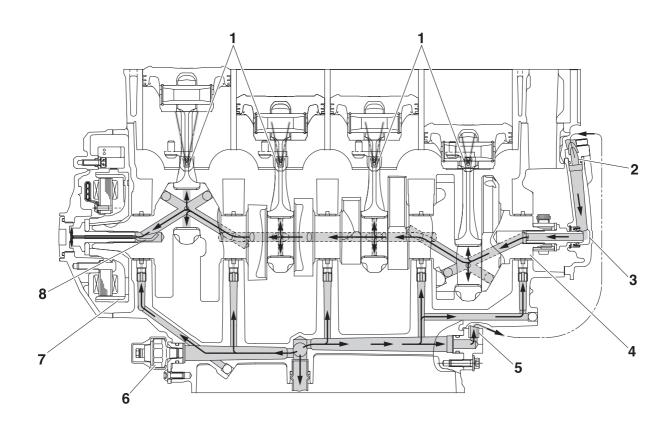
- 1. Oil cooler
- 2. Oil delivery pipe 1
- 3. Oil cooler outlet hose
- 4. Oil filter cartridge
- 5. Oil pressure switch
- 6. Oil delivery pipe 2
- 7. Oil strainer
- 8. Oil pump
- 9. Oil pipe 1
- 10.Main gallery
- 11.Relief valve
- 12.Oil pipe 2
- 13.Oil pipe 3
- 14.Oil cooler inlet hose

Camshaft and balancer shaft (top view)



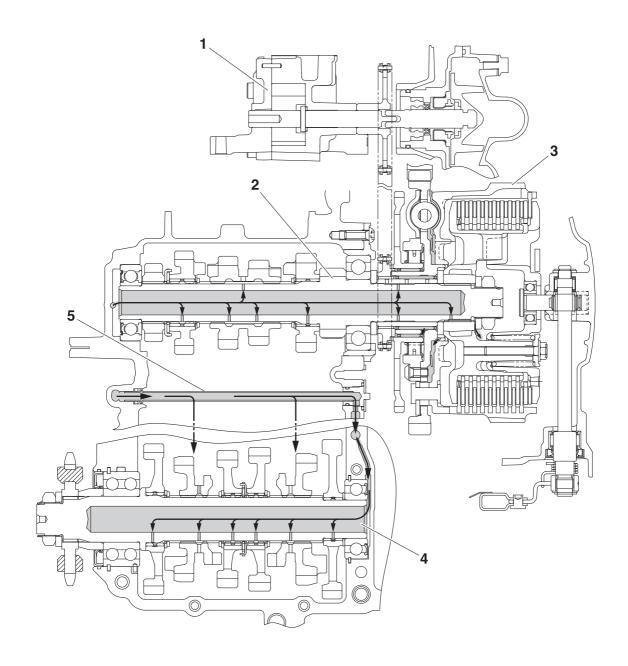
- 1. Cylinder head
- 2. Exhaust camshaft
- 3. Intake camshaft
- 4. Balancer shaft

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

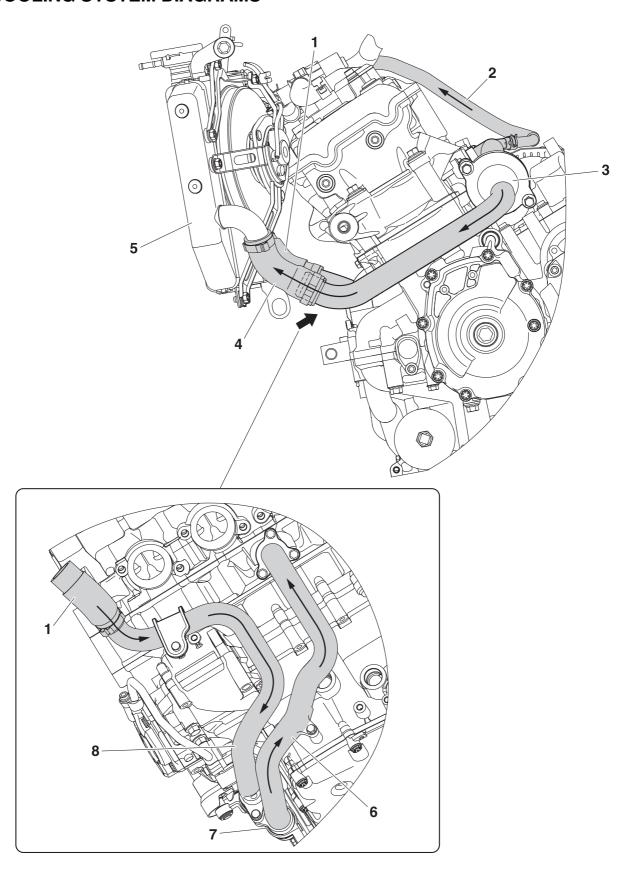
Crankshaft and transmission (top view)



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

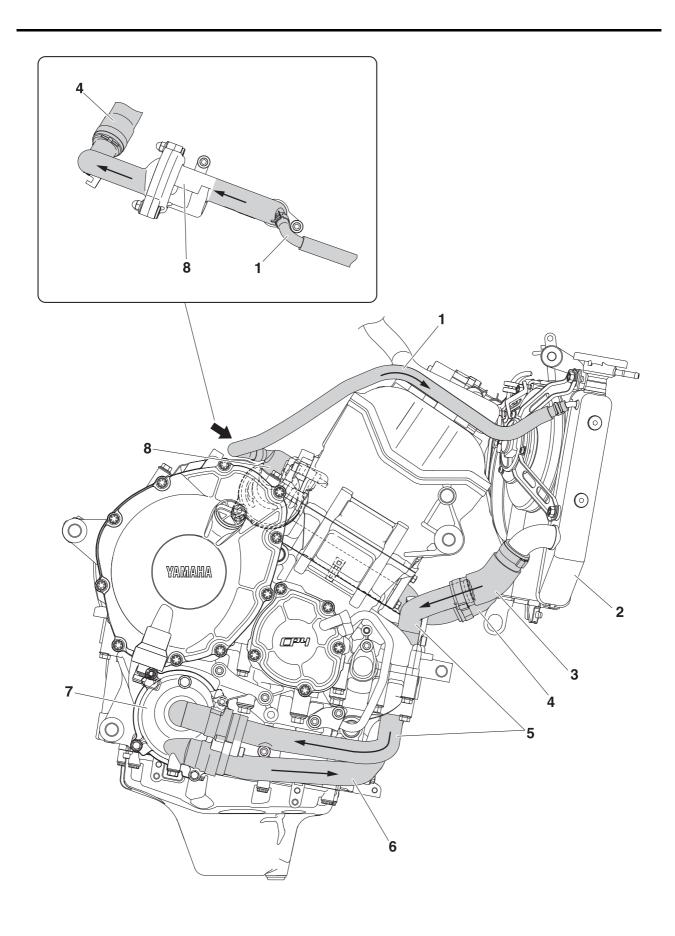
EAS20020

COOLING SYSTEM DIAGRAMS



COOLING SYSTEM DIAGRAMS

- 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



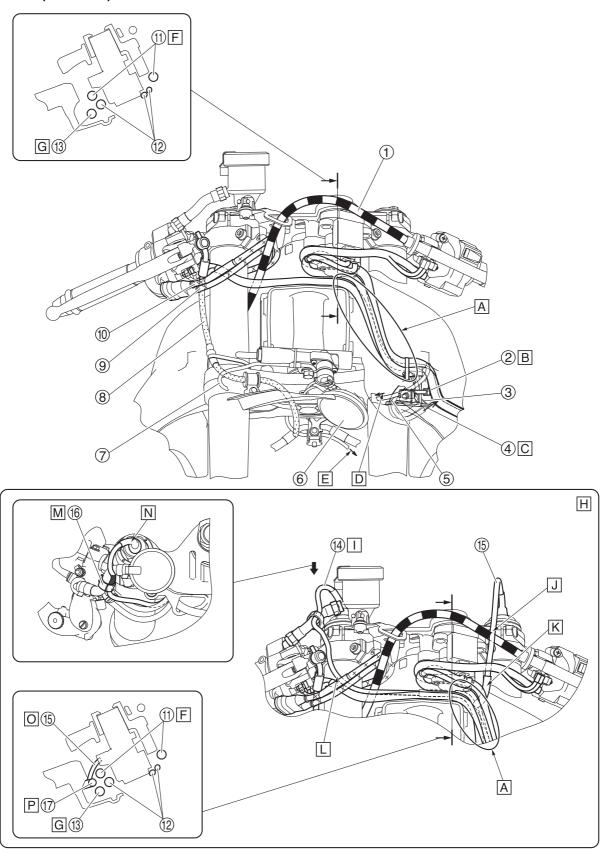
COOLING SYSTEM DIAGRAMS

- 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

EAS20021

CABLE ROUTING

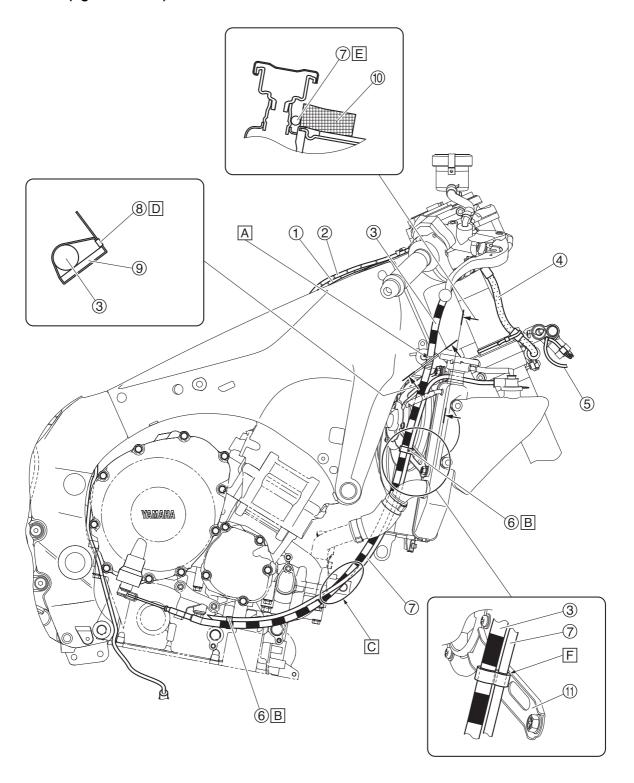
Handlebar (front view)



- 1. Clutch cable
- 2. Plastic locking tie
- 3. Plate (behind the radiator)
- Immobilizer unit lead
- Intake solenoid vacuum hose
- 6. Horn
- 7. Steering damper solenoid lead
- 8. Front brake hose
- 9. Throttle cable (decelerator cable)
- 10. Throttle cable (accelerator cable)
- 11. Handlebar switch lead (left)
- 12. Main switch lead
- 13. Handlebar switch lead (right)
- 14. Front fork stepping motor sub-lead (right)
- 15. Front fork stepping motor sub-lead (left)
- 16.Clamp
- 17. Sub-wire harness
- A. Make sure that each lead is not overlapped.
- B. Fasten the positioning tape section of the immobilizer unit lead to the radiator bracket with the plastic locking tie. Make sure that the plastic locking tie is not on the plate behind the radiator. Face the buckle of the plastic locking tie outward.
- C. Connect the immobilizer unit lead above the cylinder head cover. Route the immobilizer unit lead to the inside of the installation nut on the plate behind the radiator.
- D. To horn
- E. To front wheel sensor
- F. Route the handlebar switch lead (left) over the main switch lead and handlebar switch lead (right).
- G. Route the handlebar switch lead (right) to the rear of the main switch lead.
- H. For YZF-R1M
- 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.
- J. Route the front fork stepping motor sub-lead (left) to the front of the clutch cable.
- K. Route the front fork stepping motor sub-lead (left) over the handlebar switch lead (left), handlebar switch lead (right), and main switch lead.
- L. Route the front fork stepping motor sub-lead (right) over the throttle cables.
- M. 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.
- N. Connect the front fork stepping motor coupler, and then slide the waterproof cover over until it contacts the front fork cap bolt.

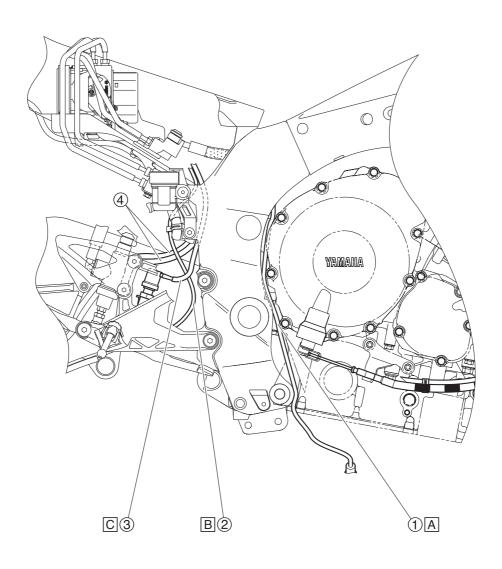
- O. Route the front fork stepping motor sub-lead (left) above the leads and in front of the vehicle, and then connect it to the front fork cap bolt.
- P. Route the sub-wire harness to the rear of the handlebar switch lead (left) and main switch lead. The sub-wire harness can move the position after installation.

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.
- 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)



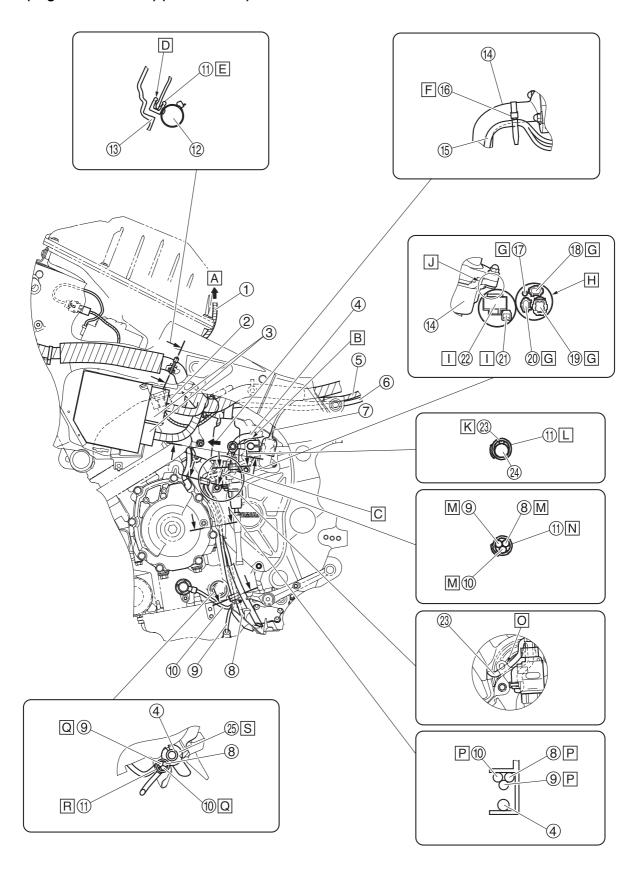
- 1. O₂ sensor lead
- 2. Rear wheel sensor lead
- 3. Rear brake light switch lead
- 4. EXUP cable
- A. Push in the ${\rm O}_2$ sensor lead from the outside until it reaches the alignment surface of the clutch cover.
- B. Route the rear wheel sensor lead to the outside of the EXUP cables.
- C. Route the rear brake light switch lead to the outside of the rear wheel sensor lead.

Electrical components tray (left side view) 17P 22 (19) J 20 16 K 21) (17) 22 L Α (15) 14 13 1B (12) H <u>~</u> F(1) 10 E C 9 D8 **D**(7) D6 40 30 20 **C**(5) (17)M N 25 N 24 (16) 23)

- 1. Intake funnel servo motor lead
- Handlebar switch lead (right) (non-waterproof 2-pole)
- Handlebar switch lead (left) (non-waterproof 4-pole)
- 4. Handlebar switch lead (right) (non-waterproof 6-pole)
- Handlebar switch lead (right) (waterproof 4pole)
- 6. Main switch lead (1-pole)
- 7. Main switch lead (2-pole)
- 8. Radiator fan motor relay lead
- Handlebar switch lead (left) (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. Handlebar switch lead (right)
- 24. Handlebar switch lead (left)
- 25. Main switch lead
- 26.Fuel rail
- A. Cut off the excess end of the plastic locking tie so that the end is not on the frame boss. Also, check the position from the side view so that the plastic locking tie is positioned above the wire harness.
- B. Connect the intake funnel servo motor lead on top of the frame, and then place it between the air filter case and frame.
- C. Route the leads (main harness side) from front of the rib "E" 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.
- D. Route the radiator fan motor relay lead and main switch lead (2-pole) to the rear of the rib "E" on the electrical components tray. Route the main switch lead (1-pole) from front of the rib "E" on the electrical components tray to the inside.
- E. Rib on the electrical components tray
- F. Connect the headlight control unit lead at the top to the headlight control unit.
- G. To intake solenoid
- H. To front turn signal light (left)

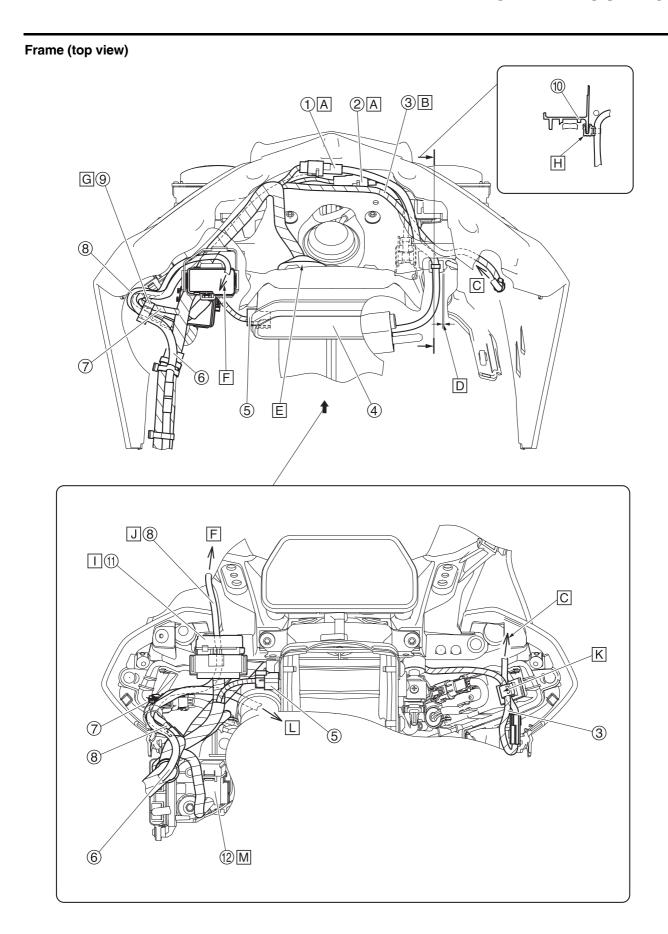
- The radiator fan motor couplers may be installed to the electrical components tray in any order.
 - Route the radiator fan motor lead to the rear of the main switch lead and handlebar switch lead (left) as shown in the illustration.
- J. When installing the plastic locking tie to the electrical components tray, position it in the center within the range shown in the illustration
- K. Fit the secondary injector lead at the white tape between the ribs of the air filter case.
- L. Route the secondary injector lead between the air filter case and cross bar.
- M. 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.
- N. The handlebar switch lead (left) and main switch lead may be routed in any order.
- O. Fasten the handlebar switch lead (right) 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.
- P. 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)



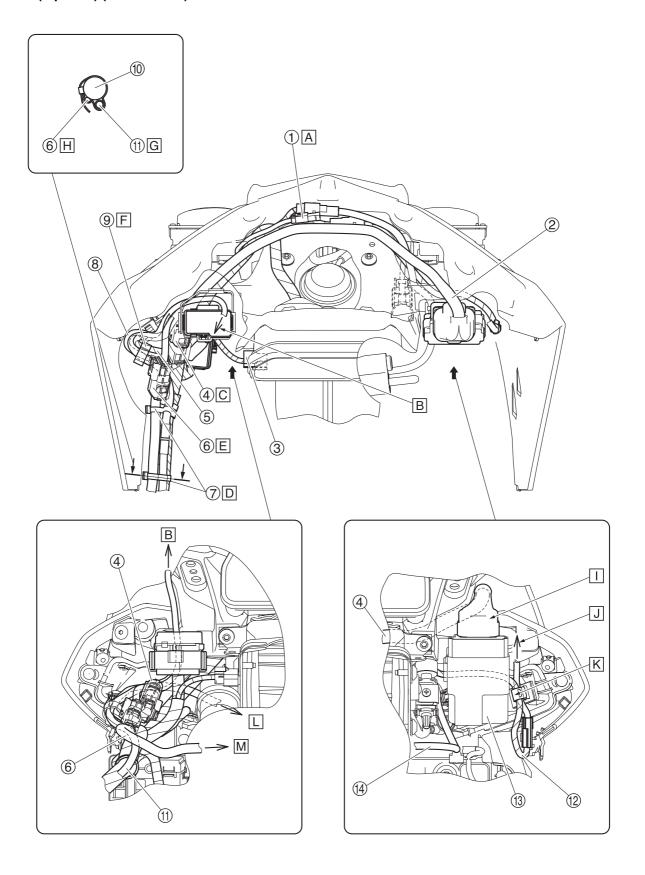
- 1. Secondary injector lead
- 2. Throttle position sensor coupler
- 3. ECU (engine control unit) coupler
- 4. Fuel tank drain hose
- 5. Engine ground lead
- 6. Starter motor lead
- 7. Gear position sensor lead
- 8. Sidestand switch lead
- 9. O₂ sensor lead (left)
- 10.Oil pressure switch lead
- 11.Clamp
- 12. Wire harness
- 13.Frame
- 14. Thermostat assembly
- 15. Stator coil assembly lead
- 16.Plastic locking tie
- 17.Oil pressure switch connector
- 18. Sidestand switch coupler (black)
- 19.0₂ sensor coupler
- 20. Shift switch coupler (white)
- 21. Crankshaft position sensor coupler
- 22. Stator coil coupler
- 23. Shift switch lead
- 24. Shift switch
- 25.Grommet
- A. To secondary injector
- B. Route the fuel tank drain hose over the boss for the shift shaft of the crankcase.
- C. Make sure that the clamp has contact with the upper surface of the shift switch body, and then install it.
- D. Insert the clamp into the frame hole. The clamp can move the position after installation, however make sure not to come off.
- 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 (black), shift switch coupler (white), and O₂ sensor coupler may be positioned in any order.
- H. Place the coupler cover behind the coupler cover (stator coil side) and push it inside the projection on the chain case cover.
- 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. Route the shift switch lead inside the shift switch body.
- L. Fasten the shift switch lead at the upper side of the shift switch body with the clamp. Make sure that the end of the blue tape of the shift switch lead is at the coupler side and that its end is aligned with the lower side of the clamp, and then install the clamp. Fasten the clamp at the position where the opening does not face the shift switch lead.
- M. The sidestand switch lead, O₂ sensor lead (left) and oil pressure switch lead may be routed in any order.
- N. Fasten the sidestand switch lead, O₂ sensor lead (left) and oil pressure 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.
- Route the shift switch lead inside the projection on the chain case cover.
- P. The oil pressure switch lead, sidestand switch lead and O₂ sensor lead (left) may be routed in any order.
- Q. The O₂ sensor lead (left) and oil pressure switch lead may be routed in any order.
- R. Fasten the sidestand switch lead, O₂ sensor lead (left) and oil pressure switch lead with the clamp.
- S. Make sure that the grommet does not protrude from the cover. Face the slit in the grommet inward. Make sure that the projection on the cover is hooked onto the groove in the grommet. Align the grommet with the paint mark on the fuel tank drain hose.

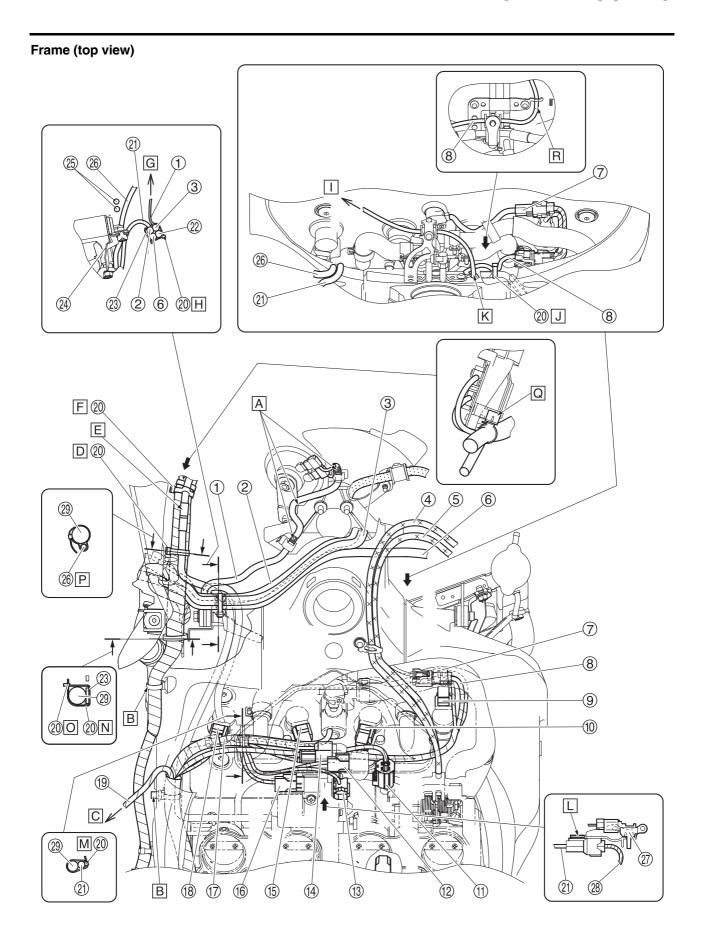


- 1. Steering damper solenoid lead
- 2. Intake solenoid lead (sub-wire harness)
- 3. Front turn signal light lead (right)
- 4. Meter assembly
- 5. Intake air temperature sensor lead
- 6. Intake solenoid vacuum hose
- 7. Auxiliary light lead
- 8. Front turn signal light lead (left)
- 9. Clamp
- 10. Headlight assembly
- 11.Fuse box 1
- 12.Fuse box 2
- A. Place the steering damper solenoid lead and intake solenoid lead (sub-wire harness) in the gap between the front cowling and front cowling assembly stay.
- B. Make sure that the front turn signal light lead (right) is not placed in the gap between the front cowling and front cowling assembly stay.
- C. To front turn signal light (right)
- 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 turn signal light (left)
- G. Fasten the intake solenoid vacuum hose, front turn signal light lead (left), 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.
- Install the rubber clamp to the fuse box 1, and then insert until it contacts the projection on the bracket.
- J. Route the front turn signal light lead (left) to the front of the fuse box 1.
- K. Connect the front turn signal light coupler (right), and then fasten the front turn signal light leads (left) 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)

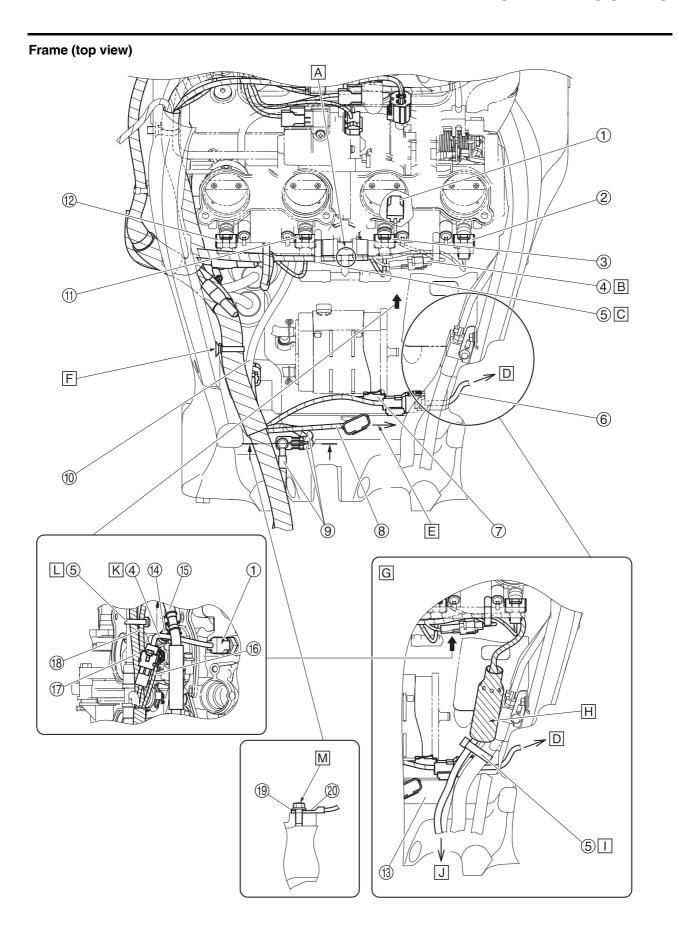


- Steering damper solenoid coupler (Öhlins: OPTION)
- 2. SCU lead (sub-wire harness)
- 3. Intake air temperature sensor
- Sub-wire harness (SCU, steering damper solenoid, sub-wire harness)
- 5. Auxiliary light lead
- Sub-wire harness (front fork stepping motor)
- 7. Plastic locking tie
- 8. Front turn 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 (Öhlins: OPTION) may be positioned in any place.
- B. To front turn signal light (left)
- 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 turn signal light lead (left), 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. (2 locations)
- Install the SCU coupler and coupler cover securely to the SCU (Suspension Control Unit). Make sure that the edges of the coupler cover are not rolled up.
- J. To front turn signal light (right)
- K. Connect the front turn signal light coupler (right), and then fasten the front turn signal light leads (right) 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. Handlebar switch lead (left)
- 4. Throttle cable (accelerator cable)
- 5. Throttle cable (decelerator cable)
- 6. Handlebar switch lead (right)
- 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

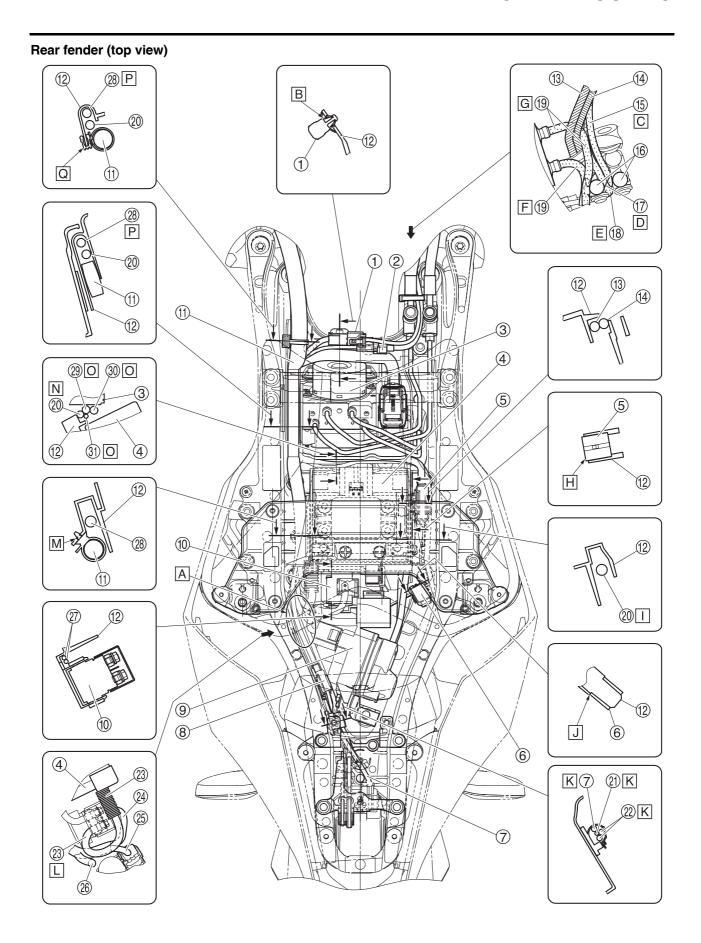
- H. Fasten the leads (right handlebar switch lead (blue), left handlebar switch lead (gray), main switch lead (white), sub-wire harness (for YZF-R1M) (white)) at the positioning tape on the guide with the plastic locking tie. Cut off the excess end of the plastic locking tie to 5 mm (0.2 in) or less.
- 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 front 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. The end of the plastic locking tie that is fastened the immobilizer unit lead to the radiator bracket.
- O. 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 plastic locking tie to 5 mm (0.2 in) or less.
- P. 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)
- Q. Insert the wire harness clamp until it contacts the claw of the electrical components tray.
- R. 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
- Coolant temperature sensor coupler (subwire harness)
- 5. Plastic locking tie
- O₂ sensor lead
- 7. Neutral switch lead
- 8. Fuel pump lead
- 9. Engine ground lead
- 10. Starter motor lead
- 11.Primary injector #2
- 12. Primary injector #1
- 13.Frame
- 14. Canister purge hose (to throttle body #3)
- 15. Canister purge hose (to throttle body #4)
- 16.Injector #3 lead
- 17.Injector #4 lead
- Rear shock absorber assembly stepping motor lead (for YZF-R1M)
- 19.Round terminal
- 20.Combination terminal
- A. Route the injector lead under the injector joint.
- B. Connect the coolant temperature sensor coupler (sub-wire harness) and wire harness.
- C. Fasten the wire harness and fuel rail with the plastic locking tie. Do not cut off the end of the plastic locking tie; point it toward the front of the vehicle and point the lock of the plastic locking tie toward the lower side of the vehicle.
- D. To O₂ sensor
- E. To fuel pump
- F. Insert the wire harness clamp into the frame hole.
- G. For YZF-R1M
- H. Connect the rear shock absorber assembly stepping motor leads (for YZF-R1M) according to those with identification tape (yellow) and those without identification tape, and then cover the coupler with the coupler cover.
- I. Fasten the bottom side of the brake hose and rear shock absorber assembly stepping motor leads (for YZF-R1M) 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. Route the coolant temperature sensor lead on the left side of the canister purge hose (leading to throttle body #3).

- L. Fasten the lead of injector #4 and the rear shock absorber assembly stepping motor lead (for YZF-R1M) to the fuel rail with the plastic locking tie.

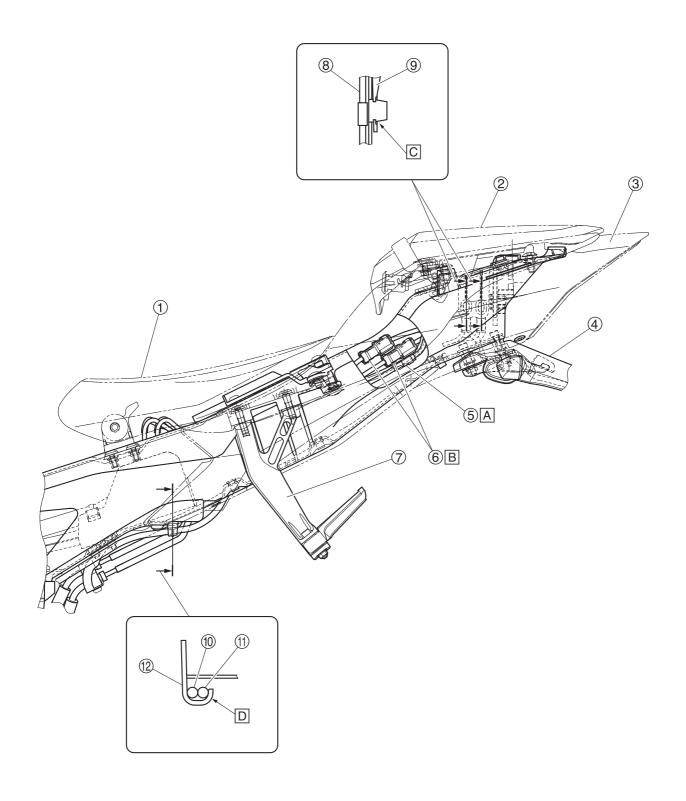
 Do not suit off the end of the plastic locking.
 - Do not cut off the end of the plastic locking tie; point it toward the front of the vehicle and point the lock of the plastic locking tie toward the lower side of the vehicle.
- M. Fasten the engine ground leads with the bolt so that the crimped section of the terminal is facing upward.



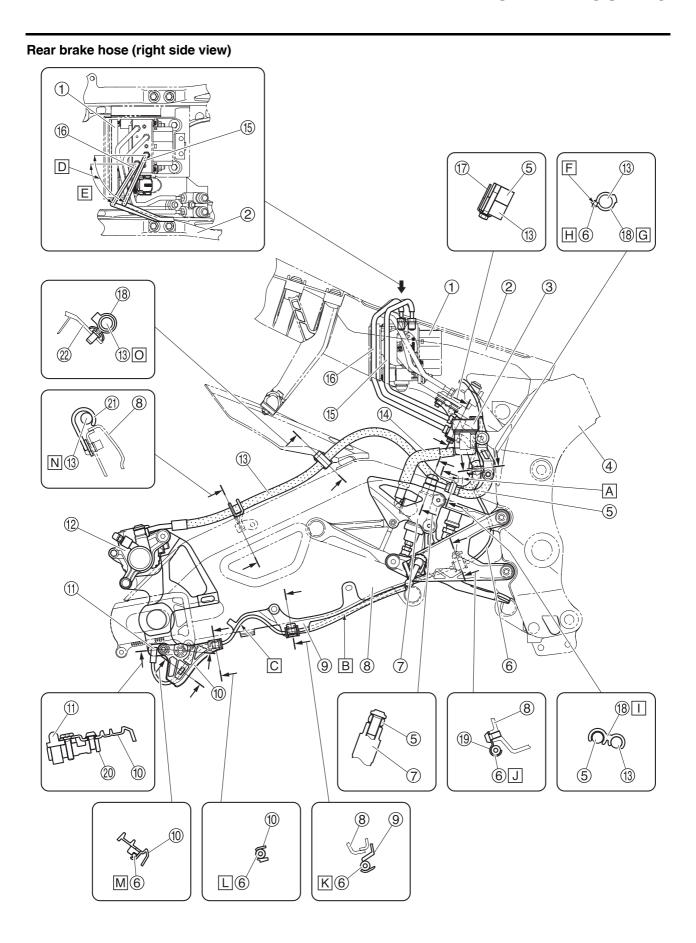
- Rear wheel sensor coupler
- 2. Rear brake light switch coupler
- 3. Hydraulic unit
- 4. Battery
- 5. Joint coupler
- Yamaha diagnostic tool coupler
- 7. Tail/brake light lead
- 8. Rear turn signal light coupler
- 9. EXUP servo motor
- 10.Starter relav
- 11.Wire harness
- 12.Battery box
- 13.EXUP cable 2
- 14.EXUP cable 1
- 15. Rear brake light switch lead
- 16.Brake hose
- 17. Plastic locking tie
- 18. Rear wheel sensor lead
- 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. (for YZF-R1M)
- H. Insert the joint coupler until it contacts the battery box as shown in the illustration.

- 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
- 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)

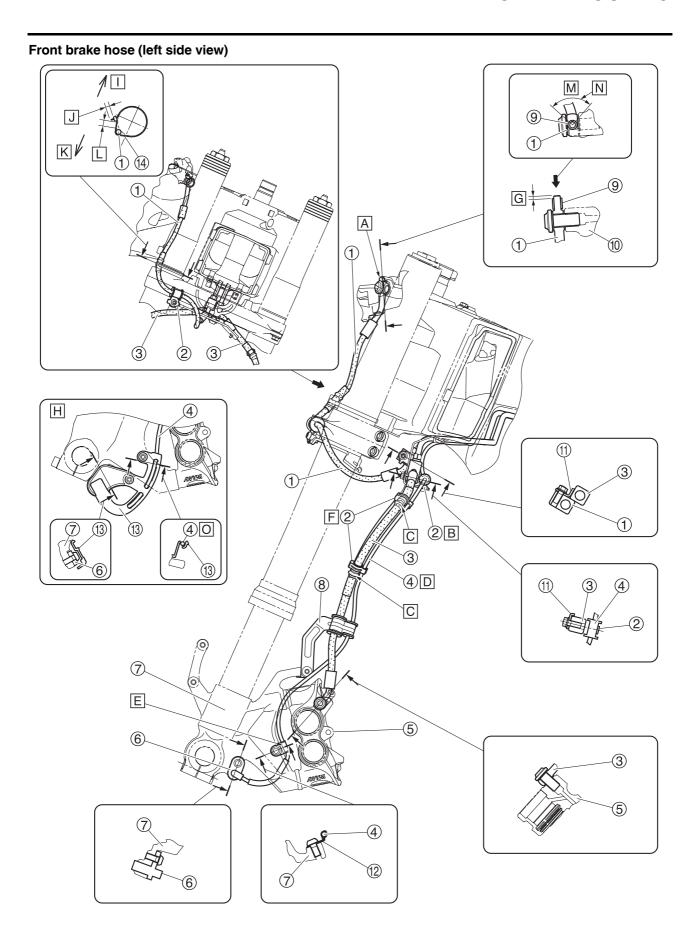


- 1. Rider seat
- 2. Passenger seat
- 3. Tail/brake light
- 4. Mudguard assembly
- 5. License plate light coupler
- 6. Rear turn signal light coupler
- 7. Passenger footrest
- 8. Rear turn signal light lead
- 9. Tail/brake light bracket
- 10.EXUP cable 1
- 11.EXUP cable 2
- 12.Battery box
- A. Connect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



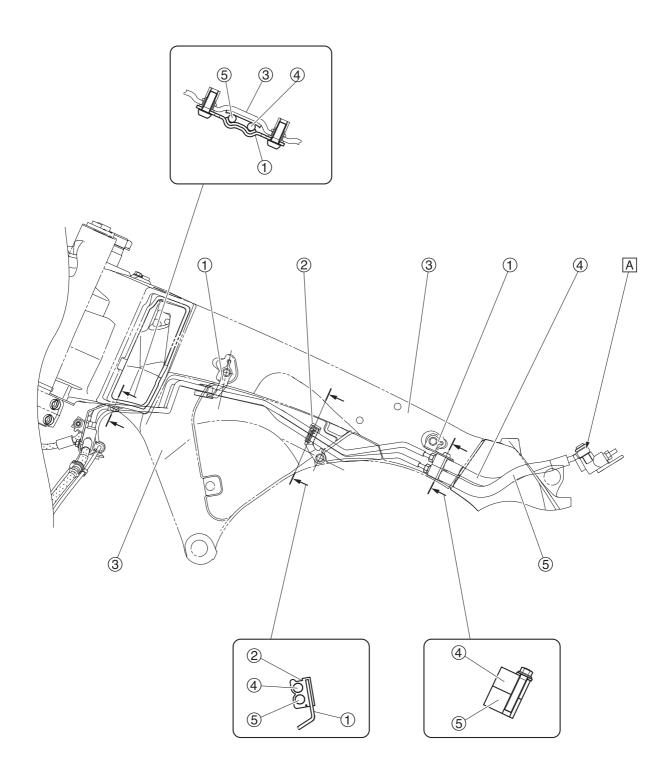
- 1. Hydraulic unit
- 2. Rear frame
- 3. Brake fluid reservoir
- 4. Frame
- Brake hose (rear brake master cylinder to hydraulic unit)
- 6. Rear wheel sensor lead
- 7. Rear brake master cylinder
- 8. Swingarm assembly
- 9. Rear wheel sensor lead cover
- 10. Rear wheel sensor protector
- 11.Rear wheel sensor
- 12.Rear brake caliper
- Brake hose (hydraulic unit to rear brake caliper)
- 14. Brake fluid reservoir hose
- Hydraulic unit brake pipe (rear brake master cylinder to hydraulic unit)
- 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.
- 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.

- 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 (hydraulic unit to rear brake caliper) between the rear brake hose holder and swing arm assembly.
- O. Fasten the brake hose (hydraulic unit to rear brake caliper) with the clamp.



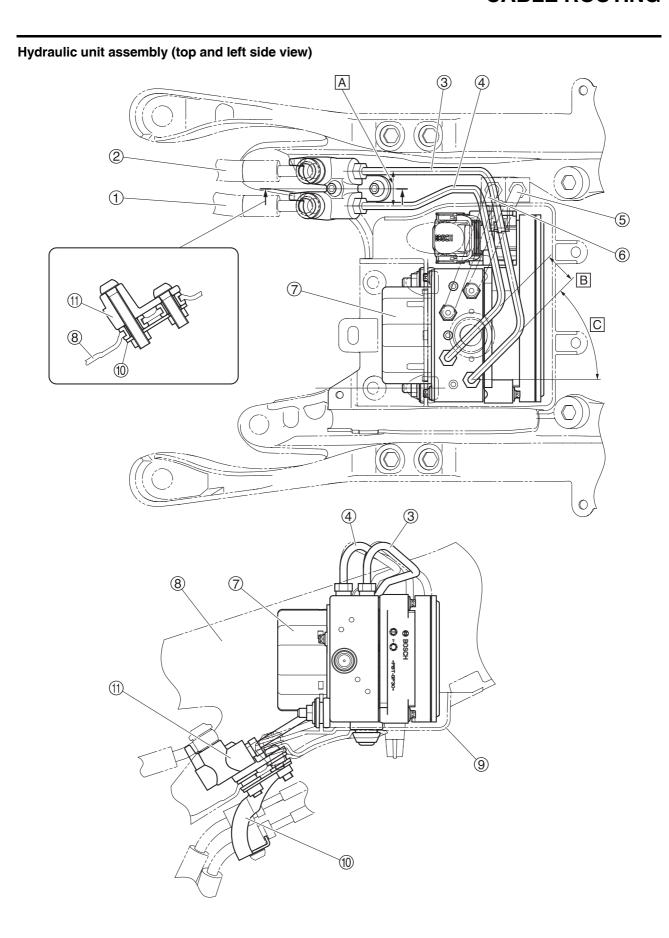
- Brake hose (front brake master cylinder to hydraulic unit)
- 2. Clamp
- Brake hose (hydraulic unit to front brake calipers)
- 4. Front wheel sensor lead
- 5. Front brake caliper
- 6. Front wheel sensor
- 7 Front fork
- 8. Front brake hose holder
- 9. Collar
- 10. Front brake master cylinder
- 11. Front brake hose bracket
- 12. Front wheel sensor lead holder
- 13. Front wheel sensor protector
- 14. Plastic locking tie
- A. When installing the brake hose (front brake master cylinder to hydraulic unit) onto the master cylinder, make sure the projection on the brake hose (front brake master cylinder to hydraulic unit) 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 (hydraulic unit to front brake calipers).
- 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 (hydraulic unit to front brake calipers) at the tube section
- G. Install the collar so that the range shown in the illustration is 1–2 mm (0.04–0.08 in).
- H. For YZF-R1M
- I. Rear side of the vehicle
- J. 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.
- K. Front side of the vehicle
- L. Position the buckle of the plastic locking tie 10 mm (0.39 in) or more from the brake hose (front brake master cylinder to hydraulic unit).
- M. 90°
- N. Install the collar so that its slit positioned within the range shown in the illustration.
- Route the front wheel sensor lead through the guide of the front wheel sensor protector.

Front brake hose (left side view)



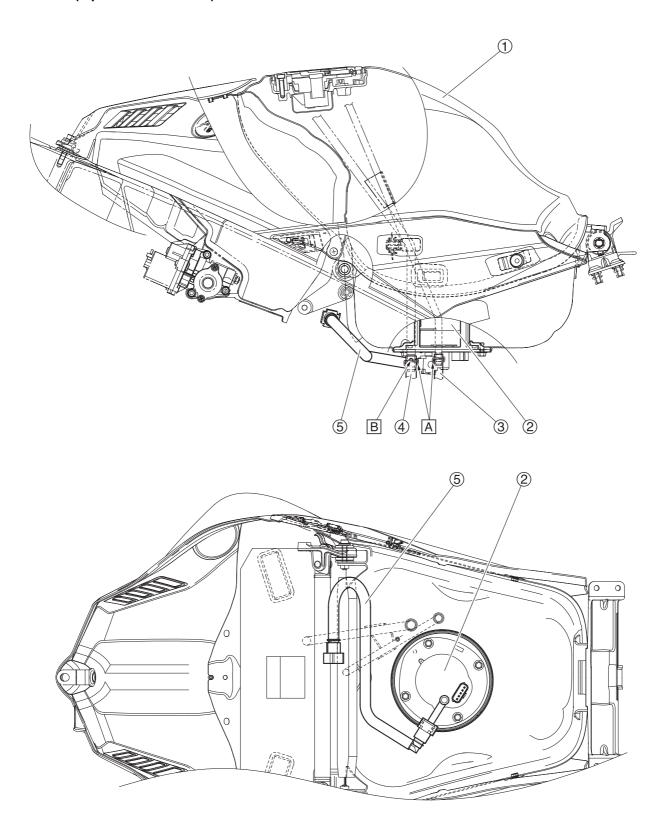
- 1. Brake hose bracket
- 2. Clamp
- 3. Frame
- Brake hose (hydraulic unit to front brake calipers)
- 5. Brake hose (front brake master cylinder to hydraulic unit)
- A. Install the brake hose (front brake master cylinder to the hydraulic unit) so that it is on the inside relative to brake hose (hydraulic 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 hydraulic unit).



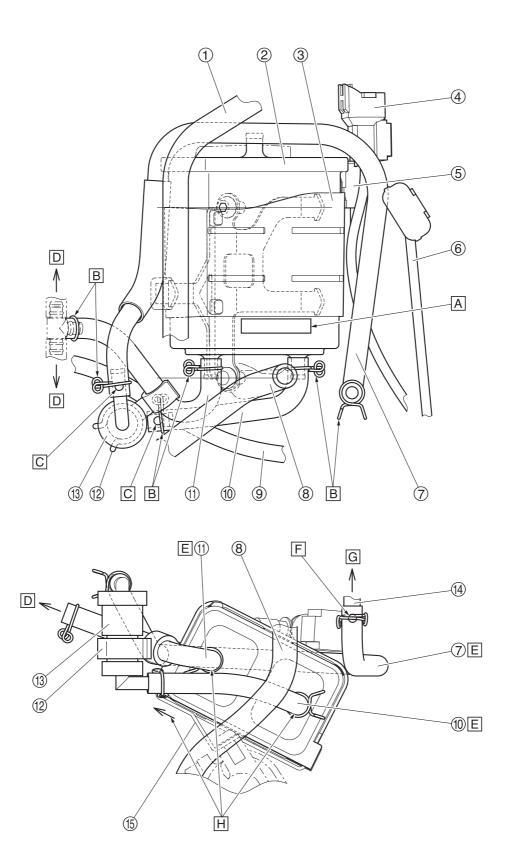
- Brake hose (front brake master cylinder to hydraulic unit)
- 2. Brake hose (hydraulic unit to front brake calipers)
- 3. Hydraulic unit brake pipe (hydraulic unit to front brake calipers)
- 4. Hydraulic unit brake pipe (front brake master cylinder to hydraulic unit)
- 5. Hydraulic unit brake pipe (hydraulic unit to rear brake caliper)
- 6. Hydraulic unit brake pipe (rear brake master cylinder to hydraulic unit)
- 7. Hydraulic unit
- 8. Rear frame
- 9. 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 hydraulic unit) and the hydraulic unit brake pipe (hydraulic unit to front brake caliper) so that they are parallel to each other.
- C. 45°

Fuel tank (top and left side view)



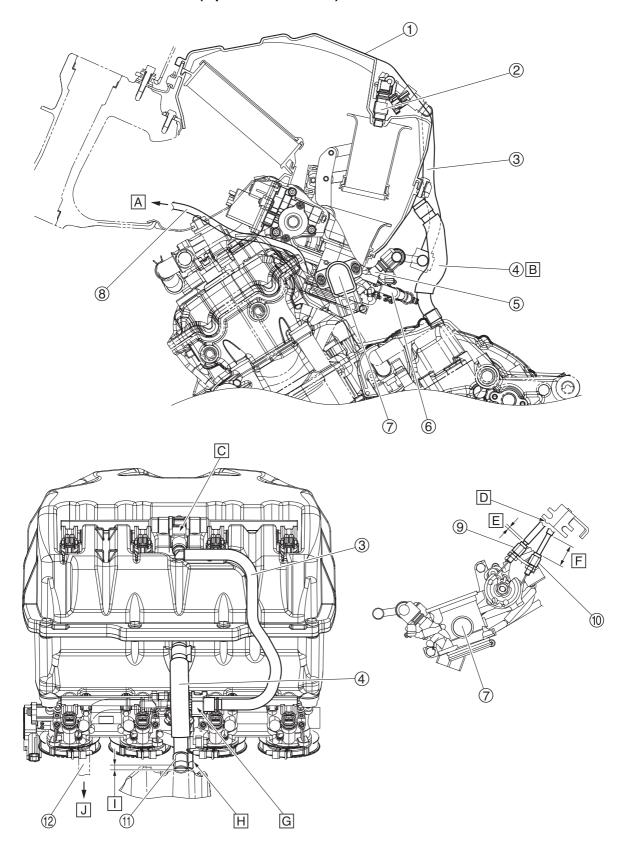
- 1. Fuel tank
- 2. Fuel pump
- 3. Fuel tank breather hose
- 4. Fuel tank drain hose
- 5. Fuel hose (fuel tank to fuel rail)
- A. Point the end of the clamp outward.
- B. Install the fuel tank drain hose with its white paint mark facing outward.

Canister



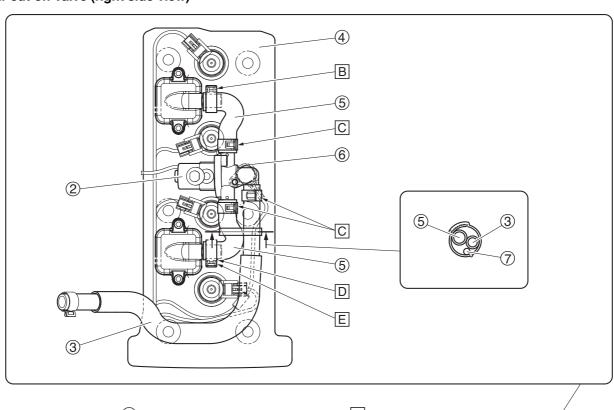
- 1. Fuel hose
- 2. Canister
- 3. Canister holder
- 4. O₂ sensor lead
- 5. Neutral switch lead
- 6. Fuel pump lead
- Fuel tank breather hose (fuel tank to rollover valve)
- 8. Fuel tank drain hose
- 9. Starter motor lead
- 10. Fuel tank breather hose (rollover valve to canister)
- 11. Canister purge hose (hose joint to canister)
- 12. Rollover valve clamp
- 13. Rollover valve
- 14. Breather pipe (fuel tank)
- 15. Canister bracket
- A. Install the canister with its stamped mark facing upward.
- B. Point the end of the clamp in the direction shown in the illustration.
- C. Install the hose with its yellow paint mark facing upward.
- D. To throttle bodies
- E. When installing the hose, may apply water or soapy water to the hose.
- F. Install the fuel tank breather hose (fuel tank to rollover valve) with its white paint mark facing outward.
- G. To fuel tank
- H. Install the hose onto the canister in the direction of the arrow shown.

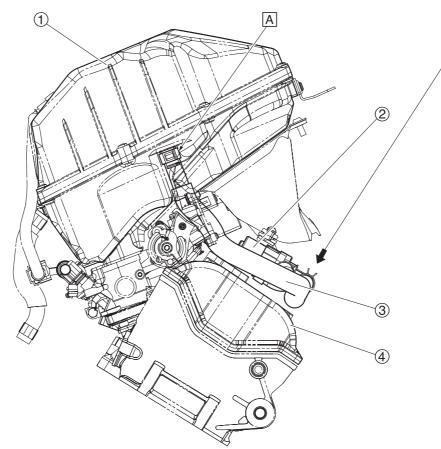
Air filter case and throttle bodies (top and left side view)



- 1. Air filter case
- 2. Secondary injector
- 3. Fuel hose (fuel rail to fuel rail)
- 4. Crankcase breather hose
- 5. Primary injector
- 6. Canister purge hose
- 7. Throttle body assembly
- 8. Intake solenoid vacuum hose (throttle body to one-way valve)
- 9. Throttle cable (accelerator cable)
- 10. Throttle cable (decelerator cable)
- 11.Clamp
- 12. 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.
- 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

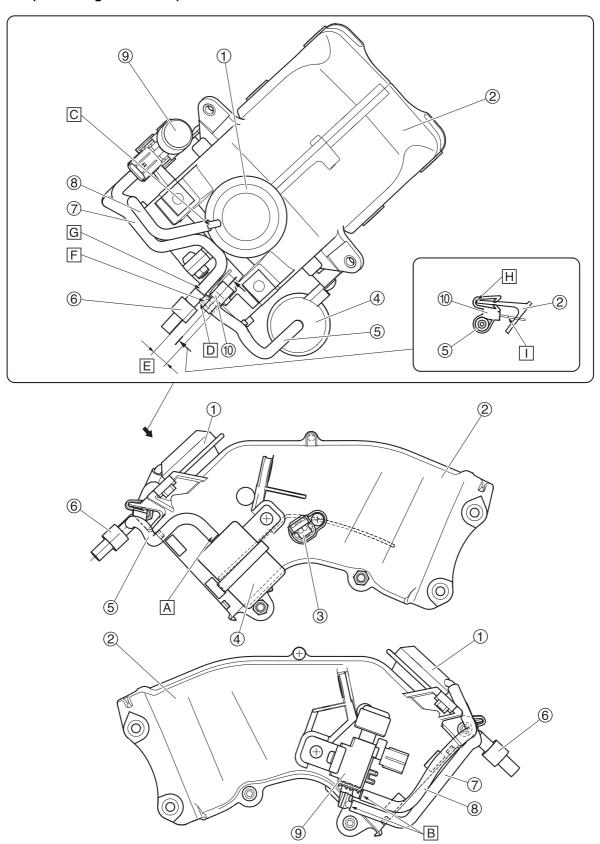
Air cut-off valve (right side view)



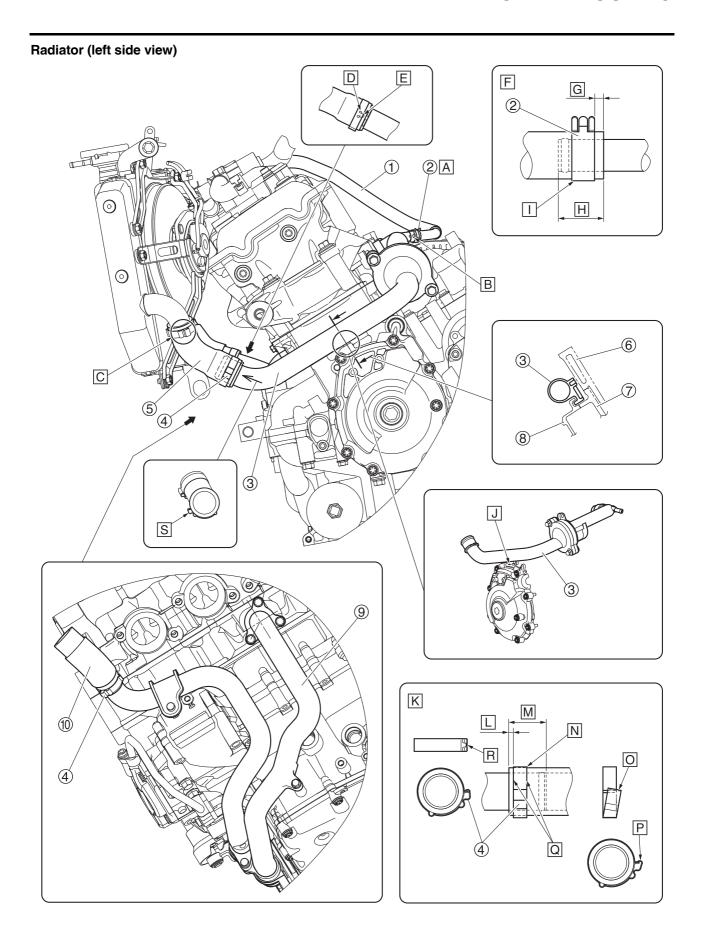


- 1. Air filter case
- 2. Air cut-off valve
- Air induction system hose (air filter case to air cut-off valve)
- 4. Cylinder head cover
- Air induction system hose (air cut-off valve to reed valve cover)
- 6. Cylinder identification sensor
- 7. Cylinder identification sensor lead
- A. Point the end of the clamp to the right. Install the air induction system hose (air filter case to air cut-off valve) 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 (air filter case to air cut-off valve), 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 (air cutoff valve to reed valve cover) 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)

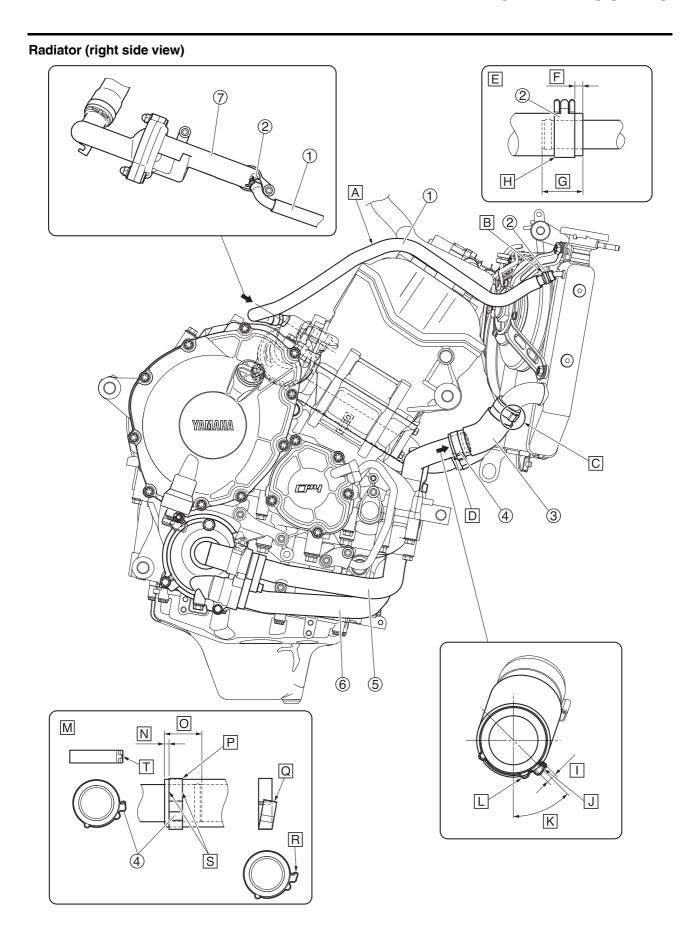


- 1. Air intake duct valve
- 2. Air intake duct
- 3. Intake air temperature sensor
- 4. Surge tank
- 5. Surge tank hose
- One-way valve
- 7. Intake solenoid vacuum hose (one-way valve to intake solenoid)
- 8. Intake solenoid vacuum hose (intake solenoid to air intake duct valve)
- 9. Intake solenoid
- 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 (intake solenoid to air intake duct valve) 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 (oneway valve to intake solenoid) 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.
- Cut off the band of the clamp to 5 mm (0.2 in) or less.

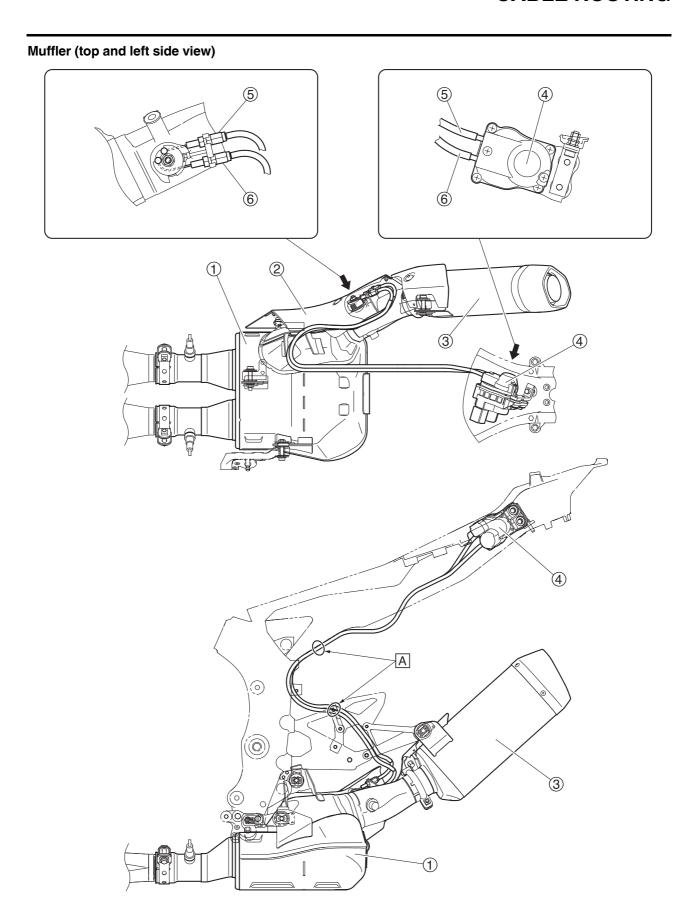


- Cooling system air bleed hose
- 2. Clamp
- 3. Thermostat assembly
- 4. Hose clamp
- 5. Radiator inlet hose
- 6. Cylinder
- 7. Crankcase
- 8. Generator cover
- 9. Water pump outlet pipe
- 10. Radiator outlet hose
- A. Point the end of the clamp toward the white paint mark on the cooling system air bleed 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. After installing the hose clamp, the end of the radiator inlet hose should be over 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)
- 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.
- 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.

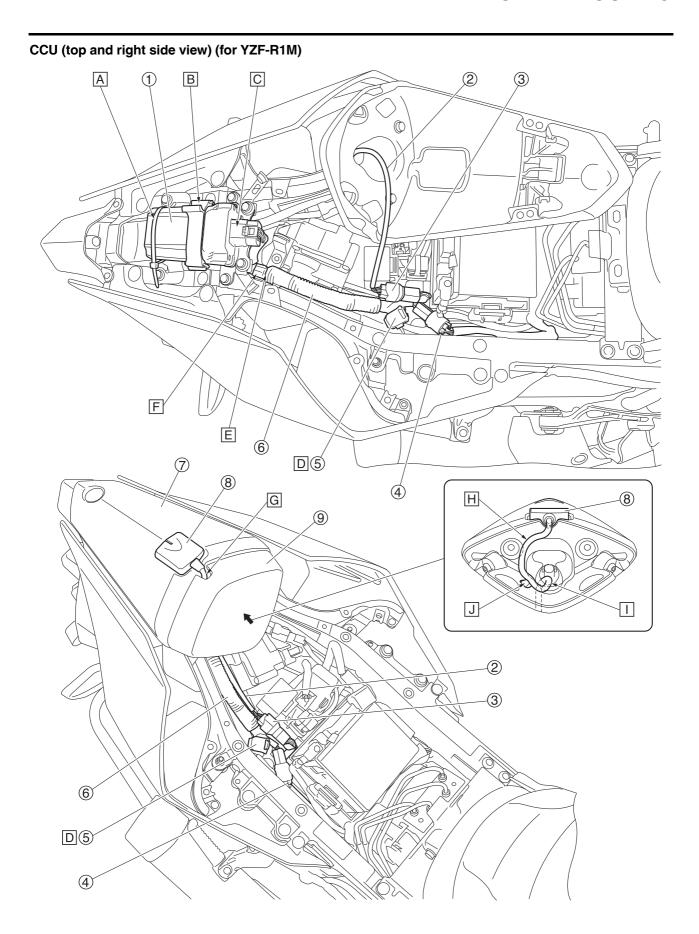
- R. Make sure that the projection on the center of the hose clamp contacts with the cut out in the end of the hose clamp.
- S. Face the opening of the hose clamp to the left.



- 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. After installing the hose clamp, the end of the radiator outlet hose should be over the projection on the radiator.
- D. Align the yellow paint mark on the radiator outlet hose with the white 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 white 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°
- 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 in the 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.



- 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
- Yamaha diagnostic tool coupler (wire harness)
- Yamaha diagnostic tool coupler (sub-wire harness)
- 6. Sub-wire harness
- 7. Passenger seat cover
- 8. GPS unit
- 9. Cushion
- A. Fasten the CCU (Communication Control Unit) and CCU bracket with the plastic locking tie.
- B. Fasten the CCU (Communication Control Unit) and CCU bracket with the band.
- C. Connect the CCU (Communication Control Unit) coupler (sub-wire harness) to the CCU.
- D. Insert the Yamaha diagnostic tool coupler (sub-wire harness) 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.
- 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	_
INTRODUCTION	3-1
PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL	0.4
SYSTEMGENERAL MAINTENANCE AND LUBRICATION CHART	
	3-1
CHECKING THE VEHICLE USING THE YAMAHA DIAGNOSTIC	0.4
TOOL	3-4
CHECKING THE FUEL LINE (Primary injector)	o-4
CHECKING THE FUEL LINE (Secondary injector)	
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	
CHECKING THE CANISTER	
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 REAR BRAKE HOSE	.3-17
BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)	.3-17
CHECKING THE WHEELS	.3-18
CHECKING THE TIRES	
CHECKING THE WHEEL BEARINGS	
CHECKING THE SWINGARM OPERATION	
LUBRICATING THE SWINGARM PIVOT	.3-19
DRIVE CHAIN SLACK	
LUBRICATING THE DRIVE CHAIN	
CHECKING AND ADJUSTING THE STEERING HEAD	
LUBRICATING THE STEERING HEAD	
CHECKING THE STEERING DAMPER	
CHECKING THE CHASSIS FASTENERS	
LUBRICATING THE BRAKE LEVER	
LUBRICATING THE CLUTCH LEVER	
LUBRICATING THE PEDAL	
CHECKING THE SIDESTAND	
LUBRICATING THE SIDESTAND	
CHECKING THE SIDESTAND SWITCH	
CHECKING THE FRONT FORK	
ADJUSTING THE EBONT FORK LEGS (for Y/E-R1)	3-23

ADJUSTING THE PRELOAD OF THE FRONT FORK LEGS	
(for YZF-R1M)	3-24
ADJUSTING THE DAMPING FORCE OF THE FRONT FORK LEGS	
AND REAR SHOCK ABSORBER ASSEMBLY (for YZF-R1M)	3-25
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY	3-26
ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY	
(for YZF-R1)	3-26
ADJUSTING THE PRELOAD OF THE REAR SHOCK ABSORBER	
ASSEMBLY (for YZF-R1M)	3-28
CHECKING THE CONNECTING ARM AND RELAY ARM	3-29
CHECKING THE ENGINE OIL LEVEL	
CHANGING THE ENGINE OIL	
MEASURING THE ENGINE OIL PRESSURE	
CHECKING THE COOLANT LEVEL	
CHECKING THE COOLING SYSTEM	
CHANGING THE COOLANT	
ADJUSTING THE EXUP CABLES	
CHECKING THE FRONT BRAKE LIGHT SWITCH	
ADJUSTING THE REAR BRAKE LIGHT SWITCH	
CHECKING AND LUBRICATING THE CABLES	
CHECKING THE THROTTLE GRIP	
CHECKING AND CHARGING THE BATTERY	
CHECKING THE FUSES	
ADJUSTING THE HEADLIGHT BEAMS	3-38

EAS2002

PERIODIC MAINTENANCE

EAS30022

INTRODUCTION

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

TIP -

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

EAS30614

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

		ITEM CHECK OR MAIN JOB	CHECK OR MAINTENANCE	ODOMETER READING					ANNUAL
N	0.			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. Replace if necessary.		V	V	V	V	V
2	*	Spark plugs	Check condition.Adjust gap and clean.		\checkmark		√		
			Replace.			√		\checkmark	
3	*	Valve clearance	Check and adjust.	Every 40000 km (24000 mi)					
		Fuel injection	Check engine idle speed.	√	√	√	√	V	√
4	*		Check and adjust synchronization.		V	V	V	V	√
5	*	Exhaust system	Check for leakage.Tighten if necessary.Replace gaskets if necessary.	V	V	V	V	V	
6	*	Evaporative emission control system	Check control system for damage. Replace if necessary.			V		V	
7	*	Air induction system	Check the air cut-off valve, reed valve, and hose for damage. Replace any damaged parts if necessary.		V	V	1	√	V

EAS30615

GENERAL MAINTENANCE AND LUBRICATION CHART

			ITEM CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL
N	0.	ITEM		1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	CHECK
1	*	Diagnostic system check	Perform dynamic inspection using Yamaha diagnostic tool. Check the fault codes.	V	V	V	V	V	V
2	*	Air filter element	Replace.	Every 40000 km (24000 mi)					
3		Clutch	Check operation. Adjust.	V	V	V	V	√	

		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING				ANNUAL	
N	0.			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	CHECK
4	*	Front brake	Check operation, fluid level, and for fluid leakage. Replace brake pads if necessary.	V	V	V	V	V	V
5	*	Rear brake	Check operation, fluid level, and for fluid leakage. Replace brake pads if necessary.	V	V	V	V	V	V
6	*	Brake hoses	Check for cracks or damage.		√	√	√	V	V
			Replace.			Every 4	4 years		
7	*	Brake fluid	Change.			Every 2	2 years		
8	*	Wheels	Check runout and for damage.Replace if necessary.		V	V	√	√	
9	*	Tires	 Check tread depth and for damage. Replace if necessary. Check air pressure. Correct if necessary. 		V	V	V	V	V
10	*	Wheel bearings	Check bearing for looseness or damage.		√	V	V	V	
11	*	Swingarm pivot	Check operation and for excessive play.		√	V	V	V	
	Lubricate with lithium-soap-based grease. Every 50000 km (3)		km (30000 m	ii)					
12		Drive chain	 Check chain slack, alignment and condition. Adjust and lubricate chain with a special O-ring chain lubricant thoroughly. 	Every 800 km (500 mi) and after washing the motorcycle, riding in the rain or riding in wet areas					
13	*	Steering bearings	Check bearing assemblies for looseness.	V	√		V		
13		Steering bearings	Moderately repack with lith- ium-soap-based grease.			V		V	
14	*	Steering damper	Check operation and for oil leakage.		√	V	V	V	
15	*	Chassis fasteners	Make sure that all nuts, bolts and screws are properly tight- ened.		$\sqrt{}$	V	V	V	V
16		Brake lever pivot shaft	Lubricate with silicone grease.		√	V	V	V	V
17		Brake pedal pivot shaft	Lubricate with lithium-soap- based grease.		V	V	V	V	V
18		Clutch lever pivot shaft	Lubricate with lithium-soap- based grease.		V	V	V	√	V
19		Shift pedal pivot shaft	Lubricate with lithium-soap- based grease.		V	V	V	V	V
20		Sidestand	Check operation. Lubricate with lithium-soap- based grease.		V	V	V	V	V
21	*	Sidestand switch	Check operation and replace if necessary.	V	V	√	V	1	V
22	*	Front fork	 Check operation and for oil leakage. Replace if necessary. 		√	√	V	V	

		ITEM	CHECK OR MAINTENANCE		ANNUAL						
N	Э.		JOB	1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	CHECK		
23	*	Shock absorber assembly	Check operation and for oil leakage. Replace if necessary.		V	V	V	V			
24	*	Rear suspension relay arm and connecting arm pivoting points	Check operation.		V	V	V	V			
25		Engine oil	Change (warm engine before draining). Check oil level and vehicle for oil leakage.	V	V	V	V	V	V		
26		Engine oil filter cartridge	Replace.	V		V		V			
27	*	Cooling system	Check coolant level and vehi- cle for coolant leakage.		V	V	V	V	V		
			Change.			Every	3 years	;			
28	*	EXUP system	Check operation, cable free play and pulley position.	V		V		V			
29	*	Front and rear brake switches	Check operation.	V	V	V	V	V	V		
30	*	Moving parts and cables	Lubricate.		V	V	V	V	V		
31	*	Throttle grip housing and cable	Check operation and free play. Adjust the throttle cable free play if necessary. Lubricate the throttle grip housing and cable.		V	V	V	V	V		
32	*	Lights, signals and switches	Check operation. Adjust headlight beam.	V	V	V	V	V	V		

TIP _

- Air filter
 - This model's air filter uses a disposable oil-coated paper element. This element cannot be cleaned with compressed air, doing so will only damage it.
 - The air filter element needs to be replaced more frequently when riding in unusually wet or dusty areas.
- Hydraulic brake service
 - Regularly check the front and rear brake fluid levels. Replenish if necessary.
 - 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 or sooner if cracked, damaged, or if any section of the stainless steel brake hose has turned black.

EAS32024

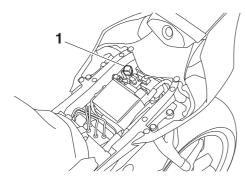
CHECKING THE VEHICLE USING THE YAMAHA DIAGNOSTIC TOOL

Use the Yamaha diagnostic tool and check the vehicle according to the following procedure.

- 1. Remove:
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- 2. Remove the protective cap "1", and then connect the Yamaha diagnostic tool to the coupler.



Yamaha diagnostic tool USB 90890-03256 Yamaha diagnostic tool (A/I) 90890-03254



- 3. Check:
 - Fault codes

TIP

Use the "Diagnosis of malfunction" function of the Yamaha diagnostic tool to check the fault codes. For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.

Fault code number is displayed → Check and repair the probable cause of the malfunction. Refer to "TROUBLESHOOTING DETAILS (FAULT CODE)" on page 8-51.

- 4. Perform:
 - Dynamic inspection

TIP

Use the "Dynamic inspection" function of the Yamaha diagnostic tool version 3.0 and after to perform the dynamic inspection. For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.

- 5. Install:
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30619

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 → Replace.
 Loose connection → Connect properly.

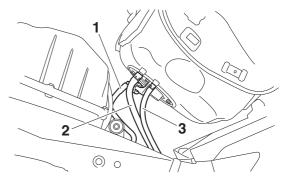
ECA14940

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.

EAS31633

CHECKING THE FUEL LINE (Secondary injector)

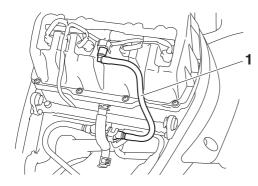
- 1. Remove:
- Rider seat

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.

EAS3062

CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

- 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.
- Air filter case
 Refer to "AIR FILTER CASE" on page 7-6.
- Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-21.

- 2. Remove:
 - Ignition coils
 - Spark plugs

ECA133

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.



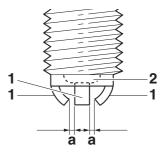
Manufacturer/model NGK/LMAR9E-J

- 4. Check:
 - Electrode "1"
 Damage/wear → 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



Spark plug 13 N·m (1.3 kgf·m, 9.6 lb·ft) Spark plug (new) 18 N·m (1.8 kgf·m, 13 lb·ft)

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 N·m (1.8 kgf·m, 13 lb·ft).

8. Install:

- Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-21.
- Air filter case Refer to "AIR FILTER CASE" on page 7-6.
- 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

EAS30622

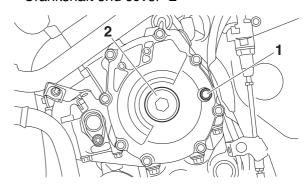
ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

TIP -

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.
- 1. Remove:
 - Rider seat Refer to "GENERAL CHASSIS (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 4-18.
 - Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-21.
- 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 → Adjust.

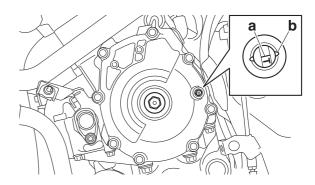


Valve clearance (cold) Intake

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".



ΠP

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

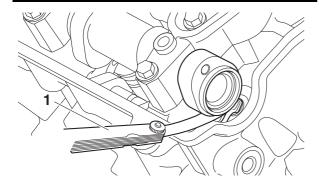
c. Measure the valve clearance #1 with a thickness gauge "1".

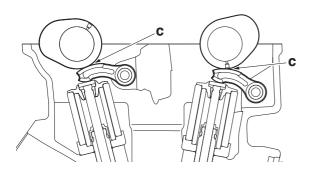
TIF

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



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

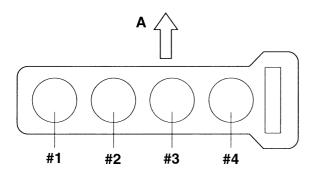




TIP

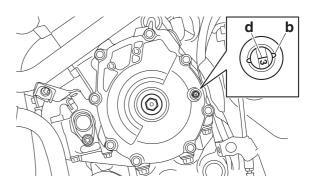
- If the valve clearance is incorrect, record the measured reading.
- Measure the valve clearance in the following sequence.

Valve clearance measuring sequence Cylinder #1 \rightarrow #3 \rightarrow #2 \rightarrow #4



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".

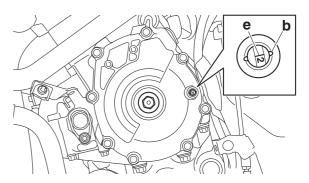


f. Measure the valve clearance #3 with a thickness gauge.



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".

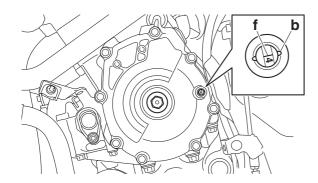


i. Measure the valve clearance #2 with a thickness gauge.



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

- 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".



 Measure the valve clearance #4 with a thickness gauge.



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

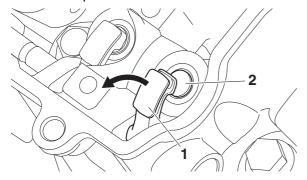
- 5. Remove:
 - Camshaft

TIP_

• Refer to "CAMSHAFTS" on page 5-9.

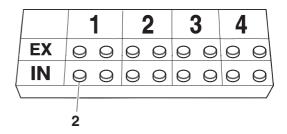
- When removing the timing chain and camshafts, fasten the timing chain with a wire to retrieve it if it falls into the crankcase.
- 6. Adjust:
- Valve clearance

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.

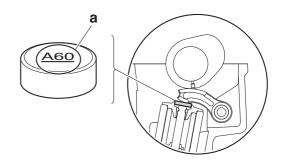
TIP

- 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) increments

Example:

Valve pad number = A63

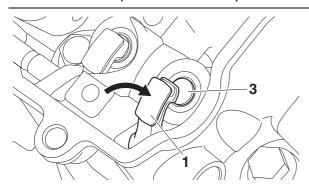
Rounded value = A65

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 N·m (0.8 kgf·m, 5.9 lb·ft) Camshaft cap bolt (new) 10 N·m (1.0 kgf·m, 7.4 lb·ft)

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 N·m (1.0 kgf·m, 7.4 lb·ft).
- Turn the crankshaft counterclockwise several full turns to seat the parts.
- h. Measure the valve clearance again.
- If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

- 7. Install:
 - All removed parts

TIP

For installation, reverse the removal procedure.

EAS31017

CHECKING THE ENGINE IDLING SPEED

TIP

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 → 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 7-14.

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.

EAS30797

SYNCHRONIZING THE THROTTLE BODIES

TIP

Before synchronizing the throttle bodies, check the following items:

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

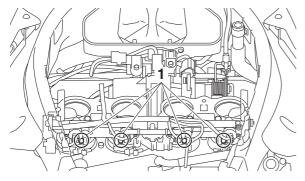
Checking the throttle body synchronization

1. Stand the vehicle on a level surface.

TIP

Place the vehicle on a maintenance stand.

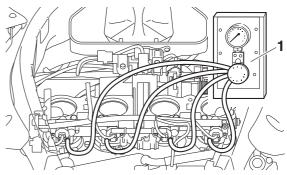
- 2. Remove:
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Fuel tank
 Refer to "FUEL TANK" on page 7-1.
- Air filter case
 Refer to "AIR FILTER CASE" on page 7-6.
- 3. Remove:
 - Caps "1"



- 4. Install:
- Vacuum gauge "1"



Vacuum gauge 90890-03094 Vacuummate YU-44456



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



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

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.

ECA21300

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

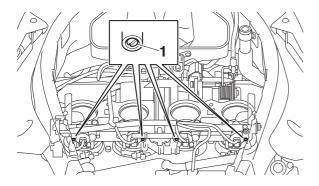
at idle and the throttle bodies may not operate properly.

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 7-6.
 - 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.

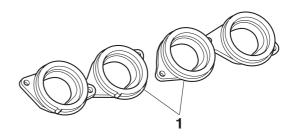


Throttle grip free play 3.0–5.0 mm (0.12–0.20 in)

EAS31318

CHECKING THE THROTTLE BODY JOINTS

- 1. Remove:
 - Throttle bodies
 Refer to "THROTTLE BODIES" on page
 7-11.
- 2. Check:
 - Throttle body joints "1"
 Cracks/damage → Replace.



- 3. Install:
 - Throttle bodies
 Refer to "THROTTLE BODIES" on page
 7-11.

EAS30800

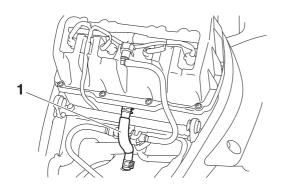
CHECKING THE CRANKCASE BREATHER HOSE

- 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

NOTICE

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.

FAS30625

CHECKING THE EXHAUST SYSTEM

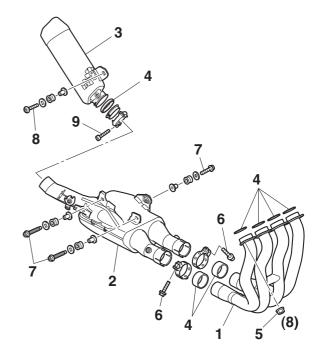
- 1. Check:
- Exhaust pipe "1"
- Exhaust chamber "2"
- Muffler "3"
 Cracks/damage → Replace.
- Gasket "4"
 Exhaust gas leaks → Replace.
- 2. Check:

Tightening torque

- Exhaust pipe nut "5"
- Exhaust pipe joint bolt "6"
- Exhaust chamber bolt "7"
- Muffler bolt "8"
- Muffler joint bolt "9"



Exhaust pipe nut
20 N·m (2.0 kgf·m, 15 lb·ft)
Exhaust pipe joint bolt
20 N·m (2.0 kgf·m, 15 lb·ft)
Exhaust chamber bolt
20 N·m (2.0 kgf·m, 15 lb·ft)
Muffler bolt
20 N·m (2.0 kgf·m, 15 lb·ft)
Muffler joint bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)



EAS30626

CHECKING THE CANISTER

- 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:
 - Canister
 - Canister purge hose
 - Fuel tank breather hose Cracks/damage → Replace.
- 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

EAS30799

ADJUSTING THE EXHAUST GAS VOLUME

TIF

- 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 opera-

tion manual of the Yamaha diagnostic tool.

 Connect the Yamaha diagnostic tool to the coupler. For information about connecting the Yamaha diagnostic tool, refer to "YAMAHA DIAGNOSTIC TOOL" on page 8-50



Yamaha diagnostic tool USB 90890-03256 Yamaha diagnostic tool (A/I) 90890-03254

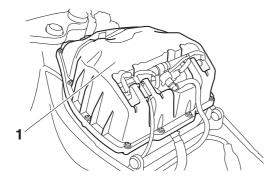
EAS3062

CHECKING THE AIR INDUCTION SYSTEM Refer to "AIR INDUCTION SYSTEM" on page 7-21.

EAS30628

REPLACING THE AIR FILTER ELEMENT

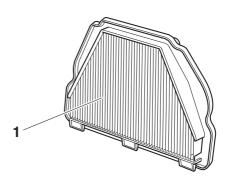
- 1. Remove:
 - Rider seat Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Fuel tank cover Refer to "GENERAL CHASSIS (2)" on page 4-7.
- Fuel tank
 Refer to "FUEL TANK" on page 7-1.
- 2. Remove:
 - Air filter case cover "1"



- 3. Check:
 - Air filter element "1"
 - Air filter seal
 Damage → 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

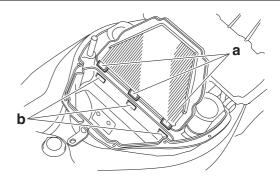
ECA20710

NOTICE

Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect throttle 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 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.

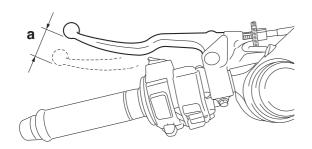
EAS30629

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

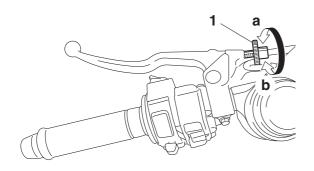
Handlebar side

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

a. 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"

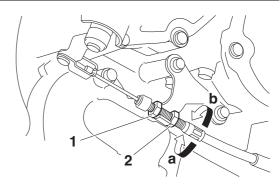
Clutch lever free play is increased. Direction "b"

Clutch lever free play is decreased.

d. Tighten the locknut "1".



Clutch cable locknut 7 N·m (0.7 kgf·m, 5.2 lb·ft)



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

EAS30801

CHECKING THE BRAKE OPERATION

- 1. Check:
- Brake operation

Brake not working properly \rightarrow Check the brake system.

Refer to "FRONT BRAKE" on page 4-44 and "REAR BRAKE" on page 4-56.

TIF

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

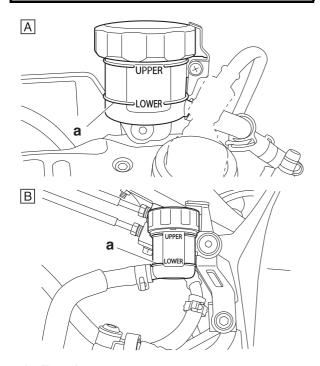
1. Stand the vehicle on a level surface.

TIP

- Place the vehicle on a maintenance 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.

Front brake Specified brake fluid DOT 4 Rear brake Specified brake fluid DOT 4



- A. Front brake
- B. Rear brake

EWA13090

WARNING

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

ECA13540

NOTICE

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

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

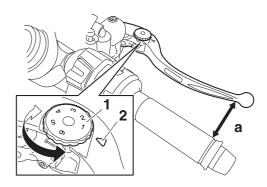
ADJUSTING THE FRONT DISC BRAKE

- 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
- 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 necessarv. bleed the brake system.

NOTICE

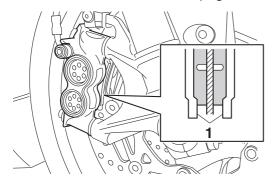
After adjusting the brake lever position, make sure there is no brake drag.

EAS3063

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

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



FAS3063

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.

WA13070

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 N·m (1.6 kgf·m, 12 lb·ft)

EWA17030

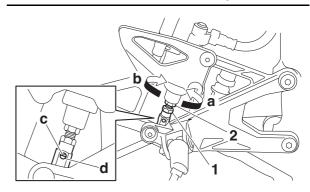
WARNING

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:

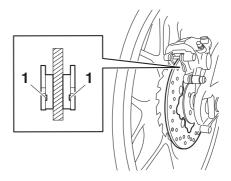
 Rear brake light switch Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-36.

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 → Replace the brake pads as a set.
 Refer to "REAR BRAKE" on page 4-56.



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
 → Replace.

- 3. Check:
 - Brake hose holder
 Loose → Tighten the holder bolt.
- 4. Hold the vehicle upright and apply the brake several times.
- 5. Check:
 - Brake hose

Brake fluid leakage → Replace the damaged hose.

Refer to "FRONT BRAKE" on page 4-44.

EAS30636

CHECKING THE REAR BRAKE HOSE

- 1. Check:
 - Brake hose Cracks/damage/wear → Replace.
- 2. Check:
 - Brake hose holder
 Loose Connection → Tighten the holder bolt.
- 3. 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 4-56.

EAS3089

BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)

EWA1400

WARNING

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

ECA22640

NOTICE

- 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

WARNING

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.

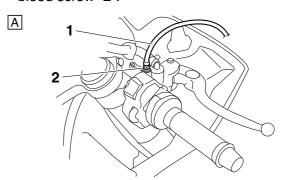
TIP

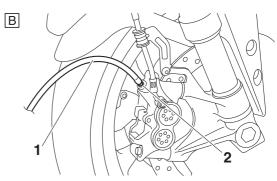
- Be careful not to spill any brake fluid or allow the brake fluid reservoir to overflow.
- When bleeding the ABS, make sure that there is always enough brake fluid before applying

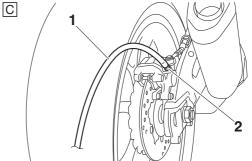
- the brake. Ignoring this precaution could allow air to enter the ABS, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours.
- Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.
- 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.
- j. Check the operation of the hydraulic unit.
 Refer to "HYDRAULIC UNIT OPERATION TEST" on page 4-71.

ECA17061

NOTICE

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.



Front brake master cylinder bleed screw

5 N·m (0.5 kgf·m, 3.7 lb·ft) Brake caliper bleed screw 5 N·m (0.5 kgf·m, 3.7 lb·ft)

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.

EWA13110

WARNING

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

FAS31428

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

- 1. Check:
 - Wheel

Damage/out-of-round \rightarrow Replace.

EWA13

WARNING

Never attempt to make any repairs to the wheel.

ГΙР

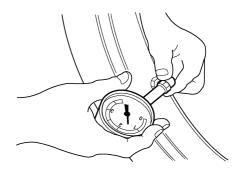
After a tire or wheel has been changed or replaced, always balance the wheel.

EAS3142

CHECKING THE TIRES

The following procedure applies to both of the tires

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



EWA1318

WARNING

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



Tire air pressure (measured on cold tires)

Front

250 kPa (2.50 kgf/cm², 36 psi)

Rea

290 kPa (2.90 kgf/cm², 42 psi)

Maximum load

187 kg (412 lb)

*Total weight of rider, passenger, cargo and accessories

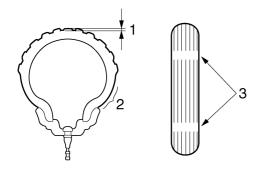
- 2. Check:
- Tire surfaces

Damage/wear \rightarrow Replace the tire.

EWA13190

WARNING

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



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



Wear limit (front)

1.5 mm (0.06 in) (AUS)

1.6 mm (0.06 in) (EUR) (RUS)

Wear limit (rear)

1.5 mm (0.06 in) (AUS)

1.6 mm (0.06 in) (EUR) (RUS)

EWA14090

WARNING

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



Front tire Size

120/70 ZR17MC (58W) Manufacturer/model

BRIDGESTONE/BATTLAX RAC-ING STREET RS10F



Rear tire

Size

190/55 ZR17M/C (75W) (YZF-R1, YZF-R1H) 200/55 ZR17M/C (78W) (YZF-R1M, YZF-R1MH) Manufacturer/model

BRIDGESTONE/BATTLAX RAC-ING STREET RS10R

WA13210

WARNING

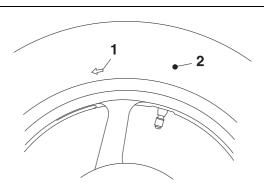
New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km

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.



FAS3064

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 4-28 and "CHECKING THE REAR
 WHEEL" on page 4-39.

EAS30802

CHECKING THE SWINGARM OPERATION

- 1. Check:
 - Swingarm operation Swingarm not working properly → Check the swingarm.
 - Refer to "SWINGARM" on page 4-113.
- 2. Check:
- Swingarm excessive play Refer to "SWINGARM" on page 4-113.

EAS30643

LUBRICATING THE SWINGARM PIVOT

- 1. Lubricate:
 - Oil seals
- Collars



Recommended lubricant Lithium-soap-based grease

Refer to "INSTALLING THE SWINGARM" on page 4-115.

EAS31033

DRIVE CHAIN SLACK Checking the drive chain slack

WARNING

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

NOTICE

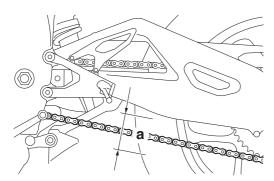
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified lim-

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



Drive chain slack (side stand) 25.0-35.0 mm (0.98-1.38 in) **Drive chain slack (Maintenance**

25.0-35.0 mm (0.98-1.38 in)



ECA20870

NOTICE

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.

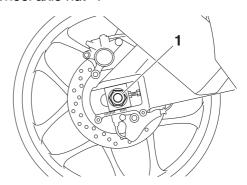
Adjusting the drive chain slack



WARNING

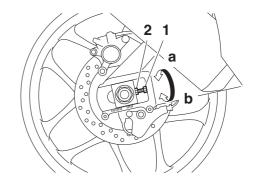
Securely support the vehicle so that there is no danger of it falling over.

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



- 2. 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.

- 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 N·m (19 kgf·m, 140 lb·ft)

d. Tighten the locknuts to specification.



Chain puller adjusting bolt lock-

16 N·m (1.6 kgf·m, 12 lb·ft)

EAS3080

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

EAS3064

CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

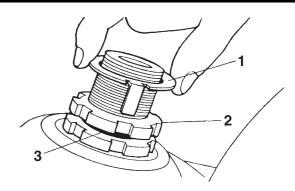
- 2. Check:
 - Steering head

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

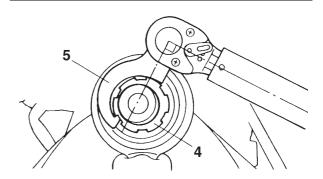
a. Remove the lock washer "1", the upper ring nut "2", and the rubber washer "3".



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.





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



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

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 N·m (1.4 kgf·m, 10 lb·ft)

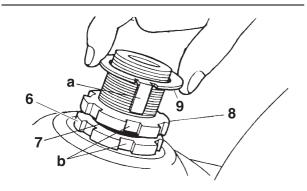
d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.

Refer to "STEERING HEAD" on page 4-101.

- 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 4-75.

FAS30646

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 4-104.

EAS31186

CHECKING THE CHASSIS FASTENERS

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

Refer to "CHASSIS TIGHTENING TORQUES" on page 2-15.

EAS3080

LUBRICATING THE BRAKE LEVER

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



Recommended lubricant Silicone grease

EAS30805

LUBRICATING THE CLUTCH LEVER

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



Recommended lubricant Lithium-soap-based grease

AS30649

LUBRICATING THE PEDAL

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



Recommended lubricant Lithium-soap-based grease

EAS3065

CHECKING THE SIDESTAND

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

EAS3065

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 8-225.

FAS30653

CHECKING THE FRONT FORK

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

- 2. Check:
- Inner tube

Damage/scratches \rightarrow Replace.

Front fork lea

Oil leaks between inner tube and outer tube

 \rightarrow Replace the oil seal.

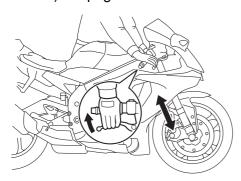
3. Hold the vehicle upright and apply the front brake.

- 4. Check:
 - Front fork operation

Push down hard on the handlebar several times and check if the front fork rebounds smoothly.

Rough movement → Repair.

Refer to "FRONT FORK (for YZF-R1)" on page 4-80 or refer to "FRONT FORK (for YZF-R1M)" on page 4-91.



EAS30806

ADJUSTING THE FRONT FORK LEGS (for YZF-R1)

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

EWA13120

WARNING

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

Spring preload

EWA17040

WARNING

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

ECA13590

NOTICE

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 Minimum (soft)

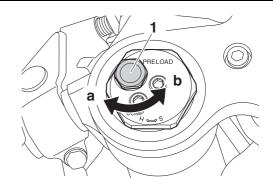
0 turn(s) in direction "a"

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

NOTICE

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).



Rebound damping

Minimum (soft)

14 click(s) in direction "b"* Standard

7 click(s) in direction "b"* Maximum (hard)

1 click(s) in direction "b"*

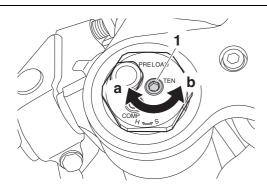
*With the adjusting bolt fully turned in direction "a"

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, check the number of clicks and modify the minimum and standard specifications as necessary.

 When turning the damping force adjusting bolt in direction "a", the 0 click position and the 1 click position may be the same.



Compression damping

ECA13590

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).



Compression damping Minimum (soft)

23 click(s) in direction "b"*
Standard

17 click(s) in direction "b"* Maximum (hard)

1 click(s) in direction "b"*

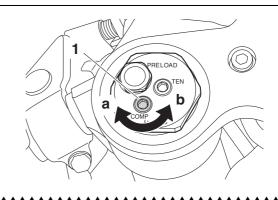
*With the adjusting bolt fully turned in direction "a"

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, check the number of clicks and modify the minimum and standard specifications as necessary.

 When turning the damping force adjusting bolt in direction "a", the 0 click position and the 1 click position may be the same.



EAS3163

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

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

EWA13120

WARNING

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

Spring preload

EWA1704

WARNING

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

ECA13590

NOTICE

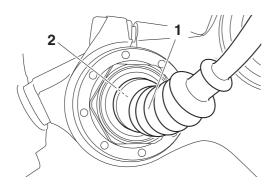
Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
- Spring preload

a. Turn the main switch to "OFF".

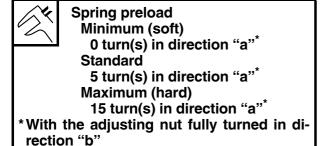
b. Slide the rubber cover "1" back at each coupler.

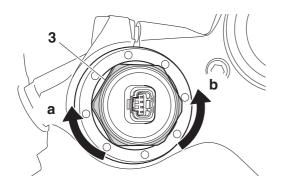
c. Disconnect the coupler "2" on each front fork.



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).





- 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.



c. Select "YRC Setting".

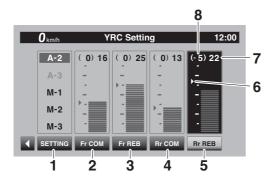


d. Select the "▶" mark located to the right of ERS.



1. To ERS menu

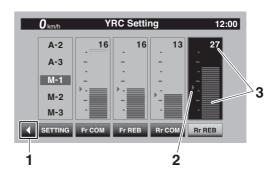
e. The display will change to the front and rear suspension setting screen and the ERS mode selection box "SETTING" is highlighted. Short push the wheel switch to enter the box and select the ERS mode A-1, A-2, M-1, M-2, M-3 that you want to adjust.



- 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.

TIF

- 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 (e). 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 4-110.

EAS30655

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

EWA1312

WARNING

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

Spring preload

ECA1359

NOTICE

Never go beyond the maximum or minimum adjustment positions.

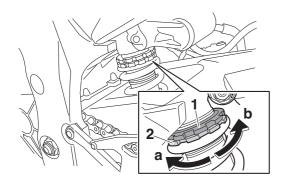
- 1. Adjust:
- Spring preload
- a. Loosen the locknut "1".
- b. Adjust the spring preload with the special wrench included in the owner's tool kit.
- c. Turn the adjusting ring "2" in direction "a" or "b".

Direction "a"

Spring preload is increased (suspension is harder).

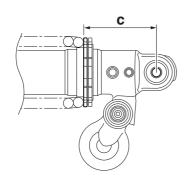
Direction "b"

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.





Spring preload
Minimum
77.5 mm (3.05 in)
Standard
79.0 mm (3.11 in)
Maximum
85.5 mm (3.37 in)

d. Tighten the locknut to the specified torque.



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

Rebound damping

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
 - Rebound damping
- a. Turn the adjusting screw "1" in direction "a" or "b".

Direction "a"

Rebound damping is increased (suspension is harder).

Direction "b"

Rebound damping is decreased (suspension is softer).



Rebound damping Minimum (soft)

23 click(s) in direction "b" Standard

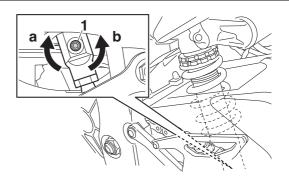
12 click(s) in direction "b" Maximum (hard)

1 click(s) in direction "b"

* With the adjusting screw fully turned in direction "a"

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, check the number of clicks and modify the minimum and standard specifications as necessary.
- When turning the damping force adjusting screw in direction "a", the 0 click position and the 1 click position may be the same.



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).



Fast compression damping Minimum (soft)

5.5 turn(s) in direction "b" Standard

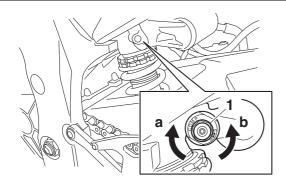
3 turn(s) in direction "b" Maximum (hard)

0 turn(s) in direction "b"

*With the adjusting bolt fully turned in direction "a"

TIP -

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



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).



Slow compression damping Minimum (soft)

18 click(s) in direction "b"*
Standard

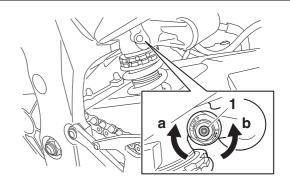
10 click(s) in direction "b" Maximum (hard)

1 click(s) in direction "b"

* With the adjusting screw fully turned in direction "a"

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, check the number of clicks and modify the minimum and standard specifications as necessary.
- When turning the damping force adjusting screw in direction "a", the 0 click position and the 1 click position may be the same.



FAS3094

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

EWA13120

WARNING

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

Spring preload

ECA13590

NOTICE

Never go beyond the maximum or minimum

adjustment positions.

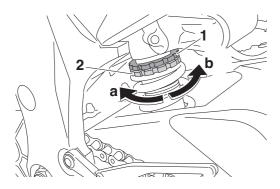
- 1. Adjust:
- Spring preload
- a. Loosen the locknut "1".
- b. Adjust the spring preload with the special wrench included in the owner's tool kit.
- c. Turn the adjusting ring "2" in direction "a" or "b".

Direction "a"

Spring preload is increased (suspension is harder).

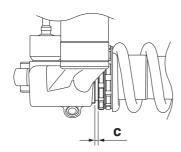
Direction "b"

Spring preload is decreased (suspension is softer).



TIF

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.





Spring preload
Minimum
0 mm (0.00 in)
Standard
4 mm (0.16 in)
Maximum
9 mm (0.35 in)

d. Tighten the locknut to the specified torque.



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

EAS30809

CHECKING THE CONNECTING ARM AND RELAY ARM

Refer to "CHECKING THE CONNECTING ARM AND RELAY ARM" on page 4-110.

EAS30656

CHECKING THE ENGINE OIL LEVEL

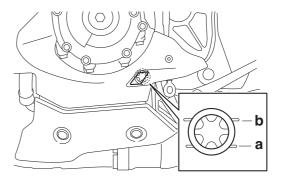
1. Stand the vehicle on a level surface.

TIP.

- Place the vehicle on a maintenance 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 viscosity grades 10W-40, 15W-50 Recommended engine oil grade API service SG type or higher, JASO standard MA

ECA13361

NOTICE

 Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use engine oils with a

grade of "CD" or higher and do not use oils labeled "ENERGY CONSERVING II".

Do not allow foreign materials to enter the crankcase.

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.

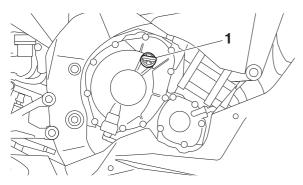
TIP_

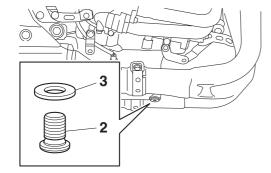
Before checking the engine oil level, wait a few minutes until the oil has settled.

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"



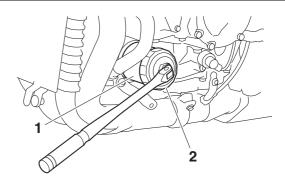


- 4. Drain:
 - Engine oil (completely from the crankcase)
- 5. If the oil filter cartridge is also to be replaced, perform the following procedure.
- a. Remove the left front side cowling.

- 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

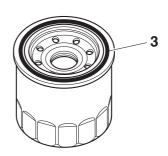


c. Lubricate the O-ring "3" of the new oil filter cartridge with a thin coat of lithium-soapbased grease.

ECA13390

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 N·m (1.7 kgf·m, 13 lb·ft)

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 N·m (2.3 kgf·m, 17 lb·ft)

7. Fill:

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



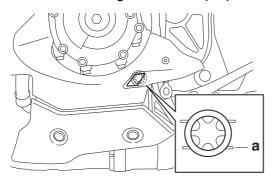
Engine oil quantity
Oil change
3.90 L (4.12 US qt, 3.43 Imp.qt)
With oil filter removal
4.10 L (4.33 US qt, 3.61 Imp.qt)
Quantity (disassembled)
4.90 L (5.18 US qt, 4.31 Imp.qt)

- 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.

EAS30810

MEASURING THE ENGINE OIL PRESSURE

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



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

ECA13410

NOTICE

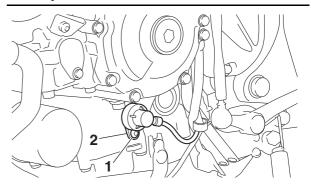
When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

- 3. Remove:
 - Front side cowling (left)

- 4. Remove:
- Oil pressure switch joint bolt "1"
- Oil pressure switch joint (with the oil pressure switch) "2"

WARNING

The engine, muffler and engine oil are extremely hot.



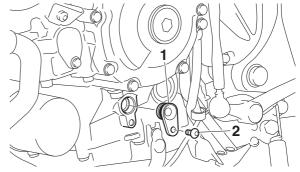
- 5. Install:
 - Oil pressure gauge joint 18 mm "1"
 - Oil pressure switch joint bolt "2"



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



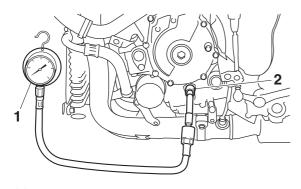
Oil pressure switch joint bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)



- 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 (2.20 kgf/cm²/5000 r/min, 31.9 psi/5000 r/min)

Out of specification \rightarrow Check.

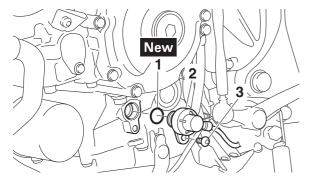
Engine oil pressure	Possible causes
Below specification	Faulty oil pump Clogged oil filter Leaking oil passage Broken or damaged oil seal
Above specification	Faulty oil filterOil viscosity too high

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"



Oil pressure switch joint bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)



= A S 3 0 8 1

CHECKING THE COOLANT LEVEL

1. Stand the vehicle on a level surface.

TIP

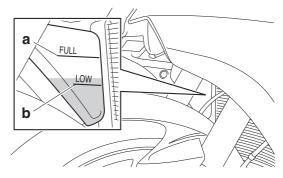
- Place the vehicle on a maintenance stand.
- Make sure the vehicle is upright.

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.



ECA2128

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.

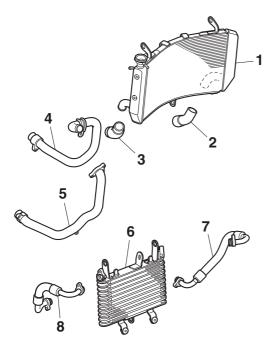
EAS30812

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

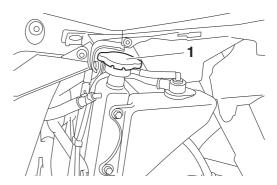
- 1. Remove:
 - Front side cowling (right)
 - Front muffler protector (right)
 Refer to "GENERAL CHASSIS (2)" on page 4-7.
 - Radiator cap "1"

EWA1303

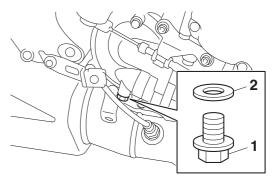
WARNING

A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:

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



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

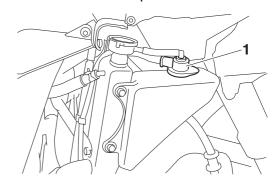


- 3. Drain:
 - Coolant (from the engine and radiator)
- 4. Install:
 - Water pump drain bolt
 - Copper washer New

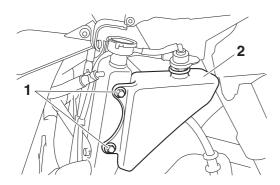


Water pump drain bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

- 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



Coolant reservoir bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft)

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



Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion
inhibitors for aluminum engines
Mixing ratio

1 : 1 (antifreeze : water)
Coolant quantity

Radiator (including all routes) 2.25 L (2.38 US qt, 1.98 lmp.qt) Coolant reservoir (up to the maximum level mark)

0.25 L (0.26 US qt, 0.22 Imp.qt)

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

WARNING

- If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.
- If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.
- If coolant is swallowed, induce vomiting and get immediate medical attention.

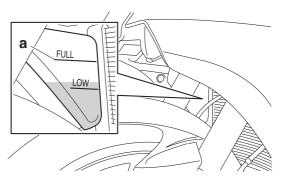
NOTICE

Adding water instead of coolant dilutes the

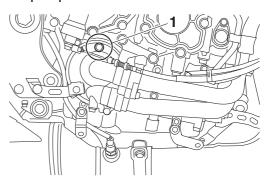
- antifreeze concentration of the coolant. If water is used instead of coolant; check, and if necessary, correct the antifreeze concentration of the coolant.
- Use only distilled water. However, if distilled water is not available, soft water may be used.
- If coolant comes into contact with painted 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.



Water pump air bleed bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

- 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.

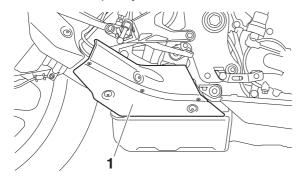
18.Install:

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

EAS31389

ADJUSTING THE EXUP CABLES

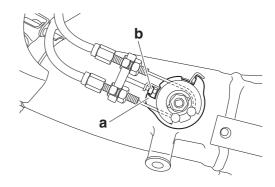
- 1. Remove:
 - EXUP valve pulley cover "1"



- 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 "\cap".
- 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

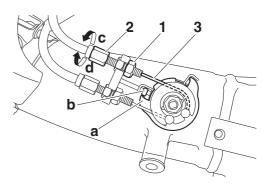
- a. Turn the main switch to "ON".
- b. Loosen the locknut "1".
- c. Turn the adjusting nut "2" in direction "c" or "d" until the projection "a" on the EXUP valve pulley slightly contacts the stopper "b" and make sure the EXUP cable (black metal) "3" is not slack.

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

d. Tighten the locknut "1" to specification.



EXUP cable locknut 6 N·m (0.6 kgf·m, 4.4 lb·ft)



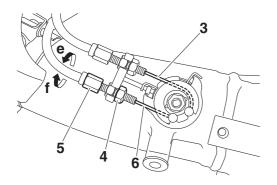
- e. Loosen the locknut "4".
- f. Turn the adjusting nut "5" in direction "e" or "f" until the tension of the EXUP cable (white metal) "6" is the same as that of the EXUP cable (black metal) "3".

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

g. Tighten the locknut "4" to specification.



EXUP cable locknut 6 N·m (0.6 kgf·m, 4.4 lb·ft)



4. Install:

EXUP valve pulley cover



EXUP valve pulley cover bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

FAS3114

CHECKING THE FRONT BRAKE LIGHT SWITCH

Refer to "ELECTRICAL COMPONENTS" on page 8-225.

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 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.

a b b

EAS3114

CHECKING AND LUBRICATING THE CABLES

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

EWA132

WARNING

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

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



Recommended lubricant
Engine oil or a suitable cable lubricant

TIP

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

EAS30815

CHECKING THE THROTTLE GRIP

- 1. Check:
 - Throttle cables
 Damage/deterioration → Replace.
 - Throttle cable installation Incorrect → Reinstall the throttle cables. Refer to "HANDLEBARS" on page 4-75.
- 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.

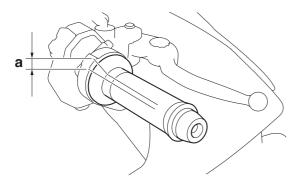
Repeat this check with the handlebar turned all the way to the left and right.

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

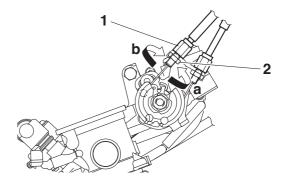
a. Loosen the locknut "1" on the accelerator ca-

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 N·m (0.45 kgf·m, 3.3 lb·ft)

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.

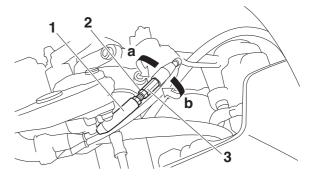
Handlebar side

- 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.



Throttle cable locknut (handlebar side)

4.3 N·m (0.43 kgf·m, 3.2 lb·ft)

e. Slide the rubber cover to its original position.

TIP

Make sure that the adjusting nut is covered com-

pletely by the rubber cover.

EAS3081

CHECKING AND CHARGING THE BATTERY
Refer to "CHECKING AND CHARGING THE

BATTERY" on page 8-233.

EAS30662

CHECKING THE FUSES

Refer to "CHECKING THE FUSES" on page 8-232.

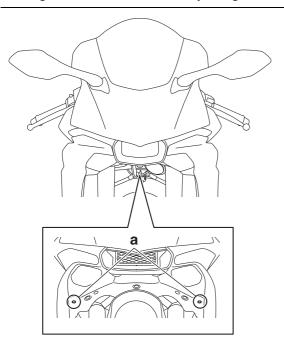
EAS30664

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.

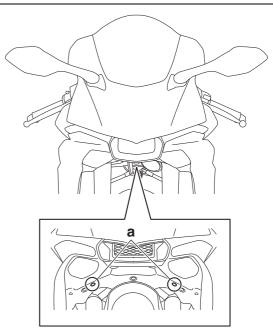


2. Adjust:

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.

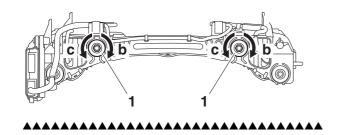
Right headlight

Direction "b"

Headlight beam moves to the left.

Direction "c"

Headlight beam moves to the right.



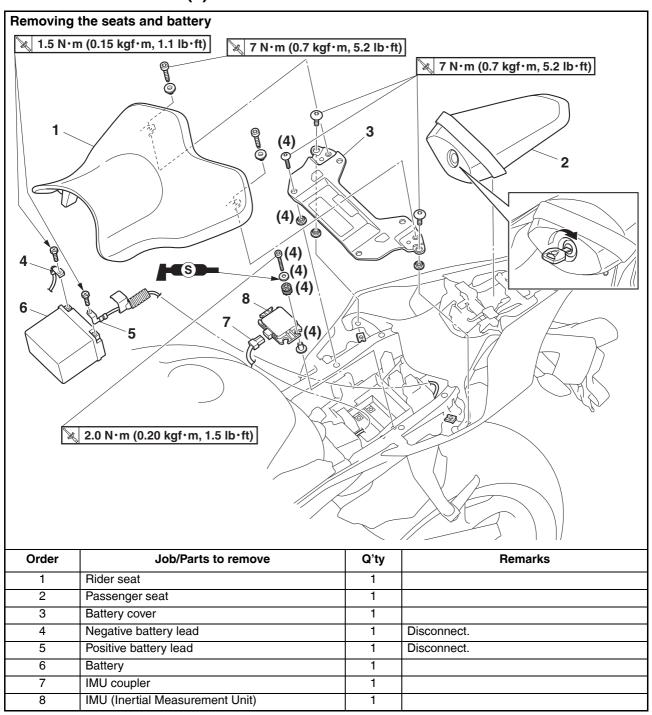
CHASSIS

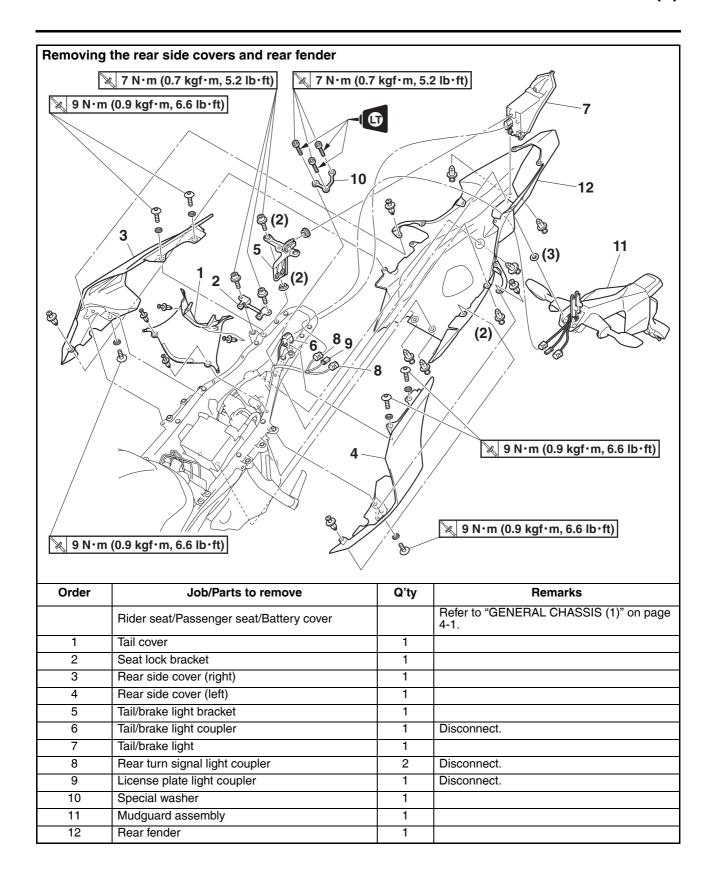
GENERAL CHASSIS (1)	4-1
INSTALLING THE IMU	4-5
CONNECTING TO THE CCU (for YZF-R1M)	
GENERAL CHASSIS (2)	47
REMOVING THE FRONT SIDE COWLINGS (for YZF-R1)	4-/ ⊿_1?
REMOVING THE FRONT SIDE COWLINGS (101 TZF-R1)	1 - 4
INSTALLING THE FRONT SIDE COWLINGS (for YZF-R1)	
INSTALLING THE FRONT SIDE COWLINGS (IOF YZF-R1)INSTALLING THE FRONT SIDE COWLINGS (FOR YZF-R1M)	
REMOVING THE FRONT PANELS	
INSTALLING THE FRONT PANELS	
REMOVING THE SIDE COVER (left)	
INSTALLING THE SIDE COVER (left)	
REMOVING THE SIDE COVER (right)	
INSTALLING THE SIDE COVER (right)	
REMOVING THE ECU (Engine Control Unit)	
INSTALLING THE ECU (Engine Control Unit)	
INSTALLING THE EGO (Engine Control Offit)	4-17
GENERAL CHASSIS (3)	4-18
REMOVING THE WINDSHIELD ASSEMBLY	4-22
INSTALLING THE WINDSHIELD ASSEMBLY	4-22
CHECKING THE AIR INTAKE DUCT VALVE	4-23
CHECKING THE VACUUM LINE	4-23
INSTALLING THE AIR INTAKE DUCT VALVE	4-24
FRONT WHEEL	4-25
REMOVING THE FRONT WHEEL	
DISASSEMBLING THE FRONT WHEEL	
CHECKING THE FRONT WHEEL	
ASSEMBLING THE FRONT WHEEL	
MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR	
ROTOR	4-30
ADJUSTING THE FRONT WHEEL STATIC BALANCE	4-31
INSTALLING THE FRONT WHEEL (DISC BRAKE)	4-32
REAR WHEEL	4-35
REMOVING THE REAR WHEEL	
DISASSEMBLING THE REAR WHEEL	
CHECKING THE REAR WHEEL	
CHECKING THE REAR WHEEL DRIVE HUB	
CHECKING AND REPLACING THE REAR WHEEL SPROCKET	
ASSEMBLING THE REAR WHEEL	
MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR	
ROTOR	4-41
ADJUSTING THE REAR WHEEL STATIC BALANCE	
INSTALLING THE REAR WHEEL (DISC BRAKE)	

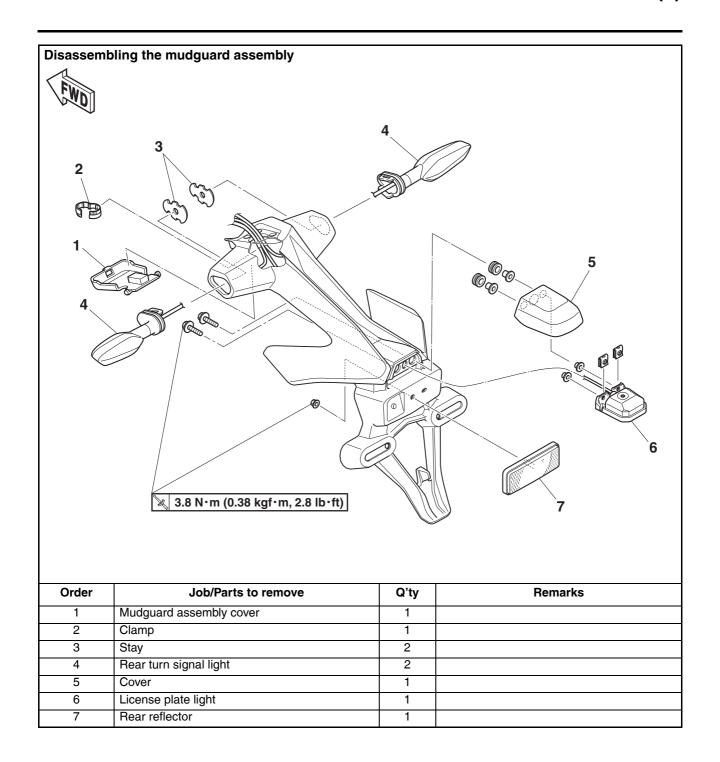
FRONT BRAKE	4-44
INTRODUCTION	
CHECKING THE FRONT BRAKE DISCS	
REPLACING THE FRONT BRAKE PADS	
REMOVING THE FRONT BRAKE CALIPERS	_
DISASSEMBLING THE FRONT BRAKE CALIPERS	
CHECKING THE FRONT BRAKE CALIPERS	
ASSEMBLING THE FRONT BRAKE CALIPERS	
INSTALLING THE FRONT BRAKE CALIPERS	
REMOVING THE FRONT BRAKE MASTER CYLINDER	
CHECKING THE FRONT BRAKE MASTER CYLINDER	
ASSEMBLING THE FRONT BRAKE MASTER CYLINDER	
INSTALLING THE FRONT BRAKE MASTER CYLINDER	4-54
REAR BRAKE	4-56
INTRODUCTION	
CHECKING THE REAR BRAKE DISC	
REPLACING THE REAR BRAKE PADS	
REMOVING THE REAR BRAKE CALIPER	
DISASSEMBLING THE REAR BRAKE CALIPER	
CHECKING THE REAR BRAKE CALIPER	
ASSEMBLING THE REAR BRAKE CALIPER	
INSTALLING THE REAR BRAKE CALIPER	
REMOVING THE REAR BRAKE MASTER CYLINDER	
CHECKING THE REAR BRAKE MASTER CYLINDER	4-64
THE REAR BRAKE MASTER CYLINDER	4-65
INSTALLING THE REAR BRAKE MASTER CYLINDER	4-65
450/4 (1.1.5.1.0.1.)	4.00
ABS (Anti-lock Brake System)	
ABS COMPONENTS CHARTREMOVING THE HYDRAULIC UNIT ASSEMBLY	
CHECKING THE HYDRAULIC UNIT ASSEMBLY	
CHECKING THE BRAKE PIPES	
INSTALLING THE HYDRAULIC UNIT ASSEMBLY	
HYDRAULIC UNIT OPERATION TEST	
CHECKING THE ABS WARNING LIGHT	
HANDLEBARS	
REMOVING THE HANDLEBARS	
CHECKING THE HANDLEBARS	
INSTALLING THE HANDLEBARS	4-77
FRONT FORK (for YZF-R1)	4-8∩
REMOVING THE FRONT FORK LEGS (for YZF-R1)	
DISASSEMBLING THE FRONT FORK LEGS (for YZF-R1)	
CHECKING THE FRONT FORK LEGS (for YZF-R1)	
ASSEMBLING THE FRONT FORK LEGS (for YZF-R1)	
INSTALLING THE FRONT FORK LEGS (for YZF-R1)	

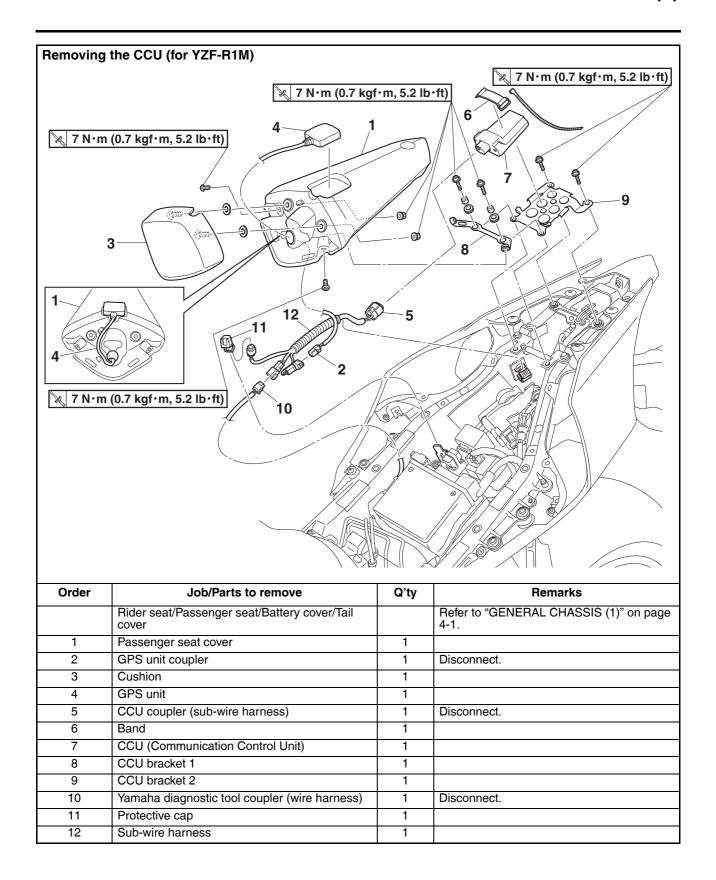
REMOVING THE FRONT FORK LEGS (for YZF-R1M)	FRONT FORK (for YZF-R1M)	4-91
DISASSEMBLING THE FRONT FORK LEGS (for YZF-R1M)		
CHECKING THE FRONT FORK LEGS (for YZF-R1M)		
ASSEMBLING THE FRONT FORK LEGS (for YZF-R1M)		
STEERING HEAD		
STEERING HEAD		
REMOVING THE LOWER BRACKET	INCOME IN THE PROPERTY OF THE PERSON OF THE	
REMOVING THE LOWER BRACKET	STEERING HEAD	4-101
CHECKING THE STEERING HEAD		
INSTALLING THE STEERING HEAD		
CHECKING THE STEERING DAMPER		
REAR SHOCK ABSORBER ASSEMBLY		
HANDLING THE REAR SHOCK ABSORBER	ONEONING THE OTEETHING BAWN EN	
HANDLING THE REAR SHOCK ABSORBER	REAR SHOCK ABSORBER ASSEMBLY	4-105
DISPOSING OF A REAR SHOCK ABSORBER 4-109 REMOVING THE REAR SHOCK ABSORBER ASSEMBLY 4-109 DISASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY 4-110 CHECKING THE REAR SHOCK ABSORBER ASSEMBLY 4-110 CHECKING THE CONNECTING ARM AND RELAY ARM 4-110 ASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY 4-111 INSTALLING THE RELAY ARM 4-111 INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY 4-112 SWINGARM 4-112 SWINGARM 4-114 CHECKING THE SWINGARM 4-114 INSTALLING THE SWINGARM 4-115 CHAIN DRIVE 4-115 CHAIN DRIVE 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-112		
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY		
DISASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY 4-110 CHECKING THE REAR SHOCK ABSORBER ASSEMBLY 4-110 CHECKING THE CONNECTING ARM AND RELAY ARM 4-110 ASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY 4-111 INSTALLING THE RELAY ARM 4-111 INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY 4-112 SWINGARM 4-113 REMOVING THE SWINGARM 4-114 CHECKING THE SWINGARM 4-115 CHAIN DRIVE 4-115 CHAIN DRIVE 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121		
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY 4-110 CHECKING THE CONNECTING ARM AND RELAY ARM 4-110 ASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY 4-111 INSTALLING THE RELAY ARM 4-111 INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY 4-112 SWINGARM 4-113 REMOVING THE SWINGARM 4-114 CHECKING THE SWINGARM 4-114 INSTALLING THE SWINGARM 4-115 CHAIN DRIVE 4-118 REMOVING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121		
CHECKING THE CONNECTING ARM AND RELAY ARM		
ASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY 4-111 INSTALLING THE RELAY ARM. 4-111 INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY 4-112 SWINGARM. 4-113 REMOVING THE SWINGARM. 4-114 CHECKING THE SWINGARM. 4-114 INSTALLING THE SWINGARM. 4-115 CHAIN DRIVE. 4-118 REMOVING THE DRIVE CHAIN. 4-119 CHECKING THE DRIVE CHAIN. 4-119 CHECKING THE DRIVE SPROCKET. 4-120 CHECKING THE REAR WHEEL SPROCKET. 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN. 4-121		
INSTALLING THE RELAY ARM		_
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY 4-112 SWINGARM 4-113 REMOVING THE SWINGARM 4-114 CHECKING THE SWINGARM 4-114 INSTALLING THE SWINGARM 4-115 CHAIN DRIVE 4-118 REMOVING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121		
SWINGARM 4-113 REMOVING THE SWINGARM 4-114 CHECKING THE SWINGARM 4-114 INSTALLING THE SWINGARM 4-115 CHAIN DRIVE 4-118 REMOVING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121		
REMOVING THE SWINGARM 4-114 CHECKING THE SWINGARM 4-114 INSTALLING THE SWINGARM 4-115 CHAIN DRIVE 4-118 REMOVING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121	INSTALLING THE HEART SHOOK ADSORDER ASSEMBLT	4-112
REMOVING THE SWINGARM 4-114 CHECKING THE SWINGARM 4-114 INSTALLING THE SWINGARM 4-115 CHAIN DRIVE 4-118 REMOVING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121	SWINGARM	/ ₋113
CHECKING THE SWINGARM 4-114 INSTALLING THE SWINGARM 4-115 CHAIN DRIVE 4-118 REMOVING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121	REMOVING THE SWINGARM	4-11 <i>d</i>
CHAIN DRIVE 4-118 REMOVING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121		
CHAIN DRIVE 4-118 REMOVING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE CHAIN 4-119 CHECKING THE DRIVE SPROCKET 4-120 CHECKING THE REAR WHEEL SPROCKET 4-120 CHECKING THE REAR WHEEL DRIVE HUB 4-120 INSTALLING THE DRIVE CHAIN 4-121		
REMOVING THE DRIVE CHAIN	INSTALLING THE SWINGARINI	4-113
REMOVING THE DRIVE CHAIN	CHAIN DRIVE	4-118
CHECKING THE DRIVE CHAIN		
CHECKING THE DRIVE SPROCKET		
CHECKING THE REAR WHEEL SPROCKET4-120 CHECKING THE REAR WHEEL DRIVE HUB4-120 INSTALLING THE DRIVE CHAIN4-121		
CHECKING THE REAR WHEEL DRIVE HUB4-120 INSTALLING THE DRIVE CHAIN4-121		
INSTALLING THE DRIVE CHAIN4-121		
ADJUSTING THE SHIFT PEDAL 4-122	ADJUSTING THE SHIFT PEDAL	

EAS2002









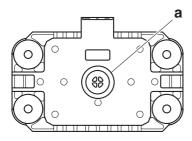
EAS31636

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.

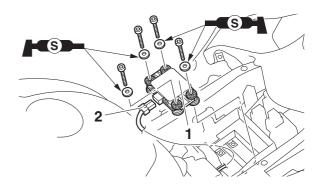
TID

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





2.0 N·m (0.20 kgf·m, 1.5 lb·ft)



EAS3167

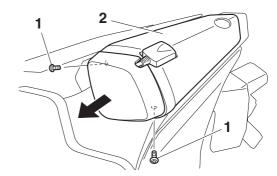
CONNECTING TO THE CCU (for YZF-R1M)

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 1-33.) Logging data and YRC setting data can be accessed when a smartphone or tablet is connected to the CCU wireless network.

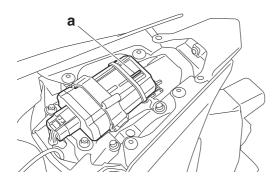
TIP

From the Google© or Apple© 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 or tablet.
- 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.

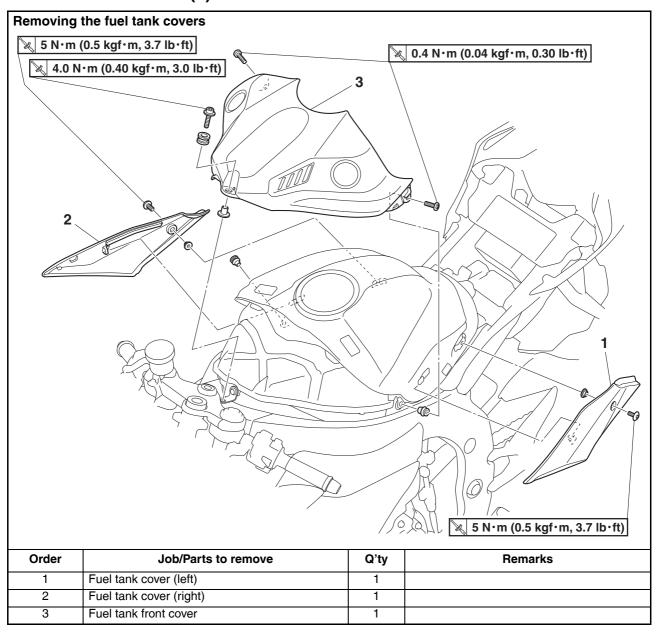
e. Install the passenger seat cover assembly to the original position, and then install the bolts.

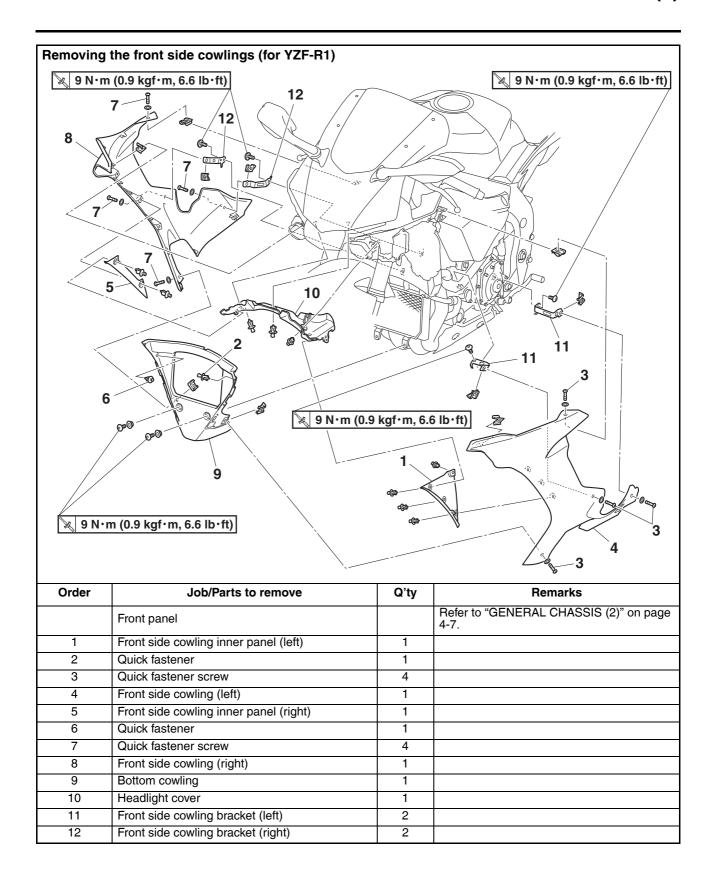


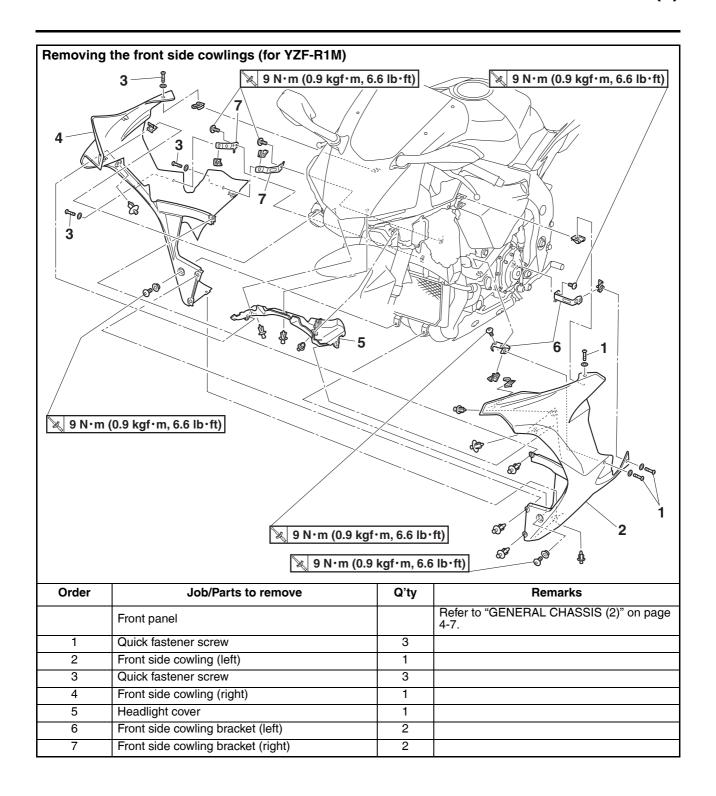
Passenger seat cover bolt (for YZF-R1M)

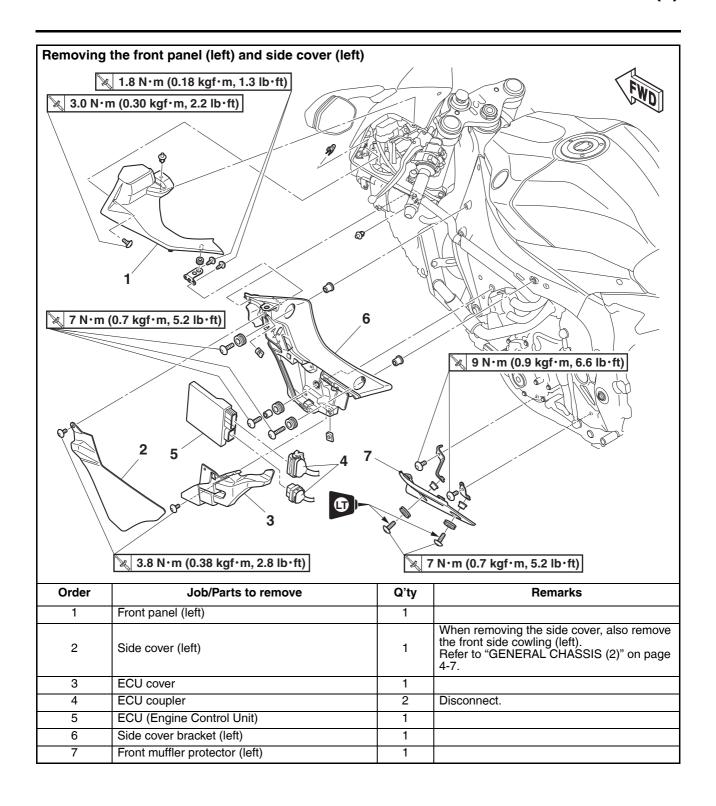
7 N·m (0.7 kgf·m, 5.2 lb·ft)

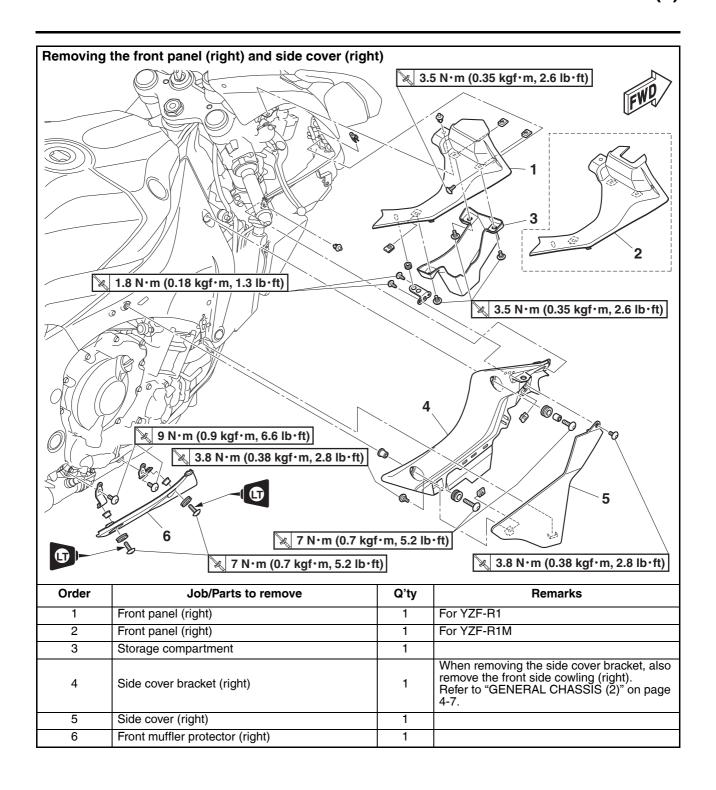
EAS2015

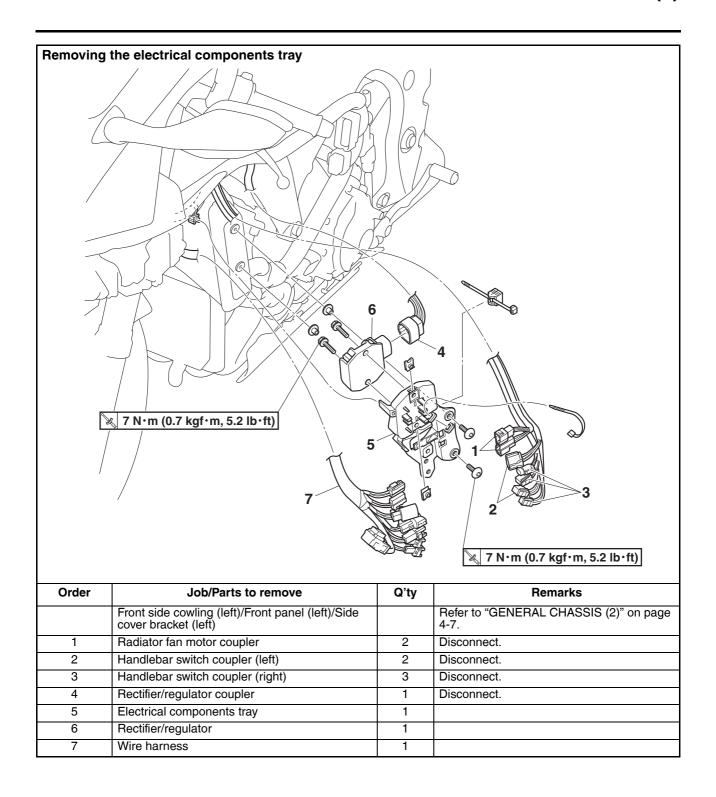








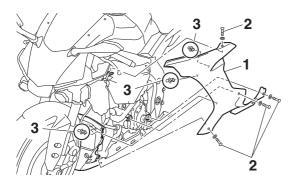




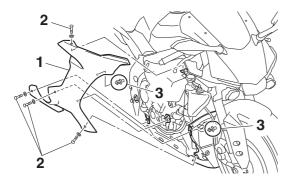
REMOVING THE FRONT SIDE COWLINGS (for YZF-R1)

- 1. Remove:
- 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.



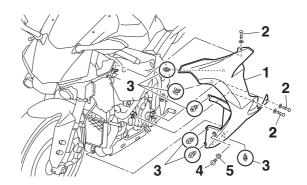
- 2. Remove:
 - Front side cowling (right) "1"
- a. Remove the quick fastener screws "2" and the quick fasteners "3".
- b. Remove the right front side cowling by pulling it forward.



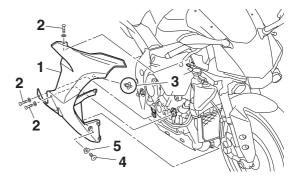
EAS3163

REMOVING THE FRONT SIDE COWLINGS (for YZF-R1M)

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



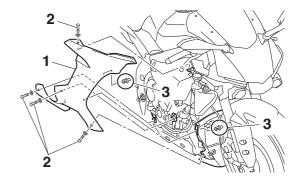
- 2. Remove
- Front side cowling (right) "1"
- a. Remove the quick fastener screws "2", quick fastener "3", bolt "4" and the collar "5".
- b. Remove the right front side cowling by pulling it forward.



EAS3138

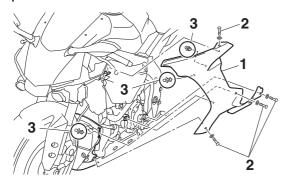
INSTALLING THE FRONT SIDE COWLINGS (for YZF-R1)

- 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".



- 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

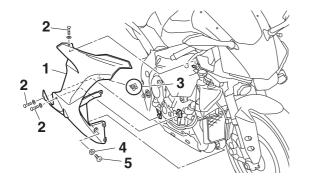
INSTALLING THE FRONT SIDE COWLINGS (for YZF-R1M)

- 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".



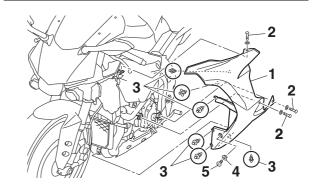
Front side cowling bolt (for YZF-R1M) 9 N·m (0.9 kgf·m, 6.6 lb·ft)



- 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".



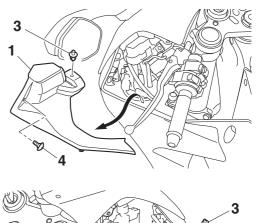
Front side cowling bolt (for YZF-R1M) 9 N·m (0.9 kgf·m, 6.6 lb·ft)

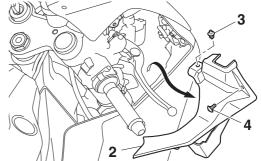


EAS3163

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.





EAS31640

INSTALLING THE FRONT PANELS

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

a. Install the front panel.

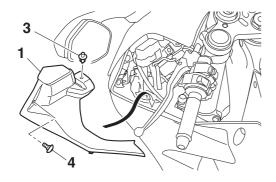
TIP

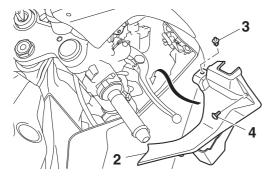
Insert projection on the front panel into grommet.

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



Front panel bolt (left)
3.0 N·m (0.30 kgf·m, 2.2 lb·ft)
Front panel bolt (right)
3.5 N·m (0.35 kgf·m, 2.6 lb·ft)





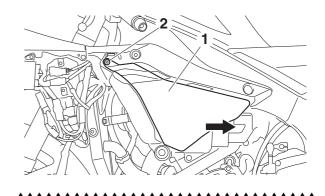
EAS31519

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.



EAS3152

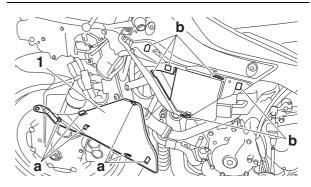
INSTALLING THE SIDE COVER (left)

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

a. Install the side cover "1".

TIP

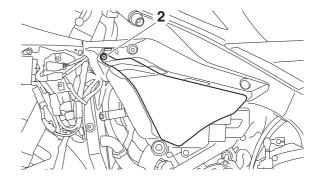
Insert projections "a" on the side cover into slots "b".



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



Side cover bolt 3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

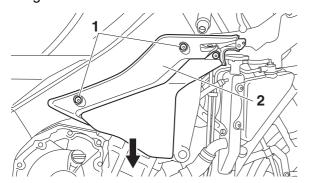


2. Install:

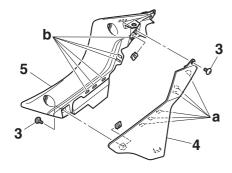
• Front side cowling (left)

REMOVING THE SIDE COVER (right)

- 1. Remove:
- Front side cowling (right)
- 2. Remove:
 - Side cover bracket (right)
 - Side cover (right)
- a. Remove the side cover bracket bolts "1".
- b. Remove the side cover assembly "2" by sliding it downward.



- c. Remove the side cover bolts "3".
- d. Remove the projections "a" from the slots "b" and the side cover "4" from the side cover bracket "5".



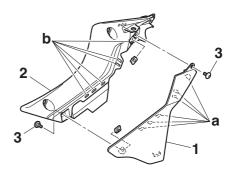
EAS32174

INSTALLING THE SIDE COVER (right)

- 1. Install:
 - Side cover (right)
 - Side cover bracket (right)
- a. Insert the projections "a" into the slots "b", and install the side cover "1" to the side cover bracket "2".
- b. Install the side cover bolts "3", and then tighten the bolt to specification.



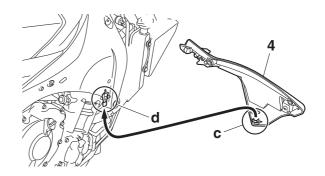
Side cover bolt 3.8 N·m (0.38 kgf·m, 2.8 lb·ft)



c. Install the side cover assembly "4".

ΓIP _____

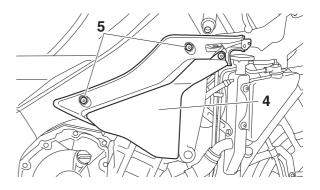
Insert slot "c" on the side cover into projection "d".



d. Install the side cover bracket bolts "5", and then tighten the bolt to specification.



Side cover bracket bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft)



- 2. Install:
 - Front side cowling (right)

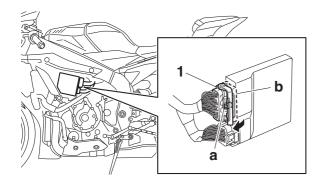
EAS31641

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.

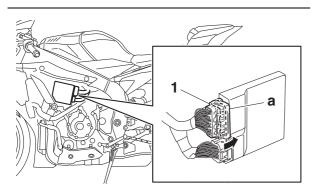


INSTALLING THE ECU (Engine Control Unit)

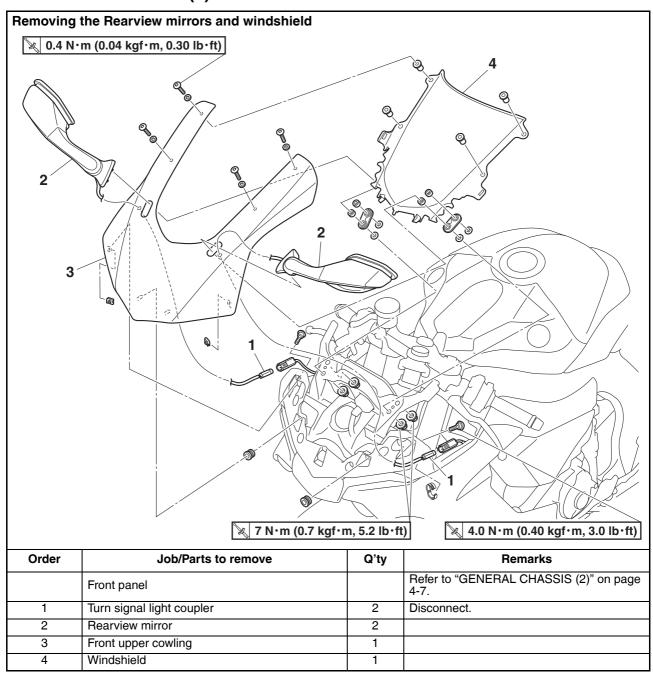
- 1. Connect:
- ECU coupler "1"

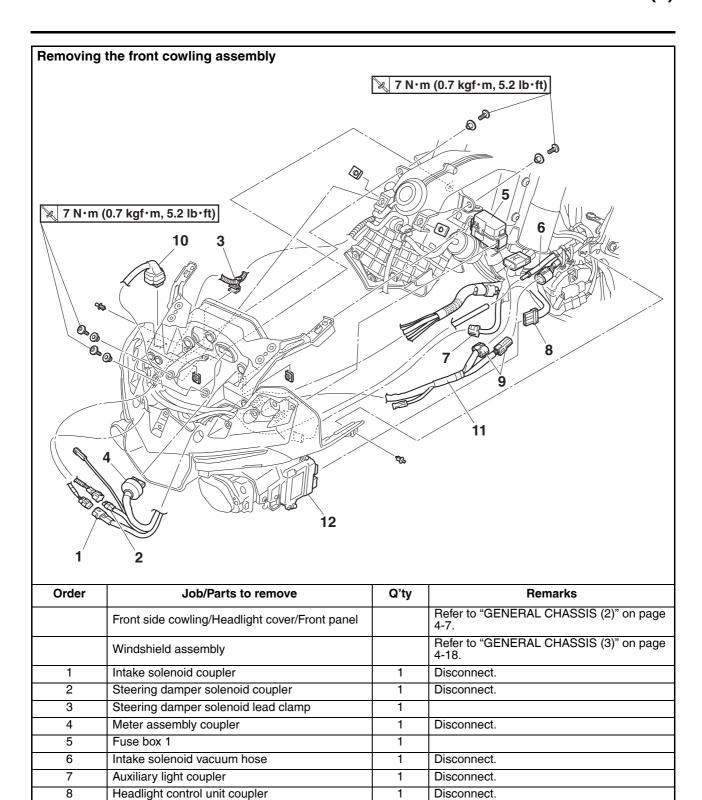
TIP_

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



GENERAL CHASSIS (3)





2

1

Disconnect. For YZF-R1M

Disconnect. For YZF-R1M

For YZF-R1M

Sub-wire harness coupler

Front cowling assembly

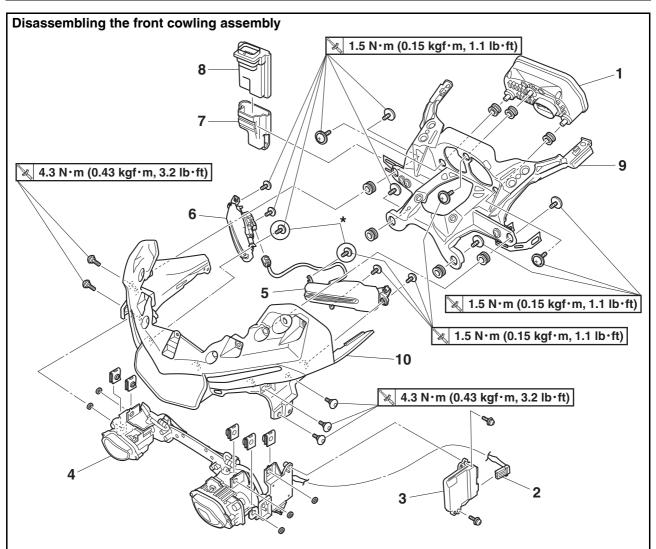
SCU coupler

Sub-wire harness

9

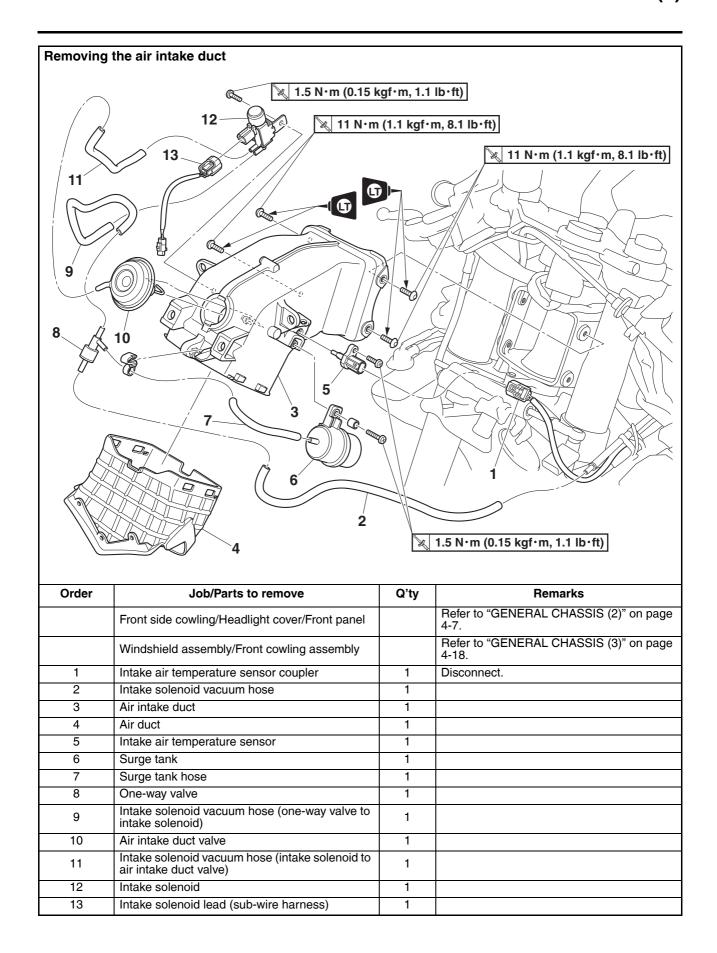
10 11

12



*When installing the auxiliary light onto the front cowling, tighten this screw last.

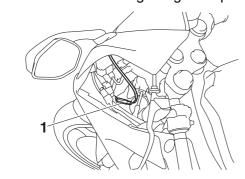
Order	Job/Parts to remove	Q'ty	Remarks
1	Meter assembly	1	
2	Headlight control unit coupler	1	Disconnect.
3	Headlight control unit	1	
4	Headlight	1	
5	Auxiliary light (left)	1	
6	Auxiliary light (right)	1	
7	SCU cover	1	For YZF-R1M
8	SCU (Suspension Control Unit)	1	For YZF-R1M
9	Front cowling assembly stay	1	
10	Front cowling	1	

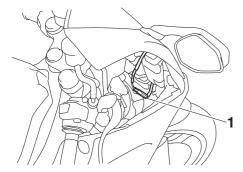


REMOVING THE WINDSHIELD ASSEMBLY

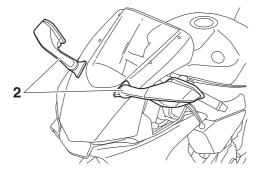
- 1. Remove:
- Front side panel (left)
- Front side panel (right)
 Refer to "GENERAL CHASSIS (2)" on page 4-7.
- 2. Remove:
 - Windshield assembly

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

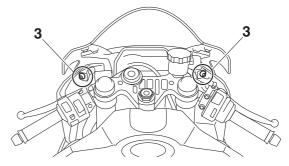




b. Remove the rearview mirror nuts, and then remove the rearview mirrors "2".



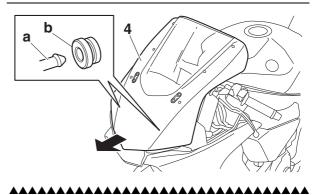
c. Remove the windshield assembly bolts "3".



d. Remove the windshield assembly "4".

TIP

Remove projections "a" on the windshield assembly from grommets "b".



EAS31644

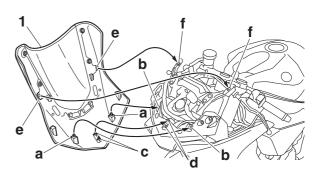
INSTALLING THE WINDSHIELD ASSEMBLY

- 1. Install:
- Windshield assembly

a. Install the windshield assembly "1".

TIP

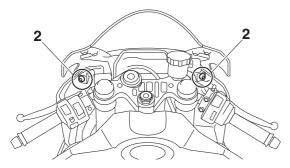
- Insert projections "a" on the windshield assembly into grommets "b".
- Insert projections "c" on the windshield assembly into holes "d".
- Insert slots "e" in the windshield assembly into projections "f" on the stay.



b. Install the windshield assembly bolts "2", and then tighten the bolts to specification.



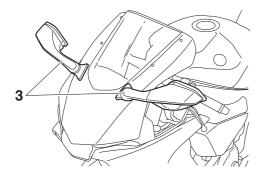
Windshield assembly bolt 4.0 N·m (0.40 kgf·m, 3.0 lb·ft)



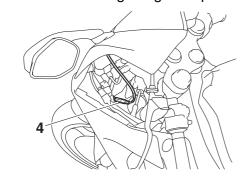
c. Install the rearview mirrors "3" and rearview mirror nuts, and then tighten the nuts to specification.

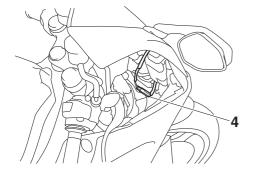


Rearview mirror nut 7 N·m (0.7 kgf·m, 5.2 lb·ft)



d. Connect the turn signal light couplers "4".





2. Install:

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

EAS31645

CHECKING THE AIR INTAKE DUCT VALVE

- 1. Check:
 - Air intake duct valve operation

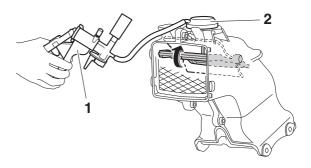
a. Connect the vacuum/pressure pump gauge set "1" to the air intake duct valve "2".



Vacuum/pressure pump gauge set 90890-06945

Pressure/ vacuum tester YB-35956-B

 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.



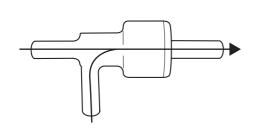
EAS31646

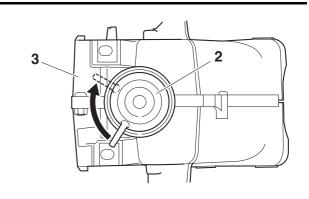
CHECKING THE VACUUM LINE

- 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 → Replace.

TIP

Check that air flows smoothly only in the direction of the arrow shown in the illustration.



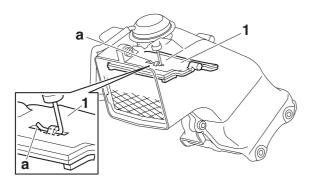


- 4. Check:
 - Intake solenoid
 Damage → Replace.
- 5. Check:
 - Intake solenoid Refer to "DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE" on page 9-20.
- 6. Check:
 - Surge tank
 Cracks/damage → Replace.

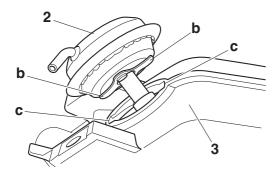
INSTALLING THE AIR INTAKE DUCT VALVE

- 1. Install:
 - Air intake duct valve

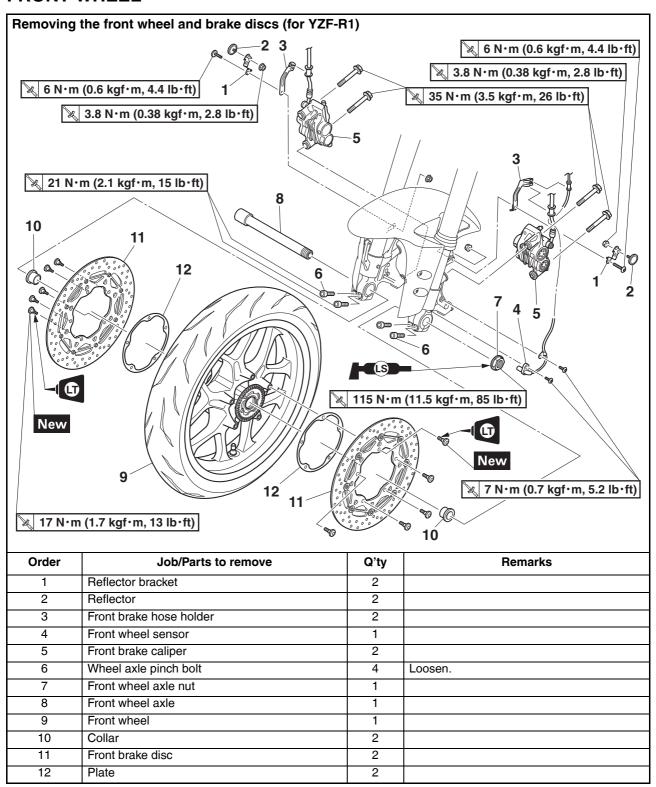
a. Hook the end of the shaft "a" onto the plate "1" as shown.

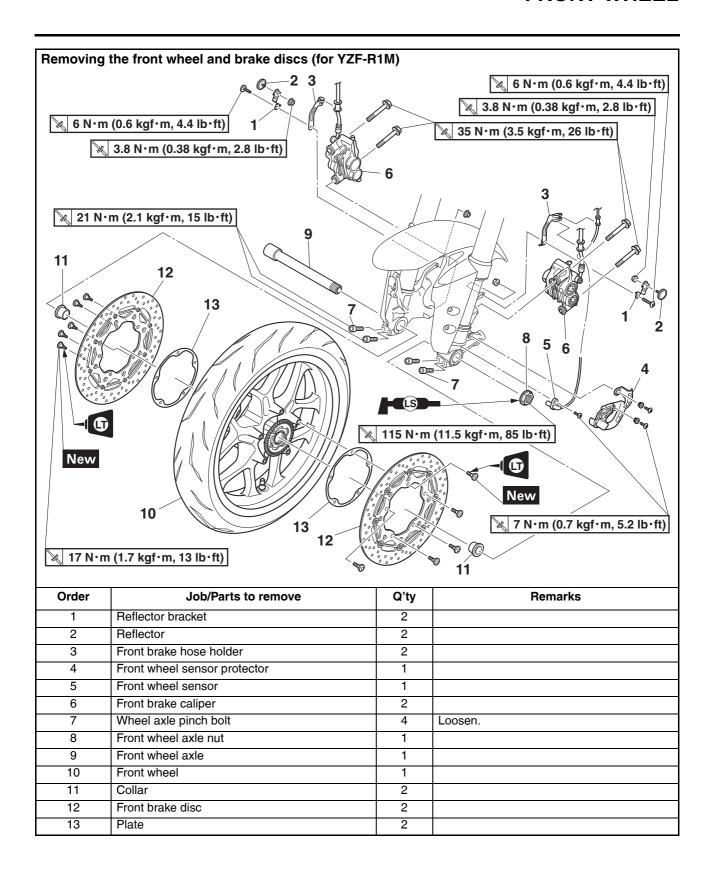


b. Align the tabs "b" on the air intake duct valve "2" with the cutouts "c" in the air intake duct "3", and then turn the air intake duct valve 90° clockwise.

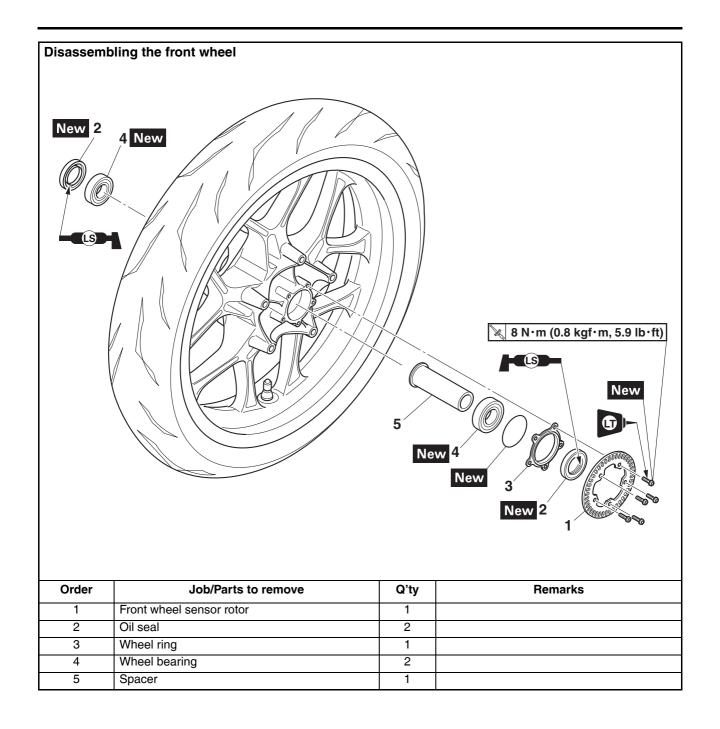


FRONT WHEEL





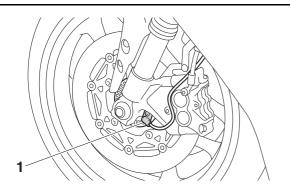
FRONT WHEEL



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.

WARNING

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

FCΔ21440

NOTICE

- 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

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

- 4. Loosen:
 - Wheel axle pinch bolt
- 5. Remove:
 - Front wheel axle
 - Front wheel

DISASSEMBLING THE FRONT WHEEL

FCA21340

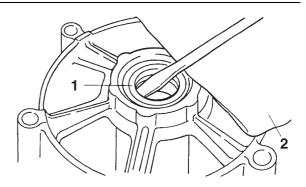
NOTICE

• Do not drop the wheel sensor rotor or subject it to shocks.

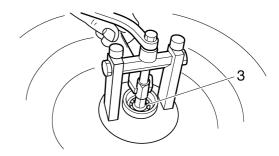
- If any solvent gets on the wheel sensor rotor, wipe it off immediately.
- 1. Remove:
 - Oil seals
 - Wheel bearings
- a. Clean the surface of the front wheel hub.
- b. Remove the oil seals "1" with a flat-head screwdriver.

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.

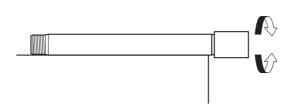


CHECKING THE FRONT WHEEL

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

WARNING

Do not attempt to straighten a bent wheel ax-



2. Check:

- Tire
- Front wheel

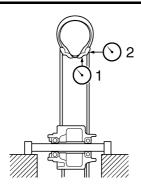
Damage/wear \rightarrow Replace.

Refer to "CHECKING THE TIRES" on page 3-18 and "CHECKING THE WHEELS" on page 3-18.

- 3. Measure:
- Radial wheel runout "1"
- Lateral wheel runout "2"
 Over the specified limits → Replace.

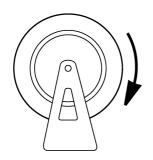


Radial wheel runout limit 1.0 mm (0.04 in) Lateral wheel runout limit 1.0 mm (0.04 in)



4. Check:

- Wheel bearings
 Front wheel turns roughly or is loose → Replace the wheel bearings.
- Oil seals
 Damage/wear → Replace.



EAS30151

ASSEMBLING THE FRONT WHEEL

CA21340

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

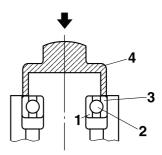
a. Install the new wheel bearing (right side).

NOTICE

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

TIP.

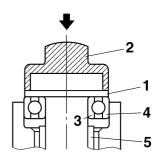
Use a socket "4" that matches the diameter of the wheel bearing outer race.



- 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 N·m (0.8 kgf·m, 5.9 lb·ft) LOCTITE®

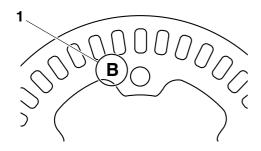
ECA17200

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 \rightarrow 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 4-30.



Wheel sensor rotor runout limit 0.25 mm (0.01 in)

EAS3015

MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR

ECA21070

NOTICE

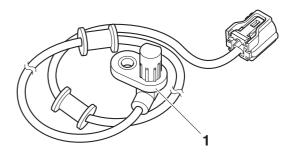
- Handle the ABS components with care since they have been accurately adjusted.
 Keep them away from dirt and do not subject them to shocks.
- The front wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.
- Keep any type of magnets (including magnetic 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.



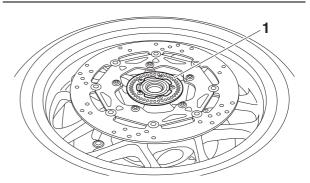
2. Check:

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.



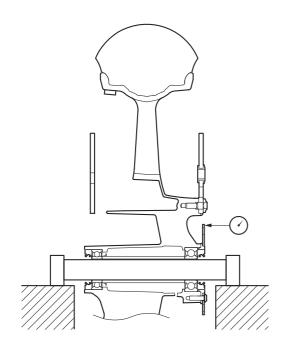
3. Measure:

Wheel sensor rotor runout
 Out of specification → Clean the installation
 surface of the wheel sensor rotor and correct
 the wheel sensor rotor runout, or replace the
 wheel sensor rotor.



Wheel sensor rotor runout limit 0.25 mm (0.01 in)

- 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 N·m (0.8 kgf·m, 5.9 lb·ft) **LOCTITE®**

ECA17200

NOTICE

Replace the wheel sensor rotor bolts with new ones.

d. If the runout is still above specification, replace the wheel sensor rotor.

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

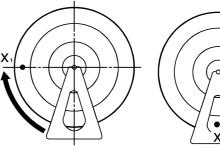
Place the front wheel on a suitable balancing stand.

- 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.



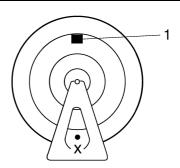


- f. Repeat steps (c) through (e) several times until all the marks come to rest at the same spot.
- g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

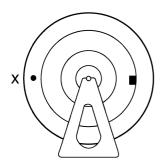
- 3. Adjust:
 - Front wheel static balance

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

Start with the lightest weight.



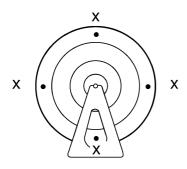
b. Turn the front wheel 90° so that the heavy spot is positioned as shown.



- c. If the heavy spot does not stay in that position, install a heavier weight.
- d. Repeat steps (b) and (c) until the front wheel is balanced.



- 4. Check:
 - Front wheel static balance
- a. Turn the front wheel and make sure it stays at each position shown.



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

EAS30154

INSTALLING THE FRONT WHEEL (DISC BRAKE)

- 1. Install:
 - Plate
 - Front brake discs



Front brake disc bolt 17 N·m (1.7 kgf·m, 13 lb·ft) LOCTITE®

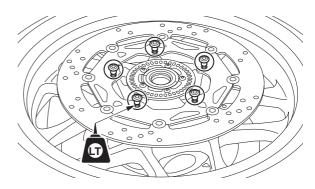
ECA19150

NOTICE

Replace the brake disc bolts with new ones.

TIP

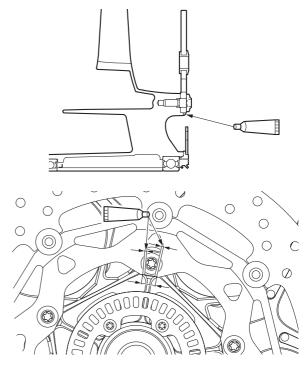
Tighten the brake disc bolts in stages and in a crisscross pattern.



- 2. Apply:
- 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 4-49.
- 4. Lubricate:
 - Oil seal lips



Recommended lubricant Lithium-soap-based grease

- 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



Front wheel axle nut 115 N·m (11.5 kgf·m, 85 lb·ft)

ECA14140

NOTICE

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

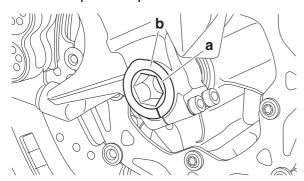
- 7. Tighten:
- Front wheel axle pinch bolt

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 N·m (2.1 kgf·m, 15 lb·ft)

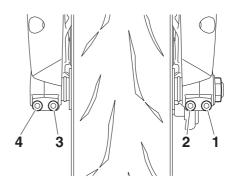
b. Check that the right end "a" of the front axle is flush with the front fork "b". If necessary, manually push the front axle or lightly tap it with a soft hammer until its end is flush with the front fork. However, if the surface of the front axle end is not parallel to the surface of the front fork, 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 N·m (2.1 kgf·m, 15 lb·ft)



8. Install:

- Front wheel sensor
- Front wheel sensor protector (for YZF-R1M)



Front wheel sensor bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft) Front wheel sensor protector bolt (for YZF-R1M) 7 N·m (0.7 kgf·m, 5.2 lb·ft)

ECA21020

NOTICE

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 2-41.

9. Measure:

• Distance "a"

(between the front 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, LOCTITE® on the mounting surface of the rotor, deformation caused by an impact during service and caught foreign materials). If there is any defective part, repair or replace the defective part.



Distance "a" (between the front wheel sensor rotor and front wheel sensor)

0.9–1.7 mm (0.035–0.067 in) (for YZF-R1)

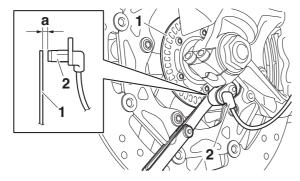
1.1–1.9 mm (0.043–0.075 in) (for YZF-R1M)

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.



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



10.Install:

- Front brake calipers
- Front brake hose holder



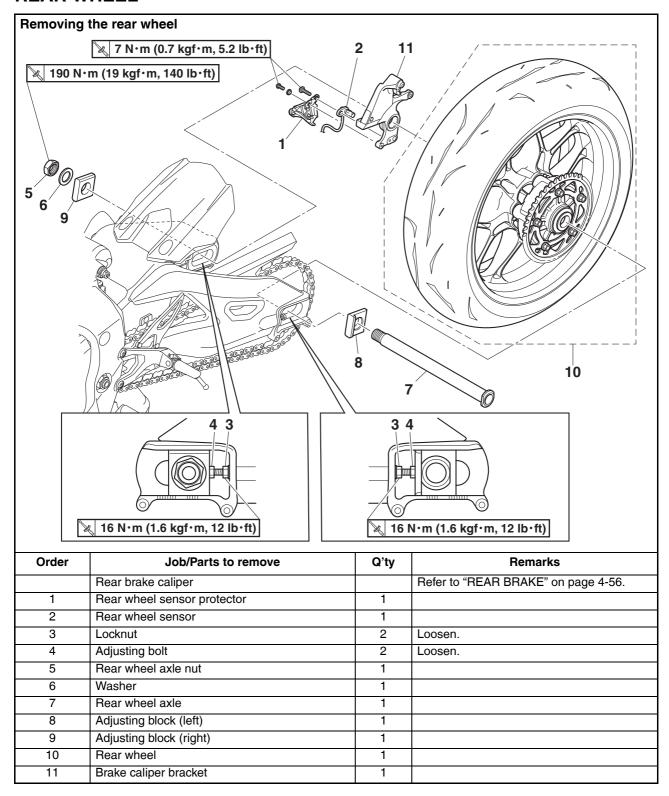
Front brake caliper bolt 35 N·m (3.5 kgf·m, 26 lb·ft) Front brake hose holder bolt 6 N·m (0.6 kgf·m, 4.4 lb·ft)

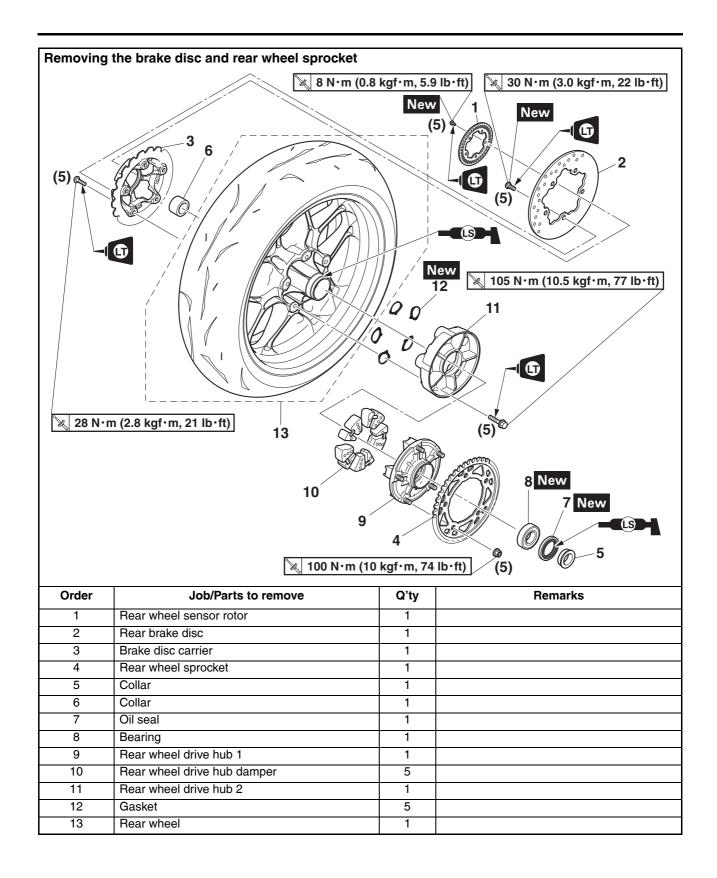




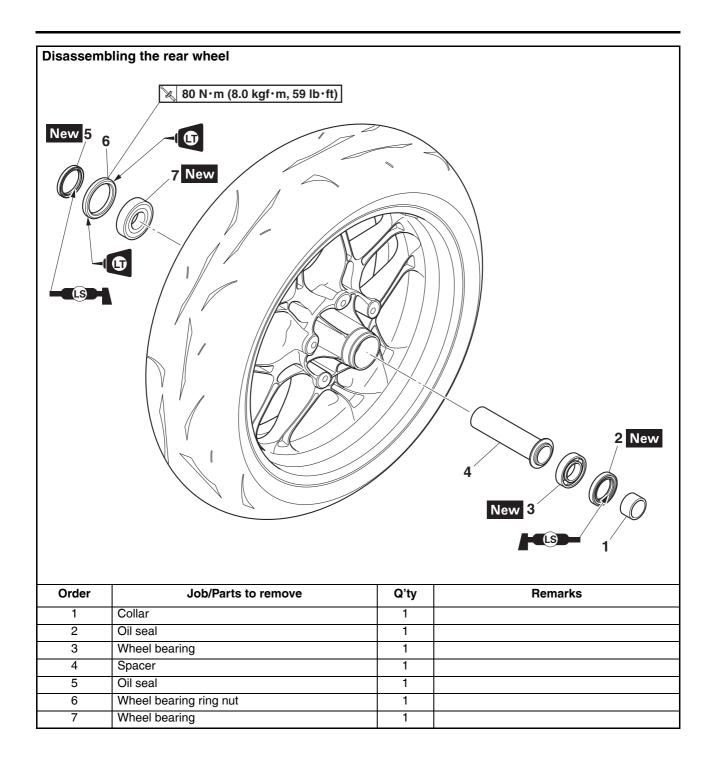
Make sure the brake hose is routed properly.

REAR WHEEL





REAR WHEEL

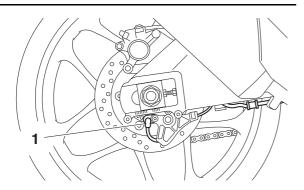


REMOVING THE REAR WHEEL

ECA21390

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.

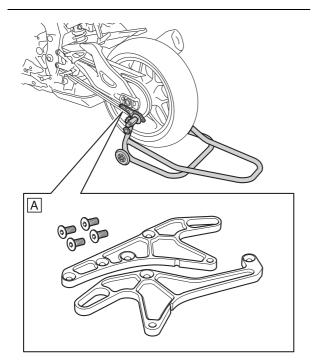
EWA13120

WARNING

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

TIP

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



A. Recommended tool Tool No.: 2CR-271A0-00

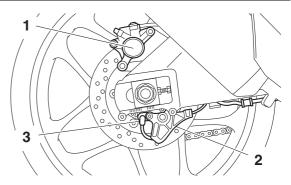
Tool name: STAND HOOK M1 Type

2. Remove:

- Rear brake caliper "1"
- Rear wheel sensor protector "2"
- Rear wheel sensor "3"

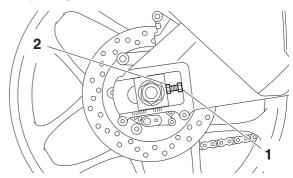
NOTICE

- 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

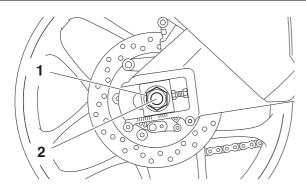
ECA21400

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.



E4930158

DISASSEMBLING THE REAR WHEEL

LIOTIOI

NOTICE

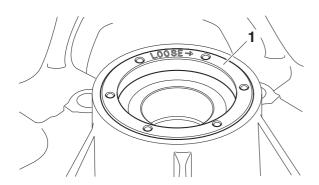
- Do not drop the wheel sensor rotor or subject it to shocks.
- If any solvent gets on the wheel sensor rotor, wipe it off immediately.
- 1. Remove:
 - Wheel bearing ring nut "1"

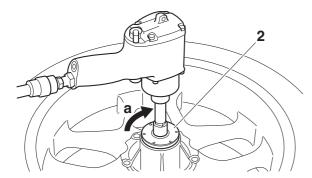
TIP

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 4-28.

EAS30159

CHECKING THE REAR WHEEL

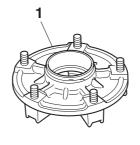
- 1. Check:
 - Wheel axle
 - Wheel bearings
- Oil seals
 Refer to "CHECKING THE FRONT WHEEL"
 on page 4-28.
- 2. Check:
 - Tire
 - Rear wheel
 Damage/wear → Replace.

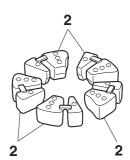
 Refer to "CHECKING THE TIRES" on page 3-18 and "CHECKING THE WHEELS" on page 3-18.
- 3. Measure:
- Radial wheel runout
- Lateral wheel runout Refer to "CHECKING THE FRONT WHEEL" on page 4-28.

EAS3016

CHECKING THE REAR WHEEL DRIVE HUB

- 1. Check:
- Rear wheel drive hub "1" Cracks/damage → Replace.
- Rear wheel drive hub dampers "2" Damage/wear → Replace.





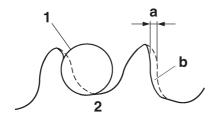
EAS30161

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

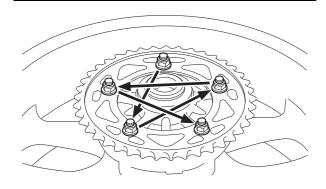
- a. Remove the rear wheel sprocket nuts and the rear wheel sprocket.
- b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
- c. Install the new rear wheel sprocket.



Rear wheel sprocket nut 100 N·m (10 kgf·m, 74 lb·ft)

TIP

Tighten the rear wheel sprocket nuts in stages and in a crisscross pattern.



EAS30163

ASSEMBLING THE REAR WHEEL

ECA21340

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

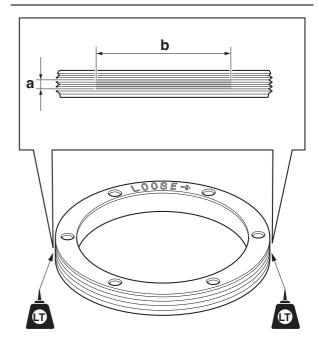
Oil seal New

Refer to "ASSEMBLING THE FRONT WHEEL" on page 4-29.

- 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

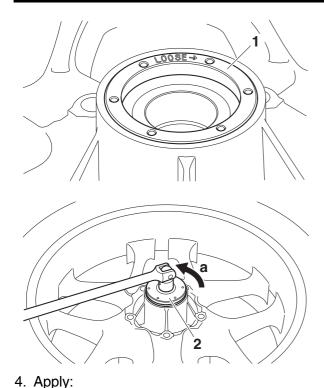
Use the wheel bearing ring nut tool "2" to tighten the wheel bearing ring nut by turning it counterclockwise "a".



Wheel bearing ring nut tool 90890-01574 YM-01574



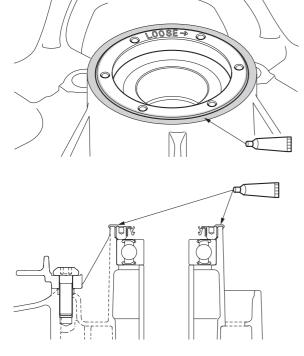
Wheel bearing ring nut 80 N·m (8.0 kgf·m, 59 lb·ft) LOCTITE®



- Sealant

TIP

Apply Three Bond No. 1215B® between the wheel bearing ring nut and the wheel surface.



MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR

ECA21060 **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 4-30.
- 2. Check:
 - Rear wheel sensor rotor Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.
- 3 Measure:
 - Wheel sensor rotor runout Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.

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 4-31.

INSTALLING THE REAR WHEEL (DISC BRAKE)

- 1. Install:
- Rear brake disc



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

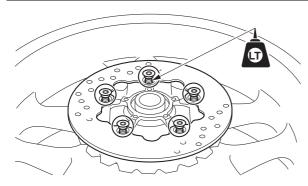
ECA19150

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 4-60.
- 3. Lubricate:
 - Oil seal lips

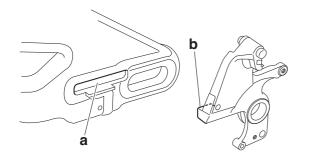


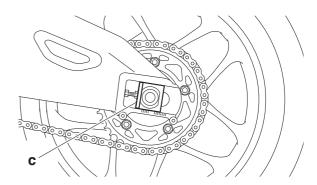
Recommended lubricant Lithium-soap-based grease

- 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 3-20.



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

- 25.0–35.0 mm (0.98–1.38 in)
- 7. Tighten:
 - Rear wheel axle nut
 - Rear brake caliper bolts



Rear wheel axle nut 190 N·m (19 kgf·m, 140 lb·ft) Rear brake caliper bolt (front) 27 N·m (2.7 kgf·m, 20 lb·ft) Rear brake caliper bolt (rear) 12 N·m (1.2 kgf·m, 8.9 lb·ft) LOCTITE®

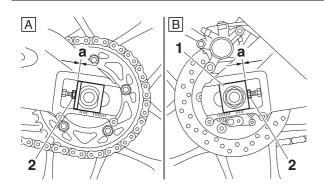
EWA1350

WARNING

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

8. Install:

- Rear wheel sensor
- Rear wheel sensor protector



Rear wheel sensor bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft) Rear wheel sensor protector bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft)

ECA21080

NOTICE

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 rear 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, LOCTITE® on the mounting surface of the rotor, deformation caused by an impact during service and caught foreign materials). If there is any defective part, repair or replace the defective part.



Distance "a" (between the rear wheel sensor rotor and rear wheel sensor)

1.3-2.1 mm (0.051-0.083 in)

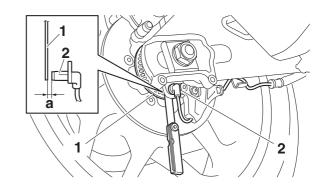
TIP

Measure the distance between the rear wheel

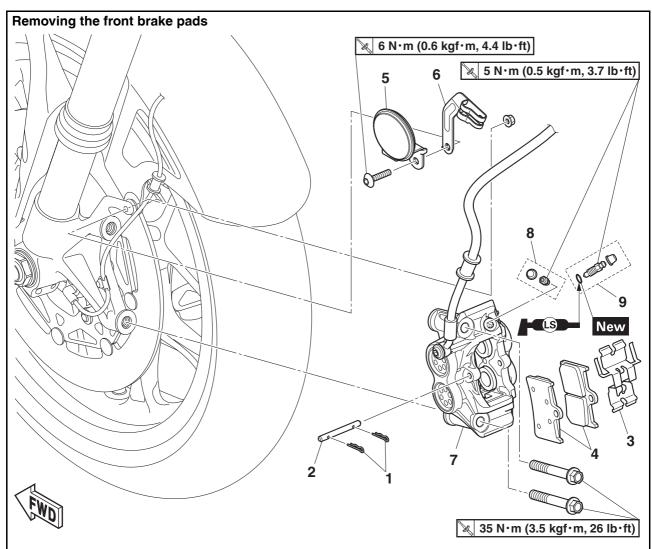
sensor rotor and rear wheel sensor in several places in one rotation of the rear wheel. Do not turn the rear wheel while the thickness gauge is installed. This may damage the rear wheel sensor rotor and the rear wheel sensor.



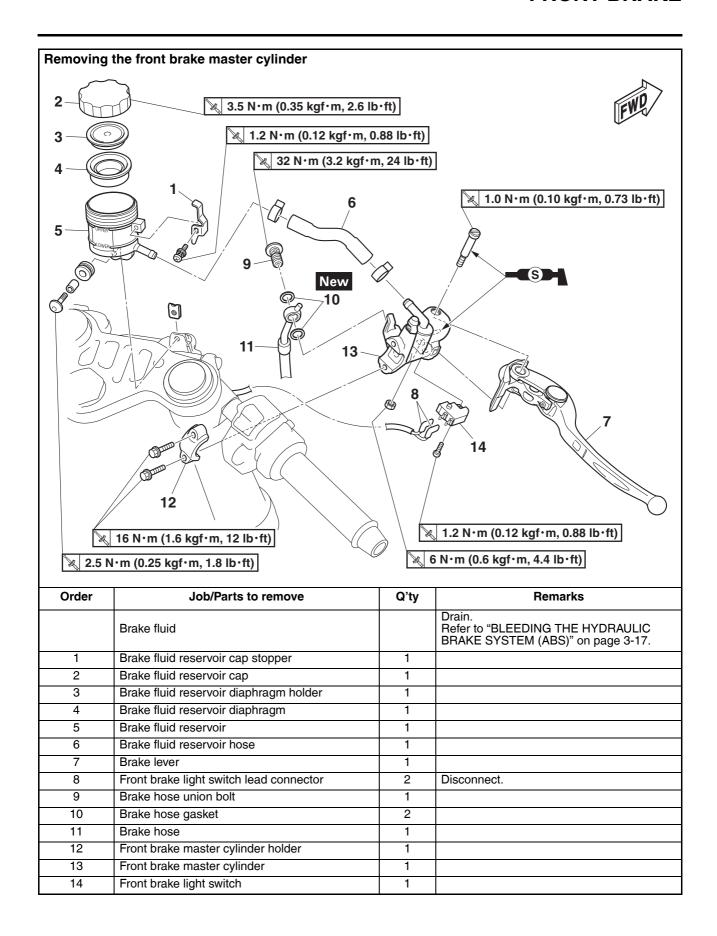
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9



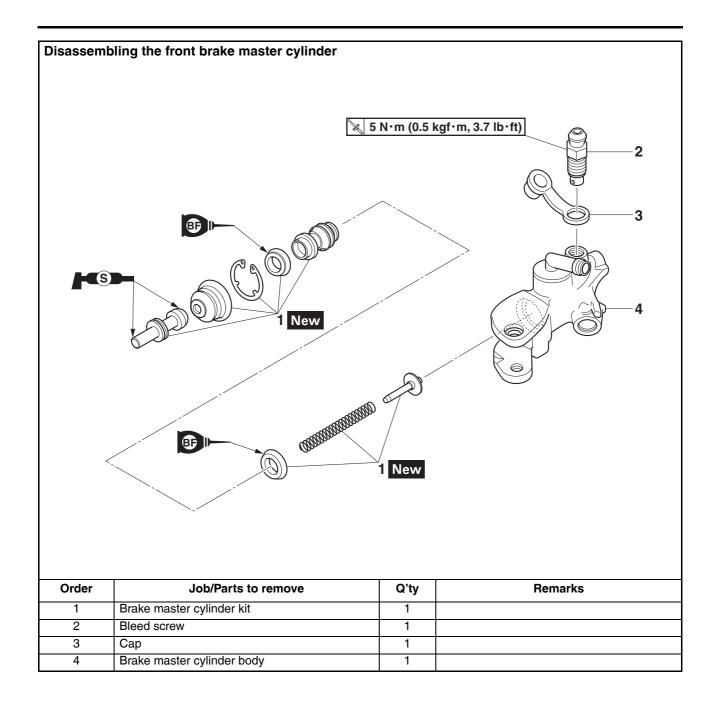
FRONT BRAKE



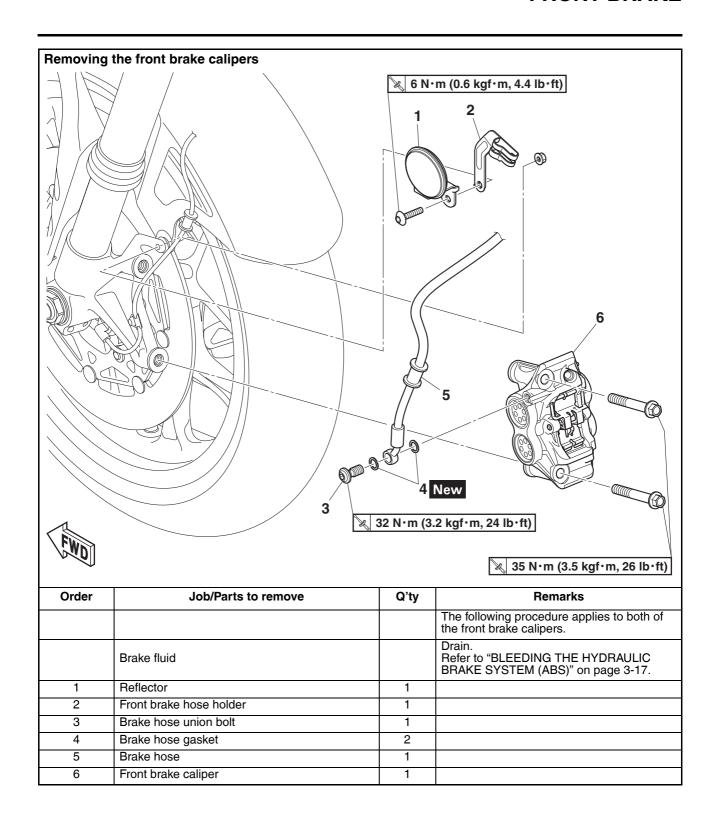
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad spring	1	
4	Brake pad	2	
5	Reflector	1	
6	Front brake hose holder	1	
7	Front brake caliper	1	
8	Bleed screw	1	
9	Bleed screw	1	Right brake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

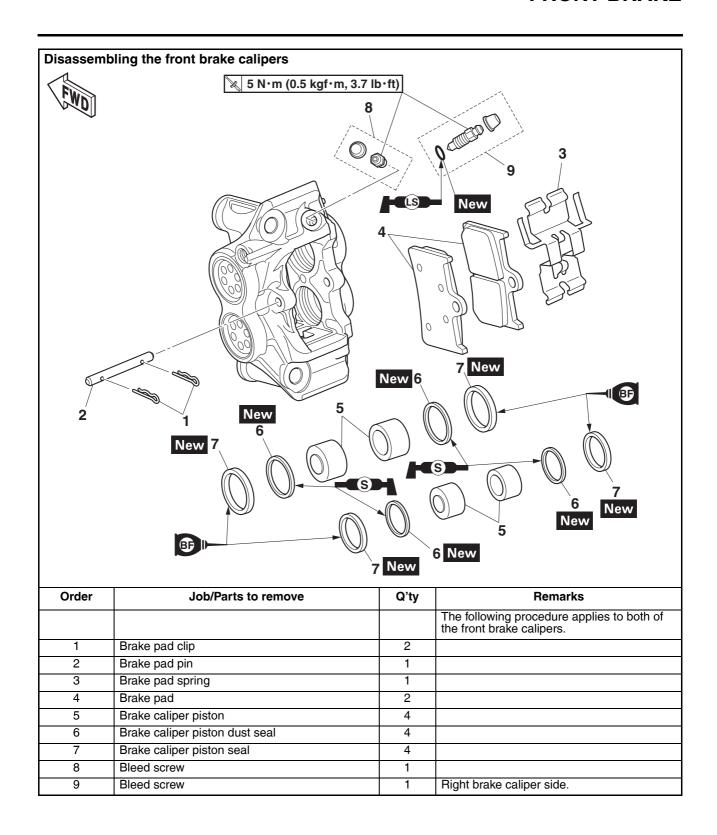


FRONT BRAKE



FRONT BRAKE





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.

EAS3016

CHECKING THE FRONT BRAKE DISCS

The following procedure applies to both brake discs.

- 1. Remove:
- Front wheel Refer to "FRONT WHEEL" on page 4-25.
- 2. Check:
 - Front brake disc Damage/galling → Replace.
- 3. Measure:
 - Brake disc runout
 Out of specification → Correct the brake disc
 runout or replace the brake disc.

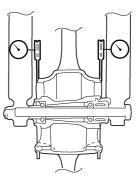


Brake disc runout limit (as measured on wheel)
0.10 mm (0.0039 in)

a. Place the vehicle on a maintenance 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.

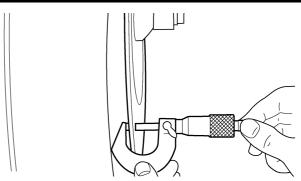


- 4. Measure:
 - Brake disc thickness
 Measure the brake disc thickness at a few different locations.

Out of specification \rightarrow Replace.



Brake disc thickness limit 4.5 mm (0.18 in)



- 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 N·m (1.7 kgf·m, 13 lb·ft) LOCTITE®

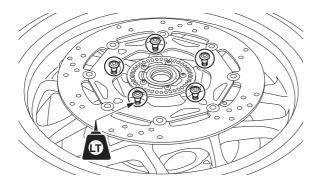
ECA19150

NOTICE

Replace the brake disc bolts with new ones.

TIP

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



- 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 4-25.

EAS30170

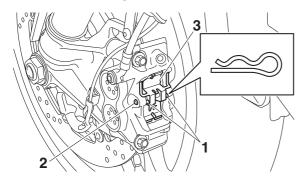
REPLACING THE FRONT BRAKE PADS

The following procedure applies to both brake calipers.

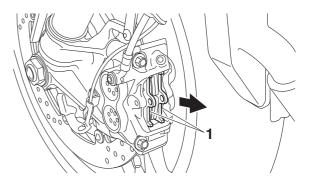
TIP_

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

- 1. 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.



Brake pad lining thickness 4.5 mm (0.18 in) Limit 0.8 mm (0.03 in)

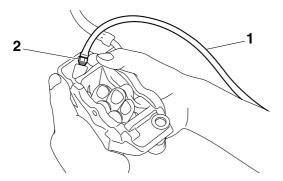


- 4. Remove:
 - Brake caliper
- 5. Install:
 - Brake pads
 - Brake pad spring

TID

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.



c. Tighten the bleed screw.

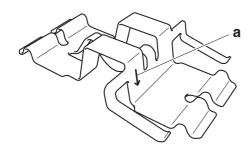


Brake caliper bleed screw 5 N·m (0.5 kgf·m, 3.7 lb·ft)

d. Install the brake pads and brake pad spring.

TIP

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



6. Install:

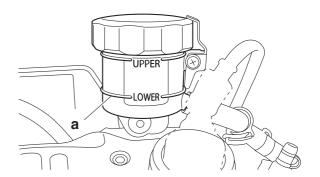
- Brake pad pin
- Brake pad clips
- Front brake caliper



Front brake caliper bolt 35 N·m (3.5 kgf·m, 26 lb·ft)

7. 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.



8. Check:

Brake lever operation
 Soft or spongy feeling → Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-17.

EAS30171

REMOVING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

TIP

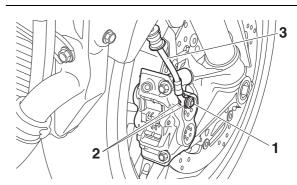
Before removing the brake caliper, drain the brake fluid from the entire brake system.

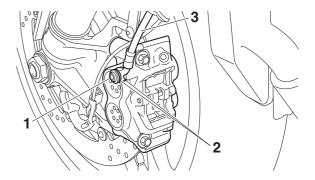
1. Remove:

- 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.



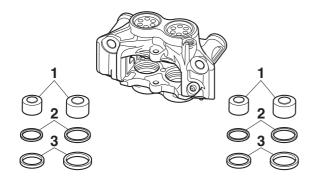


FAS30172

DISASSEMBLING THE FRONT BRAKE **CALIPERS**

The following procedure applies to both of the brake calipers.

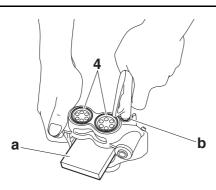
- 1. Remove:
- Brake caliper pistons "1"
- Brake caliper piston dust seals "2"
- Brake caliper piston seals "3"



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

WARNING

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

CHECKING THE FRONT BRAKE CALIPERS

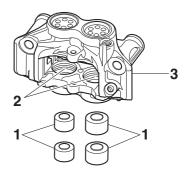
The following procedure applies to both of the brake calipers.

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 \rightarrow Blow out with compressed air. EWA13611

WARNING

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



FAS30174

ASSEMBLING THE FRONT BRAKE CALIPERS

WARNING

- · Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components as they will cause the brake caliper piston dust seals and brake caliper piston seals to swell and distort.
- Whenever a brake caliper is disassembled,

replace the brake caliper piston dust seals and brake caliper piston seals.



Specified brake fluid DOT 4

EAS30175

INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

- 1. Install:
 - Front brake caliper "1" (temporarily)
- Brake hose gaskets New
- Brake hoses "2"
- Brake hose union bolts "3"



Front brake hose union bolt 32 N·m (3.2 kgf·m, 24 lb·ft)

EWA1353

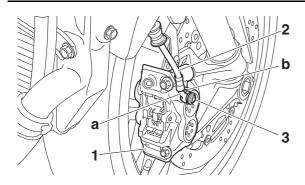
WARNING

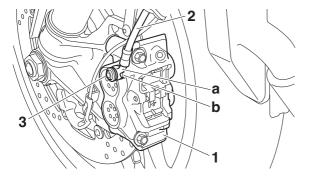
Proper brake hose routing is essential to insure safe vehicle operation.

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 N·m (3.5 kgf·m, 26 lb·ft)

Refer to "REPLACING THE FRONT BRAKE PADS" on page 4-50.

- 4 Fill
 - Brake master cylinder reservoir (with the specified amount of the specified brake fluid)



Specified brake fluid DOT 4

EWA13090

WARNING

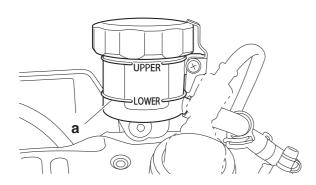
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

ECA13540

NOTICE

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

- 5. Bleed:
 - Brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-17.
- 6. Check:
 - Brake fluid level
 Below the minimum level mark "a" → Add the
 specified brake fluid to the proper level.
 Refer to "CHECKING THE BRAKE FLUID
 LEVEL" on page 3-14.



7. Check:

Brake lever operation
 Soft or spongy feeling → Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-17.

EAS30179

REMOVING THE FRONT BRAKE MASTER CYLINDER

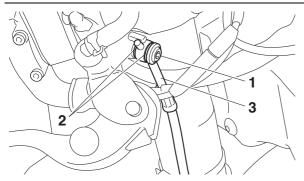
TIP.

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.



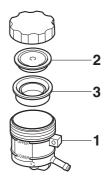
EAS3072

CHECKING THE FRONT BRAKE MASTER CYLINDER

- 1. Check:
- Brake master cylinder
 Damage/scratches/wear → Replace.
- Brake fluid delivery passages

(brake master cylinder body)
Obstruction → Blow out with compressed air.

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



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

EAS30181

ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

EWA1352

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

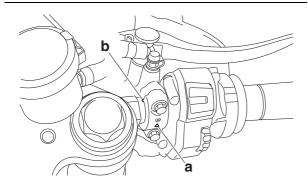
16 N·m (1.6 kgf·m, 12 lb·ft)

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 N·m (3.2 kgf·m, 24 lb·ft)

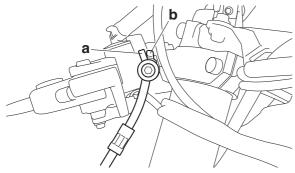
EWA1353

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.

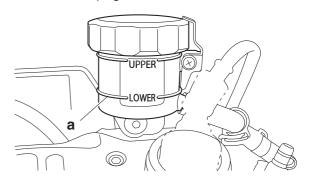
ECA13540

NOTICE

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

4. Bleed:

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

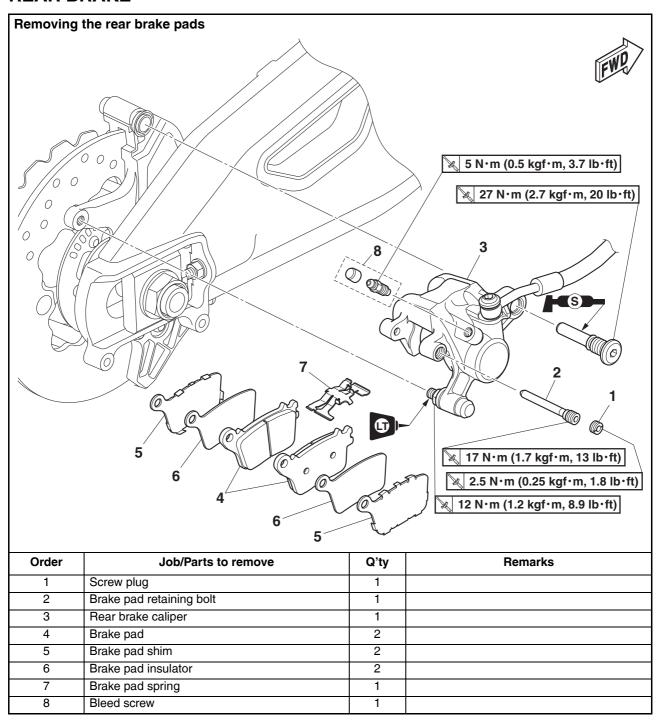


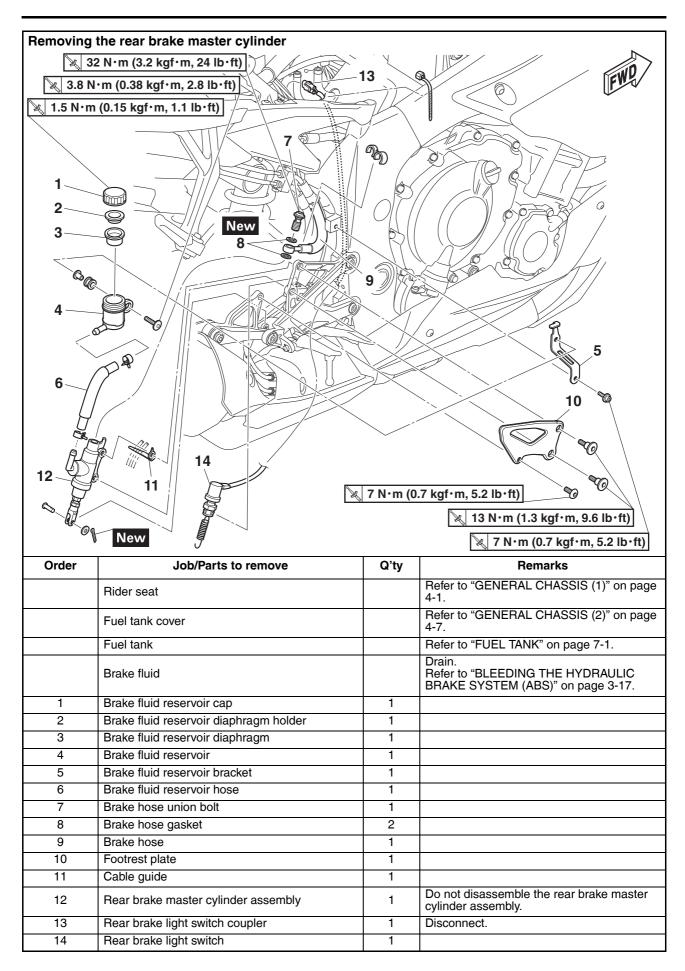
6. Check:

Brake lever operation
 Soft or spongy feeling → Bleed the brake system.

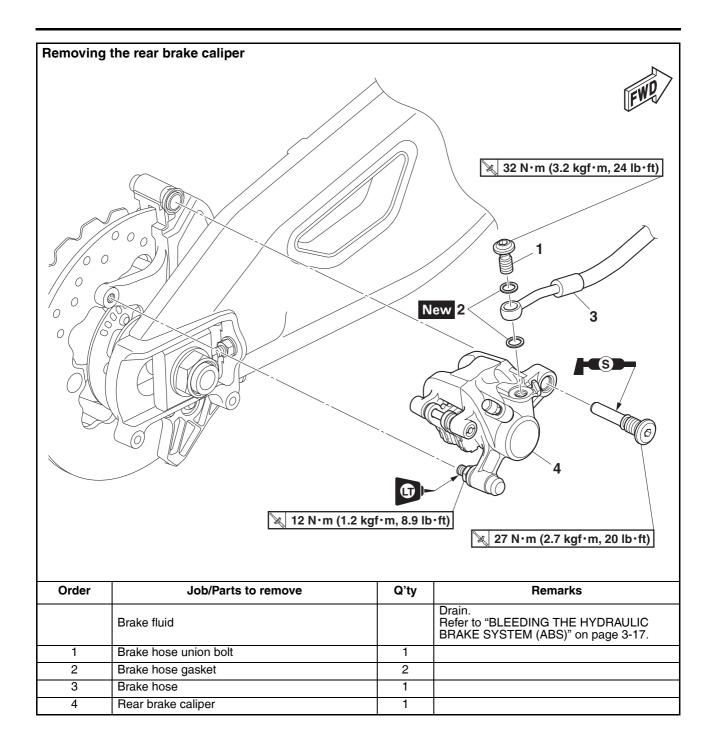
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-17.

REAR BRAKE

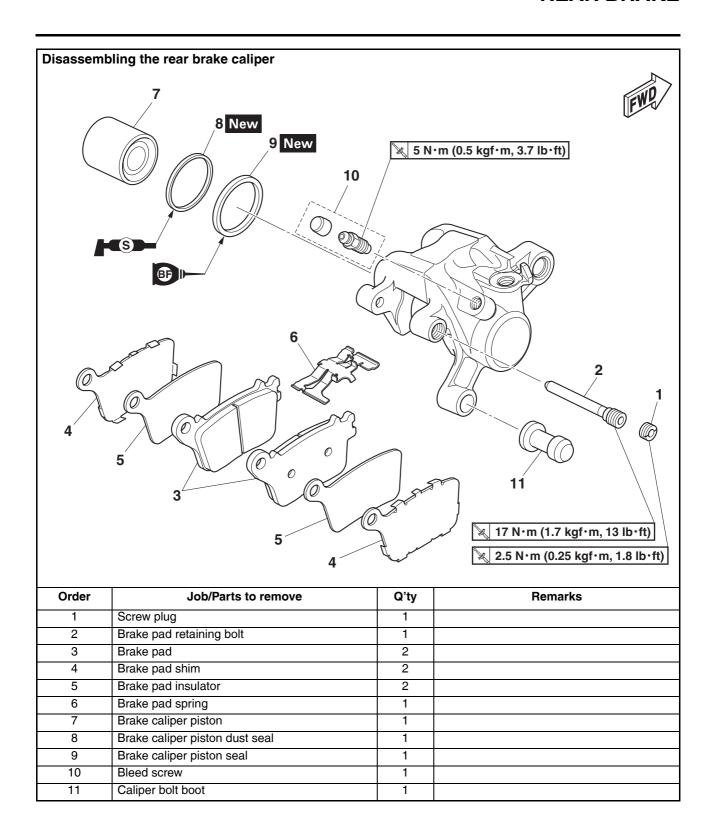




REAR BRAKE



REAR BRAKE



INTRODUCTION

EWA1410

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.

EAS3018

CHECKING THE REAR BRAKE DISC

- 1. Remove:
- Rear wheel Refer to "REAR WHEEL" on page 4-35.
- 2. Check:
 - Rear brake disc
 Damage/galling → 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 4-49.



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 4-49.



Brake disc thickness limit 4.5 mm (0.18 in)

- 5. Adjust:
 - Brake disc runout Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-49.



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

- 6. Install:
 - Rear wheel Refer to "REAR WHEEL" on page 4-35.

EAS30185

REPLACING THE REAR BRAKE PADS

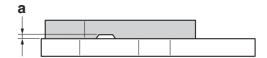
TIF

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

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



Brake pad lining thickness 4.5 mm (0.18 in) Limit 1.0 mm (0.04 in)



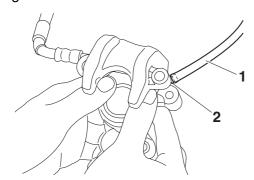
- 2. Install:
 - Brake pad insulators
 - Brake pad shims (onto the brake pads)
 - Brake pad spring (into the rear brake caliper)
 - Brake pads

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.

 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 N·m (0.5 kgf·m, 3.7 lb·ft)

d. Install the brake pad insulators and brake pad shims onto each brake pads.

TIP

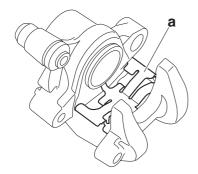
Apply silicone grease between the brake pad insulator and brake pad shim.

ECA14150

- Do not allow grease to contact the brake pads.
- Remove any excess grease.
- e. Install the brake pads and brake pad spring.

TIE

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



Recommended lubricant Silicone grease

ECA14150

NOTICE

- Do not allow grease to contact the brake pads.
- Remove any excess grease.
- 4. Install:
 - Rear brake caliper
 - Brake pad retaining bolts
 - Screw plug

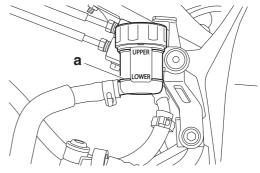


Rear brake caliper bolt (front) 27 N·m (2.7 kgf·m, 20 lb·ft) Rear brake caliper bolt (rear) 12 N·m (1.2 kgf·m, 8.9 lb·ft) LOCTITE®

Rear brake pad retaining bolt 17 N·m (1.7 kgf·m, 13 lb·ft) Rear brake caliper screw plug 2.5 N·m (0.25 kgf·m, 1.8 lb·ft)

- 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 pedal operation
 Soft or spongy feeling → Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-17.

FAS30186

REMOVING THE REAR BRAKE CALIPER

TIP

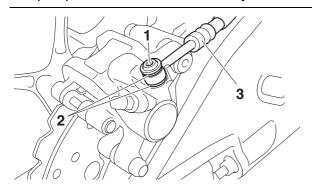
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.

- 1. Remove:
 - Brake hose union bolt "1"

- Brake hose gaskets "2"
- Brake hose "3"

TIP_

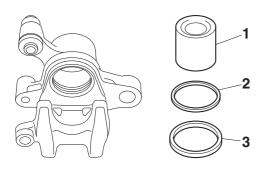
Put the end of the brake hose into a container and pump out the brake fluid carefully.



EAS30187

DISASSEMBLING THE REAR BRAKE CALIPER

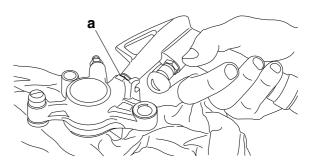
- 1. Remove:
- Brake caliper piston "1"
- Brake caliper piston dust seal "2"
- Brake caliper piston seal "3"



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

WARNING

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



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

EAS30188

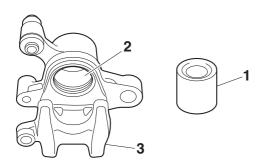
CHECKING THE REAR BRAKE CALIPER

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.

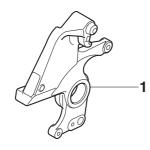
WARNING

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 4-35.



EAS30189

ASSEMBLING THE REAR BRAKE CALIPER

EWA17080

WARNING

- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components as they will cause the brake caliper piston dust 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

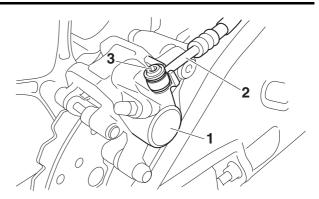
EAS30190

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 N·m (3.2 kgf·m, 24 lb·ft)



WA13531

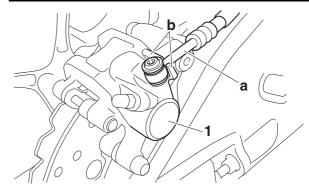
WARNING

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

ECA19080

NOTICE

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 4-60.



Rear brake caliper bolt (front) 27 N·m (2.7 kgf·m, 20 lb·ft) Rear brake caliper bolt (rear) 12 N·m (1.2 kgf·m, 8.9 lb·ft) LOCTITE®

Rear brake pad retaining bolt 17 N·m (1.7 kgf·m, 13 lb·ft) Rear brake caliper screw plug 2.5 N·m (0.25 kgf·m, 1.8 lb·ft)

4. Fill:

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



Specified brake fluid DOT 4

EWA13090

WARNING

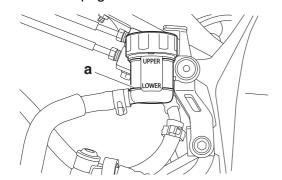
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

ECA13540

NOTICE

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

- 5. Bleed:
 - Brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-17.
- 6. Check:
 - Brake fluid level
 Below the minimum level mark "a" → Add the
 specified brake fluid to the proper level.
 Refer to "CHECKING THE BRAKE FLUID
 LEVEL" on page 3-14.



- 7. Check:
 - Brake pedal operation
 Soft or spongy feeling → Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-17.

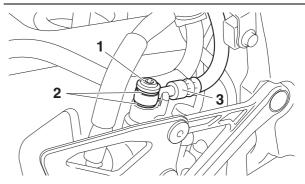
AS3019

REMOVING THE REAR BRAKE MASTER CYLINDER

- 1. Remove:
- Brake hose union bolt "1"
- Brake hose gaskets "2"
- Brake hose "3"

TIP

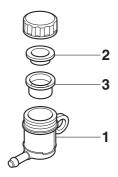
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.



EAS30194

CHECKING THE REAR BRAKE MASTER CYLINDER

- 1. Check:
 - Brake master cylinder
 Damage/scratches/wear → Replace.
 - Brake fluid delivery passages (brake master cylinder body)
 Obstruction → Blow out with compressed air.
- 2. Check:
- Brake fluid reservoir "1"
- Brake fluid reservoir diaphragm holder "2" Cracks/damage → Replace.
- Brake fluid reservoir diaphragm "3"
 Damage/wear → Replace.



- 3. Check:
 - Brake hose
 - Brake fluid reservoir hose Cracks/damage/wear → Replace.

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 N·m (3.2 kgf·m, 24 lb·ft)

EWA1353

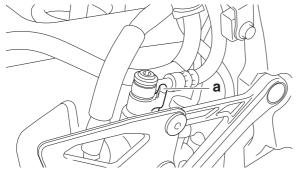
WARNING

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

ECA1416

NOTICE

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



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



Specified brake fluid DOT 4

EWA13090

WARNING

- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that

is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.

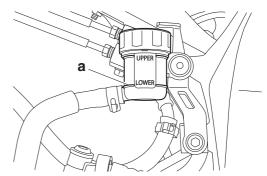
 When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

ECA13540

NOTICE

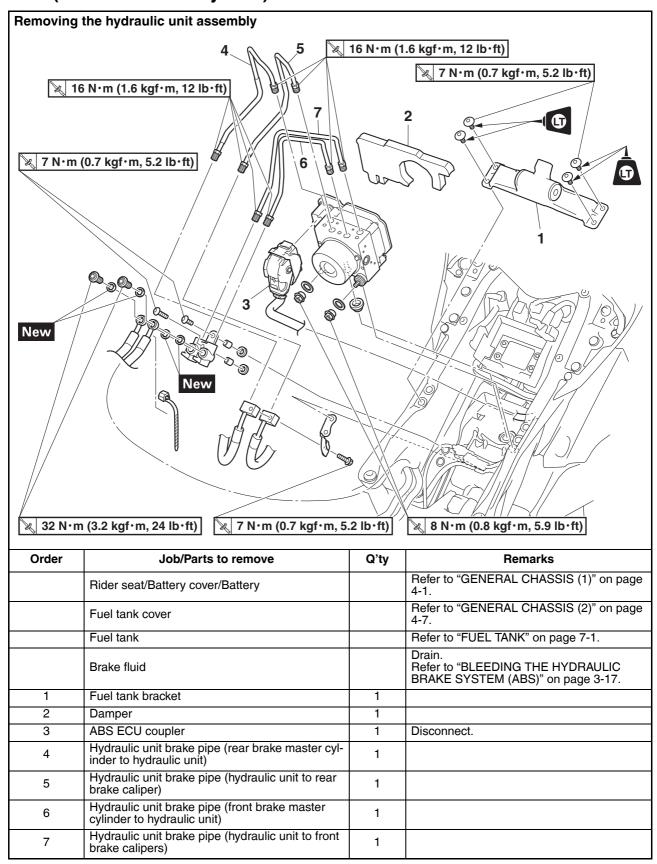
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

- 3. Bleed:
 - Brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-17.
- 4. Check:
 - Brake fluid level
 Below the minimum level mark "a" → Add the
 specified brake fluid to the proper level.
 Refer to "CHECKING THE BRAKE FLUID
 LEVEL" on page 3-14.

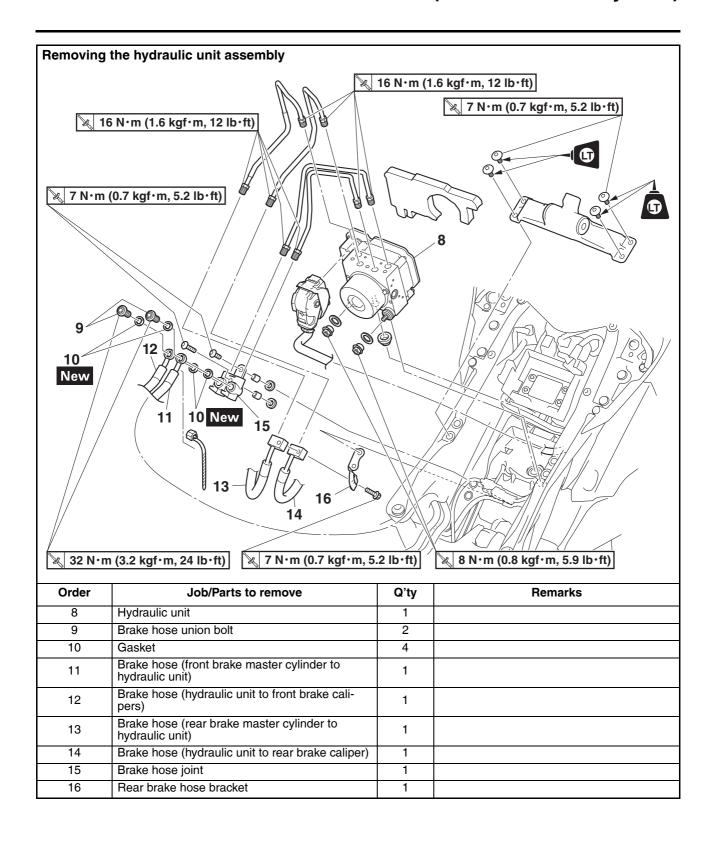


- 5. Adjust:
 - Brake pedal position
 Refer to "ADJUSTING THE REAR DISC BRAKE" on page 3-16.
- 6. Adjust:
- Rear brake light operation timing Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-36.

ABS (Anti-lock Brake System)

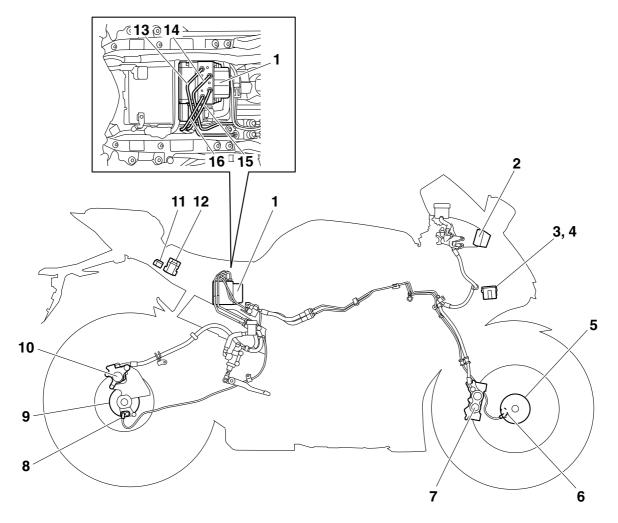


ABS (Anti-lock Brake System)



FAS30728

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)

REMOVING THE HYDRAULIC UNIT ASSEMBLY

ECA18230

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"

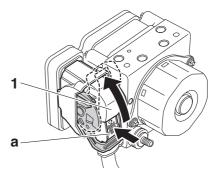
TIP

While pushing the portion "a" of the ABS ECU coupler, pull the lock lever up to release the lock.

ECA20080

NOTICE

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

NOTICE

- 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"

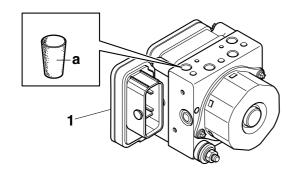
TIF

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.



CHECKING THE HYDRAULIC UNIT ASSEMBLY

- 1. Check:
 - Hydraulic unit assembly Cracks/damage → 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 → 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

NOTICE

Do not remove the rubber plugs or bolts $(M10 \times 1.0)$ installed in the flare nut holes before installing the hydraulic unit assembly.

TID

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.



Hydraulic unit assembly nut 8 N·m (0.8 kgf·m, 5.9 lb·ft)

- 2. Remove:
 - Rubber plugs or bolts (M10 × 1.0)
- 3. Install:
- Hydraulic unit brake pipe
- 4. Tighten:
 - Hydraulic unit brake pipe flare nuts



Hydraulic unit brake pipe flare nut 16 N·m (1.6 kgf·m, 12 lb·ft)

ECA19820

NOTICE

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 N·m (3.2 kgf·m, 24 lb·ft)

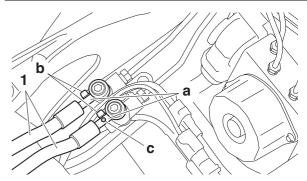
ECA22800

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

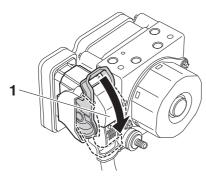
There is an identifying white paint mark "c" on the upper surface of the pipe of the brake hose (front brake master cylinder to the hydraulic unit).



- 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

EWA17280

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

NOTICE

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 3-17.
- 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 4-71.)

ECA14770

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 8-193.)
- 11.Perform a trial run. (Refer to "CHECKING THE ABS WARNING LIGHT" on page 4-74.)

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

EWA13120

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 of function 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 maintenance stand.
- 2. Turn the main switch to "OFF".
- 3. Remove:
 - 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.

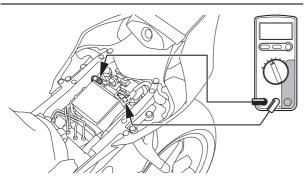


Battery voltage Higher than 12.8 V

TIP

If the battery voltage is lower than 12.8 V, charge the battery, and then perform brake line routing

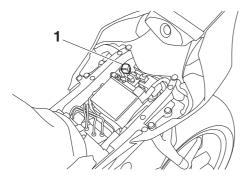
confirmation.



5. Removing the protective cap "1", and then connect the Yamaha diagnostic tool to the Yamaha diagnostic tool coupler (4P).



Yamaha diagnostic tool USB 90890-03256 Yamaha diagnostic tool (A/I) 90890-03254



- 6. Start the Yamaha diagnostic tool and display the diagnosis of function screen.
- 7. Select code No. 2, "Brake line routing confirmation".
- 8. Click "Actuator Check" "1", and then operate the brake lever "2" and brake pedal "3" simultaneously.

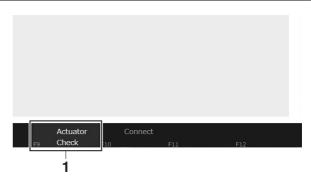
TIP -

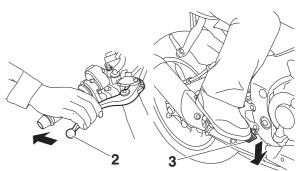
- The hydraulic unit operates 1 second after the brake lever and brake pedal are operated simultaneously and continues for approximately 5 seconds.
- The operation of the hydraulic unit can be confirmed using the indicator.

On: The hydraulic unit is operating.

Flashing: The conditions for operating the hydraulic unit have not been met.

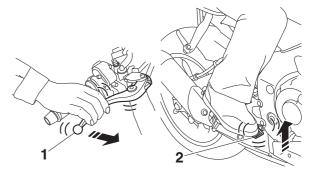
Off: The brake lever and brake pedal are not being operated.





9. Check:

Hydraulic unit operation
 Click "Actuator Check", a single pulse will be
 generated in the brake lever "1", brake pedal
 "2", and again in the brake lever "1", in this or der.



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 cor-

rectly to the hydraulic unit assembly.

10.If the operation of the hydraulic unit is normal, delete all of the fault codes.

ABS reaction-force confirmation

WARNING

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

TIP

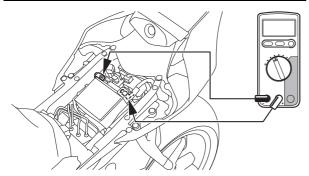
- For the ABS reaction-force confirmation, use the diagnosis of function of the Yamaha diagnostic tool. For more information, refer to the operation manual of the Yamaha diagnostic tool
- Before performing the ABS reaction-force confirmation, make sure that no malfunctions have been detected in the ABS ECU and that the wheels are not rotating.
- 1. Place the vehicle on a maintenance stand.
- 2. Turn the main switch to "OFF".
- 3. Remove:
- 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 voltage Higher than 12.8 V

TIP

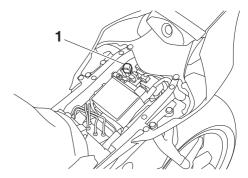
If the battery voltage is lower than 12.8 V, charge the battery, and then perform ABS reactionforce confirmation.



5. Removing the protective cap "1", and then connect the Yamaha diagnostic tool to the Yamaha diagnostic tool coupler (4P).



Yamaha diagnostic tool USB 90890-03256 Yamaha diagnostic tool (A/I) 90890-03254



- 6. Start the Yamaha diagnostic tool and display the diagnosis of function screen.
- 7. Select code No. 1, "ABS reaction-force confirmation".
- 8. Click "Actuator Check" "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.

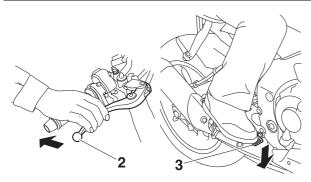
On: The hydraulic unit is operating.

Flashing: The conditions for operating the hydraulic unit have not been met.

Off: The brake lever and brake pedal are not being operated.



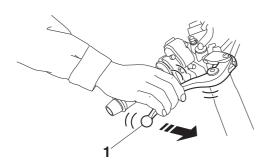
ABS (Anti-lock Brake System)



 A reaction-force pulsating action is generated in the brake lever "1" and continues for a few seconds.

TIP -

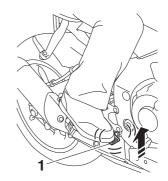
- The reaction-force pulsating action consists of quick pulses.
- Be sure to continue operating the brake lever and brake pedal even after the pulsating action has stopped.
- "ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.



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 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 "○".
- 16.Check for brake fluid leakage around the hydraulic unit.
 - Brake fluid leakage → 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.

8

9

10

11

12

Grip end (right)

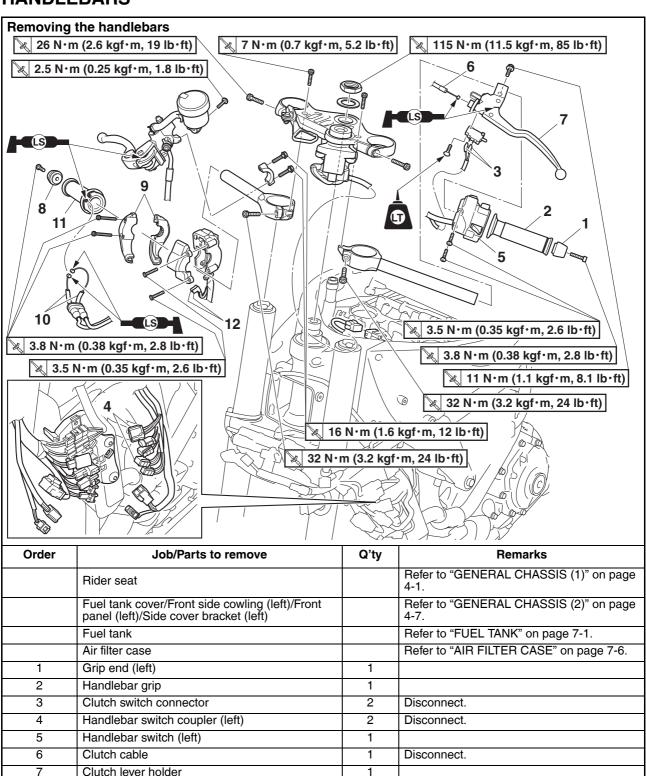
Throttle cable

Throttle grip

Throttle cable housing

Front brake light switch connector

HANDLEBARS



2

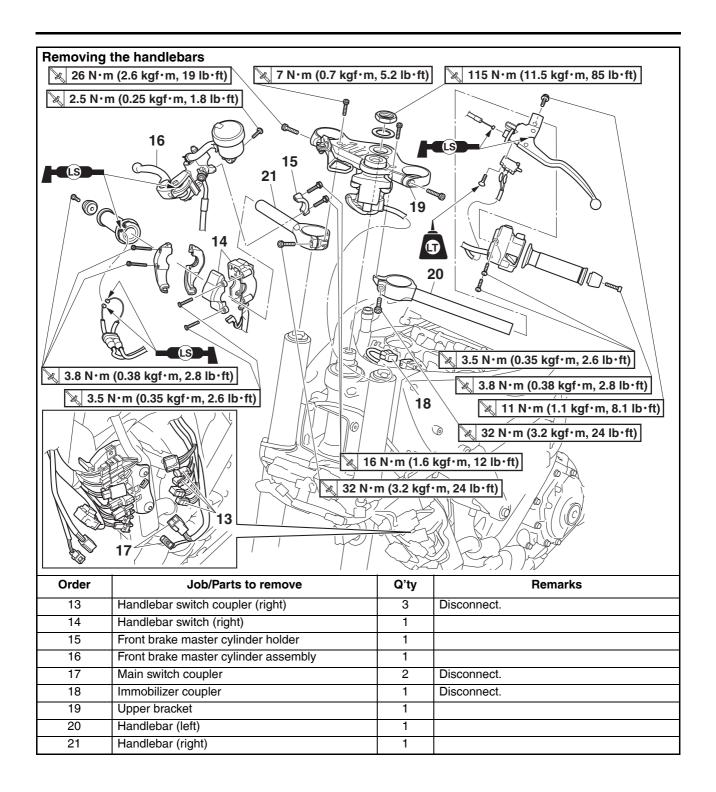
2

2

Disconnect.

Disconnect.

HANDLEBARS



REMOVING THE HANDLEBARS

1. Stand the vehicle on a level surface.

EWA1312

WARNING

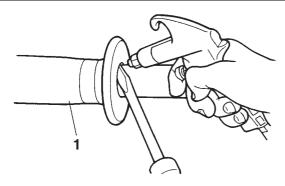
Securely support the vehicle so that there is no danger of it falling over.

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.

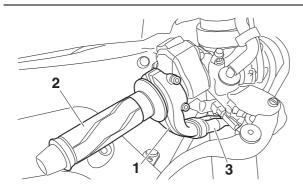


3. Remove:

- Throttle cable housings "1"
- Throttle grip "2"

TIP

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



EAS30204

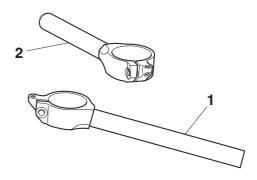
CHECKING THE HANDLEBARS

- 1. Check:
 - Handlebar (left) "1"
 - Handlebar (right) "2"
 Bends/cracks/damage → Replace.

EWA1369

WARNING

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



EAS30205

INSTALLING THE HANDLEBARS

1. Stand the vehicle on a level surface.

WA13120

WARNING

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

2. Install:

- Handlebar (left)
- Handlebar (right)
- Upper bracket



Steering stem nut
115 N·m (11.5 kgf·m, 85 lb·ft)
Upper bracket pinch bolt
26 N·m (2.6 kgf·m, 19 lb·ft)
Handlebar bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)
Handlebar pinch bolt
32 N·m (3.2 kgf·m, 24 lb·ft)

3. Install:

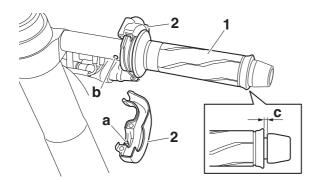
- Throttle grip "1"
- Throttle cables
- Throttle cable housings "2"
- Grip end



Throttle cable housing bolt 3.8 N·m (0.38 kgf·m, 2.8 lb·ft) Grip end bolt 3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

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.



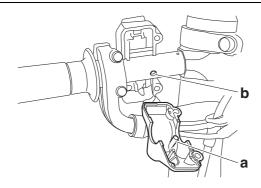
- 4. Install:
 - Handlebar switch screw (right)



Handlebar switch screw 3.5 N·m (0.35 kgf·m, 2.6 lb·ft)

TIP

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



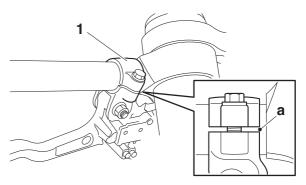
- 5. Install:
 - Front brake master cylinder assembly Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER" on page 4-54.
- 6. Install:
 - Clutch lever holder "1"
 - Clutch cable



Clutch lever holder pinch bolt 11 N·m (1.1 kgf·m, 8.1 lb·ft)

TIP

Align the center of slit on the clutch lever holder with the punch mark "a" on the handlebar.



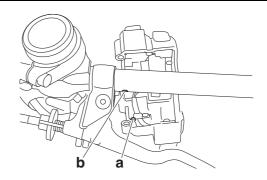
- 7. Install:
- Handlebar switch screw (left)



Handlebar switch screw 3.5 N·m (0.35 kgf·m, 2.6 lb·ft)

ГΙР

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



- 8. Install:
 - Handlebar grip "1"
 - Grip end "2"



Grip end bolt 3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

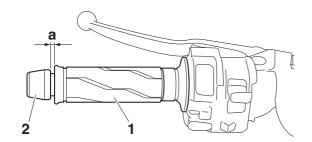
- a. Apply a thin coat of rubber adhesive onto the end of the left handlebar.
- b. Side the handlebar grip over the end of the left handlebar.
- c. Wipe off any excess rubber adhesive with a clean rag.

WARNING

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

TIP_

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



- 9. Adjust:
 - Throttle grip free play Refer to "CHECKING THE THROTTLE GRIP" on page 3-36.



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

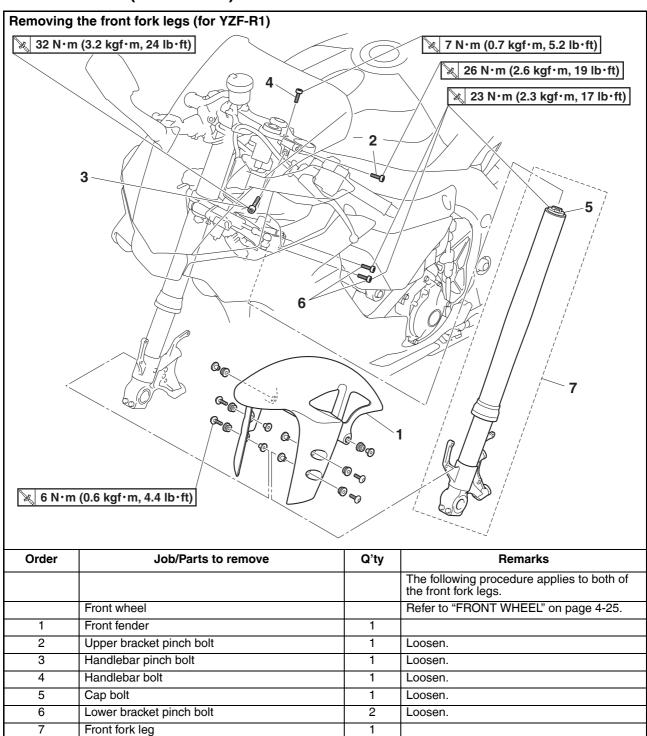
10.Adjust:

• Clutch lever free play Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-14.

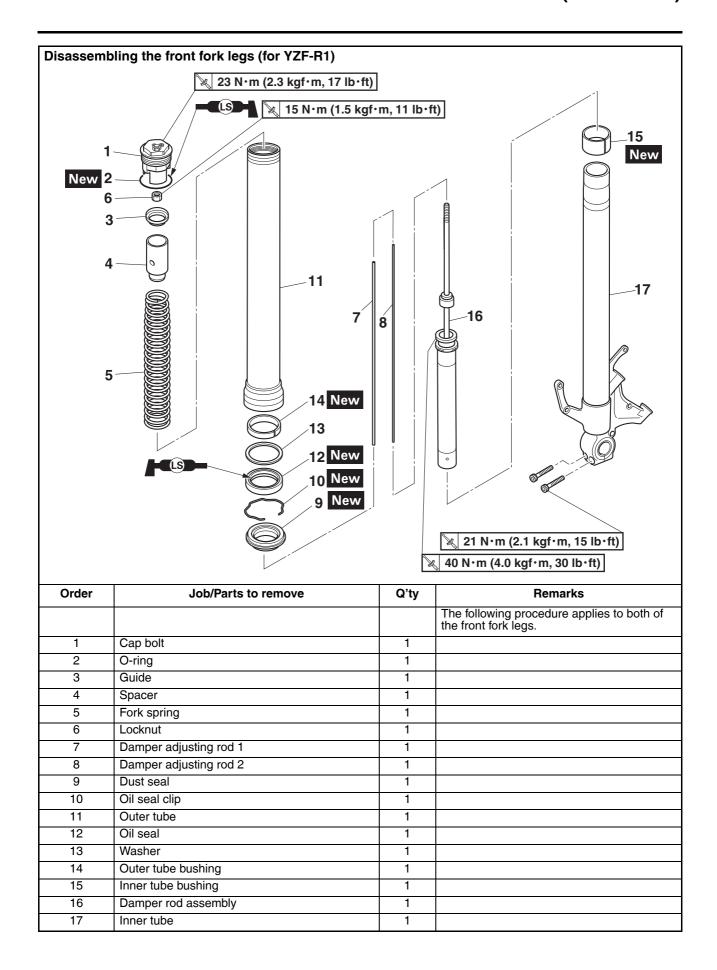


Clutch lever free play 10.0–15.0 mm (0.39–0.59 in)

FRONT FORK (for YZF-R1)



FRONT FORK (for YZF-R1)



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.

EWA13120

WARNING

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

TIP

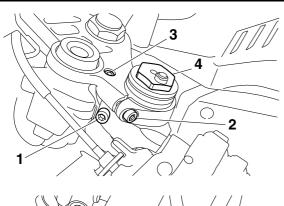
Place the vehicle on a maintenance stand so that the front wheel is elevated.

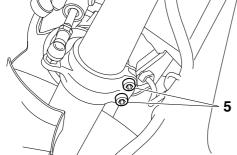
- 2. Remove:
 - Front brake caliper Refer to "FRONT BRAKE" on page 4-44.
 - Front wheel Refer to "FRONT WHEEL" on page 4-25.
- 3. Loosen:
 - Handlebar pinch bolt "1"
 - Upper bracket pinch bolt "2"
 - Handlebar bolt "3"
 - Cap bolt "4"
 - Lower bracket pinch bolts "5"

EWA1364

WARNING

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





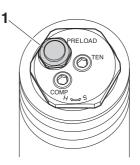
- 4. Remove:
 - Front fork leg

EAS30207

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.



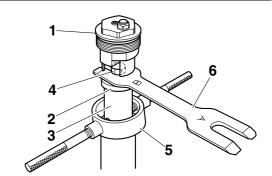
- 2. Remove:
 - Cap bolt "1" (from the damper rod assembly)
 - Guide "2"
 - Spacer "3"
 - Locknut "4"
- a. Press down on the spacer with the fork spring compressor "5".
- b. Install the rod holder "6" between the locknut "4" and the guide "2".



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

TIP

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

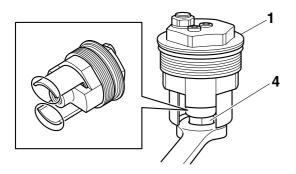


c. Hold the cap bolt "1" and loosen the locknut $_{^{\prime\prime}A}$ "

ECA17390

NOTICE

When loosening the nut, be sure not to break the projections on the cap bolt collar of the cap bolt.

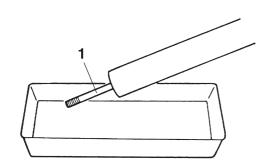


- d. Remove the cap bolt and guide.
- e. Remove the rod holder and fork spring compressor.
- f. Remove the spacer and locknut.

- 3. Drain:
 - Fork oil

TIP_

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

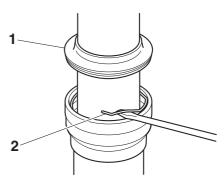


- 4. Remove:
 - Dust seal "1"
 - Oil seal clip "2" (with a flat-head screwdriver)

CA19100

NOTICE

Do not scratch the outer tube.

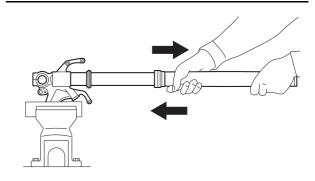


- 5. Remove:
 - Outer tube
- a. Hold the front fork leg horizontally.
- b. Securely clamp the brake caliper bracket in a vise with soft jaws.
- c. Separate the outer tube from the inner tube by pulling the outer tube forcefully but carefully.

ECA19880

NOTICE

Excessive force will damage the bushings. Damaged bushings must be replaced.



6. Remove:

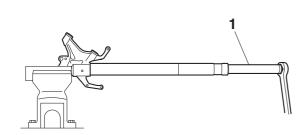
• Damper rod assembly

TID

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



Damper rod holder (ø30) 90890-01506 Damper rod holder YM-01506



CHECKING THE FRONT FORK LEGS (for YZF-R1)

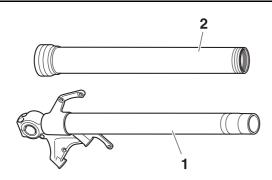
The following procedure applies to both of the front fork legs.

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

EWA13650

WARNING

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

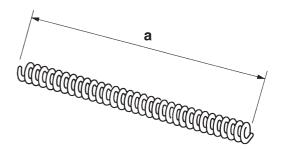


2. Measure:

Spring free length "a"
 Out of specification → Replace.



Fork spring free length
217.5 mm (8.56 in) (YZF-R1, YZF-R1H)
Limit
213.1 mm (8.39 in) (YZF-R1, YZF-R1H)

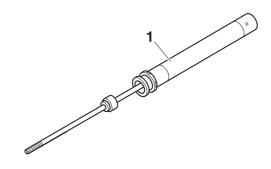


3. Check:

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

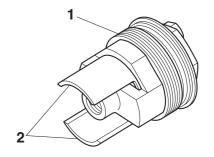
NOTICE

- 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.

EWA1836

WARNING

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.

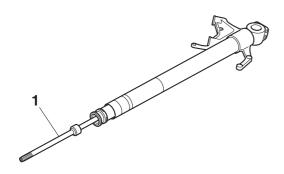
TIP.

- 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"

ECA22560

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



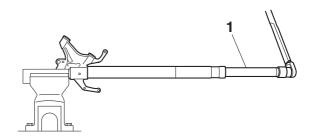
Front fork damper rod assembly (for YZF-R1)
40 N·m (4.0 kgf·m, 30 lb·ft)

TIP

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



Damper rod holder (ø30) 90890-01506 Damper rod holder YM-01506



3. Lubricate:

• Inner tube's outer surface



Recommended oil Yamaha Suspension Oil 01 (YZF-R1, YZF-R1H)

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

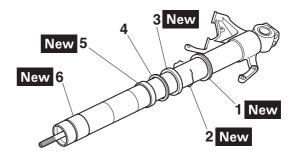
CA19170

NOTICE

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

TIP

- Before installing the oil seal, lubricate its lips with lithium-soap-based grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag to protect the oil seal during installation.

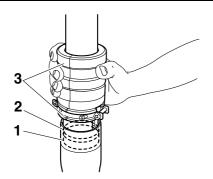




- 5. Install:
 - Outer tube (to the inner tube)
- 6. Install:
- Outer tube bushing "1"
- Washer "2" (with the fork seal driver "3")



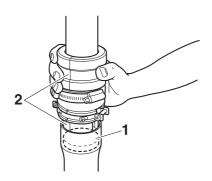
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442



- 7. Install:
 - Oil seal "1" (with the fork seal driver "2")



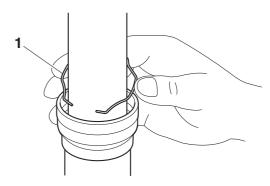
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442



- 8. Install:
 - Oil seal clip "1"

TIP

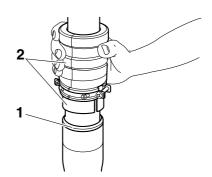
Adjust the oil seal clip so that it fits into the outer tube's groove.



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



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

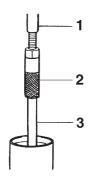


10.Install:

- Rod puller "1"
- Rod puller attachment (M10) "2" (onto the damper rod "3")



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



11.Fill:

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



Recommended oil
Yamaha Suspension Oil 01
(YZF-R1, YZF-R1H)
Quantity (left)
368.0 cm³ (12.44 US oz, 12.98 Imp.oz) (YZF-R1, YZF-R1H)
Quantity (right)
368.0 cm³ (12.44 US oz, 12.98 Imp.oz) (YZF-R1, YZF-R1H)

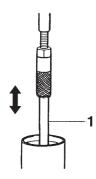
ECA14230

NOTICE

- Be sure to use the recommended fork oil.
 Other oils may have an adverse effect on front fork performance.
- When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.
- 12. After filling the front fork leg, slowly stroke the damper rod "1" up and down (at least ten times) to distribute the fork oil.

TIP

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



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

TIP

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

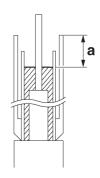
14.Measure:

 Front fork leg oil level "a" (from the top of the outer tube, with the outer tube fully compressed and without the fork spring)

Out of specification \rightarrow Correct.

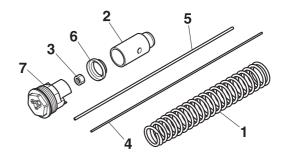


Level (left) 114 mm (4.5 in) (YZF-R1, YZF-R1H) Level (right) 114 mm (4.5 in) (YZF-R1, YZF-R1H)



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 New)

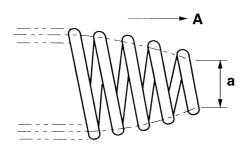


- a. Remove the rod puller and rod puller attachment.
- b. Install the fork spring.

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".



Rod puller 90890-01437

Universal damping rod bleeding tool set

YM-A8703

Rod puller attachment (M10)

90890-01436

Universal damping rod bleeding tool set

ooi set

YM-A8703

Fork spring compressor

90890-01441

Fork spring compressor

YM-01441

Rod holder

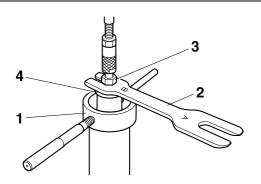
90890-01434

Damper rod holder double ended

YM-01434



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



- Remove the rod puller and rod puller attachment.
- j. Install the damper adjusting rods and cap bolt, and then finger tighten the cap bolt.

WARNING

Always use a new cap bolt O-ring.

k. Hold the cap bolt "5" and tighten the locknut "3" to specification.

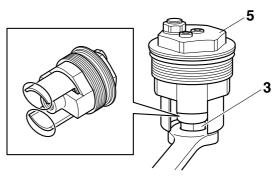
NOTICE

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 N·m (1.5 kgf·m, 11 lb·ft)



 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.

EAS30210

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.

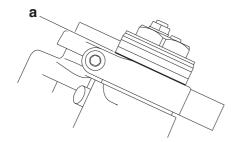
EWA13680

WARNING

Make sure the brake hoses are routed properly.

TIP

Align the outer tube with the position "a" as shown in the illustration.



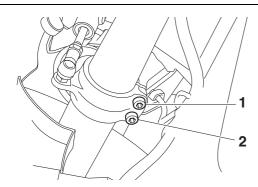
- 2. Tighten:
 - Lower bracket pinch bolts "1" and "2"



Lower bracket pinch bolt 23 N·m (2.3 kgf·m, 17 lb·ft)

TIP.

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



- 3. Tighten:
 - Cap bolt "1"



Front fork cap bolt (for YZF-R1) 23 N·m (2.3 kgf·m, 17 lb·ft)

• Handlebar bolt "2"



Handlebar bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft)

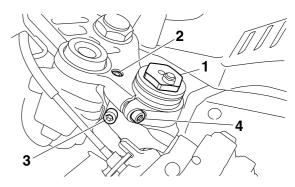
• Handlebar pinch bolt "3"



Handlebar pinch bolt 32 N⋅m (3.2 kgf⋅m, 24 lb⋅ft) • Upper bracket pinch bolt "4"

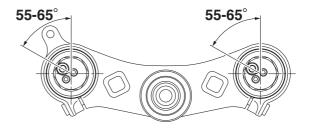


Upper bracket pinch bolt 26 N·m (2.6 kgf·m, 19 lb·ft)



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

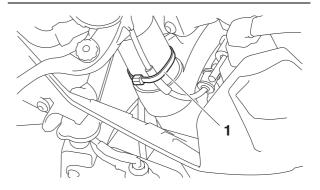
TIP

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

- 5. Install:
- Plastic locking tie "1"

TID

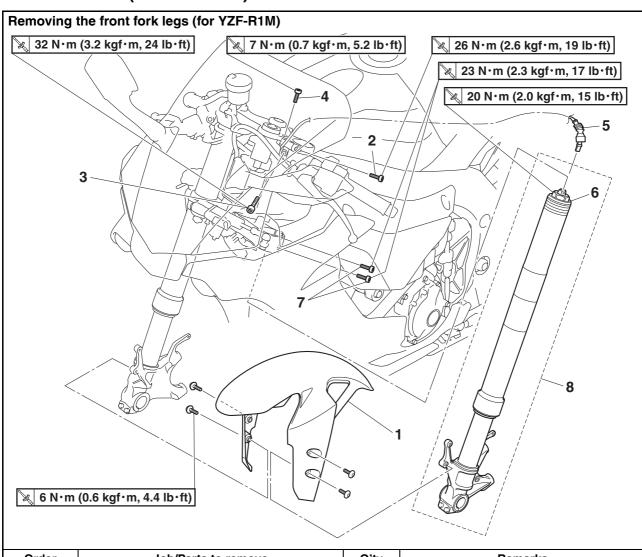
Fasten the front brake hose to the right front fork leg with the plastic locking tie.



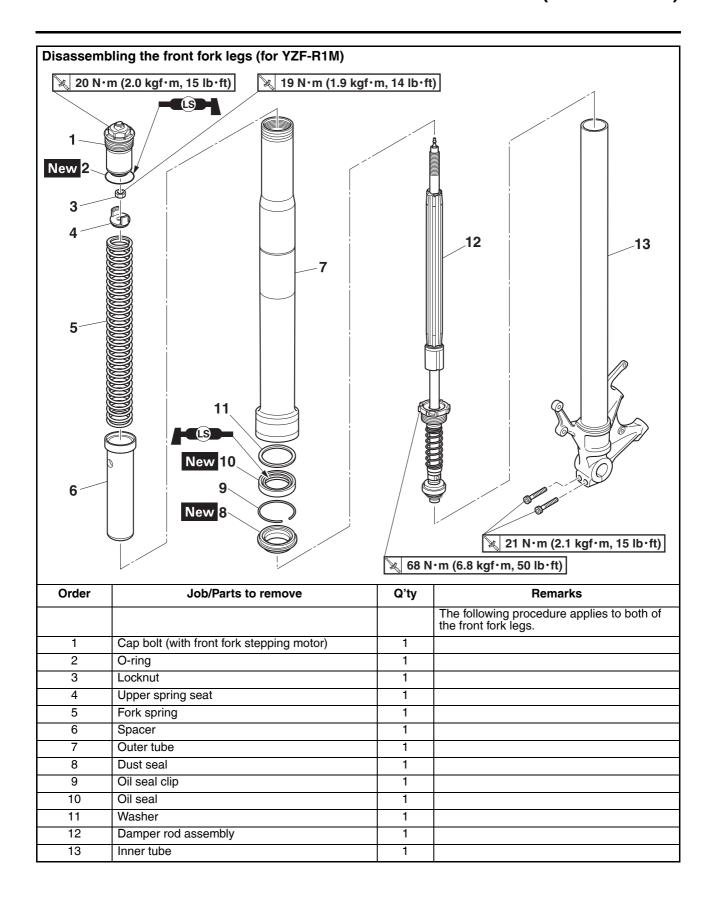
6. Adjust:

- Spring preload
- Rebound damping
- Compression damping Refer to "ADJUSTING THE FRONT FORK LEGS (for YZF-R1)" on page 3-23.

FRONT FORK (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 4-25.
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.

EWA1312

WARNING

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

TIP -

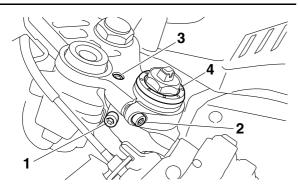
Place the vehicle on a maintenance stand so that the front wheel is elevated.

- 2. Remove:
 - Front brake caliper Refer to "FRONT BRAKE" on page 4-44.
 - Front wheel Refer to "FRONT WHEEL" on page 4-25.
- 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"

WA13640

WARNING

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

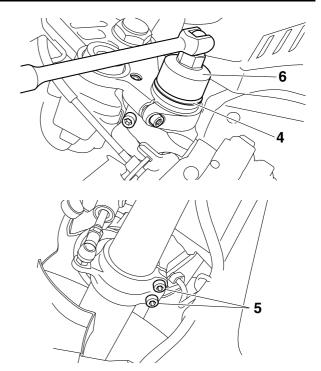


TID

Loosen the cap bolt "4" using the front fork cap bolt wrench "6".



Front fork cap bolt wrench 42mm 90890-01575 YM-01575



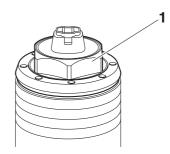
- 5. Remove:
 - Front fork leg

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.

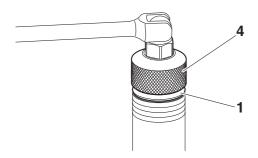


- 2. Remove:
 - Cap bolt "1" (from the damper rod assembly)
- Locknut "2"
- Upper spring seat "3"

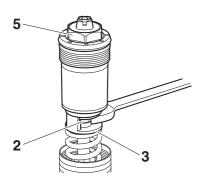
a. Loosen the cap bolt "1" using the front fork cap bolt wrench "4" and then remove it from the outer tube.



Front fork cap bolt wrench 42mm 90890-01575 YM-01575



b. Hold the spring preload adjusting bolt "5" and loosen the locknut.

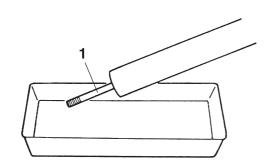


c. Remove the cap bolt, locknut and upper spring seat.

- 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



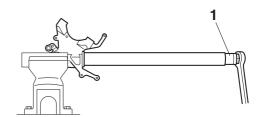
- 6. Remove:
 - Damper rod assembly

TIP

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



Damper rod holder (ø37) 90890-01504 Damper rod holder YM-01504



EAS31650

CHECKING THE FRONT FORK LEGS (for YZF-R1M)

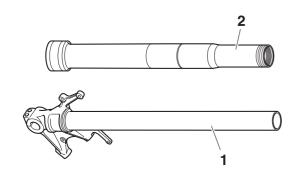
The following procedure applies to both of the front fork legs.

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

WA13650

WARNING

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

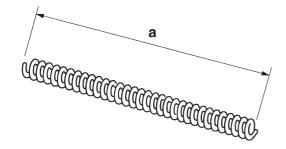


2. Measure:

Spring free length "a"
 Out of specification → Replace.



Fork spring free length 260.0 mm (10.24 in) (YZF-R1M, YZF-R1MH) Limit 254.8 mm (10.03 in) (YZF-R1M, YZF-R1MH)

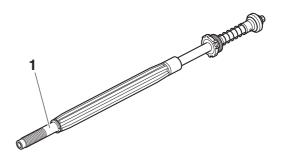


3. Check:

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

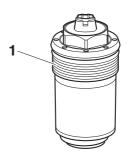
NOTICE

- 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"
 Cracks/damage → Replace.



EAS31651

ASSEMBLING THE FRONT FORK LEGS (for YZF-R1M)

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

WARNING

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.

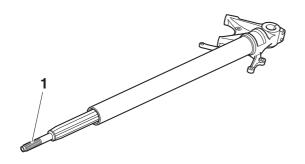
TIP

- 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

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



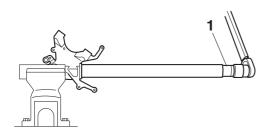
Front fork damper rod assembly (for YZF-R1M)
68 N·m (6.8 kgf·m, 50 lb·ft)

TIP.

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



Damper rod holder (ø37) 90890-01504 Damper rod holder YM-01504



3. Lubricate:

• Inner tube's outer surface



Recommended oil Ohlins R&T 43 (YZF-R1M, YZF-R1MH)

4. Install:

- Dust seal "1" New
- Oil seal clip "2"
- Oil seal "3" New
- Washer "4"

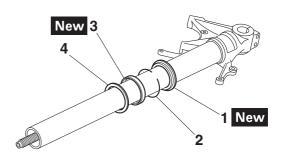
ECA19170

NOTICE

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

TID

- Before installing the oil seal, lubricate its lips with lithium-soap-based grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag to protect the oil seal during installation.



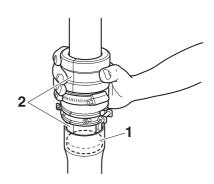


5. Install:

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



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

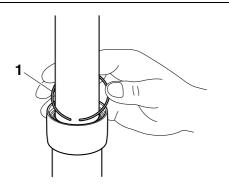


7. Install:

Oil seal clip "1"

TIP.

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

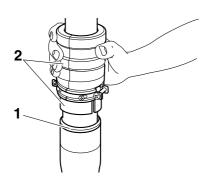


8. Install:

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



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

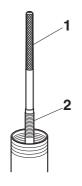


9. Install:

 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
Ohlins R&T 43 (YZF-R1M, YZF-R1MH)
Quantity (left)
405.0 cm³ (13.69 US oz, 14.28 Imp.oz) (YZF-R1M, YZF-R1MH)
Quantity (right)
405.0 cm³ (13.69 US oz, 14.28 Imp.oz) (YZF-R1M, YZF-R1MH)

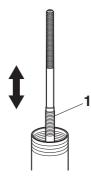
ECA14230

NOTICE

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

TIP

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.

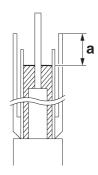


Level (left)
220 mm (8.7 in) (YZF-R1M, YZF-R1MH)
Level (right)
220 mm (8.7 in) (YZF-R1M, YZF-R1MH)

d. Install the locknut "2" all the way onto the damper rod assembly.

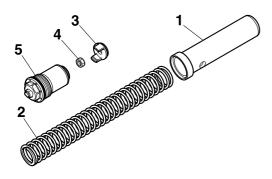


Front fork rod puller M7x0.75 90890-01576 YM-01576



14.Install:

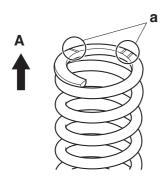
- Spacer "1"
- Fork spring "2"
- Upper spring seat "3"
- Locknut "4"
- Cap bolt "5"
 (along with the O-ring New)



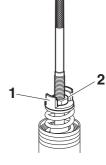
- a. Install the front fork rod puller.
- b. Install the spacer and fork spring.

TID

Install the fork spring with the marks "a" facing up "A".



c. Install the upper spring seat "1".



- e. Remove the front fork rod puller.
- f. Install the cap bolt completely, and then finger tighten the cap bolt.

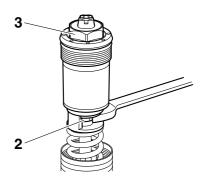
WARNING

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 N·m (1.9 kgf·m, 14 lb·ft)



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.

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.

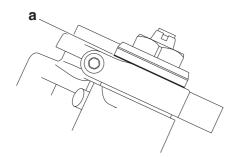
EWA13680

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:

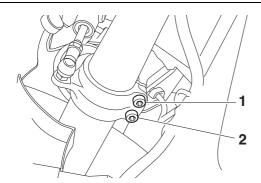
Lower bracket pinch bolts "1" and "2"



Lower bracket pinch bolt 23 N·m (2.3 kgf·m, 17 lb·ft)

TIP.

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



3. Tighten:

• Cap bolt "1"

TID

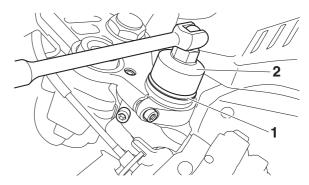
Tighten the cap bolt "1" using the front fork cap bolt wrench "2".



Front fork cap bolt wrench 42mm 90890-01575 YM-01575



Front fork cap bolt (for YZF-R1M) 20 N·m (2.0 kgf·m, 15 lb·ft)



• Handlebar bolt "3"



Handlebar bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft)

• Handlebar pinch bolt "4"

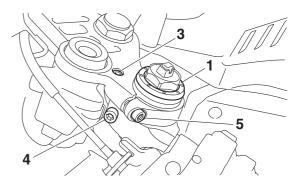


Handlebar pinch bolt 32 N·m (3.2 kgf·m, 24 lb·ft)

Upper bracket pinch bolt "5"

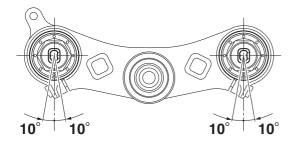


Upper bracket pinch bolt 26 N·m (2.6 kgf·m, 19 lb·ft)



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

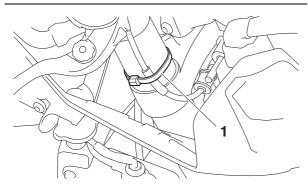
Make sure the brake hose, throttle cables, clutch cable, and handlebar switch leads are routed properly. Refer to "CABLE ROUTING" on page 2-41.

5. Install:

• Plastic locking tie "1"

TIP

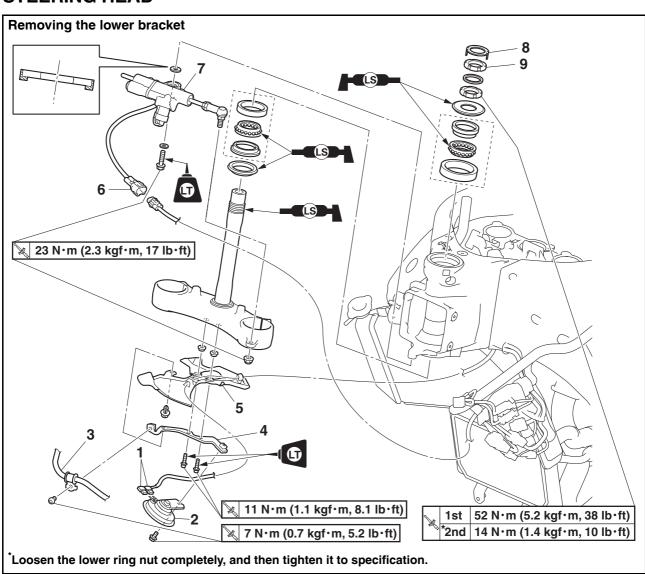
Fasten the front brake hose to the right front fork leg with the plastic locking tie.



6. Adjust:

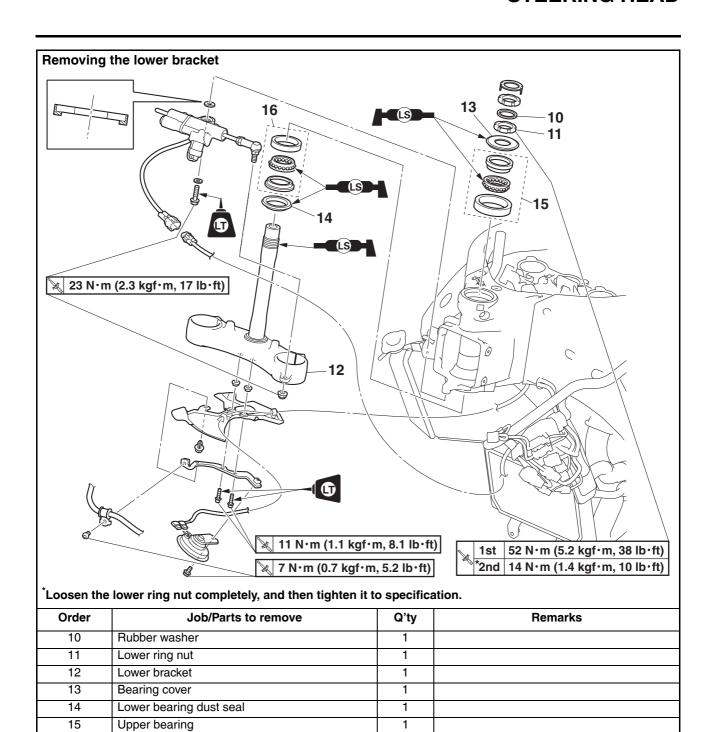
- Spring preload
- Rebound damping
- Compression damping Refer to "ADJUSTING THE PRELOAD OF THE FRONT FORK LEGS (for YZF-R1M)" on page 3-24 and "ADJUSTING THE DAMP-ING FORCE OF THE FRONT FORK LEGS AND REAR SHOCK ABSORBER ASSEM-BLY (for YZF-R1M)" on page 3-25.

STEERING HEAD



Order	Job/Parts to remove	Q'ty	Remarks
	Front cowling assembly/Air intake duct		Refer to "GENERAL CHASSIS (3)" on page 4-18.
	Front wheel		Refer to "FRONT WHEEL" on page 4-25.
	Front fork legs		Refer to "FRONT FORK (for YZF-R1)" on page 4-80 or refer to "FRONT FORK (for YZF-R1M)" on page 4-91.
	Upper bracket/Handlebars		Refer to "HANDLEBARS" on page 4-75.
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	

STEERING HEAD



_	_	_	_
1	-1	n	n
4-			_

1

16

Lower bearing

REMOVING THE LOWER BRACKET

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

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

EWA13730

WARNING

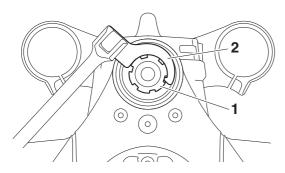
Securely support the lower bracket so that there is no danger of it falling.

TIP

- Hold the lower ring nut with 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".



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



EAS30214

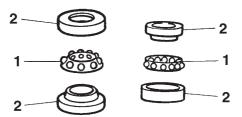
CHECKING THE STEERING HEAD

- 1. Wash:
 - Bearing
 - Bearing race



Recommended cleaning solvent Kerosene

- 2. Check:
 - Bearing "1"
- Bearing race "2"
 Damage/pitting → 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.

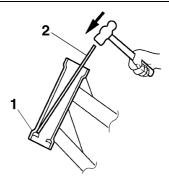
ECA14270

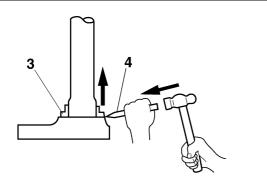
NOTICE

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

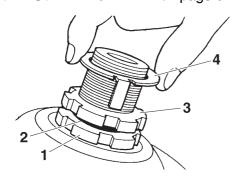
INSTALLING THE STEERING HEAD

- 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 4-75.

TIF

Temporarily tighten the steering stem nut.

- 4. Install:
 - Front fork legs
 Refer to "FRONT FORK (for YZF-R1)" on
 page 4-80 or refer to "FRONT FORK (for

YZF-R1M)" on page 4-91.

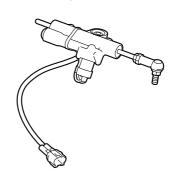
TIP -

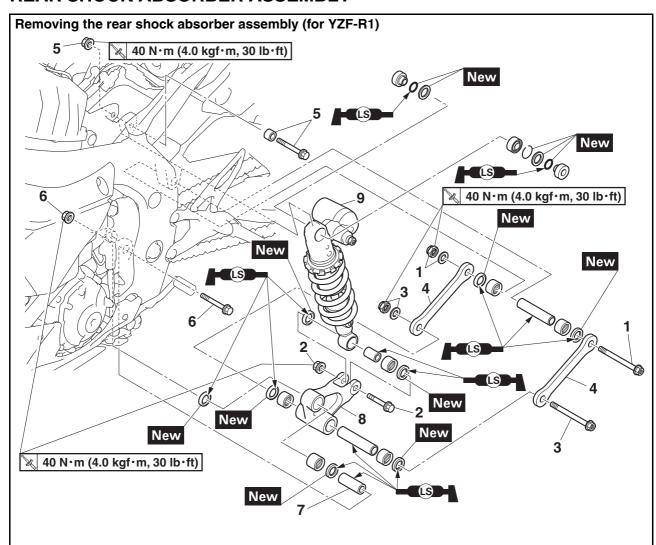
Temporarily tighten the upper and lower bracket pinch bolts.

EAS30215

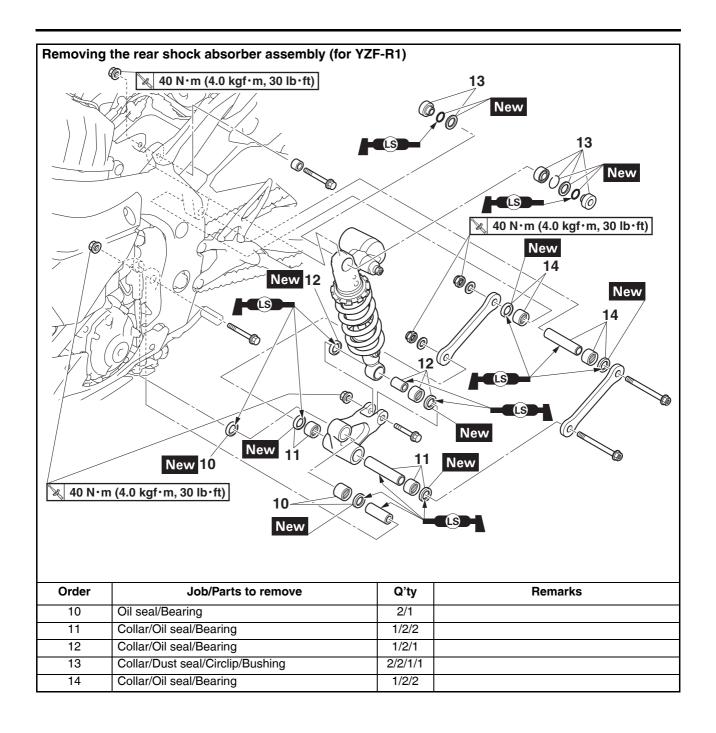
CHECKING THE STEERING DAMPER

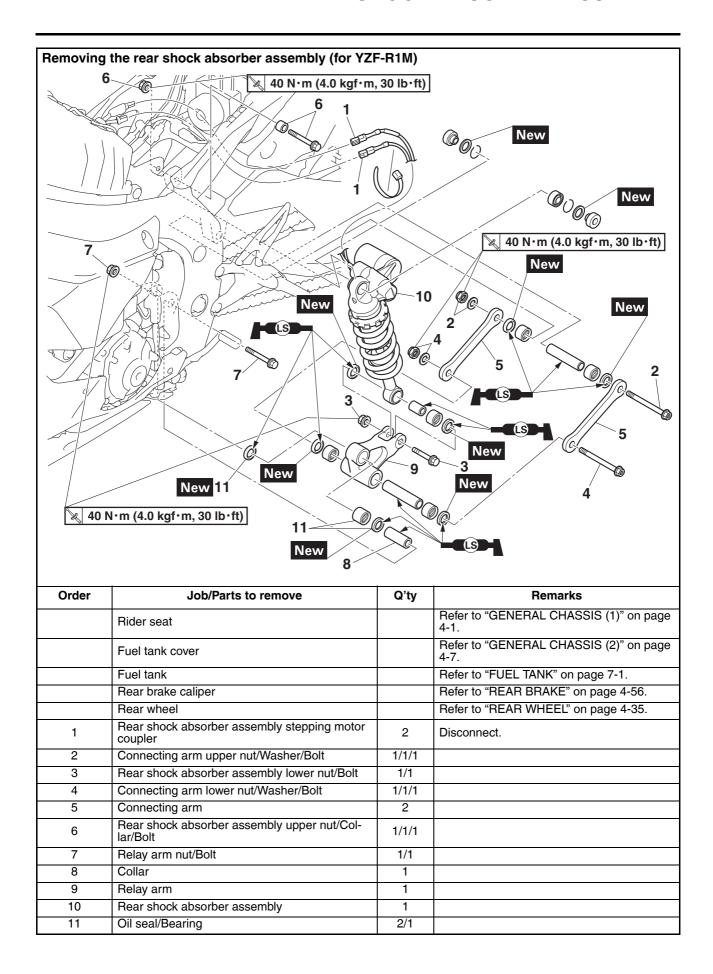
- 1. Check:
 - Steering damper body
 Damage/oil leaks → Replace the steering damper assembly.
 - Steering damper rod Bends/scratch → Replace the steering damper assembly.
 - Bearing
 Damage/pitting → Replace the steering damper assembly.

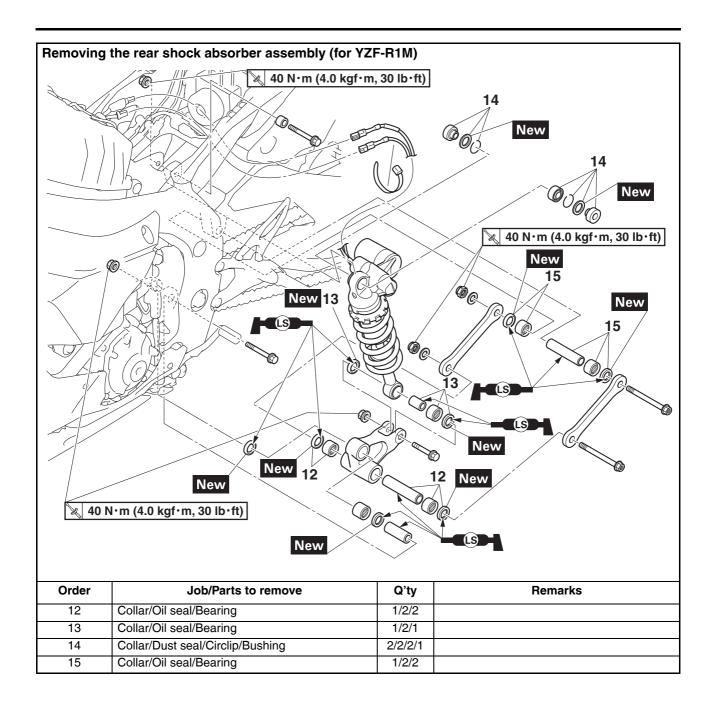




Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-56.
	Rear wheel		Refer to "REAR WHEEL" on page 4-35.
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/Collar/Bolt	1/1/1	
6	Relay arm nut/Bolt	1/1	
7	Collar	1	
8	Relay arm	1	
9	Rear shock absorber assembly	1	







HANDLING THE REAR SHOCK ABSORBER

WARNING

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

- Do not tamper or attempt to open the rear shock absorber.
- Do not subject the rear shock absorber to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.
- Do not deform or damage the rear shock absorber in any way. Rear shock absorber damage will result in poor damping performance.

EAS30729

DISPOSING OF A REAR SHOCK ABSORBER

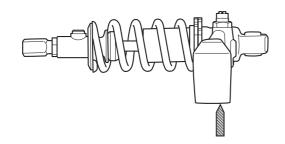
Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3 mm (0.08–0.12 in) hole through the rear shock absorber as shown.

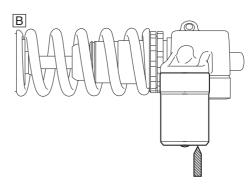
EWA13760

WARNING

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







A. YZF-R1

B. YZF-R1M

EAS30219

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

EWA1312

WARNING

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

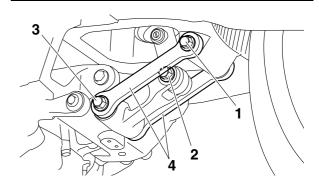
TIP

Place the vehicle on a maintenance 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.

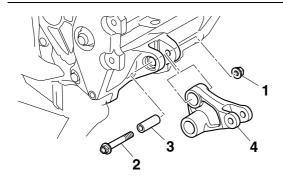


- 3. Remove:
 - Rear shock absorber assembly upper nut
 - Rear shock absorber assembly upper bolt
- 4. Remove:
 - Relay arm nut "1"
 - Relay arm bolt "2"

- Collar "3"
- Relay arm "4"

TIP

Pull out the collar "3" from the left side of the vehicle.

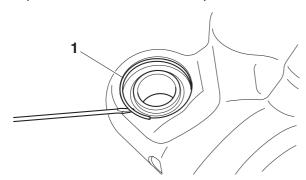


- 5. Remove:
 - Rear shock absorber assembly

FAS31653

DISASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY

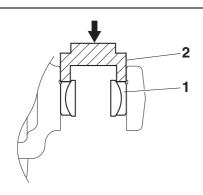
- 1. Remove:
 - Collar
 - Dust seal
- 2. Remove:
 - Circlip "1" (with a flat-head screwdriver)



- 3. Remove:
 - Bushing "1"

TIP

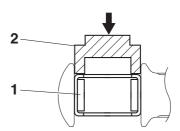
Remove the bushing with a socket "2" that matches its outside diameter.



- 4. Remove:
- Oil seal
- Bearing "1"

TIF

Remove the bearing with a socket "2" that matches its outside diameter.



EAS30220

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

- 1. Check:
 - Rear shock absorber rod Bends/damage → Replace the rear shock absorber assembly.
 - Rear shock absorber assembly
 Gas leaks/oil leaks → Replace the rear shock absorber assembly.
 - Spring
- Bushings

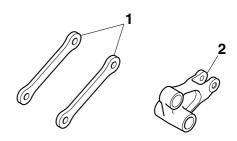
Damage/wear \rightarrow Replace the bushings.

Bolts
 Bends/damage/wear → Replace.

EAS30221

CHECKING THE CONNECTING ARM AND RELAY ARM

- 1. Check:
 - Connecting arms "1"
- Relay arm "2"
 Damage/wear → Replace.



- 2. Check:
- Bearings
- Oil seals

Damage/pitting \rightarrow Replace.

- 3. Check:
- Collars

Damage/scratches \rightarrow Replace.

EAS31654

ASSEMBLING THE REAR SHOCK ABSORBER ASSEMBLY

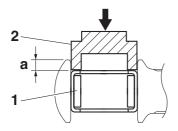
- 1. Install:
 - Bearing "1"
 - Oil seal New

TIP

Install the bearing with a socket "2" that matches its outside diameter.



Installed depth "a" 4.0 mm (0.16 in)



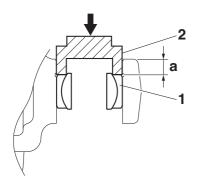
- 2. Install:
 - Bushing "1"
 - Circlip New (for YZF-R1)
 - Circlip (for YZF-R1M)
 - Dust seal New

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)



EAS30222

INSTALLING THE RELAY ARM

- 1. Lubricate:
- Collars
- Oil seals



Recommended lubricant Lithium-soap-based grease

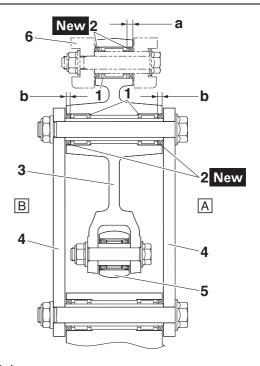
- 2. Install:
 - Bearings "1" (to the relay arm)
 - Oil seals "2" New (to the relay arm)



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

EAS30225

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.

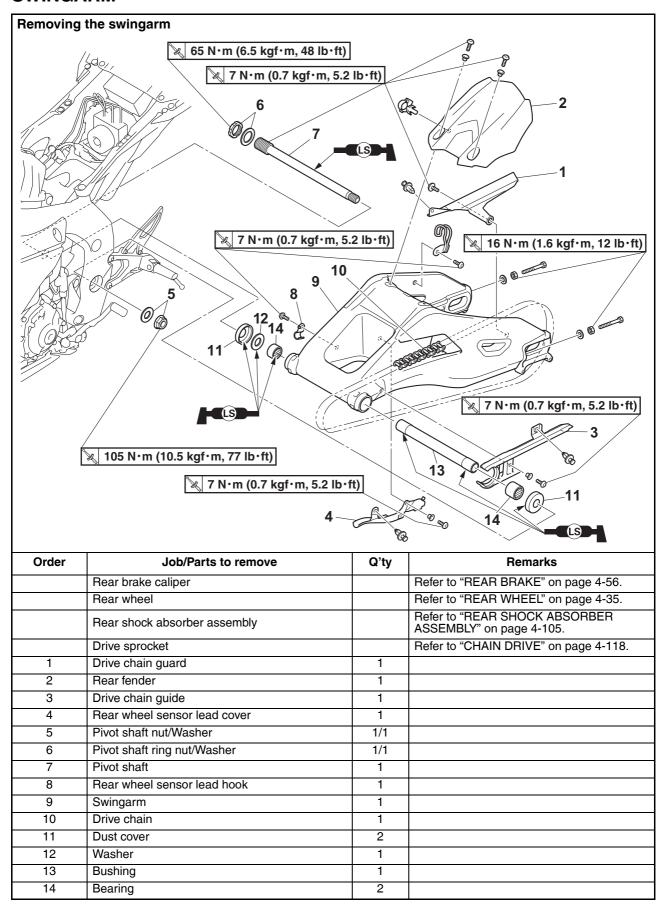
2. Tighten:

- 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 N·m (4.0 kgf·m, 30 lb·ft)
Rear shock absorber assembly upper nut
40 N·m (4.0 kgf·m, 30 lb·ft)
Connecting arm lower nut
40 N·m (4.0 kgf·m, 30 lb·ft)
Rear shock absorber assembly lower nut
40 N·m (4.0 kgf·m, 30 lb·ft)
Connecting arm upper nut
40 N·m (4.0 kgf·m, 30 lb·ft)

SWINGARM



FAS30226

REMOVING THE SWINGARM

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

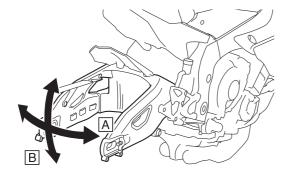
- 2. Remove:
 - Rear shock absorber assembly Refer to "REAR SHOCK ABSORBER AS-SEMBLY" on page 4-105.
- 3. Measure:
 - Swingarm side play
 - Swingarm vertical movement

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



Pivot shaft nut 105 N·m (10.5 kgf·m, 77 lb·ft) Pivot shaft ring nut 65 N·m (6.5 kgf·m, 48 lb·ft) Pivot shaft 7 N·m (0.7 kgf·m, 5.2 lb·ft)

- 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 4-119.

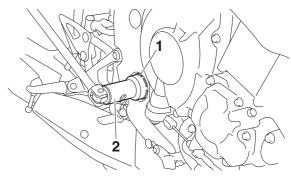
- 5. Remove:
 - Pivot shaft nut
 - Pivot shaft ring nut "1"

TIP

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



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



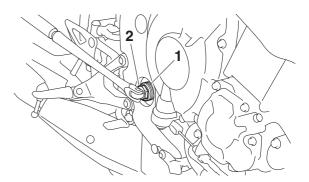
- 6. Remove:
- Pivot shaft "1"

TIP

Loosen the pivot shaft with the damper rod holder "2".



Damper rod holder (ø22) 90890-01365



- 7. Remove:
 - Swingarm

EAS30227

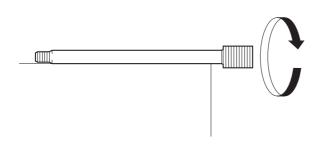
CHECKING THE SWINGARM

- 1. Check:
 - Swingarm
 Bends/cracks/damage → Replace.
- 2. Check:
 - Pivot shaft
 Roll the pivot shaft on a flat surface.
 Bends → Replace.

EWA13770

WARNING

Do not attempt to straighten a bent pivot shaft.

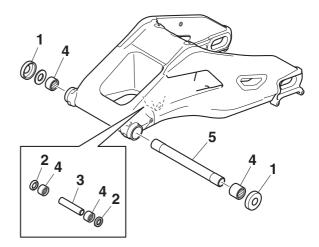


- 3. Wash:
 - Pivot shaft
 - Dust covers
 - Collar
 - Bushing
 - Washer



Recommended cleaning solvent Kerosene

- 4. Check:
- Dust covers "1"
- Oil seals "2"
 Damage/wear → Replace.
- Collar "3"
 Damage/scratches → Replace.
- Bearings "4"
 Damage/pitting → Replace.
- Bushing "5"
 Damage/pitting → Replace.



EAS30228

INSTALLING THE SWINGARM

- 1. Lubricate:
- Dust covers
- Pivot shaft
- Oil seals
- Collar
- Bushing



Recommended lubricant Lithium-soap-based grease

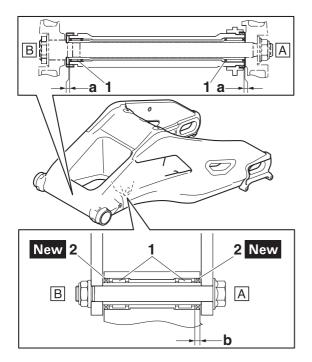
- 2. Install:
- Bearings "1" (to the swingarm)
- Oil seals "2" New (to the swingarm)



Installed depth "a" 0-1.0 mm (0-0.04 in) Installed depth "b" 4.0 mm (0.16 in)

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"



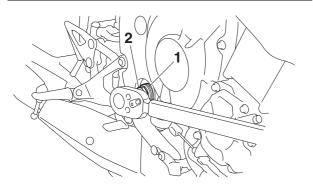
Pivot shaft 7 N⋅m (0.7 kgf⋅m, 5.2 lb⋅ft)

TID

Tighten the pivot shaft with the damper rod holder "2".



Damper rod holder (ø22) 90890-01365



- 4. Install:
 - Pivot shaft ring nut "1"



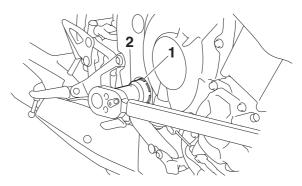
Pivot shaft ring nut 65 N·m (6.5 kgf·m, 48 lb·ft)

TIP

Tighten the pivot shaft ring nut with the ring nut wrench "2".



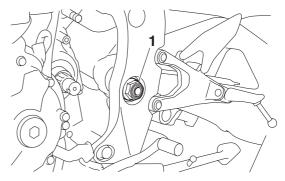
Ring nut wrench 90890-01507 Ring nut wrench YM-01507



- 5. Install:
- Pivot shaft nut "1"



Pivot shaft nut 105 N·m (10.5 kgf·m, 77 lb·ft)



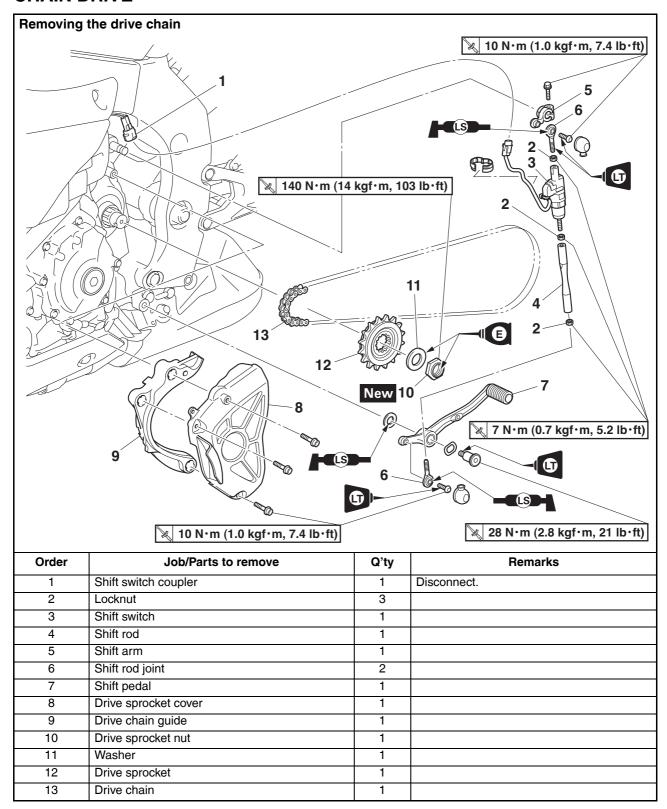
- 6. Install:
 - Drive chain Refer to "INSTALLING THE DRIVE CHAIN" on page 4-121.
 - Rear shock absorber assembly Refer to "REAR SHOCK ABSORBER AS-SEMBLY" on page 4-105.
 - Rear wheel Refer to "REAR WHEEL" on page 4-35.
- 7. Adjust:
 - Drive chain slack Refer to "Adjusting the drive chain slack" on page 3-20.



Drive chain slack (side stand) 25.0-35.0 mm (0.98-1.38 in) Drive chain slack (Maintenance stand)

25.0-35.0 mm (0.98-1.38 in)

CHAIN DRIVE



REMOVING THE DRIVE CHAIN

1. Stand the vehicle on a level surface.

EWA13120

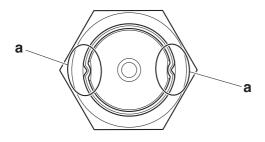
WARNING

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

TIP

Place the vehicle on a maintenance 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

EAS30230

CHECKING THE DRIVE CHAIN

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



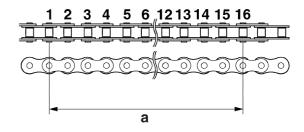
15-link length limit 239.3 mm (9.42 in)

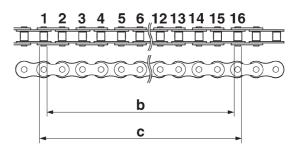
- a. Measure the length "b" between the inner sides of the pins and the length "c" between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.
- b. Calculate the 15-link section length "a" of the drive chain using the following formula.

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 → Clean and lubricate or replace.

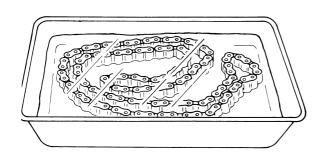


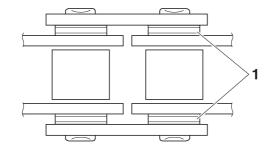
- 3. Clean:
- Drive chain
- a. Wipe the drive chain with a clean cloth.
- b. Put the drive chain in kerosene and remove any remaining dirt.
- c. Remove the drive chain from the kerosene and completely dry it.

ECA19090

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.



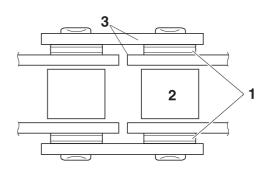


4. Check:

• O-rings "1"

Damage \rightarrow 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



Recommended lubricant Chain lubricant suitable for Oring chains

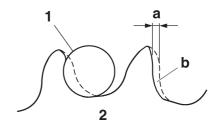
EAS30231

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

EAS30232

CHECKING THE REAR WHEEL SPROCKET
Refer to "CHECKING AND REPLACING THE
REAR WHEEL SPROCKET" on page 4-39.

FAS30233

CHECKING THE REAR WHEEL DRIVE HUB
Refer to "CHECKING THE REAR WHEEL
DRIVE HUB" on page 4-39.

INSTALLING THE DRIVE CHAIN

- 1. Install:
- Drive chain

ECA17410

NOTICE

Be sure to put on safety goggles when working.

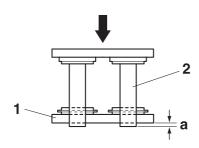
TIP_

Install the drive chain joint with the drive chain cut & rivet tool.

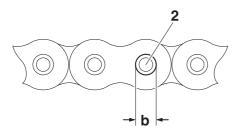


Drive chain cut & rivet tool 90890-01550 Drive chain cut & rivet tool YM-01550

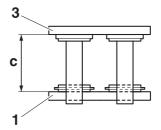
a. When press fitting the connecting plate "1", make sure the space "a" between the end of the connecting pin "2" and the connecting plate is 1.2–1.4 mm (0.05–0.06 in).



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



Recommended lubricant Chain lubricant suitable for Oring chains

3. Install:

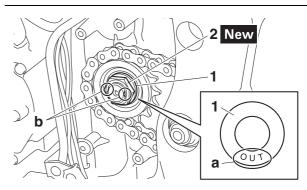
- Drive sprocket
- Washer "1"
- Drive sprocket nut "2" New



Drive sprocket nut 140 N·m (14 kgf·m, 103 lb·ft)

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:

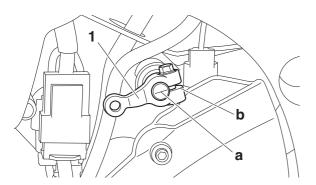
• Shift arm "1"

TIE

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 N·m (1.0 kgf·m, 7.4 lb·ft)



5. Install:

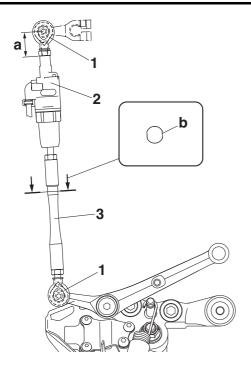
- Shift rod joint "1"
- Shift switch "2"
- Shift rod "3"

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 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE® Shift switch locknut 7 N·m (0.7 kgf·m, 5.2 lb·ft)



a. 24 mm (0.94 in)

6. Adjust:

 Installed shift rod length Refer to "ADJUSTING THE SHIFT PEDAL" on page 4-122.

7. Adjust:

 Drive chain slack Refer to "Adjusting the drive chain slack" on page 3-20.



Drive chain slack (side stand) 25.0-35.0 mm (0.98-1.38 in) Drive chain slack (Maintenance stand)

25.0-35.0 mm (0.98-1.38 in)

ECA13550

NOTICE

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

EAS31729

ADJUSTING THE SHIFT PEDAL

TIP

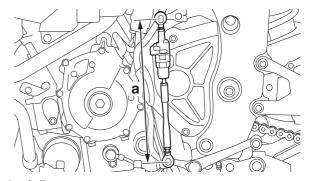
The shift pedal position is determined by the installed shift rod length.

1. Measure:

 Installed shift rod length "a" Incorrect → Adjust.



Installed shift rod length 258.5–260.5 mm (10.18–10.26 in)



2. Adjust:

• Installed shift rod length

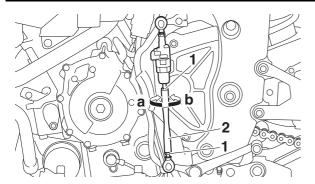
a. Loosen both locknuts "1".

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.

TIF

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 N·m (0.7 kgf·m, 5.2 lb·ft)

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

ENGINE

ENGINE INSPECTION	5-1
MEASURE THE COMPRESSION PRESSURE	5-1
ENGINE REMOVAL	5-3
REMOVING THE ENGINE	
INSTALLING THE ENGINE	
INSTALLING THE EXHAUST PIPE AND MUFFLER	
CAMSHAFTS	5-9
REMOVING THE CAMSHAFTS	5-13
REMOVING THE ROCKER ARMS AND ROCKER ARM SHAFTS	5-14
CHECKING THE CAMSHAFTS	5-14
CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS	5-15
CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET	
CHECKING THE TIMING CHAIN GUIDES	5-16
CHECKING THE TIMING CHAIN TENSIONER	
ASSEMBLING THE TIMING CHAIN COVER	
INSTALLING THE ROCKER ARMS AND ROCKER ARM SHAFTS	
INSTALLING THE TIMING CHAIN COVER	5-18
INSTALLING THE CAMSHAFTS	5-19
CYLINDER HEAD	
REMOVING THE CYLINDER HEAD	5-24
CHECKING THE CYLINDER HEAD	5-24
INSTALLING THE CYLINDER HEAD	5-24
VALVES AND VALVE SPRINGS	5-26
REMOVING THE VALVES	
CHECKING THE VALVES AND VALVE GUIDES	
CHECKING THE VALVE SEATS	
CHECKING THE VALVE SPRINGS	
CHECKING THE VALVE SPRING SEAT	
INSTALLING THE VALVES	5-32
GENERATOR	
REMOVING THE GENERATOR	
INSTALLING THE GENERATOR	5-35
STARTER CLUTCH	
REMOVING THE STARTER CLUTCH	
CHECKING THE STARTER CLUTCH	
INSTALLING THE STARTER CLUTCH	5-38
ELECTRIC STARTER	
CHECKING THE STARTER MOTOR	
ASSEMBLING THE STARTER MOTOR	5-43

OIL PUMP	5-44
REMOVING THE OIL PAN	5-47
CHECKING THE SPROCKET AND CHAIN	
CHECKING THE OIL PUMP	
CHECKING THE RELIEF VALVE	5-48
CHECKING THE OIL DELIVERY PIPES	5-48
CHECKING THE OIL STRAINER	5-48
ASSEMBLING THE OIL PUMP	5-48
INSTALLING THE OIL PUMP	
INSTALLING THE OIL PAN	5-50
CLUTCH	5-51
REMOVING THE CLUTCH	5-54
CHECKING THE FRICTION PLATES	
CHECKING THE CLUTCH PLATES	
CHECKING THE CLUTCH SPRINGS	
CHECKING THE CLUTCH HOUSING	
CHECKING THE CLUTCH BOSS	
CHECKING THE PRESSURE PLATE	
CHECKING THE PRIMARY DRIVE GEAR	
CHECKING THE PRIMARY DRIVEN GEAR	
CHECKING THE PULL LEVER SHAFT AND PULL ROD	
INSTALLING THE CLUTCH	5-5/
SHIFT SHAFT	
CHECKING THE SHIFT SHAFT	
CHECKING THE STOPPER LEVER	
INSTALLING THE SHIFT SHAFT	5-61
CRANKCASE	
DISASSEMBLING THE CRANKCASE	
CHECKING THE CRANKCASE	
ASSEMBLING THE CRANKCASE	
INSTALLING THE CRANKCASE BREATHER COVERINSTALLING THE OIL PRESSURE SWITCH	
INSTALLING THE OIL PRESSURE SWITCHINSTALLING THE GEAR POSITION SENSOR	
INSTALLING THE GEAR POSITION SENSOR	3-06
COMMENTING BODG AND DIGTORIC	= 00
CONNECTING RODS AND PISTONS	
REMOVING THE CONNECTING RODS AND PISTONS	
CHECKING THE CYLINDER AND PISTON	
CHECKING THE PISTON RINGS	_
CHECKING THE PISTON PINCHECKING THE CONNECTING RODS	
INSTALLING THE CONNECTING RODS	
INSTALLING THE CONNECTING HOD AND PISTON	5-76
ODANIKOHAET AND DAI ANOED CHAET	F 00
REMOVING THE CRANKSHAFT AND BALANCER SHAFT	
CHECKING THE OIL NOZZLESCHECKING THE CRANKSHAFT	
CHECKING THE CHANKSHAFT	
	J-03

INSTALLING THE CRANKSHAFT	5-87
INSTALLING THE THRUST BEARING	5-87
INSTALLING THE BALANCER ASSEMBLY	5-88
TRANSMISSION	5-89
REMOVING THE TRANSMISSION	5-93
CHECKING THE SHIFT FORKS	5-93
CHECKING THE SHIFT DRUM ASSEMBLY	5-94
CHECKING THE TRANSMISSION	5-94
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE	5-95
INSTALLING THE TRANSMISSION	5-95

ENGINE INSPECTION

utes, and then turn it off.

EAS3024

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 3-6.
 2. Start the engine, warm it up for several min-
- 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 7-6.
- Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-21.
- Ignition coils
- Spark plugs Refer to "CAMSHAFTS" on page 5-9.

ECA13340

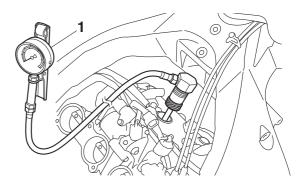
NOTICE

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

- 4. Install:
- Compression gauge "1"



Compression gauge 90890-03081 Engine compression tester YU-33223



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



Compression pressure 1261–1624 kPa/250 r/min (12.6– 16.2 kgf/cm²/250 r/min, 179.4– 231.0 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.

EWA17100

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 → Eliminate.
- d. If the compression pressure is below the minimum specification, pour a teaspoonful of engine oil into the spark plug bore and measure again.

Refer to the following table.

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

6. Install:

Spark plugs



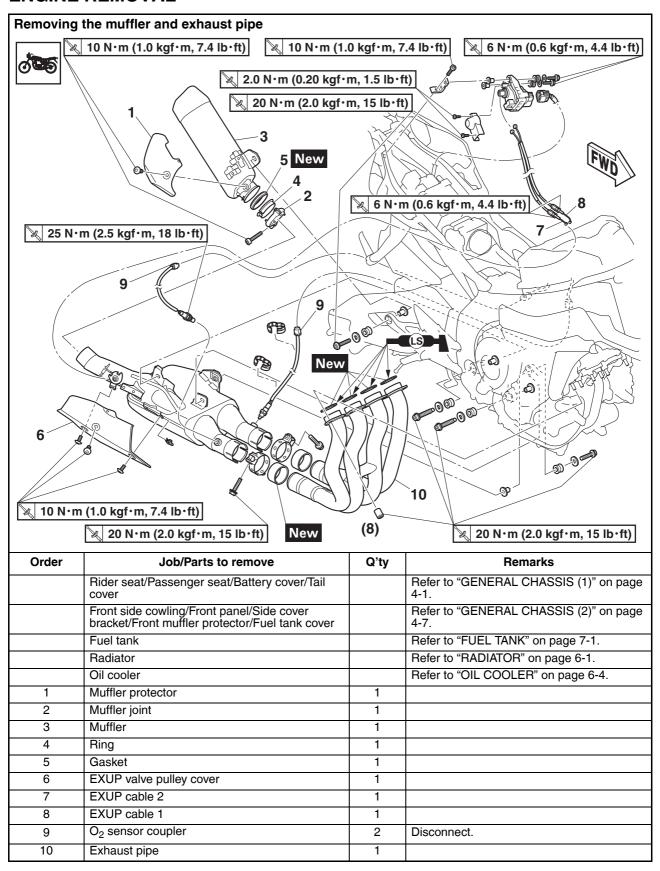
Spark plug 13 N·m (1.3 kgf·m, 9.6 lb·ft) Spark plug (new) 18 N·m (1.8 kgf·m, 13 lb·ft)

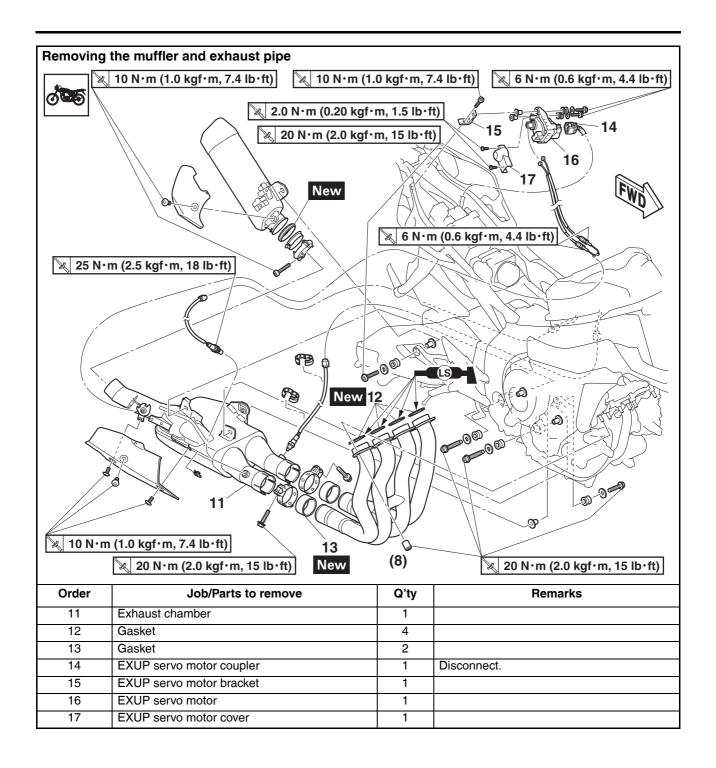
TIP.

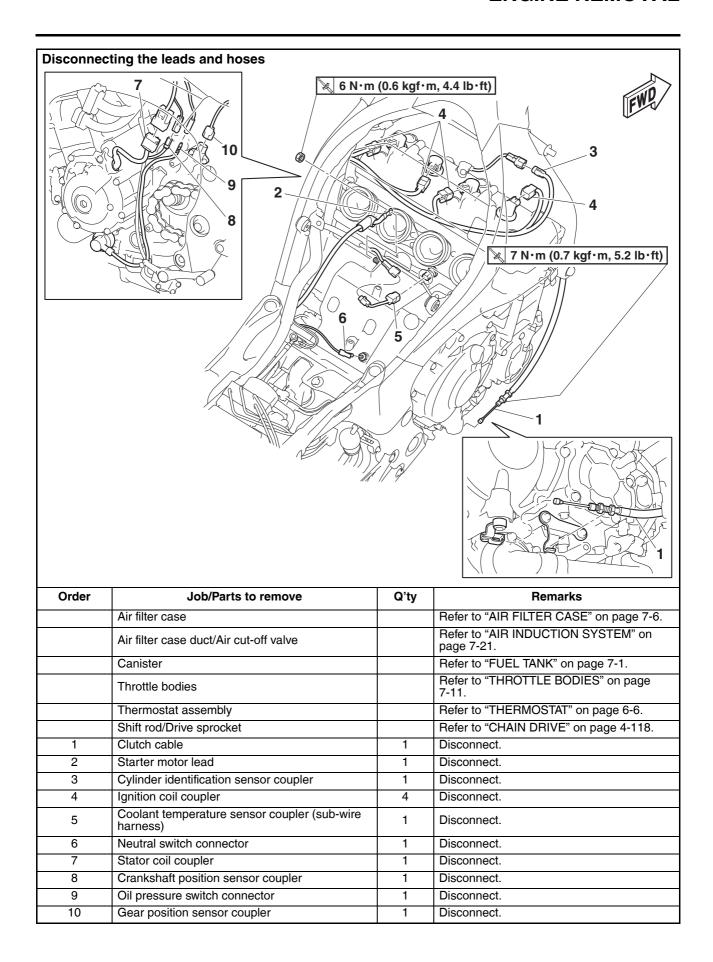
- Before installing the spark plug, clean the spark plug and gasket surface.
- If the spark plug is a new one, tighten it to 18 N·m (1.8 kgf·m, 13 lb·ft).

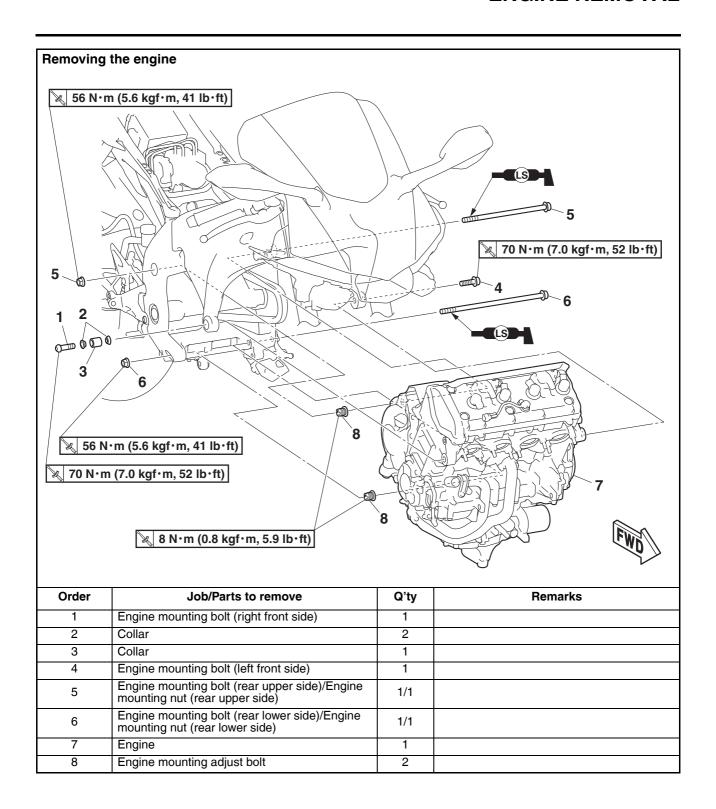
7. Install:

- Ignition coils Refer to "CAMSHAFTS" on page 5-9.
- Air cut-off valve Refer to "AIR INDUCTION SYSTEM" on page 7-21.
- Air filter case Refer to "AIR FILTER CASE" on page 7-6.
- 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.









REMOVING THE ENGINE

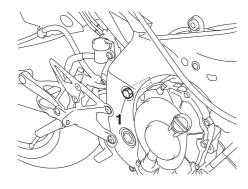
- 1. Loosen:
 - Engine mounting adjust bolt

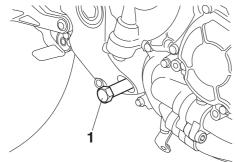
TIP

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"

ГΙР

- 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.



Engine mounting adjust bolt 8 N·m (0.8 kgf·m, 5.9 lb·ft)



Pivot shaft wrench 90890-01485 Frame mount insert wrench YM-01485

- 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 56 N·m (5.6 kgf·m, 41 lb·ft)

- 9. Tighten:
- Engine mounting nut (rear upper side) "9"



Engine mounting nut 56 N·m (5.6 kgf·m, 41 lb·ft)

10. Tighten:

• Engine mounting bolt (left front side) "4"

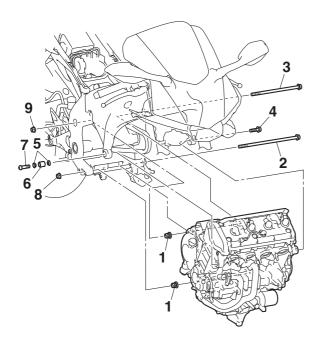


Engine mounting bolt 70 N·m (7.0 kgf·m, 52 lb·ft)

- 11. Tighten:
 - Engine mounting bolt (right front side) "7"



Engine mounting bolt 70 N·m (7.0 kgf·m, 52 lb·ft)



INSTALLING THE EXHAUST PIPE AND MUFFLER

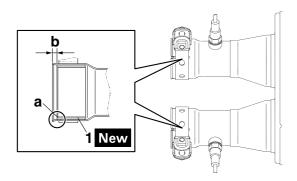
- 1. Install:
 - Exhaust pipe
 - Gasket "1" New (to exhaust chamber)
 - Muffler

TIP_

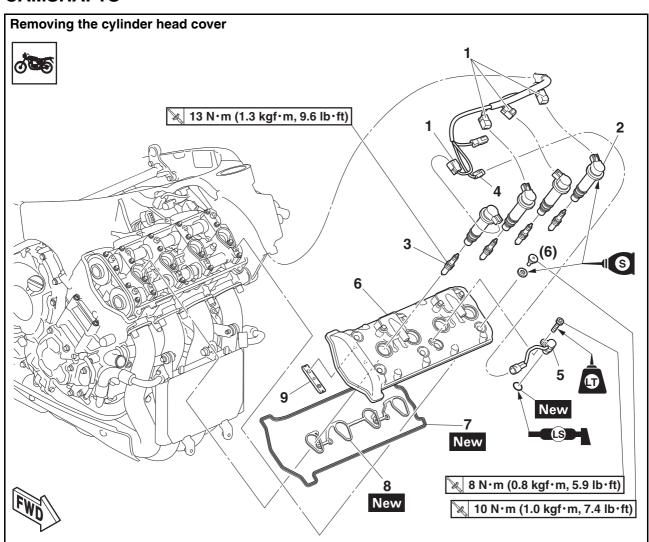
When installing the gasket, install it so that the chamfered side "a" of the gasket faces the exhaust pipe side as shown in the illustration.



Installed depth of gasket "b" 5.0 mm (0.20 in)

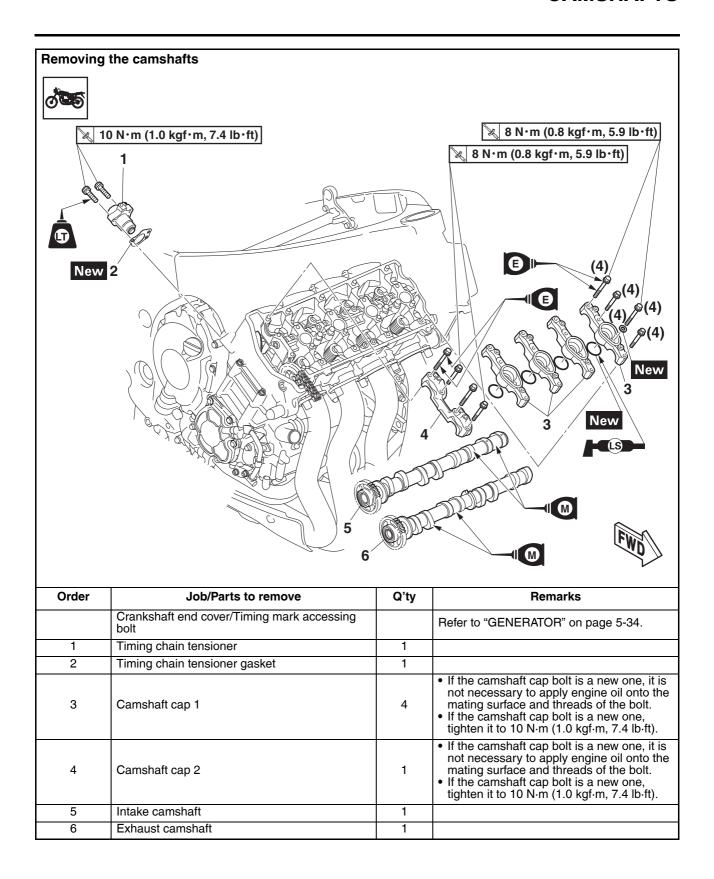


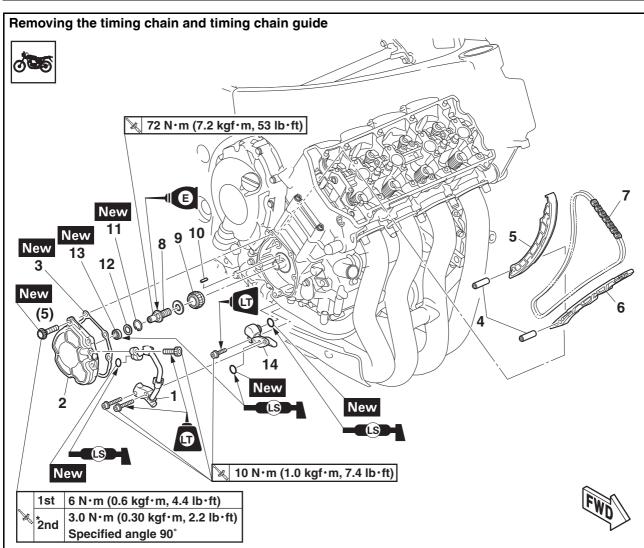
CAMSHAFTS



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 7-6.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" on page 7-21.
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 N·m (1.8 kgf·m, 13 lb·ft).
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	

CAMSHAFTS

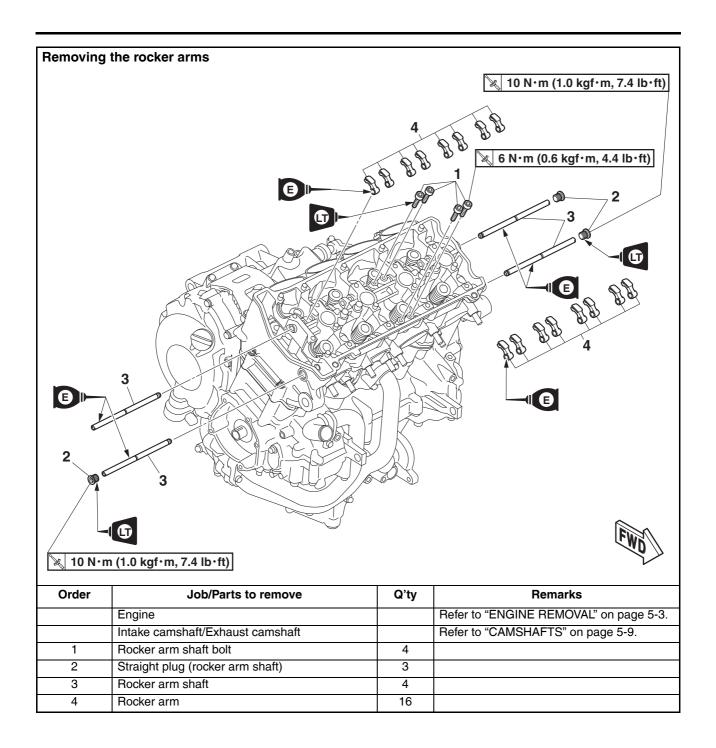




Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.

Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pipe 3	1	Install the oil pipe to the timing chain cover, and then install them to the crankcase.
2	Timing chain cover	1	Install the oil pipe to the timing chain cover, and then install them to the crankcase.
3	Timing chain cover gasket	1	
4	Dowel pin	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.

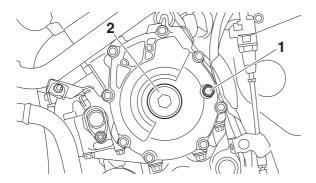
CAMSHAFTS



FAS30256

REMOVING THE CAMSHAFTS

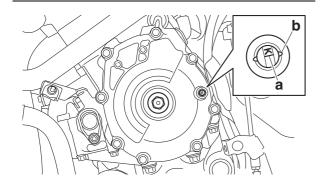
- 1. Remove:
 - Timing mark accessing bolt "1"
 - Crankshaft end cover "2"



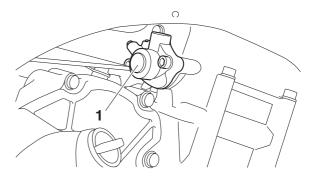
- 2. Align:
 - Mark "a" on the generator rotor (with the generator rotor cover slot "b")

- 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".

BTDC105° on the compression stroke can be found when the camshaft lobes are turned away from each other.



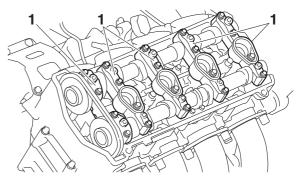
- 3. Remove:
 - Timing chain tensioner "1"
 - Timing chain tensioner gasket



- 4. Remove:
 - Camshaft cap "1"

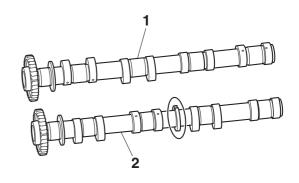
ECA13720 NOTICE

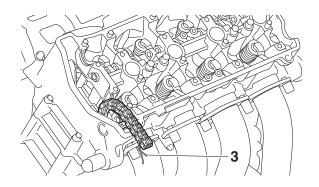
To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a crisscross pattern, working from the outside in.



- 5. Remove:
 - Intake camshaft "1"
 - Exhaust camshaft "2"

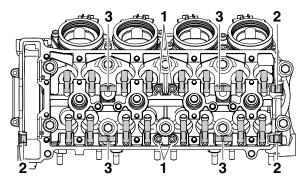
To prevent the timing chain from falling into the crankcase, fasten it with a wire "3".





REMOVING THE ROCKER ARMS AND ROCKER ARM SHAFTS

- 1. Remove:
- Rocker arm shaft bolt "1"
- Straight plug "2"
- Rocker arm shaft "3"
- Rocker arm



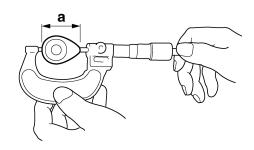
EAS30257

CHECKING THE CAMSHAFTS

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



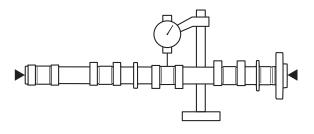
Camshaft lobe dimensions
Lobe height (Intake)
35.169-35.269 mm (1.38461.3885 in)
Limit
35.160 mm (1.3842 in)
Lobe height (Exhaust)
34.672-34.772 mm (1.36501.3690 in)
Limit
34.170 mm (1.3453 in)



- 3. Measure:
- Camshaft runout
 Out of specification → Replace.



Camshaft runout limit 0.050 mm (0.0020 in)

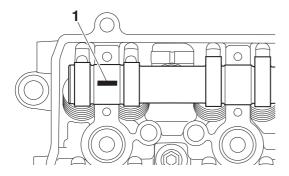


- 4. Measure:
- Camshaft-journal-to-camshaft-cap clearance Out of specification → Measure the camshaft journal diameter.



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

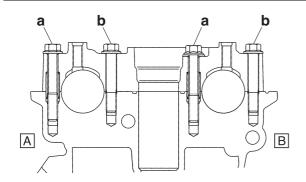
- a. Install the camshaft into the cylinder head (without the camshaft caps).
- b. Position strip of Plastigauge® "1" onto the camshaft journal as shown.



c. Install the dowel pins and camshaft caps.

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

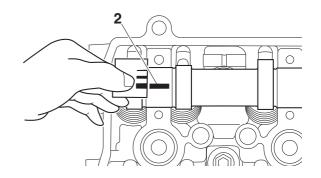
TIP

- 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 N·m (1.0 kgf·m, 7.4 lb·ft).
- 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 N·m (0.8 kgf·m, 5.9 lb·ft) Camshaft cap bolt (new) 10 N·m (1.0 kgf·m, 7.4 lb·ft)

d. Remove the camshaft caps and then measure the width of the Plastigauge® "2".

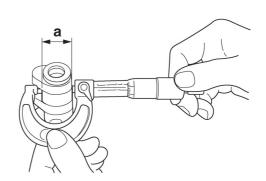


5. Measure:

Camshaft journal diameter "a"
 Out of specification → Replace the camshaft.
 Within specification → Replace the cylinder head and the camshaft caps as a set.



Camshaft journal diameter 25.459–25.472 mm (1.0023–1.0028 in)

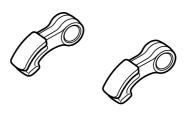


EAS3025

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 → Replace.



2. Check:

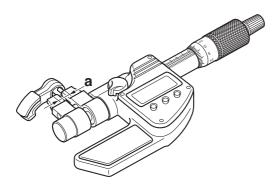
Rocker arm shaft
 Blue discoloration/excessive wear/pit-

 $ting/scratches \rightarrow Replace or check the lubrication system.$

- 3. Measure:
 - Rocker arm inside diameter "a"
 Out of specification → Replace.



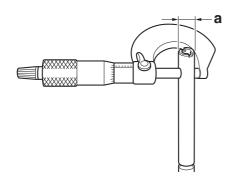
Rocker arm inside diameter 7.987–8.002 mm (0.3144–0.3150 in) Limit 8.017 mm (0.3156 in)



- 4. Measure:
 - Rocker arm shaft outside diameter "a"
 Out of specification → Replace.



Rocker arm shaft outside diameter
7.967–7.979 mm (0.3137–0.3141 in)
Limit
7.936 mm (0.3124 in)

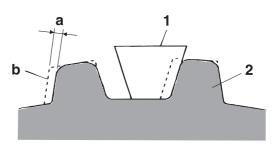


EAS3025

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" → Replace the

camshaft sprockets and the timing chain as a set.



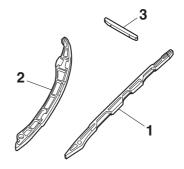
- a. 1/4 tooth
- b. Correct
- 1. Timing chain
- 2. Camshaft sprocket

EAS30265

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 → Replace the defective part(s).



EAS30266

CHECKING THE TIMING CHAIN TENSIONER

- 1. Check:
- Timing chain tensioner
 Cracks/damage/rough movement → Replace.

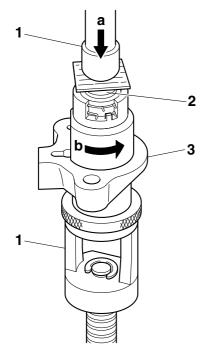
a. Using the valve spring compressor "1", push and insert timing chain tensioner rod "2" into the timing chain tensioner housing.

TIP

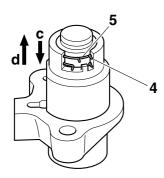
Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "3" in direction "b" until it stops.



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. 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.

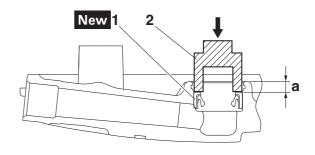


TIP

Install the oil seal with a socket "2" that matches its outside diameter.



Installed depth "a" 4.0-4.5 mm (0.16-0.18 in)



- 2. Install:
 - Washer
 - Circlip New

EAS3165

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.

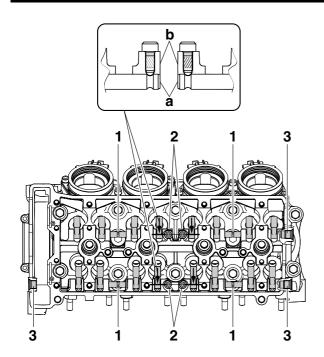


Rocker arm shaft bolt 6 N·m (0.6 kgf·m, 4.4 lb·ft) LOCTITE® Straight plug (rocker arm shaft) 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®

EAS31744

ASSEMBLING THE TIMING CHAIN COVER

- 1. Install:
- Oil seal "1" New



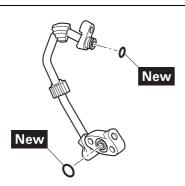
INSTALLING THE TIMING CHAIN COVER

- 1. Install:
 - Timing chain cover
 - Oil pipe 3

a. Install new O-rings to the oil pipe.

TID

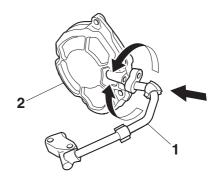
Apply lithium-soap-based grease evenly on new O-rings.



b. Install the oil pipe "1" to the timing chain cover "2"

TIF

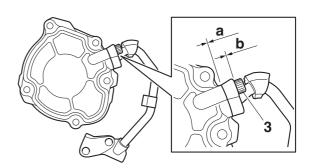
- While turning the oil pipe, install it to the timing chain cover so that the grease applied to the Orings is distributed.
- If the oil pipe is not turned smoothly, the Orings might be caught.



c. Install the oil pipe bolt "3" and tighten it temporarily until there is no clearance at "a" (timing chain cover to oil pipe) and "b" (oil pipe to oil pipe bolt).

TIP

Apply locking agent (LOCTITE®) onto the oil pipe bolt.



- d. Install the timing chain cover assembly and a new timing chain cover gasket.
- e. Install new timing chain cover bolts and tighten them.

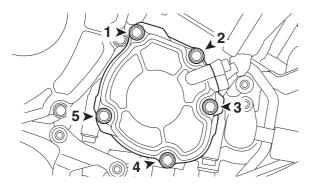


Timing chain cover bolt
1st: 6 N·m (0.6 kgf·m, 4.4 lb·ft)
*2nd: 3.0 N·m (0.30 kgf·m, 2.2 lb·ft)
Specified angle 90°

Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque and the specific angle.

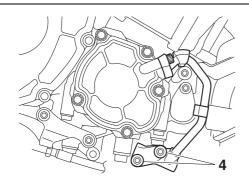
TIP

Tighten the timing chain cover bolts in the tightening sequence as shown.



f. Install the oil pipe bolts "4" and tighten them temporarily.

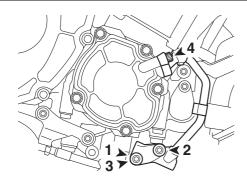
Apply locking agent (LOCTITE®) onto the oil pipe bolts.



g. Tighten the oil pipe bolts to the specified torque following the tightening order shown in the illustration.

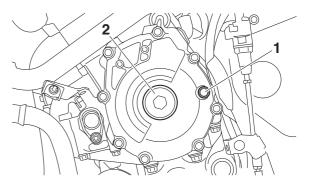


Oil pipe 3 bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) **LOCTITE®**



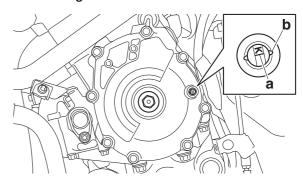
INSTALLING THE CAMSHAFTS

- 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°, align the BTDC105° mark "a" on the generator rotor with the generator rotor cover slot "b".

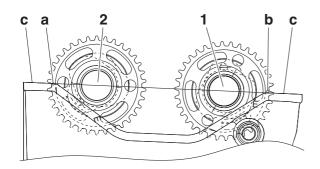


3. Install:

- 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.

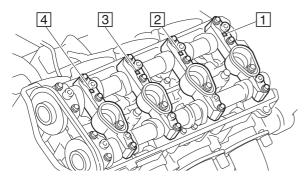


- 4. Install:
 - Camshaft cap

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 N·m (0.8 kgf·m, 5.9 lb·ft) Camshaft cap bolt (new) 10 N·m (1.0 kgf·m, 7.4 lb·ft)

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 N·m (1.0 kgf·m, 7.4 lb·ft).
- Tighten the camshaft cap bolts in stages and in a crisscross pattern, working from the inner caps out.

ECA17430

NOTICE

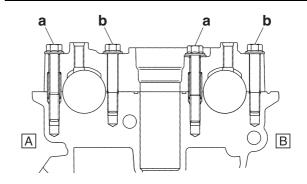
- Lubricate the camshaft cap bolts with the engine oil.
- The camshaft cap bolts must be tightened

- 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

NOTICE

There are two kinds of camshaft cap bolts with different lengths. Be sure to install each bolt onto the correct position.



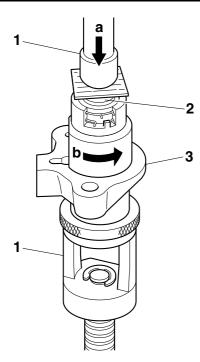
- a. Camshaft cap bolt (black): 40 mm (1.57 in)
- b. Camshaft cap bolt (silver): 35 mm (1.38 in)
- A. Intake side
- B. Exhaust side
- 6. Install:
 - Timing chain tensioner
- Timing chain tensioner gasket New
- a. Using the valve spring compressor "1", push and insert timing chain tensioner rod "2" into the timing chain tensioner housing.

TIP.

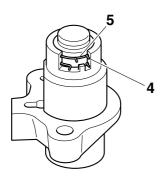
Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "3" in direction "b" until it stops.



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 N⋅m (1.0 kgf⋅m, 7.4 lb⋅ft) 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".

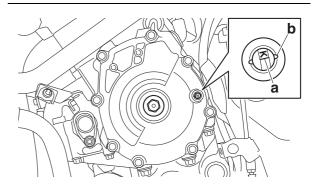
Camshaft sprocket timing mark "c"
 Make sure the camshaft sprocket timing mark
 "c" is aligned with the cylinder head mating
 surface "d".

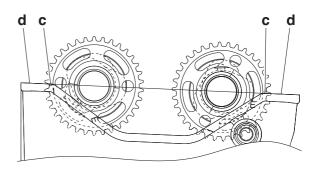
Out of alignment → Adjust.

Refer to the installation steps above.

TID

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 3-6.

10.Install:

Timing mark accessing bolt "1"

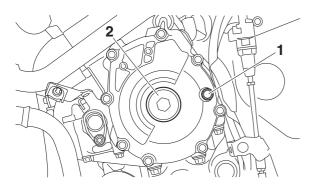


Timing mark accessing bolt 15 N·m (1.5 kgf·m, 11 lb·ft)

• Crankshaft end cover "2"



Crankshaft end cover 15 N·m (1.5 kgf·m, 11 lb·ft)



11.Install:

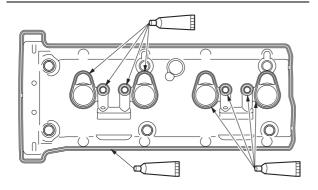
- Timing chain guide (top side)
- Cylinder head cover gasket "1" New
- Cylinder head cover gasket "2" New
- Cylinder head cover

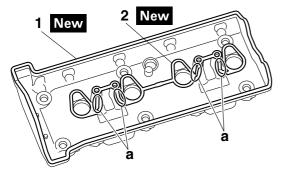


Cylinder head cover bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIF

- 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:

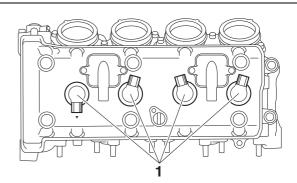
- Spark plugs
- Ignition coils "1"



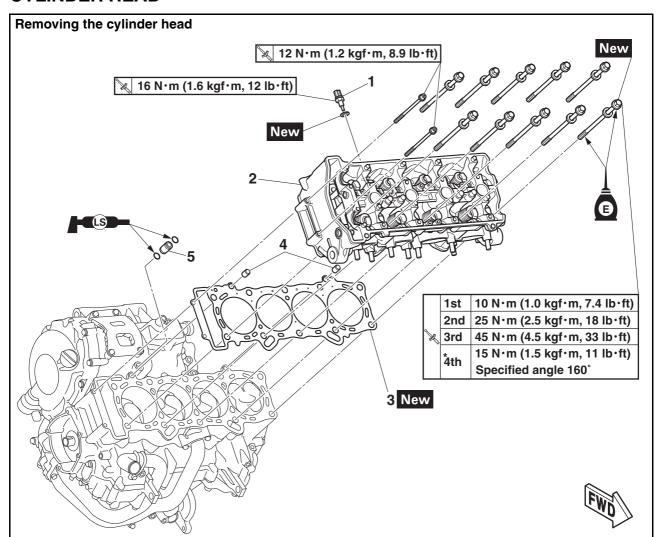
Spark plug 13 N·m (1.3 kgf·m, 9.6 lb·ft) Spark plug (new) 18 N·m (1.8 kgf·m, 13 lb·ft)

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 N·m (1.8 kgf·m, 13 lb·ft).
- Install the ignition coils "1" in the direction shown in the illustration.



CYLINDER HEAD



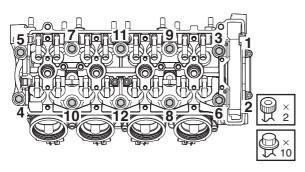
* Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.

Order	Job/Parts to remove	Q'ty	Remarks
	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	

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) (x 2)
 - Cylinder head bolt (M9) (× 10)

- 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.



CHECKING THE CYLINDER HEAD

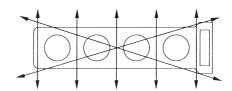
- 1. Eliminate:
 - Combustion chamber carbon deposits (with a rounded scraper)

Do not use a sharp instrument to avoid damaging or scratching:

- Spark plug bore threads
- Valve seats
- 2. Check:
 - Cylinder head Damage/scratches \rightarrow Replace.
 - Cylinder head water jacket Mineral deposits/rust → Eliminate.
- 3. Measure:
 - Cylinder head warpage Out of specification → Resurface the cylinder



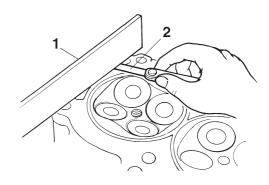
Warpage limit 0.10 mm (0.0039 in)



a. Place a straightedge "1" and a thickness gauge "2" across the cylinder head.



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

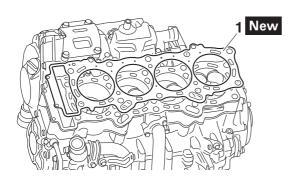


- b. Measure the warpage.
- c. If the limit is exceeded, resurface the cylinder head as follows.
- d. Place a 400-600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

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

INSTALLING THE CYLINDER HEAD

- 1. Install:
- Cylinder head gasket "1" New
- Dowel pins



Refer to "INSTALLING THE CAMSHAFTS" on page 5-19.

2. Install:

- Cylinder head
- Cylinder head bolt (M6) (× 2)
- Cylinder head bolt (M9) (x 10) New

TIF

- 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"

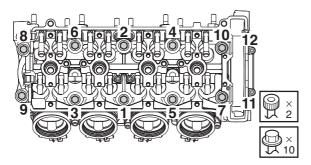


Cylinder head bolt "1"-"10"
1st: 10 N·m (1.0 kgf·m, 7.4 lb·ft)
2nd: 25 N·m (2.5 kgf·m, 18 lb·ft)
3rd: 45 N·m (4.5 kgf·m, 33 lb·ft)
*4th: 15 N·m (1.5 kgf·m, 11 lb·ft)
Specified angle 160°
Cylinder head bolt "11", "12"
12 N·m (1.2 kgf·m, 8.9 lb·ft)

* 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.

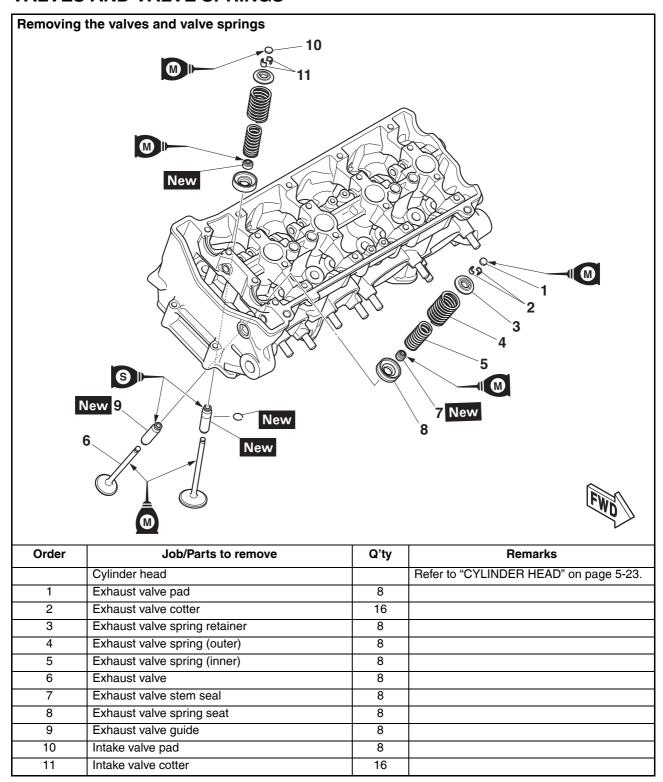


4. Install:

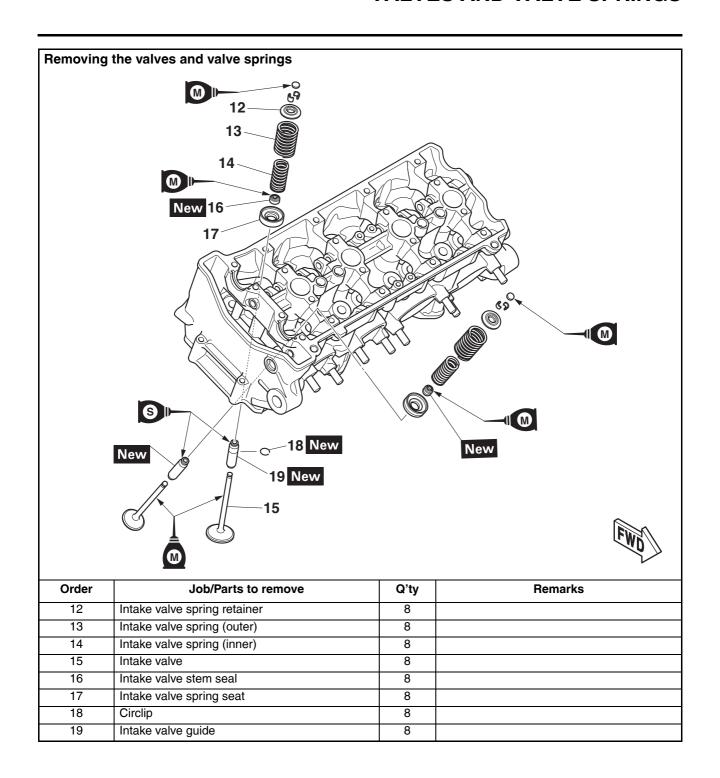
- Exhaust camshaft
- Intake camshaft

FAS2004

VALVES AND VALVE SPRINGS



VALVES AND VALVE SPRINGS



VALVES AND VALVE SPRINGS

EAS30283

REMOVING THE VALVES

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

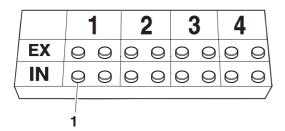
TIP

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

- 1. Remove:
- Valve 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

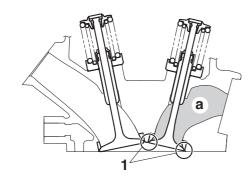
Leakage at the valve seat \rightarrow Check the valve face, valve seat, and valve seat width.

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

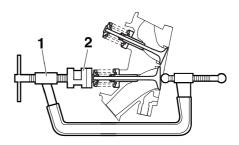
Valve spring compressor YM-04019

Valve spring compressor attachment

90890-01243

Valve spring compressor adapter (26 mm)

YM-01253-1

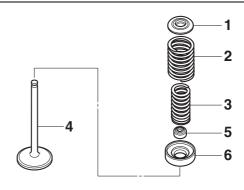


4. Remove:

- Valve spring retainer "1"
- Valve spring (outer) "2"
- Valve spring (inner) "3"
- Valve "4"
- Valve stem seal "5"
- Valve spring seat "6"

TIP

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



E453028

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 → Replace the valve

guide.

 Valve-stem-to-valve-guide clearance = Valve guide inside diameter "a" -Valve stem diameter "b"



Valve-stem-to-valve-guide clearance (intake)

0.010-0.037 mm (0.0004-0.0015 in)

Limit

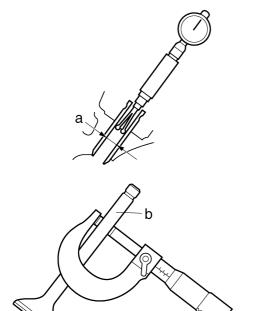
0.080 mm (0.0032 in)

Valve-stem-to-valve-guide clearance (exhaust)

0.025–0.052 mm (0.0010–0.0020

in) Limit

0.100 mm (0.0039 in)

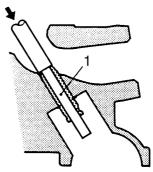


- 2. Replace:
 - Valve guide

TIP -

To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to $100 \,^{\circ}\text{C}$ (212 $^{\circ}\text{F}$) in an oven.

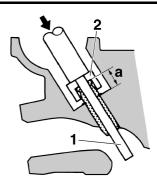
a. Remove the valve guide with the valve guide remover "1".



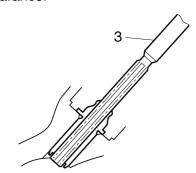
b. Install the new valve guide with the valve guide installer "2" and valve guide remover "1".



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

- 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.

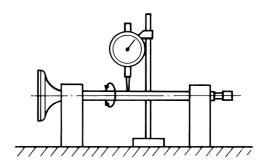
- 5. Measure:
 - Valve stem runout
 Out of specification → Replace the valve.

TIF

- 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)



EAS3028

CHECKING THE VALVE SEATS

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

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



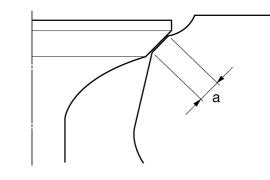
Valve seat contact width (intake) 0.90-1.10 mm (0.0354-0.0433 in) Limit

1.6 mm (0.06 in)

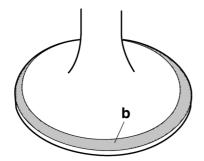
Valve seat contact width (exhaust)

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.
- 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

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

ECA22580

NOTICE

This model uses titanium intake valves. Titanium valves that have been used to lap the valve seats must not be used. Always replace lapped valves with new valves.

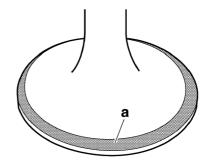
TIP -

- When replacing the intake valves, replace the intake valves without lapping the valve seats and valve faces.
- When replacing the cylinder head or intake valve guides, use new valves to lap the valve seats, and then replace them with new intake valves.
- a. Apply a coarse lapping compound "a" to the valve face.

ECA13790

NOTICE

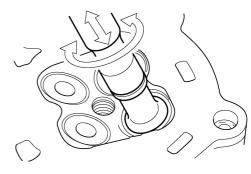
Do not let the lapping compound enter the gap between the valve stem and the valve guide.



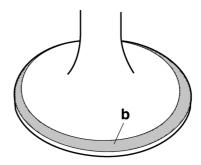
- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

TIP

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



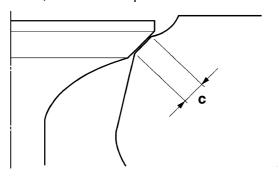
- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply blue layout fluid "b" onto the valve face.



- h. Install the valve into the cylinder head.
- 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.



1. Check:

Valve spring seat
 Damage/scratches → Replace the valve spring seat.



EACONOR

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

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



Inner spring

Free length (intake) 34.52 mm (1.36 in)

Limit

32.79 mm (1.29 in)

Free length (exhaust)

36.94 mm (1.45 in)

Limit

35.09 mm (1.38 in)

Outer spring

Free length (intake)

35.72 mm (1.41 in)

Limit

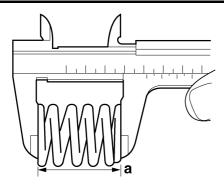
33.93 mm (1.34 in)

Free length (exhaust)

36.85 mm (1.45 in)

Limit

35.01 mm (1.38 in)



EAS31716

CHECKING THE VALVE SPRING SEAT

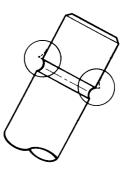
The following procedure applies to all of the valve lifters.

EAS30288

INSTALLING THE VALVES

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

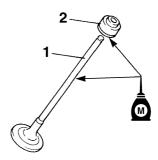
- 1. Deburr:
 - Valve stem end (with an oil stone)



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



Recommended lubricant Molybdenum disulfide oil



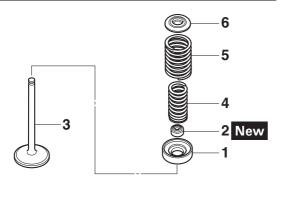
- 3. Install:
 - Valve spring seat "1"
 - Valve stem seal "2" New
 - Valve "3"

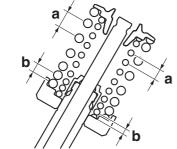
VALVES AND VALVE SPRINGS

- Valve spring (inner) "4"
- Valve spring (outer) "5"
- Valve spring retainer "6" (into the cylinder head)

TIP

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





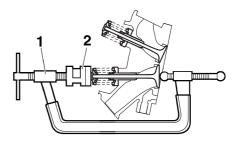
- b. Smaller pitch
- 4. Install:
 - Valve cotters

TIP_

Install the valve cotters by compressing the valve spring with the valve spring compressor "1" and the valve spring compressor attachment "2".



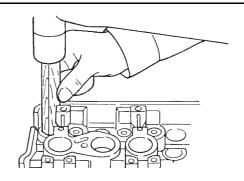
Valve spring compressor 90890-04019 Valve spring compressor YM-04019 Valve spring compressor attachment 90890-01243 Valve spring compressor adapter (26 mm) YM-01253-1



5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

NOTICE

Hitting the valve tip with excessive force could damage the valve.



- 6. Lubricate:
- Valve pad (with the recommended lubricant)



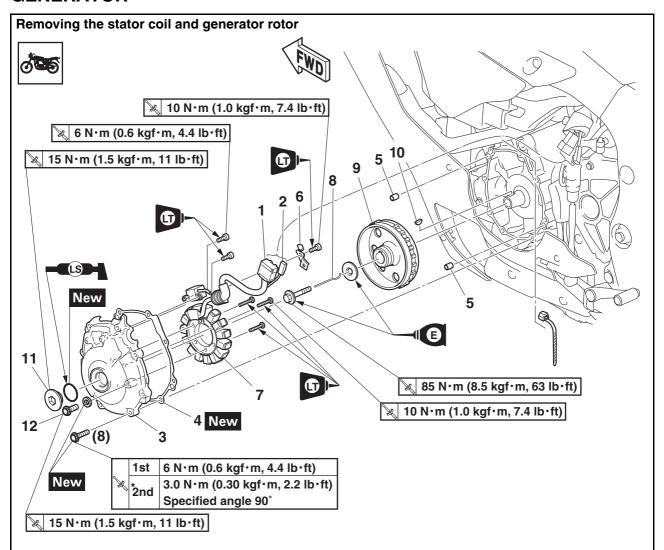
Recommended lubricant Molybdenum disulfide oil

- 7. Install:
 - Valve pad

TIP

Each valve pad must be reinstalled in its original position.

GENERATOR



* Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.

Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-30.
1	Stator coil coupler	1	Disconnect.
2	Crankshaft position sensor coupler	1	Disconnect.
3	Generator cover	1	
4	Generator cover gasket	1	
5	Dowel pin	2	
6	Stator coil lead holder	1	
7	Stator coil assembly (stator coil/crankshaft position sensor)	1	
8	Shaft	1	
9	Generator rotor	1	
10	Woodruff key	1	
11	Crankshaft end cover	1	
12	Timing mark accessing bolt	1	

REMOVING THE GENERATOR

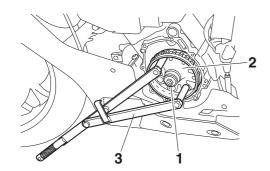
- 1. Remove:
- Generator rotor bolt "1"
- Washer

TIP_

While holding the generator rotor "2" with the 15mm pin type rotor holding tool "3", loosen the generator rotor bolt.



15mm pin type rotor holding tool 90890-04171 YM-04171



2. Install:

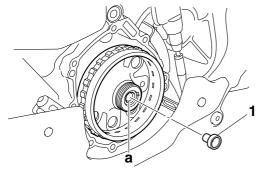
• Crankshaft protector "1"

TIP

Install the crankshaft protector to the hole "a" of the crankshaft.



Crankshaft protector 90890-01382 Crankshaft protector YM-01382



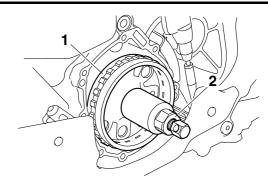
- 3. Remove:
 - Generator rotor "1" (with the flywheel puller "2")
 - Woodruff key

TIP

Install the flywheel puller to the generator rotor.



Flywheel puller 90890-01404 Flywheel puller YM-01404



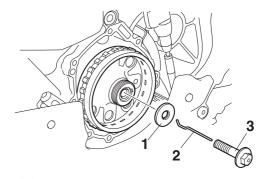
EAS30830

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 N⋅m (8.5 kgf⋅m, 63 lb⋅ft)

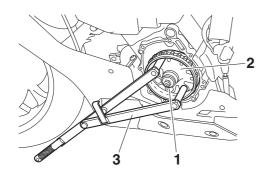
TIP

While holding the generator rotor "2" with the 15mm pin type rotor holding tool "3", tighten the

generator rotor bolt.



15mm pin type rotor holding tool 90890-04171 YM-04171

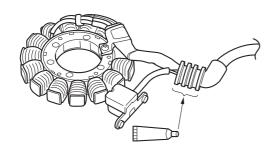


3. Apply:

 Sealant (onto the stator coil assembly lead grommet)



Yamaha bond No. 1215 90890-85505 (Three bond No.1215®)



4. Install:

- Generator cover gasket New
- Generator cover
- Generator cover bolt New

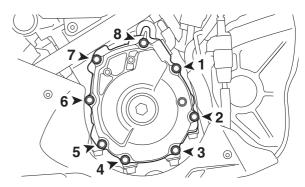


Generator cover bolt
1st: 6 N·m (0.6 kgf·m, 4.4 lb·ft)
*2nd: 3.0 N·m (0.30 kgf·m, 2.2 lb·ft)
Specified angle 90°

* 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 2-41.

FAS2004

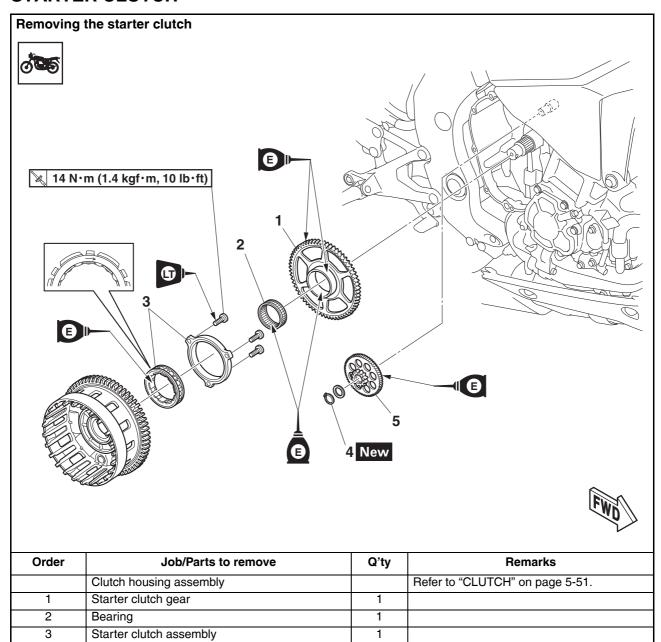
4

5

Circlip

Starter clutch idle gear

STARTER CLUTCH



1

1

REMOVING THE STARTER CLUTCH

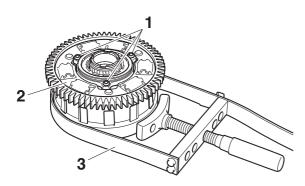
- 1. Remove:
 - Starter clutch bolt "1"

TIP

- 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.



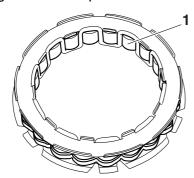
Sheave holder 90890-01701 Primary clutch holder YS-01880-A



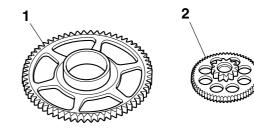
EAS30306

CHECKING THE STARTER CLUTCH

- 1. Check:
- Starter clutch rollers "1"
 Damage/wear → Replace.

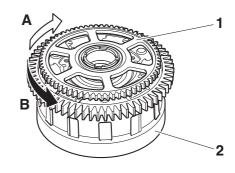


- 2. Check:
 - Starter clutch gear "1"
 - Starter clutch idle gear "2"
 Burrs/chips/roughness/wear → Replace the defective part(s).



- 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.



EAS3030

INSTALLING THE STARTER CLUTCH

- 1. Install:
 - Starter clutch



Starter clutch holder bolt 14 N·m (1.4 kgf·m, 10 lb·ft) LOCTITE®

TIP

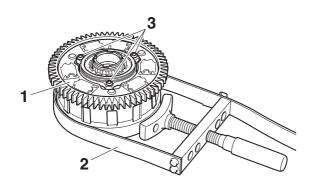
 Install the starter clutch so that the side of the starter clutch roller assembly with the arrow mark is toward the clutch housing.

STARTER CLUTCH

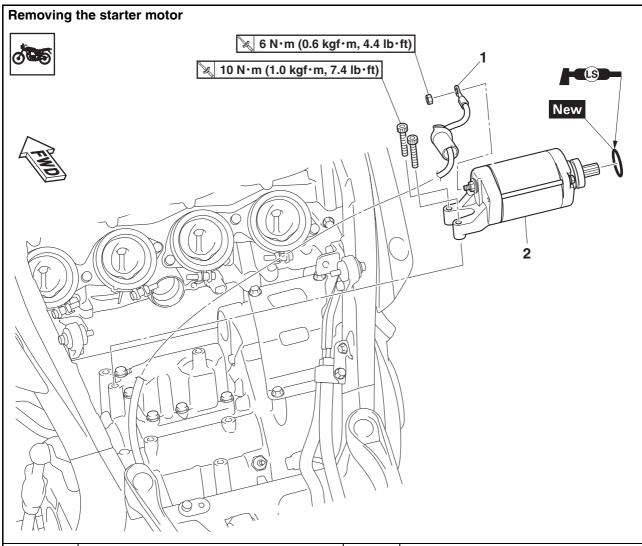
- While holding the clutch housing assembly "1" with the sheave holder "2", tighten the starter clutch holder bolt "3".
- Fix the flat surface of the clutch housing assembly with the sheave holder.



Sheave holder 90890-01701 Primary clutch holder YS-01880-A

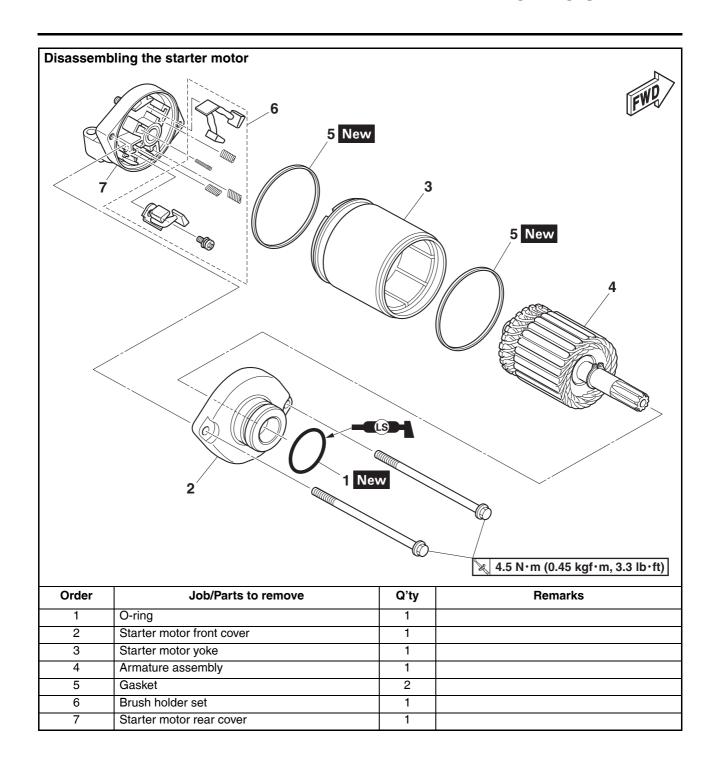


ELECTRIC STARTER



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 7-6.
	Canister		Refer to "FUEL TANK" on page 7-1.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-11.
1	Starter motor lead	1	Disconnect.
2	Starter motor	1	

ELECTRIC STARTER



CHECKING THE STARTER MOTOR

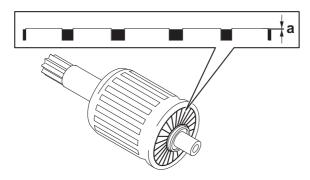
- 1. Check:
- Commutator
 Dirt → Clean with 600 grit sandpaper.
- 2. Measure:
 - Mica undercut "a"
 Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.



Mica undercut (depth) 2.40 mm (0.09 in)

TIP

The mica of the commutator must be undercut to ensure proper operation of the commutator.



- 3. Measure:
- 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.

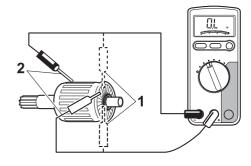


Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927



Armature coil resistance 0.0115–0.0140 Ω Insulation resistance Above 1 M Ω at 20 °C (68 °F)

b. If any resistance is out of specification, replace the starter motor.



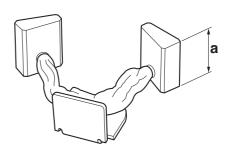
- 1. Commutator resistance
- 2. Insulation resistance

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)

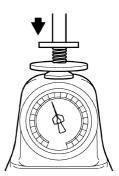


5. Measure:

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 → Replace the starter motor.

- 7. Check:
 - Bearing
 - Oil seal

 $\mbox{Damage/wear} \rightarrow \mbox{Replace the starter motor} \\ \mbox{front cover}.$

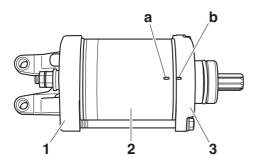
EAS3032

ASSEMBLING THE STARTER MOTOR

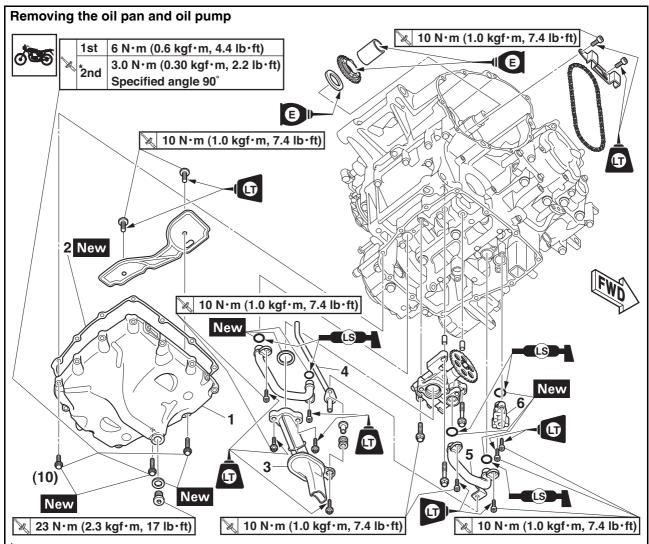
- 1. Install:
 - Starter motor rear cover "1"
 - Starter motor yoke "2"
 - Starter motor front cover "3"

TID

Align the match mark "a" on the starter motor yoke with the match mark "b" on the starter motor front cover.

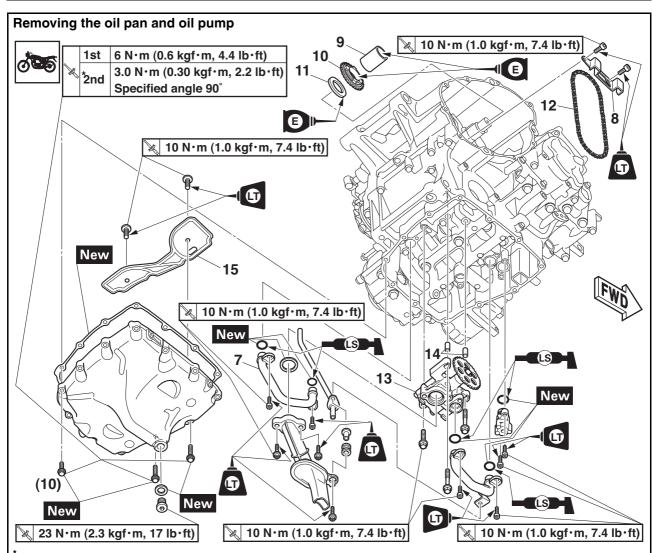


OIL PUMP



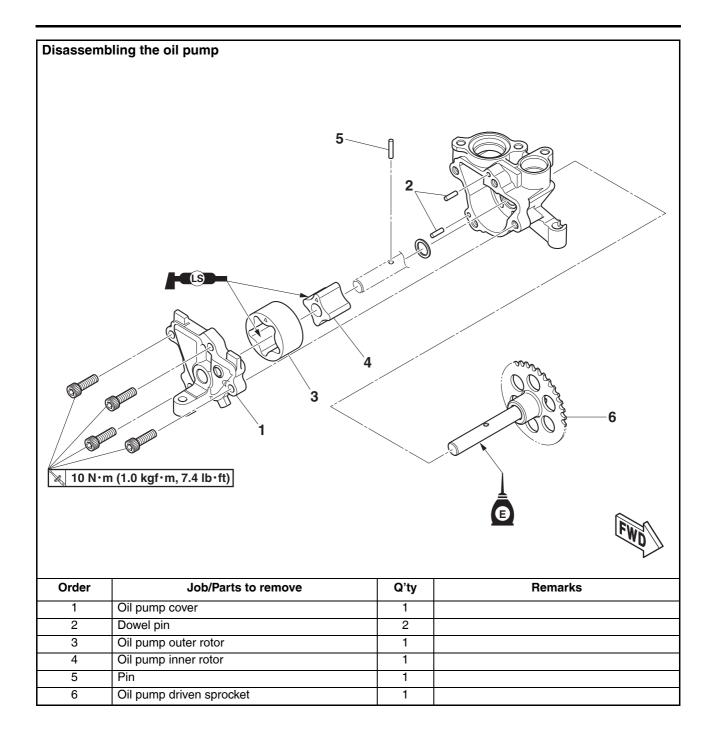
Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.

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/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	



Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.

Order	Job/Parts to remove	Q'ty	Remarks
7	Oil delivery pipe 2	1	
8	Oil pump drive chain guide	1	
9	Collar	1	
10	Oil pump drive sprocket	1	
11	Washer	1	
12	Oil pump drive chain	1	
13	Oil pump	1	
14	Dowel pin	2	
15	Baffle plate	1	

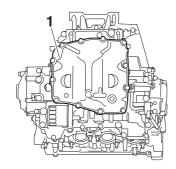


REMOVING THE OIL PAN

- 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.



EAS30336

CHECKING THE SPROCKET AND CHAIN

- 1. Check:
 - Oil pump drive sprocket "1" Cracks/damage/wear → Replace.



2. Check:

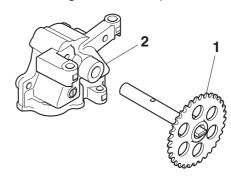
Oil pump drive chain "1"
 Damage/stiffness → Replace the oil pump drive chain and oil pump drive sprocket as a set.



EAS30337

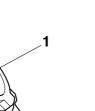
CHECKING THE OIL PUMP

- 1. Check:
 - Oil pump driven sprocket "1"
 Cracks/damage/wear → Replace.
 - Oil pump housing "2"
 Cracks/damage/wear → Replace.



- 2. Measure:
 - Inner-rotor-to-outer-rotor-tip clearance "a"
 - Outer-rotor-to-oil-pump-housing clearance "b"

Out of specification \rightarrow Replace the defective part(s).

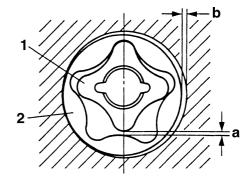


Inner-rotor-to-outer-rotor-tip clearance 0.000-0.012 mm (0.0000-0.0005 in) Limit

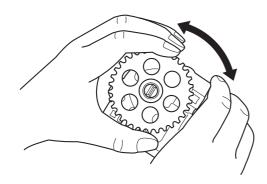
0.14 mm (0.0055 in)
Outer-rotor-to-oil-pump-housing clearance

0.09-0.15 mm (0.0035-0.0059 in) Limit

0.22 mm (0.0087 in)

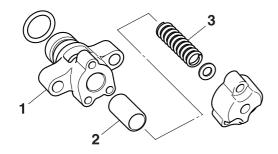


- 1. Inner rotor
- 2. Outer rotor
- 3. Check:
 - Oil pump operation
 Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



CHECKING THE RELIEF VALVE

- 1. Check:
- Relief valve body "1"
- Relief valve "2"
- Spring "3"
- Damage/wear → Replace the defective part(s).



EAS30339

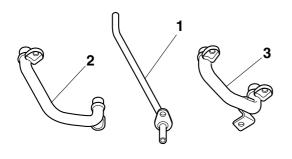
CHECKING THE OIL DELIVERY PIPES

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 → Replace.

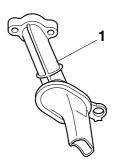
Obstruction \rightarrow Wash and blow out with compressed air.



EAS30340

CHECKING THE OIL STRAINER

- 1. Check:
 - Oil strainer "1"
 Damage → Replace.
 Contaminants → Clean with solvent.



EAS30342

ASSEMBLING THE OIL PUMP

- 1. Lubricate:
- Inner rotor
- Outer rotor
- Oil pump shaft (with the recommended lubricant)



Recommended lubricant Engine oil

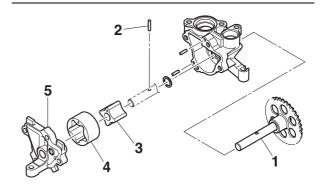
- 2. Install:
- Oil pump driven sprocket "1"
- Pin "2"
- Inner rotor "3"
- Outer rotor "4"
- Oil pump cover "5"
- Oil pump housing bolt



Oil pump housing bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

When installing the inner rotor, align the pin "2" in the oil pump shaft with the groove in the inner rotor "3".



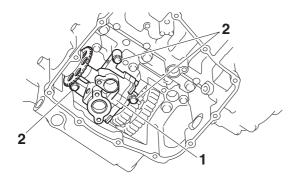
- 3. Check:
 - Oil pump operation Refer to "CHECKING THE OIL PUMP" on page 5-47.

INSTALLING THE OIL PUMP

- 1. Install:
 - Dowel pin
 - Oil pump "1"
 - Oil pump bolt "2"



Oil pump bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)



- 2. Install:
 - Washer
 - Oil pump drive chain "1"
 - Oil pump drive sprocket "2"
 - Collar

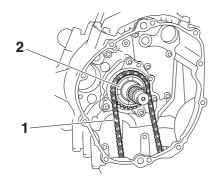
TIP

Install the oil pump drive chain "1" onto the oil pump drive sprocket "2".

ECA22830

NOTICE

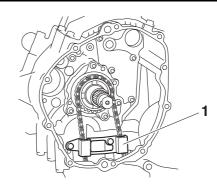
After installing the oil pump drive chain and drive sprocket, make sure the oil pump turns smoothly.



- 3. Install:
 - Oil pump drive chain guide "1"



Oil pump drive chain guide bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®



- 4. Install:
 - O-ring New
- Oil pipe 1 "1"



Oil pipe 1 bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®

- O-ring New
- Oil delivery pipe 1 "2"
- Oil strainer "3"

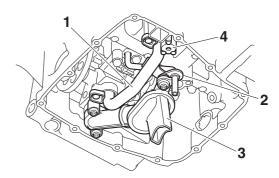


Oil strainer bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®

- O-ring New
- Relief valve assembly "4"



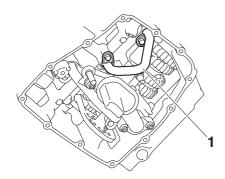
Relief valve assembly bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®



- 5. Install:
 - O-ring New
 - Oil delivery pipe 2 "1"



Oil delivery pipe 2 bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®



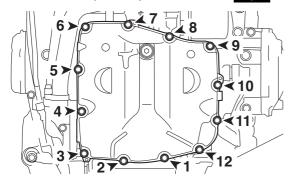
EAS30345

INSTALLING THE OIL PAN

- 1. Install:
 - Oil pan gasket New
 - Oil pan
 - Oil pan bolt (x 12)
 - M6 × 25 mm (0.98 in) bolts: "1"-"6", "9"-"12"

New

• M6 × 30 mm (1.18 in) bolts: "7", "8" New



2. Tighten:

• Oil pan bolt



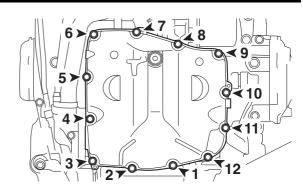
Oil pan bolt

1st: 6 N·m (0.6 kgf·m, 4.4 lb·ft)
*2nd: 3.0 N·m (0.30 kgf·m, 2.2 lb·ft)
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.

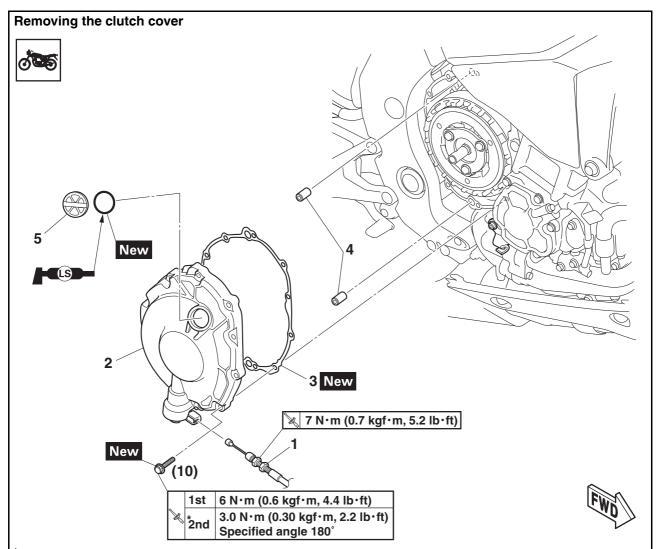


- 3. Install:
- Engine oil drain bolt
- Gasket New



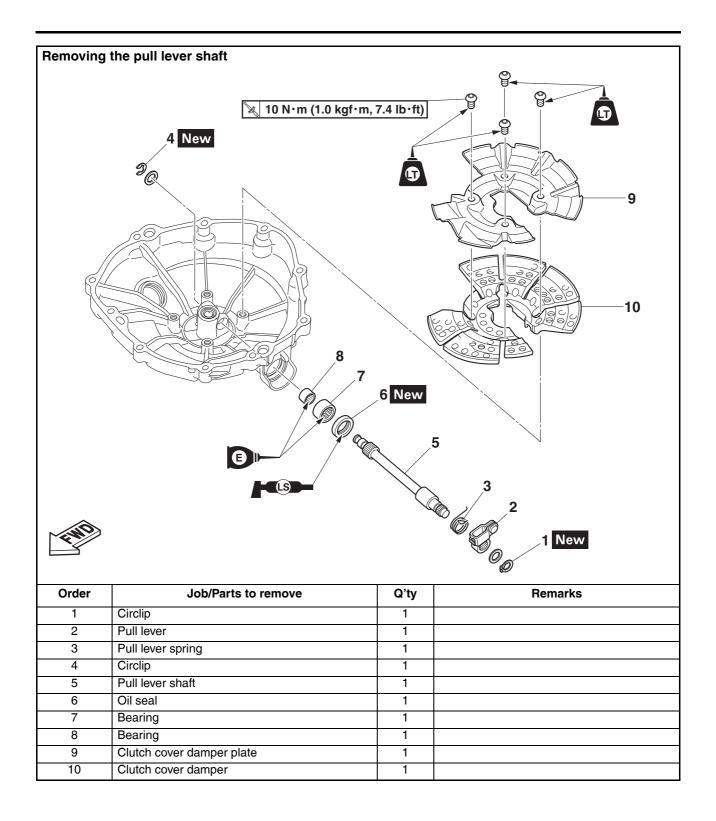
Engine oil drain bolt 23 N·m (2.3 kgf·m, 17 lb·ft)

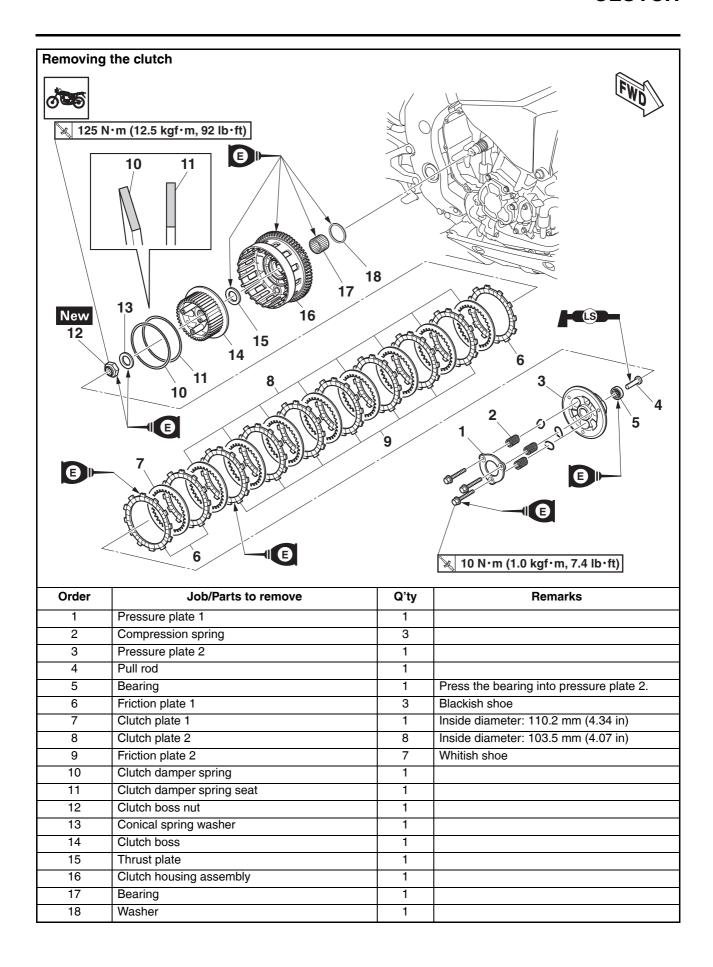
CLUTCH



Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.

Order	Job/Parts to remove	Q'ty	Remarks
	Front side cowling (right)		Refer to "GENERAL CHASSIS (2)" on page 4-7.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-30.
1	Clutch cable	1	Disconnect.
2	Clutch cover	1	
3	Clutch cover gasket	1	
4	Dowel pin	2	
5	Oil filler cap	1	





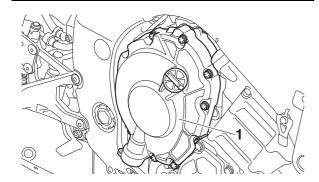
REMOVING THE CLUTCH

- 1. Remove:
 - Clutch cover "1"
 - Gasket

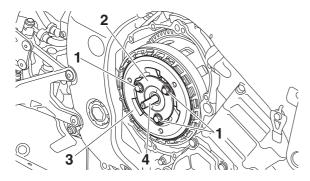
TIP -

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.

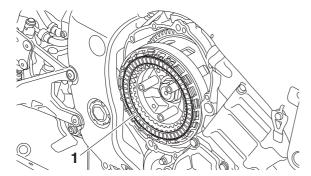
After all of the bolts are fully loosened, remove them.



- 2. Remove:
 - Compression spring bolts "1"
 - Pressure plate 1 "2"
 - Compression springs
 - Pressure plate 2 "3"
 - Pull rod "4"

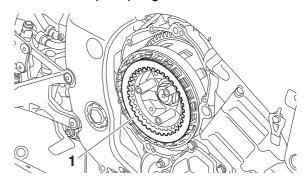


- 3. Remove:
 - Friction plates 1 "1"

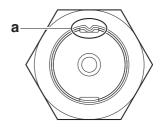


- 4. Remove:
 - Clutch plate 1 "1"
 - Clutch plates 2

- Friction plates 2
- Clutch damper spring
- Clutch damper spring seat



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



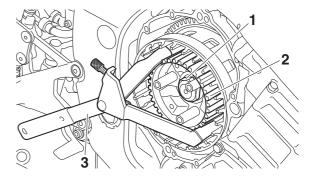
- 6. Loosen:
 - Clutch boss nut "1"

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.



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



- 7. Remove:
 - Clutch boss nut
 - Conical spring washer
 - Clutch boss

- Thrust plate
- Clutch housing assembly
- Bearing
- Washer

CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

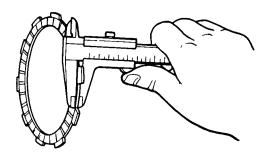
- 1. Check:
 - Friction plate 1 (blackish shoe)
 - Friction plate 2 (whitish shoe)
 Damage/wear → Replace the friction plates as a set.
- 2. Measure:
 - Friction plate 1, 2 thickness
 Out of specification → Replace the friction plates as a set.

TIP

Measure the friction plate at four places.



Friction plate 1 thickness 2.72–2.88 mm (0.107–0.113 in) Wear limit 2.62 mm (0.103 in) Friction plate 2 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.

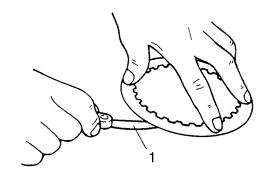
- 1. Check:
 - Clutch plate 1, 2
 Damage → Replace the clutch plates as a set.
- 2. Measure:
 - Clutch plate 1, 2 warpage
 (with a surface plate and thickness gauge "1")
 Out of specification → Replace the clutch plates as a set.



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



Clutch plate 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

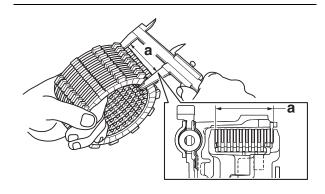
Out of specification \rightarrow Adjust.



Assembly width 48.3–49.3 mm (1.90–1.94 in)

TIP

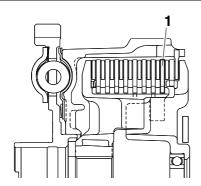
- Perform the thickness measurement without applying the oil.
- This step should be performed only if the friction plates and clutch plates were replaced.
- To measure the total width of the friction plates and clutch plates, combine 10 friction plates and 9 clutch plates as shown.



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)			



EAS3035

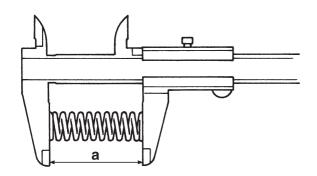
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

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



Clutch spring free length 47.36 mm (1.86 in) Limit 44.99 mm (1.77 in)



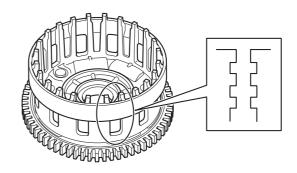
EAS30352

CHECKING THE CLUTCH HOUSING

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

TIP

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



- 2. Check:
- Bearing
 Damage/wear → Replace the bearing and clutch housing.

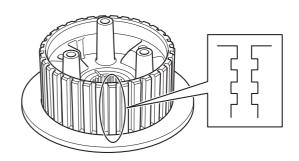
EAS30353

CHECKING THE CLUTCH BOSS

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

TIP

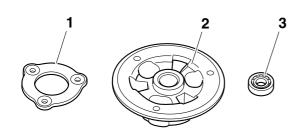
Pitting on the clutch boss splines will cause erratic clutch operation.



EAS30354

CHECKING THE PRESSURE PLATE

- 1. Check:
- Pressure plate 1 "1"
- Pressure plate 2 "2"
 Cracks/damage → Replace.
- Bearing "3"
 Damage/wear → Replace.



CHECKING THE PRIMARY DRIVE GEAR

- 1. Check:
 - Primary drive gear
 Damage/wear → Replace the crankshaft and clutch housing as a set.

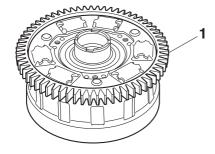
Excessive noise during operation \rightarrow Replace the crankshaft and clutch housing as a set.

EAS30357

CHECKING THE PRIMARY DRIVEN GEAR

- 1. Check:
 - Primary driven gear "1"
 Damage/wear → Replace the clutch housing and crankshaft as a set.

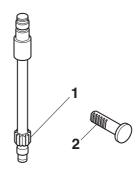
Excessive noise during operation \rightarrow Replace the clutch housing and crankshaft as a set.



EAS3035

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

TIP

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"

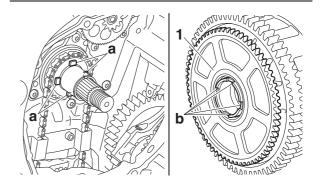
CA22570

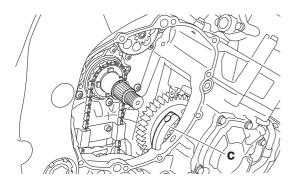
NOTICE

Make sure to fit the projections "a" of the oil pump drive sprocket to the concave "b" of the clutch housing assembly.

TIP

When installing the clutch housing assembly, turn the crankshaft so that the crankshaft web "c" cannot be seen.





2. Install:

- Thrust plate
- Clutch boss "1"
- Conical spring washer "2"
- Clutch boss nut "3" New



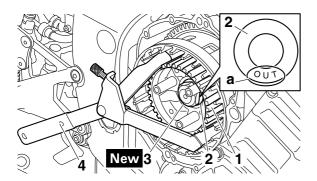
Clutch boss nut 125 N·m (12.5 kgf·m, 92 lb·ft)

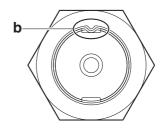
TIP

- 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.



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





3. Lubricate:

- Friction plates
- Clutch plates (with the recommended lubricant)



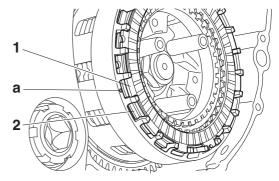
Recommended lubricant Engine oil

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:

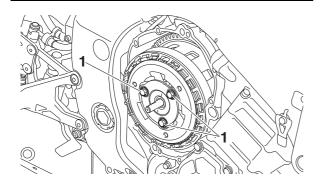
- Pull rod
- Pressure plate 2
- Clutch springs
- Pressure plate 1
- Clutch spring bolts "1"

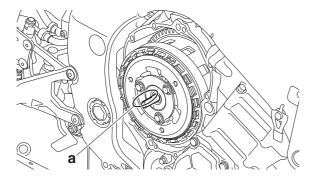


Clutch spring bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

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

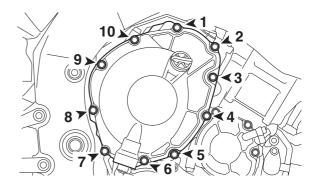


Clutch cover bolt
1st: 6 N·m (0.6 kgf·m, 4.4 lb·ft)
2nd: 3.0 N·m (0.30 kgf·m, 2.2 lb·ft)
Specified angle 180°

* 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.

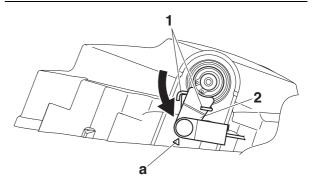


8. Install:

- Pull lever spring "1"
- Pull lever "2"
- Washer
- Circlip New

TIF

- 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.



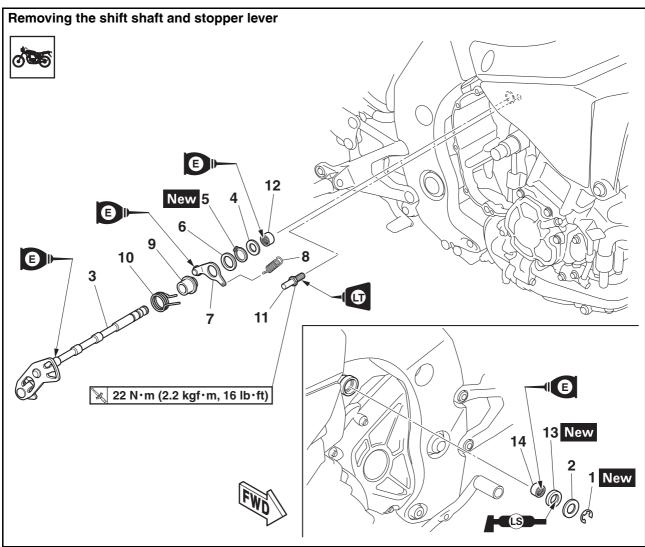
9. Adjust:

 Clutch lever free play Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-14.



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

SHIFT SHAFT

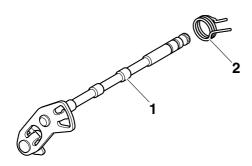


Order	Job/Parts to remove	Q'ty	Remarks
	Clutch assembly		Refer to "CLUTCH" on page 5-51.
	Shift arm		Refer to "CHAIN DRIVE" on page 4-118.
1	Circlip	1	
2	Washer	1	
3	Shift shaft	1	
4	Washer	1	
5	Circlip	1	
6	Washer	1	
7	Stopper lever	1	
8	Stopper lever spring	1	
9	Collar	1	
10	Shift shaft spring	1	
11	Shift shaft spring stopper	1	
12	Bearing	1	
13	Oil seal	1	
14	Bearing	1	

CHECKING THE SHIFT SHAFT

- 1. Check:
 - Shift shaft "1" Bends/damage/wear → Replace.
 - Shift shaft spring "2"
 - Collar

Damage/wear \rightarrow Replace.



EAS30378

CHECKING THE STOPPER LEVER

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



EAS3038

INSTALLING THE SHIFT SHAFT

- 1. Install:
 - Shift shaft spring stopper "1"
 - · Shift shaft assembly
 - Stopper lever spring "2"

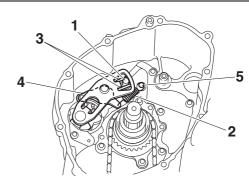


Shift shaft spring stopper 22 N⋅m (2.2 kgf⋅m, 16 lb⋅ft) LOCTITE®

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-

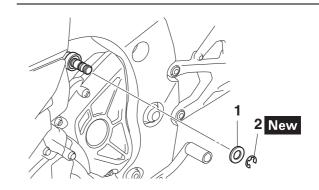
ment assembly.



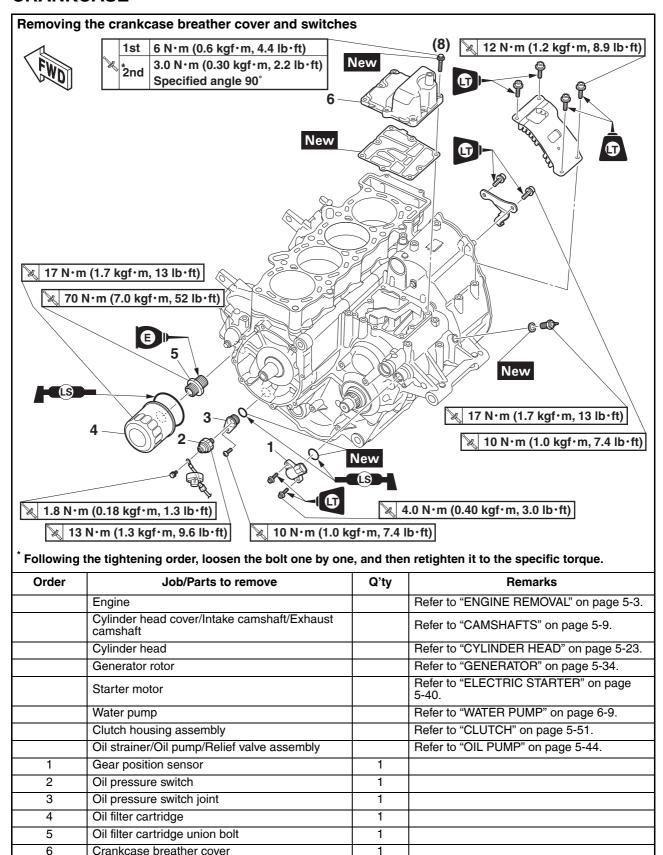
- 2. Install:
- Bearing
- Oil seal New
- Washer "1"
- Circlip "2" New

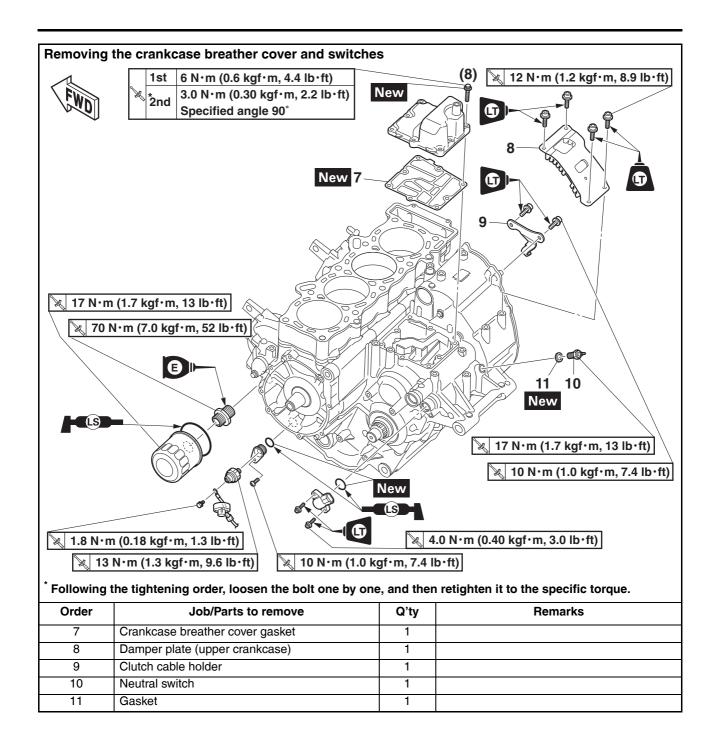
TIP -

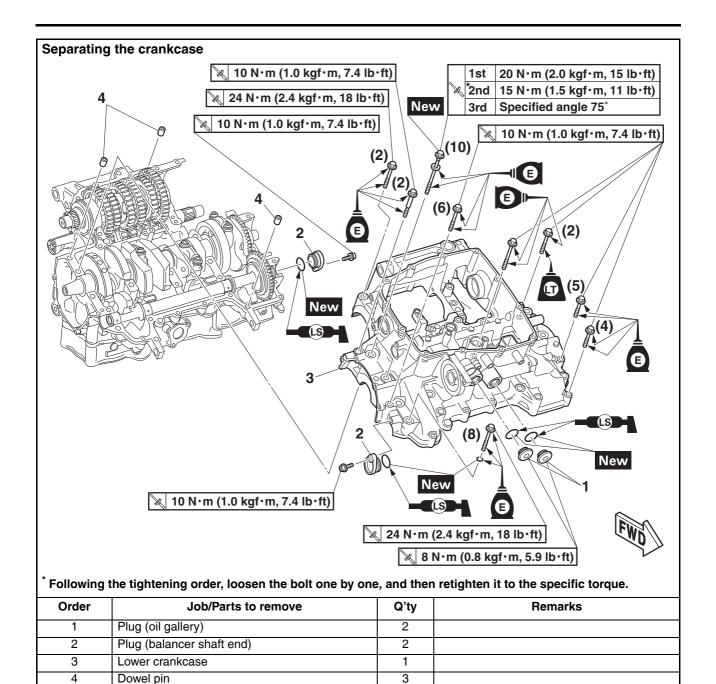
- Lubricate the oil seal lips with lithium-soapbased grease.
- Lubricate the outer periphery of the oil seal with the silicone fluid.



CRANKCASE





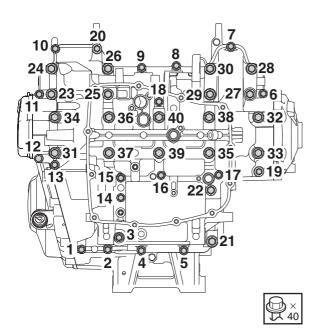


DISASSEMBLING THE CRANKCASE

- 1. Place the engine upside down.
- 2. Remove:
 - Crankcase bolt (× 40)

TIP_

- Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.
- Loosen the bolts in the proper sequence as shown.
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.



- 3. Remove:
- Lower crankcase

ECA13900

NOTICE

Tap on one side of the crankcase with a 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)

TIF

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

EAS30390

CHECKING THE CRANKCASE

- 1. Thoroughly wash the crankcase halves in a mild solvent.
- 2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
- 3. Check:
 - Crankcase
 Cracks/damage → Replace.
 - Oil delivery passages
 Obstruction → Blow out with compressed air.

EAS30397

ASSEMBLING THE CRANKCASE

- 1. Lubricate:
- Crankshaft journal bearing inner surface (with the recommended lubricant)



Recommended lubricant Engine oil

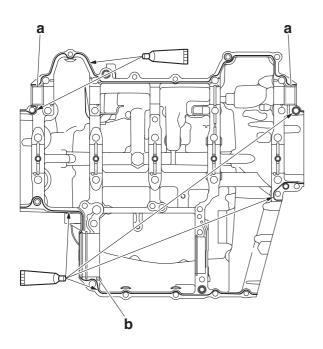
- 2. Apply:
 - Sealant (onto the crankcase mating surfaces)



Yamaha bond No. 1215 90890-85505 (Three bond No.1215®)

TIP

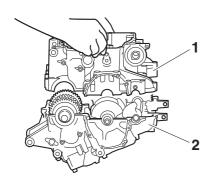
- Do not allow any sealant to come into contact with the oil gallery or crankshaft journal bearings, or balancer shaft journal bearings.
- Remove the sealant from the area "a" as shown in the illustration.
- Make sure that the sealant does not get into the groove "b" in the crankcase.



- 3. Install:
 - Dowel pins
- 4. Set the shift drum assembly and transmission gears in the neutral position.
- 5. Install:
 - Lower crankcase "1" (onto the upper crankcase "2")

ECA13980
NOTICE

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

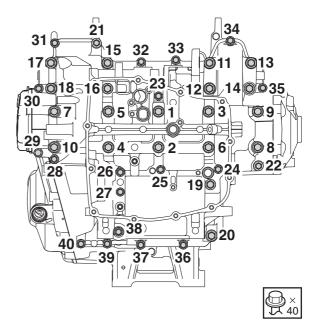


- 6. Install:
 - Crankcase bolt (x 40)

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" New
- M8 × 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 \times 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"



Crankcase bolts "1"-"10"
1st: 20 N·m (2.0 kgf·m, 15 lb·ft)
*2nd: 15 N·m (1.5 kgf·m, 11 lb·ft)
3rd: Specified angle 75°

Following the tightening order, loosen the bolt one by one and then retighten it to the specific torque.

WARNING

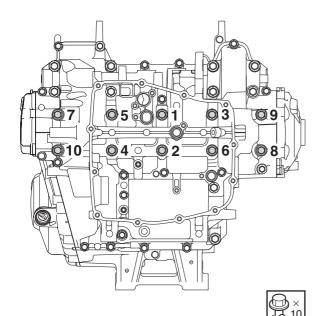
If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

ECA20890
NOTICE

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:

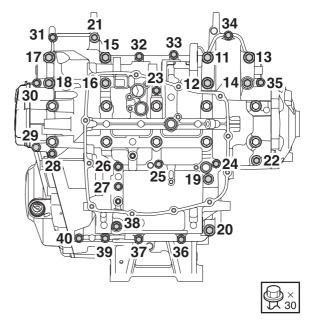
• Crankcase bolts "11"-"40"



Crankcase bolts "11"-"20" 24 N·m (2.4 kgf·m, 18 lb·ft) Crankcase bolts "21"-"40" 10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

Tighten the bolts "11"—"18" in the tightening sequence cast on the crankcase.



EAS31718

INSTALLING THE CRANKCASE BREATHER COVER

- 1. Install:
- Crankcase breather cover
- Crankcase breather cover bolt New
- 2. Tighten:
 - Crankcase breather cover bolt

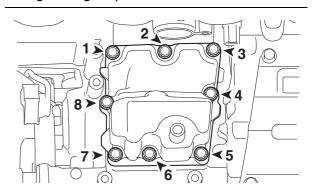


Crankcase breather cover bolt 1st: 6 N·m (0.6 kgf·m, 4.4 lb·ft) *2nd: 3.0 N·m (0.30 kgf·m, 2.2 lb·ft) Specified angle 90°

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 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 N·m (1.3 kgf·m, 9.6 lb·ft) Oil pressure switch lead bolt 1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

TIP

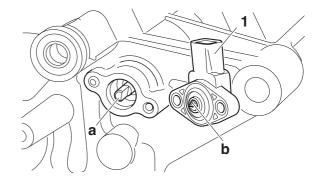
- Apply Three Bond No. 1215B® to the threads "a" of the oil pressure switch. However, do not apply Three Bond No. 1215B® to the portion "b" of the oil pressure switch.
- Install the oil pressure switch lead so that it is routed within the range shown in the illustration.

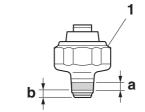


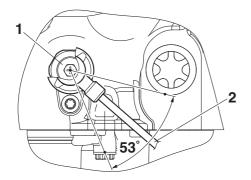
Gear position sensor bolt 4.0 N·m (0.40 kgf·m, 3.0 lb·ft) LOCTITE®

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".







FAS31658

INSTALLING THE GEAR POSITION SENSOR

ECA2263

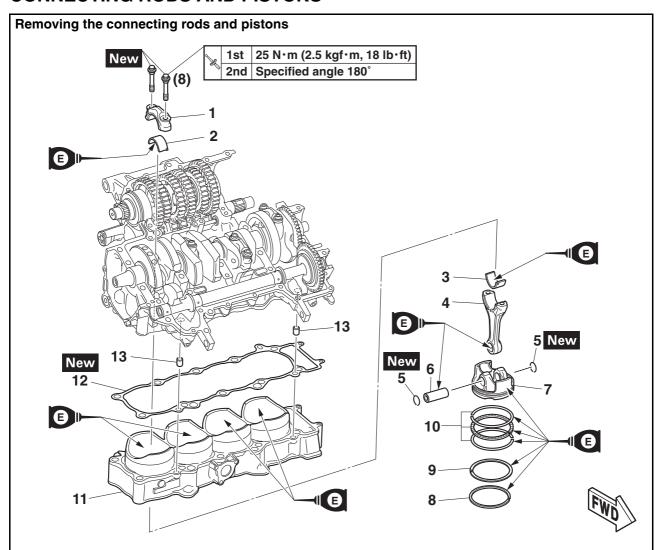
NOTICE

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"

FAS2013

CONNECTING RODS AND PISTONS



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Refer to "CRANKCASE" on page 5-62.
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	

EAS30745

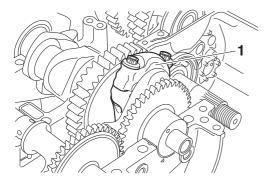
REMOVING THE CONNECTING RODS AND PISTONS

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

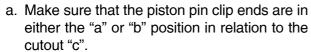
- 1. Remove:
 - Connecting rod cap "1"
- Connecting rod
- Big end bearings

TIF

- 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.

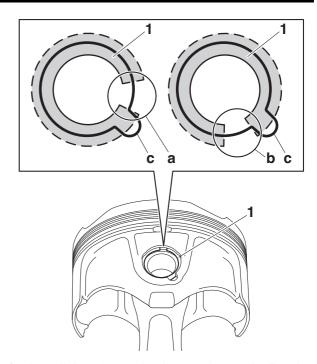


- 2. Remove:
 - Piston pin clip "1"



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).



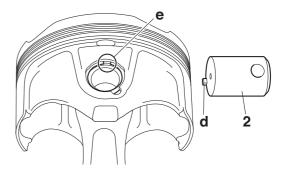
b. Install the piston pin clip rotation tool "2" to the piston pin clip.

TIP

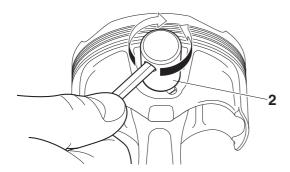
When installing the piston pin clip rotation tool, align the projection "d" on the piston pin clip rotation tool with the clip ends "e".

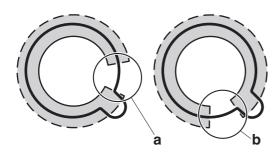


Piston pin clip rotation tool 90890-04175 YM-04175



c. Turn the piston pin clip rotation tool "2" so that the piston pin clip ends are positioned at "a" or "b".

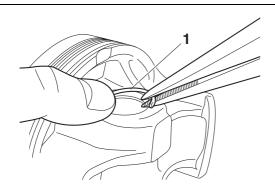




d. Remove the piston pin clip "1" using longnose pliers or a similar tool.

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

NOTICE

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

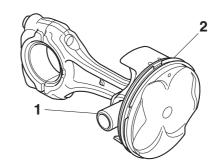
TIP

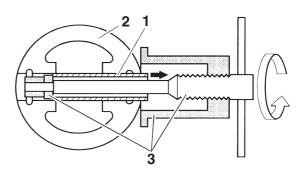
- For reference during installation, put identification marks on the piston crown.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are deburred and the piston

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

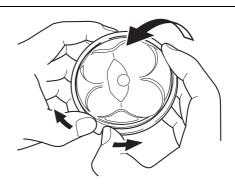




- 4. Remove:
 - Top ring
 - 2nd ring
 - Oil ring

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.



EAS30747

CHECKING THE CYLINDER AND PISTON

- 1. Check:
- Piston wall
- Cylinder wall
 Vertical scratches → 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.

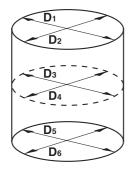
TIP_

Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder.



Bore 79.000–79.010 mm (3.1102– 3.1106 in) Wear limit 79.060 mm (3.1126 in)

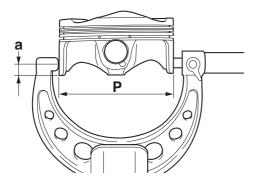
"C" = maximum of D_1 , D_2 , D_3 , D_4 , D_5 , D_6



- 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.



Piston Diameter 78.955–78.970 mm (3.1085– 3.1090 in)



- 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

EAS30748

CHECKING THE PISTON RINGS

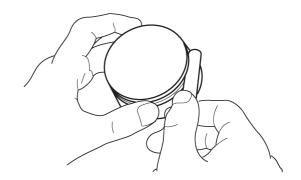
- 1. Measure:
- Piston ring side clearance
 Out of specification → Replace the piston and piston rings as a set.

TIP

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.



Piston ring
Top ring
Ring side clearance
0.030–0.065 mm (0.0012–0.0026 in)
Side clearance limit
0.115 mm (0.0045 in)
2nd ring
Ring side clearance
0.020–0.055 mm (0.0008–0.0022 in)
Side clearance limit
0.115 mm (0.0045 in)



- 2. Install:
- Piston ring (into the cylinder)

TIF

Use the piston crown to level the piston ring near bottom of cylinder "a", where cylinder wear is lowest.

3. Measure:

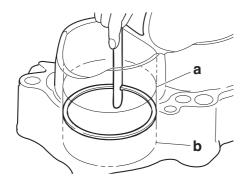
Piston ring end gap
 Out of specification → Replace the piston ring.

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.



Top ring
End gap limit
0.50 mm (0.0197 in)
2nd ring
End gap limit
1.15 mm (0.0453 in)



b. Upper of cylinder

EAS30749

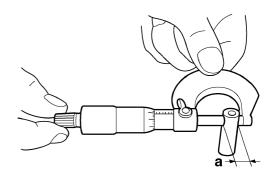
CHECKING THE PISTON PIN

The following procedure applies to all of the piston pins.

- 1. Measure:
 - Piston pin outside diameter "a"
 Out of specification → Replace the piston pin.



Piston pin outside diameter 16.991–17.000 mm (0.6689– 0.6693 in) Limit 16.971 mm (0.6681 in)

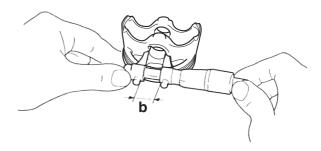


2. Measure:

Piston pin bore inside diameter "b"
 Out of specification → Replace the piston.



Piston pin bore inside diameter 17.002–17.013 mm (0.6694– 0.6698 in) Limit 17.043 mm (0.6710 in)



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)

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.

ECA13930

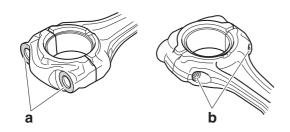
NOTICE

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

a. Clean the big end bearings, crankshaft pins, and the connecting rods with oil cleaner.

TIP

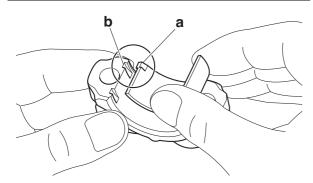
When cleaning the connecting rod, clean the bearing surface "a" of the connecting rod bolt and threads "b".



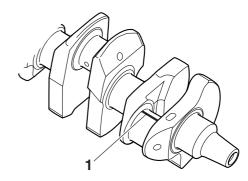
- b. Wait five minutes to dry the remaining oil cleaner component.
- c. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

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.

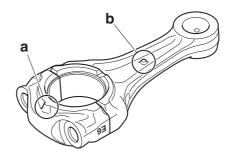
ECA18390

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 "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.



TIP

Install by carrying out the following procedures in order to assemble in the most suitable condition.

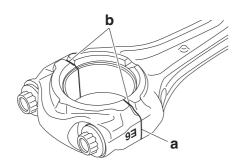
f. Tighten the connecting rod bolt while checking that the sections shown "a" and "b" are flush with each other by touching the surface.



Connecting rod bolt 30 N·m (3.0 kgf·m, 22 lb·ft)

TIP

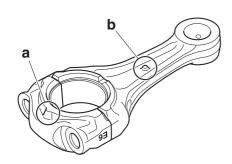
To install the connecting rod cap, care should be taken not to install it at an angle and the position should not be out of alignment.

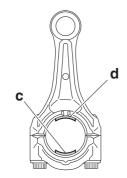


- a. Side machined face
- b. Thrusting faces
- g. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

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 "o" mark "b" on the connecting rod.
- Make sure the "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".



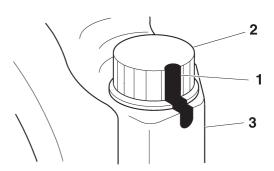


h. Tighten the connecting rod bolts with a torque wrench.



Connecting rod bolt (1st) 25 N·m (2.5 kgf·m, 18 lb·ft)

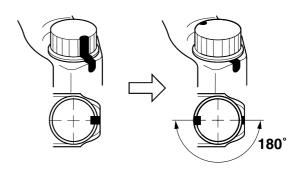
i. Put a mark "1" on the corner of the connecting rod bolt "2" and the connecting rod cap "3".



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 N·m (4.0 kgf·m, 30 lb·ft) to 85 N·m (8.5 kgf·m, 63 lb·ft) 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).



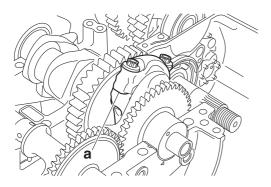
Connecting rod bolt (final) Specified angle 175°–185°



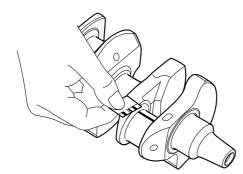
WARNING

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 crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



2. Select:

• Big end bearings (P₁-P₄)

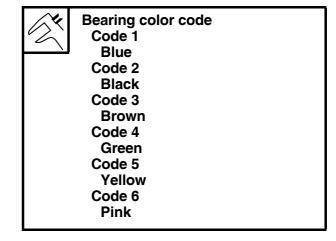
TID

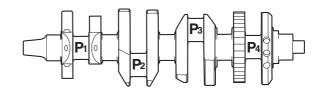
• The numbers "A" stamped into the crankshaft web and the numbers "1" on the connecting rods are used to determine the replacement big end bearings sizes.

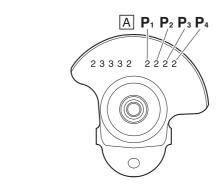
• "P₁"-"P₄" refer to the bearings shown in the crankshaft illustration.

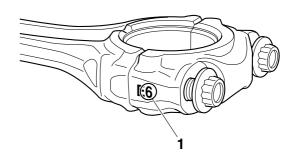
For example, if the connecting rod "P₁" and the crankshaft web "P₁" numbers are 6 and 2 respectively, then the bearing size for "P₁" is:

" P_1 " (connecting rod) - " P_1 " (crankshaft web) = 6 - 2 = 4 (green)









EAS30751

INSTALLING THE CONNECTING ROD AND PISTON

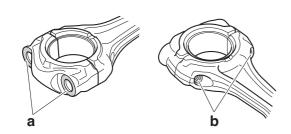
The following procedure applies to all of the connecting rods and pistons.

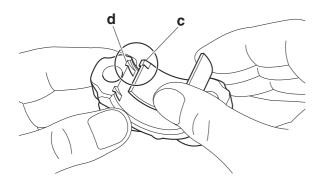
- 1. Install:
 - Big end bearings
 - Connecting rod cap

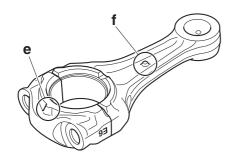
(onto the connecting rod)

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 connecting 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 "o" mark "f" on the connecting rod.







- 2. Tighten:
 - Connecting rod bolts New

ECA18390

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.

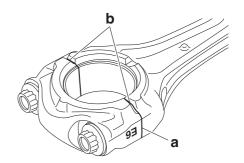
- Replace the connecting rod bolts with new ones.
- b. After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.
- c. Tighten the connecting rod bolt while checking that the sections shown "a" and "b" are flush with each other by touching the surface.



Connecting rod bolt 30 N·m (3.0 kgf·m, 22 lb·ft)

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.



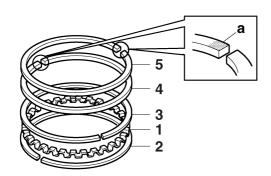
- a. Side machined face
- b. Thrusting faces
- d. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

- 3. Install:
 - Oil ring expander "1"
 - Lower oil ring rail "2"
 - Upper oil ring rail "3"
 - 2nd ring "4"
 - Top ring "5"

(into the piston)

TIP -

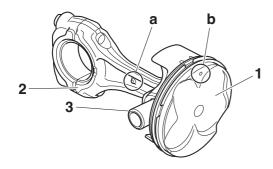
Be sure to install the piston rings so that the manufacturer's marks or numbers "a" face up.



- 4. Install:
 - Piston "1" (onto the respective connecting rod "2")
 - Piston pin "3"

TIP

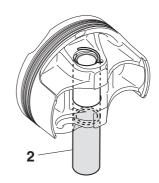
- Apply engine oil onto the piston pin.
- Make sure that the "o" mark "a" on the connecting rod faces left when the punch mark "b" on the piston is pointing up as shown.
- Reinstall each piston into its original cylinder.



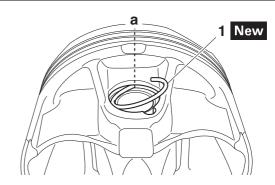
- 5. Install:
- Piston pin clip "1" New
- a. Install the piston pin clip "1" in the piston as shown in the illustration.

TIP

When installing the first piston pin clip, place other piston pin "2" under the piston pin as shown in the illustration.



Align the piston pin clip end with the position "a".



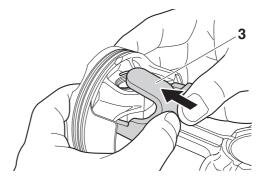
b. Push the piston pin clip insertion tool "3" in the direction as shown in the illustration and place the piston pin clip into the piston pin bore.

TIP

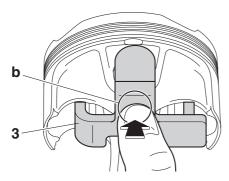
Push in the piston pin clip insertion tool while holding it parallel with the upper surface of the piston and rear surface of the piston pin clip insertion tool.



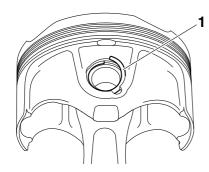
Piston pin clip insertion tool 90890-04173 YM-04173



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.



d. Make sure the piston pin clip "1" is positioned as shown in the illustration.

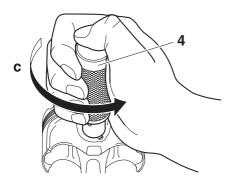


e. Install the piston pin clip installer tool "4" onto the piston.

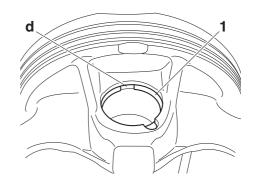


Piston pin clip installer tool 90890-04174 YM-04174

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".

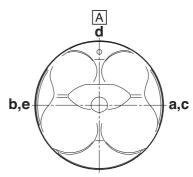


- 6. Lubricate:
- Piston
- Piston rings
- Cylinder (with the recommended lubricant)



Recommended lubricant Engine oil

- 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)



Recommended lubricant Engine oil

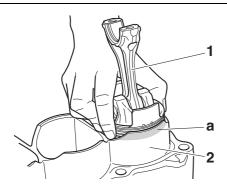
- 9. Install:
 - Piston assemblies "1" (into the cylinder "2")

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".

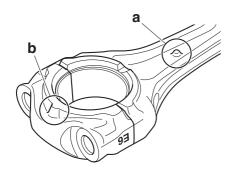


10.Install:

- Cylinder gasket New
- Dowel pins
- Cylinder assembly
- Connecting rod caps
- Connecting rod bolts

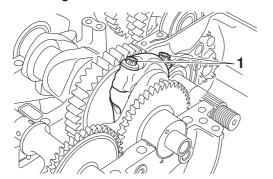
TIP

- Make sure the "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 "o" mark "a" on the connecting rod.



11.Tighten:

• Connecting rod bolts "1"



TIP

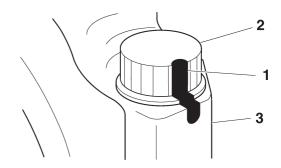
Tighten the connecting rod bolts using the following procedure.

a. Tighten the connecting rod bolts with a torque wrench.



Connecting rod bolt (1st) 25 N·m (2.5 kgf·m, 18 lb·ft)

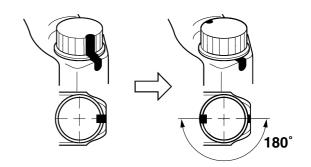
b. Put a mark "1" on the corner of the connecting rod bolt "2" and the connecting rod cap "3".



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 N·m (4.0 kgf·m, 30 lb·ft) to 85 N·m (8.5 kgf·m, 63 lb·ft) 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).



Connecting rod bolt (final) Specified angle 175°–185°



MARNING

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.

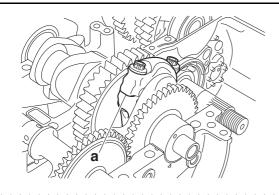
d. After the installation, check that the section shown "a" is flush with each other by touching

the surface.

EWA17120

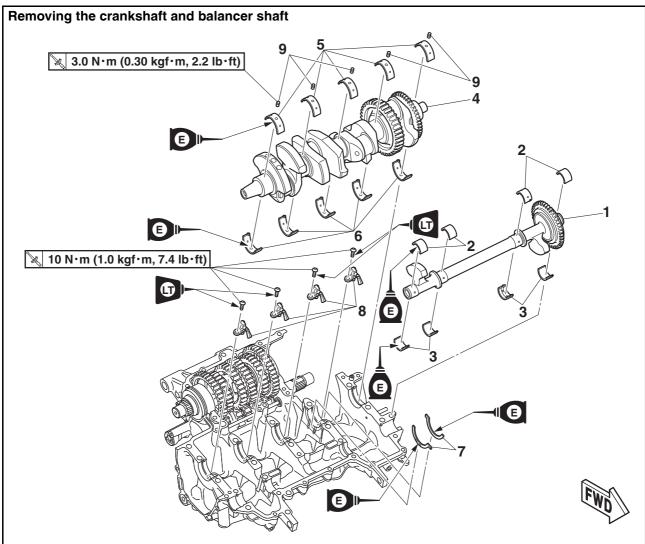
WARNING

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.



FAS2017

CRANKSHAFT AND BALANCER SHAFT



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Refer to "CRANKCASE" on page 5-62.
	Connecting rod		Refer to "REMOVING THE CONNECTING RODS AND PISTONS" on page 5-70.
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	Thrust bearing	2	
8	Oil nozzle 1	4	
9	Oil nozzle 2	5	

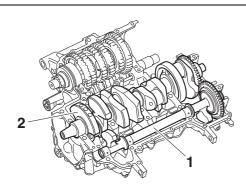
EAS31171

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.

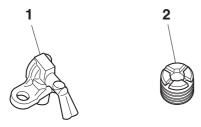


EAS31174

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 → Replace the oil nozzle.
- Oil passage Obstruction → Blow out with compressed air.



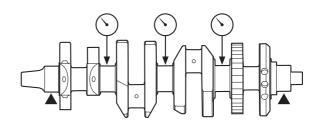
EAS31075

CHECKING THE CRANKSHAFT

- 1. Measure:
 - Crankshaft runout
 Out of specification → Replace the crankshaft.



Runout limit 0.030 mm (0.0012 in)



- 2. Check:
 - Crankshaft journal surfaces
- Crankshaft pin surfaces
 Scratches/wear → 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 crankshaft journal bearings.



Journal oil clearance 0.027–0.045 mm (0.0011–0.0018 in)

ECA13920

NOTICE

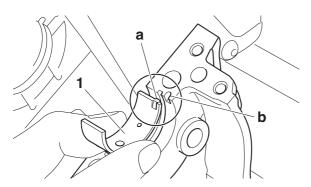
Do not interchange the crankshaft journal bearings. To obtain the correct crankshaft-journal-to-crankshaft-journal-bearing clearance and prevent engine damage, the crankshaft journal bearings must be installed in their original positions.

a. Clean the crankshaft journal bearings, crankshaft journals, and bearing portions of the crankcase.

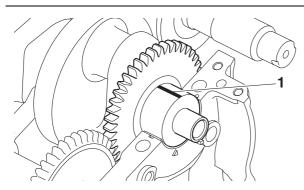
- b. Place the upper crankcase upside down on a bench.
- c. Install the crankshaft journal upper bearings "1" and the crankshaft into the upper crankcase.

TIP

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



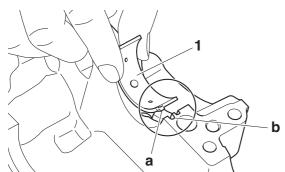
d. Put a piece of Plastigauge® "1" on each crankshaft journal.



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

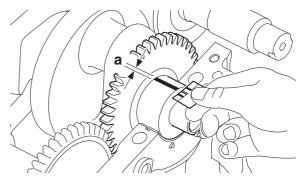
TIP

- 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 5-62.
- 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

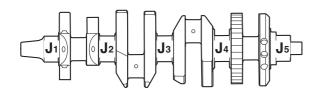
- The numbers "A" stamped into the crankshaft web and the numbers "B" stamped into the lower crankcase are used to determine the replacement crankshaft journal bearing sizes.
- "J₁"-"J₅" refer to the bearings shown in the crankshaft and lower crankcase illustration.

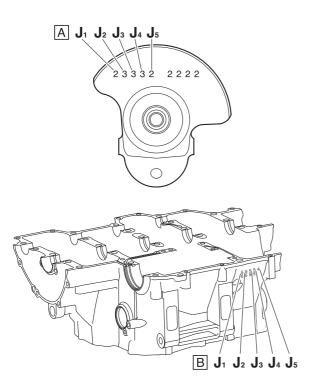
For example, if the crankcase " J_1 " and crankshaft web " J_1 " numbers are 5 and 2 respectively, then the bearing size for " J_1 " is:

" J_1 " (crankcase) - " J_1 " (crankshaft web) + 4 = 5 - 2 + 4 = 7 (red)



Bearing color code
Code 1
Blue
Code 2
Black
Code 3
Brown
Code 4
Green
Code 5
Yellow
Code 6
Pink
Code 7
Red





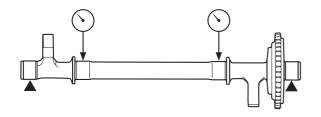
EAS31076

CHECKING THE BALANCER SHAFT

- 1. Measure:
 - Balancer shaft runout
 Out of specification → Replace the balancer shaft.



Balancer shaft runout limit 0.030 mm (0.0012 in)



- 2. Check:
 - Balancer shaft journal surfaces

- Scratches/wear \rightarrow 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.



Balancer shaft journal to balancer shaft bearing clearance 0.028–0.046 mm (0.0011–0.0018 in)

ECA18400

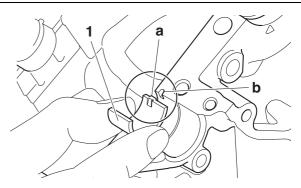
NOTICE

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

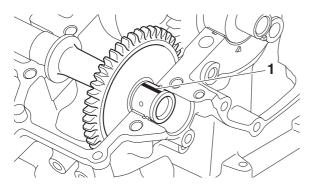
Align the projections "a" on the balancer shaft journal upper bearings with the notches "b" in the upper crankcase.



d. Put a piece of Plastigauge® "1" on each balancer shaft journal.

TIF

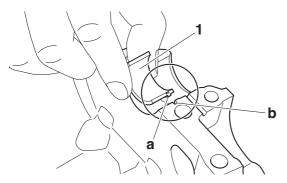
Do not put the Plastigauge® over the oil hole in the balancer shaft journal.



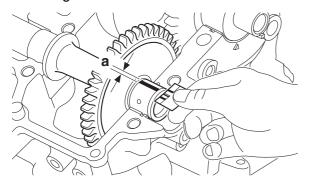
e. Install the balancer shaft journal lower bearings "1" into the lower crankcase and assemble the crankcase halves.

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 5-62.
- 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.



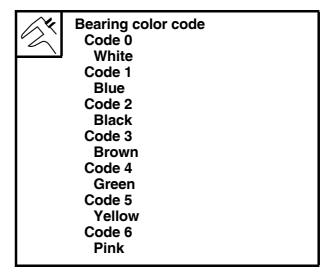
- 4. Select:
- Balancer shaft journal bearing (J₁–J₄)

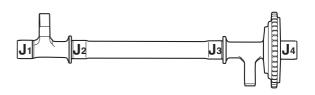
TIP

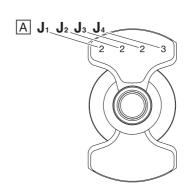
- The numbers "A" stamped into the balancer shaft web and the numbers "B" stamped into the lower crankcase are used to determine the replacement balancer shaft journal bearing sizes.
- "J₁"-"J₄" refer to the bearings shown in the balancer shaft and lower crankcase illustration.

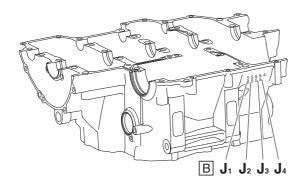
For example, if the crankcase " J_1 " and balancer shaft web " J_1 " numbers are 6 and 2 respectively, then the bearing size for " J_1 " is:

" J_1 " (crankcase) - " J_1 " (balancer shaft web) - 1 = 6 - 2 - 1 = 3 (brown)









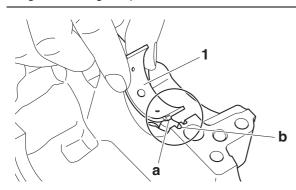
FAS31077

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.



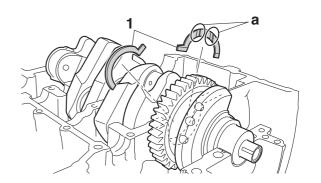
EAS31799

INSTALLING THE THRUST BEARING

- 1. Install:
 - Thrust bearing "1"

TIP

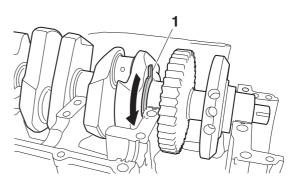
- Install the thrust bearings to the both side of the journal #4 of the upper crankcase.
- The thickness of the thrust bearing is only one.
 No need to adjust the clearance between the thrust bearing and the crankshaft.
- Install the thrust bearing with the grooves "a" side is facing the crankshaft.
- Apply engine oil on the grooves "a" side of the thrust bearing.



a. Insert the thrust bearing "1" into the slot of the upper crankcase as shown in the illustration and slide it in the direction of the arrow.

TIP

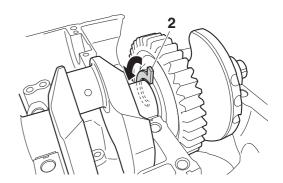
When installing the thrust bearing, shift the crankshaft to the left to widen the gap between the crankshaft and the crankcase.



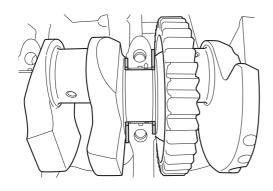
b. Insert the thrust bearing "2" into the slot of the upper crankcase as shown in the illustration and slide it in the direction of the arrow.

TID

When installing thrust bearing "2", shift the crankshaft to the right to widen the gap between the crankshaft and the crankcase.



c. Check that the thrust bearing is inserted properly into the groove of the crankcase.



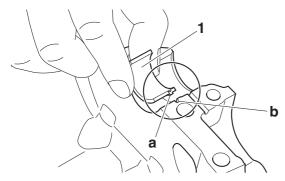
EAS31172

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

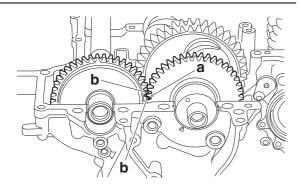
- Align the projections "a" on the balancer shaft journal bearings "1" with the notches "b" in the crankcases.
- Be sure to install each balancer shaft journal bearing in its original place.



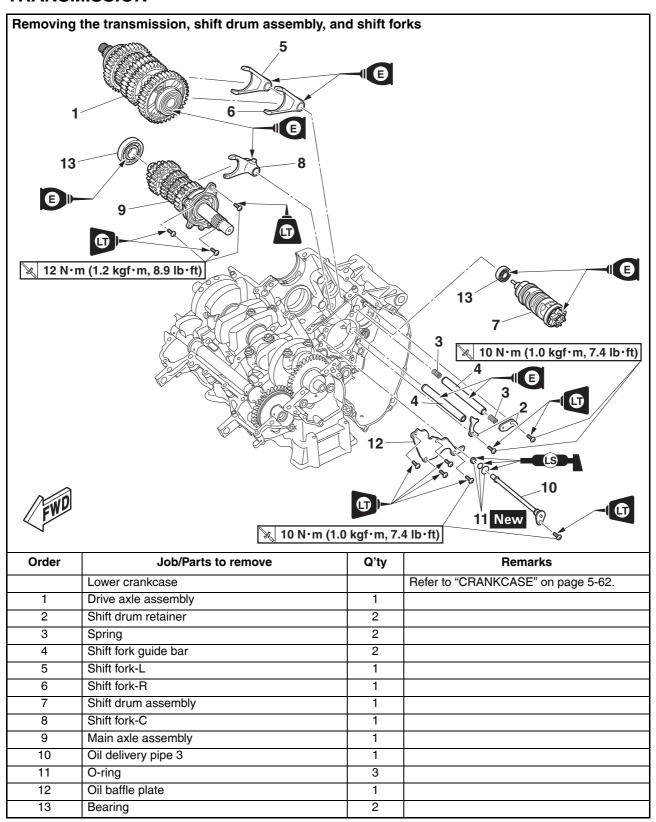
- 2. Install:
 - Balancer shaft

TIP

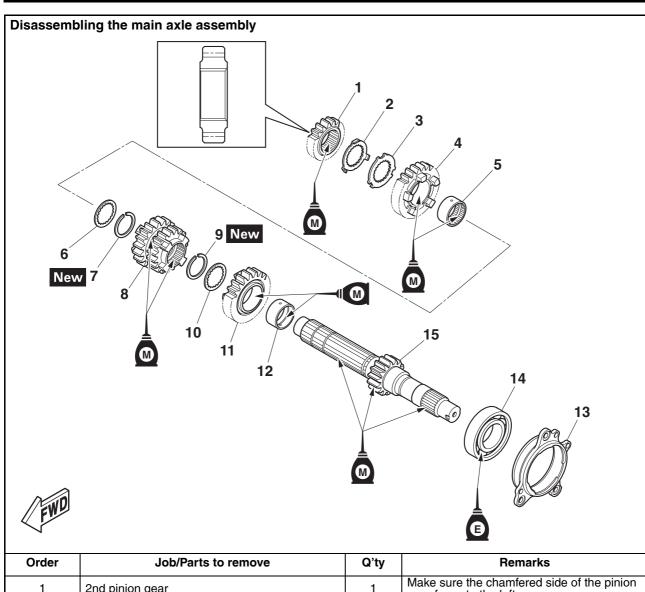
Install by aligning the crankshaft match mark "a" and the balancer shaft match marks "b".



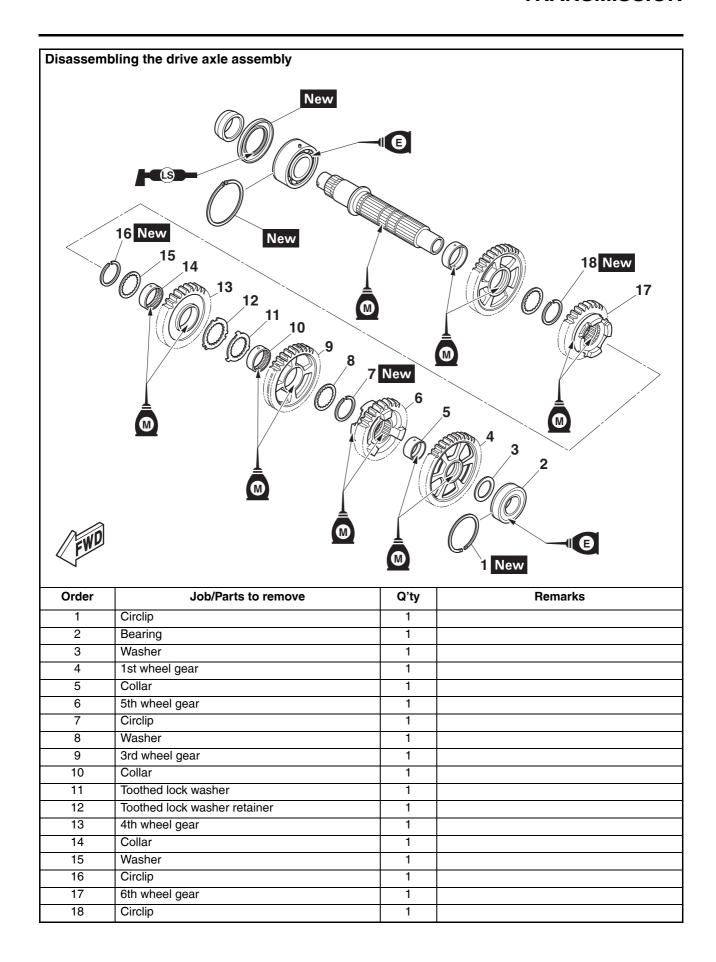
TRANSMISSION



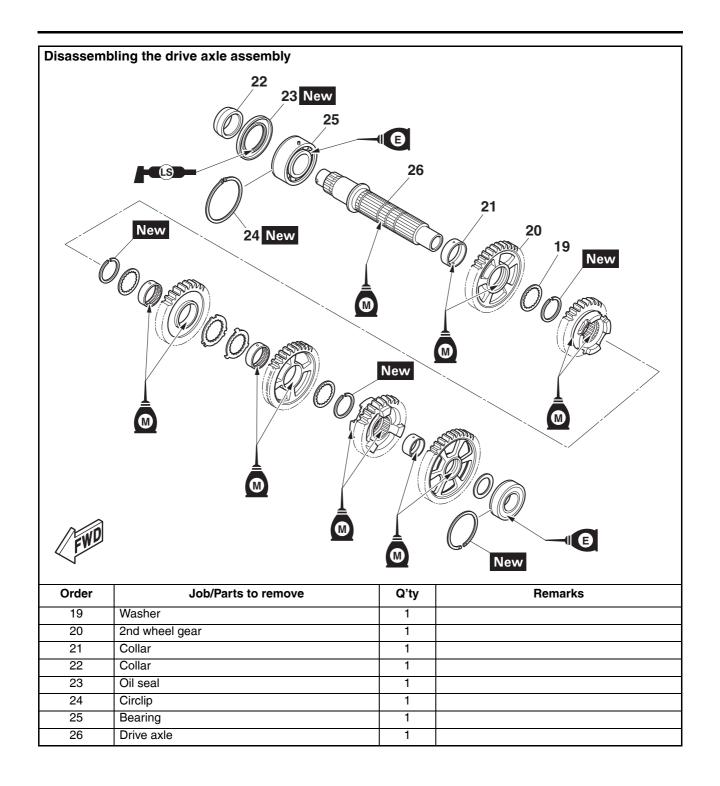
TRANSMISSION



Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	Make sure the chamfered side of the pinion gear faces to the left.
2	Toothed lock washer	1	
3	Toothed lock washer retainer	1	
4	6th pinion gear	1	
5	Collar	1	
6	Washer	1	
7	Circlip	1	
8	3rd pinion gear	1	
9	Circlip	1	
10	Washer	1	
11	5th pinion gear	1	
12	Collar	1	
13	Bearing housing	1	
14	Bearing	1	
15	Main axle	1	

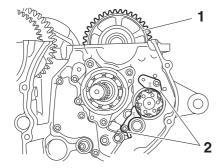


TRANSMISSION

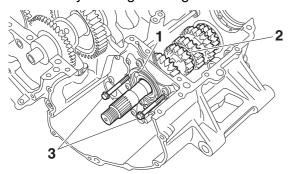


REMOVING THE TRANSMISSION

- 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

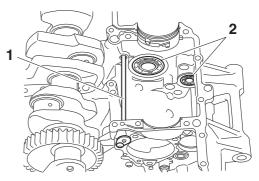


- 2. Remove:
 - Bearing housing "1"
 - Main axle assembly "2"
- a. Insert two bolts "3" of the proper size, as shown in the illustration, into the main axle assembly bearing housing.



- 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"

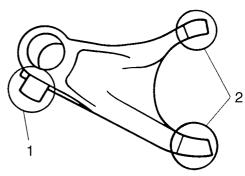


EAS30431

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.

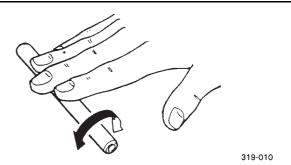


- 2. Check:
 - Shift fork guide bar
 Roll the shift fork guide bar on a flat surface.
 Bends → Replace.

EWA128

WARNING

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



3. Check:

Shift fork movement
 (along the shift fork guide bar)
 Rough movement → Replace the shift forks
 and shift fork guide bar as a set.



319-011

4. Check:

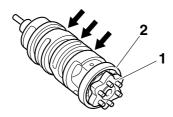
Shift fork guide bar (for the shift fork-C) oil passage

Clogging/damage \rightarrow Replace the shift fork guide bar (for the shift fork-C).

EAS30432

CHECKING THE SHIFT DRUM ASSEMBLY

- 1. Check:
 - Shift drum groove
 Damage/scratches/wear → Replace the shift
 drum assembly.
 - Shift drum segment "1"
 Damage/wear → Replace the shift drum assembly.
 - Shift drum bearing "2"
 Damage/pitting → Replace the shift drum assembly.



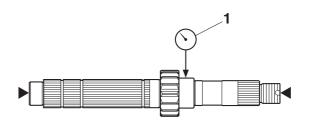
EAS30433

CHECKING THE TRANSMISSION

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



Main axle runout limit 0.08 mm (0.0032 in)

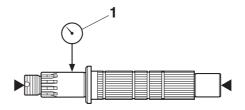


2. Measure:

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

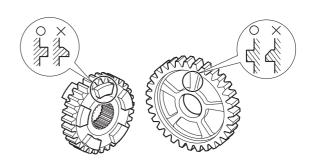


Drive axle runout limit 0.08 mm (0.0032 in)



3. Check:

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



4. Check:

 Transmission gear engagement (each pinion gear to its respective wheel gear)

Incorrect \rightarrow Reassemble the transmission axle assemblies.

- 5. Check:
 - Transmission gear movement
 Rough movement → Replace the defective part(s).
- 6. Check:
 - Circlips
 Bends/damage/looseness → Replace.

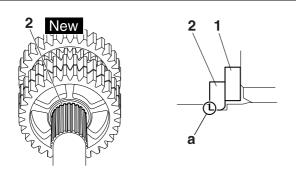
F483043

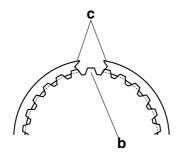
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

- 1. Install:
- Toothed washer "1"
- Circlip "2" New

TIF

- 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.

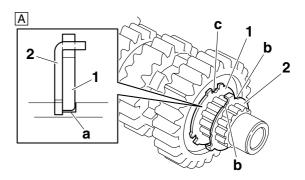


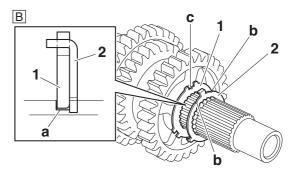


- 2. Install:
 - Toothed lock washer retainer "1"
 - Toothed lock washer "2"

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

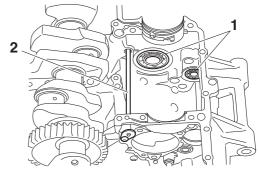
- 1. Install:
- Bearings "1"
- Oil delivery pipe 3 "2"

TIP

Face the seal side of bearing to the outside.



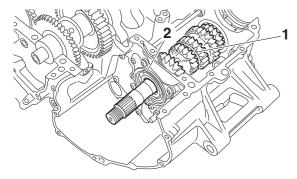
Oil delivery pipe 3 bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®



- 2. Install:
 - Main axle assembly "1"
 - Bearing housing "2"



Main axle bearing housing bolt 12 N⋅m (1.2 kgf⋅m, 8.9 lb⋅ft) LOCTITE®

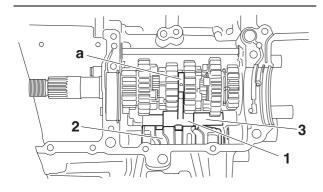


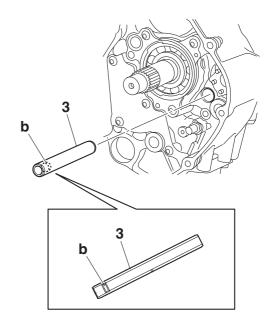
3. Install:

- 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
- Install shift fork-C into the groove "a" in the 3rd pinion gear on the main axle.
- Install the shift fork guide bar "3" in the crankcase with the cap "b" facing toward the direction shown in the illustration.





4. Install:

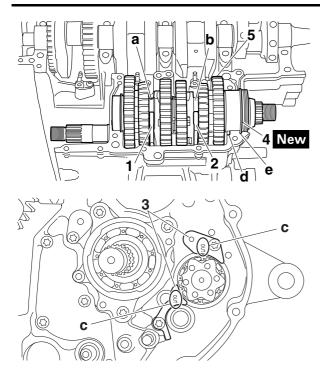
- Shift fork-R "1"
- Shift fork-L "2"
- Shift fork guide bar
- Shift drum retainers "3"
- Bearing
- Oil seal NewCirclip "4" New
- Drive axle assembly "5"



Shift drum retainer bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) **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.



5. Check:

 $\begin{tabular}{ll} \bullet & Transmission \\ & Rough & movement \rightarrow Repair. \\ \end{tabular}$

TIP

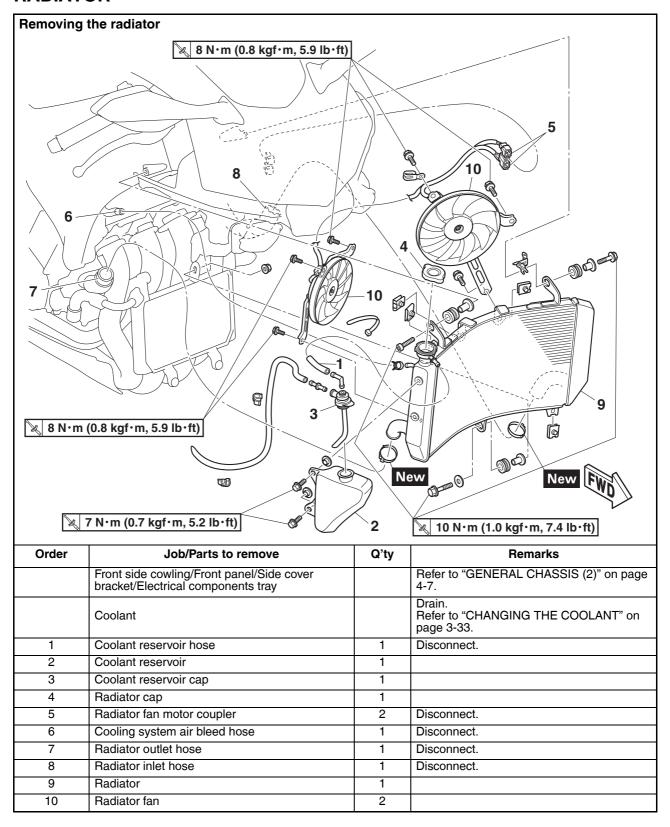
Oil each gear, shaft, and bearing thoroughly.

6

COOLING SYSTEM

RADIATOR	
REMOVING THE RADIATOR	6-2
CHECKING THE RADIATOR	6-2
INSTALLING THE RADIATOR	6-3
OIL COOLER	6-4
CHECKING THE OIL COOLER	
INSTALLING THE OIL COOLER	6-5
THERMOSTAT	6-6
REMOVING THE THERMOSTAT ASSEMBLY	6-7
CHECKING THE THERMOSTAT	
ASSEMBLING THE THERMOSTAT ASSEMBLY	6-7
INSTALLING THE THERMOSTAT ASSEMBLY	6-7
WATER PUMP	6-9
DISASSEMBLING THE WATER PUMP	
CHECKING THE WATER PUMP	6-11
ASSEMBLING THE WATER PUMP	6-11
INSTALLING THE WATER PUMP	6-12

RADIATOR

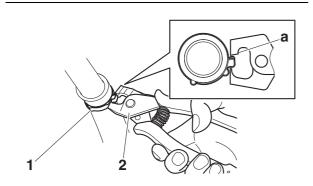


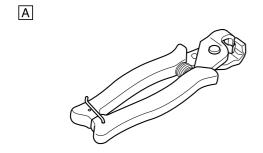
REMOVING THE RADIATOR

- 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

EAS30430

CHECKING THE RADIATOR

- 1. Check:
 - Radiator fins

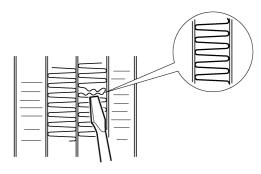
Obstruction \rightarrow Clean.

Apply compressed air to the rear of the radiator.

Damage → Repair or replace.

TIP

Straighten any flattened fins with a thin, flat-head screwdriver.



- 2. Check:
 - Radiator hoses
 Cracks/damage → Replace.
- 3. Measure:
 - Radiator cap valve opening pressure
 Below the specified pressure → Replace the radiator cap.



Radiator cap valve opening pressure 107.9–137.3 kPa (1.08–1.37

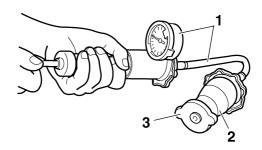
kgf/cm², 15.6–19.9 psi)

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 → Replace.

Malfunction → Check and repair.

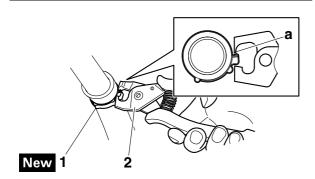
Refer to "COOLING SYSTEM" on page 8-39.

INSTALLING THE RADIATOR

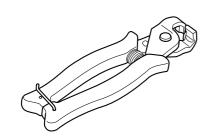
- 1. Install:
- Radiator
- 2. Connect:
 - Radiator inlet hose
 - Radiator outlet hose
- 3. Install:
 - Hose clamp (Clic-R) "1" New

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 2-41.







A. Hose clamp pliers

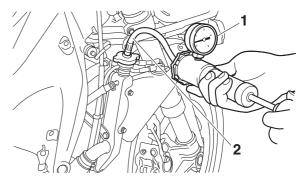
4. Fill:

- Cooling system (with the specified amount of the recommended coolant)
 Refer to "CHANGING THE COOLANT" on page 3-33.
- 5. Check:
 - Cooling system Leaks → Repair or replace any faulty part.

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

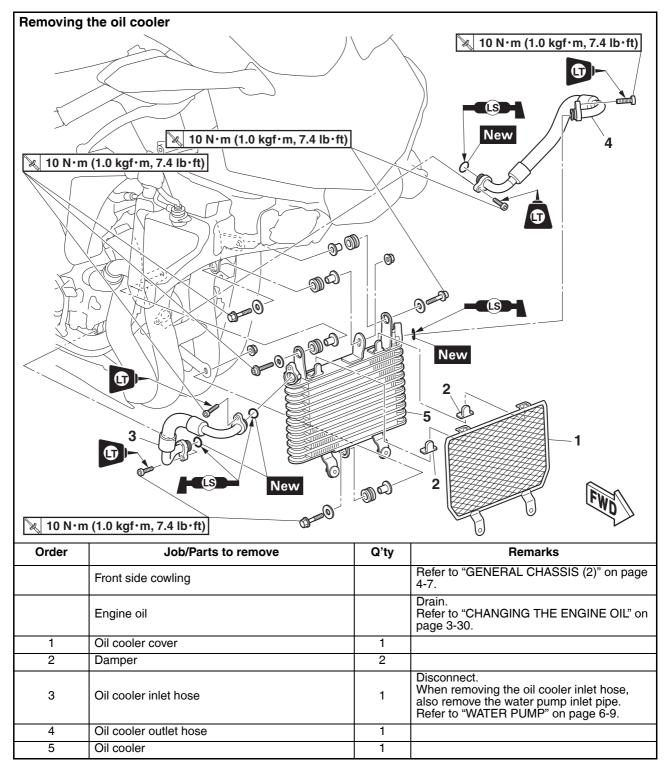


- b. Apply 137.3 kPa (1.37 kgf/cm², 19.9 psi) of pressure.
- c. Measure the indicated pressure with the gauge.

- 6. Measure:
 - Radiator cap valve 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

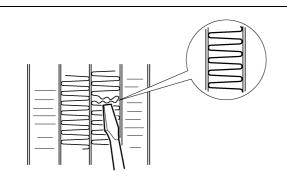
Obstruction \rightarrow Clean.

Apply compressed air to the rear of the oil cooler.

Damage → Repair 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.

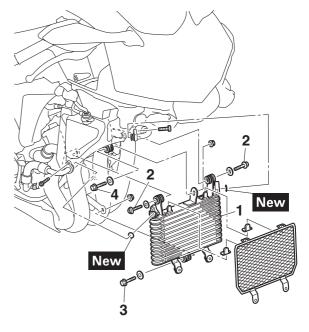
EAS3044

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 N·m (1.0 kgf·m, 7.4 lb·ft)

- 3. Tighten:
- Oil cooler bolt (lower) "3"



Oil cooler bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

- 4. Tighten:
- Radiator bolt "4"



Radiator bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

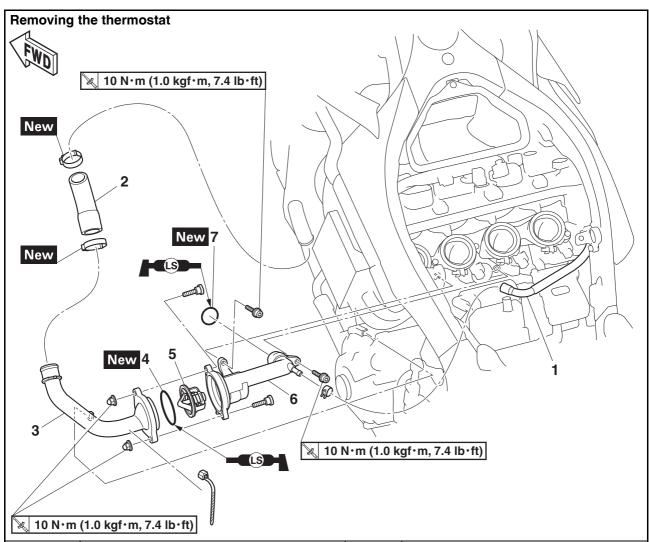
- 5. Fill:
 - Crankcase

(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 7-6.
	Canister		Refer to "FUEL TANK" on page 7-1.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-11.
	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

EAS3044

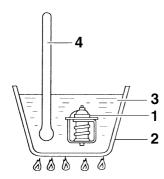
CHECKING THE THERMOSTAT

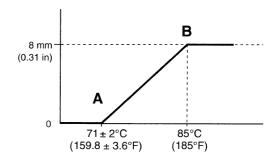
- 1. Check:
- Thermostat

Does not open at 69–73 °C (156–163 °F) \rightarrow 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

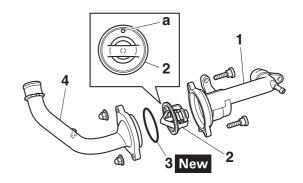
- 1. Install:
 - Thermostat housing "1"
 - Thermostat "2"
 - O-ring "3" New
 - Thermostat housing cover "4"



Thermostat housing cover nut 10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIF

Install the thermostat with its breather hole "a" facing up.



EAS30445

INSTALLING THE THERMOSTAT ASSEMBLY

- 1. Install:
 - Thermostat assembly

2. Install:

- Radiator inlet hose
- Hose clamp (Clic-R) New Refer to "INSTALLING THE RADIATOR" on page 6-3.

TIP_

For more information about installing the hose, refer to "CABLE ROUTING" on page 2-41.

3. Fill:

Cooling system

(with the specified amount of the recommended coolant)

Refer to "CHANGING THE COOLANT" on page 3-33.

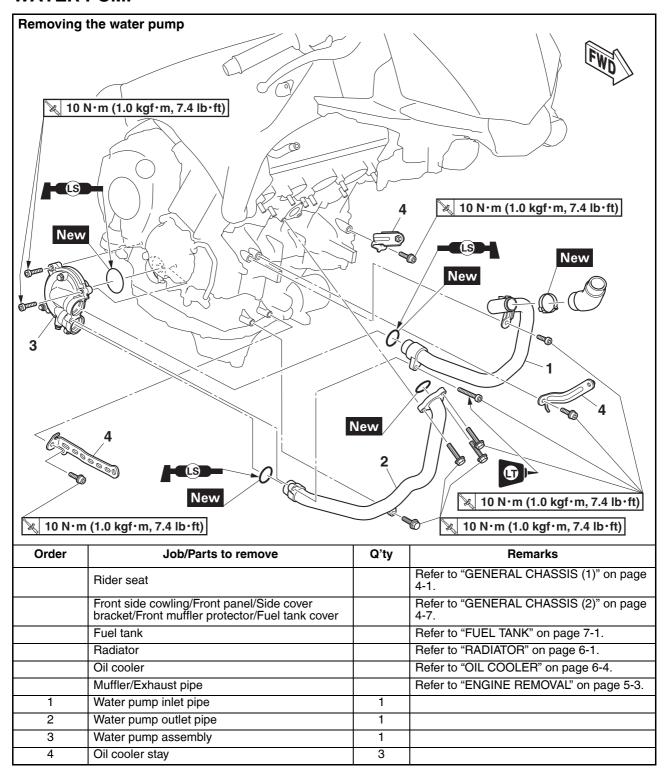
- 4. Check:
 - Cooling system
 Denoises

Leaks \rightarrow Repair or replace any faulty part. Refer to "INSTALLING THE RADIATOR" on page 6-3.

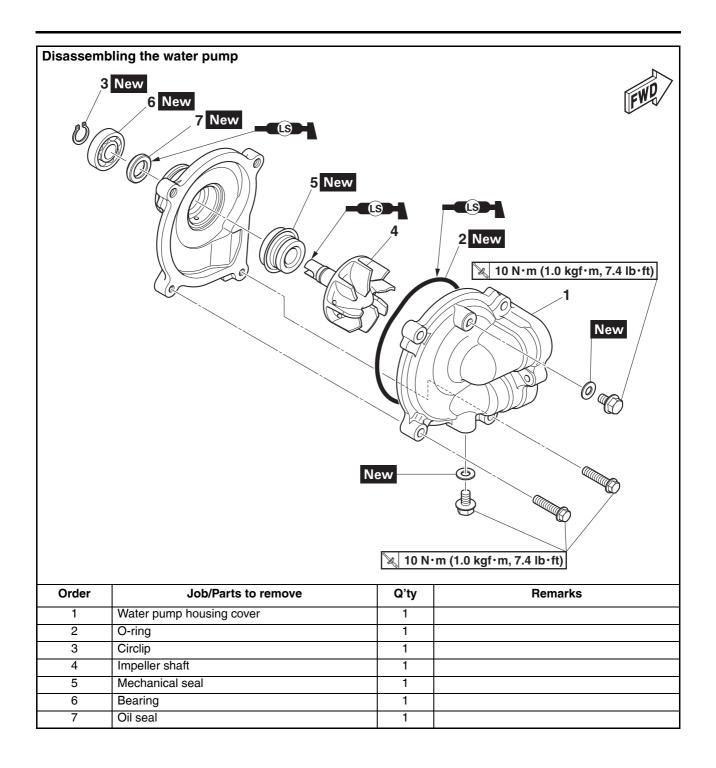
- 5. Measure:
 - Radiator cap valve opening pressure Below the specified pressure → Replace the radiator cap.

Refer to "CHECKING THE RADIATOR" on page 6-2.

WATER PUMP



WATER PUMP



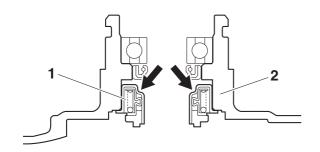
FAS30446

DISASSEMBLING THE WATER PUMP

- 1. Remove:
 - Mechanical seal (housing side) "1"

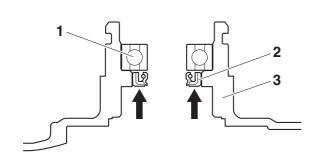
TIP -

Remove the mechanical seal (housing side) from the inside of the water pump housing "2".



- 2. Remove:
 - Bearing "1"
 - Oil seal "2"

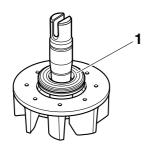
Remove the oil seal and bearing from the outside of the water pump housing "3".



- 3. Remove:
 - Mechanical seal (impeller side) "1" (from the impeller, with a thin, flat-head screwdriver)

TIP -

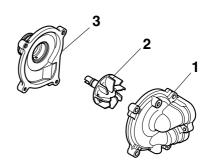
Do not scratch the impeller shaft.



FAS30447

CHECKING THE WATER PUMP

- 1. Check:
- Water pump housing cover "1"
- Impeller shaft "2" Cracks/damage/wear → Replace.
- Water pump housing "3" Cracks/damage/wear \rightarrow 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

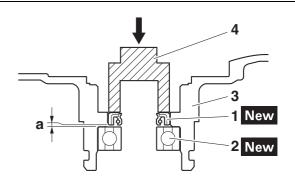
- 1. Install:
 - Oil seal "1" New
- Bearing "2" New (into the water pump housing "3")



Installed depth "a" 0.5-1.0 mm (0.02-0.04 in)

TIP

Install the oil seal with a socket "4" that matches its outside diameter.



- 2. Install:
 - Mechanical seal (housing side) "1" New



ECA20330

NOTICE

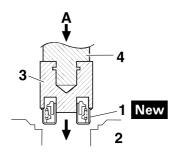
Never lubricate the mechanical seal (housing side) surface with oil or grease.

TIP

Use the special tools and a press to press the mechanical seal (housing side) straight in until it touches the water pump housing.



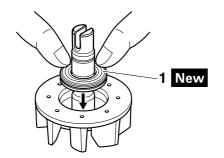
Mechanical seal installer 90890-04132 Water pump seal installer YM-33221-A Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 & 50 mm YM-04058



- 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

Before installing the mechanical seal (impeller side) apply ton water or coolent anto its outer.

- side), apply tap water or coolant onto its outer surface.
- If the top of the mechanical seal is dirty, clean it.



4. Measure:

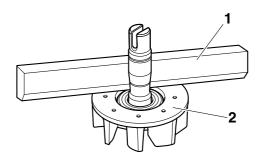
Impeller shaft tilt
 Out of specification → Repeat steps (3) and
 (4).

NOTICE

Make sure the mechanical seal (impeller side) is flush with the impeller.



Impeller shaft tilt limit 0.15 mm (0.006 in)



- 1. Straightedge
- 2. Impeller

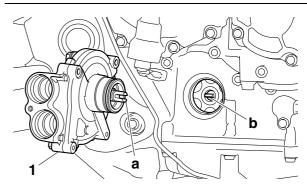
EAS30449

INSTALLING THE WATER PUMP

- 1. Install:
 - Water pump assembly "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 recom-

mended coolant)
Refer to "CHANGING THE COOLANT" on page 3-33.

- 3. Check:
 - Cooling system
 Leaks → Repair or replace the faulty part.

4. Measure:

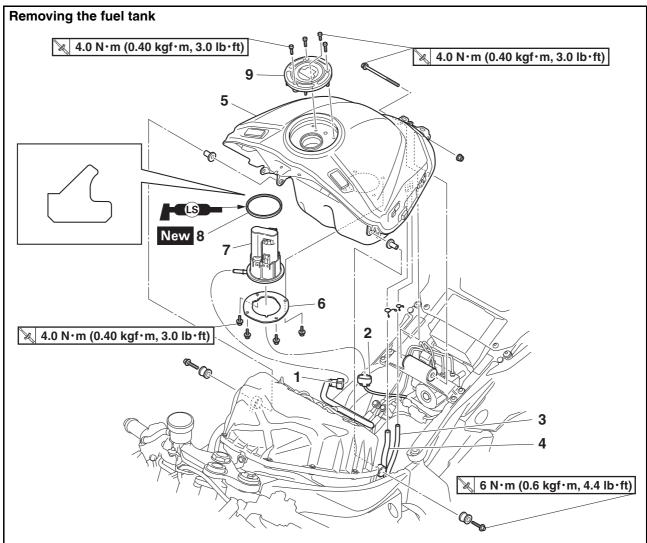
Radiator cap valve opening pressure
 Below the specified pressure → Replace the
 radiator cap.
 Refer to "CHECKING THE RADIATOR" on

page 6-2.

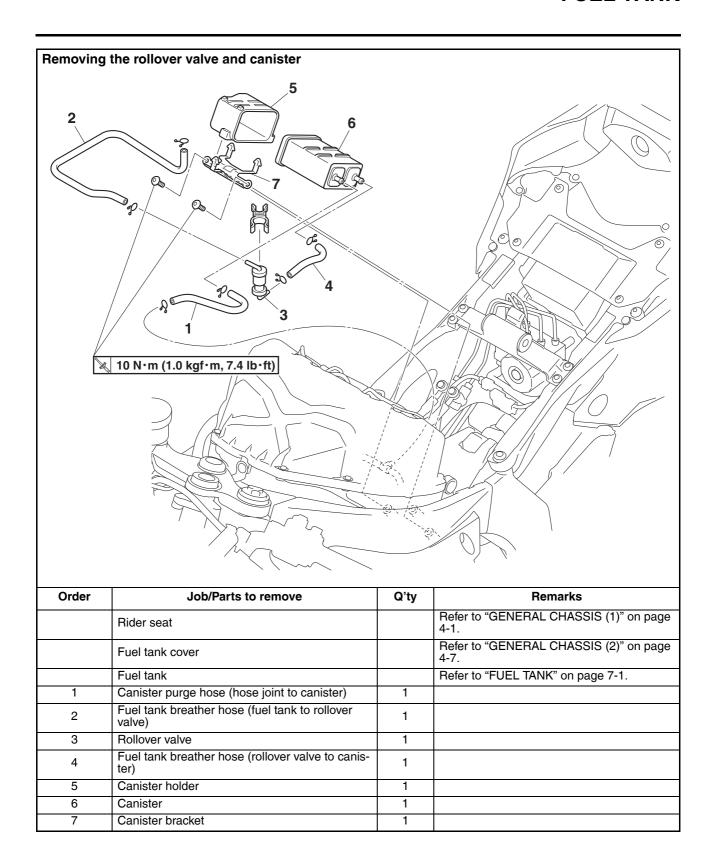
FUEL SYSTEM

FUEL TANK	7-1
REMOVING THE FUEL TANK	
REMOVING THE FUEL PUMP	
CHECKING THE FUEL PUMP BODY	7-3
CHECKING THE FUEL PUMP OPERATION	7-3
CHECKING THE ROLLOVER VALVE	7-4
INSTALLING THE FUEL PUMP	7-4
INSTALLING THE FUEL TANK	7-4
AIR FILTER CASE	7-6
CHECKING THE SECONDARY INJECTORS (BEFORE REMOVING) REMOVING THE FUEL HOSE (PRIMARY INJECTOR JOINT SIDE	
AND SECONDARY INJECTOR JOINT SIDE)	7-7
REMOVING THE SECONDARY INJECTORS	
REMOVING THE AIR FILTER CASE	
REMOVING THE INTAKE FUNNEL ASSEMBLY	
CHECKING THE SECONDARY INJECTORS	
CHECKING THE AIR FILTER CASE SEAL	
CHECKING THE INTAKE FUNNEL	
INSTALLING THE INTAKE FUNNEL AND AIR FILTER CASE	
CHECKING THE INTAKE FUNNEL OPERATION	
INSTALLING THE SECONDARY INJECTORS	
INSTALLING THE AIR FILTER CASE COVERINSTALLING THE FUEL HOSE (PRIMARY INJECTOR JOINT SIDE	
AND SECONDARY INJECTOR JOINT SIDE)	7-10
THROTTLE BODIES	7-11
CHECKING THE PRIMARY INJECTORS (BEFORE REMOVING)	
REMOVING THE PRIMARY INJECTORS	7-14
CHECKING THE PRIMARY INJECTORS	7-14
CHECKING AND CLEANING THE THROTTLE BODIES	
REPLACING THE THROTTLE BODIES	7-16
INSTALLING THE PRIMARY INJECTORS	
CHECKING THE INJECTOR PRESSURE	
CHECKING THE FUEL PRESSURE	
ADJUSTING THE THROTTLE POSITION SENSOR	
ADJUSTING THE ACCELERATOR POSITION SENSOR	7-18
AIR INDUCTION SYSTEM	
CHECKING THE AIR INDUCTION SYSTEM	_
INICTALLING THE AID INDUCTION CYCTEM	7.06

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	



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

EWA17

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.

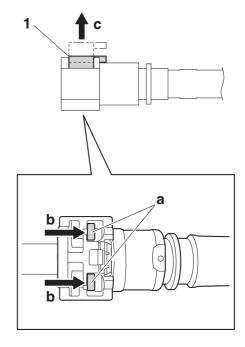
ECA17490

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.

EAS30451

REMOVING THE FUEL PUMP

- 1. Remove:
- Fuel pump

ECA14721

NOTICE

- Do not drop the fuel pump or give it a strong shock.
- Do not touch the base section of the fuel sender.

EAS30454

CHECKING THE FUEL PUMP BODY

- 1. Check:
- Fuel pump body
 Obstruction → Clean.
 Cracks/damage → Replace fuel pump assembly.

EAS30455

CHECKING THE FUEL PUMP OPERATION

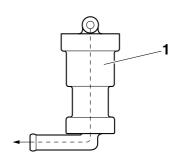
- 1. Check:
 - Fuel pump operation Refer to "CHECKING THE FUEL PRES-SURE" on page 7-17.

CHECKING THE ROLLOVER VALVE

- 1. Check:
- Rollover valve "1"
 Damage/faulty → Replace.

TIP

- Check that air flows smoothly only in the direction of the arrow shown in the illustration.
- The rollover valve must be in an upright position when checking the airflow.



EAS30456

INSTALLING THE FUEL PUMP

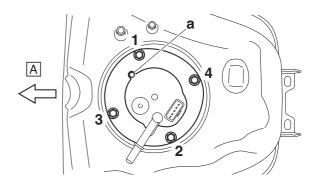
- 1. Install:
 - Fuel pump gasket New
 - Fuel pump
 - Fuel pump bracket
 - Fuel pump bolts



Fuel pump bolt 4.0 N·m (0.40 kgf·m, 3.0 lb·ft)

TIP.

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Install the fuel pump gasket so that the lip side turns to the inside of the fuel tank.
- Install the fuel pump as shown in the illustra-
- 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)

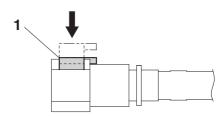
ECA17500

NOTICE

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

TIP

- Install the fuel hose 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



Front fuel tank bolt 6 N·m (0.6 kgf·m, 4.4 lb·ft)

- 5. Tighten:
 - Rear fuel tank bolt

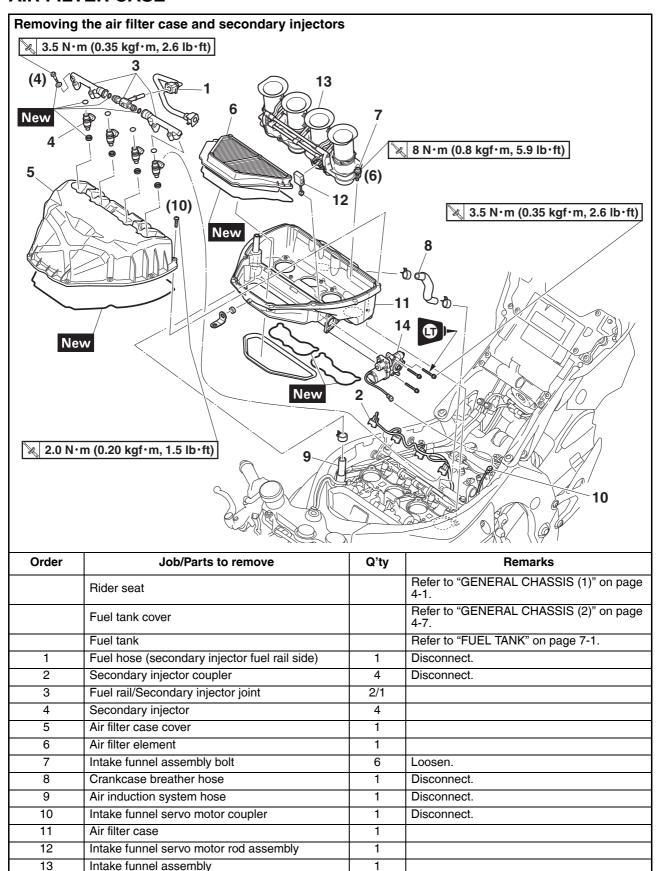


Rear fuel tank bolt 4.0 N·m (0.40 kgf·m, 3.0 lb·ft)

14

Intake funnel servo motor

AIR FILTER CASE



CHECKING THE SECONDARY INJECTORS (BEFORE REMOVING)

- 1. Check:
 - 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)

EWA1732

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.

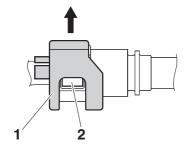
ECA1749

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.



EAS3046

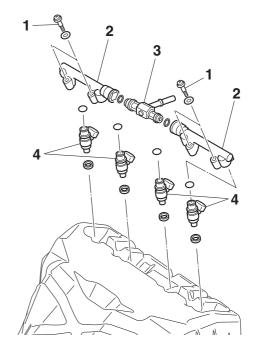
REMOVING THE SECONDARY INJECTORS

EWA17330

WARNING

 Check the injectors in a well-ventilated area free of combustible materials. Make sure

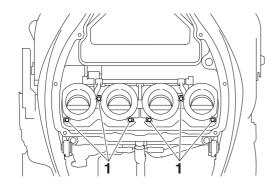
- that there is no smoking or use of electric tools in the vicinity of the injectors.
- Be careful when disconnecting the fuel hose. Any remaining pressure in the fuel hose may cause the fuel to spray out. Place a container or rag under the hose to catch any fuel that spills. Always clean up any spilt 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 7-3.
- 2. Remove:
 - Fuel rail screw "1"
 - Fuel rail "2"
 - Secondary injector joint "3"
 - Secondary injector "4"



EAS31663

REMOVING THE AIR FILTER CASE

- 1. Remove:
 - Air filter case cover
- 2. Loosen:
- Intake funnel assembly bolt "1"



- 3. Disconnect:
 - Crankcase breather hose
 - Air induction system hose
- Intake funnel servo motor coupler
- 4. Remove:
 - Air filter case

REMOVING THE INTAKE FUNNEL ASSEMBLY

- 1. Remove:
 - Intake funnel servo motor rod assembly
 - Intake funnel servo motor
- 2. Remove:
- Intake funnel assembly

ECA17530

NOTICE

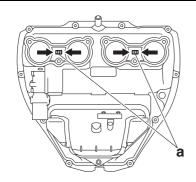
Do not disassemble the intake funnel assembly.

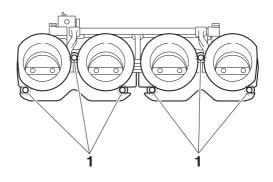
a. Keep the two tabs "a" pushed in the direction shown in the illustration and separate the intake funnel assembly from air filter case.

ECA22590

NOTICE

Do not remove the bolts "1" from the intake funnel joint.





EAS3046

CHECKING THE SECONDARY INJECTORS

- 1. Check:
 - Injectors

Obstruction \rightarrow Replace and check the fuel pump/fuel supply system.

Deposit \rightarrow Replace.

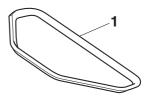
Damage \rightarrow Replace.

- 2. Check:
 - Injector resistance Refer to "CHECKING THE FUEL INJEC-TORS" on page 8-245.

EAS31664

CHECKING THE AIR FILTER CASE SEAL

- 1. Check:
- Air filter case seal "1"
 Damage → Replace.



EAS3046

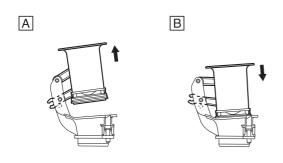
CHECKING THE INTAKE FUNNEL

- 1. Check:
 - Intake funnel servo motor rod assembly Damage/scratches → Replace.
 - Intake funnel assembly Cracks/damage → Replace.
- 2. Check:
 - Intake funnel movement Sticks → Replace the intake funnel assembly.

ECA17550

NOTICE

- Make sure that the intake funnel smoothly moves to the contacting surface between upper stopper and lower seating position when it is moved by hand.
- Make sure that the intake funnel smoothly strokes from the upper position to the seating position by its own weight.



- A. Upper
- B. Lower

EAC31666

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 N·m (0.8 kgf·m, 5.9 lb·ft)

EAS3046

CHECKING THE INTAKE FUNNEL OPERATION

- 1. Check:
- Intake funnel servo motor operation
- a. Activate the diagnostic mode and select the diagnostic code number "34".

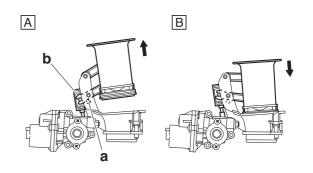
Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.

- b. Set the start/engine stop switch to "()".
- 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

ECA21550

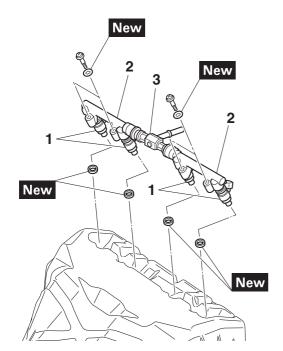
NOTICE

- 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.
- 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 N·m (0.35 kgf·m, 2.6 lb·ft)



Check the injector pressure after the injectors are installed.

Refer to "CHECKING THE INJECTOR PRESSURE" on page 7-16.

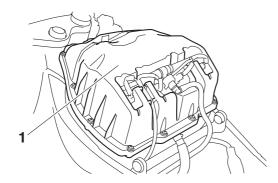
EAS31731

INSTALLING THE AIR FILTER CASE COVER

- 1. Install:
- Air filter case cover "1"



Air filter case cover screw 2.0 N·m (0.20 kgf·m, 1.5 lb·ft)



EAS3046

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)

ECA17500

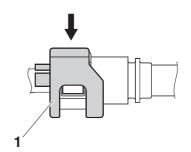
NOTICE

When installing the fuel hose, make sure that it is securely connected, and that the fuel

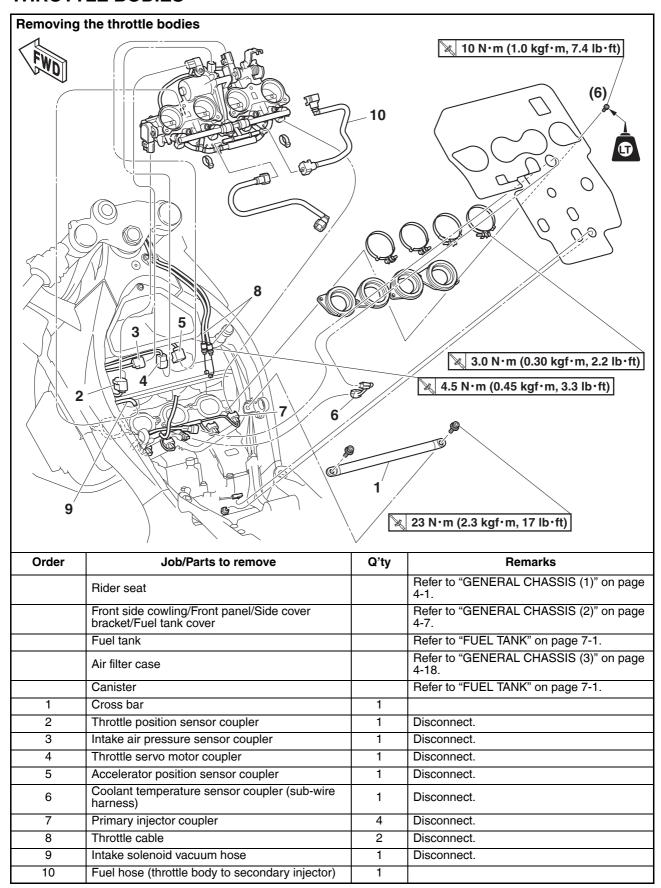
hose connector cover on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.

TIP

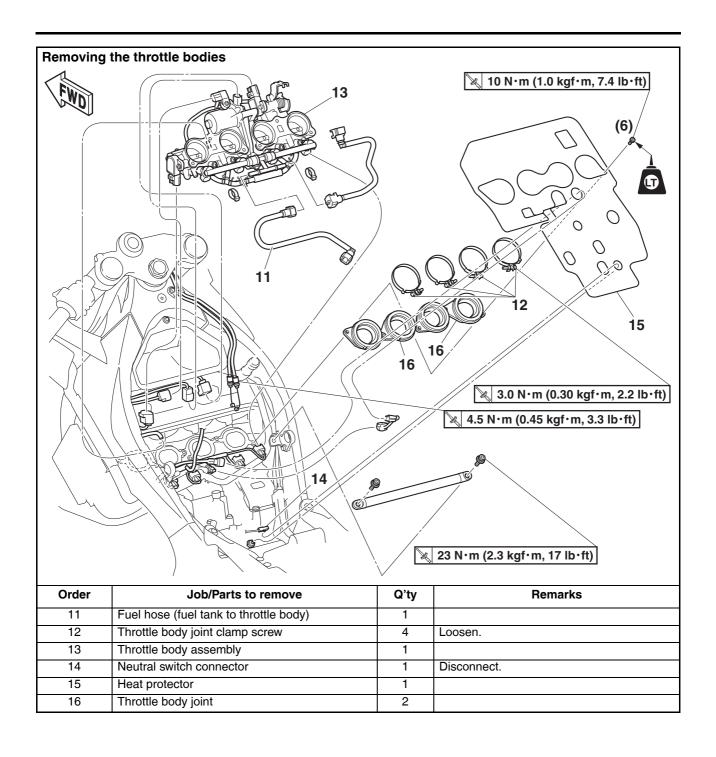
- Install the fuel hose securely onto the secondary injector joint until a distinct "click" is heard.
- To install the fuel hose onto the secondary injector joint, slide the fuel hose connector cover
 "1" on the end of the hose in the direction of the arrow shown.



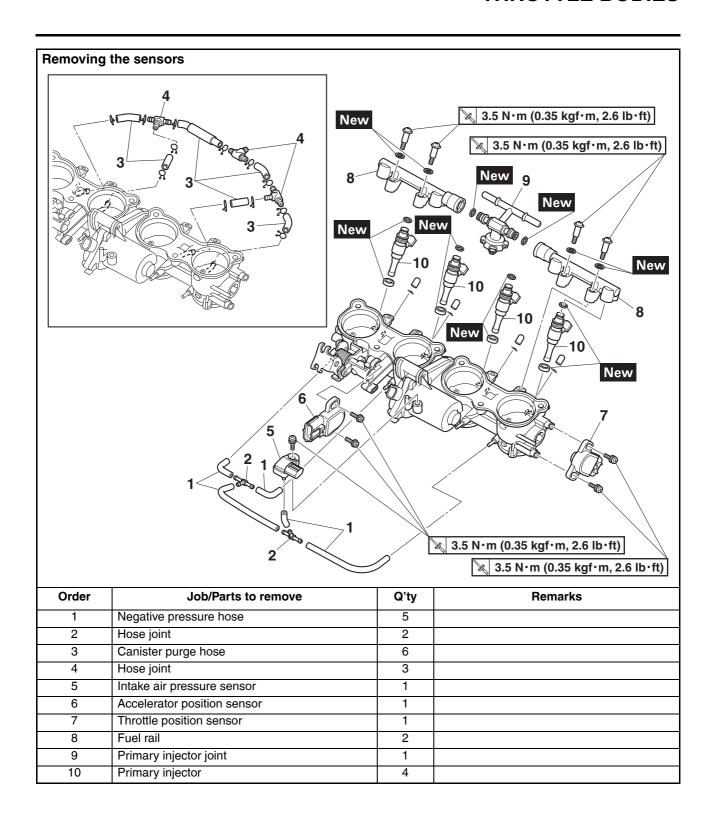
THROTTLE BODIES



THROTTLE BODIES



THROTTLE BODIES



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.

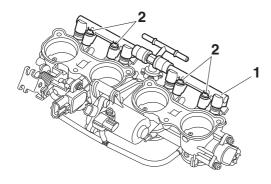
EAS31667

REMOVING THE PRIMARY INJECTORS

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 rail "1"

a. Remove the fuel rail screws "2".



EAS3166

CHECKING THE PRIMARY INJECTORS

- 1. Check:
 - Injectors

Obstruction → Replace and check the fuel pump/fuel supply system.

Deposit \rightarrow Replace.

 $\mathsf{Damage} \to \mathsf{Replace}.$

- 2. Check:
 - Injector resistance
 Refer to "CHECKING THE FUEL INJEC-

TORS" on page 8-245.

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

EWA173

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 → Replace the throttle bodies as a set.
- 2. Clean:
 - Throttle bodies

ECA21540

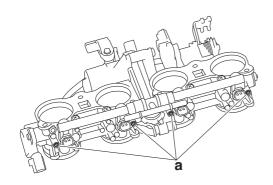
NOTICE

- 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.

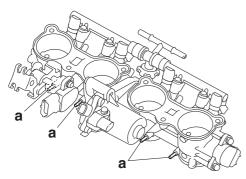


Recommended cleaning solvent Yamaha Oil & Brake Cleaner

THROTTLE BODIES



- 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".



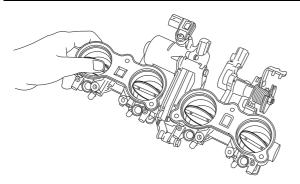
c. Hold the throttle valves in the open position.

WARNING

When cleaning the throttle bodies, be careful not to injure yourself on the throttle valves or other components of the throttle bodies.

ECA20380 NOTICE

- 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.

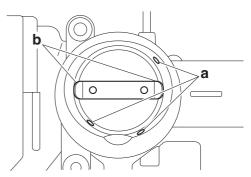
TIP

- 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.

ECA17590

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 3-10.

EAS31160

REPLACING THE THROTTLE BODIES

- 1. Remove the throttle bodies from the vehicle.
- 2. Install a new throttle bodies to the vehicle.
- 3 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 3-10.
- 5. Place the vehicle on a maintenance 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

EAS3166

INSTALLING THE PRIMARY INJECTORS

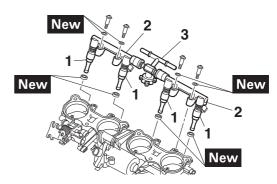
ECA21550

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.
- 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 N·m (0.35 kgf·m, 2.6 lb·ft)



5. Check the injector pressure after the injectors are installed.

Refer to "CHECKING THE INJECTOR PRESSURE" on page 7-16.

EAS3048

CHECKING THE INJECTOR PRESSURE

TIP_

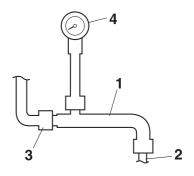
- After installing the injectors, perform the following steps to check the injector pressure.
- Do not allow any foreign materials to enter the fuel lines.
- 1. Check:
- Injector pressure

a. Connect the 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".



Pressure gauge 90890-03153 Pressure gauge YU-03153 Fuel injector pressure adapter 90890-03210 Fuel injector pressure adapter YU-03210



- c. Close the valve on the injector pressure adapter.
- d. Apply air pressure with the air compressor.
- e. Open the valve on the injector pressure adapter until the specified pressure is reached.



Specified air pressure 490 kPa (5.0 kgf/cm², 71.1 psi)

ECA17600

NOTICE

Never exceed the specified air pressure or damage could occur.

- f. Close the valve on the injector pressure adapter.
- g. Check that the specified air pressure is held at least one minute.

Pressure drops \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.

EWA17

WARNING

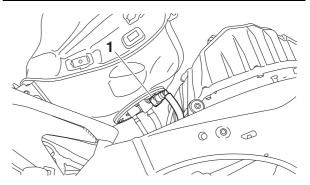
Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

ECA17490

NOTICE

Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with

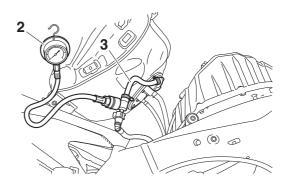
tools.



c. Connect the pressure gauge "2" and fuel pressure adapter "3" to the fuel hose.



Pressure gauge 90890-03153 Pressure gauge YU-03153 Fuel pressure adapter 90890-03176 Fuel pressure adapter YM-03176



- d. Start the engine.
- e. Measure the fuel pressure. Faulty \rightarrow Replace the fuel pump.



Fuel line pressure (at idle) 300–390 kPa (3.0–3.9 kgf/cm², 43.5–56.6 psi)

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

ECA17540

NOTICE

- 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 "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-17.
- 2. Adjust:
 - Throttle position sensor angle

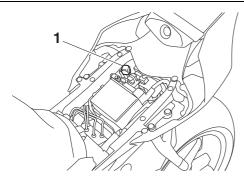
TIP

Before adjusting the throttle position sensor, the throttle bodies must be removed.

- a. Temporary tighten the throttle position sensor screws.
- b. Check that the throttle valves are fully closed.
- c. Connect the throttle position sensor to the wire harness.
- d. Remove the protective cap "1", and then connect the Yamaha diagnostic tool to coupler.

TIP

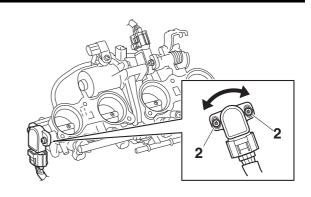
For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.



- e. Diagnostic code number "01" is selected.
- f. Adjust the position of the throttle position sensor angle so that 11–21 can appear in the Yamaha diagnostic tool screen.
- g. After adjusting the throttle position sensor angle, tighten the throttle position sensor bolts "2".



Throttle position sensor bolt 3.5 N·m (0.35 kgf·m, 2.6 lb·ft)



EAS30486

ADJUSTING THE ACCELERATOR POSITION SENSOR

EWA159

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.
- 1 Check:
 - Accelerator position sensor Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-17.
- 2. Adjust:
 - Accelerator position sensor angle

TIP

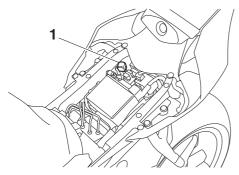
Before adjusting the accelerator position sensor, the throttle bodies must be removed.

- a. Temporary tighten the accelerator position sensor bolts.
- 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. Remove the protective cap "1", and then connect the Yamaha diagnostic tool to coupler.

TIP

For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.

THROTTLE BODIES

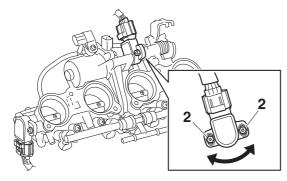


- f. Diagnostic code number "14" is selected.
- g. Turn the throttle grip to the fully closed posi-
- h. Adjust the position of the accelerator position sensor angle so that 11–21 can appear in the Yamaha diagnostic tool screen.
- After adjusting the accelerator position sensor angle, tighten the accelerator position sensor screws "2".



Accelerator position sensor screw

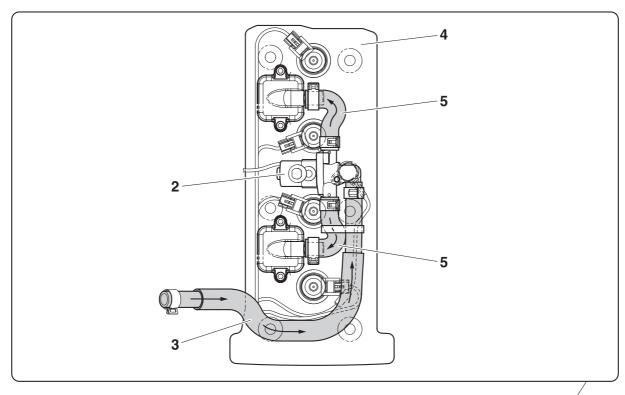
3.5 N·m (0.35 kgf·m, 2.6 lb·ft)

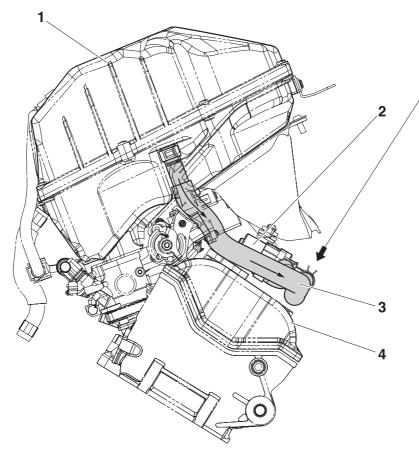


- j. Turn the throttle grip to the fully open position.
- k. Check the Yamaha diagnostic tool screen value. If the Yamaha diagnostic tool screen value is not 96–107, adjust the accelerator position sensor angle.
- I. Select the diagnostic code number "15".
- m. Turn the throttle grip to the fully closed position.
- n. Check the Yamaha diagnostic tool screen value. If the Yamaha diagnostic tool screen value is not 9–23, adjust the accelerator position sensor angle.
- o. Turn the throttle grip to the fully open position.
- p. Check the Yamaha diagnostic tool screen value. If the Yamaha diagnostic tool screen value is not 93–109, adjust the accelerator position sensor angle.
- q. Repeat steps (f) to (p) until the Yamaha diagnostic tool screen values are within the spec-

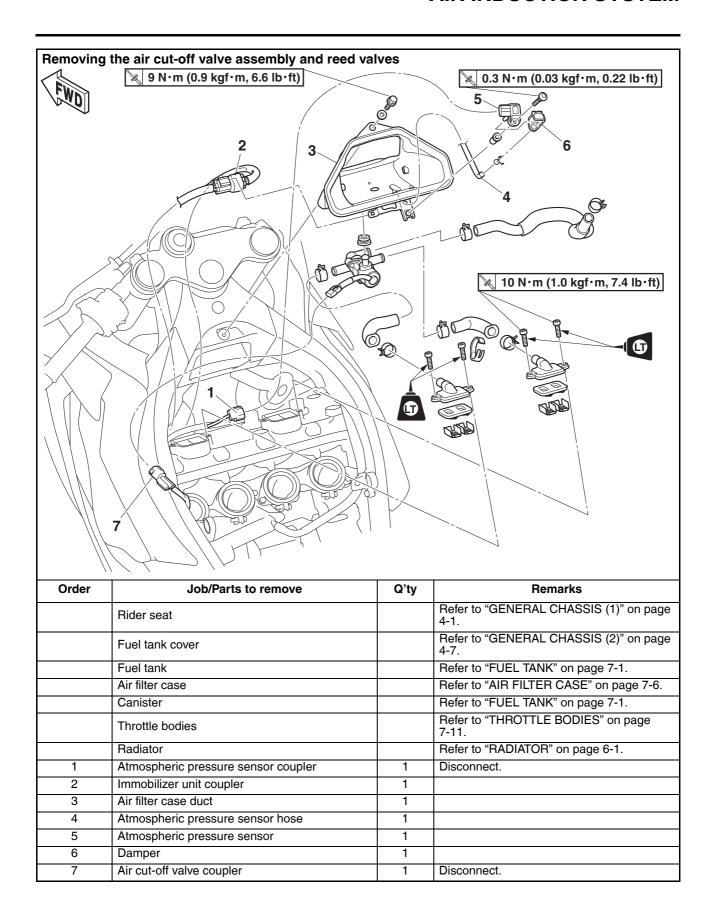
ified ranges.

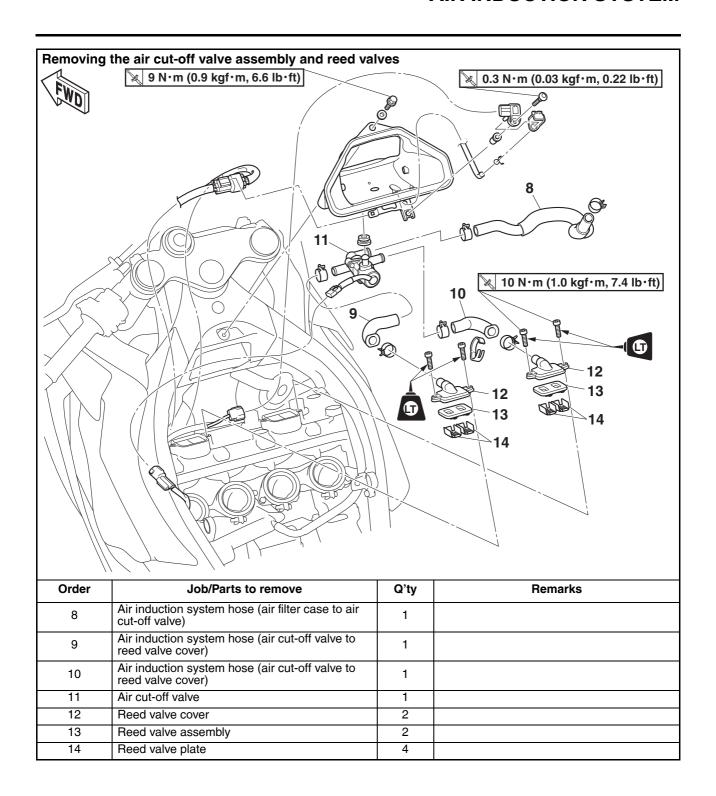
r. If the Yamaha diagnostic tool screen values are not within the specified ranges after repeating steps (f) to (p) several times, replace the accelerator position sensor.





- 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)



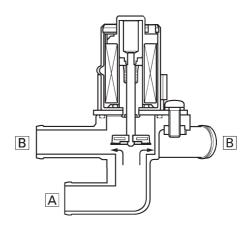


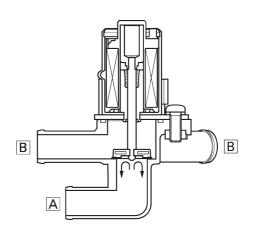
CHECKING THE AIR INDUCTION SYSTEM Air injection

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 → Replace the reed valve assembly.



Reed valve bending limit 0.4 mm (0.02 in)

AIR INDUCTION SYSTEM



- 3. Install:
 - Reed valve cover



Reed valve cover bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) 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 8-243.

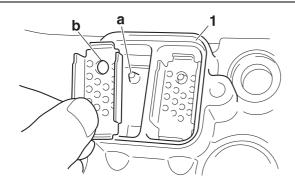
EAS30489

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

AIR INDUCTION SYSTEM

ELECTRICAL SYSTEM

IGNITION SYSTEM	8-1
CIRCUIT DIAGRAM	8-1
ENGINE STOPPING DUE TO SIDESTAND OPERATION	8-5
TROUBLESHOOTING	8-6
FI FOTDIC CTARTING CVCTFM	0.0
ELECTRIC STARTING SYSTEM	
CIRCUIT DIAGRAM	
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION	
TROUBLESHOOTING	8-14
CHARGING SYSTEM	0 17
CIRCUIT DIAGRAM	
TROUBLESHOOTING	8-21
LIGHTING SYSTEM	8-23
CIRCUIT DIAGRAM	
TROUBLESHOOTING	
11166522616611116	
SIGNALING SYSTEM	8-29
CIRCUIT DIAGRAM	8-29
TROUBLESHOOTING	8-33
COOLING SYSTEM	
CIRCUIT DIAGRAM	
TROUBLESHOOTING	8-43
FUEL INJECTION SYSTEM	0.45
CIRCUIT DIAGRAM	
ECU SELF-DIAGNOSTIC FUNCTION	
TROUBLESHOOTING METHOD	
YAMAHA DIAGNOSTIC TOOL	
TROUBLESHOOTING DETAILS (FAULT CODE)	8-51
FUEL PUMP SYSTEM	8-145
CIRCUIT DIAGRAM	
TROUBLESHOOTING	
	170
IMMOBILIZER SYSTEM	8-151
CIRCUIT DIAGRAM	8-151
GENERAL INFORMATION	8-155
PARTS REPLACEMENT AND KEY CODE REGISTRATION	
REQUIREMENTS	8-155
TROUBLESHOOTING	
SELE-DIAGNOSIS FAULT CODE INDICATION	

	0.400
ABS (Anti-lock Brake System)	
CIRCUIT DIAGRAM	
ABS COMPONENTS CHART	8-167
ABS COUPLER LOCATION CHART	8-169
MAINTENANCE OF THE ABS ECU	8-171
ABS TROUBLESHOOTING OUTLINE	
BASIC INSTRUCTIONS FOR TROUBLESHOOTING	
BASIC PROCESS FOR TROUBLESHOOTING	
[A] CHECKING THE ABS WARNING LIGHT	
[A] CHECKING THE ADS WARNING LIGHT	0-1/4
[A-1] ONLY THE ABS WARNING LIGHT FAILS TO COME ON	
[A-2] THE ABS WARNING LIGHT AND OTHER INDICATOR LIGHT	
FAIL TO COME ON	
[A-3] THE ABS WARNING LIGHT COMES ON	
[A-4] ONLY THE ABS ECU FAILS TO COMMUNICATE	8-175
[A-5] ABS ECU AND FI ECU FAIL TO COMMUNICATE	
[B-1] MALFUNCTION ARE CURRENTLY DETECTED	
[B-2] DIAGNOSIS USING THE FAULT CODES	
[B-3] DELETING THE FAULT CODES	
[C-1] FINAL CHECK	
[C-1] FINAL OFFICK	0-194
STEERING DAMPER SYSTEM	8-195
CIRCUIT DIAGRAM	
SELF-DIAGNOSTIC FUNCTION	
TROUBLESHOOTING METHOD	
BASIC INSTRUCTIONS FOR DIAGNOSTIC FUNCTION	8-199
TROUBLESHOOTING DETAILS (STEERING DAMPER)	
(FAULT CODE)	8-199
ELECTRONICALLY AR INCTARLE CHORENCION OVOTEM	
ELECTRONICALLY ADJUSTABLE SUSPENSION SYSTEM	
(for YZF-R1M)	
CIRCUIT DIAGRAM	
MAINTENANCE OF THE SCU (Suspension Control Unit)	8-205
SCU (Suspension Control Unit) SELF-DIAGNOSTIC FUNCTION	8-205
TROUBLESHOOTING METHOD (SCU)	8-205
BASIC INSTRUCTIONS FOR DIAGNOSTIC FUNCTION	
TROUBLESHOOTING DETAILS (SCU)	
111005220110011110 52171120 (000)	0 200
COMMUNICATION CONTROL SYSTEM (for YZF-R1M)	8-221
CIRCUIT DIAGRAM	8-221
TROUBLESHOOTING	8-223
ELECTRICAL COMPONENTS	8-225
CHECKING THE SWITCHES	8-229
CHECKING THE FUSES	8-232
REPLACING THE ECU (Engine Control Unit)	
CHECKING AND CHARGING THE BATTERY	
CHECKING THE RELAYS	
CHECKING THE RELAY UNIT (DIODE)	
	8-227
CHECKING THE IGNITION COILS	8-238
CHECKING THE IGNITION COILSCHECKING THE IGNITION SPARK GAPCHECKING THE CRANKSHAFT POSITION SENSOR	8-238 8-238

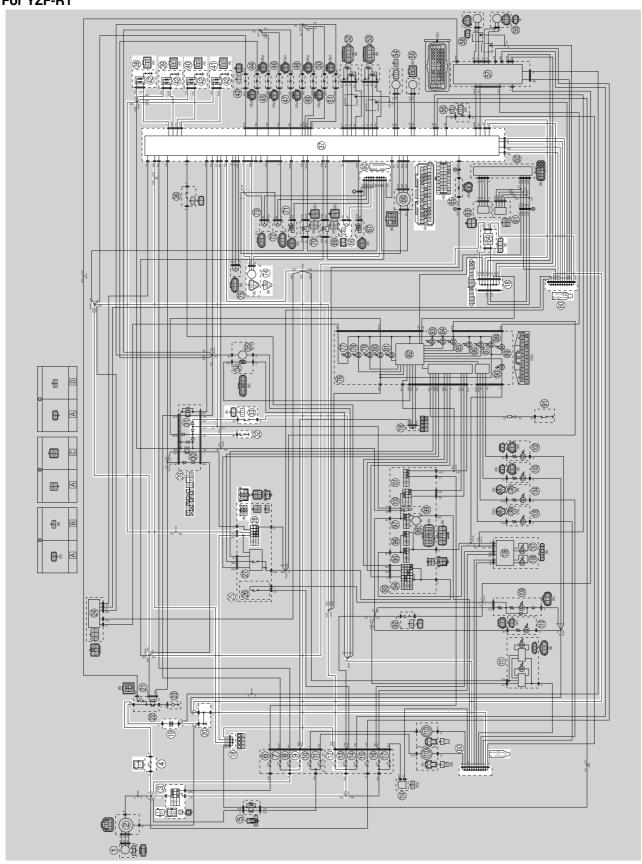
CHECKING THE STARTER MOTOR OPERATION	8-239
CHECKING THE STATOR COIL	8-239
CHECKING THE RECTIFIER/REGULATOR	8-240
CHECKING THE HORN	8-241
CHECKING THE FUEL SENDER	8-241
CHECKING THE FUEL LEVEL WARNING LIGHT	8-241
CHECKING THE RADIATOR FAN MOTORS	8-241
CHECKING THE COOLANT TEMPERATURE SENSOR	8-242
CHECKING THE THROTTLE SERVO MOTOR	8-242
CHECKING THE AIR INDUCTION SYSTEM SOLENOID	8-243
CHECKING THE CYLINDER IDENTIFICATION SENSOR	8-243
CHECKING THE INTAKE AIR TEMPERATURE SENSOR	8-244
CHECKING THE STEERING DAMPER SOLENOID	8-244
CHECKING THE FUEL INJECTORS	
CHECKING THE WHEEL SWITCH	8-245

IGNITION SYSTEM

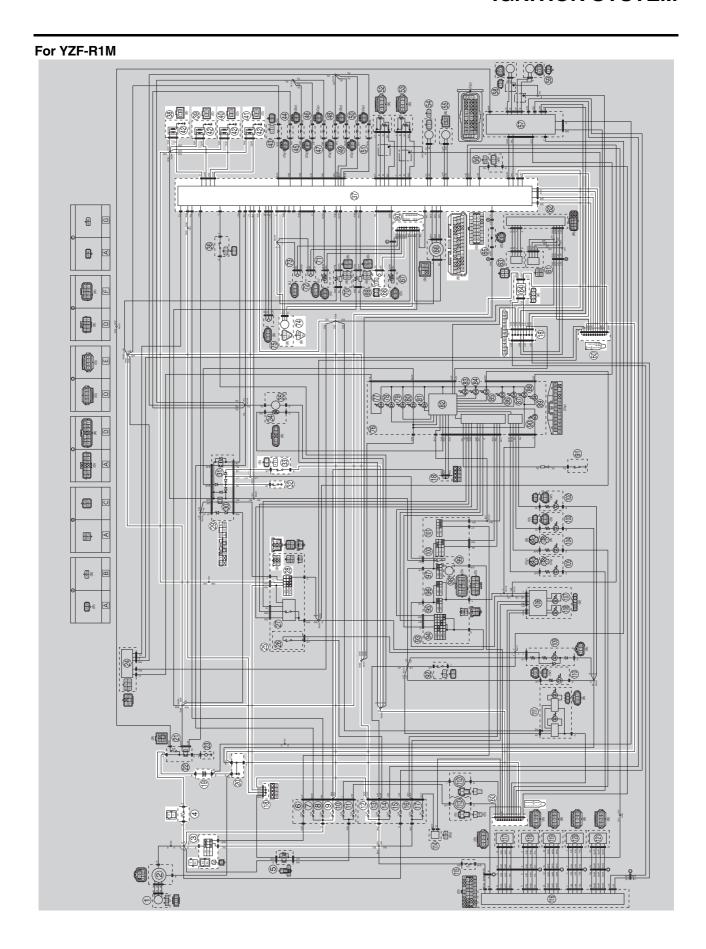
EAS30490

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

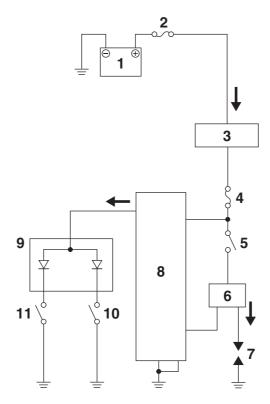


- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20. Engine ground
- 25. Handlebar switch (right)
- 28. Start/engine stop switch
- 29.Relay unit
- 32. Neutral switch
- 33. Sidestand switch
- 37.ECU (Engine Control Unit)
- 38.Ignition coil #1
- 39.Ignition 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

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

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

TIP

- 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
 - Check the fuses.
 (Main, ignition and backup)
 Refer to "CHECKING THE FUSES"
 on page 8-232.

 $NG \rightarrow$

Replace the fuse(s).

OK↓

2. Check the battery.
Refer to "CHECKING AND
CHARGING THE BATTERY" on
page 8-233.

NG→

Clean the battery terminals.Recharge or replace the battery.

OK↓

3. Check the spark plugs.
Refer to "CHECKING THE SPARK PLUGS" on page 3-5.

 $NG \rightarrow$

Re-gap or replace the spark plug(s).

OK↓

4. Check the ignition spark gap. Refer to "CHECKING THE SPARK PLUGS" on page 3-5.

 $\mathsf{OK} \!\! o \!\!$

Ignition system is OK.

NG↓

5. Check the ignition coils. Refer to "CHECKING THE IGNITION COILS" on page 8-238.

 $NG \rightarrow$

Replace the ignition coil(s).

OK↓

6. Check the crankshaft position sensor.

Refer to "CHECKING THE CRANK-SHAFT POSITION SENSOR" on page 8-239.

 $NG \rightarrow$

Replace the crankshaft position sensor.

OK↓

7. Check the cylinder identification sensor.

Refer to "CHECKING THE CYLIN-DER IDENTIFICATION SENSOR" on page 8-243.

NG→

Replace the cylinder identification sensor.

OK↓

8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

 $NG \rightarrow$

Replace the main switch/immobilizer unit.

OK↓

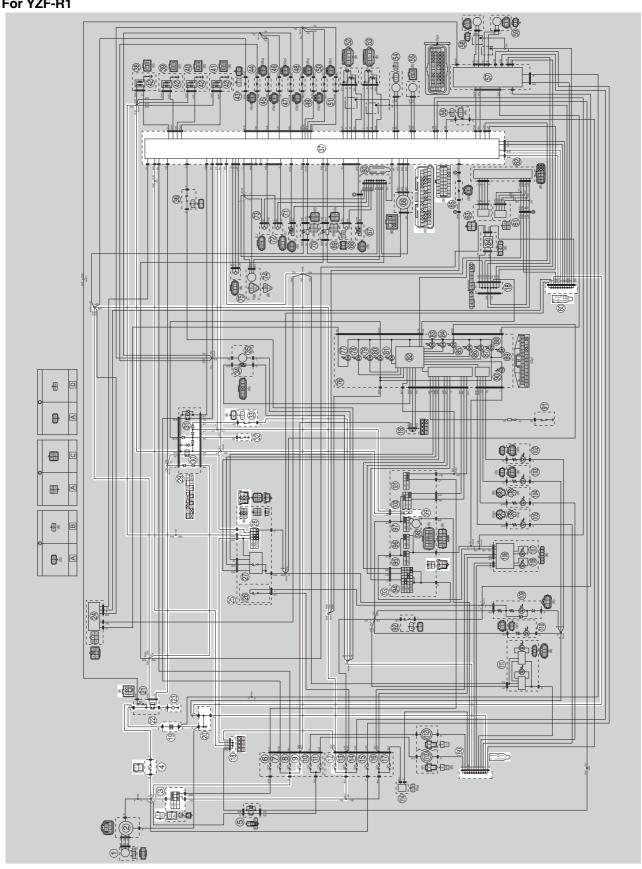
9. Check the start/engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	$NG \rightarrow$	Replace the handlebar switch (right).
OK↓		
10.Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	$NG \rightarrow$	Replace the neutral switch.
OK↓		
11.Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	$NG {\to}$	Replace the sidestand switch.
OK↓		
12.Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-237.	$NG {\to}$	Replace the relay unit.
OK↓		
13.Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	$NG \rightarrow$	Properly connect or repair the ignition system's wiring.
OK↓		
Replace the ECU or IMU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.		

FAS20073

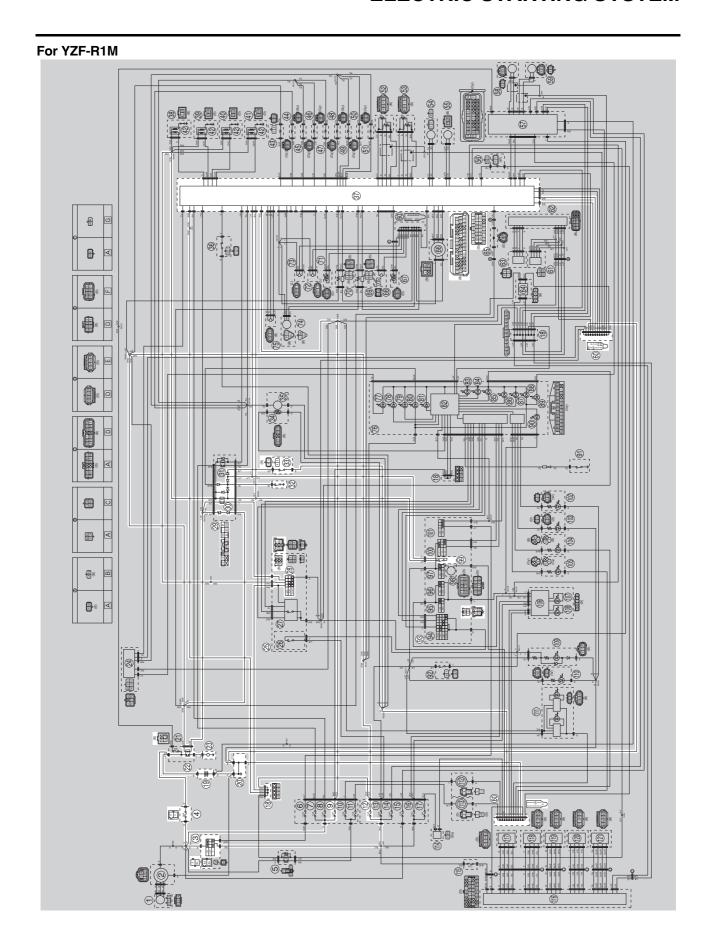
ELECTRIC STARTING SYSTEM

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
- 93. Handlebar switch (left)
- 99.Clutch switch



- 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
- 93. Handlebar switch (left)
- 99.Clutch switch

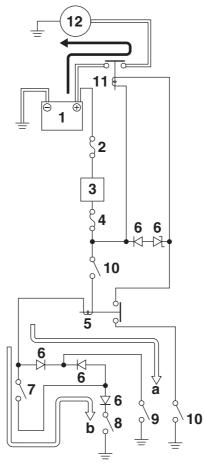
EAS30494

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the main switch is turned to "ON" and the "(s)" 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 "\$\mathbb{S}\$" side of the start/engine stop switch.



- a. WHEN THE TRANSMISSION IS IN NEU-TRAI
- b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR
- 1. Battery
- 2. Main fuse
- 3. Main switch
- 4. Ignition fuse
- 5. 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

The starter motor fails to turn. FIP • Before troubleshooting, remove the follow 1. Front side cowling/Front panel/Side cov 2. Rider seat 3. Fuel tank cover 4. Fuel tank 5. Air filter case 6. Throttle bodies	•	
Check the fuses. (Main, ignition and backup) Refer to "CHECKING THE FUSES" on page 8-232.	$NG {\rightarrow}$	Replace the fuse(s).
OK↓		
 Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-233. 	$NG \rightarrow$	Clean the battery terminals.Recharge or replace the battery.
OK↓		
3. Check the starter motor operation. Refer to "CHECKING THE START- ER MOTOR OPERATION" on page 8-239.	$OK\!\!\to\!$	Starter motor is OK. Perform the electric starting system troubleshooting, starting with step (5).
NG↓		
4. Check the starter motor. Refer to "CHECKING THE START-ER MOTOR" on page 5-42.	$NG {\rightarrow}$	Repair or replace the starter motor.
OK↓		
5. Check the relay unit (starting circuit cut-off relay). Refer to "CHECKING THE RE-LAYS" on page 8-236.	NG→	Replace the relay unit.
ОК↓		
6. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-237.	$NG {\rightarrow}$	Replace the relay unit.
ОК↓		
7. Check the starter relay. Refer to "CHECKING THE RE- LAYS" on page 8-236.	$NG {\rightarrow}$	Replace the starter relay.
OK↓		
8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	$NG {\rightarrow}$	Replace the main switch/immobilizer unit
OK↓		

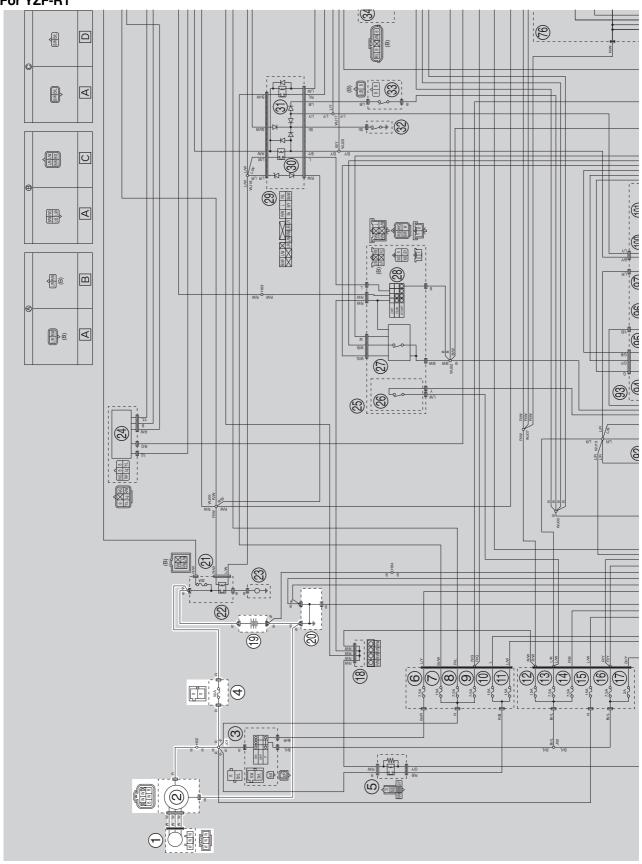
9. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	$NG \rightarrow$	Replace the neutral switch.
OK↓		
10.Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	$NG \rightarrow$	Replace the sidestand switch.
ОК↓		
11.Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	$NG \rightarrow$	Replace the clutch switch.
OK↓		
12.Check the start/engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	$NG {\rightarrow}$	Replace the handlebar switch (right).
ОК↓		
13.Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-9.	$NG\!\!\to\!$	Properly connect or repair the starting system's wiring.
ОК↓		
Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.		

CHARGING SYSTEM

EAS3049

CIRCUIT DIAGRAM

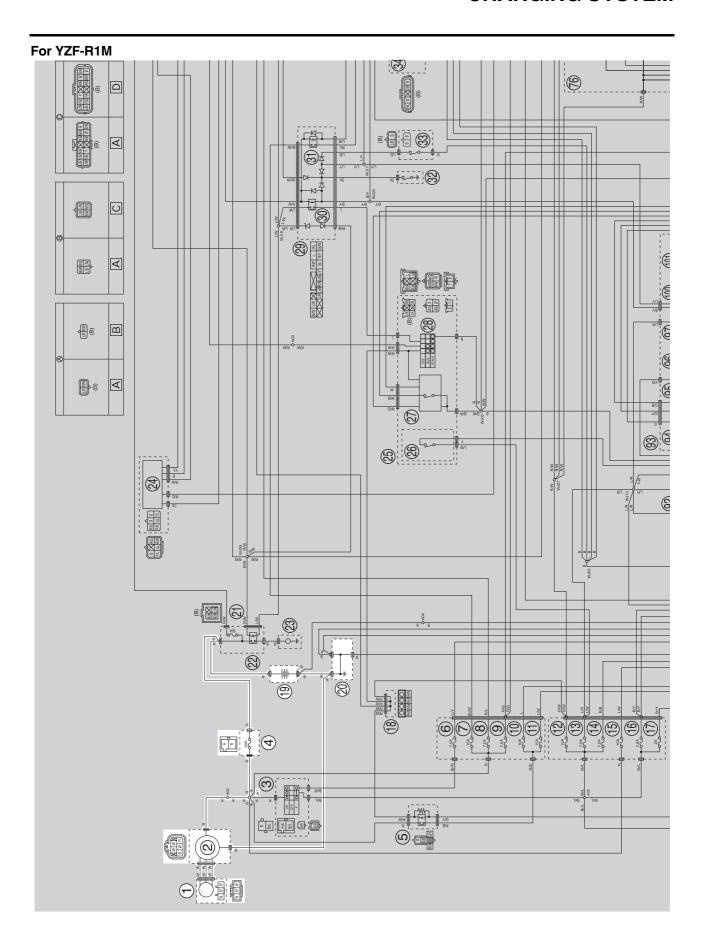
For YZF-R1



CHARGING SYSTEM

- 1. AC magneto
- 2. Rectifier/regulator
- 4. Main fuse
- 19.Battery
- 20.Engine ground

CHARGING SYSTEM



CHARGING SYSTEM

- 1. AC magneto
- 2. Rectifier/regulator
- 4. Main fuse
- 19.Battery
- 20.Engine ground

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
 - Check the fuse.
 (Main)
 Refer to "CHECKING THE FUSES"
 on page 8-232.

 $NG \rightarrow$

Replace the fuse.

OK↓

Check the battery.
 Refer to "CHECKING AND
 CHARGING THE BATTERY" on
 page 8-233.

 $NG \rightarrow$

• Clean the battery terminals.

• Recharge or replace the battery.

OK↓

3. Check the stator coil.
Refer to "CHECKING THE STATOR COIL" on page 8-239.

 $NG \rightarrow$

Replace the stator coil assembly.

OK↓

 Check the rectifier/regulator. Refer to "CHECKING THE RECTI-FIER/REGULATOR" on page 8-240.

 $NG\rightarrow$

Replace the rectifier/regulator.

OK↓

 Check the entire charging system's wiring.
 Refer to "CIRCUIT DIAGRAM" on page 8-17.

 $NG \rightarrow$

Properly connect or repair the charging system's wiring.

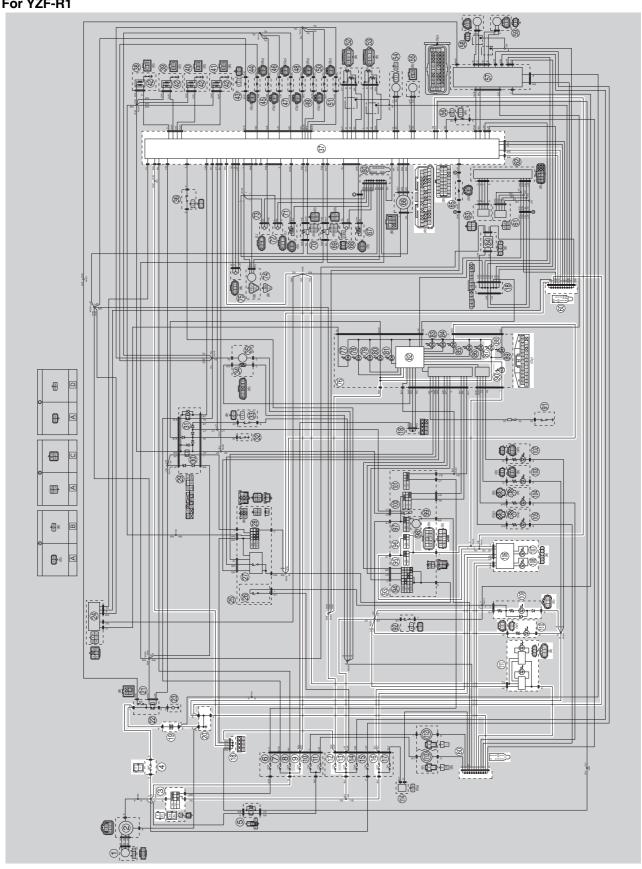
OK↓

The charging system circuit is OK.

LIGHTING SYSTEM

CIRCUIT DIAGRAM

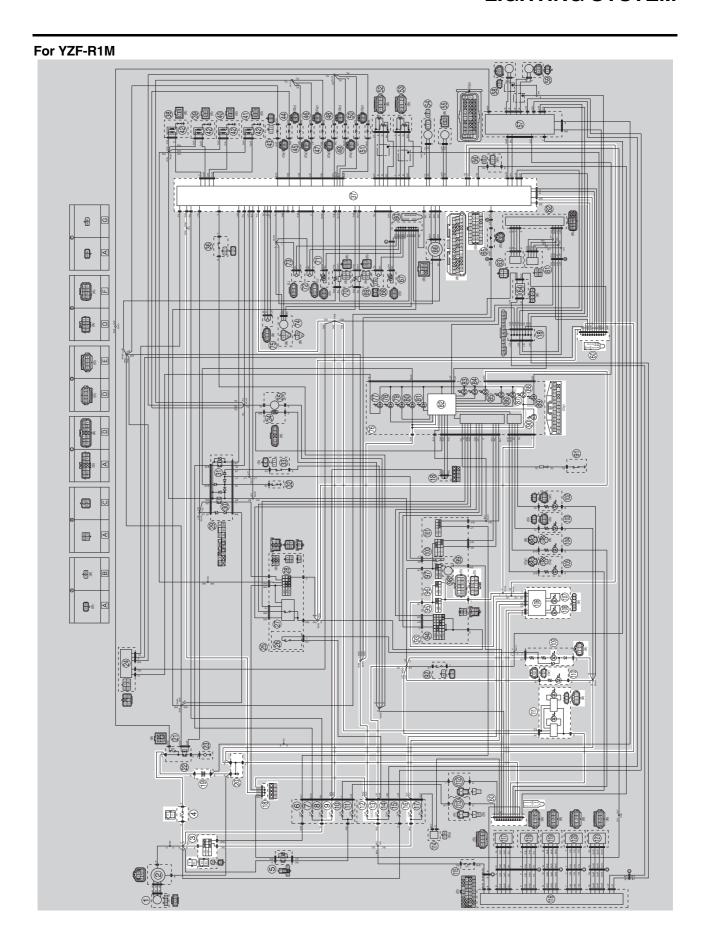
For YZF-R1



LIGHTING SYSTEM

- 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
- 82. Multi-function meter
- 88.Meter light
- 90. High beam indicator light
- 93. Handlebar switch (left)
- 95.Pass/LAP switch
- 96. Dimmer switch
- 106.Headlight control unit
- 107.Headlight (high beam)
- 108.Headlight (low beam)
- 109.Tail/brake light
- 110.License plate light
- 111.Auxiliary light

LIGHTING SYSTEM



LIGHTING SYSTEM

- 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
- 82. Multi-function meter
- 88.Meter light
- 90. High beam indicator light
- 93. Handlebar switch (left)
- 95.Pass/LAP switch
- 96. Dimmer switch
- 106.Headlight control unit
- 107.Headlight (high beam)
- 108.Headlight (low beam)
- 109. Tail/brake light
- 110.License plate light
- 111.Auxiliary light

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
 - Check the fuses. (Main, headlight, backup, ignition and signaling system) Refer to "CHECKING THE FUSES" on page 8-232.

 $NG \rightarrow$

Replace the fuse(s).

OK↓

2. Check the battery.
Refer to "CHECKING AND
CHARGING THE BATTERY" on
page 8-233.

NG→

• Clean the battery terminals.

Recharge or replace the battery.

OK↓

3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

 $NG \rightarrow$

Replace the main switch/immobilizer unit.

OK↓

4. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

 $NG \rightarrow$

The dimmer switch is faulty. Replace the handlebar switch (left).

OK↓

5. Check the Pass/LAP switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

 $NG\rightarrow$

The Pass/LAP switch is faulty. Replace the handlebar switch (left).

OK↓

 Check the entire lighting system's wiring.
 Refer to "CIRCUIT DIAGRAM" on page 8-23.

 $NG\rightarrow$

Properly connect or repair the lighting system's wiring.

OK↓

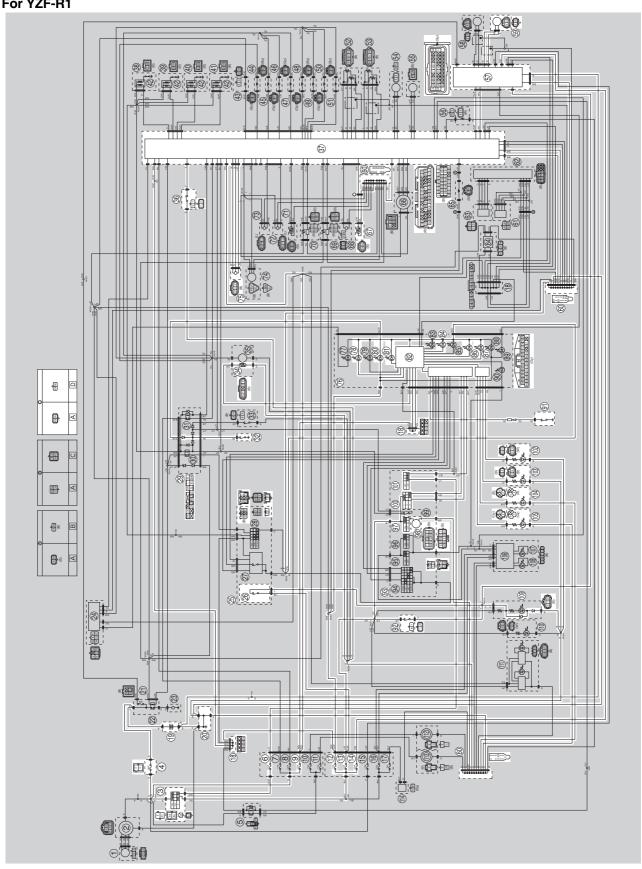
Replace the ECU, meter assembly, headlight assembly, tail/brake light, license plate light or auxiliary light. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.

SIGNALING SYSTEM

EAS30500

CIRCUIT DIAGRAM

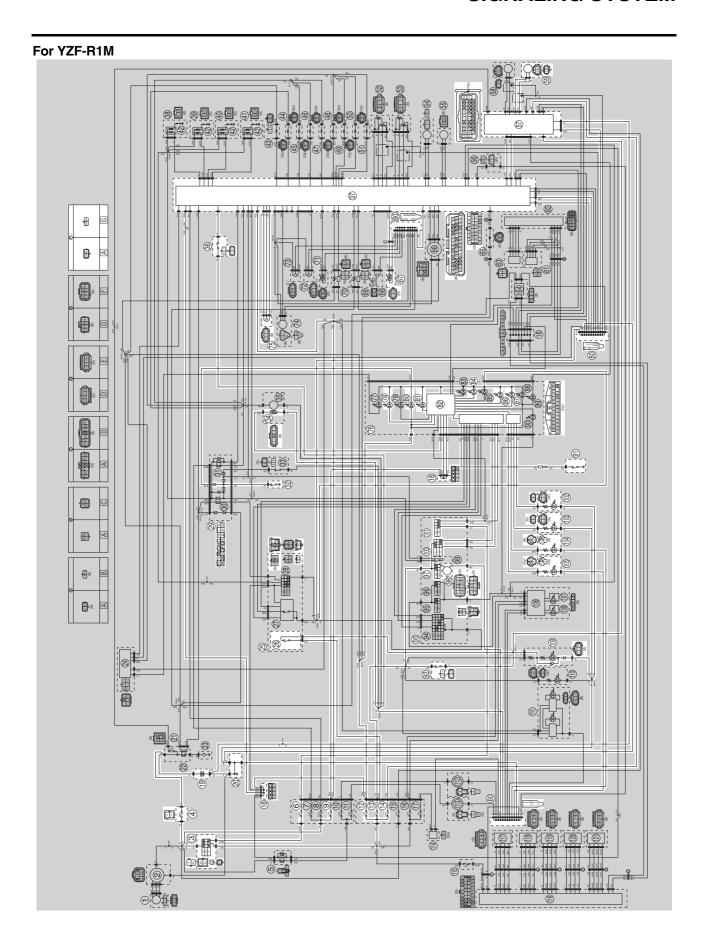
For YZF-R1



SIGNALING SYSTEM

- 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
- 80. Neutral indicator light
- 81. Shift timing indicator light
- 82. Multi-function meter
- 84.Oil pressure and coolant temperature warning light
- 86. Turn signal indicator light (right)
- 87. Turn signal indicator light (left)
- 91.Oil pressure switch
- 92. Rear brake light switch
- 93. Handlebar switch (left)
- 97. Horn switch
- 98.Horn
- 100. Turn signal switch
- 101.Hazard switch
- 102.Rear turn signal light (right)
- 103.Rear turn signal light (left)
- 104. Front turn signal light (right)
- 105.Front turn signal light (left)
- 109.Tail/brake light
- A. Wire harness
- D. Sub-wire harness (coolant temperature sensor)

SIGNALING SYSTEM



- 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
- 80. Neutral indicator light
- 81. Shift timing indicator light
- 82. Multi-function meter
- 84.Oil pressure and coolant temperature warning light
- 86. Turn signal indicator light (right)
- 87. Turn signal indicator light (left)
- 91.Oil pressure switch
- 92. Rear brake light switch
- 93. Handlebar switch (left)
- 97. Horn switch
- 98.Horn
- 100. Turn signal switch
- 101.Hazard switch
- 102.Rear turn signal light (right)
- 103.Rear turn signal light (left)
- 104. Front turn signal light (right)
- 105.Front turn signal light (left)
- 109.Tail/brake light
- A. Wire harness
- G. Sub-wire harness (coolant temperature sensor)

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
 - 1. Check the fuses. (Main, ignition, signaling system, backup, ABS ECU and hazard light-Refer to "CHECKING THE FUSES" on page 8-232.

OK↓

2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-233.

OK↓

Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

OK↓

4. Check the entire signaling system's Refer to "CIRCUIT DIAGRAM" on page 8-29.

OK↓

Check the condition of each of the signaling system circuits. Refer to "Checking the signaling sys-

Checking the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

OK↓

 $NG \rightarrow$

Replace the fuse(s).

- Clean the battery terminals. $NG \rightarrow$
 - Recharge or replace the battery.

 $NG \rightarrow$

Replace the main switch/immobilizer unit.

 $NG \rightarrow$

Properly connect or repair the signaling system's wiring.

 $NG \rightarrow$

Replace the handlebar switch (left).

Check the horn. Refer to "CHECKING THE HORN" on page 8-241.	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.
ОК↓	•	
This circuit is OK.		
The tail/brake light fails to come on.		
Check the front brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	NG→	Replace the front brake light switch.
ОК↓		
Check the rear brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	NG→	Replace the rear brake light 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.
OK↓		
Replace the tail/brake light.		
The turn signal light, turn signal indicator	ı light or both 1	fail to blink.
Check the turn signal switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	NG→	Replace the handlebar switch (left).
OK↓		
Check the hazard switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	NG→	Replace the handlebar switch (left).
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↓	I	
Replace the meter assembly or turn signal light.		

The neutral indicator light fails to come or	າ.	
Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-229.	 NG→	Replace the neutral switch.
OK↓	l	
2. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-237.	$NG \rightarrow$	Replace the relay unit.
OK↓	·	
Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29.	$NG \rightarrow$	Properly connect or repair the signaling system's wiring.
OK↓	•	
Replace the meter assembly.		
The oil pressure and coolant temperature to "ON".	warning light	t fails to come on when the main switch is set
Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29.	$NG \rightarrow$	Properly connect or replace the wiring harness.
OK↓		
Disconnect the oil pressure switch lead from the oil pressure switch, and then check whether the oil pressure and coolant temperature warning light comes on when the lead is connected to the engine ground.	$NG \rightarrow$	Replace the meter assembly.
OK↓		
Replace the oil pressure switch.		
The oil pressure and coolant temperature	warning ligh	t remains on after the engine is started.
Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29.	NG→	Properly connect or replace the wiring harness.
OK↓		
Measure the engine oil pressure. Refer to "MEASURING THE ENGINE OIL PRESSURE" on page 3-31.	$NG \rightarrow$	Check the engine oil leakage, oil viscosity, oil seal, oil filter, or oil pump.
OK↓	l	
Replace the oil pressure switch.		

The fuel level warning light fails to come on.						
Check the fuel sender. Refer to "CHECKING THE FUEL SENDER" on page 8-241.	$NG \rightarrow$	Replace the fuel pump assembly.				
OK↓						
Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29.	$NG{ o}$	Properly connect or repair the signaling system's wiring.				
OK↓	•					
Replace the meter assembly.						
The oil pressure and coolant temperature	warning ligh	t fails to come on.				
Check the coolant temperature sensor. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-242.	NG→	Replace the coolant temperature sensor.				
OK↓	l					
Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29.	$NG\!\!\to\!$	Properly connect or replace the wiring harness.				
OK↓						
Replace the ECU or meter assembly. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.						
QSS (Quick Shift System) does not opera	ate.					
Check that the engine trouble warning light does not come on.	NG→	Repair the faulty parts.				
OK↓	•					
Check that the QSS is working under normal QSS operating conditions.	$NG \rightarrow$	Check the QSS operating conditions explained 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 displayed at the top of the meter.)	$NG \rightarrow$	Activate the QSS. (Set the QSS to a setting other than "OFF".)				
OK↓						
Check that the shift switch coupler is connected.	NG→	Connect the shift switch coupler.				
OK↓	•					

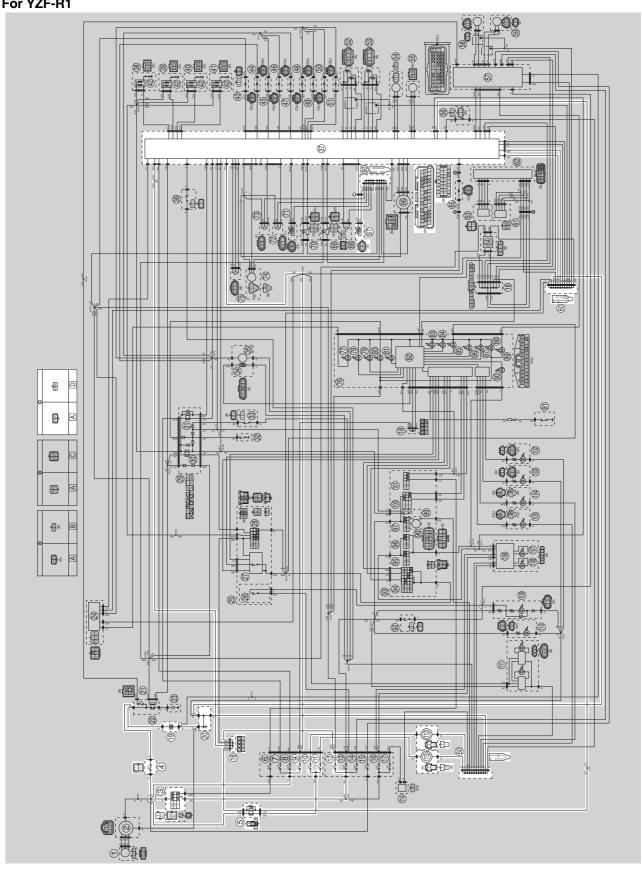
5. Check the shift switch. Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on Replace the shift switch. $NG \rightarrow$ page 9-17 and "CHECKING THE SWITCHES" on page 8-229. OK↓ 6. Check the neutral switch. Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on Replace the neutral switch. $NG \rightarrow$ page 9-17 and "CHECKING THE SWITCHES" on page 8-229. OK↓ 7. 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 ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232. The speedometer fails to operate. 1. Check the rear wheel sensor. Refer to "MAINTENANCE OF THE Replace the rear wheel sensor. REAR WHEEL SENSOR AND $NG \rightarrow$ SENSOR ROTOR" on page 4-41. OK↓ 2. Check the entire wheel sensor wir-Properly connect or repair the wheel senina. sor wiring. $NG \rightarrow$ Refer to TIP. OK↓ Replace the hydraulic unit assembly, ECU, meter assembly. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232. 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. (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)

FAS20077

COOLING SYSTEM

CIRCUIT DIAGRAM

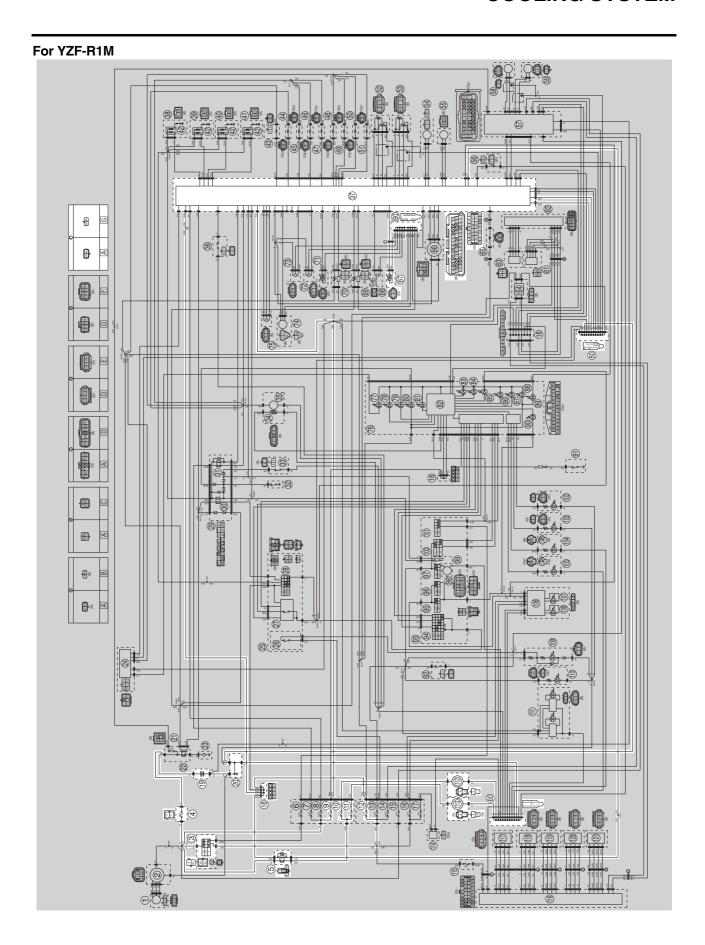
For YZF-R1



COOLING SYSTEM

- 3. Main switch
- 4. Main fuse
- 5. Radiator fan motor relay
- 9. Backup fuse
- 10. Sub radiator fan motor fuse
- 11. Radiator fan motor fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20. Engine ground
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 67. Coolant temperature sensor
- 112.Sub radiator fan motor (right)
- 113.Radiator fan motor (left)
- A. Wire harness
- D. Sub-wire harness (coolant temperature sensor)

COOLING SYSTEM



COOLING SYSTEM

- 3. Main switch
- 4. Main fuse
- 5. Radiator fan motor relay
- 9. Backup fuse
- 10. Sub radiator fan motor fuse
- 11. Radiator fan motor fuse
- 12.Ignition fuse
- 18. Joint coupler
- 19.Battery
- 20. Engine ground
- 37.ECU (Engine Control Unit)
- 60. Joint connector
- 67. Coolant temperature sensor
- 112.Sub radiator fan motor (right)
- 113.Radiator fan motor (left)
- A. Wire harness
- G. Sub-wire harness (coolant temperature sensor)

EAS30503

TROUBLESHOOTING

TIP

- Before troubleshooting, remove the following part(s):
- 1. Front side cowling/Front panel/Side cover bracket/Electrical components tray
- 2. Rider seat
- 3. Fuel tank cover
- 4. Fuel tank
- 5. Air filter case
- 6. Throttle bodies
 - Check the fuses. (Main, ignition, backup, radiator fan motor and sub radiator fan motor) Refer to "CHECKING THE FUSES" on page 8-232.

 $NG \rightarrow$

Replace the fuse(s).

OK↓

Check the battery.
 Refer to "CHECKING AND
 CHARGING THE BATTERY" on
 page 8-233.

 $NG \rightarrow$

Clean the battery terminals.Recharge or replace the battery.

OK↓

3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

NG→

Replace the main switch/immobilizer unit.

OK↓

4. Check the radiator fan motor. Refer to "CHECKING THE RADIA-TOR FAN MOTORS" on page 8-241.

NG→

Replace the radiator fan motor.

OK↓

Check the radiator fan motor relay. Refer to "CHECKING THE RE-LAYS" on page 8-236.

 $NG\rightarrow$

Replace the radiator fan motor relay.

OK↓

 Check the coolant temperature sensor.
 Refer to "CHECKING THE COOL-ANT TEMPERATURE SENSOR"

 $NG \rightarrow$

Replace the coolant temperature sensor.

OK↓

on page 8-242.

 Check the entire cooling system's wiring.
 Refer to "CIRCUIT DIAGRAM" on page 8-39.

NG→

Properly connect or repair the cooling system's wiring.

OK↓

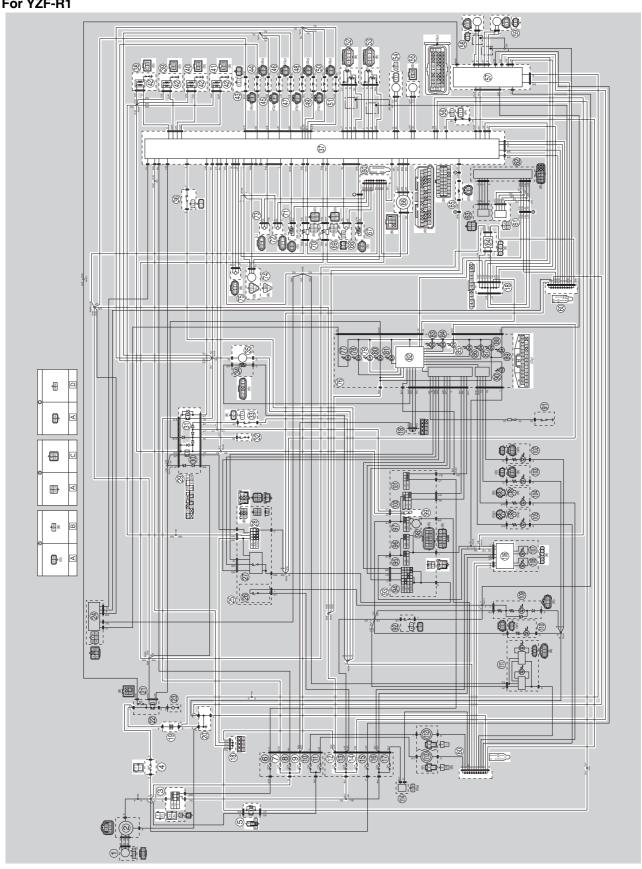
Replace the ECU.
Refer to "REPLACING THE ECU
(Engine Control Unit)" on page 8-232.

FAS20078

FUEL INJECTION SYSTEM

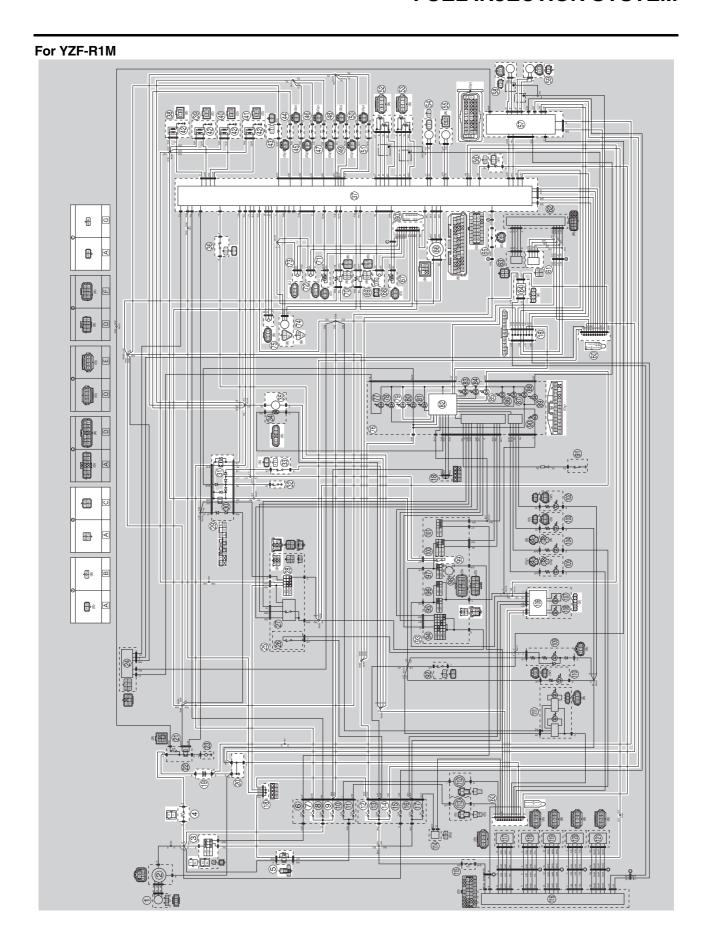
CIRCUIT DIAGRAM

For YZF-R1



- 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)
- 70.0₂ 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
- 79. Engine trouble warning light
- 82. Multi-function meter
- 85.Steering damper and suspension warning light
- 93. Handlebar switch (left)
- 99.Clutch switch
- 106.Headlight control unit
- A. Wire harness
- B. Sub-wire harness (intake solenoid)
- C. Sub-wire harness (Yamaha diagnostic tool coupler)
- Sub-wire harness (coolant temperature sensor)



- 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 #452.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)
- 70.0₂ 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
- 79. Engine trouble warning light
- 82. Multi-function meter
- 85.Steering damper and suspension warning light
- 93. Handlebar switch (left)
- 99.Clutch switch
- 106.Headlight control unit
- A. Wire harness
- B. Sub-wire harness (intake solenoid)
- C. Sub-wire harness (Yamaha diagnostic tool coupler, CCU, GPS unit)
- G. Sub-wire harness (coolant temperature sensor)

EAS30505

ECU SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code number is stored in the memory of the ECU.

Checking the engine trouble warning light

The engine trouble warning light comes on for around 2.0 seconds after the main switch has been set to "ON". If the warning light does not come on, the warning light (LED) may be defective.

ECU detects an abnormal signal from a sensor

If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue operating or stop operating, depending on the conditions.

EAS30506

TROUBLESHOOTING METHOD

The engine operation is not normal and the engine trouble warning light comes on.

- 1. Check:
 - Fault code number

- a. Check the fault code numbers that have a condition of "Detected" using the Yamaha diagnostic tool.
- 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 (FAULT CODE)" on page 8-51. Monitor the operation of the sensors and actuators in the diagnostic mode. Refer to "TROUBLESHOOT-ING DETAILS (FAULT CODE)" on page 8-51 and "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.	Check and repair.

Perform the reinstatement action for the fuel injection system.
 Refer to "Confirmation of service completion" in the appropriate table in "TROUBLESHOOTING DETAILS (FAULT CODE)" on page 8-51.

TIP

- If another fault code number is displayed, repeat steps (1) to (3) until no fault code number is displayed.
- Turning the main switch to "OFF" will not erase the malfunction history.

The engine operation is not normal, but the engine trouble warning light does not come on.

1. Check the operation of the following sensors and actuators in the diagnostic mode. Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-17 and "DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE" on page 9-20.

01: 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.

FAS30951

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 USB 90890-03256 Yamaha diagnostic tool (A/I) 90890-03254

A generic scan tool can also be used to identify malfunctions.



OBD/ GST Leadwire kit 90890-03249

Features of the Yamaha diagnostic tool

You can use the Yamaha diagnostic tool to identify malfunctions guicker than with conventional meth-

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 codes recorded on the ECU are read, and the contents are dis-Diagnosis of malfunction:

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.

Diagnosis of function: Check the operation of the output value of each sensor and actuator.

Dynamic inspection: Check the electric component condition automatically.

Active test: Manually adjust injection duration and/or switch some actuators for

troubleshooting.

Maintenance record: Store the inspection history into the Yamaha diagnostic tool application.

Recall search: Search the recall campaign information.

Monitoring: Displays a graph of sensor output values for actual operating condi-

tions.

Logging: Records and saves the sensor output value in actual driving conditions.

CO adjustment: Adjust the concentration of CO admissions during idling.

Reprogram ECU: 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.

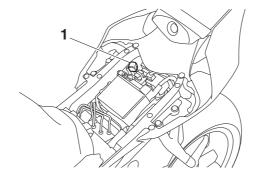
Writing VIN/frame number: Write the VIN/frame number in the ECU.

View logs: Displays the logging data.

However, the Yamaha 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.



EAS31791

TROUBLESHOOTING DETAILS (FAULT CODE)

This section describes the measures per fault code number displayed on the Yamaha diagnostic tool. 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, delete the fault codes displayed on the Yamaha diagnostic tool according to the reinstatement method.

Fault code No.:

Fault code number displayed on the Yamaha diagnostic tool when the engine failed to work normally. Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.

Parts connected to the ECU

The following parts are connected to the ECU.

When checking for a power short circuit, the couplers must be disconnected from all of the following parts beforehand.

· Crankshaft position sensor

• O₂ sensor 2

Primary injector #1

• ABS ECU (Electronic Control Unit)

Primary injector #2

Air induction system solenoid

• Primary injector #3

• Throttle servo motor

- Primary injector #4
- Secondary injector #1
- Secondary injector #2
- Secondary injector #3
- Secondary injector #4
- Ignition coil #1
- Ignition coil #2
- Ignition coil #3
- Ignition coil #4
- Throttle position sensor
- Accelerator position sensor
- Intake air pressure sensor
- Atmospheric pressure sensor
- Coolant temperature sensor
- Gear position sensor
- Shift switch
- Intake air temperature sensor
- O₂ sensor 1

- Relay unit
- Radiator fan motor relay
- Meter assembly
- Immobilizer unit
- Steering damper solenoid
- EXUP servo motor
- Cylinder identification sensor
- Main switch
- Intake funnel servo motor
- Intake solenoid
- Headlight control unit
- Handlebar switch (left and right)
- Front brake light switch
- Rear brake light switch
- Neutral switch
- Sidestand switch
- IMU (Inertial Measurement unit)
- SCU (Suspension Control Unit) (YZF-R1M)

Fault code No. P0030

TIP -

- If fault code numbers "P0030" and "P0112" are both indicated, take the actions specified for fault code number "P0112" first.
- If fault code numbers "P0030" and "P0113" are both indicated, take the actions specified for fault code number "P0113" first.
- If fault code numbers "P0030" and "P0122" are both indicated, take the actions specified for fault code number "P0122" first.
- If fault code numbers "P0030" and "P0123" are both indicated, take the actions specified for fault code number "P0123" first.
- If fault code numbers "P0030" and "P0222" are both indicated, take the actions specified for fault code number "P0222" first.
- If fault code numbers "P0030" and "P0223" are both indicated, take the actions specified for fault code number "P0223" first.
- If fault code numbers "P0030" and "P2135" are both indicated, take the actions specified for fault code number "P2135" first.

Hulli	ber P2135 IIISt.					
Fault	code No.	P0030				
Item O ₂ sensor 1 heater: defective heater controller detected.						
Fail-e	afe system	Able	to start engine			
l all-s	Fail-safe system		Able to drive vehicle			
Diagn	nostic code No.	code No. —				
Tool	display	_				
Proce	edure	_				
Item Probable cause of malfunction and check		Maintenance job	Confirmation of service completion			
1	Connection of O ₂ sensor 1 pler. Check the locking conditio		Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code us fill a Variable.		

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine, and then check the condition of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 2. TIP For this check, also set the start/engine stop switch to "ON".

Fault	code No.	P003	0			
Item		O ₂ se	O ₂ sensor 1 heater: defective heater controller detected.			
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine, and then check the condition of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 6. TIP For this check, also set the start/engine stop switch to "ON".		
3	Wire harness continuity.		Open or short circuit → Properly connect or replace the wire harness. Between O ₂ sensor 1 coupler and ECU coupler. pink/black–pink/black Between O ₂ sensor 1 coupler and ignition fuse. red/white–red/white Between main switch and ignition fuse. brown/blue–brown/blue	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine, and then check the condition of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 4. TIP For this check, also set the start/engine stop switch to "ON".		
4	Defective O ₂ sensor 1 heat	ter.	Replace the O ₂ sensor 1.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine, and then check the condition of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 5. TIP For this check, also set the start/engine stop switch to "ON".		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.		

Fault	code No.	P0030		
Item O ₂ sensor 1 heater: d		ensor 1 heater: defective heater	controller detected.	
6	6 Delete the fault code and check that the engine trouble warning light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0050

TIP

- If fault code numbers "P0050" and "P0112" are both indicated, take the actions specified for fault code number "P0112" first.
- If fault code numbers "P0050" and "P0113" are both indicated, take the actions specified for fault code number "P0113" first.
- If fault code numbers "P0050" and "P0122" are both indicated, take the actions specified for fault code number "P0122" first.
- If fault code numbers "P0050" and "P0123" are both indicated, take the actions specified for fault code number "P0123" first.
- If fault code numbers "P0050" and "P0222" are both indicated, take the actions specified for fault code number "P0222" first.
- If fault code numbers "P0050" and "P0223" are both indicated, take the actions specified for fault code number "P0223" first.
- If fault code numbers "P0050" and "P2135" are both indicated, take the actions specified for fault code number "P2135" first.

Fault	code No.	P0050		
Item		O ₂ sensor 2 heater: defective heater controller detected.		
Fail a	efe avatem	Able	to start engine	
raii-s	afe system	Able	to drive vehicle	
Diagn	ostic code No.	_		
Tool	display	_		
Proce	edure			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion
1	Connection of O ₂ sensor 2 pler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotterminals and locking cond of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine, and then check the condition of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 2. TIP For this check, also set the start/engine stop switch to "ON".

Fault	Fault code No. P0050					
Item		O ₂ se	O ₂ sensor 2 heater: defective heater controller 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine, and then check the condition of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 6. TIP For this check, also set the start/engine stop switch to "ON".		
3	Wire harness continuity.		Open or short circuit → Properly connect or replace the wire harness. Between O ₂ sensor 2 coupler and ECU coupler. pink/white–pink/white Between O ₂ sensor 2 coupler and ignition fuse. red/white–red/white Between main switch and ignition fuse. brown/blue–brown/blue	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine, and then check the condition of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 4. TIP For this check, also set the start/engine stop switch to "ON".		
4	Defective O ₂ sensor 2 hear	ter.	Replace the O ₂ sensor 2.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine, and then check the condition of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 5. TIP For this check, also set the start/engine stop switch to "ON".		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.		

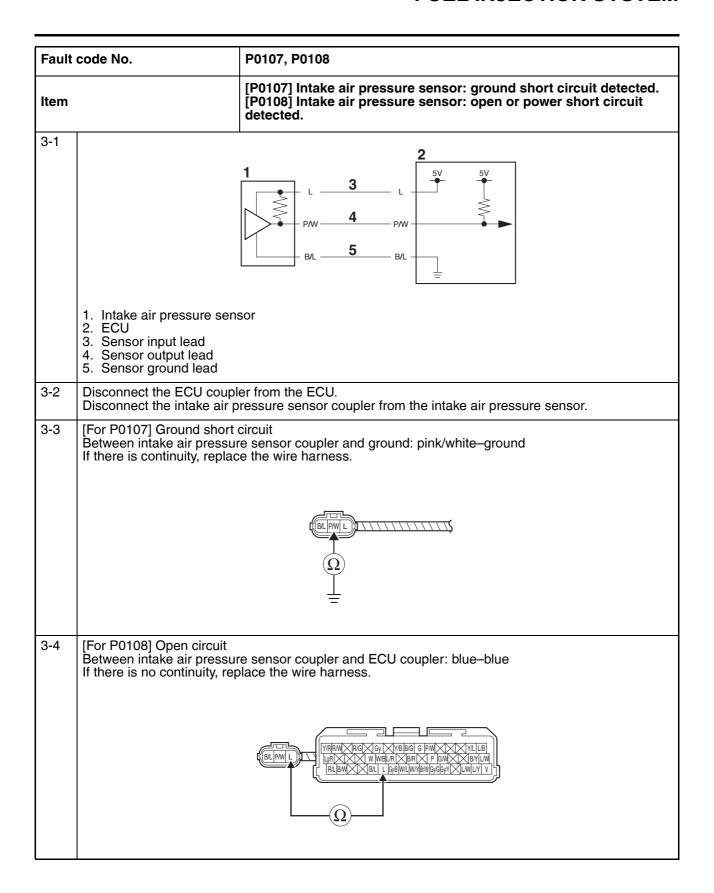
Fault code No. P0050		0		
Item O ₂ s		ensor 2 heater: defective heater	controller detected.	
6	Delete the fault code and check that the engine trouble warning light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0069

Fault	Fault code No. P0069			
Item		Intake air pressure sensor or atmospheric pressure sensor: whe main switch is turned to "ON", the intake air pressure sens voltage and atmospheric pressure sensor voltage differ greatly		
Fail a	efe ovetem	Able	to start engine	
raii-s	afe system	Able	to drive vehicle	
Diagn	ostic code No.	03, 0	2	
	Tool display	Displa	ays the intake air pressure.	
03	Procedure	Opera switch	ate the throttle while pushing the " h. (If the display value changes, th	(§)" side of the start/engine stop e performance is OK.)
	Tool display	Displa	ays the atmospheric pressure.	
02	Procedure	Comp play v	pare the actually measured atmospalue.	oheric pressure with the tool dis-
Item	Probable cause of malfunction and che	ck	Maintenance job	Confirmation of service completion
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 → Replace the intake air pressure sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 4 and finish the service. Condition is "Detected" → 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 → Replace the atmospheric pressure sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 4 and finish the service. Condition is "Detected" → Go to item 3.

Fault code No. P000		P006	9	
Item the		the n	ke air pressure sensor or atmospheric pressure sensor: when main switch is turned to "ON", the intake air pressure sensor age and atmospheric pressure sensor voltage differ greatly.	
3	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.
4	Delete the fault code and check that the engine trouble warning light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0107, P0108					
Fault	code No.	P010	7, P0108		
Item		[P010	P0107] Intake air pressure sensor: ground short circuit detected. P0108] Intake air pressure sensor: open or power short circuit etected.		
Fail-s	afe system	Able	to start engine		
		Able	to drive vehicle		
Diagn	ostic code No.	03			
Tool o	display	Displa	ays the intake air pressure.		
Proce	edure	Opera switch	ate the throttle while pushing the "and the throttle while pushing the factorial through the throttle through the throttle through the throttle through the throttle throttle through the throttle through the throttle thr	(s)" side of the start/engine stop e performance is OK.)	
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Connection of intake air pressure 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	



Fault	code No.	P0107, P0108		
Item		[P0107] Intake air pressure sensor: ground short circuit detected. [P0108] Intake air pressure sensor: open or power short circuit detected.		
3-5	[For P0108] Open circuit Between intake air pressure sensor coupler and ECU coupler: pink/white–pink/white If there is no continuity, replace the wire harness.			
		VALENCE OF AND STATE OF AND STA		
3-6	[For P0108] Open circuit Between intake air pressure sensor coupler and ECU coupler: black/blue-black/blue If there is no continuity, replace the wire harness.			
		VARINA BIG OY VARING BIR P GW BATUM BIL L SIGNAL WARNING GRAN LAWLY V OR DESCRIPTION OF THE STREET		
3-7	Disconnect the couplers from Refer to "Parts connected to "Parts connected to "Parts connected to "Parts".	om the parts that are connected to the ECU. to the ECU" on page 8-51.		
3-8	[For P0107/P0108] Short of Between intake air pressur ECU coupler terminal "b". If there is continuity, replace	e sensor output terminal (pink/white) "a" of ECU coupler and any other		
		A VIRRW RICK OV VINBUG G PW VILUB LIGHT W WINDLER BAR GOWN BYLLW RILBW BAL L LOBBWLWY99W 9769/Y LUMLY V D O O O O O O O O O O O O		

Fault	code No.	P0107, P0108			
Item		[P0107] Intake air pressure sensor: [P0108] Intake air pressure sensor: detected.	07] Intake air pressure sensor: ground short circuit detected. 08] Intake air pressure sensor: open or power short circuit cted.		
4	Installed condition of intake pressure sensor.	air Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.		
5	Defective intake air pressu sensor.	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), approx. 3.64 V 1000 m (3300 ft) above sea level: Approx. 90 kPa (675.1 mmHg, 26.6 inHg), approx. 3.30 V 2000 m (6700 ft) above sea level: Approx. 80 kPa (600.0 mmHg, 23.6 inHg), approx. 3.00 V 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg), approx. 2.70 V When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking → Check the intake air pressure sensor. Replace if defective. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.			
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.		
7	Delete the fault code and code that the engine trouble war light goes off.				

Fault code No. P0112, P0113

TIP

Perform this procedure when the engine is cold.

Fault	code No.	P011	2, P0113		
Item de [Po		detection [P01]	P0112] Intake air temperature sensor: ground short circuit detected. P0113] Intake air temperature sensor: open or power short circuit detected.		
Fail-e	afe system	Able	to start engine		
i aii-s	are system	Able	to drive vehicle		
Diagn	ostic code No.	05			
Tool	display	Displa	ays the air temperature.		
Proce	edure	Comp value	pare the actually measured air ten	nperature with the tool display	
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Connection of intake air temperature 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	

Fault	code No.	P0112, P0113			
Item		[P0112] Intake air temperature sensor: ground short circuit detected. [P0113] Intake air temperature sensor: open or power short circuit detected.			
3-1	1. Intake air temperature sensor 2. ECU 3. Sensor output lead				
0.0	Sensor ground lead				
3-2	Disconnect the ECU coupler from the ECU. Disconnect the intake air temperature sensor coupler from the intake air temperature sensor.				
3-3	If there is continuity, replace	ature sensor coupler and ground: brown/white-ground			
3-4	[For P0113] Open circuit Between intake air temper If there is no continuity, rep	ature sensor coupler and ECU coupler: brown/white–brown/white blace the wire harness.			

Fault	code No.	P0112, P0113			
Item		detected.	0113] Intake air temperature sensor: open or power short circuit		
3-5	[For P0113] Open circuit Between intake air tempera If there is no continuity, rep	ature sensor coupler and ECU coupler: blace the wire harness.	olack/blue-black/blue		
		YRRW RIG GY YYBBG G PM YYL LIGHT W WOLR BR P GW BY RLBW BL L GORMLWYBW GOGGYY LWL			
3-6	Disconnect the couplers from Refer to "Parts connected in the couplers from Parts connected in the Coupler from Parts	om the parts that are connected to the Ed to the ECU" on page 8-51.	CU.		
3-7	[For P0112/P0113] Short circuit Between intake air temperature sensor output terminal (brown/white) "a" of ECU coupler and any other ECU coupler terminal "b". If there is continuity, replace the wire harness.				
		TYRRW/RG/Oy/YBBG G PM/VLUB LIGHT W MBURN BRIN P GW/BYCGYY LUMLUY VI BRUBW/BR L L Dyc WLLWYSW BYCGYY LUMLUY VI D D			
4	Installed condition of intake temperature sensor.	e air Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.		
5	Defective intake air temper ture sensor.	a- 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 temperature → Check the intake air temperature sensor. Replace if defective. Refer to "CHECKING THE INTAKE AIR TEMPERATURE SENSOR" on page 8-244.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.		

Fault code No. P011		2, P0113		
Item dete		detection [P01]	12] Intake air temperature sensor: ground short circuit cted. 13] Intake air temperature sensor: open or power short circuit cted.	
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0117, P0118

TIP

Perform this procedure when the engine is cold.

Fault	code No.	P011	7, P0118		
Item	Item [F		[P0117] Coolant temperature sensor: ground short circuit detected. [P0118] Coolant temperature sensor: open or power short circuit detected.		
Fail-s	afe system	Able	to start engine		
		Able	to drive vehicle		
Diagn	nostic code No.	06			
Tool	display	Wher Wher	n engine is cold: Displays tempera n engine is hot: Displays current co	ture closer to air temperature. oolant temperature.	
Proce	Procedure		Compare the actually measured coolant temperature with the tool display value.		
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Connection of coolant temperature 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.		

Fault	Fault code No.		7, P0118		
Item		[P011	0117] Coolant temperature sensor: ground short circuit detected. 0118] Coolant temperature sensor: open or power short circuit tected.		
3	Wire harness and/or sub-w harness continuity.	vire	Open or short circuit → Replace the wire harness and/or subwire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	
3-1			2		
		1	5 3 GW - GW -	5V	
	 Coolant temperature se ECU Sensor output lead Sensor ground lead Sub-wire harness 	ensor			
3-2	Disconnect the ECU couple Disconnect the coolant term		n the ECU. ure sensor coupler from the coolar	nt temperature sensor.	
3-3	[For P0117] Ground short circuit Between wire harness coupler (ECU side) and ground: green/white–ground Between sub-wire harness coupler (coolant temperature sensor side) and ground: green/white– ground If there is continuity, replace the wire harness and/or sub-wire harness.				
	A		В		
				BA)	
	A. Wire harness coupler (EB. Sub-wire harness coupl		de) blant temperature sensor side)		

Fault	code No.	P0117, P0118		
Item		[P0117] Coolant temperature sensor: ground short circuit detected. [P0118] Coolant temperature sensor: open or power short circuit detected.		
3-4	Between sub-wire harness sor coupler: green/white-g	upler (ECU side) and ECU coupler: green/white–green/white s coupler (coolant temperature sensor side) and coolant temperature sengreen/white place the wire harness and/or sub-wire harness.		
	A	В		
	GWBL YRRW R LQR RLBW	GO GY YYBBIG G PM YYLLB WWWBLR BRN P GW BBYLW BYLW Y LWLYY Y L		
	A. Wire harness coupler (B. Sub-wire harness coup	ECU side) ller (coolant temperature sensor side)		
3-5	Between sub-wire harness sor coupler: black/blue-bla	upler (ECU side) and ECU coupler: black/blue-black/blue s coupler (coolant temperature sensor side) and coolant temperature senack/blue blace the wire harness and/or sub-wire harness.		
	A	В		
		GC GY YVB BG G PMX YVLUB W WIBLR BRR P GW BYLW BL L GyBWLWYBWGGGYY LWLYY Y		
	A. Wire harness coupler (B. Sub-wire harness coup	ECU side) ller (coolant temperature sensor side)		

Disconnect the couplers from the parts that are connected to the ECU. Refer to "Parts connected to the ECU" on page 8-51.

3-6

Fault	Fault code No. P0117, P0118				
rault code No.		P0117, P0118			
Item		[P0117] Coolant temperature sens [P0118] Coolant temperature sens detected.	[7] Coolant temperature sensor: ground short circuit detected.[8] Coolant temperature sensor: open or power short circuit cted.		
3-7	Between wire harness (EC ECU coupler terminal "b". Between sub-wire harness output terminal (black/blue)	or P0117/P0118] Short circuit etween wire harness (ECU side) output terminal (green/white) "a" of ECU coupler and any other CU coupler terminal "b". etween sub-wire harness (coolant temperature sensor side) output terminal (green/white) "c" and etput terminal (black/blue) "d". there is continuity, replace the wire harness and/or sub-wire harness.			
	A VIRW VIRW D	a B	C d		
	A. Wire harness coupler (B. Sub-wire harness coup	CU side) er (coolant temperature sensor side)			
4	Installed condition of coola temperature sensor.	Check for looseness or pinching. Improperly installed sensor -> Reinstall or replace the sensor	and then check the condition of the fault code using the mal-		
5	Defective coolant temperat sensor.	Execute the diagnostic mode. (Code No. 06) When engine is cold: Displayed temperature is clos to the ambient temperature is not close to the ambient temp ature → Check the coolant te perature sensor. Replace if defective. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-242.	and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service.		
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" or page 8-232.	Service is finished.		
7	Delete the fault code and of that the engine trouble war light goes off.		s		

Fault code No. P0122, P0123, P0222, P0223, P2135

TIP

If a fault code other than No. "P2135" ("P0122, P0123, P0222, P0223") is detected, perform trouble-shooting first.

Fault	code No.	P012	2, P0123, P0222, P0223, P2135	
ltem		[P0122] Throttle position sensor: ground short circuit detected. [P0123] Throttle position sensor: open or power short circuit detected. [P0222] Throttle position sensor: ground short circuit detected. [P0223] Throttle position sensor: open or power short circuit detected. [P2135] Throttle position sensor: output voltage deviation error.		
Fail-s	afe system	Able/	Unable to start engine	
			Unable to drive vehicle	
Diagn	ostic code No.	01, 1	3	
01	Tool display	• 11–	tle position sensor signal 1 21 (fully closed position) 107 (fully open position)	
	Procedure		eck with throttle valves fully closed eck with throttle valves fully open.	
13	Tool display	• 9–2	tle position sensor signal 2 3 (fully closed position) 109 (fully open position)	
	Procedure • Ch		heck with throttle valves fully closed. heck with throttle valves fully open.	
Item	Probable cause of malfunction and chec	:k	Maintenance job	Confirmation of service completion
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.
3	Wire harness continuity.		Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.

Fault	code No.	P0122, P0123, P0222, P0223, P2135	
Item		[P0122] Throttle position sensor: ground short circuit detected. [P0123] Throttle position sensor: open or power short circuit detected. [P0222] Throttle position sensor: ground short circuit detected. [P0223] Throttle position sensor: open or power short circuit detected. [P2135] Throttle position sensor: output voltage deviation error.	
3-1	1. Throttle position sensor 2. ECU 3. Sensor input lead 4. Sensor output lead 1 5. Sensor output lead 2	1 3 L 5V	
3-2	6. Sensor ground lead Disconnect the ECU couple Disconnect the throttle posi	er from the ECU. ition sensor coupler from the throttle position sensor.	
3-3	[For P0122] Ground short of	circuit ensor coupler and ground: white-ground	

Fault	code No.	P0122, P0123, P0222, P0223, P2135
Item		[P0122] Throttle position sensor: ground short circuit detected. [P0123] Throttle position sensor: open or power short circuit detected. [P0222] Throttle position sensor: ground short circuit detected. [P0223] Throttle position sensor: open or power short circuit detected. [P2135] Throttle position sensor: output voltage deviation error.
3-4	[For P0123] Open circuit Between throttle position s If there is no continuity, rep	sensor coupler and ECU coupler: white—white olace the wire harness. O Θ//PD/G/J/G/PD/PM/LR L L/Y B R/B/G/B/B/B/B/B/B/B/B/B/B/B/B/B/B/B/B/B/
3-5	[For P0222] Ground short Between throttle position s If there is continuity, replace	ensor coupler and ground: black-ground
3-6	[For P0223] Open circuit Between throttle position s If there is no continuity, rep	sensor coupler and ECU coupler: black-black blace the wire harness. O DIRDIGING PRIMUR L LLY BERBGBLED DE BIR W W X B WILLSH WIND FIGHT BANKLYL SD LWY/B FIGHT

Fault	code No.	P0122, P0123, P0222, P0223, P2135	
		[P0122] Throttle position sensor: ground short circuit detected. [P0123] Throttle position sensor: open or power short circuit detected.	
Item		[P0222] Throttle position sensor: ground short circuit detected. [P0223] Throttle position sensor: open or power short circuit detected. [P2135] Throttle position sensor: output voltage deviation error.	
	T		
3-7	[For P0123/P0223] Open of Between throttle position so If there is no continuity, rep	ensor coupler and ECU coupler: blue-blue	
		(VII BURNALANDA O	
		BG W L B RBGGBUB DB Binn Y W W X B WULSWM BIY BIB GN B B B B BWR/L Y/L Sb LLW Y/B E GB/L	
		$\boxed{\Omega}$	
3-8	[For P0123/P0223] Open circuit Between throttle position sensor coupler and ECU coupler: black/green-black/green If there is no continuity, replace the wire harness.		
		O SyRDIGS/GPB PMUR L LVY B RRBGRUB DR BAR W W W X B WULSMB/M BABGAY B B X BWRLY/L Sb LWY/B BGBL	
3-9	Disconnect the couplers fr Refer to "Parts connected	om the parts that are connected to the ECU. to the ECU" on page 8-51.	
3-10	[For P0122/P0123] Short circuit Between throttle position sensor output terminal (white) "a" of ECU coupler and any other ECU coupler terminal "b". If there is continuity, replace the wire harness.		
		а	
		D GyR D/G GyG P/B PMLR L LY B R/B G/B L/B D/B B/R W W W B W/LSb/M B/Y B/B G/Y B B B/M R/L Y/L Sb L/M Y/B B/G B/L	
		b Ω	

Fault	code No.	P0122, P0123, P0222, P0223, P2135	
Item		[P0122] Throttle position sensor: gro [P0123] Throttle position sensor: op detected. [P0222] Throttle position sensor: gro [P0223] Throttle position sensor: op detected. [P2135] Throttle position sensor: ou	en or power short circuit ound short circuit detected. en or power short circuit
3-11	[For P0222/P0223] Short of Between throttle position is pler terminal "b". If there is continuity, replace	ensor output terminal (black) "a" of ECU	coupler and any other ECU cou-
		O GYRD/GGYGP/BPWL/R / LYY B R/B G/B L/B D/B B/r W W X B W/LSW B/Y B/B G/Y B B B BWR/L Y/L Sb L/WY/B B/GB/L	
4	Installed condition of thrott position sensor.	e Check for looseness or pinching. Improperly installed sensor → Reinstall or adjust the sensor. Refer to "ADJUSTING THE THROTTLE POSITION SEN- SOR" on page 7-18.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.
5	Defective throttle position sor.	en- 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 96–107 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 93–109 is indicated. An indicated value is out of the specified range → Replace the throttle position sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.

Fault code No. P012		P0122, P0123, P0222, P0223, P2135
Item		[P0122] Throttle position sensor: ground short circuit detected. [P0123] Throttle position sensor: open or power short circuit detected. [P0222] Throttle position sensor: ground short circuit detected. [P0223] Throttle position sensor: open or power short circuit detected. [P2135] Throttle position sensor: output voltage deviation error.
7	Delete the fault code and contract the engine trouble war light goes off.	

Fault code No.	P0132	
Item	O ₂ sensor 1: short circuit detected (power short circuit).	
Fall aufo acceptant	Able to start engine	
Fail-safe system	Able to drive vehicle	
Diagnostic code No.	-	
Tool display	-	
Procedure	_	

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed condition of O ₂ sensor 1.	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.

Fault code No. Po		P0132		
Item		O ₂ sensor 1: short circuit detected (power short circuit).		
4	Wire harness continuity.	Open or short circuit \rightarrow Properly connect or replace the wire harness. Between O_2 sensor 1 coupler and joint connector. black/blue—black/blue Between joint connector and ECU coupler. black/blue—black/blue Between O_2 sensor 1 coupler and ECU coupler. gray/green—gray/green	of Go	
5	Defective O ₂ sensor 1.	Check the O_2 sensor 1. Defective \rightarrow Replace the O_2 sensor 1. Refer to "ENGINE REMOVAL" on page 5-3. Turn the main switch to "ON", and then check the condition the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" \rightarrow to item 7 and finish the service Condition is "Detected" \rightarrow Go item 6.	of Go	
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232. Service is finished.		
7	Delete the fault code and of that the engine trouble war light goes off.			

Fault code No.	P0152 O ₂ sensor 2: short circuit detected (power short circuit).	
Item		
Fail aufa avatam	Able to start engine	
Fail-safe system	Able to drive vehicle	
Diagnostic code No.	_	
Tool display	<u> </u>	
Procedure	_	
Droboble course o	f Confirmation of convic	

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed condition of O ₂ sensor 2.	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.

Fault	code No.	P015	2		
Item	Item C		sensor 2: short circuit detected (power short circuit).		
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	
4	Wire harness continuity.		Open or short circuit → Properly connect or replace the wire harness. 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 ECU coupler. gray/yellow-gray/yellow	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	
5	Defective O ₂ sensor 2.		Check the O_2 sensor 2. Defective \rightarrow Replace the O_2 sensor 2. Refer to "ENGINE REMOVAL" on page 5-3.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.	
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.	
7	Delete the fault code and c that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.		

Fault	code No.	P020	1			
Item Prim		Prim	mary injector #1: malfunction in primary injector #1.			
Foil o	ofo ovotom	Able	Able to start engine (depending on the number of faulty cylinders)			
raii-s	afe system	Able	to drive vehicle (depending on the	number of faulty cylinders)		
Diagr	nostic code No.	36				
Actua	ation	The "	ates primary injector #1 five times a check" indicator on the Yamaha di time the primary injector is actuate	agnostic tool screen comes on		
Proce	edure	Disco ated	onnect the fuel pump coupler. Chec five times by listening for the opera	ck that primary injector #1 is actu- ting sound.		
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion		
1	Connection of primary inje #1 coupler. Check the locking conditio the coupler. Disconnect the coupler and check the pins (bent or broaterminals and locking cond of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 36) Operating sound → Go to item 6. No operating sound → Go to item 2.		
2	Defective primary injector #1.		Measure the primary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-245.	Execute the diagnostic mode. (Code No. 36) Operating sound → Go to item 6. No operating sound → Go to item 3.		
3	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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 36) Operating sound → Go to item 6. No operating sound → Go to item 4.		
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between primary injector coupler and ECU coupler. red/black—red/black Between primary injector coupler and relay unit coupler. red/blue—red/blue	Execute the diagnostic mode. (Code No. 36) Operating sound → Go to item 6. No operating sound → Go to item 5.		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.			
6	Delete the fault code and of that the engine trouble was light goes off.		Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.			

Fault	code No.	DOOD	2		
	COUR NO.	P0202			
Item		Primary injector #2: malfunction in primary injector #2.			
Fail-s	afe system	Able to start engine (depending on the number of faulty cylinders)			
i un o	uro cyclom	Able	to drive vehicle (depending on the	number of faulty cylinders)	
Diagn	ostic code No.	37			
Actua	ntion	The "	ates primary injector #2 five times a check" indicator on the Yamaha di time the primary injector is actuate	agnostic tool screen comes on	
Proce	edure	Disco	onnect the fuel pump coupler. Cheo five times by listening for the opera	ck that primary injector #2 is actu- ting sound.	
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion	
1	Connection of primary injector #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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 37) Operating sound → Go to item 6. No operating sound → Go to item 2.	
2	Defective primary injector #2.		Measure the primary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-245.	Execute the diagnostic mode. (Code No. 37) Operating sound → Go to item 6. No operating sound → Go to item 3.	
3	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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 37) Operating sound → Go to item 6. No operating sound → Go to item 4.	
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between primary injector coupler and ECU coupler. green/black-green/black Between primary injector coupler and relay unit coupler. red/blue-red/blue	Execute the diagnostic mode. (Code No. 37) Operating sound → Go to item 6. No operating sound → Go to item 5.	
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.		
6	Delete the fault code and of that the engine trouble war light goes off.		Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.		

Fault	code No.	P0203				
Item P		Prima	Primary injector #3: malfunction in primary injector #3.			
Fail a			Able to start engine (depending on the number of faulty cylinders)			
raii-s	afe system	Able	to drive vehicle (depending on the	number of faulty cylinders)		
Diagn	ostic code No.	38				
Actua	ntion	The "	ates primary injector #3 five times a check" indicator on the Yamaha di time the primary injector is actuate	agnostic tool screen comes on		
Proce	edure	Disco ated	onnect the fuel pump coupler. Chec five times by listening for the opera	ck that primary injector #3 is actu- ting sound.		
Item	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service completion		
1	Connection of primary injector #3 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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 38) Operating sound → Go to item 6. No operating sound → Go to item 2.		
2	Defective primary injector #3.		Measure the primary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-245.	Execute the diagnostic mode. (Code No. 38) Operating sound → Go to item 6. No operating sound → Go to item 3.		
3	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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 38) Operating sound → Go to item 6. No operating sound → Go to item 4.		
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between primary injector coupler and ECU coupler. blue/black-blue/black Between primary injector coupler and relay unit coupler. red/blue-red/blue	Execute the diagnostic mode. (Code No. 38) Operating sound → Go to item 6. No operating sound → Go to item 5.		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.			
6	Delete the fault code and of that the engine trouble war light goes off.		Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.			

Fault	code No.	DOOO	4			
Fauit	code No.	P0204				
Item		Primary injector #4: malfunction in primary injector #4.				
Fail-s	Fail-safe system		Able to start engine (depending on the number of faulty cylinders)			
i un o		Able	to drive vehicle (depending on the	number of faulty cylinders)		
Diagn	ostic code No.	39				
Actua	ntion	The "	ates primary injector #4 five times a check" indicator on the Yamaha di time the primary injector is actuate	agnostic tool screen comes on		
Proce	edure	Disco ated	onnect the fuel pump coupler. Chec five times by listening for the opera	ck that primary injector #4 is actu- ting sound.		
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion		
1	Connection of primary injector #4 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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 39) Operating sound → Go to item 6. No operating sound → Go to item 2.		
2	Defective primary injector #4.		Measure the primary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-245.	Execute the diagnostic mode. (Code No. 39) Operating sound → Go to item 6. No operating sound → Go to item 3.		
3	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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 39) Operating sound → Go to item 6. No operating sound → Go to item 4.		
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between primary injector coupler and ECU coupler. orange/black—orange/black Between primary injector coupler and relay unit coupler. red/blue—red/blue	Execute the diagnostic mode. (Code No. 39) Operating sound → Go to item 6. No operating sound → Go to item 5.		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.			
6	Delete the fault code and of that the engine trouble was light goes off.		Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.			

Fault	code No.	P033	5		
Item		Crankshaft position sensor: no normal signals are received from the crankshaft position sensor.			
Fail-e	afe system	Unab	le to start engine		
raii-s	ale system	Unab	le to drive vehicle		
Diagr	nostic code No.	_			
Tool	display	_			
Proce	edure	—			
Item	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service completion	
1	Connection of crankshaft p tion 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 → Connect the coupler securely or replace the wire harness.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	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 → Connect the coupler securely or replace the wire harness.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between crankshaft position sensor coupler and ECU coupler. gray—gray Between crankshaft position sensor coupler and joint connector. black/blue—black/blue Between joint connector and ECU coupler. black/blue—black/blue	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	
4	Installed condition of crank position sensor. Check for looseness or pin ing. Check the gap (0.75 mm ((in)) between the crankshaf position sensor and the ge tor rotor.	ch- 0.03	Improperly installed sensor → Reinstall or replace the sensor. Refer to "GENERATOR" on page 5-34.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	

Fault code No. P033		P0335	
		rankshaft position sensor: no normal signals are received from ne crankshaft position sensor.	
5	Defective crankshaft positio sensor.	Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-239. Replace if defective. Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.	
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	
7	Delete the fault code and che that the engine trouble warr light goes off.		

	rault code No. F0340				
Fault	code No.	P034	P0340		
Item		Cylinder identification sensor: no normal signals are received from the cylinder identification sensor.			
Fail-s	afe system	Unab	le to start engine	_	
raii-s	ale system	Able	to drive vehicle		
Diagn	ostic code No.	_			
Tool o	display	_			
Proce	edure	_			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Connection of cylinder identification 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 → Connect the coupler securely or replace the wire harness.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
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 → Connect the coupler securely or replace the wire harness.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.	

Fault	Fault code No.		P0340			
Item	Item Cy		der identification sensor: no no ylinder identification sensor.	rmal signals are received from		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between cylinder identification sensor coupler and ECU coupler. white/black-white/black blue-blue Between cylinder identification sensor coupler and joint connector. black/blue-black/blue Between joint connector and ECU coupler. black/blue-black/blue	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.		
4	Installed condition of cylinder identification sensor. Check for looseness or pinching.		Improperly installed sensor → Reinstall or replace the sensor.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.		
5	Defective cylinder identification sensor.		Replace the cylinder identification sensor.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.		
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.		
7	Delete the fault code and code that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.			

Fault	code No.	P035	1		
Item		Cylinder-#1 ignition coil: open or short circuit detected in the primary lead of the cylinder-#1 ignition coil.			
Fail-s	afe system	Able	to start engine (depending on the	number of faulty cylinders)	
i ali-3	are system	Able	to drive vehicle (depending on the	number of faulty cylinders)	
Diagn	ostic code No.	30			
Actua	ition	The "	ates the cylinder-#1 ignition coil five check" indicator on the Yamaha di time the ignition coil is actuated.	e times at one-second intervals. agnostic tool screen comes on	
Proce	edure		k that a spark is generated five tim nect an ignition checker.	nes.	
Item	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service completion	
1	Connection of cylinder-#1 ignition 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 → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	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 → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 Between cylinder-#1 ignition coil coupler and handlebar switch coupler (right). red/white—red/white	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	
4	Installed condition of cylind ignition coil.	er-#1	Check for looseness or pinching. Improperly installed ignition coil → Reinstall or replace the ignition coil.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	

Faul	t code No.	P0351		
Item	I.	Cylinder-#1 ignition coil: open or short circuit detected in the primary lead of the cylinder-#1 ignition coil.		
5	Defective cylinder-#1 ignition coil.	Measure the primary coil resistance of the cylinder-#1 ignition coil. Replace if out of specification. Refer to "CHECKING THE IGNITION COILS" on page 8-238. Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.		
6	Malfunction in ECU.	Execute the diagnostic mode. (Code No. 30) No spark → Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.		
7	Delete the fault code and c that the engine trouble war light goes off.			

Fault code No.		P0352			
Item		Cylin mary	der-#2 ignition coil: open or sho lead of the cylinder-#2 ignition	ort circuit detected in the pri- coil.	
Foil o	afe system	Able	to start engine (depending on the	number of faulty cylinders)	
raii-s	ale system	Able	to drive vehicle (depending on the	number of faulty cylinders)	
Diagr	nostic code No.	31			
Actuation		The "	Actuates the cylinder-#2 ignition coil five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen comes on each time the ignition coil is actuated.		
Proce	edure	Check that a spark is generated five times. • Connect an ignition checker.			
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion	
1	Connection of cylinder-#2 ignition 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 → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	

Fault	code No.	P035	2	
Item		Cylinder-#2 ignition coil: open or short circuit detected in mary lead of the cylinder-#2 ignition coil.		ort circuit detected in the pri- coil.
2	Connection of ECU couple 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 oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 Between cylinder-#2 ignition coil coupler and handlebar switch coupler (right). red/white—red/white	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.
4	Installed condition of cylind ignition coil.	er-#2	Check for looseness or pinching. Improperly installed ignition coil → Reinstall or replace the ignition coil.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.
5	Defective cylinder-#2 ignition	on	Measure the primary coil resistance of the cylinder-#2 ignition coil. Replace if out of specification. Refer to "CHECKING THE IGNITION COILS" on page 8-238.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 8-232.	Service is finished.
7	Delete the fault code and control that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault	code No.	P035	3		
Item	Item		Cylinder-#3 ignition coil: open or short circuit detected in the primary lead of the cylinder-#3 ignition coil.		
Fail-e	afe system	Able	to start engine (depending on the	number of faulty cylinders)	
r all-5	ale system	Able	to drive vehicle (depending on the	number of faulty cylinders)	
Diagn	ostic code No.	32			
Actua	ation	The "	ates the cylinder-#3 ignition coil five check" indicator on the Yamaha di time the ignition coil is actuated.	e times at one-second intervals. agnostic tool screen comes on	
Proce	edure		k that a spark is generated five tim nnect an ignition checker.	ies.	
Item	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service completion	
1	Connection of cylinder-#3 tion coil coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or broterminals and locking cond of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	Connection of ECU couple Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotterminals and locking cond of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 Between cylinder-#3 ignition coil coupler and handlebar switch coupler (right). red/white—red/white	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	
4	Installed condition of cylind ignition coil.	er-#3	Check for looseness or pinching. Improperly installed ignition coil → Reinstall or replace the ignition coil.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	

Fault	code No.	P0353		
Item		Cylinder-#3 ignition coil: open or short circuit detected in the pri- mary lead of the cylinder-#3 ignition coil.		
5	Defective cylinder-#3 ignition coil.	Measure the primary coil resistance of the cylinder-#3 ignition coil. Replace if out of specification. Refer to "CHECKING THE IGNITION COILS" on page 8-238. Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 8-232.		
7	Delete the fault code and contract the engine trouble war light goes off.			

	Code No. F0354	1			
Fault	code No.	P0354			
Item		Cylin mary	der-#4 ignition coil: open or sho lead of the cylinder-#4 ignition	ort circuit detected in the pri- coil.	
Fail-e	afe system	Able	to start engine (depending on the	number of faulty cylinders)	
raii-s	ale system	Able	to drive vehicle (depending on the	number of faulty cylinders)	
Diagr	nostic code No.	33			
Actua	Actuation		Actuates the cylinder-#4 ignition coil five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen comes on each time the ignition coil is actuated.		
Proce	edure	Check that a spark is generated five times. • Connect an ignition checker.			
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion	
1	Connection of cylinder-#4 ignition 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 → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	

Fault	code No.	P035	4	
Item			der-#4 ignition coil: open or sho lead of the cylinder-#4 ignition	
2	Connection of ECU couple 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 oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 Between cylinder-#4 ignition coil coupler and handlebar switch coupler (right). red/white—red/white	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.
4	Installed condition of cylind ignition coil.	er-#4	Check for looseness or pinching. Improperly installed ignition coil → Reinstall or replace the ignition coil.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.
5	Defective cylinder-#4 ignition	on	Measure the primary coil resistance of the cylinder-#4 ignition coil. Replace if out of specification. Refer to "CHECKING THE IGNITION COILS" on page 8-238.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 8-232.	Service is finished.
7	Delete the fault code and control that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0476

TIP

If fault code numbers "P048D/P048E" and "P0476" are both indicated, take the actions specified for fault code number "P048D/P048E" first.

Fault code No.		P047	P0476			
Item		EXU	servo motor: stuck EXUP serv	o motor is detected.		
Fails	Fail-safe system		to start engine			
raii-5	ale system	Able	to drive vehicle			
Diagn	ostic code No.	53				
Actua	ition	media This	the EXUP is fully closed, it stops a ate position). operation takes approximately 3 se ator is displayed on the Yamaha di	econds during which the "check"		
Proce	edure	Chec	k the operating sound.			
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion		
1	Connection of EXUP served motor coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or broaderminals and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Conditions is "Recovered" → Go to item 7 and finish the service. Conditions is "Detected" → 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Conditions is "Recovered" → Go to item 7 and finish the service. Conditions is "Detected" → 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", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Conditions is "Recovered" → Go to item 7 and finish the service. Conditions is "Detected" → Go to item 4.		
4	Defective EXUP servo mot	tor.	Disconnect the cables and execute the diagnostic code. (Code No. 53) Check the operating sound of the motor. Replace if defective.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Conditions is "Recovered" → Go to item 7 and finish the service. Conditions is "Detected" → Go to item 5.		

Fault code No.		P047	6	
Item		EXUI	servo motor: stuck EXUP serv	o motor is detected.
5	Defective EXUP valve, pull and cables.	еу,	Turn the EXUP valve manually with the cables disconnected. Replace if defective.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Conditions is "Recovered" → Go to item 7 and finish the service. Conditions is "Detected" → Go to item 6.
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.
7	Delete the fault code and of that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No.		P0480			
Item		Radia	ator fan motor relay: open or sh	ort circuit detected.	
Foil o	afe system	Able	to start engine		
raii-S	ale system	Able	to drive vehicle		
Diagn	ostic code No.	51			
Actua	ition	The "	ites the radiator fan motor relay fiv check" indicator on the Yamaha di time the relay is actuated.	e times at 5 seconds intervals. agnostic tool screen come on	
Proce	Procedure		Check that the radiator fan motor relay is actuated five times by listening for the operating sound.		
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Connection of radiator fan motor relay 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 2.	
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 3.	

Fault	code No.	P0480	
Item		Radiator fan motor relay: open or she	ort circuit detected.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between radiator fan motor relay and ECU coupler. green/yellow–green/yellow Between radiator fan motor relay and fuse box (ignition fuse). red/white–red/white	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 4.
4	Defective radiator fan moto relay.	r Replace the radiator fan motor relay.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 5.
5	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.
6	Delete the fault code and c that the engine trouble war light goes off.		

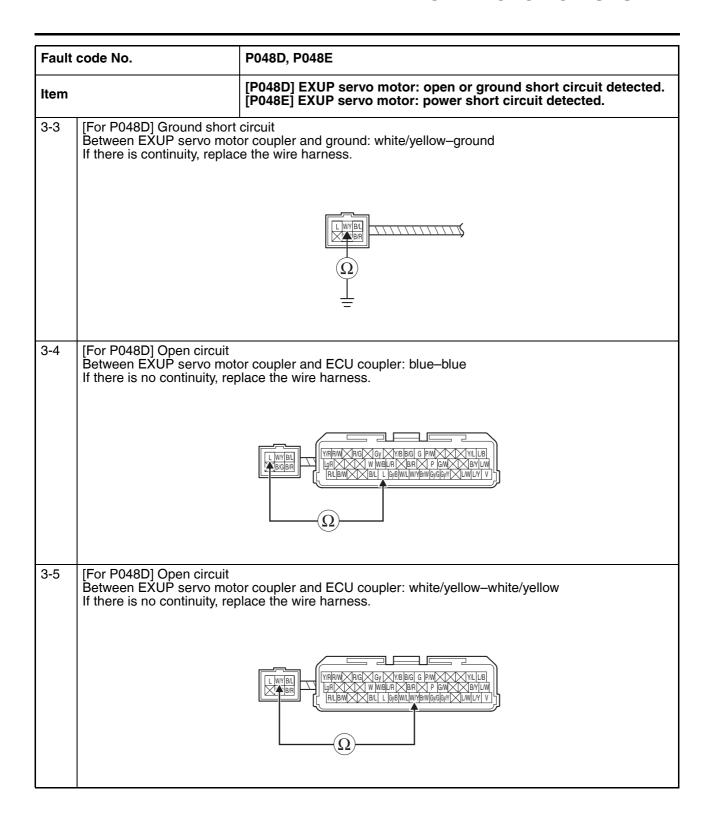
Fault code No. P048D, P048E

TIP _

If fault code numbers "P048D/P048E" and "P0476" are both indicated, take the actions specified for fault code number "P048D/P048E" first.

Fault	code No.	P048D, P048E		
Item [P048D] EXUP servo motor: open or ground short of [P048E] EXUP servo motor: power short circuit det			ground short circuit detected. ort circuit detected.	
Fail-safe system		Able t	to start engine	
		Able to drive vehicle		
Diagnostic code No.		53		
Actuation		media This	the EXUP is fully closed, it stops at ate position). operation takes approximately 3 se ator is displayed on the Yamaha dia	conds during which the "check"
Procedure		Check the operating sound.		
Item	Probable cause of malfunction and chec	:k	Maintenance job	Confirmation of service completion

Fault code No.		P048	D, P048E		
Item	Item		[P048D] EXUP servo motor: open or ground short circuit detected. [P048E] EXUP servo motor: power short circuit detected.		
1	Connection of EXUP servo 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 2.	
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 4.	
3-1			2		
		1	3 L 5V		
	 EXUP servo motor ECU Sensor input lead Sensor output lead Sensor ground lead 				
3-2	Disconnect the ECU couple Disconnect the EXUP serve		n the ECU. or coupler from the EXUP servo m	otor.	



Fault	code No.	P048D, P048E				
Item		[P048D] EXUP servo motor: open or ground short circuit detected. [P048E] EXUP servo motor: power short circuit detected.				
3-6	[For P048E] Open circuit Between EXUP servo moto If there is no continuity, rep	or coupler and ECU coupler: black/blue- lace the wire harness.	black/blue			
	VYRRW/RIG GY YVBBG FRW YVLLB LIGHT W WBLR BR P GW BYLW RLBW/BL L GIEWILWYBWGIGINY LWLV V					
3-7	Disconnect the couplers from Refer to "REPLACING THI	om the parts that are connected to the E E ECU (Engine Control Unit)" on page 8-	CU. 232.			
3-8	[For P048D/P048E] Short circuit Between EXUP servo motor output terminal (white/yellow) "a" of ECU coupler and any other ECU coupler terminal "b". If there is continuity, replace the wire harness.					
	A VYRIAN RIGG OV VYBEG G PM VYLLUB I I I I I I I I I I I I I I I I I I I					
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", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 5.			
5	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.			
6	Delete the fault code and of that the engine trouble war light goes off.					

Fault code No. P0500, P1500

TIP

In case "P0500" is detected, or both "P0500" and "P1500" are detected, proceed from item A-1.

Fault code No.		P0500, P1500				
		A	Rear wheel sensor: no normal signals are received from the rear wheel sensor.			
Item	Item		Neutral switch: open or short circuit is detected.			
		С	C Clutch switch: open or short circuit is detected.			
Eoil o	ofo ovotom	Able	to start engine			
raii-s	afe system	Able	to drive vehicle			
Diagn	ostic code No.	07				
Tool	display	Rear 0–99	wheel speed pulse 9			
Proce	edure		k that the number increases when per is cumulative and does not rese			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		
A-1	1 Locate the malfunction.		(Fault code No. P0500 or P0500 and P1500 detected.) Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases. (Fault code No. P1500 detected.) 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"	Value does not increase → Go to item A-2. 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 → Go to item C-2 for the clutch switch.		
A-2	Connection of rear wheel 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 → 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 → Go to item A-8. Value does not increase → Go to item A-3.		

Fault	Fault code No.		0, P1500		
		A	Rear wheel sensor: no normal rear wheel sensor.	signals are received from the	
Item		В	Neutral switch: open or short circuit is detected.		
		С	Clutch switch: open or short ci	rcuit is detected.	
A-3	Connection of ABS ECU copler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or broterminals and locking cond of the pins).	n of d ken	Improperly connected → 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	
A-4	Connection of ECU couple 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 → 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 → Go to item A-8. Value does not increase → Go to item A-5.	
A-5	Rear wheel sensor lead co ity, or defective rear wheel sor.		Open or short circuit, or defective sensor → Replace the rear wheel sensor. Between rear wheel sensor coupler 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	
A-6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases. Value increases → Go to item A-8. Value does not increase → Go to item A-7.	
A-7	Malfunction in ABS ECU.		Replace the ABS ECU.	Go to item A-8.	
A-8	Delete the fault code and of that the engine trouble war light goes off.		Turn the main switch to "ON", and then rotate the rear wheel by hand. Start the engine, and input the vehicle speed signals by operating the vehicle at 20 to 30 km/h (12 to 19 mph). Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code. Delete this fault code even if it has a condition of "Detected".		

Fault	Fault code No.		0, P1500		
			Rear wheel sensor: no normal signals are received from the rear wheel sensor.		
Item		В	Neutral switch: open or short circuit is detected.		
		С	Clutch switch: open or short ci	rcuit is detected.	
Fail-e	afe system	Able	to start engine		
i ali-s	are system	Able	to drive vehicle		
Diagn	ostic code No.	21			
Tool	lisplay	• "ON	ral switch I" (when the transmission is in neu F" (when the transmission is in ge	tral) ar with the clutch lever released)	
Proce	dure	Opera	ate the transmission and clutch lev	ver.	
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
B-1	Locate the malfunction.		(Fault code No. P0500 or P0500 and P1500 detected.) Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases. (Fault code No. P1500 detected.) 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" When the transmission is in gear with the clutch lever squeezed and the sidestand is retracted: "ON"	Value does not increase → Go to item A-2 for the rear wheel sensor. Incorrect indication → Go to item B-2. Incorrect indication → 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).		Improperly connected → Connect the coupler securely or replace the wire harness.	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 → Go to item B-9. Incorrect indication → Go to item B-3.	

Fault	code No.	P050	P0500, P1500		
		Α	Rear wheel sensor: no normal rear wheel sensor.	signals are received from the	
Item		В	Neutral switch: open or short circuit is detected.		
		С	Clutch switch: open or short ci	rcuit is detected.	
B-3	Connection of ECU couple Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or broterminals and locking cond of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	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 → Go to item B-9. Incorrect indication → Go to item B-4.	
B-4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between relay unit coupler and ECU coupler. black/yellow-black/yellow Between relay unit coupler and neutral switch coupler. sky blue-sky blue	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 → Go to item B-9. Incorrect indication → Go to item B-5.	
B-5	Defective relay unit.		Check the relay unit. Replace if defective. Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-237.	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 → Go to item B-9. Incorrect indication → Go to item B-6.	
B-6	Defective neutral switch.		Check the neutral switch. Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-229.	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 → Go to item B-9. Incorrect indication → Go to item B-7.	
B-7	Faulty shift drum (neutral dition area).	letec-	Malfunction → Replace the shift drum. Refer to "TRANSMISSION" on page 5-89.	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 → Go to item B-9. Incorrect indication → Go to item B-8.	

Fault	Fault code No. P050		0, P1500	
A		A	Rear wheel sensor: no normal rear wheel sensor.	signals are received from the
Item		В	Neutral switch: open or short circuit is detected.	
		С	Clutch switch: open or short ci	ircuit is detected.
B-8	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.
B-9	Delete the fault code and check that the engine trouble warning light goes off.		Turn the main switch to "ON", and then rotate the rear wheel by hand. Start the engine, and input the vehicle speed signals by operating the vehicle at 20 to 30 km/h (12 to 19 mph). Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code. Delete this fault code even if it has a condition of "Detected".	

Fault	code No.	P050	0, P1500			
		A	Rear wheel sensor: no normal rear wheel sensor.	signals are received from the		
Item		В	Neutral switch: open or short o	circuit is detected.		
			Clutch switch: open or short ci	rcuit is detected.		
Fail-es	Fail-safe system		Able to start engine			
i ali-se	are system	Able to drive vehicle				
Diagn	ostic code No.	21				
Tool display		 Clutch switch "ON" (when the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted) "OFF" (when the clutch lever is squeezed with the transmission in geal and when the sidestand is extended) 				
Proce	Procedure		Operate the transmission, clutch lever, and sidestand.			
Item	Probable cause of malfunction and chec	k	Maintenance job	Confirmation of service completion		

Fault	Fault code No.		P0500, P1500		
		A	Rear wheel sensor: no normal rear wheel sensor.	signals are received from the	
Item		В	Neutral switch: open or short circuit is detected.		
		С	Clutch switch: open or short circuit is detected.		
C-1	Locate the malfunction.		(Fault code No. P0500 or P0500 and P1500 detected.) Execute the diagnostic mode. (Code No. 07) Rotate the rear wheel by hand and check that the indicated value increases.	Value does not increase → Go to item A-2 for the rear wheel sensor.	
			(Fault code No. P1500 detected.) 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 → Go to item C-2.	
C-2	Clutch lever adjustment.		Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-14.	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→ Go to item C-8. Incorrect indication → Go to item C-3.	
C-3	Connection of clutch switch pler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotterminals and locking cond of the pins).	n of d oken	Improperly connected → Connect the coupler 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→ Go to item C-8. Incorrect indication → Go to item C-4.	

Fault	code No.	P050	0, P1500	
		A	Rear wheel sensor: no normal rear wheel sensor.	signals are received from the
Item		В	Neutral switch: open or short circuit is detected.	
		С	Clutch switch: open or short ci	ircuit is detected.
C-4	Connection of ECU couple 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 → Connect the coupler 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→ Go to item C-8. Incorrect indication → Go to item C-5.
C-5	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between ECU coupler and relay unit coupler. black/yellow-black/yellow blue/yellow-blue/yellow Between clutch switch coupler and relay unit 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→ Go to item C-8. Incorrect indication → Go to item C-6.
C-6	Defective clutch switch.		Check the clutch switch. Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-229.	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→ Go to item C-8. Incorrect indication → Go to item C-7.
C-7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.

Fault code No.		P0500, P1500		
		A	Rear wheel sensor: no normal rear wheel sensor.	signals are received from the
Item		В	Neutral switch: open or short circuit is detected.	
		С	Clutch switch: open or short circuit is detected.	
C-8			Turn the main switch to "ON", and then rotate the rear wheel by hand. Start the engine, and input the vehicle speed signals by operating the vehicle at 20 to 30 km/h (12 to 19 mph). Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code. Delete this fault code even if it has a condition of "Detected".	

Fault code No.	P0560
Item	Charging voltage is abnormal.
Fail aafa ayatam	Able to start engine
Fail-safe system	Able to drive vehicle
Diagnostic code No.	_
Tool display	_
Procedure	-

1 1000	duic		
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Malfunction in charging system.	Check the charging system. Refer to "CHARGING SYSTEM" on page 8-17. Defective rectifier/regulator or AC magneto → Replace. Defective connection in the charging system circuit → Properly connect or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 2 and finish the service. Condition is "Detected" → Repeat item 1.
2	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0601, P0606

Fault	code No.	P0601, P0606				
Internal malfunction the ECU, the fault or play.)			nal malfunction in ECU. (When t CCU, the fault code number migh)	his malfunction is detected in it not appear on the tool dis-		
Fail-e	afe system	Able/	Unable to start engine			
l all-s	are system	Able/Unable to drive vehicle				
Diagn	ostic code No.	_				
Tool	display					
Proce	edure	_				
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		
1	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Turn the main switch to "ON". Check that the engine trouble warning light does not come on.		

Fault code No. P062F

Fault	code No.	P062	F			
Item		EEPROM fault code number: an error is detected while reading or writing on EEPROM.				
Fail a	efe ovetem	Able/	Unable to start engine			
raii-S	afe system	Able/	Unable to drive vehicle			
Diagn	ostic code No.	60				
Tool display		 No malfunctions detected (If the self-diagnosis fault code P062F is indicated, the ECU is defective.) 01–04 (CO adjustment value) (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) 12 (O₂ feedback learning value) 13 (OBD memory value) 				
Proce	edure	<u> </u>				
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion		
1	Locate the malfunction		Execute the diagnostic mode. (Code No. 60) 00: Go to item 7. 01: Go to item 2. 02: Go to item 3. 03: Go to item 4. 04: Go to item 5. 11–13: Go to item 6.			

Fault	code No.	P062	F		
Item			EPROM fault code number: an error is detected while reading or riting on EEPROM.		
2	"01" is indicated in diagnos mode (code No. 60). EEPR data error for adjustment of concentration of cylinder #1	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, turn the main switch to "OFF".	Set the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Repeat item 1. If the same number is indicated, go to item 7.	
3	"02" is indicated in diagnostic mode (code No. 60). EEPROM data error for adjustment of CO concentration of cylinder #2.		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, turn the main switch to "OFF".	Set the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Repeat item 1. If the same number is indicated, go to item 7.	
4	"03" is indicated in diagnos mode (code No. 60). EEPR data error for adjustment of concentration of cylinder #3	ROM f 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, turn the main switch to "OFF".	Set the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Repeat item 1. If the same number is indicated, go to item 7.	
5	"04" is indicated in diagnostic mode (code No. 60). EEPROM data error for adjustment of CO concentration of cylinder #4.		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, turn the main switch to "OFF".	Set the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Repeat item 1. If the same number is indicated, go to item 7.	
6	"11" is indicated in diagnos mode (code No. 60). EEPR data error for ISC (idle spectontrol) learning values. "12" is indicated in the diag tic mode. (Code No. 60) EEPROM data error for O ₂ back learning values. "13" is indicated in the diag tic mode. (Code No. 60) EEPROM data error for OB memory values.	ROM ed nos- feed- nos-	Turn the main switch to "OFF".	Set the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Repeat item 1. If the same number is indicated, go to item 7.	

Fault code No.		P062	F	
		PROM fault code number: an error is detected while reading or ing on EEPROM.		
7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.
8	Delete the fault code and check that the engine trouble warning light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0638

Fault code No.	P0638
Item	YCC-T drive system: malfunction detected.
Fail acts system	Able/Unable to start engine
Fail-safe system	Able/Unable to drive vehicle
Diagnostic code No.	_
Tool display	_
Procedure	_

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of throttle 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 2.
2	Connection of wire harness ECU coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 3.
3	Check the electronic throttle valve fuse.	Abnormality → Replace the electronic throttle valve fuse.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 4.

Foult	code No.	P063	0		
rauit	radii code No.		330		
Item		YCC.	T drive system: malfunction det	tected.	
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", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 5.	
5	Defective throttle servo motor.		Check the throttle servo motor. Replace the throttle bodies if defective. Refer to "CHECKING THE THROTTLE SERVO MOTOR" on page 8-242.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 6.	
6	Defective throttle bodies.		Check the throttle bodies. Replace if defective. Refer to "CHECKING THE THROTTLE SERVO MOTOR" on page 8-242.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 7.	
7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.	
8	Delete the fault code and code that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.		

Fault code No. P0657

Fault	code No.	P065	7		
Item			uel system voltage: incorrect voltage supplied to the fuel injector nd fuel pump.		
		Able	to start engine		
Fail-s	afe system	Able	to drive vehicle		
Diagn	ostic code No.	09, 5	0		
	Tool display	Fuel:	system voltage (battery voltage) oximately 12.0		
09	Procedure	meas	ne start/engine stop switch to "()", ured battery voltage with the tool of I battery voltage is low, recharge th	display value. (If the actually mea-	
50	Actuation	The "	ites the relay unit five times at one check" indicator on the Yamaha ditime the relay is actuated.	-second intervals. agnostic tool screen come on	
	Procedure	Chec ing so	k that the relay unit is actuated five ound.	e times by listening for the operat-	
Item	Probable cause of malf	unc-	Maintenance job	Confirmation of service completion	
1	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 → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	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 → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between fuse box (fuel injection system fuse) and relay unit coupler. brown/white—brown/white Between fuse box (ignition fuse) and handlebar switch coupler (right). red/white—red/white Between handlebar switch coupler (right) and relay unit coupler. red/white—red/white Between relay unit coupler. red/white—red/blue 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. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	

Fault	code No.	0657		
Item		uel system voltage: incorrect voltage supplied to the fuel injector nd fuel pump.		
4	Defective relay unit.	Execute the diagnostic mode. (Code No. 50) No operating sound → Replace the relay unit.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	
5	Defective relay unit.	Execute the diagnostic mode. (Code No. 09) Fuel system voltage is below 3 V → Replace the relay unit.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.	
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.	
7	Delete the fault code and che that the engine trouble warni light goes off.			

Fault code No. P0916, P0917

Fault o	code No.	P091	P0916, P0917			
Item		[P0916] Gear position sensor: open or ground short circuit detected. [P0917] Gear position sensor: power short circuit detected.				
			to start engine			
Fail-safe system		Howe	Able to drive vehicle However, the vehicle cannot start off again after stopping without changing gears.			
Diagno	ostic code No.	_				
Tool d	isplay	<u> </u>				
Procedure		_				
Item	Item Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		

Fault	code No.	P091	6, P0917				
Item		detec	[P0916] Gear position sensor: open or ground short circuit detected. [P0917] Gear position sensor: power short circuit detected.				
1	Connection of gear 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.			
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.			
3	Wire harness continuity.		Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.			
3-1							
		1	3 UR 5 W 5 W	∧ — ▶			
	 Gear position sensor ECU Sensor input lead Sensor output lead Sensor ground lead 						
3-2	Disconnect the ECU couple Disconnect the gear position	er from	n the ECU. sor coupler from the gear position	sensor.			

Fault	code No.	P0916, P0917		
Item		[P0916] Gear position sensor: open or ground short circuit detected. [P0917] Gear position sensor: power short circuit detected.		
3-3	[For P0916] Ground short Between gear position ser If there is continuity, replace	nsor coupler and ground: green-ground		
3-4	[For P0916] Open circuit Between gear position sensor coupler and ECU coupler: blue/red—blue/red If there is no continuity, replace the wire harness.			
		VIRIAM RIGE GV VIEBE G PM VILLUB LURG W WINDLE BRY P GW BYLW RRLBW BL L SINLWYBWGGGVY LWLY V OR DEL L SINLWYBWGGGGYY LWLY V		
3-5	[For P0916] Open circuit Between gear position ser If there is no continuity, re	nsor coupler and ECU coupler: green-green place the wire harness.		
		YRRW RIG GV YVBBG G PM YVLLB LORG W WWDLR BRAP P GW BYLW RLBW BL L Gy6WLWN WWGy6GyY LWLY V		

Fault	code No.	P0916, P0917			
Item		[P0916] Gear position sensor: open of detected. [P0917] Gear position sensor: power			
3-6	[For P0917] Open circuit Between gear position sen If there is no continuity, rep	sor coupler and ECU coupler: white-whi lace the wire harness.	ite		
		VRRW RG Gy YBBG BM YVL IGR WWBLR BR P GW BA RLBW L Gordwr Wybwgogon Lwild O	LB VLW VI V		
3-7	Disconnect the couplers from Refer to "Parts connected"	om the parts that are connected to the Edo the ECU" on page 8-51.	CU.		
3-8	[For P0916/P0917] Short circuit Between gear position sensor output terminal (green) "a" of ECU coupler and any other ECU coupler terminal "b". If there is continuity, replace the wire harness.				
	TYRRW RIG GY YBBG FW YLLB LIGHT P GW BRYLW RLBR LIGHT P GW BRYLW BRYLW BRL LIGHT P GW BRYLWLY V				
4	Installed condition of gear tion sensor. Check for looseness or pin ing.	Reinstall or adjust the sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.		
5	Display of each gear position the meter.	on on Make sure that the position of each gear is correctly displayed on the meter. If incorrect → Replace the gear position sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.		
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.		

Fault code No. P0		P091	6, P0917	
Item dete		detec	l6] Gear position sensor: open deted. I7] Gear position sensor: power	
7	Delete the fault code and contract that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P1400

Fault	code No.	P140	0			
Item	Item		Air induction system solenoid: open or short circuit detected.			
Foil o	afe system	Able	to start engine			
raii-s	ale system	Able	to drive vehicle			
Diagr	nostic code No.	48				
48	Actuation 48		Actuates the air induction system solenoid five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the air induction system solenoid is actuated.			
	Procedure Che tenii		Check that the air induction system solenoid is actuated five times by li- ening for the operating sound.			
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion		
1	Connection of air induction tem solenoid coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotherminals and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine and check the status of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 2. TIP Check that the start/engine stop switch is turned to "ON" then.		

Fault	code No.	P140	0		
Item		Air ir	Air induction system solenoid: open or short circuit detected.		
2	Connection of ECU couple 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 oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine and check the status of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Becovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 3. TIP Check that the start/engine stop switch is turned to "ON" then.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between air induction system solenoid coupler and ECU coupler. brown/red-brown/red Between air induction system solenoid coupler and fuse box (ignition fuse). red/white-red/white	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine and check the status of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 6. TIP Check that the start/engine stop switch is turned to "ON" then.	
4	Defective air induction syst solenoid.	tem	Refer to "CHECKING THE AIR INDUCTION SYSTEM SOLE-NOID" on page 8-243.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Start the engine and check the status of the fault code. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 5. TIP Check that the start/engine stop switch is turned to "ON" then.	
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.	

Fault code No.		P140	0	
Item		Air ir	nduction system solenoid: open	or short circuit detected.
6	Delete the fault code and of that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P1600

TIP

If fault code numbers "U0125" and "P1600" are both indicated, take the actions specified for fault code number "U0125" first.

Fault	code No.	P160	0			
Item	Item		Lean angle sensor: open or short circuit detected.			
Fail-e	afe system	Unab	le to start engine			
i ali-s	are system	Unab	le to drive vehicle			
Diagn	ostic code No.	17				
Tool	display	• 0 - 5	ays the bank angle in increments of vehicle is vertical) s than 30° (when the sidestand is			
Proce	edure	Chec playe	k that 0–5° is displayed when the divalue increases as the vehicle c	vehicle is vertical and that the disontinues to incline.		
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.		
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.		

Fault	code No.	P1600		
Item		Lean angle sensor: open or short circuit detected.		
3	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between ECU coupler and joint connector. blue/white-blue/white blue/black-blue/black Between joint connector and IMU coupler. blue/white-blue/white blue/black-blue/black Between ECU coupler and IMU coupler. black/white-black/white Between fuse box (ignition fuse) and IMU coupler. red/white-red/white	Turn the main switch to "ON", then to "OFF", and then back to "ON". Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	
5	Malfunction in IMU.	Replace the IMU.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.	
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.	
7	Delete the fault code and c that the engine trouble war light goes off.			

Fault code No. P1601

Fault	code No.	P160	1		
Item		Sidestand switch: open or short circuit of the blue/yellow lead of the ECU is detected.			
Coil o	efe ovetem	Unab	le to start engine		
raii-s	afe system	Unab	le to drive vehicle		
Diagn	ostic code No.	20			
Tool	lisplay	• "ON	stand switch I" (sidestand retracted) F" (sidestand extended)		
Proce	edure	Exter	nd and retract the sidestand (with t	he transmission in gear).	
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion	
1	Connection of sidestand structure coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotterminals and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	

Faul	t code No.	P1601		
		Sidestand switch: open or short circuit of the blue/yellow lead of the ECU is detected.		
5	Defective sidestand switch.	(Code No. 20) Shift the transmission into gear. Sidestand retracted: "ON" Sidestand extended: "OFF" Replace if defective. and the sidesta Check code us mode of tool. Condition to item	e main switch to "ON", en extend and retract the and. the condition of the fault sing the malfunction of the Yamaha diagnostic on is "Recovered" → Go 7 and finish the service. on is "Detected" → Go to	
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	e is finished.	
7	Delete the fault code and c that the engine trouble war light goes off.			

Fault code No. P1602

Fault	code No.	P1602			
Item		Malfunction in ECU internal circuit (malfunction of ECU power cut- off function).			
Foil o	ofo ovotom	Able/	Unable to start engine		
raii-s	afe system	Able/	Unable to drive vehicle		
Diagn	ostic code No.	_			
Tool	display	_			
Proce	edure	_			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Installed condition of battery leads. Check the installed condition of the battery and battery leads (loose bolts).		Improperly installed battery or battery leads → Reinstall or replace the battery leads.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	Connection of starter relay 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.	

Fault	code No.	P160	2		
Item			lalfunction in ECU internal circuit (malfunction of ECU power cut- ff function).		
3	Check the fuel backup fuse	Э.	Blown fuse \rightarrow Replace the fuse.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	
4	Wire harness continuity between battery and ECU pler.	cou-	Open or short circuit → Replace the wire harness. Between battery and fuse box 1. red-red Between fuse box 1 (backup fuse) and ECU coupler. red/green-red/green	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	
5	Wire harness continuity between main switch and E coupler.	ECU	Open or short circuit → Replace the wire harness. Between main switch coupler and fuse box 2 (ignition fuse). brown/blue—brown/blue Between fuse box 2 (ignition fuse) and ECU coupler. red/white—red/white	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.	
6	Malfunction in ECU.		Replace the ECU.	Service is finished.	
7	Delete the fault code and code that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.		

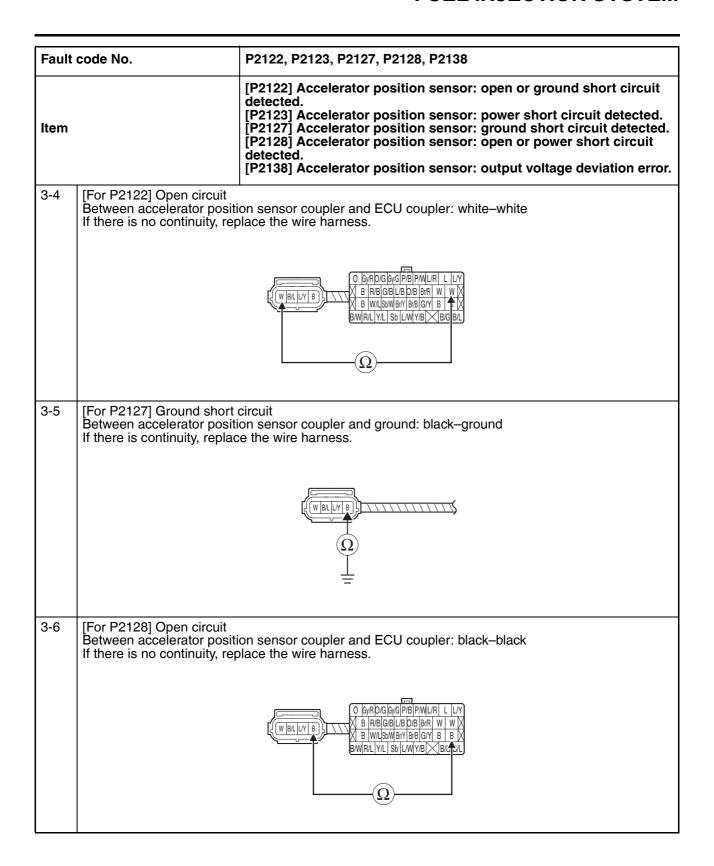
Fault code No. P2122, P2123, P2127, P2128, P2138

TIP

If a fault code other than No. "P2138" ("P2122, P2123, P2127, P2128") is detected, perform trouble-shooting first.

Fault	code No.	P2122, P2123, P2127, P2128, P2138			
Item		[P2122] Accelerator position sensor: open or ground short circuit detected. [P2123] Accelerator position sensor: power short circuit detected. [P2127] Accelerator position sensor: ground short circuit detected. [P2128] Accelerator position sensor: open or power short circuit detected. [P2138] Accelerator position sensor: output voltage deviation error.			
Fail-s	afe system	Able/	Unable to start engine		
i un s	uic dystein	Able/	Unable to drive vehicle		
Diagr	nostic code No.	14, 1	5		
14	Tool display	• 11–	lerator position sensor signal 1 21 (fully closed position) 107 (fully open position)		
	Procedure	• Che	eck with throttle grip in fully closed eck with throttle grip in fully open p	position. osition.	
15	Tool display	• 9–2	lerator position sensor signal 2 3 (fully closed position) 109 (fully open position)		
	Procedure • Ch		Check with throttle grip in fully closed position. Check with throttle grip in fully open position.		
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion	
1	Connection of accelerator 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.	
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.	

Fault	code No.	P2122, P2123, P2127, P2128, P2138		
Item		[P2122] Accelerator position sensor: open or ground short circuit detected. [P2123] Accelerator position sensor: power short circuit detected. [P2127] Accelerator position sensor: ground short circuit detected. [P2128] Accelerator position sensor: open or power short circuit detected. [P2138] Accelerator position sensor: output voltage deviation error.		
3-1	 Accelerator position set ECU Sensor input lead Sensor output lead 1 Sensor output lead 2 	1 3 LY 5V		
3-2	6. Sensor ground lead Disconnect the ECU coupl Disconnect the accelerator	er from the ECU. r position sensor coupler from the accelerator position sensor.		
3-3	[For P2122] Ground short Between accelerator positi If there is continuity, replace	ion sensor coupler and ground: white–ground		



Fault	code No.	P2122, P2123, P2127, P2128, P2138		
Item		[P2122] Accelerator position sensor: open or ground short circuit detected. [P2123] Accelerator position sensor: power short circuit detected. [P2127] Accelerator position sensor: ground short circuit detected. [P2128] Accelerator position sensor: open or power short circuit detected. [P2138] Accelerator position sensor: output voltage deviation error.		
3-7	[For P2122/P2128] Open of Between accelerator positions of there is no continuity, reported by the property of	on sensor coupler and ECU coupler: blue/yellow-blue/yellow		
		O SYRDIGSYGFIBPMUR L LY B RIBGIBUB DIB BIR W VA B WULDDWIN BIRB GIV B B X BWRIL YIL SO LWY/B BIGBL O SYRDIGSYGFIBPMUR L LYY B RIBGIBUB DIB BIR W VA B WULDDWIN BIRB GIV B B X BWRIL YIL SO LWY/B BIGBL		
3-8	[For P2122/P2128] Open of Between accelerator position of there is no continuity, rep	on sensor coupler and ECU coupler: black/blue-black/blue		
		O Syrpog Gyg P/B P/ML/R L LY B RIB G/B LB D/B BirR W W X B W/LSWM BirY BirB G/Y B B X BWR/L Y/L Sb LWY/B B/G B/L		
3-9	Disconnect the couplers from Refer to "Parts connected"	om the parts that are connected to the ECU. to the ECU" on page 8-51.		
3-10	[For P2122/P2123] Short circuit Between accelerator position sensor output terminal (white) "a" of ECU coupler and any other ECU coupler terminal "b". If there is continuity, replace the wire harness.			
		a /		
		D Gyr DG Gyr PB PMLR L I/Y B RNB GNB LNB DNB BNR W W X B WLLSSW BNY BNB GNY B A X BWRIL Y/L Sb LLWY/B BIG BIL A		

Fault	code No.	P212	2, P2123, P2127, P2128, P2138				
Item		detection [P212 [P212 detection]	122] Accelerator position sensor: open or ground short circuit ected. 123] Accelerator position sensor: power short circuit detected. 127] Accelerator position sensor: ground short circuit detected. 128] Accelerator position sensor: open or power short circuit ected. 128] Accelerator position sensor: output voltage deviation error.				
3-11	[For P2127/P2128] Short circuit Between accelerator position sensor output terminal (black) "a" of ECU coupler and any other ECU coupler terminal "b". If there is continuity, replace the wire harness.						
	O GYRD/GGYGP/BPWLR L LY B R/B/G/B/UB D/B B/R W W W B W/LSW/B/W/B/B/B/Y B/B/J/L BW/R/L Y/L Sb L/W Y/B B/L						
4	Installed condition of accelerator position sensor.	era-	Check for looseness or pinching. Improperly installed sensor → Reinstall or adjust the sensor. Refer to "ADJUSTING THE ACCELERATOR POSITION SENSOR" on page 7-18.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.			
5	Defective accelerator positi sensor.	on	Check accelerator position sensor signal 1. Execute the diagnostic mode. (Code No. 14) When the throttle grip is fully closed: A value of 11–21 is indicated. When throttle grip is fully open: A value of 96–107 is indicated. Check accelerator position sensor signal 2. Execute the diagnostic mode. (Code No. 15) When the throttle grip is fully closed: A value of 9–23 is indicated. When the throttle grip is fully open: A value of 93–109 is indicated. An indicated value is out of the specified range → Replace the accelerator position sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.			
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.			

Fault	code No.	2122, P2123, P2127, P2128, P2138		
ltem		22122] Accelerator position sensor: open or ground short circuit etected. 22123] Accelerator position sensor: power short circuit detected. 22127] Accelerator position sensor: ground short circuit detected. 22128] Accelerator position sensor: open or power short circuit etected. 22138] Accelerator position sensor: output voltage deviation erro		
7	Delete the fault code and che that the engine trouble warnin light goes off.			

Fault code No. P2158					
Fault code No. P219		P215	8		
Item			t wheel sensor: no normal signa el sensor.	Is are received from the front	
Fail-e	afe system	Able	to start engine		
i ali-5	ale system	Able	to drive vehicle		
Diagn	ostic code No.	16			
Tool c	lisplay	Front 0–99	wheel speed pulse 9		
Proce	dure	Chec numb	k that the number increases when er is cumulative and does not rese	the front wheel is rotated. The et each time the wheel is stopped.	
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Locate the malfunction.		If the ABS warning light is on, refer to "BASIC INSTRUC-TIONS FOR TROUBLESHOOT-ING" on page 8-172. 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 → Go to item 9 and finish the service. Value does not increase → Go to item 2.		
2	Connection of front wheel 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 → 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 Go to item 9 and finish the service. Value does not increase Go to item 3.	

Fault	code No.	P215	8			
Item			Front wheel sensor: no normal signals are received from the front wheel sensor.			
3	Connection of ABS ECU copler. 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 → 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 → Go to item 9 and finish the service. Value does not increase → Go to item 4.		
4	Connection of ECU couple 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 → 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 → Go to item 9 and finish the service. Value does not increase → 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 → Go to item 9 and finish the service. Value does not increase → Go to item 6.		
6	Defective front wheel sense	or.	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 → Go to item 9 and finish the service. Value does not increase → Go to item 7.		
7	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Execute the diagnostic mode. (Code No. 16) Rotate the front wheel by hand and check that the indicated value increases. Value increases → Go to item 9 and finish the service. Value does not increase → Go to item 8.		
8	Malfunction in ABS ECU.		Replace the ABS ECU.	Go to item 9.		

Fault code No.		158			
Item		Front wheel sensor: no normal signals are received from the front wheel sensor.			
9	Delete the fault code and of that the engine trouble war light goes off.	, , , , , , , , , , , , , , , , , , , ,			

Fault code No. P2195

TIP

If fault code numbers "P2195" and "P0030" are both indicated, take the actions specified for fault code number "P0030" first.

Fault code No.		P219	5	
Item		O ₂ se	ensor 1: open circuit detected.	
Fail o	ofo ovotom	Able	to start engine	
raii-s	afe system	Able	to drive vehicle	
Diagn	nostic code No.	_		
Tool	display	_		
Proce	edure	_		
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion
1	Installed condition of O ₂ set 1.	ensor	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 2. Also, delete this fault code, which has a condition of "Detected".

Fault	code No.	P219	5		
Item		O ₂ se	ensor 1: open circuit detected.		
2	Connection of O ₂ sensor 1 pler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or broterminals and locking cond of the pins).	n of d ken	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 3. Also, delete this fault code, which has a condition of "Detected".	
3	Connection of ECU couple Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotterminals and locking cond of the pins).	n of d ken	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 4. Also, delete this fault code, which has a condition of "Detected".	
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between O ₂ sensor 1 coupler and ECU coupler. gray/green—gray/green pink/black—pink/black Between O ₂ sensor 1 coupler and joint connector. black/blue—black/blue Between O ₂ sensor 1 coupler and ignition fuse. red/white—red/white Between joint connector and ECU coupler. black/blue—black/blue	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 5. Also, delete this fault code, which has a condition of "Detected".	
5	Check fuel pressure.		Refer to "CHECKING THE FUEL PRESSURE" on page 7-17.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 6. Also, delete this fault code, which has a condition of "Detected".	

Faul	t code No.	P2195 O ₂ sensor 1: open circuit detected.			
Item	0				
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 and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 7. Also, delete this fault code, which has a condition of "Detected".		
7	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.		
8	Delete the fault code and che that the engine trouble warnir light goes off.				

Fault code No. P2197

TIP_

If fault code numbers "P2197" and "P0050" are both indicated, take the actions specified for fault code number "P0050" first.

Fault code No.		P219	P2197			
Item		O ₂ se	ensor 2: open circuit detected.			
Fail-e	afe system	Able	to start engine			
i ali-s	are system	Able	to drive vehicle			
Diagn	ostic code No.	_				
Tool	display	_				
Proce	edure	_				
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion		
1	Installed condition of O ₂ set 2.	ensor	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 2. Also, delete this fault code, which has a condition of "Detected".		

Fault	code No.	P219	7		
Item	Item O ₂ se		ensor 2: open circuit detected.		
2	Connection of O ₂ sensor 2 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 → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 3. Also, delete this fault code, which has a condition of "Detected".	
3	Connection of ECU couple 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 → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 4. Also, delete this fault code, which has a condition of "Detected".	
4	Wire harness continuity.		Open or short circuit → 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 O ₂ sensor 2 coupler and ignition fuse. red/white-red/white Between joint connector and ECU coupler. black/blue-black/blue	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 5. Also, delete this fault code, which has a condition of "Detected".	
5	Check fuel pressure.		Refer to "CHECKING THE FUEL PRESSURE" on page 7-17.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 6. Also, delete this fault code, which has a condition of "Detected".	

Fault	code No.	2197		
Item	(O ₂ sensor 2: open circuit detected.		
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 and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 8 and finish the service. Condition is "Detected" → Go to item 7. Also, delete this fault code, which has a condition of "Detected".	
7	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.	
8	Delete the fault code and che that the engine trouble warninght goes off.			

Fault code No. P21CF

rault code No. P21CF						
Fault	code No.	P210	F			
Item		Seco	ndary injector #1: malfunction in	n secondary injector #1.		
Eail-c	afe system	Able	to start engine (depending on the	number of faulty cylinders)		
i ali-s	are system	Able	to drive vehicle (depending on the	number of faulty cylinders)		
Diagn	ostic code No.	40				
Actuation The		The "	Actuates secondary injector #1 five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen comes on each time the secondary injector is actuated.			
Procedure D ad		Disco actua	Disconnect the fuel pump coupler. Check that secondary injector #1 is actuated five times by listening for the operating sound.			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		
1	Connection of secondary is tor #1 coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brownials and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 40) Operating sound → Go to item 6. No operating sound → Go to item 2.		
2	Defective secondary inject	or #1.	Measure the secondary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-245.	Execute the diagnostic mode. (Code No. 40) Operating sound → Go to item 6. No operating sound → Go to item 3.		

Fault	Fault code No. P210		F	
Item		Seco	ndary injector #1: malfunction i	n secondary injector #1.
3	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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 40) Operating sound → Go to item 6. No operating sound → Go to item 4.
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between secondary injector coupler and ECU coupler. white/blue—white/blue Between secondary injector coupler and relay unit coupler. red/blue—red/blue	Execute the diagnostic mode. (Code No. 40) Operating sound → Go to item 6. No operating sound → Go to item 5.
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	
6	Delete the fault code and ce that the engine trouble war light goes off.		Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P21D0

Fauit	-ault code No. P21D0					
Fault	code No.	P21D0				
Item		Seco	ndary injector #2: malfunction in	n secondary injector #2.		
Fail-e	afe system	Able	to start engine (depending on the	number of faulty cylinders)		
l all-s	ale system	Able	to drive vehicle (depending on the	number of faulty cylinders)		
Diagn	nostic code No.	41				
Actuation		Actuates secondary injector #2 five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen comes on each time the secondary injector is actuated.				
Proce	edure	Disconnect the fuel pump coupler. Check that secondary injector #2 is actuated five times by listening for the operating sound.				
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion		
1	Connection of secondary is tor #2 coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or broad terminals and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 41) Operating sound → Go to item 6. No operating sound → Go to item 2.		

Fault	Fault code No.		P21D0		
Item		Seco	ndary injector #2: malfunction i	n secondary injector #2.	
2	Defective secondary injector #2.		Measure the secondary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-245.	Execute the diagnostic mode. (Code No. 41) Operating sound → Go to item 6. No operating sound → Go to item 3.	
3	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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 41) Operating sound → Go to item 6. No operating sound → Go to item 4.	
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between secondary injector coupler and ECU coupler. sky blue/white—sky blue/white Between secondary injector coupler and relay unit coupler. red/blue—red/blue	Execute the diagnostic mode. (Code No. 41) Operating sound → Go to item 6. No operating sound → Go to item 5.	
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.		
6	Delete the fault code and of that the engine trouble war light goes off.		Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.		

Fault code No. P21D1

Fault code No.	P21D	P21D1		
Item	Seco	ndary injector #3: malfunction in	n secondary injector #3.	
Eail aafa ayatam	Able t	to start engine (depending on the i	number of faulty cylinders)	
Fail-safe system	Able t	Able to drive vehicle (depending on the number of faulty cylinders)		
Diagnostic code No.	42	42		
Actuation	The "	Actuates secondary injector #3 five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen comes on each time the secondary injector is actuated.		
Procedure	Disco actua	Disconnect the fuel pump coupler. Check that secondary injector #3 is actuated five times by listening for the operating sound.		
Item Probable cause malfunction and c		Maintenance job	Confirmation of service completion	

Fault	code No.	P21D1				
Item		Seco	Secondary injector #3: malfunction in secondary injector #3.			
1	Connection of secondary injector #3 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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 42) Operating sound → Go to item 6. No operating sound → Go to item 2.		
2	Defective secondary injector #3.		Measure the secondary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-245.	Execute the diagnostic mode. (Code No. 42) Operating sound → Go to item 6. No operating sound → Go to item 3.		
3	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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 42) Operating sound → Go to item 6. No operating sound → Go to item 4.		
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between secondary injector coupler and ECU coupler. brown/yellow-brown/yellow Between secondary injector coupler and relay unit coupler. red/blue-red/blue	Execute the diagnostic mode. (Code No. 42) Operating sound → Go to item 6. No operating sound → Go to item 5.		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.			
6	Delete the fault code and c that the engine trouble war light goes off.		Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.			

Fault code No. P21D2

Fault	code No.	P21D	12		
Item		Secondary injector #4: malfunction in secondary injector #4.			
Fail-s	Fail-safe system		to start engine (depending on the i		
	-		to drive vehicle (depending on the	number of faulty cylinders)	
Diagn	ostic code No.	43			
Actua	ition	The "	ates secondary injector #4 five time check" indicator on the Yamaha did time the secondary injector is actu	agnostic tool screen comes on	
Proce	edure	Disco actua	onnect the fuel pump coupler. Chec ted five times by listening for the o	ck that secondary injector #4 is perating sound.	
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion	
1	Connection of secondary in tor #4 coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brownials and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 43) Operating sound → Go to item 6. No operating sound → Go to item 2.	
2	Defective secondary injector #4.		Measure the secondary injector resistance. Replace if out of specification. Refer to "CHECKING THE FUEL INJECTORS" on page 8-245.	Execute the diagnostic mode. (Code No. 43) Operating sound → Go to item 6. No operating sound → Go to item 3.	
3	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 → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 43) Operating sound → Go to item 6. No operating sound → Go to item 4.	
4	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between secondary injector coupler and ECU coupler. brown/black–brown/black Between secondary injector coupler and relay unit coupler. red/blue–red/blue	Execute the diagnostic mode. (Code No. 43) Operating sound → Go to item 6. No operating sound → Go to item 5.	
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.		
6	Delete the fault code and check that the engine trouble warning light goes off.		Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of "Recovered" using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.		

Fault code No. P2228, P2229

Fault	code No.	P222	8, P2229			
Item	Item		[P2228] Atmospheric pressure sensor: ground short circuit detected. [P2229] Atmospheric pressure sensor: open or power short circuit detected.			
Fail-e	afe system	Able	to start engine			
i an-3	are system	Able	to drive vehicle			
Diagn	ostic code No.	02				
Tool	display	Displ	ays the atmospheric pressure.			
Proce	edure		pare the actually measured atmospalue.	pheric pressure with the tool dis-		
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		
1	Connection of atmospheric pressure 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.		
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 4.		

Fault	code No.	P2228, P2229			
Item		[P2228] Atmospheric pressure sensor: ground short circuit detected. [P2229] Atmospheric pressure sensor: open or power short circuit detected.			
3-1		1			
	 Atmospheric pressure ECU Sensor input lead Sensor output lead Sensor ground lead 	sensor			
3-2	Disconnect the ECU coupler from the ECU. Disconnect the atmospheric pressure sensor coupler from the atmospheric pressure sensor.				
3-3	[For P2228] Ground short Between atmospheric presif there is continuity, replaced to the second short of t	ssure sensor coupler and ground: pink-ground			
J-4	Between atmospheric pres If there is no continuity, rep	ssure sensor coupler and ECU coupler: blue–blue place the wire harness.			

Fault	code No.	P2228, P2229
rauit	COUE NO.	<u> </u>
Item		[P2228] Atmospheric pressure sensor: ground short circuit detected. [P2229] Atmospheric pressure sensor: open or power short circuit detected.
3-5	[For P2229] Open circuit Between atmospheric pres If there is no continuity, rep	ssure sensor coupler and ECU coupler: pink–pink place the wire harness.
		WIRE GY YEBS G PM YILUB LIGHT WINDER BRI P GW BRILW RLBW BL L GEWLWYBW SIGNY LUWLY V
3-6	[For P2229] Open circuit Between atmospheric pres If there is no continuity, rep	ssure sensor coupler and ECU coupler: black/blue-black/blue blace the wire harness.
		PL VYRRW RIG G PW VYLLIB LIGHT W WINDLE BRY P GW BRYLW RLBW BL L GREWLW/BWGGGYY LWLYY V O O
3-7	Disconnect the couplers fr Refer to "Parts connected	om the parts that are connected to the ECU. to the ECU" on page 8-51.
3-8	[For P2228/P2229] Short of Between atmospheric prescoupler terminal "b". If there is continuity, replace	ssure sensor output terminal (pink) "a" of ECU coupler and any other ECU
		A VARIANCE BOY NABBE & PMN VALUE Land NABAN BAL L GARMAN SAMPLAN LA SAMPLAN BAL L GARMAN SAMPLAN LA SAMPLAN LA

Fault	code No.	P222	8, P2229		
Item		detec [P222	228] Atmospheric pressure sensor: ground short circuit ected. 229] Atmospheric pressure sensor: open or power short circuit ected.		
4	Installed condition of atmospheric pressure sensor.		Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.	
5	Defective atmospheric pressensor.	ssure	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), approx. 3.64 V 1000 m (3300 ft) above sea level: Approx. 90 kPa (675.1 mmHg, 26.6 inHg), approx. 3.30 V 2000 m (6700 ft) above sea level: Approx. 80 kPa (600.0 mmHg, 23.6 inHg), approx. 3.00 V 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg), approx. 2.70 V Displayed value is incorrect → Replace the atmospheric pressure sensor.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.	
6	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.	
7	Delete the fault code and control that the engine trouble war light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.		

Fault code No. U0155 or "Err"

TIP

"Err" is displayed on the clock display of the multi-function meter, but the engine trouble warning light does not come on.

Fault	Fault code No. U0155 or "Err"					
Item			Multi-function meter: signals cannot be transmitted between the ECU and the multi-function meter.			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 2.		
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" \rightarrow Go to item 6 and finish the service. Condition is "Detected" \rightarrow Go to item 3.		
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between meter assembly coupler and joint coupler. blue/black-blue/black blue/white-blue/white Between joint coupler and ECU coupler. blue/white-blue/white blue/black-blue/black	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 4.		
4	Defective meter assembly.		Replace the meter assembly.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 5.		
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.		
6	Delete the fault code and check that the engine trouble warning light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.			

Fault code No. U0125

TIP_

If fault code numbers "U0125" and "P1600" are both indicated, take the actions specified for fault code number "U0125" first.

Item Fail-safe system		U0125 Signals cannot be transmitted between the ECU and the IMU.				
		Able/	Unable to drive vehicle			
		Diagr	nostic code No.	_		
Tool	display	_				
Proce	edure					
Item	Probable cause of malfunction and chec	:k	Maintenance job	Confirmation of service completion		
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 2.		
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → 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 IMU coupler. blue/white-blue/white blue/white-blue/black Between IMU coupler and ignition fuse connector. red/white-red/white Between IMU coupler and ECU coupler. black/white-black/white	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 4.		
4	Malfunction in IMU.		Replace the IMU.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 5.		

Fault code No. U012		0125			
Item	1	Signals cannot be transmitted be	nals cannot be transmitted between the ECU and the IMU.		
5	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" or page 8-232.	Service is finished.		
6	Delete the fault code and cl that the engine trouble warr light goes off.		S		

Fault code No. C0520

Fault code No. C0520					
Item		ECU receives a signal from the IMU indicating that a malfunction was detected or the ECU does not receive normal signals from the IMU.			
Fail aufa avatam	Able/	Able/Unable to start engine			
Fail-safe system	Able/	Able/Unable to drive vehicle			
Diagnostic code No.	-	_			
Tool display	_				
Procedure	1-				
Probable cause o	f		Confirmation of service		

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 2.
2	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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 3.

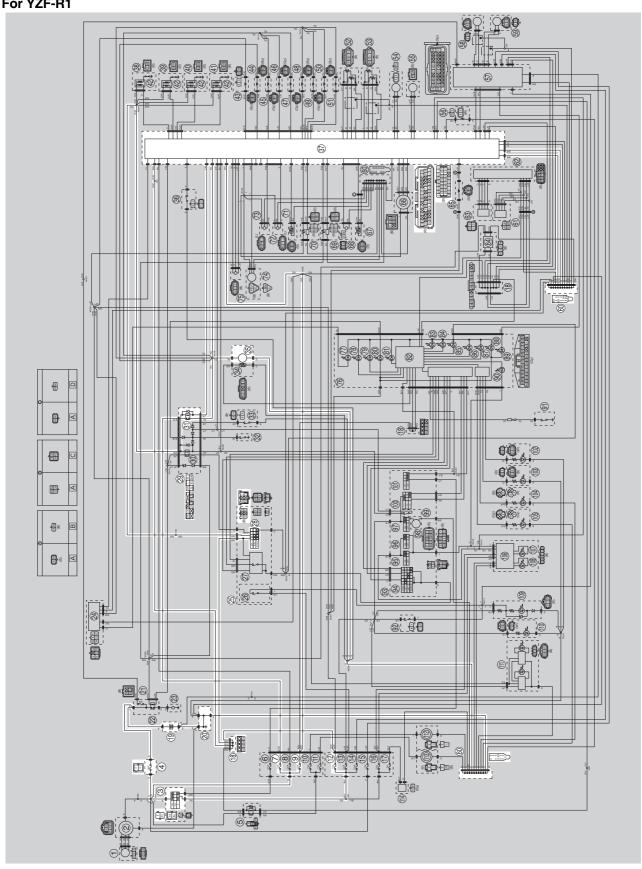
Fault code No.		C0520				
Item v		CU receives a signal from the IMU indicating that a malfunction ras detected or the ECU does not receive normal signals from the MU.				
3	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between ECU coupler and joint coupler. blue/white-blue/white blue/black-blue/black Between joint coupler and IMU coupler. blue/white-blue/white blue/black-blue/black Between IMU coupler and ignition fuse connector. red/white-red/white Between IMU coupler and ECU coupler. black/white-black/white	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → 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", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 5.			
5	Malfunction in IMU.	Replace the IMU.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 7 and finish the service. Condition is "Detected" → Go to item 6.			
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.			
7	Delete the fault code and of that the engine trouble war light goes off.					

FAS20081

FUEL PUMP SYSTEM

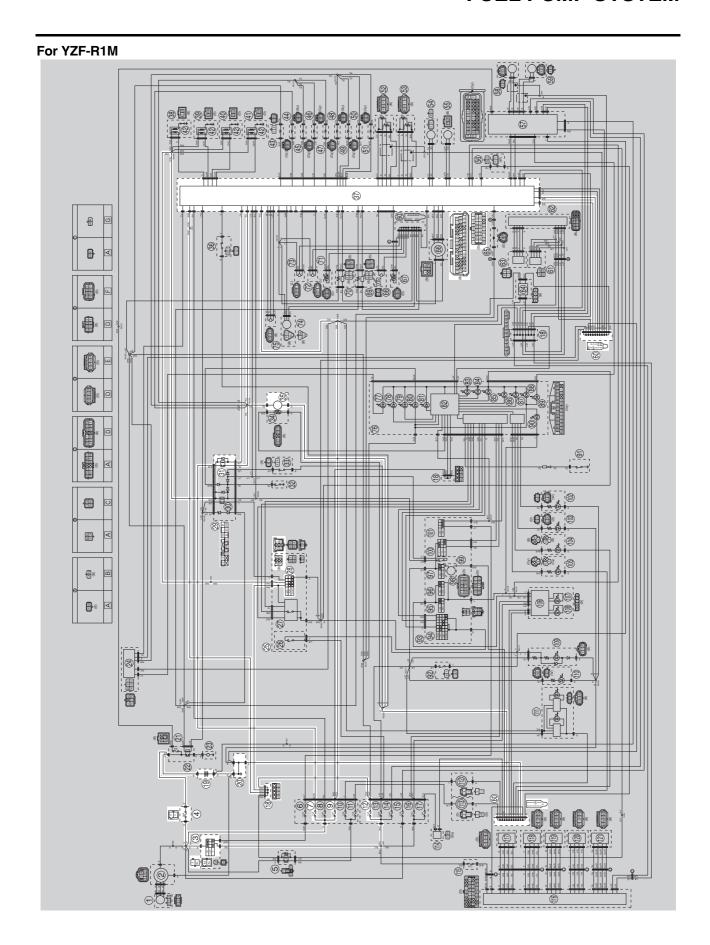
CIRCUIT DIAGRAM

For YZF-R1



FUEL PUMP SYSTEM

- 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



FUEL PUMP SYSTEM

- 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

EAS20514 **TROUBLESHOOTING** If the fuel pump fails to operate. • Before troubleshooting, remove the following part(s): 1. Front side cowling/Front panel 2. Rider seat 3. Fuel tank cover 4. Fuel tank 1. Check the fuses. (Main, ignition, backup and fuel injection system) Replace the fuse(s). $NG \rightarrow$ Refer to "CHECKING THE FUSES" on page 8-232. OK↓ 2. Check the battery. Refer to "CHECKING AND • Clean the battery terminals. CHARGING THE BATTERY" on Recharge or replace the battery. $NG \rightarrow$ page 8-233. OK↓ 3. Check the main switch. Refer to "CHECKING THE Replace the main switch/immobilizer unit. $NG \rightarrow$ SWITCHES" on page 8-229. OK↓ 4. Check the start/engine stop switch. Refer to "CHECKING THE Replace the handlebar switch (right). $NG \rightarrow$ SWITCHES" on page 8-229. OK↓ 5. Check the relay unit (fuel pump re-Replace the relay unit. Refer to "CHECKING THE RE- $NG \rightarrow$ LAYS" on page 8-236. OK↓ 6. Check the fuel pump. Refer to "CHECKING THE FUEL Replace the fuel pump. $NG \rightarrow$ PUMP OPERATION" on page 7-3. OK↓ 7. Check the entire fuel pump system's wiring. Properly connect or repair the fuel pump Refer to "CIRCUIT DIAGRAM" on system's wiring. $NG \rightarrow$ page 8-145. OK↓

Replace the ECU.

Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.

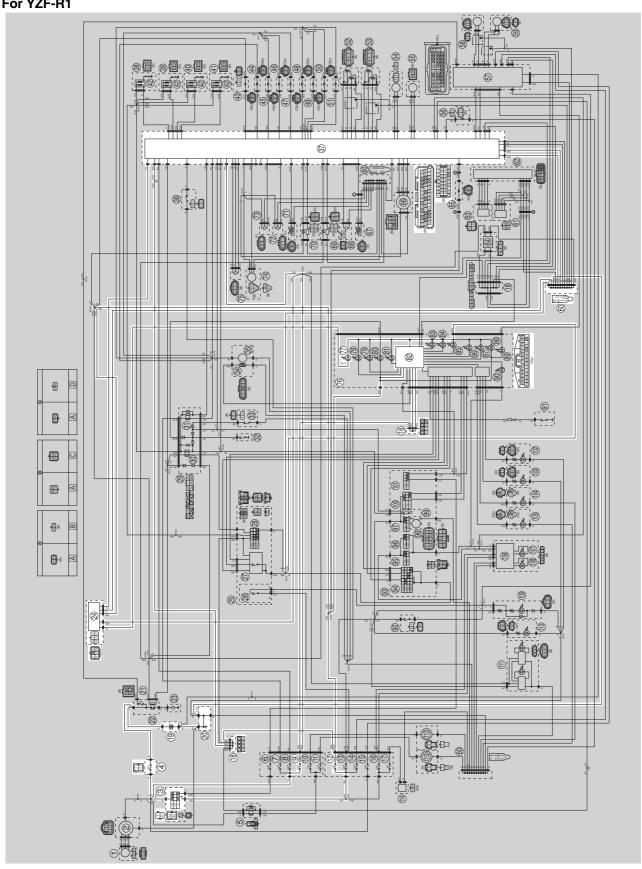
EAS20084

IMMOBILIZER SYSTEM

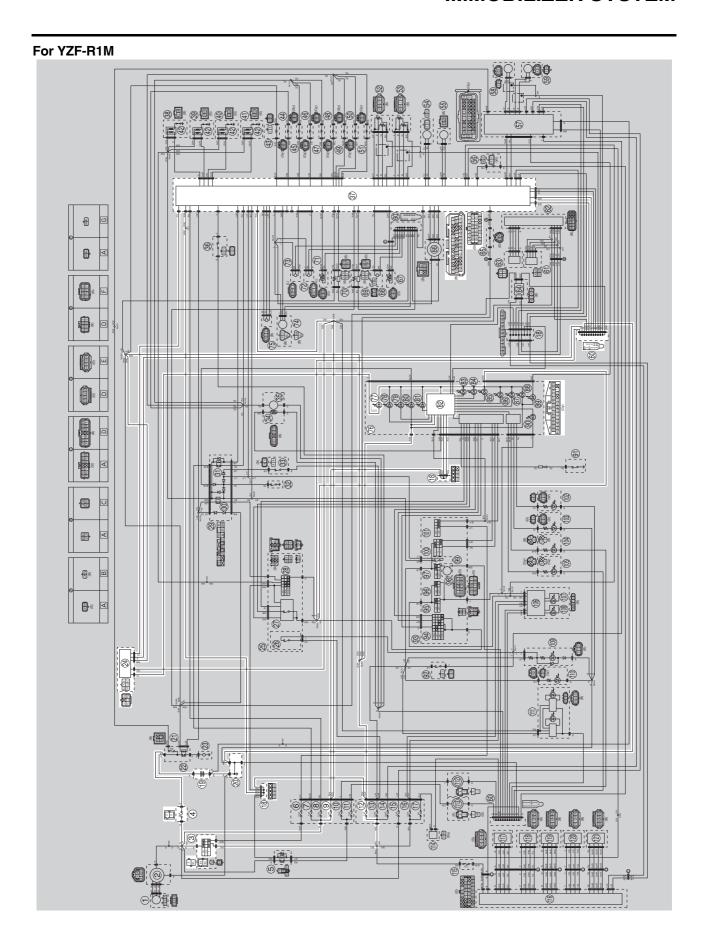
FAS30519

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
- 82.Multi-function meter



- 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
- 82.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.

EAS3052

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.

	Parts to be replaced						
	Main switch/ immobilizer unit		Standard	ECU	Accessory lock* and	Key registration requirement	
	Main switch	Immobilizer unit	key	LCO	key		
Standard key is lost			V			New standard key	
All keys have been lost (including code re-registering key)		V	V	V	V	Code re-registering key and standard keys	
ECU is defective				√		Code re-registering key and standard keys	
Immobilizer unit is defective		V				Code re-registering key and standard keys	
Main switch is defective		√	V	√	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.

TIF

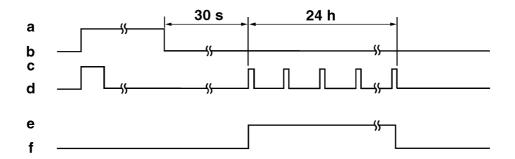
Check that the immobilizer system indicator light comes on for one second, then goes off. When the immobilizer system indicator light goes off, the code re-registering key has been registered.

- 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 8-160).

- 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

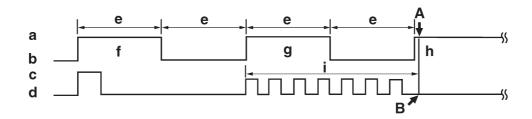
If he immobilizer system indicator light stops flashing 5 seconds after the first standard key is registered, the registration mode is deactivated. If this occurs, the second standard key cannot be registered, and steps (2) to (4) need to be repeated to register both standard keys.

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**



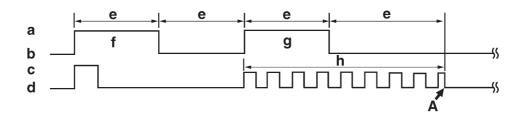
- a. Main switch "ON"
- b. Main switch "OFF"
- c. LED on
- d. LED off
- e. Less than 5.0 s
- f. Code re-registering key
- g. First standard key

- h. Second standard key
- i. Registration mode
- A. Registration of the second standard key is complete.
- B. Immobilizer system indicator light stops flashing when the registration of the second standard key is complete.

Voiding the standard key code:

If a standard key has been lost, it is possible to disable its use by re-registering the remaining standard key. Standard key registration erases the stored standard key code from the memory, thus disabling the lost standard key. To re-register, refer to "Standard key registration".

Standard key code voiding method



- a. Main switch "ON"
- b. Main switch "OFF"
- c. LED on
- d. LED off
- e. Less than 5.0 s
- f. Code re-registering key
- g. Remaining standard key
- h. Registration mode
- A. If the immobilizer system indicator light stops flashing 5 seconds after the first standard key is registered, the second standard key cannot be registered.

EAS30522

TROUBLESHOOTING

When the main switch is turned to "ON", the immobilizer system indicator light does not come on nor flashes.

 Check the fuses. (Main, ignition, and backup) Refer to "CHECKING THE FUSES" on page 8-232.

 $NG \rightarrow$

Replace the fuse(s).

OK↓

2. Check the battery.
Refer to "CHECKING AND
CHARGING THE BATTERY" on
page 8-233.

 $NG \rightarrow$

Clean the battery terminals.Recharge or replace the battery.

OK↓

3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

 $NG \rightarrow$

Replace the main switch/immobilizer unit.

OK↓

Check the entire immobilizer system wiring.
 Refer to "CIRCUIT DIAGRAM" on page 8-151.

 $NG \rightarrow$

Properly connect or repair the immobilizer system wiring.

OK↓

- Check the condition of the each immobilizer system circuits.
- Refer to "SELF-DIAGNOSIS FAULT CODE INDICATION" on page 8-160.

EAS30523

SELF-DIAGNOSIS FAULT CODE INDICATION

When a system malfunction occurs, the fault code number is indicated in the meter display and the immobilizer system indicator light flashes at the same time. The pattern of flashing also shows the fault code.

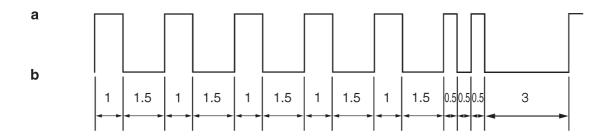
Fault code	Part	Symptom	Cause	Action
51	IMMOBILIZER UNIT	Code cannot be transmitted between the key and the immobilizer unit.	 Radio wave interference caused by objects around the keys and antennas. Immobilizer unit malfunction. Key malfunction. 	 Keep magnets, metal objects, and other immobilizer system 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 consecutive 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.
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 connector. Replace the main switch/immobilizer unit. Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.
54	IMMOBILIZER UNIT	Codes transmitted between the ECU and the immobilizer unit do not match.	Noise interference or disconnected lead/cable. 1. Interference due to radio wave noise. 2. Disconnected communication harness. 3. Immobilizer unit malfunction. 4. ECU failure. (The ECU or immobilizer unit was replaced with a used unit from another vehicle.)	 Register the code re-registering key. Check the wire harness and connector. Replace the main switch/immobilizer unit. Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.
55	IMMOBILIZER UNIT	Key code registration malfunction.	Same standard key was attempted to be registered two consecutive times.	Register another standard key.

Fault code	Part	Symptom	Cause	Action
56	ECU	Unidentified code is received.	Noise interference or disconnected lead/cable.	 Check the wire harness and connector. Replace the main switch/immobilizer unit. Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.

Immobilizer system indicator light fault code indication

Digit of 10: Cycles of 1 sec. ON and 1.5 sec. OFF. Digit of 1: Cycles of 0.5 sec. ON and 0.5 sec. OFF.

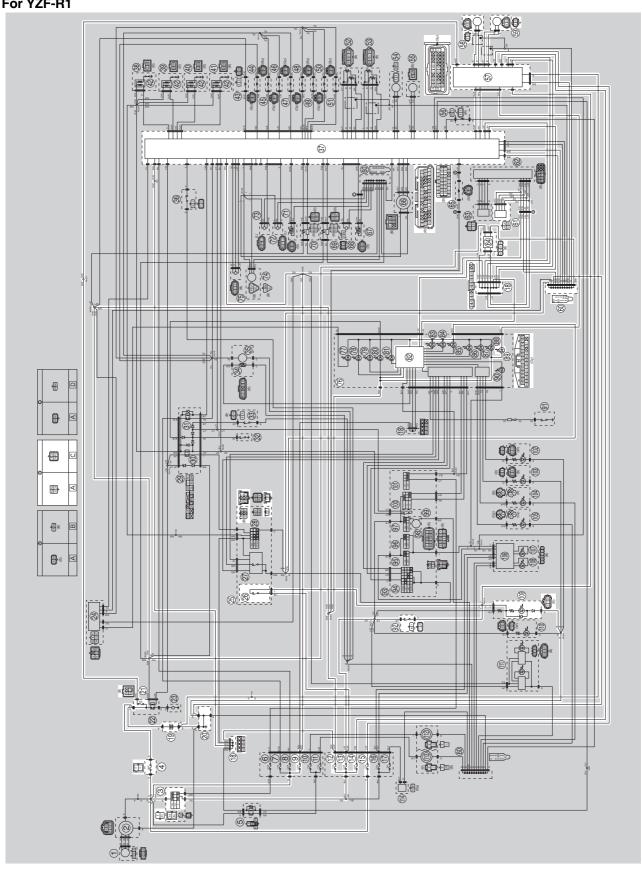
Example: fault code 52



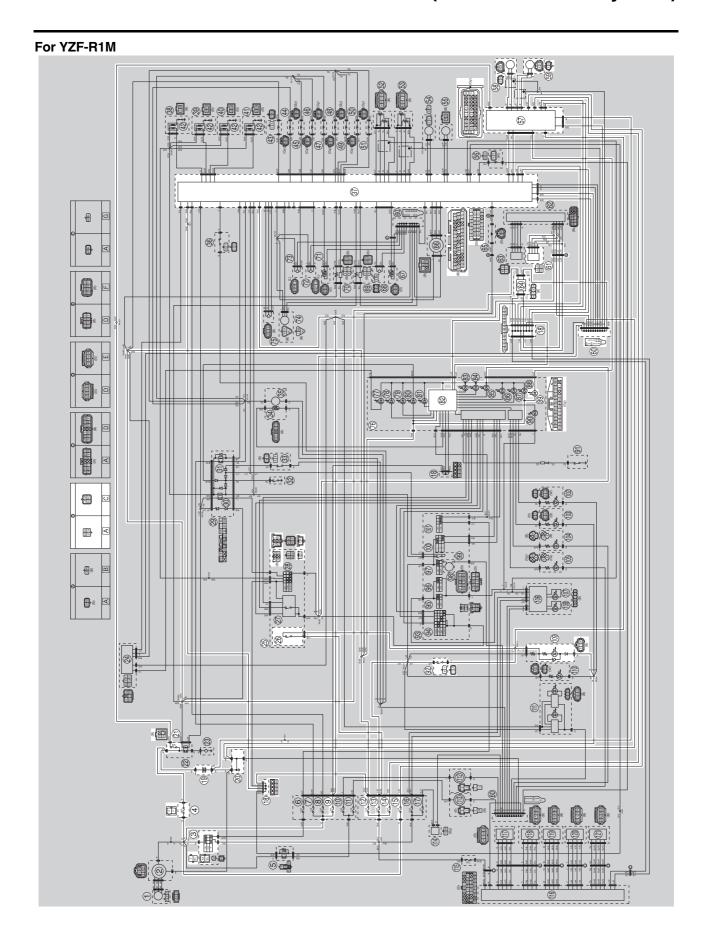
- a. Light on
- b. Light off

CIRCUIT DIAGRAM

For YZF-R1

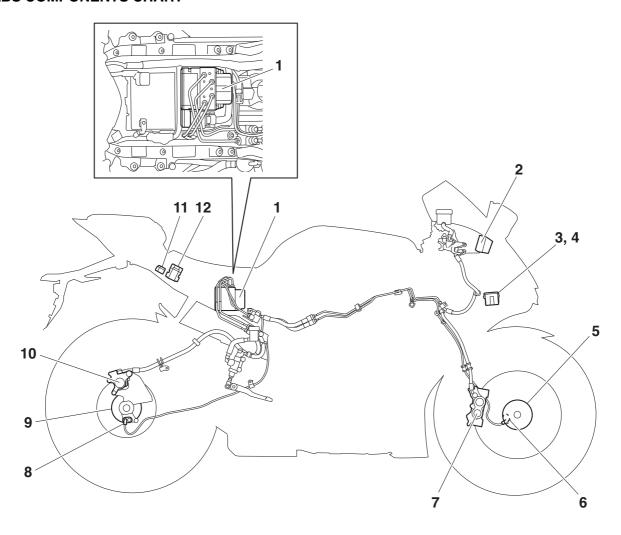


- 3. Main switch
- 4. Main fuse
- 9. Backup fuse
- 12.Ignition fuse
- 13. Signaling system fuse
- 14.ABS ECU fuse
- 15.ABS solenoid fuse
- 18. Joint coupler
- 19.Battery
- 20. Engine ground
- 21.ABS motor fuse
- 25. Handlebar switch (right)
- 26. Front brake light switch
- 37.ECU (Engine Control Unit)
- 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
- 82.Multi-function meter
- 89.ABS warning light
- 92.Rear brake light switch
- 109.Tail/brake light
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler)



- 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
- 82. Multi-function meter
- 89.ABS warning light
- 92.Rear brake light switch
- 109.Tail/brake light
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler, CCU, GPS unit)

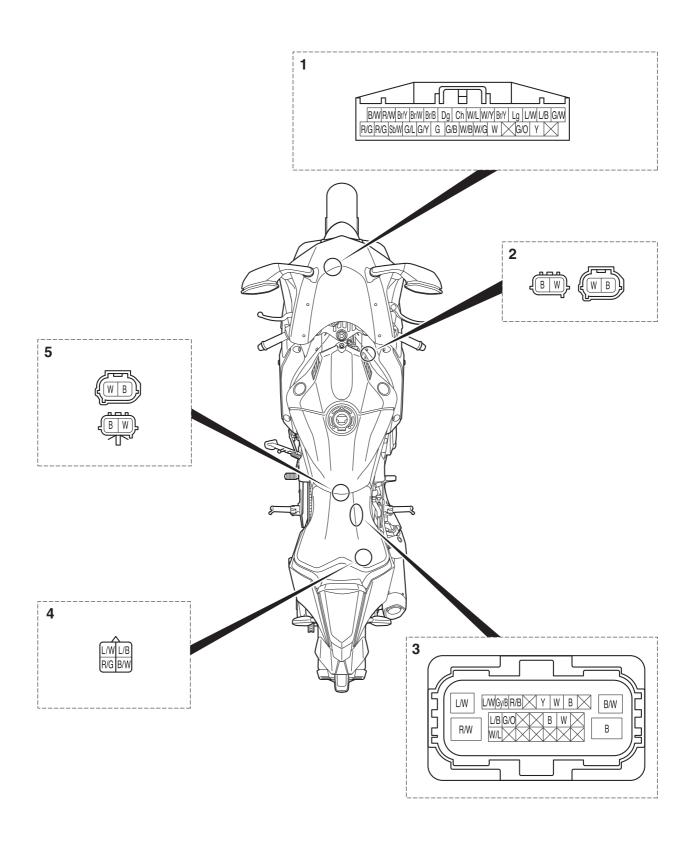
EAS30525 ABS COMPONENTS CHART



- 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

EAS30845

MAINTENANCE OF THE ABS ECU Checking the ABS ECU

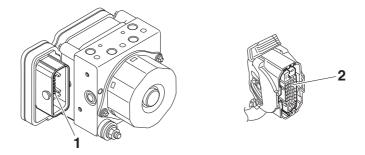
- 1. Check:
- Terminals "1" of the ABS ECU

Cracks/damages \rightarrow 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] DIAGNOSIS USING THE FAULT CODES" on page 8-175. For troubleshooting items other than the following items, follow the normal service method.

WA16710

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.

TIP

To final check, refer to "[C-1] FINAL CHECK" on page 8-194.

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 8-172.

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 information about deleting the fault codes, refer to "[B-3] DELETING THE FAULT CODES" on page 8-193. 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

ECA17620

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.)

EAS3052

BASIC INSTRUCTIONS FOR TROUBLESHOOTING

EWA17420

WARNING

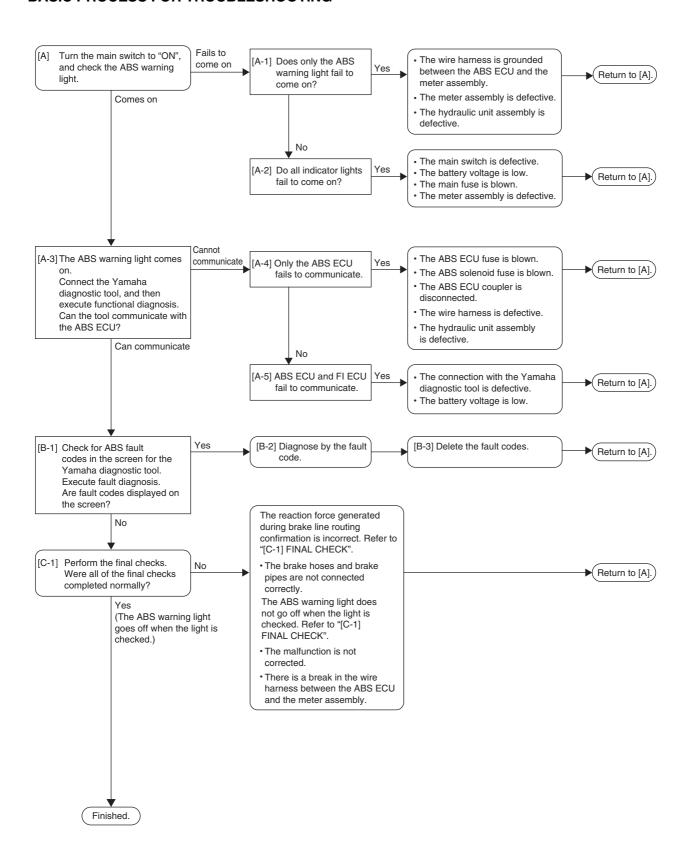
- Perform the troubleshooting [A]→[B]→[C] in order. Be sure to follow the order since a wrong diagnosis could result if the steps are followed in a different order or omitted.
- Use sufficiently charged regular batteries only.
- [A] Malfunction check using the ABS warning light
- [B] Use the Yamaha diagnostic 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.

FAS30530

BASIC PROCESS FOR TROUBLESHOOTING



EWA16710

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.

TIP

To final check, refer to "[C-1] FINAL CHECK" on page 8-194.

FAS3053

[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]

EAS30532

[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 8-229.

- 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 8-233.

- 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 8-232.

- If the main fuse is blown, replace the fuse.
- 4. Circuit
 - Check the meter assembly circuit.

Refer to "CIRCUIT DIAGRAM" on page 8-163.

• If the meter assembly circuit is open, replace the wire harness.

EAS3116

[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.)

EAS31163

[A-4] ONLY THE ABS ECU FAILS TO COMMUNICATE

- 1. ABS ECU fuse
 - Check the ABS ECU fuse for continuity.
 Refer to "CHECKING THE FUSES" on page 8-232.
 - 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 4-70.
- 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)

EAS3116

[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.

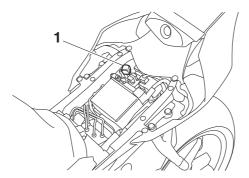


Yamaha diagnostic tool USB 90890-03256 Yamaha diagnostic tool (A/I) 90890-03254

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]

TIP

Check the inspection points after terminating the connection with the Yamaha diagnostic tool and turning the main switch off.

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 (intermittent 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 sensor Incorrect installation of the front wheel Defective sensor rotor or incorrect installation of the rotor Defective front wheel sensor or incorrect installation of the sensor
12	Rear wheel sensor (intermittent 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 sensor Incorrect installation of the rear wheel Defective sensor rotor or incorrect installation of the rotor Defective rear wheel sensor or incorrect installation of the sensor
13* 26*	Front wheel sensor (abnormal 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 sensor Incorrect installation of the front wheel Defective sensor rotor or incorrect installation of the rotor Defective front wheel sensor or incorrect installation of the sensor

Fault code No.	Item	Symptom	Check point
14* 27*	Rear wheel sensor (abnormal 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 sensor Incorrect installation of the rear wheel Defective sensor rotor or incorrect installation of the rotor Defective rear wheel sensor 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 sensor 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 sensor or hydraulic unit assembly
21	Hydraulic unit assembly (defective solenoid drive circuit)	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 hydraulic unit assembly Open or short circuit in the wire harness between the battery and the hydraulic unit assembly Defective hydraulic unit assembly
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 hydraulic 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 circuit in the hydraulic unit assembly.	Defective hydraulic unit assembly

Fault code No.	Item	Symptom	Check point
41	Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	 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. 	Incorrect installation of the front wheel sensor Incorrect rotation of the front wheel Front brake dragging Defective hydraulic unit assembly
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. 	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 sensor Incorrect installation of the front wheel Defective sensor rotor or incorrect installation of the rotor Defective front wheel sensor or incorrect installation of the sensor
44* 46*	Rear wheel sensor (missing pulses)	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	 Foreign material adhered around the rear wheel sensor Incorrect installation of the rear wheel Defective sensor rotor or incorrect installation of the rotor Defective rear wheel sensor 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
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

Fault code No.	Item	Symptom	Check point
57	Vehicle CAN communication line or power source of vehi- cle system	Short-circuit in CAN communication 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 supply circuit of hydraulic unit assembly.	Defective hydraulic unit assembly
63	Defective front pressure sensor	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 sensor	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 hydraulic unit assembly.	In case of electrical interlocking brake • Defective front brake line • Defective hydraulic unit assembly
69	Hydraulic unit assembly (defective rear pressure sensor)	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
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

Fault code No. 11

Fault code No.		11		
Item		Front wheel se	Front wheel sensor (intermittent pulses or no pulses)	
Symptom		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	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 4-28.	
3	Defective sensor rotor or incorrect installation 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 4-30.	
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 4-30.	

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		
Item		Rear wheel se	Rear wheel sensor (intermittent pulses or no pulses)	
Symptom		Rear wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)		
Order	r Item/components and probable 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 4-39.	
3	Defective sensor rotor or incorrect installation 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 4-41.	

^{*}The fault code number varies according to the vehicle conditions.

Fault code No.		12		
Item		Rear wheel sensor (intermittent pulses or no pulses)		
Symptom		Rear wheel sensor signal is not received properly. (Pulses are no received or are received intermittently while the vehicle is traveling.)		
Order	r Item/components and probable cause		Check or maintenance job	
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 4-41.	

Fault code No. 13, 26

Fault	code No.	13 26		
Item		Front wheel se	ensor (abnormal pulse period)	
Sympt	tom	Front wheel se period is abno	Front wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	
Order	Item/components and pr	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 4-28.	
3	Defective sensor rotor or incorrect installation 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 4-30.	
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 4-30.	

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 code No. 14, 27

Fault code No.		14 27		
Item		Rear wheel ser	nsor (abnormal pulse period)	
Sympt	tom	Rear wheel ser is abnormal wi	Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	
Order	Item/components and pr	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 4-39.	
3	Defective sensor rotor or incorrect installation 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 4-41.	
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 4-41.	

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. Item		15	
		Front wheel sensor (open or short circuit)	
Symptom		Open or short circuit is detected in the front wheel sensor.	
Order	er 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 Turn the main switch to "OFF" before disconnecting or connecting a coupler.

Fault o	code No.	15		
Item		Front wheel se	Front wheel sensor (open or short circuit)	
Sympt	tom	Open or short	circuit is detected in the front wheel sensor.	
Order	Item/components and pr	robable cause	Check or maintenance job	
2	Open or short circuit in the between the front wheel s 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 "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. 	
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 4-25 and "ABS (Anti-lock Brake System)" on page 4-66.	

Fault code No.		16		
Item		Rear wheel sensor (open or short circuit)		
Symptom O		Open or short	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 Turn the main switch to "OFF" before disconnecting or connecting a coupler.	

Fault code No.		16	
Item		Rear wheel sensor (open or short circuit)	
Sympt	tom	Open or short	circuit is detected in the rear wheel sensor.
Order	Item/components and p	robable cause	Check or maintenance job
2	Open or short circuit in the between the rear wheel so 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 "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.
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 4-35 and "ABS (Antilock Brake System)" on page 4-66.

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 4-66.

Fault code No. 31

Fault code No.		31	
Item		Hydraulic unit assembly (defective ABS solenoid power circuit)	
Sympt	om	Power is not supplied to the solenoid circuit in the hydraulic unit assembly.	
Order	Item/components and pr	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 8-232.
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 4-66.

Fault (code No.	33		
Item Symptom		Hydraulic unit assembly (abnormal ABS motor power supply)		
		Power is not supplied to the motor circuit in the hydraulic unit assembly.		
Order	Item/components and pr	robable 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 8-232.	
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 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 4-66.	

Fault code No. 34

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 4-66.

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 probable 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 4-28.
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 4-28 and "CHECKING THE FRONT BRAKE DISCS" on page 4-49.
3	Front brake dragging		Check that the brake fluid pressure is correctly transmitted 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 4-49.
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 4-66.

Fault code No. 42

Fault code No.		42	
Item		Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	
Symptom		 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 probable 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 4-39.
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 4-39.
3	Rear brake dragging		Check that the brake fluid pressure is correctly transmitted to the brake caliper when the brake pedal is operated and that the pressure decreases when the pedal is released. Refer to "CHECKING THE REAR BRAKE DISC" on page 4-60.
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 4-66.

Fault code No. 43, 45

Fault	code No.	43 45		
Item		Front wheel sensor (missing pulses)		
Symptom		Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)		
Order	Item/components and probable 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 4-28.	
3	Defective sensor rotor or incorrect installation 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 4-30.	
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 4-30.	

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 code No.		44 46		
Item		Rear wheel sensor (missing pulses)		
Symp	tom	Rear wheel ser 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 probable 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 4-39.	
3	Defective sensor rotor or incorrect installation 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 4-41.	
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 4-41.	

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	
		Vehicle system power supply (voltage of ABS ECU power supply is high)	
		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 8-233.
2	Disconnected battery terminal		Check the connection. Replace or reconnect the terminal if necessary.
3	Defective charging system		Check the charging system. Refer to "CHARGING SYSTEM" on page 8-17.

Fault code No. 53

Fault o	code No.	53		
Item		Vehicle system power supply (voltage of ABS ECU power supply is low)		
Sympt	om	Power voltage bly is too low.	Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too low.	
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 8-233.	
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 4-66.

Fault code No.		56	
Item		Hydraulic unit assembly (abnormal internal circuit)	
Symptom		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 4-66.

Fault code No. 57

Fault code No.		57		
Item		Vehicle CAN c	Vehicle CAN communication line or power source of vehicle system	
Sympt	tom		Short-circuit in CAN communication line or the voltage that supplies the hydraulic unit assembly is too low.	
Order	Item/components and pr	obable 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-blue/black) • Between joint coupler and ECU coupler. (blue/white-blue/white) (blue/black-blue/black)	
2	Defective battery		Recharge or replace the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-233.	
3	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.	
4	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 ABS solenoid fuse. (blue/white-blue/white)	
5	Defective charging system	1	Check the charging system. Refer to "CHARGING SYSTEM" on page 8-17.	

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 4-66.

Fault code No. 63

Fault code No.		63	
Item		Defective front pressure sensor	
Symptom		Abnormality detected in pressure sensor circuit at front master cylinder side of hydraulic 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 4-66.

Fault code No. 64

Fault code No.		64	
Item		Defective rear pressure sensor	
Symptom		Abnormality detected in pressure sensor circuit at rear master cylinder side of hydraulic 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 4-66.

Fault code No. 68

Fault code No.		68	
Item		Defective hydraulic unit assembly (defective front pressure sensor)	
Symptom		Abnormality detected in pressure sensor circuit at front caliper side of hydraulic 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 4-66.

Fault code No.		69	
Item		Defective hydraulic unit assembly (defective rear pressure sensor)	
Symptom		Abnormality detected in pressure sensor circuit of hydraulic 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.

Fault code No.		69	
Item		Defective hydraulic unit assembly (defective rear pressure sensor)	
Symptom		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 4-66.

Fault code No. 89

Fault o	ode No.	89		
Item		CAN communication (between meter assembly and hydraulic unit assembly)		
Sympt	om	Transmitted da received.	Transmitted data from the meter assembly cannot be normally received.	
Order	Item/components and probable 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 Turn the main switch to "OFF" before disconnecting or connecting a coupler.	
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-blue/black) • Between joint coupler and ABS ECU coupler. (blue/white-blue/white) (blue/black-blue/black)	
3	Defective meter assembly		Replace the meter assembly.	
4	Defective hydraulic unit assembly		Replace the hydraulic unit assembly. Refer to "ABS (Anti-lock Brake System)" on page 4-66.	

Fault code No. Item		90	
		CAN communication (between FI ECU and hydraulic unit assembly)	
Symptom		Transmitted data from the FI ECU cannot be normally received.	
Order	Item/components and probable cause		Check or maintenance job
1	Defective coupler between the FI ECU 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.

1		90		
		CAN communication (between FI ECU and hydraulic unit assembly)		
Symptom Train		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-blue/black) • Between joint coupler and ABS ECU coupler. (blue/white-blue/white) (blue/black-blue/black)	
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 4-66.	

Fault code No. 91

Fault o	code No.	91		
Item		CAN communi	CAN communication (between IMU and hydraulic unit assembly)	
Sympt	om	Transmitted da	ata from the IMU cannot be normally received.	
Order	r Item/components and probable 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-blue/black) • Between joint coupler and ABS ECU coupler. (blue/white-blue/white) (blue/black-blue/black)	
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 4-66.	

EAS31167

[B-3] DELETING THE FAULT CODES

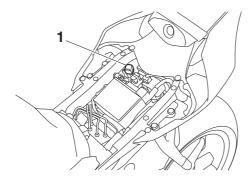
To delete the fault codes, use the Yamaha diagnostic tool. For information about deleting the fault codes, refer to the operation manual of the Yamaha diagnostic tool. Check that all the displayed fault codes are deleted.



Yamaha diagnostic tool USB 90890-03256 Yamaha diagnostic tool (A/I) 90890-03254

Connecting the Yamaha diagnostic tool

Remove the protective cap "1", and then connect the Yamaha diagnostic tool to the coupler.



EAS31168

[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

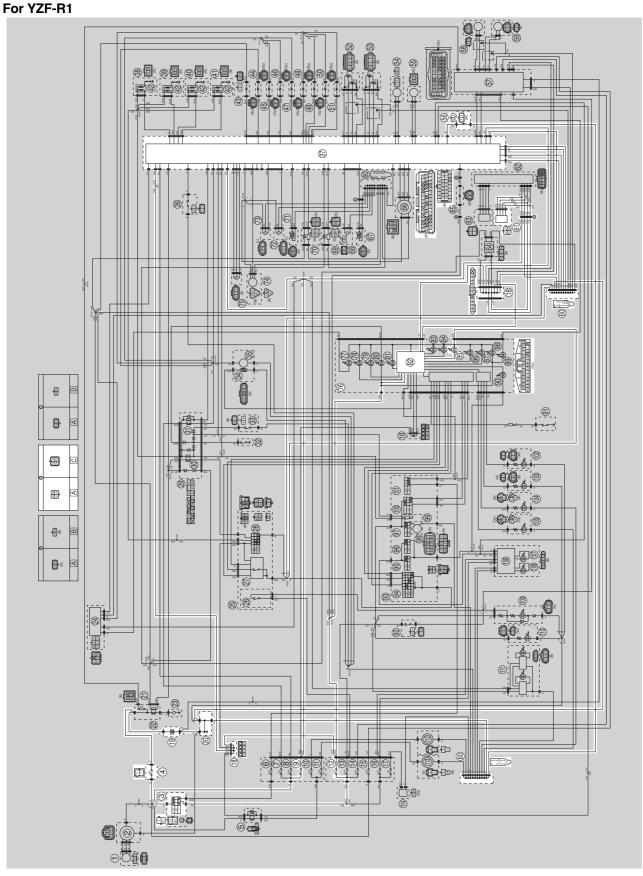
- 1. Check the brake fluid level in the brake master cylinder reservoir and brake fluid reservoir. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.
- 2. Check the wheel sensors for proper installation.

 Refer to "INSTALLING THE FRONT WHEEL (DISC BRAKE)" on page 4-32 and "INSTALLING THE REAR WHEEL (DISC BRAKE)" on page 4-41.
- 3. Perform brake line routing confirmation.
 - Refer to "HYDRAULIC UNIT OPERATION TEST" on page 4-71.
 - 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 8-193.
- 5. Checking the ABS warning light.
 - Refer to "CHECKING THE ABS WARNING LIGHT" on page 4-74.
 - 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.

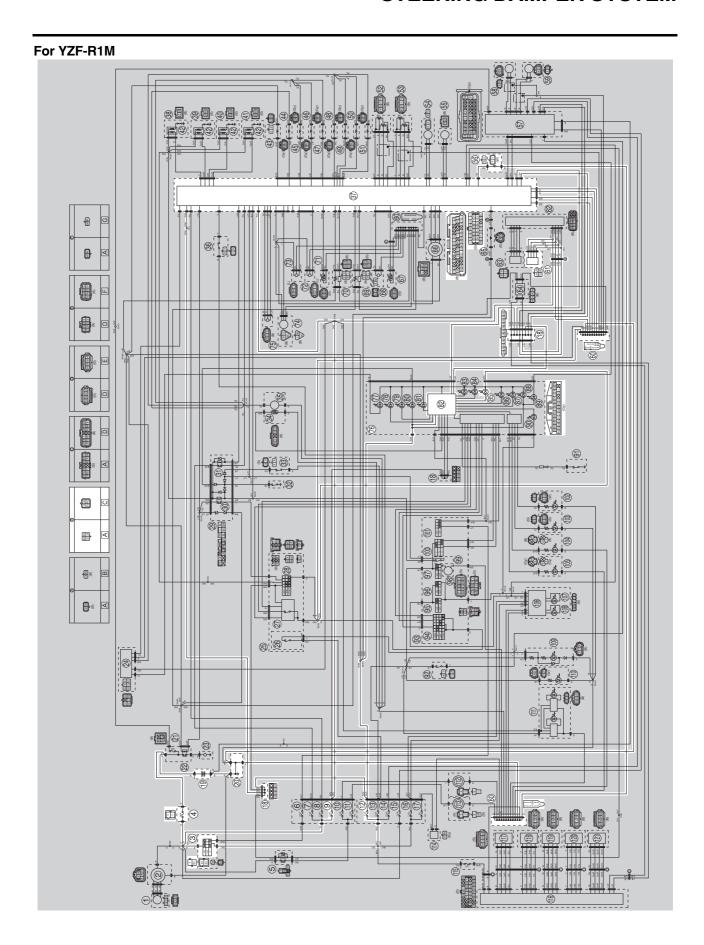
FAS20259

STEERING DAMPER SYSTEM

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)
- 56. Steering damper solenoid
- 60. Joint connector
- 61. Yamaha diagnostic tool coupler
- 76.Meter assembly
- 82. Multi-function meter
- 85.Steering damper and suspension warning light
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler)



- 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)
- 56. Steering damper solenoid
- 60. Joint connector
- 61. Yamaha diagnostic tool coupler
- 76.Meter assembly
- 82. Multi-function meter
- 85.Steering damper and suspension warning light
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler, CCU, GPS unit)

FAS32037

SELF-DIAGNOSTIC FUNCTION

The this vehicle is equipped with a self-diagnostic function in order to ensure that the steering damper system is operating normally. If this function detects a malfunction in the system, illuminates the steering damper and suspension 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.

Checking the steering damper and suspension warning light

The steering damper and suspension warning light comes on for around 2.0 seconds after the main switch has been set to "ON". If the warning light does not come on, the warning light (LED) may be defective.

ECU detects an abnormal signal from the steering damper

If the ECU detects an abnormal signal from the steering damper, the ECU illuminates the steering damper and suspension warning light.

EAS32038

TROUBLESHOOTING METHOD

The steering damper and suspension warning light comes on.

- 1. Check:
 - Fault code number

- a. Check the fault code number that have a condition of "Detected" using the Yamaha diagnostic tool.
- b. Identify the faulty system with the fault code number.
- c. Identify the probable cause of the malfunction.

- Check and repair the probable cause of the malfunction.
 Refer to "TROUBLESHOOTING DETAILS (STEERING DAMPER) (FAULT CODE)" on page 8-199 and "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.
- Perform the reinstatement action for the fuel injection system.
 Refer to "Confirmation of service completion" in the appropriate table in "TROUBLESHOOTING DETAILS (STEERING DAMPER) (FAULT CODE)" on page 8-199.

TIP

Turning the main switch to "OFF" will not erase the malfunction history.

EAS3095

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 8-50.

EAS32039

TROUBLESHOOTING DETAILS (STEERING DAMPER) (FAULT CODE)

This section describes the measures for the fault code number displayed on the Yamaha diagnostic tool. 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, delete the fault codes displayed on the Yamaha diagnostic tool according to the reinstatement method.

Fault code No .:

Fault code number displayed on the Yamaha diagnostic tool when the engine failed to work normally. Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.

Fault code No.		C1000			
Item		Steering damper solenoid: open or short circuit detected.			
		Able to start engine			
Faii-s	Fail-safe system		to drive vehicle		
Diagr	ostic code No.	47			
Actuation		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.			
Proce	edure	Chec	k the operation of the damper.		
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion	
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → 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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 3.	
3	Wire harness continuity.		Open or short circuit → Replace the wire harness. Between steering damper solenoid coupler and ECU coupler. yellow/black-yellow/black Between steering damper solenoid coupler and ground. black-black	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → 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 8-244.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Go to item 6 and finish the service. Condition is "Detected" → Go to item 5.	
5	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.		

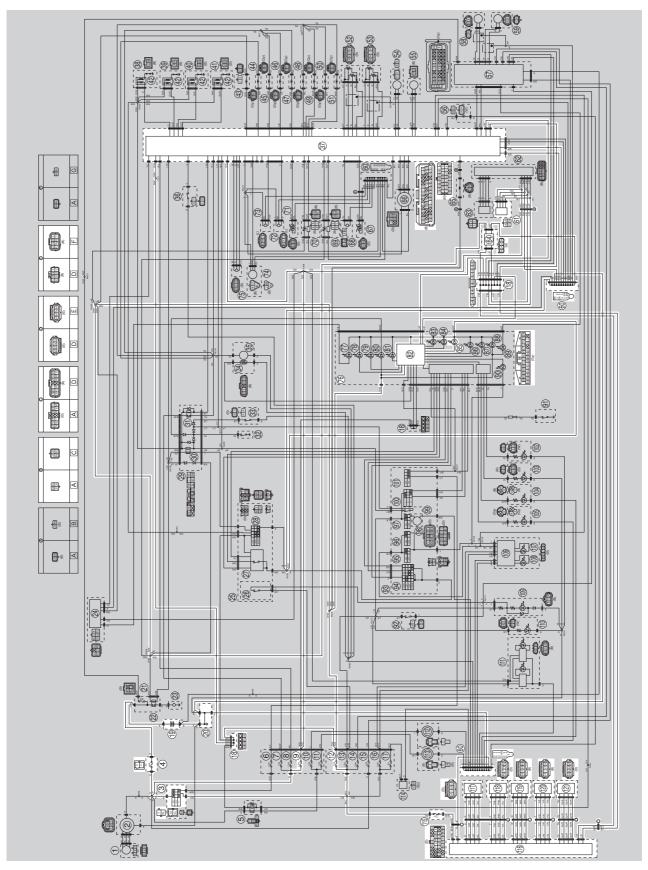
Fault code No.		C100	0	
Item :		Steer	Steering damper solenoid: open or short circuit detected.	
6	Delete the fault code and check that the engine trouble warning light goes off.		Confirm that the fault code has a condition of "Recovered" using the Yamaha diagnostic tool, and then delete the fault code.	

EAS2016

ELECTRONICALLY ADJUSTABLE SUSPENSION SYSTEM (for YZF-R1M)

EAS31009

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
- 64.IMU (Inertial Measurement Unit)
- 76.Meter assembly
- 82. Multi-function meter
- 85.Steering damper and suspension warning light
- 115.SCU fuse
- 116.SCU (Suspension Control Unit)
- 117.Front fork stepping motor (left)
- 118.Front fork stepping motor (right)
- 119.Rear shock absorber assembly stepping motor (compression damping)
- 120.Rear shock absorber assembly stepping motor (rebound damping)
- 121. 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)

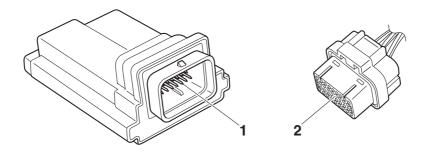
EAS31010

MAINTENANCE OF THE SCU (Suspension Control Unit) Checking the SCU (Suspension Control Unit)

- 1. Check:
 - Terminals "1" of the SCU
 Cracks/damages → Replace the SCU.
- Terminals "2" of the SCU couplers
 Connection defective, contaminated, come-off → Replace or clean.

TIP

If the SCU couplers are clogged with mud or dirt, clean with compressed air.



EAS3101

SCU (Suspension Control Unit) SELF-DIAGNOSTIC FUNCTION

The SCU (Suspension Control Unit) 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 steering damper and suspension 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 (Suspension Control Unit).

Checking the steering damper and suspension warning light

The steering damper and suspension warning light come on for 2.0 seconds after the main switch has been turned to "ON". If the steering damper and suspension 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 steering damper and suspension 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)

TID

If there is a malfunction in the electronically adjustable suspension system, the steering damper and suspension warning light "1" will come on, and a SCU trouble warning icon "2" will be displayed.



The steering damper and suspension warning light comes on.

- 1. Check:
 - Fault code number

- a. Check the fault code numbers that have a condition of "Detected" using the Yamaha diagnostic tool.
- b. Identify the faulty system with the fault code number.
- c. Identify the probable cause of the malfunction.

- Check and repair the probable cause of the malfunction.
 Refer to "TROUBLESHOOTING DETAILS (SCU)" on page 8-206 and "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (SCU)" on page 9-23.
- 3. Perform the reinstatement action for the electronically adjustable suspension system. Refer to "Confirmation of service completion" in the appropriate table in "TROUBLESHOOTING DETAILS (SCU)" on page 8-206.
- 4. Check the fault code numbers using the Yamaha diagnostic tool.

TIP

- If another fault code number is displayed, repeat steps (1) to (4) until no fault code number is displayed.
- Turning the main switch to "OFF" will not erase the malfunction history.

EAS3101

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 8-50.

EAS31014

TROUBLESHOOTING DETAILS (SCU)

This section describes the measures per fault code number displayed on the Yamaha diagnostic tool. 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, delete the fault codes displayed on the Yamaha diagnostic tool according to the reinstatement method.

Fault code No.:

Fault code number displayed on the Yamaha diagnostic tool 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 DIAGNOSTIC TOOL" on page 8-50.

Fault code No. C0044

Fault code No.		C0044				
Item		Abnormal ABS				
Fail-safe system		Able to start engine				
l an sc	ne system	Able to drive vehicle				
Diagn	ostic code No.	_				
Indica	ted	_				
Proce	dure	—				
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		
1	Abnormal ABS					

Fault code No.	C0520
Item	Abnormal IMU
Fail-safe system	Unable to start engine
i all-sale system	Able/Unable to drive vehicle
Diagnostic code No.	_
Indicated	_
Procedure	_

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Abnormal IMU	Check the item of fault code No. C0520 for the ECU. Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Refer to the item corresponding to fault code.

Fault code No. C1002

Fault code No.		C1002			
Item		Abnormal SCU EEPROM			
Fall aufo accetom		Able	Able to start engine		
raii-Sa	Fail-safe system		to drive vehicle		
Diagn	ostic code No.	-			
Indica	ted	-			
Proce	dure	-			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Confirmation after correction of abnormality		Turn the main switch to "OFF" and back to "ON".	Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 2.	
2	Malfunction in SCU.		Replace the SCU.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic	

tool. Condition is "Recovered" → Service is finished.

Fault code No. C10		C100	C1003		
Item Step		Stepp	Stepping motor: open or short circuit detected.		
Fail-safe system		Able t	Able to start engine		
		Able t	o drive vehicle		
Diagn	ostic code No.	_			
Meter	display	_			
Proce	Procedure -		_		
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Connection of stepping motor coupler. Check the locking condition of the coupler. • Left front fork stepping motor • Right front fork stepping motor • Rear shock absorber assembly stepping motor (× 2) Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).		Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 2.	

Fault code No.		C1003			
Item		Stepp	Stepping motor: open or short circuit detected.		
2	Connection of SCU couple Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or broad terminals and locking conditions).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 3.	
3	Connection of front fork steping motor sub-lead couple Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotterminals and locking condition of the pins).	er. n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 4.	

Fault code No. Item		C1003		
		Stepping motor: open or short circuit detected.		
4	Wire harness continuity.	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—green/blue—green/blue—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 white/black—white/red—white/green • Between SCU coupler and rear shock absorber assembly stepping motor (rebound damping). yellow—yellow yellow/black—yellow/black yellow/red—yellow/red yellow/red—yellow/red yellow/red—yellow/green Short-circuit → Replace the wire harness. • Between left front fork stepping motor "1" and power ground "2". green—black green/black—black green/blue—black • Between right front fork stepping motor "3" and power ground "2". pink—black • Between lack pink/black—black pink/black—black pink/blue—black	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 5.	

Fault code No.		C1003		
Item		Stepping motor: open or short circuit detected.		
4	Wire harness continuity.	Between rear shock absorber assembly stepping motor (compression damping) "4" and power ground "2". white-black white/fed-black white/fed-black white/fed-black white/plack-black white/plack-black white/plack-black white/plack-black white/plack-black white/plack-black white/plack-black white/plack-black white/plack-black yellow/fed-black yellow/green-black Between left front fork stepping motor "1" and power battery "6". green-brown/white green/blue-brown/white green/blue-brown/white pink/blue-brown/white pink/blue-brown/white pink/blue-brown/white pink/blue-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/green-brown/white white/fed-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 white/green-brown/white white/green-brown/white yellow/back-brown/white yellow/back-brown/white yellow/back-brown/white yellow/green-brown/white yellow/green		

Fault o	Fault code No.		3	
Item		Step	ping motor: open or short circui	t detected.
5	Malfunction in stepping m		Stepping motor confirmation steps: a. Connect the digital circuit tester (Ω) to the stepping motor. • Positive tester probe "1" • Negative tester probe "2" A B 1 3	Turn the main switch to "ON". Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 6.
6	Malfunction in SCU.		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 digital circuit tester (Ω) 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 4-91, "REAR SHOCK ABSORBER ASSEMBLY" on page 4-105. Replace the SCU.	Turn the main switch to "OFF" and back to "ON", and then should the condition of the foult
				check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Refer to the item corresponding to fault code.

Fault code No. C1007

Fault code No.		C1007		
Item		Abno	rmality inside SCU	
Fail-safe system		Able t	o start engine	
raii-se	ale system	Able t	o drive vehicle	
Diagn	ostic code No.	_		
Indicated		_		
Proce	dure	_		
Item	Probable cause of malfunction and che		Maintenance job	Confirmation of service completion
1	Malfunction in SCU.		Replace the SCU.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished.

Fault code No. P0500

Fault code No.	P0500
Item	Abnormal rear wheel sensor
Fail-safe system	Able to start engine
ran-sale system	Able to drive vehicle
Diagnostic code No.	_
Indicated	_
Procedure	_

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Abnormal rear wheel sensor	Check the item of fault code No. P0500 for the ECU. Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)" on page 9-5.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Refer to the item corresponding to fault code.

Fault code No. P0560

Fault code No.		P0560			
Item		Abno	rmal SCU power supply voltage		
Fail-ea	Fail-safe system		o start engine		
raii-se	ale system	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.			
Item	Probable cause of malfunction and che		Maintenance job	Confirmation of service completion	
1	Malfunction in charging system.		Check the charging system. Refer to "CHARGING SYSTEM" on page 8-17. Defective rectifier/regulator or AC magneto → Replace. Defective connection in the charging system circuit → Properly connect or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Repeat the maintenance job.	

Fault code No. U0100

Fault code No. U0100			
Item	Abnormal CAN communication (between ECU and SCU)		
Fail aufa avatam	Able to start engine		
Fail-safe system	Able to drive vehicle		
Diagnostic code No.	_		
Indicated	_		
Procedure			
Probable caus	confirmation of service		

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 2.

Fault code No.		U0100			
Item		Abnormal CAN communication (between ECU and SCU)			
2	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between SCU coupler and joint coupler. blue/white-blue/white blue/black Between the joint coupler and ECU coupler. blue/white-blue/white blue/white-blue/white blue/black-blue/black blue/black-blue/black Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 3.			
3	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.			

Malfunction in ABS ECU.

3

Fault o	code No. U0121					
Fault code No.		U012	U0121			
Item		Abno	ormal CAN communication (betw	veen ABS ECU and SCU)		
Fail-safe system		Able t	to start engine			
r all-sc	ale system	Able	to drive vehicle			
Diagn	ostic code No.	_				
Indica	ited	_				
Proce	dure					
Item	Probable cause of malfunction and che		Maintenance job	Confirmation of service completion		
1	Connection of ABS ECU of pler. Check the locking condition the coupler. Disconnect the coupler are check the pins (bent or broterminals and locking con of the pins).	on of nd oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → 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 Retween the joint coupler and	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool.		

blue/white-blue/white blue/black-blue/black

assembly.

Replace the hydraulic unit

Between the joint coupler and ABS ECU coupler.

Condition is "Recovered" →

Condition is "Detected" \rightarrow Go to

Service is finished.

item 3.

Fault code No. U0125

Fault co	ode No.	U0125			
Item		Abnormal CAN communication (between IMU and SCU)			
Fall and another		Able to start engine			
raii-Saie	Fail-safe system		Able to drive vehicle		
Diagnostic code No.		_			
Indicated		_			
Procedure		_			
Item	Probable cause of	_	Maintenance job	Confirmation of service	

Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
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 → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → 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 then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 3.
3	Malfunction in IMU.	Replace the IMU.	

Fault code No. U0155

Fault code No.		U0155 (or "Err" is displayed)				
Item		Abnormal CAN communication (between meter assembly and SCU)				
F. II f		Able to start engine				
raii-sa	Fail-safe system		Able to drive vehicle			
Diagno	Diagnostic code No.		_			
Indica	ted	_				
Procedure		_				
Item	Item Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		

Fault code No. U0		U015	55 (or "Err" is displayed)		
Item Abno		ermal CAN communication (between meter assembly and SCU)			
1	Connection of meter asse coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or broad terminals and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → 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 then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recovered" → Service is finished. Condition is "Detected" → Go to item 3.	
3	Malfunction in meter asse	mbly.	Replace the meter assembly.		

Fault code No. — (steering damper (manufactured by Öhlins: optional) malfunction)					
		— (st tion)	— (steering damper (manufactured by Öhlins: optional) malfunction)		
Item		Steering damper stepping motor (manufactured by Öhlins: optional): open circuit or short-circuit detected.			
Fail-safe system		Able to start engine			
		Able to drive vehicle			
Diagnostic code No.		_			
Indicated		_			
Procedure		_			
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion	
1	Connection of stepping m coupler. Check the locking condition the coupler. • Steering damper Disconnect the coupler are check the pins (bent or broterminals and locking confort the pins).	on of nd oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check that the steering damper and suspension warning light "△" and steering damper warning icon "→" come on. The warning light and icon do not come on → Service is finished. The warning light and icon come on → Go to item 2.	

		— (steering damper (manufactured by Öhlins: optional) malfunction)			
Item			Steering damper stepping motor (manufactured by Öhlins: optional): open circuit or short-circuit detected.		
2	Connection of wire harnes SCU coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotterminals and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check that the steering damper and suspension warning light "△" and steering damper warning icon "→" come on. The warning light and icon do not come on → Service is finished. The warning light and icon come on → Go to item 3.	
3	Connection of stepping me sub-wire harness coupler. Check the locking condition the coupler. Disconnect the coupler and check the pins (bent or brotterminals and locking condition of the pins).	n of d oken	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "OFF" and back to "ON" and check that the steering damper and suspension warning light "△" and steering damper warning icon "→" come on. The warning light and icon do not come on → Service is finished. The warning light and icon come on → Go to item 4.	
4	Wire harness continuity.		Open circuit → Replace the wire harness. • Between SCU coupler and stepping motor. gray—gray gray/black—gray/black gray/red—gray/green—Short-circuit → Replace the wire harness. • Between stepping motor "1" and power ground "2". gray—black gray/green—black gray/green—black gray/green—black gray/green—black • Between stepping motor "1" and power battery "3". gray—brown/white gray/black—brown/white gray/black—brown/white gray/green—brown/white gray/green—brown/white gray/green—brown/white	Turn the main switch to "OFF" and back to "ON" and check that the steering damper and suspension warning light "△" and steering damper warning icon "→" come on. The warning light and icon do not come on → Service is finished. The warning light and icon come on → Go to item 5.	

Fault code No ((steering damper (manufactured by Öhlins: optional) malfunc-		
		Steering damper stepping motor (manufactured by Öhlins: optional): open circuit or short-circuit detected.		
5 6	Malfunction in stepping m	optional): open circuit or short-circuit detected.		
		suspension warning light "△" and steering damper warning icon "→" come on. The warning light and icon do not come on → Service is finished. The warning light and icon come on → Refer to the item corresponding to the fault code.		

Fault code No. — (ERS icon blinks)

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		_		
Item	Probable cause of malfunction and check		Maintenance job	Confirmation of service completion
1	Zero point adjustment of damping force adjustment system was not performed.		Turn the main switch to "OFF" and back to "ON" with the vehicle stopped.	Check the ERS icon. The ERS icon does not blink → Service is finished

TIP -

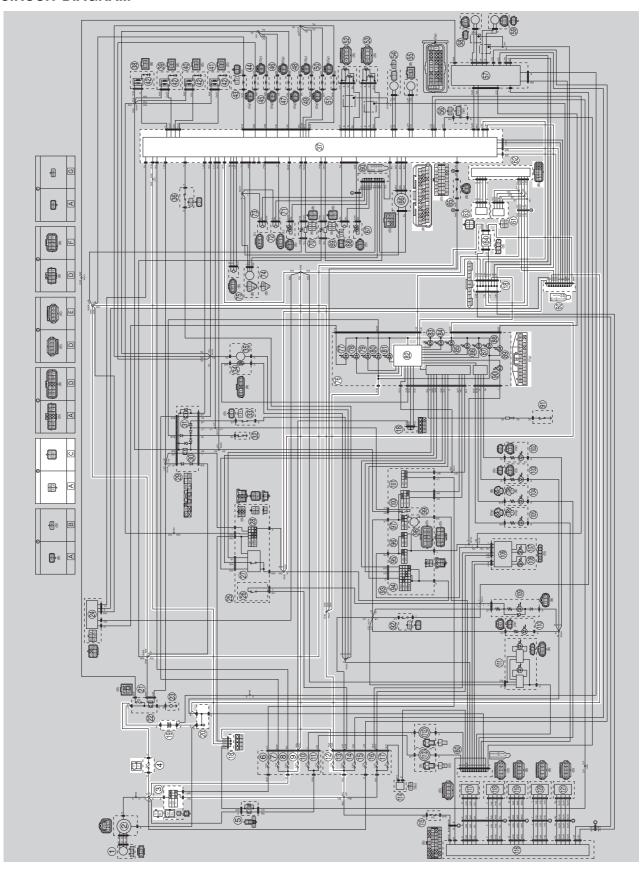
If any other fault codes of the SCU and ECU are displayed, repair the faults first.

EAS2021

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
- 82. Multi-function meter
- A. Wire harness
- C. Sub-wire harness (Yamaha diagnostic tool coupler, CCU, GPS unit)

EAS31672

TROUBLESHOOTING

The communication control system failed to function.

TIP

- Before troubleshooting, remove the following part(s):
- 1. Front side cowling/Front panel/Side cover
- 2. Rider seat/Passenger seat/Battery cover/Tail cover
 - Check the fuses. (Main, ignition and backup) Refer to "CHECKING THE FUSES" on page 8-232.

 $NG \rightarrow$

Replace the fuse(s).

OK↓

Check the battery.
 Refer to "CHECKING AND
 CHARGING THE BATTERY" on
 page 8-233.

 $NG \rightarrow$

• Clean the battery terminals.

• Recharge or replace the battery.

OK↓

3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-229.

 $NG \rightarrow$

Replace the main switch/immobilizer unit.

OK↓

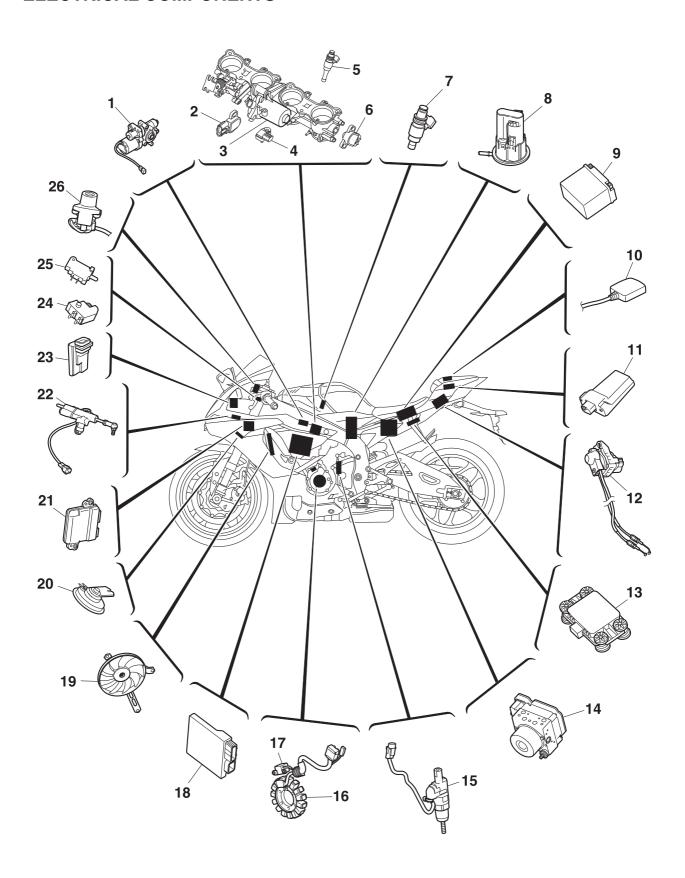
 Check the entire communication control system's wiring.
 Refer to "CIRCUIT DIAGRAM" on page 8-221.

 $NG\rightarrow$

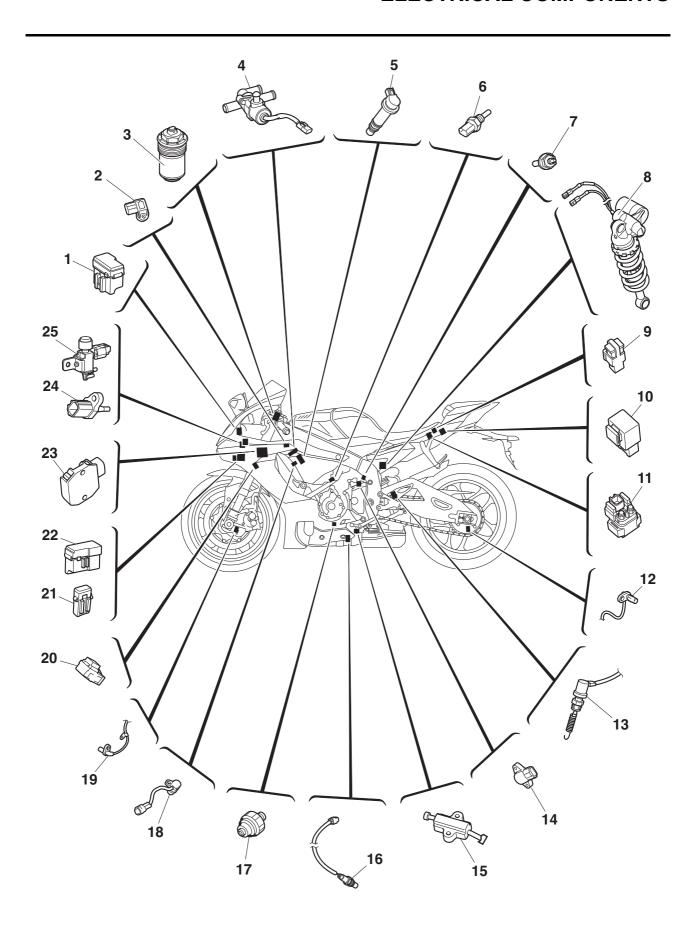
Properly connect or repair the communication control system's wiring.

OK↓

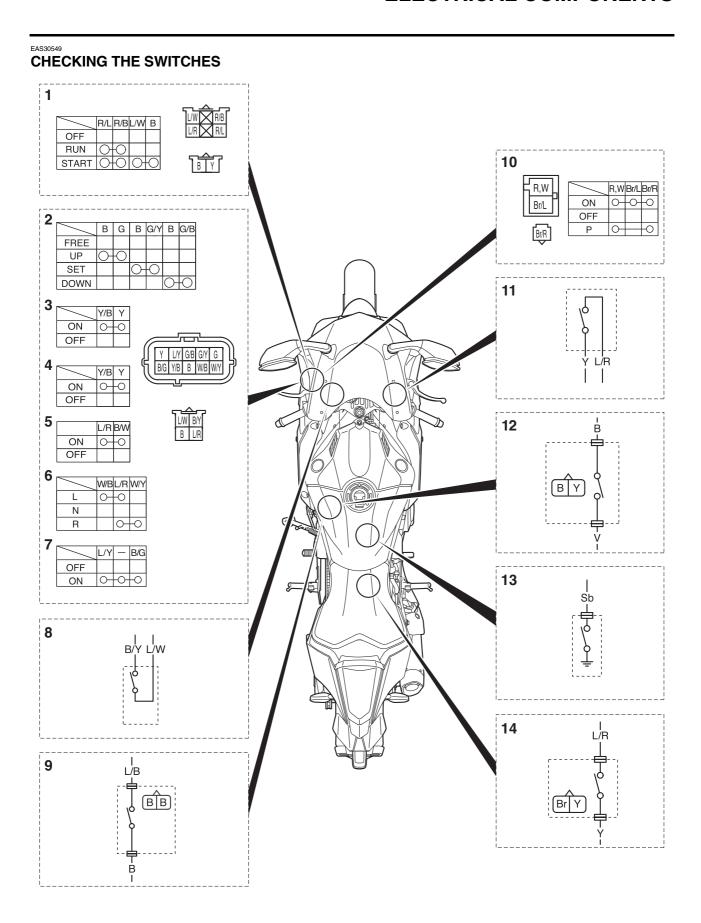
Replace the ECU, CCU, GPS unit, IMU or meter assembly. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.



- 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
- 16.0₂ 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



- 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 digital circuit tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

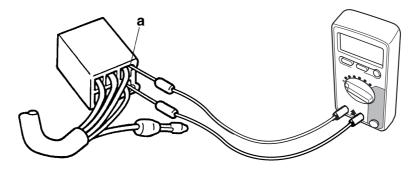
NOTICE

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

- \bullet Before checking for continuity, set the digital circuit tester to the " $\!\Omega\!$ " range.
- When checking for continuity, switch back and forth between the switch positions a few times.



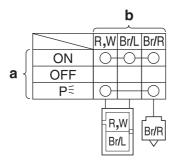
The switches and their terminal connections are illustrated as in the following example of the main switch.

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 "."



EAS3055

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 digital circuit tester to the fuse and check the continuity.

TIP

Set the digital circuit tester selector to " Ω ".



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

b. If the digital circuit tester indicates "O.L", replace the fuse.

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

Fuses	Amperage rating	Q'ty
Main	50 A	1
Headlight	7.5 A	1
Signaling system	7.5 A	1
Ignition	15 A	1
Radiator fan motor	15 A	1
Sub radiator fan motor	10 A	1
Hazard	7.5 A	1

Fuses	Amperage rating	Q'ty
Fuel injection system	15 A	1
ABS motor	30 A	1
ABS ECU	7.5 A	1
ABS solenoid	15 A	1
Auxiliary	2 A	1
Backup	7.5 A	1
Electronic throttle valve	7.5 A	1
SCU (for YZF-R1M)	7.5 A	1
Spare	30 A	1
Spare	15 A	1
Spare	10 A	1
Spare	7.5 A	1
Spare	2 A	1

WA13310

WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

- 4. Install:
 - Rider seat/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 7-14.
- 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

WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.
- KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.
- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

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

INTERNAL

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

ECA13661

NOTICE

- This is a VRLA (Valve Regulated Lead Acid) battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.
- Charging time, charging amperage and charging voltage for a VRLA (Valve Regulated Lead Acid) battery are different from those of conventional batteries. The VRLA (Valve Regulated Lead Acid) battery should be charged according to the appropriate charging method. If the battery is 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

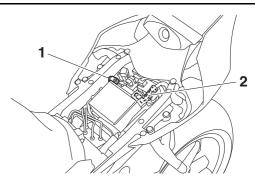
Since VRLA (Valve Regulated Lead Acid) batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

- 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".



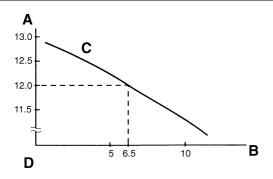
- 3. Remove:
 - Battery Refer to "GENERAL CHASSIS (1)" on page 4-1.
- 4. Check:
- Battery charge
- a. Connect a digital circuit tester to the battery terminals.
- Positive tester probe positive battery terminal
- Negative tester probe negative battery terminal

TIP

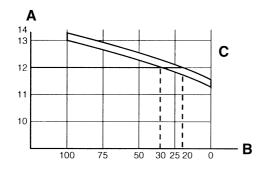
- The charge state of a VRLA (Valve Regulated Lead Acid) battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.
- b. Check the charge of the battery, as shown in

the charts and the following example.

Example
Open-circuit voltage = 12.0 V
Charging time = 6.5 hours
Charge of the battery = 20–30 %



- A. Open-circuit voltage (V)
- B. Charging time (hours)
- C. Relationship between the open-circuit voltage and the charging time at 20 °C (68 °F)
- D. These values vary with the temperature, the condition of the battery plates, and the electrolyte level.



- A. Open-circuit voltage (V)
- B. Charging condition of the battery (%)
- C. Ambient temperature 20 °C (68 °F)

5. Charge:

Battery

(refer to the appropriate charging method)

EWA13300

WARNING

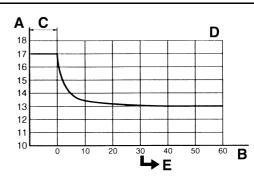
Do not quick charge a battery.

ECA13671

NOTICE

- Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
- · When charging a battery, be sure to remove

- it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative battery lead from the battery terminal.)
- To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
- Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
- If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!
- As shown in the following illustration, the open-circuit voltage of a VRLA (Valve Regulated Lead Acid) battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.



- A. Open-circuit voltage (V)
- B. Time (minutes)
- C. Charging
- D. Ambient temperature 20 °C (68 °F)
- E. Check the open-circuit voltage.

Charging method using a variable-current (voltage) charger

a. Measure the open-circuit voltage prior to charging.

TIP

Voltage should be measured 30 minutes after the engine is stopped.

b. Connect a charger and ammeter to the battery and start charging.

TIP_

Set the charging voltage to 16–17 V. If the setting is lower, charging will be insufficient. If too high, the battery will be over-charged.

 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.
- 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.

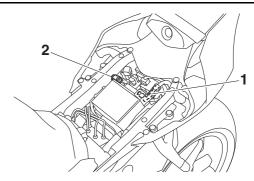
6. Install:

• Battery Refer to "GENERAL CHASSIS (1)" on page 4-1.

- 7. Connect:
- Battery leads (to the battery terminals)

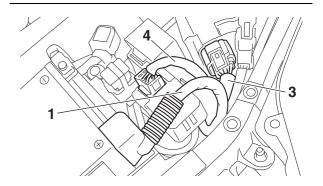
NOTICE

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

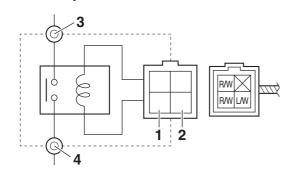
Check each switch for continuity with the digital circuit tester. If the continuity reading is incorrect, replace the relay.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- 1. Disconnect the relay from the wire harness.
- Connect the digital circuit tester (Ω) and battery (12 V) to the relay terminal as shown.
 Check the relay operation.
 Out of specification → Replace.

Starter relay

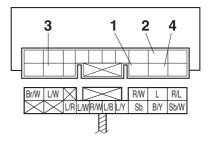


- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



Relay operation Continuity (between "3" and "4")

Relay unit (starting circuit cut-off relay)

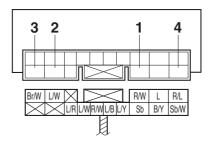


- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



Result
Continuity
(between "3" and "4")

Relay unit (fuel pump relay)

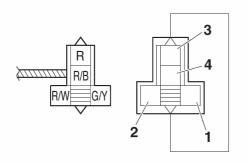


- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



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



Result Continuity (between "3" and "4")

FAS30795

CHECKING THE RELAY UNIT (DIODE)

- Check:
- Relay unit (diode) Out of specification \rightarrow Replace.

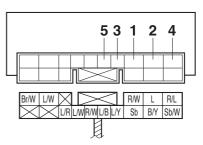


Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

The digital circuit tester readings are shown in the following table.



Continuity Positive tester probe sky blue "1" Negative tester probe black/yellow "2" No continuity Positive tester probe black/yellow "2" **Negative tester probe** sky blue "1" Continuity Positive tester probe sky blue "1" **Negative tester probe** blue/yellow "3" No continuity Positive tester probe blue/yellow "3" **Negative tester probe** sky blue "1" Continuity Positive tester probe sky blue "1" **Negative tester probe** sky blue/white "4" No continuity Positive tester probe sky blue/white "4" **Negative tester probe** sky blue "1" Continuity Positive tester probe blue/black "5" **Negative tester probe** blue/yellow "3" No continuity Positive tester probe blue/yellow "3" **Negative tester probe** blue/black "5"



- a. Disconnect the relay unit coupler from the wire harness.
- b. Connect the digital circuit tester (Ω) to the re-

lay unit terminal as shown.

- c. Check the relay unit (diode) for continuity.
- d. Check the relay unit (diode) for no continuity.

EAS3055

CHECKING THE IGNITION COILS

The following procedure applies to all of the ignition coils.

- 1. Check:
 - Primary coil resistance
 Out of specification → Replace.



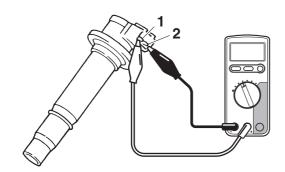
Primary coil resistance 0.85–1.15 Ω

- a. Disconnect the ignition coil coupler from the ignition coil.
- b. Connect the digital circuit tester (Ω) to the ignition coil as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe Ignition coil terminal "1"
- Negative tester probe Ignition coil terminal "2"



c. Measure the primary coil resistance.

- 2. Check:
 - Secondary coil resistance
 Out of specification → Replace.



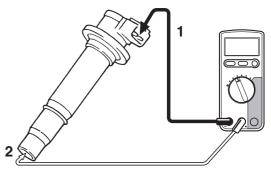
Secondary coil resistance 8.50–11.50 k Ω

a. Connect the digital circuit tester (Ω) to the ignition coil as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- 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.



Minimum ignition spark gap 6.0 mm (0.24 in)

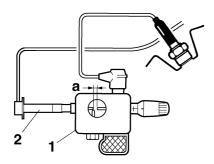
TIP

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.



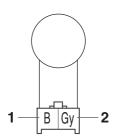
Crankshaft position sensor resistance 189–231 Ω

a. Connect the digital circuit tester (Ω) to the crankshaft position sensor coupler as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe
 It is als "1"
- 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).

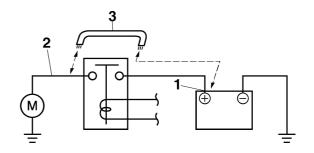
Refer to "TROUBLESHOOTING" on page 8-14.

a. Connect the positive battery terminal "1" and starter motor lead "2" with a jumper lead "3".

EWA13810

WARNING

- A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.



b. Check the starter motor operation.

AS30566

CHECKING THE STATOR COIL

- 1. Disconnect:
- Stator coil coupler

(from the wire harness)

- 2. Check:
- Stator coil resistance
 Out of specification → Replace the stator coil.



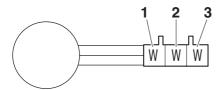
Stator coil resistance 0.112–0.168 Ω

a. Connect the digital circuit tester to the stator coil coupler as shown.



Digital circuit tester (CD732) 90890-03243 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.

FAS30680

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 8-239.



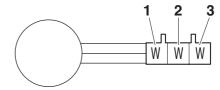
Rectifier/regulator input voltage above 14 V at 5000 r/min

a. Connect the digital circuit tester (AC V) to the rectifier/regulator coupler as shown.



Digital circuit tester (CD732) 90890-03243 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. 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.



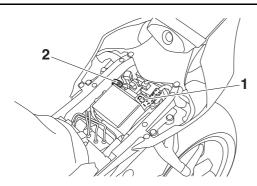
Regulated voltage (DC) 14.3–14.7 V

a. Connect the digital circuit tester (DC V) to the battery as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- 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

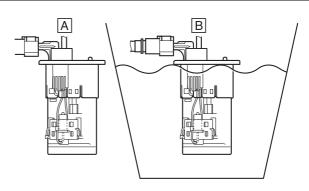
CHECKING THE HORN

- Check:
- Horn sound Faulty sound → 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 → Replace the fuel pump.
- Fuel pump is atmosphere "A"
 - → Fuel level warning light is come on
- Fuel pump is soaked in fuel "B"
 - → Fuel level warning light is goes off



EAS30574

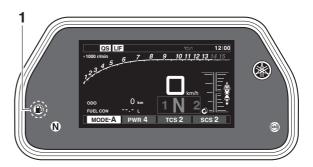
CHECKING THE FUEL LEVEL WARNING LIGHT

This model is equipped with a self-diagnosis device for the fuel level detection circuit.

- 1. Check:
 - 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

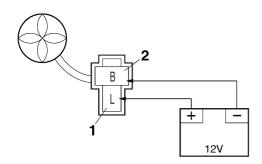
the meter assembly. Warning light flashes eight times, then goes off for 3 seconds in a repeated cycle (malfunction detected in fuel sender) → Replace the fuel pump assembly.



EAS30577

CHECKING THE RADIATOR FAN MOTORS

- 1. Check:
 - Radiator fan motor
 Faulty/rough movement → Replace.
- a. Disconnect the radiator fan motor coupler from the wire harness.
- b. Connect the battery (DC 12 V) as shown.
- Positive tester probe blue "1"
- Negative tester probe black "2"



c. Measure the radiator fan motor movement.

EAS3057

CHECKING THE COOLANT TEMPERATURE SENSOR

- 1. Remove:
- Coolant temperature sensor Refer to "CYLINDER HEAD" on page 5-23.

EWA14130

WARNING

- Handle the coolant temperature sensor with special care.
- Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.
- 2. Check:
 - Coolant temperature sensor resistance
 Out of specification → Replace.



Coolant temperature sensor resistance

2512–2777 Ω at 20 °C (2512–2777 Ω at 68 °F)

Coolant temperature sensor resistance

210–220 Ω at 100 °C (210–220 Ω at 212 °F)

a. Connect the digital circuit tester (Ω) to the coolant temperature sensor as shown.



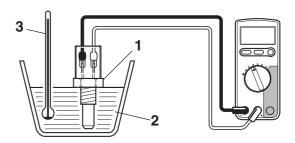
Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

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.



- 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 N·m (1.6 kgf·m, 12 lb·ft)

EAS30592

CHECKING THE THROTTLE SERVO MOTOR

- 1. Remove:
- Air filter case
 Refer to "AIR FILTER CASE" on page 7-6.
- 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.

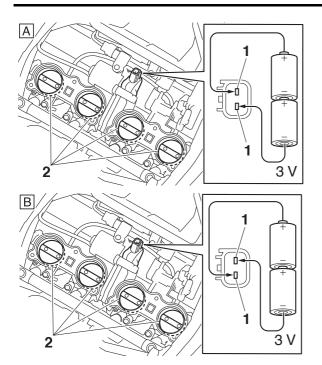
ECA17660

NOTICE

Do not use a 12 V battery to operate the throttle 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.

FAS30587

CHECKING THE AIR INDUCTION SYSTEM SOLENOID

- 1. Check:
 - Air induction system solenoid resistance Out of specification → Replace.



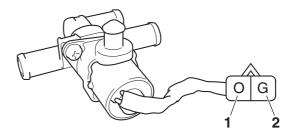
Solenoid resistance 18–22 Ω

- Remove the air induction system solenoid coupler from the air induction system solenoid.
- b. Connect the digital circuit tester (Ω) to the air induction system solenoid terminal as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe orange "1"
- Negative tester probe green "2"



c. Measure the air induction system solenoid resistance.

EAS3058

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 7-6.
- Air filter case duct
 Air cut-off valve
 Refer to "AIR INDUCTION SYSTEM" on
 page 7-21.
- 2. Check:
 - Cylinder identification sensor output voltage Out of specification → Replace.



Cylinder identification sensor output voltage (ON) 4.8 V Cylinder identification sensor output voltage (OFF) 0.8 V

a. Connect the test harness– speed sensor (3P)
 "1" to the rear speed sensor coupler and wire harness as shown.

b. Connect the digital circuit tester (DC V) to the test harness– speed sensor (3P).



Digital circuit tester (CD732) 90890-03243

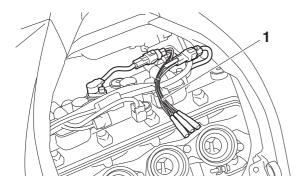
Model 88 Multimeter with tachometer

YU-A1927

Test harness– speed sensor (3P) 90890-03208

Test harness– speed sensor (3P) YU-03208

- 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.

EAS3059

CHECKING THE INTAKE AIR TEMPERATURE SENSOR

- 1. Remove:
- Intake air temperature sensor

EWA14110

WARNING

- Handle the intake air temperature sensor with special care.
- Never subject the intake air temperature sensor to strong shocks. If the intake air temperature sensor is dropped, replace it.
- 2. Check:
 - Intake air temperature sensor resistance
 Out of specification → Replace.



Intake air temperature sensor resistance

5400–6600 Ω at 0 °C (5400–6600 Ω at 32 °F)

Intake air temperature sensor resistance

289–391 Ω at 80 °C (289–391 Ω at 176 °F)

a. Connect the digital circuit tester (Ω) to the intake air temperature sensor terminal as shown.



Digital circuit tester (CD732) 90890-03243

Model 88 Multimeter with tachometer

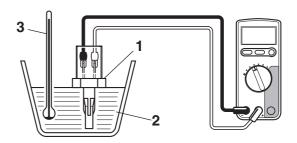
YU-A1927

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

EAS30598

CHECKING THE STEERING DAMPER SOLENOID

- 1. Remove:
 - Front upper cowling Refer to "GENERAL CHASSIS (3)" on page 4-18.
- 2. Check:
 - Steering damper solenoid resistance
 Out of specification → Replace the steering damper assembly.



Steering damper solenoid resistance

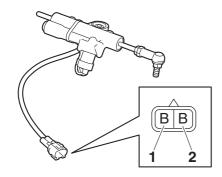
49.82–56.18 Ω

- a. Disconnect the steering damper lead coupler from wire harness.
- b. Connect the digital circuit tester (Ω) to the steering damper lead coupler.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe black "1"
- Negative tester probe black "2"



Measure the steering damper solenoid resistance.

EAS30681

CHECKING THE FUEL INJECTORS

The following procedure applies to all of the fuel injectors.

- 1. Remove:
- Fuel injector Refer to "THROTTLE BODIES" on page 7-11 or "AIR FILTER CASE" on page 7-6.
- 2. Check:
 - Fuel injector resistance
 Out of specification → Replace the fuel injector.



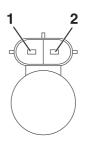
Resistance 12.0 Ω

- a. Disconnect the fuel injector coupler from the fuel injector.
- b. Connect the digital circuit tester (Ω) to the fuel injector coupler as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe Injector terminal "1"
- Negative 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 → Replace the handlebar
 switch (right).

a. Connect the digital circuit tester (DC V) to the handlebar switch coupler (right) as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe white/green "2"
 Negative tester probe
- 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 digital circuit tester (DC V) to the handlebar switch coupler (right) as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- 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.

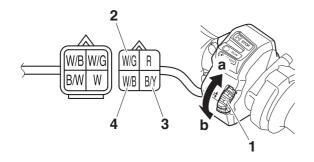


Output voltage More than 5 V

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



TROUBLESHOOTING	9-1
GENERAL INFORMATION	9-1
STARTING FAILURES	
INCORRECT ENGINE IDLING SPEED	9-1
POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE	9-2
FAULTY GEAR SHIFTING	
SHIFT PEDAL DOES NOT MOVE	9-2
JUMPS OUT OF GEAR	9-2
FAULTY CLUTCH	9-2
OVERHEATING	9-2
OVERCOOLING	9-3
POOR BRAKING PERFORMANCE	9-3
FAULTY FRONT FORK LEGS	
UNSTABLE HANDLING	
FAULTY LIGHTING OR SIGNALING SYSTEM	
TROUBLESHOOTING AT THE ABS WARNING LIGHT	9-4
SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE	
(ECU)	9-5
SELF-DIAGNOSTIC FUNCTION TABLE (FOR FUEL INJECTION	0
SYSTEM)	9-5
SELF-DIAGNOSTIC FUNCTION TABLE (FOR STEERING DAMPER	
SYSTEM)	9-16
SELF-DIAGNOSTIC FUNCTION TABLE (FOR IMMOBILIZER	
SYSTEM)	9-16
COMMUNICATION ERROR WITH THE METER	9-17
DIAGNOSTIC CODE: SENSOR OPERATION TABLE	9-17
DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE	9-20
SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE	
(SCU)	0.22
SELF-DIAGNOSTIC FUNCTION TABLE	9-∠ა ი ივ
DIAGNOSTIC CODE TABLE	
DIAGNOSTIC CODE TABLE	5-20
EVENT CODE TABLE	
TROUBLESHOOTING DETAILS (EVENT CODE)	9-28

EAS20090

TROUBLESHOOTING

EAS30599

GENERAL INFORMATION

TIP

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic trouble-shooting. 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

EAS3060

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

FAS3060

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

EAS3060

FAULTY GEAR SHIFTING Shifting is difficult

Refer to "Clutch drags".

FAS30604

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

FAS30849

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

FAS30607

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

- Spark plug(s)
- Incorrect spark plug gap
- Incorrect spark plug heat range
- 2. Ignition system
 - Faulty ECU

EAS3060

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)

EAS3061

UNSTABLE HANDLING

Handlebar

• Bent or improperly installed handlebar

Steering head components

- Improperly installed upper bracket
- Improperly installed lower bracket (improperly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork leg(s)

- Uneven oil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Broken fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Swingarm

- Worn bearing or bushing
- Bent or damaged swingarm

Rear shock absorber assembly

- 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

EACO0610

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 8-173.

EAS2016

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (ECU)

EAS31794

SELF-DIAGNOSTIC FUNCTION TABLE (FOR FUEL INJECTION SYSTEM)

TIP

For details of the fault code, refer to "TROUBLESHOOTING METHOD" on page 8-49.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0030	O ₂ sensor 1 heater (defective heater con- troller detected)	 Open or short circuit in wire harness. Disconnected coupler. Defective O₂ sensor 1 heater controller (Malfunction in ECU). Broken or disconnected lead in O₂ sensor 1 heater. 	(When the O ₂ sensor 1 does not operate because the exhaust temperature is low) Increased exhaust emissions. Fuel learning cannot be carried out.	Display only (If the O ₂ sensor 1 does not operate, O ₂ feedback is not carried out.)
P0050	O ₂ sensor 2 heater (defective heater con- troller detected)	 Open or short circuit in wire harness. Disconnected coupler. Defective O₂ sensor 2 heater controller (Malfunction in ECU). Broken or disconnected lead in O₂ sensor 2 heater. 	(When the O ₂ sensor 2 does not operate because the exhaust temperature is low) Increased exhaust emissions. Fuel learning cannot be carried out.	Display only (If the O ₂ sensor 2 does not operate, O ₂ feedback is not carried out.)
P0069	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.)	Malfunction in ECU. Intake air pressure sensor hose is disconnected, clogged, kinked, or pinched. Defective intake air pressure sensor or atmospheric pressure sensor.	Engine is difficult to start. Engine idling speed is unstable. Increased exhaust emissions. Loss of engine power.	Intake air pressure is fixed to 101.3 [kPa]. Intake air pressure difference is fixed to 0 [kPa]. Atmospheric pressure is fixed to 101.3 [kPa]. α –N is fixed. Fuel is not cut off due to the intake air pressure difference. Atmospheric pressure sensor output correction value is fixed to 0. O_2 feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0107 P0108	[P0107] Intake air pressure sensor (ground short circuit detected) [P0108] Intake air pressure sensor (open or power short circuit detected)	[P0107] Low voltage of the intake air pressure sensor circuit (0.5 V or less) [P0108] High voltage of the intake air pressure sensor circuit (4.8 V or more) • Defective coupler between intake air pressure sensor and ECU. • Open or short circuit in wire harness between intake air pressure sensor and ECU. • Defective intake air pressure sensor. • Malfunction in ECU.	Engine idling speed is unstable. Engine response is poor. Loss of engine power. Increased exhaust emissions.	Intake air pressure difference is fixed to 0 [kPa]. α-N is fixed. Fuel is not cut off due to the intake air pressure difference. Atmospheric pressure sensor output correction value is fixed to 0. Intake air pressure is fixed to 101.3 [kPa]. O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.
P0112 P0113	[P0112] Intake air temperature sensor (ground short circuit detected) [P0113] Intake air temperature sensor (open or power short circuit detected)	 [P0112] Low voltage of the intake air temperature sensor circuit (0.1 V or less) [P0113] High voltage of the intake air temperature sensor circuit (4.8 V or more) Defective coupler between intake air temperature sensor and ECU. Open or short circuit in wire harness between intake air temperature sensor and ECU. Improperly installed intake air temperature sensor. Defective intake air temperature sensor. Malfunction in ECU. 	Engine is difficult to start. Increased exhaust emissions. Engine idling speed is unstable.	The intake air temperature is fixed to 20 [°C]. O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0117 P0118	[P0117] Coolant temperature sensor (ground short circuit detected) [P0118] Coolant temperature sensor (open or power short circuit detected)	[P0117] Low voltage of the coolant temperature sensor circuit (0.1 V or less) [P0118] High voltage of the coolant temperature sensor circuit (4.9 V or more) • Defective coupler between coolant temperature sensor and ECU. • Open or short circuit in wire harness between coolant temperature sensor and ECU. • Improperly installed coolant temperature sensor. • Defective coolant temperature sensor. • Defective coolant temperature sensor.	Engine is difficult to start. Increased exhaust emissions. Engine idling speed is unstable.	The radiator fan motor relay is on only when the vehicle is traveling at low speeds. O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out. The coolant temperature is fixed to 60 [°C].
P0122 P0123 P0222 P0223 P2135	[P0122] Throttle position sensor (ground short circuit detected) [P0123] Throttle position sensor (open or power short circuit detected) [P0222] Throttle position sensor (ground short circuit detected) [P0223] Throttle position sensor (open or power short circuit detected) [P2135] Throttle position sensor (output voltage deviation error)	[P0122, P0222] Low voltage of the throttle position sensor circuit (0.25 V or less) [P0123, P0223] High voltage of the throttle position sensor circuit (4.75 V or more) [P2135] Difference in output voltage 1 and output voltage 2 of the throttle position sensor • Defective coupler between throttle position sensor and ECU. • Open or short circuit in wire harness between throttle position sensor and ECU. • Improperly installed throttle position sensor. • Defective throttle position sensor.	Engine idling speed is high. Engine idling speed is unstable. Engine response is poor. Loss of engine power. Deceleration is poor. Increased exhaust emissions. Vehicle cannot be driven.	Change in the throttle opening is 0 (transient control is not carried out). D–j is fixed. Throttle opening is fixed to 125[°]. O ₂ feedback is not carried out. Fuel is not cut off due to the throttle opening. Output is restricted. Air induction system solenoid is turned on all the time (air induction system air cut off). ISC feedback is not carried out. ISC learning is not carried out.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0132	O ₂ sensor 1 (short circuit detected (power short circuit))	 [P0132] High voltage of the O₂ sensor 1 circuit (4.8 V or more) Improperly installed O₂ sensor 1. Defective coupler between O₂ sensor 1 and ECU. Open or short circuit in wire harness between O₂ sensor 1 and ECU. Incorrect fuel pressure. Defective O₂ sensor 1. Malfunction in ECU. 	Increased exhaust emissions.	O ₂ feedback is not carried out. O ₂ feedback learning is not carried out. Air induction system solenoid is turned on all the time (air induction system air cut off).
P0152	O ₂ sensor 2 (short circuit detected (power short circuit))	[P0152] High voltage of the O ₂ sensor 2 circuit (4.8 V or more) • Improperly installed O ₂ sensor 2. • Defective coupler between O ₂ sensor 2 and ECU. • Open or short circuit in wire harness between O ₂ sensor 2 and ECU. • Incorrect fuel pressure. • Defective O ₂ sensor 2. • Malfunction in ECU.	Increased exhaust emissions.	O ₂ feedback is not carried out. O ₂ feedback learning is not carried out. Air induction system solenoid is turned on all the time (air induction system air cut off).
P0201 P0202 P0203 P0204	[P0201] Primary injector #1 (malfunction in primary injector #1) [P0202] Primary injector #2 (malfunction in primary injector #2) [P0203] Primary injector #3 (malfunction in primary injector #3) [P0204] Primary injector #4 (malfunction in primary injector #4)	 Defective coupler between injector and ECU. Open or short circuit in wire harness between injector and ECU. Defective injector. Malfunction in ECU. Improperly installed injector. 	Loss of engine power. Engine is difficult to start. Engine cannot be started. Engine stops. Engine idling speed is unstable. Increased exhaust emissions.	O ₂ feedback is not carried out. Air induction system solenoid is turned on all the time (air induction system air cut off). ISC feedback is not carried out. ISC learning is not carried out. Injection to the applicable cylinder group (cylinders #1 and #4 or cylinders #2 and #3) is cut off.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0335	Crankshaft position sensor (no normal signals are received from the crankshaft position sensor)	 Defective coupler between crankshaft position sensor and ECU. Open or short circuit in wire harness between crankshaft position sensor and ECU. Improperly installed crankshaft position sensor. Malfunction in generator rotor. Defective crankshaft position sensor. Malfunction in ECU. 	Engine cannot be started.	Does not operate. ISC feedback is not carried out. ISC learning is not carried out.
P0340	Cylinder identification sensor (no normal signals are received from the cylinder iden- tification sensor)	 Defective coupler between cylinder identification sensor and ECU. Open or short circuit in wire harness between cylinder identification sensor and ECU. Improperly installed cylinder identification sensor. Defective pickup rotor. Defective cylinder identification sensor. Malfunction in ECU. 	Engine cannot be started.	The vehicle is operated using only the cylinder identification information stored during operation.
P0351 P0352 P0353 P0354	[P0351] Cylinder-#1 ignition coil (open or short circuit detected in the primary lead of the cylinder-#1 ignition coil) [P0352] Cylinder-#2 ignition coil (open or short circuit detected in the primary lead of the cylinder-#2 ignition coil) [P0353] Cylinder-#3 ignition coil (open or short circuit detected in the primary lead of the cylinder-#3 ignition coil) [P0354] Cylinder-#4 ignition coil (open or short circuit detected in the primary lead of the cylinder-#4 ignition coil of the cylinder-#4 ignition coil)	Defective coupler between ignition coil and ECU. Open or short circuit in wire harness between ignition coil and ECU. Improperly installed ignition coil. Defective ignition coil. Malfunction in ECU.	Engine stops. Loss of engine power. Engine is difficult to start. Engine cannot be started. Engine idling speed is unstable. Increased exhaust emissions.	Injection to the applicable cylinder group (cylinders #1 and #4 or cylinders #2 and #3) is cut off. Air induction system solenoid is turned on all the time (air induction system air cut off). O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.

Fault	lke	Probable cause of	Vahiala suuratau	Fail-safe system
code No.	Item	malfunction	Vehicle symptom	operation
P0476	EXUP servo motor (Stuck)	Defective coupler between EXUP servo motor and ECU. Open or short circuit in wire harness between EXUP servo motor and ECU. Improperly installed EXUP servo motor and cables. Defective EXUP servo motor. Stuck EXUP servo motor (mechanism or motor). Malfunction in ECU.	Loss of engine power.	Learning values for fully closed EXUP are fixed. Learning values for fully open EXUP are fixed. O ₂ feedback is not carried out.
P0480	Radiator fan motor relay (open or short circuit detected)	 Open or short circuit in wire harness. Disconnected coupler. Defective radiator fan motor relay. Defective radiator fan motor relay controller (Malfunction in ECU). 	Engine is difficult to start. Loss of engine power. Engine overheats. Increased exhaust emissions.	Radiator fan motor relay is off all the time. O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.
P048D P048E	EXUP position sensor [P048D] EXUP position sensor (open or ground short circuit detected) [P048E] EXUP position sensor (power short circuit detected)	Defective coupler between EXUP position sensor and ECU. Open or short circuit in wire harness between EXUP position sensor and ECU. Defective EXUP position sensor. Malfunction in ECU.	Loss of engine power.	Learning values for fully closed EXUP are fixed. Learning values for fully open EXUP are fixed. O ₂ feedback is not carried out.

				·
Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0500 P1500	[P0500, P1500] Rear wheel sensor (no normal signals are received from the rear wheel sensor) [P1500] Neutral switch (open or short circuit is detected) [P1500] Clutch switch (open or short circuit is detected)	 Open or short circuit in wire harness between rear wheel sensor and ABS unit. Open or short circuit in wire harness between ABS unit and ECU. Open or short circuit in wire harness between neutral switch and ECU. Open or short circuit in wire harness between neutral switch and ECU. Open or short circuit in wire harness between clutch switch and ECU. Defective rear wheel sensor. Defective neutral switch. Defective clutch switch. Improper adjustment of clutch lever. Malfunction in ECU. 	Vehicle speed is not displayed on the meter. Indication of the neutral indicator light is incorrect. Engine idling speed is unstable. Traction control does not work.	Vehicle speed displayed on the meter = 0 [km/h] O ₂ feedback is not carried out. Fuel cut-off control when the rear wheel sensor or neutral switch malfunctions is carried out. ISC feedback is not carried out. ISC learning is not carried out. Traction control does not work.
P0560	Rectifier/regulator: malfunction detected. Charging voltage is abnormal.	Battery overcharging (defective rectifier/regulator). Battery overcharging (broken or disconnected lead in rectifier/regulator wire harness). Battery over-discharging (broken or disconnected lead in charging system). Battery over-discharging (defective rectifier/regulator).	Engine is difficult to start. Increased exhaust emissions. Battery performance has deteriorated or battery is defective.	O ₂ feedback is not carried out.
P0601	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the tool display.)	Malfunction in ECU.	Engine cannot be started.	Engine cannot be started.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0606	Internal malfunction in ECU (When this malfunction is detected in the ECU, the fault code number might not appear on the tool display.)	Malfunction in ECU.	Engine cannot be started. Engine response is poor. Loss of engine power.	Engine cannot be started. Ignition and injection are not carried out. Judgment for other fault codes is not carried out. Load control is not carried out. (The relay unit, radiator fan motor relay, and other relays are all turned off.) The CO adjustment mode and diagnostic mode cannot be activated. Output is restricted.
P062F	EEPROM fault code number (an error is detected while read- ing or writing on EEPROM)	 CO adjustment value is not properly written. ISC learning value is not properly written. OBD memory value is not properly written. Malfunction in ECU. 	Increased exhaust emissions. Engine cannot be started or is difficult to start. Engine idling speed is unstable. OBD memory value is not correct.	CO adjustment value for the faulty cylinder = 0 (default value) ISC learning values = Default values. OBD memory value is initialized. Initialization of O ₂ feedback learning value.
P0638	YCC-T drive system (malfunction detected)	 Defective coupler between throttle servo motor and ECU. Open or short circuit in wire harness between throttle servo motor and ECU. Defective throttle servo motor. Throttle servo motor is stuck (mechanism or motor). Malfunction in ECU. Blown electric throttle valve fuse. 	Engine response is poor. Loss of engine power. Engine idling speed is unstable.	O ₂ feedback is not carried out. YCC-T evacuation is activated. Output is restricted. ISC feedback is not carried out. ISC learning is not carried out.
P0657	Fuel system voltage (incorrect voltage sup- plied to the fuel injec- tor, fuel pump and relay unit)	 Open or short circuit in wire harness between relay unit and ECU. Open circuit in wire harness between battery and ECU. Defective relay unit. Malfunction in ECU. 	Engine is difficult to start. Increased exhaust emissions.	Monitor voltage = 12 [V] O ₂ feedback is not carried out.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0916 P0917	[P0916] Gear position sensor (no signals are received from the gear position sensor that an open or ground short circuit was detected) [P0917] Gear position sensor (no signals are received from the gear position sensor that a power short circuit was detected)	 Defective coupler between gear position sensor and ECU. Open or power short circuit in wire harness between gear position sensor and ECU. Improperly installed gear position sensor. Defective gear position sensor. Malfunction in ECU. 	Improper display for position. Defective engine response.	Maintains the gear position value at the previous value.
P1400	Air induction system solenoid (open or short circuit detected)	 Open or short circuit in wire harness. Disconnected coupler. Defective air induction system solenoid. Defective air induction system solenoid controller. (malfunction in ECU) 	Increased exhaust emissions.	Electric current in air induction system solenoid is prohibited (air induction system air in). O ₂ feedback is not carried out.
P1600	Lean angle sensor (malfunction detected)	 Open or short circuit in wire harness. Malfunction in IMU. Malfunction in ECU. 	Engine cannot be started.	Engine cannot be started.
P1601	Sidestand switch (open or short circuit of the blue/yellow lead of the ECU is detected)	 Defective coupler between relay unit and ECU. Open or short circuit in wire harness between relay unit and ECU. Defective coupler between sidestand switch and relay unit. Open or short circuit in wire harness between sidestand switch and relay unit. Defective sidestand switch and relay unit. Defective sidestand switch. Malfunction in ECU. 	Engine cannot be started.	Engine is forcefully stopped (the injector output is stopped).
P1602	Malfunction in ECU internal circuit (malfunction of ECU power cut-off function)	 Open or short circuit in wire harness between ECU and battery. Open or short circuit in wire harness between ECU and main switch. Blown backup fuse. Malfunction in ECU. 	Engine idling speed is unstable. Engine idling speed is high. Increased exhaust emissions. Engine is difficult to start.	O ₂ feedback learning is not carried out. O ₂ feedback learning value is not written.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P2122 P2123 P2127 P2128 P2138	[P2122] Accelerator position sensor (open or ground short circuit detected) [P2123] Accelerator position sensor (power short circuit detected) [P2127] Accelerator position sensor (ground short circuit detected) [P2128] Accelerator position sensor (open or power short circuit detected) [P2138] Accelerator position sensor (output voltage deviation error)	[P2122, P2127] Low voltage of the accelerator position sensor circuit (0.25 V or less) [P2123, P2128] High voltage of the accelerator position sensor circuit (4.75 V or more) [P2138] Difference in output voltage 1 and output voltage 2 of the accelerator position sensor • Defective coupler between accelerator position sensor and ECU. • Open or short circuit in wire harness between accelerator position sensor and ECU. • Improperly installed accelerator position sensor. • Defective accelerator position sensor. • Defective accelerator position sensor.	Engine response is poor. Loss of engine power. Engine idling speed is unstable.	No change in accelerator opening. (transient control is not carried out). Accelerator opening is fixed to 0[°]. O ₂ feedback is not carried out. YCC-T evacuation is activated. Fuel cut is prohibited by accelerator opening. Output is restricted. ISC feedback is not carried out. ISC learning is not carried out.
P2158	Front wheel sensor (no normal signals are received from the front wheel sensor)	Open or short circuit in wire harness between front wheel sensor and ECU. Defective front wheel sensor. Malfunction in ECU.	Traction control does not work. Traction control system indicator on the meter comes on. Traction control system switch is disabled. (Traction control system indicator on the meter goes OFF.)	Traction control does not work.
P2195	O ₂ sensor 1 (no signals are received from the O ₂ sensor 1)	 Signal voltage is 0.25–0.53 V. Improperly installed O₂ sensor 1. Defective coupler between O₂ sensor 1 and ECU. Open or short circuit in wire harness between O₂ sensor 1 and ECU. Defective O₂ sensor 1. Malfunction in ECU. 	Increased exhaust emissions.	O ₂ feedback is not carried out. O ₂ feedback learning is not carried out. Air induction system solenoid is turned on all the time (air induction system air cut off).

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P2197	O ₂ sensor 2 (no signals are received from the O ₂ sensor 2)	 Signal voltage is 0.25–0.53 V. Improperly installed O₂ sensor 2. Defective coupler between O₂ sensor 2 and ECU. Open or short circuit in wire harness between O₂ sensor 2 and ECU. Defective O₂ sensor 2. Malfunction in ECU. 	Increased exhaust emissions.	O ₂ feedback is not carried out. O ₂ feedback learning is not carried out. Air induction system solenoid is turned on all the time (air induction system air cut off).
P21CF P21D0 P21D1 P21D2	[P21CF] Secondary injector #1 (malfunction in secondary injector #1) [P21D0] Secondary injector #2 (malfunction in secondary injector #2) [P21D1] Secondary injector #3 (malfunction in secondary injector #3) [P21D2] Secondary injector #4 (malfunction in secondary injector #4)	 Defective coupler between injector and ECU. Open or short circuit in wire harness between injector and ECU. Defective injector. Malfunction in ECU. Improperly installed injector. 	Loss of engine power.	O ₂ feedback is not carried out. Air induction system solenoid is turned on all the time (air induction system air cut off). ISC feedback is not carried out. ISC learning is not carried out. Injection to the applicable cylinder group (cylinders #1 and #4 or cylinders #2 and #3) is cut off.
P2228 P2229	[P2228] Atmospheric pressure sensor (ground short circuit detected) [P2229] Atmospheric pressure sensor (open or power short circuit detected)	[P2228] Low voltage of the atmospheric pressure sensor circuit (0.5 V or less) [P2229] High voltage of the atmospheric pressure sensor circuit (4.8 V or more) • Defective coupler between atmospheric pressure sensor and ECU. • Open or short circuit in wire harness between atmospheric pressure sensor and ECU. • Improperly installed atmospheric pressure sensor. • Defective atmospheric pressure sensor. • Malfunction in ECU.	Engine is difficult to start. Increased exhaust emissions. Insufficient power at high altitudes. Engine idling speed is unstable.	α-N is fixed. Intake air pressure difference is fixed to 0 [kPa]. Atmospheric pressure is fixed to 101.3 [kPa]. Atmospheric pressure sensor output correction value is fixed to 0. Fuel is not cut off due to the intake air pressure difference. O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.
U0125	Signals cannot be transmitted between the ECU and the IMU.	Defective IMU coupler or ECU coupler. Open or short circuit in wire harness between IMU and ECU. Malfunction in IMU. Malfunction in ECU.	Engine cannot be started.	Engine cannot be started.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
C0520	ECU receives a signal from the IMU indicating that a malfunction was detected or the ECU does not receive normal signals from the IMU.	 Defective IMU coupler or ECU coupler. Open or short circuit in wire harness between IMU and ECU. Improperly installed IMU. Malfunction in IMU. Malfunction in ECU. 	Engine cannot be started (depending on the circumstances).	Engine cannot be started (depending on the circumstances).

EAS32040

SELF-DIAGNOSTIC FUNCTION TABLE (FOR STEERING DAMPER SYSTEM)

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
C1000	Steering damper sole- noid (open or short circuit detected)	 Defective coupler between steering damper solenoid and ECU. Open or short circuit in wire harness between steering damper solenoid and ECU. Defective steering damper solenoid. Malfunction in ECU. 	Steering damper does not work.	Solenoid fixed at OFF.

EAS31795

SELF-DIAGNOSTIC FUNCTION TABLE (FOR IMMOBILIZER SYSTEM)

TIP

For details of the fault code, refer to "SELF-DIAGNOSIS FAULT CODE INDICATION" on page 8-160.

Fault code No.	Item		
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.		

EAS31119

COMMUNICATION ERROR WITH THE METER

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
U0155 (Yamaha diagnostic tool) Err (multi- function meter dis- play)	CAN communication error (with the meter)	Communication between the ECU and the meter is not possi- ble • Defective meter cou- pler and ECU cou- pler • Open or short cir- cuit in the wire har- ness between the meter and the ECU • Defective meter • Defective ECU	Defective meter display. Traction control does not work.	MAP changeover: State is fixed. Traction control does not work. Meter switch input: OFF is fixed.

EAS31057

DIAGNOSTIC CODE: SENSOR OPERATION TABLE

Diagnostic code No.	Item	Meter display	Procedure
01	Throttle position sensor signal 1		
	Fully closed position	11–21	Check with throttle valves fully closed.
	Fully open position	96–107	Check with throttle valves fully open.
02	Atmospheric pressure	Displays the atmospheric pressure.	Compare the actually measured atmospheric pressure with the tool display value.
03	Intake air pressure	Displays the intake air pressure.	Operate the throttle while pushing the "③" 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 measured air temperature with the tool display value.
06	Coolant temperature	When engine is cold: Displays temperature closer to air temperature. When engine is hot: Displays current coolant temperature.	Compare the actually measured coolant temperature with the tool 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 "()", and then compare the actually measured battery voltage with the tool display value. (If the actually measured battery voltage is low, recharge the battery.)

Diagnostic	Item	Meter display	Procedure
code No.	-	,	
13	Throttle position sensor signal 2		
	Fully closed position	9–23	Check with throttle valves fully closed.
	Fully open position	93–109	Check with throttle valves fully open.
14	Accelerator position sensor signal 1		
	Fully closed position	11–21	Check with throttle grip fully closed position.
	Fully open position	96–107	Check with throttle grip fully open position.
15	Accelerator position sensor signal 2		
	Fully closed position	9–23	Check with throttle grip fully closed position.
	Fully open position	93–109	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 in 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 continues to incline.
20	Sidestand switch		Extend and retract the sides-
	Sidestand retracted	ON	tand (with the transmission in 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	

Diagnostic code No.	Item	Meter display	Procedure
60	EEPROM fault code display		_
	No history	On No malfunctions detected (If the self-diagnosis fault code P062F is indicated, the ECU is defective.)	
	History exists	01–04 (CO adjustment value) • (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 val- ues) 12 (O ₂ feedback learning value) 13 (OBD memory value)	
67	ISC (Idle Speed Control) learning condition display ISC (Idle Speed Control) learning data erasure	OO ISC (Idle Speed Control) learning data has been erased. O1 It is not necessary to erase the ISC (Idle Speed Control) learning data. O2 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 "\times" to "\cap " 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	
87	O ₂ feedback learning data erasure	00 O ₂ feedback learning data has been erased. 01 O ₂ feedback learning data has not been erased.	To erase the O_2 feedback learning data, set the start/engine stop switch from " \boxtimes " to " \bigcirc " 3 times in 5 seconds.

EAS3105

DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE

Diagnostic code No.	Item	Actuation	Procedure
30	Cylinder-#1 ignition coil	Actuates the cylinder-#1 ignition coil five times at onesecond intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the ignition coil is actuated.	Check that a spark is generated five times. Connect an ignition checker.
31	Cylinder-#2 ignition coil	Actuates the cylinder-#2 ignition coil five times at onesecond intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the ignition coil is actuated.	Check that a spark is generated five times. Connect an ignition checker.
32	Cylinder-#3 ignition coil	Actuates the cylinder-#3 ignition coil five times at onesecond intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the ignition coil is actuated.	Check that a spark is generated five times. Connect an ignition checker.
33	Cylinder-#4 ignition coil	Actuates the cylinder-#4 ignition coil five times at onesecond intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the ignition coil is actuated.	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 trouble warning light.	Check the operating of the intake funnel servo motor.
36	Primary injector #1	Actuates the primary injector #1 five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	Check that primary injector #1 is actuated five times by listening for the operating sound.
37	Primary injector #2	Actuates the primary injector #2 five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	Check that primary injector #2 is actuated five times by listening for the operating sound.
38	Primary injector #3	Actuates the primary injector #3 five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	Check that primary injector #3 is actuated five times by listening for the operating sound.

Diagnostic code No.	Item	Actuation	Procedure
39	Primary injector #4	Actuates the primary injector #4 five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	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. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	Check that secondary injector #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. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	Check that secondary injector #2 is actuated five times by listening for the operating sound.
42	Secondary injector #3	Actuates the secondary injector #3 five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	Check that secondary injector #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. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	Check that secondary injector #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. The "check" indicator on the Yamaha diagnostic tool screen come on each time the steering damper solenoid is actuated.	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. The "check" indicator on the Yamaha diagnostic tool screen come on each time the air induction system solenoid is actuated.	Check that the air induction system solenoid is actuated five times by listening for the operating sound.

Diagnostic code No.	Item	Actuation	Procedure
49	Intake solenoid	Actuates fuel intake sole- noid five times at one-sec- ond intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the intake solenoid is actu- ated.	Check that intake solenoid is actuated five times by listening for the operating sound.
50	Relay unit	Actuates the relay unit five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the relay is actuated.	Check that the relay unit is actuated five times by listening for the operating sound.
51	Radiator fan motor relay	Actuates the radiator fan motor relay five times at five-seconds intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the relay is actuated.	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-seconds intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the headlight is actuated.	Check that the headlight comes on five times.
53	EXUP servo motor	After the EXUP is fully closed, it stops at the opening base position (intermediate position). This operation takes approximately 3 seconds during which the "check" indicator is displayed on the Yamaha diagnostic tool.	Check the operating sound.

EAS2023

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE (SCU)

EAS32359

SELF-DIAGNOSTIC FUNCTION TABLE

TIP

For details of the fault code, refer to "TROUBLESHOOTING METHOD (SCU)" on page 8-205.

Fault code No.	ltem	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
C0044	Abnormal ABS	Defective front brake line. Defective hydraulic unit assembly.	 ERS adjustments cannot be performed. The damping preset value is fixed at the prescribed position (automatic setting modes). 	_
C0520	Abnormal IMU	 Defective IMU coupler or ECU coupler. Open or short circuit in wire harness between IMU and ECU. Improperly installed IMU. Malfunction in IMU. Malfunction in ECU. 	 ERS adjustments cannot be performed. The damping preset value is fixed at the prescribed position (automatic setting modes). 	_
C1002	Abnormal SCU EEPROM	 SCU abnormal data writing error. Malfunction in SCU. 	ERS adjustments can- not be performed.	_
C1003	Stepping motor: open or short cir- cuit detected.	 Defective connection of stepping motor and SCU couplers. Defective connection of sub-wire harness coupler. Short circuit in wire harness or wire harness continuity. Defective stepping motor. Malfunction in SCU. 	 ERS adjustments cannot be performed. The damping preset value is fixed on the defective side (front fork or RCU) at the current value (automatic setting modes). 	
C1007	Abnormality inside SCU	Malfunction in SCU.	ERS adjustments can- not be performed.	_
P0500	Abnormal rear wheel sensor	 Open or short circuit in wire harness between rear wheel sensor and ABS unit. Open or short circuit in wire harness between ABS unit and ECU. Defective rear wheel sensor. Malfunction in ECU. 	 ERS adjustments cannot be performed. The damping preset value is fixed at the prescribed position (automatic setting modes). 	_

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation	
P0560	Abnormal SCU power supply volt- age	 Battery overcharging (defective rectifier/regulator). Battery overcharging (broken or disconnected lead in rectifier/regulator wire harness). Battery over-discharging (broken or disconnected lead in charging system). Battery over-discharging (defective rectifier/regulator). 	ERS adjustments cannot be performed.		
U0100	Abnormal CAN communication (between ECU and SCU)	 Defective connection of wire harness, ECU, and SCU couplers. Wire harness continuity. Malfunction in SCU. Malfunction in ECU. 	 ERS adjustments cannot be performed. The damping preset value is fixed at the prescribed position (automatic setting modes). 	_	
U0121	Abnormal CAN communication (between ABS ECU and SCU)	 Defective connection of wire harness, ABS ECU, and SCU couplers. Wire harness continuity. Malfunction in SCU. Malfunction in ABS ECU. 	 ERS adjustments cannot be performed. The damping preset value is fixed at the prescribed position (automatic setting modes). 	_	
U0125	Abnormal CAN communication (between IMU and SCU)	 Defective connection of wire harness, IMU, and SCU couplers. Wire harness continuity. Malfunction in SCU. Malfunction in IMU. 	 ERS adjustments cannot be performed. The damping preset value is fixed at the prescribed position (automatic setting modes). 	_	
U0155	Abnormal CAN communication (between meter assembly and SCU)	 Defective connection of wire harness, meter assembly, and SCU couplers. Wire harness continuity. Malfunction in SCU. Malfunction in meter assembly. 	 ERS adjustments cannot be performed. The damping preset value is fixed at the prescribed position (automatic setting modes). 	_	
_	Abnormality inside SCU	Malfunction in SCU.	 ERS adjustments cannot be performed. The "Err" and ERS icons are displayed on the meter display. 	_	

Fault code No.	ltem	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
_	Steering damper stepping motor (manufactured by Öhlins: optional): open circuit or short-circuit detected.	 Defective connection of stepping motor and SCU couplers. Defective connection of sub-wire harness coupler. Short circuit in wire harness or wire harness continuity. Defective stepping motor. Malfunction in SCU. 	 ERS adjustments cannot be performed. The damping preset value is fixed at the current value. The steering damper and suspension warning light comes on on the meter and the steering damper warning icon is displayed on the meter display. 	
_	Zero point adjust- ment of damping force adjustment system was not performed.	_	ERS icon blinks.	_

EAS32360

DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Tool display	Procedure
09	Monitor voltage	Displays the SCU power supply voltage. Approximately 12.0 V	Check the displayed SCU power supply voltage.

EAS20164

EVENT CODE TABLE

TIF

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 for fault code number P0107 and P0108	Perform the inspection items listed for fault code number P0107 and P0108.	
193	Throttle position sensor	Brief abnormality detected in the throt- tle position sensor	Same as for fault code number P0122, P0123, P0222 and P0223	Perform the inspection items listed for fault code number P0122, P0123, P0222 and P0223.	
194	EXUP servo motor circuit	Brief abnormality detected in EXUP servo motor circuit	Same as for fault code number P0476, P048D and P048E	Perform the inspection items listed for fault code number P0476, P048D and P048E.	
195	Sidestand switch	Brief abnormality detected in the ECU (blue/yellow) input line	Same as for fault code number P1601	Perform the inspection items listed for fault code number P1601.	
196	Coolant tempera- ture sensor	Brief abnormality detected a in the coolant temperature sensor	Same as for fault code number P0117 and P0118	Perform the inspection items listed for fault code number P0117 and P0118.	
197	Intake air temper- ature sensor	Brief abnormality detected in the intake air temperature sen- sor	Same as for fault code number P0112 and P0113	Perform the inspection items listed for fault code number P0112 and P0113.	
198	Atmospheric pressure sensor	Brief abnormality detected in atmo- spheric pressure sen- sor	Same as for fault code number P2228 and P2229	Perform the inspection items listed for fault code number P2228 and P2229.	
207	Accelerator position sensor	Brief abnormality detected in the accel- erator position sensor	Same as for fault code number P2122, P2123, P2127 and P2128	Perform the inspection items listed for fault code number P2122, P2123, P2127 and P2128.	
220	Gear position sensor	Brief abnormality detected in the gear position sensor	Same as for fault code number P0916 and P0917	Perform the inspection items listed for fault code number P0916 and P0917.	
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.	

EVENT CODE TABLE

No.	Item	Symptom	Possible causes	Note
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.
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 throttle 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 occurring, 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 throttle 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 throttle 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.

FAS3202

TROUBLESHOOTING DETAILS (EVENT CODE)

Event code No. 30

LVCIII	Code No. 30					
Event code No.		30	30			
Item	Item		Latch up detected.			
Coil o	efe avatem	Unab	le to start engine			
raii-s	afe system	Unab	le to drive vehicle			
Diagr	nostic code No.	17				
Meter	r display	• 0-5	ays the bank angle in increments of the control of			
Proce	edure	Chec playe	k that 0–5 $^{\circ}$ is displayed when the v d value increases as the vehicle c	vehicle is vertical and that the disontinues to incline.		
Item	Probable cause of malfunction and chec	ck	Maintenance job	Confirmation of service completion		
1	The vehicle has overturned.		Raise the vehicle upright.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Engine trouble warning light does not come on → Service is finished. Engine trouble warning light → 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". Engine trouble warning light does not come on → Service is finished. Engine trouble warning light → 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 continues to incline. Replace if defective.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Engine trouble warning light does not come on → Service is finished. Engine trouble warning light → Go to item 4.		
4	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.			

EVENT CODE TABLE

Event code No. 70

TIP ___

If another error code is displayed at the same time, check the other error code first and repair it.

		70	70			
		Engine of tin	gine forcibly stops when the vehicle is left idling for a long period ime.			
Item	m Probable cause of malfunction and check		Maintenance job	Confirmation of service completion		
1	Allow to idle for a long peritime.	od of	Turn the main switch to "OFF".	Check whether it is possible to start the engine. Able to start the engine → Service is finished. Unable to start the engine → Go to item 2.		
2	Malfunction in ECU.		Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-232.	Service is finished.		

EAS20091

WIRING DIAGRAM

YZF-R1/YZF-R1H 2017

- 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. Electronic throttle valve fuse
- 9. Backup fuse
- 10. Sub radiator fan motor fuse
- 11. Radiator fan motor fuse
- 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
- 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. 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
- 77. Immobilizer system indicator light
- 78. Fuel level warning light
- 79. Engine trouble warning light
- 80. Neutral indicator light
- 81. Shift timing indicator light
- 82. Multi-function meter
- 83. Stability control indicator light
- 84. Oil pressure and coolant temperature warning light
- 85. Steering damper and suspension warning light
- 86. Turn signal indicator light (right)
- 87. Turn signal indicator light (left)
- 88. Meter light
- 89. ABS warning light
- 90. High beam indicator light
- 91. Oil pressure switch
- 92. Rear brake light switch
- 93. Handlebar switch (left)
- 94. Mode switch
- 95. Pass/LAP switch
- 96. Dimmer switch
- 97. Horn switch
- 98. Horn
- 99. Clutch switch
- 100.Turn signal switch
- 101.Hazard switch
- 102.Rear turn signal light (right)
- 103.Rear turn signal light (left)
- 104.Front turn signal light (right)
- 105.Front turn signal light (left)
- 106.Headlight control unit
- 107.Headlight (high beam) 108.Headlight (low beam)
- 109.Tail/brake light

- 110.License plate light
- 111.Auxiliary light
- 112.Sub radiator fan motor (right)
- 113.Radiator fan motor (left)
- 114. Auxiliary DC connector
- A. Wire harness
- B. Sub-wire harness (intake solenoid)
- C. Sub-wire harness (Yamaha diagnostic tool coupler)
- D. Sub-wire harness (coolant temperature sensor)

YZF-R1M/YZF-R1MH 2017

- 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. Electronic throttle valve fuse
- 9. Backup fuse
- 10. Sub radiator fan motor fuse
- 11. Radiator fan motor fuse
- 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
- 58. Front wheel sensor

- 59. Rear wheel sensor
- 60. Joint connector
- 61. Yamaha diagnostic tool cou-
- 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
- 76. Meter assembly
- 77. Immobilizer system indicator light
- 78. Fuel level warning light
- 79. Engine trouble warning light
- 80. Neutral indicator light
- 81. Shift timing indicator light
- 82. Multi-function meter
- 83. Stability control indicator light
- 84. Oil pressure and coolant temperature warning light
- 85. Steering damper and suspension warning light
- 86. Turn signal indicator light (right)
- 87. Turn signal indicator light (left)
- 88. Meter light
- 89. ABS warning light
- 90. High beam indicator light
- 91. Oil pressure switch
- 92. Rear brake light switch
- 93. Handlebar switch (left)
- 94. Mode switch
- 95. Pass/LAP switch
- 96. Dimmer switch
- 97. Horn switch
- 98. Horn
- 99. Clutch switch
- 100. Turn signal switch
- 101.Hazard switch
- 102.Rear turn signal light (right)
- 103.Rear turn signal light (left)
- 104. Front turn signal light (right)
- 105.Front turn signal light (left)
- 106.Headlight control unit
- 107. Headlight (high beam)
- 108.Headlight (low beam) 109.Tail/brake light
- 110.License plate light
- 111.Auxiliary light
- 112.Sub radiator fan motor (right)

- 113.Radiator fan motor (left)
- 114. Auxiliary DC connector
- 115.SCU fuse
- 116.SCU (Suspension Control
- 117.Front fork stepping motor (left)
- 118. Front fork stepping motor (right)
- 119.Rear shock absorber assembly stepping motor (compression damping)
- 120.Rear shock absorber assembly stepping motor (rebound damping)
- 121. Steering damper solenoid (OPTION)
- A. Wire harness
- B. Sub-wire harness (intake sole-
- 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 so-
- F. Sub-wire harness (front fork stepping motor)
- G. Sub-wire harness (coolant temperature sensor)

EAS30613 COLOR CODE

В Black Br Brown Ch Chocolate Dg Dark green G Green Gy Gray L Blue Lg Light green O Orange Р Pink R Red Sb Sky blue ٧ Violet W White Υ Yellow B/G Black/Green B/L Black/Blue B/R Black/Red B/W Black/White B/Y Black/Yellow Br/B Brown/Black Brown/Blue Br/L Brown/Red Br/R Br/W Brown/White Br/Y Brown/Yellow G/B Green/Black Green/Blue G/L G/O Green/Orange Green/Red G/R Green/White G/W 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/R Blue/Red L/W Blue/White L/Y Blue/Yellow Lg/R Light green/Red Orange/Black O/B O/G Orange/Green P/B Pink/Black P/L Pink/Blue P/W Pink/White R/B Red/Black R/G Red/Green Red/Blue R/L R/W Red/White R/Y Red/Yellow Sb/W Sky blue/White W/B White/Black White/Green W/G White/Blue W/L W/R White/Red W/Y White/Yellow

Y/B

Y/G

Yellow/Black

Yellow/Green

Y/L Yellow/Blue Y/R Yellow/Red

