YAMAHA 2007

MOTOMATRIX

FZ6-N/S
FZ6-NA/SA
FZ6-NHG(W)
FZ6-SHG(W)
FZ6-NAHG/SAHG
SERVICE MANUAL

4S8-28197-E0

EAS20040

FZ6-N/S
FZ6-NA/SA
FZ6-NHG(W)/SHG(W)
FZ6-NAHG/SAHG
SERVICE MANUAL

First edition, August 2006

EAS20070
NOTICE

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.
This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the vehicle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his vehicle and to conform to federal environmental quality objectives.
Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

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

EAS20080
IMPORTANT MANUAL INFORMATION

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

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

⚠ WARNING — Failure to follow WARNING instructions could result in severe injury or death to the vehicle operator, a bystander or a person checking or repairing the vehicle.

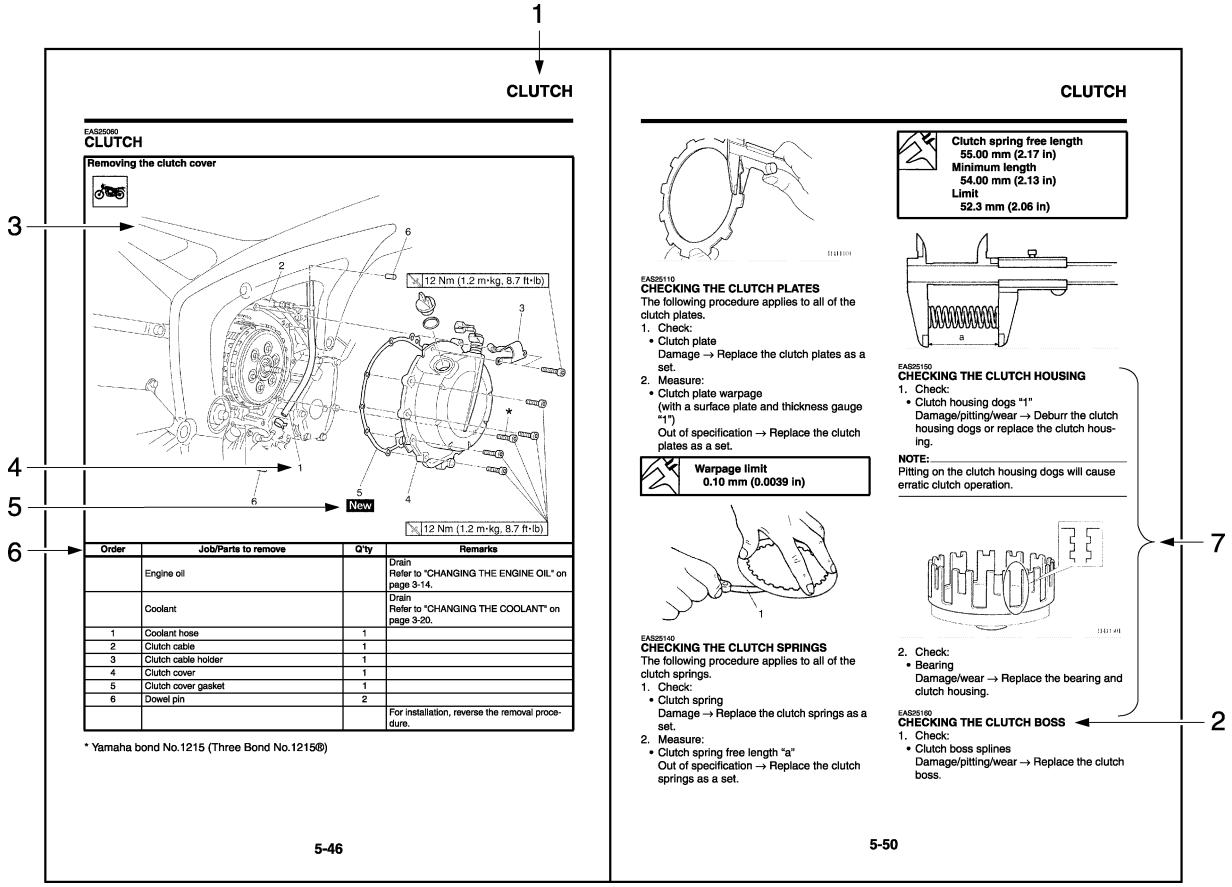
CAUTION: — A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

NOTE: — A NOTE provides key information to make procedures easier or clearer.

EAS20090
HOW TO USE THIS MANUAL

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

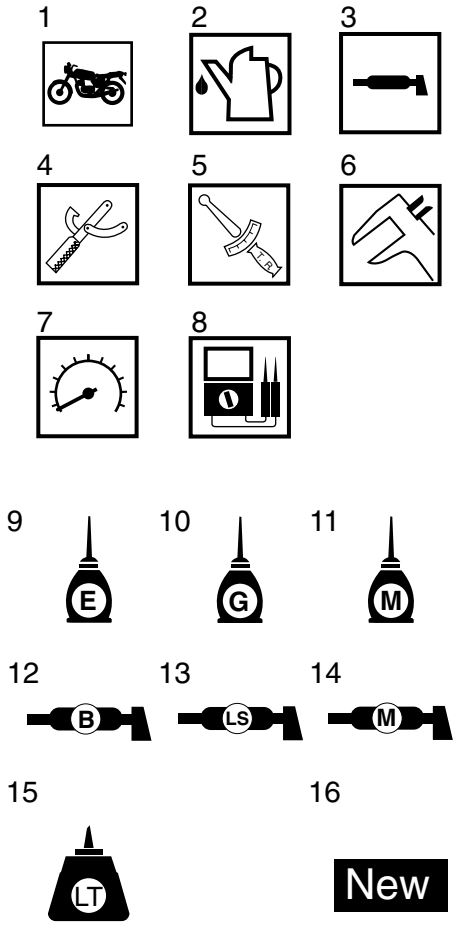
- The manual is divided into chapters and each chapter is divided into sections. The current section title is shown at the top of each page “1”.
- Sub-section titles appear in smaller print than the section title “2”.
- To help identify parts and clarify procedure steps, there are exploded diagrams at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



EAS20100
SYMBOLS

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

NOTE:
The following symbols are not relevant to every vehicle.



1. Serviceable with engine mounted
2. Filling fluid
3. Lubricant
4. Special tool
5. Tightening torque
6. Wear limit, clearance
7. Engine speed
8. Electrical data
9. Engine oil
10. Gear oil
11. Molybdenum-disulfide oil
12. Wheel-bearing grease
13. Lithium-soap-based grease
14. Molybdenum-disulfide grease
15. Apply locking agent (LOCTITE®)
16. Replace the part

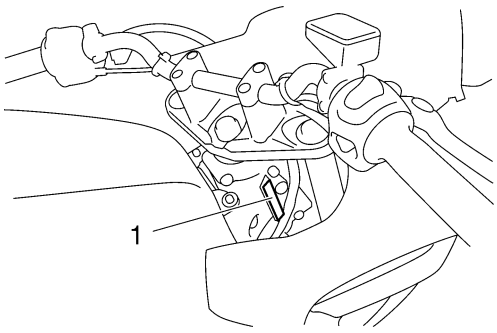
EAS20110

TABLE OF CONTENTS

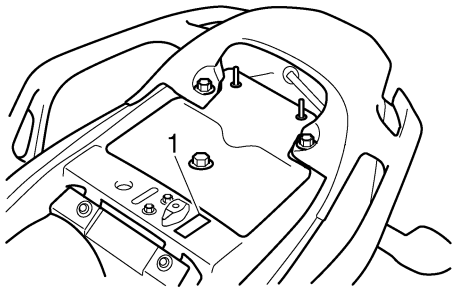
GENERAL INFORMATION

EAS20130
IDENTIFICATION

EAS20140
VEHICLE IDENTIFICATION NUMBER
The vehicle identification number “1” is stamped into the right side of the steering head pipe.



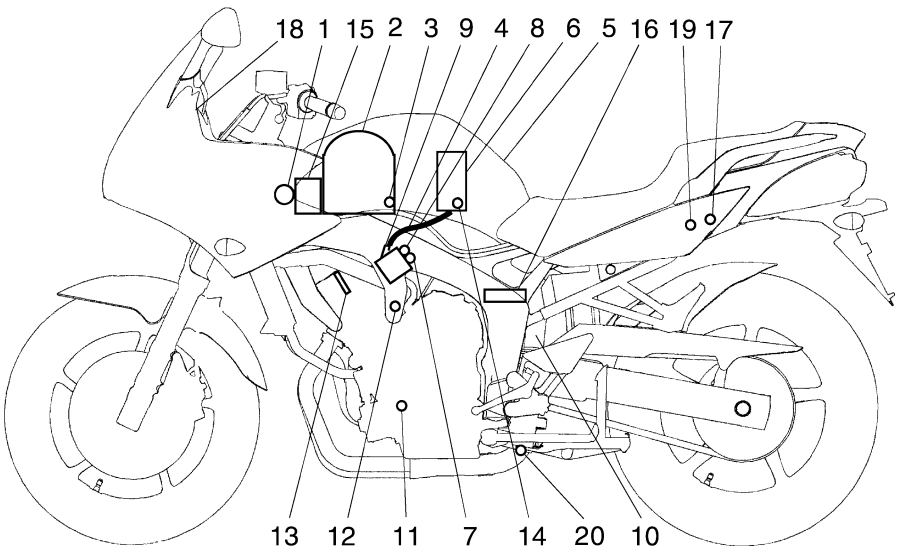
EAS20150
MODEL LABEL
The model label “1” is affixed to the frame. This information will be needed to order spare parts.



EAS20170
FEATURES

EAS4S81003
OUTLINE OF FI SYSTEM

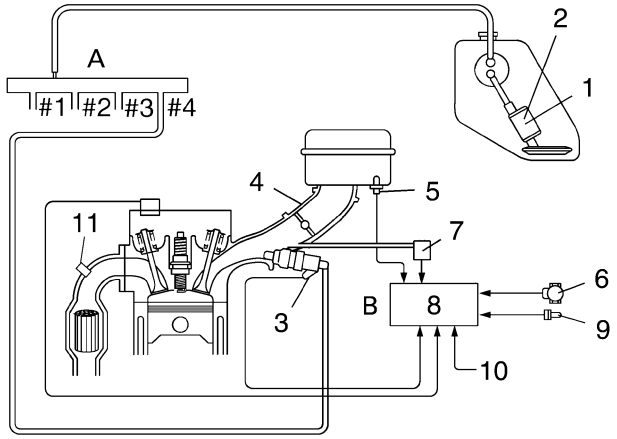
The main function of a fuel supply system is to provide fuel to the combustion chamber at the optimum air-fuel ratio in accordance with the engine operating conditions and the atmospheric temperature.
In the conventional carburetor system, the air-fuel ratio of the mixture that is supplied to the combustion chamber is created by the volume of the intake air and the fuel that is metered by the jet used in the respective carburetor.
Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operating under a heavy load. Carburetors that meter the fuel through the use of jets have been provided with various auxiliary devices, so that an optimum air-fuel ratio can be achieved to accommodate the constant changes in the operating conditions of the engine.
As the requirements for the engine to deliver more performance and cleaner exhaust gases increase, it becomes necessary to control the air-fuel ratio in a more precise and finely tuned manner. To accommodate this need, this model has adopted an electronically controlled fuel injection (FI) system, in place of the conventional carburetor system. This system can achieve an optimum air-fuel ratio required by the engine at all times by using a microprocessor that regulates the fuel injection volume according to the engine operating conditions detected by various sensors.
The adoption of the FI system has resulted in a highly precise fuel supply, improved engine response, better fuel economy, and reduced exhaust emissions. Furthermore, the air induction system (AI system) has been placed under computer control together with the FI system in order to realize cleaner exhaust gases.



1. Ignition coil
2. Air filter case
3. Intake air temperature sensor
4. Fuel delivery hose
5. Fuel tank
6. Fuel pump
7. Intake air pressure sensor
8. Throttle position sensor
9. Fuel injector
10. Catalytic converter
11. Crankshaft position sensor
12. Coolant temperature sensor
13. Spark plug
14. Pressure regulator
15. Battery
16. ECU
17. Fuel injection system relay
18. Engine trouble warning light
19. Lean angle sensor
20. O_2 sensor

EAS4S81004
FI SYSTEM

The fuel pump delivers fuel to the injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the injector at only 250 kPa (2.5 kg/cm^2). Accordingly, when the energizing signal from the ECU energizes the injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remains open. Therefore, the longer the length of time the injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the injector is energized (injection duration), the lesser the volume of fuel that is supplied.
The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, crankshaft position sensor, intake air pressure sensor, intake temperature sensor, coolant temperature sensor and O_2 sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions.

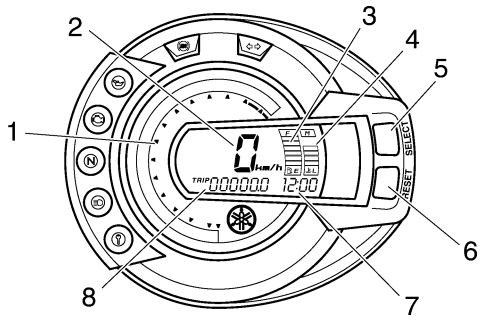


1. Fuel pump
2. Pressure regulator
3. Fuel injector
4. Throttle body
5. Intake air temperature sensor
6. Throttle position sensor
7. Intake air pressure sensor
8. ECU
9. Coolant temperature sensor
10. Crankshaft position sensor
11. O_2 sensor

A. Fuel system
B. Control system

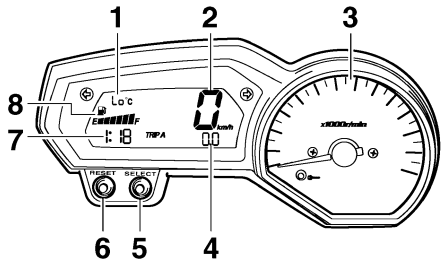
EAS4S81005
INSTRUMENT FUNCTIONS
Multi-function meter unit

A



A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
1. Tachometer
2. Speedometer
3. Fuel meter
4. Coolant temperature display
5. “SELECT” button
6. “RESET” button
7. Clock/air intake temperature/CO adjusting mode tachometer display
8. Odometer/tripmeter/fuel reserve tripmeter/ tachometer

B



B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/ FZ6-SAHG
1. Coolant temperature display/air intake temperature display
2. Speedometer
3. Tachometer
4. Odometer/tripmeter/fuel reserve tripmeter
5. “SELECT” button
6. “RESET” button
7. Clock
8. Fuel meter

EWA4S81002

⚠ WARNING

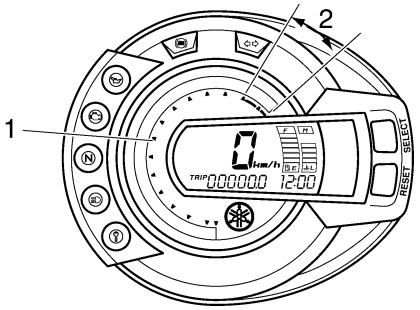
Be sure to stop the vehicle before making any setting changes to the multi-function meter unit.

The multi-function meter unit is equipped with the following:
- a speedometer (which shows the riding speed)
- a tachometer (which shows engine speed)
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled since the left segment of the fuel meter started flashing)
- a clock
- a fuel meter
- a coolant temperature display
- an air intake temperature displaya self-diagnosis device
- an LCD and tachometer brightness control mode

NOTE:
- Be sure to turn the key to “ON” before using the “SELECT” and “RESET” buttons.
- For the U.K. only: To switch the speedometer and odometer/tripmeter displays between kilometers and miles, press the “SELECT” button for at least two second. (FZ6-N/FZ6-NA/FZ6-S/FZ6-SA)
- For the U.K. only: To switch the speedometer and odometer/tripmeter displays between kilometers and miles, press the “SELECT” button for at least one second. (FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)

Tachometer

A



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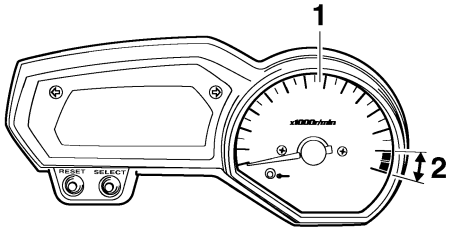

A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA

B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/ FZ6-SAHG

1. Tachometer
2. Tachometer red zone.

The electric tachometer allows the rider to monitor the engine speed and keep it within the ideal power range.
When the key is turned to “ON”, the tachometer needle will sweep once across the r/min range and then return to zero r/min in order to test the electrical circuit.

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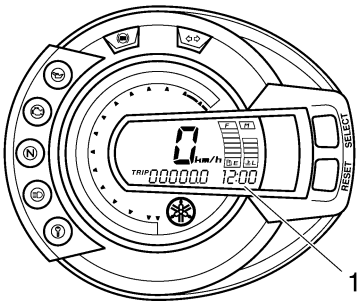
CAUTION:

Do not operate the engine in the tachometer red zone.
Red zone: 14000 r/min and above

Clock mode

A



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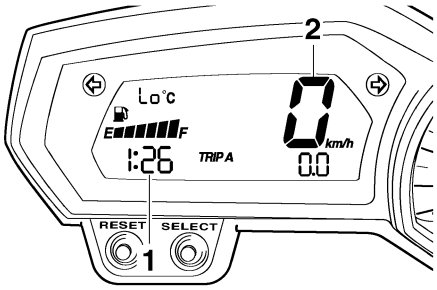
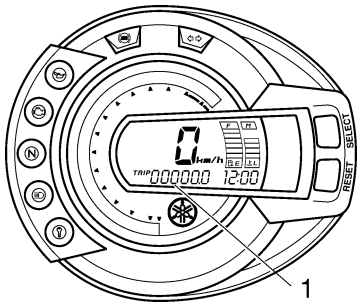


A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/ FZ6-SAHG

1. Clock
2. Speedometer

The clock is displayed when the key is turned to “ON”. In addition, the clock can be displayed for 10 seconds by pushing the “SELECT” button when the main switch is in the “OFF” or “LOCK” position.
To set the clock
1 Turn the key to “ON”.
2 Push the “SELECT” button and “RESET” button together for at least two seconds.
3 When the hour digits start flashing, push the “RESET” button to set the hours.
4 Push the “SELECT” button, and the minute digits will start flashing.
5 Push the “RESET” button to set the minutes.
6 Push the “SELECT” button and then release it to start the clock.

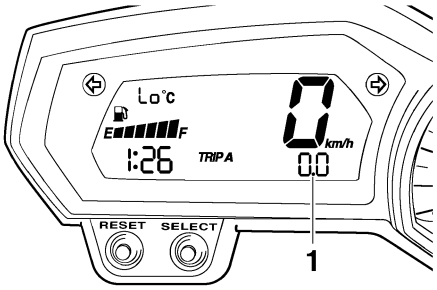
Odometer and tripmeter modes (FZ6-N/FZ6-NA/ FZ6-S/FZ6-SA)



1. Odometer/tripmeter/fuel reserve tripmeter/ tachometer

Push the “SELECT” button to switch the display between the odometer mode “ODO” and the tripmeter modes “TRIP A” and “TRIP B” in the following order:
“ODO” → “TRIP 1” → “TRIP 2” → “TRIP F” → “E” → “ODO”
When the fuel amount in the fuel tank decreases to 3.6 L (0.90 US gal) (0.79 Imp.gal), the bottom segment of the fuel meter will start flashing, and the odometer display will automatically change to the fuel reserve tripmeter mode “TRIP F” and start counting the distance traveled from that point. In that case, push the “SELECT” button to switch the display between the various tripmeter and odometer modes in the following order:
“TRIP F” → “E” → “ODO” → “TRIP 1” → “TRIP 2” → “TRIP F”
To reset a tripmeter, select it by pushing the “SELECT” button, and then push the “RESET” button for at least one second. If you do not reset the fuel reserve tripmeter manually, it will reset itself automatically and the display will return to the prior mode after refueling and traveling 5 km (3 mi).

Odometer and tripmeter modes (FZ6-NHG(W)/ FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)

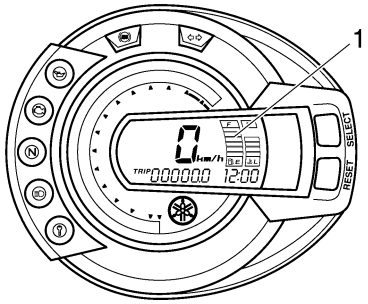


1. Odometer/tripmeter/fuel reserve tripmeter

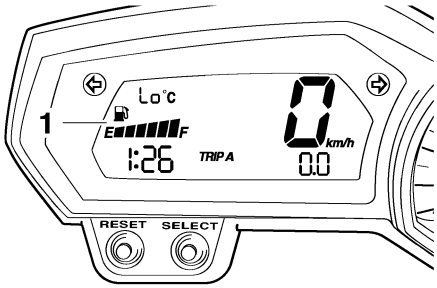
Push the “SELECT” button to switch the display between the odometer mode “ODO” and the tripmeter modes “TRIP A” and “TRIP B” in the following order:
“TRIP A” → “TRIP B” → “ODO” → “TRIP A”
When the fuel amount in the fuel tank decreases to 3.4 L (0.90 US gal) (0.75 Imp.gal), the left segment of the fuel meter will start flashing, and the odometer display will automatically change to the fuel reserve tripmeter mode “F TRIP” and start counting the distance traveled from that point. In that case, push the “SELECT” button to switch the display between the various tripmeter and odometer modes in the following order:
“F-TRIP” → “TRIP A” → “TRIP B” → “ODO” → “F-TRIP”
To reset a tripmeter, select it by pushing the “SELECT” button, and then push the “RESET” button for at least one second. If you do not reset the fuel reserve tripmeter manually, it will reset itself automatically and the display will return to the prior mode after refueling and traveling 5 km (3 mi).

Fuel meter

A



B

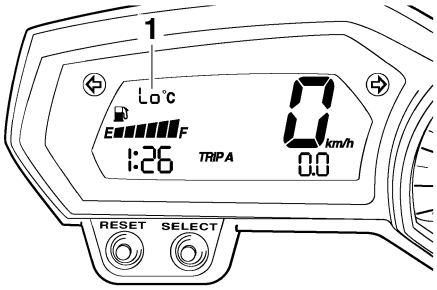


A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/ FZ6-SAHG
1. Fuel meter

The fuel meter indicates the amount of fuel in the fuel tank. The display segments of the fuel meter disappear towards “E” (Empty) as the fuel level decreases. When only one segment is left near “E”, refuel as soon as possible.

NOTE:
This fuel meter is equipped with a self-diagnosis system. If the electrical circuit is defective, the following cycle will be repeated until the malfunction is corrected: “E” (Empty), “F” (Full) and symbol “⛽” will flash eight times, then go off for approximately 3 seconds. If this occurs, have a Yamaha dealer check the electrical circuit.

Coolant temperature mode (FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)



1. Coolant temperature display

The coolant temperature display indicates the temperature of the coolant.
Push the “RESET” button to switch the coolant temperature display to the air intake temperature display.

NOTE:

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

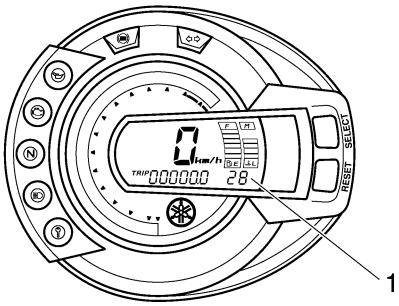
ECA4S81009

CAUTION:

Do not operate the engine if it is overheated.

Air intake temperature mode

A



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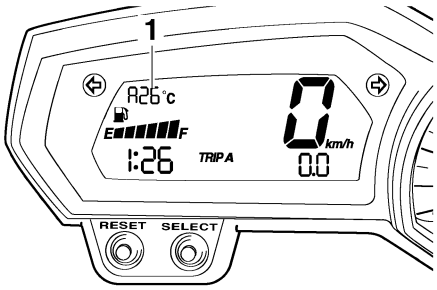


A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG
1. Air intake temperature display

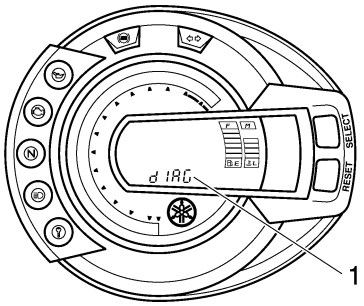
The air intake temperature display indicates the temperature of the air drawn into the air filter case. Push the “RESET” button to switch the coolant temperature display to the air intake temperature display.

NOTE:

- Even if the air intake temperature is set to be displayed, the coolant temperature warning light comes on when the engine overheats.
- When the key is turned to “ON”, the coolant temperature is automatically displayed, even if the air intake temperature was displayed prior to turning the key to “OFF”.
- When the air intake temperature display is selected, “A” is displayed for one second, and then the air intake temperature is displayed. (FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)

Self-diagnosis device

A



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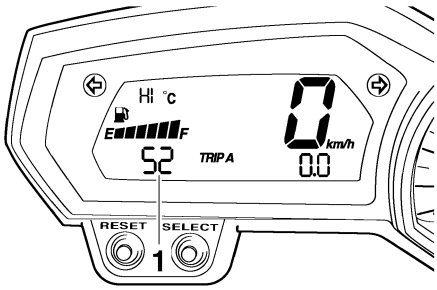


A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG
1. Error code display

This model is equipped with a self-diagnosis device for various electrical circuits.
If any of those circuits are defective, the engine trouble warning light will come on, and then the display will indicate a two-digit error code (e.g., 11, 12, 13).
This model is also equipped with a self-diagnosis device for the immobilizer system.

If any of the immobilizer system circuits are defective, the immobilizer system indicator light will flash, and then the display will indicate a two-digit error code (e.g., 51, 52, 53).

NOTE:

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

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

NOTE:

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

2 If the engine starts, turn it off and try starting the engine with the standard keys.
3 If one or both of the standard keys do not start the engine, take the vehicle, the code re-registering key and both standard keys to a Yamaha dealer and have the standard keys re-registered.

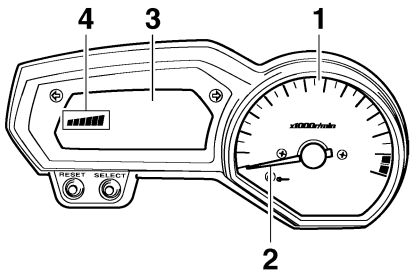
If the display indicates any error codes, note the code number, and then have a Yamaha dealer check the vehicle.

ECA4S81010

CAUTION:

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

LCD and tachometer brightness control mode (FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)



1. Tachometer panel
2. Tachometer needle
3. LCD
4. Brightness level

This function allows you to adjust the brightness of the LCD and the tachometer panel and needle to suit the outside lighting conditions.

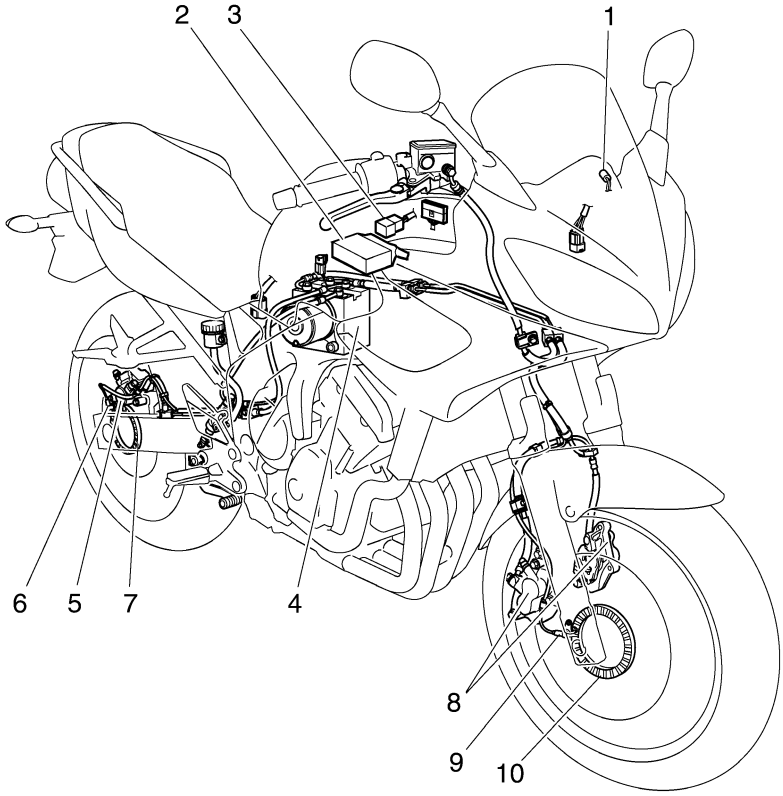
To set the brightness

1 Turn the key to “OFF”.
2 Push and hold the “SELECT” button.
3 Turn the key to “ON”, and then release the “SELECT” button after five seconds.
4 Push the “RESET” button to select the desired brightness level.
5 Push the “SELECT” button to confirm the selected brightness level. The display will return to the odometer or tripmeter mode.

EAS4S81007
OUTLINE OF THE ABS

1 The Yamaha ABS (anti-lock brake system) features a dual electronic control system, which acts on the front and rear brakes independently.
2 The ABS features a compact and lightweight design to help maintain the basic maneuverability of the vehicle.
3 The hydraulic unit, which is the main component of the ABS, is centrally located on the vehicle to increase mass centralization.

ABS layout



1. ABS warning light
2. ABS ECU (electronic control unit)
3. ABS motor relay
4. Hydraulic unit (HU)
5. Rear brake caliper
6. Rear wheel sensor
7. Rear wheel sensor rotor
8. Front brake caliper
9. Front wheel sensor
10. Front wheel sensor rotor

ABS

The operation of the Yamaha ABS brakes is the same as conventional brakes on other vehicles, with a brake lever for operating the front brake and a brake pedal for operating the rear brake.
When wheel lock is detected during emergency braking, hydraulic control is performed by the hydraulic system on the front and rear brakes independently.

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.

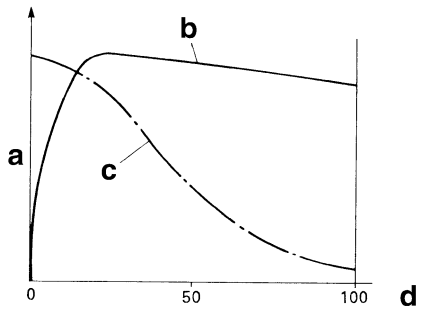
$$\text{Slip ratio} = \frac{\text{Chassis speed} - \text{Wheel speed}}{\text{Chassis speed}} \times 100\ (\%)$$

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).

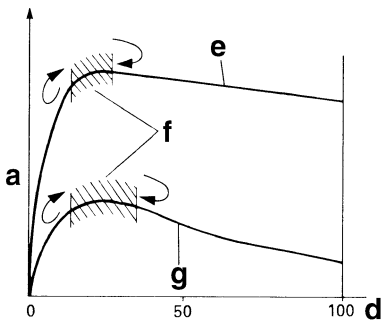
Brake force and vehicle stability

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”.

A



B



a. Friction force between the tire and road surface
b. Brake force
c. Side force
d. Slip ratio (%)
e. Less slippery road surface

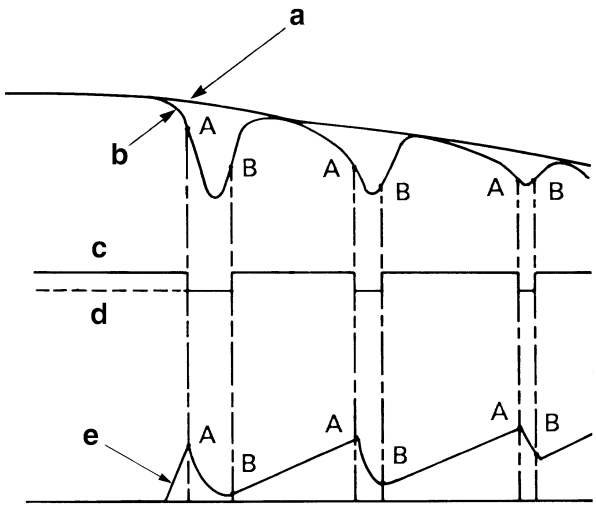
f. Controlling zone
g. Slippery road surface

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 brake fluid pressure in the brake caliper. The ABS ECU increases the pressure of the brake fluid in the brake caliper when the tendency to lock has diminished (point B in the following figure).



a. Vihicle speed
b. Wheel speed
c. Pressurized
d. Depressurized
e. Brake force

ABS operation and vehicle control

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

NOTE:

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.

EWA4S81004

⚠ WARNING

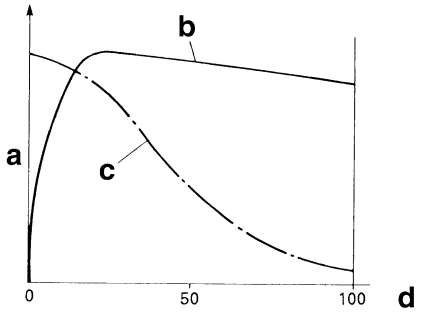
The braking of the vehicle, even in the worst case, is principally executed when the vehicle is advancing straight ahead. During a turn, sudden braking is liable to cause a loss of traction of the tires. Even in vehicles equipped with ABS, overturning of the vehicle cannot be prevented if it is braked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

The ABS functions to prevent the tendency of the wheel to lock by controlling the brake fluid 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.

EWA13870

⚠ 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.

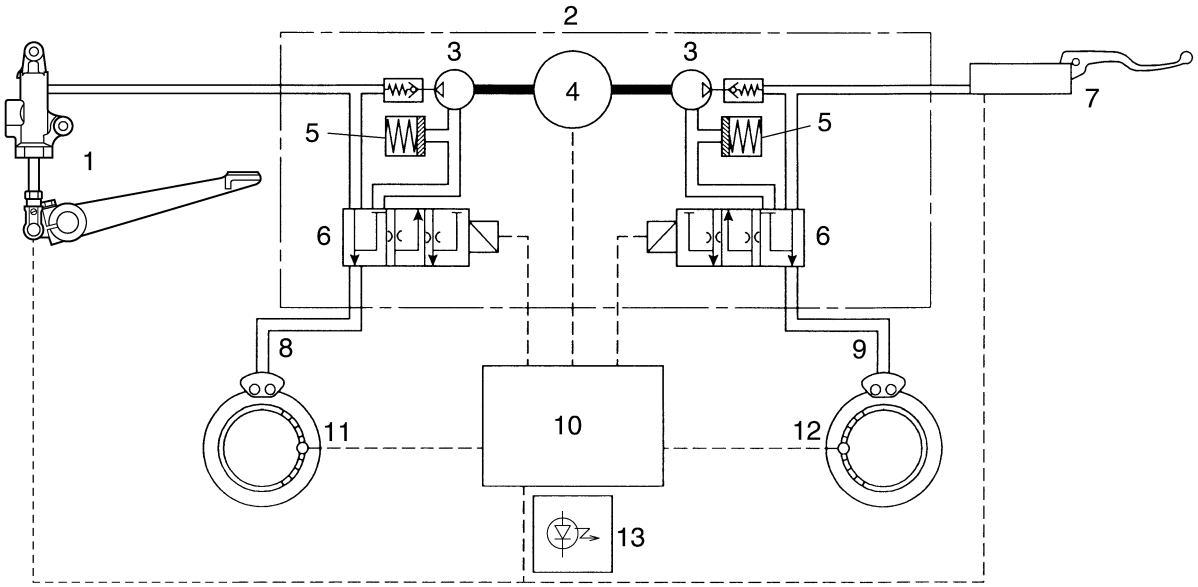


a. Friction force between the tire and road surface
b. Brake force
c. Side force
d. Slip ratio (%)

Electronic ABS features

The Yamaha ABS (anti-lock brake system) has been developed with the most advanced electronic technology.
The ABS control is processed with good response under various vehicle travel conditions.
The ABS also includes a highly developed self-diagnosis function. The ABS detects any problem condition and allows normal braking even if the ABS is not operating properly.
When this occurs, the ABS warning light on the meter assembly comes on.
The ABS stores the malfunction codes in the memory of the ABS ECU for easy problem identification and troubleshooting.

ABS block diagram



1. Rear brake master cylinder
2. Hydraulic unit
3. Hydraulic pump
4. ABS motor
5. Buffer chamber
6. Hydraulic control valve
7. Front brake master cylinder
8. Rear brake caliper
9. Front brake caliper
10. ABS ECU
11. Rear wheel sensor
12. Front wheel sensor
13. ABS warning light

EAS4S81008
ABS COMPONENT FUNCTIONS

Wheel sensors and wheel sensor rotors

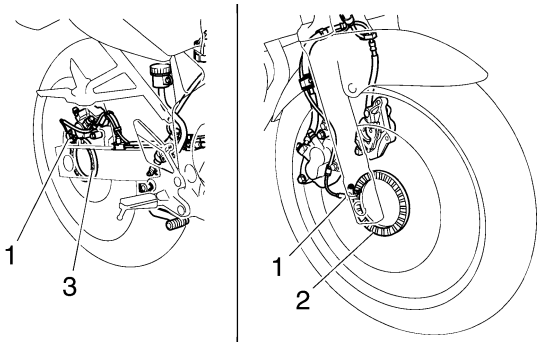
Wheel sensors “1” detect the wheel rotation speed and transmit the wheel rotation signal to the ABS ECU.

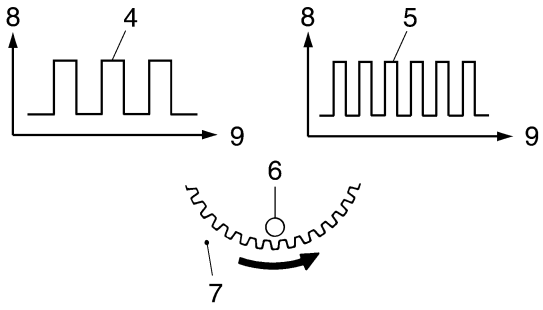
Each wheel sensor is composed of a permanent magnet and a hall IC. The wheel sensors are installed in the sensor housing for each wheel.

Sensor rotor “2” is pressed in the inner side of the front wheel hub and rotate with the wheel.

Sensor rotor “3” is install on the rear hub and rotate with the wheel. The sensor rotors have 42/front, 44/rear serrations inside 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 the voltage which is proportional to the magnetic flux density, and the generated voltage is processed for waveform shaping in the hall IC to output.

The ABS ECU calculates the wheel rotation speed by detecting the frequency of this voltage.





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

ABS warning light

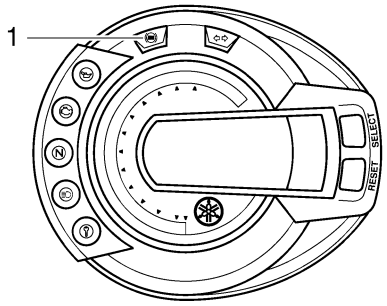
The ABS warning light "1" comes on to warn the rider if a malfunction in the ABS occurs.
When the main switch is turned to "ON", the ABS warning light comes on for 2 seconds, then goes off, so that the rider can check if the ABS warning light is disconnected and check if the ABS is operating properly.

ECA4S81005

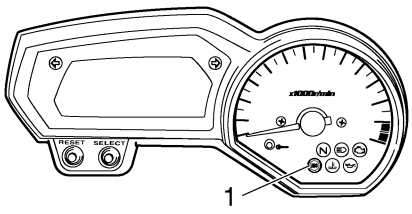
CAUTION:

If the rear wheel is raced with the vehicle on the suitable stand, the ABS warning light may flash or 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 for 2 seconds, then goes off.

A



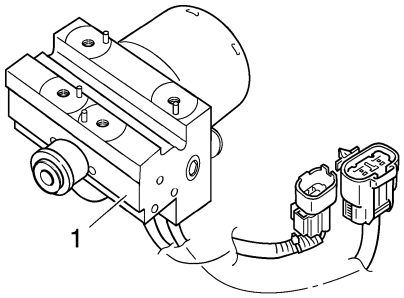
B

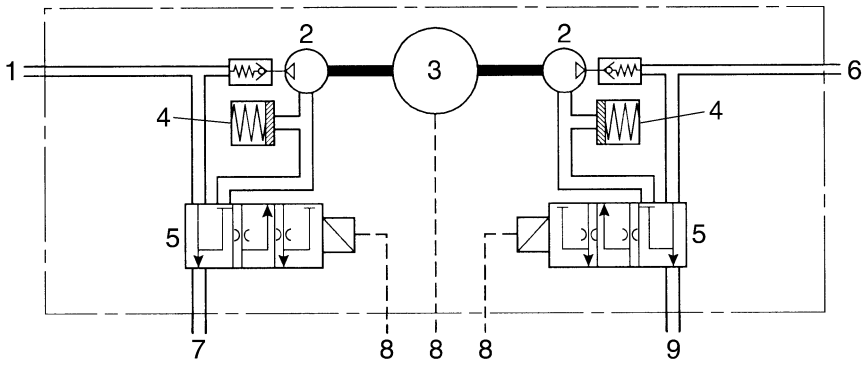


A. FZ6-NA/FZ6-SA
B. FZ6-NAHG/FZ6-SAHG

Hydraulic unit

The hydraulic unit “1” is composed of three hydraulic control valves (each with a solenoid valve and flow control valve), two buffer chambers, two hydraulic pumps, and an ABS motor. The hydraulic unit adjusts the front and rear wheel brake fluid pressure to control the wheel speed according to signals transmitted from the ABS ECU.





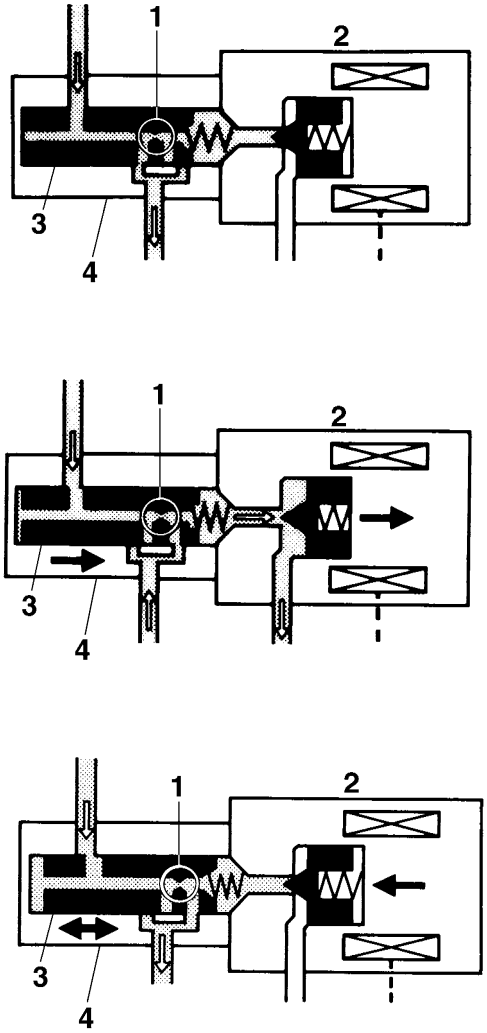
1. To the rear brake master cylinder
2. Hydraulic pump
3. ABS motor
4. Buffer chamber
5. Hydraulic control valve
6. To the front brake master cylinder
7. To the rear brake caliper
8. To the ABS ECU
9. To the front brake caliper

- Hydraulic control valve

  The hydraulic control valve is composed of a flow control valve and solenoid valve.

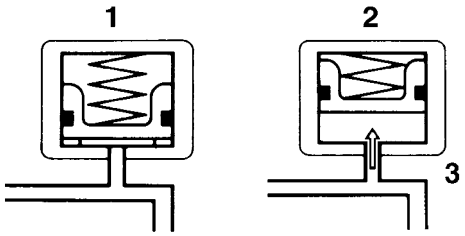
  When the ABS is activated, the flow control valve regulates the flow of brake fluid to the brake and the solenoid valve decreases and increases the brake fluid pressure.

  1. When the brakes are operated normally, the solenoid valve “2” is closed, the spool “3” of the flow control valve does not move, and the hydraulic line between the brake master cylinder and brake caliper is open.
  2. When the ABS is activated, the solenoid valve “2” is opened by the power supplied from the ABS ECU signals to decrease the brake fluid pressure and the spool “3” of the flow control valve is moved toward the solenoid valve.
  3. When the ABS ECU stops transmitting signals to decrease the brake fluid pressure, the solenoid valve “2” closes and the brake fluid is pressurized again. Pressurizing the brake fluid again, while the ABS is activated, limits the flow of the brake fluid with the movement of the flow control valve spool “3” and provides a gradual pressure increase.



1. Orifice
2. Solenoid valve
3. Spool
4. Flow control valve

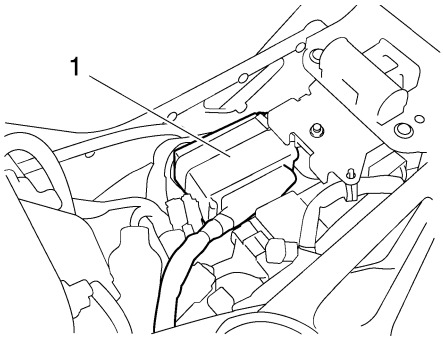
• Buffer chamber
The buffer chamber accumulates the brake fluid that is depressurized while the ABS is operating.

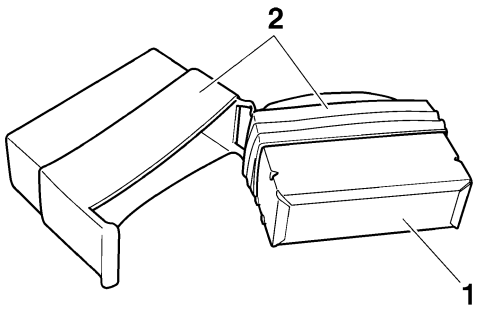


1. Buffer chamber (pressurized)
2. Buffer chamber (depressurized)
3. Raised piston

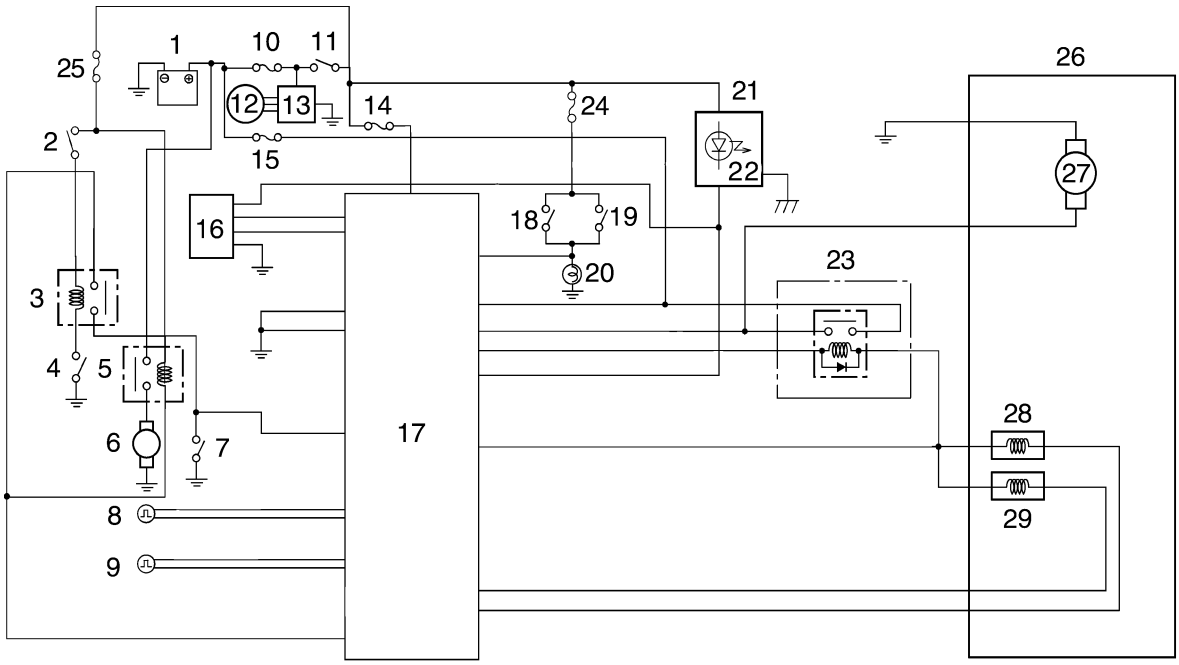
ABS ECU (electronic control unit)

The ABS ECU “1” controls the ABS and is installed inside the right cowling. To protect the ABS ECU from water damage, it is protected by a cover “2”.





As shown in the block following 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. Engine stop switch
3. Starting circuit cut-off relay
4. Sidestand switch
5. Starter relay
6. Starter motor
7. Start switch
8. Front wheel sensor
9. Rear wheel sensor
10. Main fuse
11. Main switch
12. Generator

13. Rectifier/regulator
14. ABS fuse
15. ABS motor fuse
16. ABS test coupler
17. ABS ECU
18. Rear brake light switch
19. Front brake light switch
20. Tail/brake light
21. Meter assembly
22. ABS warning light
23. ABS motor relay
24. Signal fuse
25. Ignition fuse
26. Hydraulic unit
27. ABS motor
28. Front brake solenoid
29. Rear brake solenoid

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

ABS control operation

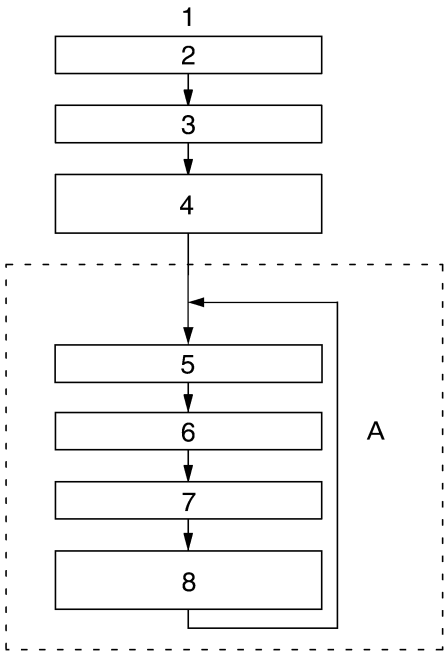
The ABS control operation performed in the ABS ECU is divided into the following two parts.

- Hydraulic control
- Self-diagnosis

These operations are performed once every 8/1000th of a second. When a failure is detected in the ABS, a malfunction code is stored in the memory of the ABS ECU for easy problem identification and troubleshooting.

NOTE:

Some types of failures are not recorded in the memory of the ABS ECU (e.g., a drop in battery voltage).

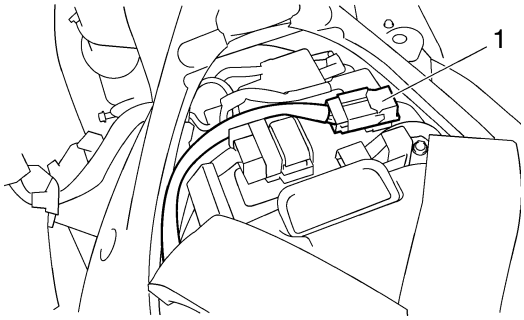


1. Software operation flow
2. Main switch “ON”
3. Initialize
4. Self-diagnosis (when static)
5. Self-diagnosis (when riding)
6. Receive signals
7. Control operation
8. Depressurize/pressurize

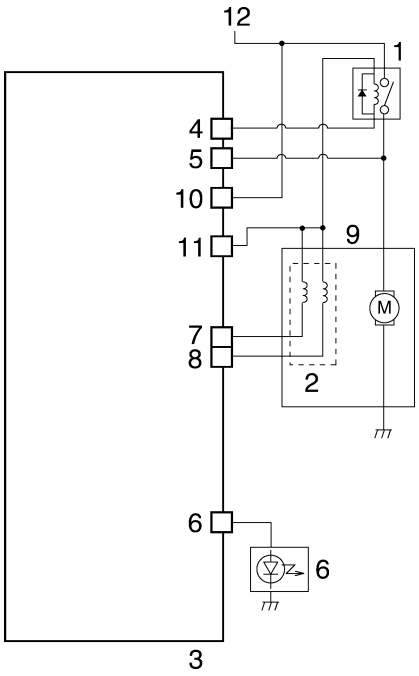
A. 8/1000th of a second

ABS motor relay

The ABS motor relay “1” controls the power supply of the hydraulic unit and is located on the battery.



Composition and operation
The ABS motor relay is activated by signals transmitted from the ABS ECU and operates simultaneously when the ABS starts to reduce the hydraulic pressure of the brake fluid. If the solenoid relay is turned off, the ABS motor relay is also deactivated and the motor stops operating if there is a malfunction.

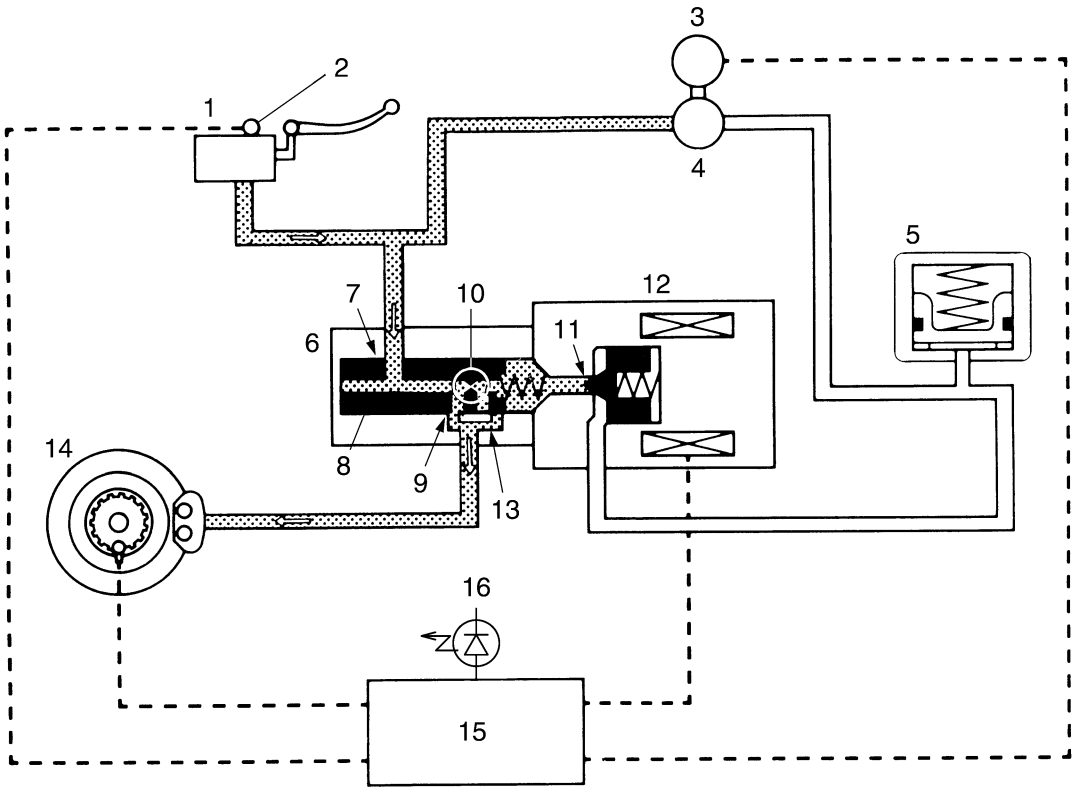


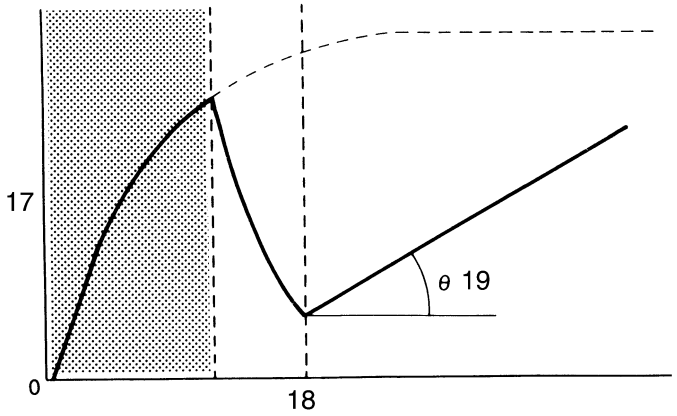
1. ABS motor relay
2. Solenoid valves
3. ABS ECU
4. Pump motor relay coil
5. Pump motor monitor
6. ABS warning light
7. Front brake solenoid
8. Rear brake solenoid
9. Hydraulic unit
10. Power supply
11. Power of solenoid
12. Power

EAS4S81009
ABS OPERATION
The ABS hydraulic circuit consists of two systems: the front wheel, and rear wheel. The following describes the front system only.

Normal braking (ABS not activated)
When the ABS is not activated, port D “11” of the solenoid valve is closed because a control signal has not been transmitted from the ABS ECU and port A “7” and port B “9” of the flow control valve are open.

Therefore, when the brake lever is squeezed, the hydraulic pressure in the brake master cylinder increases and the brake fluid is sent to the brake caliper via port A “7” and port B “9”.
At this time, the inlet and outlet check valves of the pump close the lines and brake fluid is not sent. As a result, the brake master cylinder directly pressurizes the brake caliper during normal braking.
When the brake lever is released, the brake fluid in the brake caliper returns to the brake master cylinder via port A “7” and port B “9”.





1. Brake master cylinder
2. Brake light switch
3. ABS motor
4. Hydraulic pump
5. Buffer chamber
6. Flow control valve
7. Port A
8. Spool
9. Port B
10. Orifice
11. Port D
12. Solenoid valve
13. Port C
14. Brake caliper
15. ABS ECU
16. ABS warning light

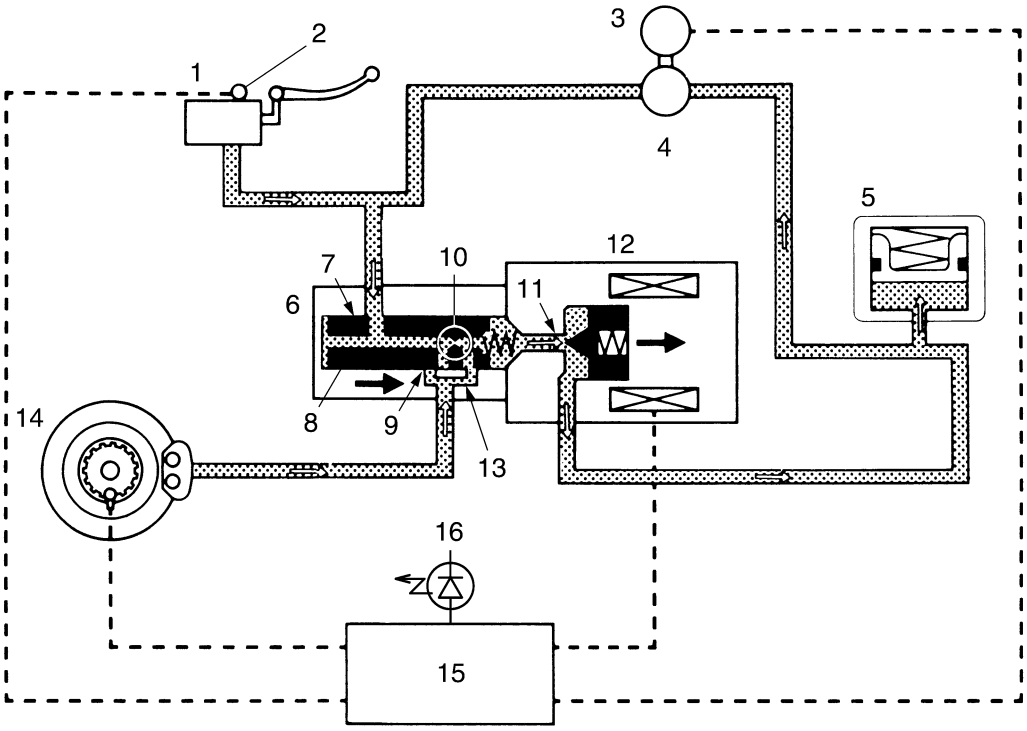
17.Brake fluid pressure
18.Time
19.Repressurizing

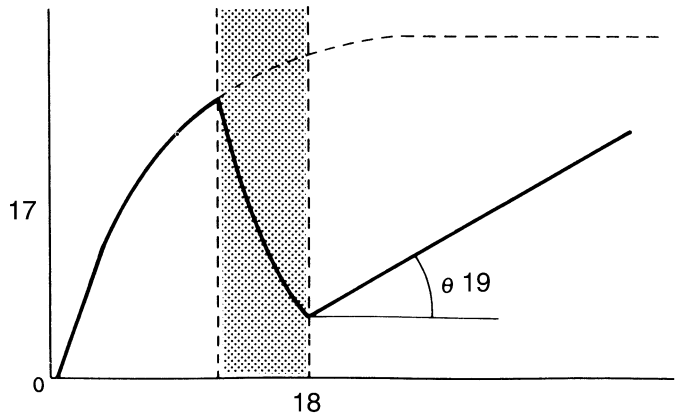
Emergency braking (ABS activated)

1.Depressurized state

When the front wheel is about to lockup, port D “11” of the solenoid valve is opened by the “depressurization” signal transmitted from the ABS ECU. When this occurs, the spool of the flow control valve compresses the return spring and closes port B “9”. Brake fluid that has entered through port A “7” is restricted by the orifice “10” and the brake fluid is sent to the brake caliper via port C “13” and port D “11”, and 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 fluid pressure pump linked to the pump motor.

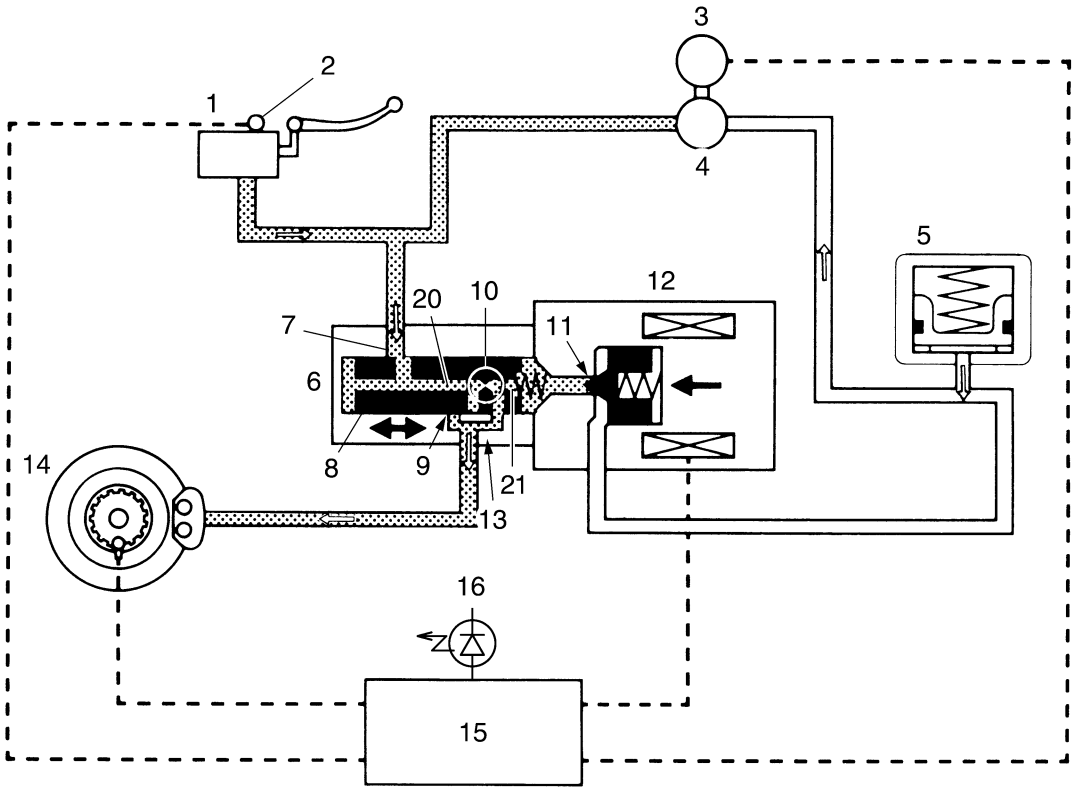


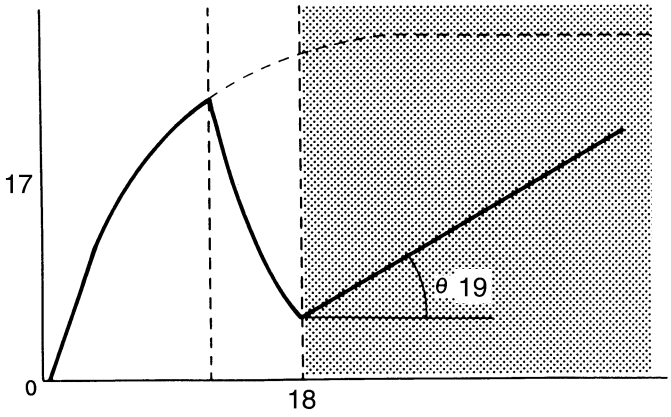


1. Brake master cylinder
2. Brake light switch
3. ABS motor
4. Hydraulic pump
5. Buffer chamber
6. Flow control valve
7. Port A
8. Spool
9. Port B
10. Orifice
11. Port D
12. Solenoid valve
13. Port C
14. Brake caliper
15. ABS ECU
16. ABS warning light
17. Brake fluid pressure
18. Time
19. Repressurizing

2. Pressurized state

Port D “11” is closed by the “pressurization” signal transmitted from the ABS ECU. Before this occurs, the spool of the flow control valve has compressed the return spring and closed port B “9”. Brake fluid that has entered through port A “7” is further restricted by the orifice “10” and the brake fluid is sent to the brake calipers via port A “7” and port C “13”. At this time, the brake is pressurized at a constant speed regardless of the brake fluid pressure level since restriction of port A “7” changes so that a constant pressure difference is maintained between chamber A “20”and chamber B “21” of the flow control valve.





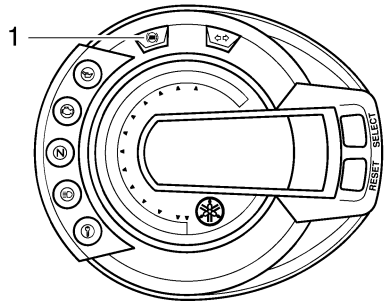
1. Brake master cylinder
2. Brake light switch
3. ABS motor
4. Hydraulic pump
5. Buffer chamber
6. Flow control valve
7. Port A
8. Spool
9. Port B
10. Orifice
11. Port D
12. Solenoid valve
13. Port C
14. Brake caliper
15. ABS ECU
16. ABS warning light
17. Brake fluid pressure
18. Time
19. Repressurizing
20. Chamber A
21. Chamber B

EAS4S81010
ABS SELF-DIAGNOSIS FUNCTION

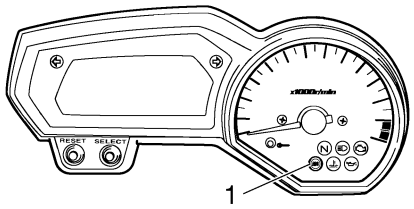
ABS warning light

The ABS warning light “1” comes on when a malfunction is detected by the ABS self-diagnosis. It is located in the meter assembly.

A



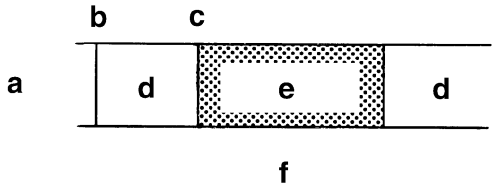
B



A. FZ6-NA/FZ6-SA
B. FZ6-NAHG/FZ6-SAHG

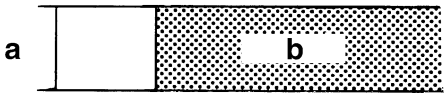
Instances when the ABS warning light comes on

1.The ABS warning light comes on when the main switch is turned to “ON”.
The ABS warning light comes on for 2 seconds while the ABS is performing a self-diagnosis, then goes off if there are no problems.



a. ABS warning light
b. Main switch “OFF”
c. Main switch “ON”
d. Goes off
e. Comes on for 2 seconds
f. Preparation

2.The ABS warning light comes on while riding.
If the ABS warning light comes on while riding, a malfunction has been detected in the ABS. The ABS hydraulic control will not be performed. The ABS will have recourse to manual braking if this occurs.

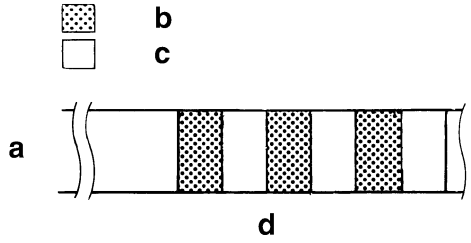


a. ABS warning light
b. Comes on

3.The ABS warning light flashes while riding.
If the ABS warning light flashes while riding, there is no problem with the function of the ABS. However, the ABS ECU input has unstable factors.
(For details, refer to "ABS TROUBLESHOOTING OUTLINE" on page 8-73.

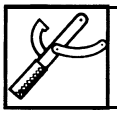
NOTE:

- The ABS warning light comes on or flashes if the vehicle is ridden with the test coupler adapter connected to the ABS test coupler.
- The ABS warning light comes on during the engine cranking when the starter switch is pressed and starting circuit cut-off relay is turned “ON”.



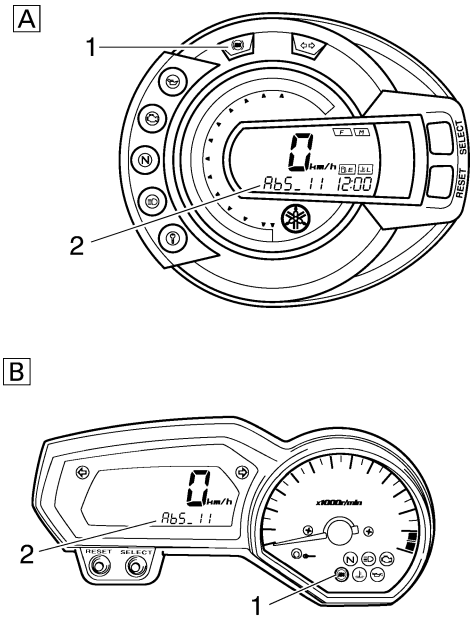
a. ABS warning light
b. Comes on
c. Goes off
d. Preparation

4. The ABS warning light "1" flashes and a malfunction code "2" is indicated on the multi-function display when the test coupler adapter "3" is connected to the ABS test coupler "4" for troubleshooting the ABS.
   The ABS test coupler can be accessed by removing the left inner panel (front cowling). When the test coupler adapter is connected to the ABS test coupler, the ABS warning light starts flashing and the multi-function display indicates all the malfunction codes recorded in the ABS ECU.

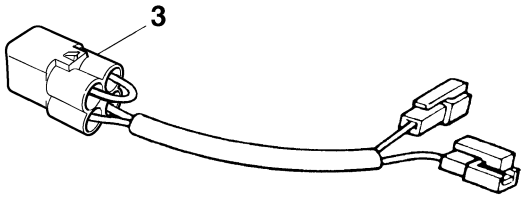


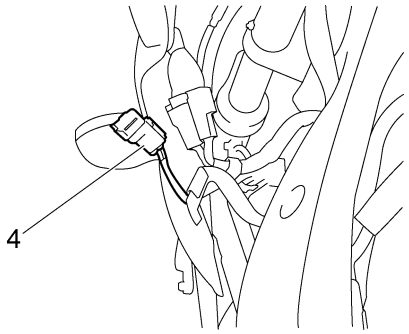
Test coupler adapter
90890-03149

NOTE:
The ABS warning light comes on or flashes if the vehicle is ridden with the test coupler adapter connected to the ABS test coupler.



A. FZ6-NA/FZ6-SA
B. FZ6-NAHG/FZ6-SAHG





- **Disgnosis indication**
  The place where the ABS diagnosis code is displayed is also used for the indication of the FI diagnosis code, odometer, trip meter and fuel trip.
  As the priority level of indication, the diagnosis code for FI is the first and the diagnosis code for ABS is the second.
  Accordingly, the ABS diagnosis code is not displayed during the diagnosis for FI.

NOTE:
It shall not be in the diagnosis mode for FI.

EAS4S81011
ABS WARNING LIGHT AND OPERATION

ABS warning light
- When the main switch is turned to “ON”, the ABS warning light comes on for 2 seconds, then goes off.
- 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 for 2 seconds, then goes off.
- The ABS operation is normal if the ABS warning light flashes.
- Even if the ABS warning light remains on and does not go off, or if it comes on after riding, conventional braking performance of the vehicle is maintained.

ABS function
- A brake system in which the hydraulic control has been performed by the ABS alerts a rider that the wheels had 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 cannnot prevent wheel lock* on slippery surface such as ice, when it is caused by engine braking, even if the ABS is activated.
- The ABS 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 does not work when the main switch is turned 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.

EAS20180
IMPORTANT INFORMATION

EAS20190
PREPARATION FOR REMOVAL AND DISASSEMBLY

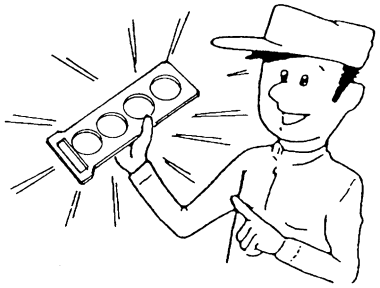
1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.

2. Use only the proper tools and cleaning equipment.
   Refer to "SPECIAL TOOLS" on page 1-31.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been “mated” through normal wear. Mated parts must always be reused or replaced as an assembly.

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

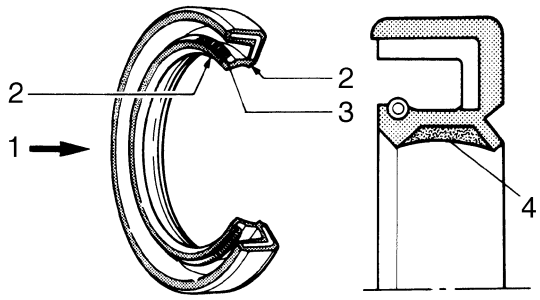
EAS20200
REPLACEMENT PARTS

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



EAS20210
GASKETS, OIL SEALS AND O-RINGS

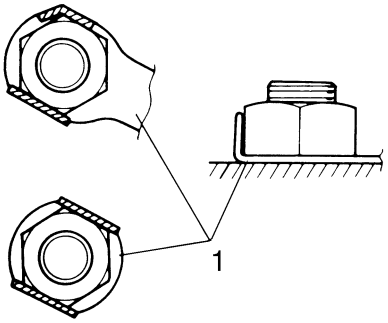
1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



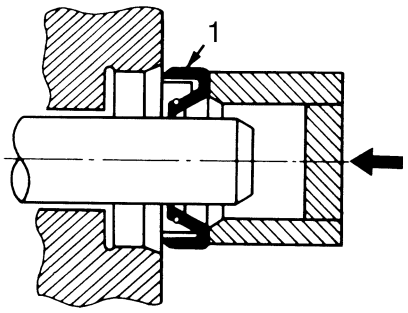
1. Oil
2. Lip
3. Spring
4. Grease

EAS20220
LOCK WASHERS/PLATES AND COTTER PINS

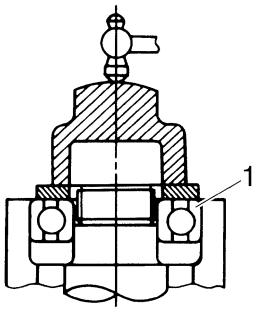
After removal, replace all lock washers/plates “1” and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.

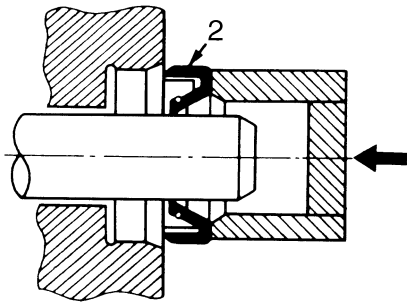


EAS20230
BEARINGS AND OIL SEALS
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals "1", lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

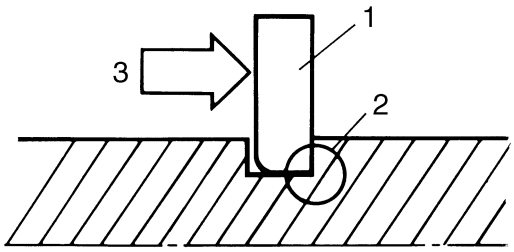


ECA13300
CAUTION:
Do not spin the bearing with compressed air because this will damage the bearing surfaces.





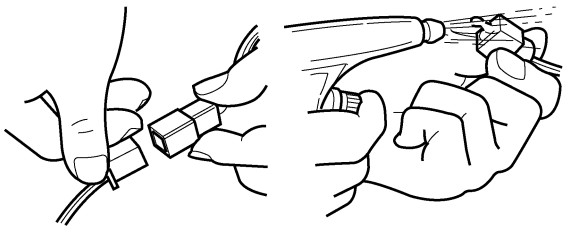
EAS20240
CIRCLIPS
Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip "1", make sure the sharp-edged corner "2" is positioned opposite the thrust "3" that the circlip receives.



EAS20250
CHECKING THE CONNECTIONS

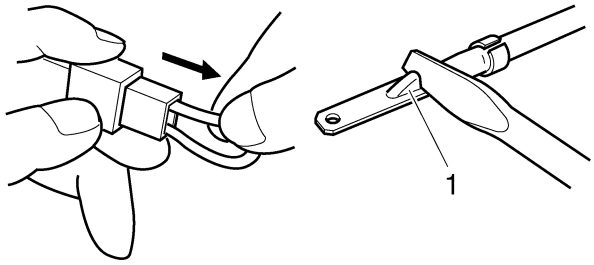
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
   - Lead
   - Coupler
   - Connector
2. Check:
   - Lead
   - Coupler
   - Connector
   Moisture → Dry with an air blower.
   Rust/stains → Connect and disconnect several times.



3. Check:
   - All connections
   Loose connection → Connect properly.

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



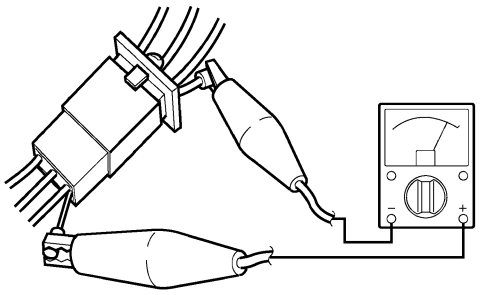
4. Connect:
   - Lead
   - Coupler
   - Connector

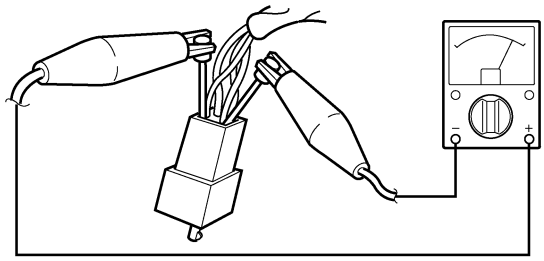
NOTE:
Make sure all connections are tight.

5. Check:
   - Continuity
   (with the pocket tester)

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

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

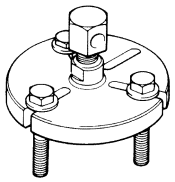
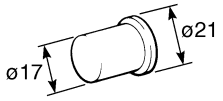
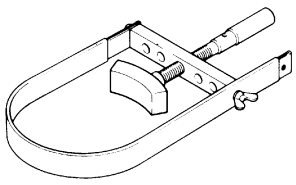
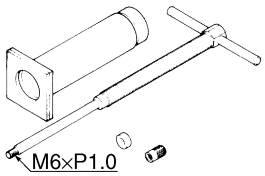
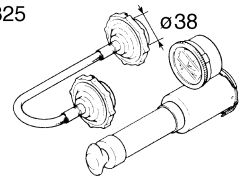
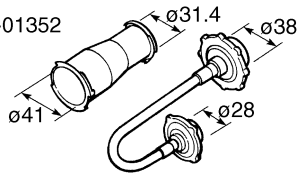


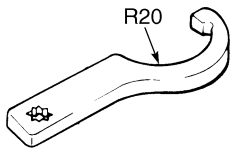
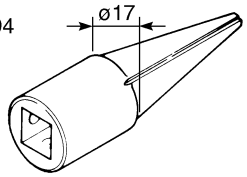
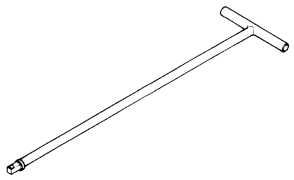
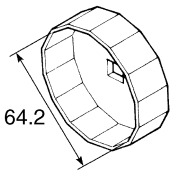
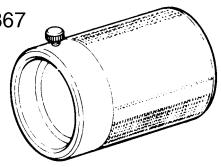
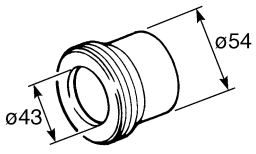
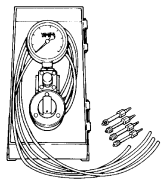
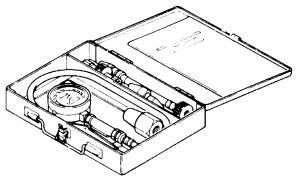


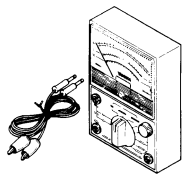
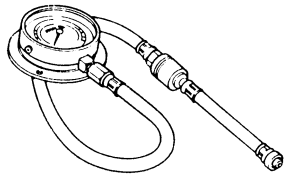
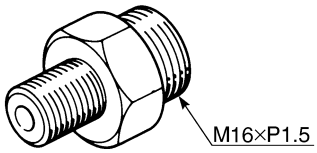
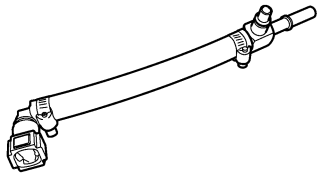
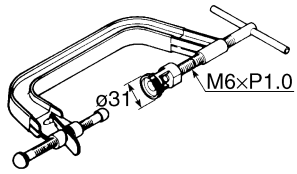
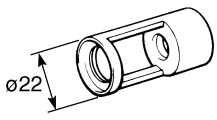
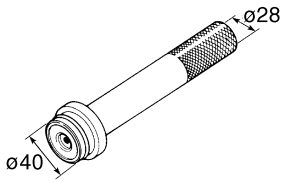
EAS20260
SPECIAL TOOLS

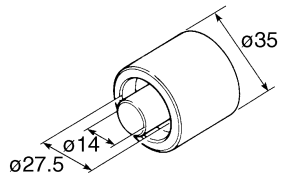
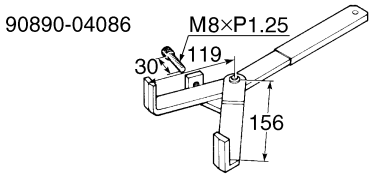
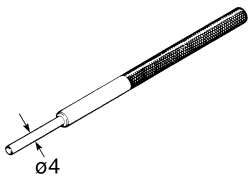
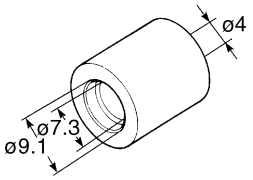
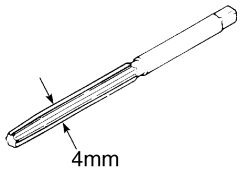
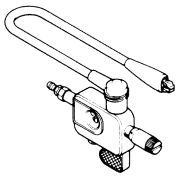
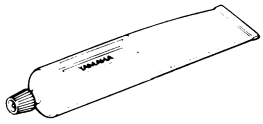
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

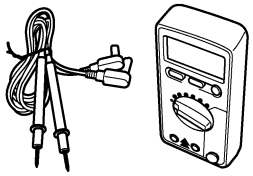
NOTE:
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part number starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Flywheel puller 90890-01362 Heavy duty puller YU-33270-B		5-30
Flywheel puller attachment 90890-04089 Crankshaft protector YM-33282	90890-04089 	5-30
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-30, 5-31, 5-32, 5-34
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304 	5-62
Radiator cap tester 90890-01325 Radiator pressure tester YU-24460-01	90890-01325 	6-3
Radiator cap tester adapter 90890-01352 Radiator pressure tester adapter YU-33984	90890-01352 	6-3

Tool name/Tool No.	Illustration	Reference pages
Steering nut wrench 90890-01403 Spanner wrench YU-33975		3-29, 4-74
Damper rod holder 90890-01294 Damping rod holder set YM-01300	90890-01294 	4-66, 4-68
T-handle 90890-01326 YM-01326		4-66, 4-68
Oil filter wrench 90890-01426 YU-38411		3-15
Fork seal driver weight 90890-01367 Replacement hammer YM-A9409-7	90890-01367 	4-68, 4-69
Fork seal driver attachment (ø43) 90890-01374 Replacement 43 mm YM-A5142-3		4-68
Vacuum gauge 90890-03094 Carburetor synchronizer YU-44456	90890-03094 	3-7
Compression gauge 90890-03081 Engine compression tester YU-33223		3-12

Tool name/Tool No.	Illustration	Reference pages
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-30, 5-38, 8-111, 8-112, 8-113, 8-114, 8-117, 8-118, 8-119, 8-120, 8-121, 8-122, 8-123, 8-124, 8-125, 8-126, 8-127, 8-128, 8-129, 8-130
Pressure gauge 90890-03153 YU-03153		3-16, 7-6
Oil pressure adapter H 90890-03139		3-16
Fuel pressure adapter 90890-03176 YM-03176		7-6
Valve spring compressor 90890-04019 YM-04019		5-21, 5-27
Valve spring compressor attachment 90890-04108 Valve spring compressor adapter 22 mm YM-04108		5-21, 5-27
Middle driven shaft bearing driver 90890-04058 Bearing driver 40 mm YM-04058		6-12

Tool name/Tool No.	Illustration	Reference pages
Mechanical seal installer 90890-04078 Water pump seal installer YM-33221-A		6-12
Universal clutch holder 90890-04086 YM-91042		5-49, 5-51
Valve lapper 90890-04101 Valve lapping tool YM-A8998		3-5
Valve guide remover (ø4) 90890-04111 Valve guide remover (4.0 mm) YM-04111		5-23
Valve guide installer (ø4) 90890-04112 Valve guide installer (4.0 mm) YM-04112		5-23
Valve guide reamer (ø4) 90890-04113 Valve guide reamer (4.0 mm) YM-04113		5-23
Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487		8-122
Yamaha bond No. 1215 (Three bond No.1215®) 90890-85505		5-32, 5-35, 5-58, 6-12

Tool name/Tool No.	Illustration	Reference pages
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		7-7
Test coupler adapter 90890-03149		1-25, 4-57, 4-58

SPECIFICATIONS

2

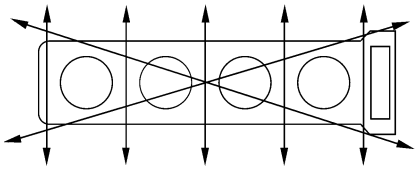
EAS20280
GENERAL SPECIFICATIONS

Model	
Model	1B3D (Europe) FZ6-N (Standard) 5S31 (Europe) FZ6-NA (ABS) 5S51 (Europe) FZ6-NHG (High-grade) 5S52 (Aus) FZ6-NHGW (High-grade) 5S41 (Europe) FZ6-NAHG (High-grade+ABS) 5VXL (Europe) FZ6-S (Standard) 4P53 (Europe) FZ6-SA (ABS) 4P54 (Europe) FZ6-SA (ABS) 4S81 (Europe) FZ6-SHG (High-grade) 4S85 (Aus) FZ6-SHGW (High-grade) 5S21 (Europe) FZ6-SAHG (High-grade+ABS)
Dimensions	
Overall length	2095 mm (82.5 in)
Overall width	750 mm (29.5 in) (FZ6-S/FZ6-SA/FZ6-SHG(W)/FZ6-SAHG) 755 mm (29.7 in) (FZ6-N/FZ6-NA/FZ6-NHG(W)/FZ6-NAHG)
Overall height	1085 mm (42.7 in) (FZ6-N/FZ6-NA/FZ6-NHG(W)/FZ6-NAHG) 1210 mm (47.6 in) (FZ6-SHG(W)/FZ6-SAHG) 1215 mm (47.8 in) (FZ6-S/FZ6-SA)
Seat height	795 mm (31.3 in)
Wheelbase	1440 mm (56.7 in)
Ground clearance	145 mm (5.71 in)
Minimum turning radius	2800 mm (110.2 in)
Weight	
With oil and fuel	201.0 kg (443 lb) (FZ6-N/FZ6-NHG(W)) 206.0 kg (454 lb) (FZ6-NA/FZ6-NAHG) 207.0 kg (456 lb) (FZ6-S/FZ6-SHG(W)) 212.0 kg (467 lb) (FZ6-SA/FZ6-SAHG)
Maximum load	185 kg (408 lb) (FZ6-SA/FZ6-SAHG) 190 kg (419 lb) (FZ6-S/FZ6-SHG(W)) 191 kg (421 lb) (FZ6-NA/FZ6-NAHG) 196 kg (432 lb) (FZ6-N/FZ6-NHG(W))

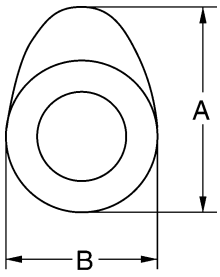
EAS20290
ENGINE SPECIFICATIONS

Engine	
Engine type	Liquid cooled 4-stroke, DOHC
Displacement	600.0 cm³
Cylinder arrangement	Forward-inclined parallel 4-cylinder
Bore × stroke	65.5 × 44.5 mm (2.58 × 1.75 in)
Compression ratio	12.20 :1
Standard compression pressure (at sea level)	1550 kPa/400 r/min (220.5 psi/400 r/min) (15.5 kgf/cm²/400 r/min)
Minimum–maximum	1350–1736 kPa (192.0–246.9 psi) (13.5–17.4 kgf/cm²)
Starting system	Electric starter
Fuel	
Recommended fuel	Regular unleaded gasoline only Unleaded gasoline only (AUS)
Fuel tank capacity	19.4 L (5.13 US gal) (4.27 Imp.gal)
Fuel reserve amount	3.6 L (0.95 US gal) (0.79 Imp.gal)
Engine oil	
Lubrication system	Wet sump
Type	SAE10W30, SAE10W40, SAE15W40, SAE20W40 or SAE20W50
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Engine oil quantity	
Total amount	3.40 L (3.59 US qt) (2.99 Imp.qt)
Without oil filter cartridge replacement	2.50 L (2.64 US qt) (2.20 Imp.qt)
With oil filter cartridge replacement	2.80 L (2.96 US qt) (2.46 Imp.qt)
Oil pressure	240 kPa at 6,600 r/min (2.4 kg/cm² at 6,600 r/min) (2.4 bar at 6,600 r/min) (34.1 psi at 6,600 r/min)
Oil filter	
Oil filter type	Formed
Oil pump	
Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	0.030–0.090 mm (0.0012–0.0035 in)
Limit	0.15 mm (0.0059 in)
Outer-rotor-to-oil-pump-housing clearance	0.030–0.080 mm (0.0012–0.0032 in)
Limit	0.150 mm (0.0059 in)
Bypass valve opening pressure	80.0–120.0 kPa (11.6–17.4 psi) (0.80–1.20 kgf/cm²)
Relief valve operating pressure	450.0–550.0 kPa (65.3–79.8 psi) (4.50–5.50 kgf/cm²)
Pressure check location	Main gallery

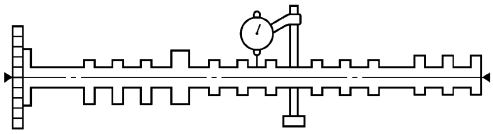
Cooling system	
Radiator capacity (including all routes)	2.00 L (2.11 US qt) (1.76 Imp.qt)
Radiator capacity	0.60 L (0.63 US qt) (0.53 Imp.qt)
Coolant reservoir capacity (up to the maximum level mark)	0.25 L (0.26 US qt) (0.22 Imp.qt)
Radiator cap opening pressure	93–123 kPa (13.2–17.5 psi) (0.93–1.23 kgf/cm²)
Radiator core	
Width	300.0 mm (11.81 in)
Height	188.0 mm (7.40 in)
Depth	24.0 mm (0.94 in)
Water pump	
Water pump type	Single suction centrifugal pump
Reduction ratio	86/44 × 31/31 (1.955)
Max. impeller shaft tilt	0.15 mm (0.006 in)
Spark plug (s)	
Manufacturer/model	NGK/CR9EK
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
Cylinder head	
Volume	10.33–10.93 cm³ (0.63–0.67 cu.in)
Warpage limit	0.05 mm (0.0020 in)



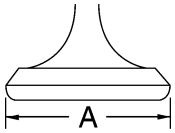
Camshaft	
Drive system	Chain drive (right)
Camshaft cap inside diameter	23.008–23.029 mm (0.9058–0.9067 in)
Camshaft journal diameter	22.967–22.980 mm (0.9042–0.9047 in)
Camshaft-journal-to-camshaft-cap clearance	0.028–0.062 mm (0.0011–0.0024 in)
Limit	0.080 mm (0.0032 in)
Camshaft lobe dimensions	
Intake A	32.450–32.550 mm (1.2776–1.2815 in)
Limit	32.400 mm (1.2756 in)
Intake B	24.950–25.050 mm (0.9823–0.9862 in)
Limit	24.900 mm (0.9803 in)
Exhaust A	32.450–32.550 mm (1.2776–1.2815 in)
Limit	32.400 mm (1.2756 in)
Exhaust B	24.950–25.050 mm (0.9823–0.9862 in)
Limit	24.900 mm (0.9803 in)



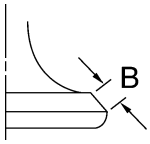
Camshaft runout limit	0.060 mm (0.0024 in)



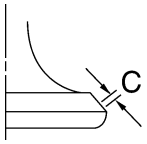
Timing chain	
Model/number of links	92RH2015/120
Tensioning system	Automatic
Valve clearance (cold)	
Intake	0.13–0.20 mm (0.0051–0.0079 in)
Exhaust	0.23–0.30 mm (0.0091–0.0118 in)
Valve dimensions	
Valve head diameter A (intake)	24.90–25.10 mm (0.9803–0.9882 in)
Valve head diameter A (exhaust)	21.90–22.10 mm (0.8622–0.8701 in)



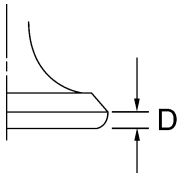
Valve face width B (intake)	1.140–1.980 mm (0.0449–0.0780 in)
Valve face width B (exhaust)	1.140–1.980 mm (0.0449–0.0780 in)



Valve seat width C (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)
Valve seat width C (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)

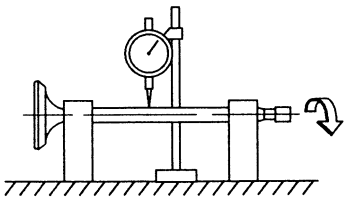


Valve margin thickness D (intake)	0.60–0.80 mm (0.0236–0.0315 in)
Limit	0.5 mm (0.02 in)
Valve margin thickness D (exhaust)	0.60–0.80 mm (0.0236–0.0315 in)
Limit	0.5 mm (0.02 in)



Valve stem diameter (intake)	3.975–3.990 mm (0.1565–0.1571 in)
Limit	3.950 mm (0.1555 in)
Valve stem diameter (exhaust)	3.960–3.975 mm (0.1559–0.1565 in)
Limit	3.935 mm (0.1549 in)
Valve guide inside diameter (intake)	4.000–4.012 mm (0.1575–0.1580 in)
Limit	4.042 mm (0.1591 in)
Valve guide inside diameter (exhaust)	4.000–4.012 mm (0.1575–0.1580 in)
Limit	4.042 mm (0.1591 in)

Valve-stem-to-valve-guide clearance (intake)	0.010–0.037 mm (0.0004–0.0015 in)
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)	0.025–0.052 mm (0.0010–0.0020 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.040 mm (0.0016 in)

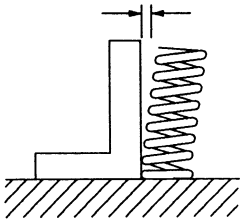


Cylinder head valve seat width (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)
Cylinder head valve seat width (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)

Valve spring

Inner spring

Free length (intake)	37.04 mm (1.46 in)
Limit	35.20 mm (1.39 in)
Free length (exhaust)	41.79 mm (1.65 in)
Limit	39.70 mm (1.56 in)
Installed length (intake)	30.02 mm (1.18 in)
Installed length (exhaust)	36.12 mm (1.42 in)
Spring rate K1 (intake)	10.50 N/mm (59.96 lb/in) (1.07 kgf/mm)
Spring rate K2 (intake)	17.00 N/mm (97.07 lb/in) (1.73 kgf/mm)
Spring rate K1 (exhaust)	30.26 N/mm (172.78 lb/in) (3.09 kgf/mm)
Spring rate K2 (exhaust)	49.53 N/mm (282.82 lb/in) (5.05 kgf/mm)
Installed compression spring force (intake)	69–79 N (15.51–17.76 lbf) (7.04–8.06 kgf)
Installed compression spring force (exhaust)	160–184 N (35.97–41.36 lbf) (16.32–18.76 kgf)
Spring tilt (intake)	2.5 °/1.6 mm (0.06 in)
Spring tilt (exhaust)	2.5 °/1.8 mm (0.07 in)



Winding direction (intake)	Counter clockwise
Winding direction (exhaust)	Clockwise

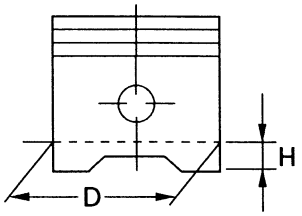
Outer spring

Free length (intake)	38.40 mm (1.51 in)
Limit	36.50 mm (1.44 in)
Installed length (intake)	32.52 mm (1.28 in)
Spring rate K1 (intake)	20.80 N/mm (118.77 lb/in) (2.12 kgf/mm)
Spring rate K2 (intake)	33.30 N/mm (190.14 lb/in) (3.40 kgf/mm)
Installed compression spring force (intake)	114–132 N (25.63–29.67 lbf) (11.62–13.46 kgf)
Spring tilt (intake)	2.5 °/1.7 mm (0.07 in)
Winding direction (intake)	Clockwise

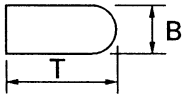
Cylinder

Bore	65.500–65.510 mm (2.5787–2.5791 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.050 mm (0.0020 in)

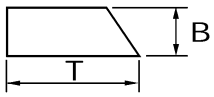
Piston	
Piston-to-cylinder clearance	0.010–0.035 mm (0.0004–0.0014 in)
Limit	0.05 mm (0.0020 in)
Diameter D	65.475–65.490 mm (2.5778–2.5783 in)
Height H	4.0 mm (0.16 in)



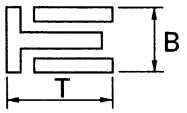
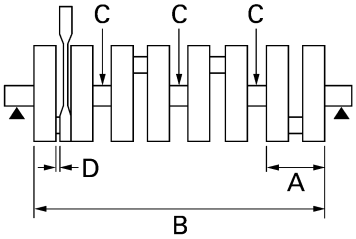
Offset	0.50 mm (0.0197 in)
Offset direction	Intake side
Piston pin bore inside diameter	16.002–16.013 mm (0.6300–0.6304 in)
Limit	16.043 mm (0.6316 in)
Piston pin outside diameter	15.991–16.000 mm (0.6296–0.6299 in)
Limit	15.971 mm (0.6288 in)
Piston-pin-to-piston-pin-bore clearance	0.002–0.022 mm (0.0001–0.0009 in)
Limit	0.072 mm (0.0028 in)
Piston ring	
Top ring	
Ring type	Barrel
Dimensions (B × T)	0.90 × 2.45 mm (0.04 × 0.10 in)



End gap (installed)	0.25–0.35 mm (0.0098–0.0138 in)
Limit	0.60 mm (0.0236 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
Limit	0.115 mm (0.0045 in)
2nd ring	
Ring type	Taper
Dimensions (B × T)	0.80 × 2.50 mm (0.03 × 0.10 in)



End gap (installed)	0.70–0.80 mm (0.0276–0.0315 in)
Limit	1.15 mm (0.0453 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
Limit	0.125 mm (0.0049 in)

Oil ring	
Dimensions (B × T)	1.50 × 2.00 mm (0.06 × 0.08 in)
	
End gap (installed)	0.10–0.35 mm (0.0039–0.0138 in)
Connecting rod	
Oil clearance (using plastigauge®)	0.028–0.052 mm (0.0011–0.0020 in)
Limit	0.08 mm (0.0032 in)
Bearing color code	1.Blue 2.Black 3.Brown 4.Green
Crankshaft	
Width A	51.850–52.550 mm (2.04–2.06 in)
Width B	268.80–270.00 mm (10.58–10.63 in)
Runout limit C	0.030 mm (0.0012 in)
Big end side clearance D	0.160–0.262 mm (0.0063–0.0103 in)
	
Big end radial clearance	0.028–0.052 mm (0.0011–0.0020 in)
Small end free play	0.32–0.50 mm (0.01–0.02 in)
Journal oil clearance (using plastigauge®)	0.034–0.058 mm (0.0013–0.0023 in)
Limit	0.10 mm (0.0039 in)
Bearing color code	0.White 1.Black 2.Brown 3.Green 4.Yellow
Clutch	
Clutch type	Wet, multiple-disc
Clutch release method	Outer pull, rack and pinion pull
Clutch release method operation	Cable operation
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Friction plate thickness	2.92–3.08 mm (0.115–0.121 in)
Wear limit	2.80 mm (0.1102 in)
Plate quantity	6 pcs
Friction plate thickness	2.92–3.08 mm (0.115–0.121 in)
Plate quantity	2 pcs
Clutch plate thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	7 pcs
Warpage limit	0.10 mm (0.0039 in)
Clutch plate thickness	2.20–2.40 mm (0.087–0.094 in)
Plate quantity	1 pcs
Warpage limit	0.10 mm (0.0039 in)
Clutch spring free length	55.00 mm (2.17 in)
Limit	52.30 mm (2.06 in)
Spring quantity	6 pcs

Transmission	
Transmission type	Constant mesh 6-speed
Primary reduction system	Spur gear
Primary reduction ratio	86/44 (1.955)
Secondary reduction system	Chain drive
Secondary reduction ratio	46/16 (2.875)
Operation	Left foot operation
Gear ratio	
1st	37/13 (2.846)
2nd	37/19 (1.947)
3rd	28/18 (1.556)
4th	32/24 (1.333)
5th	25/21 (1.190)
6th	26/24 (1.083)
Main axle runout limit	0.02 mm (0.0008 in)
Drive axle runout limit	0.02 mm (0.0008 in)
Shifting mechanism	
Shift mechanism type	Shift drum
Shift fork guide bar bending limit	0.050 mm (0.0020 in)
Shift fork thickness	5.76–5.89 mm (0.2268–0.2319 in)
Air filter	
Air filter element	Oil-coated paper element
Fuel pump	
Pump type	Electrical
Model/manufacturer	5VX/DENSO
Maximum consumption amperage	5.5 A
Output pressure	250.0 kPa (36.3 psi) (2.50 kgf/cm^2)
Fuel injector	
Model/quantity	0290 x 4
Manufacturer	DENSO
Throttle body	
Type/quantity	36EIDW-B1/1 (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/FZ6-NAHG) 36EIDW-B7/1 (FZ6-S/FZ6-SA (4P53)/FZ6-N/FZ6-NA) 36EIDW-B10/1 (FZ6-SA (4P54))
Manufacturer	MIKUNI
ID mark	4P54 00 (FZ6-SA (4P54)) 5VX1 03 (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/FZ6-NAHG) 5S31 00 (FZ6-S/FZ6-SA (4P53)/FZ6-N/FZ6-NA)
Throttle valve size	#50
Throttle position sensor	
Resistance	4.0–6.0 kΩ
Output voltage (at idle)	0.63–0.73 V Adjusted by tachometer
Idling condition	
Engine idling speed	1250–1350 r/min
Intake vacuum	29.0 kPa (8.6 inHg) (218 mmHg)
Water temperature	95.0–105.0 °C (203.00–221.00 °F)
Oil temperature	75.0–85.0 °C (167.00–185.00 °F)
Throttle cable free play	3.0–5.0 mm (0.12–0.20 in)

EAS20300
CHASSIS SPECIFICATIONS

Chassis	
Frame type	Diamond
Caster angle	25.00 °
Trail	97.5 mm (3.84 in)
Front wheel	
Wheel type	Cast wheel
Rim size	17M/C x MT3.50
Rim material	Aluminum
Wheel travel	130.0 mm (5.12 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Rear wheel	
Wheel type	Cast wheel
Rim size	17M/C x MT5.50
Rim material	Aluminum
Wheel travel	130.0 mm (5.12 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Front tire	
Type	Tubeless
Size	120/70 ZR17M/C (58W)
Manufacturer/model	BRIDGESTONE/BT020F GG
Manufacturer/model	DUNLOP/D252F
Wear limit (front)	0.8 mm (0.03 in)
Rear tire	
Type	Tubeless
Size	180/55 ZR17M/C (73W)
Manufacturer/model	BRIDGESTONE/BT020R GG
Manufacturer/model	DUNLOP/D252
Wear limit (rear)	0.8 mm (0.03 in)
Tire air pressure (measured on cold tires)	
Loading condition	0–90 kg (0–198 lb)
Front	225 kPa (33 psi) (2.25 kgf/cm²) (2.25 bar)
Rear	250 kPa (36 psi) (2.50 kgf/cm²) (2.50 bar)
Loading condition	90–185 kg (198–408 lb) (FZ6-SA/FZ6-SAHG) 90–190 kg (198–419 lb) (FZ6-S/FZ6-SHG(W)) 90–191 kg (198–421 lb) (FZ6-NA/FZ6-NAHG) 90–196 kg (198–432 lb) (FZ6-N/FZ6-NHG(W))
Front	250 kPa (36 psi) (2.50 kgf/cm²) (2.50 bar)
Rear	290 kPa (42 psi) (2.90 kgf/cm²) (2.90 bar)
High-speed riding	
Front	225 kPa (33 psi) (2.25 kgf/cm²) (2.25 bar)
Rear	250 kPa (36 psi) (2.50 kgf/cm²) (2.50 bar)
Front brake	
Type	Dual disc brake
Operation	Right hand operation
Front disc brake	
Disc outside diameter × thickness	298.0 × 5.0 mm (11.73 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc deflection limit	0.10 mm (0.0039 in)
Brake pad lining thickness (inner)	4.5 mm (0.18 in) (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/FZ6-NAHG)

	6.0 mm (0.24 in) (FZ6-S/FZ6-SA/FZ6-N/FZ6-NA)
Limit	0.5 mm (0.02 in) (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/FZ6-NAHG) 0.8 mm (0.03 in) (FZ6-S/FZ6-SA/FZ6-N/FZ6-NA)
Brake pad lining thickness (outer)	4.5 mm (0.18 in) (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/FZ6-NAHG) 6.0 mm (0.24 in) (FZ6-S/FZ6-SA/FZ6-N/FZ6-NA)
Limit	0.5 mm (0.02 in) (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/FZ6-NAHG) 0.8 mm (0.03 in) (FZ6-S/FZ6-SA/FZ6-N/FZ6-NA)
Master cylinder inside diameter	16.00 mm (0.63 in)
Caliper cylinder inside diameter	30.20 mm (1.19 in)
Caliper cylinder inside diameter	27.00 mm (1.06 in) (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/FZ6-NAHG) 25.4 mm (1.00 in) (FZ6-S/FZ6-SA/FZ6-N/FZ6-NA)
Recommended fluid	DOT 4
Rear brake	
Type	Single disc brake
Operation	Right foot operation
Brake pedal position (below the bottom of the forest bracket)	25.8 mm (1.02 in)
Rear disc brake	
Disc outside diameter × thickness	245.0 × 5.0 mm (9.65 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	6.0 mm (0.24 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	6.0 mm (0.24 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	38.10 mm (1.50 in)
Recommended fluid	DOT 4
Steering	
Steering bearing type	Angular bearing
Lock to lock angle (left)	35.0 °
Lock to lock angle (right)	35.0 °
Front suspension	
Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	130.0 mm (5.12 in)
Fork spring free length	354.0 mm (13.94 in)
Limit	347 mm (13.56 in)
Collar length	131.5 mm (5.18 in)
Installed length	347.0 mm (13.66 in)
Spring rate K1	7.40 N/mm (42.25 lb/in) (0.75 kgf/mm)
Spring rate K2	11.80 N/mm (67.38 lb/in) (1.20 kgf/mm)
Spring stroke K1	0.0–70.0 mm (0.00–2.76 in)
Spring stroke K2	70.0–130.0 mm (2.76–5.12 in)
Inner tube outer diameter	43.0 mm (1.69 in)
Inner tube bending limit	0.2 mm (0.01 in)
Optional spring available	No
Recommended oil	Suspension oil 01 or equivalent
Quantity	467.0 cm^3 (15.79 US oz) (16.47 Imp.oz)
Level	134.0 mm (5.28 in)

Rear suspension	
Type	Swingarm (monocross)
Spring/shock absorber type	Coil spring/gas-oil damper
Rear shock absorber assembly travel	50.0 mm (1.97 in)
Spring free length	185.0 mm (7.28 in)
Installed length	172.0 mm (6.77 in)
Spring rate K1	127.40 N/mm (727.45 lb/in) (12.99 kgf/mm)
Spring stroke K1	0.0–50.0 mm (0.00–1.97 in)
Optional spring available	No
Enclosed gas/air pressure (STD)	1200 kPa (170.7 psi) (12.0 kgf/cm^2)
Spring preload adjusting positions (Minimum)	1
Spring preload adjusting positions (Standard)	3
Spring preload adjusting positions (Maximum)	7
Swingarm radial free play	1.0 mm (0.039 in)
Swingarm axial free play	1.0 mm (0.039 in)
Drive chain	
Type/manufacturer	50V4/DAIDO
Link quantity	118
Drive chain slack	45.0–55.0 mm (1.77–2.17 in)
15-link length limit	239.3 mm (9.42 in)

EAS20310
ELECTRICAL SPECIFICATIONS

Voltage	
System voltage	12 V
Ignition system	
Ignition system	Transistorized coil ignition (digital)
Ignition system type	DC. TCI
Advancer type	Digital
Ignition timing (B.T.D.C.)	5.0 °/1300 r/min
Engine control unit	
Model/manufacturer	FUA0015/MITSUBISHI (FZ6-SHG(W)/FZ6-NHG(W)) FUA0018/MITSUBISHI (FZ6-NAHG/FZ6-SAHG) FUA0019/MITSUBISHI (FZ6-SA/FZ6-NA) FUA0020/MITSUBISHI (FZ6-S/FZ6-N)
Ignition coil	
Model/manufacturer	JO383/DENSO
Minimum ignition spark gap	6.0 mm (0.24 in)
Primary coil resistance	1.53–2.07 Ω at 20°C (68°F)
Secondary coil resistance	12.0–18.0 kΩ at 20°C (68°F)
Spark plug cap	
Material	Resin
Resistance	10.0 kΩ
AC magneto	
Model/manufacturer	F5VX/MORIC
Stator coil resistance	0.22–0.34 Ω at 20°C (68°F)
Standard output	14.0 V310 W5000 r/min
Rectifier/regulator	
Regulator type	Semi conductor-short circuit
Model/manufacturer	SH719AA/SHINDENGEN
No load regulated voltage	14.1–14.9 V
Rectifier capacity	25.0 A
Withstand voltage	240.0 V
Battery	
Model	GT12B-4
Voltage, capacity	12 V, 10.0 Ah
Specific gravity	1.320
Manufacturer	GYM
Ten hour rate amperage	1.00 A
Headlight	
Bulb type	Halogen bulb
Bulb voltage, wattage × quantity	
Headlight	12 V, 60 W/55.0 W × 1 (FZ6-N/FZ6-NA/FZ6-NHG(W)/FZ6-NAHG) 12 V, 55.0 W × 1 (FZ6-S/FZ6-SA/FZ6-SHG(W)/FZ6-SAHG)
Auxiliary light	12 V, 5.0 W × 1 (FZ6-N/FZ6-NA/FZ6-NHG(W)/FZ6-NAHG)

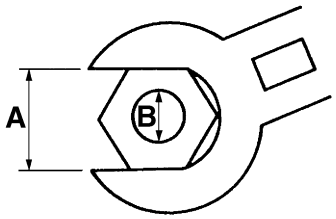
	12 V, 5.0 W × 2 (FZ6-S/FZ6-SA/FZ6-SHG(W)/ FZ6-SAHG)
Tail/brake light	12 V, 5.0 W/21.0 W × 1
Front turn signal light	12 V, 10.0 W × 2
Rear turn signal light	12 V, 10.0 W × 2
License plate light	12 V, 5.0 W × 1
Meter lighting	LED (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/ FZ6-NAHG) EL backlight LCD (FZ6-S/FZ6-SA/FZ6-N/FZ6-NA)
Indicator light	
Neutral indicator light	LED
Turn signal indicator light	LED
Oil level warning light	LED
High beam indicator light	LED
Coolant temperature warning light	LED (FZ6-SHG(W)/FZ6-SAHG/FZ6-NHG(W)/ FZ6-NAHG)
Engine trouble warning light	LED
Immobilizer system indicator light	LED
ABS warning light	LED (FZ6-NA/FZ6-NAHG/FZ6-SA/FZ6-SAHG)
Electric starting system	
System type	Constant mesh
Starter motor	
Model/manufacturer	SM-14/MITSUBA
Power output	0.60 kW
Armature coil resistance	0.0012–0.0022 Ω
Brush overall length	10.0 mm (0.39 in)
Limit	3.50 mm (0.14 in)
Brush spring force	7.16–9.52 N (25.77–34.27 oz) (730–971 gf)
Commutator diameter	28.0 mm (1.10 in)
Limit	27.0 mm (1.06 in)
Mica undercut (depth)	0.70 mm (0.03 in)
Starter relay	
Model/manufacturer	MS5F-441/JIDECO
Amperage	180.0 A
Coil resistance	4.18–4.62 Ω at 20°C (68°F)
Horn	
Horn type	Plane
Quantity	1 pcs
Model/manufacturer	HF-12/NIKKO
Maximum amperage	3.0 A
Coil resistance	1.01–1.11 Ω
Performance	105–118 dB/2m
Turn signal relay	
Relay type	Full transistor
Model/manufacturer	FE218BH/DENSO
Built-in, self-canceling device	No
Turn signal blinking frequency	75.0–95.0 cycles/min
Wattage	10 W × 2 + 3.4 W
Oil level switch	
Model/manufacturer	5VX/SOMIC ISHIKAWA

Fuel gauge	
Model/manufacturer	5VX/DENSO
Sender unit resistance (full)	19.0–21.0 Ω
Sender unit resistance (empty)	139.0–141.0 Ω
Starting circuit cut-off relay	
Model/manufacturer	G8R-30Y-V3/OMRON
Coil resistance	162–198 Ω
Radiator fan motor relay	
Model/manufacturer	ACM33211M05/MATSUSHITA
Coil resistance	86.4–105.6 Ω
Headlight relay	
Model/manufacturer	ACM33211M05/MATSUSHITA
Coil resistance	86.4–105.6 Ω
Fuel injection system relay	
Model/manufacturer	G8R-30Y-R/OMRON
Resistance	162–198 Ω
Thermo unit	
Model/manufacturer	8CC/MITSUBISHI
Resistance at 80°C	290.0–354.0 Ω
Fuses	
Main fuse	30.0 A
Headlight fuse	20.0 A
Taillight fuse	10.0 A
Signaling system fuse	10.0 A
Ignition fuse	10.0 A
Radiator fan fuse	20.0 A
Fuel injection system fuse	10.0 A
Backup fuse	10.0 A
ABS motor fuse	30.0 A (FZ6-NA/FZ6-NAHG/FZ6-SA/FZ6-SAHG)
ABS control unit fuse	10.0 A (FZ6-NA/FZ6-NAHG/FZ6-SA/FZ6-SAHG)
Reserve fuse	30.0 A
Reserve fuse	20.0 A
Reserve fuse	10.0 A

EAS20320
TIGHTENING TORQUES

EAS20330
GENERAL TIGHTENING TORQUE SPECIFICATIONS

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



A. Distance between flats
B. Outside thread diameter

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

EAS20340
ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Spark plugs	M10	4	18 Nm (1.8 m·kg, 13 ft·lb)	
Cylinder head bolt	M10	10	See NOTE	E
Cylinder head bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Camshaft caps bolt	M6	20	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Cylinder head cover bolt	M6	6	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Camshaft cap oil check bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Air indication system reed valve cover bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Air cut-off valve stay bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Camshaft sprocket bolt	M7	4	20 Nm (2.0 m·kg, 14 ft·lb)	
Connecting rod cap bolt	M7	8	15 Nm (1.5 m·kg, 11 ft·lb) + 120°	M
Generator rotor bolt	M12	1	75 Nm (7.5 m·kg, 54 ft·lb)	
Timing chain tensioner bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Timing chain tensioner cap bolt	M6	1	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Thermostat cover bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Coolant hose joint bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	LT
Water pump cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Water pump bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Thermo sensor	M12	1	18 Nm (1.8 m·kg, 13 ft·lb)	
Coolant drain bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Radiator bolt	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Radiator stay and crankcase	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Radiator cap stopper bolt	M5	1	5 Nm (0.5 m·kg, 3.6 ft·lb)	
Radiator hose stay bolt	M10	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil pump cover bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil pump bolt	M6	3	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Oil pan bolt	M6	12	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Center oil pan bolt	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Oil cooler union bolt	M20	1	63 Nm (6.3 m·kg, 46 ft·lb)	
Engine oil drain bolt	M14	1	43 Nm (4.3 m·kg, 31 ft·lb)	
Oil filter union bolt	M20	1	70 Nm (7.0 m·kg, 51 ft·lb)	
Oil filter	M20	1	17 Nm (1.7 m·kg, 12 ft·lb)	E
Oil pump chain guide bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Oil pipe bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Throttle body joint bolt	M6	8	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Air filter case cover	M5	6	1.2 Nm (0.12 m·kg, 0.9 ft·lb)	
Throttle body and throttle body joint	M4	4	3 Nm (0.3 m·kg, 2.2 ft·lb)	
Throttle body and air filter case	M5	4	3 Nm (0.3 m·kg, 2.2 ft·lb)	
Front exhaust pipe nut	M8	8	20 Nm (2.0 m·kg, 14 ft·lb)	
Rear exhaust pipe bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	

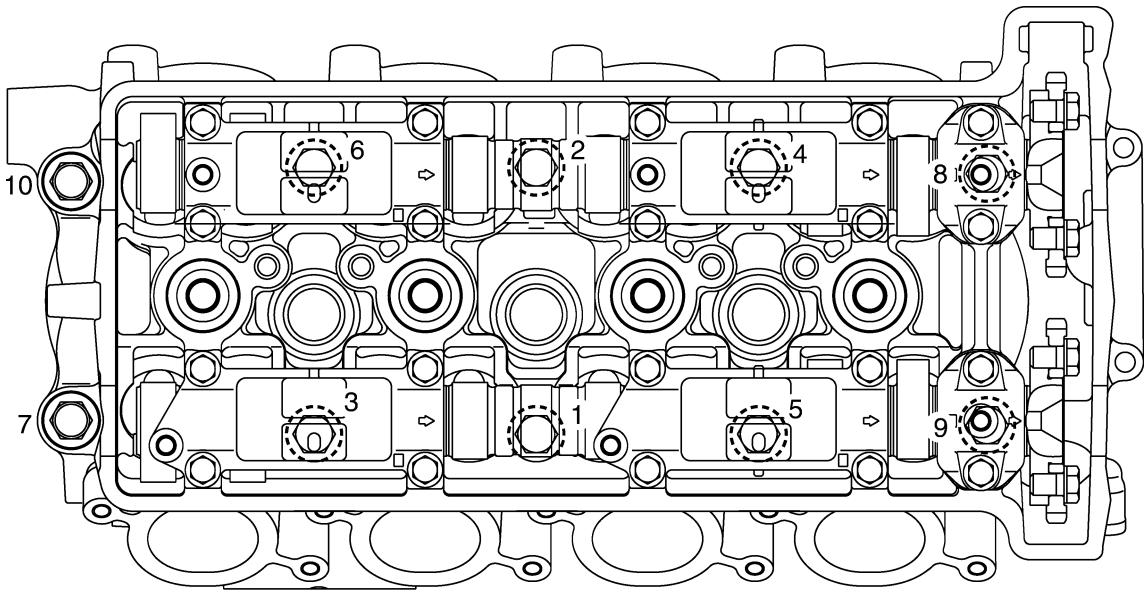
Item	Thread size	Q'ty	Tightening torque	Remarks
Catalyst pipe and catalyst pipe stay bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Muffler joint bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	See NOTE
Catalyst joint bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	See NOTE
Exhaust pipe stay bolt	M8	2	20 Nm (2.0 m·kg, 14 ft·lb)	
Catalyst pipe stay bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Muffler stay bolt	M8	2	20 Nm (2.0 m·kg, 14 ft·lb)	
Muffler protector screw	M6	2	9 Nm (0.9 m·kg, 6.5 ft·lb)	
Crankcase bolt (main journal)	M8	10	See NOTE	E
Crankcase bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	E
Crankcase bolt	M6	12	10 Nm (1.0 m·kg, 7.2 ft·lb)	E
Crankcase bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	E, LT
Crankcase bolt	M8	2	24 Nm (2.4 m·kg, 17 ft·lb)	E
Generator rotor cover bolt	M6	9	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Clutch cover bolt	M6	7	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Clutch cover bolt	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Clutch cable holder bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Pickup coil rotor cover bolt	M6	7	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Pickup coil rotor cover bolt	M8	1	15 Nm (1.5 m·kg, 11 ft·lb)	
Shift shaft cover bolt	M6	6	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Breather plate screw	M6	3	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Stator coil screw	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	LT
Pickup rotor cover clamp screw	M6	1	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Drive sprocket cover bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil gallery bolt	M16	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Generator rotor cover and stator coil lead clamp screw	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Breather hose cover bolt	M6	4	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Oil pipe bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Crankshaft position sensor bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Starter clutch screw	M8	3	32 Nm (3.2 m·kg, 23 ft·lb)	
Starter motor cover bolt	M6	2	3.4 Nm (0.34 m·kg, 2.3 ft·lb)	
Clutch pressure plate screw	M6	6	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Clutch boss nut	M20	1	90 Nm (9.0 m·kg, 65 ft·lb)	Use a lock washer
Drive sprocket nut	M20	1	85 Nm (8.5 m·kg, 61 ft·lb)	Use a lock washer
Transmission bearing housing screw	M6	3	12 Nm (1.2 m·kg, 8.7 ft·lb)	LT
Shift drum retainer bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	LT

Item	Thread size	Q'ty	Tightening torque	Remarks
O_2 sensor	M18	1	45 Nm (4.5 m·kg, 33 ft·lb)	
Shift shaft spring stopper screw	M8	1	22 Nm (2.2 m·kg, 16 ft·lb)	LT
Shift rod nut	M6	1	7 Nm (0.7 m·kg, 5.0 ft·lb)	Left thread
Shift rod nut	M6	1	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Shift rod joint	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	LT
Shift arm bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Pickup coil rotor bolt	M8	1	35 Nm (3.5 m·kg, 25 ft·lb)	
Starter motor bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Neutral switch	M10	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Oil level switch bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Speed sensor bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	

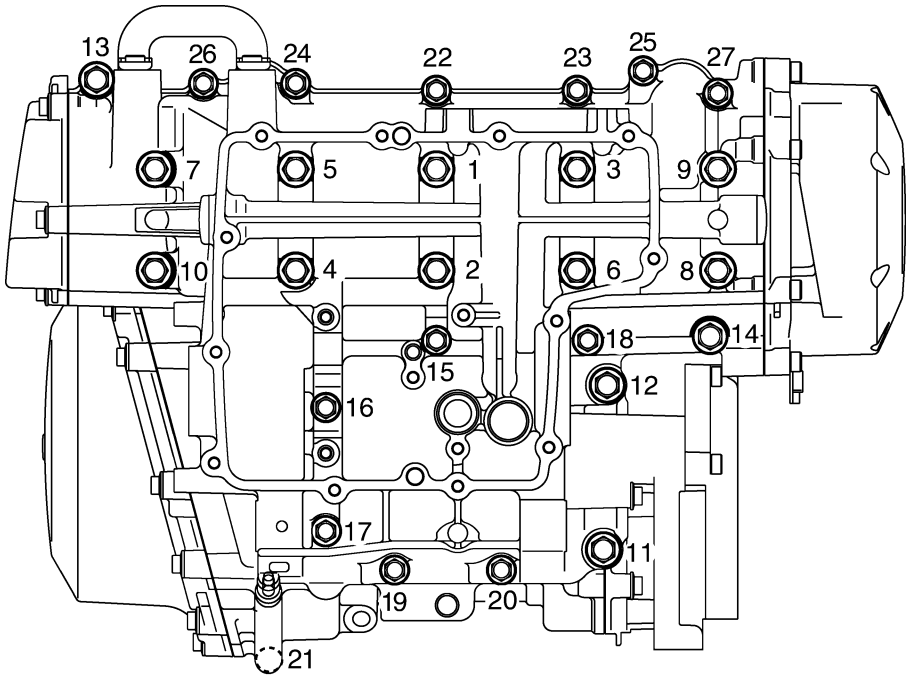
NOTE:

- Cylinder head bolt
  1 First, tighten the bolts to approximately 19 Nm (1.9 m·kg, 14 ft·lb) with a torque wrench following the tightening order.
  2 Retighten the bolts 50 Nm (5.0 m·kg, 36 ft·lb) with a torque wrench.
- Crankcase bolt (main journal)
  1 First, tighten the bolts to approximately 12 Nm (1.2 m·kg, 8.7 ft·lb) with a torque wrench following the tightening order.
  2 Retighten the bolts 25 Nm (2.5 m·kg, 18 ft·lb) with a torque wrench.
  3 Loosen the all bolts one by one following the tightening order and then tighten them to 27 Nm (2.7 m·kg, 20 ft·lb) again.
- Muffler joint bolt
  Retighten the bolt at 1000 km (600 ml).
- Catalyst joint bolt
  Retighten the bolt at 1000 km (600 ml).

Cylinder head tightening sequence.



Crankcase tightening sequence.



EAS20350
CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Upper bracket pinch bolt	M8	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Steering stem nut	M22	1	110 Nm (11 m·kg, 80 ft·lb)	
Upper bracket and upper handle-bar holder	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Lower bracket pinch bolt	–	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Lower ring nut	M25	1	18 Nm (1.8 m·kg, 13 ft·lb)	See NOTE
Front fork cap bolt	M35	2	24 Nm (2.4 m·kg, 17 ft·lb)	
Damper rod assembly bolt	M10	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Front wheel axle pinch bolt	M8	1	23 Nm (2.3 m·kg, 17 ft·lb)	
Front brake master cylinder bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Front brake master cylinder cap screw	M4	2	2 Nm (0.2 m·kg, 1.4 ft·lb)	
Front brake hose union blot	M10	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Front brake hose holder and front fork	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Front cowling stay and frame	M8	2	33 Nm (3.3 m·kg, 24 ft·lb)	
Front cowling bracket and frame	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Front fender and front fork	M6	2	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Clutch lever holder pinch bolt	M6	1	11 Nm (1.1 m·kg, 8.0 ft·lb)	
Engine mount bolts (left of front side)	M10	1	55 Nm (5.5 m·kg, 40 ft·lb)	See NOTE
Engine mount bolts (left of rear side)	M10	1	55 Nm (5.5 m·kg, 40 ft·lb)	See NOTE
Engine mount bolts (right of front side)	M10	1	55 Nm (5.5 m·kg, 40 ft·lb)	See NOTE
Engine mount self locking nut (upper)	M10	1	55 Nm (5.5 m·kg, 40 ft·lb)	See NOTE
Engine mount self locking nut (lower)	M10	1	55 Nm (5.5 m·kg, 40 ft·lb)	See NOTE
Pivot shaft and frame	M18	1	120 Nm (12 m·kg, 87 ft·lb)	
Rear shock absorber and frame	M10	1	40 Nm (4.0 m·kg, 29 ft·lb)	
Rear shock absorber and rear arm	M10	1	40 Nm (4.0 m·kg, 29 ft·lb)	
Seal guard and rear arm	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Rear fender and rear arm	M6	3	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Rear brake hose holder and rear arm	M6	1	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Fuel tank bracket and frame	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Fuel tank bracket and fuel tank	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Fuel tank and rear frame	M6	1	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Fuel tank and fuel tank cap	M5	5	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Fuel pump and fuel tank	M5	6	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Ignition coil and battery box	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Seat lock and frame	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Licence plate light screw	M5	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Rear reflector bolt	M5	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Flap and bracket 6	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Blacket 6 and rear frame	M6	2	19 Nm (1.9 m·kg, 14 ft·lb)	
Tail/brake right unit screw	M6	2	3 Nm (0.3 m·kg, 2.2 ft·lb)	
Rear fender cover bolt	M5	4	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Seat handle bolt	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Muffler and rear fender bolt	M6	4	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Side cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Lean angle sensor bolt	M4	2	2 Nm (0.2 m·kg, 1.4 ft·lb)	
Coolant reserver tank cover bolt	M6	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Front wheel axle shaft bolt	M18	1	72 Nm (7.2 m·kg, 52 ft·lb)	
Front brake caliper bolt	M10	4	40 Nm (4.0 m·kg, 29 ft·lb)	
Front brake disc bolt	M6	10	18 Nm (1.8 m·kg, 13 ft·lb)	
Brake caliper bleed screw	M7	3	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Rear wheel axle nut	M24	1	120 Nm (12 m·kg, 87 ft·lb)	
Rear brake disc and rear wheel	M8	5	30 Nm (3.0 m·kg, 22 ft·lb)	
Rear brake caliper bolt front and rear brake caliper bracket	M8	1	27 Nm (2.7 m·kg, 20 ft·lb)	
Rear brake caliper bolt rear and rear brake caliper bracket	M8	1	22 Nm (2.2 m·kg, 16 ft·lb)	
Rear wheel sprocket and rear wheel drive hub	M10	6	100 Nm (10 m·kg, 72 ft·lb)	
Chain adjusting bolt lock nut	M8	2	16 Nm (1.6 m·kg, 12 ft·lb)	
Rear brake hose union bolt	M10	1	30 Nm (3.0 m·kg, 22 ft·lb)	
Sidestand bolt	M10	1	46 Nm (4.6 m·kg, 33 ft·lb)	
Sidestand bracket and frame	M10	2	63 Nm (6.3 m·kg, 46 ft·lb)	
Sidestand switch screw	M5	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Footrest bracket and frame	M8	4	30 Nm (3.0 m·kg, 22 ft·lb)	
Rear brake reserver tank and bracket	M6	1	3 Nm (0.3 m·kg, 2.2 ft·lb)	
Rear master cylinder and footrest bracket	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Mainstand bolt	M10	2	73 Nm (7.3 m·kg, 53 ft·lb)	
Front wheel sensor bolt (with ABS)	M6	1	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Rear wheel sensor bolt (with ABS)	M6	1	7 Nm (0.7 m·kg, 5.0 ft·lb)	
ECU bolt (engine control unit)	M6	2	7 Nm (0.7 m·kg, 5.0 ft·lb)	
Bracket and hydraulic unit bracket 1 bolt (with ABS)	M6	6	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Hydraulic unit bracket 1 and hydraulic unit bracket 2 bolt (with ABS)	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Hydraulic unit bracket 1 and stay bolt (with ABS)	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Rear wheel sensor rotor bolt (with ABS)	M5	5	6 Nm (0.6 m·kg, 4.3 ft·lb)	LT
Stay and frame bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Hydraulic unit and brake hose union bolt (with ABS)	M10	4	30 Nm (3.0 m·kg, 22 ft·lb)	

NOTE:

- Lower ring nut
  1. First, tighten the ring nut to approximately 52 Nm (5.2 m·kg, 38 ft·lb) with a torque wrench, then loosen the ring nut completely.
  2. Retighten the lower ring nut to specification.
- Engine mount bolts and engine mount self locking nut
  Refer to "INSTALLING THE ENGINE" on page 5-6.

EAS20360
LUBRICATION POINTS AND LUBRICANT TYPES

EAS20370
ENGINE

Lubrication point	Lubricant
Oil seal lips	LS
O-rings	LS
Bearings and bushes	E
Crankshaft pins	E
Piston surfaces	E
Piston pins	E
Connecting rod bolts	M
Crankshaft journals	E
Camshaft lobes	M
Camshaft journals	M
Valve stems (intake and exhaust)	M
Valve stem ends (intake and exhaust)	E
Valve lifter surface	E
Piston cooler (O-ring)	E
Oil pump rotors (inner and outer)	E
Oil pump housing	E
Oil strainer	E
Clutch (pull rod)	LS
Starter clutch idle gear inner surface	E
Starter clutch assembly	E
Primary driven gear	E
Transmission gears (wheel and pinion)	M
Main axle and drive axle	M
Shift drum	E
Shift forks and shift fork guide bars	E
Shift shaft	E
Shift shaft boss	E
Cylinder head cover mating surface	Yamaha bond No.1215
Cylinder head cover semicircular	Yamaha bond No.1215
Crankcase mating surface	Yamaha bond No.1215
Generator rotor cover (stator coil assembly lead grommet)	Yamaha bond No.1215
Pickup rotor cover (crankshaft position sensor lead grommet)	Yamaha bond No.1215

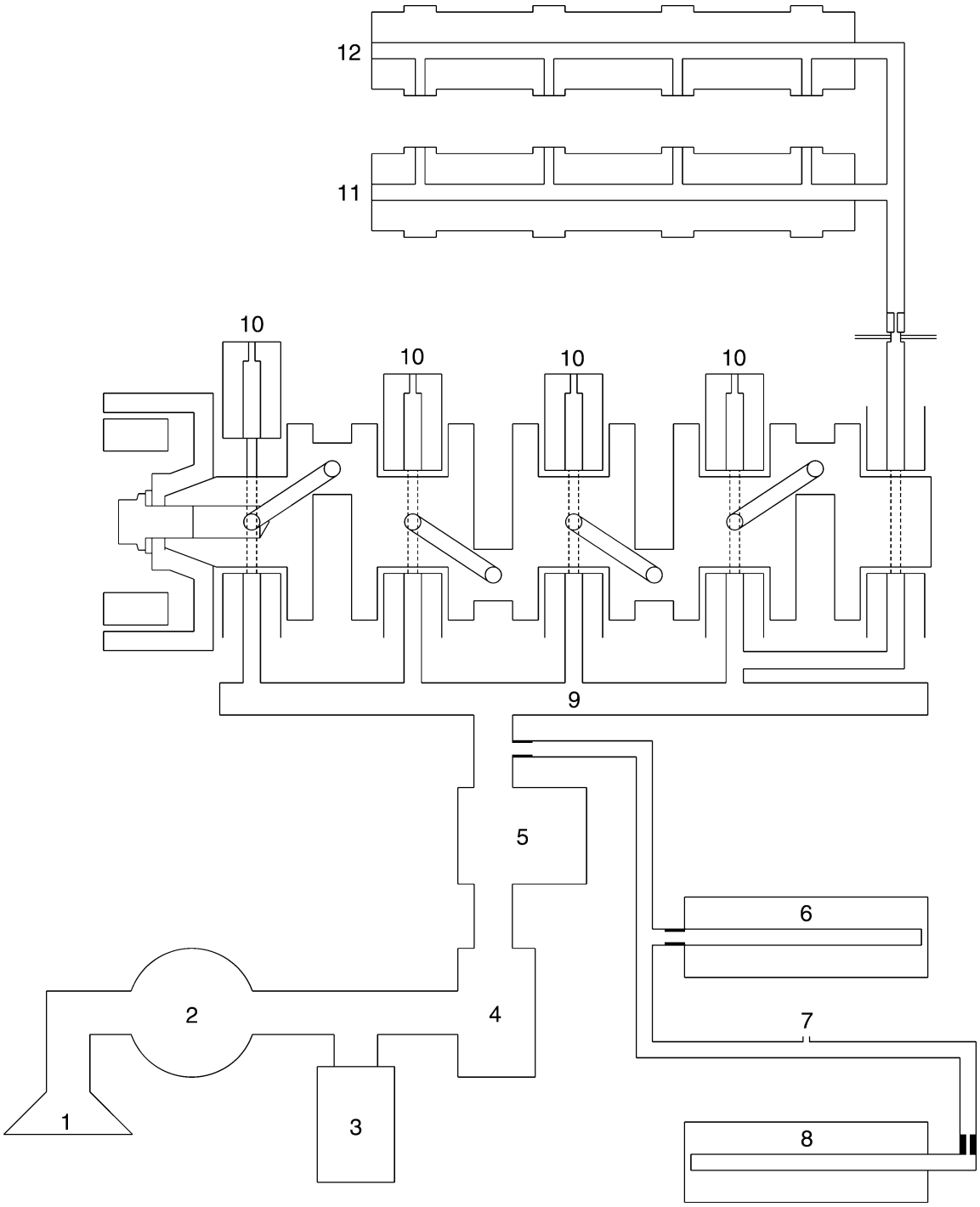
LUBRICATION POINTS AND LUBRICANT TYPES

EAS20380
CHASSIS

Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	LS
Front wheel oil seal (right and left)	LS
Rear wheel oil seal	LS
Rear wheel drive hub oil seal	LS
Rear wheel drive hub mating surface	LS
Rear brake pedal shaft	LS
Sidestand pivoting point and metal-to-metal moving parts	LS
Link and sidestand switch contact point	LS
Throttle grip inner surface	LS
Brake lever pivoting point and metal-to-metal moving parts	LS
Clutch lever pivoting point and metal-to-metal moving parts	LS
Rear shock absorber collar	LS
Pivot shaft	LS
Swingarm pivot bearing	LS
Swingarm head pipe end, oil seal and bush	LS
Engine mount bolts (rear upper and lower)	LS
Shift pedal shaft	LS
Shift shaft joint	LS
Rear footrest ball and metal-to-metal moving parts	LS
Main stand metal-to-metal moving parts	LS

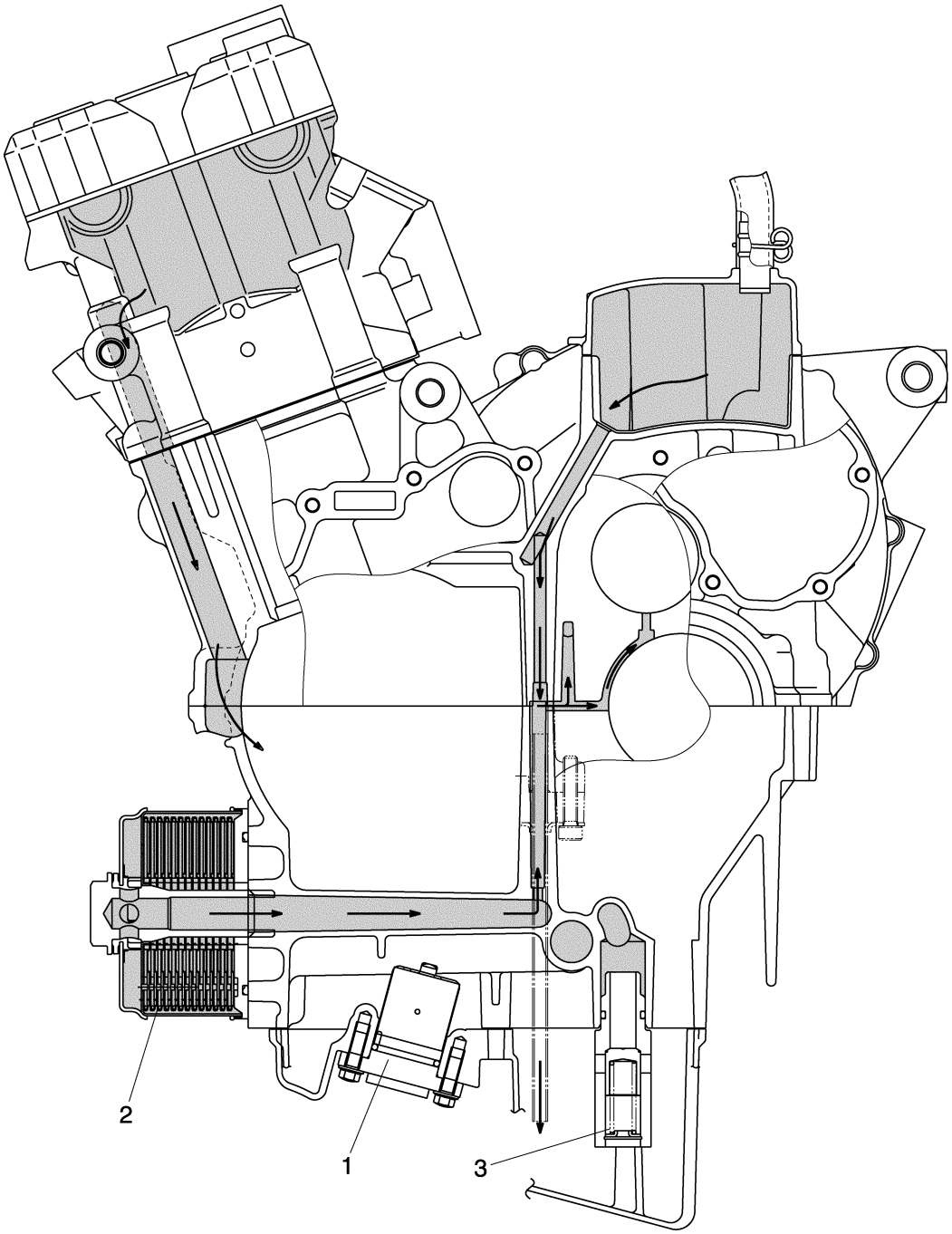
EAS20390
LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20400
ENGINE OIL LUBRICATION CHART

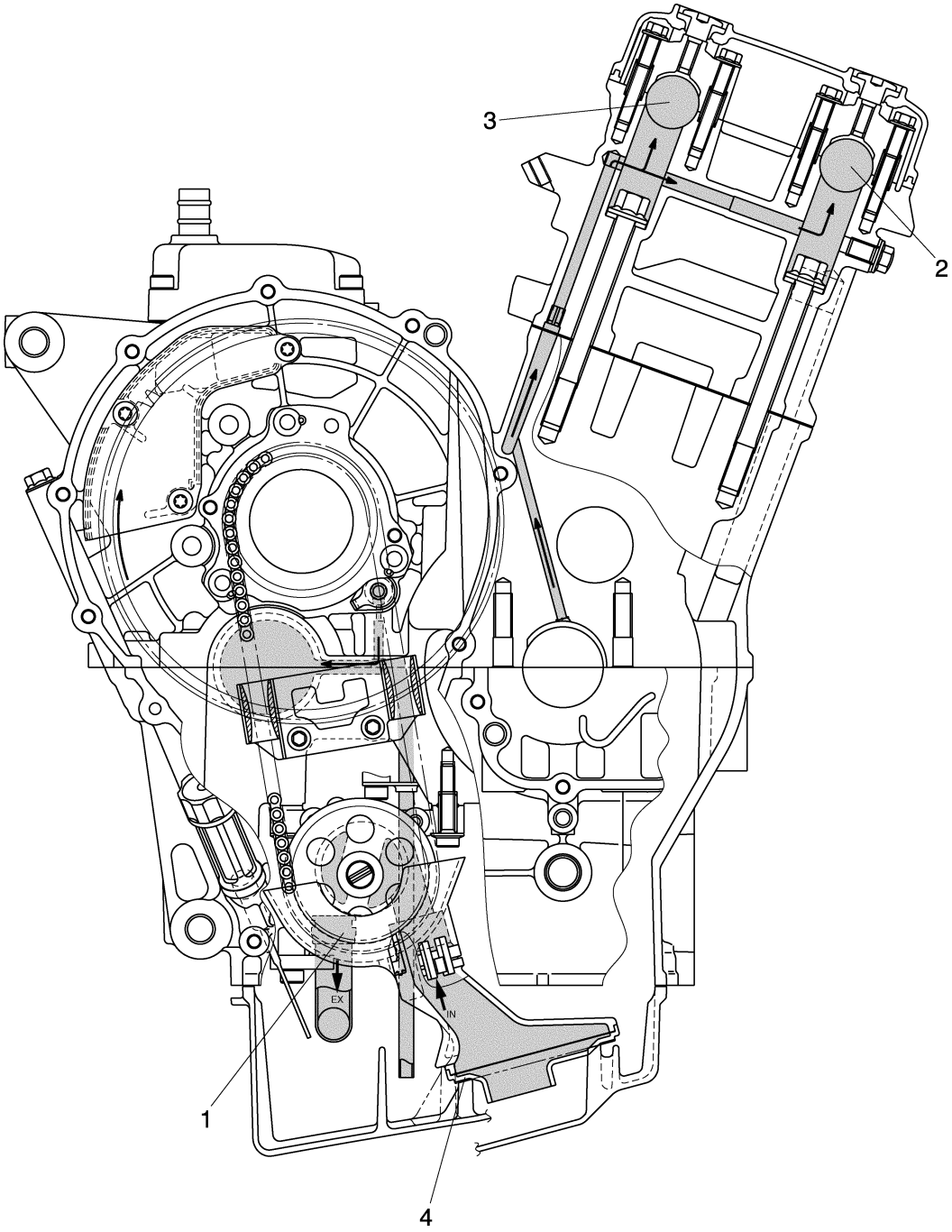


1. Oil strainer
2. Oil pump
3. Relief valve
4. Oil filter
5. Oil cooler
6. Main axle
7. Mission cooler
8. Drive axle
9. Main gallery
10. Piston cooler
11. Intake camshaft
12. Exhaust camshaft

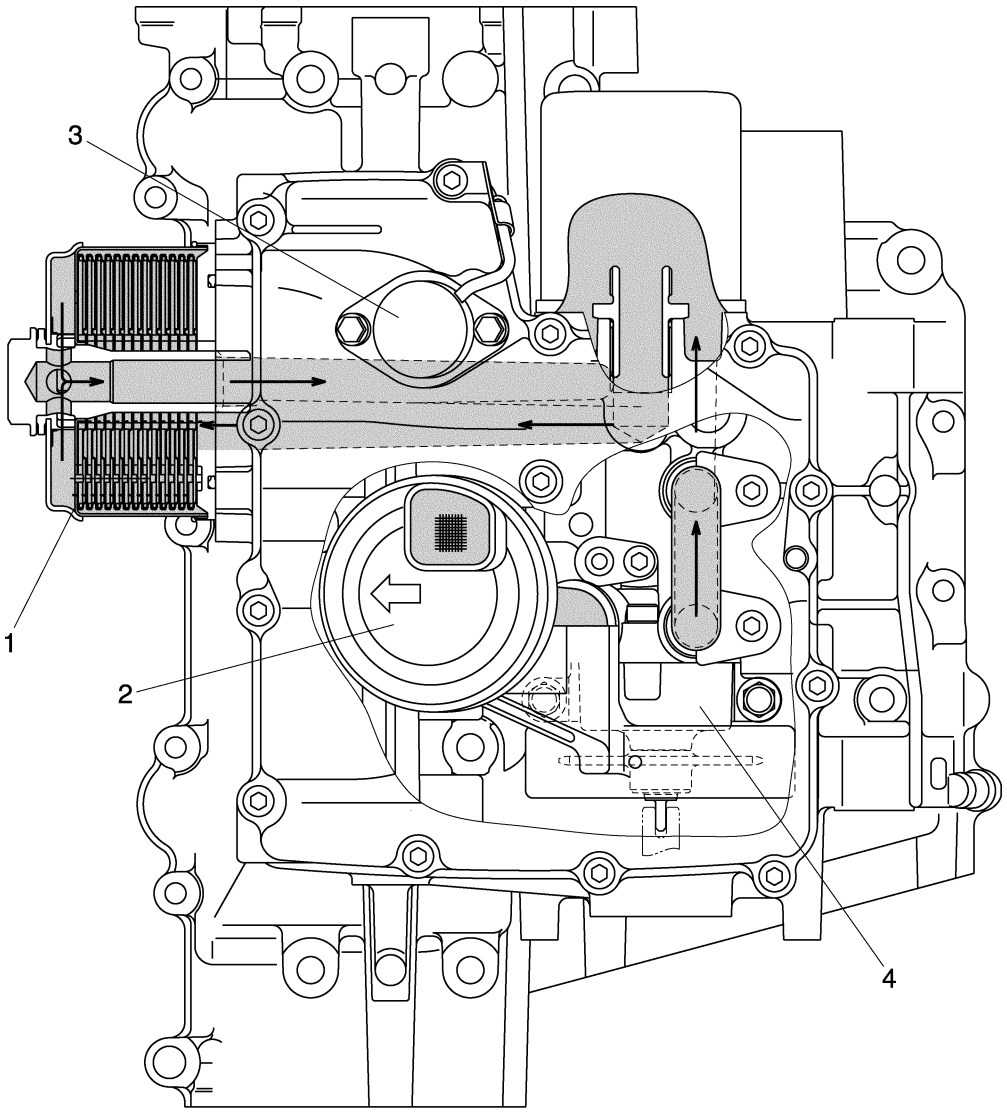
EAS20410
LUBRICATION DIAGRAMS



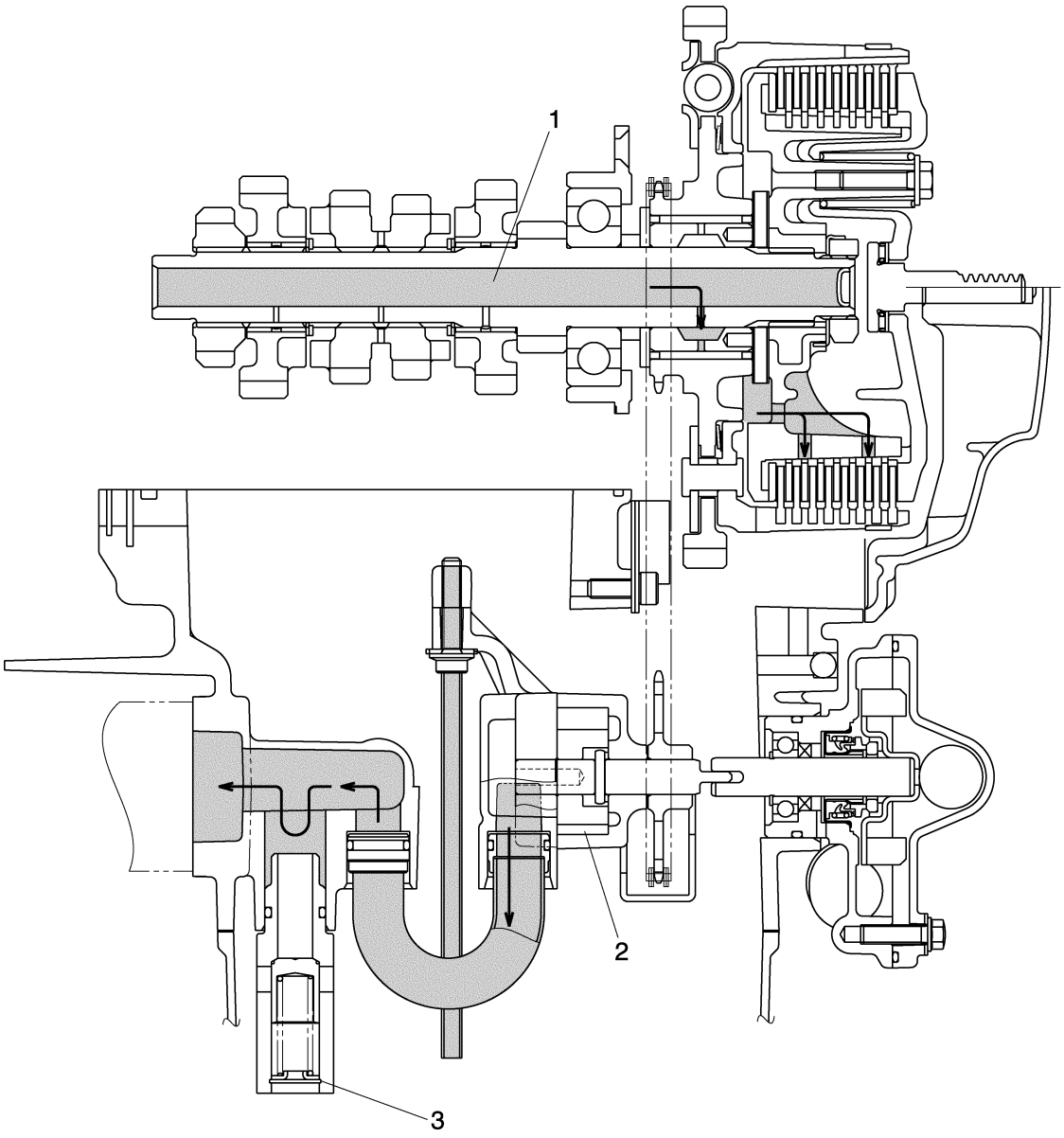
1. Oil level switch
2. Oil cooler
3. Relief valve



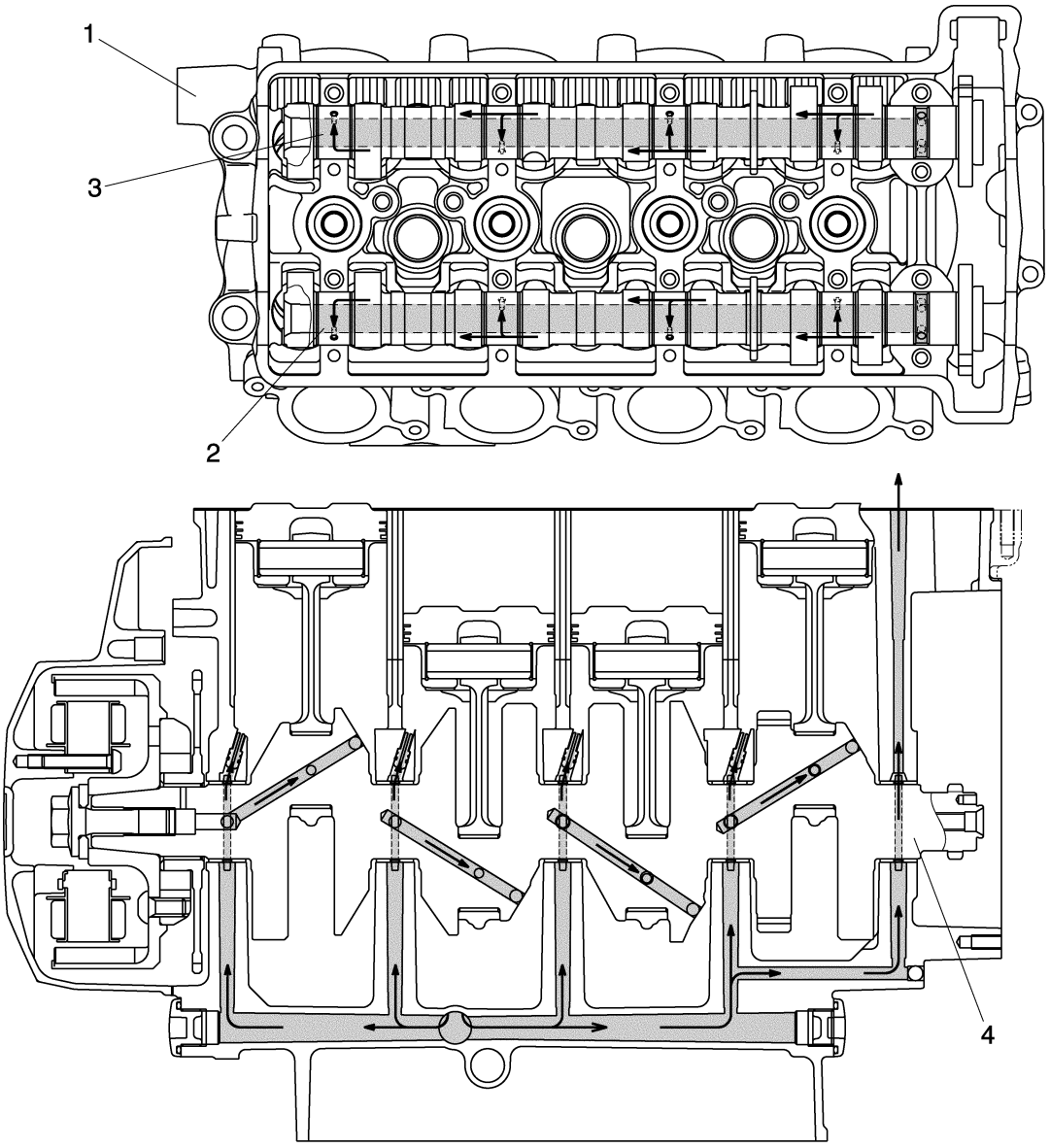
1. Oil pump
2. Exhaust camshaft
3. Intake camshaft
4. Oil strainer



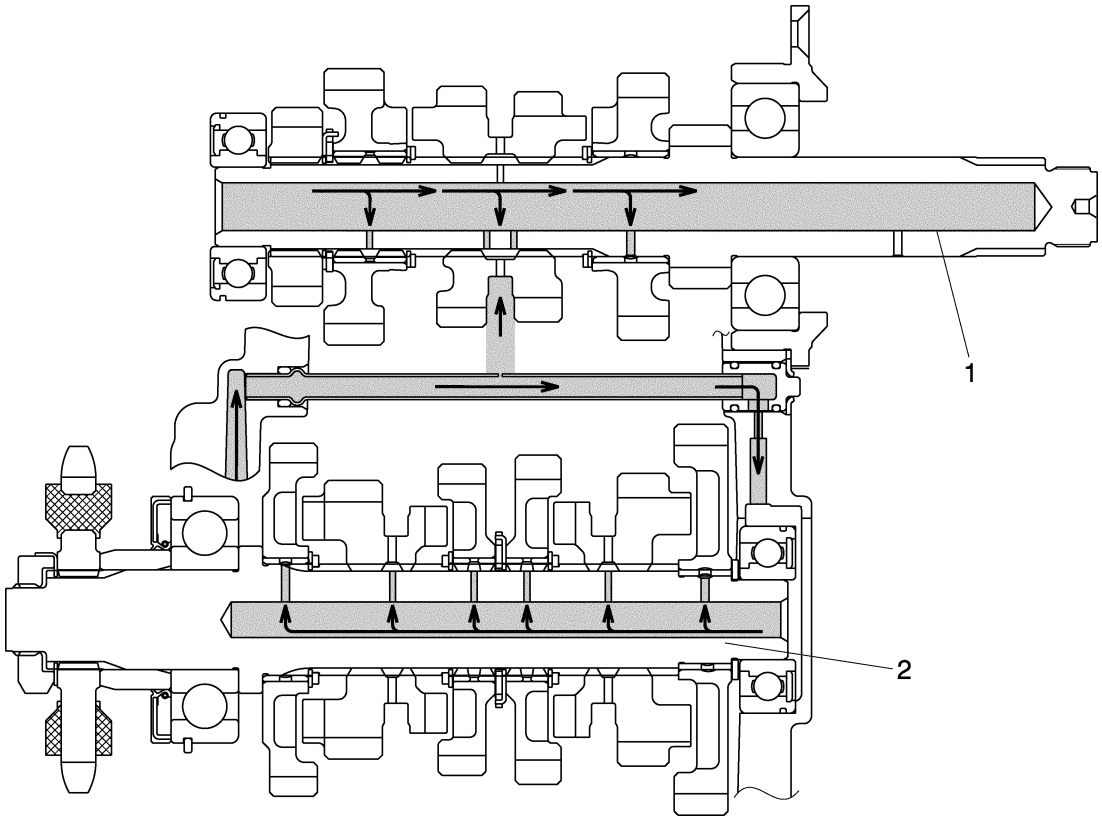
1. Oil cooler
2. Oil strainer
3. Oil level switch
4. Oil pump



1. Main axle
2. Oil pump
3. Relief valve

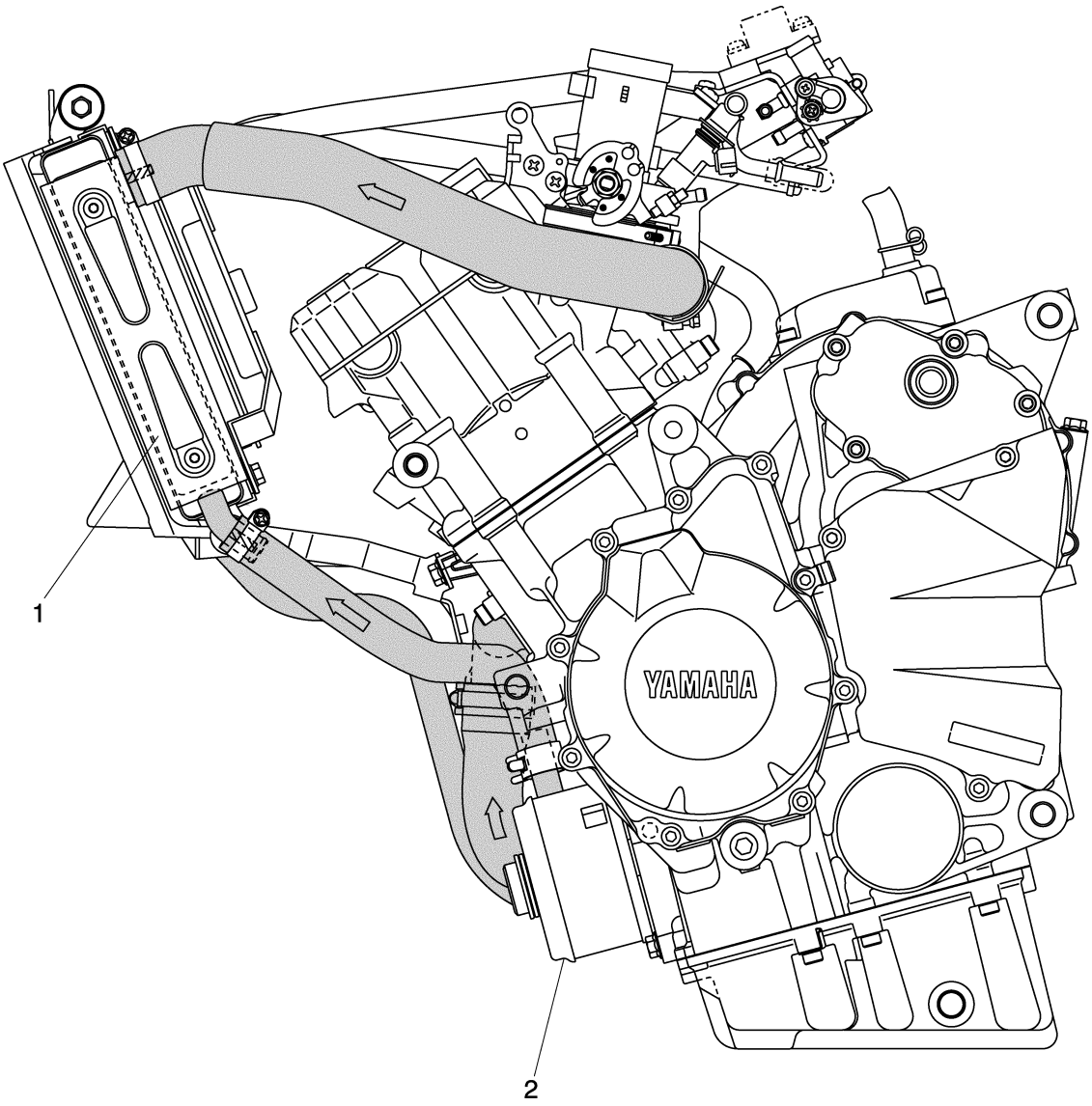


1. Cylinder head
2. Intake camshaft
3. Exhaust camshaft
4. Crankshaft

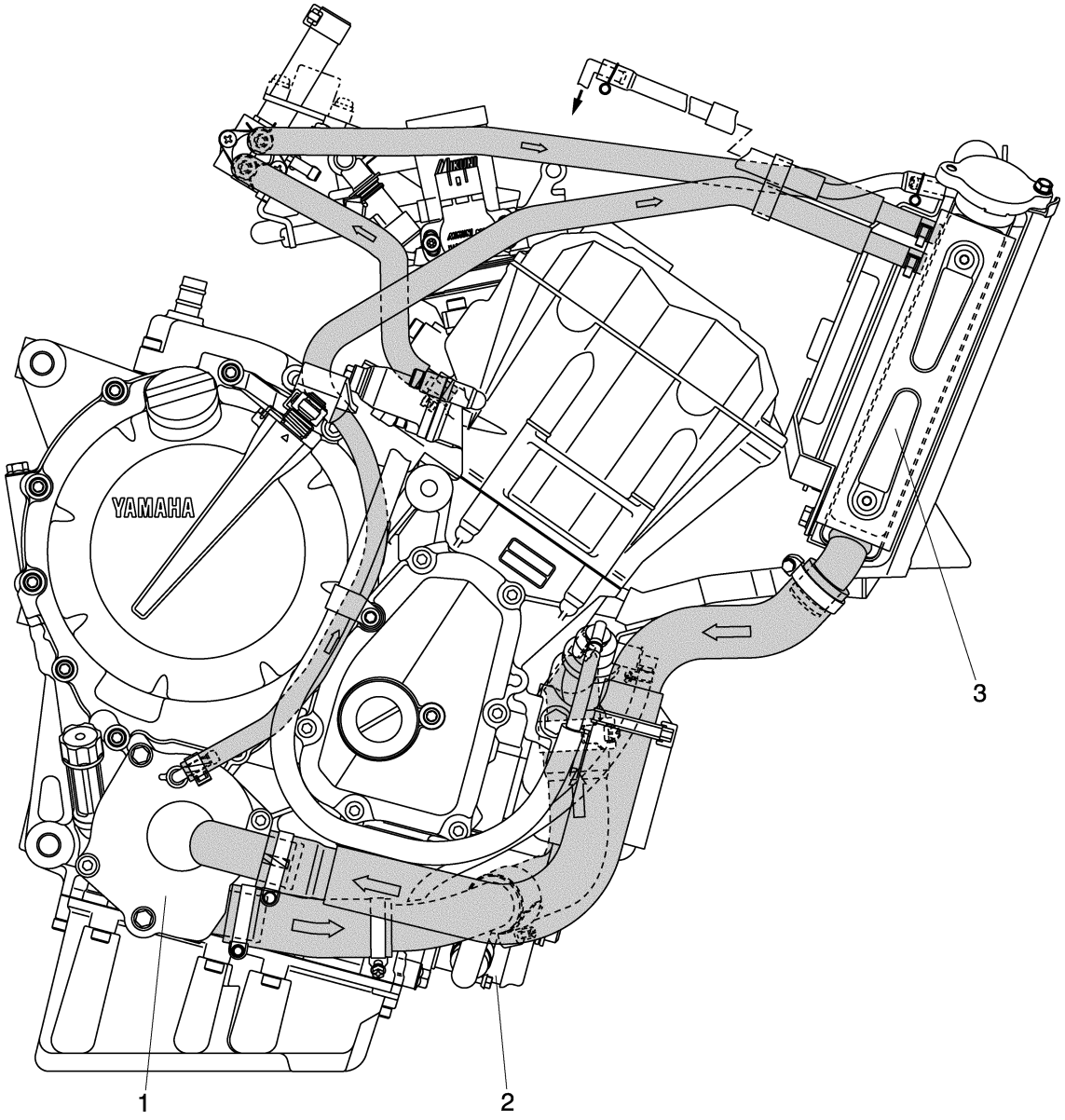


1. Main axle
2. Drive axle

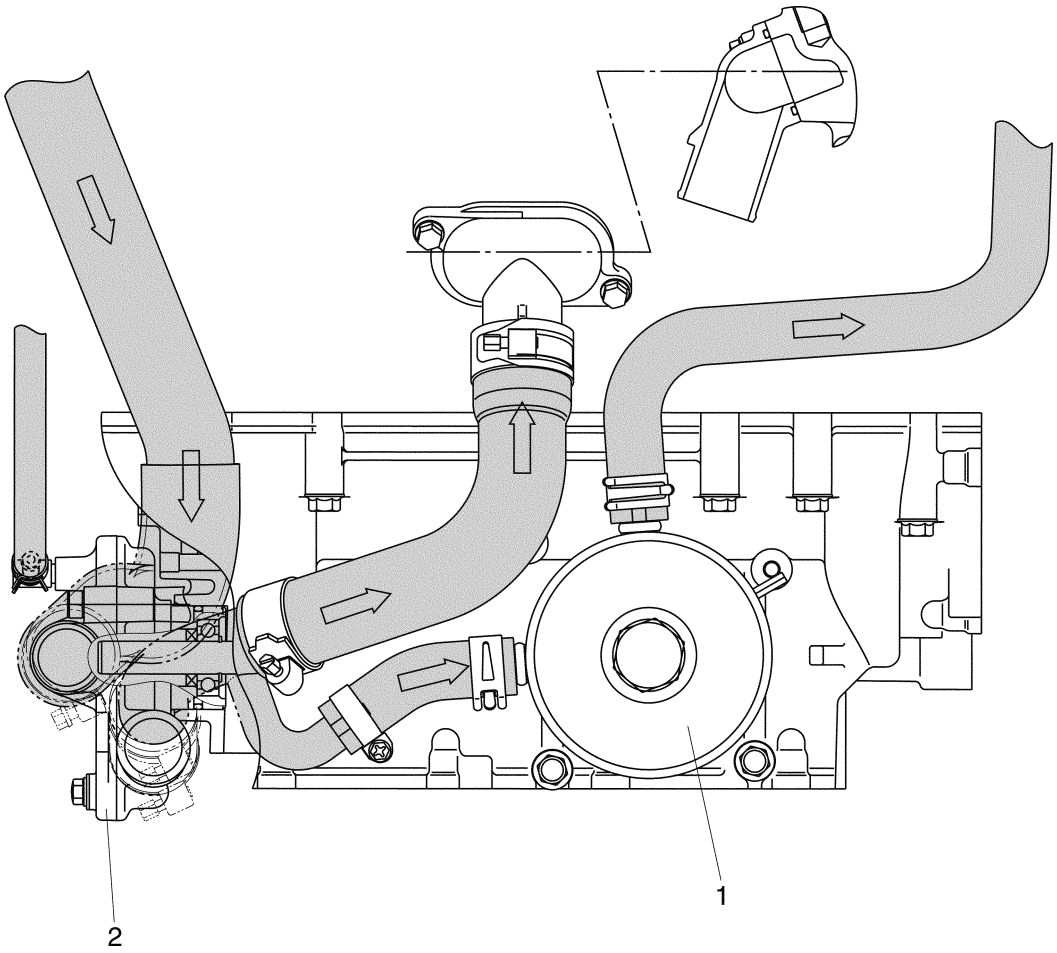
EAS20420
COOLING SYSTEM DIAGRAMS



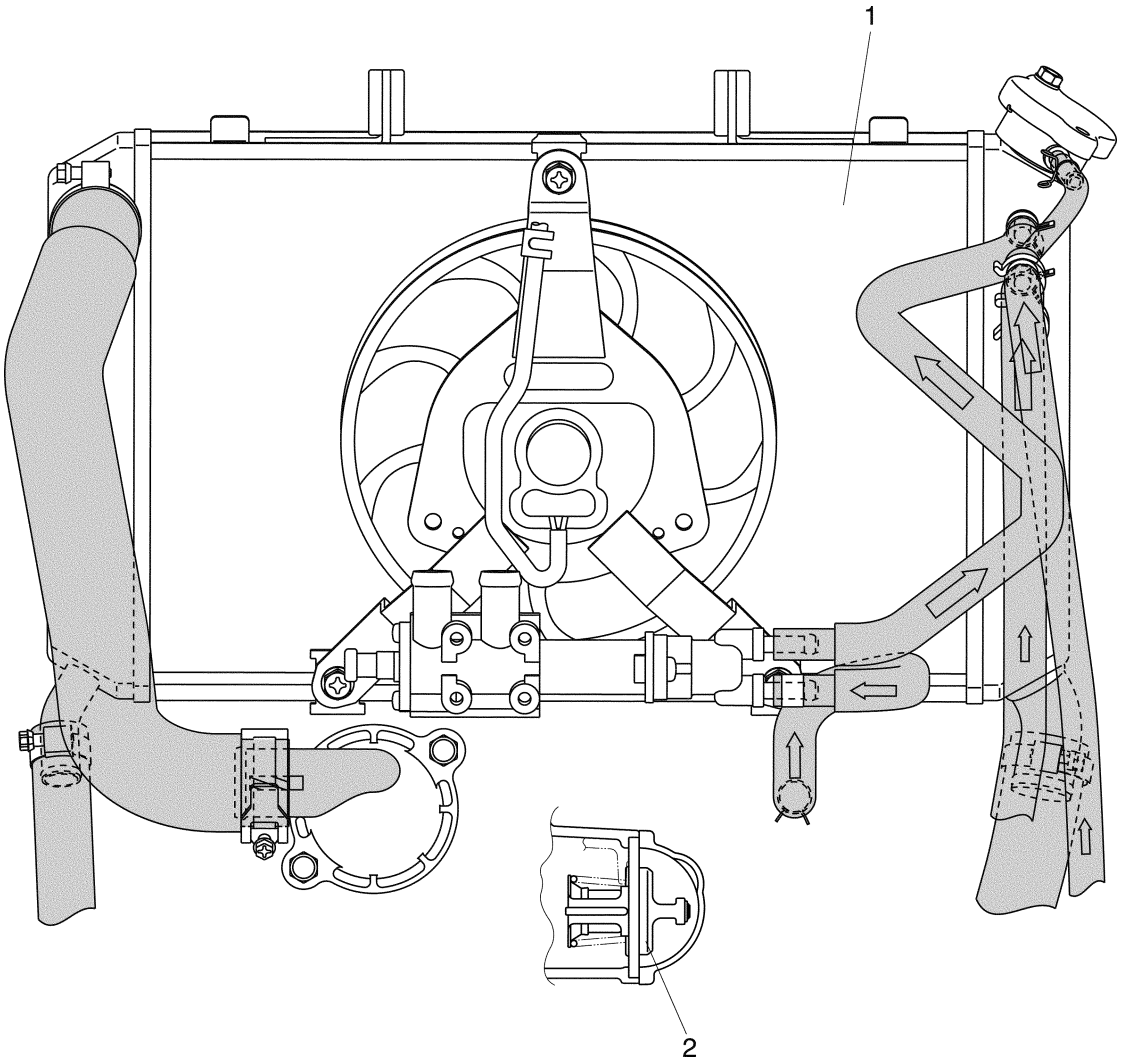
1. Radiator
2. Oil cooler



1. Water pump
2. Oil cooler
3. Radiator

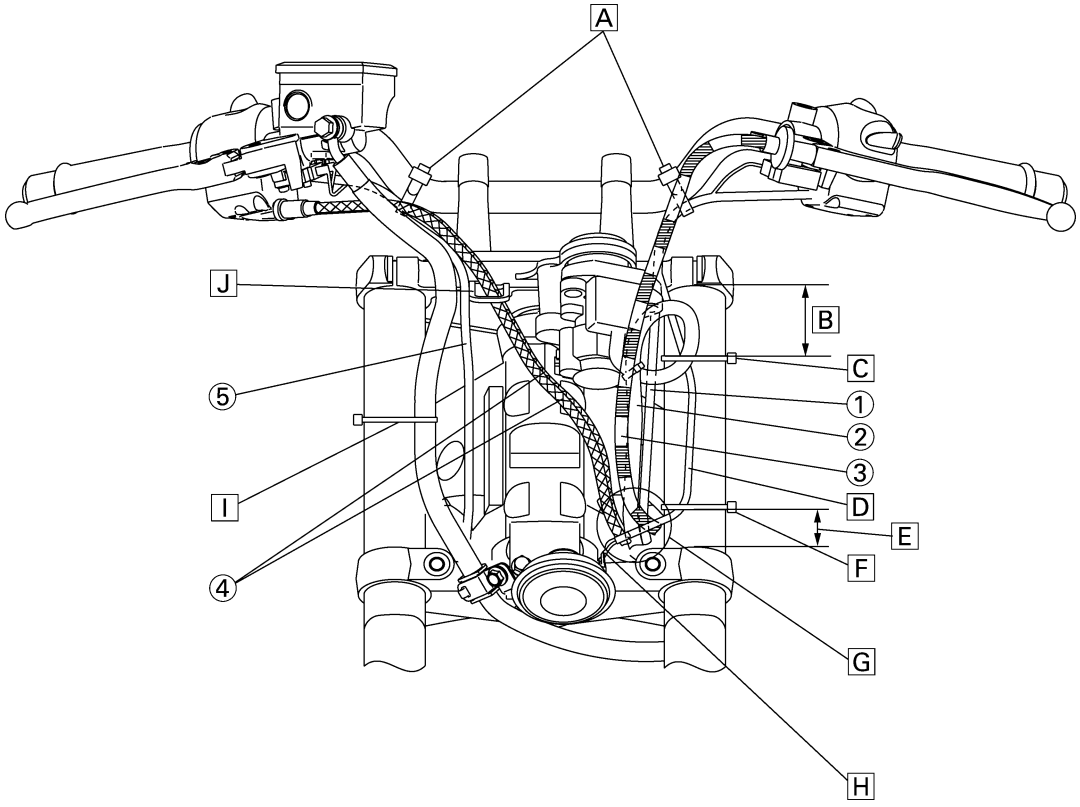


1. Oil cooler
2. Water pump



1. Radiator
2. Thermostat

EAS20430
CABLE ROUTING
FZ6-S/FZ6-SHG(W)/FZ6-SA/FZ6-SAHG

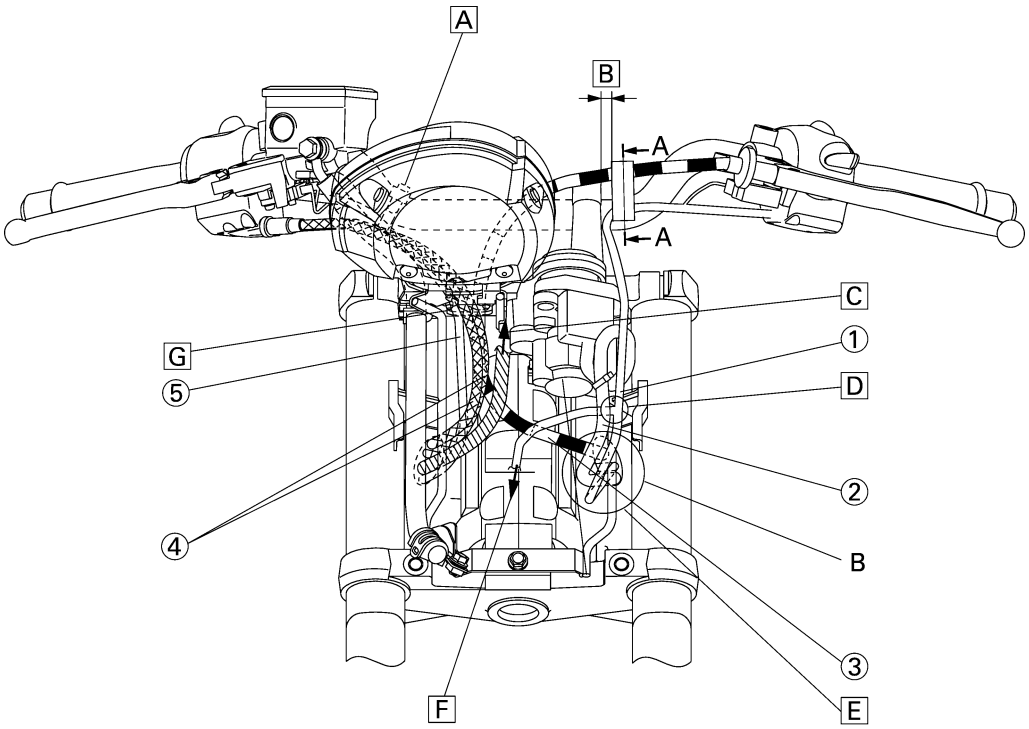


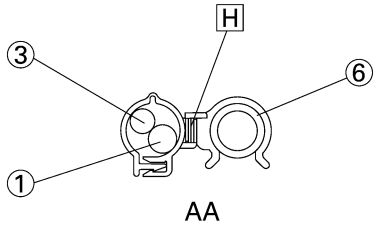
FZ6-S/FZ6-SHG(W)/FZ6-SA/FZ6-SAHG

1. Left handlebar switch lead
2. Main switch and immobilizer lead
3. Clutch cable
4. Throttle cables
5. Right handlebar switch lead

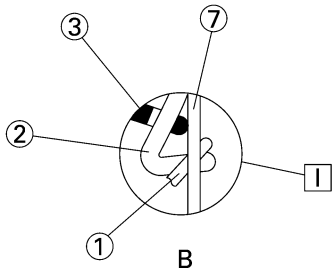
A. Clamp the right and left handlebar switch leads and handlebars. Point the tip of the clamp downward in front of the handlebar.
B. 45–65 mm (1.77–2.56 in)
C. Clamp the horn lead and main switch and immobilizer lead to the inner tube. Point the binding section to the outside of the vehicle body and cut the tip down to the length of 1 to 5 mm (0.04 to 0.20 in).
D. Route the horn lead by the headmost side.
E. 5–25 mm (0.20–0.98 in)
F. Clamp the horn lead to the inner tube. Point the binding section to the outside of the vehicle body and cut the tip down to the length of 1 to 5 mm (0.04 to 0.20 in).
G. Pass the throttle cables, wire harness lead, clutch cable, main switch and immobilizer lead and left handlebar switch lead in order through the frame hole from the lower side of the vehicle.
H. Point the lead, which comes from the terminal, to the front side of the vehicle body. There should be no slack of leads between the band and terminals.
I. Clamp the brake hose to the inner tube. Point the binding section to the outside of the vehicle body and cut the tip down to the length of 1 to 5 mm (0.04 to 0.20 in).
J. Pass the throttle cables through the wire guide. Route the right handlebar switch lead by the outside of the wire guide.

FZ6-N/FZ6-NA





AA



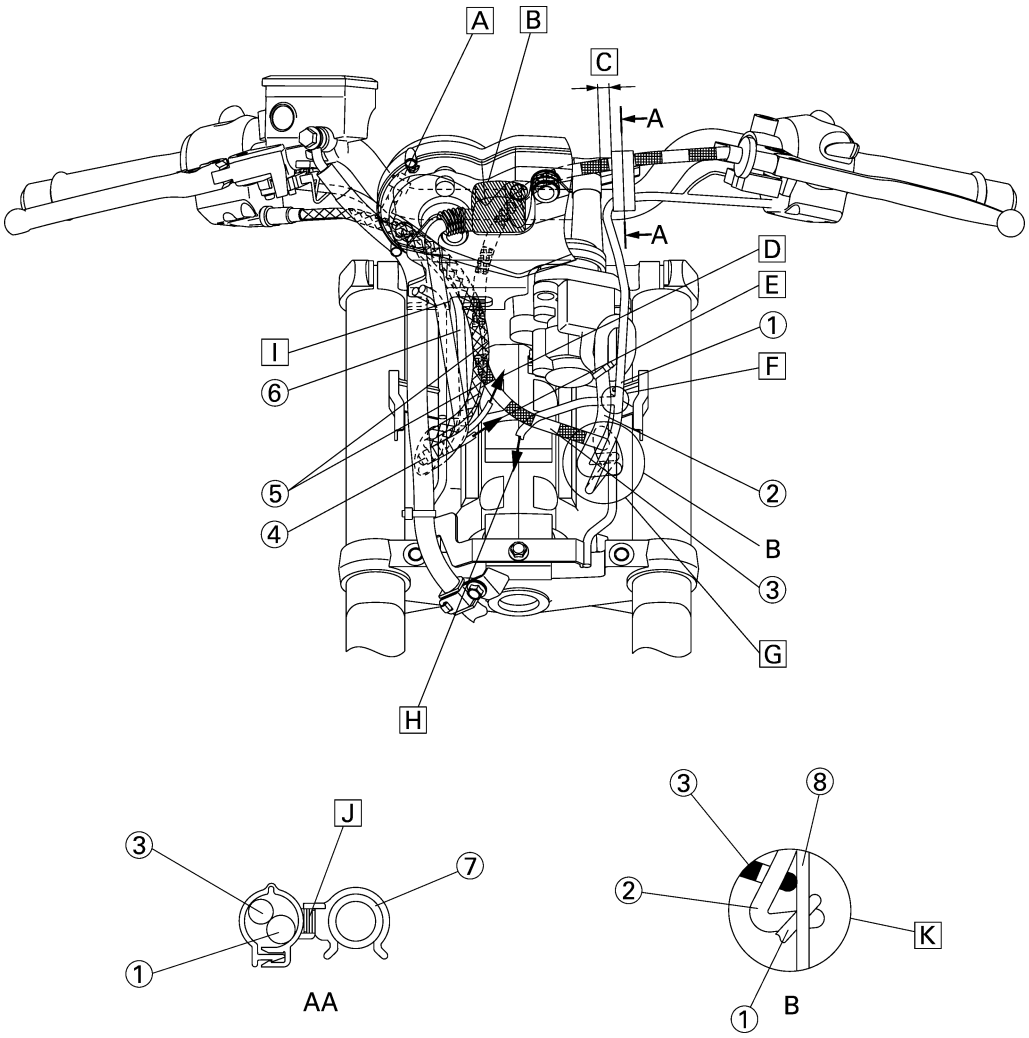
B

FZ6-N/FZ6-NA

1. Left handlebar switch lead
2. Main switch and immobilizer lead
3. Clutch cable
4. Throttle cables
5. Right handlebar switch lead
6. Handlebar
7. Headlight stay

A. Clamp the right handlebar switch lead and handlebars. Point the tip of the clamp downward in front of the handlebar.
B. 5 mm (0.20 in) or less
C. To the meter
D. Route the branched lead behind the main switch and immobilizer lead.
E. Pass the leads through the hole of the frame from the vehicle down side in order of the main switch lead, immobilizer lead, left handlebar switch lead and clutch cable.
F. To the headlight and meter
G. Pass the right handlebar switch lead and throttle cable, clutch cable through the meter cover hole.
H. Install the clamp in the direction as shown in the illustration.
I. Route the main switch lead and immobilizer lead, left handlebar switch lead clutch cable by the inside of the headlight stay.

FZ6-NHG(W)/FZ6-NAHG

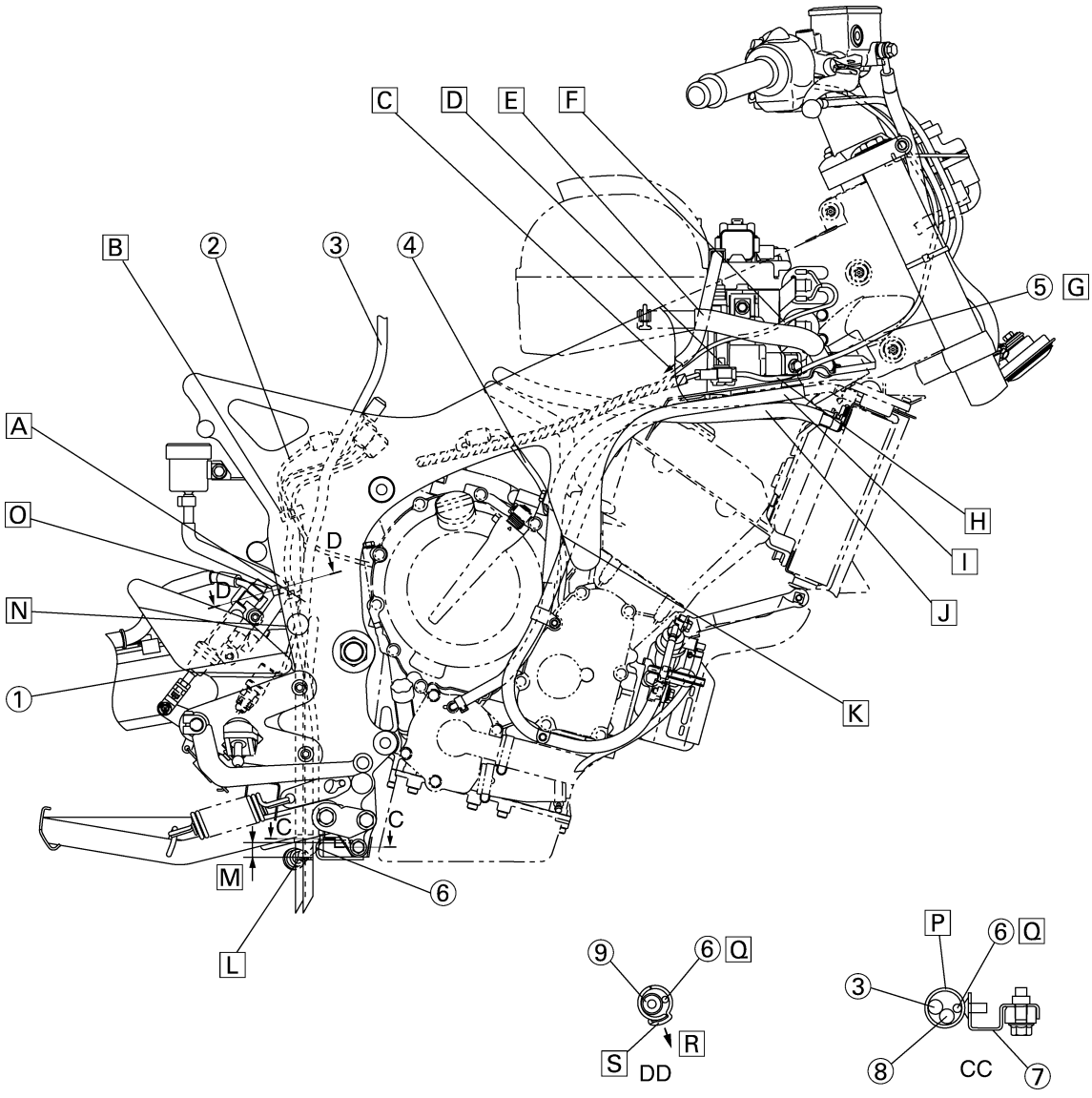


FZ6-NHG(W)/FZ6-NAHG

1. Left handlebar switch lead
2. Main switch and immobilizer lead
3. Clutch cable
4. Wire harness
5. Throttle cables
6. Right handlebar switch lead
7. Handlebar
8. Headlight stay

A. Clamp the right handlebar switch lead and handlebars. Point the tip of the clamp downward in front of the handlebar.
B. Connect the lead to the meter.
C. 5 mm (0.20 in) or less
D. To the sub-wire harness
E. To the left handlebar switch lead
F. Route the branched lead behind the main switch and immobilizer lead.
G. Pass the main switch lead immobilizer lead, left handlebar switch lead and clutch cable in order through the frame hole from the lower side of the vehicle.
H. To the headlight and wire harness
I. Pass the right handlebar switch lead and throttle cable, clutch cable through the opening section of the headlight stay.
J. Install the clamp in the direction as shown in the illustration.
K. Route the main switch lead and immobilizer lead, left handlebar switch lead clutch cable by the inside of the headlight stay.

FZ6-S/FZ6-SHG(W)

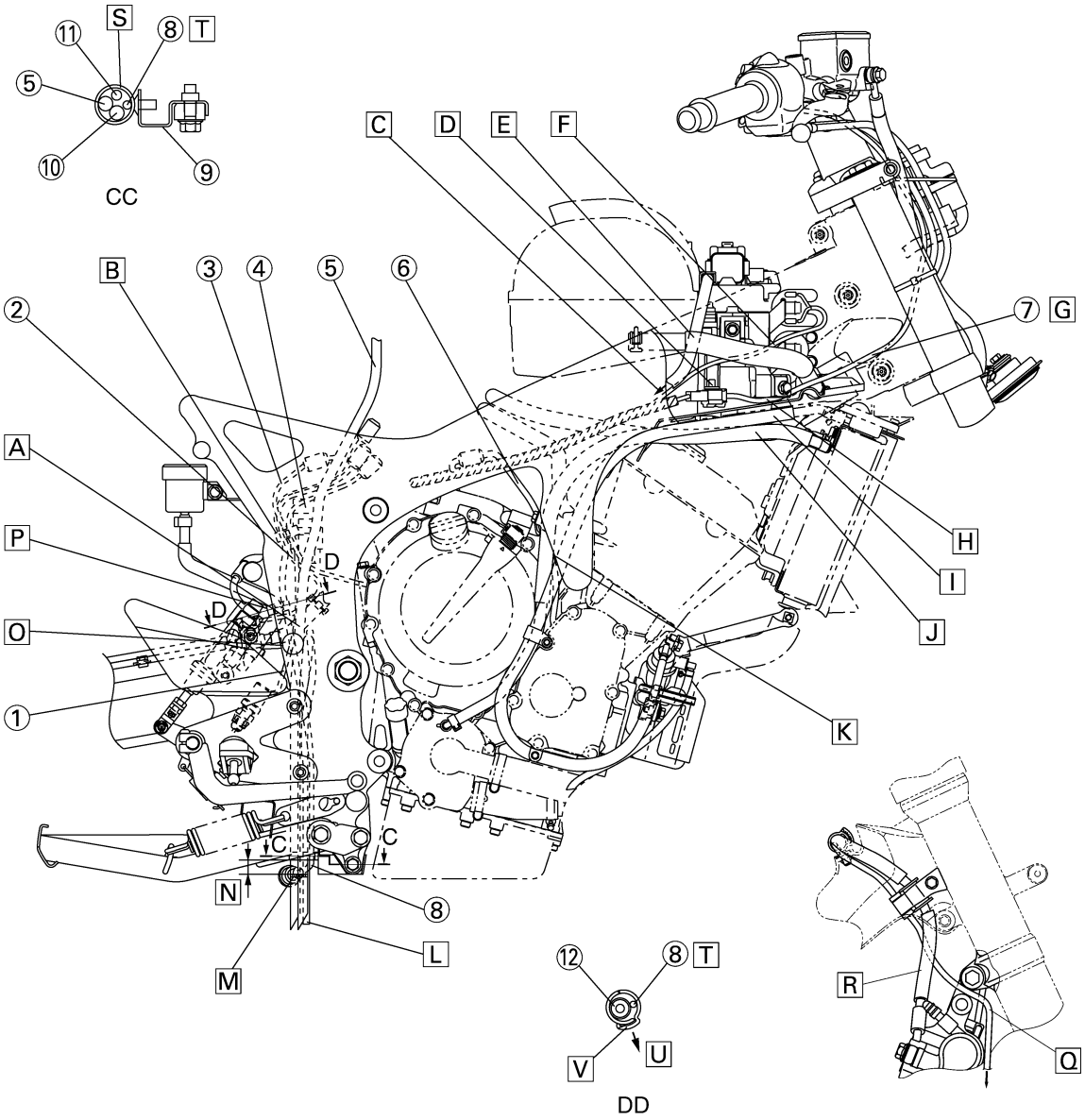


FZ6-S/FZ6-SHG(W)

1. Rear brake light switch lead
2. Neutral switch lead
3. Fuel tank breather hose
4. Crankshaft position sensor lead
5. Right handlebar switch lead
6. O_2 sensor lead
7. Bracket
8. Fuel tank drain hose
9. Rear brake reservoir hose

A. Pass the fuel tank breather hose, fuel tank drain hose and brake light switch lead through the guide of the stay assembly 2.
B. Clamp the tail/brake light switch lead together with the O_2 sensor lead and the neutral switch lead.
C. To the starter motor
D. Install the right handlebar switch lead coupler through the hole of the bracket 2 from the downside.
E. Route the starter motor lead by the inner side of the air cut-off valve hose.
F. Pass the ignition coil leads #1 and #4 through inner side of the air cut-off valve hose, and then between the frame and bracket 2.
G. Pass the right handlebar switch lead through the hole located on the right side of the frame.
H. Route the right handlebar switch lead under the bracket 2.
I. Route the coolant reservoir tank hose under the cover 2. Route the radiator hose (outside) outside.
J. Route the radiator hoses (2 pieces) under the cover 2.
K. Route the crankshaft position sensor lead inner side of the radiator hose.
L. Pull down the mark-painted sections of the fuel tank breather hose and fuel tank drain hose to be lower than the clamp position of the muffler stay. Any order to take out the fuel tank breather hose and fuel tank drain hose can be accepted.
M. 0–20mm (0–0.79 in)
N. Route the O_2 sensor lead by the outer side of the vehicle as viewed from the rear tail/brake light switch lead.
O. Clamping position should be at the center of bend-R as shown in the illustration for the rear brake reservoir tank hose.
P. Pass the fuel tank breather hose, fuel tank drain hose and O_2 sensor lead through the clamp and insert them to the bracket.
Q. Clamp the O_2 sensor lead to the front side of the vehicle.
R. Outside of the vehicle.
S. Attach the clamp so that the opening may be turned to the Outside of the vehicle.

FZ6-SA/FZ6-SAHG

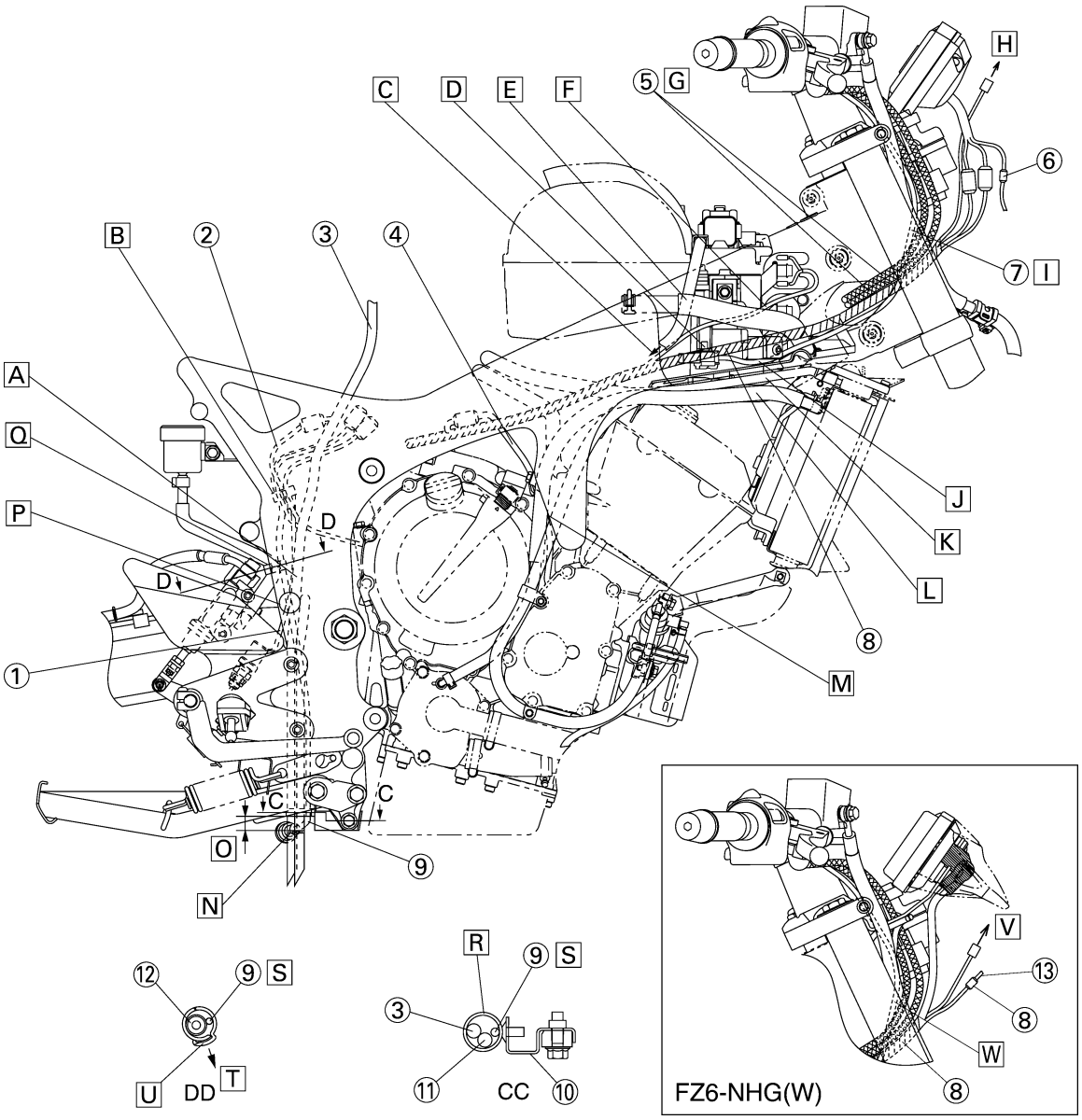


FZ6-SA/FZ6-SAHG

1. Rear brake light switch lead
2. Rear wheel sensor lead
3. Neutral switch lead
4. ABS motor coupler
5. Fuel tank breather hose
6. Crankshaft position sensor lead
7. Right handlebar switch lead
8. O_2 sensor lead
9. Bracket
10. Fuel tank drain hose
11. Hydraulic unit drain hose
12. Rear brake reservoir hose

A. Pass the fuel tank breather hose, fuel tank drain hose, hydraulic unit drain hose and brake light switch lead through the guide of the stay assembly 2.
B. Clamp the tail/brake light switch lead together with the rear wheel sensor lead, O_2 sensor lead and the neutral switch lead.
C. To the starter motor
D. Install the right handlebar switch lead coupler through the hole of the bracket 2 from the downside.
E. Route the starter motor lead by the inner side of the air cut-off valve hose.
F. Pass the ignition coil leads #1 and #4 through inner side of the air cut-off valve hose, and then between the frame and bracket 2.
G. Pass the right handlebar switch lead through the hole located on the right side of the frame.
H. Route the right handlebar switch lead under the bracket 2.
I. Route the coolant reservoir tank hose under the cover 2. Route the radiator hose (outside) outside.
J. Route the radiator hoses (2 pieces) under the cover 2.
K. Route the crankshaft position sensor lead inner side of the radiator hose.
L. Pass the hydraulic unit drain hose through the clamp of muffler stay.
Align the protrusion allowance from the clamp with the fuel tank drain hose.
M. Pull down the mark-painted sections of the fuel tank breather hose and fuel tank drain hose to be lower than the clamp position of the muffler stay. Any order to take out the fuel tank breather hose and fuel tank drain hose can be accepted.
N. 0–20 mm (0–0.79 in)
O. Route the O_2 sensor lead by the outer side of the vehicle as viewed from the rear tail/brake light switch lead.
P. Clamping position should be at the center of bend-R as shown in the illustration for the rear brake reservoir tank hose.
Q. Insert the front wheel sensor lead between the bosses.
R. Route the front wheel sensor lead by the inner side of the front brake hose.
S. Pass the hose and lead through the clamp and insert the clamp into the bracket.
T. Clamp the O_2 sensor lead to the front side of the vehicle.
U. Outside of the vehicle
V. Attach the clamp so that the opening may be turned to the Outside of the vehicle.

FZ6-N/FZ6-NHG(W)

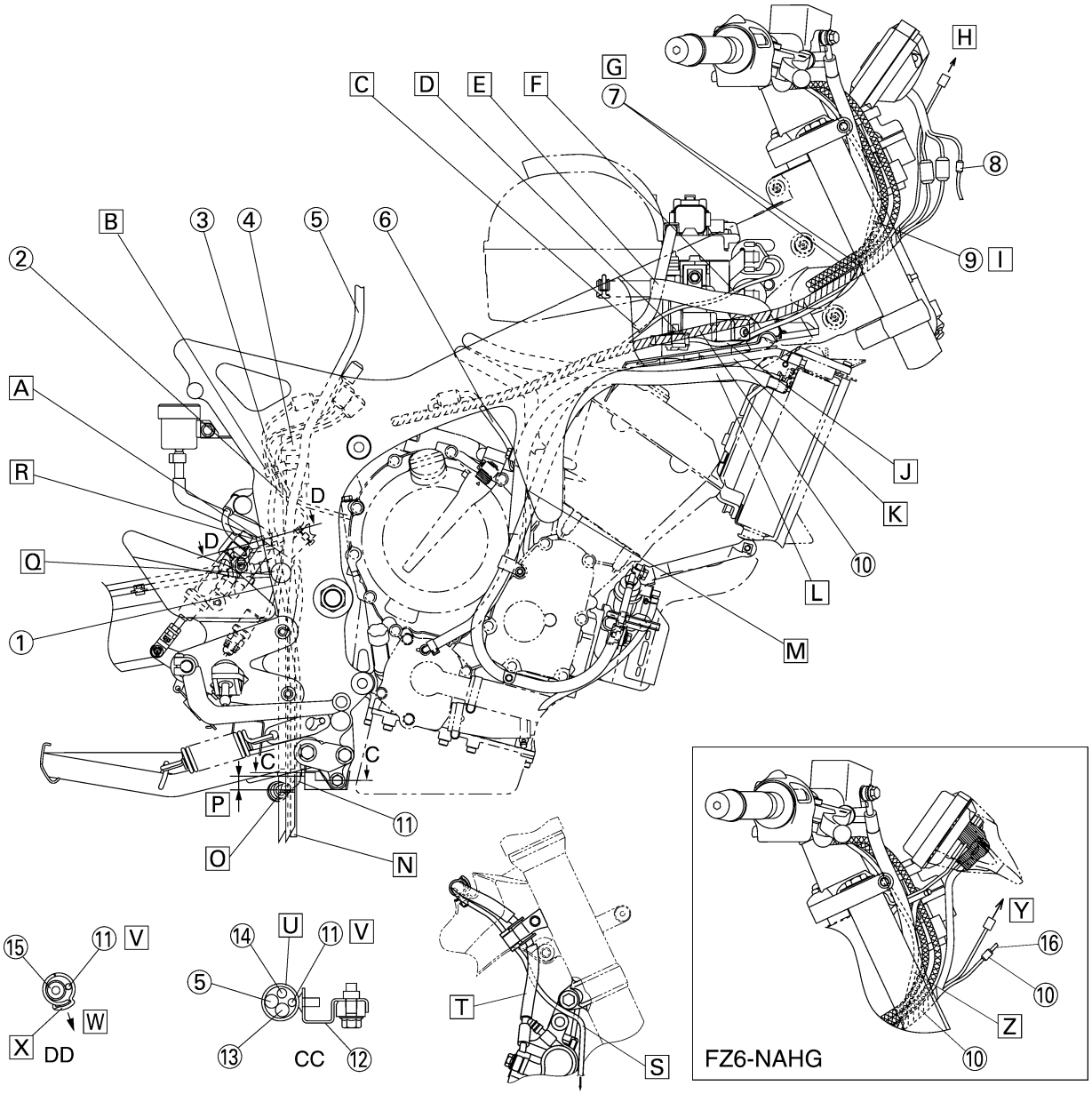


FZ6-N/FZ6-NHG(W)

1. Rear brake light switch lead
2. Neutral switch lead
3. Fuel tank breather hose
4. Crankshaft position sensor lead
5. Throttle cables
6. Meter and left handlebar switch lead
7. Right handlebar switch lead
8. Wire harness
9. O_2 sensor lead
10. Bracket
11. Fuel tank drain hose
12. Rear brake reservoir hose
13. Left handlebar switch lead

A. Pass the fuel tank breather hose, fuel tank drain hose and brake light switch lead through the guide of the stay assembly 2.
B. Clamp the tail/brake light switch lead together with the O_2 sensor lead and the neutral switch lead.
C. To the starter motor
D. Install the right handlebar switch lead coupler through the hole of the bracket 2 from the downside.
E. Route the starter motor lead by the inner side of the air cut-off valve hose.
F. Pass the ignition coil leads #1 and #4 through inner side of the air cut-off valve hose, and then between the frame and bracket 2.
G. Pass the throttle cable through the hole located on the right side of the frame. Route the throttle cable above the wire harness.
H. To the sub-wire harness
I. Pass the right handlebar switch lead through the hole on the right side of the frame. Route it under the inside of the throttle cable and wire harness.
J. Route the right handlebar switch lead under the bracket 2.
K. Route the coolant reservoir tank hose under the cover 2. Route the radiator hose (outside) outside.
L. Route the radiator hoses (2 pieces) under the cover 2.
M. Route the crankshaft position sensor lead inner side of the radiator hose.
N. Pull down the mark-painted sections of the fuel tank breather hose and fuel tank drain hose to be lower than the clamp position of the muffler stay. Any order to take out the fuel tank breather hose and fuel tank drain hose can be accepted.
O. 0-20 mm (0-0.79 in)
P. Route the O_2 sensor lead by the outer side of the vehicle as viewed from the rear tail/brake light switch lead.
Q. Clamping position should be at the center of bend-R as shown in the illustration for the rear brake reservoir tank hose.
R. Pass the fuel tank breather hose, fuel tank drain hose and O_2 sensor lead through the clamp and insert them to the bracket.
S. Clamp the O_2 sensor lead to the front side of the vehicle.
T. Outside of the vehicle.
U. Attach the clamp so that the opening may be turned to the outside of the vehicle.
V. To the sub-wire harness.
W. Pass the right handlebar switch lead through the hole on the right side of the frame. Route it under the inside of the throttle cable and wire haress.

FZ6-NA/FZ6-NAHG

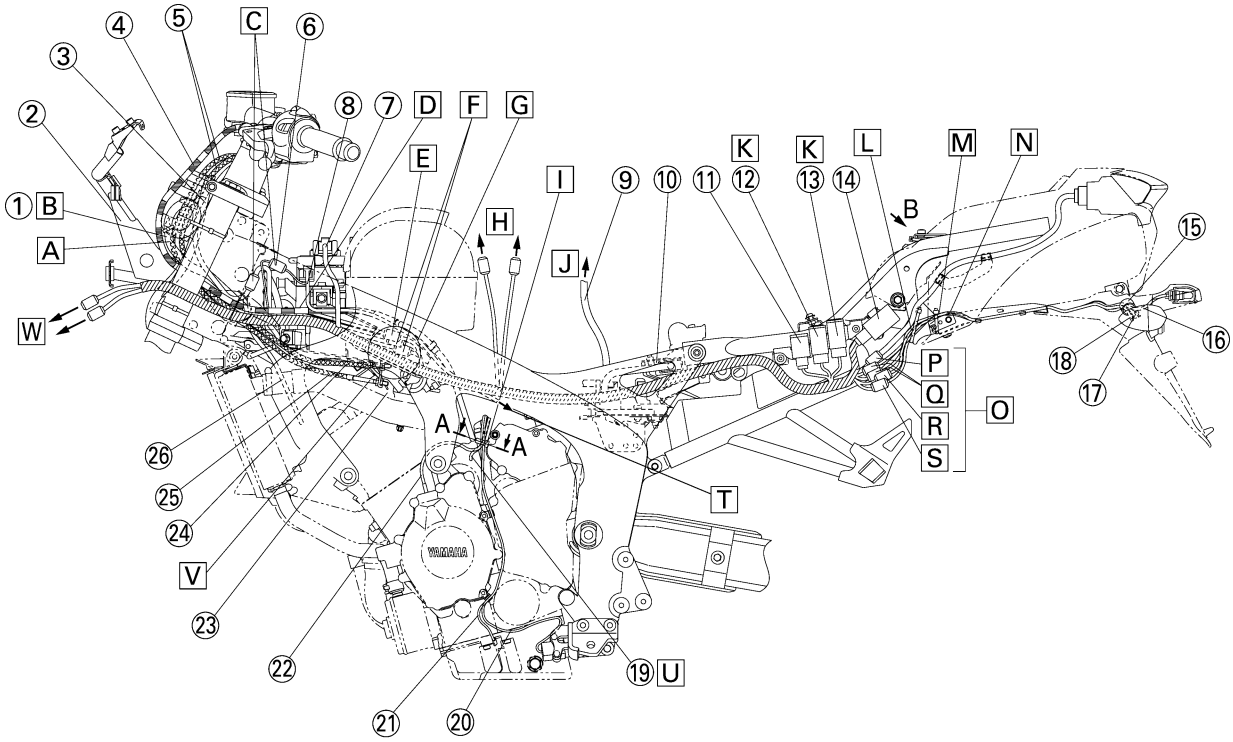


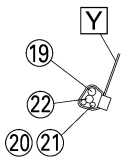
FZ6-NA/FZ6-NAHG

1. Rear brake light switch lead
2. Rear wheel sensor lead
3. Neutral switch lead
4. Hydraulic unit motor coupler
5. Fuel tank breather hose
6. Crankshaft position sensor lead
7. Throttle cables
8. Meter and left handlebar switch lead
9. Right handlebar switch lead
10. Wire harness
11. O_2 sensor lead
12. Bracket
13. Fuel tank drain hose
14. Hydraulic unit drain hose
15. Rear brake reservoir hose
16. Left handlebar switch lead

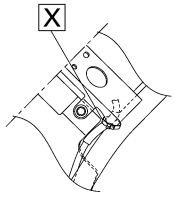
A. Pass the fuel tank breather hose, fuel tank drain hose, hydraulic unit drain hose and brake light switch lead through the guide of the stay assembly 2.
B. Clamp the tail/brake light switch lead together with the rear wheel sensor lead, O_2 sensor lead and the neutral switch lead.
C. To the starter motor
D. Install the right handlebar switch lead coupler through the hole of the bracket 2 from the downside.
E. Route the starter motor lead by the inner side of the air cut-off valve hose.
F. Pass the ignition coil leads #1 and #4 through inner side of the air cut-off valve hose, and then between the frame and bracket 2.
G. Pass the throttle cable through the hole located on the right side of the frame. Route the throttle cable above the wire harness.
H. To the sub-wire harness
I. Pass the right handlebar switch lead through the hole located on the right side of the frame.
J. Route the right handlebar switch lead under the bracket 2.
K. Route the coolant reservoir tank hose under the cover 2. Route the radiator hose (outside) outside.
L. Route the radiator hoses (2 pieces) under the cover 2.
M. Route the crankshaft position sensor lead inner side of the radiator hose.
N. Pass the hydraulic unit drain hose through the clamp of muffler stay. Align the protrusion allowance from the clamp with the fuel tank drain hose.
O. Pull down the mark-painted sections of the fuel tank breather hose and fuel tank drain hose to be lower than the clamp position of the muffler stay. Any order to take out the fuel tank breather hose and fuel tank drain hose can be accepted.
P. 0-20 mm (0-0.79 in)
Q. Route the O_2 sensor lead by the outer side of the vehicle as viewed from the rear tail/brake light switch lead.
R. Clamping position should be at the center of bend-R as shown in the illustration for the rear brake reservoir tank hose.
S. Insert the front wheel sensor lead between the bosses.
T. Route the front wheel sensor lead by the inner side of the front brake hose.
U. Pass the hose and lead through the clamp and insert the clamp into the bracket.
V. Clamp the O_2 sensor lead to the front side of the vehicle.
W. Outside of the vehicle
X. Attach the clamp so that the opening may be turned to the outside of the vehicle.
Y. To the sub-wire harness.
Z. Pass the right handlebar switch lead through the hole on the right side of the frame. Route it under the inside of the throttle cable and wire harness.

FZ6-S/FZ6-SHG(W)





A-A



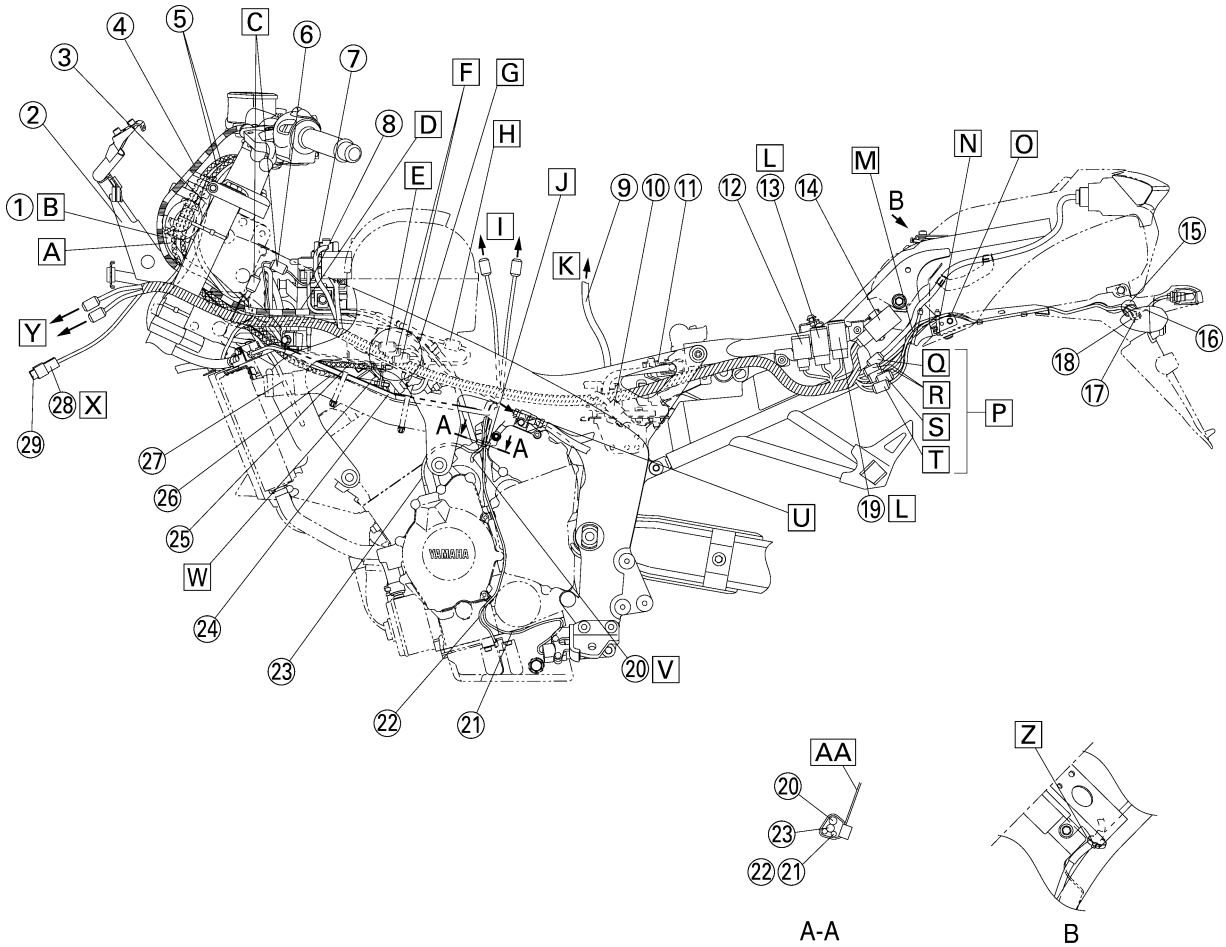
B

FZ6-S/FZ6-SHG(W)

1. Main switch and immobilizer lead
2. Stay assembly
3. Left handlebar switch lead
4. Clutch cable
5. Throttle cables
6. Battery negative lead coupler
7. Starter relay lead
8. Battery negative lead
9. Fuel tank drain hose
10. Rectifier/regulator
11. Turn signal relay
12. Radiator fan motor relay
13. Starting circuit cut-off relay
14. Clamp
15. License plate light lead
16. Rear right turn signal light lead
17. Rear left turn signal light lead
18. Dimmer relay
19. Speed sensor lead
20. Sidestand switch lead
21. Oil level switch lead
22. AC magneto lead
23. Front brake hose
24. Throttle cable (return side)
25. Throttle cable (pull side)
26. Radiator fan motor lead

A. Route the throttle cables above the stay assembly 1.
B. Route the main switch and immobilizer lead above the clutch cable.
C. Line up the left handlebar switch lead coupler and radiator fan motor lead coupler behind the head pipe.
D. Route the clutch cable over the wire harness.
E. To the immobilizer
F. To the main switch
G. Place three couplers on the flange of the cover.
H. To the fuel pump
I. Clamp four wire leads. There should be no excessive slack on the wire leads.
J. To the fuel tank
K. Either installation position can be accepted, but make sure that the leads are not crossed.
L. Clamp the rear turn signal lead and license plate light lead to the frame. Hook the clamp to the bracket. Pull out the lead sufficiently to the frame side and route it along with the side of the back stay. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in) upward.
M. Clamp the rear turn signal light lead and license plate light lead to the frame. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in).
N. Gap between the lead and muffler should be 10 mm (0.39 in) or more.
O. Coupler should not run on the relay assembly.
P. To the tail/brake light
Q. To the license plate light
R. To the rear right turn signal light
S. To the rear left turn signal light
T. To the engine
U. Route the speed sensor lead behind the starter motor lead
V. Point the bend-R section of the throttle cable (pull side) to the inner side horizontally. It is also possible to visually check the bend-R section.
W. To the headlight lead
X. Clamp the seat lock cable to the frame as shown in the illustration. Secure the clamp to the weld of the cross member with the frame. Position the binding section in front of the vehicle body and cut the tip to be between 1 and 5 mm (0.04 and 0.20 in).
Y. Point the tip of the clamp to the inner side of the vehicle body.

FZ6-SA/FZ6-SAHG

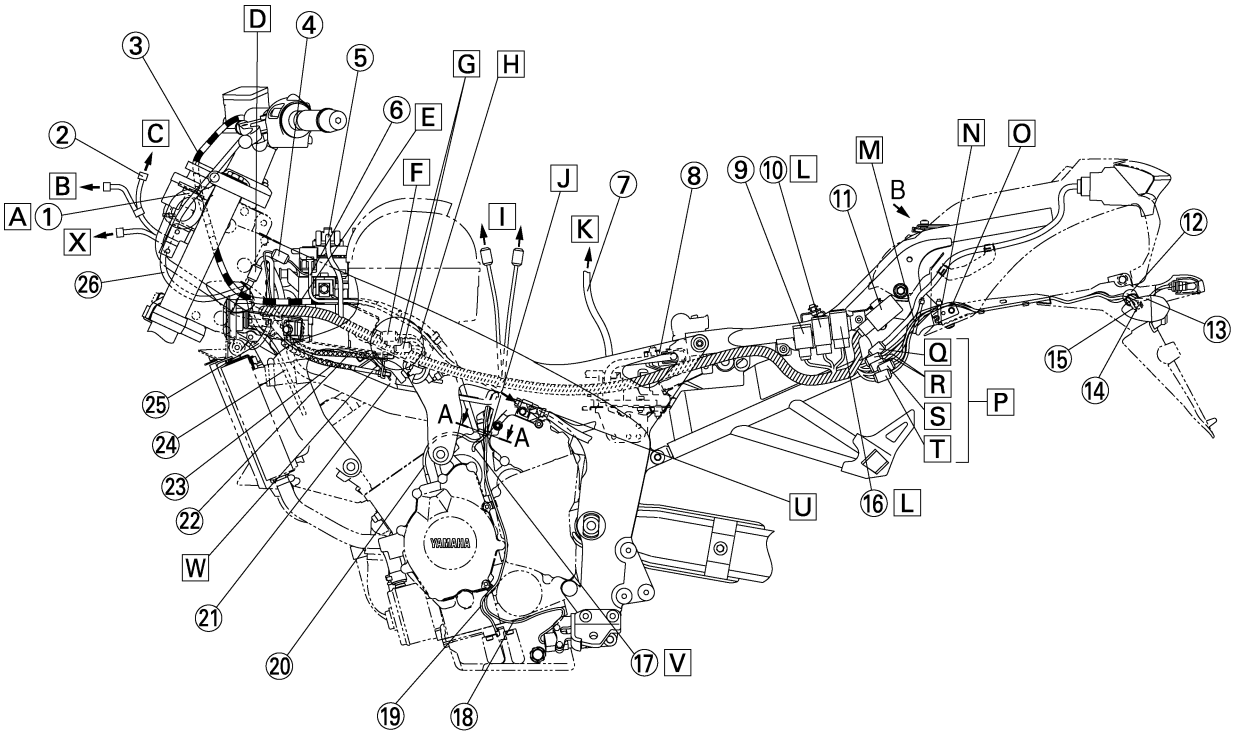


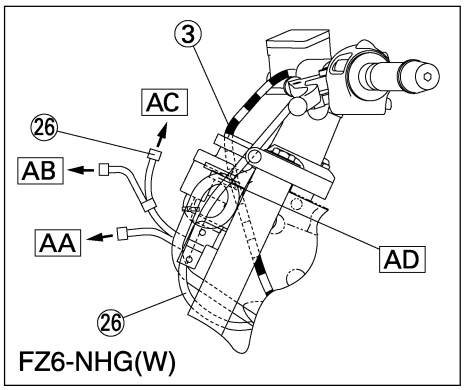
FZ6-SA/FZ6-SAHG

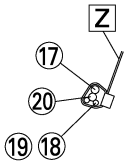
1. Main switch and immobilizer lead
2. Stay assembly
3. Left handlebar switch lead
4. Clutch cable
5. Throttle cables
6. Battery negative lead coupler
7. Starter relay lead
8. Battery negative lead
9. Fuel tank drain hose
10. Hydraulic unit lead
11. Rectifier/regulator
12. Turn signal relay
13. Radiator fan motor relay
14. Starting circuit cut-off relay
15. Clamp
16. License plate light lead
17. Rear turn signal light lead (right)
18. Rear turn signal light lead (left)
19. Dimmer relay
20. Speed sensor lead
21. Sidestand switch lead
22. Oil level switch lead
23. AC magneto lead
24. Front brake hose
25. Throttle cable (return side)
26. Throttle cable (pull side)
27. Radiator fan motor lead
28. ABS check coupler
29. Connector

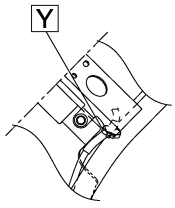
A. Route the throttle cables above the stay assembly1.
B. Route the main switch and immobilizer lead above the clutch cable.
C. Line up the left handlebar switch lead coupler and radiator fan motor lead coupler behind the head pipe.
D. Route the clutch cable over the wire harness.
E. To the immobilizer
F. To the main switch
G. Place three couplers on the flange of the cover.
H. To the front wheel sensor. Place the between frame and clutch cable on the clutch cable fixing bracket.
I. To the fuel pump
J. Clamp four wire leads. There should be no excessive slack on the wire leads.
K. To the fuel tank
L. Either installation position can be accepted, but make sure that the leads are not crossed.
M. Clamp the rear turn signal lead and license plate light lead to the frame. Hook the clamp to the bracket. Pull out the lead sufficiently to the frame side and route it along with the side of the back stay. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in) upward.
N. Clamp the rear turn signal light lead and license plate light lead to the frame. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in).
O. Gap between the lead and muffler should be 10 mm (0.39 in) or more.
P. Coupler should not run on the relay assembly.
Q. To the tail/brake light
R. To the license plate light
S. To the rear turn signal light (right)
T. To the rear turn signal light (left)
U. To the engine
V. Route the speed sensor lead behind the starter motor lead
W. Point the bend-R section of the throttle cable (pull side) to the inner side horizontally. It is also possible to visually check the bend-R section.
X. Attach the ABS check coupler to the bracket after inserting the connector.
Y. To the headlight lead
Z. Clamp the seat lock cable to the frame as shown in the illustration. Secure the clamp to the weld of the cross member with the frame. Position the binding section in front of the vehicle body and cut the tip to be between 1 and 5 mm (0.04 and 0.20 in).
AA. Point the tip of the clamp to the inner side of the vehicle body.

FZ6-N/FZ6-NHG(W)







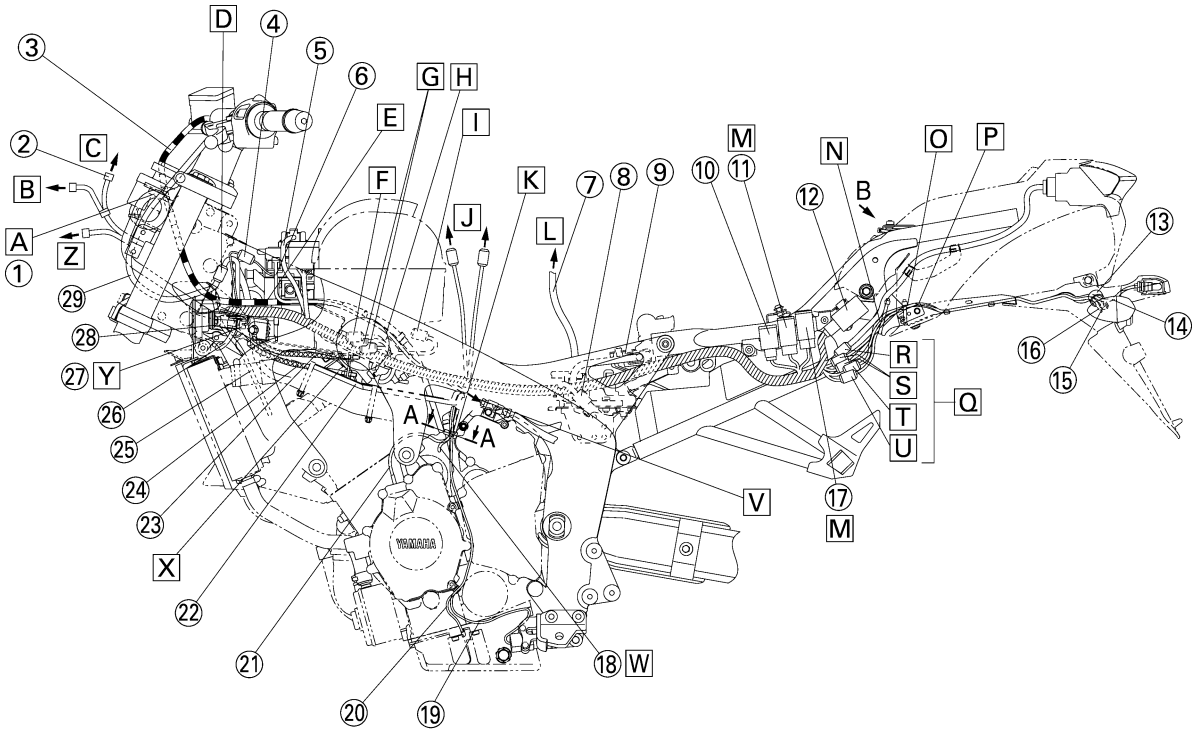


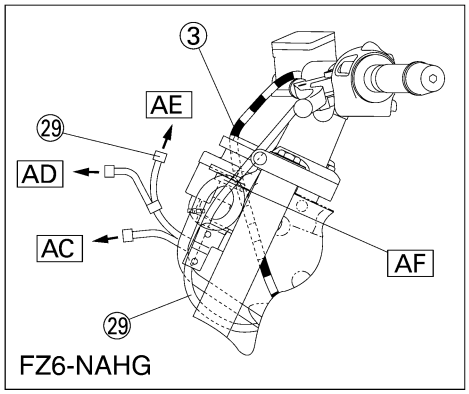
FZ6-N/FZ6-NHG(W)

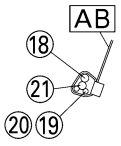
1. Main switch and immobilizer lead
2. Meter and left handlebar switch lead
3. Clutch cable
4. Battery negative lead coupler
5. Starter motor relay lead
6. Battery negative lead
7. Fuel tank drain hose
8. Rectifier/regulator
9. Turn signal relay
10. Radiator fan motor relay
11. Starting circuit cut-off relay
12. Clamp
13. License plate light lead
14. Rear right turn signal light lead
15. Rear left turn signal light lead
16. Dimmer relay
17. Speed sensor lead
18. Sidestand switch lead
19. Oil level switch lead
20. AC magneto lead
21. Front brake hose
22. Throttle cable (return side)
23. Throttle cable (pull side)
24. Radiator fan motor lead
25. Air cut-off valve lead
26. Left handlebar switch lead

A. Route the main switch and immobilizer lead inside (in the width direction of the vehicle) of the left handlebar switch lead.
B. To the auxiliary light
C. To the meter
D. Line up the left handlebar switch lead coupler and radiator fan motor lead coupler behind the head pipe.
E. Route the clutch cable over the wire harness.
F. To the immobilizer
G. To the main switch
H. Place three couplers on the flange of the cover.
I. To the fuel pump
J. Clamp four wire leads. There should be no excessive slack on the wire leads.
K. To the fuel tank
L. Either installation position can be accepted, but make sure that the leads are not crossed.
M. Clamp the rear turn signal lead and license plate light lead to the frame. Hook the clamp to the bracket. Pull out the lead sufficiently to the frame side and route it along with the side of the back stay. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in) upward.
N. Clamp the rear turn signal light lead and license plate light lead to the frame. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in).
O. Gap between the lead and muffler should be 10 mm (0.39 in) or more.
P. Coupler should not run on the relay assembly.
Q. To the tail/brake light
R. To the license plate light
S. To the rear right turn signal light
T. To the rear left turn signal light
U. To the engine
V. Route the speed sensor lead behind the starter motor lead.
W. Point the bend-R section of the throttle cable (pull side) to the inner side horizontally. It is also possible to visually check the bend-R section.
X. To the headlight bulb
Y. Clamp the seat lock cable to the frame as shown in the illustration. Secure the clamp to the weld of the cross member with the frame. Position the binding section in front of the vehicle body and cut the tip to be between 1 and 5 mm (0.04 and 0.20 in).
Z. Point the tip of the clamp to the inner side of the vehicle body.
AA. To the headlight bulb
AB. To the auxiliary light socket
AC. To the wire harness
AD. Route the main switch and immobilizer lead inside (in the width direction of the vehicle) of the handlebar switch lead.

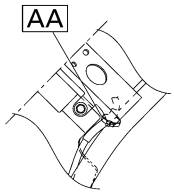
FZ6-NA/FZ6-NAHG







A-A



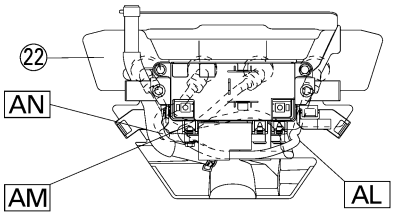
B

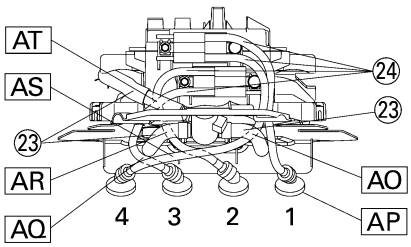
FZ6-NA/FZ6-NAHG

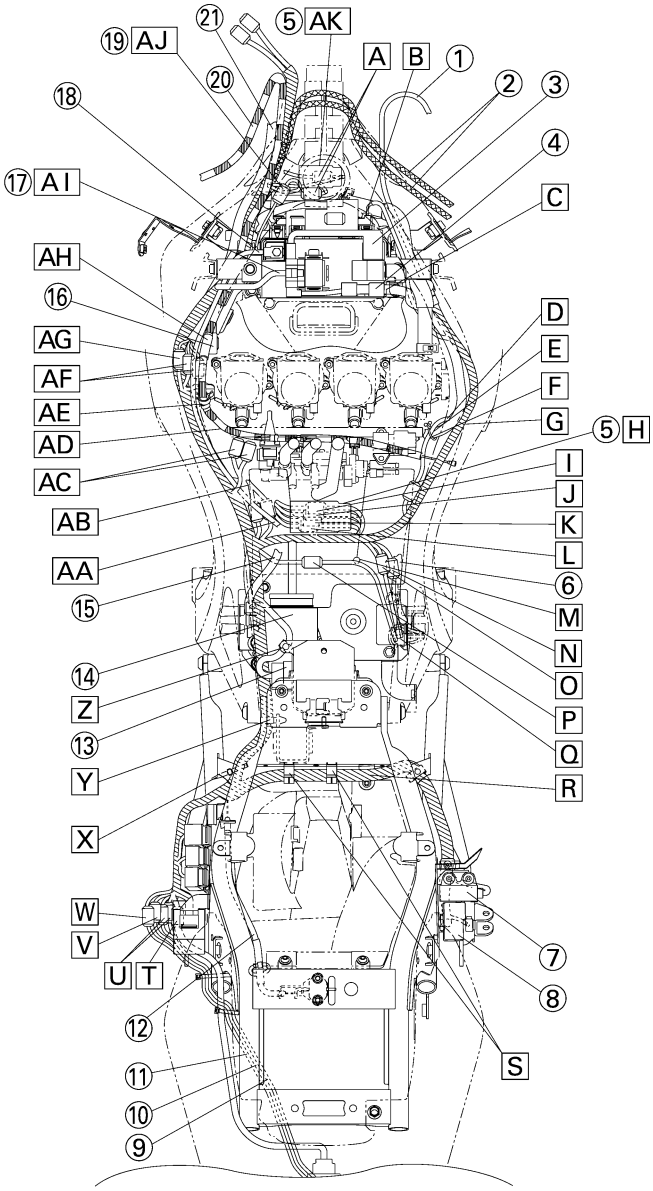
1. Main switch and immobilizer lead
2. Meter and left handlebar switch lead
3. Clutch cable
4. Battery negative lead coupler
5. Starter motor relay lead
6. Battery negative lead
7. Fuel tank drain hose
8. Hydraulic unit lead
9. Rectifier/regulator
10. Turn signal relay
11. Radiator fan motor relay
12. Starting circuit cut-off relay
13. Clamp
14. License plate light lead
15. Rear right turn signal light lead
16. Rear left turn signal light lead
17. Dimmer relay
18. Speed sensor lead
19. Sidestand switch lead
20. Oil level switch lead
21. AC magneto lead
22. Front brake hose
23. Throttle cable (return side)
24. Throttle cable (pull side)
25. Radiator fan motor lead
26. Air cut-off valve lead
27. ABS check coupler
28. Connector
29. Left handlebar switch lead

A. Route the main switch and immobilizer lead inside (in the width direction of the vehicle) of the left handlebar switch lead.
B. To the auxiliary light
C. To the meter
D. Line up the left handlebar switch lead coupler and radiator fan motor lead coupler behind the head
E. Route the clutch cable over the wire harness.
F. To the immobilizer
G. To the main switch
H. Place three couplers on the flange of the cover.
I. To the front wheel sensor. Place the between frame and clutch cable on the clutch cable fixing bracket.
J. To the fuel pump
K. Clamp four wire leads. There should be no excessive slack on the wire leads.
L. To the fuel tank
M. Either installation position can be accepted, but make sure that the leads are not crossed.
N. Clamp the rear turn signal lead and license plate light lead to the frame. Hook the clamp to the bracket. Pull out the lead sufficiently to the frame side and route it along with the side of the back stay. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in) upward.
O. Clamp the rear turn signal light lead and license plate light lead to the frame. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in).
P. Gap between the lead and muffler should be 10 mm (0.39 in) or more.
Q. Coupler should not run on the relay assembly.
R. To the tail/brake light
S. To the license plate light
T. To the rear turn signal light (right)
U. To the rear turn signal light (left)
V. To the engine
W. Route the speed sensor lead behind the starter motor lead
X. Point the bend-R section of the throttle cable (pull side) to the inner side horizontally. It is also possible to visually check the bend-R section. the illustration. Secure the clamp to the weld of the cross member with the frame. Position the binding section in front of the vehicle body and cut the tip to be between 1 and 5 mm (0.04 and 0.20 in).
Y. Connect the ABS check coupler to the connector, and then install the ABS check coupler to the bracket.
Z. To the headlight bulb
AA. Clamp the seat lock cable to the frame as shown in the illustration. Secure the clamp to the weld of the cross member with the frame. Position the binding section in front of the vehicle body and cut the tip to be between 1 and 5 mm (0.04 and 0.20 in).
AB. Point the tip of the clamp to the inner side of the vehicle body.
AC. To the headlight bulb
AD. To the auxiliary light socket
AE. To the wire harness
AF. Route the main switch and immobilizer lead inside (in the width direction of the vehicle of the left handlebar switch lead.)

FZ6-S/FZ6-SHG(W)





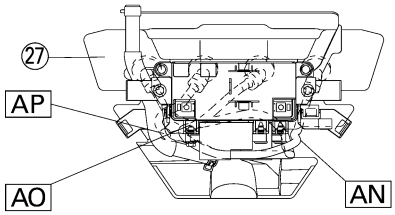


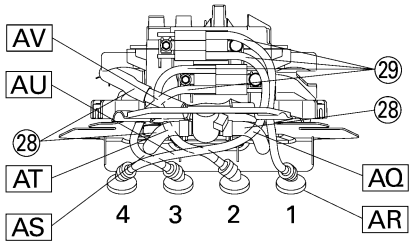
FZ6-S/FZ6-SHG(W)

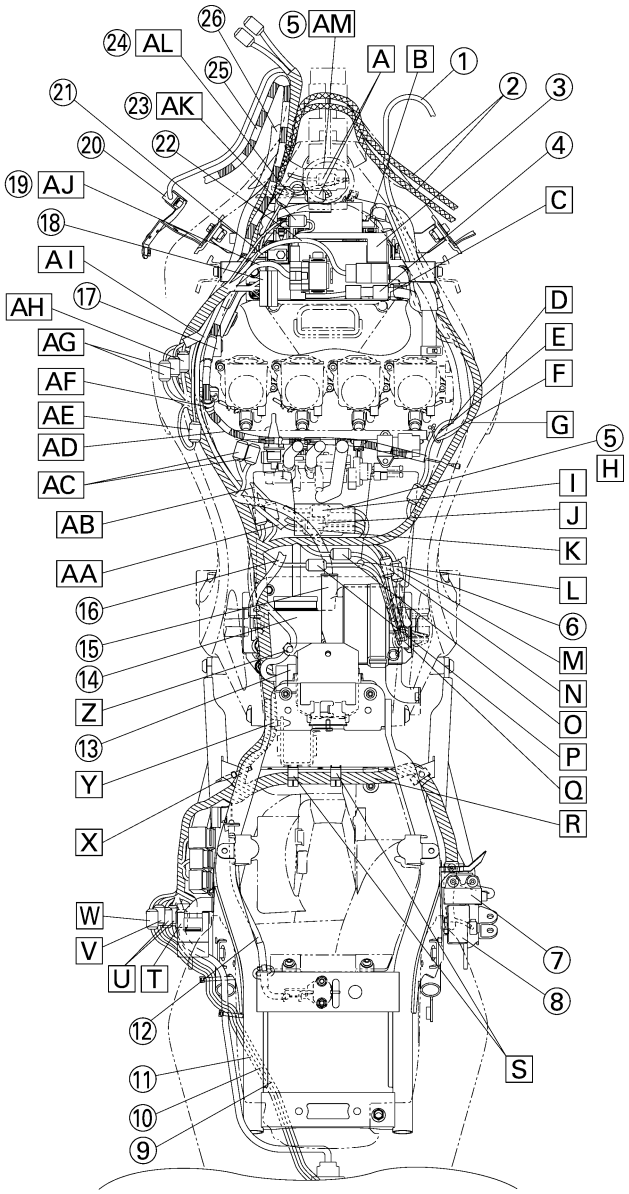
1. Right handlebar switch lead
2. Throttle cables
3. Battery positive lead
4. Battery cover
5. Connector cover
6. Fuel tank breather hose
7. Lean angle sensor
8. Fuse box
9. Rear right turn signal light lead
10. License plate light lead
11. Rear left turn signal light lead
12. Seat lock cable
13. Rectifier/regulator
14. ECU (engine control unit)
15. Fuel tank drain hose
16. Cover
17. Starter relay lead
18. Battery negative lead
19. Battery negative lead coupler
20. Clutch cable
21. Main switch/immobilizer lead
22. Cover 2
23. Air cut-off valve hose
24. Spark plug lead

A. Either front or rear side arrangement for the left handlebar switch lead coupler and radiator fan motor coupler can be accepted.
B. Point the L-shape terminal to the front side of the vehicle.
C. Hook the starter motor lead to the alternate pawls on the battery cover.
D. To the crankshaft position sensor.
E. Route the crankshaft position sensor lead above the starter motor leads.
F. Clamp the starter motor lead and crankshaft position sensor lead. Point the projected part of the tip to the inner side of the vehicle.
G. Pass the radiator hose, wire harness and starter motor lead in order through the lower side of the vehicle.
H. Set the 4 couplers in the connector cover after wiring it.
I. To the sidestand switch
J. To the speed sensor
K. To the AC magneto
L. To the oil level switch
M. The flap hole is located at the right side of the vehicle.
N. To the neutral switch. Place the neutral switch lead coupler under other leads so that it is not seen through the frame openings.
O. To the tail/brake light switch
P. To the O_2 sensor
Q. Clamp the neutral switch lead, tail/brake light lead and O_2 sensor lead. Point the clamp opening to the rear side.
R. Push the wire harness in the groove of the mud guard.
S. Point the opening section of the clamp upward.
T. To the tail/brake light
U. To the license plate light
V. To the rear left turn signal light
W. To the rear right turn signal light
X. Point the tip of the clamp to the outside of the vehicle.
Y. Insert the enwinding clamp of the wire harness into the hole of the rear frame.
Z. Attach the rectifier/regulator lead with the clamp of the regulator bracket.
AA. To the engine ground.
AB. To the fuel injection
AC. To the fuel pump
AD. Route the clutch cable under the fuel injection lead.
AE. Pass the clutch cables through the clamp, and then install the clamp to the cover. Position of the clamp is forward of the cable stopper.
AF. To the main switch
AG. To the immobilizer
AH. Place the adjuster of the clutch cable above the cover.
AI. Route the starter relay lead outside of the main switch and immobilizer lead and pass forward the fuse holder.
AJ. Press the battery negative lead into the space between the ribs of the frame.
AK. After connecting the coupler of the connector cover, positiion it inside.
AL. Pass the spark plug leads #1 and #4 through the slit of the cover 2.
AM. Pass the spark plug lead #2 through the inner hole of the cover 2.
AN. Pass the spark plug lead #3 through the outer hole of the cover 2.
AO. Route the spark plug lead #4 behind the air cutoff valve hose.
AP. Point the spark plug caps of #1 to #4 to the direction as shown in the illustration.
AQ. Route the spark plug lead #3 under the air cutoff valve hose.
AR. Route the spark plug lead #2 behind the air cutoff valve hose.
AS. Route the spark plug lead #4 by the front side of the spark plug leads #2 and #3.
AT. Route the spark plug leads #2 and #3 behind the air cut-off valve hose.

FZ6-SA/FZ6-SAHG



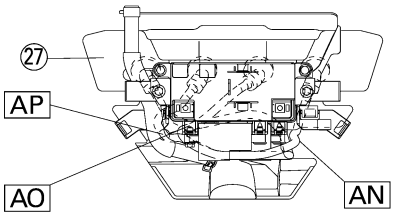


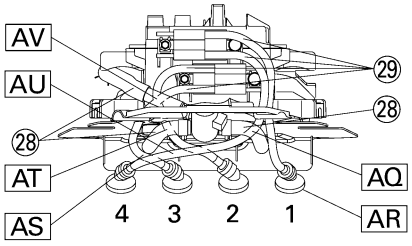


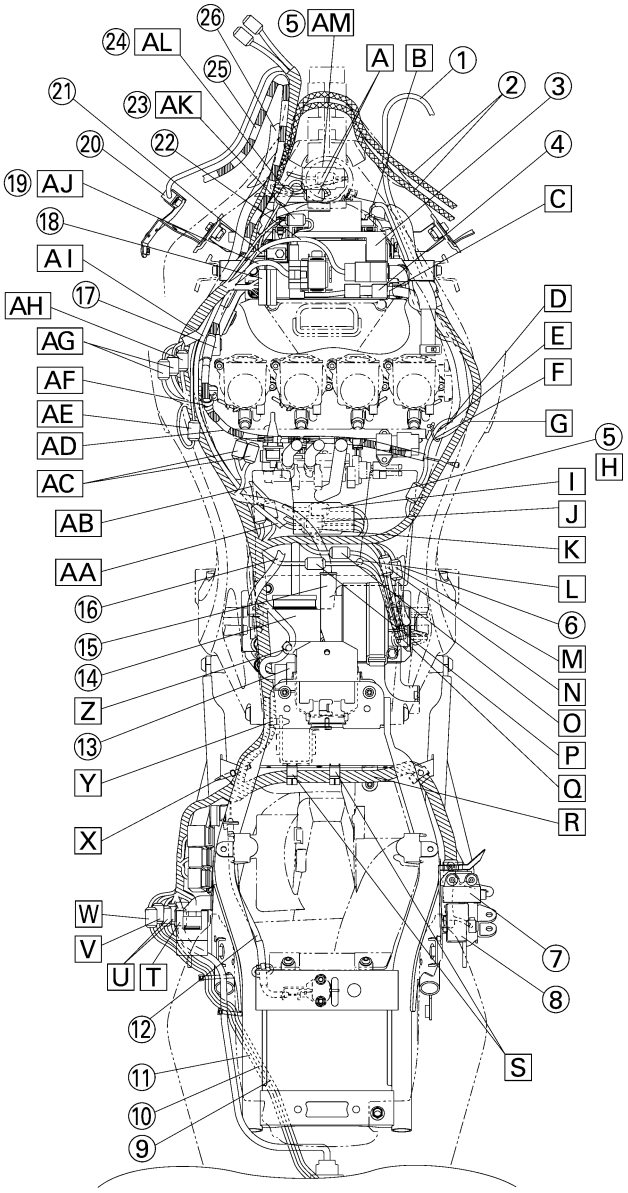
FZ6-SA/FZ6-SAHG

1. Right handlebar switch lead
2. Throttle cables
3. Battery positive lead
4. Battery cover
5. Connector cover
6. Fuel tank breather hose
7. Lean angle sensor
8. Fuse box
9. Rear right turn signal light lead
10. License plate light lead
11. Rear left turn signal light lead
12. Seat lock cable
13. Rectifier/regulator
14. ECU (engine control unit)
15. ABS ECU
16. Fuel tank drain hose
17. Cover
18. Fuse holder
19. Starter relay lead
20. ABS check coupler
21. Battery negative lead
22. ABS motor relay lead
23. Battery positive lead coupler
24. Battery negative lead coupler
25. Clutch cable
26. Main switch/immobilizer lead
27. Cover 2
28. Air cut-off valve hose
29. Spark plug lead

A. Either front or rear side arrangement for the left handlebar switch lead coupler and radiator fan motor coupler can be accepted.
B. Point the L-shape terminal to the front side of the vehicle.
C. Hook the starter motor lead to the alternate pawls on the battery cover.
D. To the crankshaft position sensor.
E. Route the crankshaft position sensor lead above the starter motor leads.
F. Clamp the starter motor lead and crankshaft position sensor lead. Point the projected part of the tip to the inner side of the vehicle.
G. Pass the radiator hose, wire harness and starter motor lead in order through the lower side of the vehicle.
H. Set the 4 couplers in the connector cover after wiring it.
I. To the sidestand switch
J. To the AC magneto
K. To the oil level switch
L. The flap hole is located at the right side of the vehicle.
M. To the neutral switch. Place the neutral switch lead coupler under other leads so that it is not seen through the frame openings.
N. To the tail/brake light switch
O. To the rear wheel sensor
P. To the O_2 sensor
Q. Clamp the neutral switch lead, tail/brake light lead, rear wheel sensor lead and O_2 sensor lead. Point the clamp opening to the rear side.
R. Push the wire harness in the groove of the mud guard.
S. Point the opening section of the clamp upward.
T. To the tail/brake light
U. To the license plate light
V. To the rear left turn signal light
W. To the rear right turn signal light
X. Point the tip of the clamp to the outside of the vehicle.
Y. Insert the enwinding clamp of the wire harness into the hole of the rear frame.
Z. Attach the rectifier/regulator lead with the clamp of the regulator bracket.
AA. To the engine ground.
AB. To the fuel injection
AC. To the fuel pump
AD. Route the clutch cable under the fuel injection lead.
AE. To the front wheel sensor
AF. Pass the clutch cables through the clamp, and then install the clamp to the cover. Position of the clamp is forward of the cable stopper.
AG. To the main switch
AH. To the immobilizer
AI. Place the adjuster of the clutch cable above the cover.
AJ. Route the starter relay lead outside of the main switch and immobilizer lead and pass forward the fuse holder.
AK. Put the battery positive lead coupler inside the frame.
AL. Press the battery negative lead into the space between the ribs of the frame.
AM. After connecting the coupler of the connector cover, positiion it inside.
AN. Pass the spark plug leads #1 and #4 through the slit of the cover 2.
AO. Pass the spark plug lead #2 through the inner hole of the cover 2.
AP. Pass the spark plug lead #3 through the outer hole of the cover 2.
AQ. Route the spark plug lead #4 behind the air cutoff valve hose.
AR. Point the spark plug caps of #1 to #4 to the direction as shown in the illustration.







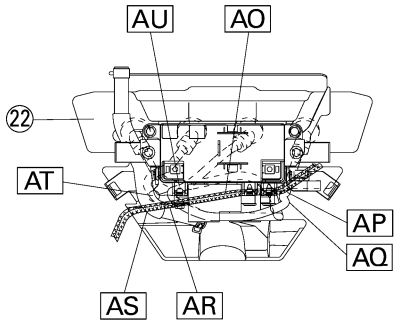
AS. Route the spark plug lead #3 under the air cutoff valve hose.

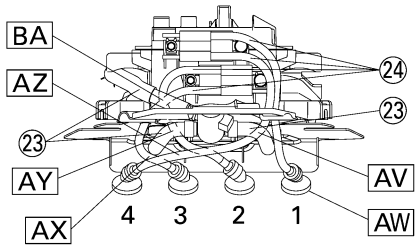
AT. Route the spark plug lead #2 behind the air cutoff valve hose.

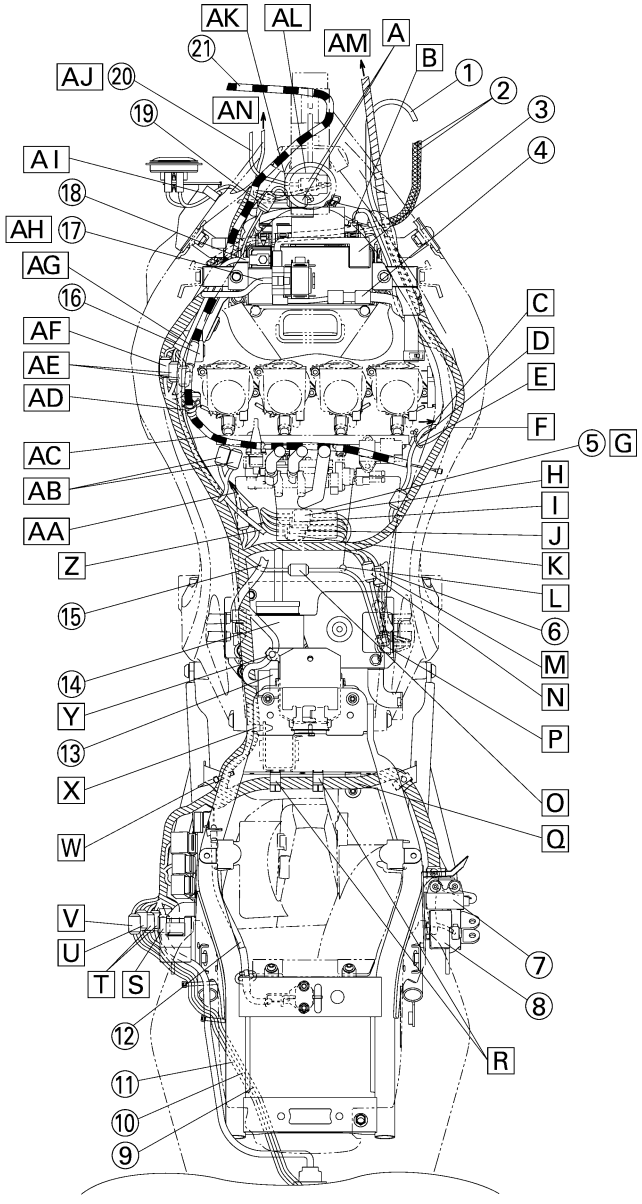
AU. Route the spark plug lead #4 by the front side of the spark plug leads #2 and #3.

AV. Route the spark plug leads #2 and #3 behind the air cut-off valve hose.

FZ6-N/FZ6-NHG(W)



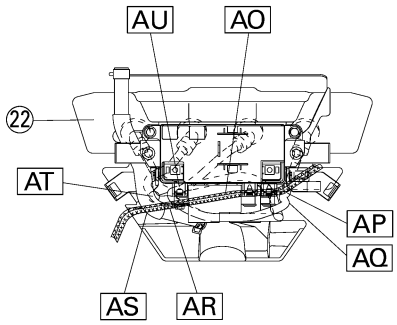


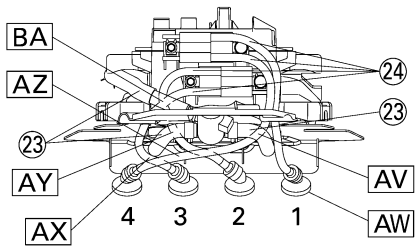


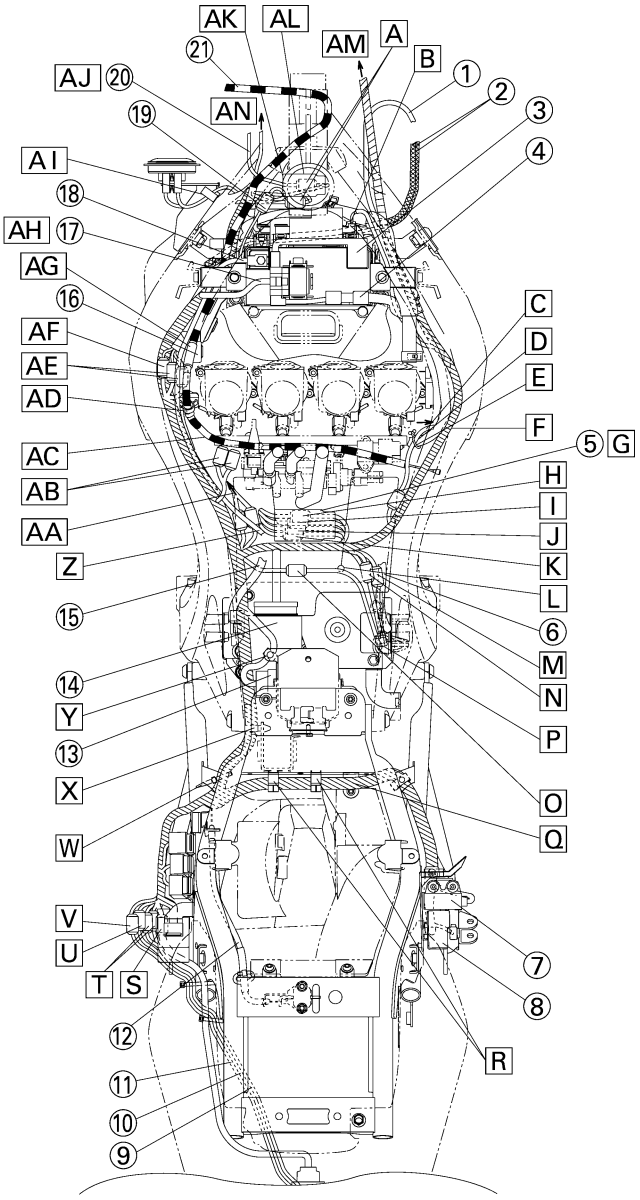
FZ6-N/FZ6-NHG(W)

1. Right handlebar switch lead
2. Throttle cables
3. Battery positive lead
4. Battery cover
5. Connector cover
6. Fuel tank breather hose
7. Lean angle sensor
8. Fuse box
9. Rear right turn signal light lead
10. License plate light lead
11. Rear left turn signal light lead
12. Seat lock cable
13. Rectifier/regulator
14. ECU (engine control unit)
15. Fuel tank drain hose
16. Cover
17. Starter relay lead
18. Battery negative lead
19. Battery negative lead coupler
20. Left handlebar switch lead
21. Clutch cable
22. Cover 2
23. Air cut-off valve hose
24. Spark plug lead

A. Either front or rear side arrangement for the left handlebar switch lead coupler and radiator fan motor coupler can be accepted.
B. Point the L-shape terminal to the front side of the vehicle.
C. To the crankshaft position sensor.
D. Route the crankshaft position sensor lead above the starter motor leads.
E. Clamp the starter motor lead and crankshaft position sensor lead. Point the projected part of the tip to the inner side of the vehicle.
F. Pass the radiator hose, wire harness and starter motor lead in order through the lower side of the vehicle.
G. Set the 4 couplers in the connector cover after wiring it.
H. To the sidestand switch
I. To the speed sensor
J. To the AC magneto
K. To the oil level switch
L. The flap hole is located at the right side of the vehicle.
M. To the neutral switch. Place the neutral switch lead coupler under other leads so that it is not seen through the frame openings.
N. To the tail/brake light switch
O. To the O_2 sensor
P. Clamp the neutral switch lead, tail/brake light lead and O_2 sensor lead. Point the clamp opening to the rear side.
Q. Push the wire harness in the groove of the mud guard.
R. Point the opening section of the clamp upward.
S. To the tail/brake light
T. To the license plate light
U. To the rear left turn signal light
V. To the rear right turn signal light
W. Point the tip of the clamp to the outside of the vehicle.
X. Insert the enwinding clamp of the wire harness into the hole of the rear frame.
Y. Attach the rectifier/regulator lead with the clamp of the regulator bracket.
Z. To the engine ground.
AA. To the fuel injection
AB. To the fuel pump
AC. Route the clutch cable under the fuel injection lead.
AD. Pass the clutch cables through the clamp, and then install the clamp to the cover. Position of the clamp is forward of the cable stopper.
AE. To the main switch
AF. To the immobilizer
AG. Place the adjuster of the clutch cable above the cover.
AH. Route the starter relay lead outside of the main switch and immobilizer lead and pass forward the fuse holder.
AI. Clamp the horn lead. Point the opening section of the clamp outside.
AJ. Route the left handlebar switch lead under of the clutch cable.
AK. Install the connector cover pointing its large diameter opening to the left side of the vehicle body.
AL. After connecting the coupler of the connector cover, position it inside.
AM. To the meter
AN. To the main switch and immobilizer
AO. Throttle cables can be routed under the battery box.
AP. Route the throttle cables behind the #1 and #4 spark plug lead.
AQ. Pass the spark plug leads #1 and #4 through the slit of the cover 2.
AR. Route the throttle cables by the front side of the #2 and #3 spark plug lead.
AS. Route the throttle cables under the vent hose of the air-cut valve.
AT. Pass the spark plug lead #3 through the outer hole of the cover 2.
AU. Pass the spark plug lead #2 through the inner hole of the cover 2.

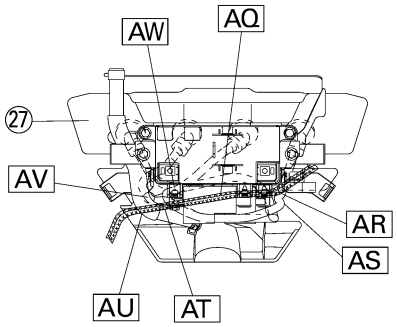


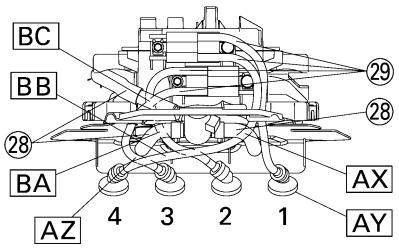


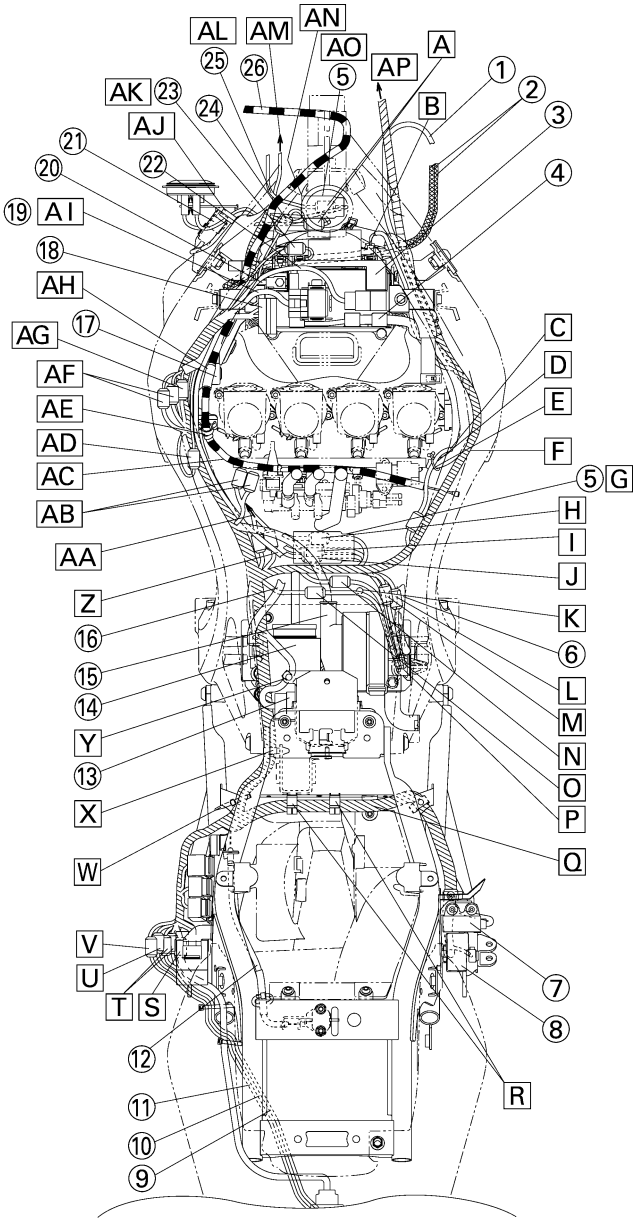


AV. Route the spark plug lead #4 behind the air cut-off valve hose.
AW. Point the spark plug caps of #1 to #4 to the direction as shown in the illustration.
AX. Route the spark plug lead #3 under the air cut-off valve hose.
AY. Route the spark plug lead #2 behind the air cut-off valve hose.
AZ. Route the spark plug lead #4 by the front side of the spark plug leads #2 and #3.
BA. Route the spark plug leads #2 and #3 behind the air cut-off valve hose.

FZ6-NA/FZ6-NAHG



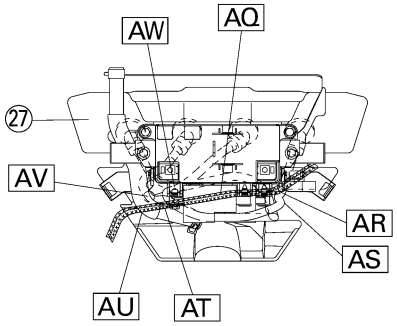


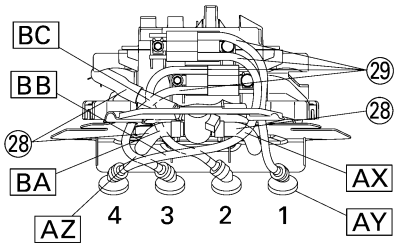


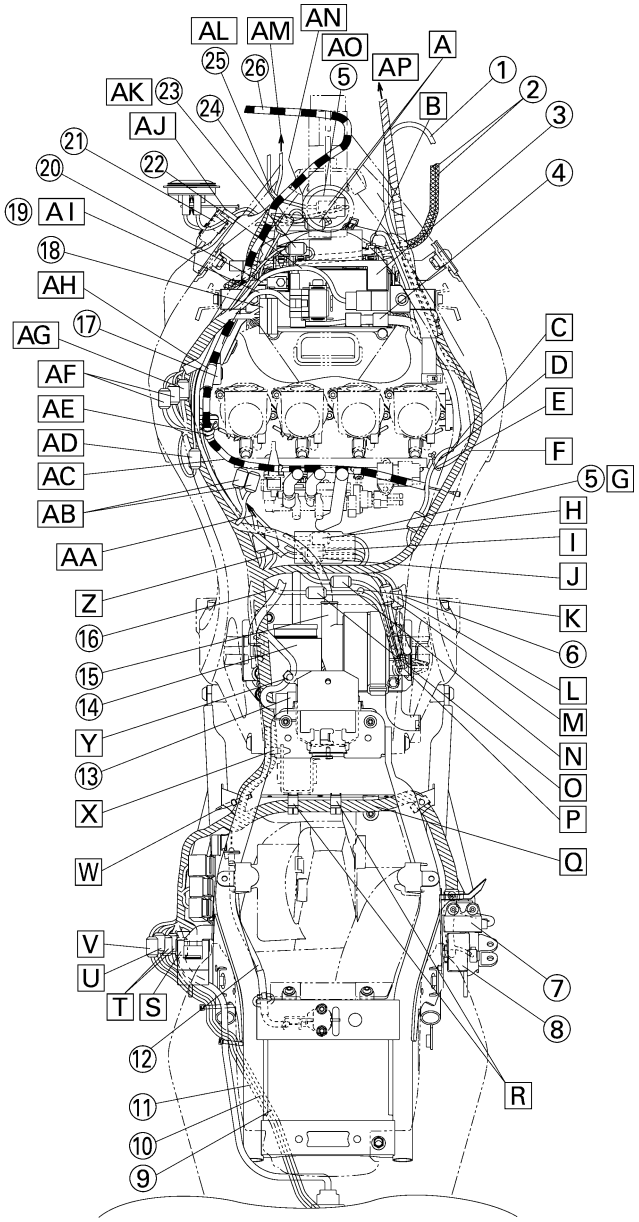
FZ6-NA/FZ6-NAHG

1. Right handlebar switch lead
2. Throttle cables
3. Battery positive lead
4. Battery cover
5. Connector cover
6. Fuel tank breather hose
7. Lean angle sensor
8. Fuse box
9. Rear right turn signal light lead
10. License plate light lead
11. Rear left turn signal light lead
12. Seat lock cable
13. Rectifier/regulator
14. ECU (engine control unit)
15. ABS ECU
16. Fuel tank drain hose
17. Cover
18. Fuse holder
19. Starter relay lead
20. Battery negative lead
21. ABS check coupler
22. ABS motor relay lead
23. Battery positive lead coupler
24. Battery negative lead coupler
25. Left handlebar switch lead
26. Clutch cable
27. Cover 2
28. Air cut-off valve hose
29. Spark plug lead

A. Either front or rear side arrangement for the left handlebar switch lead coupler and radiator fan motor coupler can be accepted.
B. Point the L-shape terminal to the front side of the vehicle.
C. To the crankshaft position sensor.
D. Route the crankshaft position sensor lead above the starter motor leads.
E. Clamp the starter motor lead and crankshaft position sensor lead. Point the projected part of the tip to the inner side of the vehicle.
F. Pass the radiator hose, wire harness and starter motor lead in order through the lower side of the vehicle.
G. Set the 4 couplers in the connector cover after wiring it.
H. To the sidestand switch
I. To the AC magneto
J. To the oil level switch
K. Set the FLAP hole at the right side of the vehicle and the leads should not pass through the hole.
L. To the neutral switch. Place the neutral switch lead coupler under other leads so that it is not seen through the frame openings.
M. To the tail/brake light switch
N. To the rear wheel sensor
O. To the O_2 sensor
P. Clamp the neutral switch lead, tail/brake light lead, rear wheel sensor lead and O_2 sensor lead. Point the clamp opening to the rear side.
Q. Push the wire harness in the groove of the mud guard.
R. Point the opening section of the clamp upward.
S. To the tail/brake light
T. To the license plate light
U. To the rear left turn signal light
V. To the rear right turn signal light
W. Point the tip of the clamp to the outside of the vehicle.
X. Insert the enwinding clamp of the wire harness into the hole of the rear frame.
Y. Attach the rectifier/regulator lead with the clamp of the regulator bracket.
Z. To the engine ground.
AA. To the fuel injection
AB. To the fuel pump
AC. Route the clutch cable under the fuel injection lead.
AD. To the front wheel sensor
AE. Pass the clutch cables through the clamp, and then install the clamp to the cover. Position of the clamp is forward of the cable stopper.
AF. To the main switch
AG. To the immobilizer
AH. Place the adjuster of the clutch cable above the cover.
AI. Route the starter relay lead outside of the main switch and immobilizer lead and pass forward the fuse holder.
AJ. Clamp the horn lead and ABS check lead. Point the opening section of the clamp outside.
AK. Put the battery positive lead coupler inside the frame.
AL. Route the left handlebar switch lead under of the clutch cable.
AM. To the main switch and immobilizer
AN. Install the connector cover pointing its large diameter opening to the left side of the vehicle body.
AO. After connecting the coupler of the connector cover, position it inside.
AP. To the meter
AQ. Throttle cables can be routed under the battery box.







. Route the throttle cables behind the #1 and #4 spark plug lead.
. Pass the spark plug leads #1 and #4 through the slit of the cover 2.
. Route the throttle cables by the front side of the #2 and #3 spark plug lead.

AU. Route the throttle cables under the vent hose of the air-cut valve.

AV. Pass the spark plug lead #3 through the outer hole of the cover 2.

AW. Pass the spark plug lead #2 through the inner hole of the cover 2.

AX. Route the spark plug lead #4 behind the air cut-off valve hose.

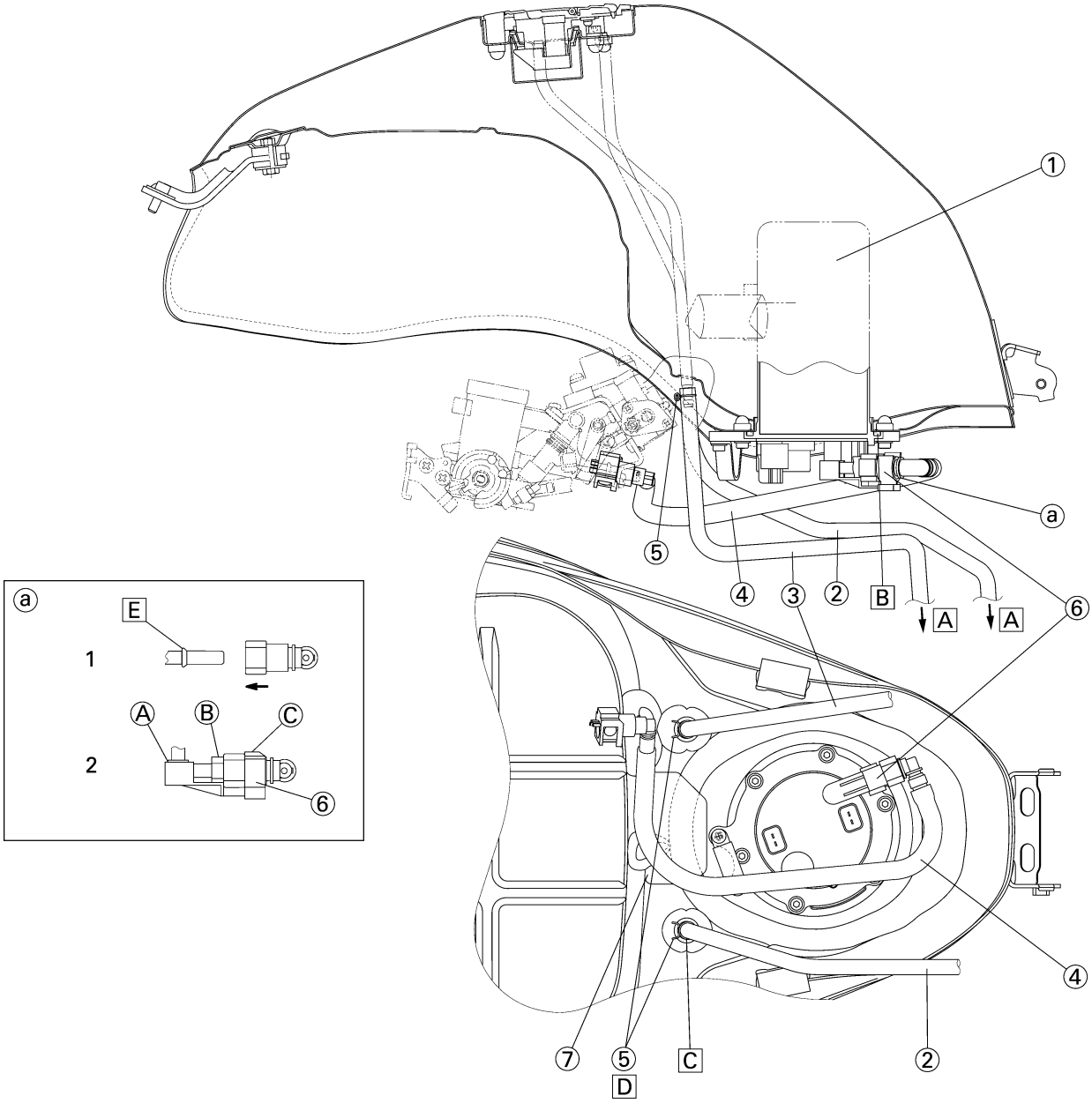
AY. Point the spark plug caps of #1 to #4 to the direction as shown in the illustration.

AZ. Route the spark plug lead #3 under the air cut-off valve hose.

BA. Route the spark plug lead #2 behind the air cut-off valve hose.

BB. Route the spark plug lead #4 by the front side of the spark plug leads #2 and #3.

BC. Route the spark plug leads #2 and #3 behind the air cut-off valve hose.



1. Fuel pump assembly
2. Fuel tank breather hose
3. Fuel tank drain hose
4. Fuel hose
5. Clip
6. Clamp
7. Fuel tank protector

A. Air opening.
B. Install the O-ring with its lip pointed upward.
C. Fuel tank breather hose has a white point mark. (fuel tank breather hose side)
D. Point the knob of clip front side

a. Fuel piping connector attachment directions. (fuel pump side) Don't use tool.

1. It is inserted until it makes a click sound the connector, and it checks that a connector does not fall out. It takes care that a foreign substance does not enter into a seal portion. (Working groves should not be used at the time of work.)

E. It prevents that this portion falls out.

2. The clamp is attached from the bottom after the work of "1". It checks being completely equipped with, "A", "B" and "C" section.

PERIODIC CHECKS AND ADJUSTMENTS

EAS20450
PERIODIC MAINTENANCE

EAS20460
INTRODUCTION

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

NOTE:

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

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (X 1000 km)					Annual check
				1	10	20	30	40	
1	*	**Fuel line**	• Check fuel hoses for cracks or damage.		√	√	√	√	√
2	*	**Spark plugs**	• Check condition. • Clean and regap.		√		√		
			• Replace.			√		√	
3	*	**Valves**	• Check valve clearance. • Adjust.	Every 40000 km					
4		**Air filter element**	• Replace.					√	
5		**Clutch**	• Check operation. • Adjust.	√	√	√	√	√	
6	*	**Front brake**	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
			• Replace brake pads.	Whenever worn to the limit					
7	*	**Rear brake**	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
			• Replace brake pads.	Whenever worn to the limit					
8	*	**Brake hoses**	• Check for cracks or damage.		√	√	√	√	√
			• Replace.	Every 4 years					
9	*	**Wheels**	• Check runout and for damage.		√	√	√	√	
10	*	**Tires**	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
11	*	**Wheel bearings**	• Check bearing for looseness or damage.		√	√	√	√	
12	*	**Swingarm**	• Check operation and for excessive play.		√	√	√	√	
			• Lubricate with lithium-soap-based grease.	Every 50000 km					

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (X 1000 km)					Annual check
				1	10	20	30	40	
13		**Drive chain**	• Check chain slack, alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 1000 km and after washing the vehicle or riding in the rain					
14	*	**Steering bearings**	• Check bearing play and steering for roughness.	√	√	√	√	√	
			• Lubricate with lithium-soap-based grease.	Every 20000 km					
15	*	**Chassis fasteners**	• Make sure that all nuts, bolts and screws are properly tightened.		√	√	√	√	√
16		**Sidestand, centerstand**	• Check operation. • Lubricate.		√	√	√	√	√
17	*	**Sidestand switch**	• Check operation.	√	√	√	√	√	√
18	*	**Front fork**	• Check operation and for oil leakage.		√	√	√	√	
19	*	**Shock absorber assembly**	• Check operation and shock absorber for oil leakage.		√	√	√	√	
20	*	**Fuel injection**	• Adjust engine idling speed and synchronization.	√	√	√	√	√	√
21		**Engine oil**	• Change. • Check oil level and vehicle for oil leakage.	√	√	√	√	√	√
22		**Engine oil filter cartridge**	• Replace.	√		√		√	
23	*	**Cooling system**	• Check coolant level and vehicle for coolant leakage.		√	√	√	√	√
			• Change.	Every 3 years					
24	*	**Front and rear brake switches**	• Check operation.	√	√	√	√	√	√
25		**Moving parts and cables**	• Lubricate.		√	√	√	√	√
26	*	**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.		√	√	√	√	√
27	*	**Air induction system**	• Check the air cut-off valve, reed valve, and hose for damage. • Replace the entire air induction system if necessary.		√	√	√	√	√
28	*	**Muffler and exhaust pipe**	• Check the screw clamp for looseness.	√	√	√	√	√	
29	*	**Lights, signals and switches**	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

NOTE:

- Air filter
  - This model's air filter is equipped with a disposable oil-coated paper element, which must not be cleaned with compressed air to avoid damaging it.
  - The air filter element needs to be replaced more frequently when riding in unusually wet or dusty areas.
- Hydraulic brake service
  - Regularly check and, if necessary, correct the brake fluid level.
  - Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
  - Replace the brake hoses every four years and if cracked or damaged.

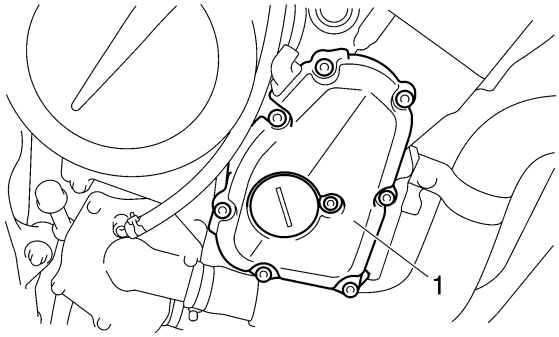
EAS20470
ENGINE

EAS20490
ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

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

1. Remove:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Battery
     Refer to "GENERAL CHASSIS" on page 4-1 and "CHECKING AND CHARGING THE BATTERY" on page 8-109.
   - Air filter case
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Battery box
   - Battery box bracket
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Throttle bodies
     Refer to "THROTTLE BODIES" on page 7-4.
   - Air cut-off valve
     Refer to "AIR INDUCTION SYSTEM" on page 7-8.
   - Radiator
   - Radiator fan motor
     Refer to "RADIATOR" on page 6-1.
2. Remove:
   - Ignition coils
   - Spark plugs
   - Cylinder head cover
   - Cylinder head cover gasket
     Refer to "CAMSHAFTS" on page 5-8.
3. Remove:
   - Pickup rotor cover “1”



4. Measure:
   - Valve clearance
     Out of specification → Adjust.

Valve clearance (cold)
Intake
0.13–0.20 mm (0.0051–0.0079 in)
Exhaust
0.23–0.30 mm (0.0091–0.0118 in)

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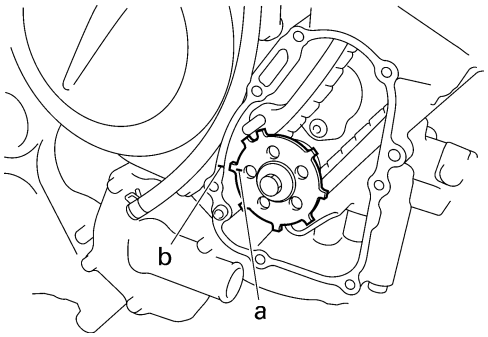
a. Turn the crankshaft counterclockwise.
b. When piston #1 is at TDC on the compression stroke, align the TDC mark “a” on the pickup rotor with the crankcase mating surface “b”.

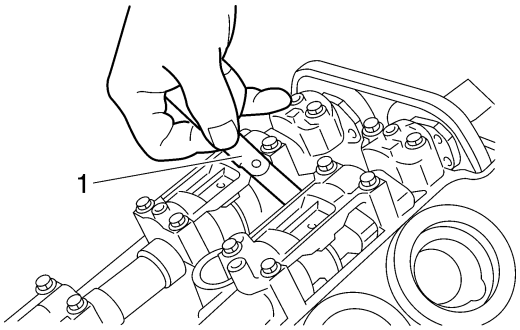
NOTE:
TDC on the compression stroke can be found when the camshaft lobes are turned away from each other.

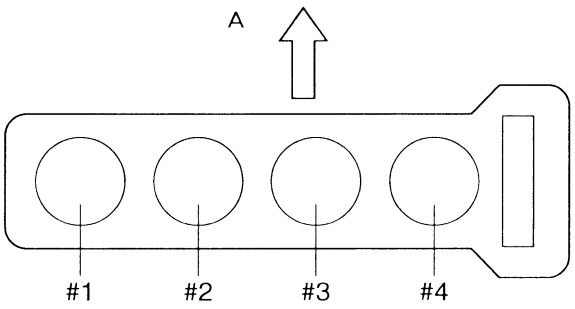


c. Measure the valve clearance with a thickness gauge “1”.

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

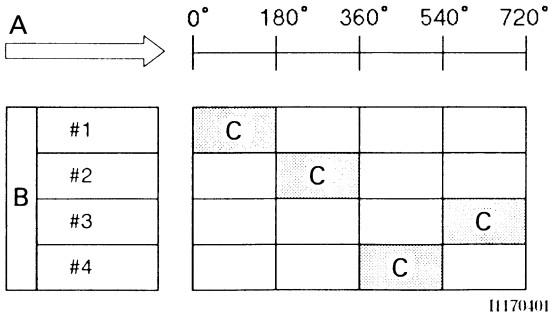
Valve clearance measuring sequence
Cylinder #1 → #2 → #4 → #3





A. Front

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



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

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

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5. Remove:
   • Camshafts

NOTE:
• Refer to "CAMSHAFTS" on page 5-8.
• 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

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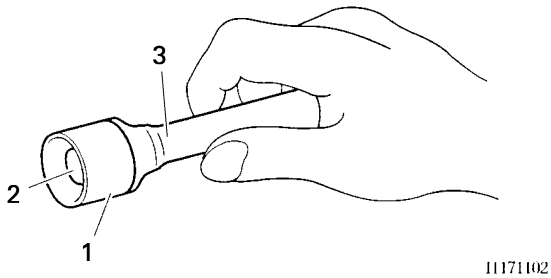
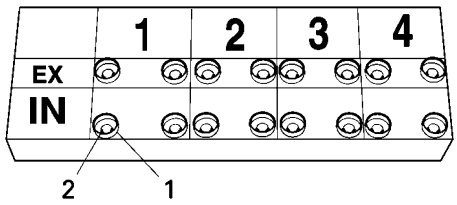
a. Remove the valve lifter "1" and the valve pad "2" with a valve lapper "3".

Valve lapper
90890-04101
Valve lapping tool
YM-A8998

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



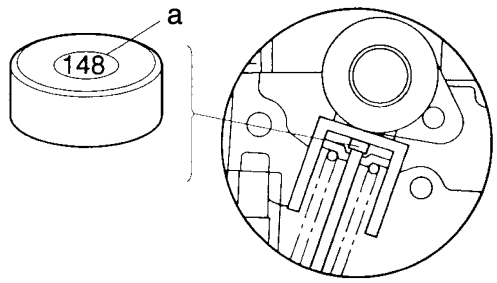


b. Select the proper valve pad from the following table.

Valve pad range	Nos. 120–240
Valve pad thickness	1.20–2.40 mm (0.0472–0.0945 in)
Available valve pads	25 thicknesses in 0.05 mm (0.002 in) increments

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

- Since valve pads of various sizes are originally installed, the valve pad number must be rounded in order to reach the closest equivalent to the original.



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

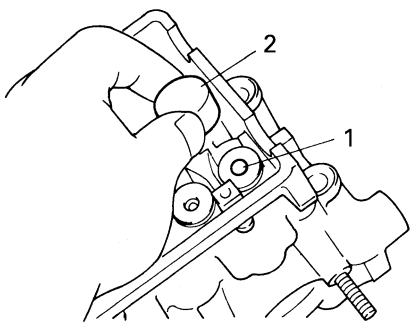
Last digit	Rounded value
0 or 2	0
5	5
8	10

EXAMPLE:
Original valve pad number = 148 (thickness = 1.48 mm (0.058 in))
Rounded value = 150

d. Locate the rounded number of the original valve pad and the measured valve clearance in the valve pad selection table. The point where the column and row intersect is the new valve pad number.

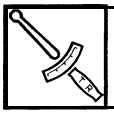
NOTE:
The new valve pad number is only an approximation. The valve clearance must be measured again and the above steps should be repeated if the measurement is still incorrect.

e. Install the new valve pad "1" and the valve lifter "2".



NOTE:
- Lubricate the valve pad with molybdenum disulfide grease.
- Lubricate the valve lifter with molybdenum disulfide oil.
- The valve lifter must turn smoothly when rotated by hand.
- Install the valve lifter and the valve pad in the correct place.

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



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

NOTE:
- Refer to "CAMSHAFTS" on page 5-8.
- Lubricate the camshaft bearings, camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshaft marks with the camshaft cap marks.
- Turn the crankshaft counterclockwise several full turns to seat the parts.

g. Measure the valve clearance again.
h. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

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7. Install:
   - All removed parts

NOTE:
For installation, reverse the removal procedure.

EAS20570
SYNCHRONIZING THE THROTTLE BODIES

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

1. Stand the vehicle on a level surface.

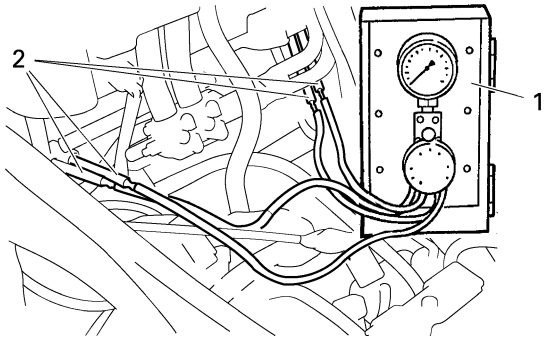
NOTE:
Place the vehicle on a suitable stand.

2. Remove:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.

- Air filter case
  Refer to "GENERAL CHASSIS" on page 4-1.

3. Install:
   - Vacuum gauge "1"
     (onto the synchronizing hose "2")

Vacuum gauge
90890-03094
Carburetor synchronizer
YU-44456



4. Install:
   - Air filter case
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
5. Start the engine and let it warm up for several minutes.
6. Check:
   - Engine idling speed
     Out of specification → Adjust.
     Refer to "ADJUSTING THE ENGINE IDLING SPEED" on page 3-9.

Engine idling speed
1250–1350 r/min

7. Adjust:
   - Throttle body synchronization

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a. With throttle body #1 "2" as standard, adjust throttle bodies #2 "3", #3 "4", and #4 "5" using the air screw "1".

NOTE:

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

ECA14900

CAUTION:

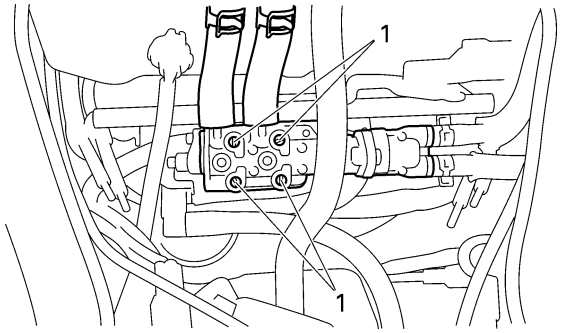
Do not use the throttle valve adjusting screws to adjust the throttle body syncronization.

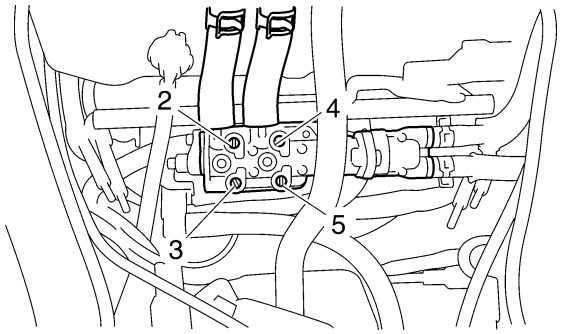
Vacuum gauge
90890-03094
Carburetor synchronizer
YU-44456

Intake vacuum
29.0 kPa (8.6 inHg) (218 mmHg)

NOTE:

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





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8. Measure:
   - Engine idling speed
     Out of specification → Adjust.
     Make sure that the vacuum pressure is within specification.
9. Stop the engine and remove the measuring equipment.
10. Adjust:
    - Throttle cable free play
      Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" on page 3-10.

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

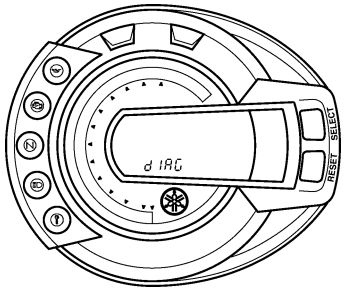
11. Install:
    - Fuel tank
      Refer to "FUEL TANK" on page 7-1.
    - Seat
      Refer to "GENERAL CHASSIS" on page 4-1.

EAS4S81012
ADJUSTING THE EXHAUST GAS VOLUME (FZ6-N/FZ6-NA/FZ6-S/FZ6-SA)

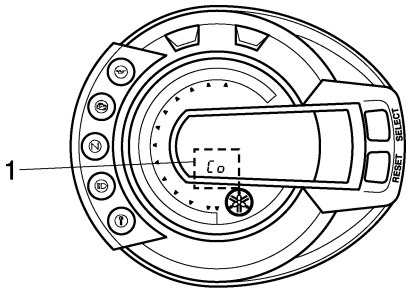
NOTE:
Be sure to set the CO density level to standard, and then adjust the exhaust gas volume.

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

NOTE:
“dIAG” appear on the odo meter LCD.

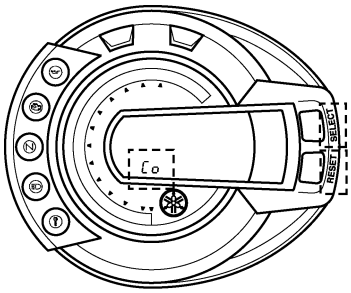


3. Press the “SELECT” button to select the CO adjustment mode “Co” “1” or the diagnostic mode “dI”.



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

NOTE:
The selected cylinder number appears on the clock LCD.
- To decrease the selected cylinder number, press the “RESET” button.
- To increase the selected cylinder number, press the “SELECT” button.



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

NOTE:
The CO adjustment volume appears on the tripmeter LCD.
- To decrease the CO adjustment volume, press the “RESET” button.
- To increase the CO adjustment volume, press the “SELECT” button.

7. Release the switch to execute the selection.
8. Simultaneously press the “SELECT” and “RESET” buttons to return to the cylinder selection (step 5).
9. Turn the main switch to “OFF” to cancel the mode.

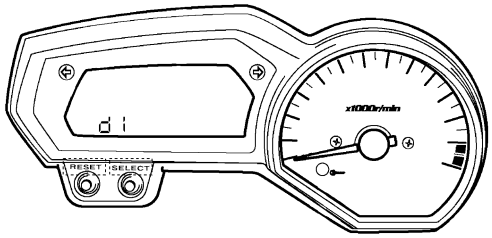
EAS4S81002
ADJUSTING THE EXHAUST GAS VOLUME (FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)

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

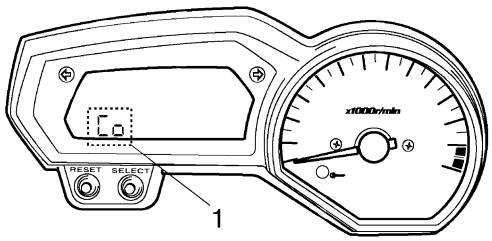
1. Turn the main switch to “OFF” and set the engine stop switch to “ON”.

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

NOTE:
"dI" appears on the clock LCD.

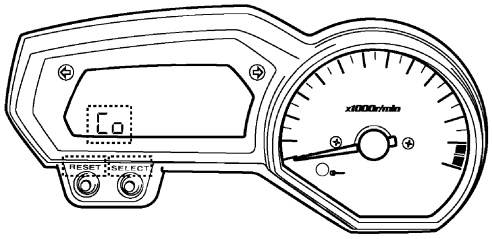


3. Press the "SELECT" button to select the CO adjustment mode "Co" "1" or the diagnostic mode "dI".



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

NOTE:
The selected cylinder number appears on the clock LCD.
- To decrease the selected cylinder number, press the "RESET" button.
- To increase the selected cylinder number, press the "SELECT" button.



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

NOTE:
The CO adjustment volume appears on the tripmeter LCD.
- To decrease the CO adjustment volume, press the "RESET" button.
- To increase the CO adjustment volume, press the "SELECT" button.

7. Release the switch to execute the selection.
8. Simultaneously press the "SELECT" and "RESET" buttons to return to the cylinder selection (step 5).
9. Turn the main switch to "OFF" to cancel the mode.

EAS20610
ADJUSTING THE ENGINE IDLING SPEED

NOTE:
Prior to adjusting the engine idling speed, the throttle bodies 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 → Adjust.

	Engine idling speed **1250–1350 r/min**

3. Adjust:
   - Engine idling speed

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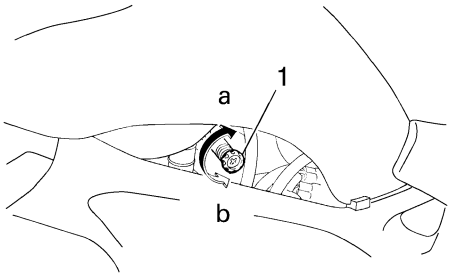
a. Turn the idle adjusting screw “1” in direction “a” or “b” until the specified engine idling speed is obtained.

Direction “a”
Engine idling speed is increased.
Direction “b”
Engine idling speed is decreased.



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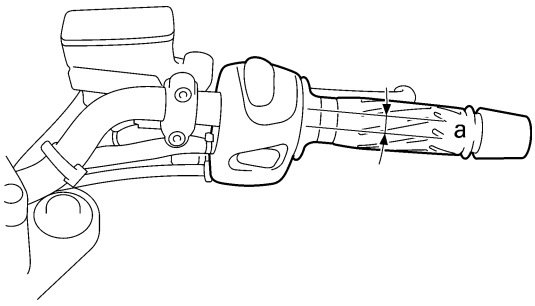
4. Adjust:
   - Throttle cable free play
     Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" on page 3-10.

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

EAS20630
ADJUSTING THE THROTTLE CABLE FREE PLAY

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

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



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

2. Remove:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Air filter case
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Battery
     Refer to "GENERAL CHASSIS" on page 4-1 and "CHECKING AND CHARGING THE BATTERY" on page 8-109.
3. Adjust:
   - Throttle cable free play

NOTE:
When the throttle is opened, the accelerator cable “1” is pulled.

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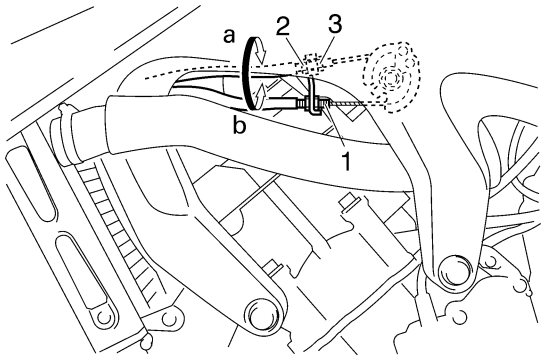
Throttle body side

a. Loosen the locknut “2” on the decelerator cable.
b. Turn the adjusting nut “3” in direction “a” or “b” to take up any slack on the decelerator cable.

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

c. Tighten the locknuts

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



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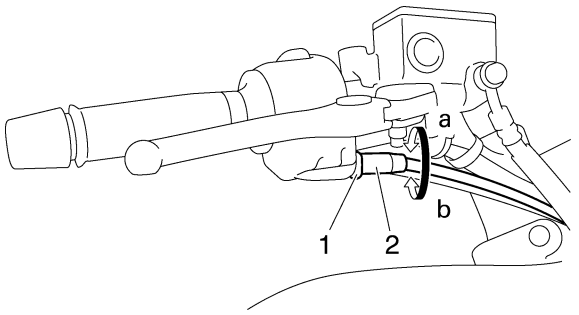
Handlebar side

a. Loosen the locknut “1”.

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

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

c. Tighten the locknut



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4. Install:
   - Battery
     Refer to "GENERAL CHASSIS" on page 4-1 and "CHECKING AND CHARGING THE BATTERY" on page 8-109.
   - Air filter case
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.

EWA4S81001

⚠ WARNING

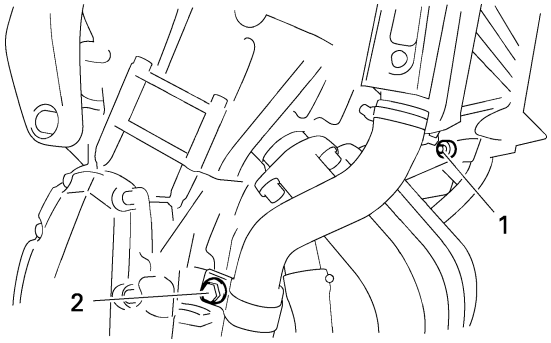
After adjusting the throttle cable free play, start the engine and turn the handlebar to the right and to the left to ensure that this does not cause the engine idling speed to change.

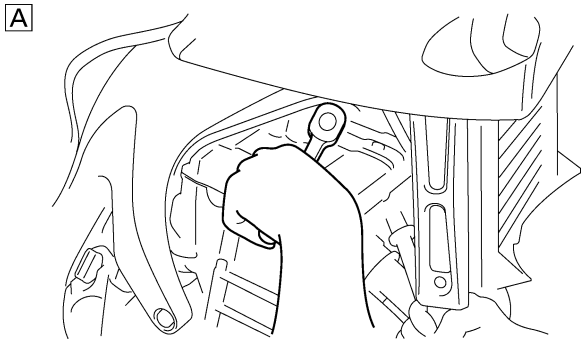
EAS20680

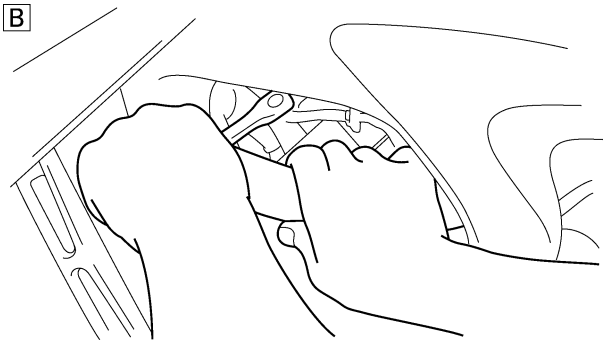
CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

1. Remove:
   - Radiator lower bolt “1”
   - Radiator lower hose bracket bolt “2”
     Refer to "RADIATOR" on page 6-1.
2. Disconnect:
   - Spark plug caps
3. Remove:
   - Spark plugs







A. Right side #1, #2 and #3
B. Left side #4

ECA13320

CAUTION:

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

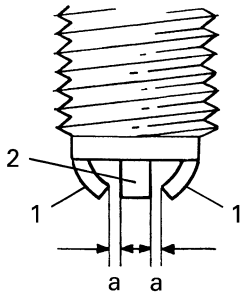
4. Check:
   - Spark plug type
     Incorrect → Change.

Manufacturer/model
NGK/CR9EK

5. Check:
   - Electrode “1”
     Damage/wear → Replace the spark plug.
   - Insulator “2”
     Abnormal color → Replace the spark plug.

Normal color is medium-to-light tan.
6. Clean:
   • Spark plug
   (with a spark plug cleaner or wire brush)
7. 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)



8. Install:
   • Spark plugs

Spark plug
18 Nm (1.8 m·kg, 13 ft·lb)

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

9. Connect:
   • Spark plug caps
10. Install:
    • Radiator lower hose bracket bolt
    • Radiator lower bolt
    Refer to "RADIATOR" on page 6-1.

EAS20710
MEASURING THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

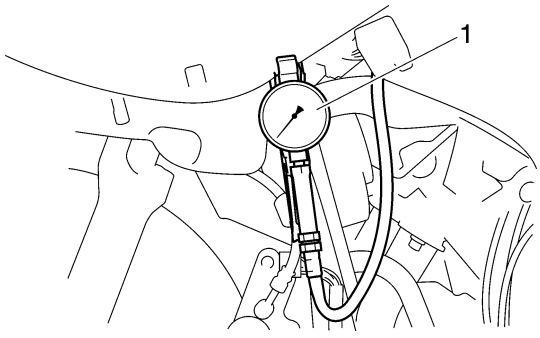
NOTE:
Insufficient compression pressure will result in a loss of performance.

1. Measure:
   • Valve clearance
   Out of specification → Adjust.
   Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-4.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
   • Seat
   Refer to "GENERAL CHASSIS" on page 4-1.
   • Fuel tank
   Refer to "FUEL TANK" on page 7-1.
   • Air filter case
   Refer to "GENERAL CHASSIS" on page 4-1.
   • Battery
   Refer to "GENERAL CHASSIS" on page 4-1 and "CHECKING AND CHARGING THE BATTERY" on page 8-109.
   • Battery box
   • Battery box bracket
   Refer to "GENERAL CHASSIS" on page 4-1.
   • Heat protector plate
   • Cover
   • Ignition coils
4. Disconnect:
   • Spark plug caps
5. Remove:
   • Spark plugs

ECA13340
CAUTION:
Before removing the spark plugs, use compressed air to blow away any dirt accumulated in the spark plug wells to prevent it from falling into the cylinders.

6. Install:
   • Compression gauge “1”

Compression gauge
90890-03081
Engine compression tester
YU-33223



7. Measure:
   • Compression pressure

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

Standard compression pressure (at sea level)
1550 kPa/400 r/min (220.5 psi/400 r/min) (15.5 kgf/cm²/400 r/min)
Minimum–maximum
1350–1736 kPa (192.0–246.9 psi) (13.5–17.4 kgf/cm²)

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

EWA4S81003

⚠ WARNING

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

ECA13340

CAUTION:

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

NOTE:

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

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

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

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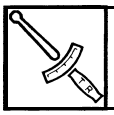
8. Install:
   • Spark plugs



Spark plug
18 Nm (1.8 m·kg, 13 ft·lb)

9. Connect:
   • Spark plug caps
10. Install:
   • Ignition coils
   • Cover
   • Heat protector plate
   • Battery box bracket
   • Battery box
   Refer to "GENERAL CHASSIS" on page 4-1.
   • Battery
   Refer to "GENERAL CHASSIS" on page 4-1 and "CHECKING AND CHARGING THE BATTERY" on page 8-109.
   • Air filter case
   Refer to "GENERAL CHASSIS" on page 4-1.
   • Fuel tank
   Refer to "FUEL TANK" on page 7-1.
   • Seat
   Refer to "GENERAL CHASSIS" on page 4-1.

EAS20730

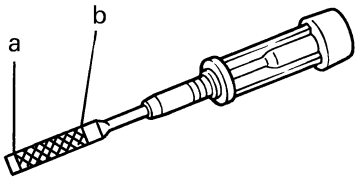
CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

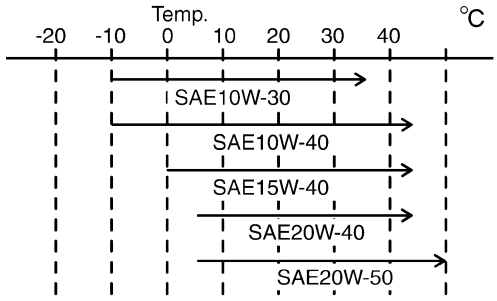
NOTE:

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

2. Start the engine, warm it up for several minutes, and then turn it off.
3. Check:
   • Engine oil level
   The engine oil level should be between the minimum level mark "a" and maximum level mark "b".
   Below the minimum level mark → Add the recommended engine oil to the proper level.



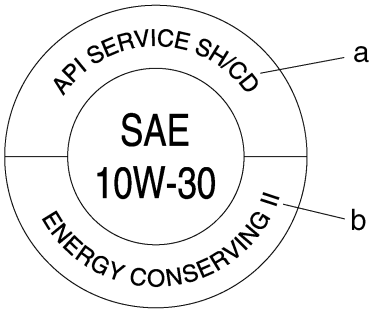
Type
SAE10W30, SAE10W40, SAE15W40, SAE20W40 or SAE20W50
Recommended engine oil grade
API service SG type or higher, JASO standard MA



ECA4S81007

CAUTION:

- **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 "a" or higher and do not use oils labeled "ENERGY CONSERVING II" "b" or higher.**
- **Do not allow foreign materials to enter the crankcase.**



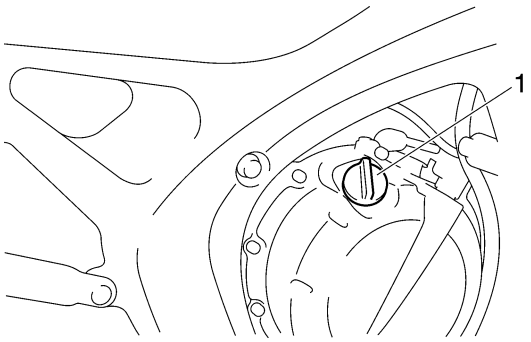
NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.

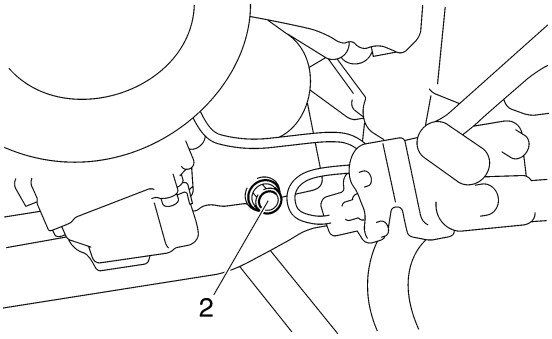
4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check the engine oil level again.

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

EAS20790
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" (along with the gasket)





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

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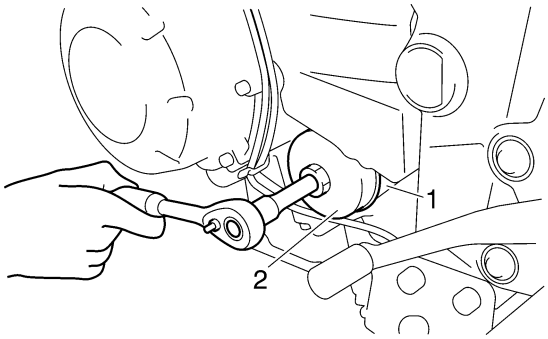
a. Remove the oil filter cartridge "1" with an oil filter wrench "2".

Oil filter wrench
90890-01426
YU-38411

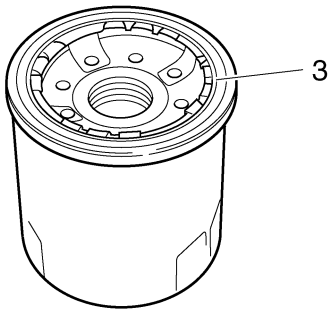


b. Lubricate the O-ring "3" of the new oil filter cartridge with a thin coat of engine oil.

ECA13390

CAUTION:

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



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

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

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

Engine oil drain bolt
43 Nm (4.3 m·kg, 31 ft·lb)

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

Engine oil quantity
Total amount
3.40 L (3.59 US qt) (2.99 Imp.qt)
Without oil filter cartridge replacement
2.50 L (2.64 US qt) (2.20 Imp.qt)
With oil filter cartridge replacement
2.80 L (2.96 US qt) (2.46 Imp.qt)

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

EAS20820

MEASURING THE ENGINE OIL PRESSURE

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

ECA13410

CAUTION:

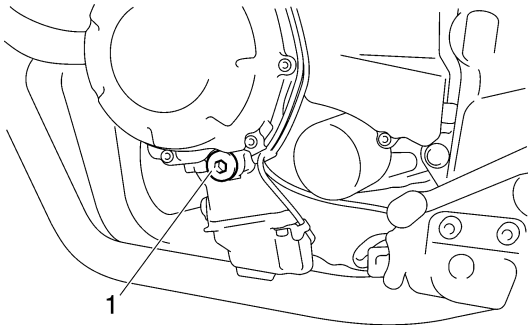
When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

3. Remove:
   - Oil gallery bolt "1"

EWA12980

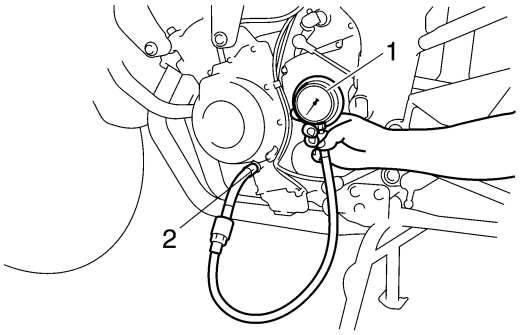
⚠ WARNING

The engine, muffler and engine oil are extremely hot.



4. Install:
   - Oil pressure gauge “1”
   - Adapter “2”

Pressure gauge
90890-03153
YU-03153
Oil pressure adapter H
90890-03139



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

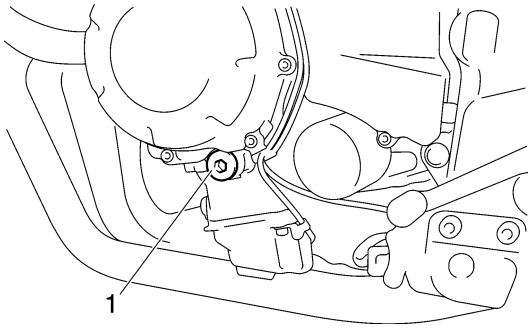
Engine oil pressure
240 kPa (34.1 psi) (2.4 kg/cm^2)
Engine speed
Approx 6,600 r/min
Oil temperature
75.0–85.0 °C (167.00–185.00 °F)

Out of specification → Adjust.

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

6. Install:
   - Main gallery bolt “1”

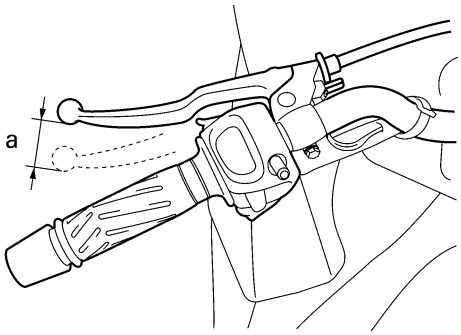
Main gallery bolt
8 Nm (0.8 m·kg, 5.8 ft·lb)



EAS20870
ADJUSTING THE CLUTCH CABLE FREE PLAY

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

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



2. Adjust:
   - Clutch cable free play

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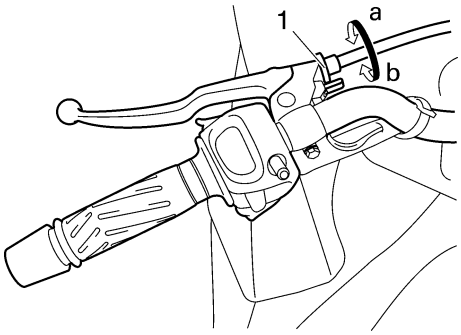
Handlebar side

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

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

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



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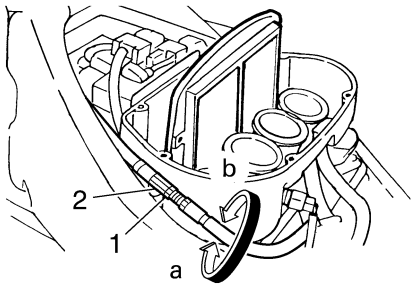
Engine side
a. Loosen the locknuts "1".
b. Turn the adjusting nut "2" in direction "a" or "b" until the specified clutch cable free play is obtained.

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

c. Tighten the locknuts.



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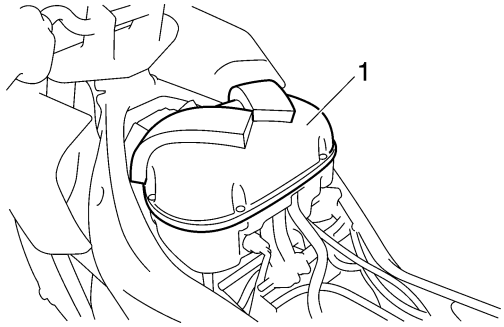
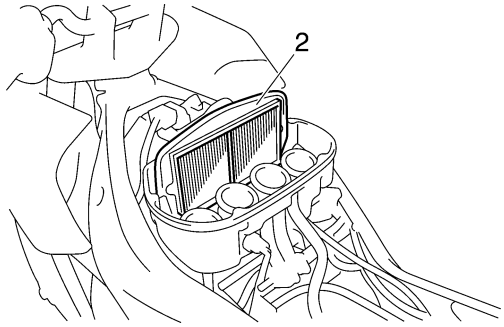
EAS20950
CLEANING THE AIR FILTER ELEMENT

1. Remove:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Remove:
   - Air filter case cover "1"
   - Air filter element "2"





3. Clean:
   - Air filter element
     (with solvent)
4. Check:
   - Air filter element
     Damage → Replace.
5. Install:
   - Air filter element
   - Air filter case cover

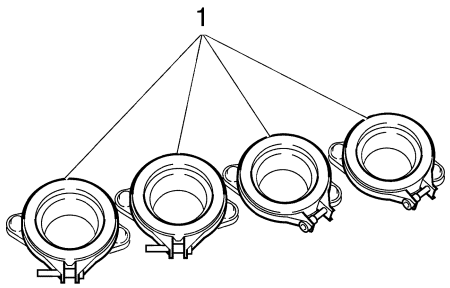
ECA4S81008
CAUTION:
Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect throttle bodies synchronization, leading to poor engine performance and possible overheating.

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

6. Install:
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Seat

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

EAS21010
CHECKING THE THROTTLE BODY JOINTS
The following procedure applies to all of the throttle body joints and intake manifolds.
1. Remove:
   - Throttle bodies
     Refer to "THROTTLE BODIES" on page 7-4.
2. Check:
   - Throttle body joints "1"
     Cracks/damage → Replace.

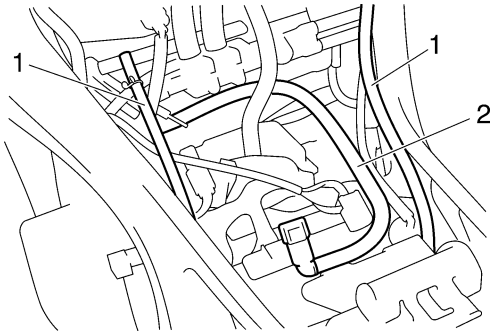


3. Install:
   - Throttle bodies
     Refer to "THROTTLE BODIES" on page 7-4.

EAS21030
CHECKING THE FUEL LINE
The following procedure applies to all of the fuel, vacuum and breather hoses.
1. Remove:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Check:
   - Breather hose "1"
   - Fuel hose "2"
     Cracks/damage → Replace.
     Loose connection → Connect properly.

NOTE:
- Before removing the fuel hose, place a few rags in the area under where it will be removed.
- There is a white mark on the fuel tank breather hose.
  Refer to "CABLE ROUTING" on page 2-47.

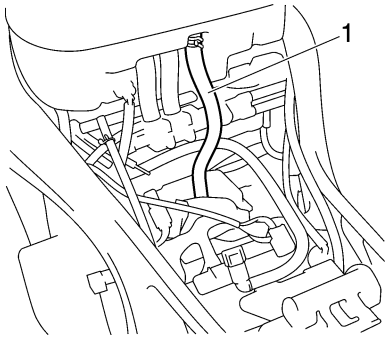
ECA14940
CAUTION:
Make sure the fuel tank breather hose is routed correctly.



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

EAS21070
CHECKING THE CRANKCASE BREATHER HOSE
1. Remove:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Check:
   - Crankcase breather hose "1"
     Cracks/damage → Replace.
     Loose connection → Connect properly.

ECA13450
CAUTION:
Make sure the crankcase breather hose is routed correctly.



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

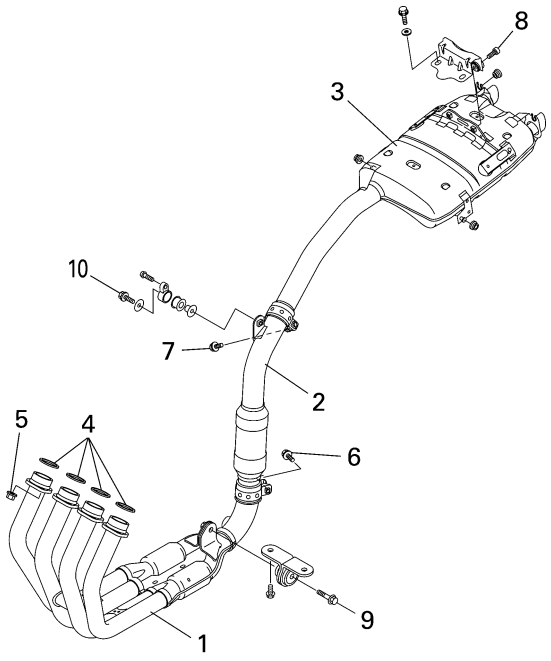
- Seat
  Refer to "GENERAL CHASSIS" on page 4-1.

EAS21080
CHECKING THE EXHAUST SYSTEM

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

1. Remove:
   - Radiator
     Refer to "RADIATOR" on page 6-1.
2. Check:
   - Exhaust pipe “1”
   - Catalytic converter pipe “2”
   - Muffler “3”
     Cracks/damage → Replace.
   - Gasket “4”
     Exhaust gas leaks → Replace.
3. Check:
   - Tightening torque
   - Exhaust pipe nut “5”
   - Catalytic converter joint bolt “6”
   - Muffler joint bolt “7”
   - Muffler stay bolt “8”
   - Exhaust pipe stay bolt “9”
   - Catalytic converter pipe stay bolt “10”

Exhaust pipe nut
20 Nm (2.0 m·kg, 15 ft·lb)
Catalytic converter joint bolt
20 Nm (2.0 m·kg, 15 ft·lb)
Muffler joint bolt
20 Nm (2.0 m·kg, 15 ft·lb)
Muffler stay bolt
20 Nm (2.0 m·kg, 15 ft·lb)
Exhaust pipe stay bolt
20 Nm (2.0 m·kg, 15 ft·lb)
Catalytic converter pipe stay bolt
20 Nm (2.0 m·kg, 15 ft·lb)



4. Install:
   - Radiator
     Refer to "RADIATOR" on page 6-1.

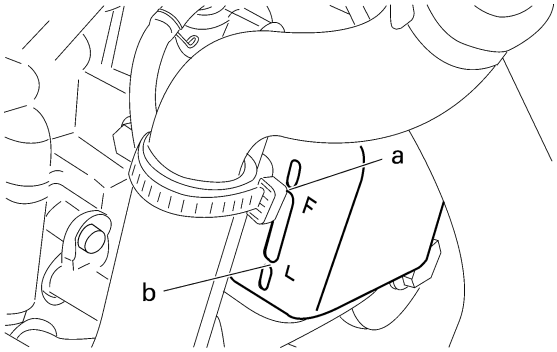
EAS21110
CHECKING THE COOLANT LEVEL

1. Stand the vehicle on a level surface.

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

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

ECA13470
CAUTION:
- **Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.**
- **Use only distilled water. However, if distilled water is not available, soft water may be used.**

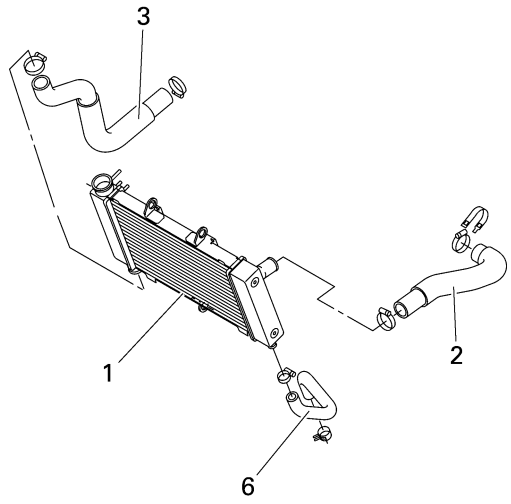


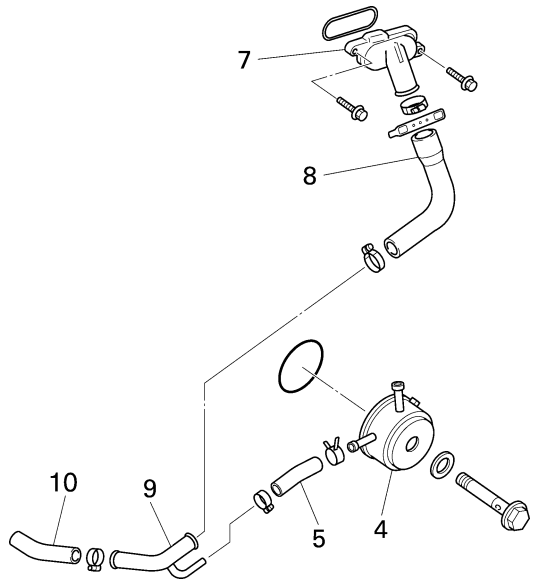
3. Start the engine, warm it up for several minutes, and then turn it off.
4. Check:
   • Coolant level

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

EAS21120
CHECKING THE COOLING SYSTEM

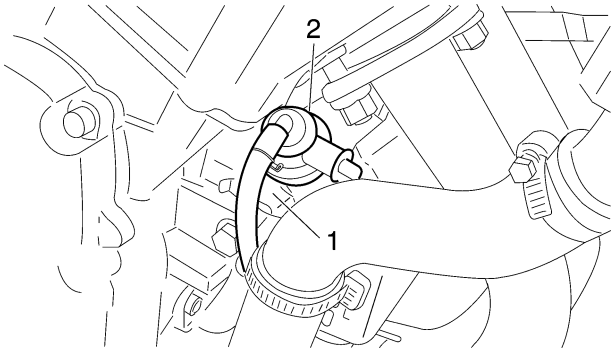
1. Check:
   • Radiator “1”
   • Radiator inlet hose “2”
   • Radiator outlet hose “3”
   • Oil cooler “4”
   • Oil cooler inlet hose “5”
   • Oil cooler outlet hose “6”
   • Water jacket joint “7”
   • Water jacket joint hose “8”
   • Oil cooler inlet pipe “9”
   • Water pump outlet hose “10”
   Cracks/damage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



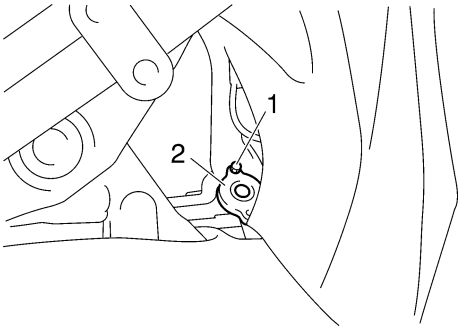


EAS21130
CHANGING THE COOLANT

1. Remove:
   • Coolant reservoir “1”
   • Coolant reservoir cap “2”



2. Drain:
   • Coolant
   (from the coolant reservoir)
3. Remove:
   • Radiator cap lock bolt “1”
   • Radiator cap “2”



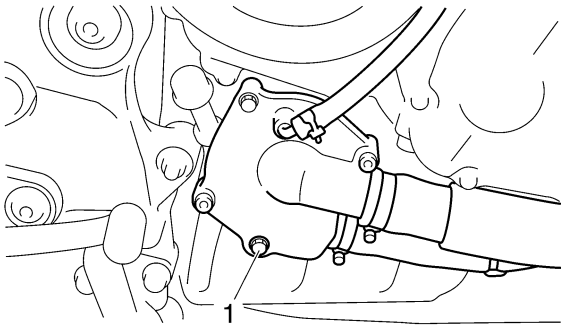
EWA13030

⚠ WARNING

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

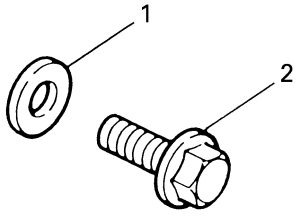
The following procedure applies to all of the coolant drain bolts and copper washers.

4. Remove:
   - Coolant drain bolt (water pump) "1" (along with the copper washer)



5. Drain:
   - Coolant (from the engine and radiator)
6. Check:
   - Copper washer "1" New
7. Install:
   - Coolant drain bolt (water pump) "2"

Coolant drain bolt (water pump)
10 Nm (1.0 m·kg, 7.2 ft·lb)



8. Install:
   - Coolant reservoir
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)
Radiator capacity (including all routes)
2.00 L (2.11 US qt) (1.76 Imp.qt)
Coolant reservoir capacity (up to the maximum level mark)
0.25 L (0.26 US qt) (0.22 Imp.qt)

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

EWA13040

⚠ WARNING

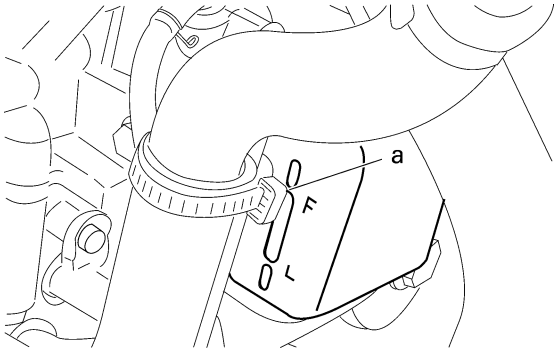
- **If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.**
- **If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.**
- **If coolant is swallowed, induce vomiting and get immediate medical attention.**

ECA13480

CAUTION:

- **Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.**
- **Use only distilled water. However, if distilled water is not available, soft water may be used.**
- **If coolant comes into contact with painted surfaces, immediately wash them with water.**
- **Do not mix different types of antifreeze.**

10. Install:
    - Radiator cap
11. Fill:
    - Coolant reservoir (with the recommended coolant to the maximum level mark "a")



12. Install:
    - Coolant reservoir cap
13. Start the engine, warm it up for several minutes, and then stop it.
14. Check:
    - Coolant level
      Refer to "CHECKING THE COOLANT LEVEL" on page 3-19.

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

EAS21140
CHASSIS

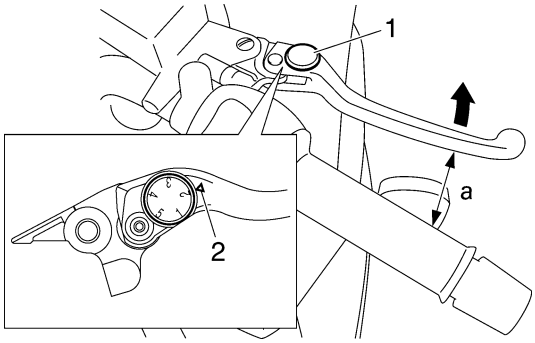
EAS21160
ADJUSTING THE FRONT DISC BRAKE

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

NOTE:

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

Position #1
Distance “a” is the largest.
Position #5
Distance “a” is the smallest.



EWA13060

⚠ WARNING

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

ECA13490

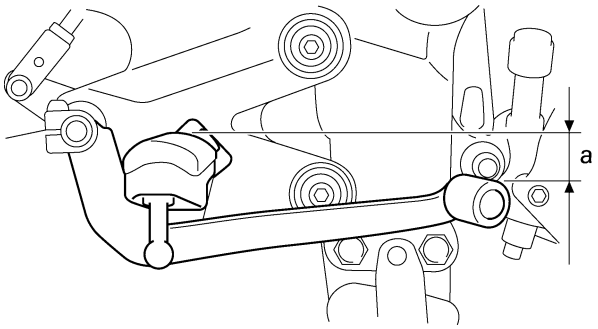
CAUTION:

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

EAS21190
ADJUSTING THE REAR DISC BRAKE

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

Brake pedal position (below the top of the rider footrest)
25.8 mm (1.02 in)



2. Adjust:
   - Brake pedal position

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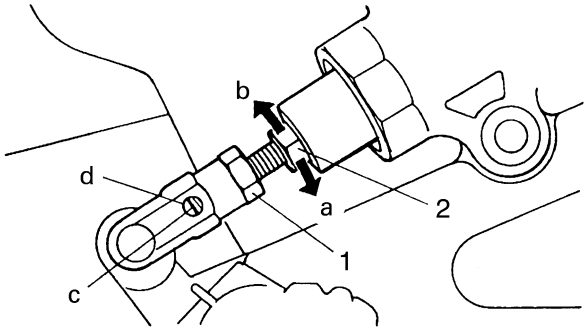
a. Loosen the locknut “1”.
b. Turn the adjusting bolt “2” in direction “a” or “b” until the specified brake pedal position is obtained.

Direction “a”
Brake pedal is raised.
Direction “b”
Brake pedal is lowered.

EWA13070

⚠ WARNING

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



c. Tighten the locknut “1” to specification.

Locknut
18 Nm (1.8 m·kg, 13 ft·lb)

EWA4S81005

⚠ 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

CAUTION:

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

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3. Adjust:
   - Rear brake light switch
     Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-25.

EAS21240

CHECKING THE BRAKE FLUID LEVEL

1. Stand the vehicle on a level surface.

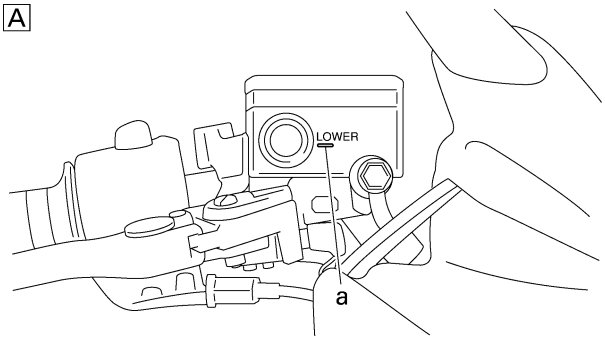
NOTE:

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

2. Check:
   - Brake fluid level
     Below the minimum level mark “a” → Add the recommended brake fluid to the proper level.

Recommended fluid
DOT 4

A



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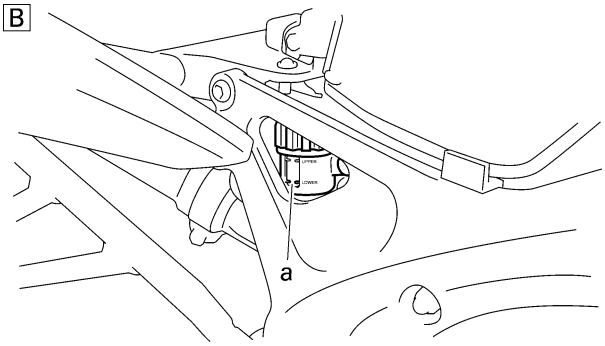


A. Front brake
B. Rear brake

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

CAUTION:

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

NOTE:

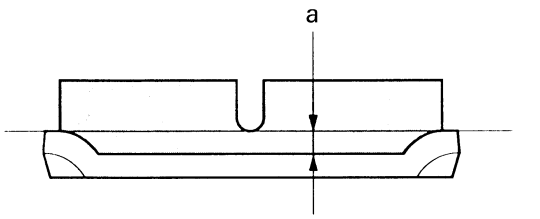
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

EAS21250

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
   - Front brake pad
     Wear indicators “a” almost touch the brake disc → Replace the brake pads as a set.
     Refer to "FRONT BRAKE" on page 4-23.



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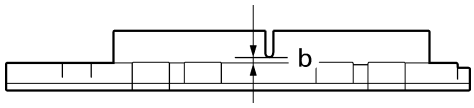
EAS21260
CHECKING THE REAR BRAKE PADS

The following procedure applies to all of the brake pads.

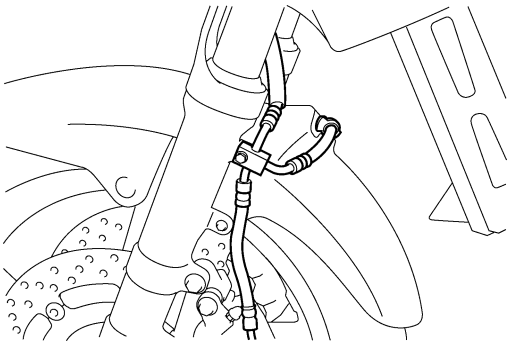
1. Operate the brake.
2. Check:
   - Rear brake pad
     Wear indicators “b” almost touch the brake disc → Replace the brake pads as a set.
     Refer to "REAR BRAKE" on page 4-41.



EAS21280
CHECKING THE FRONT BRAKE HOSES

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

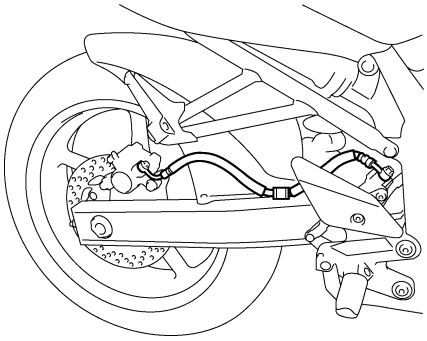
1. Check:
   - Brake hose
     Cracks/damage/wear → Replace.



2. Check:
   - Brake hose clamp
     Loose → Tighten the clamp bolt.
3. Hold the vehicle upright and apply the brake several times.
4. Check:
   - Brake hose
     Brake fluid leakage → Replace the damaged hose.
     Refer to "FRONT BRAKE" on page 4-23.

EAS21290
CHECKING THE REAR BRAKE HOSE

1. Check:
   - Brake hose
     Cracks/damage/wear → Replace.



2. Check:
   - Brake hose clamp
     Loose Connection → Tighten the clamp bolt.
3. Hold the vehicle upright and apply the rear brake several times.
4. Check:
   - Brake hose
     Brake fluid leakage → Replace the damaged hose.
     Refer to "REAR BRAKE" on page 4-41.

EAS21330
ADJUSTING THE REAR BRAKE LIGHT SWITCH

NOTE:

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

1. Check:
   - Rear brake light operation timing
     Incorrect → Adjust.
2. Adjust:
   - Rear brake light operation timing

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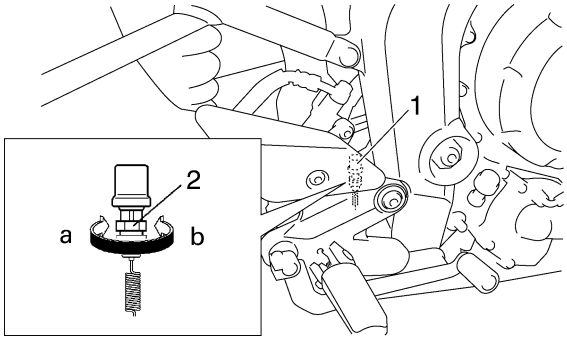
a. Hold the main body “1” of the rear brake light switch so that it does not rotate and turn the adjusting nut “2” in direction “a” or “b” until the rear brake light comes on at the proper time.

Direction “a”
Brake light comes on sooner.
Direction “b”
Brake light comes on later.



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EAS21340

BLEEDING THE HYDRAULIC BRAKE SYSTEM

EWA13100

⚠ WARNING

Bleed the hydraulic brake system whenever:

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

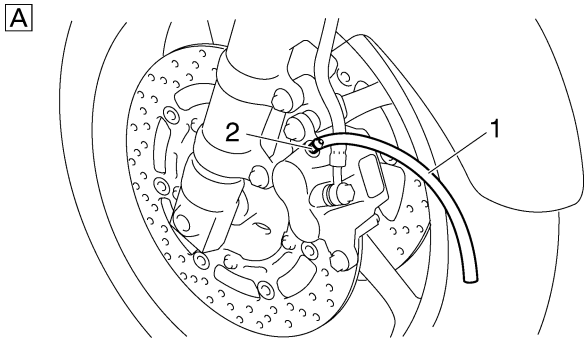
NOTE:

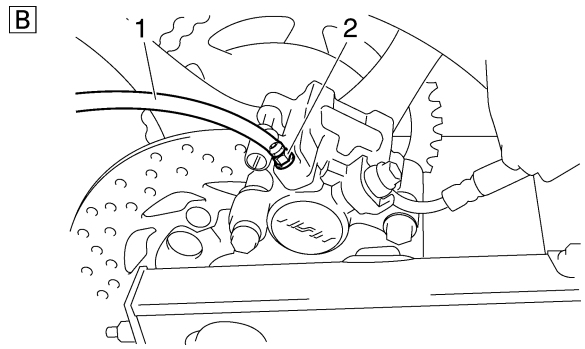
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir or brake fluid reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic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

1. Bleed:
   - Hydraulic brake system

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
c. Connect a clear plastic hose “1” tightly to the bleed screw “2”.





A. Front
B. Rear

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

NOTE:

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

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

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

k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.

EWA13110

⚠ WARNING

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

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Bleeding the ABS brake

EWA14010

⚠ WARNING

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

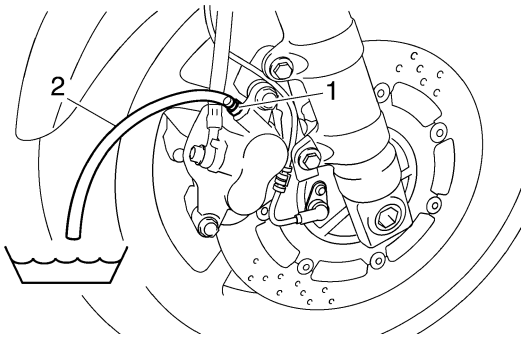
NOTE:
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir or brake fluid reservoir to overflow.
- When bleeding the ABS, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the ABS, considerably lengthening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

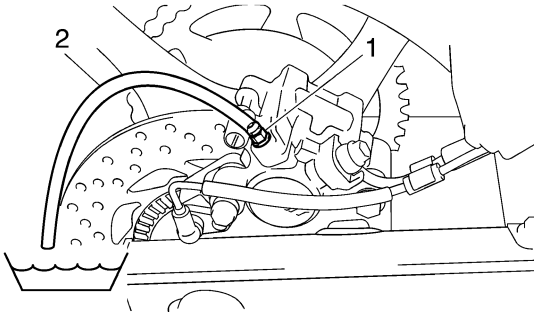
▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
c. Connect a clear plastic hose “1” tightly to the bleed screw “2”.

A



B



A. Front
B. Rear

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.

NOTE:

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

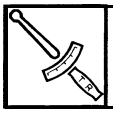
h. Tighten the bleed screw, and then release the brake lever or brake pedal.
i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
j. Check the operation of the hydraulic unit.
   Refer to "HYDRAULIC UNIT OPERATION TEST" on page 4-56.

ECA14780

CAUTION:

Make sure that the main switch is set to “OFF” before checking the operation of the hydraulic unit.

k. After operating the ABS, repeat steps (e) to (i), and then fill the primary circuit with the recommended brake fluid.
l. Tighten the bleed screw to the specified torque.

	**Brake caliper bleed screw 6 Nm (0.6 m·kg, 4.3 ft·lb)**

m. Fill the brake master cylinder reservoir or brake fluid reservoir to the proper level with the recommended brake fluid.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.

EWA14020

⚠ WARNING

After bleeding the ABS, check the brake operation.

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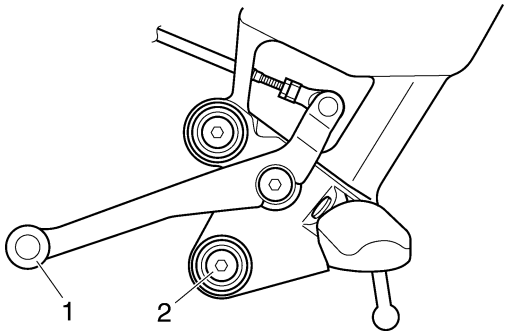
EAS21370

ADJUSTING THE SHIFT PEDAL

1. Check:
   - Shift pedal position
     Align the center of shift pedal "1" and center of footrest bracket bolt "2" in a straight line.
     Incorrect → Adjust.



2. Adjust:
   - Shift pedal position

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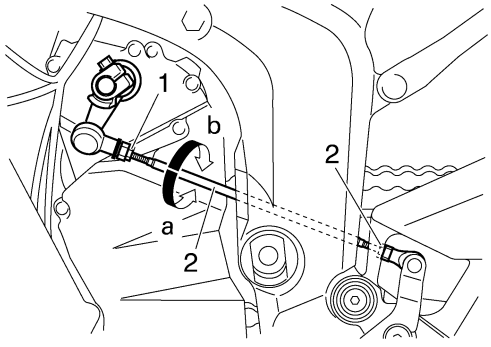
a. Loosen both locknuts "1".
b. Turn the shift rod "2" in direction "a" or "b" to obtain the correct shift pedal position.

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



c. Tighten both locknuts.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS21390

ADJUSTING THE DRIVE CHAIN SLACK

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

ECA13550

CAUTION:

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

1. Stand the vehicle on a level surface.

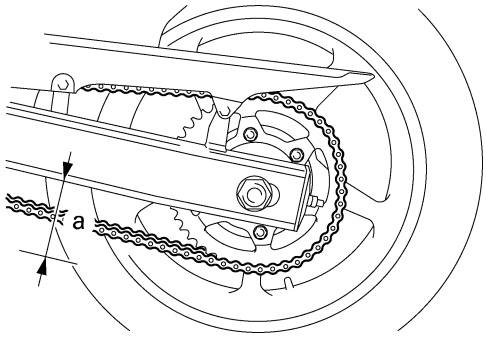
EWA13120

⚠ WARNING

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

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

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



Drive chain slack
45.0–55.0 mm (1.77–2.17 in)

4. Adjust:
   - Drive chain slack

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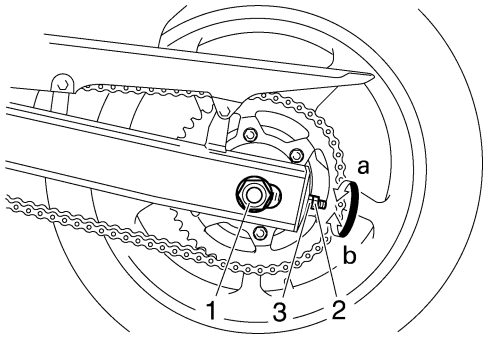
a. Loosen the wheel axle nut "1".
b. Loosen both locknuts "2".
c. Turn both adjusting nuts "3" in direction "a" or "b" until the specified drive chain slack is obtained.

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

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



d. Tighten both locknuts to specification.

Locknut
16 Nm (1.6 m·kg, 12 ft·lb)

e. Tighten the wheel axle nut to specification.

Wheel axle nut
120 Nm (12 m·kg, 87 ft·lb)

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EAS21440
LUBRICATING THE DRIVE CHAIN

The drive chain consists of many interacting parts. If the drive chain is not maintained properly, it will wear out quickly. Therefore, the drive chain should be serviced, especially when the vehicle is used in dusty areas.
This vehicle has a drive chain with small rubber O-rings between each side plate. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings. Therefore, use only kerosene to clean the drive chain. Wipe the drive chain dry and thoroughly lubricate it with engine oil or chain lubricant that is suitable for O-ring chains. Do not use any other lubricants on the drive chain since they may contain solvents that could damage the O-rings.

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

EAS21500
CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

EWA13120

⚠ WARNING

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

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

2. Check:
   - Steering head
     Grasp the bottom of the front fork legs and gently rock the front fork.
     Binding/looseness → Adjust the steering head.
3. Remove:
   - Upper bracket
     Refer to "STEERING HEAD" on page 4-72.
4. Adjust:
   - Steering head

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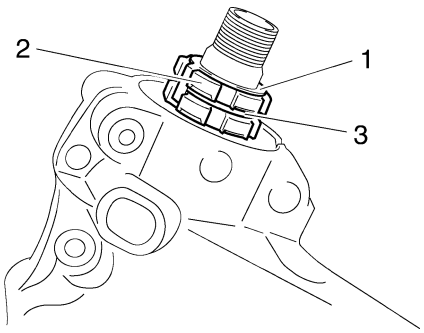
a. Remove the lock washer "1", the upper ring nut "2", and the rubber washer "3".



b. Tighten the lower ring nut "4" with a steering nut wrench "5".

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

Steering nut wrench
90890-01403
Spanner wrench
YU-33975

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

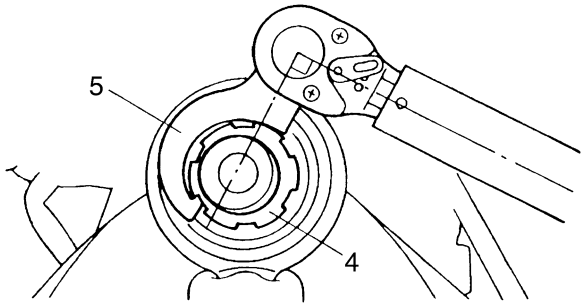
c. Loosen the lower ring nut “4” completely and then tighten it to specification with a steering nut wrench.

EWA13140

⚠ WARNING

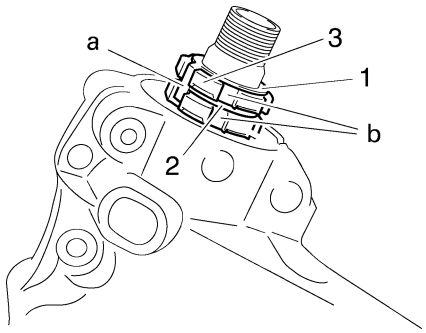
Do not overtighten the lower ring nut.

Lower ring nut (final tightening torque)
18 Nm (1.8 m·kg, 13 ft·lb)



d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.
Refer to "STEERING HEAD" on page 4-72.
e. Install the rubber washer “2”.
f. Install the upper ring nut “3”.
g. Finger tighten the upper ring nut “3”, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
h. Install the lock washer “1”.

NOTE:
Make sure the lock washer tabs “a” sit correctly in the ring nut slots “b”.



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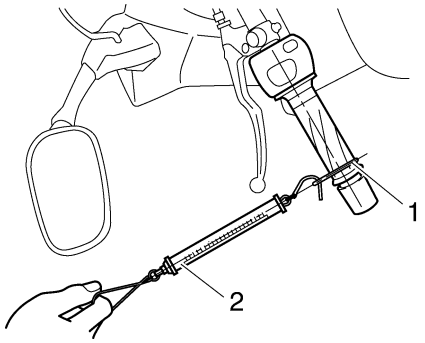
5. Install:
• Upper bracket
Refer to "STEERING HEAD" on page 4-72.
6. Measure:
• Steering head tension

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

a. Point the front wheel straight ahead.
b. Install a plastic locking tie “1” loosely around the end of the handlebar as shown.
c. Hook a spring gauge “2” onto the plastic locking tie.



d. Hold the spring gauge at a 90° angle from the handlebar, pull the spring gauge, and then record the measurement when the handlebar starts to run.

Steering head tension
200–500g

e. Repeat the above procedure on the opposite handlebar.
f. If the steering head tension is out of specification (both handlebars should be within specification), remove the upper bracket and loosen or tighten the upper ring nut.
g. Reinstall the upper bracket and measure the steering head tension again as described above.
h. Repeat the above procedure until the steering head tension is within specification.
i. Grasp the bottom of the front fork legs and gently rock the front fork.
Binding/looseness → Adjust the steering head.

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EAS21530

CHECKING THE FRONT FORK

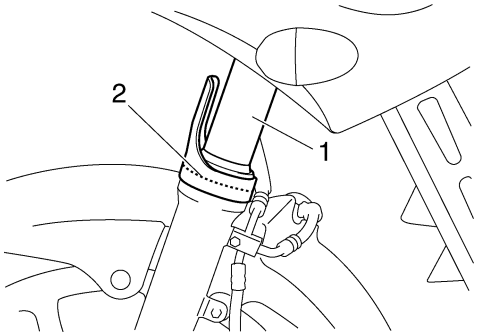
1. Stand the vehicle on a level surface.

EWA13120

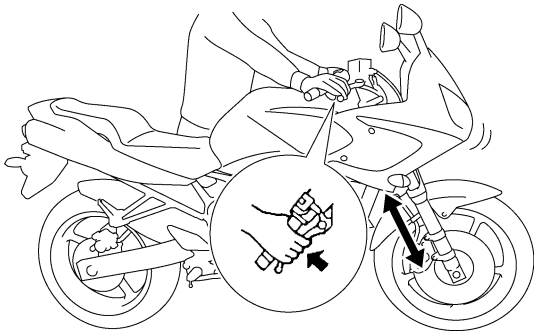
⚠ WARNING

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

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



3. Hold the vehicle upright and apply the front brake.
4. Check:
   - Front fork operation
     Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
     Rough movement → Repair.
     Refer to "FRONT FORK" on page 4-64.



EAS21590

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

EWA13120

⚠ WARNING

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

Spring preload

ECA13590

CAUTION:

Never go beyond the maximum or minimum adjustment positions.

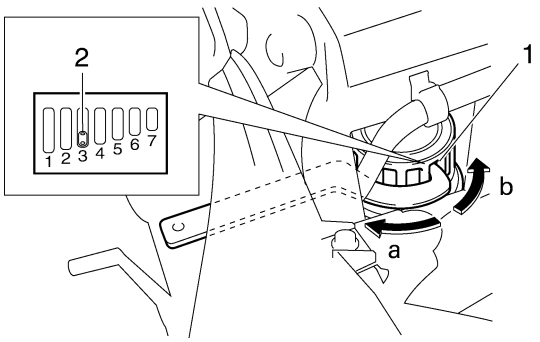
1. Adjust:
   - Spring preload

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Adjust the spring preload with the special wrench and extension bar included in the owner's tool kit.
b. Turn the adjusting ring "1" in direction "a" or "b".
c. Align the desired position on the adjusting ring with the stopper "2".

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

Spring preload adjusting positions
Minimam
1
Standard
3
Maximum
7



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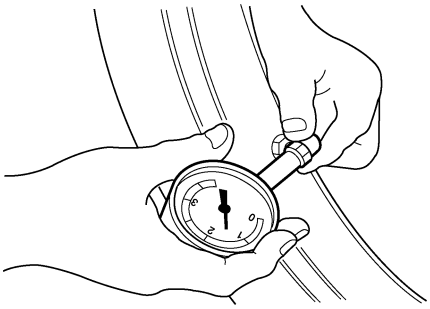
EAS21650

CHECKING THE TIRES

The following procedure applies to both of the tires.

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



EWA13180

⚠ WARNING

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

Tire air pressure (measured on cold tires)

Loading condition*
0–90 kg (0–198 lb)
Front
225 kPa (33 psi) (2.25 kgf/cm²) (2.25 bar)
Rear
250 kPa (36 psi) (2.50 kgf/cm²) (2.50 bar)
Loading condition*
90–185 kg (198–408 lb) (FZ6-SA, FZ6-SHGW, FZ6-SAHG)
90–190 kg (198–419 lb) (FZ6-S, FZ6-SHG)
90–191 kg (198–421 lb) (FZ6-NA, FZ6-NAHG)
90–196 kg (198–432 lb) (FZ6-N, FZ6-NHG, FZ6-NHGW)
Front
250 kPa (36 psi) (2.50 kgf/cm²) (2.50 bar)
Rear
290 kPa (42 psi) (2.90 kgf/cm²) (2.90 bar)
High-speed riding
Front
225 kPa (33 psi) (2.25 kgf/cm²) (2.25 bar)
Rear
250 kPa (36 psi) (2.50 kgf/cm²) (2.50 bar)
Maximum load*
185 kg (408 lb) (FZ6-SA, FZ6-SHGW, FZ6-SAHG)
190 kg (419 lb) (FZ6-S, FZ6-SHG)
191 kg (421 lb) (FZ6-NA, FZ6-NAHG)
196 kg (432 lb) (FZ6-N, FZ6-NHG, FZ6-NHGW)

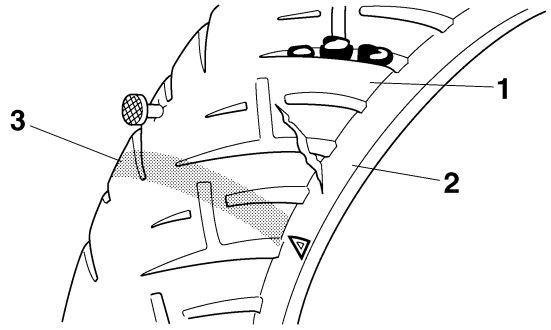
*** Total weight of rider, passenger, cargo and accessories**

EWA13190

⚠ WARNING

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

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



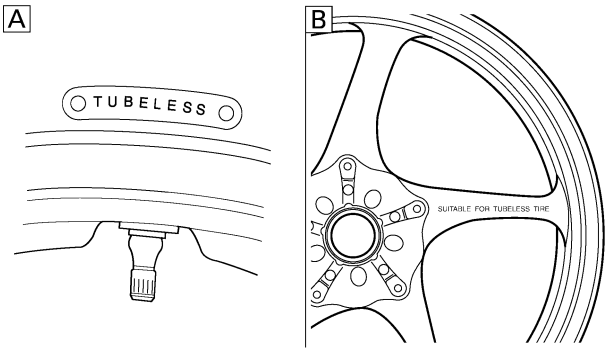
1. Tire tread depth
2. Side wall
3. Wear indicator

Wear limit (front)
0.8 mm (0.03 in)
Wear limit (rear)
0.8 mm (0.03 in)

EWA14080

WARNING

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



A. Tire
B. Wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

EWA14090

WARNING

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

Front tire
Size
120/70 ZR17M/C (58W)
Manufacturer/model
BRIDGESTONE/BT020F GG
Manufacturer/model
DUNLOP/D252F

Rear tire
Size
180/55 ZR17M/C (73W)
Manufacturer/model
BRIDGESTONE/BT020R GG
Manufacturer/model
DUNLOP/D252

EWA13210

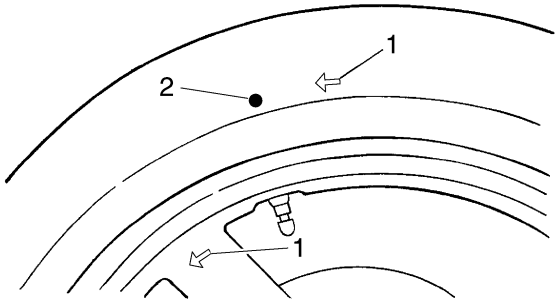
WARNING

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

NOTE:

For tires with a direction of rotation mark “1”:

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark “2” with the valve installation point.



EAS21670
CHECKING THE WHEELS
The following procedure applies to both of the wheels.
1. Check:
   - Wheel
     Damage/out-of-round → Replace.

EWA13260
⚠ WARNING

Never attempt to make any repairs to the wheel.

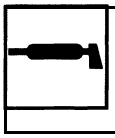
NOTE:
After a tire or wheel has been changed or replaced, always balance the wheel.

EAS21690
CHECKING AND LUBRICATING THE CABLES
The following procedure applies to all of the inner and outer cables.

EWA13270
⚠ WARNING

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

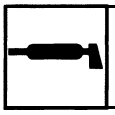
1. Check:
   - Outer cable
     Damage → Replace.
2. Check:
   - Cable operation
     Rough movement → Lubricate.



Recommended lubricant
Engine oil or a suitable cable lubricant

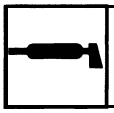
NOTE:
Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubricating device.

EAS21700
LUBRICATING THE LEVERS
Lubricate the pivoting point and metal-to-metal moving parts of the levers.



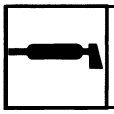
Recommended lubricant
Lithium-soap-based grease

EAS21710
LUBRICATING THE PEDAL
Lubricate the pivoting point and metal-to-metal moving parts of the pedal.



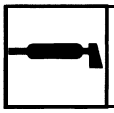
Recommended lubricant
Lithium-soap-based grease

EAS21720
LUBRICATING THE SIDESTAND
Lubricate the pivoting point and metal-to-metal moving parts of the sidestand.



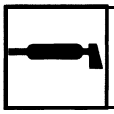
Recommended lubricant
Lithium-soap-based grease

EAS21730
LUBRICATING THE CENTERSTAND
Lubricate the pivoting point and metal-to-metal moving parts of the centerstand.



Recommended lubricant
Lithium-soap-based grease

EAS21740
LUBRICATING THE REAR SUSPENSION
Lubricate the pivoting point and metal-to-metal moving parts of the rear suspension.



Recommended lubricant
Molybdenum disulfide grease

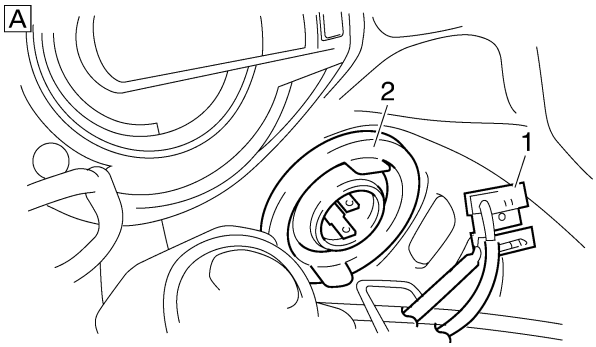
EAS21750
ELECTRICAL SYSTEM

EAS21790
REPLACING THE HEADLIGHT BULBS

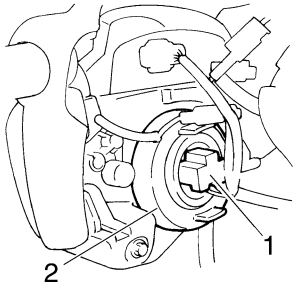
The following procedure applies to both of the headlight bulbs.

1. Disconnect:
   - Headlight coupler “1”
2. Remove:
   - Headlight bulb cover “2”

A



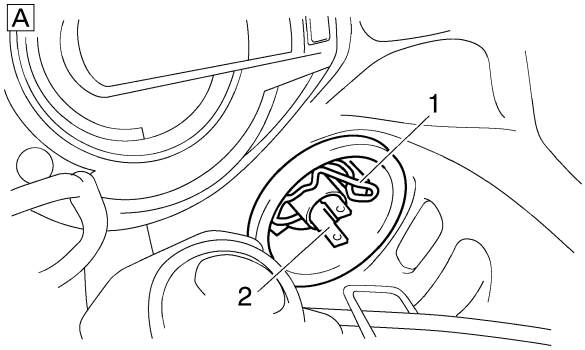
B



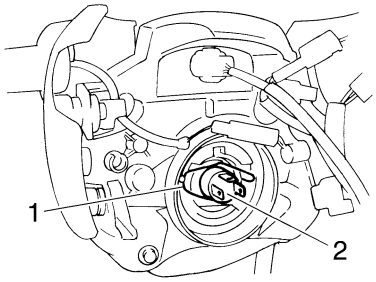
A. FZ6-S/FZ6-SHG(W)/FZ6-SA/FZ6-SAHG
B. FZ6-N/FZ6-NHG(W)/FZ6-NA/FZ6-NAHG

3. Remove:
   - Headlight bulb holder “1”
4. Remove:
   - Headlight bulb “2”

A



B



A. FZ6-S/FZ6-SHG(W)/FZ6-SA/FZ6-SAHG
B. FZ6-N/FZ6-NHG(W)/FZ6-NA/FZ6-NAHG

EWA13320

⚠ WARNING

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

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

ECA13690

CAUTION:

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

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

EAS21810
ADJUSTING THE HEADLIGHT BEAMS

The following procedure applies to both of the headlights.

1. Adjust:
   - Headlight beam (vertically)

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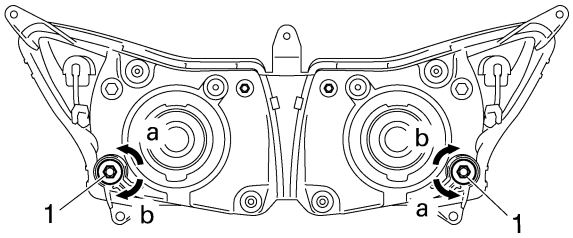
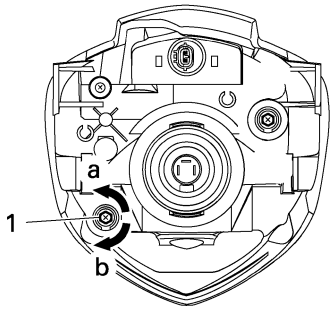
a. Turn the adjusting screw “1” in direction “a” or “b”.

Direction “a”
Headlight beam is raised.
Direction “b”
Headlight beam is lowered.

A



B



A. FZ6-S/FZ6-SHG(W)/FZ6-SA/FZ6-SAHG
B. FZ6-N/FZ6-NHG(W)/FZ6-NA/FZ6-NAHG

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2. Adjust:
   • Headlight beam (horizontally)

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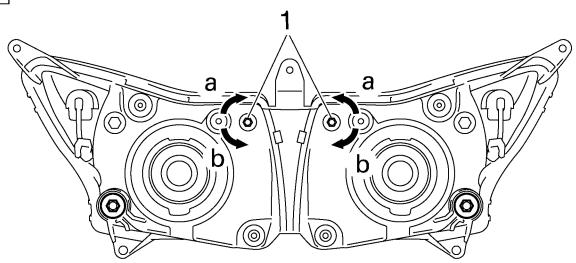
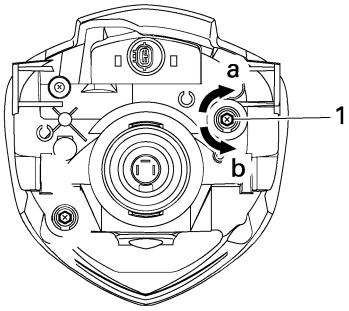
a. Turn the adjusting screw “1” in direction “a” or “b”.

Direction “a”
Headlight beam moves to the right.
Direction “b”
Headlight beam moves to the left.

A



B



A. FZ6-S/FZ6-SHG(W)/FZ6-SA/FZ6-SAHG
B. FZ6-N/FZ6-NHG(W)/FZ6-NA/FZ6-NAHG

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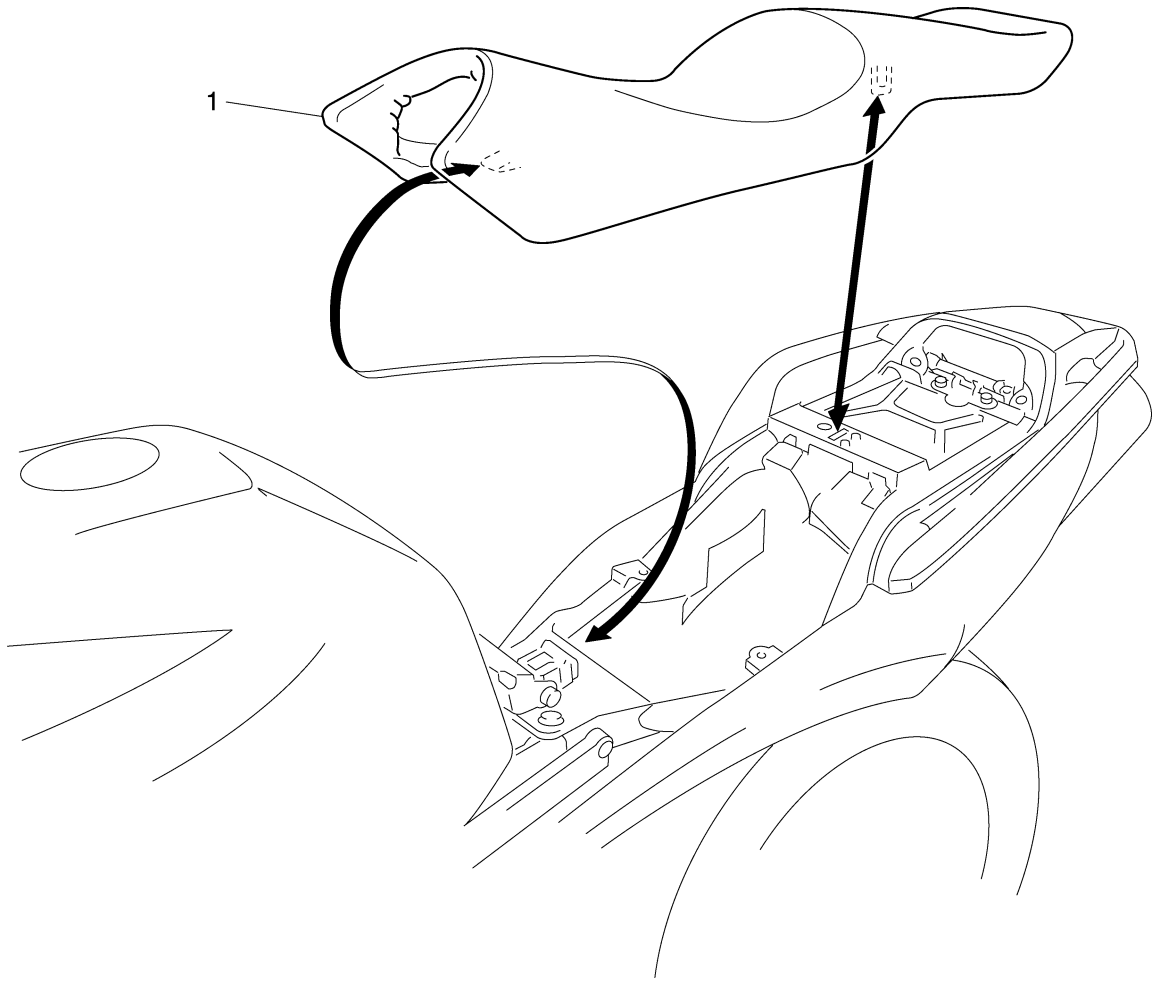
CHASSIS

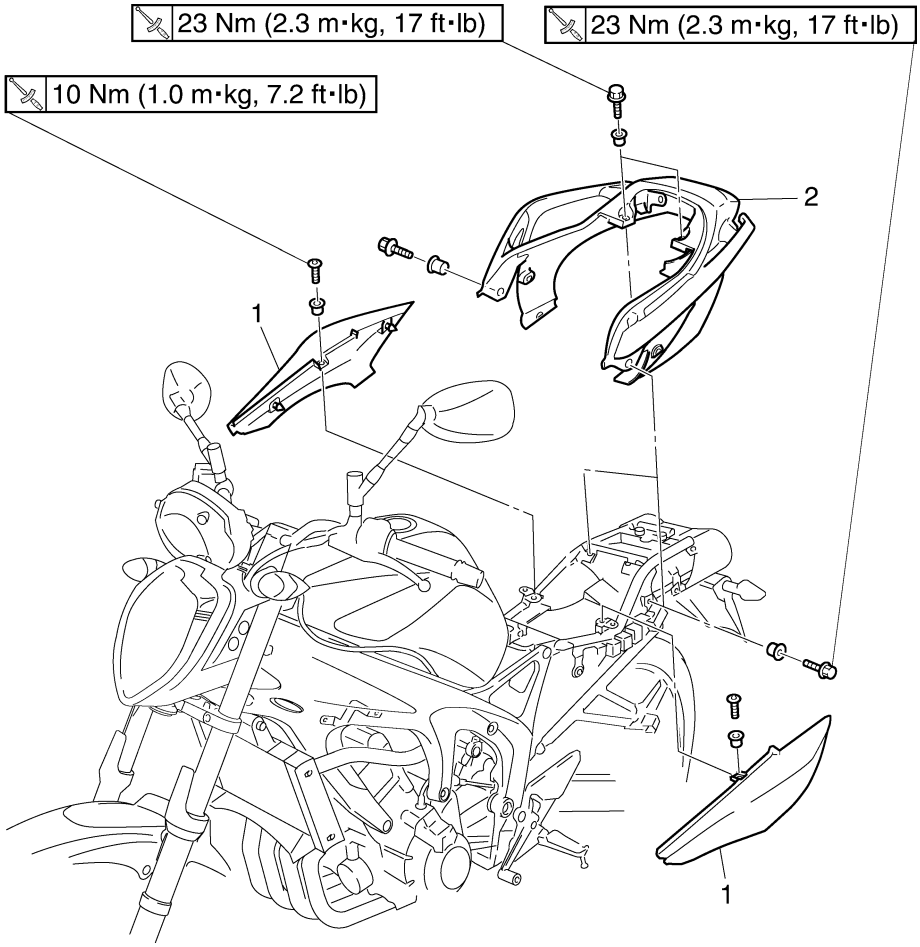
EAS21830
GENERAL CHASSIS

Removing the seat



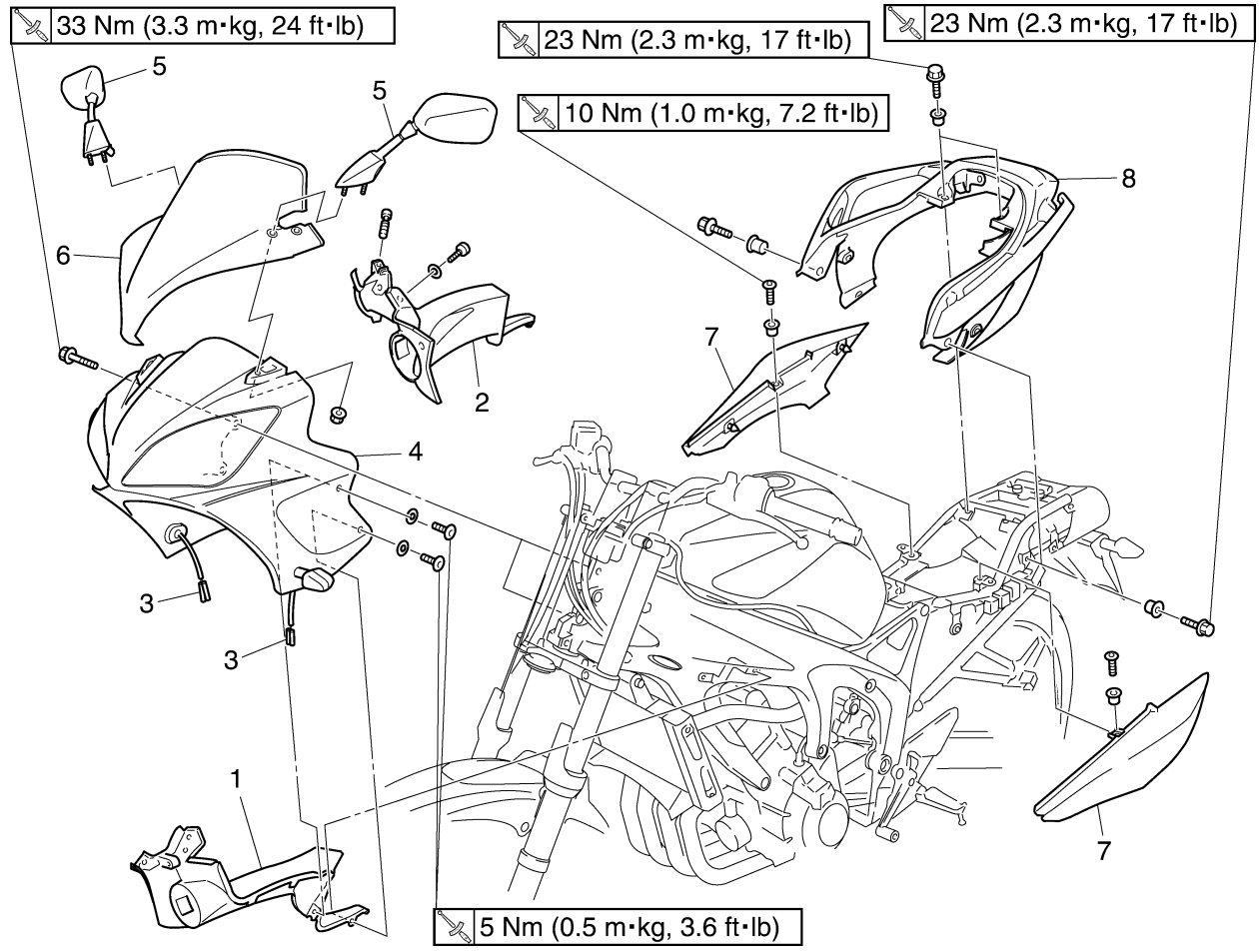
Order	Job/Parts to remove	Q'ty	Remarks
1	Seat	1	
			For installation, reverse the removal procedure.

Removing the cowlings (FZ6-N/FZ6-NHG(W)/FZ6-NA/FZ6-NAHG)



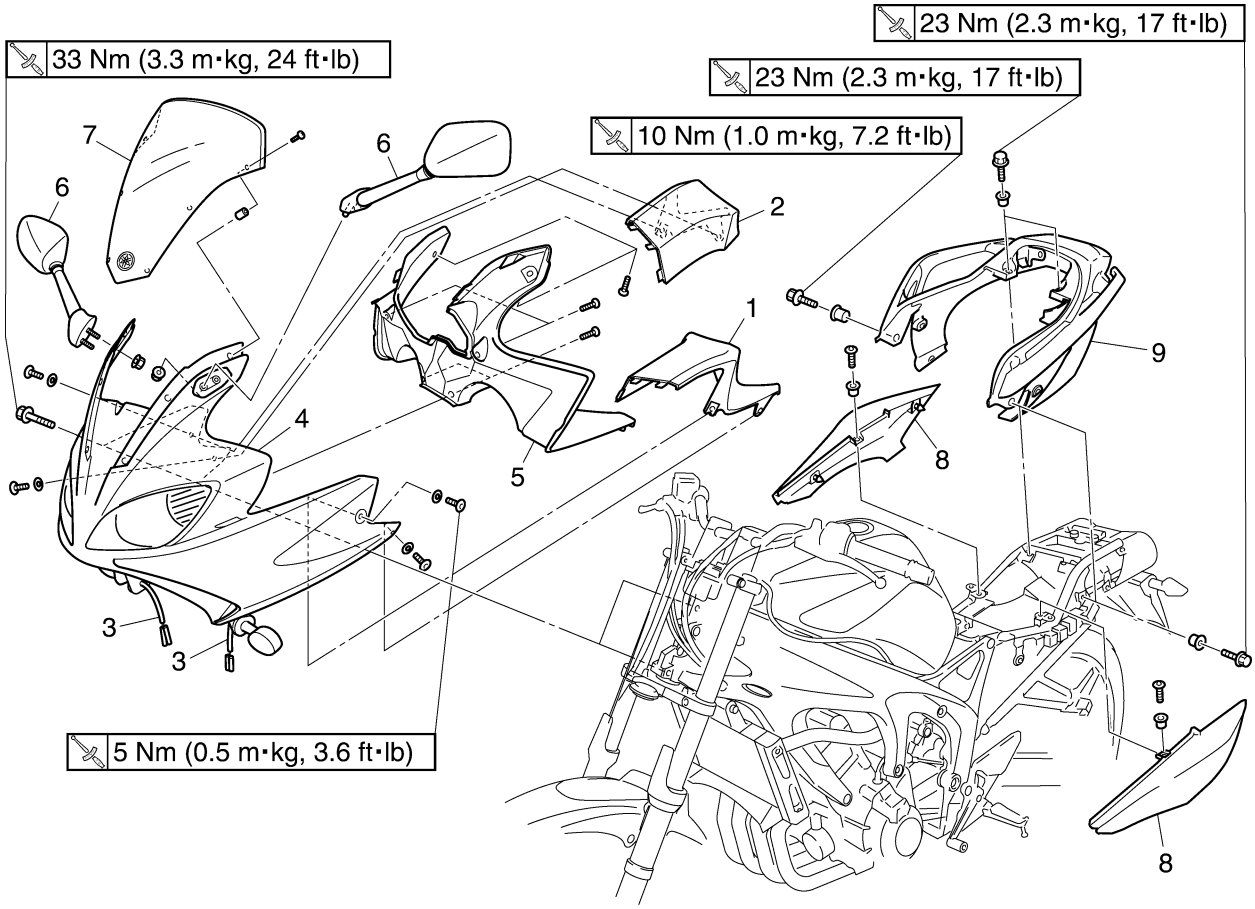
Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
1	Side cover	2	
2	Rear cowling	1	
			For installation, reverse the removal procedure.

Removing the cowlings (FZ6-S/FZ6-SA)



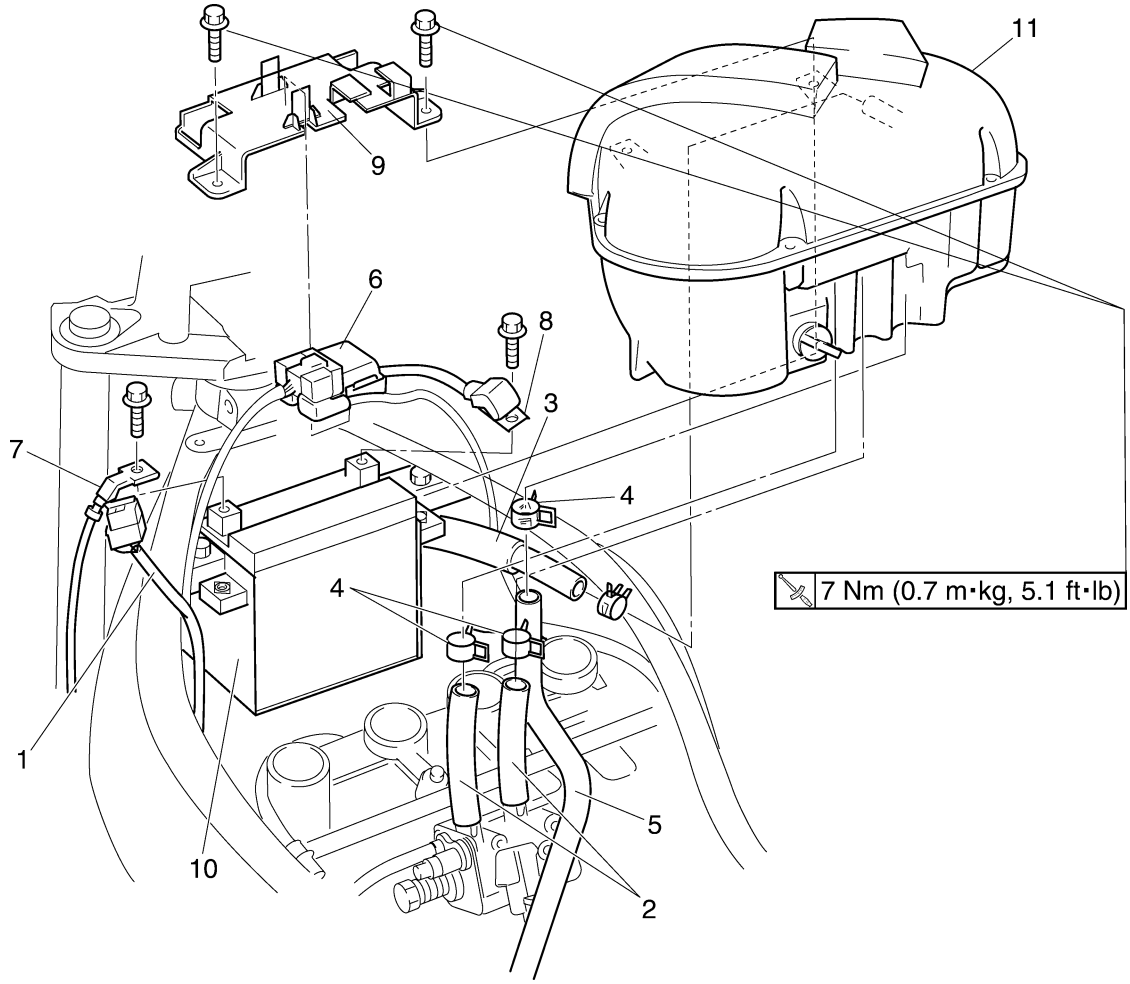
Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
1	Left front cowling inner panel (with cowling)	1	
2	Right front cowling inner panel (with cowling)	1	
3	Front turn signal light coupler	2	Disconnect.
4	Front cowling	1	
5	Rear view mirrors	2	
6	Windshield	1	
7	Side cover	2	
8	Rear cowling	1	
			For installation, reverse the removal procedure.

Removing the cowlings (FZ6-SHG(W)/FZ6-SAHG)



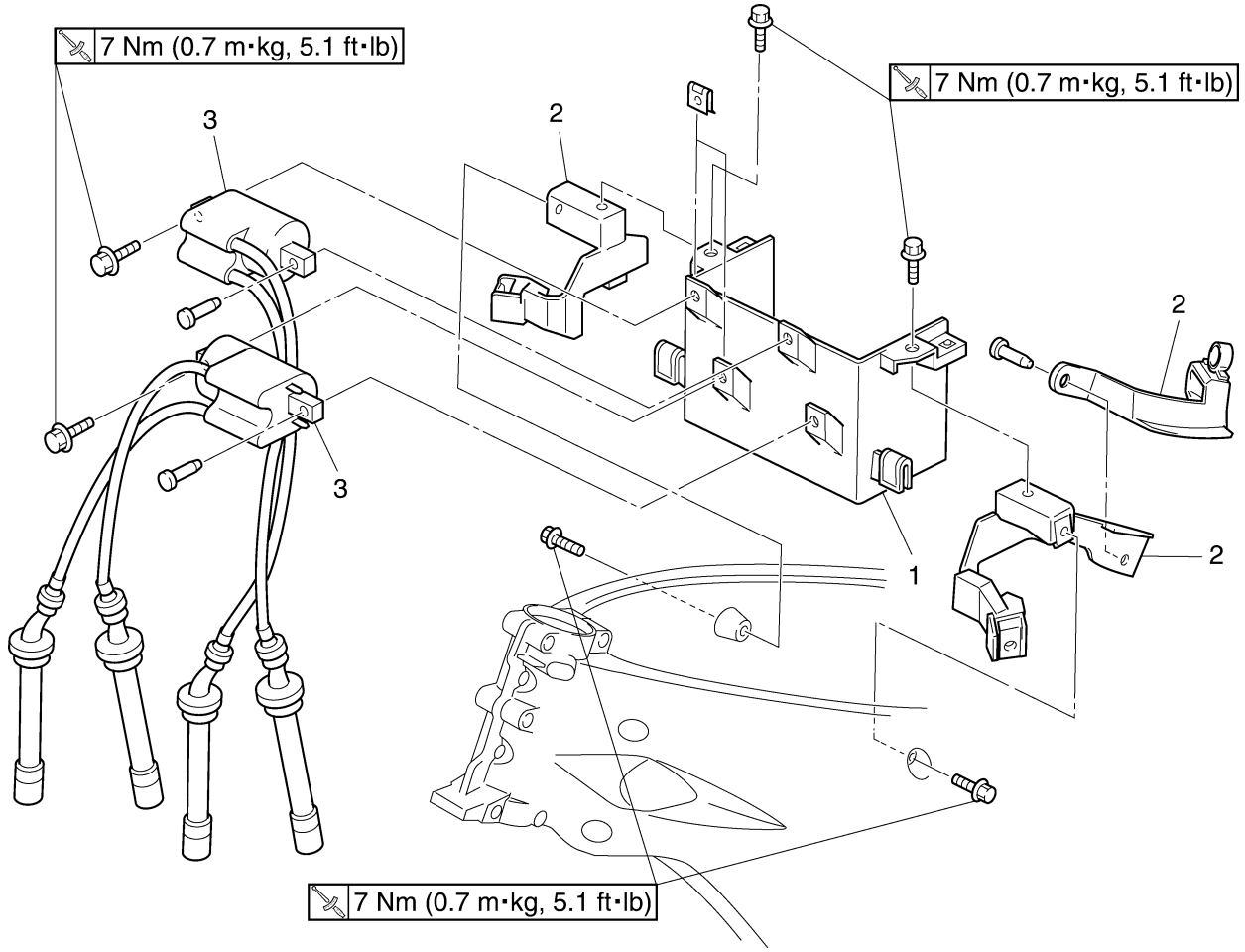
Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
1	Left front cowling inner panel (with cowling)	1	
2	Right front cowling inner panel (with cowling)	1	
3	Front turn signal light coupler	2	Disconnect.
4	Front cowling	1	
5	Front cowling inner panel (center)	1	
6	Rear view mirrors	2	
7	Windshield	1	
8	Side cover	2	
9	Rear cowling	1	
			For installation, reverse the removal procedure.

Removing the air filter case and battery



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	ABS motor relay (with ABS)		Refer to "ABS ECU AND ABS MOTOR RELAY" on page 8-72.
1	Intake air temperature sensor coupler	1	Disconnect.
2	Throttle body hose	2	Disconnect.
3	Air induction system hose	1	Disconnect.
4	Clamp	4	Loosen.
5	Crankcase breather hose	1	Disconnect.
6	Starter relay	1	
7	Battery negative lead	1	Disconnect.
8	Battery positive lead	1	Disconnect.
9	Battery cover	1	
10	Battery	1	
11	Air filter case	1	
			For installation, reverse the removal procedure.

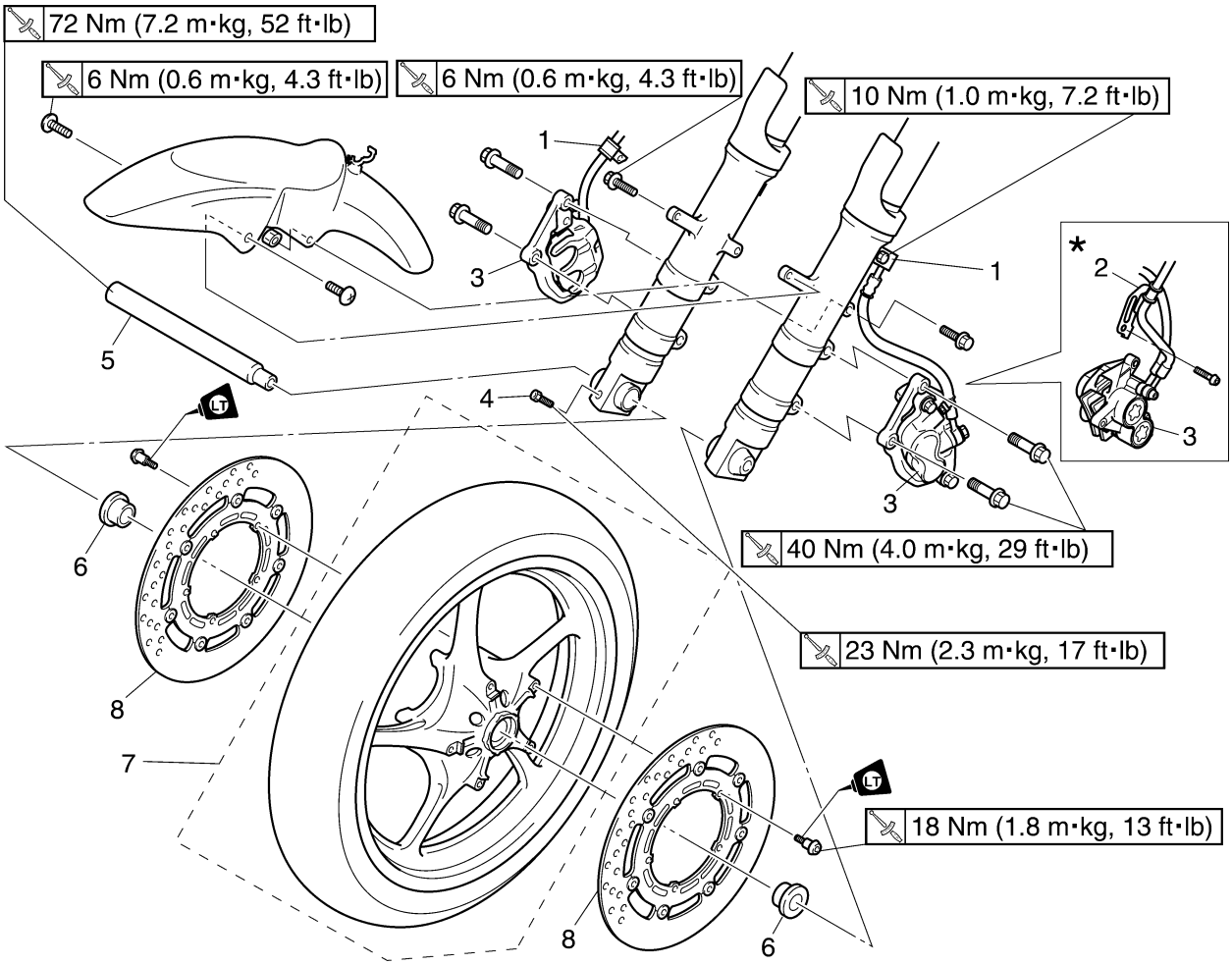
Removing the battery box



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Battery		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
1	Battery box	1	
2	Battery box bracket	3	
3	Ignition coil	2	
			For installation, reverse the removal procedure.

EAS21880
FRONT WHEEL

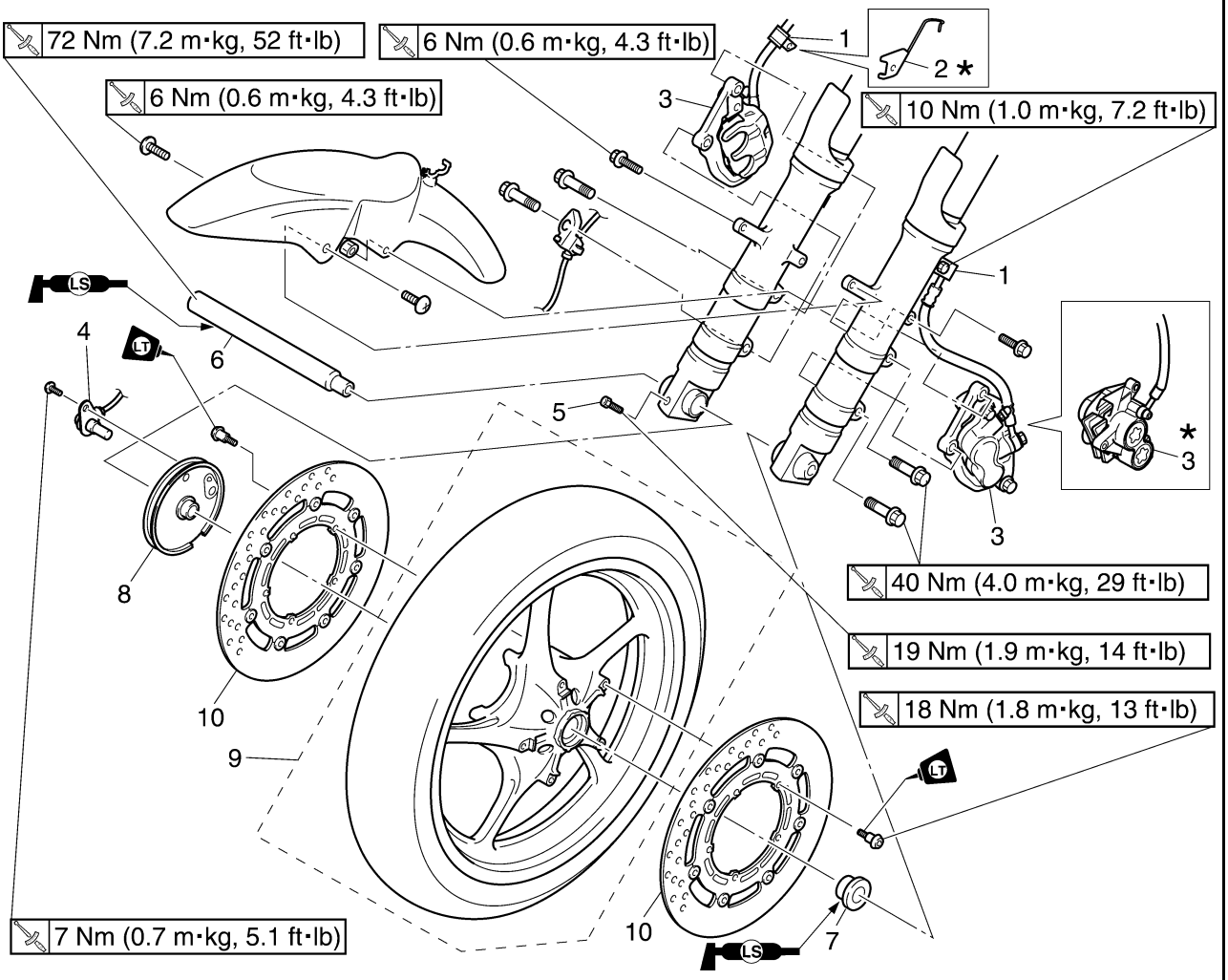
Removing the front wheel and brake discs (FZ6-N/FZ6-NHG(W)/FZ6-S/FZ6-SHG(W))



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake hose holder	2	
2	Brake hose holder	1	
3	Front brake caliper	2	
4	Front wheel axle pinch bolt	1	Loosen.
5	Front wheel axle	1	
6	Collar	2	
7	Front wheel	1	
8	Front brake disc	2	
			For installation, reverse the removal procedure.

* FZ6-NHG(W)/FZ6-SHG(W)

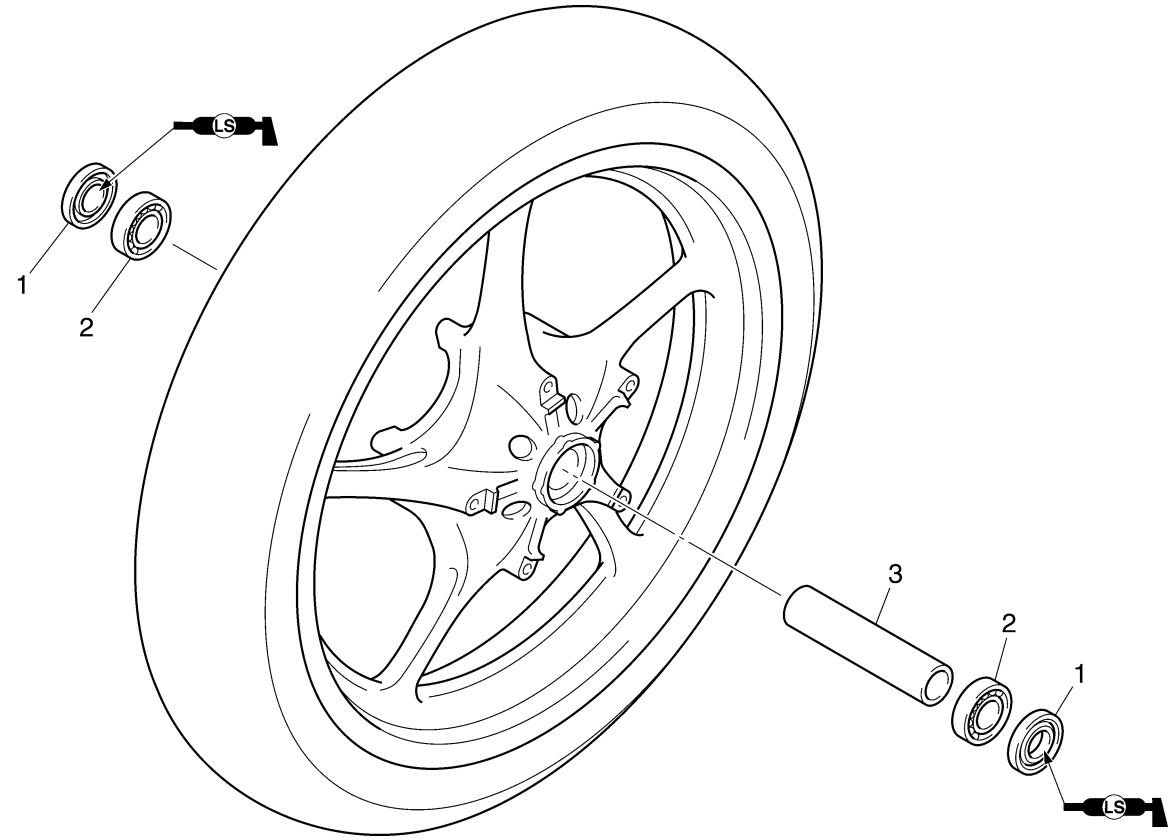
Removing the front wheel sensor and sensor rotor (FZ6-NA/FZ6-NAHG/FZ6-SA/FZ6-SAHG)



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake hose holder	2	
2	Brake hose holder	1	
3	Front brake caliper	2	
4	Front wheel sensor	1	
5	Front wheel axle pinch bolt	1	Loosen.
6	Front wheel axle	1	
7	Collar	1	
8	Sensor housing	1	
9	Front wheel	1	
10	Front brake disc	2	
			For installation, reverse the removal procedure.

* FZ6-NAHG/FZ6-SAHG

Disassembling the front wheel



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

EAS21900
REMOVING THE FRONT WHEEL

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

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

2. Remove:
   - Left brake caliper
   - Right brake caliper

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

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

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

5. Remove:
   - Front wheel axle
   - Front wheel
6. Remove:
   - Collers

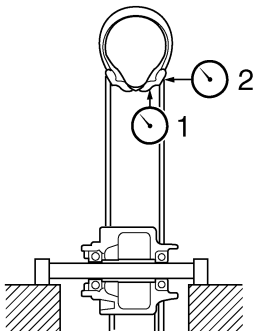
EAS21920
CHECKING THE FRONT WHEEL

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

EWA13460
⚠ WARNING

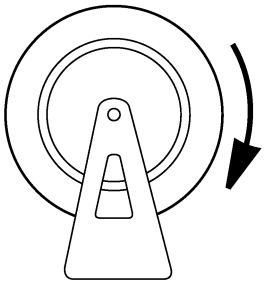
Do not attempt to straighten a bent wheel axle.

2. Check:
   - Tire
   - Front wheel
     Damage/wear → Replace.
     Refer to "CHECKING THE TIRES" on page 3-31 and "CHECKING THE WHEELS" on page 3-34.
3. Measure:
   - Radial wheel runout “1”
   - Lateral wheel runout “2”
     Over the specified limits → Replace.



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

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



5. Replace:
   - Wheel bearings New
   - Oil seals New

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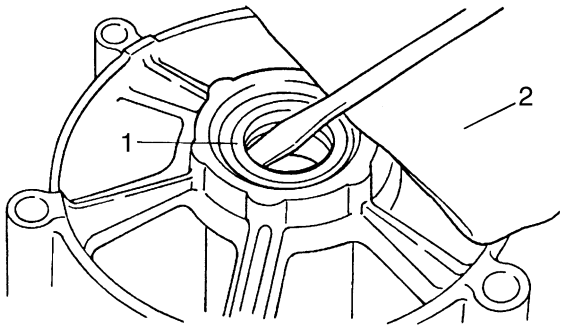
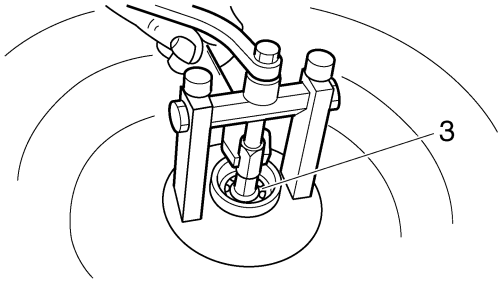
a. Clean the outside of the front wheel hub.
b. Remove the oil seals “1” with a flat-head screwdriver.

NOTE:
To prevent damaging the wheel, place a rag “2” between the screwdriver and the wheel surface.



c. Remove the wheel bearings “3” with a general bearing puller.



d. Install the new wheel bearings and oil seals in the reverse order of disassembly.

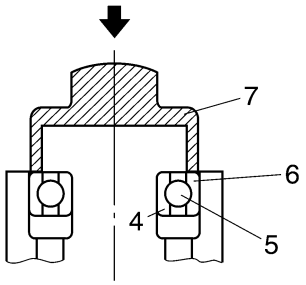
ECA14130

CAUTION:

Do not contact the wheel bearing inner race “4” or balls “5”. Contact should be made only with the outer race “6”.

NOTE:

Use a socket “7” that matches the diameter of the wheel bearing outer race and oil seal.



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EAS22010

[D-3] MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR

- ABS wheel speed sensor and sensor rotor

ECA14450

CAUTION:

- **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 ABS wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.**

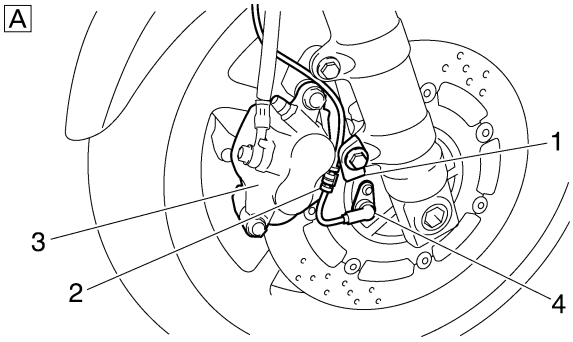
Removing the front wheel sensor

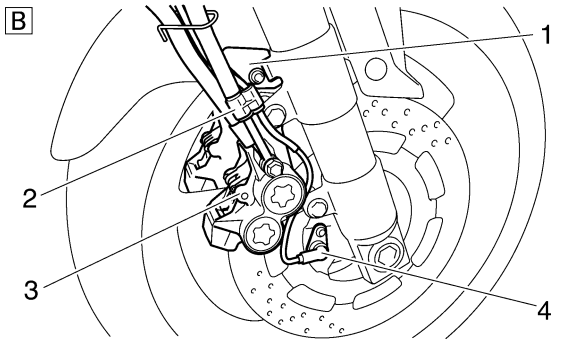
1. Remove:
   - Brake hose holder “1”
   - Front wheel sensor lead holder “2”
   - Brake caliper “3”
   - Front wheel sensor “4”

ECA4S81011

CAUTION:

- **Be sure not to contact the sensor electrode to any metal part when removing the front wheel sensor from the sensor housing.**
- **Do not operate the brake lever when removing the brake caliper.**

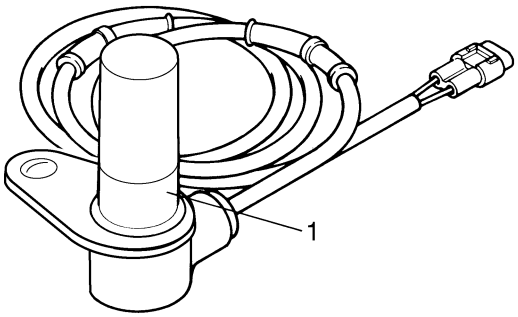




A. FZ6-NA/FZ6-SA
B. FZ6-NAHG/FZ6-SAHG

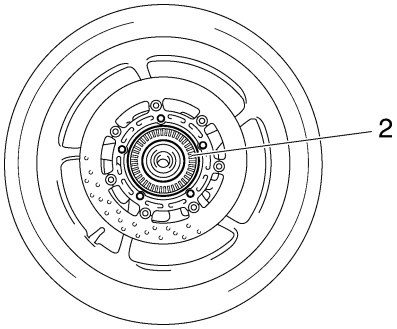
Checking the front wheel sensor and sensor rotor

1. Check:
   - Front wheel sensor “1”
     Cracks/bends/distortion → Replace.
     Iron powder/dust → Clean.



2. Check:
   - Front wheel sensor rotor “2”
     Cracks/damage → Replace the front wheel assembly.

NOTE:
The wheel sensor rotor of the vehicle is inserted under pressure by a special process and cannot be replaced as a single unit. To replace the sensor rotor, replace the wheel assembly.

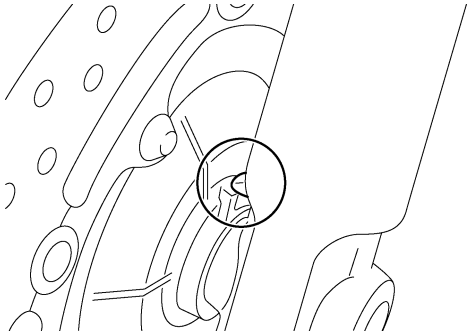


Installing the front wheel sensor

1. Install:
   - Front wheel

NOTE:
Align the slot in the sensor housing with the projection of the front fork before assembly.

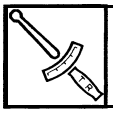
ECA14470
CAUTION:
Make sure there are no foreign materials in the wheel hub. Foreign materials cause damage to the inner sensor rotor and wheel sensor.



2. Install:
   - Front wheel sensor “1”

Front wheel sensor bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)

   - Front wheel sensor lead holder “2”
   - Brake caliper “3”



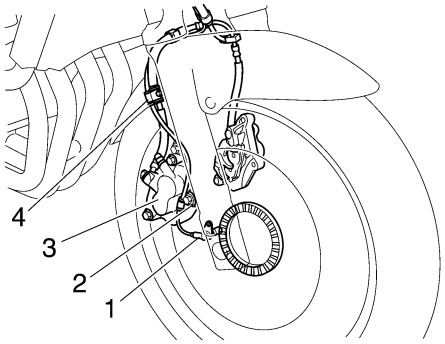
Front brake caliper bolt
40 Nm (4.0 m·kg, 29 ft·lb)

   - Brake hose holder “4”

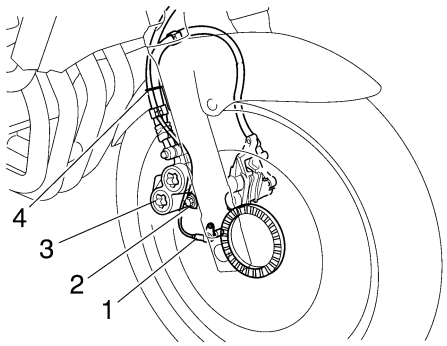
NOTE:
When installing the front wheel sensor, check the wheel sensor lead for twists and the sensor electrode for foreign materials.

ECA14480
CAUTION:
To route the front wheel sensor lead, refer to "CABLE ROUTING" on page 2-47.

A



B



A. FZ6-NA/FZ6-SA
B. FZ6-NAHG/FZ6-SAHG

3. Check:
   • Front wheel sensor installation
   Check if the wheel sensor housing is installed properly.
   Refer to "[D-3] MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-11.

EAS21970
ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:
- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.

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

NOTE:
Place the front wheel on a suitable balancing stand.

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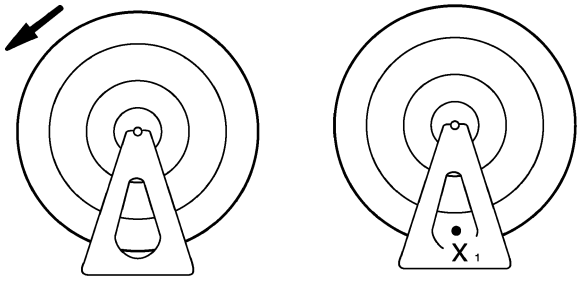
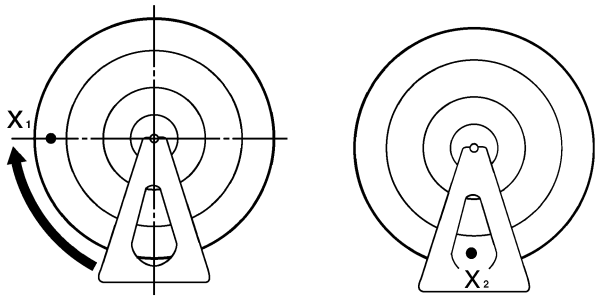
a. Spin the front wheel.
b. When the front wheel stops, put an "X_1" mark at the bottom of the wheel.



c. Turn the front wheel 90° so that the "X_1" mark is positioned as shown.
d. Release the front wheel.
e. When the wheel stops, put an "X_2" mark at the bottom of the wheel.



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

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3. Adjust:
   • Front wheel static balance

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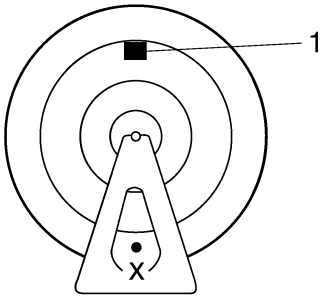
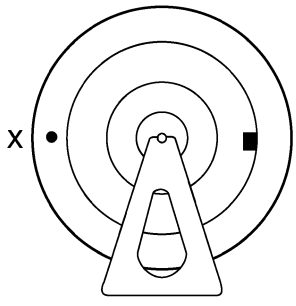
a. Install a balancing weight "1" onto the rim exactly opposite the heavy spot "X".



NOTE:
Start with the lightest weight.

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



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

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4. Check:
   • Front wheel static balance

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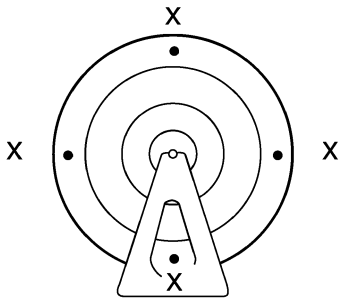
a. Turn the front wheel and make sure it stays at each position shown.



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

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EAS22000
INSTALLING THE FRONT WHEEL

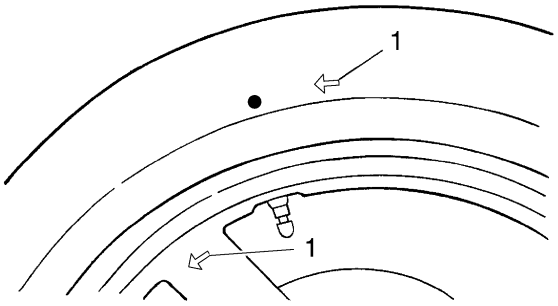
The following procedure applies to both of the brake discs.

1. Lubricate:
   • Wheel axle
   • Oil seal lips

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

2. Install:
   • Coller
   • Wheel axle

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



3. Tighten:
   • Wheel axle

	Wheel axle nut **72 Nm (7.2 m·kg, 52 ft·lb)**

   • Wheel axle pinch bolt

	Wheel axle pinch bolt **19 Nm (1.9 m·kg, 14 ft·lb)**

ECA14140
CAUTION:
Before tightening the wheel axle nut, push down hard on the handlebar(s) several times and check if the front fork rebounds smoothly.

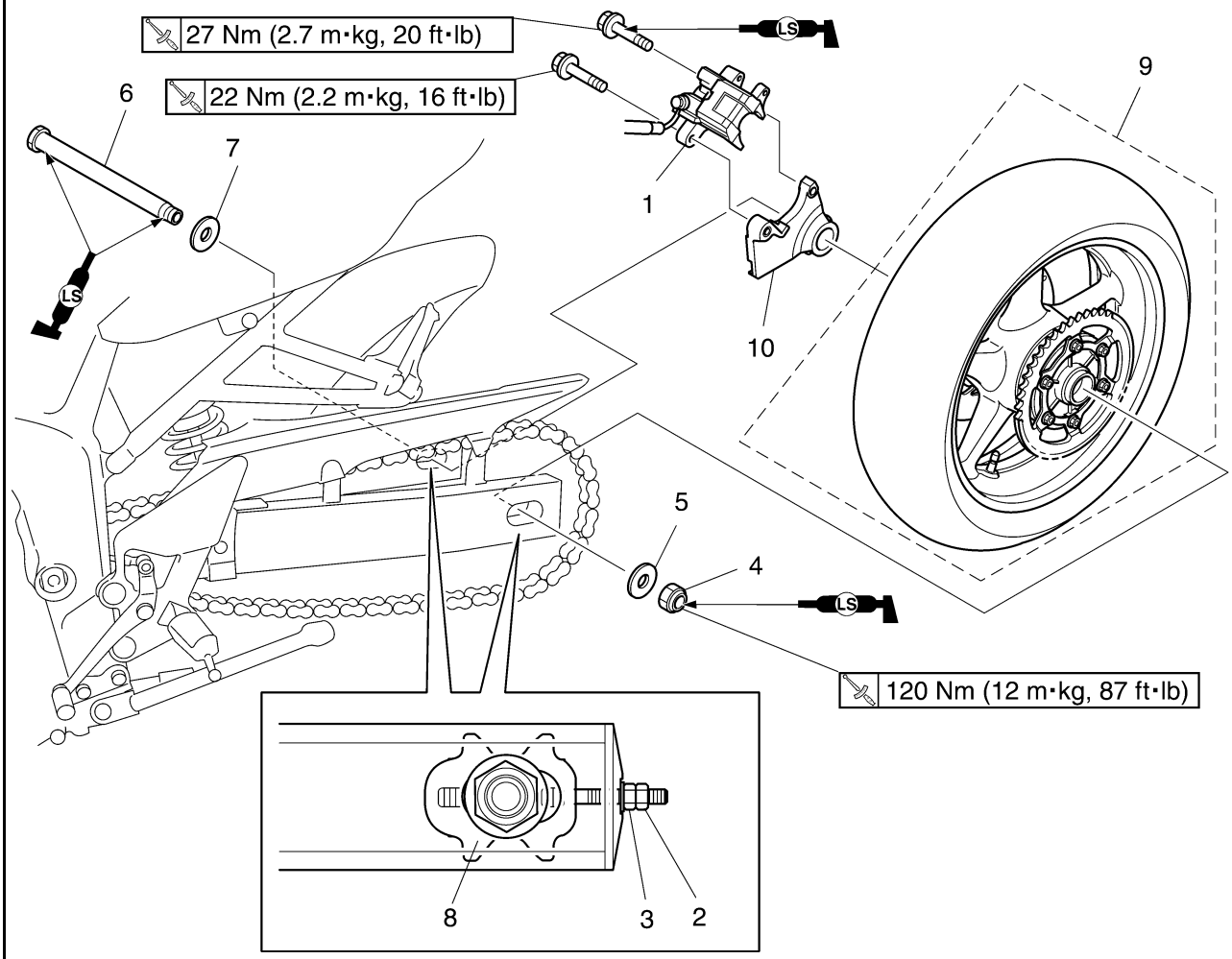
4. Install:
   • Brake calipers

	Front brake caliper bolt **40 Nm (4.0 m·kg, 29 ft·lb)**

EWA13490
WARNING
Make sure the brake cable is routed properly.

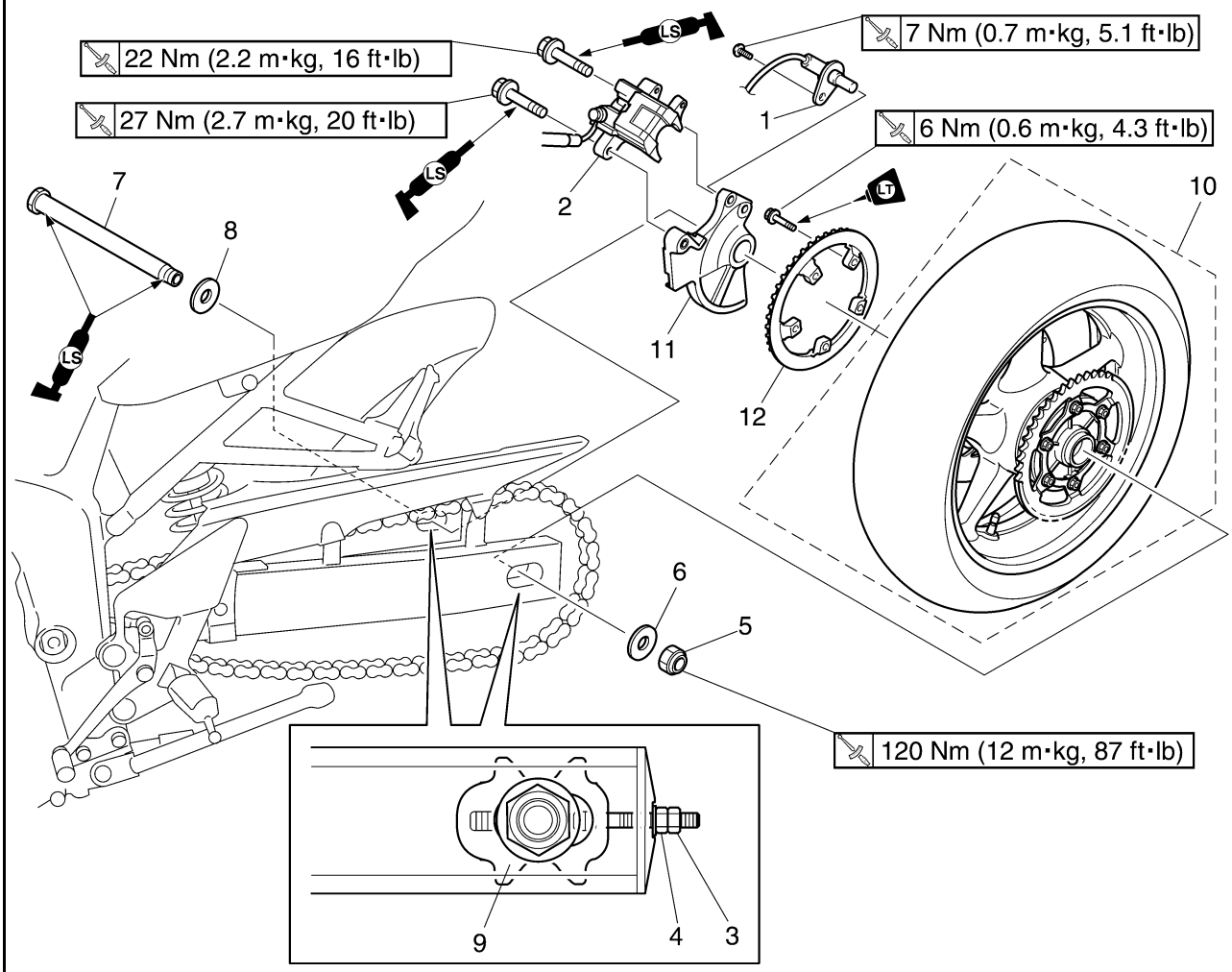
EAS22030
REAR WHEEL

Removing the rear wheel (FZ6-N/FZ6-NHG(W)/FZ6-S/FZ6-SHG(W))



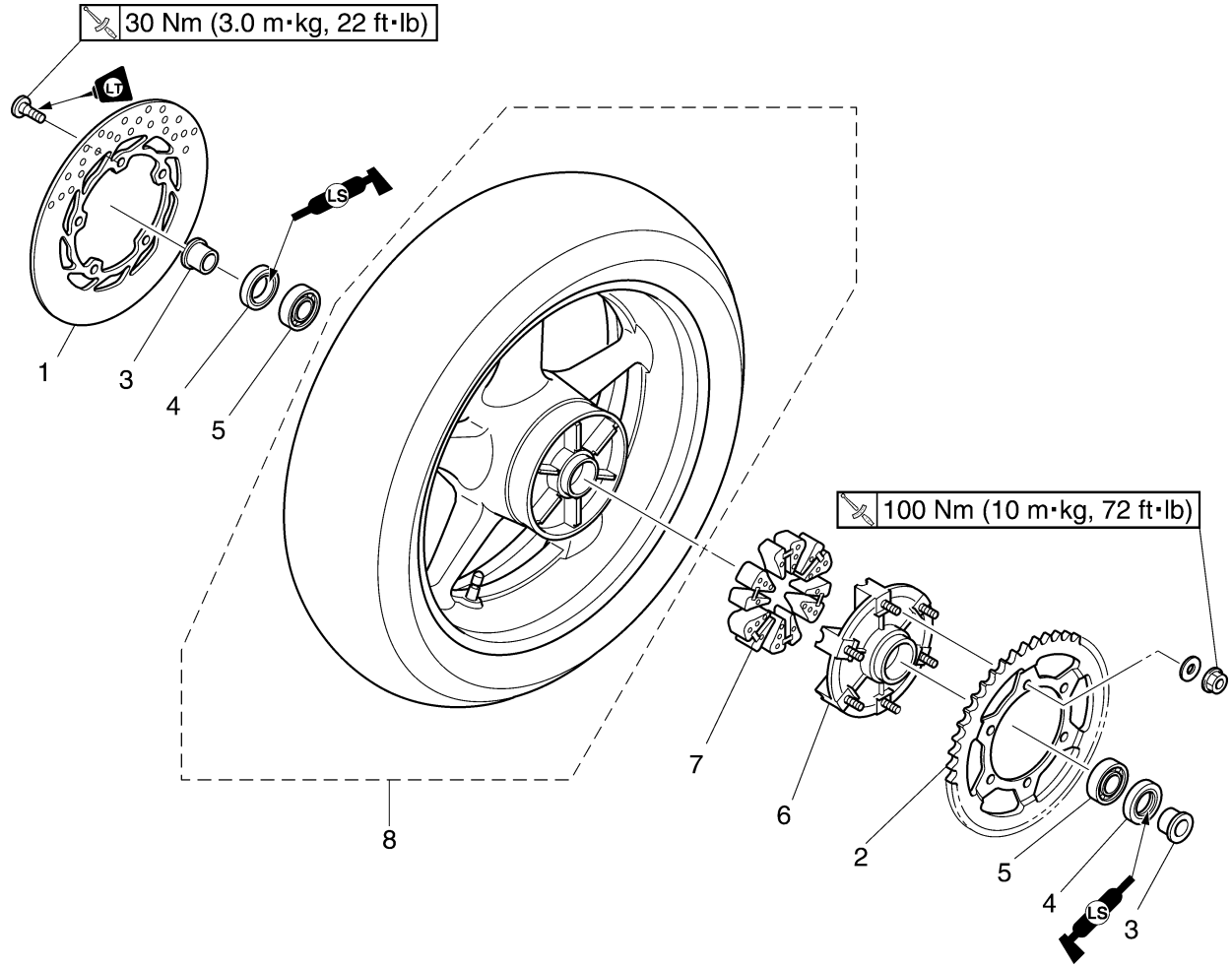
Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake caliper	1	
2	Locknut	2	Loosen.
3	Adjusting nut	2	Loosen.
4	Rear wheel axle nut	1	
5	Washer	1	
6	Rear wheel axle	1	
7	Washer	1	
8	Drive chain puller	2	
9	Rear wheel	1	
10	Rear brake caliper bracket	1	
			For installation, reverse the removal procedure.

Removing the rear wheel sensor and sensor rotor (FZ6-NA/FZ6-NAHG/FZ6-SA/FZ6-SAHG)



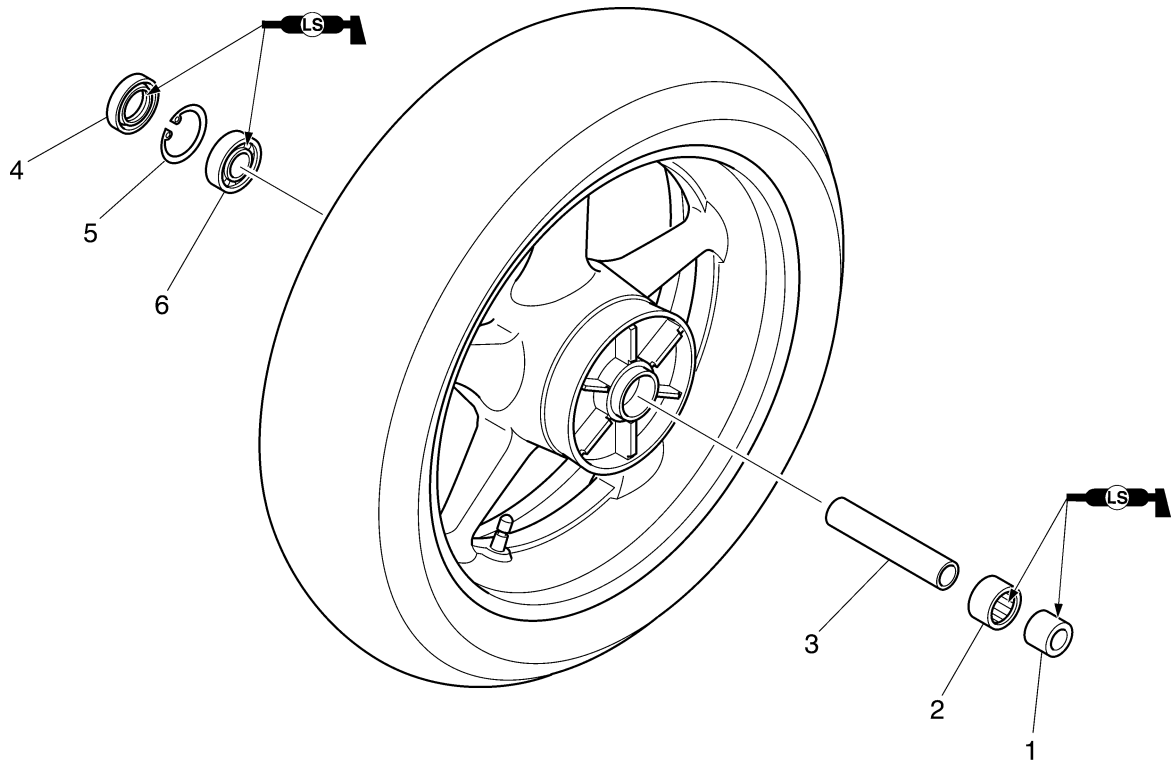
Order	Job/Parts to remove	Q'ty	Remarks
1	Rear wheel sensor	1	
2	Rear brake caliper	1	
3	Lock nut	2	Loosen.
4	Adjusting nut	2	Loosen.
5	Wheel axle nut	1	
6	Washer	1	
7	Rear wheel axle	1	
8	Washer	1	
9	Drive chain puller	2	
10	Rear wheel	1	
11	Rear brake caliper bracket	1	
12	Sensor rotor	1	
			For installation, reverse the removal procedure.

Removing the rear brake disc and rear wheel sprocket



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

Disassembling the rear wheel



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

EAS22040
REMOVING THE REAR WHEEL

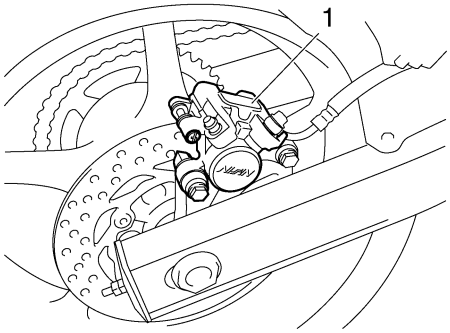
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

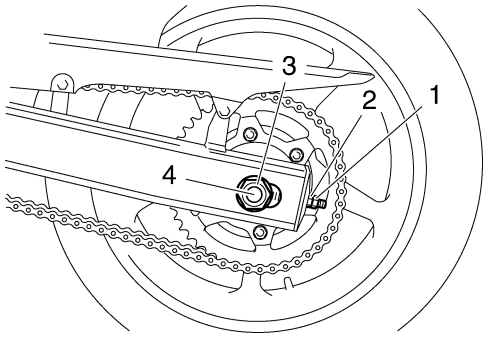
NOTE:
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - Brake caliper “1”



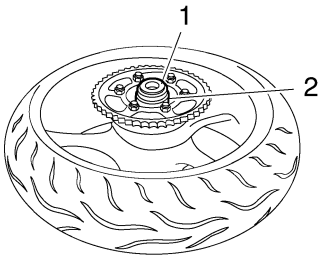
NOTE:
Do not depress the brake pedal when removing the brake caliper.

3. Loosen:
   - Locknut “1”
   - Adjusting nut “2”
4. Remove:
   - Wheel axle nut “3”
   - Wheel axle “4”
   - Washers
   - Rear wheel



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

5. Remove:
   - Left collar “1”
   - Rear wheel drive hub “2”
   - Rear wheel drive hub damper
   - Right collar

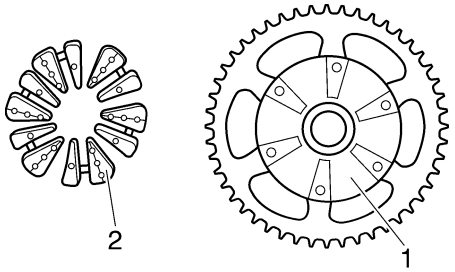


EAS22090
CHECKING THE REAR WHEEL

1. Check:
   - Wheel axle
   - Rear wheel
   - Wheel bearings
   - Oil seals
   Refer to "CHECKING THE FRONT WHEEL" on page 4-10.
2. Check:
   - Tire
   - Rear wheel
   Damage/wear → Replace.
   Refer to "CHECKING THE TIRES" on page 3-31 and "CHECKING THE WHEELS" on page 3-34.
3. Measure:
   - Radial wheel runout
   - Lateral wheel runout
   Refer to "CHECKING THE FRONT WHEEL" on page 4-10.

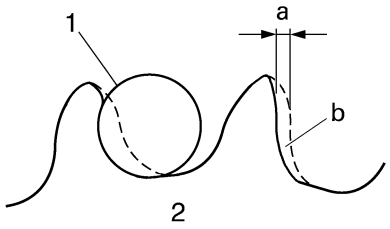
EAS22110
CHECKING THE REAR WHEEL DRIVE HUB

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



EAS22120
CHECKING AND REPLACING THE REAR WHEEL SPROCKET

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



b. Correct
1. Drive chain roller
2. Rear wheel sprocket

2. Replace:
   • Rear wheel sprocket

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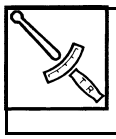
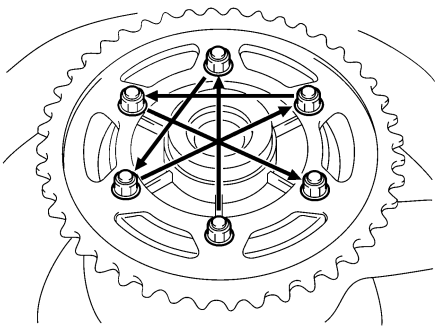
a. Remove the self-locking nuts and the rear wheel sprocket.
b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
c. Install the new rear wheel sprocket.



Rear wheel sprocket self-locking nut
100 Nm (10.0 m·kg, 72 ft·lb)

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



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EAS22200
[D-4] MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR

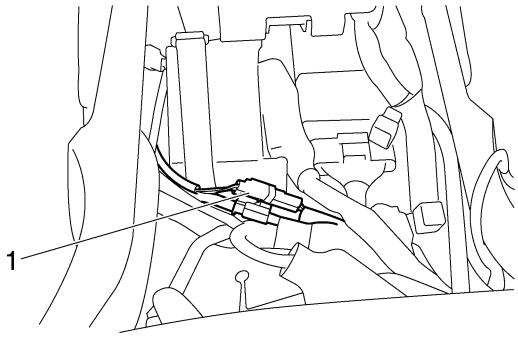
ECA4S81012

CAUTION:

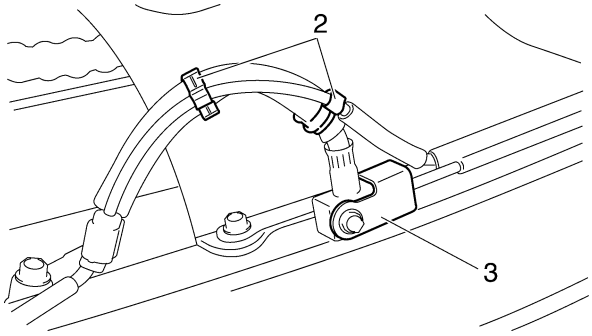
- **Be sure not to contact the sensor electrode to any metal part when removing the rear wheel sensor from the sensor housing.**
- **Do not operate the brake lever when removing the brake caliper.**

Removing the rear wheel sensor

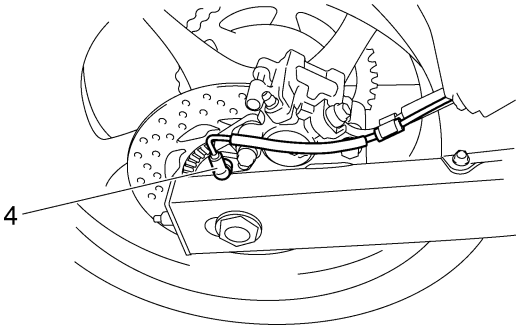
1. Disconnect:
   • Rear wheel sensor coupler "1"



2. Remove:
   • Clamp "2"
   • Rear wheel sensor lead holder "3"



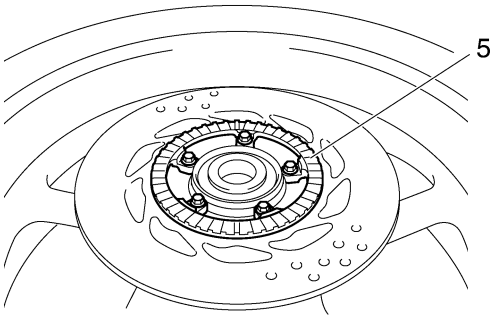
3. Remove:
   • Rear wheel sensor "4"



4. Remove:

- Rear wheel
  Refer to "REMOVING THE REAR WHEEL" on page 4-19.

5. Remove:
   - Sensor rotor “5”



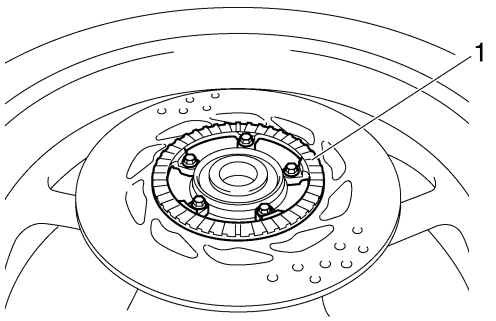
Checking the rear wheel sensor and sensor rotor

1. Check:
   - Rear wheel sensor
     Cracks/bends/distortion → Replace.
     Iron powder/dust → Clean.
2. Check:
   - Rear wheel sensor rotor
     Cracks/damage → Replace.

Installing the rear wheel sensor

1. Install:
   - Sensor rotor “1”

	Sensor rotor bolt **6 Nm (0.6 m·kg, 4.3 ft·lb)**



2. Install:
   - Rear wheel
     Refer to "INSTALLING THE REAR WHEEL" on page 4-22.

ECA14470

CAUTION:

Make sure there are no foreign materials in the wheel hub. Foreign materials cause damage to the inner sensor rotor and wheel sensor.

3. Install:
   - Rear wheel sensor “2”

	Rear wheel sensor bolt **7 Nm (0.7 m·kg, 5.1 ft·lb)**

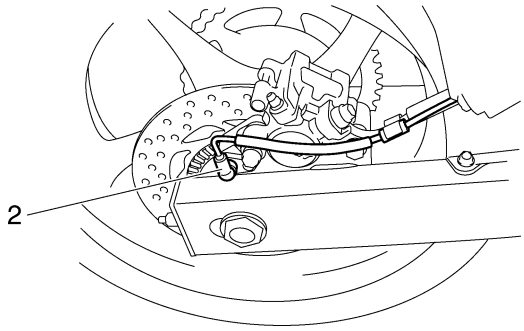
NOTE:

When installing the rear wheel sensor, check the rear wheel sensor lead for twists and the sensor electrode for foreign materials.

ECA14500

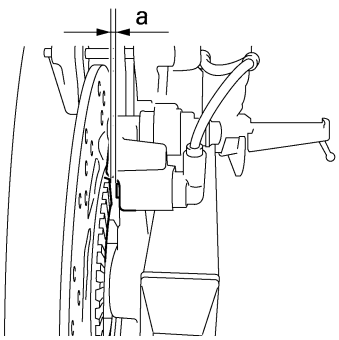
CAUTION:

To route the rear wheel sensor lead, refer to "CABLE ROUTING" on page 2-47.

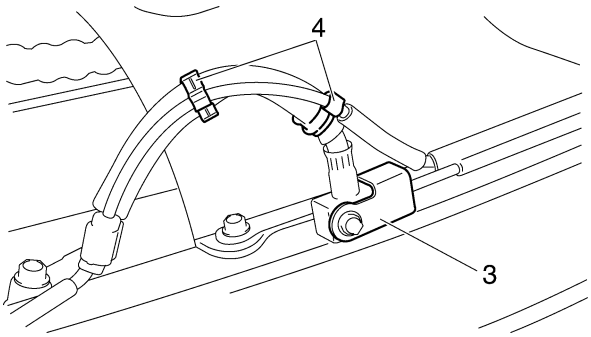


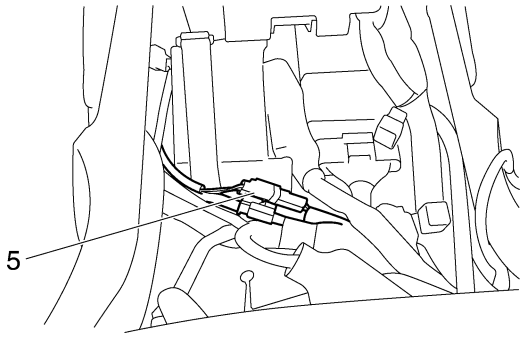
4. Check:
   - Check the clearance “a” between the rear wheel sensor and sensor rotor.
     Out of specification → Check the existence of foreign matters in the wheel sensor attaching section, remove if any, and perform the installation.

	Rear wheel sensor and sensor rotor clearance **0.9–1.5 mm (0.035–0.059 in)**
	Thickness gauge



5. Connect:
   - Rear wheel sensor lead holder “3”
   - Clamp “4”
   - Rear wheel sensor coupler “5”





ECA14500

CAUTION:

To route the rear wheel sensor lead, refer to "CABLE ROUTING" on page 2-47.

6. Check:
   - Rear wheel sensor installation
     Check if the wheel sensor housing is installed properly.

EAS22150

ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:

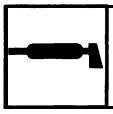
- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and rear wheel drive hub installed.

1. Adjust:
   - Rear wheel static balance
     Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-13.

EAS22160

INSTALLING THE REAR WHEEL

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



Recommended lubricant
Lithium-soap-based grease

2. Install:
   - Collars
   - Rear brake caliper bracket
   - Rear wheel
   - Washer
   - Rear wheel axle
3. Adjust:
   - Drive chain slack
     Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-28.

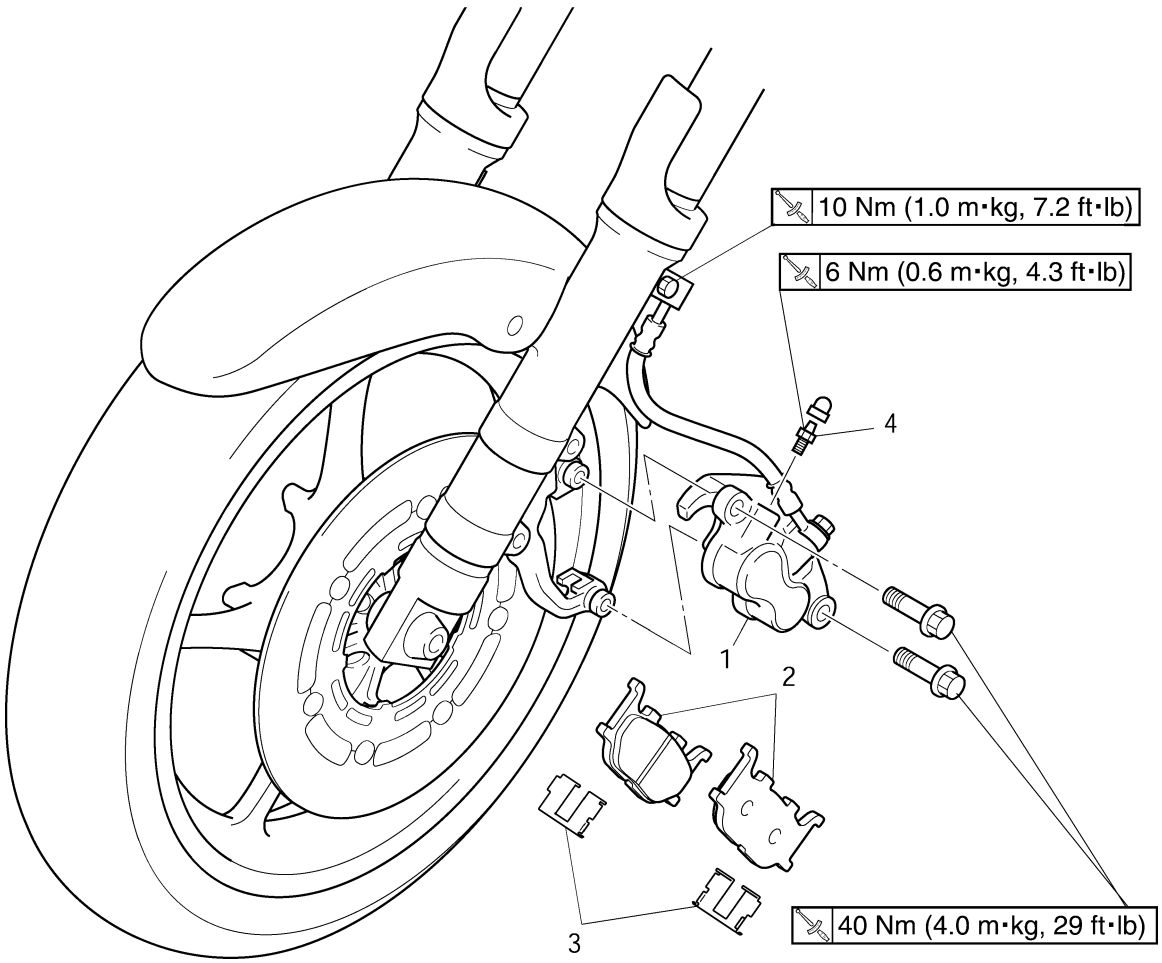
Drive chain slack
45.0–55.0 mm (1.77–2.17 in)

4. Tighten:
   - Wheel axle nut
   - Rear brake caliper bolts

Wheel axle nut
120 Nm (12 m·kg, 87 ft·lb)
Rear brake caliper bolt (front side)
27 Nm (2.7 m·kg, 20 ft·lb)
Rear brake caliper bolt (rear side)
22 Nm (2.2 m·kg, 16 ft·lb)

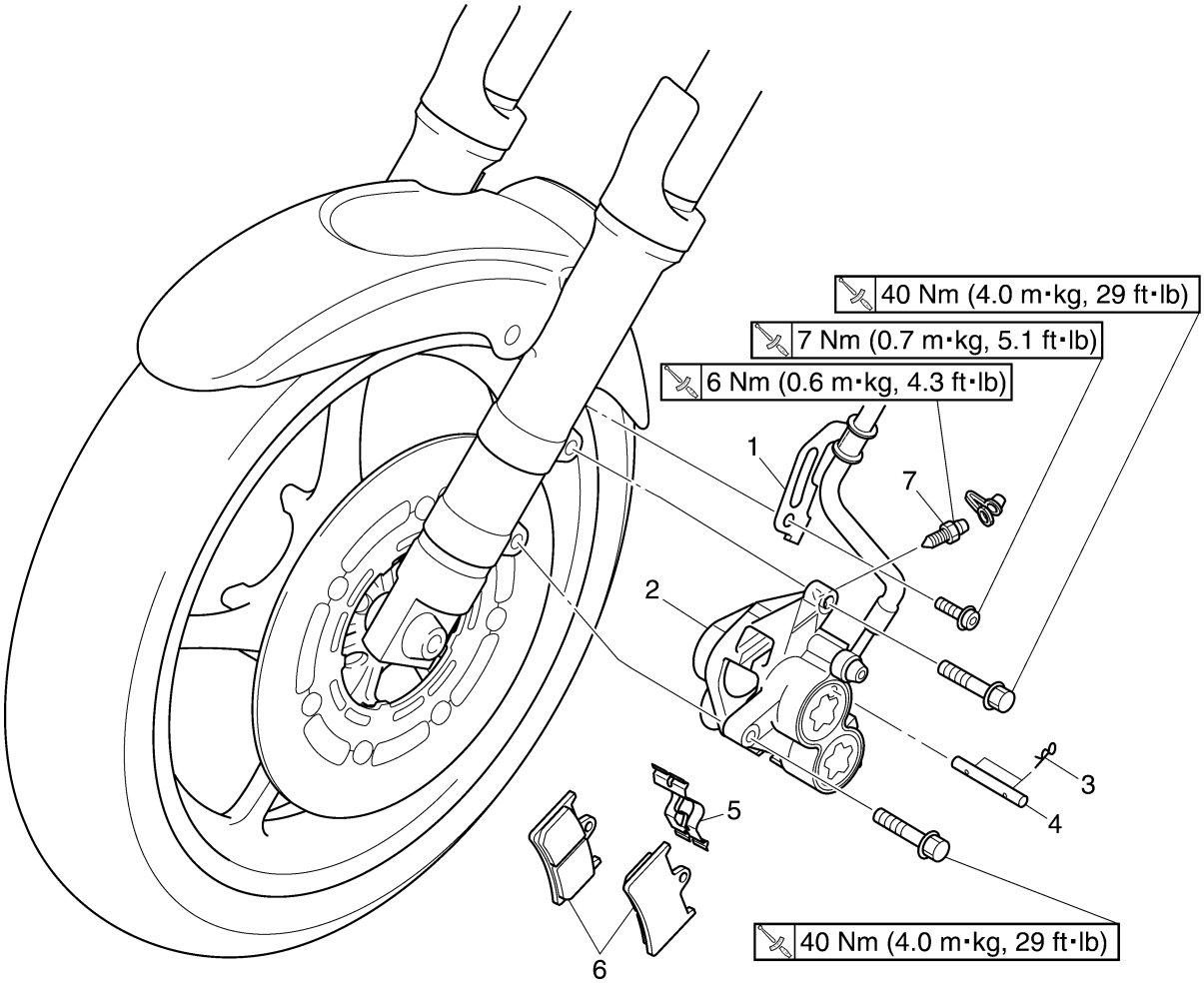
EAS22210
FRONT BRAKE

Removing the front brake pads (FZ6-N/FZ6-NA/FZ6-S/FZ6-SA)



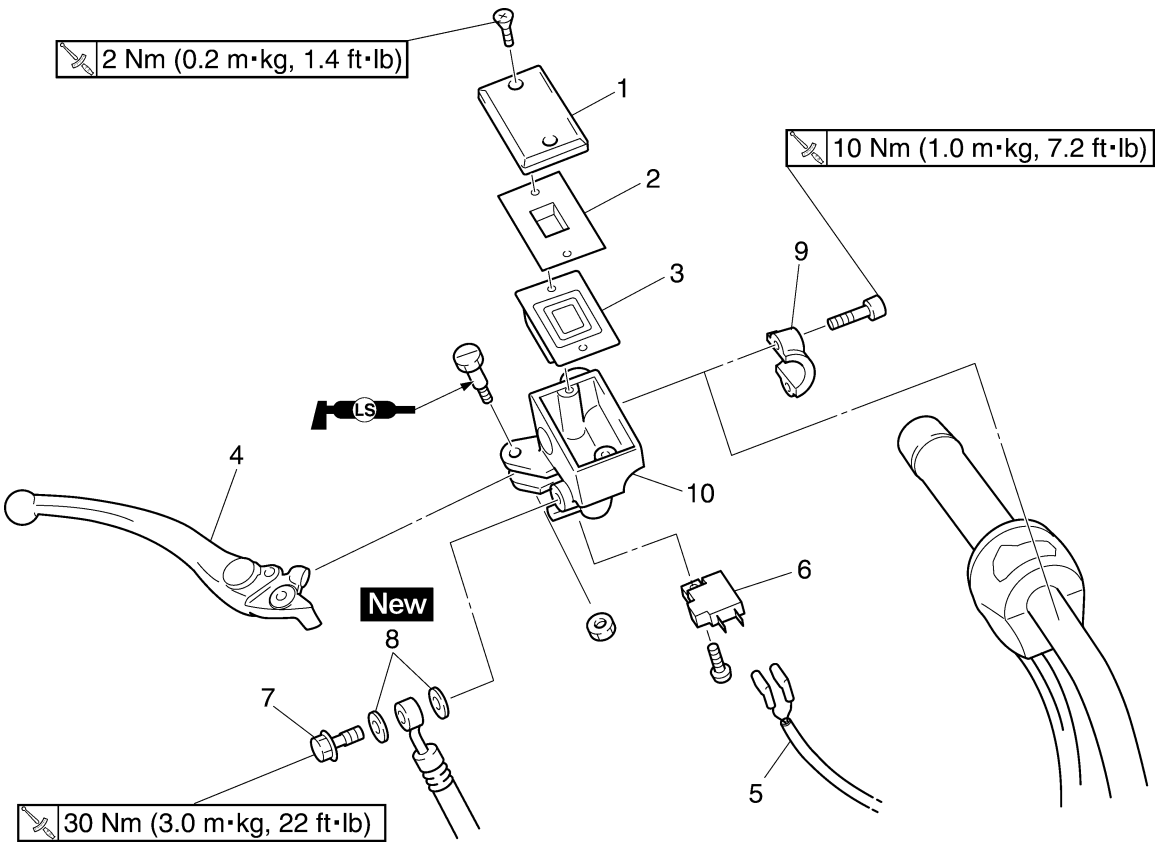
Order	Job/Parts to remove	Q'ty	Remarks
1	Front brake caliper	1	
2	Brake pad	2	
3	Brake pad spring	2	
4	Bleed screw	1	
			For installation, reverse the removal procedure.

Removing the front brake pads (FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)



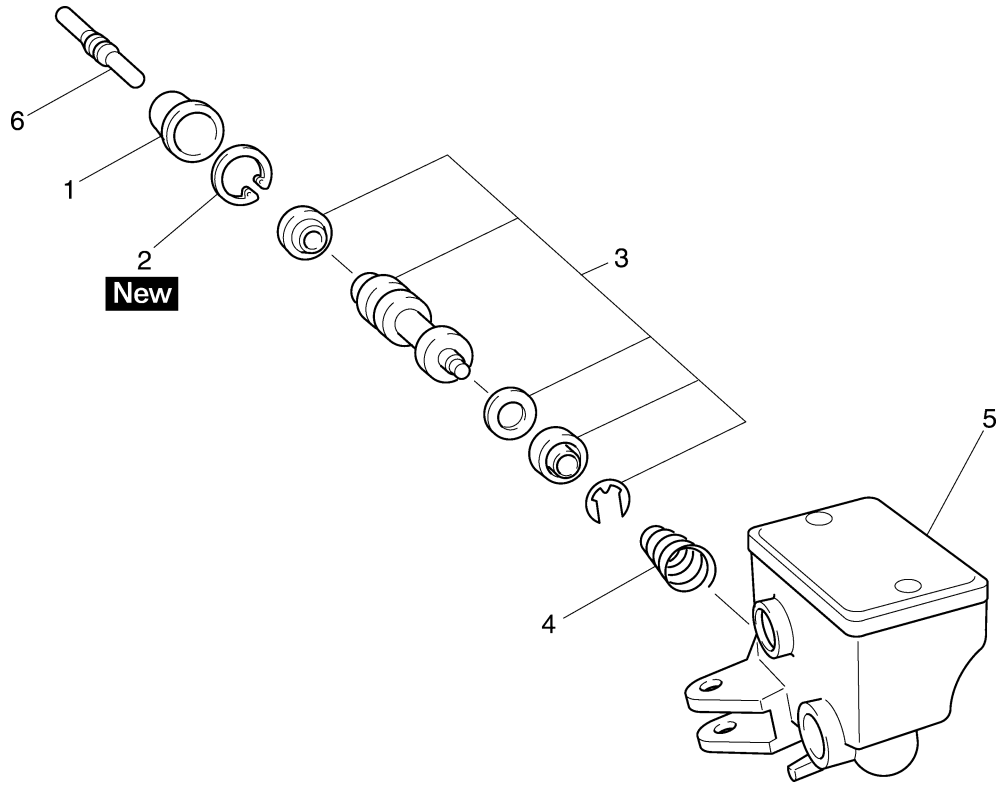
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake hose holder	1	
2	Front brake caliper	1	
3	Brake pad clip	2	
4	Brake pad pin	1	
5	Brake pad spring	1	
6	Brake pad	2	
7	Bleed screw	1	
			For installation, reverse the removal procedure.

Removing the front brake master cylinder



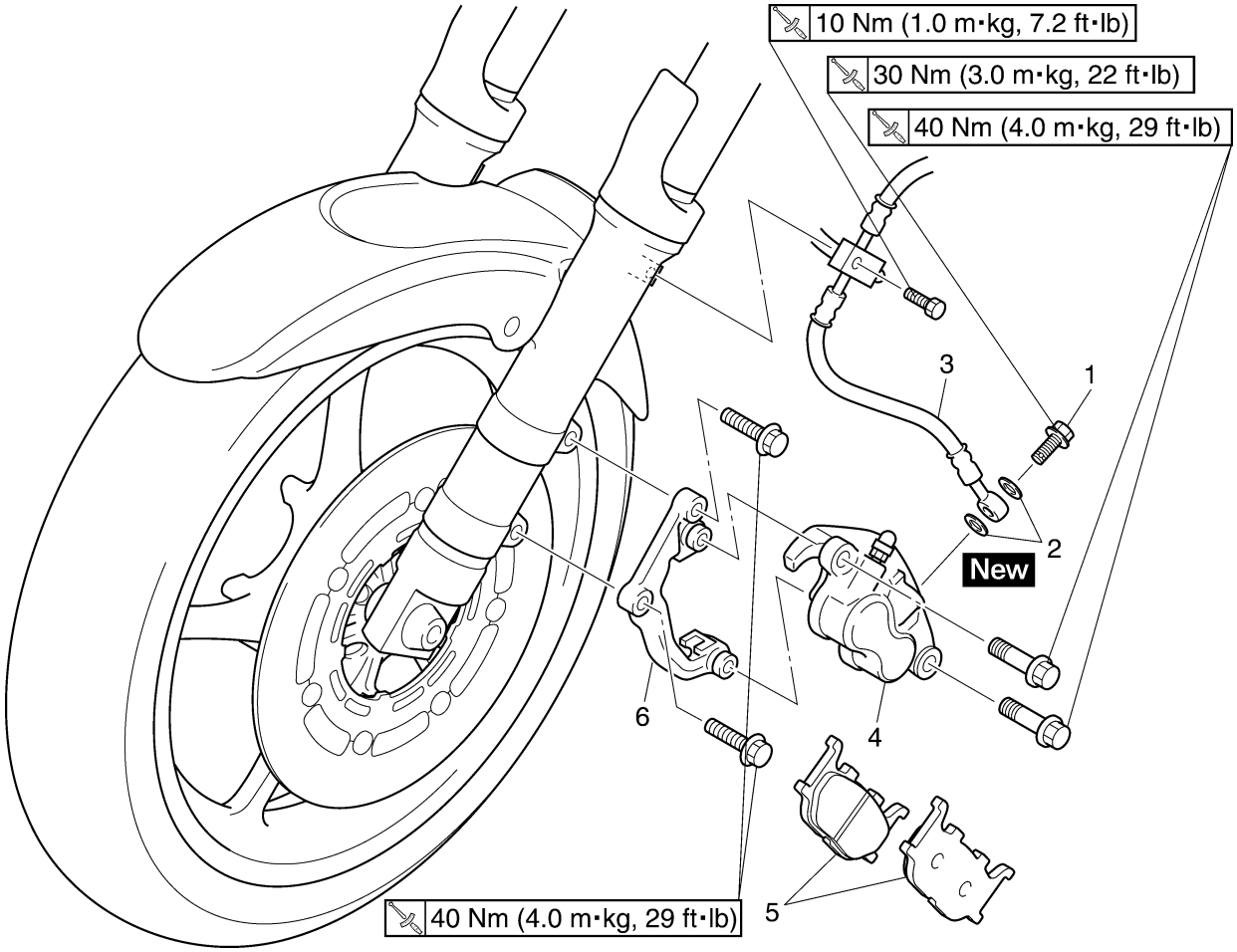
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
1	Brake master cylinder reservoir cap	1	
2	Brake master cylinder reservoir diaphragm holder	1	
3	Brake master cylinder reservoir diaphragm	1	
4	Brake lever	1	
5	Front brake light switch lead coupler	1	Disconnect.
6	Front brake light switch	1	
7	Union bolt	1	
8	Copper washer	2	
9	Front brake master cylinder holder	1	
10	Front brake master cylinder	1	
			For installation, reverse the removal procedure.

Disassembling the front brake master cylinder



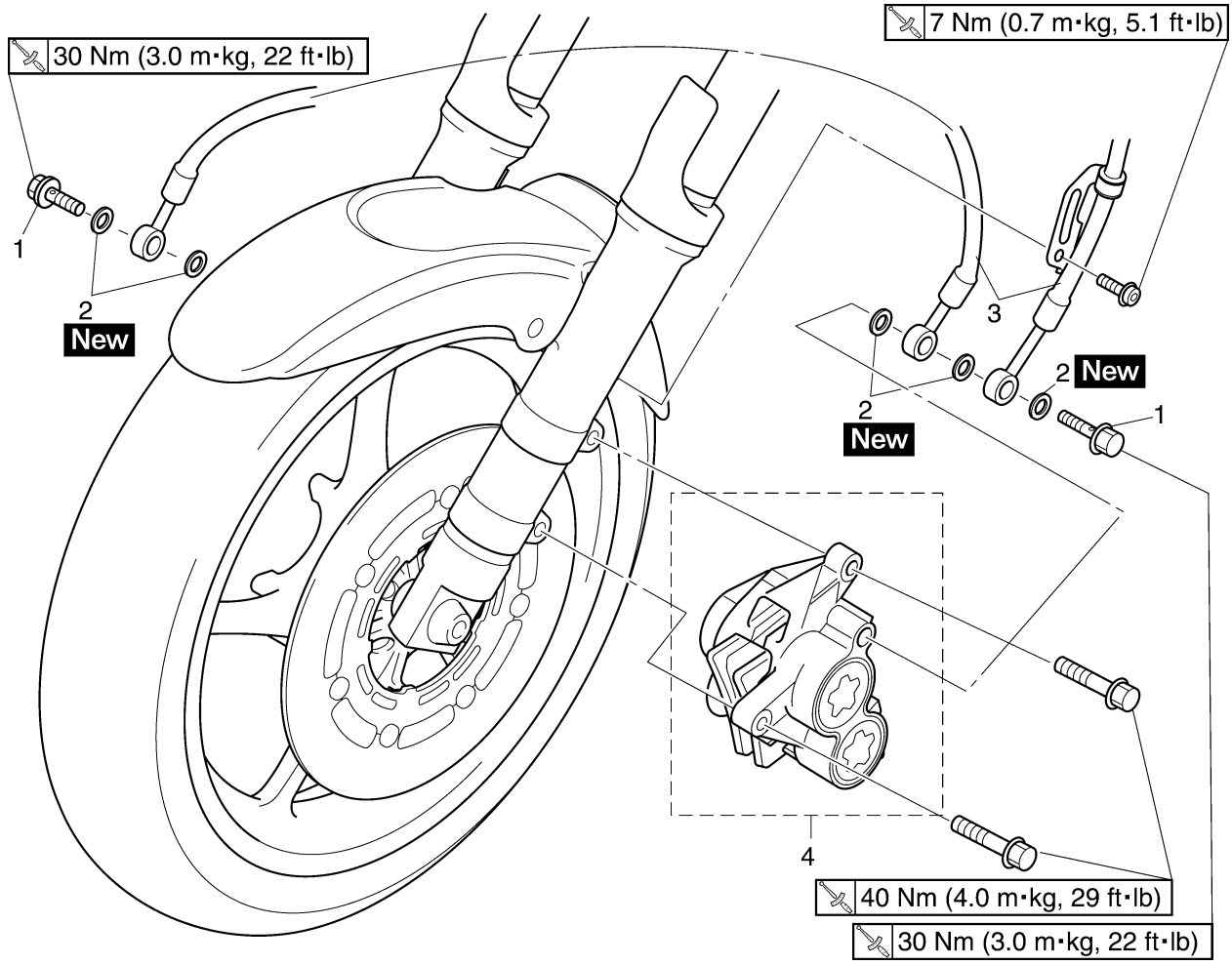
Order	Job/Parts to remove	Q'ty	Remarks
1	Dust boot	1	
2	Circlip	1	
3	Master cylinder kit	1	
4	Spring	1	
5	Master cylinder	1	
6	Push rod	1	
			For assembly, reverse the disassembly procedure.

Removing the front brake calipers (FZ6-N/FZ6-NA/FZ6-S/FZ6-SA)



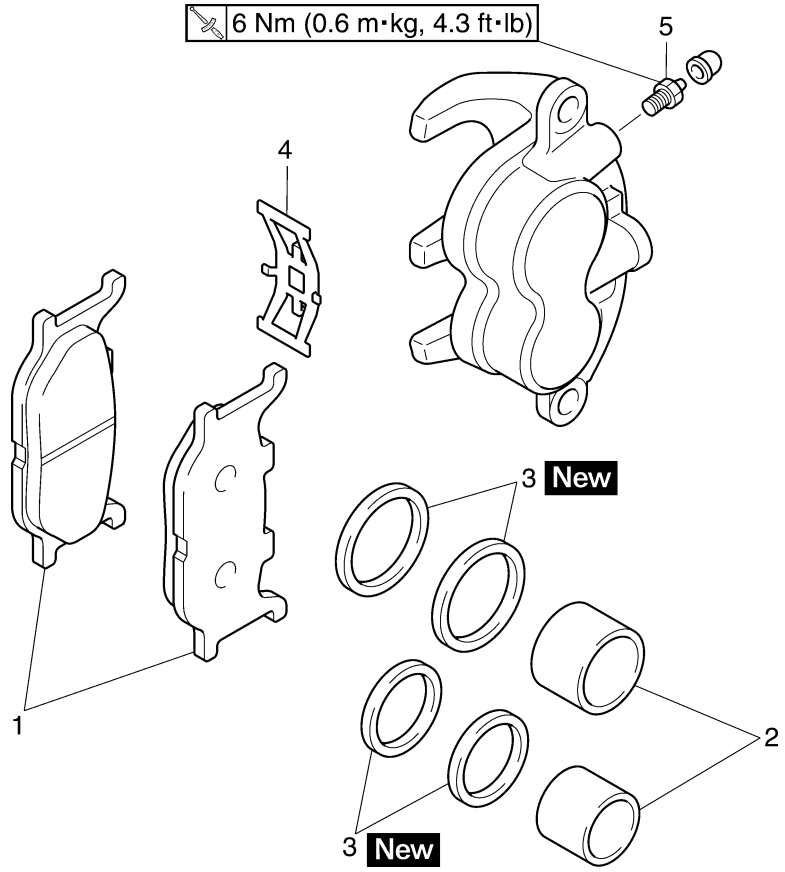
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
1	Union bolt	1	
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper	1	
5	Brake pad	2	
6	Brake caliper bracket	1	
			For installation, reverse the removal procedure.

Removing the front brake calipers (FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)



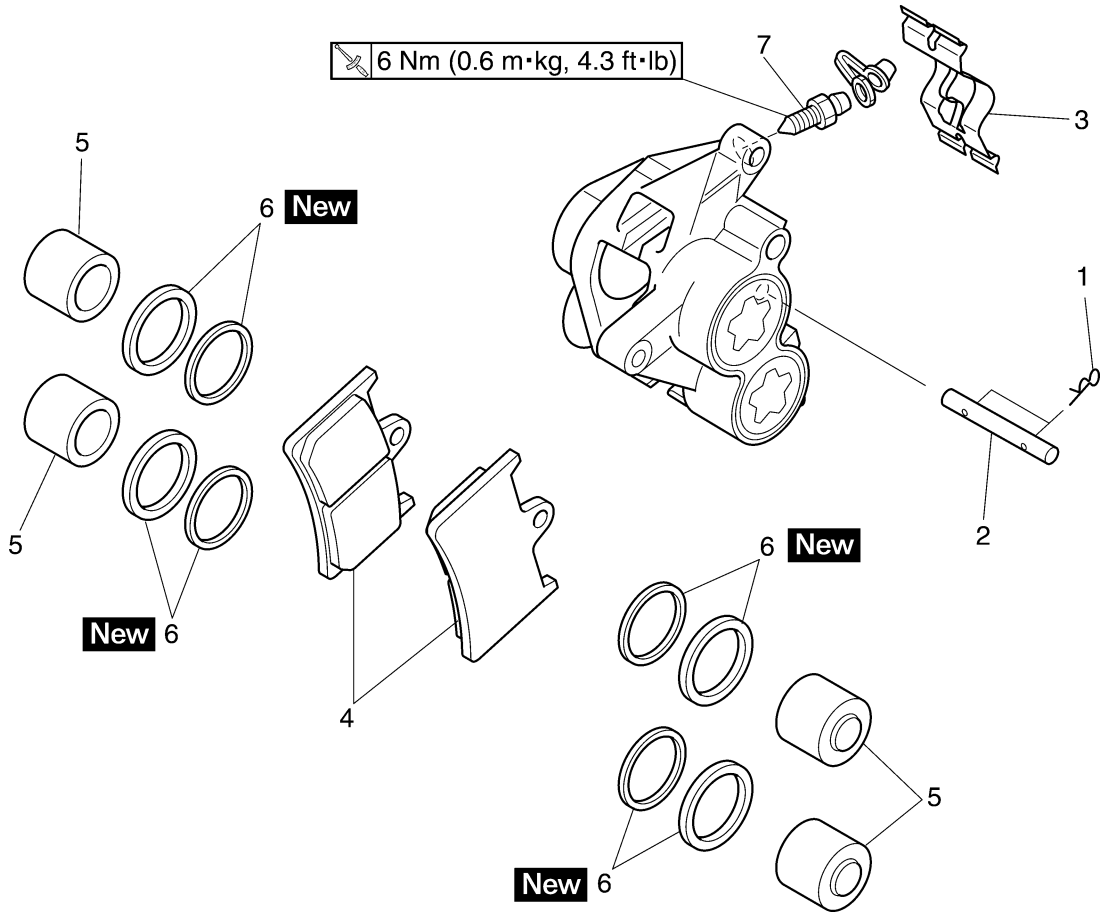
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
1	Union bolt	2	
2	Copper washer	5	
3	Brake hose	2	
4	Brake caliper	1	
			For installation, reverse the removal procedure.

Disassembling the front brake calipers (FZ6-N/FZ6-NA/FZ6-S/FZ6-SA)



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad	2	
2	Brake caliper piston	2	
3	Brake caliper piston seal	4	
4	Brake pad spring	1	
5	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

Disassembling the front brake calipers (FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG)

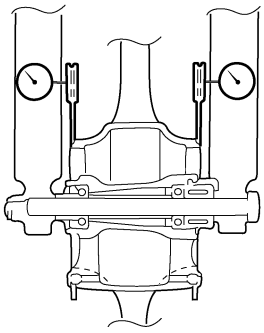


Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad spring	1	
4	Brake pad	2	
5	Brake caliper piston	4	
6	Brake caliper piston seal	8	
7	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS22220
INTRODUCTION
EWA14100
⚠ WARNING

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

EAS22240
CHECKING THE FRONT BRAKE DISCS
The following procedure applies to both brake discs.
1. Check:
   - Brake disc
     Damage/galling → Replace.
2. Measure:
   - Brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.



Brake disc deflection limit
0.10 mm (0.0039 in)

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a. Place the vehicle on a suitable stand so that the front wheel is elevated.
b. Before measuring the front brake disc deflection, 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 deflection 2–3 mm (0.0787–0.1181 in) below the edge of the brake disc.

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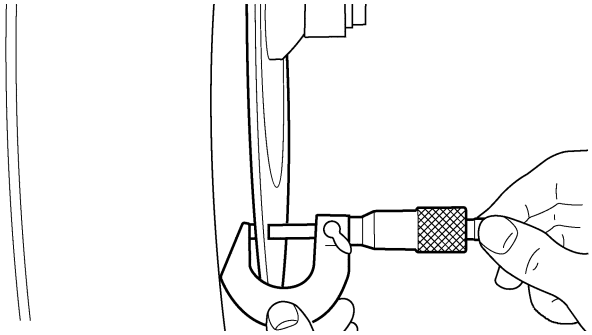
3. Measure:
   - Brake disc thickness
     Measure the brake disc thickness at a few different locations.
     Out of specification → Replace.



Brake disc thickness limit
4.5 mm (0.18 in)

4. Adjust:
   - Brake disc deflection

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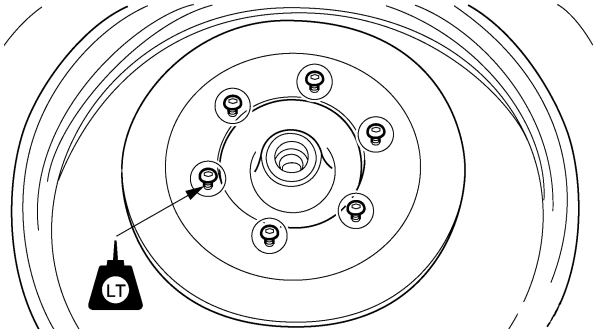
a. Remove the brake disc.
b. Rotate the brake disc by one bolt hole.
c. Install the brake disc.

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



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

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

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EAS22270
REPLACING THE FRONT BRAKE PADS

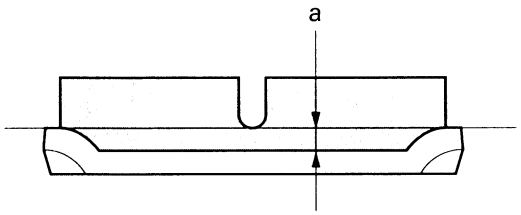
The following procedure applies to both brake calipers.

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

FZ6-N/FZ6-NA/FZ6-S/FZ6-SA

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

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



I2220404

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

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

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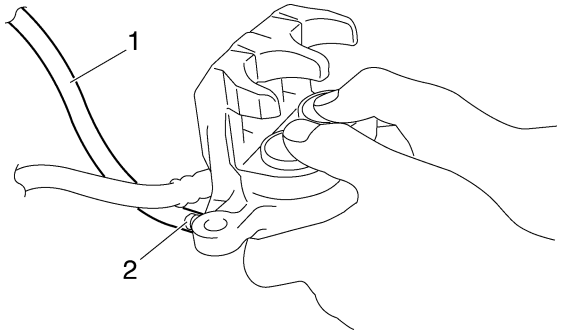
a. Connect a clear plastic hose "1" tightly to the bleed screw "2". Put the other end of the hose into an open container.
b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
c. Tighten the bleed screw.

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

d. Install a new brake pad shim onto each new brake pad.



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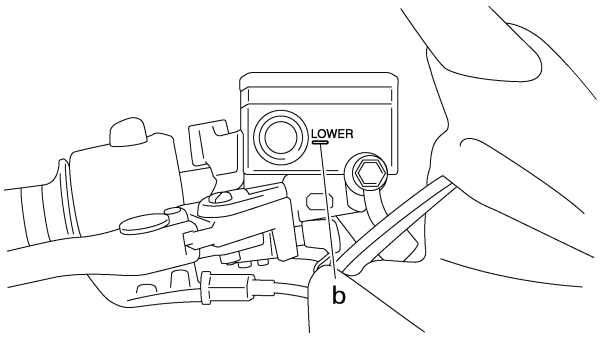
3. Install:
   • Brake caliper

Brake caliper bolt
40 Nm (4.0 m·kg, 29 ft·lb)

4. Check:
   • Brake fluid level
   Below the minimum level mark "b" → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.

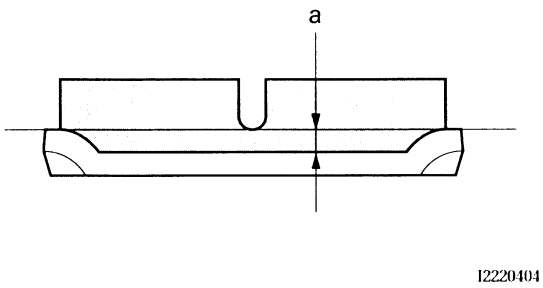


5. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.

FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG

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

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



2. Install:
   - Brake pads
   - Brake pad spring

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

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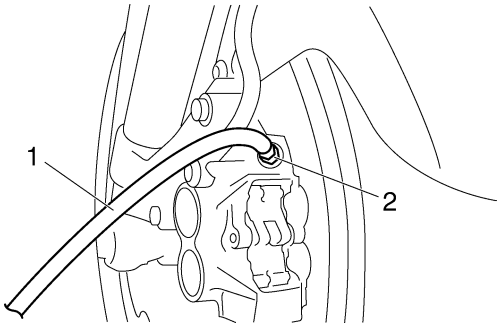
a. Connect a clear plastic hose “1” tightly to the bleed screw “2”. Put the other end of the hose into an open container.

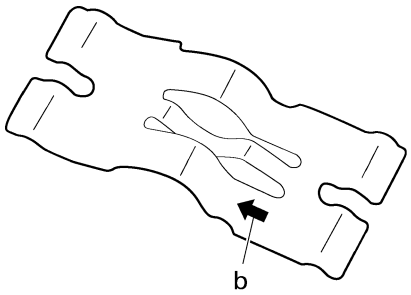


b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
c. Tighten the bleed screw.

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

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

NOTE:
The arrow mark “b” on the brake pad spring must point in the direction of disc rotation.



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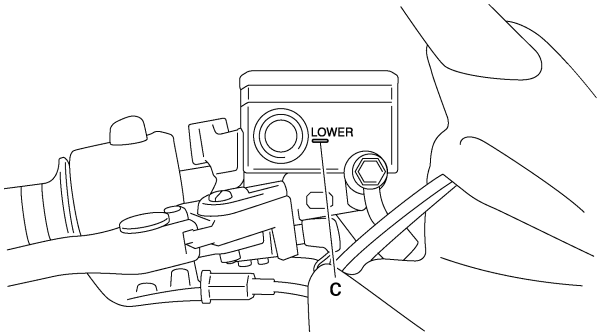
3. Install:
   - Brake pad pins
   - Brake pad clips
   - Brake caliper

	Brake caliper bolt **40 Nm (4.0 m·kg, 29 ft·lb)**

4. Check:
   - Brake fluid level
     Below the minimum level mark “c” → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.



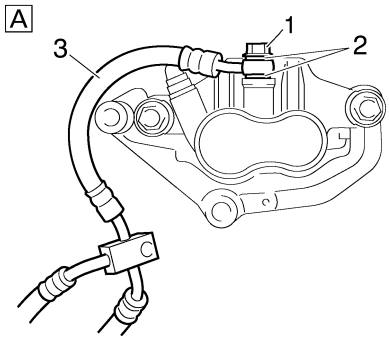
5. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.

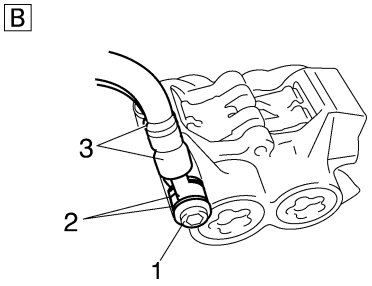
EAS22300
REMOVING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

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

1. Remove:
   - Union bolt "1"
   - Copper washers "2"
   - Brake hose "3"
   - Brake caliper





A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/ FZ6-SAHG

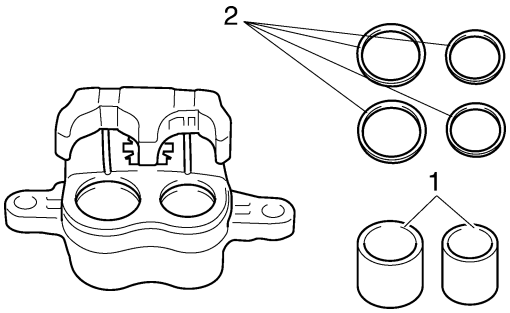
NOTE:
Put the end of the brake hose into a container and pump out the brake fluid carefully.

EAS22360
DISASSEMBLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

FZ6-N/FZ6-NA/FZ6-S/FZ6-SA

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



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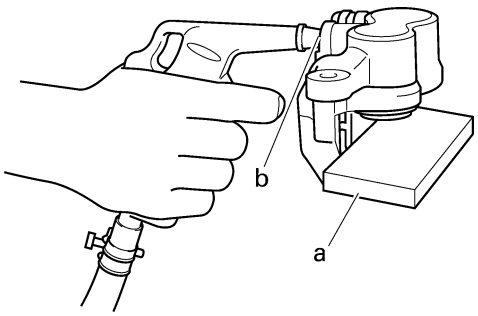
a. Secure the right side brake caliper pistons with a piece of wood "a".
b. Blow compressed air into the brake hose joint opening "b" to force out the left side pistons from the brake caliper.



EWA4S81006

⚠ WARNING

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

c. Remove the brake caliper piston seals.

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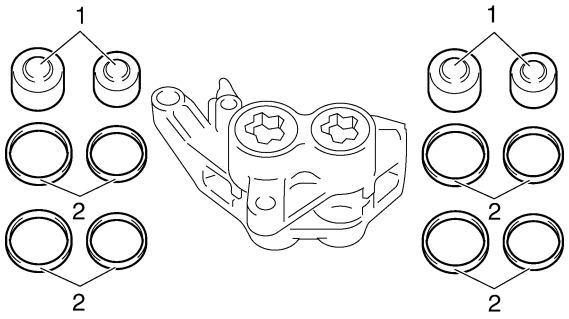
FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG

1. Remove:
   - Brake caliper pistons “1”
   - Brake caliper piston seals “2”



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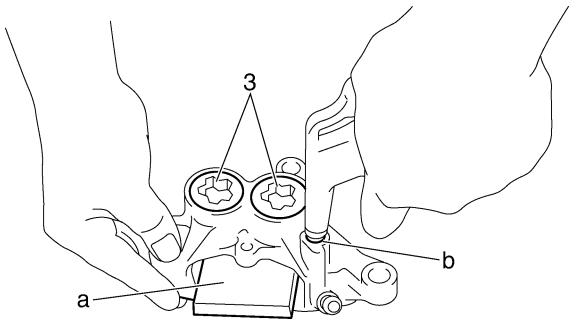
a. Secure the brake caliper pistons with a piece of wood “a”.
b. Blow compressed air into the brake hose joint opening “b” to force out the left side pistons from the brake caliper.

EWA13570

⚠ WARNING

- **Cover the brake caliper piston with a lag. Be careful not the get injured when the pistons are expelled from the brake caliper.**
- **Never try to pry out the brake caliper pistons.**
- **Do not loosen the bolts “3”.**



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

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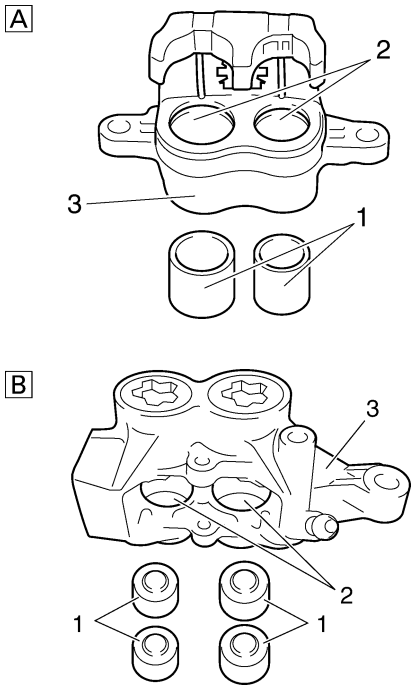
EAS22390

CHECKING THE FRONT BRAKE CALIPERS

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

1. Check:
   - Brake caliper pistons “1”
     Rust/scratches/wear → Replace the brake caliper pistons.
   - Brake caliper cylinders “2”
     Scratches/wear → Replace the brake caliper assembly.
   - Brake caliper body “3”
     Cracks/damage → Replace the brake caliper assembly.
   - Brake fluid delivery passages (brake caliper body)
     Obstruction → Blow out with compressed air.



A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG

EWA13600

⚠ WARNING

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

EAS22410
ASSEMBLING THE FRONT BRAKE CALIPERS

EWA13620
⚠ WARNING

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

Recommended fluid
DOT 4

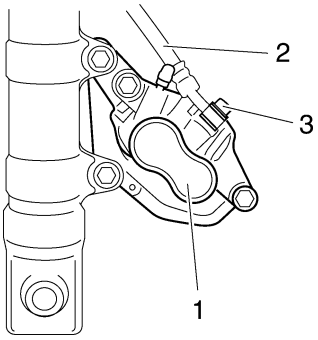
1. Install:
   - Brake caliper seals New
   - Brake caliper pistons

EAS22440
INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

FZ6-N/FZ6-NA/FZ6-S/FZ6-SA

1. Install:
   - Brake caliper "1"
   - Copper washers New
   - Brake hose "2"
   - Union bolt "3"



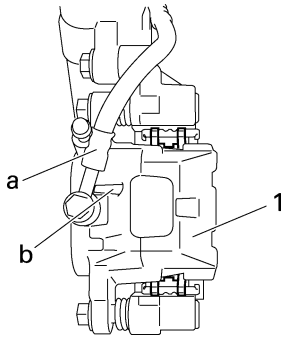
Brake caliper bolt
40 Nm (4.0 m·kg, 29 ft·lb)
Brake hose union bolt
30 Nm (3.0 m·kg, 22 ft·lb)

EWA13530
⚠ WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-47.

ECA14170
CAUTION:

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

Recommended fluid
DOT 4

EWA13090
⚠ WARNING

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

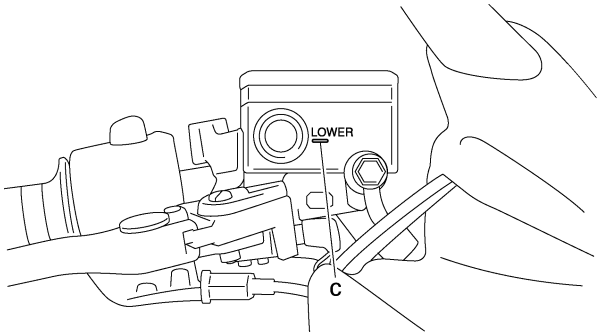
ECA13540
CAUTION:

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

3. Bleed:

- Brake system
  Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.

4. Check:
   - Brake fluid level
     Below the minimum level mark “c” → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.



5. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.

FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG

1. Install:
   - Brake caliper “1” (temporarily)
   - Copper washers New
   - Brake hose “2”
   - Union bolt “3”

Brake hose union bolt
30 Nm (3.0 m·kg, 22 ft·lb)

EWA13530

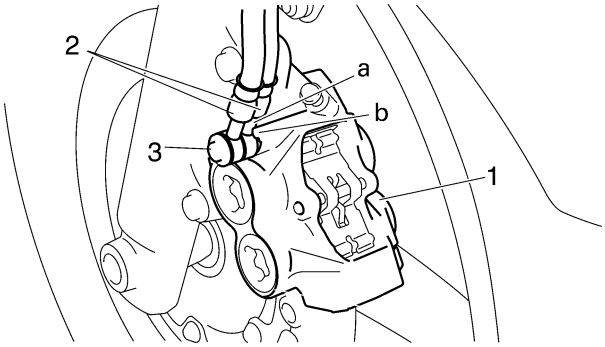
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-47.

ECA14170

CAUTION:

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

Recommended fluid
DOT 4

EWA13090

WARNING

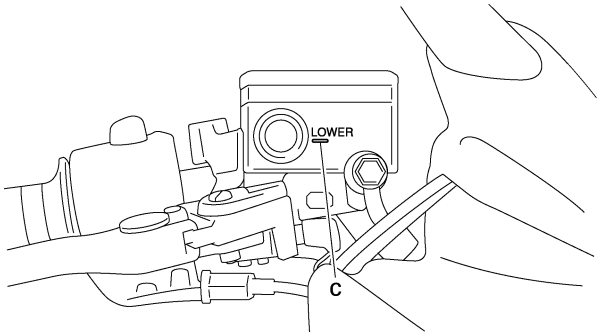
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor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

ECA13540

CAUTION:

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

3. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
4. Check:
   - Brake fluid level
     Below the minimum level mark “c” → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.



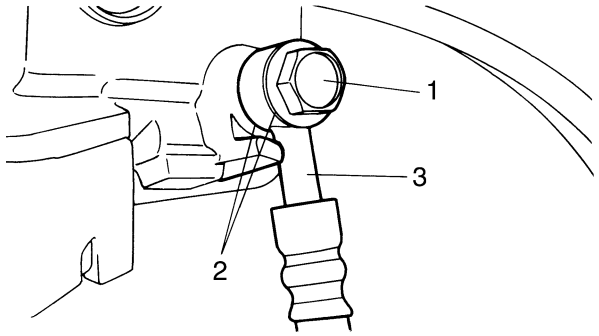
5. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.

EAS22490
REMOVING THE FRONT BRAKE MASTER CYLINDER

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

1. Disconnect:
   - Brake switch coupler (from the brake switch)
2. Remove:
   - Union bolt "1"
   - Copper washers "2"
   - Brake hoses "3"

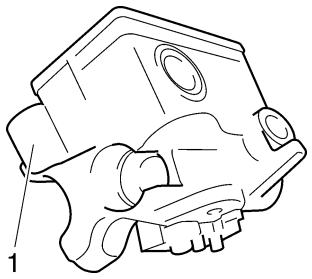
NOTE:
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.



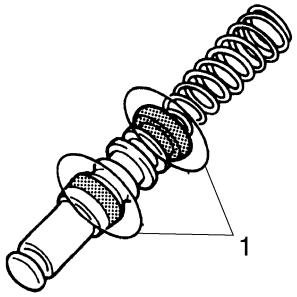
3. Remove:
   - Brake lever
   - Brake master cylinder holder
   - Brake master cylinder

EAS22500
CHECKING THE FRONT BRAKE MASTER CYLINDER

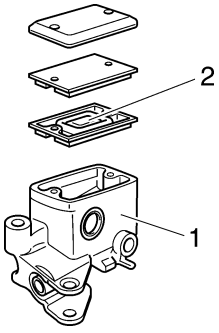
1. Check:
   - Brake master cylinder "1"
     Damage/scratches/wear → Replace.
   - Brake fluid delivery passages (brake master cylinder body)
     Obstruction → Blow out with compressed air.



2. Check:
   - Brake master cylinder kit "1"
     Damage/scratches/wear → Replace.



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



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

EAS22520
ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

EWA13520
⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**

Recommended fluid
DOT 4

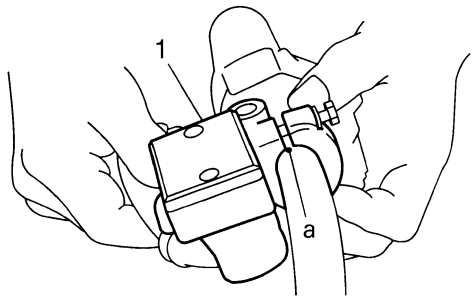
1. Install:
   - Master cylinder kit
   - Circlip New

EAS22530
INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:
   - Brake master cylinder "1"

Brake master cylinder holder bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)

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



2. Install:
   - Copper washers "1" New
   - Brake hose "2"
   - Union bolt "3"

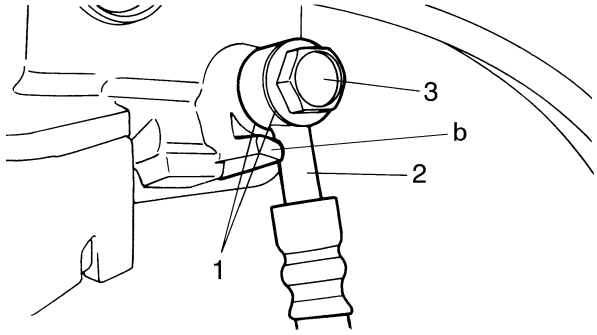
Brake hose union bolt
30 Nm (3.0 m·kg, 22 ft·lb)

EWA13530
⚠ WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-47.

ECA4S81013
CAUTION:

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



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

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

Recommended fluid
DOT 4

EWA13540
⚠ 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**

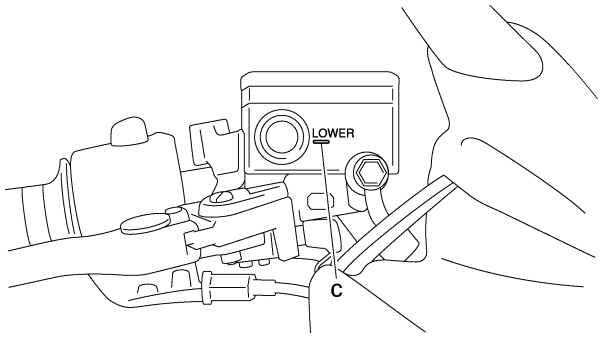
boiling point of the brake fluid and could cause vapor lock.

ECA13540

CAUTION:

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

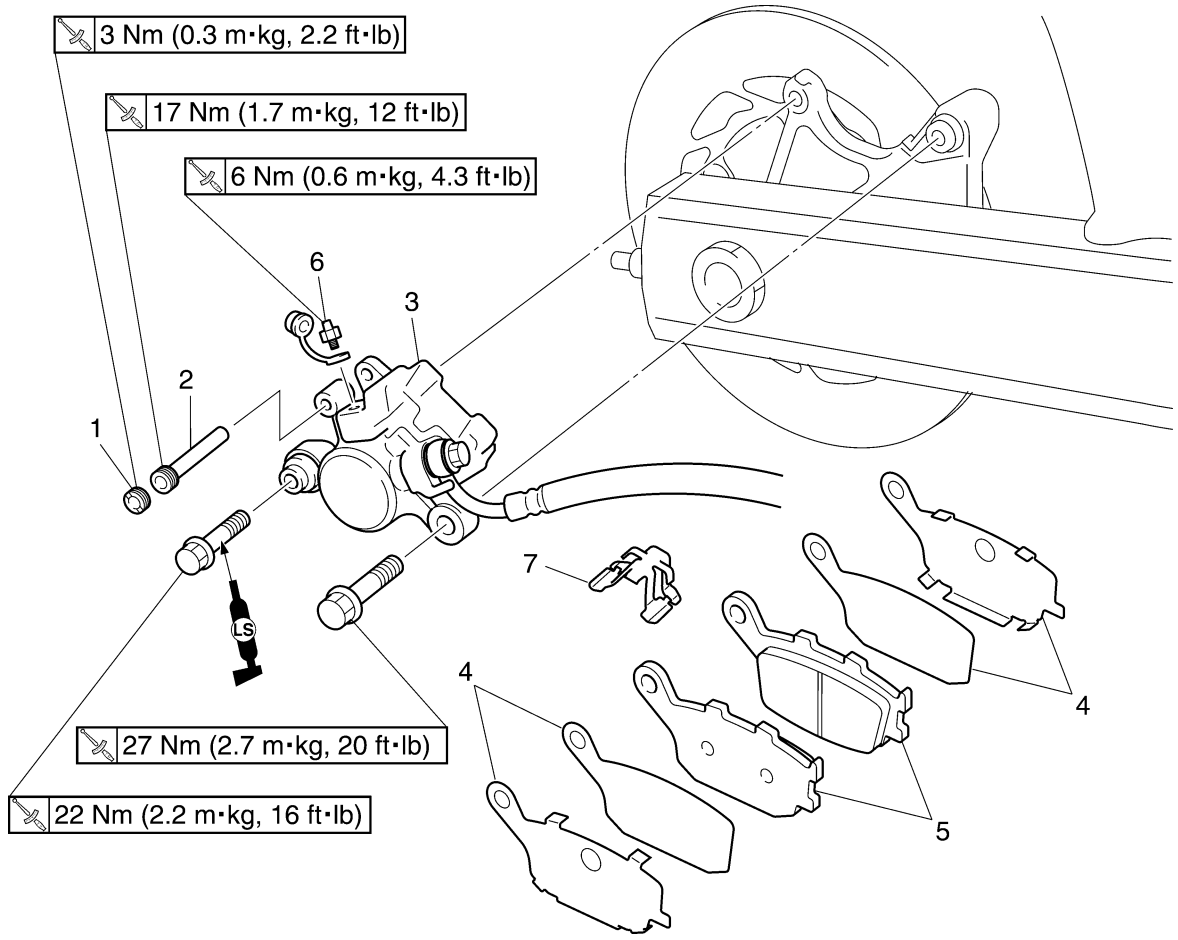
4. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
5. Check:
   - Brake fluid level
     Below the minimum level mark “c” → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.



6. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.

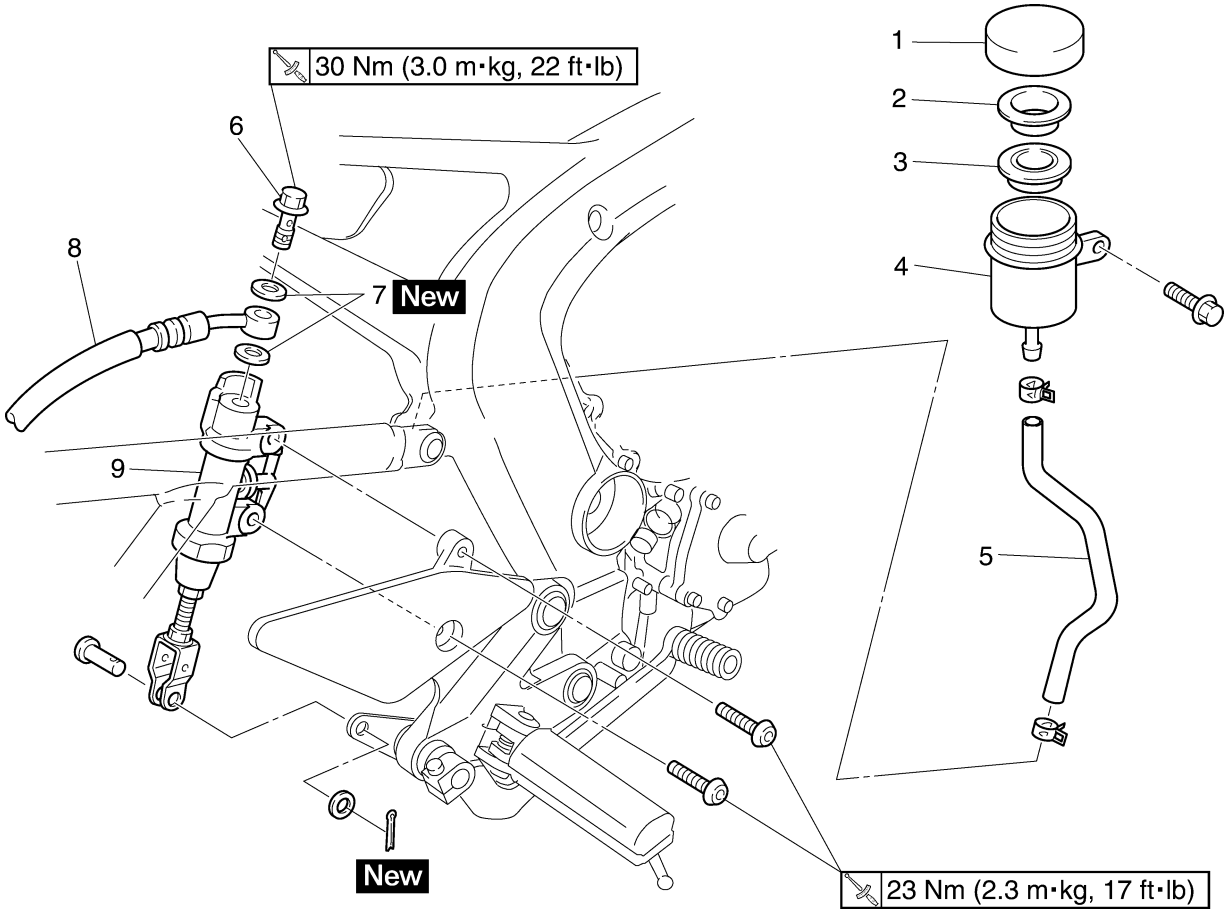
EAS22550
REAR BRAKE

Removing the rear brake pads



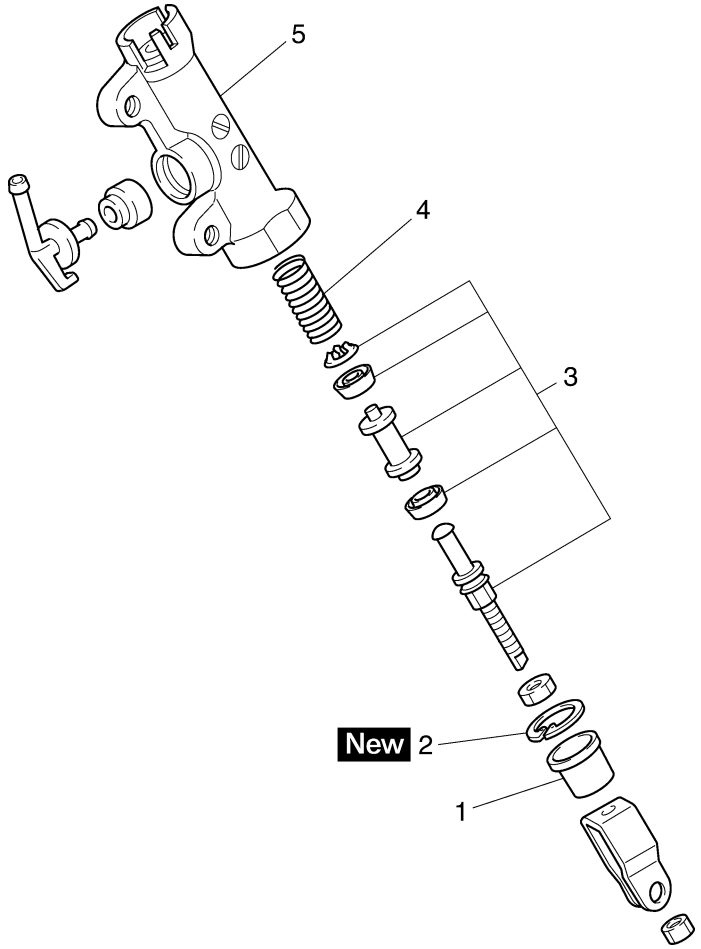
Order	Job/Parts to remove	Q'ty	Remarks
1	Screw plug	1	
2	Brake pad pin	1	
3	Rear brake caliper	1	
4	Brake pad shim	4	
5	Brake pad	2	
6	Brake screw	1	
7	Brake pad spring	1	
			For installation, reverse the removal procedure.

Removing the rear brake master cylinder



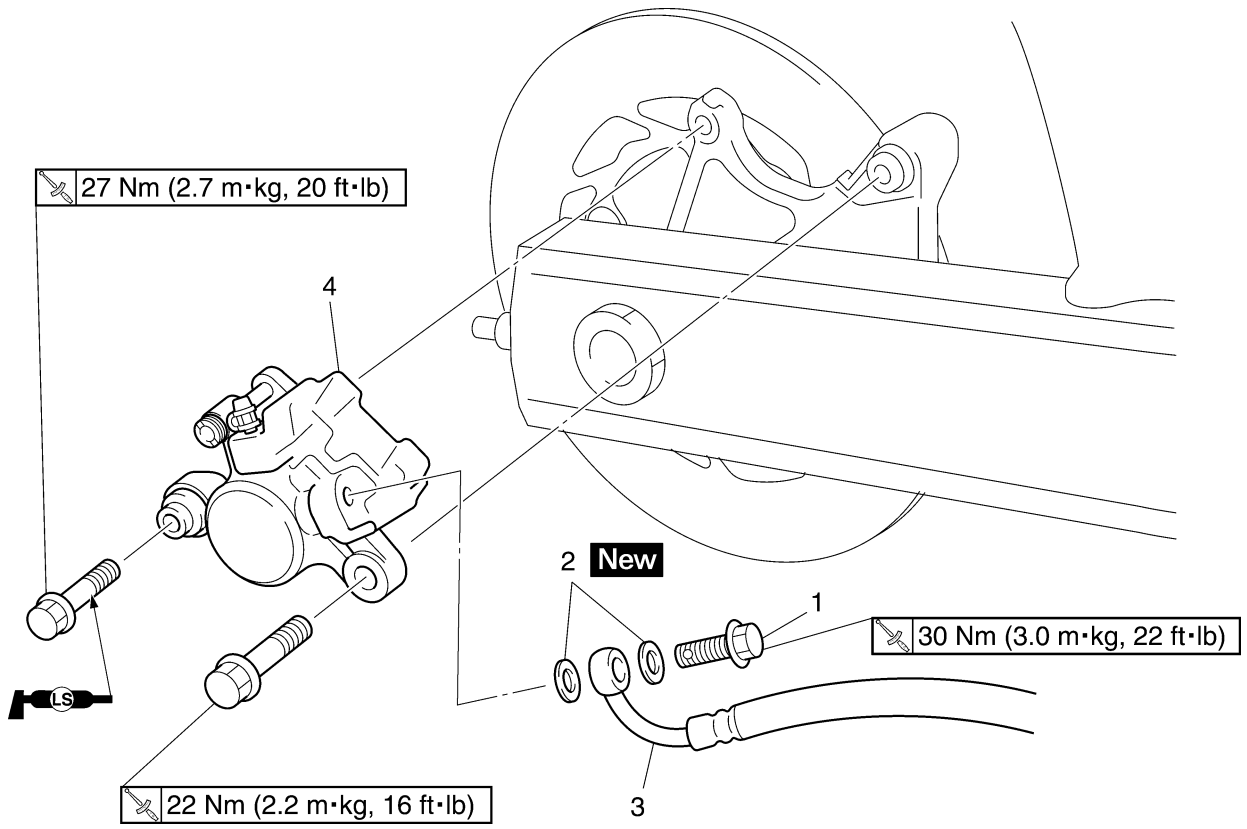
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
1	Brake fluid reservoir cap	1	
2	Rear brake fluid reservoir diaphragm holder	1	
3	Rear brake fluid reservoir diaphragm	1	
4	Brake fluid reservoir	1	
5	Brake fluid reservoir hose	1	
6	Union bolt	1	
7	Copper washer	1	
8	Brake hose	1	
9	Rear brake master cylinder	1	
			For installation, reverse the removal procedure.

Disassembling the rear brake master cylinder



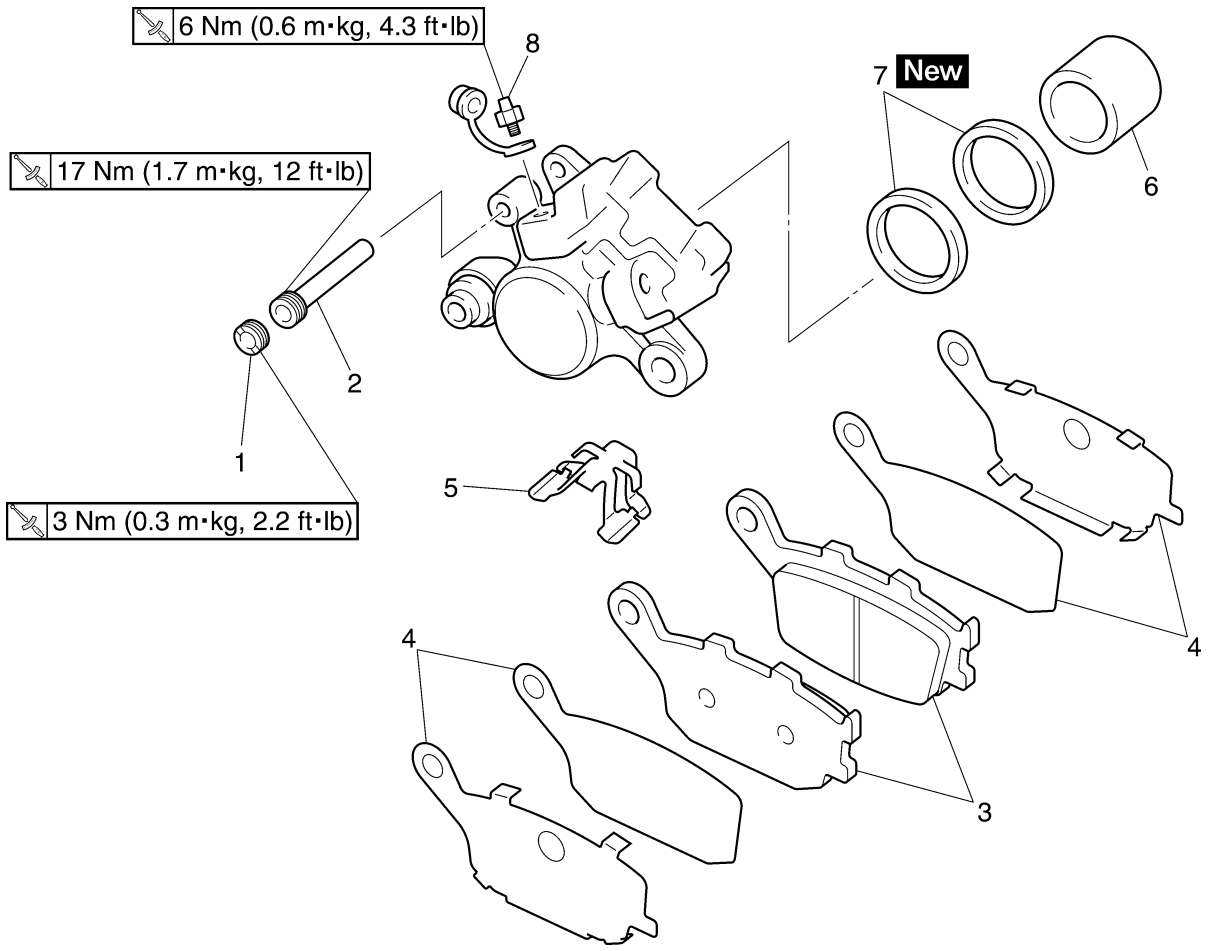
Order	Job/Parts to remove	Q'ty	Remarks
1	Dust boot	1	
2	Circlip	1	
3	Brake master cylinder kit	1	
4	Spring	1	
5	Brake master cylinder body	1	
			For installation, reverse the removal procedure.

Removing the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
1	Union bolt	1	
2	Copper washer	2	
3	Brake hose	1	
4	Rear brake caliper	1	
			For installation, reverse the removal procedure.

Disassembling the rear brake caliper



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

EAS22560
INTRODUCTION
EWA14100
⚠ WARNING

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

EAS22570
CHECKING THE REAR BRAKE DISC
1. Check:
   - Brake disc
     Damage/galling → Replace.
2. Measure:
   - Brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.
     Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-31.

Brake disc deflection limit
0.15 mm (0.0059 in)

3. Measure:
   - Brake disc thickness
     Measure the brake disc thickness at a few different locations.
     Out of specification → Replace.
     Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-31.

Brake disc thickness limit
4.5 mm (0.18 in)

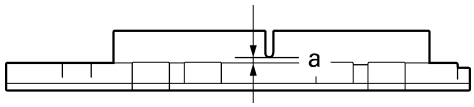
4. Adjust:
   - Brake disc deflection
     Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-31.

Brake disc bolt
30 Nm (3.0 m·kg, 22 ft·lb)
LOCTITE®

EAS22580
REPLACING THE REAR BRAKE PADS
NOTE:
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

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

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



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

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

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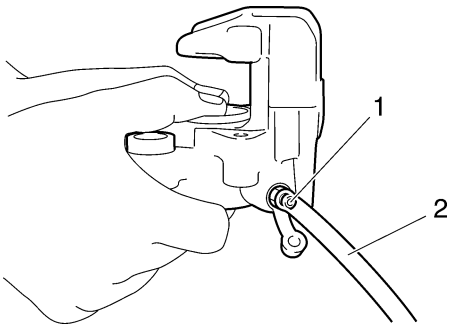
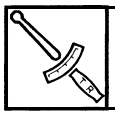
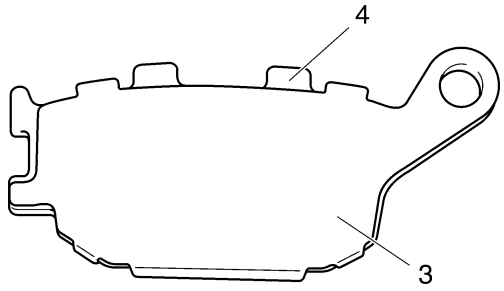
a. Connect a clear plastic hose “1” tightly to the bleed screw “2”. Put the other end of the hose into an open container.



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

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

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



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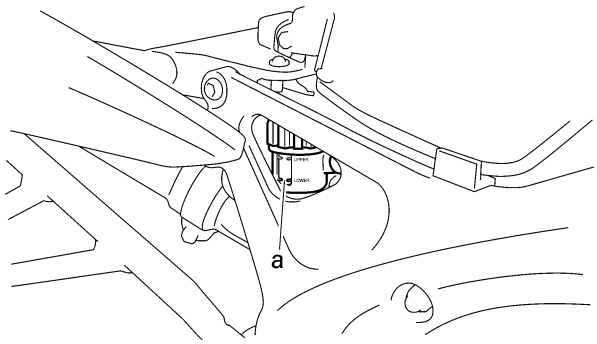
3. Install:
   - Brake caliper
   - Brake pad pin
   - Screw plug

	**Brake caliper bolt (front side)** **27 Nm (2.7 m·kg, 20 ft·lb)** **Brake caliper bolt (rear side)** **22 Nm (2.2 m·kg, 16 ft·lb)** **Brake pad pin** **17 Nm (1.7 m·kg, 12 ft·lb)** **Screw plug** **3 Nm (0.3 m·kg, 22 ft·lb)**

4. Check:
   - Brake fluid level
     Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.

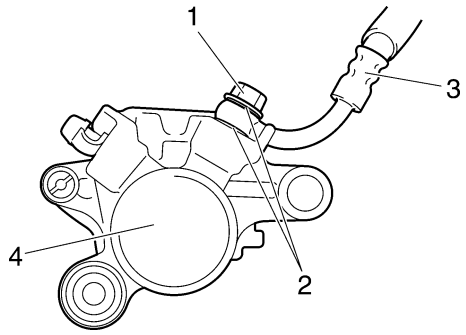


5. Check:
   - Brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.

EAS22590
REMOVING THE REAR BRAKE CALIPER

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

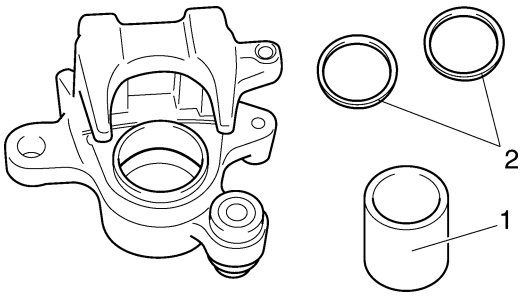
1. Remove:
   - Union bolt "1"
   - Copper washers "2"
   - Brake hose "3"
   - Brake caliper "4"



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

EAS22600
DISASSEMBLING THE REAR BRAKE CALIPER

1. Remove:
   - Brake caliper piston "1"
   - Brake caliper piston seals "2"



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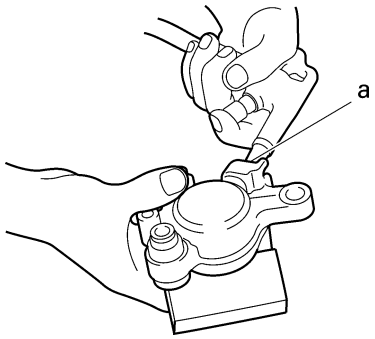
a. Blow compressed air into the brake hose joint opening "a" to force out the piston from the brake caliper.

EWA13550

⚠ WARNING

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



b. Remove the brake caliper piston seals.

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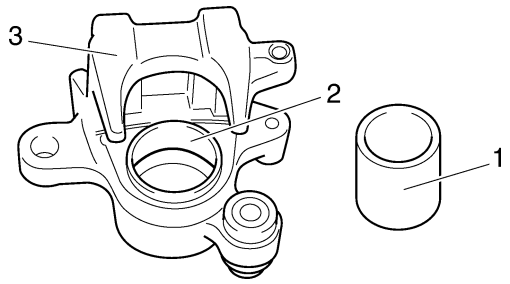
EAS22640

CHECKING THE REAR BRAKE CALIPER

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

1. Check:
   - Brake caliper pistons "1"
     Rust/scratches/wear → Replace the brake caliper pistons.
   - Brake caliper cylinders "2"
     Scratches/wear → Replace the brake caliper assembly.
   - Brake caliper body "3"
     Cracks/damage → Replace the brake caliper assembly.
   - Brake fluid delivery passages (brake caliper body)
     Obstruction → Blow out with compressed air.

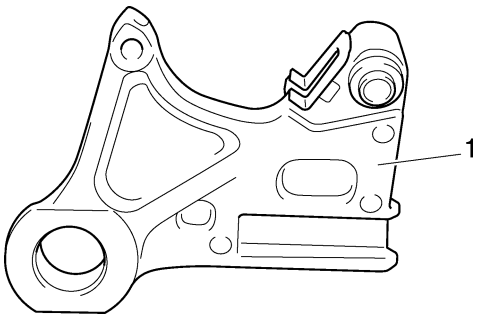


EWA13610

⚠ WARNING

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

2. Check:
   - Rear brake caliper bracket "1"
     Cracks/damage → Replace.



EAS22650

ASSEMBLING THE REAR BRAKE CALIPER

EWA13620

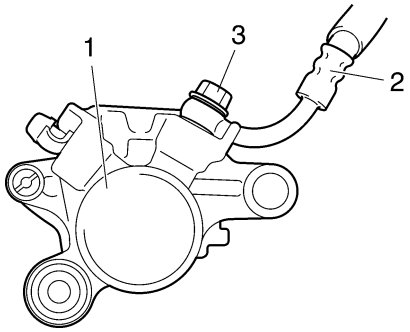
⚠ WARNING

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

	Recommended fluid **DOT 4**

1. Install:
   - Brake caliper seals New
   - Brake caliper piston

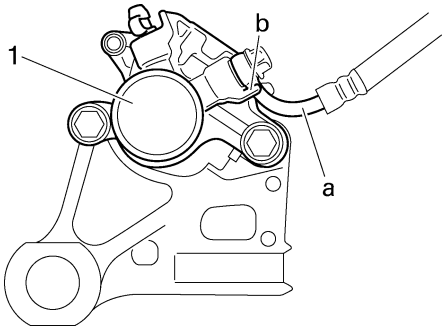
EAS22670
INSTALLING THE REAR BRAKE CALIPER
1. Install:
   - Brake caliper “1” (temporarily)
   - Copper washers New
   - Brake hose “2”
   - Union bolt “3”



Brake hose union bolt
30 Nm (3.0 m·kg, 22 ft·lb)

EWA13530
WARNING
Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-47.

ECA14170
CAUTION:
When installing the brake hose onto the brake caliper “1”, make sure the brake pipe “a” touches the projection “b” on the brake caliper.



2. Remove:
   - Brake caliper
3. Install:
   - Brake pad spring
   - Brake pad shims (on to the brake pads)
   - Brake pads
   - Brake caliper

Brake caliper bolt (front side)
27 Nm (2.7 m·kg, 20 ft·lb)
Brake caliper bolt (rear side)
22 Nm (2.2 m·kg, 16 ft·lb)
Brake pas pin
17 Nm (1.7 m·kg, 12 ft·lb)
Screw plug
3 Nm (0.3 m·kg, 2.2 ft·lb)

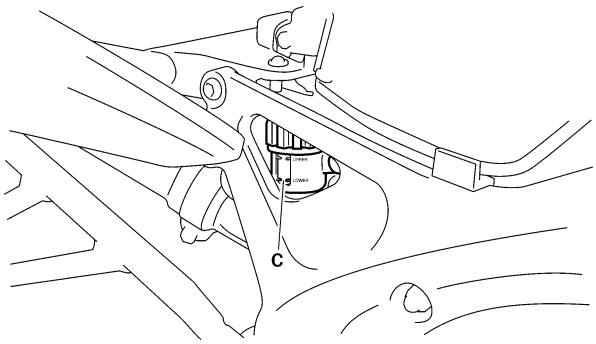
4. Fill:
   - Brake fluid reservoir (with the specified amount of the recommended brake fluid)

Recommended fluid
DOT 4

EWA13090
WARNING
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

ECA13540
CAUTION:
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

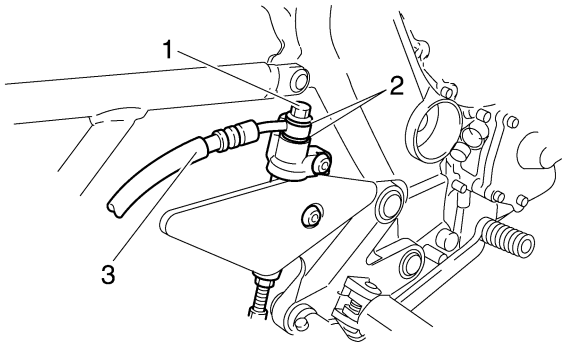
5. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
6. Check:
   - Brake fluid level
     Below the minimum level mark “c” → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.



7. Check:
   - Brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.

EAS22700
REMOVING THE REAR BRAKE MASTER CYLINDER

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

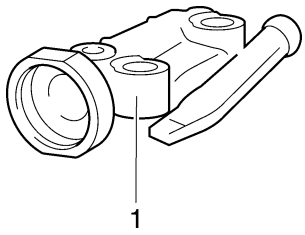


NOTE:
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

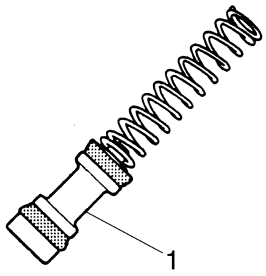
2. Disconnect:
   - Brake fluid reservoir hose
3. Remove:
   - Pin (from the brake pedal link)
4. Remove:
   - Rear brake master cylinder
5. Remove:
   - Circlip (from the rear brake master cylinder)
   - Master cylinder kit

EAS22720
CHECKING THE REAR BRAKE MASTER CYLINDER

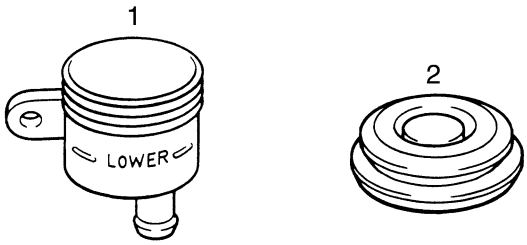
1. Check:
   - Brake master cylinder "1"
     Damage/scratches/wear → Replace.
   - Brake fluid delivery passages (brake master cylinder body)
     Obstruction → Blow out with compressed air.



2. Check:
   - Brake master cylinder kit "1"
     Damage/scratches/wear → Replace.



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



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

EAS22730
ASSEMBLING THE REAR BRAKE MASTER CYLINDER

EWA13520
⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**

Recommended fluid
DOT 4

1. Install:
   - Master cylinder kit
   - Circlip New

EAS22740
INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:
   - Copper washers New
   - Brake hoses
   - Union bolt

Brake hose union bolt
30 Nm (3.0 m·kg, 22 ft·lb)

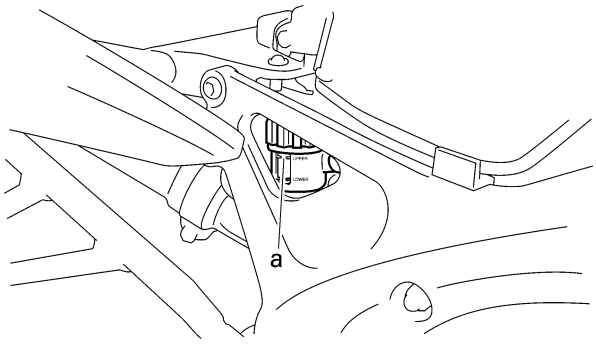
EWA13530
⚠ WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-47.

ECA14160
CAUTION:

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
     (to the maximum level mark "a")



Recommended fluid
DOT 4

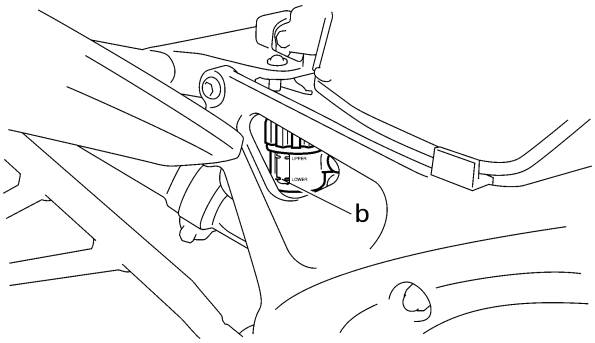
EWA13090
⚠ WARNING

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

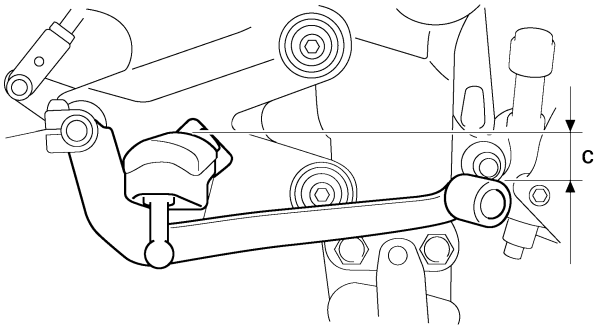
ECA13540
CAUTION:

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

3. Bleed:
   - Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
4. Check:
   - Brake fluid level
     Below the minimum level mark "b" → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-24.



5. Adjust:
   - Brake pedal position "c"
     Refer to "ADJUSTING THE REAR DISC BRAKE" on page 3-23.

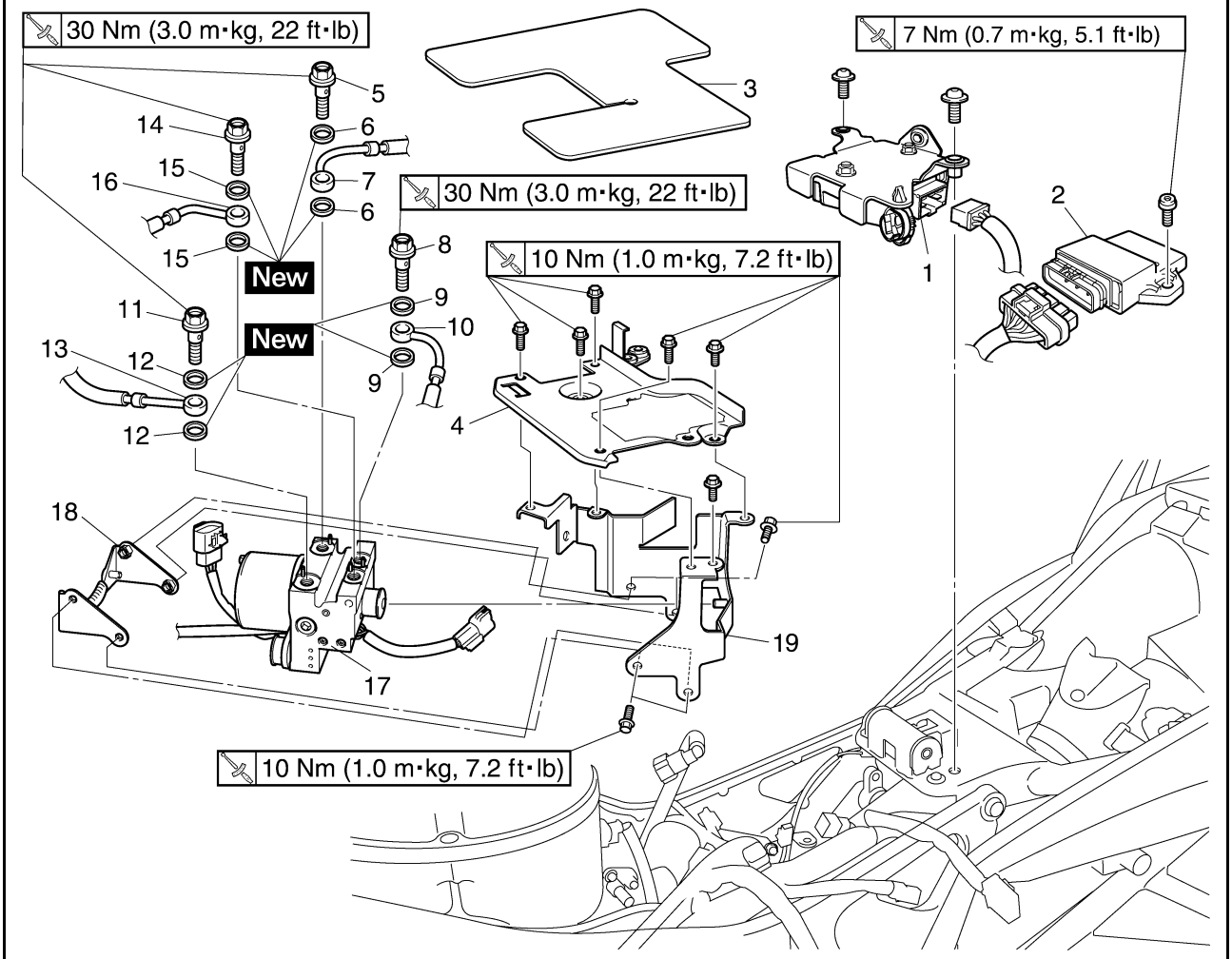


Brake pedal position
25.8 mm (1.02 in)

6. Adjust:
   - Rear brake light operation timing
     Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-25.

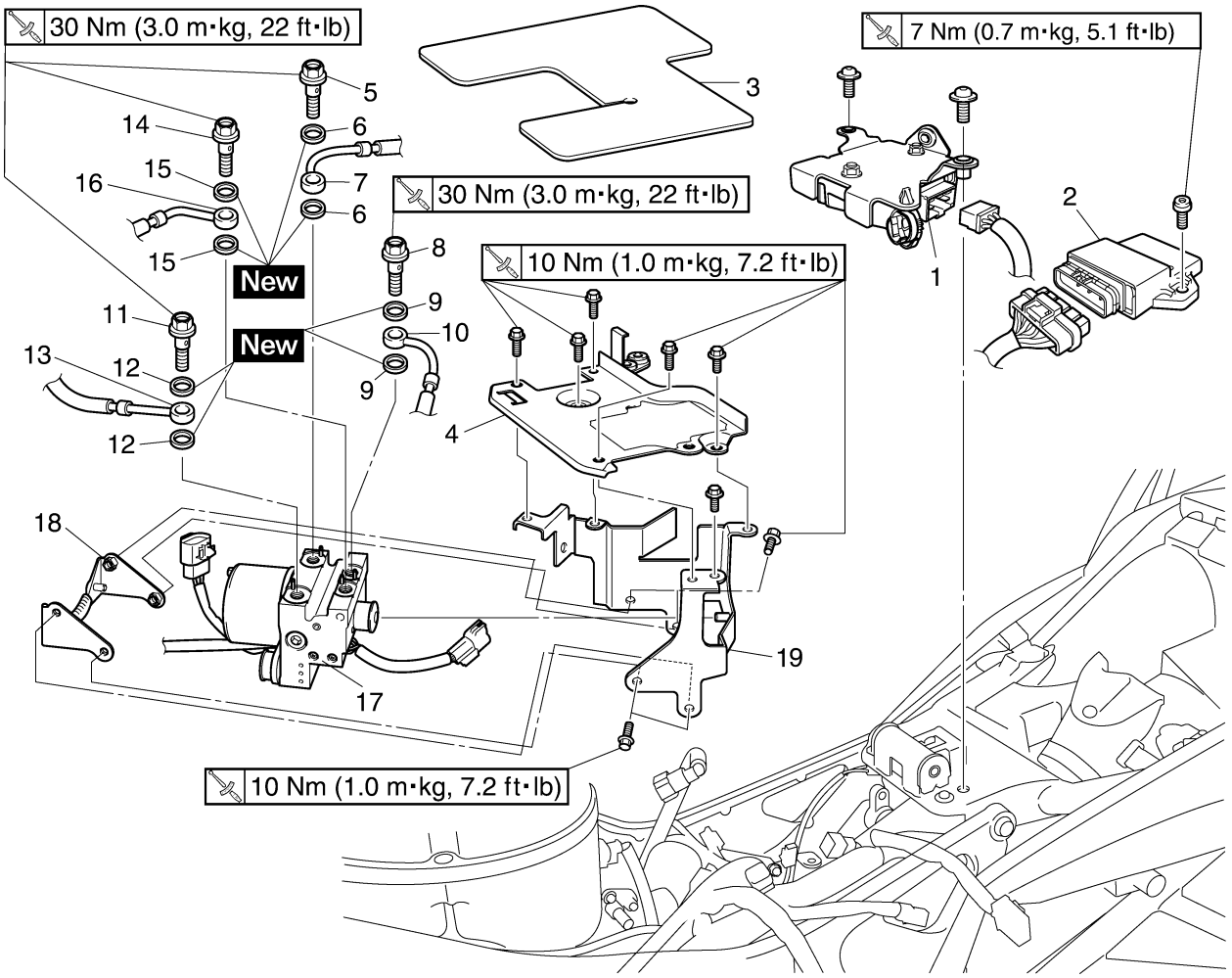
EAS22760
ABS (ANTI-LOCK BRAKE SYSTEM)

Removing the hydraulic unit



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	ABS ECU		Refer to "ABS ECU AND ABS MOTOR RELAY" on page 8-72.
	Hydraulic unit solenoid coupler		Refer to "ABS ECU AND ABS MOTOR RELAY" on page 8-72.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-26.
1	Rectifier/regulator	1	
2	ECU	1	
3	Cover	1	
4	Sub-complete bracket 1	1	
5	Union bolt	1	
6	Copper washer	2	
7	Brake hose (front brake master cylinder to hydraulic unit)	1	
8	Union bolt	1	
9	Copper washer	2	

Removing the hydraulic unit

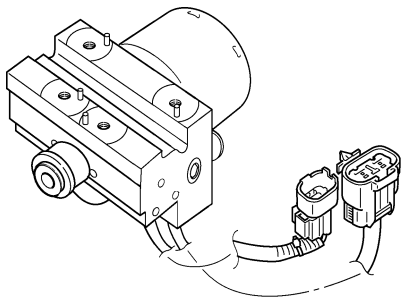


Order	Job/Parts to remove	Q'ty	Remarks
10	Brake hose (hydraulic unit to front brake calipers)	1	
11	Union bolt	1	
12	Copper washer	2	
13	Brake hose (rear brake master cylinder to hydraulic unit)	1	
14	Union bolt	1	
15	Copper washer	2	
16	Brake hose (hydraulic unit to rear brake caliper)	1	
17	Hydraulic unit	1	
18	Hydraulic unit bracket 1	1	
19	Hydraulic unit bracket 2	1	
			For installation, reverse the removal procedure.

EAS22770
[D-5] MAINTENANCE OF THE HYDRAULIC UNIT

ECA15060
CAUTION:

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



EWA13930
⚠ WARNING

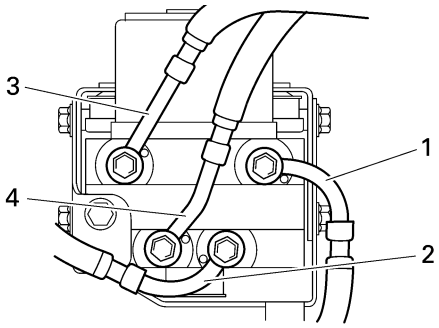
Refill with the same type of brake fluid that is already in the system. Mixing fluids may result in a harmful chemical reaction, leading to poor braking performance.

ECA14520
CAUTION:

- **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 ABS wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.**
- **Do not turn the main switch to "ON" when removing the hydraulic unit.**
- **Do not clean with compressed air.**
- **Do not use 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 union bolts for the hydraulic unit have been removed, be sure to tighten them to the specified torque and bleed the brake system.**

Removing the hydraulic unit

1. Remove:
   - Brake hose "1" (from the front brake master cylinder)
   - Brake hose "2" (to the front brake caliper)
   - Brake hose "3" (from the rear brake master cylinder)
   - Brake hose "4" (to the rear brake caliper)



NOTE:
Do not operate the brake lever and brake pedal while removing the brake hoses.

ECA14530
CAUTION:

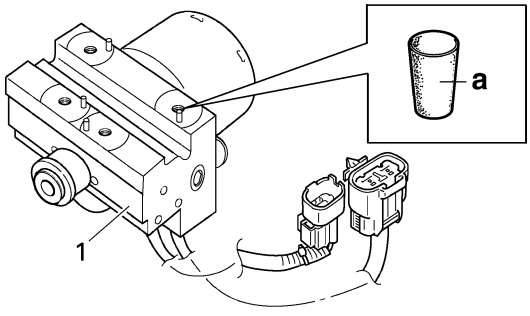
When removing the brake hoses, cover the area around the hydraulic unit to catch any spilt brake fluid. Do not allow the brake fluid to contact other parts.

2. Remove:
   - Hydraulic unit bracket

NOTE:
Loosen the bolt in the proper sequence.

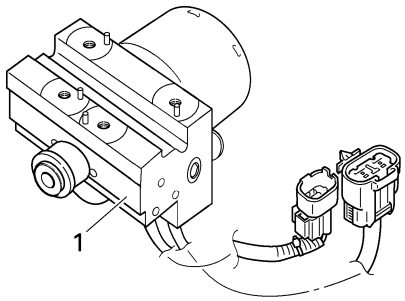
3. Remove:
   - Hydraulic unit "1"

NOTE:
To avoid brake fluid leakage and to prevent foreign materials from entering the hydraulic unit, insert a rubber plug "a" or a bolt (M10 × 1.25) into each union bolt hole.



Checking the hydraulic unit

1. Check:
   - Hydraulic unit "1"
     Cracks/damage → Replace the hydraulic unit.



Installing the hydraulic unit
Proceed in the reverse order of disassembly.
Pay attention to the following items.
1. Install:
   • Hydraulic unit bracket

	Hydraulic unit bracket bolt 10 Nm (1.0 m·kg, 7.2 ft·lb)

NOTE:
Tighten the nuts in the proper sequence.

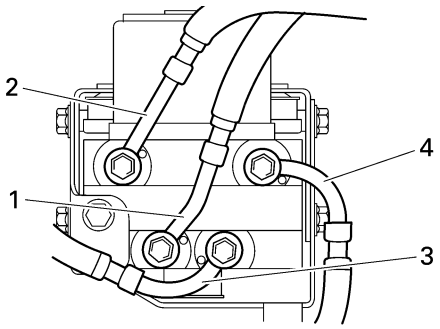
2. Install:
   • Hydraulic unit

NOTE:
Do not allow any foreign materials to enter the hydraulic unit or the brake hoses when installing the hydraulic unit.

ECA14740
CAUTION:
When installing the fuel hose, make sure that it is securely connected, and that the fuel hose holders are in the correct position, otherwise the fuel hose will not be properly installed.

3. Remove:
   • Rubber plugs or bolts (M10 × 1.25)
4. Install:
   • Copper washer New
   • Brake hose “1” (to the rear brake caliper)
   • Brake hose “2” (from the rear brake master cylinder)
   • Brake hose “3” (to the front brake caliper)
   • Brake hose “4” (from the front brake master cylinder)
   • Union bolt

	Brake hose union bolt 30 Nm (3.0 m·kg, 22 ft·lb)



EWA13940
WARNING
The brake hoses to the front and rear brake calipers can be distinguished by the rubber at the end of each hose. Be sure to connect each brake hose to the correct union bolt hole.

ECA14760
CAUTION:
To route the front and rear brake hoses, refer to "CABLE ROUTING" on page 2-47.

5. Fill:
   • Brake master cylinder reservoir

	Recommended brake fluid DOT 4

6. Bleed the brake system.
7. 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 4-56.)

ECA14770
CAUTION:
Always check the operation of the hydraulic unit according to the brake lever and the brake pedal response.

8. Delete the malfunction codes. (Refer to "[D-6-4] DELETING THE MALFUNCTION CODE" on page 8-96.)
9. Perform a trial run. (Refer to "[D-6-5] TRIAL RUN" on page 4-59.)

EAS22800
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 by the following two methods.

- Hydraulic unit operation test 1: this test generates the same reaction-force pulsating action that is generated in the brake lever and brake pedal when the ABS is activated.
- Hydraulic unit operation test 2: this test checks the function of the ABS after the system was disassembled, adjusted, or serviced.

Hydraulic unit operation test 1

EWA13120

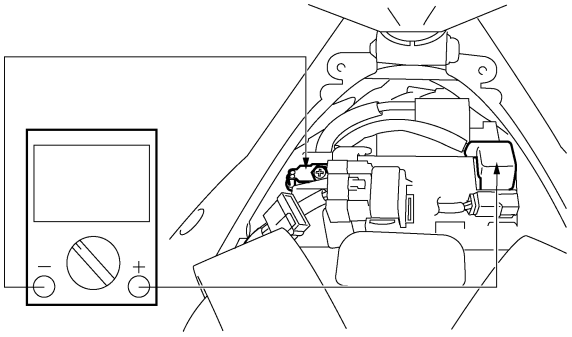
⚠ WARNING

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

1. Place the vehicle on the centerstand.
2. Set the main switch to "OFF".
3. Remove:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Front cowling inner panel (left side)
     Refer to "GENERAL CHASSIS" on page 4-1.
4. Check:
   - Battery voltage

Battery voltage
Higher than 12.8 V

Lower than 12.8 V → Charge or replace the battery.

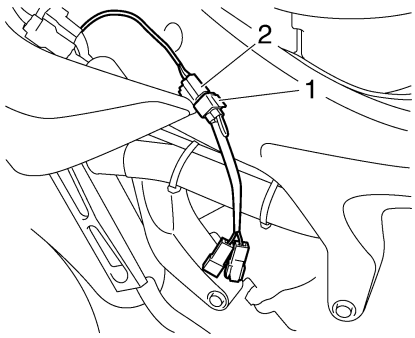


NOTE:

- If the battery voltage is lower than 12.8 V, charge the battery and perform hydraulic unit operation test 2.
- If the battery voltage is lower than 10 V, the ABS warning light comes on and the ABS does not operate.

5. Connect the test coupler adaptor "1" to the test coupler "2".

Test coupler adapter
90890-03149

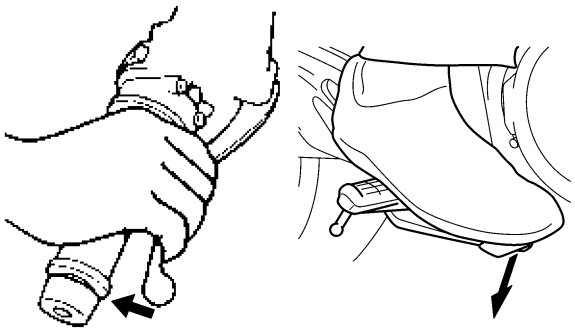


6. Set the main switch to "ON" while operating the brake lever and the brake pedal simultaneously.

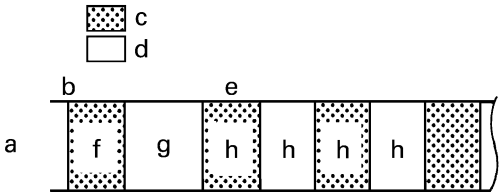
ECA4S81014

CAUTION:

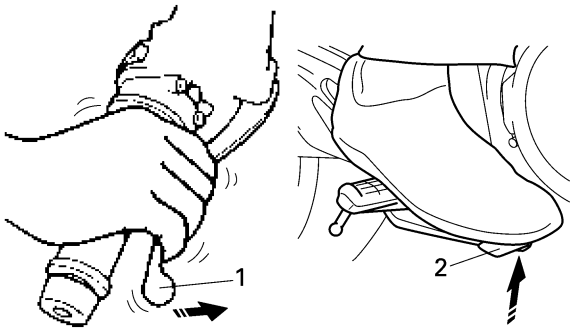
When the main switch is set to "ON", be sure to operate both the brake levers and the brake pedal simultaneously. If only the brake levers or brake pedal are operated, set the main switch to "OFF" and start the procedure again.



7. Check:
   - Hydraulic unit operation
     When the main switch is set to "ON", the ABS warning light comes on for 2 seconds, goes off for 3 seconds, then starts flashing. When the ABS warning light starts flashing, the brake lever "1" will return to its home position. The brake pedal "2" will then return to its home position, then the brake lever will return to its home position again.



a. ABS warning light
b. Main switch “ON”
c. Comes on
d. Goes off
e. Frashes
f. 2.0 seconds
g. 3.0 second
h. 0.5 second



ECA14810

CAUTION:

- **Check that the brake lever returns to its home position before the brake pedal returns to its home position.**
- **If the brake pedal returns to its home position before the brake lever does, check that the brake hoses are connected correctly to the hydraulic unit.**
- **If either the brake lever or brake pedal returns its home position slowly, check that the brake hoses are connected correctly to the hydraulic unit.**

  - If the operation of the hydraulic unit is normal, delete all of the malfunction codes.

Hydraulic unit operation test 2

EWA13120

⚠ WARNING

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

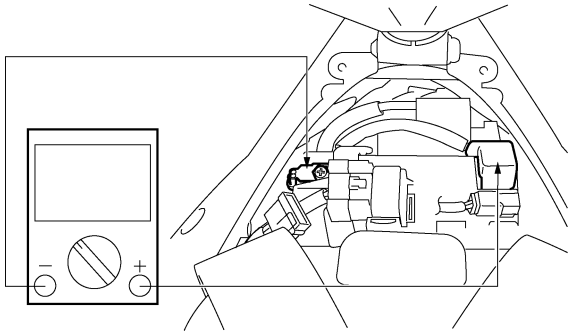
1. Place the vehicle on the centerstand.
2. Set the main switch to “OFF”.
3. Remove:
   - Seat

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

     Refer to "FUEL TANK" on page 7-1.
4. Check:
   - Battery voltage

Battery voltage
Higher than 12.8 V

Lower than 12.8 V → Charge or replace the battery.

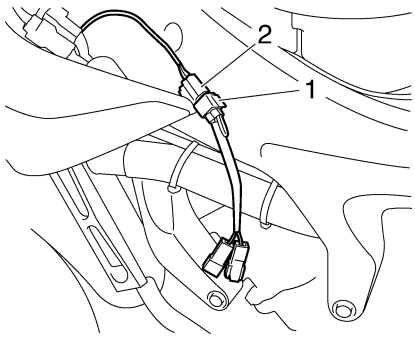


NOTE:

- If the battery voltage is lower than 12.8 V, charge the battery and perform hydraulic unit operation test 1.
- If the battery voltage is lower than 10 V, the ABS warning light comes on and the ABS does not operate.

5. Connect the test coupler adaptor “1” to the test coupler “2”.

Test coupler adapter
90890-03149



6. Set the engine stop switch to “⊠”.
7. Set the main switch to “ON”.

NOTE:
After setting the main switch to "ON", wait (approximately 2 seconds) until the ABS warning light goes off.

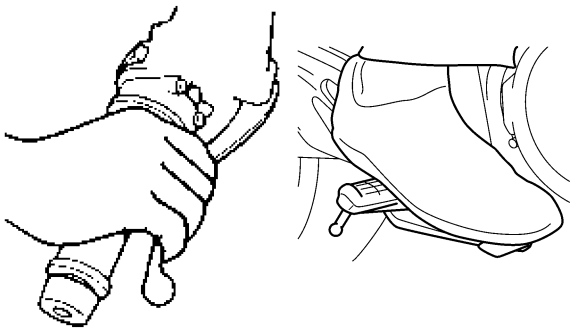
8. Push the start switch for at least 4 seconds.

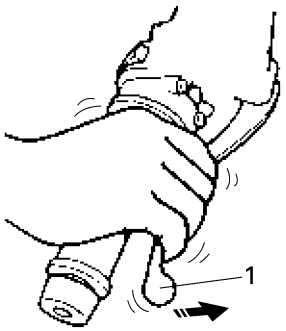
ECA14790

CAUTION:
Do not operate the brake lever or the brake pedal.

9. After releasing the start switch, operate the brake lever and the brake pedal simultaneously.

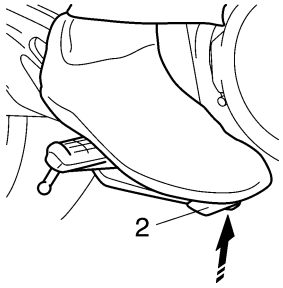
NOTE:
- A reaction-force pulsating action is generated in the brake lever "1" 0.5 second after the brake lever and the brake pedal are operated simultaneously and continues for approximately 1 second.
- Be sure to continue to operate the brake lever and brake pedal even after the pulsating action has stopped.





10. After the pulsating action has stopped in the brake lever, it is generated in the brake pedal "2" 0.5 second after and continues for approximately 1 second.

NOTE:
Be sure to continue to operate the brake lever and brake pedal even after the pulsating action has stopped.



11. After the pulsating action has stopped in the brake pedal, it is generated in the brake lever 0.5 second after and continues for approximately 1 second.

ECA14800

CAUTION:
- **Check that the pulsating action is felt in the brake lever, brake pedal, and again in the brake lever, respectively.**
- **If the pulsating action is felt in the brake pedal before it is felt in the brake lever, check that the brake hoses are connected correctly to the hydraulic unit.**
- **If the pulsating action is hardly felt in either the brake lever or brake pedal, check that the brake hoses are connected correctly to the hydraulic unit.**

12. Set the main switch to "OFF".
13. Remove the test coupler adaptor from the test coupler.
14. Set the main switch to "ON".
15. Set the engine stop switch to "∩".

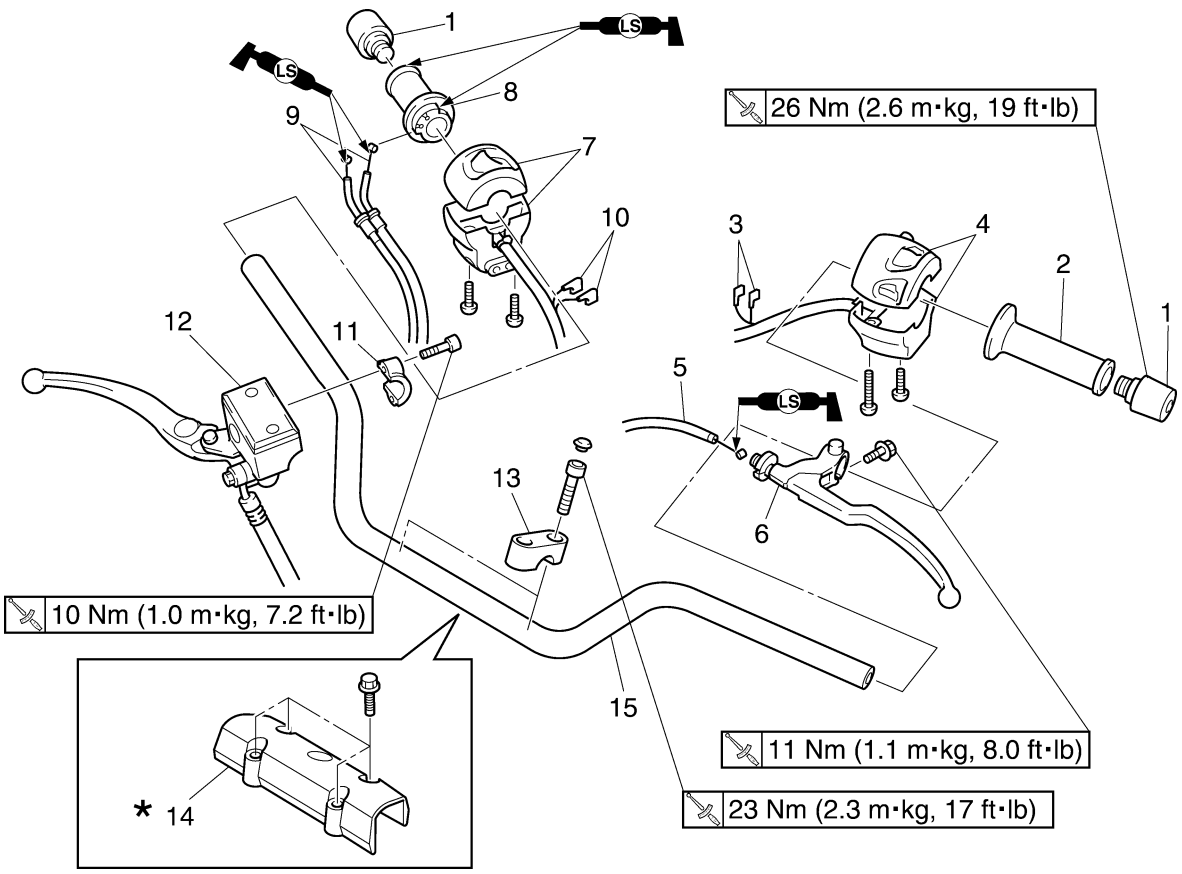
EAS22820

[D-6-5] TRIAL RUN

After all checks and services are completed, always ensure the scooter has no problems by performing the trial running at a speed of faster than 10 km/h.

EAS22840
HANDLEBAR

Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
1	Grip end	2	
2	Handlebar grip	1	
3	Clutch switch connector	1	Disconnect.
4	Left handlebar switch	1	
5	Clutch cable	1	
6	Clutch lever	1	
7	Right handlebar switch	1	
8	Throttle grip	1	
9	Throttle cable	2	
10	Front brake light switch connector	1	Disconnect.
11	Front brake master cylinder holder	1	
12	Front brake master cylinder	1	
13	Upper handlebar holder	2	
14	Upper handlebar holder	1	
15	Handlebar	1	
			For installation, reverse the removal procedure.

* FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG

EAS22860
REMOVING THE HANDLEBARS

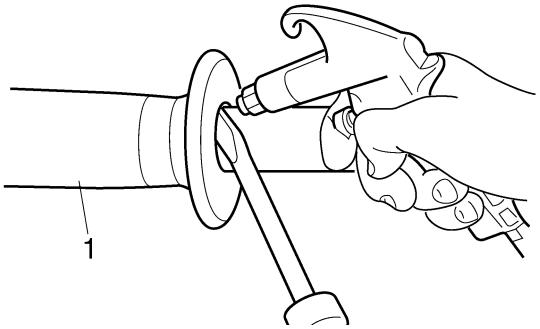
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

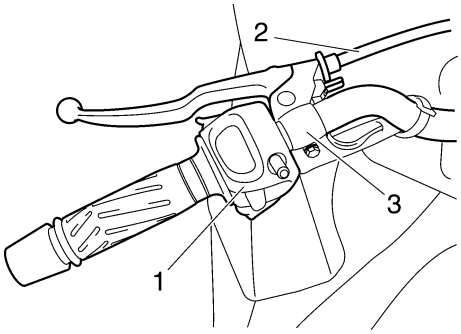
Securely support the vehicle so that there is no danger of it falling over.

2. Remove:
   - Handlebar grip "1"

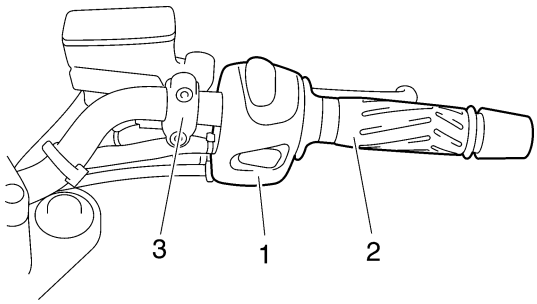
NOTE:
Blow compressed air between the left handlebar and the handlebar grip, and gradually push the grip off the handlebar.



3. Disconnect:
   - Clutch switch connector
4. Remove:
   - Left handlebar switch "1"
   - Clutch cable "2"
   - Clutch lever holder "3"



5. Remove:
   - Right handlebar switch "1"
   - Throttle grip "2"
   - Throttle cable
6. Disconnect:
   - Front brake light switch connector
7. Remove:
   - Front brake master cylinder holder "3"
   - Front brake master cylinder
   - Upper handlebar holder
   - Handlebar

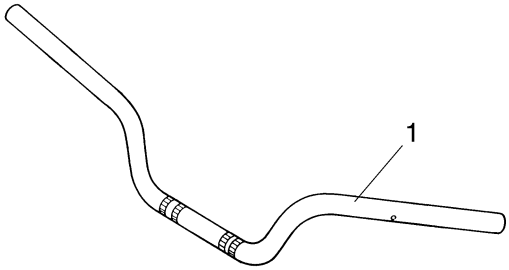


EAS22880
CHECKING THE HANDLEBAR

1. Check:
   - Handlebar "1"
     Bends/cracks/damage → Replace.

EWA13690
⚠ WARNING

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



2. Install:
   - Handlebar grip

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

EWA13700
⚠ WARNING

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

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EAS22930
INSTALLING THE HANDLEBAR

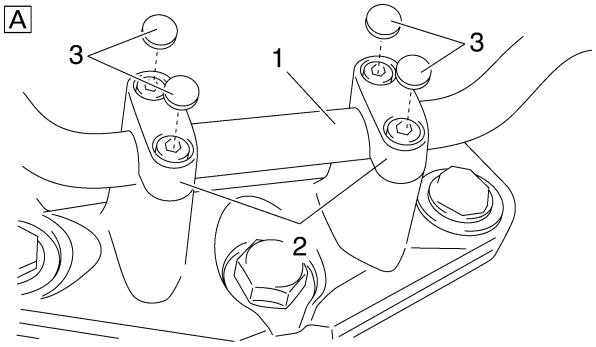
1. Stand the vehicle on a level surface.

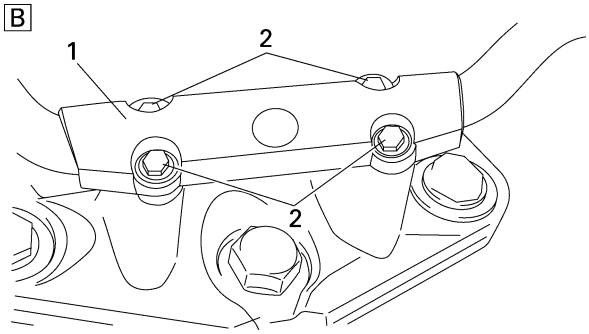
EWA13120
⚠ WARNING

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

2. Install:
   - Handlebar “1”
   - Upper handlebar holders “2”
   - Upper handlebar holder caps “3” (Standard)

	Upper handlebar holder bolt 23 Nm (2.3 m·kg, 17 ft·lb)





A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/FZ6-SAHG

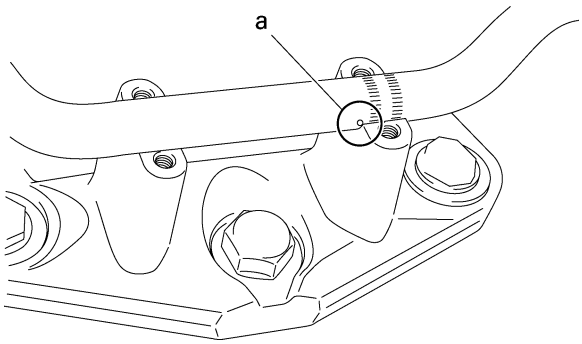
ECA14250

CAUTION:

- **First, tighten the bolts on the front side of the handlebar holder, and then on the rear side.**
- **Turn the handlebar all the way to the left and right. If there is any contact with the fuel tank, adjust the handlebar position.**

NOTE:

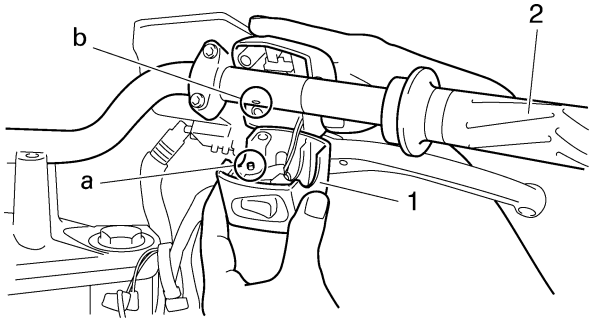
Align the match marks “a” on the handlebar with the upper surface of the lower handlebar holders.



3. Install:
   - Throttle cables
   - Right handlebar switch “1”
   - Throttle grip “2”

NOTE:

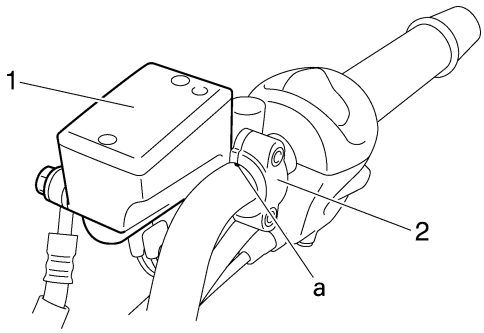
Align the projections “a” on the handlebar switch with the holes “b” in the handlebar.



4. Install:
   - Brake master cylinder “1”
   - Brake master cylinder holder “2”
     Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER" on page 4-39.

NOTE:

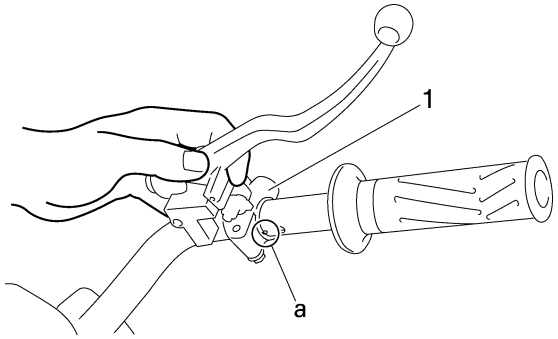
Align the mating surfaces of the brake master cylinder bracket with the punch mark (right handlebar switch side) “a” on the handlebar.



5. Install:
   - Clutch lever holder “1”

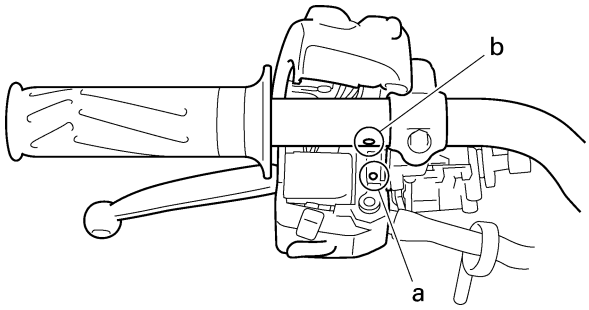
- Clutch cable

NOTE:
Align the slit on the clutch lever holder with the punch mark “a” on the handlebar.



6. Install:
   - Left handlebar switch

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



7. Install:
   - Handlebar grip
   - Grip end

	Grip end **26 Nm (2.6 m·kg, 19 ft·lb)**

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

EWA13700

⚠ WARNING

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

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8. Adjust:
   - Throttle cable free play

Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" on page 3-10.

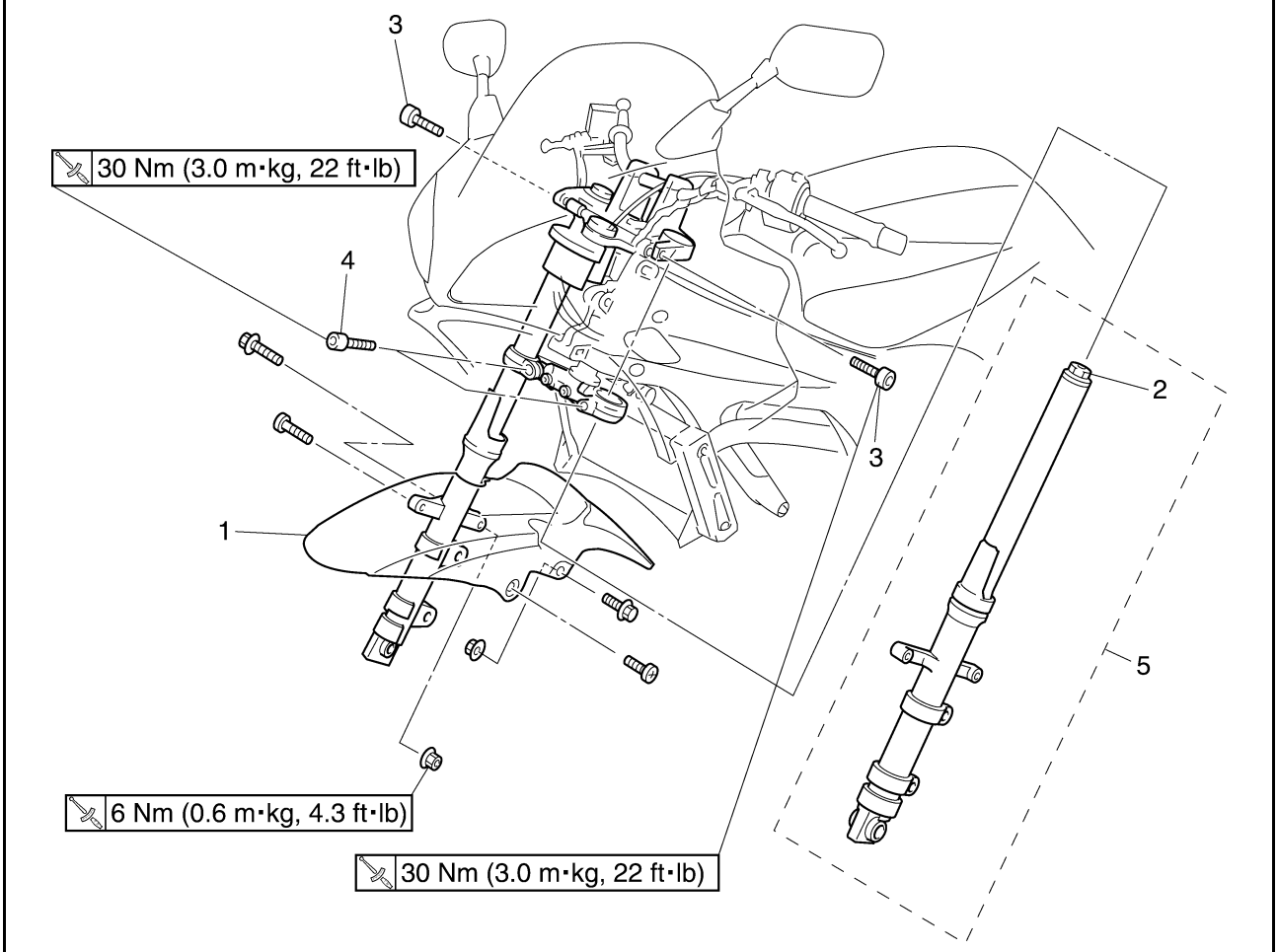
	Throttle cable free play **3.0–5.0 mm (0.12–0.20 in)**

9. Adjust:
   - Clutch cable free play

Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" on page 3-16.

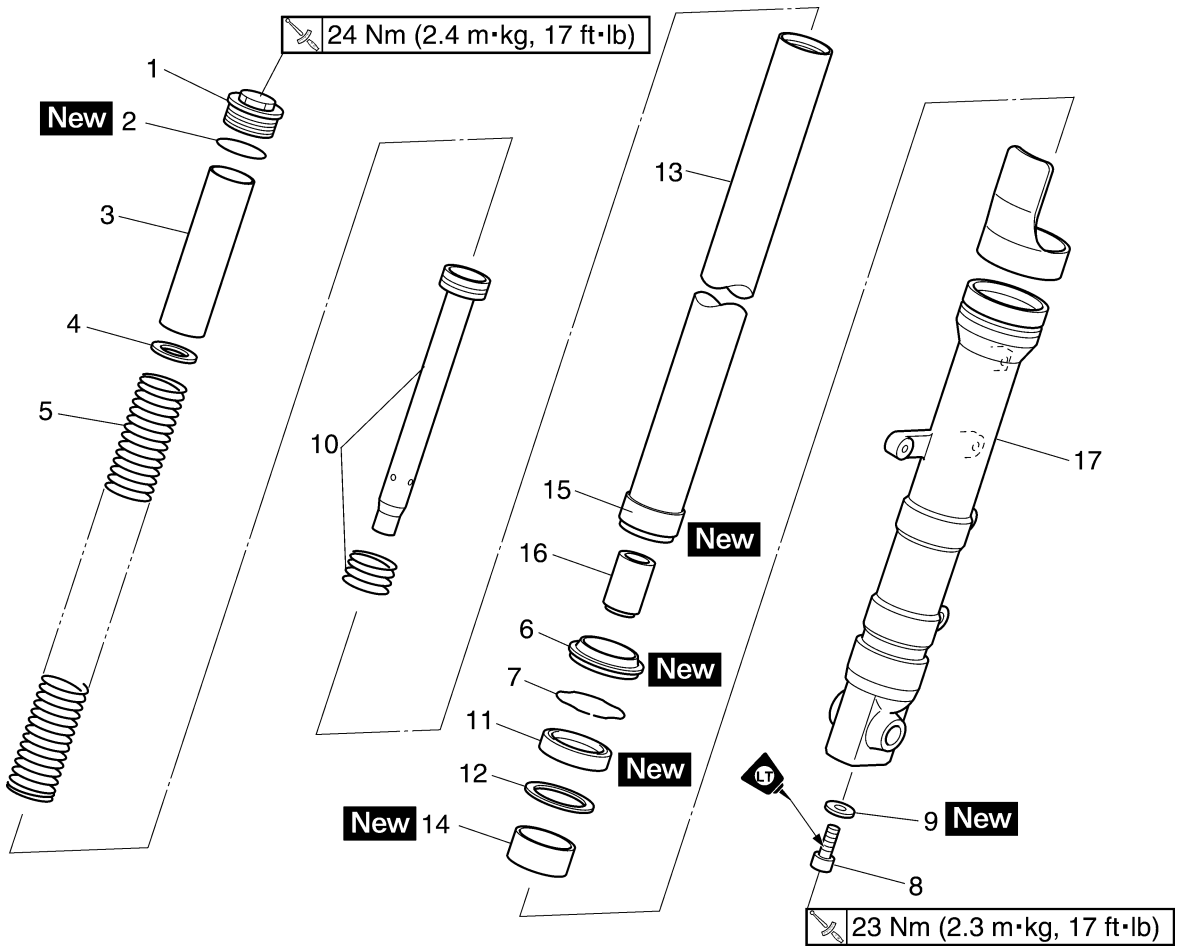
EAS22950
FRONT FORK

Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
	Front wheel		Refer to "FRONT WHEEL" on page 4-7.
	Front brake calipers		Refer to "FRONT BRAKE" on page 4-23.
1	Front fender	1	
2	Cap bolt	1	Loosen.
3	Upper bracket pinch bolt	1	Loosen.
4	Under bracket pinch bolt	1	Loosen.
5	Front fork leg	1	
			For installation, reverse the removal procedure.

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
1	Cap bolt	1	
2	O-ring	1	
3	Spacer	1	
4	Washer	1	
5	Front fork spring	1	
6	Dust seal	1	
7	Oil seal clip	1	
8	Damper rod assembly bolt	1	
9	Copper washer	1	
10	Damper rod assembly	1	
11	Oil seal	1	
12	Washer	1	
13	Inner tube	1	
14	Outer tube bushing	1	
15	Inner tube bushing	1	
16	Oil flow stopper	1	
17	Outer tube	1	
			For assembly, reverse the disassembly procedure.

EAS22970
REMOVING THE FRONT FORK LEGS

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

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

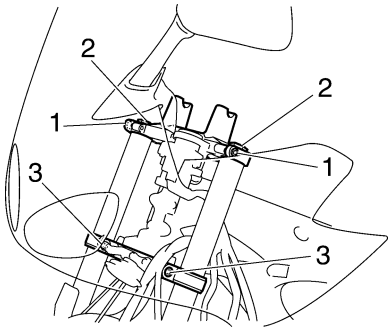
Securely support the vehicle so that there is no danger of it falling over.

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

2. Loosen:
   - Upper bracket pinch bolts “1”
   - Cap bolt “2”
   - Lower bracket pinch bolts “3”

EWA13640
⚠ WARNING

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



3. Remove:
   - Front fork leg

EAS22990
DISASSEMBLING THE FRONT FORK LEGS

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

1. Remove:
   - Cap bolt
   - Washer
   - Spacer
   - Fork spring
2. Drain:
   - Fork oil

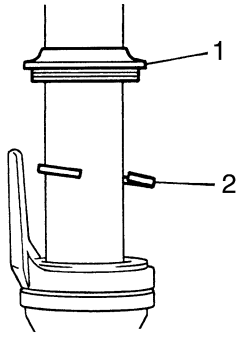
NOTE:
Stroke the inner tube several times while draining the fork oil.

3. Remove:
   - Dust seal “1”
   - Oil seal clip “2”

(with a flat-head screwdriver)

ECA14180
CAUTION:

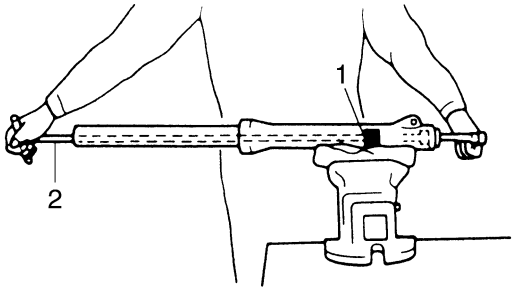
Do not scratch the inner tube.



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

NOTE:
While holding the damper rod with the damper rod holder “1” and T-handle “2”, loosen the damper rod assembly bolt.

Damper rod holder
90890-01294
Damping rod holder set
YM-01300
T-handle
90890-01326
YM-01326



5. Remove:
   - Inner tube

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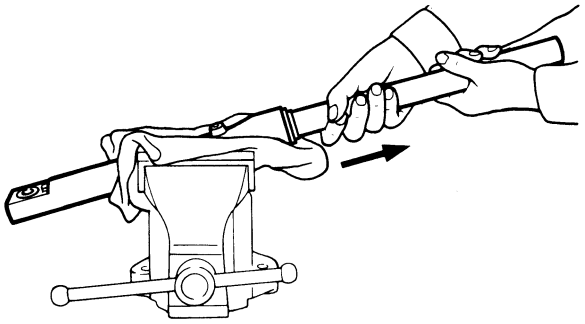
a. Hold the front fork leg horizontally.
b. Securely clamp the brake caliper bracket in a vise with soft jaws.
c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

ECA14190

CAUTION:

- **Excessive force will damage the oil seal and bushing. A damaged oil seal or bushing must be replaced.**
- **Avoid bottoming the inner tube into the outer tube during the above procedure, as the oil flow stopper will be damaged.**



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EAS23010

CHECKING THE FRONT FORK LEGS

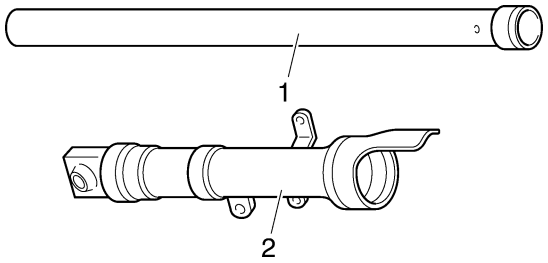
The following procedure applies to both of the front fork legs.

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

EWA13650

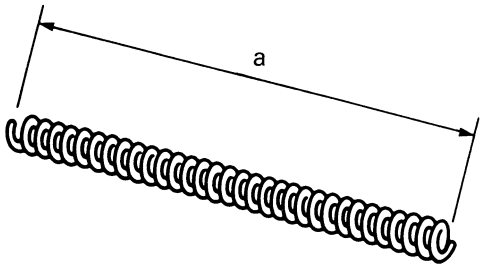
⚠ WARNING

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



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

Fork spring free length
354.0 mm (13.94 in)
Limit
347.0 mm (13.66 in)

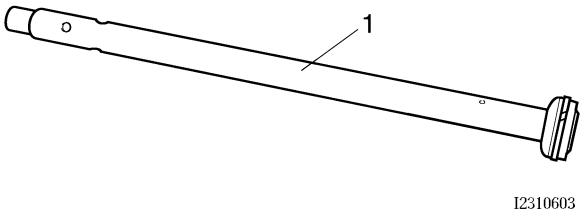


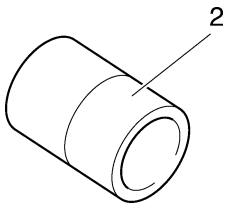
3. Check:
   - Damper rod “1”
     Damage/wear → Replace.
     Obstruction → Blow out all of the oil passages with compressed air.
   - Oil flow stopper “2”
     Damage → Replace.

ECA14200

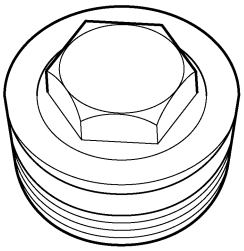
CAUTION:

- **The front fork leg has a built-in damper adjusting rod and a very sophisticated internal construction, which are particularly sensitive to foreign material.**
- **When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.**





4. Check:
   - Cap bolt O-ring
     Damage/wear → Replace.



I2310302

EAS23020
ASSEMBLING THE FRONT FORK LEGS

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

EWA13660
⚠ WARNING

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

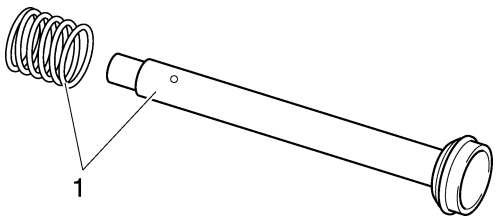
NOTE:

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

1. Install:
   - Inner tube bushing
   - Outer tube bushing
   - Oil flow stopper
   - Damper rod assembly “1”
   - Copper washer New

ECA14210
CAUTION:

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



2. Lubricate:
   - Inner tube’s outer surface

Recommended lubricant
Suspension oil 01 or eqivalent

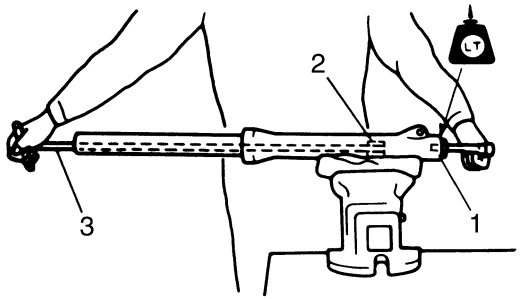
3. Tighten:
   - Damper rod assembly bolt “1”

Damper rod assembly bolt
23 Nm (2.3 m·kg, 17 ft·lb)
LOCTITE®

NOTE:

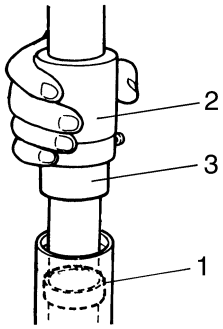
While holding the damper rod assembly with the damper rod holder “2” and T-handle “3”, tighten the damper rod assembly bolt.

Damper rod holder
90890-01294
Damping rod holder set
YM-01300
T-handle
90890-01326
YM-01326



4. Install:
   - Outer tube bushing “1”
     (with the fork seal driver “2” and fork seal attachment “3”)

Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø43)
90890-01374
Replacement 43 mm
YM-A5142-3



5. Install:
   - Washer
   - Oil seal "1"
     (with the fork seal driver and adapter)

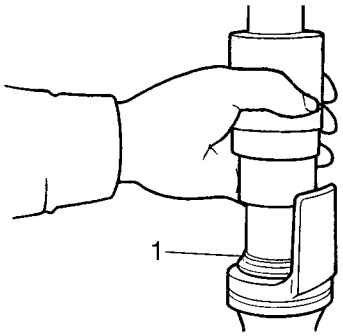
ECA14220

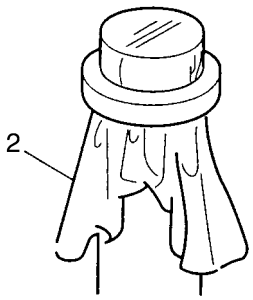
CAUTION:

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

NOTE:

- Before installing the oil seal, lubricate its lips with lithium soap base 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 "2" to protect the oil seal during installation.

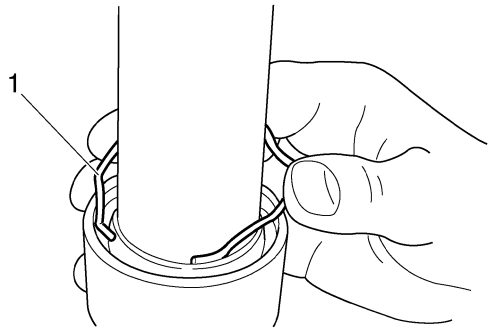




6. Install:
   - Oil seal clip "1"

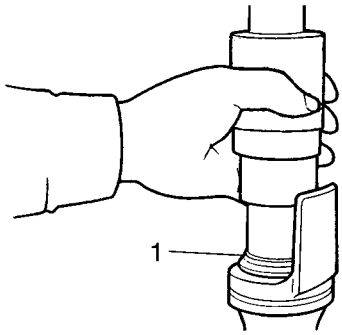
NOTE:

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



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

Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7



8. Fill:
   - Front fork leg
     (with the specified amount of the recommended fork oil)

Quantity
467.0 cm³ (15.79 US oz) (16.47 Imp.oz)
Recommended oil
Suspension oil 01 or equivalent

ECA4S81015

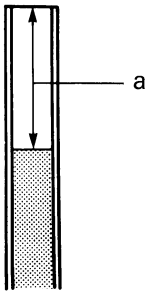
CAUTION:

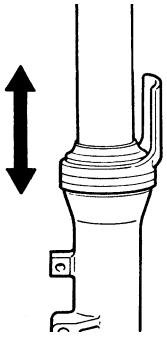
- **Be sure to use the recommended fork oil. Other oils may have an adverse effect on front fork performance.**
- **When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.**

9. Measure:
   • Front fork leg oil level “a”
   Out of specification → Correct.

Level
134.0 mm (5.28 in)

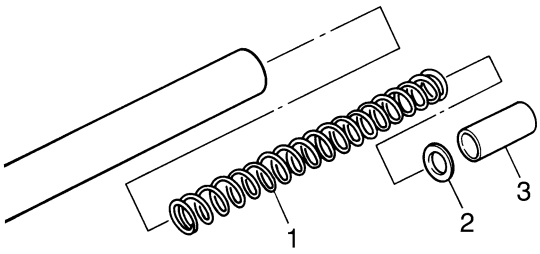
NOTE:
- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.

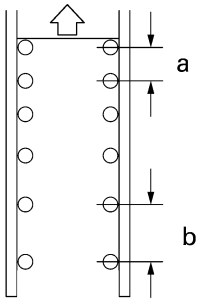




10. Install:
    • Spring “1”
    • Spring seat “2”
    • Spacer “3”
    • Cap bolt

NOTE:
- Install the spring with the smaller pitch “a” facing down.
- Before installing the cap bolt, lubricate its O-ring with grease.
- Temporarily tighten the cap bolt.





b. Lager pitch

EAS23050
INSTALLING THE FRONT FORK LEGS

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

1. Install:
   • Front fork leg
   Temporarily tighten the upper and lower bracket pinch bolts.

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

2. Tighten:
   • Lower bracket pinch bolt “1”

Lower bracket pinch bolt
30 Nm (3.0 m·kg, 22 ft·lb)

   • Cap bolt “2”

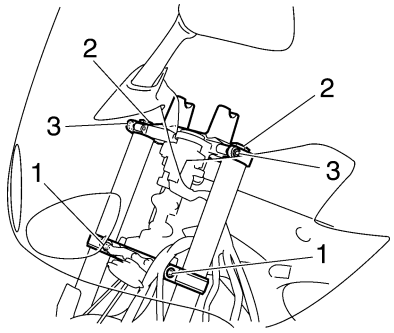
Cap bolt
24 Nm (2.4 m·kg, 17 ft·lb)

   • Upper bracket pinch bolt “3”

Upper bracket pinch bolt
30 Nm (3.0 m·kg, 22 ft·lb)

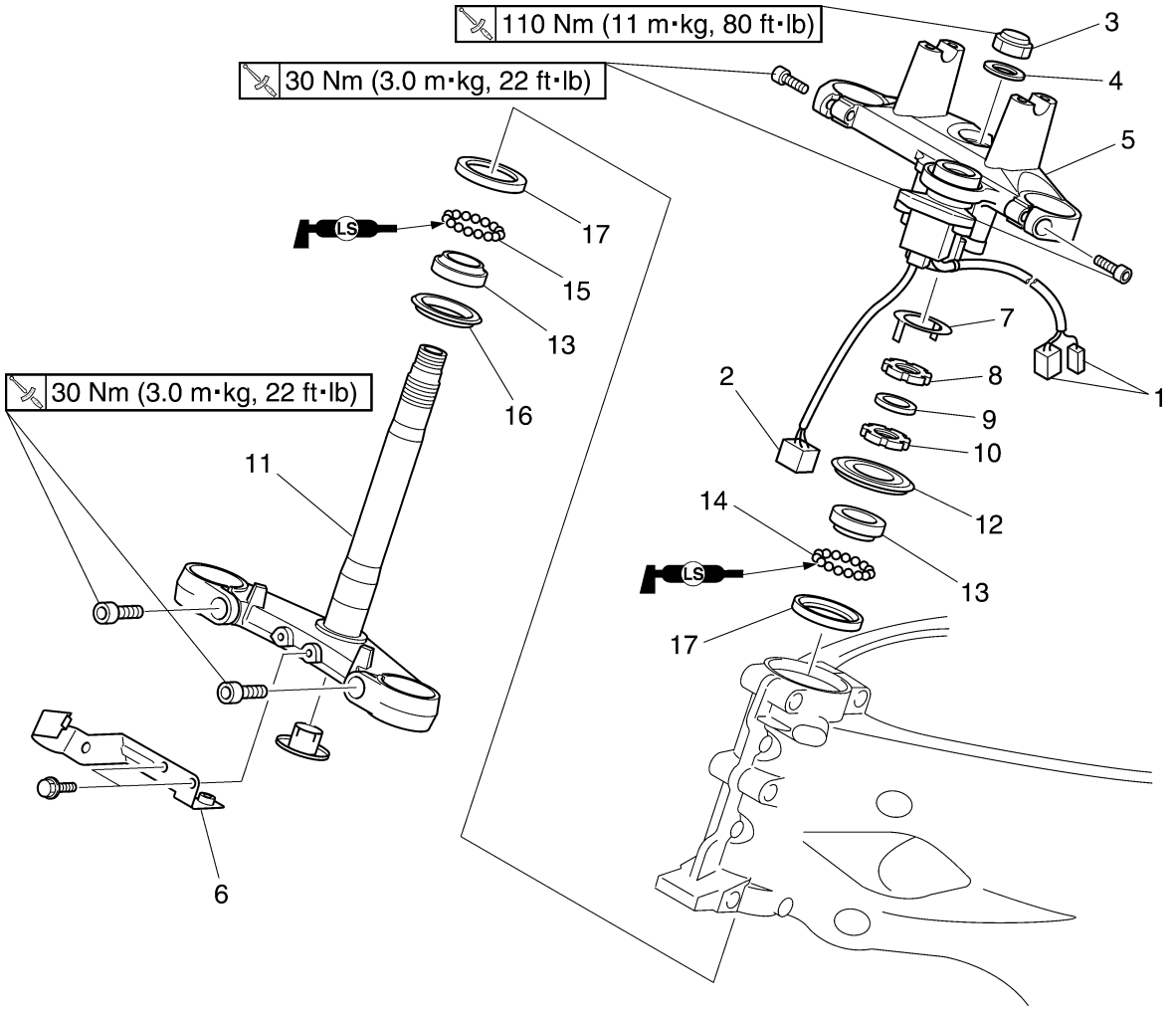
EWA13680
⚠ WARNING

Make sure the brake hoses are routed properly.



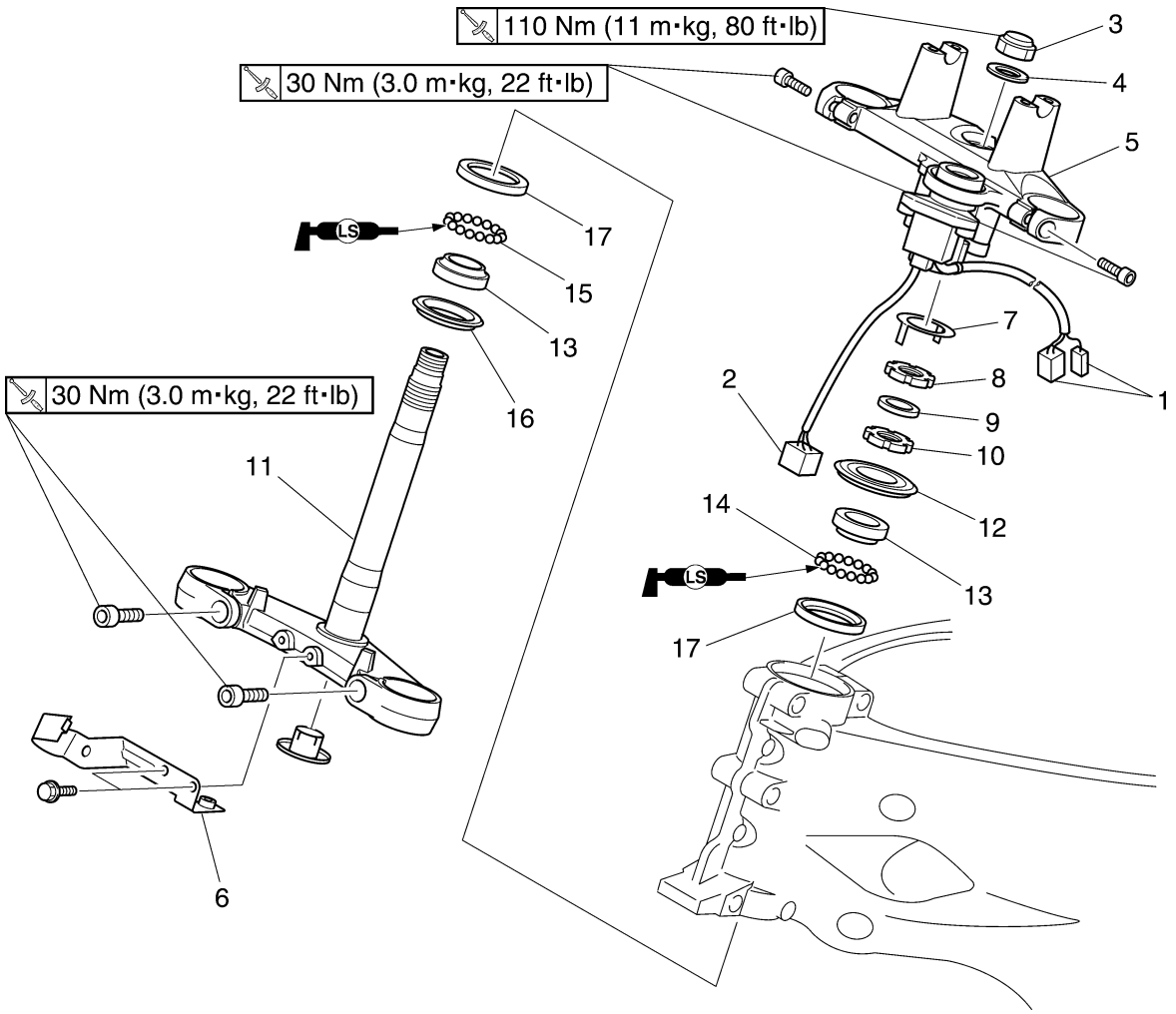
EAS23090
STEERING HEAD

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
	Front wheel		Refer to "FRONT WHEEL" on page 4-7.
	Front fender		Refer to "FRONT FORK" on page 4-64.
	Front fork		Refer to "FRONT FORK" on page 4-64.
	Handlebar		Refer to "HANDLEBAR" on page 4-60.
	Front cowling inner panel (left side)		Refer to "GENERAL CHASSIS" on page 4-1.
	Front cowling inner panel (right side)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Main switch coupler	2	Disconnect.
2	Immobilizer coupler	1	Disconnect.
3	Steering stem nut	1	
4	Washer	1	
5	Upper bracket	1	
6	Horn stay	1	
7	Lock washer	1	
8	Upper ring nut	1	
9	Rubber washer	1	
10	Lower ring nut	1	
11	Lower bracket	1	
12	Bearing cover	1	

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
13	Bearing inner race	2	
14	Upper bearing	1	
15	Lower bearing	1	
16	Dust seal	1	
17	Bearing outer race	2	
			For installation, reverse the removal procedure.

EAS23110
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:
   - Steering stem nut
   - Washer
   - Upper ring nut
   - Lock washer
   - Rubber washer
   - Lower ring nut “1”
     (with the steering nut wrench “2”)
   - Lower bracket

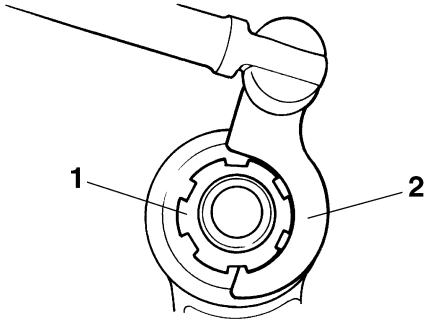
NOTE:

Hold the lower ring nut with the exhaust and steering nut wrench, and then remove the upper ring nut with the ring nut wrench.

Steering nut wrench
90890-01403
Spanner wrench
YU-33975

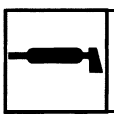
EWA13730
⚠ WARNING

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



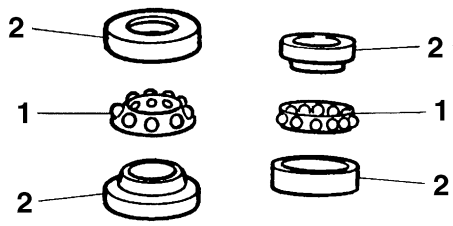
EAS23130
CHECKING THE STEERING HEAD

1. Wash:
   - Bearing balls
   - Bearing races



Recommended cleaning solvent
Kerosene

2. Check:
   - Bearing balls “1”
   - Bearing races “2”
     Damage/pitting → Replace.



3. Replace:
   - Bearing balls
   - Bearing races

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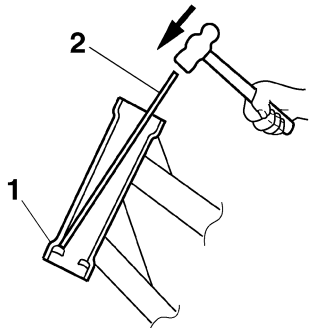
a. Remove the bearing races “1” from the steering head pipe with a long rod “2” and hammer.
b. Remove the bearing race “3” from the lower bracket with a floor chisel “4” and hammer.
c. Install a new dust seal and new bearing races.

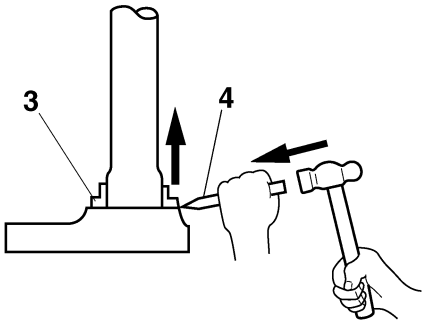
ECA14270
CAUTION:

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

NOTE:

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





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4. Check:

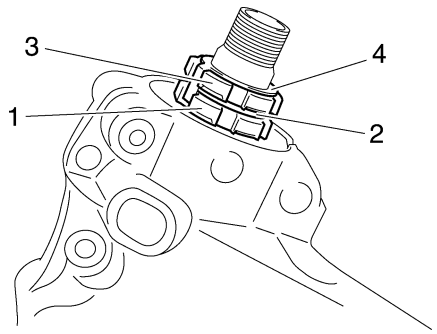
- Upper bracket
- Lower bracket
  (along with the steering stem)
  Bends/cracks/damage → Replace.

EAS23140
INSTALLING THE STEERING HEAD

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

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

2. Install:
   - Lower bracket
   - Lower ring nut “1”
   - Rubber washer “2”
   - Upper ring nut “3”
   - Lock washer “4”
     Refer to "CHECKING THE STEERING HEAD" on page 4-74.



3. Install:
   - Upper bracket
   - Washer
   - Steering stem nut

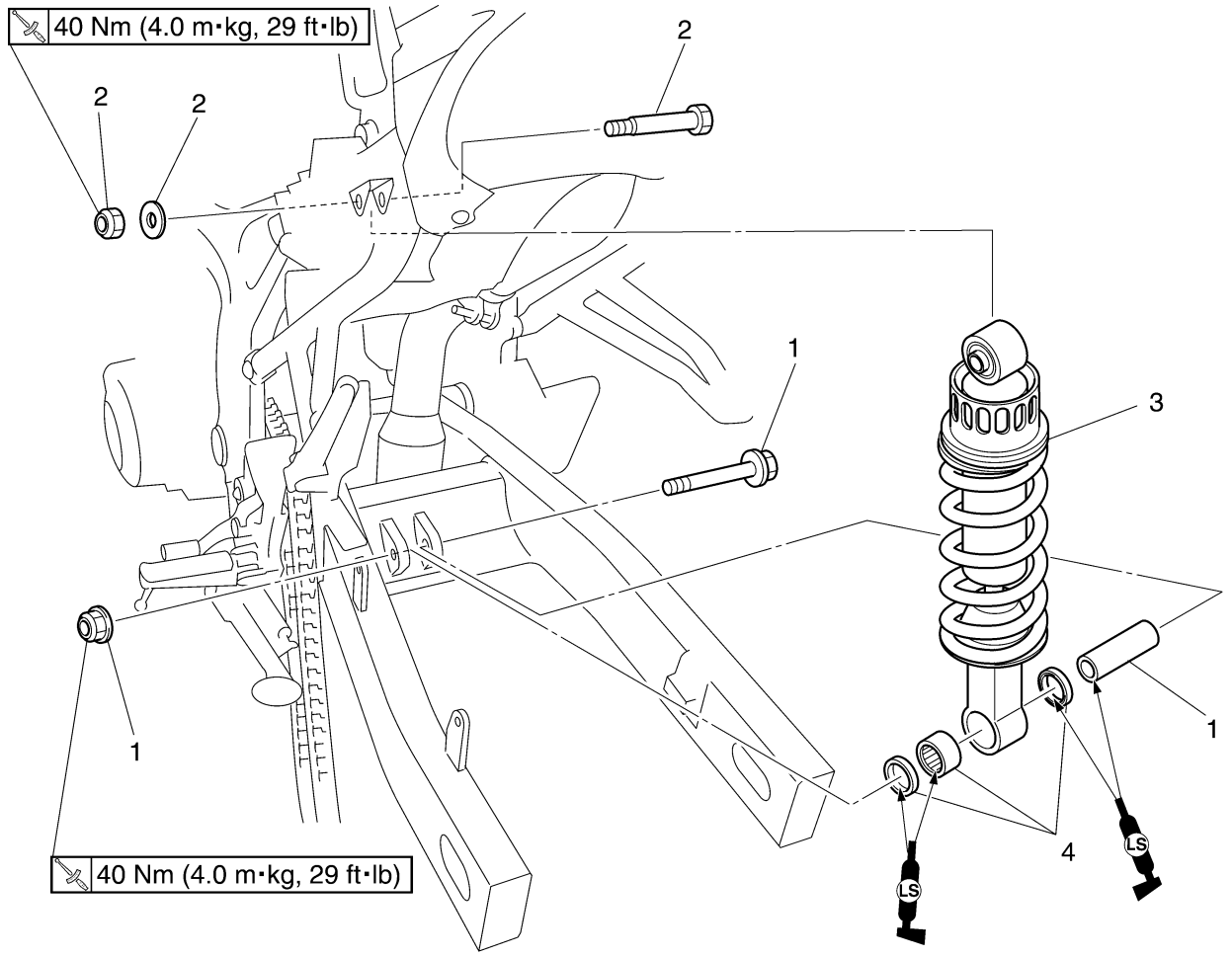
NOTE:
Temporarily tighten the steering stem nut.

4. Install:
   - Front fork legs
     Refer to "INSTALLING THE FRONT FORK LEGS" on page 4-70.

NOTE:
Temporarily tighten the upper and lower bracket pinch bolts.

EAS23160
REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-41.
	Rear wheel		Refer to "REAR WHEEL" on page 4-15.
1	Self-locking nut/collar/bolt	1/1/1	
2	Self-locking nut/washer/bolt	1/1/1	
3	Rear shock absorber assembly	1	
4	Oil seal/bearing	2/1	
			For installation, reverse the removal procedure.

EAS23180
HANDLING THE REAR SHOCK ABSORBER

EWA13740

⚠ WARNING

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

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

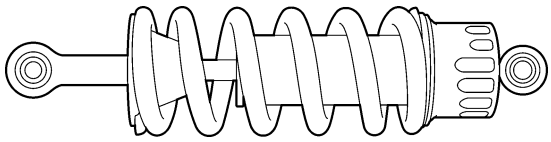
EAS23190
DISPOSING OF A REAR SHOCK ABSORBER

1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3-mm hole through the rear shock absorber at a point 15–20 mm from its end as shown.

EWA13760

⚠ WARNING

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



EAS23210
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

EWA13120

⚠ WARNING

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

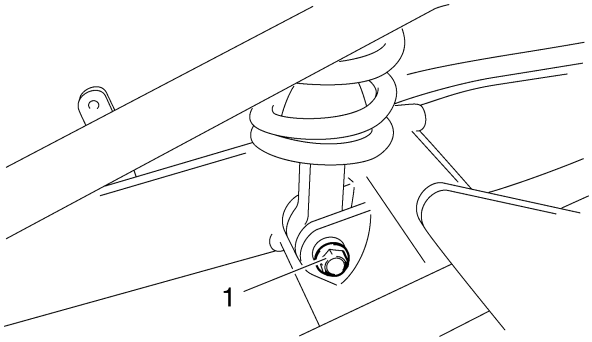
NOTE:

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

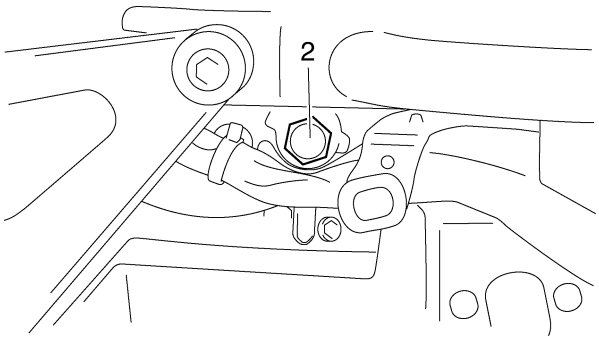
2. Remove:
   - Seat
   - Side cover
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Rear wheel
     Refer to "REAR WHEEL" on page 4-15.
3. Remove:
   - Rear shock absorber assembly lower bolt “1”

NOTE:

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



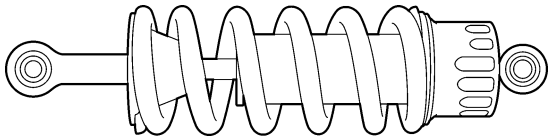
4. Remove:
   - Rear shock absorber assembly upper bolt “2”
   - Rear shock absorber assembly



EAS23240
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:
   - Rear shock absorber rod
     Bends/damage → Replace the rear shock absorber assembly.
   - Rear shock absorber
     Gas leaks/oil leaks → Replace the rear shock absorber assembly.
   - Spring
     Damage/wear → Replace the rear shock absorber assembly.

- Bushings
  Damage/wear → Replace.
- Dust seals
  Damage/wear → Replace.
- Bolts
  Bends/damage/wear → Replace.



EAS23300
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
   - Collar
   - Bearings
   - Oil seals

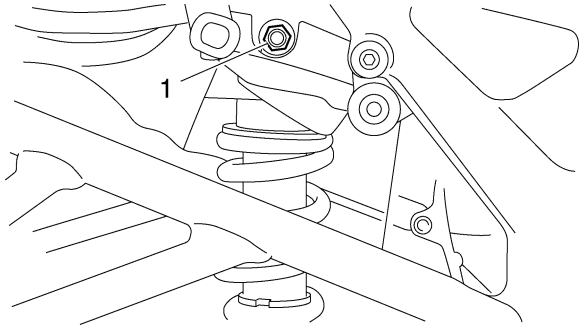
Recommended lubricant
Molybdenum disulfide grease

2. Install:
   - Rear shock absorber assembly

NOTE:
When installing the rear shock absorber assembly, lift up the swingarm.

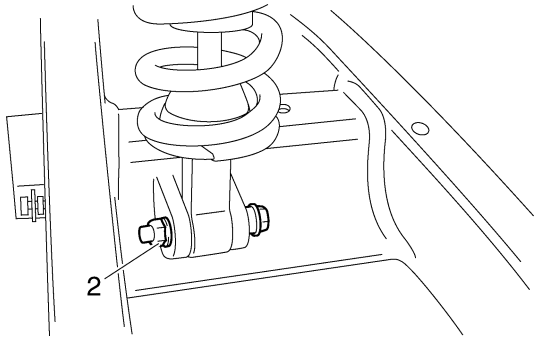
3. Tighten:
   - Rear shock absorber assembly upper nut "1"

Rear shock absorber assembly upper nut
40 Nm (4.0 m·kg, 29 ft·lb)



   - Rear shock absorber assembly lower nut "2"

Rear shock absorber assembly lower nut
40 Nm (4.0 m·kg, 29 ft·lb)

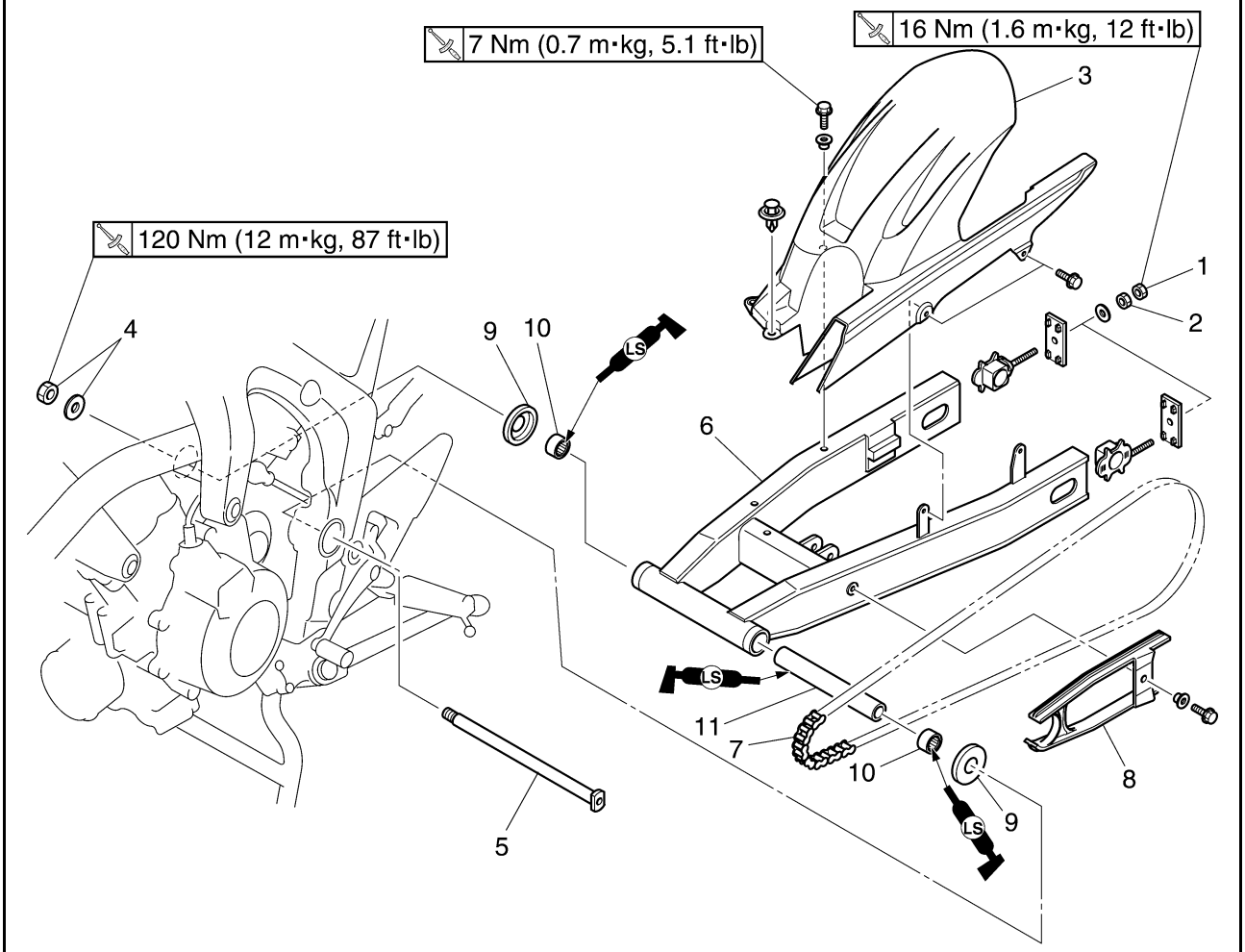


4. Install:
   - Rear wheel
     Refer to "REAR WHEEL" on page 4-15.
5. Adjust:
   - Drive chain slack
     Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-28.

Drive chain slack
45.0–55.0 mm (1.77–2.17 in)

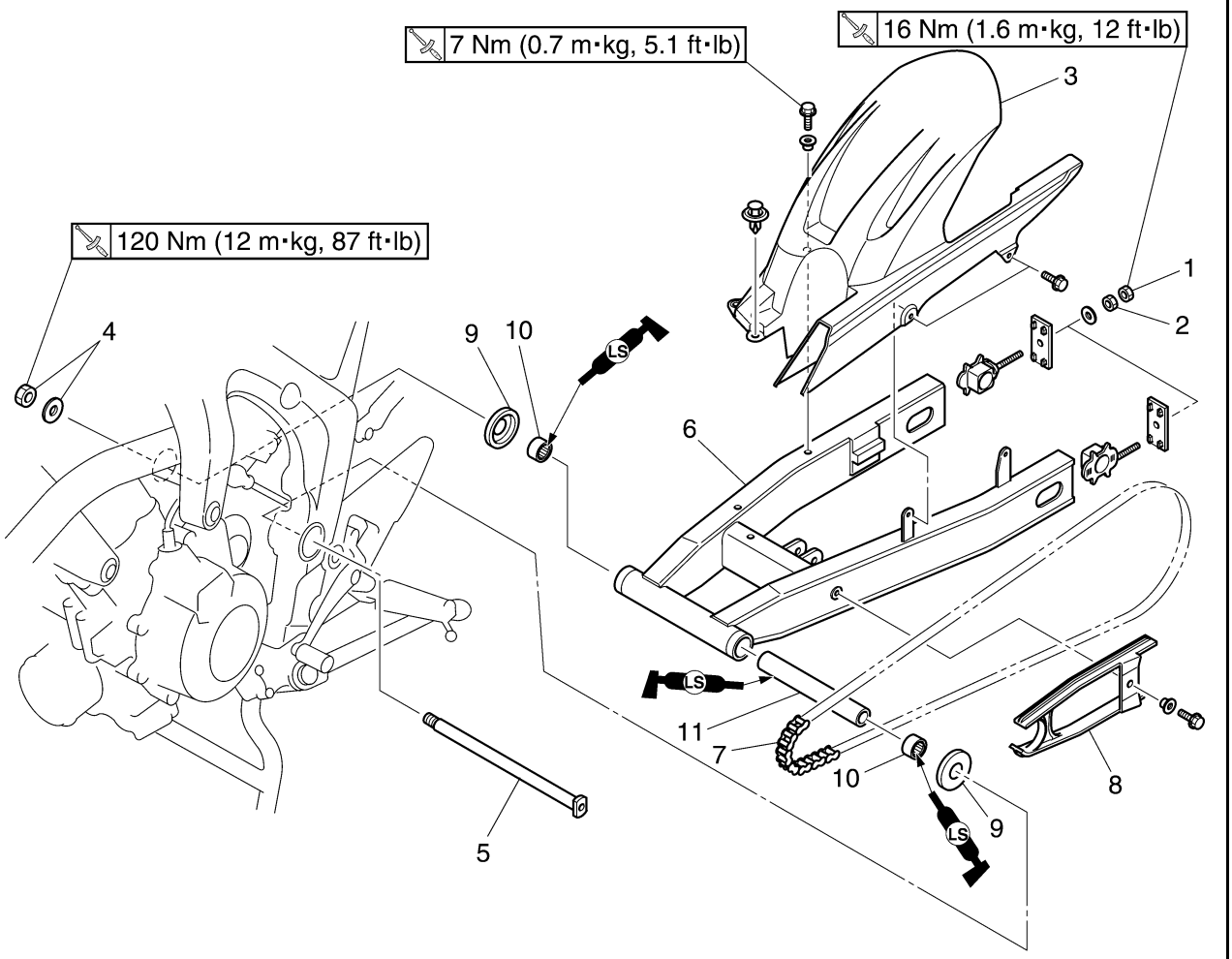
EAS23330
SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Muffler assembly		Refer to "ENGINE REMOVAL" on page 5-1.
	Catalyst assembly		Refer to "ENGINE REMOVAL" on page 5-1.
	Exhaust pipe assembly		Refer to "ENGINE REMOVAL" on page 5-1.
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-41.
	Rear wheel		Refer to "REAR WHEEL" on page 4-15.
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-76.
	Drive sprocket cover		Refer to "ENGINE REMOVAL" on page 5-1.
1	Locknut	2	Loosen.
2	Adjusting nut	2	Loosen.
3	Rear fender	1	
4	Pivot shaft nut/washer	1/1	
5	Pivot shaft	1	
6	Swingarm	1	
7	Drive chain	1	
8	Drive chain guide	1	
9	Dust cover	2	
10	Bearing	2	
11	Spacer	1	

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
			For installation, reverse the removal procedure.

EAS23340
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.

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

2. Measure:
   - Swingarm side play
   - Swingarm vertical movement

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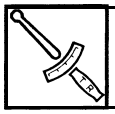
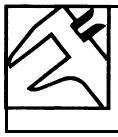
a. Measure the tightening torque of the swingarm pivot shaft bolt and nut.



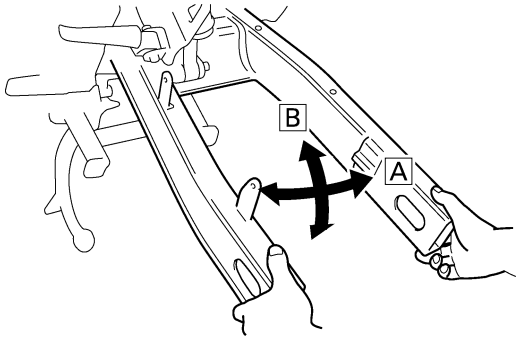
Pivot shaft nut
120 Nm (12.0 m·kg, 87 ft·lb)

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



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

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



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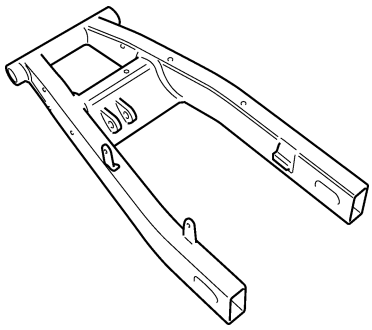
EAS23370
CHECKING THE SWINGARM

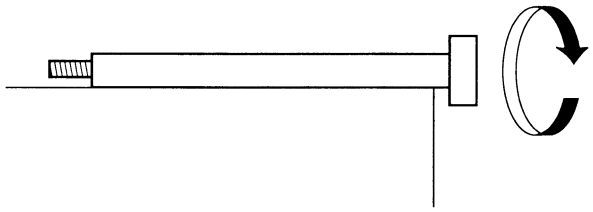
1. Check:
   - Swingarm
   Bends/cracks/damage → Replace.



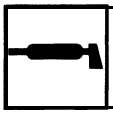
2. Check:
   - Pivot shaft
   Roll the pivot shaft on a flat surface.
   Bends → Replace.

EWA4S81007
⚠ WARNING

Do not attempt to straighten a bent pivot shaft.

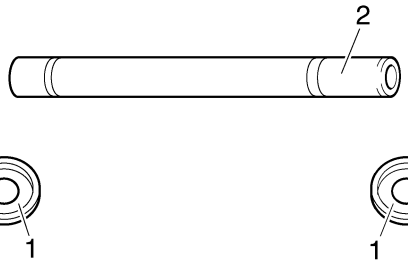


3. Wash:
   - Pivot shaft
   - Dust covers
   - Spacer
   - Washers
   - Bearings



Recommended cleaning solvent
Kerosene

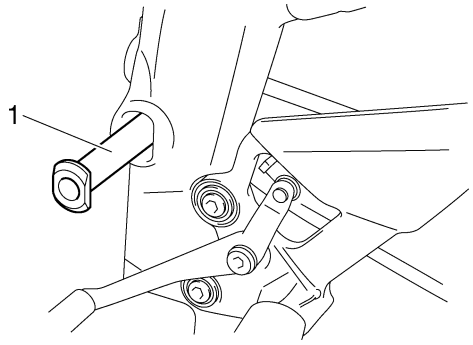
4. Check:
   - Dust covers "1"
   - Spacer "2"
   Damage/wear → Replace.
   - Bearings
   Damage/pitting → Replace.



EAS23380
INSTALLING THE SWINGARM

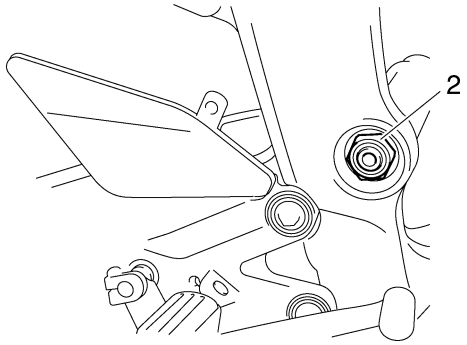
1. Lubricate:
   - Bearings
   - Spacers
   - Dust covers
   - Pivot shaft “1”

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



2. Install:
   - Swingarm
   - Pivot shaft nut “2”

	Pivot shaft nut **120 Nm (12.0 m·kg, 87 ft·lb)**

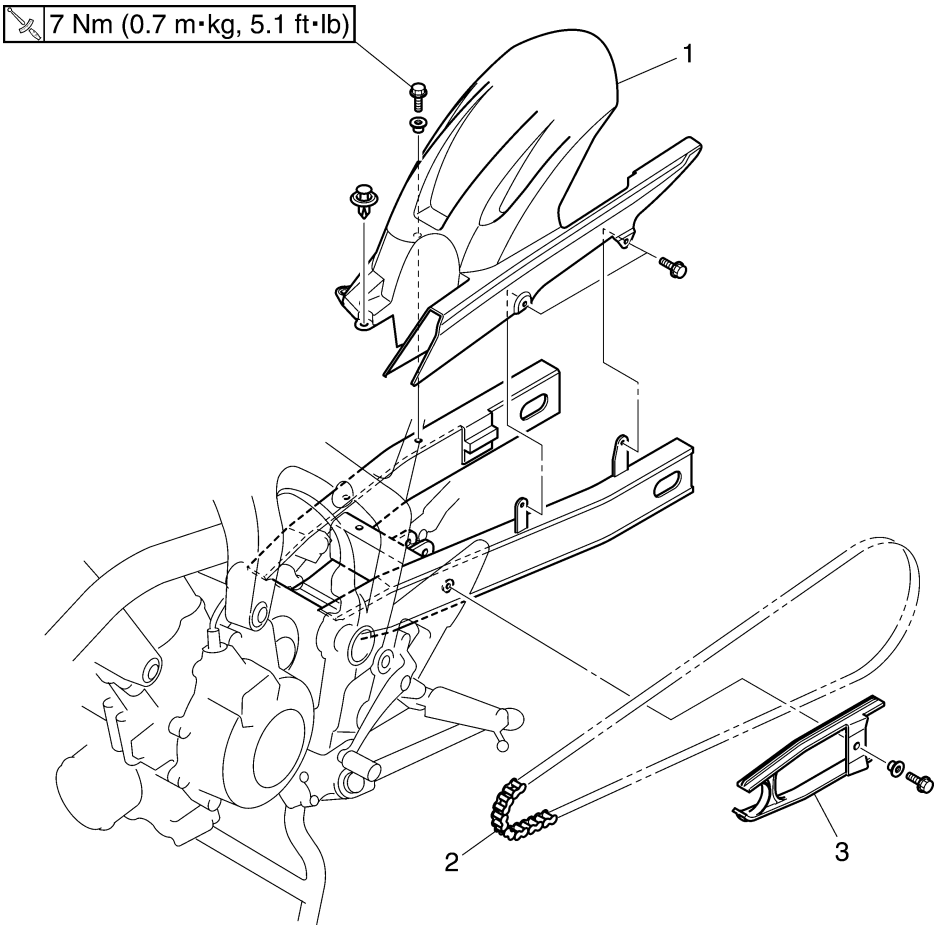


3. Install:
   - Rear shock absorber assembly
     Refer to "INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY" on page 4-78.
   - Rear wheel
     Refer to "INSTALLING THE REAR WHEEL" on page 4-22.
4. Adjust:
   - Drive chain slack
     Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-28.

	Drive chain slack **45.0–55.0 mm (1.77–2.17 in)**

EAS23400
CHAIN DRIVE

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Drive sprocket cover		Refer to "ENGINE REMOVAL" on page 5-1.
	Swingarm		Refer to "REMOVING THE SWINGARM" on page 4-81.
1	Rear fender	1	
2	Drive chain	1	
3	Chain protector	1	
			For installation, reverse the removal procedure.

EAS23410
REMOVING THE DRIVE CHAIN

1. Stand the vehicle on a level surface.

EWA13120

⚠ WARNING

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

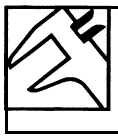
NOTE:

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

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

EAS23440
CHECKING THE DRIVE CHAIN

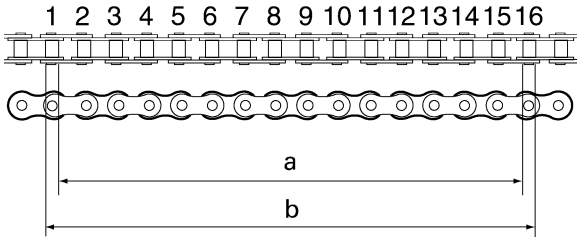
1. Measure:
   - Measure the dimension between 15-links on the inner side “a” and outer side “b” of the roller and calculate the dimension between pin centers.
   - Dimension “c” between pin centers = (Inner dimension “a” + Outer dimension “b”)/2
   - 15-link section “c” of the drive chain
     Out of specification → Replace the drive chain, front drive sprocket and rear drive sprocket as a set.

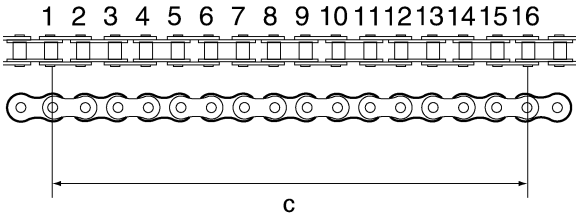


15-link drive chain section limit (maximum)
239.3 mm (9.42 in)

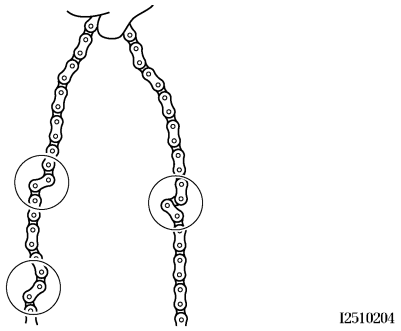
NOTE:

- While measuring the 15-link section, push down on the drive chain to increase its tension.
- Perform this measurement at two or three different places.





2. Check:
   - Drive chain
     Stiffness → Clean and lubricate or replace.



3. Clean:
   - Drive chain

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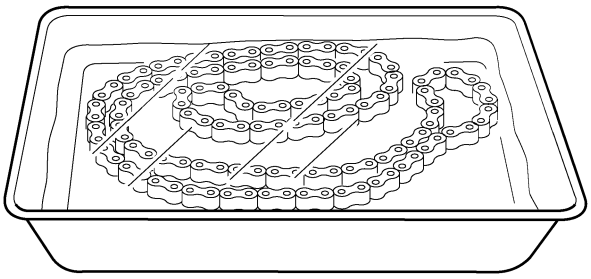
a. Wipe the drive chain with a clean cloth.
b. Put the drive chain in kerosene and remove any remaining dirt.
c. Remove the drive chain from the kerosene and completely dry it.

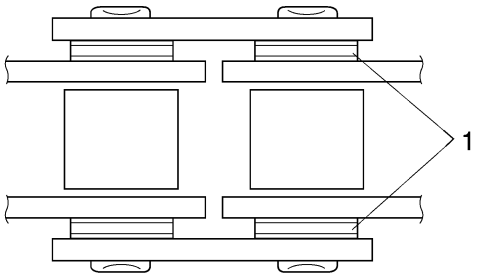
ECA14290

CAUTION:

- **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 O-rings can be damaged.**



I2510302



I2510201

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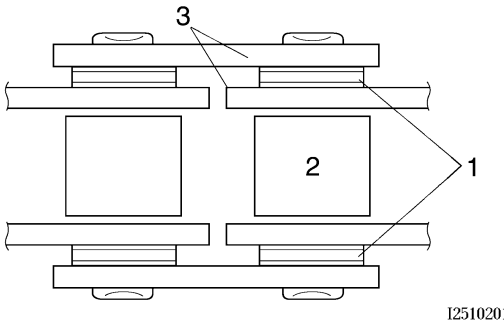
4. Check:
   - O-rings “1”
     Damage → Replace the drive chain.
   - Drive chain rollers “2”
     Damage/wear → Replace the drive chain.
   - Drive chain side plates “3”
     Damage/wear → Replace the drive chain.
     Cracks → Replace the drive chain and make sure the battery breather hose is properly routed away from the drive chain and below the swingarm.



I2510201

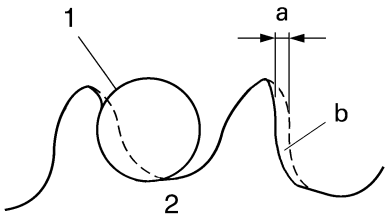
5. Lubricate:
   - Drive chain

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

EAS23460
CHECKING THE DRIVE SPROCKET

1. Check:
   - Drive sprocket

More than 1/4 tooth “a” wear → Replace the drive chain sprockets as a set.
Bent teeth → Replace the drive chain sprockets as a set.



a. Correct
1. Drive chain roller
2. Drive chain sprocket

EAS23470
CHECKING THE REAR WHEEL SPROCKET

Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-20.

EAS23480
CHECKING THE REAR WHEEL DRIVE HUB

Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-19.

EAS28800
INSTALLING THE DRIVE CHAIN

1. Lubricate:
   - Drive chain

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

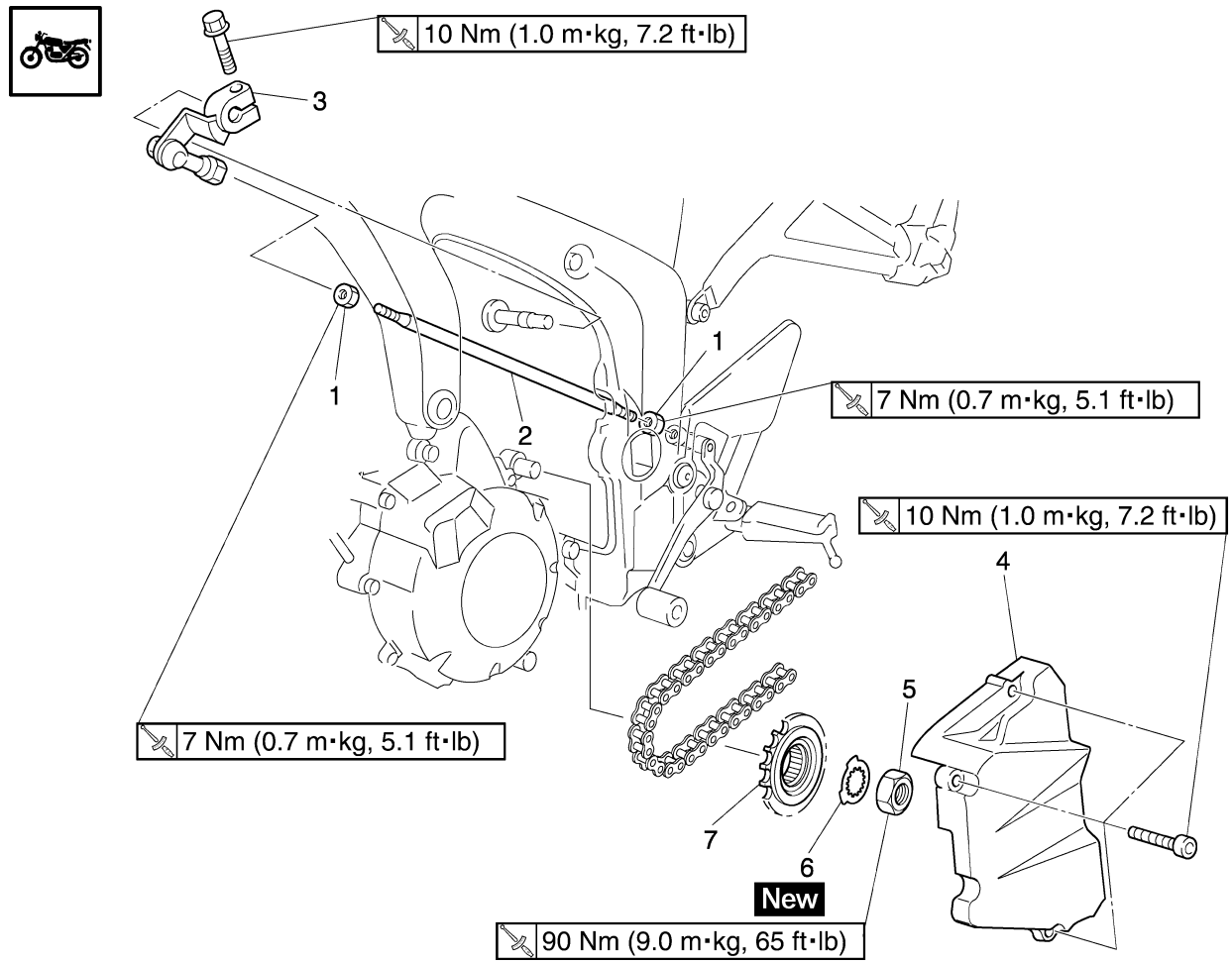
2. Install:
   - Drive chain
3. Install:
   - Swingarm
     Refer to "INSTALLING THE SWINGARM" on page 4-82.

ENGINE

5

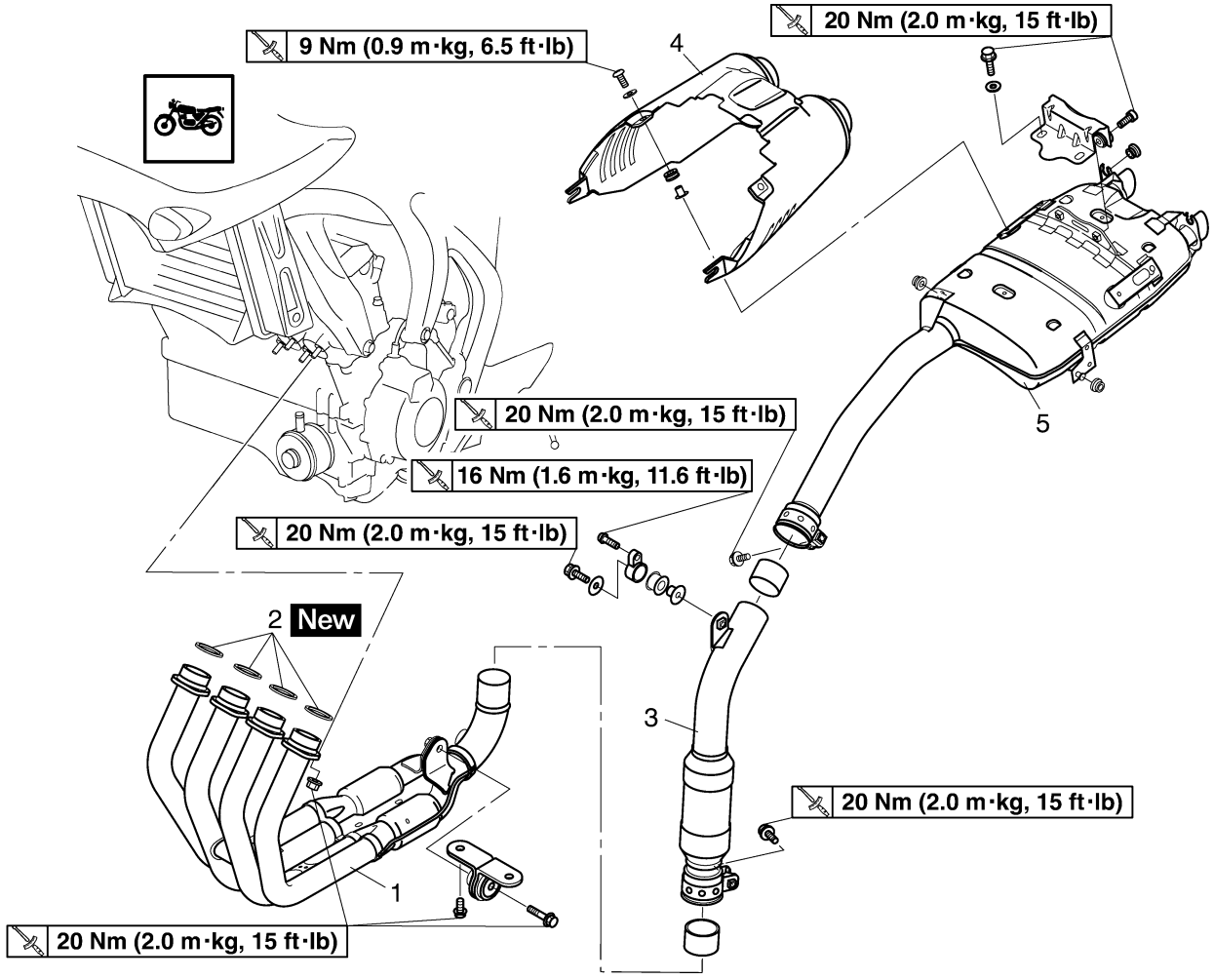
EAS23710
ENGINE REMOVAL

Removing the drive sprocket



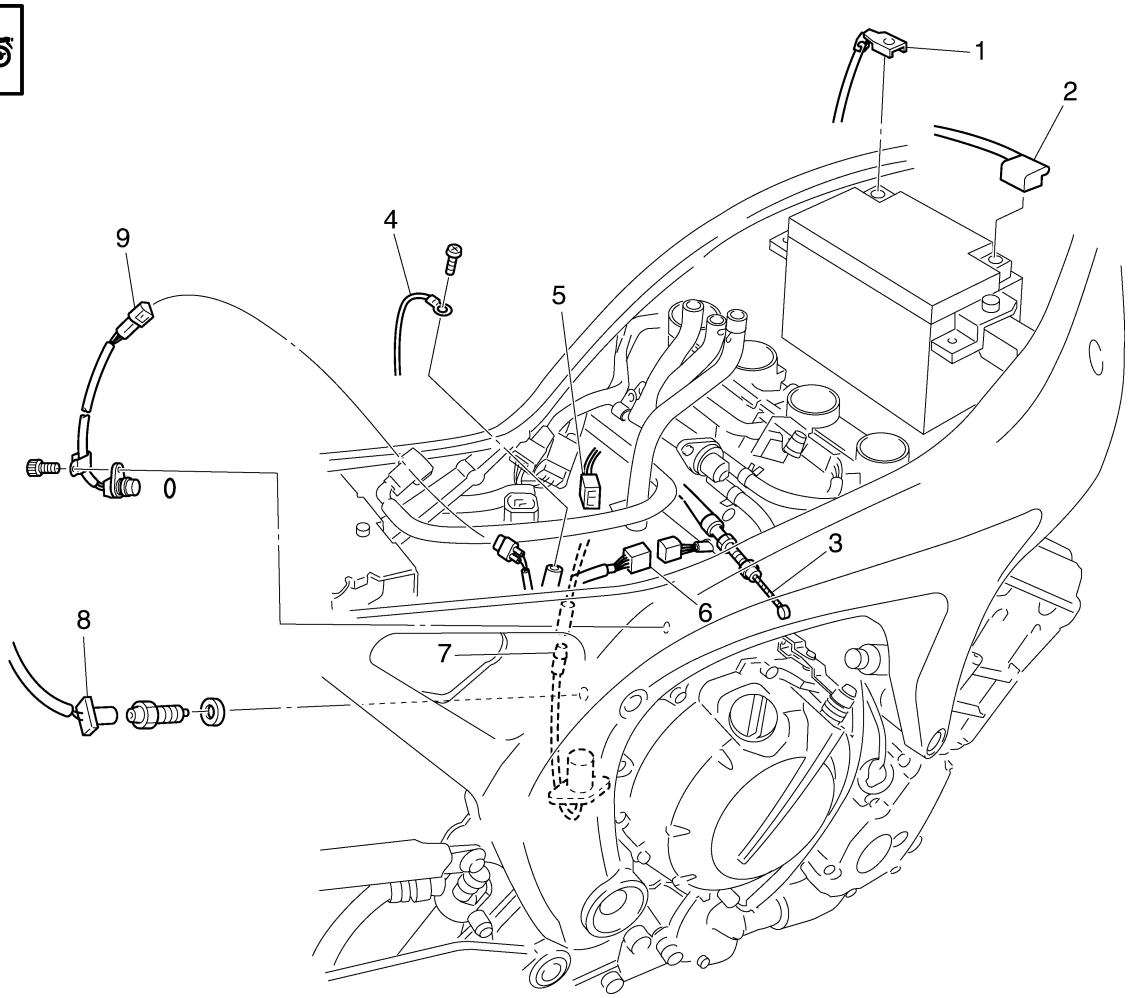
Order	Job/Parts to remove	Q'ty	Remarks
	Drive chain		Loosen Refer to "ADJUSTING THE SHIFT PEDAL" on page 3-28.
1	Locknut	1	
2	Shift rod	1	
3	Shift arm	1	
4	Drive sprocket cover	1	
5	Drive sprocket nut	1	
6	Lock washer	1	
7	Drive sprocket	1	
			For installation, reverse the removal procedure.

Removing the exhaust pipe



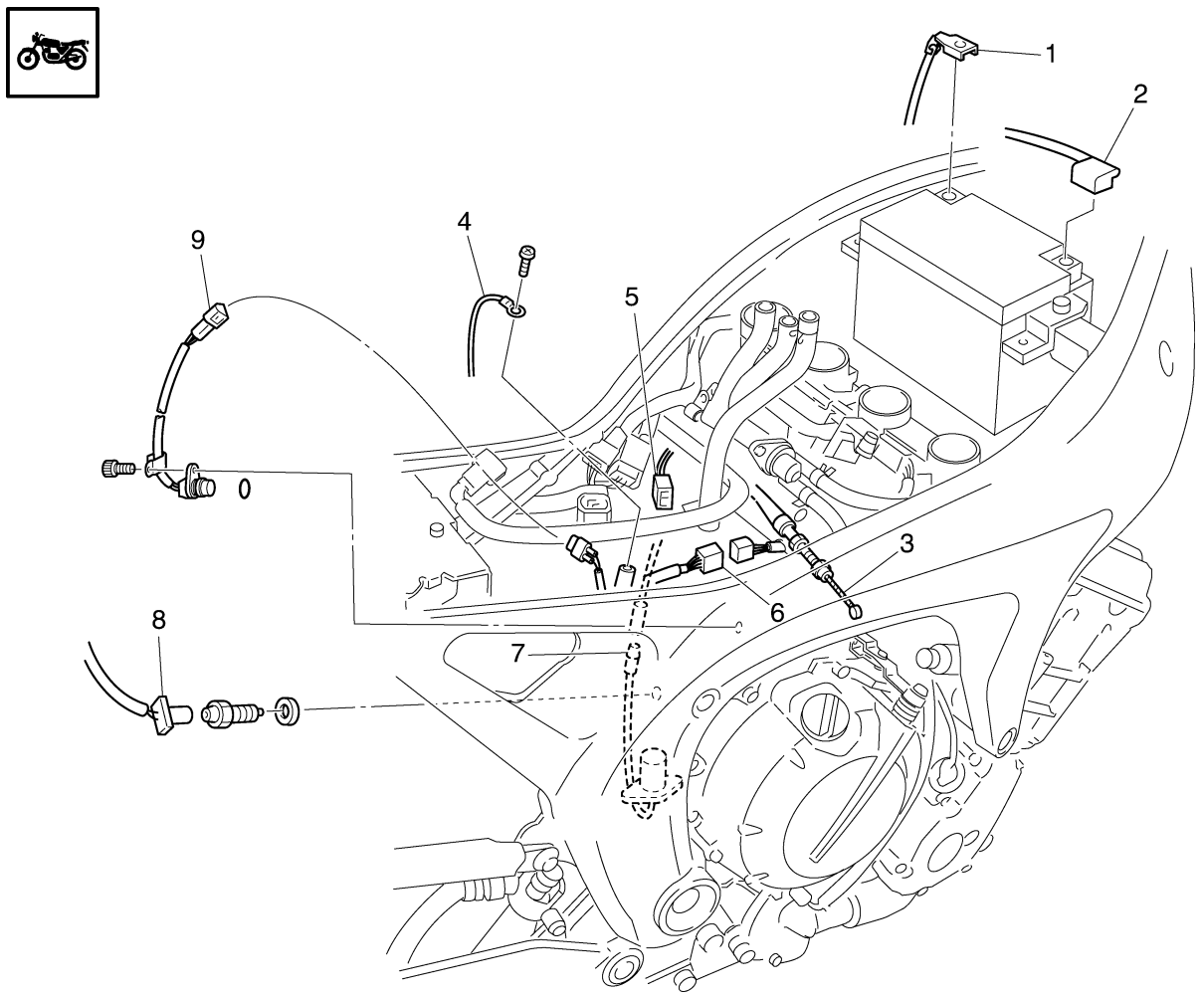
Order	Job/Parts to remove	Q'ty	Remarks
1	Exhaust pipe assembly	1	
2	Exhaust pipe gasket	4	
3	Catalytic converter pipe	1	
4	Muffler cover	1	
5	Muffler	1	
			For installation, reverse the removal procedure.

Disconnecting the leads and hoses



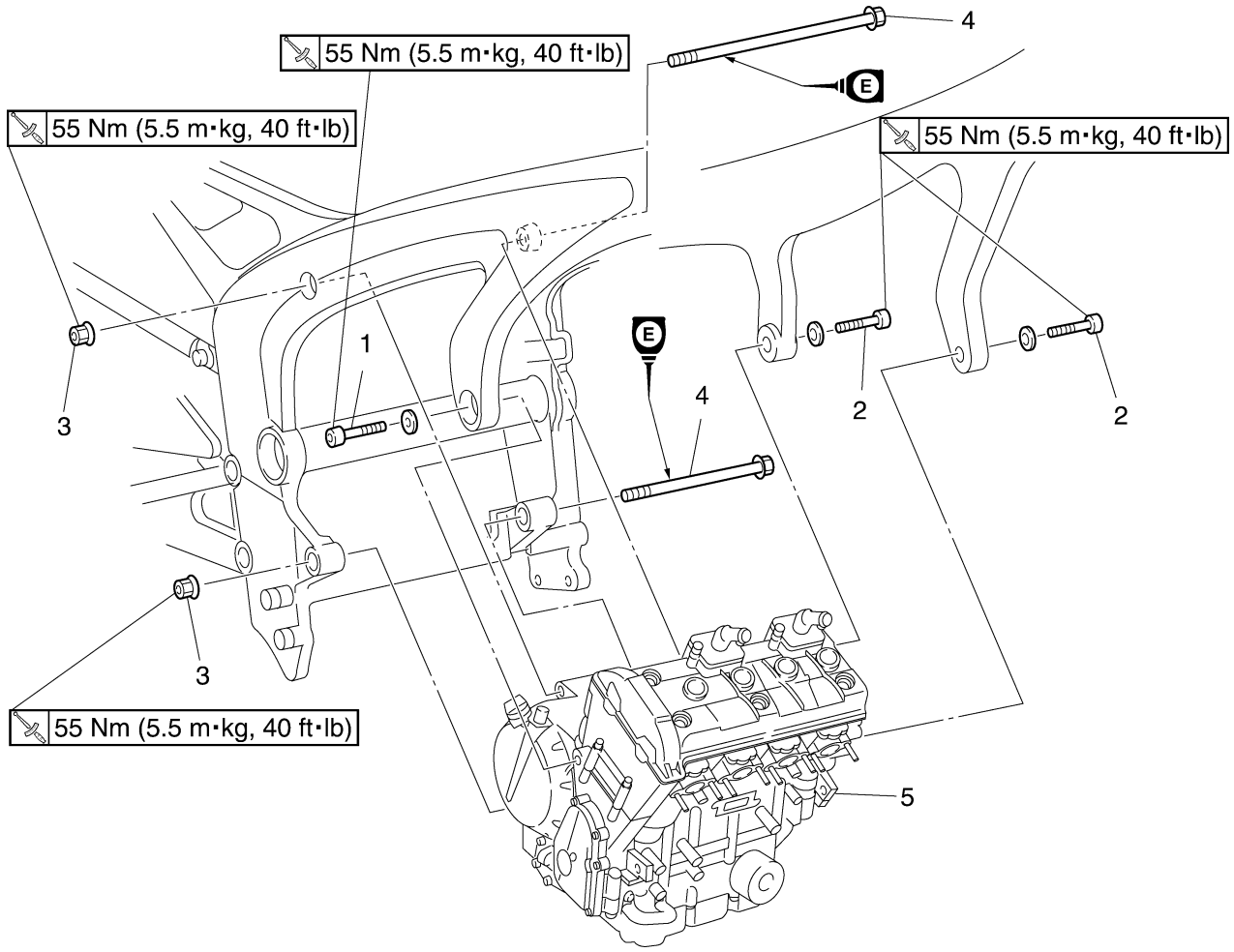
Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Battery		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery box		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery box bracket		Refer to "GENERAL CHASSIS" on page 4-1.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-4.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-14.
	Oil cooler		Refer to "OIL COOLER" on page 6-4.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" on page 7-8.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-36.
1	Battery negative lead	1	
2	Battery positive lead	1	
3	Clutch cable	1	
4	Ground lead	1	

Disconnecting the leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
5	Starter motor lead	1	Disconnect.
6	Stator coil assembly coupler	1	Disconnect.
7	Oil level switch connector	1	Disconnect.
8	Neutral switch coupler	1	Disconnect.
9	Speed sensor coupler	1	Disconnect.
			For assembly, reverse the removal procedure.

Removing the engine

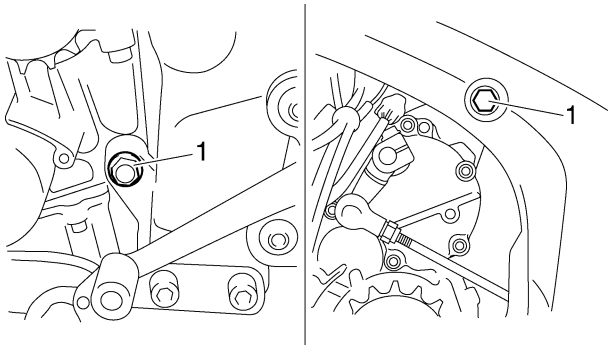


Order	Job/Parts to remove	Q'ty	Remarks
1	Right front engine mounting bolt	1	
2	Left front engine mounting bolt	2	
3	Self-locking nut	2	
4	Rear engine mounting bolt	2	
5	Engine	1	
			For installation, reverse the removal procedure.

EAS23720
INSTALLING THE ENGINE

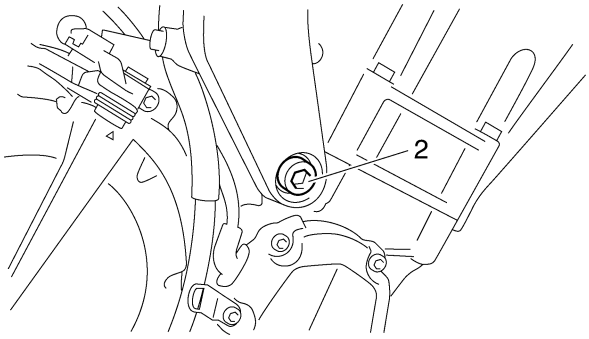
1. Install:
   - Rear engine mounting bolts “1”

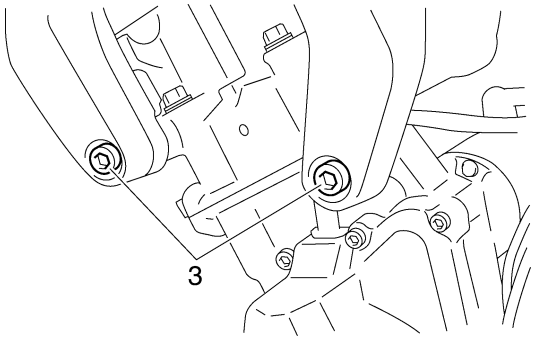
NOTE:
Lubricate the rear engine mounting bolt threads with engine oil.



2. Install:
   - Right front engine mounting bolt “2”
   - Left front engine mounting bolts “3”

NOTE:
Do not fully tighten the bolts.

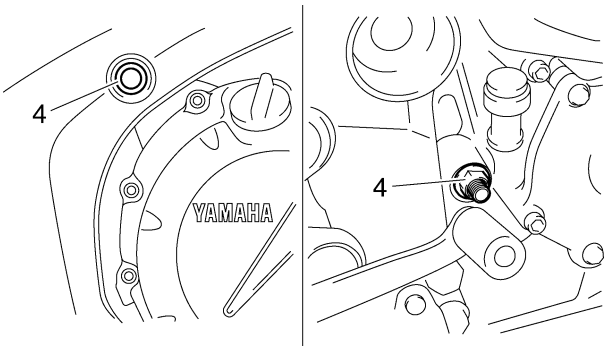




3. Tighten:
   - Self-locking nut “4”

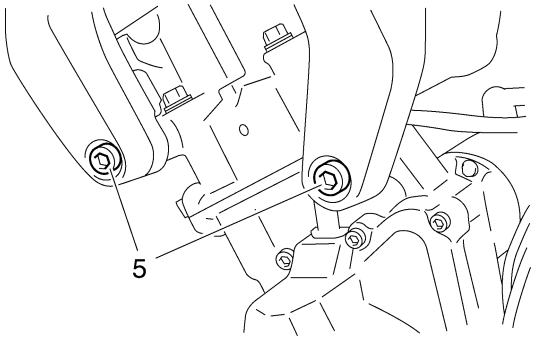
	Self-locking nut **55 Nm (5.5 m·kg, 40 ft·lb)**

NOTE:
First tighten the lower self-locking nut.



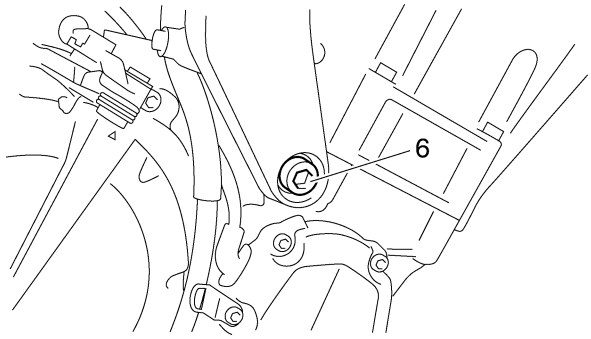
4. Tighten:
   - Left front engine mounting bolts “5”

	Left front engine mounting bolt **55 Nm (5.5 m·kg, 40 ft·lb)**



5. Tighten:
   - Right front engine mounting bolt “6”

	Right front engine mounting bolt **55 Nm (5.5 m·kg, 40 ft·lb)**

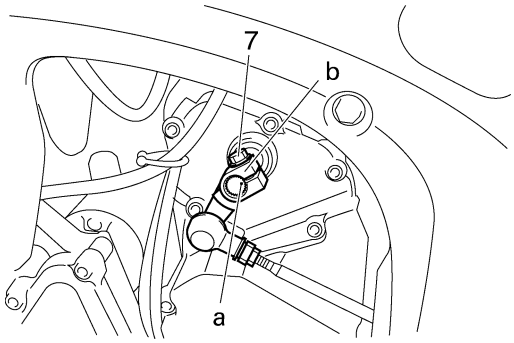


6. Install:
   - Shift arm bolt “7”

	Shift arm bolt **10 Nm (1.0 m·kg, 7.2 ft·lb)**

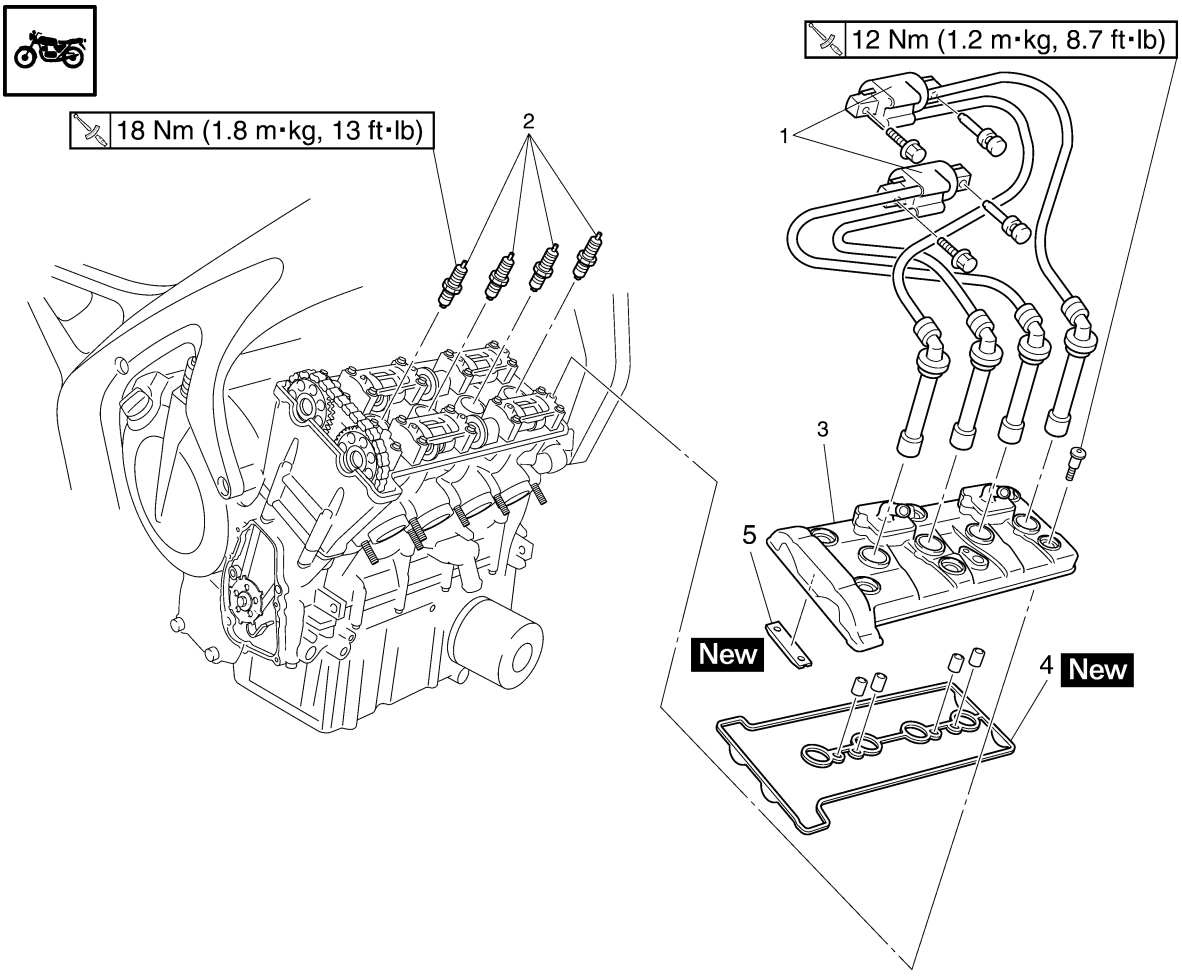
NOTE:

- Before installing, make sure to align the punch mark “a” of the shift shaft with the punch mark “b” of the shift arm.
- Align the bottom edge of the shift pedal with the mark on the frame-to-swingarm bracket.



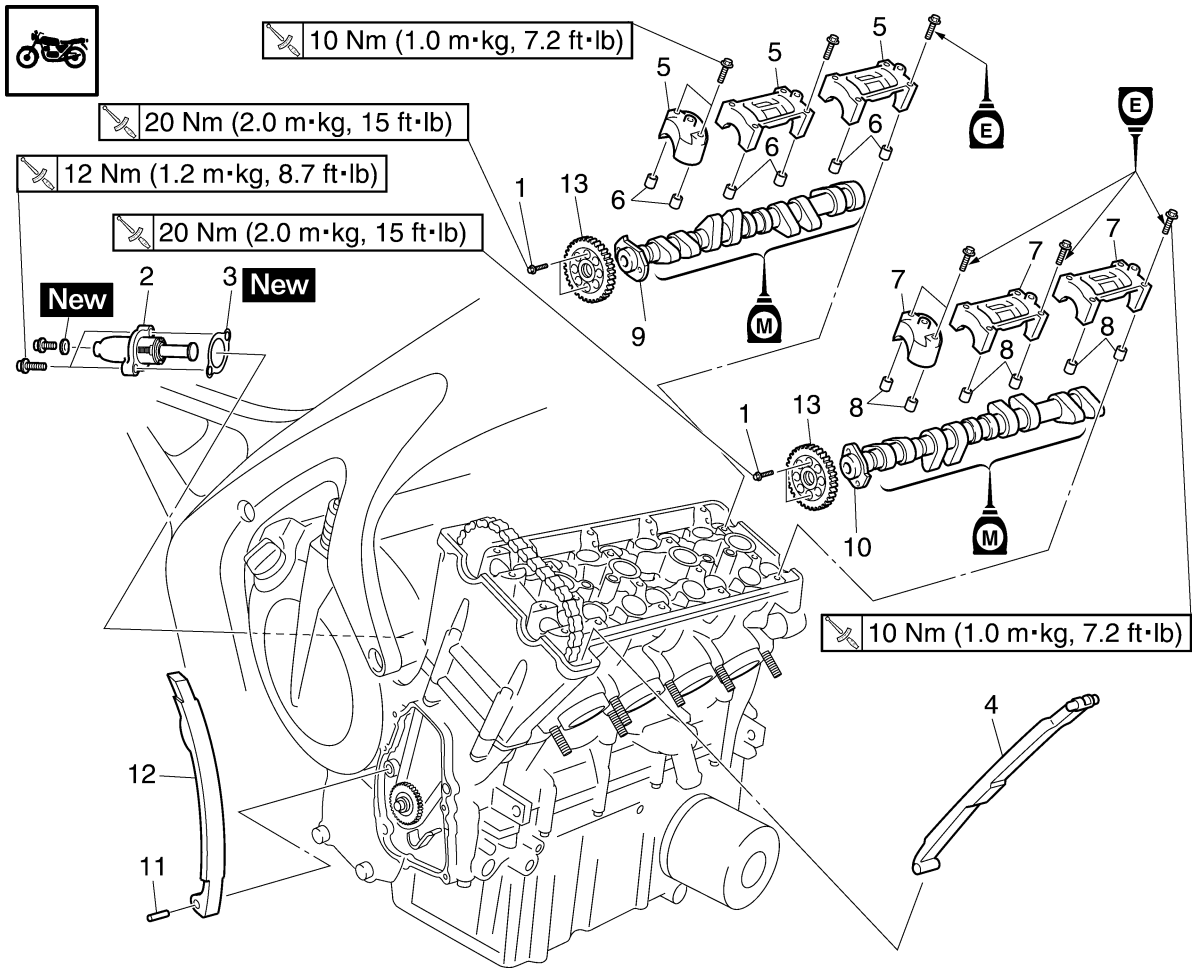
EAS23760
CAMSHAFTS

Removing the cylinder head cover



Order	Job/Parts to remove	Q'ty	Remarks
	Battery		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery box		Refer to "FUEL TANK" on page 7-1.
	Battery box bracket		Refer to "GENERAL CHASSIS" on page 4-1.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-4.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" on page 7-8.
1	Ignition coil	2	
2	Spark plug	4	
3	Cylinder head cover	1	
4	Cylinder head cover gasket	1	
5	Timing chain guide (top side)	1	
			For installation, reverse the removal procedure.

Removing the camshafts



Order	Job/Parts to remove	Q'ty	Remarks
	Pickup rotor cover		Refer to "PICKUP ROTOR" on page 5-33.
1	Camshaft sprocket bolt	4	
2	Timing chain tensioner	1	
3	Timing chain tensioner gasket	1	
4	Timing chain guide (exhaust side)	1	
5	Intake camshaft cap	3	
6	Dowel pin	6	
7	Exhaust camshaft cap	3	
8	Dowel pin	6	
9	Intake camshaft	1	
10	Exhaust camshaft	1	
11	Pin	1	
12	Timing chain guide (intake side)	1	
13	Camshaft sprocket	2	
			For installation, reverse the removal procedure.

EAS23810
REMOVING THE CAMSHAFTS

1. Remove:
   - Pickup rotor cover
     Refer to "PICKUP ROTOR" on page 5-33.
2. Align:
   - "T" mark "a" on the pickup rotor
     (with the crankcase mating surface "b")

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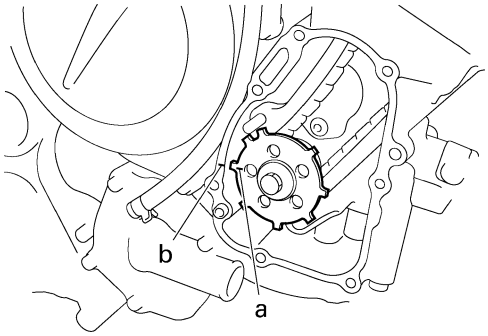
a. Turn the crankshaft clockwise.
b. When piston #1 is at TDC on the compression stroke, align the "T" mark "a" on the pickup rotor with the crankcase mating surface "b".

NOTE:

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



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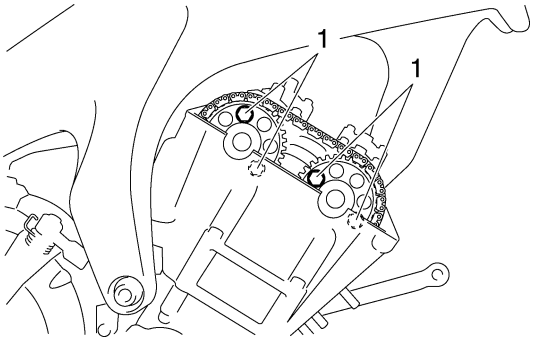
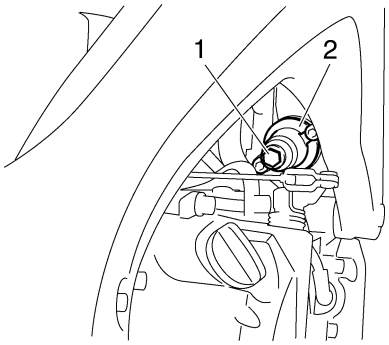
3. Loosen:
   - Camshaft sprocket bolts "1"



4. Loosen:
   - Timing chain tensioner cap bolt "1"
5. Remove:
   - Timing chain tensioner "2"
   - Gasket

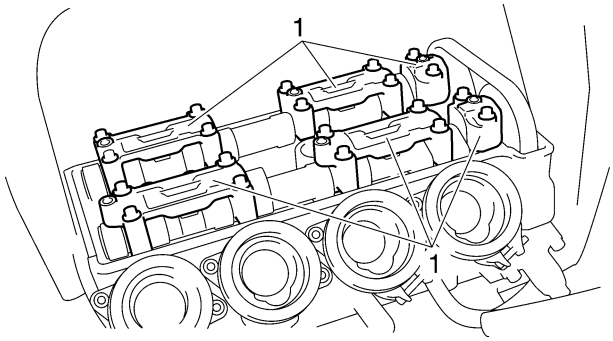


6. Remove:
   - Timing chain guide (exhaust side)
   - Camshaft caps "1"
   - Dowel pins

ECA13720

CAUTION:

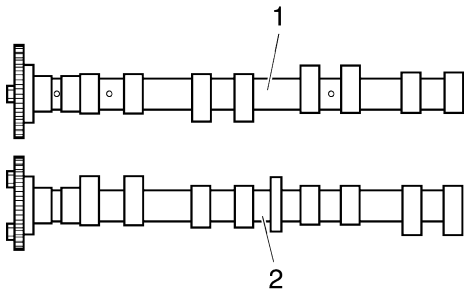
To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a criss-cross pattern, working from the outside in.

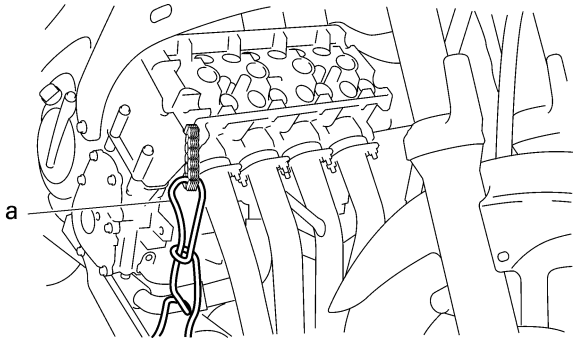


7. Remove:
   - Intake camshaft "1"
   - Exhaust camshaft "2"

NOTE:

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



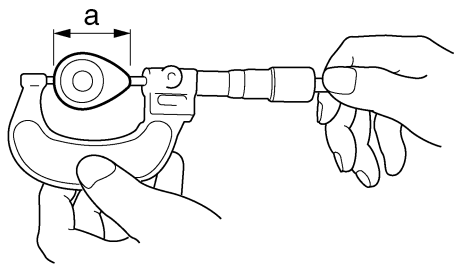


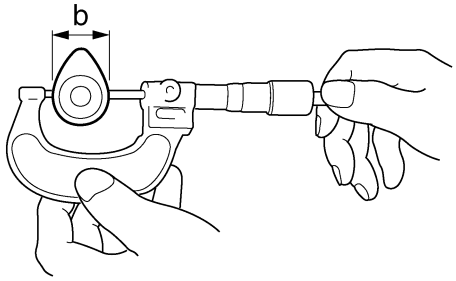
8. Remove:
   • Camshaft sprockets

EAS23850
CHECKING THE CAMSHAFTS

1. Check:
   • Camshaft lobes
   Blue discoloration/pitting/scratches → Replace the camshaft.
2. Measure:
   • Camshaft lobe dimensions “a” and “b”
   Out of specification → Replace the camshaft.

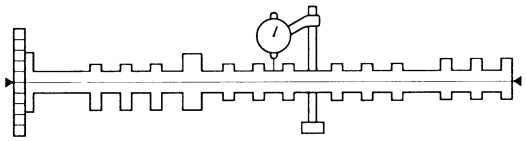
Camshaft lobe dimension limit
Intake A
32.450–32.550 mm (1.2776–1.2815 in)
Limit
32.400 mm (1.2756 in)
Intake B
24.950–25.050 mm (0.9823–0.9862 in)
Limit
24.900 mm (0.9803 in)
Exhaust A
32.450–32.550 mm (1.2776–1.2815 in)
Limit
32.400 mm (1.2756 in)
Exhaust B
24.950–25.050 mm (0.9823–0.9862 in)
Limit
24.900 mm (0.9803 in)





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

Camshaft runout limit
0.060 mm (0.0024 in)



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

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

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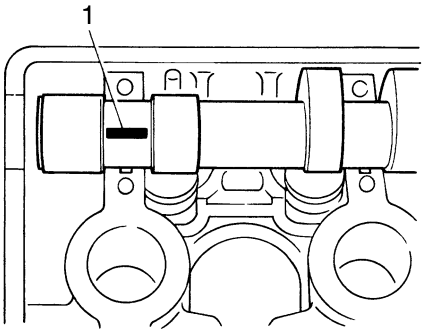
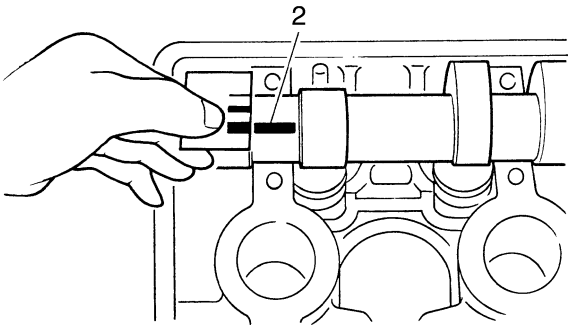
a. Install the camshaft into the cylinder head (without the dowel pins and camshaft caps).
b. Position strip of Plastigauge® “1” onto the camshaft journal as shown.
c. Install the dowel pins and camshaft caps.

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

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

d. Remove the camshaft caps and then measure the width of the Plastigauge® "2".





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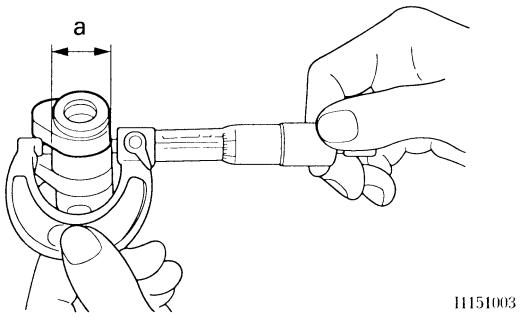
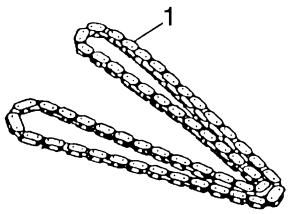
5. Measure:
   - Camshaft journal diameter "a"
     Out of specification → Replace the camshaft.
     Within specification → Replace the cylinder head and the camshaft caps as a set.

Camshaft journal diameter
22.967–22.980 mm (0.9042–0.9047 in)

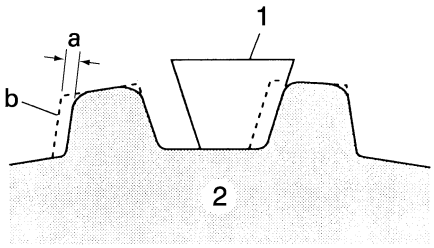


EAS23870
CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET

1. Check:
   - Timing chain "1"
     Damage/stiffness → Replace the timing chain and camshaft sprocket as a set.



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

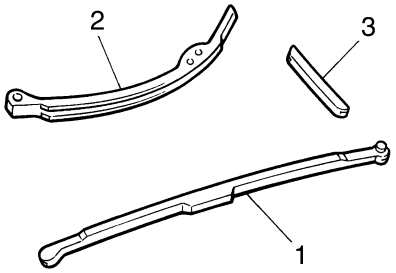


a. 1/4 tooth
b. Correct
1. Timing chain roller
2. Camshaft sprocket

EAS23950
CHECKING THE TIMING CHAIN GUIDES

1. Check:
   - Timing chain guide (exhaust side) "1"
   - Timing chain guide (intake side) "2"
   - Timing chain guide (top side) "3"

Damage/wear → Replace the defective part(s).



EAS23970
CHECKING THE TIMING CHAIN TENSIONER

1. Check:
   - Timing chain tensioner
     Cracks/damage → Replace.
2. Check:
   - One-way cam
     Rough movement → Replace the timing chain tensioner assembly.

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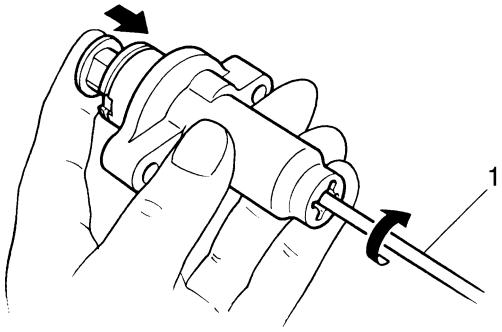
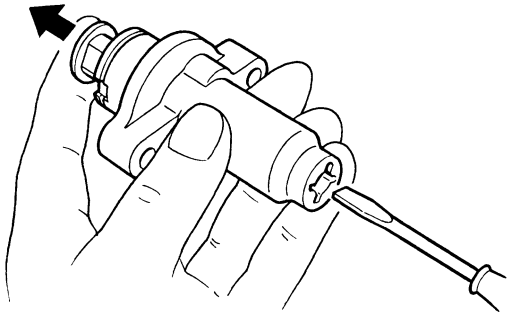
a. Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.

NOTE:
While pressing the timing chain tensioner rod, wind it clockwise with a thin screwdriver "1" until it stops.

b. Remove the screwdriver and slowly release the timing chain tensioner rod.
c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.





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3. Check:
   - Timing chain tensioner cap bolt
   - Aluminum washer New
   - Gasket New
     Damage/wear → Replace the defective part(s).

EAS24010
INSTALLING THE CAMSHAFTS

1. Align:
   - "T" mark "a" on the pickup rotor
     (with the crankcase mating surface "b")

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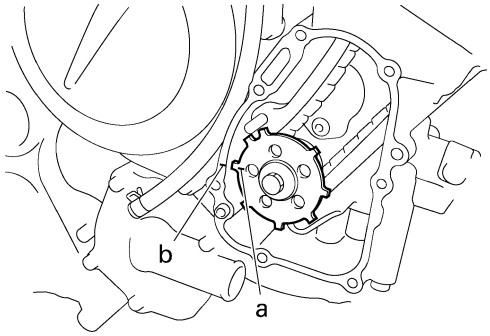
a. Turn the crankshaft clockwise.
b. When piston #1 is at TDC, align the "T" mark "a" with the crankcase mating surface "b".



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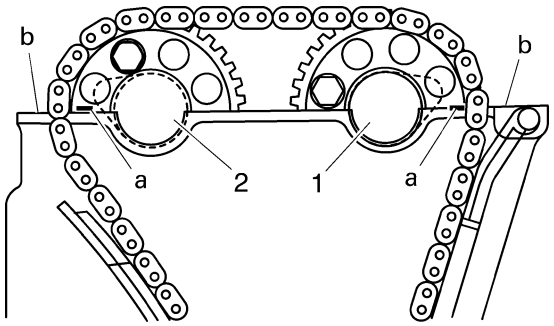
2. Install:
   - Exhaust camshaft "1"
   - Intake camshaft "2"
     (with the camshaft sprockets temporarily tightened)

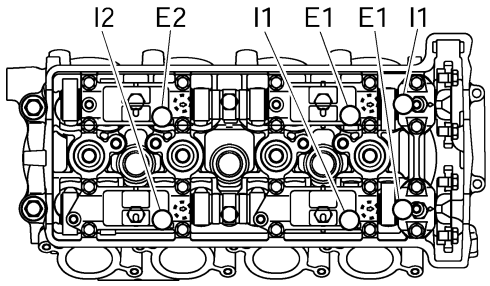
NOTE:
Make sure the match mark "a" on the camshaft sprockets is aligned with the cylinder head edge "b".

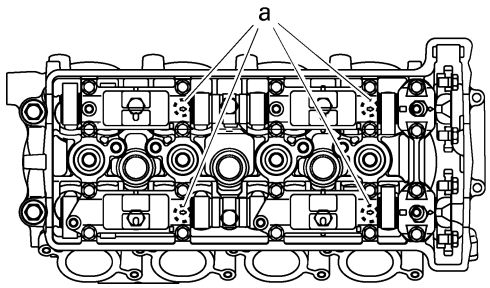


3. Install:
   - Dowel pins
   - Intake camshaft caps
   - Exhaust camshaft caps

NOTE:

- Make sure each camshaft cap is installed in its original place. Refer to the identification marks as follows:
  "I1", "I2": Intake side camshaft cap mark
  "E1", "E2": Exhaust side camshaft cap mark
- Make sure the arrow mark "a" on each camshaft points towards the right side of the engine.





4. Install:
   - Camshaft cap bolts

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

NOTE:

Tighten the camshaft cap bolts in stages and in a crisscross pattern, working from the inner caps out.

ECA4S81016

CAUTION:

- **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.**

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

NOTE:

When installing the timing chain guide, be sure to keep the timing chain as tight as possible on the exhaust side.

6. Install:
   - Timing chain tensioner

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

EWA4S81008

⚠ WARNING

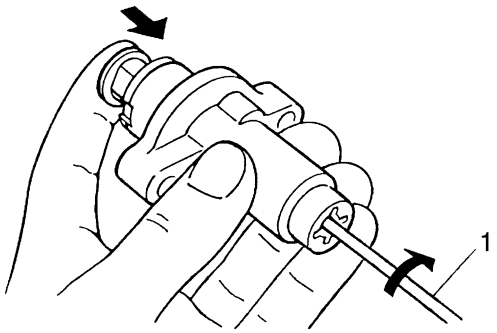
Always use a new gasket.

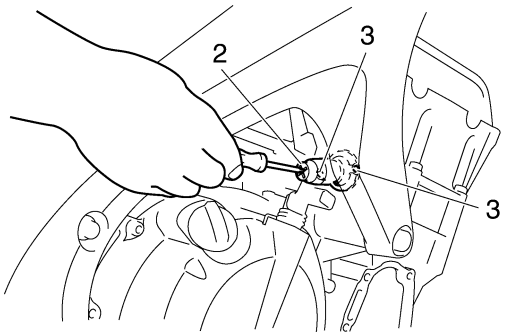
c. Tighten the timing chain tensioner bolts "3" to the specified torque.

	Timing chain tensioner bolt **12 Nm (1.2 m·kg, 8.7 ft·lb)**

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

	Timing chain tensioner cap bolt **7 Nm (0.7 m·kg, 5.1 ft·lb)**





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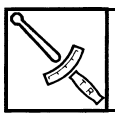
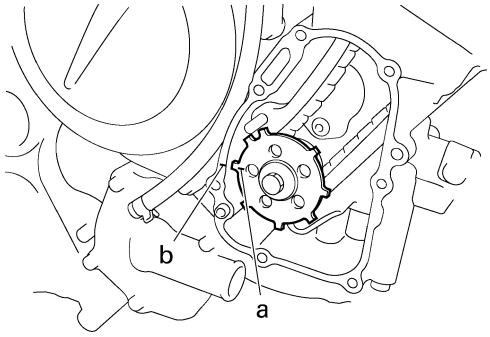
7. Turn:
   - Crankshaft
     (several full turns clockwise)
8. Check:
   - "T" mark "a"
     Make sure the "T" mark on the pickup rotor is aligned with the crankcase mating sure face "b".
   - Camshaft sprocket match mark "c"
     Make sure the match marks on the camshaft sprockets are aligned with the edge of the cylinder head "d".
     Out of alignment → Adjust.
     Refer to the installation steps above.
9. Tighten:
   - Camshaft sprocket bolts "1"

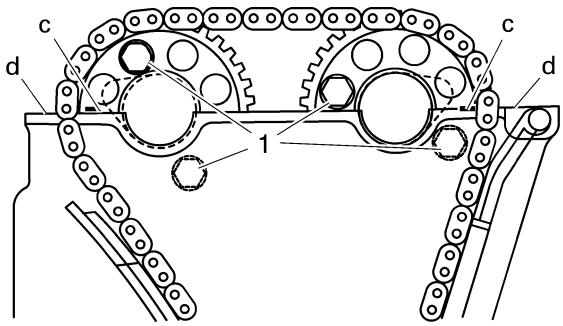
	**Camshaft sprocket bolts 20 Nm (2.0 m·kg, 1.5 ft·lb)**

ECA4S81017

CAUTION:

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

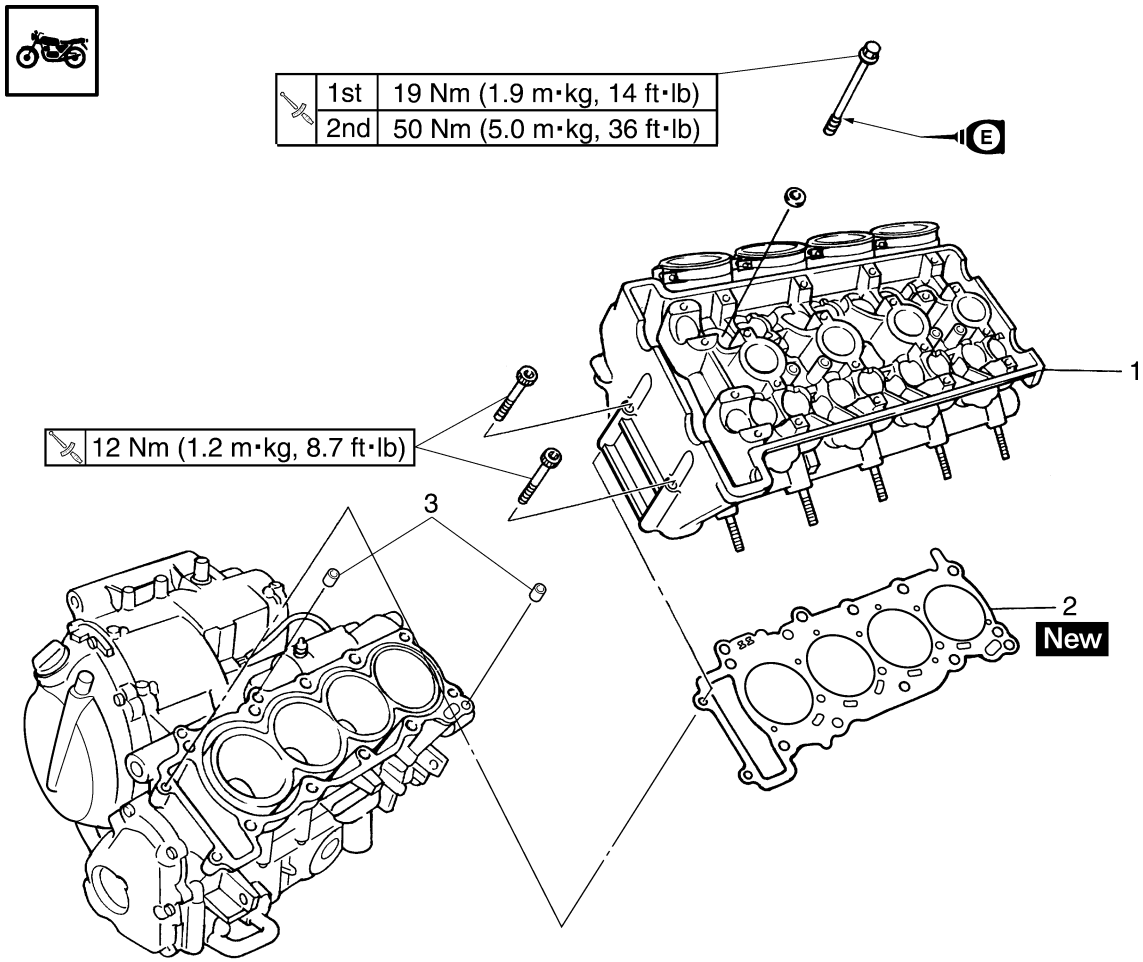




10. Measure:
    - Valve clearance
      Out of specification → Adjust.
      Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-4.

EAS24100
CYLINDER HEAD

Removing the cylinder head

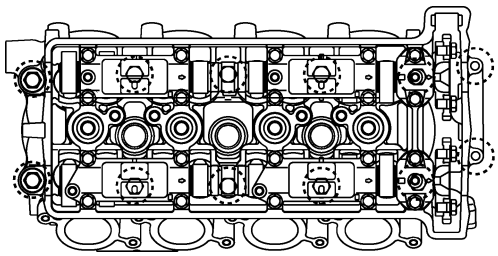


Order	Job/Parts to remove	Q'ty	Remarks
	Intake camshaft		Refer to "CAMSHAFTS" on page 5-8.
	Exhaust camshaft		Refer to "CAMSHAFTS" on page 5-8.
1	Cylinder head	1	
2	Cylinder head gasket	1	
3	Dowel pin	2	
			For installation, reverse the removal procedure.

EAS24120
REMOVING THE CYLINDER HEAD

1. Remove:
   - Cylinder head bolts

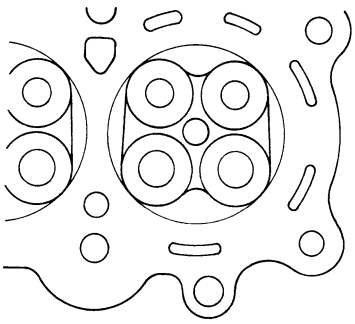
NOTE:
- Loosen the bolts in the proper sequence as shown.
- Loosen each bolts 1/2 of a turn at a time. After all of the bolts are fully loosened, remove them.



EAS24160
CHECKING THE CYLINDER HEAD

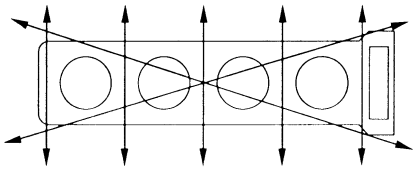
1. Eliminate:
   - Combustion chamber carbon deposits (with a rounded scraper)

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



2. Check:
   - Cylinder head
     Damage/scratches → Replace.
   - Cylinder head water jacket
     Mineral deposits/rust → Eliminate.
3. Measure:
   - Cylinder head warpage
     Out of specification → Resurface the cylinder head.

	Warpage limit **0.05 mm (0.0020 in)**



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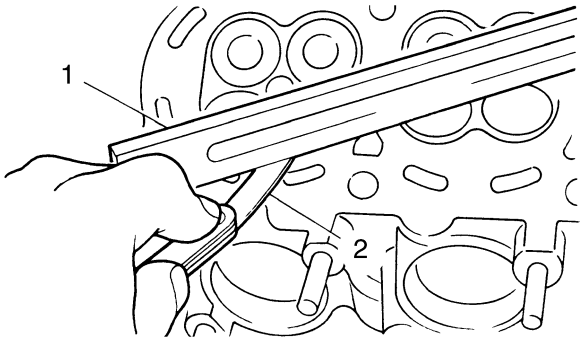
a. Place a straightedge “1” and a thickness gauge “2” across the cylinder head.



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

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

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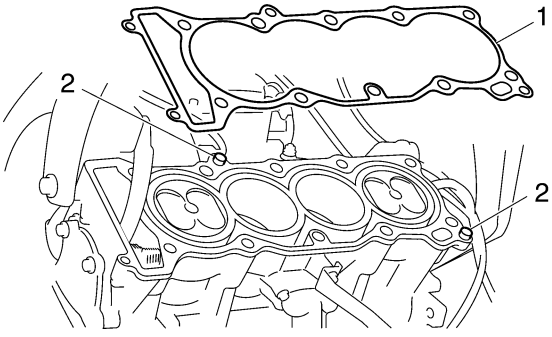
EAS24240
INSTALLING THE CYLINDER HEAD

1. Install:
   - Cylinder head gasket “1” New
   - Dowel pins “2”



2. Install:
   - Cylinder head

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

3. Tighten:
   • Cylinder head bolts “1” – “10”

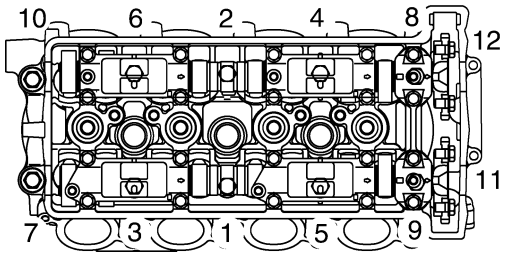
	Cylinder head bolt (1st) **19 Nm (1.9 m·kg, 14 ft·lb)**

	Cylinder head bolt (2 nd) **50 Nm (5.0 m·kg, 36 ft·lb)**

   • Cylinder head bolts “11” “12”

	Cylinder head bolt **12 Nm (1.2 m·kg, 8.7 ft·lb)**

NOTE:
- Lubricate the cylinder head bolts with engine oil.
- Tighten the cylinder head bolts in the proper tightening sequence as shown and torque them in two stages.
- First, tighten the bolts “1” – ”10” to approximately 19 Nm (1.9 m·kg, 14 ft·lb) with a torque wrench and then tighten the 50 Nm (5.0 m·kg, 36 ft·lb).

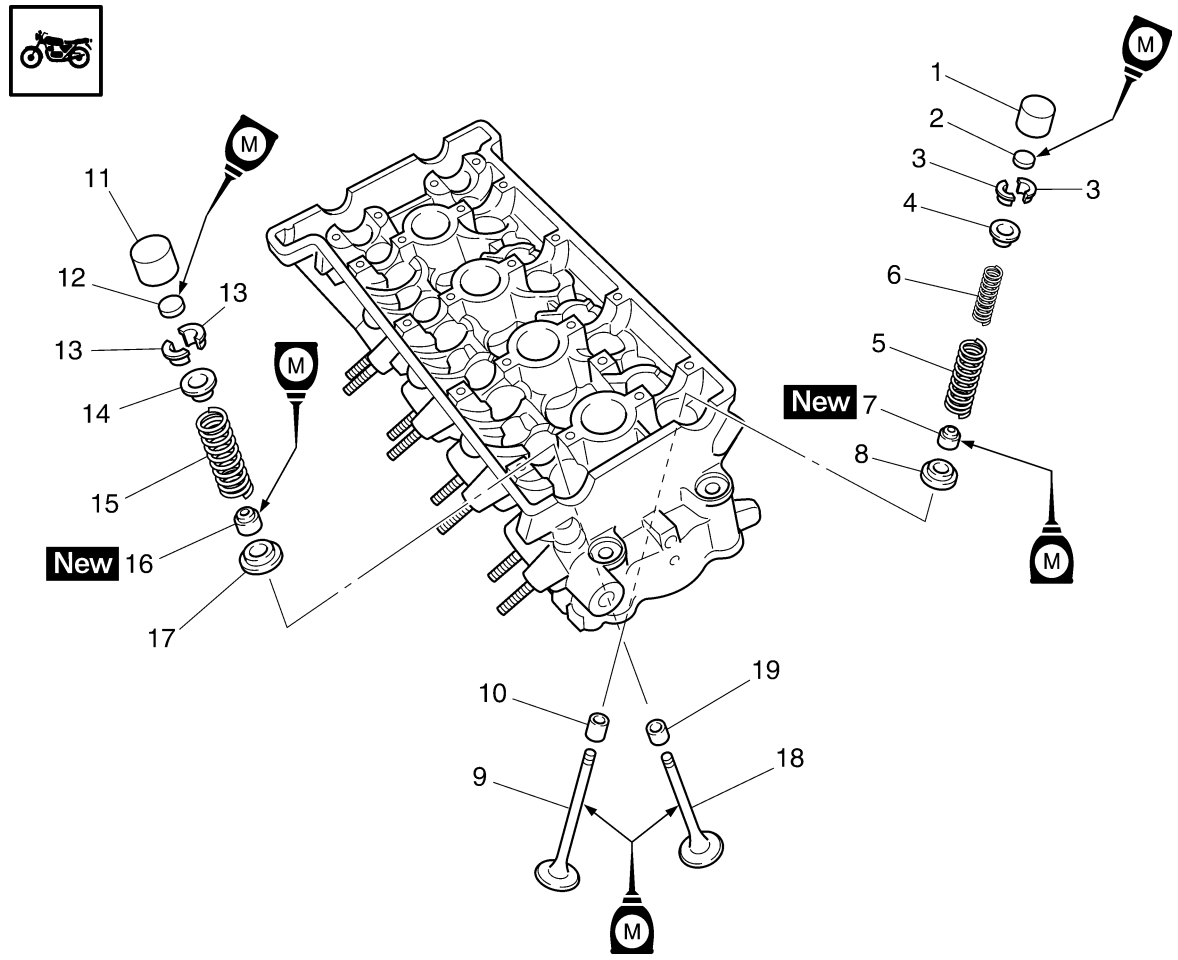


4. Install:
   • Exhaust camshaft
   • Intake camshaft
   Refer to "INSTALLING THE CAMSHAFTS" on page 5-13.

EAS24270

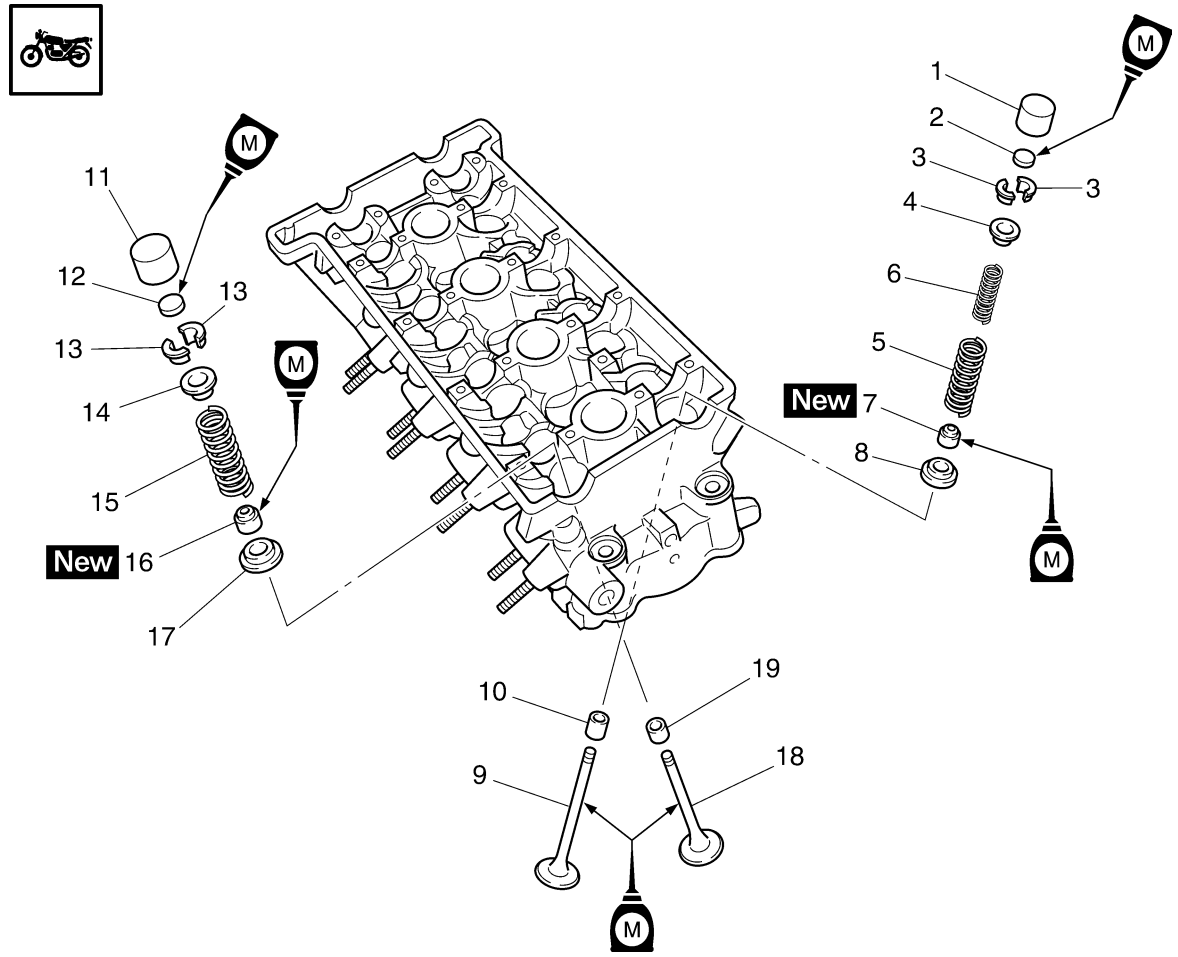
VALVES AND VALVE SPRINGS

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-16.
1	Intake valve lifter	8	
2	Intake valve pad	8	
3	Intake valve cotter	16	
4	Intake valve upper spring seat	8	
5	Intake valve spring outer	8	
6	Intake valve spring inner	8	
7	Intake valve stem seal	8	
8	Intake valve lower spring seat	8	
9	Intake valve	8	
10	Intake valve guide	8	
11	Exhaust valve lifter	8	
12	Exhaust valve pad	8	
13	Exhaust valve cotter	16	
14	Exhaust valve upper spring seat	8	
15	Exhaust valve spring	8	
16	Exhaust valve stem seal	8	
17	Exhaust valve lower spring seat	8	
18	Exhaust valve	8	
19	Exhaust valve guide	8	

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
			For installation, reverse the removal procedure.

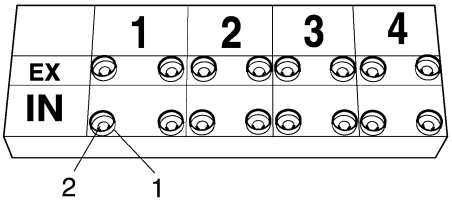
EAS24280
REMOVING THE VALVES

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

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

1. Remove:
   - Valve lifter “1”
   - Valve pad “2”

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



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2. Check:
   - Valve sealing
     Leakage at the valve seat → Check the valve face, valve seat, and valve seat width. Refer to "CHECKING THE VALVE SEATS" on page 5-23.

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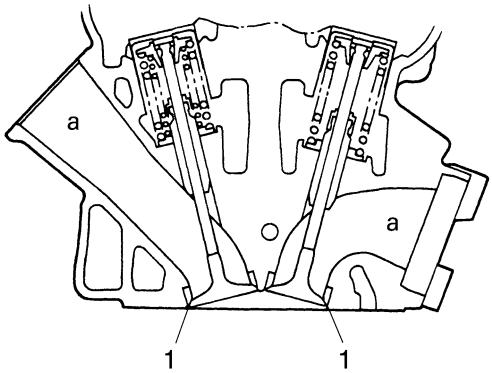
a. Pour a clean solvent “a” into the intake and exhaust ports.
b. Check that the valves properly seal.

NOTE:
There should be no leakage at the valve seat “1”.



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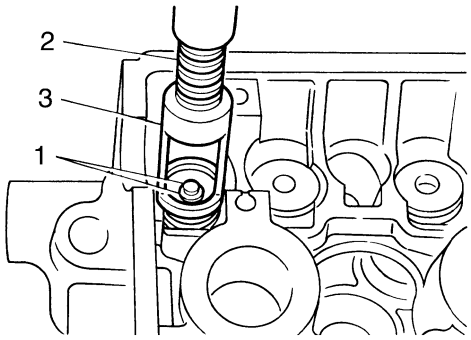
3. Remove:
   - Valve cotters “1”

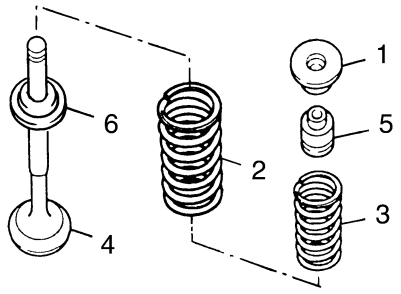
NOTE:
Remove the valve cotters by compressing the valve springs with the valve spring compressor “2” and the valve spring compressor attachment “3”.

Valve spring compressor
90890-04019
YM-04019
Valve spring compressor attachment
90890-04108
Valve spring compressor adapter 22 mm
YM-04108



4. Remove:
   - Upper spring seat “1”
   - Valve spring outer “2”
   - Valve spring inner (intake only) “3”
   - Valve “4”
   - Valve stem seal “5”
   - Lower spring seat “6”

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



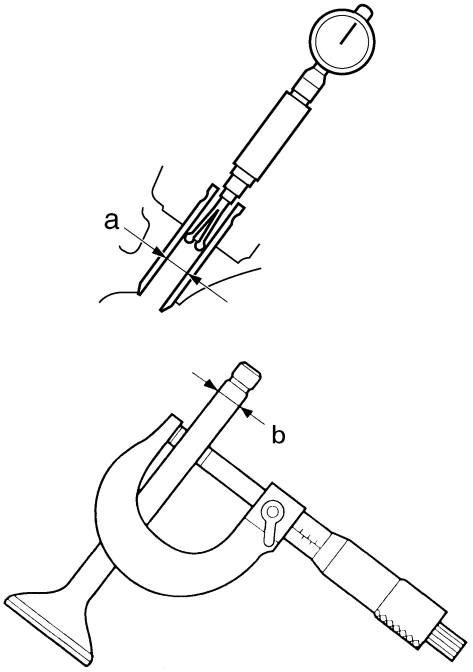
EAS24290
CHECKING THE VALVES AND VALVE GUIDES

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"

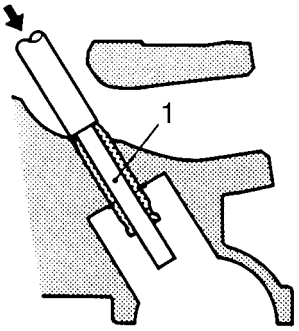
Valve-stem-to-valve-guide clearance
Valve-stem-to-valve-guide clearance (intake)
0.010–0.037 mm (0.0004–0.0015 in)
Limit
0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)
0.025–0.052 mm (0.0010–0.0020 in)
Limit
0.100 mm (0.0039 in)



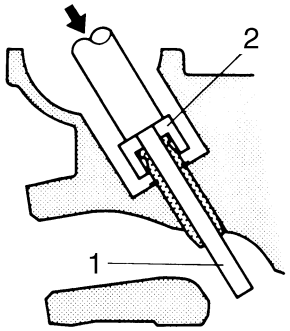
2. Replace:
   - Valve guide

NOTE:
To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100°C (212°F) in an oven.

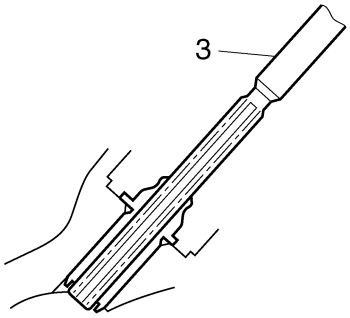
a. Remove the valve guide with the valve guide remover "1".



b. Install the new valve guide with the valve guide installer "2" and valve guide remover "1".



c. After installing the valve guide, bore the valve guide with the valve guide reamer "3" to obtain the proper valve-stem-to-valve-guide clearance.



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

Valve guide remover (ø4)
90890-04111
Valve guide remover (4.0 mm)
YM-04111
Valve guide installer (ø4)
90890-04112
Valve guide installer (4.0 mm)
YM-04112
Valve guide reamer (ø4)
90890-04113
Valve guide reamer (4.0 mm)
YM-04113

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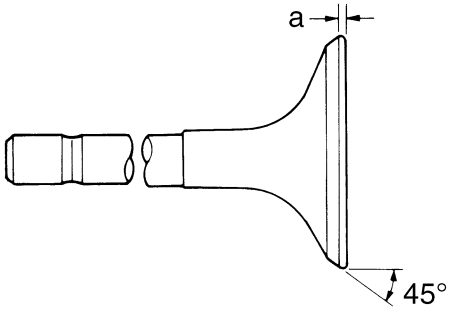
3. Eliminate:
   - Carbon deposits
     (from the valve face and valve seat)
4. Check:
   - Valve face
     Pitting/wear → Grind the valve face.
   - Valve stem end
     Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
   - Valve margin thickness "a"
     Out of specification → Replace the valve.

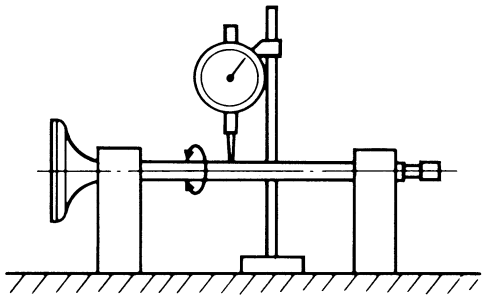
Valve margin thickness
Valve margin thickness D (intake)
0.60–0.80 mm (0.0236–0.0315 in)
Limit
0.5 mm (0.02 in)
Valve margin thickness D (exhaust)
0.60–0.80 mm (0.0236–0.0315 in)
Limit
0.5 mm (0.02 in)



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

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

Valve stem runout
Valve stem runout
0.040 mm (0.0016 in)

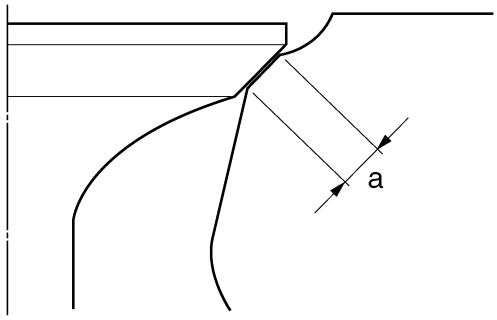


EAS24300
CHECKING THE VALVE SEATS

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

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

Valve seat width
Valve seat width C (intake)
0.90–1.10 mm (0.0354–0.0433 in)
Limit
1.6 mm (0.06 in)
Valve seat width C (exhaust)
0.90–1.10 mm (0.0354–0.0433 in)
Limit
1.6 mm (0.06 in)



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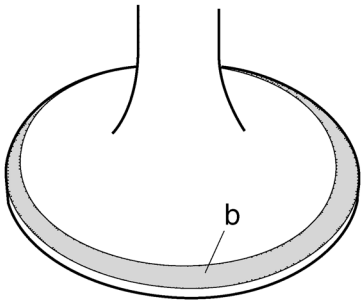
a. Apply Mechanic's blueing dye (Dykem) "b" onto the valve face.



b. Install the valve into the cylinder head.
c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
d. Measure the valve seat width.

NOTE:

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

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4. Lap:
   - Valve face
   - Valve seat

NOTE:

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

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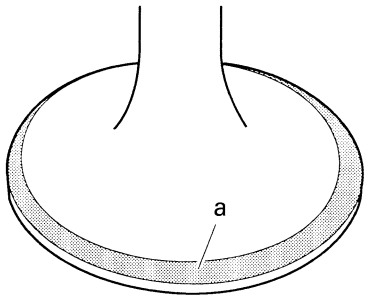
a. Apply a coarse lapping compound "a" to the valve face.

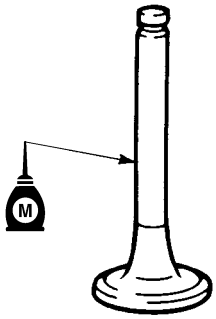
ECA13790

CAUTION:

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



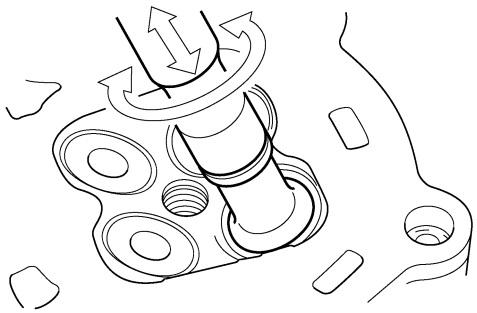
b. Apply molybdenum disulfide oil onto the valve stem.



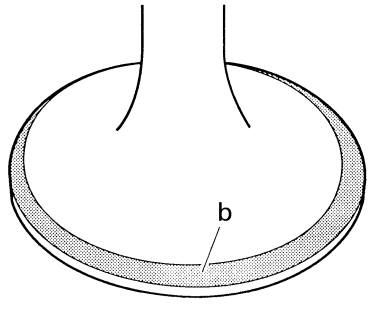
c. Install the valve into the cylinder head.
d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

NOTE:

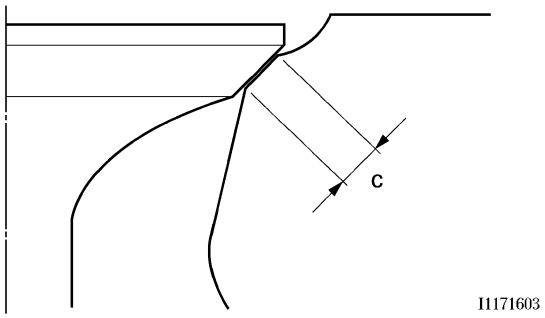
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



e. Apply a fine lapping compound to the valve face and repeat the above steps.
f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
g. Apply Mechanic's blueing dye (Dykem) "b" onto the valve face.



h. Install the valve into the cylinder head.
i. Press the valve through the valve guide and onto the valve seat to make a clear impression.
j. Measure the valve seat width “c” again. If the valve seat width is out of specification, reface and lap the valve seat.



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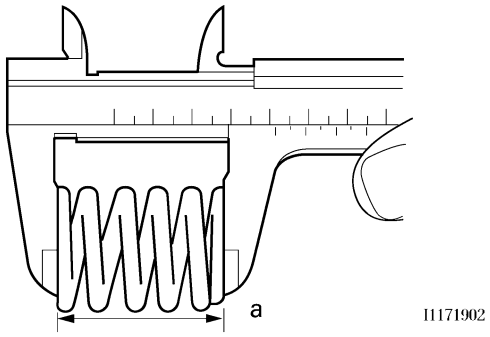
EAS24310
CHECKING THE VALVE SPRINGS

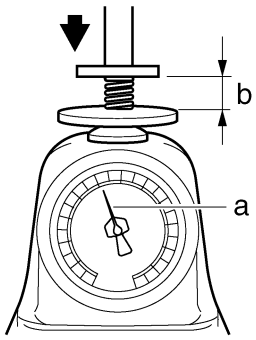
The following procedure applies to all of the valve springs.

1. Measure:
   • Valve spring free length “a”
   Out of specification → Replace the valve spring.

Inner spring
Free length (intake)
37.04 mm (1.46 in)
Limit
35.20 mm (1.39 in)
Free length (exhaust)
41.79 mm (1.65 in)
Limit
39.70 mm (1.56 in)
Outer spring
Free length (intake)
38.40 mm (1.51 in)
Limit
36.50 mm (1.44 in)

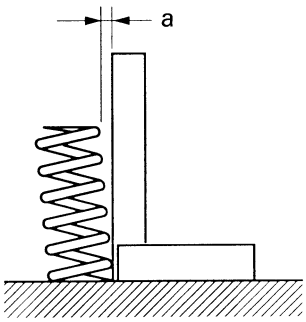


2. Measure:
   • Compressed valve spring force “a”
   Out of specification → Replace the valve spring.



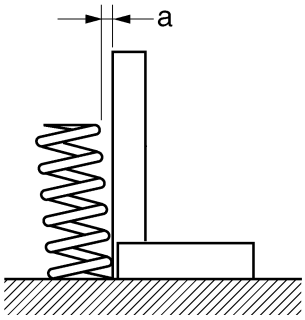
b. Installed length

Inner spring
Installed compression spring force (intake)
69–79 N (15.51–17.76 lbf) (7.04–8.06 kgf)
Installed compression spring force (exhaust)
160–184 N (35.97–41.36 lbf) (16.32–18.76 kgf)
Outer spring
Installed compression spring force (intake)
114–132 N (25.63–29.67 lbf) (11.62–13.46 kgf)
Inner spring
Installed length (intake)
30.02 mm (1.18 in)
Installed length (exhaust)
36.12 mm (1.42 in)
Outer spring
Installed length (intake)
32.52 mm (1.28 in)



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

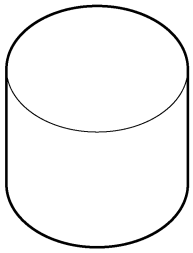
Spring tilt limit
Spring tilt (intake)
2.5 °/1.6 mm (0.06 in)
Spring tilt (exhaust)
2.5 °/1.8 mm (0.07 in)
Spring tilt (intake)
2.5 °/1.7 mm (0.07 in)



EAS24320
CHECKING THE VALVE LIFTERS

The following procedure applies to all of the valve lifters.

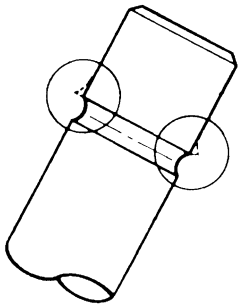
1. Check:
   • Valve lifter
   Damage/scratches → Replace the valve lifters and cylinder head.



EAS24340
INSTALLING THE VALVES

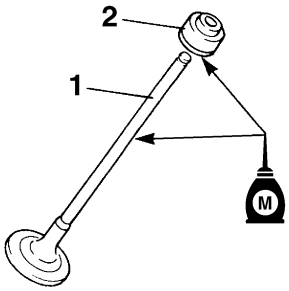
The following procedure applies to all of the valves and related components.

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



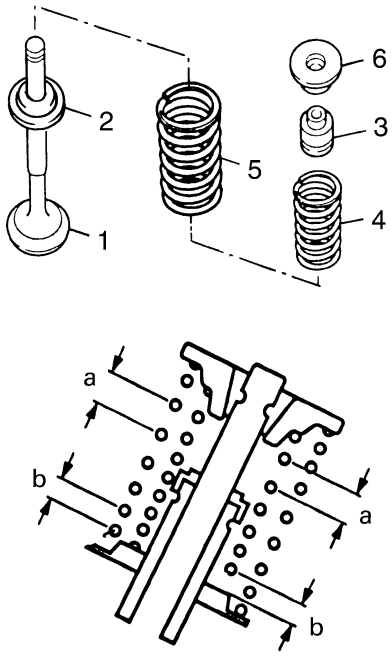
2. Lubricate:
   • Valve stem “1”
   • Valve stem seal “2”
   (with the recommended lubricant)

Recommended lubricant
Molybdenum disulfide oil



3. Install:
   • Valve “1”
   • Lower spring seat “2”
   • Valve stem seal “3”
   • Valve spring inner (intake only) “4”
   • Valve spring outer “5”
   • Upper spring seat “6”
   (into the cylinder head)

NOTE:
- Make sure each valve is installed in its original place.
- Install the valve springs with the larger pitch “a” facing up.

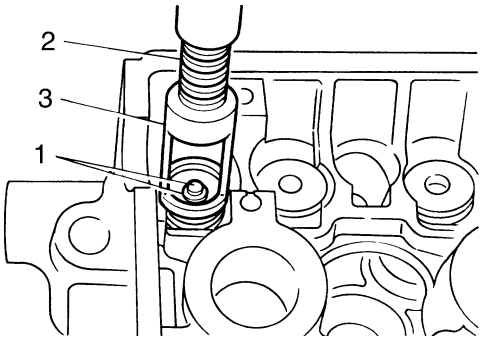


b. Smaller pitch

4. Install:
   • Valve cotters “1”

NOTE:
Install the valve cotters by compressing the valve spring with the valve spring compressor “2” and the valve spring compressor attachment “3”.

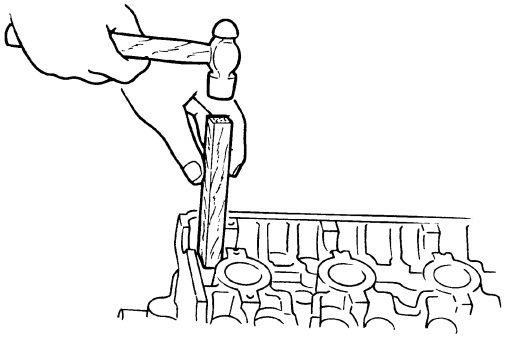
Valve spring compressor
90890-04019
YM-04019
Valve spring compressor attachment
90890-04108
Valve spring compressor adapter 22 mm
YM-04108



5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

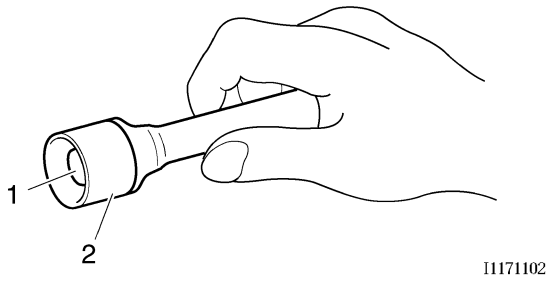
ECA13800

CAUTION:
Hitting the valve tip with excessive force could damage the valve.



6. Lubricate:
   • Valve pad “1”
   • Valve lifter “2”
   (with the recommended lubricant)

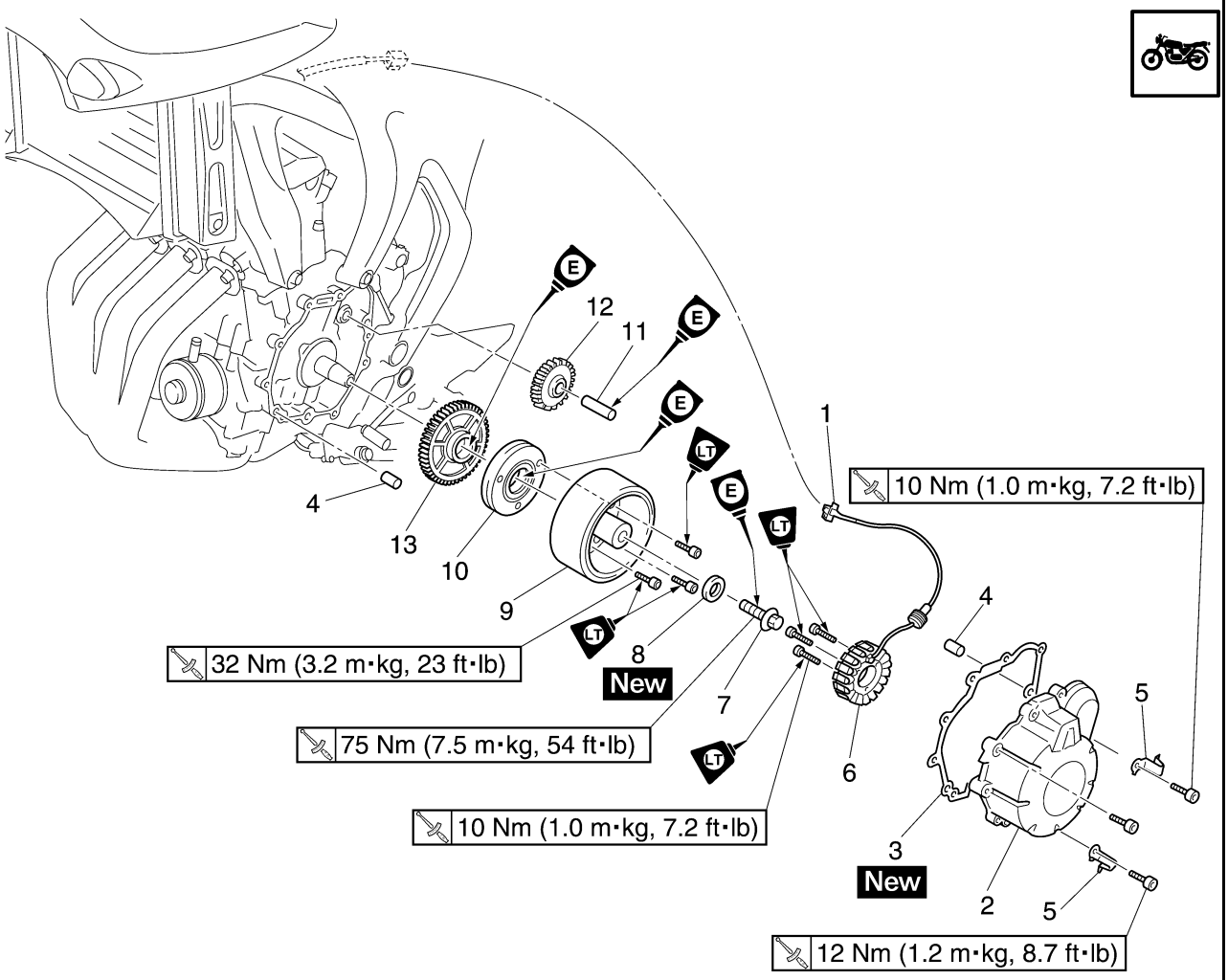
NOTE:
- Lubricate the valve lifter and valve pad with molybdenum disulfide oil.
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in its original position.



EAS4S81014

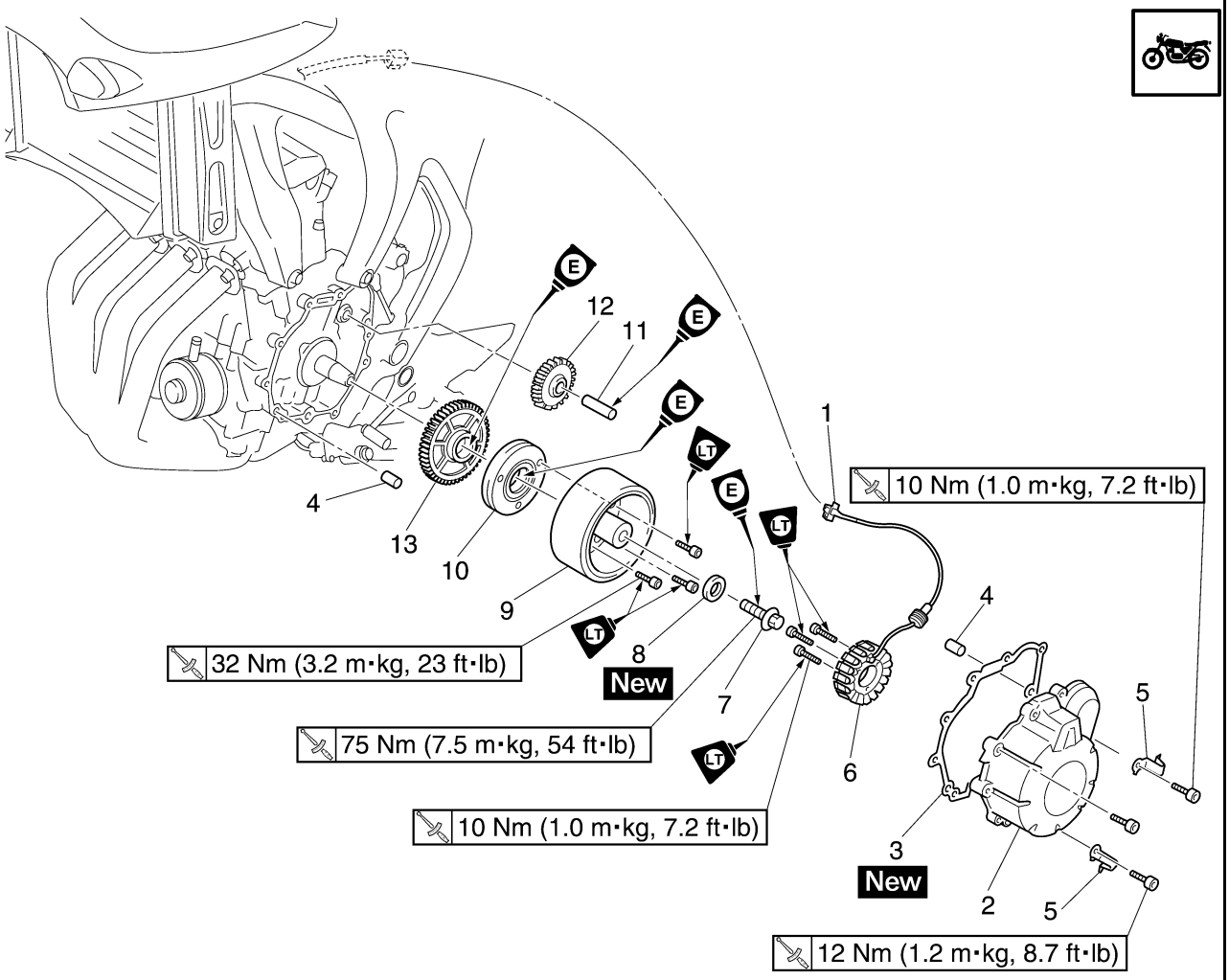
GENERATOR AND STARTER CLUTCH

Removing the generator and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Coolant		Drain Refer to "CHANGING THE COOLANT" on page 3-20.
	Coolant reservoir tank		Refer to "RADIATOR" on page 6-1.
	Engine oil		Drain Refer to "CHANGING THE ENGINE OIL" on page 3-14.
1	Startor coil assembly lead coupler	1	Disconnect.
2	Generator rotor cover	1	
3	Generator rotor cover gasket	1	
4	Dowel pin	2	
5	Startor coil assembly lead holder	2	
6	Startor coil assembly	1	
7	Generator rotor bolt	1	
8	Washer	1	
9	Generator rotor	1	
10	Starter clutch assembly	1	

Removing the generator and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
11	Idler gear shaft	1	
12	Idler gear	1	
13	Starter clutch drive gear	1	
			For installation, reverse the removal procedure.

EAS24490
REMOVING THE GENERATOR

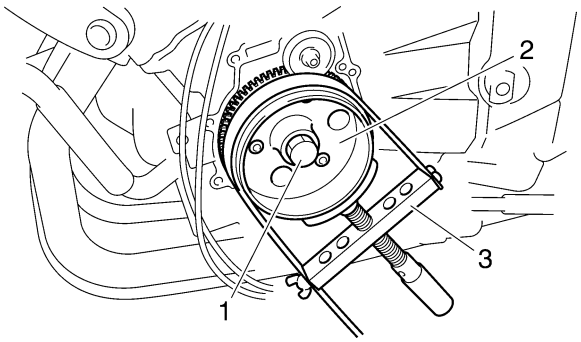
1. Remove:
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Drain:
   - Coolant
     Refer to "CHANGING THE COOLANT" on page 3-20.
   - Engine oil
     Refer to "CHANGING THE ENGINE OIL" on page 3-14.
3. Remove:
   - Generator rotor cover

NOTE:
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.

4. Remove:
   - Generator rotor bolt "1"
   - Washer

NOTE:
- While holding the generator rotor "2" with the sheave holder "3", loosen the generator rotor bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.

Sheave holder
90890-01701
Primary clutch holder
YS-01880-A

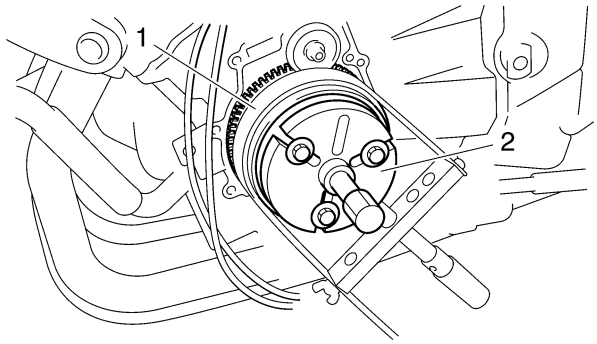


5. Remove:
   - Generator rotor "1"
     (with the flywheel puller "2" and flywheel puller attachment)
   - Woodruff key

ECA13880
CAUTION:
To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set's center bolt and the crankshaft.

NOTE:
Make sure the flywheel puller is centered over the generator rotor.

Flywheel puller
90890-01362
Heavy duty puller
YU-33270-B
Flywheel puller attachment
90890-04089
Crankshaft protector
YM-33282

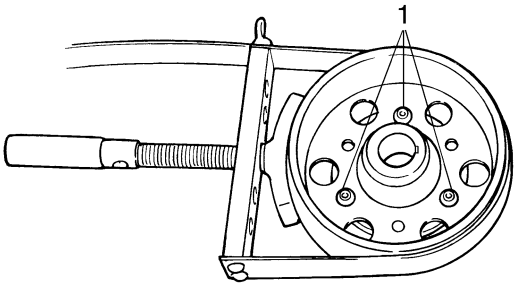


EAS24560
REMOVING THE STARTER CLUTCH

1. Remove:
   - Starter clutch bolt "1"

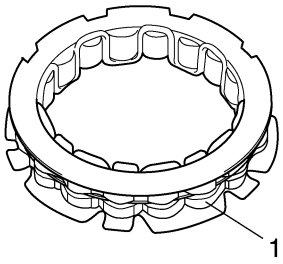
NOTE:
- While holding the generator rotor with the sheave holder, remove the starter clutch bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.

Sheave holder
90890-01701
Primary clutch holder
YS-01880-A

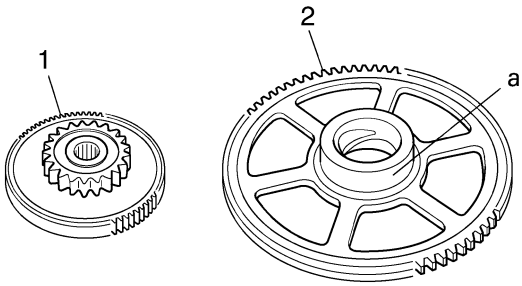


EAS24570
CHECKING THE STARTER CLUTCH

1. Check:
   - Starter clutch rollers “1”
     Damage/wear → Replace.



2. Check:
   - Starter clutch idle gear “1”
   - Starter clutch drive gear “2”
     Burrs/chips/roughness/wear → Replace the defective part(s).
3. Check:
   - Starter clutch gear’s contacting surfaces “a”
     Damage/pitting/wear → Replace the starter clutch gear.



4. Check:
   - Starter clutch operation

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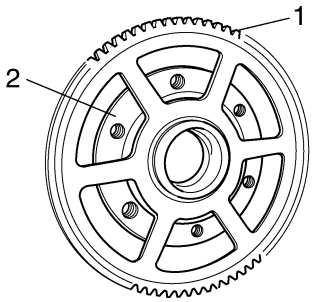
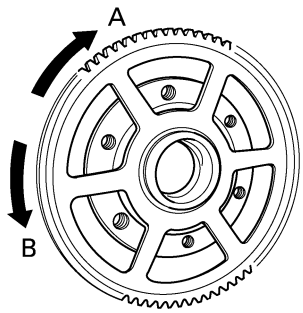
a. Install the starter clutch drive gear “1” onto the starter clutch “2” and hold the starter clutch.
b. When turning the starter clutch drive gear clockwise “A”, the starter clutch and the starter clutch drive gear should engage, otherwise the starter clutch is faulty and must be replaced.
c. When turning the starter clutch drive gear counterclockwise “B”, it should turn freely, otherwise the starter clutch is faulty and must be replaced.





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EAS24600
INSTALLING THE STARTER CLUTCH

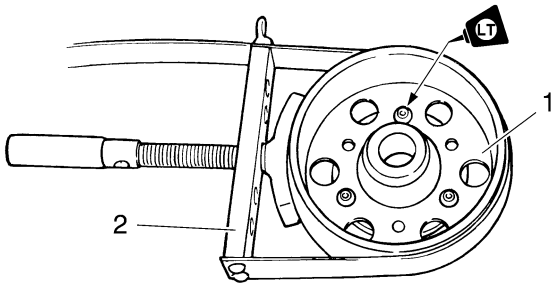
1. Install:
   - Starter clutch

Starter clutch bolt
32 Nm (3.2 m·kg, 23 ft·lb)
LOCTITE®

NOTE:

- While holding the generator rotor “1” with the sheave holder “2”, tighten the starter clutch bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.

Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



EAS24500
INSTALLING THE GENERATOR

1. Install:
   - Generator rotor
   - Washer New
   - Generator rotor bolt

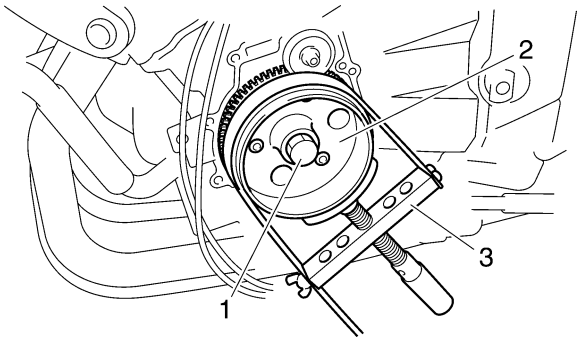
NOTE:
- Clean the tapered portion of the crankshaft and the generator rotor hub.
- Replace the washer with a new one.

2. Tighten:
   - Generator rotor bolt "1"

Generator rotor bolt
75 Nm (7.5 m·kg, 54 ft·lb)

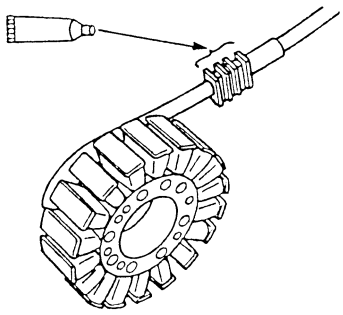
NOTE:
- While holding the generator rotor "2" with the sheave holder "3", tighten the generator rotor bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.

Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



3. Apply:
   - Sealart
     (onto the startor coil assembly lead grommet)

Yamaha bond No. 1215
(Three bond No.1215®)
90890-85505



4. Install:
   - Stator coil
5. Install:
   - Generator rotor cover

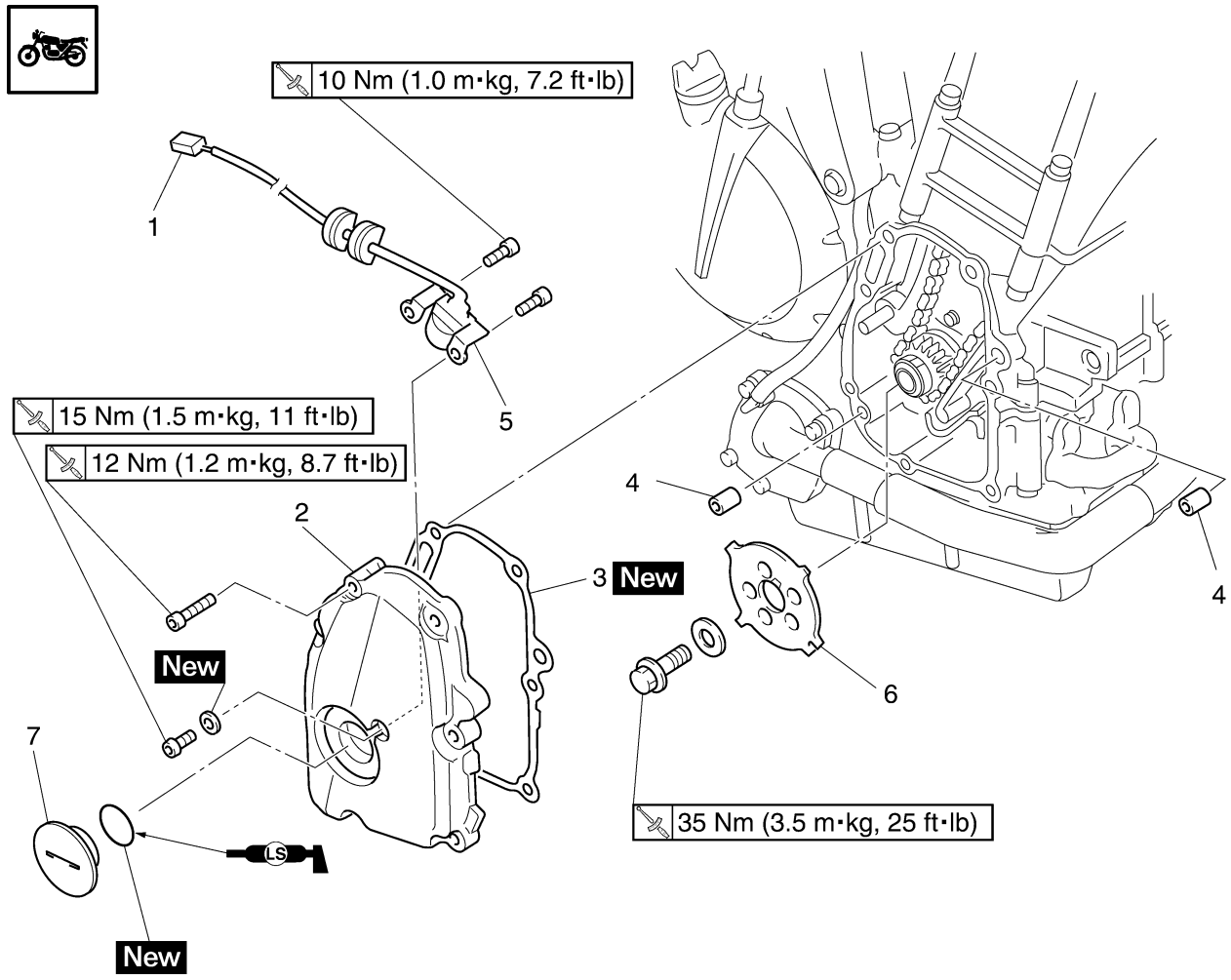
Timing plate bolt
12 Nm (1.2 m·kg, 8.7 ft·lb)

NOTE:
Tighten the generator rotor cover bolts in stages and in a crisscross pattern.

6. Fill:
   - Engine oil
     Refer to "CHANGING THE ENGINE OIL" on page 3-14.
   - Coolant
     Refer to "CHANGING THE COOLANT" on page 3-20.
7. Install:
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Seat
     Refer to "GENERAL CHASSIS" on page 4-1.

EAS4S81015
PICKUP ROTOR

Removing the pickup rotor

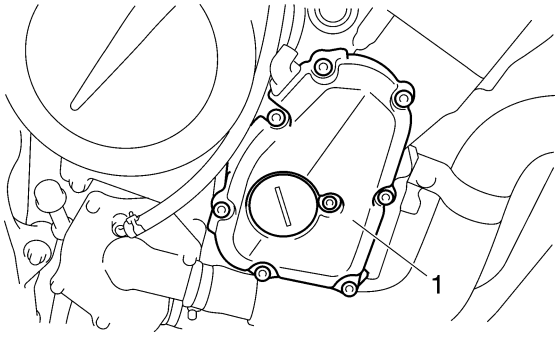


Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Engine oil		Drain Refer to "CHANGING THE ENGINE OIL" on page 3-14.
	Generator rotor cover		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-28.
1	Crankshaft position sensor lead coupler	1	Disconnect.
2	Pickup rotor cover	1	
3	Pickup rotor cover gasket	1	
4	Dowel pin	2	
5	Crankshaft position sensor	1	
6	Pickup rotor	1	
7	Cover	1	
			For assembly, reverse the removal procedure.

EAS4S81041
REMOVING THE PICKUP ROTOR

1. Remove:
   - Pickup rotor cover “1”

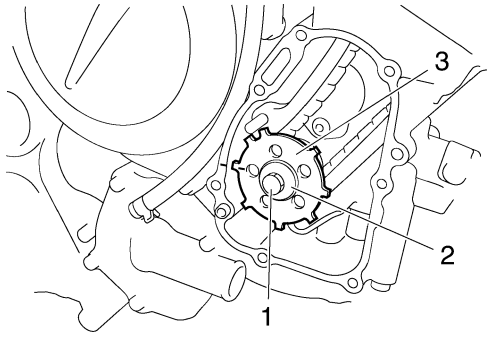
NOTE:
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.

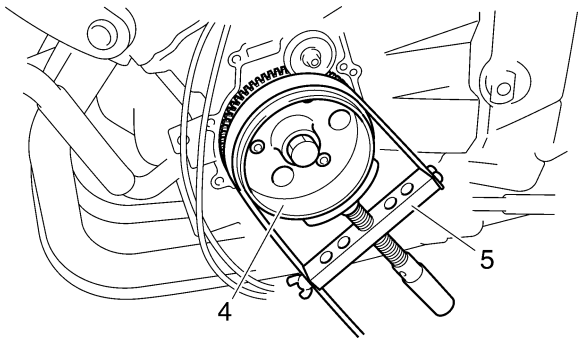


2. Remove:
   - Pickup rotor bolt “1”
   - Washer “2”
   - Pickup rotor “3”

NOTE:
While holding the generator rotor “4” with the sheave holder “5”, loosen the pickup rotor bolt.

Sheave holder
90890-01701
Primary clutch holder
YS-01880-A

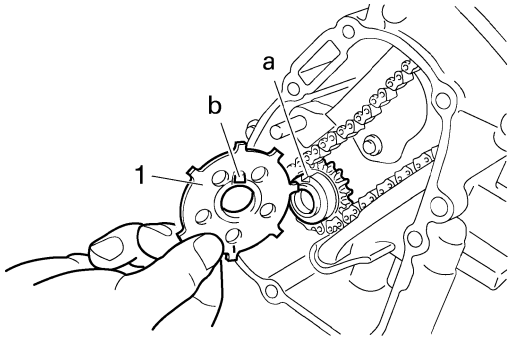




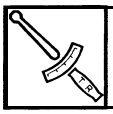
EAS4S81042
INSTALLING THE PICKUP ROTOR

1. Install:
   - Pickup rotor “1”
   - Washer
   - Pickup rotor bolt

NOTE:
When installing the pickup rotor, align the groove “a” in the crankshaft sprocket with the projection “b” in the pickup rotor.



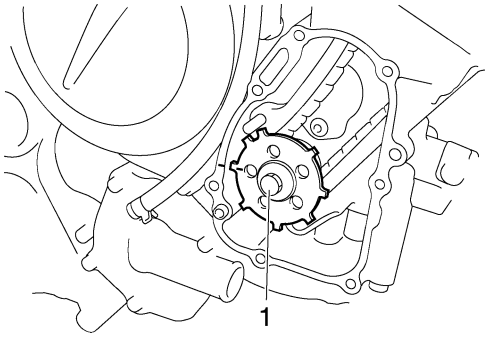
2. Tighten:
   - Pickup rotor bolt “1”

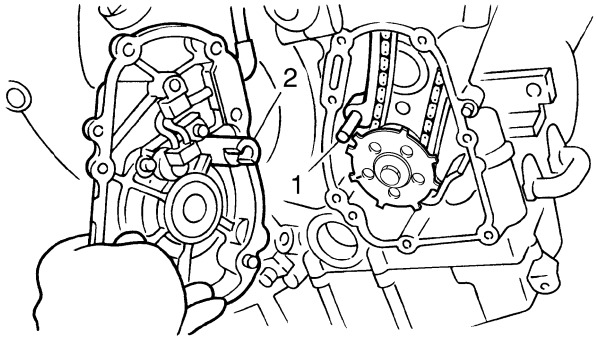


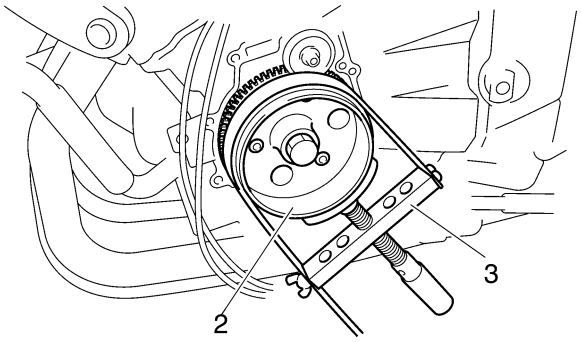
Pickup rotor bolt
35 Nm (3.5 m·kg, 25 ft·lb)

NOTE:
While holding the generator rotor “2” with the sheave holder “3”, tighten the pickup rotor bolt.

Sheave holder
90890-01701
Primary clutch holder
YS-01880-A

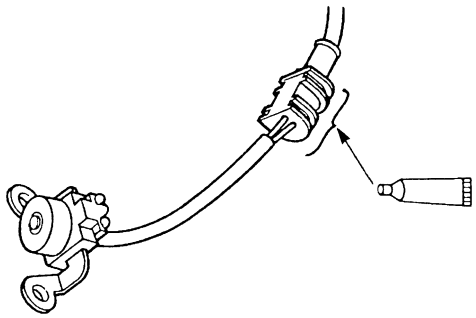






3. Apply:
   - Sealant
     (onto the crankshaft position sensor lead grommet)

Yamaha bond No. 1215
90890-85505
(Three Bond No.1215®)

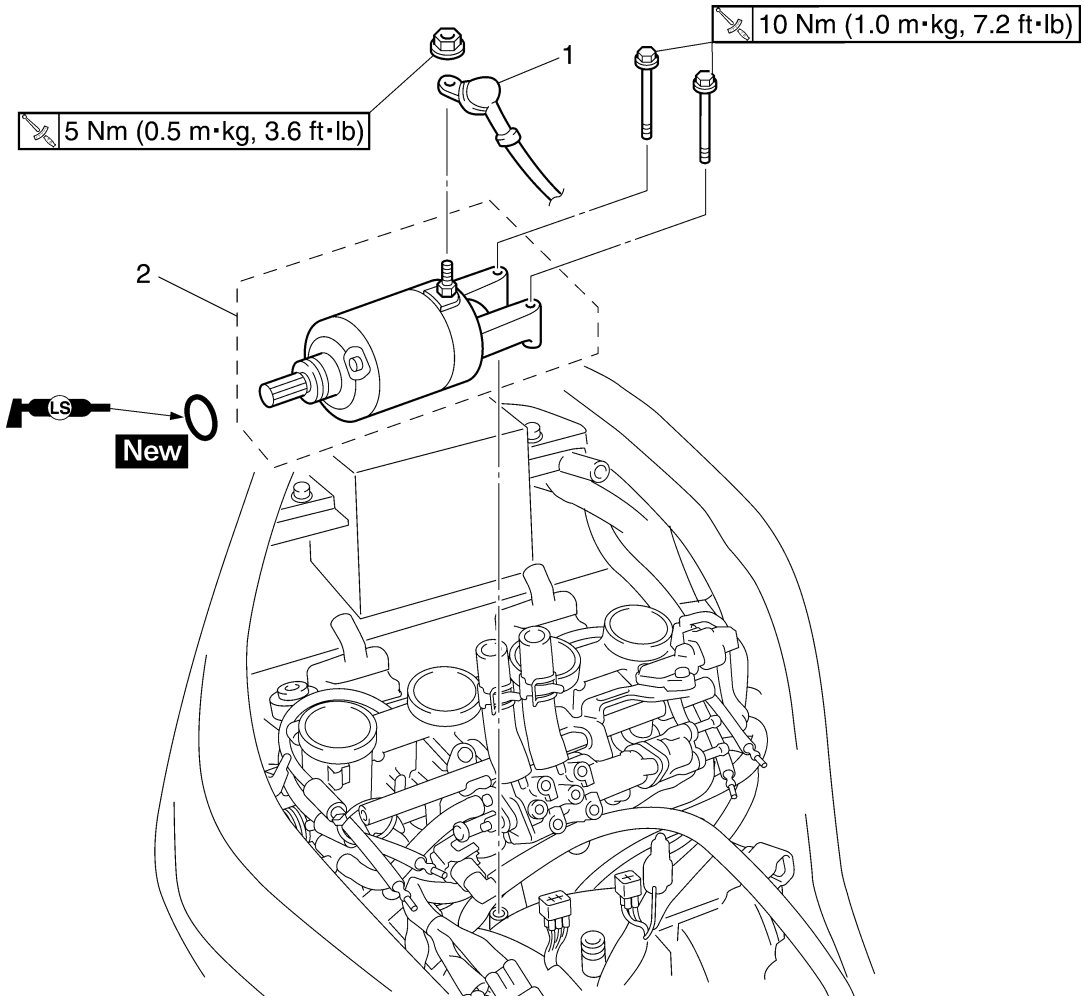


4. Install:
   - Pickup rotor cover gasket New
   - Pickup rotor cover

NOTE:
- When installing the pickup rotor cover, align the timing chain guide (intake side) pin "1" with the hole "2" in the pickup rotor cover.
- Tighten the pickup rotor cover bolts in stages and in a crisscross pattern.

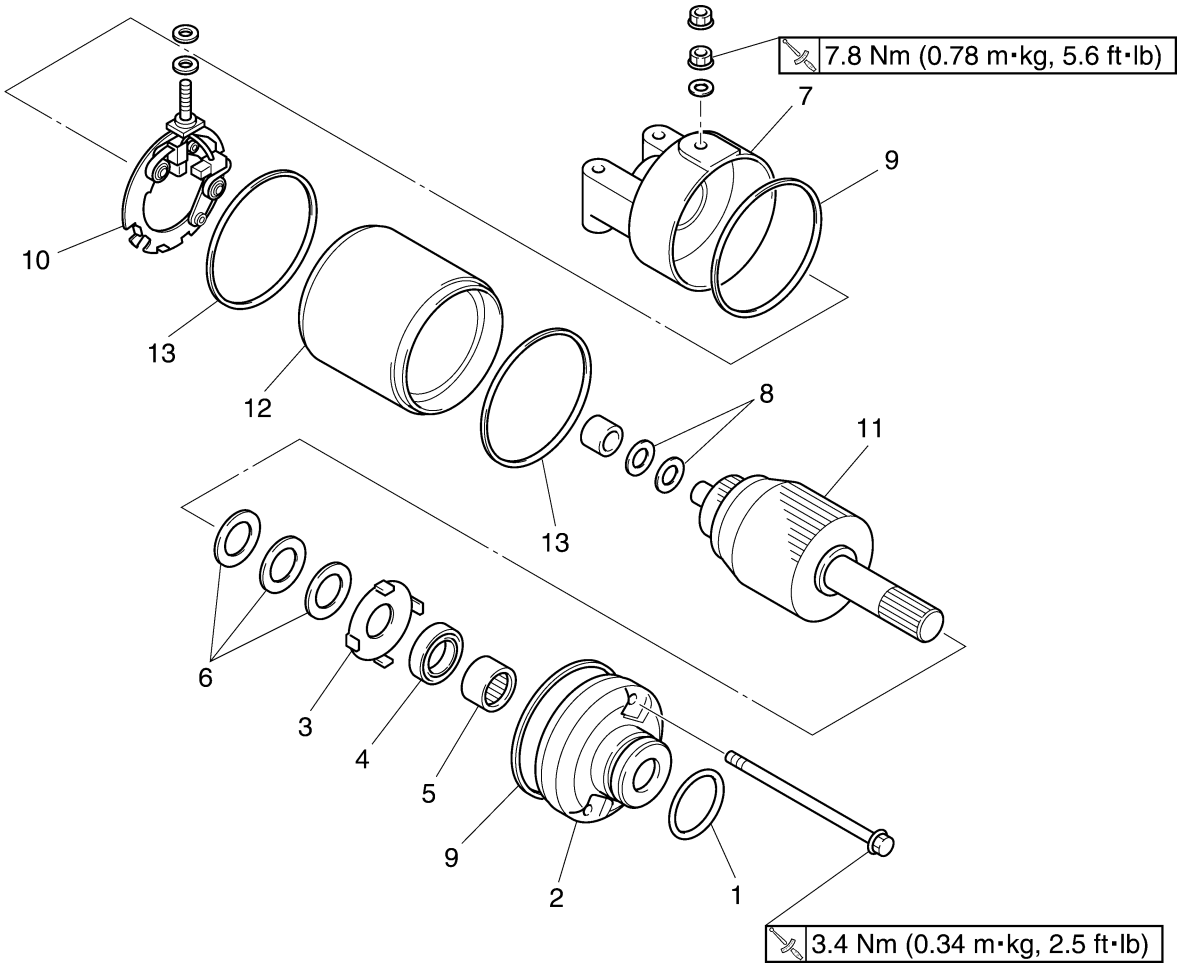
EAS24780
ELECTRIC STARTER

Removing the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-4.
1	Starter motor lead	1	
2	Starter motor	1	
			For installation, reverse the removal procedure.

Disassembling the starter motor

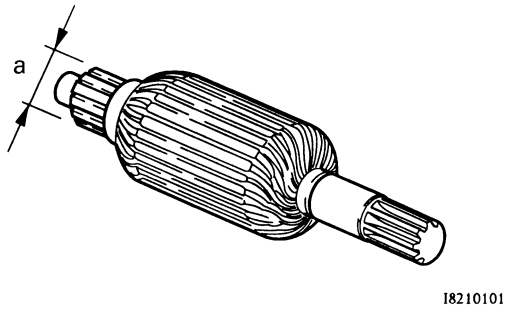


Order	Job/Parts to remove	Q'ty	Remarks
1	O-ring	1	
2	Starter motor front cover	1	
3	Lock washer	1	
4	Oil seal	1	
5	Bearing	1	
6	Washer set	1	
7	Starter motor rear cover	1	
8	Washer set	1	
9	O-ring	2	
10	Brush holder	1	
11	Armature assembly	1	
12	Starter motor yoke	1	
13	O-ring	2	
			For assembly, reverse the disassembly procedure.

EAS24790
CHECKING THE STARTER MOTOR

1. Check:
   - Commutator
     Dirt → Clean with 600 grit sandpaper.
2. Measure:
   - Commutator diameter “a”
     Out of specification → Replace the starter motor.

Limit
27.0 mm (1.06 in)



3. Measure:
   - Mica undercut “a”
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

Mica undercut (depth)
0.70 mm (0.03 in)

NOTE:
The mica of the commutator must be undercut to ensure proper operation of the commutator.

4. Measure:
   - Armature assembly resistances (commutator and insulation)
     Out of specification → Replace the starter motor.

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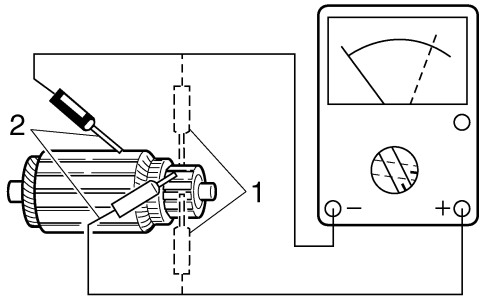
a. Measure the armature assembly resistances with the pocket tester.

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

Armature coil
Commutator resistance “1”
0.0012–0.0022 Ω at 20°C (68°F)
Insulation resistance “2”
Above 1 MΩ at 20°C (68°F)

b. If any resistance is out of specification, replace the starter motor.



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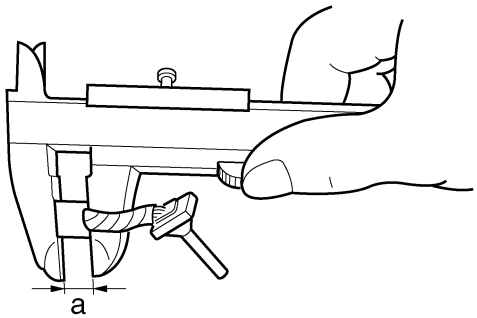
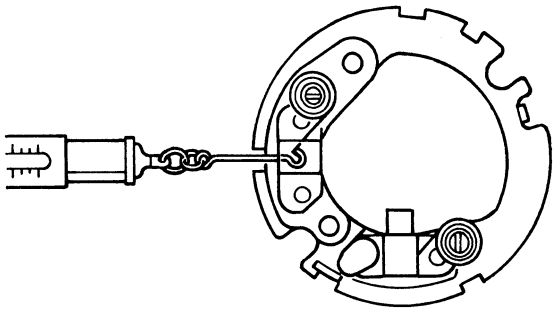
5. Measure:
   - Brush length “a”
     Out of specification → Replace the brushes as a set.

Limit
3.50 mm (0.14 in)



6. Measure:
   - Brush spring force
     Out of specification → Replace the brush springs as a set.

Brush spring force
7.16–9.52 N (25.77–34.27 oz) (730–971 gf)

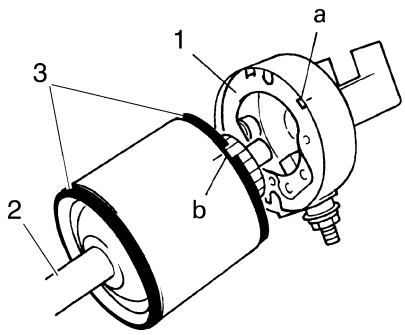


7. Check:
   - Gear teeth
     Damage/wear → Replace the gear.
8. Check:
   - Bearing
   - Oil seal
     Damage/wear → Replace the defective part(s).

EAS24800
ASSEMBLING THE STARTER MOTOR

1. Install:
   - Brush seat “1”
2. Install:
   - Armature “2”
   - O-ring “3” New

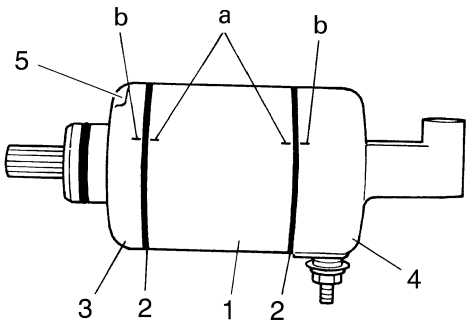
NOTE:
Align the tab “a” on the brush seat with the slot “b” in the starter motor yoke.



3. Install:
   - Starter motor yoke “1”
   - O-ring “2” New
   - Starter motor front cover “3”
   - Starter motor rear cover “4”
   - Starter motor assembling bolts “5”

	Starter motor assembling bolt **3.4 Nm (0.34 m·kg, 2.5 ft·lb)**

NOTE:
Align the match marks “a” on the starter motor yoke with the match marks “b” on the starter motor front and rear covers.



EAS24810
INSTALLING THE STARTER MOTOR

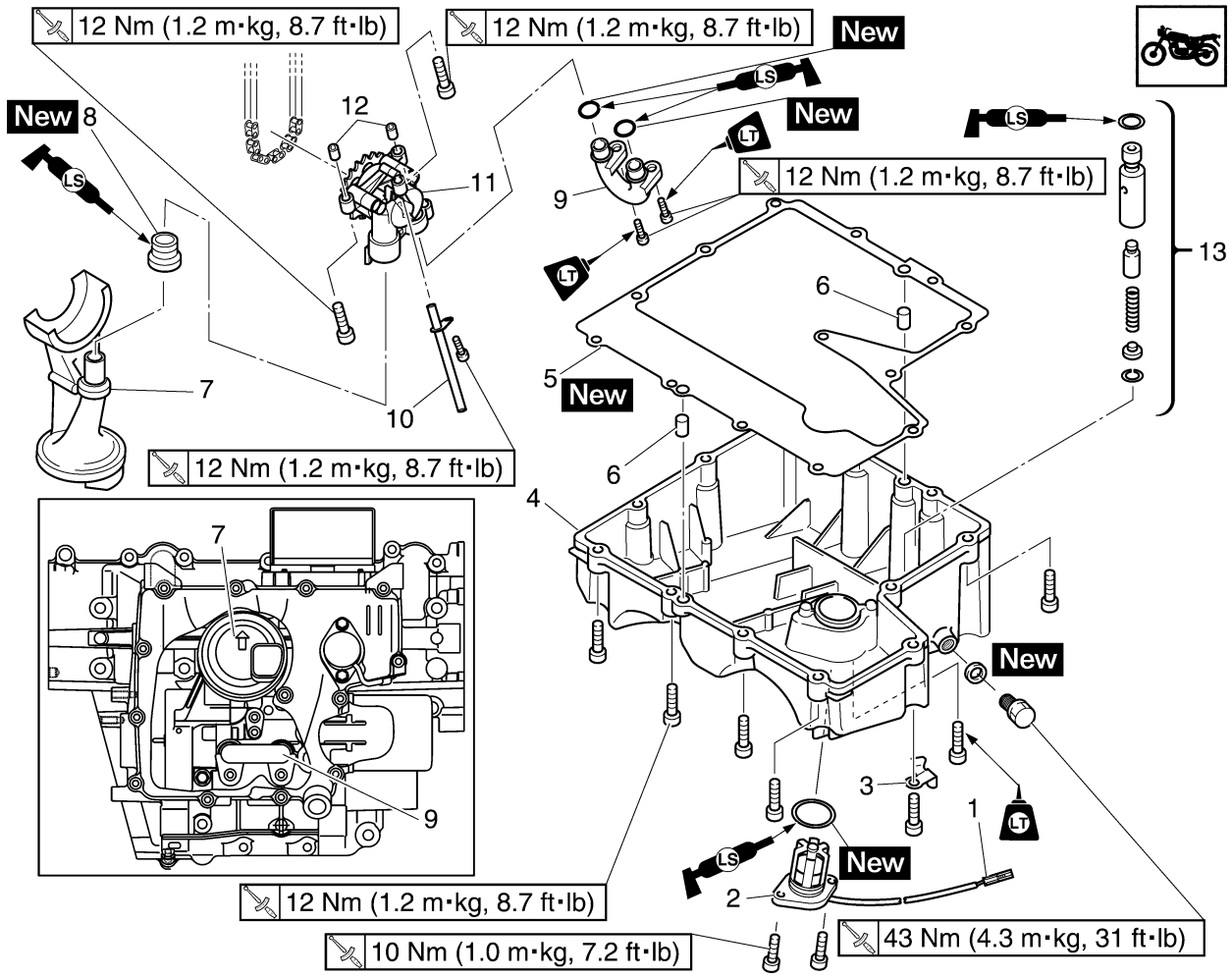
1. Install:
   - Starter motor
   - Starter motor bolts

	Starter motor bolt **10 Nm (1.0 m·kg, 7.2 ft·lb)**

2. Connect:
   - Starter motor lead

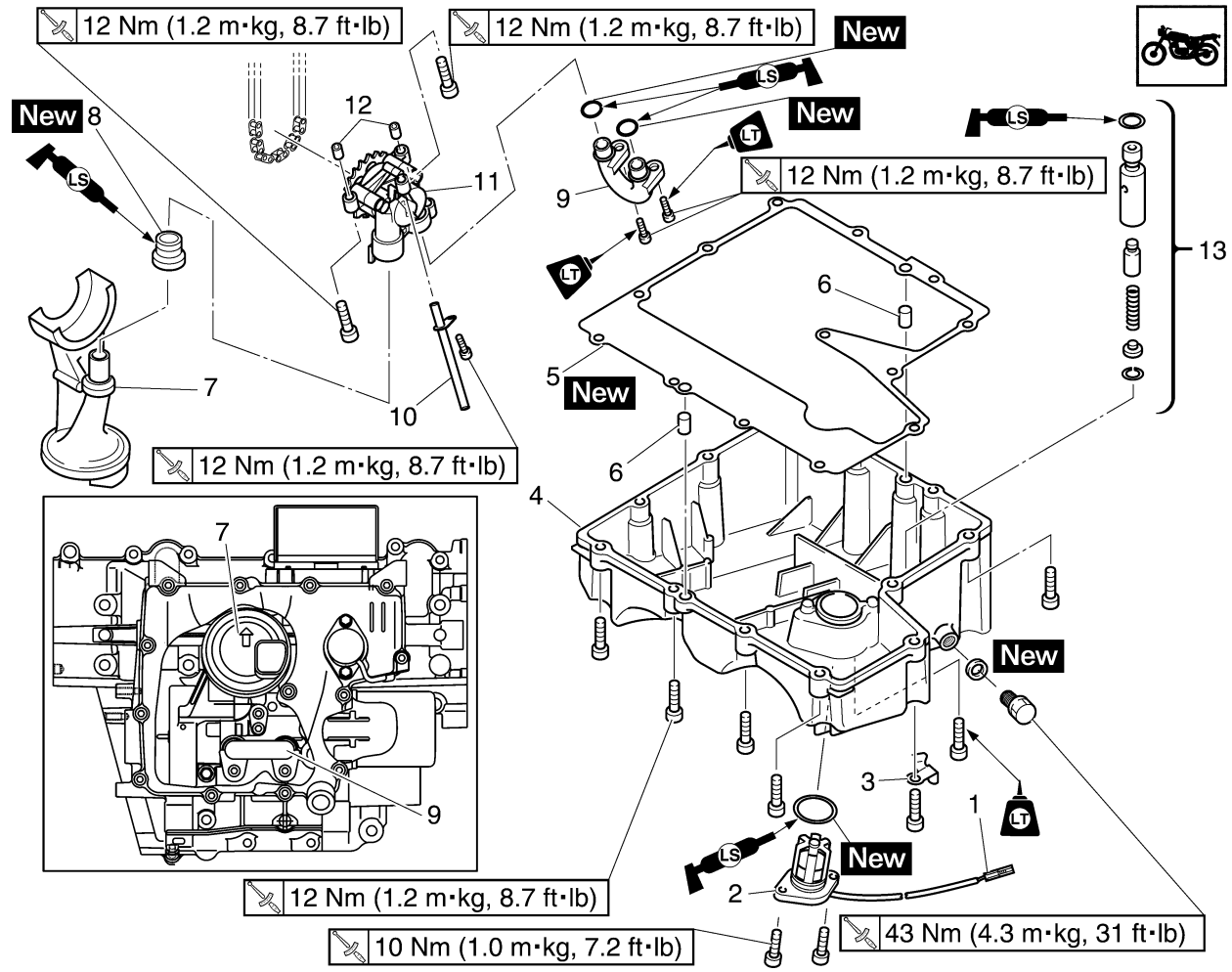
EAS24920
OIL PUMP

Removing the oil pan and oil pump



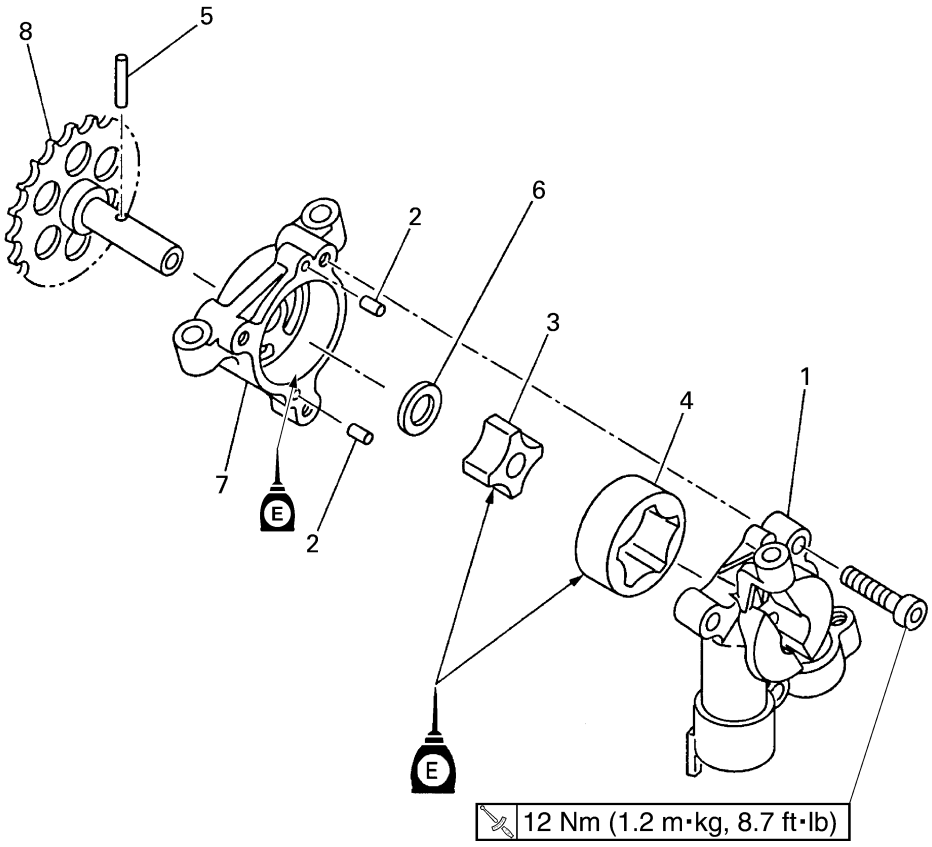
Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-14.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-20.
	Exhaust pipe assembly		Refer to "ENGINE REMOVAL" on page 5-1.
	Water pump		Refer to "WATER PUMP" on page 6-9.
1	Oil level switch lead coupler	1	Disconnect.
2	Oil level switch	1	
3	Oil level switch lead holder	1	
4	Oil pan	1	
5	Oil pan gasket	1	
6	Dowel pin	2	
7	Oil strainer	1	
8	Oil strainer gasket	1	
9	Oil pipe	1	
10	Oil delivery pipe	1	
11	Oil pump assembly	1	
12	Dowel pin	2	

Removing the oil pan and oil pump



Order	Job/Parts to remove	Q'ty	Remarks
13	Relief valve assembly	1	
			For installation, reverse the removal procedure.

Disassembling the oil pump

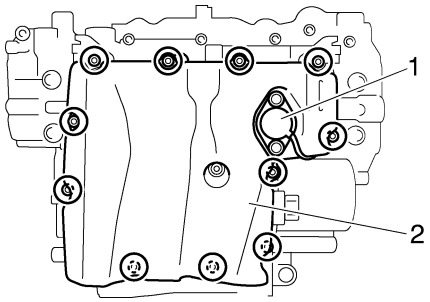


Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump cover	1	
2	Pin	2	
3	Oil pump inner rotor	1	
4	Oil pump outer rotor	1	
5	Pin	1	
6	Washer	1	
7	Oil pump rotor housing	1	
8	Oil pump driven sprocket	1	
			For assembly, reverse the removal procedure.

EAS24930
REMOVING THE OIL PAN

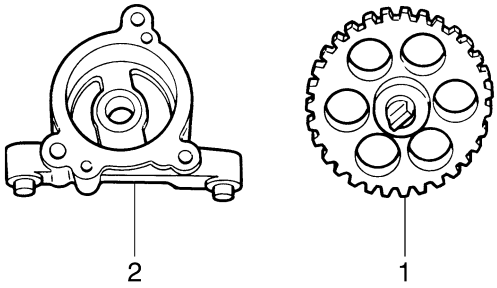
1. Remove:
   - Oil level switch “1”
   - Oil pan “2”
   - Oil pan gasket
   - Dowel pins

NOTE:
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



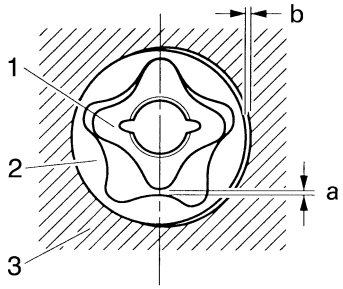
EAS24960
CHECKING THE OIL PUMP

1. Check:
   - Oil pump driven gear “1”
   - Oil pump rotor housing “2”
   - Oil pump cover
     Cracks/damage/wear → Replace the defective part(s).



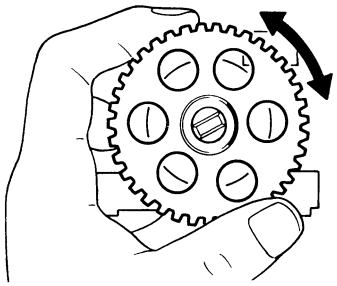
2. Measure:
   - Inner-rotor-to-outer-rotor-tip clearance “a”
   - Outer-rotor-to-oil-pump-housing clearance “b”

Inner-rotor-to-outer-rotor-tip clearance
0.030–0.090 mm (0.0012–0.0035 in)
Limit
0.15 mm (0.0059 in)
Outer-rotor-to-oil-pump-housing clearance
0.030–0.080 mm (0.0012–0.0032 in)
Limit
0.150 mm (0.0059 in)



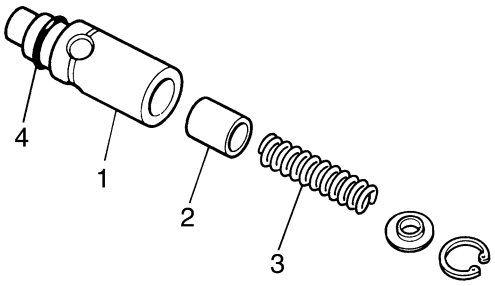
1. Inner rotor
2. Outer rotor
3. Oil pump housing

3. Check:
   - Oil pump operation
     Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

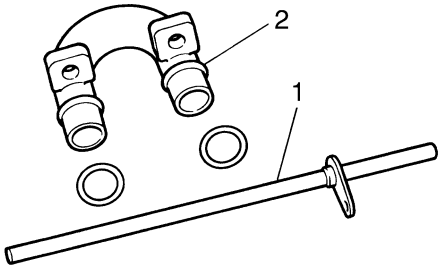


EAS24970
CHECKING THE RELIEF VALVE

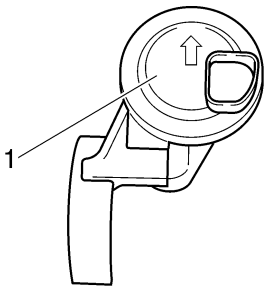
1. Check:
   - Relief valve body “1”
   - Relief valve “2”
   - Spring “3”
   - O-ring “4”
     Damage/wear → Replace the defective part(s).



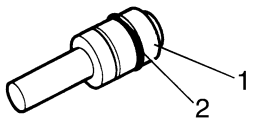
EAS24980
CHECKING THE OIL DELIVERY PIPES
1. Check:
   - Oil delivery pipe “1”
   - Oil pipe “2”
     Damage → Replace.
     Obstruction → Wash and blow out with compressed air.



EAS24990
CHECKING THE OIL STRAINER
1. Check:
   - Oil strainer “1”
     Damage → Replace.
     Contaminants → Clean with solvent.



EAS4S81016
CHECKING THE OIL NOZZLES
The following procedure applies to all of the oil nozzles.
1. Check:
   - Oil nozzle “1”
     Damage/wear → Replace the oil nozzle.
   - O-ring “2”
     Damage/wear → Replace.
   - Oil nozzle passage
     Obstruction → Blow out with compressed air.



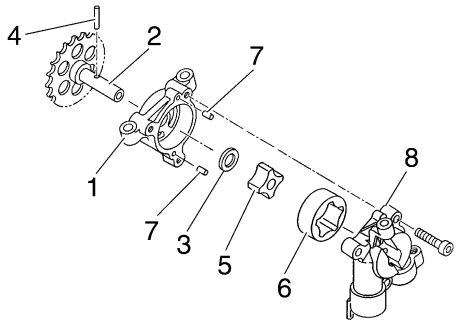
EAS25010
ASSEMBLING THE OIL PUMP
1. Lubricate:
   - Inner rotor
   - Outer rotor
   - Oil pump shaft
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

2. Install:
   - Oil pump housing “1”
   - Oil pump shaft “2”
   - Washer “3”
   - Pin “4”
   - Inner rotor “5”
   - Outer rotor “6”
   - Dowel pins “7”
   - Oil pump cover “8”
   - Oil pump housing screw

	Oil pump housing screw **12 Nm (1.2 m·kg, 8.7 ft·lb)**

NOTE:
When installing the inner rotor, align the pin “4” in the oil pump shaft with the groove “a” in the inner rotor “5”.



3. Check:
   - Oil pump operation
     Refer to "CHECKING THE OIL PUMP" on page 5-43.

EAS25030
INSTALLING THE OIL PUMP

1. Install:
   - Oil pump drive chain
   - Gear cover
   - Oil pump
   - Oil pump bolts

	Oil pump bolt **12 Nm (1.2 m·kg, 8.7 ft·lb)**

ECA4S81018
CAUTION:

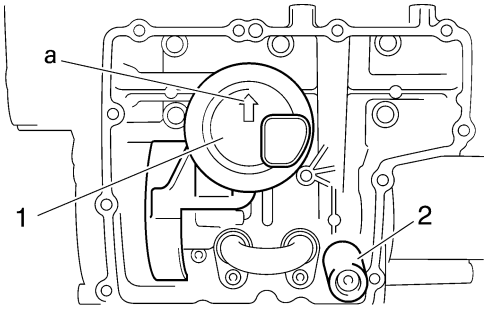
After tightening the bolts, make sure the oil pump turns smoothly.

EAS25040
INSTALLING THE OIL STRAINER

1. Install:
   - Oil strainer “1”
   - Relief valve “2”

NOTE:

Make sure to check the arrow mark “a” located on the oil strainer housing for the front and rear direction of the engine and then install the oil strainer so that its arrow mark points to the front side of the engine.



EAS25050
INSTALLING THE OIL PAN

1. Install:
   - Oil pipe
   - Oil delivery pipe
2. Install:
   - Dowel pins
   - Gasket New
   - Oil pan “1”

	Oil pan bolt **12 Nm (1.2 m·kg, 8.7 ft·lb)**

   - Oil level switch “2”

	Oil level switch bolt **10 Nm (1.0 m·kg, 7.2 ft·lb)**

   - Engine oil drain bolt

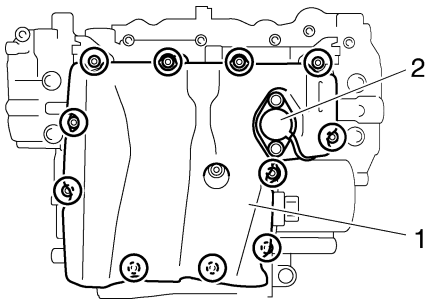
	Engine oil drain bolt **43 Nm (4.3 m·kg, 31 ft·lb)**

EWA12820
WARNING

Always use new copper washers.

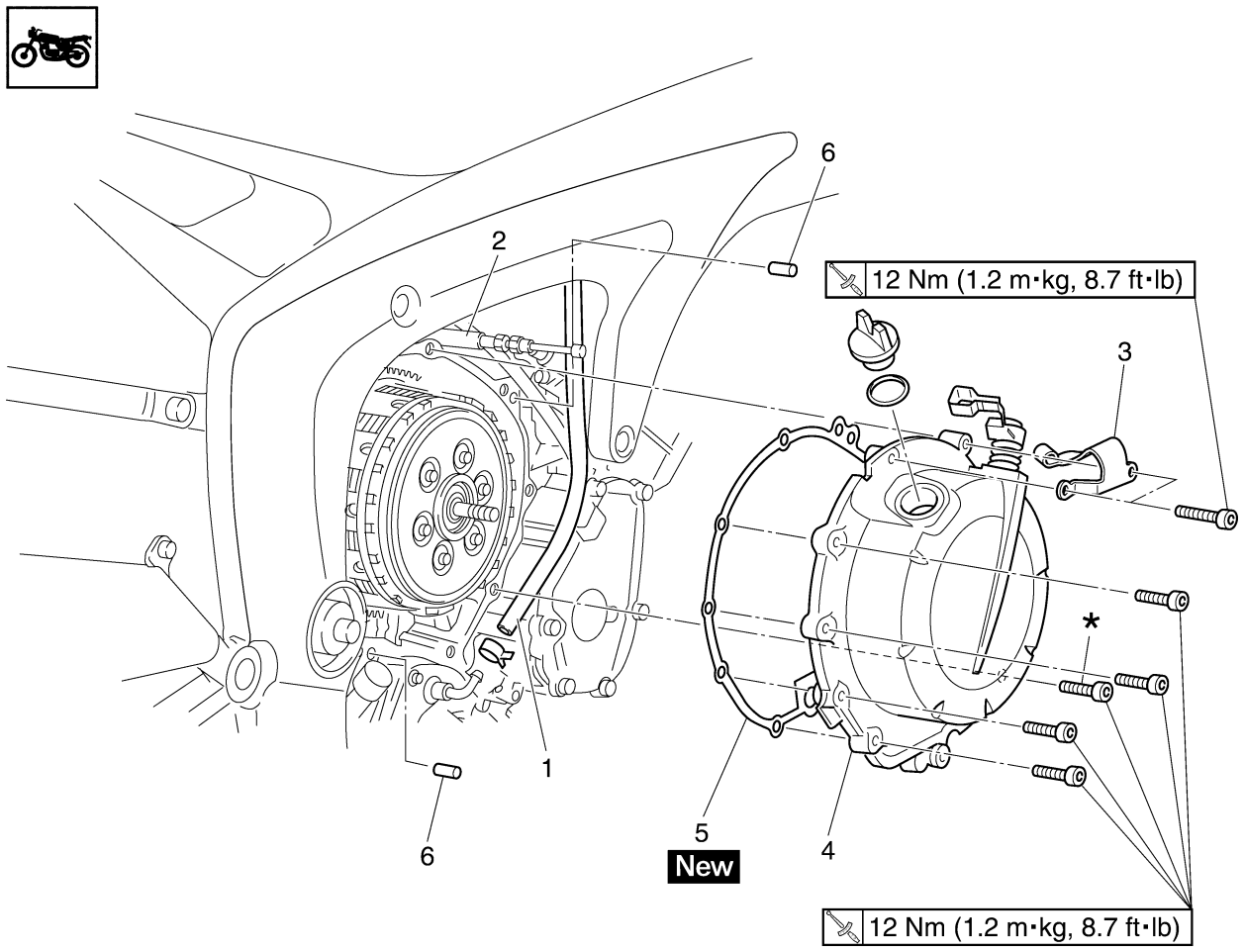
NOTE:

- Tighten the oil pan bolts in stages and in a crisscross pattern.
- Lubricate the oil level switch O-ring with engine oil.



EAS25060
CLUTCH

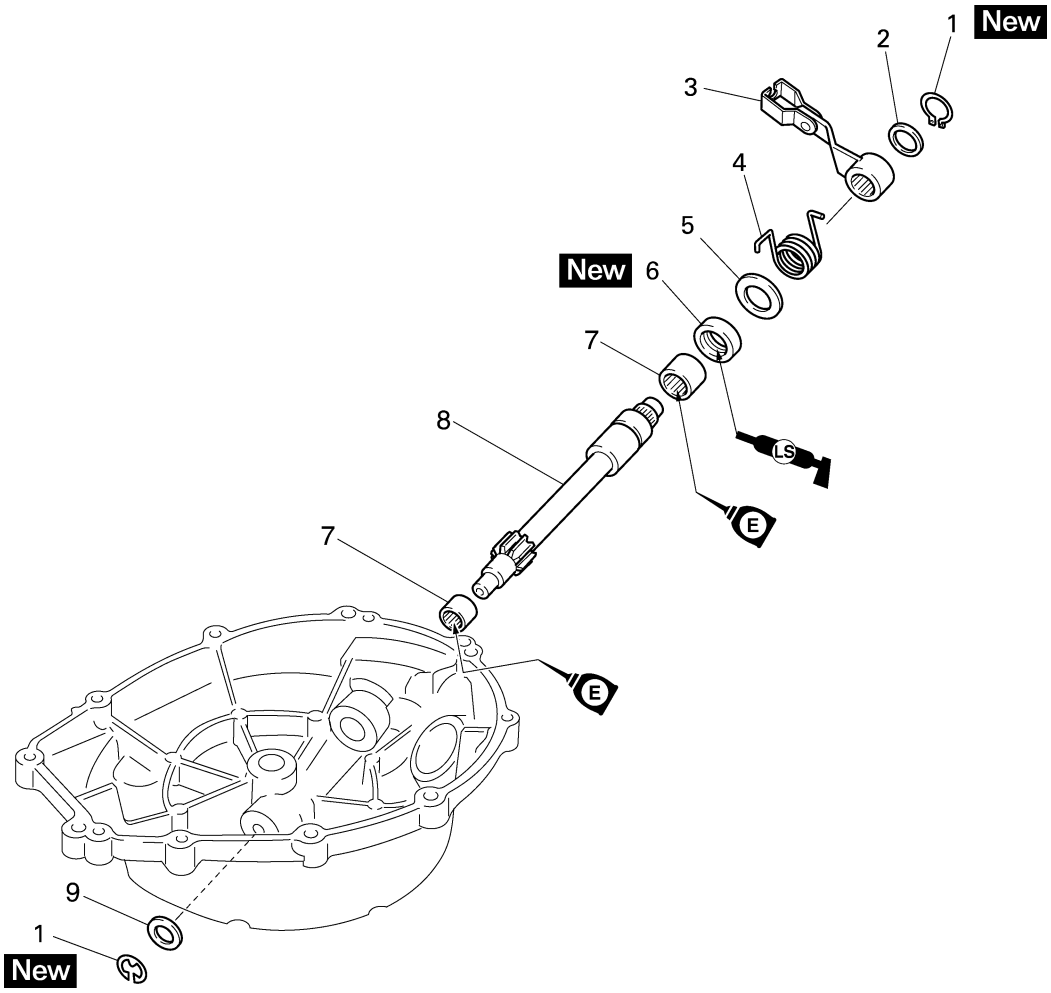
Removing the clutch cover



Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain Refer to "CHANGING THE ENGINE OIL" on page 3-14.
	Coolant		Drain Refer to "CHANGING THE COOLANT" on page 3-20.
1	Coolant hose	1	
2	Clutch cable	1	
3	Clutch cable holder	1	
4	Clutch cover	1	
5	Clutch cover gasket	1	
6	Dowel pin	2	
			For installation, reverse the removal procedure.

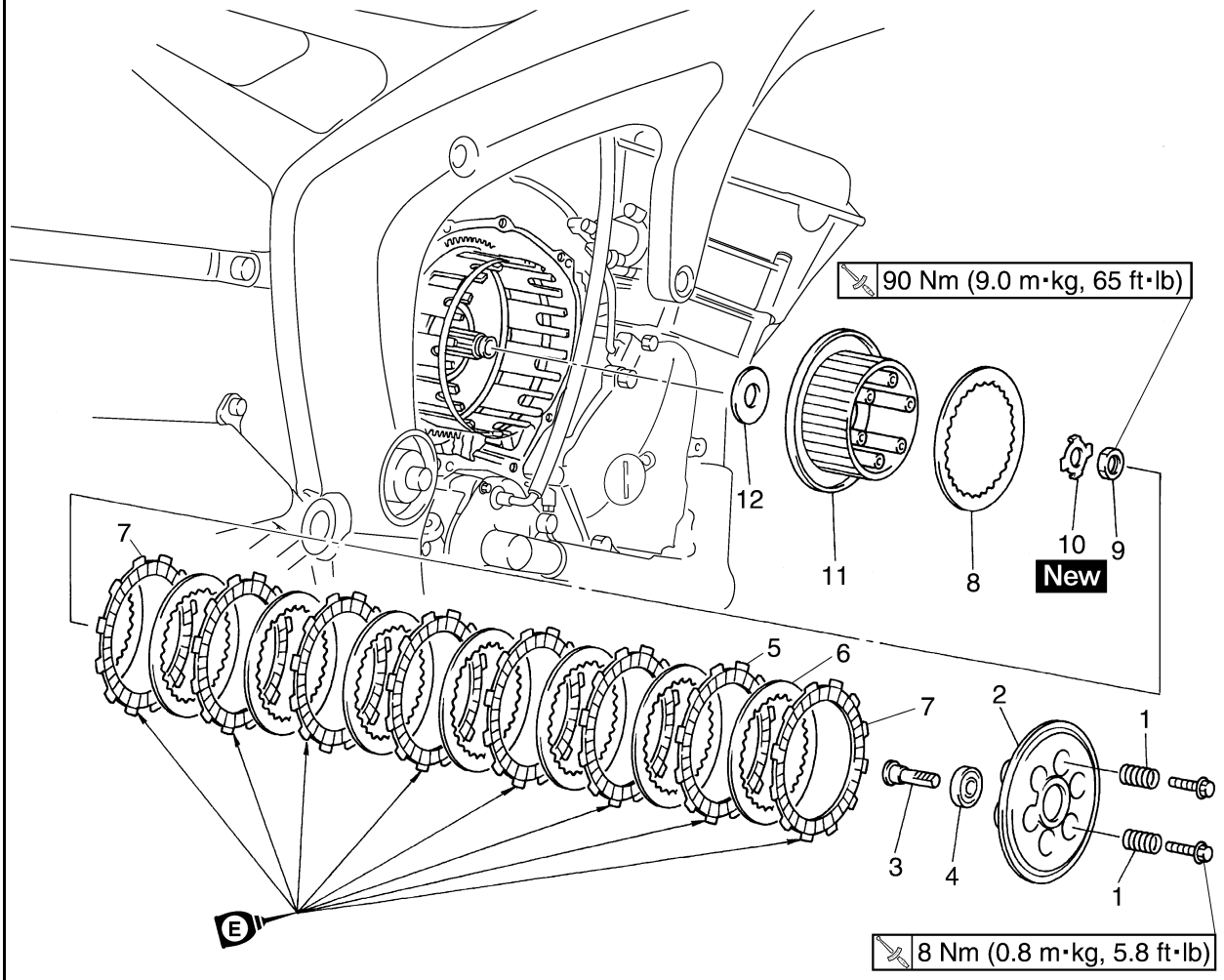
* Yamaha bond No.1215 (Three Bond No.1215®)

Removing the pull lever shaft



Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	2	
2	Washer	1	
3	Pull lever	1	
4	Pull lever spring	1	
5	Washer	1	
6	Oil seal	1	
7	Bearing	2	
8	Pull lever shaft	1	
9	Washer	1	
			For installation, reverse the removal procedure.

Removing the clutch

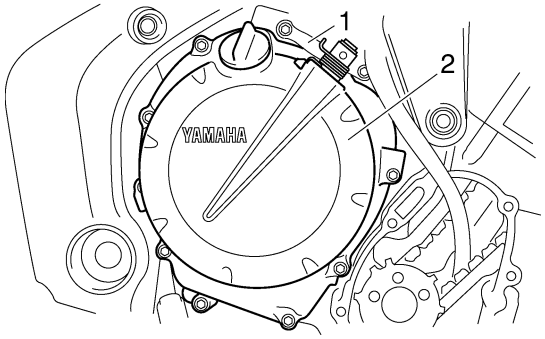


Order	Job/Parts to remove	Q'ty	Remarks
1	Compression spring	6	
2	Pressure plate	1	
3	Pull rod	1	
4	Bearing	1	
5	Friction plate 1	6	
6	Clutch plate 1	7	
7	Friction plate 2	2	
8	Clutch plate 2	1	
9	Clutch boss nut	1	
10	Lock washer	1	
11	Clutch boss	1	
12	Thrust plate	1	
			For assembly, reverse the removal procedure.

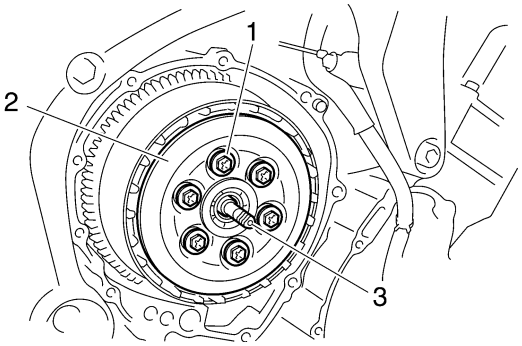
EAS25070
REMOVING THE CLUTCH

1. Remove:
   - Clutch cable holder “1”
   - Clutch cover “2”
   - Gasket

NOTE:
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.
After all of the bolts are fully loosened, remove them.

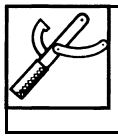


2. Remove:
   - Compression spring bolts “1”
   - Compression springs
   - Pressure plate “2”
   - Pull rod “3”
   - Friction plates
   - Clutch plates

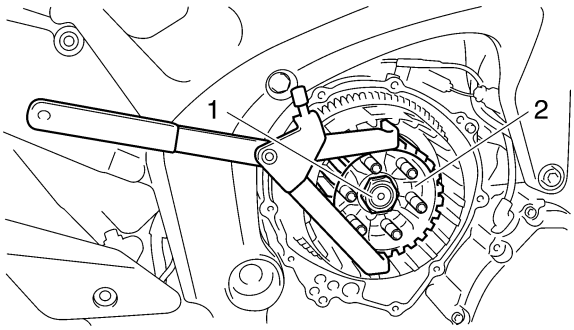


3. Straighten the lock washer tab.
4. Loosen:
   - Clutch boss nut “1”

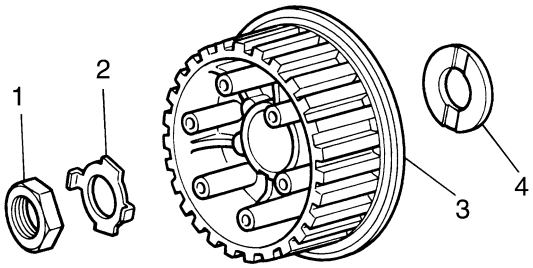
NOTE:
While holding the clutch boss “2” with the universal clutch holder, loosen the clutch boss nut.



Universal clutch holder
90890-04086
YM-91042



5. Remove:
   - Clutch boss nut “1”
   - Lock washer “2”
   - Clutch boss “3”
   - Thrust plate “4”



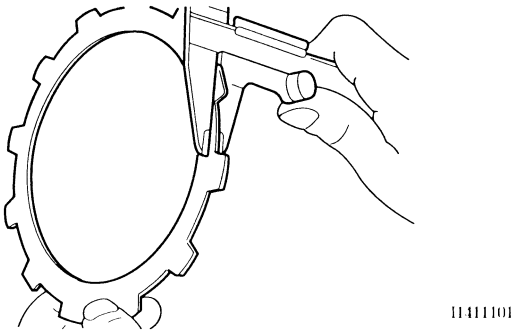
EAS25100
CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

1. Check:
   - Friction plate
     Damage/wear → Replace the friction plates as a set.
2. Measure:
   - Friction plate thickness
     Out of specification → Replace the friction plates as a set.

NOTE:
Measure the friction plate at four places.

Friction plate thickness
2.92–3.08 mm (0.115–0.121 in)
Wear limit
2.80 mm (0.1102 in)

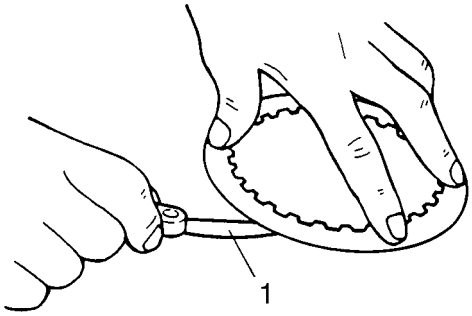


EAS25110
CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

1. Check:
   - Clutch plate
     Damage → Replace the clutch plates as a set.
2. Measure:
   - Clutch plate warpage
     (with a surface plate and thickness gauge "1")
     Out of specification → Replace the clutch plates as a set.

Warpage limit
0.10 mm (0.0039 in)

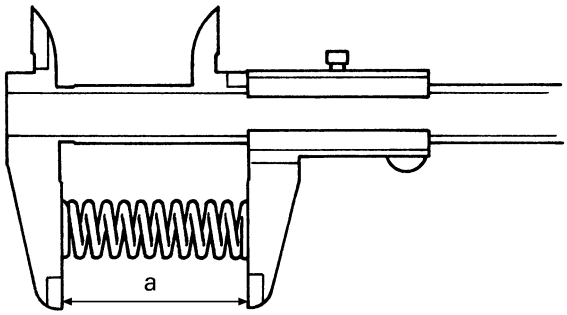


EAS25140
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

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

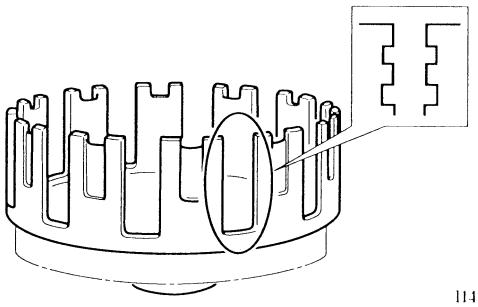
Clutch spring free length
55.00 mm (2.17 in)
Minimum length
54.00 mm (2.13 in)
Limit
52.3 mm (2.06 in)



EAS25150
CHECKING THE CLUTCH HOUSING

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

NOTE:
Pitting on the clutch housing dogs will cause erratic clutch operation.

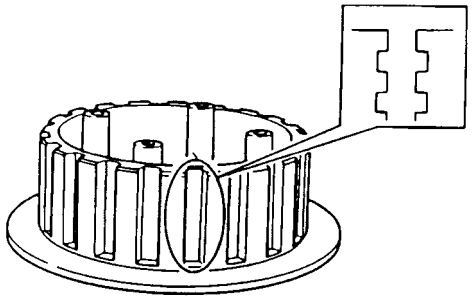


2. Check:
   - Bearing
     Damage/wear → Replace the bearing and clutch housing.

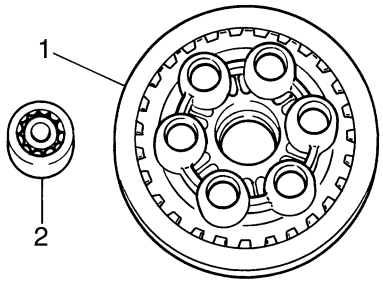
EAS25160
CHECKING THE CLUTCH BOSS

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

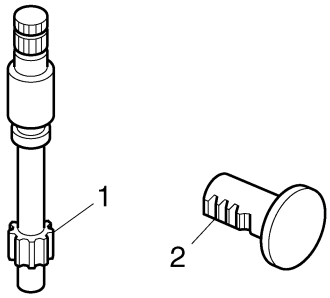
NOTE:
Pitting on the clutch boss splines will cause erratic clutch operation.



EAS25170
CHECKING THE PRESSURE PLATE
1. Check:
   - Pressure plate "1"
     Cracks/damage → Replace.
   - Bearing "2"
     Damage/wear → Replace.

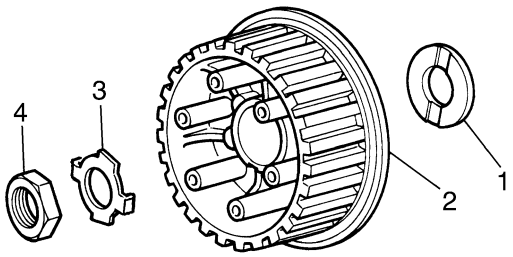


EAS25220
CHECKING THE PULL LEVER SHAFT AND PULL ROD
1. Check:
   - Pull lever shaft pinion gear teeth "1"
   - Pull rod teeth "2"
     Damage/wear → Replace the pull rod and pull lever shaft pinion gear as a set.

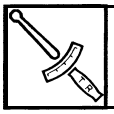


2. Check:
   - Pull rod bearing
     Damage/wear → Replace.

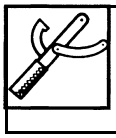
EAS25270
INSTALLING THE CLUTCH
1. Install:
   - Thrust plate "1"
   - Clutch boss "2"
   - Lock washer "3" New
   - Clutch boss nut "4"

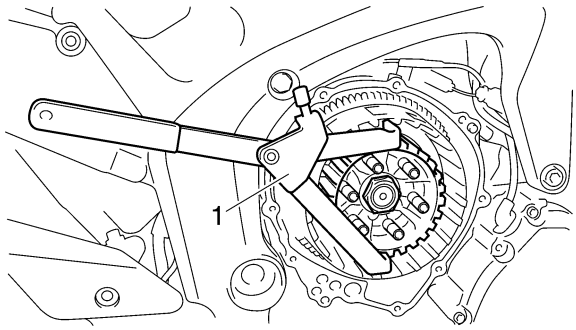


2. Tighten:
   - Clutch boss nut

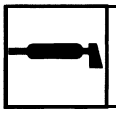
	**Clutch boss nut** **90 Nm (9.0 m·kg, 65 ft·lb)**

NOTE:
While holding the clutch boss with the universal clutch holder "1", tighten the clutch boss nut.

	**Universal clutch holder** **90890-04086** **YM-91042**



3. Bend the lock washer tab along a flat side of the nut.
4. Lubricate:
   - Friction plates
   - Clutch plates
     (with the recommended lubricant)

	**Recommended lubricant** **Engine oil**

5. Install:
   - Friction plates
   - Clutch plates

NOTE:
First, install a friction plate and then alternate between a clutch plate and a friction plate.

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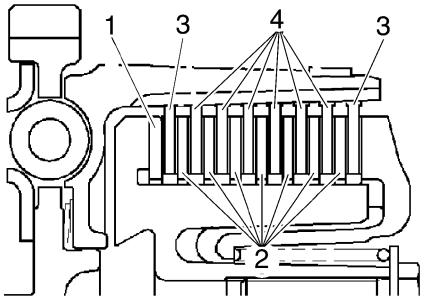
a Install the clutch plate and friction plate as shown in the illustration.
Clutch plate "1": t=2.3 mm (0.09 in)
Clutch plate "2": t=2.0 mm (0.08 in)
Friction plate "3"
Friction plate "4": Color/Brown



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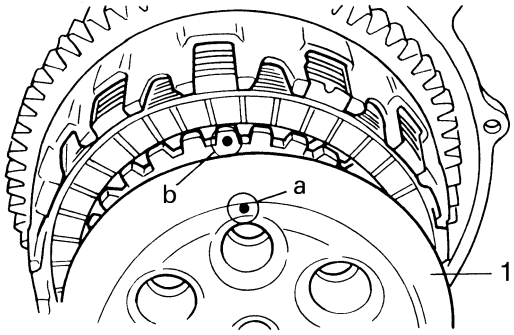
6. Install:
   - Pressure plate "1"

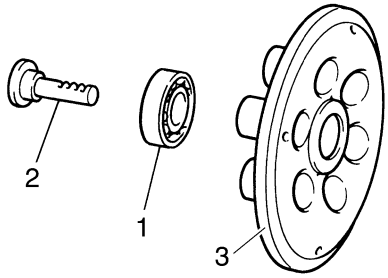
NOTE:
Align the punch mark "a" in the pressure plate with the punch mark "b" in the clutch boss.



7. Install:
   - Bearing "1"
   - Pill rod "2"
   - Pressure plate "3"
   - Clutch springs
   - Clutch spring bolts

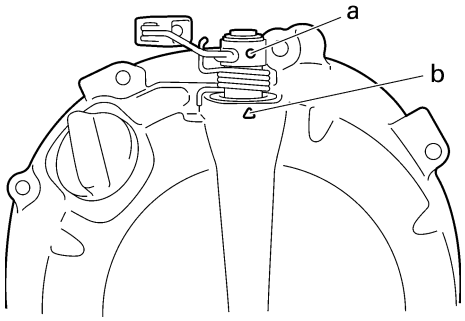
	Clutch spring bolt **8 Nm (0.8 m·kg, 5.8 ft·lb)**

NOTE:
Tighten the clutch spring bolts in stages and in a crisscross pattern.



8. Install:
   - Pull lever
9. Install:
   - Clutch cover
   - Gasket New
   - Clutch cable holder

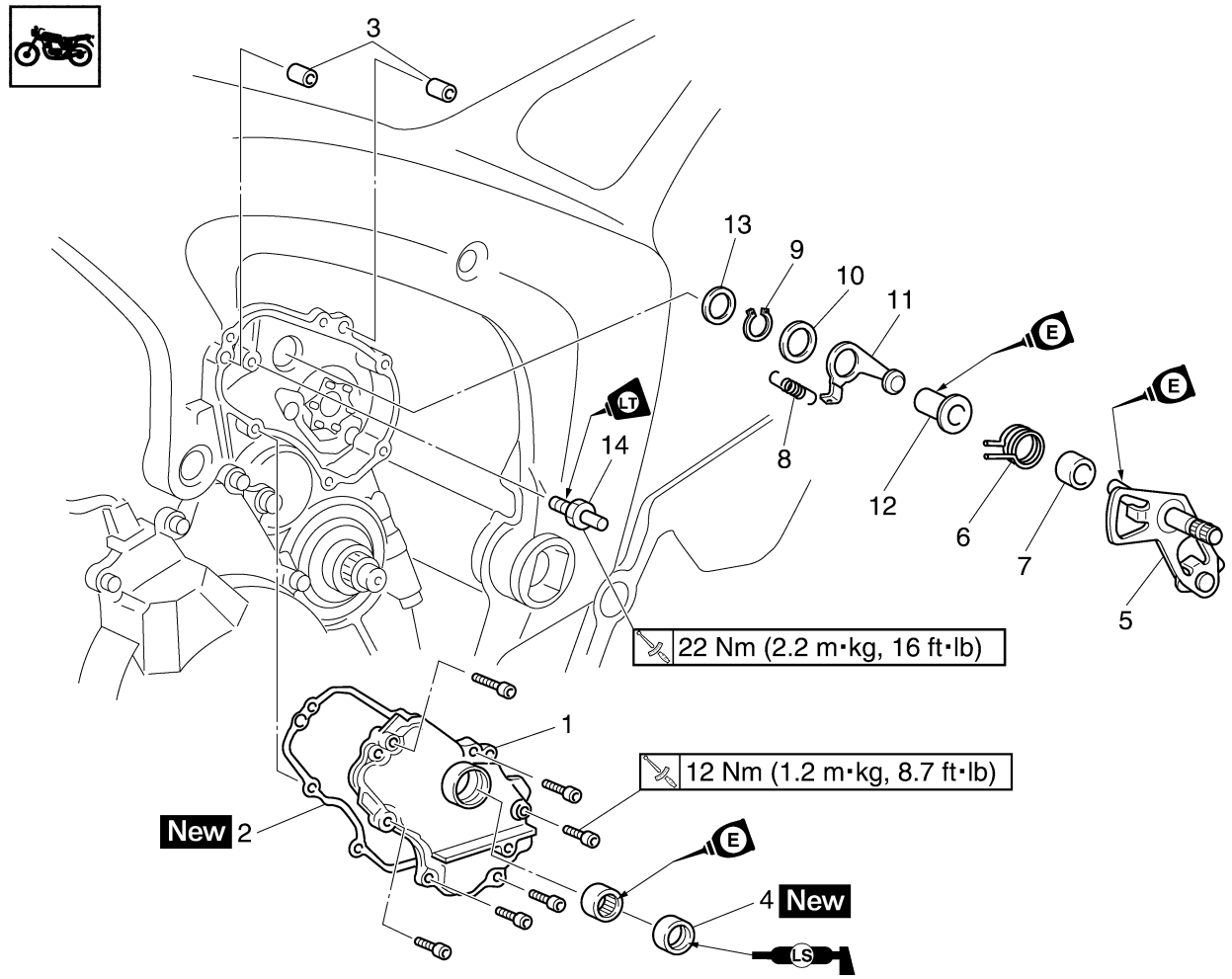
NOTE:
- Install the pull rod so that the teeth a face towards the rear of the vehicle. Then, install the clutch cover.
- Apply oil onto the bearing.
- Apply molybdenum disulfide grease onto the pull rod.
- When installing the clutch cover, push the pull lever and check that the punch mark "a" on the pull lever aligns with the mark "b" on the clutch cover. Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.
- Tighten the clutch cover bolts in stages and in a crisscross pattern.



10. Adjust:
    - Clutch cable free play
      Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" on page 3-16.

EAS25410
SHIFT SHAFT

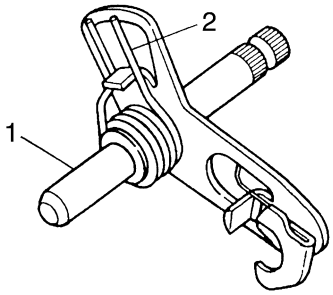
Removing the shift shaft and stopper lever



Order	Job/Parts to remove	Q'ty	Remarks
	Drive sprocket cover		Refer to "ENGINE REMOVAL" on page 5-1.
1	Shift shaft cover	1	
2	Shift shaft cover gasket	1	
3	Dowel pin	2	
4	Oil seal	1	
5	Shift shaft	1	
6	Shift shaft spring	1	
7	Collar	1	
8	Stopper lever spring	1	
9	Circlip	1	
10	Washer	1	
11	Stopper lever	1	
12	Collar	1	
13	Washer	1	
14	Shift shaft spring stopper	1	
			For installation, reverse the removal procedure.

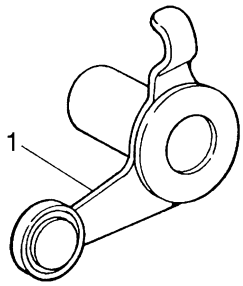
EAS25420
CHECKING THE SHIFT SHAFT

1. Check:
   - Shift shaft “1”
     Bends/damage/wear → Replace.
   - Shift shaft spring “2”
     Damage/wear → Replace.



EAS25430
CHECKING THE STOPPER LEVER

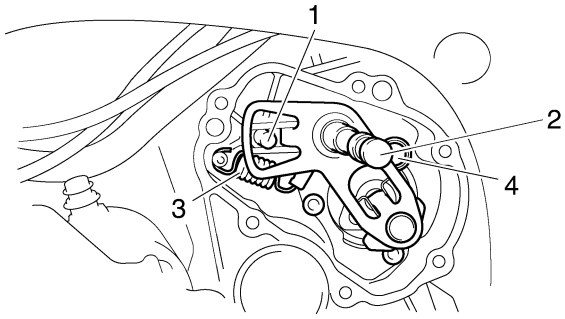
1. Check:
   - Stopper lever “1”
     Bends/damage → Replace.
     Roller turns roughly → Replace the stopper lever.



EAS25450
INSTALLING THE SHIFT SHAFT

1. Install:
   - Shift shaft spring stopper “1”
   - Washers
   - Shift shaft “2”

NOTE:
- Apply LOCTITE® to the threads of the shift shaft spring stopper.
- Hook the ends of the stopper lever spring “3” onto the stopper lever “4” and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.

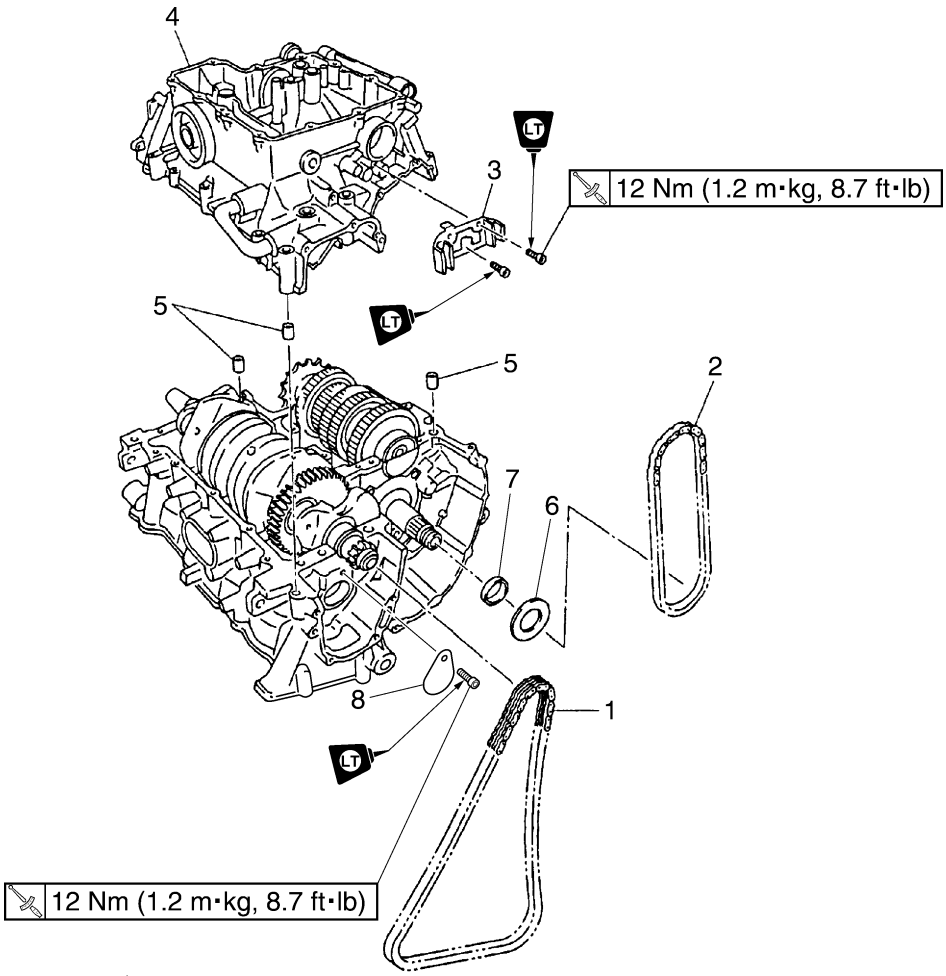


2. Install:
   - Shift shaft cover

NOTE:
Lubricate the oil seal lips with lithium-soap-based grease.

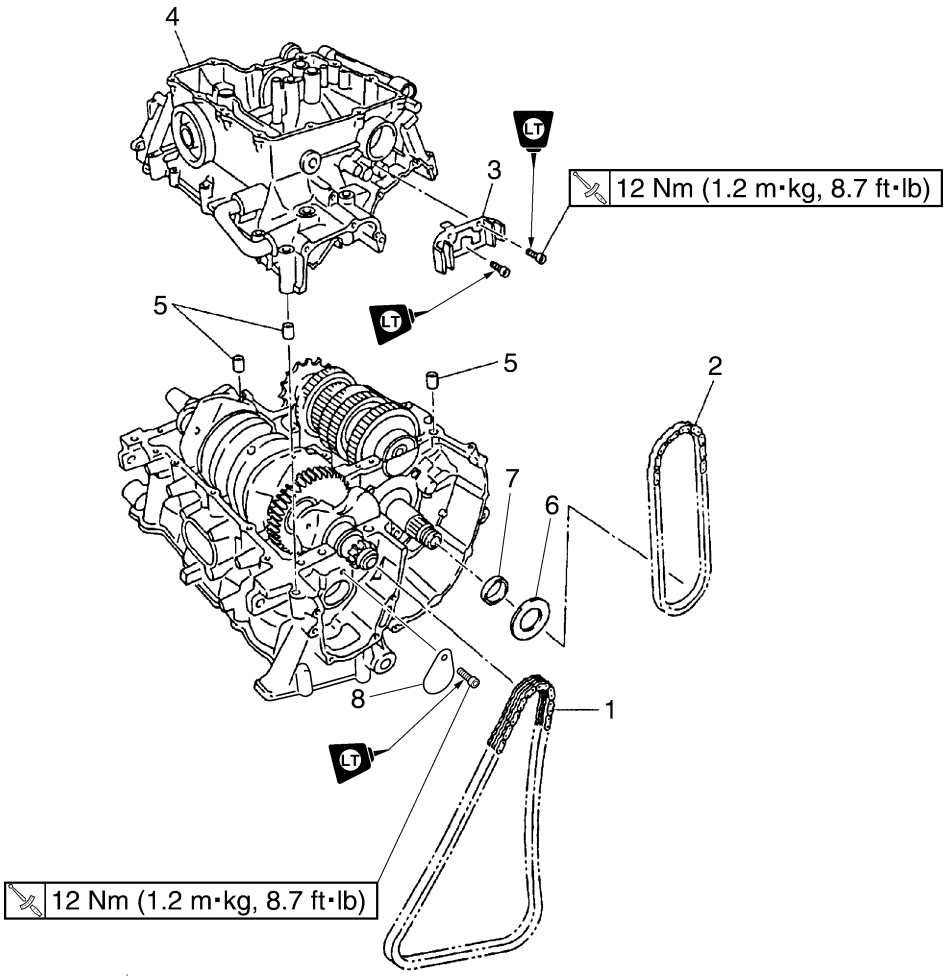
EAS25540
CRANKCASE

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-16.
	Generator		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-28.
	Starter clutch		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-28.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-53.
	Crankshaft position sensor		Refer to "PICKUP ROTOR" on page 5-33.
	Pickup rotor		Refer to "PICKUP ROTOR" on page 5-33.
	Clutch		Refer to "CLUTCH" on page 5-46.
	Water pump		Refer to "WATER PUMP" on page 6-9.
	Oil pan		Refer to "OIL PUMP" on page 5-40.
	Oil pump		Refer to "OIL PUMP" on page 5-40.
1	Timing chain	1	
2	Oil pump drive chain	1	
3	Oil pump drive chain guide	1	
4	Lower crankcase	1	
5	Dowel pin	3	
6	Thrust plate	1	
7	Washer	1	

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
8	Plate	1	
			For installation, reverse the removal procedure.

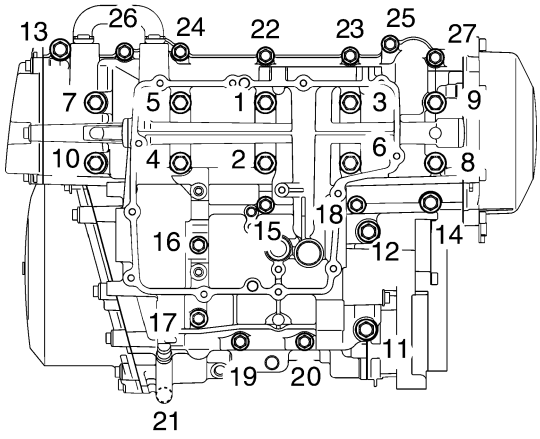
EAS25550
DISASSEMBLING THE CRANKCASE

1. Place the engine upside down.
2. Remove:
   - Crankcase bolts

NOTE:

- Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.
- Loosen the bolts in decreasing numerical order (refer to the numbers in the illustration).
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.

M8 × 85 mm (3.3 in) bolts: “1”–“7”, “10”
M8 × 115 mm (4.5 in) bolts: “8”, “9”
M8 × 65 mm (2.6 in) bolts: “11”, “12”
M6 × 65 mm (2.6 in) bolts: “13”, “14”
M6 × 55 mm (2.2 in) bolts: “15”, “22”–“26”
M6 × 45 mm (1.8 in) bolts: “16”, “19”, “20”
M6 × 65 mm (2.6 in) bolts: “17”, “27”
M6 × 75 mm (3.0 in) bolt: “18”
M6 × 100 mm (3.9 in) bolt: “21”



3. Remove:
   - Lower crankcase

ECA13900

CAUTION:

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

4. Remove:
   - Dowel pins
5. Remove:
   - Crankshaft journal lower bearing (from the lower crankcase)

NOTE:

Identify the position of each crankshaft journal lower bearing so that it can be reinstalled in its original place.

EAS25580
CHECKING THE CRANKCASE

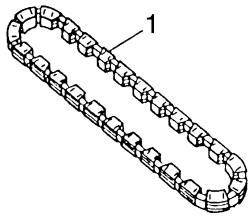
1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
   - Crankcase
     Cracks/damage → Replace.
   - Oil delivery passages
     Obstruction → Blow out with compressed air.

EAS4S81034
CHECKING THE BEARINGS AND OIL SEALS

1. Check:
   - Bearings
     Clean and lubricate the bearings, then rotate the inner race with your finger.
     Rough movement → Replace.
2. Check:
   - Oil seals
     Damage/wear → Replace.

EAS25620
CHECKING THE OIL PUMP DRIVE CHAIN

1. Check:
   - Oil pump drive chain “1”
     Damage/stiffness → Replace the oil pump drive chain, oil pump drive sprocket and oil pump shaft as a set.



2. Check:
   - Oil pump drive sprocket
     Cracks/damage/wear → Replace the oil pump drive sprocket and the oil pump drive chain as a set.

EAS25660
ASSEMBLING THE CRANKCASE

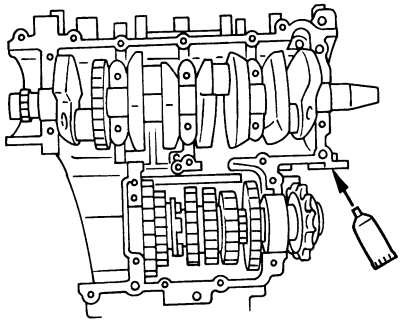
1. Lubricate:
   • Crankshaft journal bearings
   (with the recommended lubricant)

	Recommended lubricant **Engine oil**

2. Apply:
   • Sealant
   (onto the crankcase mating surfaces)

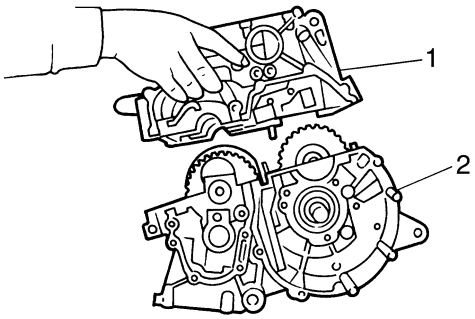
	Yamaha bond No. 1215 **90890-85505**

NOTE:
Do not allow any sealant to come into contact with the oil gallery or crankshaft journal bearings. Do not apply sealant to within 2–3 mm of the crankshaft journal bearings.



3. Install:
   • Dowel pin
4. Set the shift drum assembly and transmission gears in the neutral position.
5. Install:
   • Lower crankcase "1"
   (onto the upper crankcase "2")

ECA13980
CAUTION:
Before tightening the crankcase bolts, make sure the transmission gears shift correctly when the shift drum assembly is turned by hand.



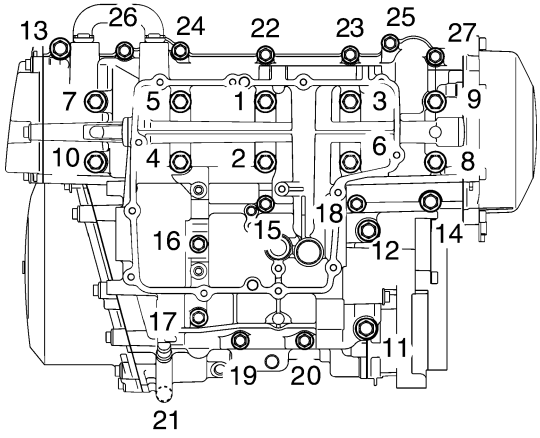
6. Install:
   • Crankcase bolts

NOTE:
- Lubricate the bolt threads with engine oil.
- Install a washer on bolts "1"–"10"
- Seal bolt "18"
- Tighten the bolts in the tightening sequence cast on the crankcase.

M8 × 85 mm (3.3 in) bolts: "1"–"7", "10"
M8 × 115 mm (4.5 in) bolts: "8", "9"
M8 × 65 mm (2.6 in) bolts: "11", "12"
M6 × 65 mm (2.6 in) bolts: "13", "14"
M6 × 55 mm (2.2 in) bolts: "15", "22"–"26"
M6 × 45 mm (1.8 in) bolts: "16", "19", "20"
M6 × 65 mm (2.6 in) bolts: "17", "27"
M6 × 75 mm (3.0 in) bolt: "18" LOCTITE®
M6 × 100 mm (3.9 in) bolt: "21"

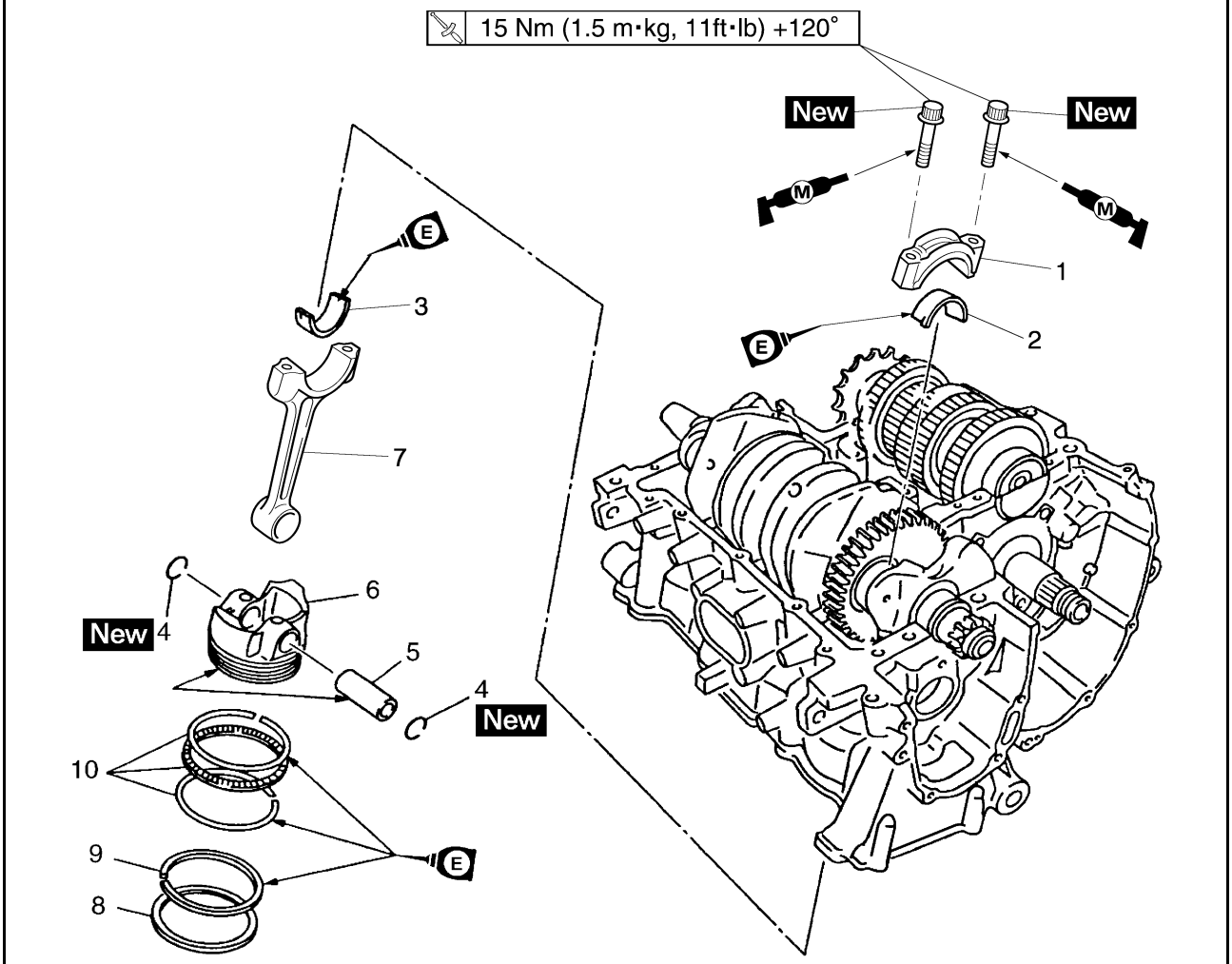
	Crankcase bolt **Bolt "1"–"10"** **1st: 12 Nm (1.2 m·kg, 8.7 ft·lb)** **2nd: 25 Nm (2.5 m·kg, 18 ft·lb)** **3rd*: 27 Nm (2.7 m·kg, 20 ft·lb)** **Bolt "11", "12"** **24 Nm (2.4 m·kg, 17 ft·lb)** **Bolt "13", "14"** **14 Nm (1.4 m·kg, 1.0 ft·lb)** **Bolt "15"–"27"** **12 Nm (1.2 m·kg, 8.7 ft·lb)**

*Loosen the bolts following the tightening order and then tighten to specification torque.



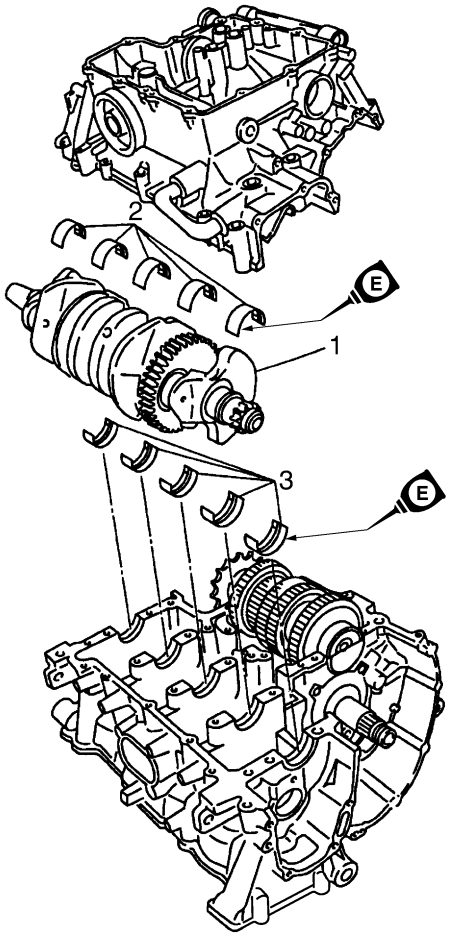
EAS25950
CRANKSHAFT

Removing the connecting rods and pistons



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Refer to "CRANKCASE" on page 5-55.
1	Connecting rod cap	4	
2	Big end lower bearing	4	
3	Big end upper bearing	4	
4	Piston pin clip	8	
5	Piston pin	4	
6	Piston	4	
7	Connecting rod	4	
8	Top ring	4	
9	2nd ring	4	
10	Oil ring	4	
			For installation, reverse the removal procedure.

Removing the crankshaft



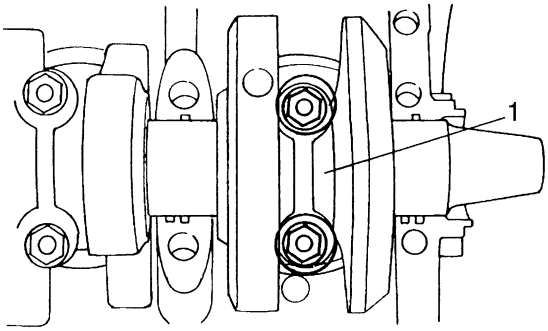
Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-55.
	Connecting rods caps		Refer to "CRANKSHAFT" on page 5-60.
1	Crankshaft	1	
2	Crankshaft journal lower bearing	5	
3	Crankshaft journal upper bearing	5	
			For installation, reverse the removal procedure.

EAS26030
REMOVING THE CONNECTING RODS AND PISTONS

The following procedure applies to all of the connecting rods and pistons.

1. Remove:
   - Connecting rod cap "1"
   - Big end bearings

NOTE:
Identify the position of each bigend bearing so that it can be reinstalled in its original place.

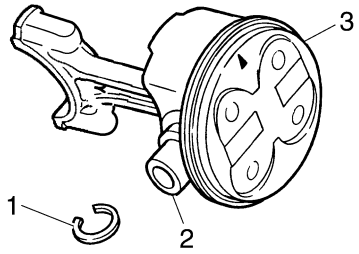


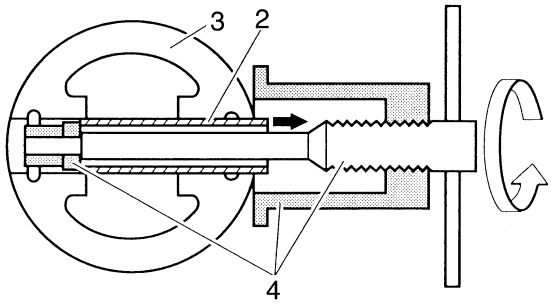
2. Remove:
   - Piston pin clips "1"
   - Piston pin "2"
   - Piston "3"

ECA4S81024
CAUTION:
Do not use a hammer to drive the piston pin out.

NOTE:
- For reference during installation, put identification marks on the piston crown.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set "4".

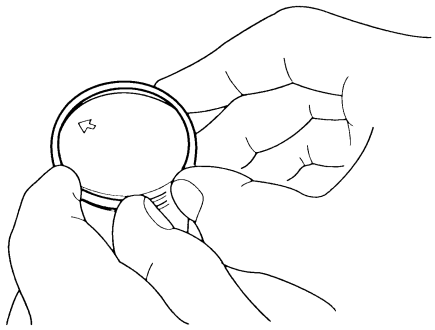
Piston pin puller set
90890-01304
Piston pin puller
YU-01304





3. Remove:
   - Top ring
   - 2nd ring
   - Oil ring

NOTE:
When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.



EAS25980
REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:
   - Crankshaft assembly
   - Crankshaft journal upper bearings (from the upper crankcase)
     Refer to "CRANKSHAFT" on page 5-60.

NOTE:
Identify the position of each crankshaft journal upper bearing so that it can be reinstalled in its original place.

EAS24390
CHECKING THE CYLINDER AND PISTON

1. Check:
   - Piston wall
   - Cylinder wall
     Vertical scratches → Replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
   - Piston-to-cylinder clearance

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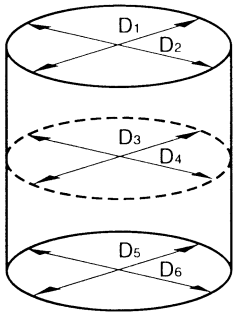
a. Measure cylinder bore "C" with the cylinder bore gauge.

NOTE:
Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

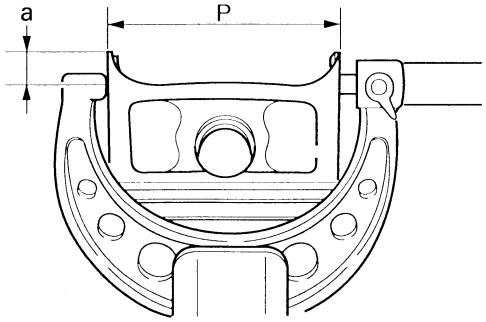
Bore
65.500–65.510 mm (2.5787–2.5791 in)
Wear limit
65.56 mm (2.5811 in)
Taper limit
0.050 mm (0.0020 in)
Out of round limit
0.050 mm (0.0020 in)

"C" = maximum of D_1–D_6
"T" = maximum of D_1 or D_2 - maximum of D_5 or D_6
"R" = maximum of D_1, D_3 or D_5 - minimum of D_2, D_4 or D_6



b. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.
c. Measure piston skirt diameter "P" with the micrometer.

Piston size "P"
Standard
65.475–65.490 mm (2.5778–2.5783 in)



a. 4 mm (0.16 in) from the bottom edge of the piston

d. If out of specification, replace the piston and piston rings as a set.
e. Calculate the piston-to-cylinder clearance with the following formula.

- Piston-to-cylinder clearance = Cylinder bore "C" - Piston skirt diameter "P"

Piston-to-cylinder clearance
0.010–0.035 mm (0.0004–0.0014 in)
Limit
0.05 mm (0.0020 in)

f. If out of specification, replace the cylinder, and the piston and piston rings as a set.

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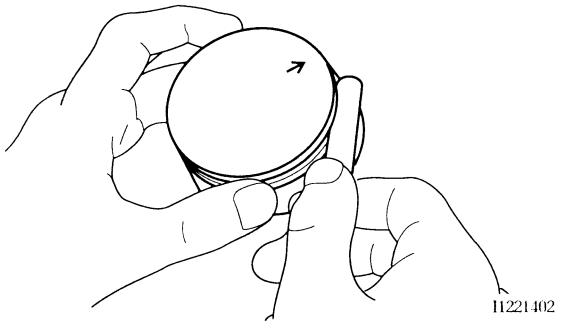
EAS24430
CHECKING THE PISTON RINGS

1. Measure:
   - Piston ring side clearance
     Out of specification → Replace the piston and piston rings as a set.

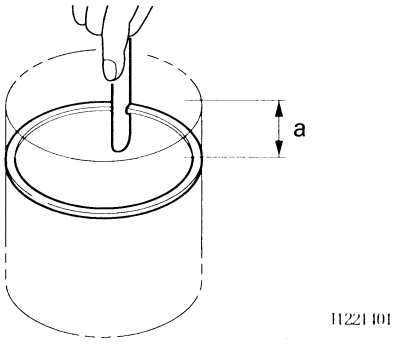
NOTE:
Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

Top ring
Ring side clearance
0.030–0.065 mm (0.0012–0.0026 in)
Limit
0.115 mm (0.0045 in)
2nd ring
Ring side clearance
0.030–0.065 mm (0.0012–0.0026 in)
Limit
0.125 mm (0.0049 in)



2. Install:
   - Piston ring
     (into the cylinder)

NOTE:
Level the piston ring into the cylinder with the piston crown.



a. 5 mm (0.20 in)

3. Measure:
   - Piston ring end gap
     Out of specification → Replace the piston ring.

NOTE:
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

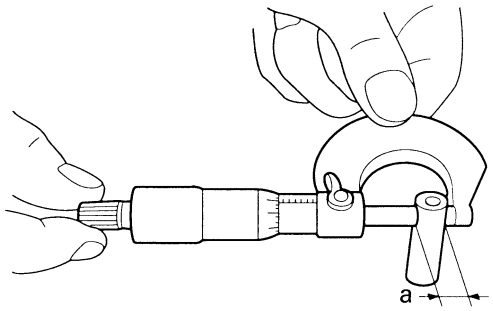
Top ring
End gap (installed)
0.25–0.35 mm (0.0098–0.0138 in)
Limit
0.60 mm (0.0236 in)
2nd ring
End gap (installed)
0.70–0.80 mm (0.0276–0.0315 in)
Limit
1.15 mm (0.0453 in)
Oil ling
End gap (installed)
0.10–0.35 mm (0.0039–0.0138 in)

EAS24440
CHECKING THE PISTON PINS

The following procedure applies to all of the piston pins.

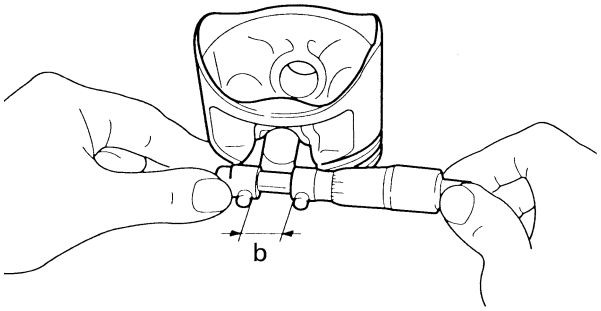
1. Check:
   - Piston pin
     Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.
2. Measure:
   - Piston pin outside diameter "a"
     Out of specification → Replace the piston pin.

Piston pin outside diameter
15.991–16.000 mm (0.6296–0.6299 in)
Limit
15.971 mm (0.6288 in)



3. Measure:
   - Piston pin bore inside diameter "b"
     Out of specification → Replace the piston.

Piston pin bore inside diameter
16.002–16.013 mm (0.6300–0.6304 in)
Limit
16.043 mm (0.6316 in)



4. 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 diameter "b" - Piston pin outside diameter "a"

Piston-pin-to-piston-pin-bore clearance
0.002–0.022 mm (0.0001–0.0009 in)
Limit
0.072 mm (0.0028 in)

EAS4S81037
CHECKING THE BIG END BEARINGS

1. Measure:
   • Crankshaft-pin-to-big-end-bearing clearance
   Out of specification → Replace the big end bearings.

Crankshaft-pin-to-big-end-bearing clearance
0.028–0.052 mm (0.0011–0.0020 in)

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The following procedure applies to all of the connecting rods.

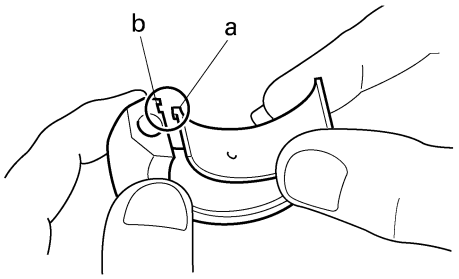
ECA4S81025
CAUTION:

Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft-pin-to-big-end-bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.

a. Clean the big end bearings, crankshaft pins, and the inside of the connecting rod halves.
b. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

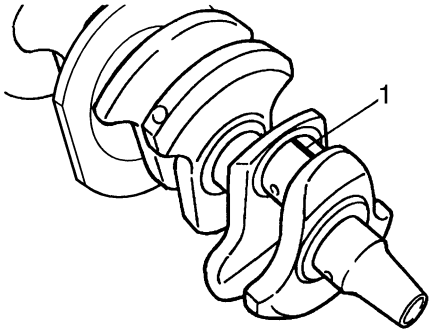
NOTE:

Align the projections "a" on the big end bearings with the notches "b" in the connecting rod and connecting rod cap.



I1630301

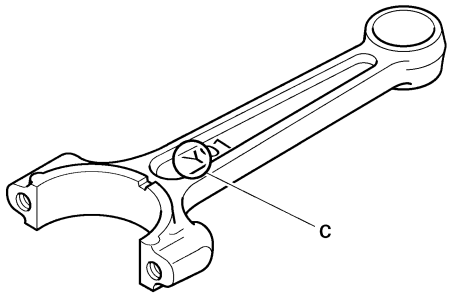
c. Put a piece of Plastigauge® "1" on the crankshaft pin.

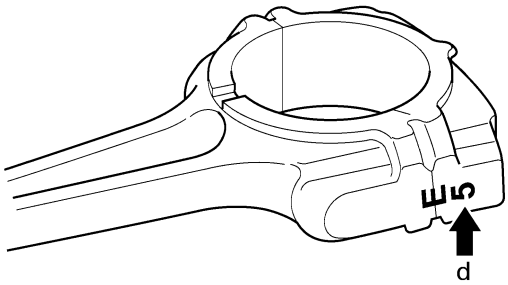


d. Assemble the connecting rod halves.

NOTE:

• Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
• Lubricate the bolt threads and seats with molybdenum disulfide grease.
• Make sure that the "Y" mark "c" on the connecting rod faces towards the left side of the crankshaft.
• Make sure that the characters "d" on both the connecting rod and connecting rod cap are aligned.





e. Tighten the connecting rod bolts.

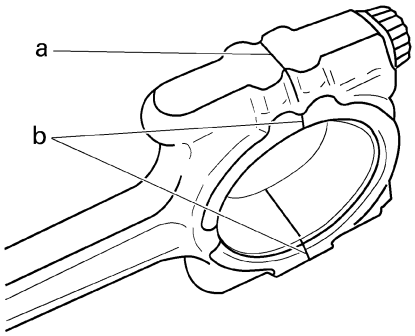
NOTE:
Install by carrying out the following procedures in order to assemble in the most suitable condition.

- Connecting rod bolts

	Connecting rod bolt **24.5 Nm (2.5 m·kg, 17.7 ft·lb)**

f. Replace the connecting rod bolts with new ones.
g. Clean the connecting rod bolts.
h. After installing the big end bearing, assemble the connecting rod and connecting rod cap once using a single unit of the connecting rod.
i. Tighten the connecting rod bolt while checking that the sections shown “a” and “b” are flush with each other by touching the surface.
   - Side machined face “a”
   - Thrusting faces (4 places at front and rear) “b”

NOTE:
To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.



j. 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.
k. Tighten the connecting rod bolts.

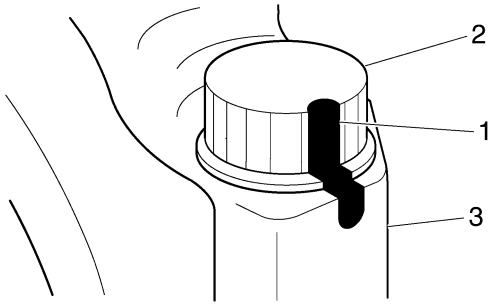
	Connecting rod bolt **15 Nm (1.5 m·kg, 11 ft·lb) + 120°**

ECA4S81026

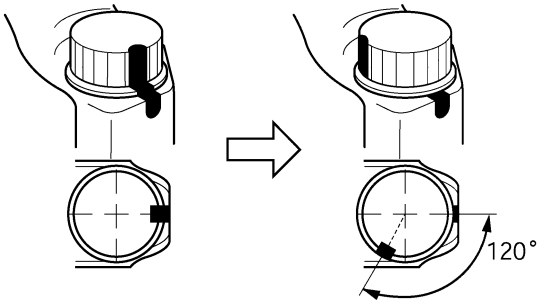
CAUTION:

Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts.

l. Clean the connecting rod bolts.
m. Tighten the connecting rod bolts.
n. Put a mark “1” on the corner of the connecting rod bolt “2” and the connecting rod cap “3”



o. Tighten the bolt further to reach the specified angle (120°).



p. After the installation, check that the section show “a” is flush with each other by touching the surface.
   • Side machined face “a”

EWA4S81014

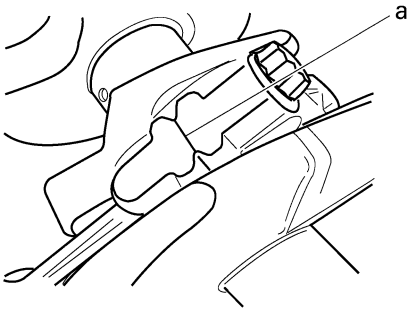
⚠ WARNING

- **When the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it.**
  Replace the bolt with a new one and perform the procedure again.
- **If they are not flush with each other, remove the connecting rod bolt and big end bearing and restart from step "e". In this case, make sure to replace the connecting rod bolt.**

ECA4S81027

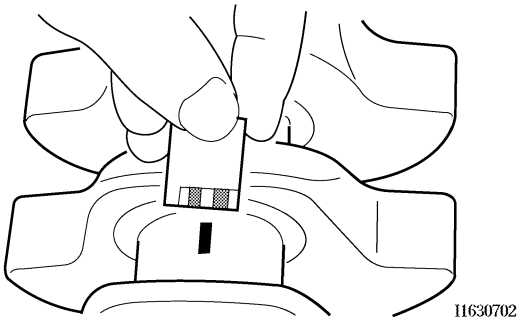
CAUTION:

- **Do not use a torque wrench to tighten the nut to the specified angle.**
- **Tighten the bolt until it is at the specified angles.**



q. Remove the connecting rod and big end bearings.
   Refer to "REMOVING THE CONNECTING RODS AND PISTONS" on page 5-62.

r. Measure the compressed Plastigauge® width on the crankshaft pin.
   If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



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2. Select:
   • Big end bearings (P1–P4)

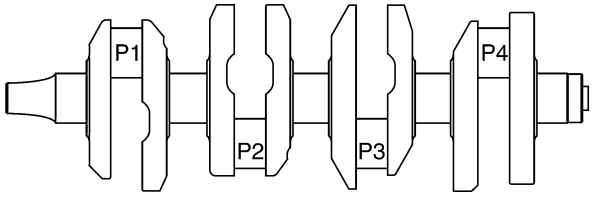
NOTE:

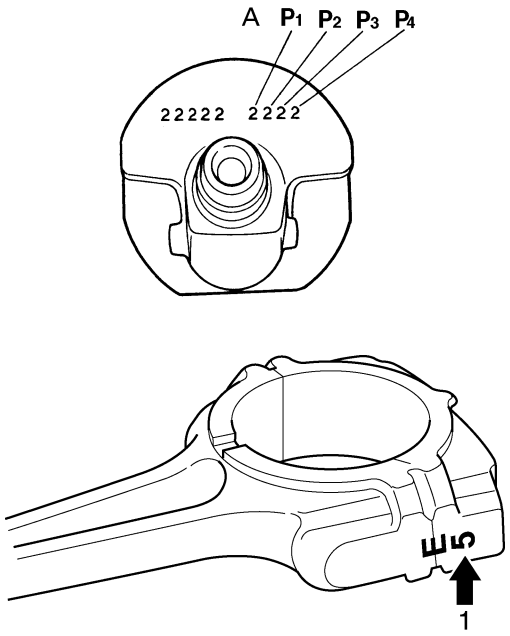
- The numbers “A” stamped into the crankshaft web and the numbers “1” on the connecting rods are used to determine the replacement big end bearing sizes.
- “P1”–“P4” refer to the bearings shown in the crankshaft illustration.

For example, if the connecting rod “P_1” and the crankshaft web “P_1” numbers are “5” and “2” respectively, then the bearing size for “P_1” is:

P_1 (connecting rod) – P_1 (crankshaft web) = 5 – 2 = 3 (brown)

COLOR CODE	
1	Blue
2	Black
3	Brown
4	Green



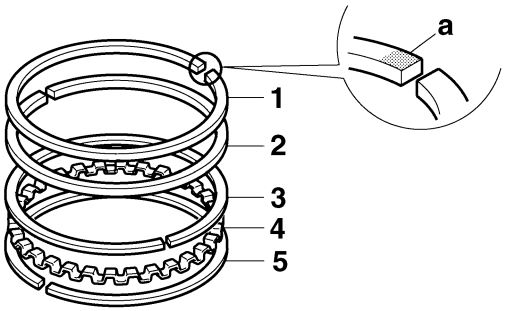


EAS26190
INSTALLING THE CONNECTING ROD AND PISTON

The following procedure applies to all of the connecting rods and pistons.

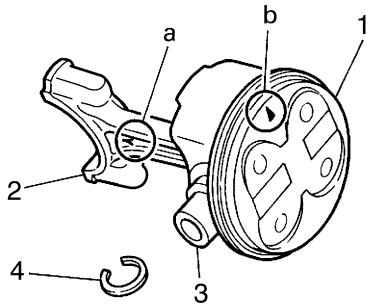
1. Install:
   - Top ring “1”
   - 2nd ring “2”
   - Upper oil ring rail “3”
   - Oil ring expander “4”
   - Lower oil ring rail “5”

NOTE:
Be sure to install the piston rings so that the manufacturer’s marks or numbers “a” face up.



2. Install:
   - Piston “1”
     (onto the respective connecting rod “2”)
   - Piston pin “3”
   - Piston pin clip “4” New

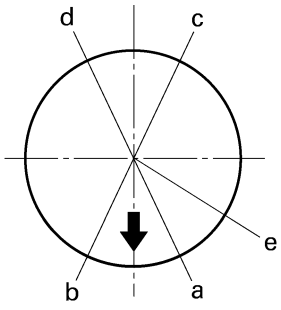
NOTE:
- Apply engine oil onto the piston pin.
- Make sure that the “Y” mark “a” on the connecting rod faces left when the arrow mark “b” on the piston is pointing up as shown.
- Reinstall each piston into its original cylinder (numbering order starting from the left: #1 to #4).



3. Lubricate:
   - Piston
   - Piston rings
   - Cylinder
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

4. Offset:
   - Piston ring end gaps



I1221202

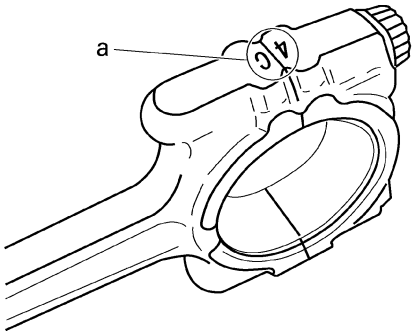
a. Top ring
b. Lower oil ring rail
c. Upper oil ring rail
d. 2nd ring
e. Oil ring expander

5. Lubricate:
   - Crankshaft pins
   - Big end bearings
   - Connecting rod big end inner surface
     (with the recommended lubricant)

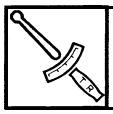
	Recommended lubricant **Engine oil**

6. Install:
   - Big end bearings
   - Connecting rod cap
     (onto the connecting rod)

NOTE:
- Align the projections on the big end bearings with the notches in the connecting rods and connecting rod caps.
- Make sure that the characters “a” on both the connecting rod and connecting rod cap are aligned.



7. Tighten:
   - Connecting rod bolts

	**Connecting rod bolt** **24.5 Nm (2.5 m·kg, 17.7 ft·lb)**

NOTE:
Install by carrying out the following procedures in order to assemble in the most suitable condition.

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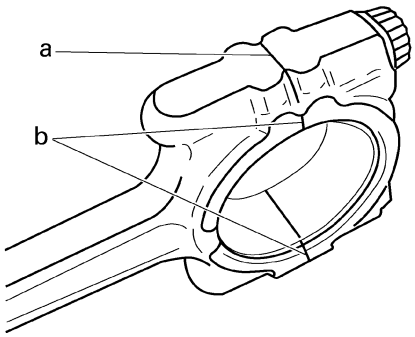
a. Replace the connecting rod bolts with new ones.
b. Clean the connecting rod bolts.
c. After installing the big end bearing, assemble the connecting rod and connecting rod cap once using a single unit of the connecting rod.
d. Tighten the connecting rod bolt while checking that the sections shown “a” and “b” are flush with each other by touching the surface.



a. Side machined face
b. Thrusting faces (4 places at front and rear)

NOTE:
To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.

e. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

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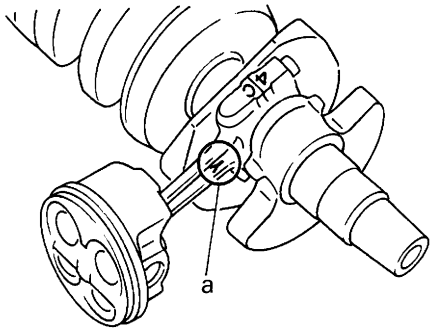
8. Install:
   - Connecting rod assembly
     (into the cylinder and onto the crankshaft pin)

NOTE:
- While compressing the piston rings with one hand, install the connecting rod assembly into the cylinder with the other hand.
- Make sure that the “Y” marks “a” on the connecting rods face towards the left side of the crankshaft.



9. Tighten:
   • Connecting rod bolts

Connecting rod bolt
15 Nm (1.5 m·kg, 11 ft·lb) + 120°

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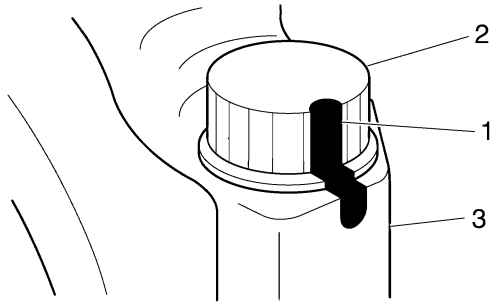
ECA14980

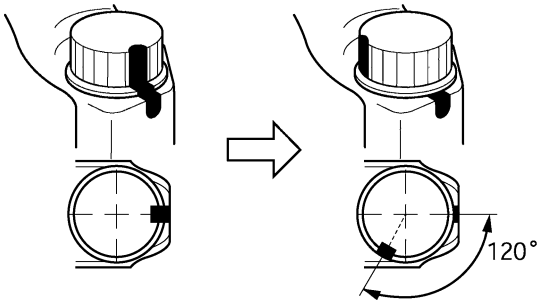
CAUTION:

Tighten the connecting rod bolts using the plastic-region tightening angle method.

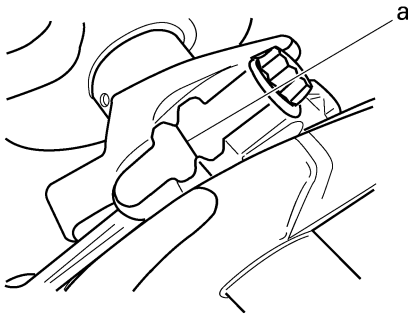
a. Clean the connecting rod bolts.
b. Tighten the connecting rod bolts.
c. Put a mark “1” on the corner of the connecting rod bolt “2” and the connecting rod cap “3”.



d. Tighten the bolt further to reach the specified angle (120°).



e. After the installation, check that the section shown “a” is flush with each other by touching the surface.



a. Side machined face

EWA13990

WARNING

- **When the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Replace the bolt with a new one and perform the procedure again.**
- **If they are not flush with each other, remove the connecting rod bolt and big end bearing and restart from step “7”. In this case, make sure to replace the connecting rod bolt.**

ECA4S81029

CAUTION:

- **Do not use a torque wrench to tighten the bolt to the specified angle.**
- **Tighten the bolt until it is at the specified angles.**

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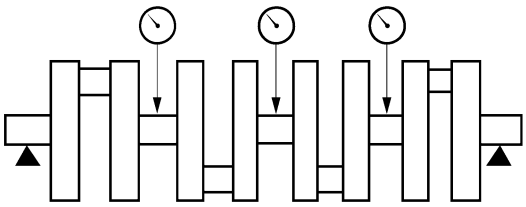
EAS4S81038

CHECKING THE CRANKSHAFT

1. Measure:
   • Crankshaft runout
   Out of specification → Replace the crankshaft.

Crankshaft runout
Less than 0.03 mm (0.0012 in)



I1631006

2. Check:
   • Crankshaft journal surfaces
   • Crankshaft pin surfaces
   • Bearing surfaces
   Scratches/wear → Replace the crankshaft.

EAS4S81039

CHECKING THE CRANKSHAFT JOURNAL BEARINGS

1. Measure:
   • Crankshaft-journal-to-crankshaft-journal-bearing clearance

Out of specification → Replace the crankshaft journal bearings.

Crankshaft-journal-to-crankshaft journal bearing clearance
0.034–0.058 mm
(0.0013–0.0023 in)

ECA4S81028

CAUTION:

Do not interchange the crankshaft journal bearings. To obtain the correct crankshaft-journal- to-crankshaft-journal-bearing clearance and prevent engine damage, the crankshaft journal bearings must be installed in their original positions.

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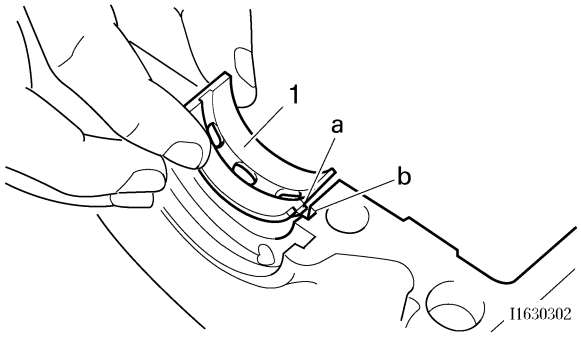
a. Clean the crankshaft journal bearings, crankshaft journals, and bearing portions of the crankcase.
b. Place the upper crankcase upside down on a bench.
c. Install the crankshaft journal upper bearings “1” and the crankshaft into the upper crankcase.

NOTE:

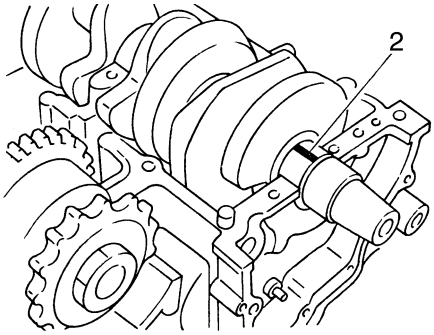
Align the projections “a” on the crankshaft journal upper bearings with the notches “b” in the upper crankcase.



d. Put a piece of Plastigauge® “2” on each crankshaft journal.

NOTE:

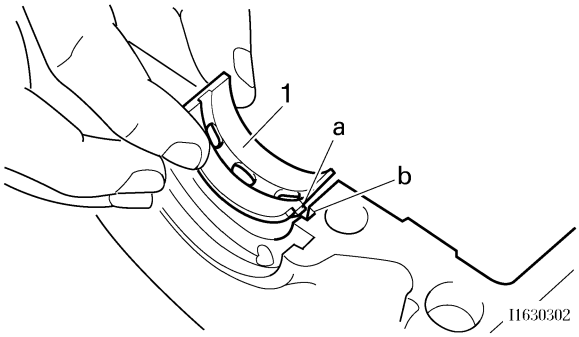
Do not put the Plastigauge® over the oil hole in the crankshaft journal.



e. Install the crankshaft journal lower bearings “1” into the lower crankcase and assemble the crankcase halves.

NOTE:

- Align the projections “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.

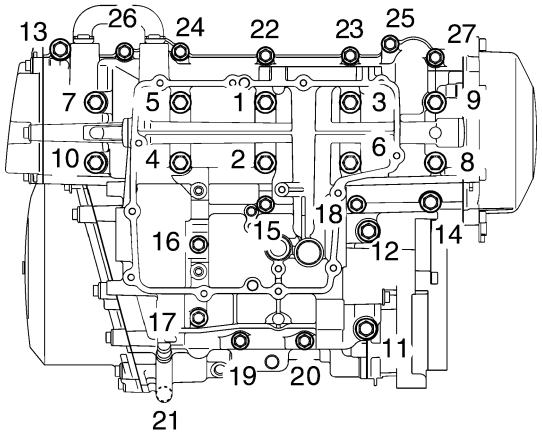
Crankcase bolt
Bolt “1”–“10”
1st: 12 Nm (1.2 m·kg, 8.7 ft·lb)
2nd: 25 Nm (2.5 m·kg, 18 ft·lb)
3rd*: 27 Nm (2.7 m·kg, 20 ft·lb)
Bolt “11”, “12”
24 Nm (2.4 m·kg, 17 ft·lb)
Bolt “13”, “14”
14 Nm (1.4 m·kg, 1.0 ft·lb)
Bolt “15”–”27”
12 Nm (1.2 m·kg, 8.7 ft·lb)

*Loosen the bolts following the tightening order and then tighten to specification torque.

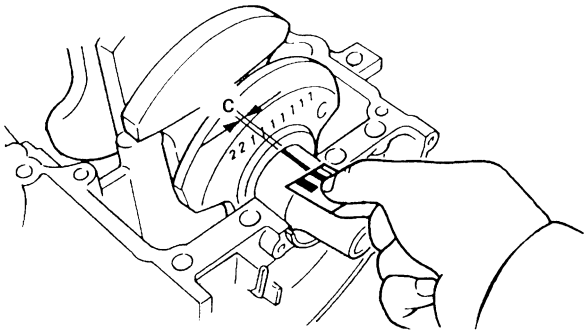
NOTE:

Lubricate the crankcase bolt threads with engine oil.

Refer to "CRANKCASE" on page 5-55.



g. Remove the lower crankcase and the crankshaft journal lower bearings.
h. Measure the compressed Plastigauge® width "c" on each crankshaft journal.
If the crankshaft-journal-to-crankshaft-journal-bearing clearance is out of specification, select replacement crankshaft journal bearings.



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2. Select:
   • Crankshaft journal bearings (J1–J5)

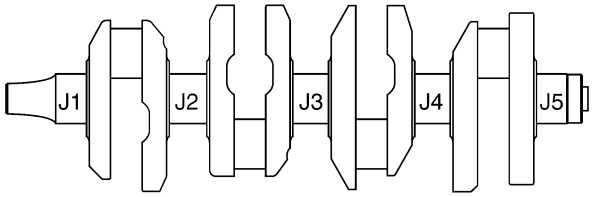
NOTE:

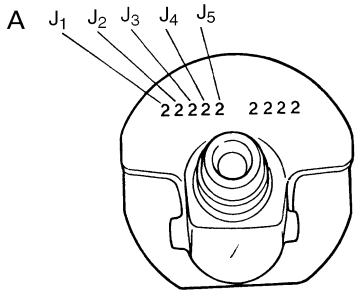
- The numbers "A" stamped into the crankshaft web and the numbers "1" stamped into the lower crankcase are used to determine the replacement crankshaft journal bearing sizes.
- "J1–J5" refer to the bearings shown in the crankshaft illustration.
- If "J1–J5" are the same, use the same size for all of the bearings.
- If the size is the same for all "J_1 to J_5" one digit for that size is indicated. (Crankcase side only)

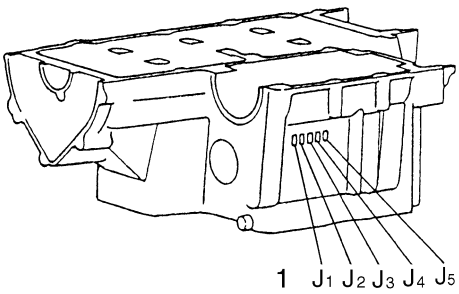
For example, if the crankcase "J_1" and crankshaft web "J_1" numbers are "6" and "2" respectively, than the bearing size for "J_1" is:

"J_1" (crankcase) – "J_1" (crankshaft web) – 1 = 6 – 2 – 1 = 3 (brown)

CRANKSHAFT JOURNAL BEARING COLOR CODE	
0	White
1	Blue
2	Black
3	Brown
4	Green





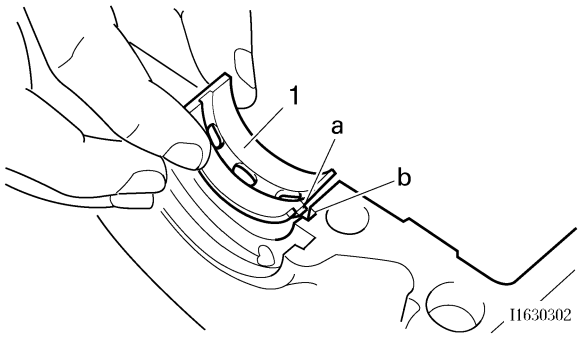


EAS4S81040

INSTALLING THE CRANKSHAFT

1. Install:
   • Crankshaft journal upper bearings "1" (into the upper crankcase)

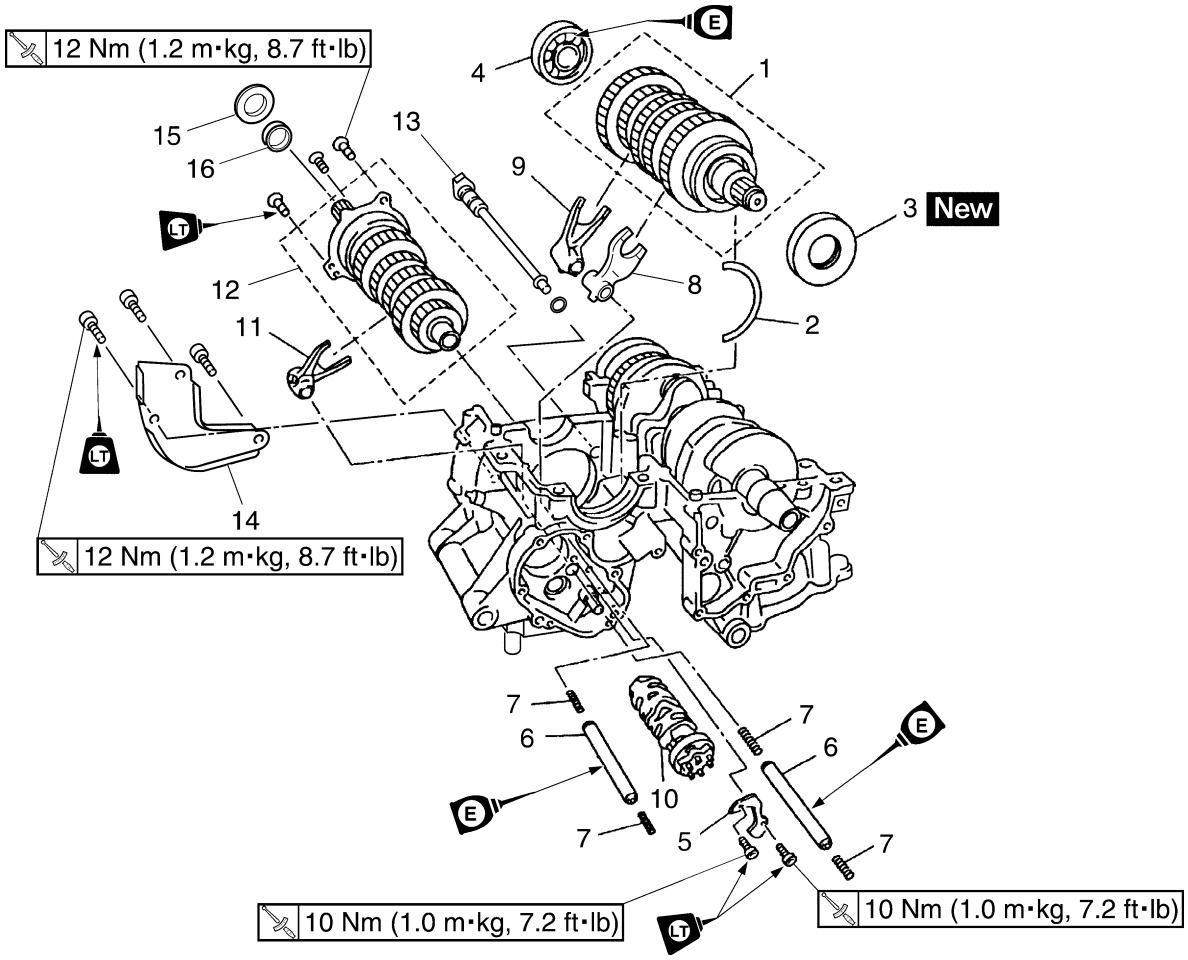
NOTE:
- Align the projections “a” on the crankshaft journal upper bearings with the notches “b” in the upper crankcase.
- Be sure to install each crankshaft journal upper bearing in its original place.



2. Install:
   - Crankshaft
3. Install:
   - Lower crankcase
     Refer to "CRANKCASE" on page 5-55.

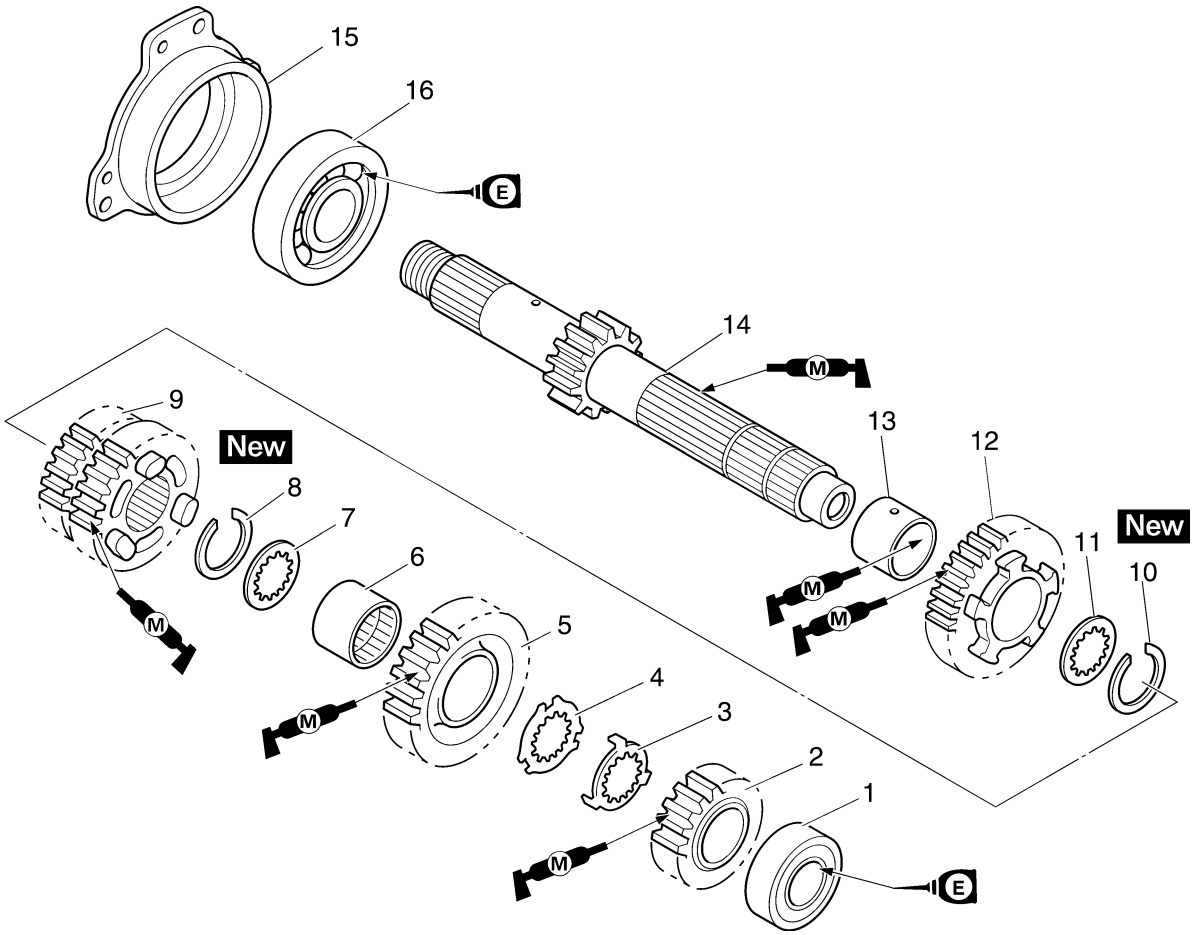
EAS26240
TRANSMISSION

Removing the transmission, shift drum assembly, and shift forks



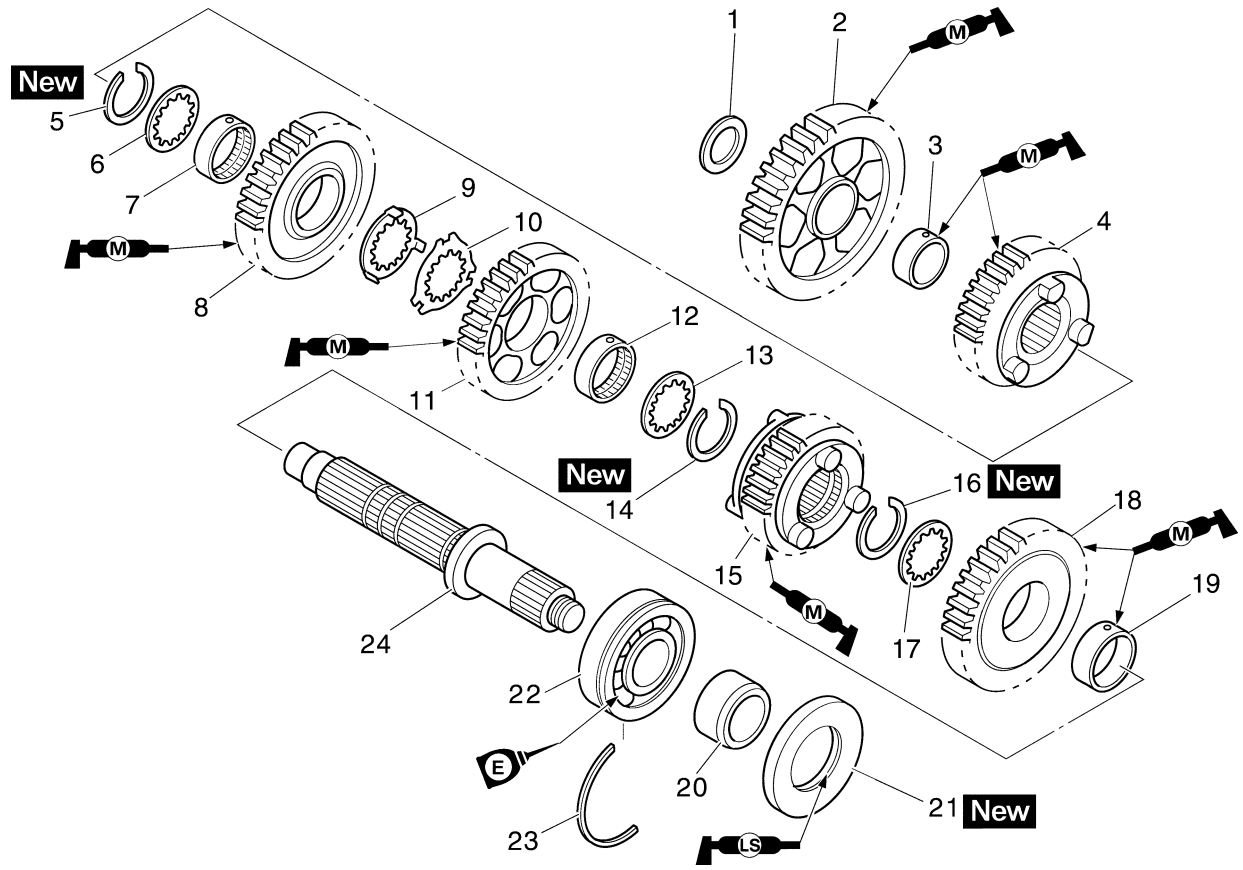
Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase	1	Refer to "CRANKCASE" on page 5-55.
1	Drive axle assembly	1	
2	Circlip	1	
3	Oil seal	1	
4	Bearing	1	
5	Shift drum retainer	1	
6	Shift fork guide bar	2	
7	Spring	4	
8	Shift fork-L	1	
9	Shift fork-R	1	
10	Shift drum assembly	1	
11	Shift fork-C	1	
12	Main axle assembly	1	
13	Oil pipe	1	
14	Oil baffle plate	1	
15	Thrust plate	1	
16	Washer	1	
			For installation, reverse the removal procedure.

Disassembling the main axle assembly



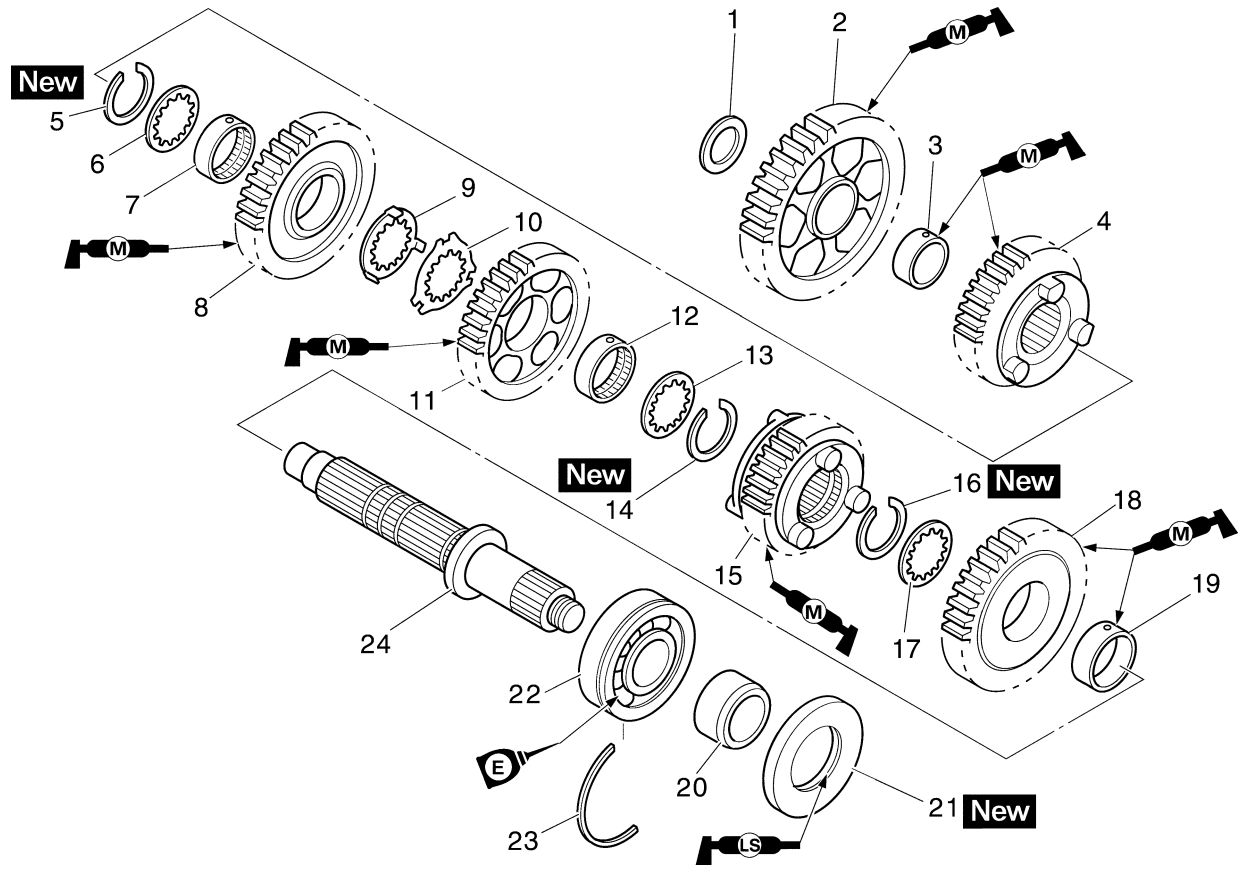
Order	Job/Parts to remove	Q'ty	Remarks
1	Bearing	1	
2	2nd pinion gear	1	
3	Toothed lock washer	1	
4	Toothed lock washer retainer	1	
5	6th pinion gear	1	
6	Collar	1	
7	Washer	1	
8	Circlip	1	
9	3rd pinion gear	1	
10	Circlip	1	
11	Washer	1	
12	5th pinion gear	1	
13	Collar	1	
14	Main axle	1	
15	Bearing housing	1	
16	Bearing	1	
			For installation, reverse the removal procedure.

Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Washer	1	
2	1st wheel gear	1	
3	Collar	1	
4	5th wheel gear	1	
5	Circlip	1	
6	Washer	1	
7	Collar	1	
8	3rd wheel gear	1	
9	Toothed lock washer	1	
10	Toothed lock washer retainer	1	
11	4th wheel gear	1	
12	Collar	1	
13	Washer	1	
14	Circlip	1	
15	6th wheel gear	1	
16	Circlip	1	
17	Washer	1	
18	2nd wheel gear	1	
19	Collar	1	
20	Collar	1	
21	Oil seal	1	
22	Bearing	1	
23	Circlip	1	
24	Drive axle	1	

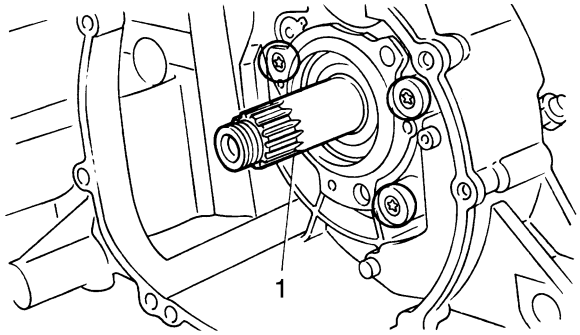
Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
			For installation, reverse the removal procedure.

EAS26250
REMOVING THE TRANSMISSION

1. Remove:
   - Main axle assembly “1”
     (with the Torx® wrench)



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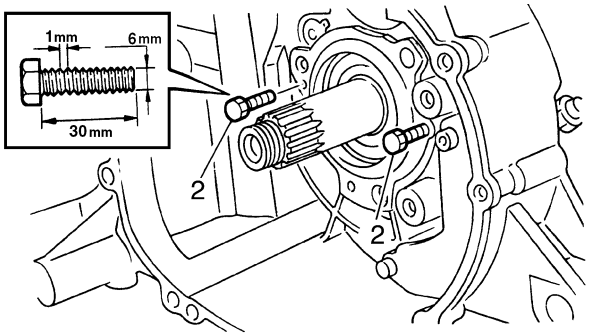
a. Insert two bolts “2” of the proper size, as shown in the illustration, into the main axle assembly bearing housing.
b. Tighten the bolts until they contact the crankcase surface.
c. Continue tightening the bolts until the main axle assembly comes free from the upper crankcase.



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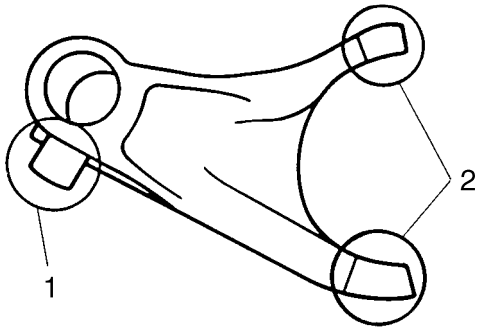
EAS26260
CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

1. Check:
   - Shift fork cam follower “1”
   - Shift fork pawl “2”
     Bends/damage/scoring/wear → Replace the shift fork.

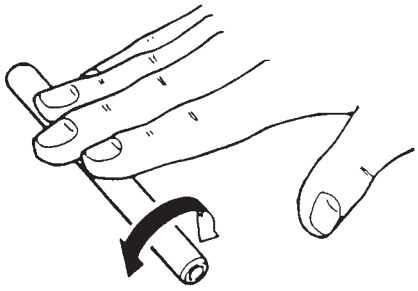


2. Check:
   - Shift fork guide bar
     Roll the shift fork guide bar on a flat surface.
     Bends → Replace.

EWA12840

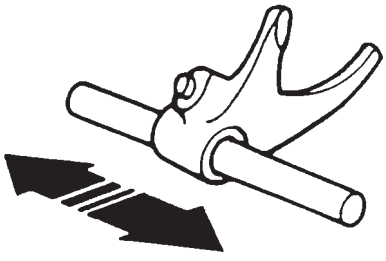
⚠ WARNING

Do not attempt to straighten a bent shift fork guide bar.



319-010

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.

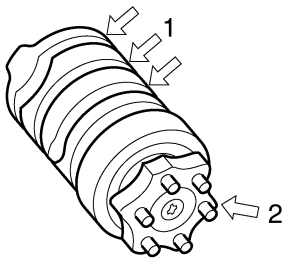


319-011

EAS26270
CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:
   - Shift drum groove
     Damage/scratches/wear → Replace the shift drum assembly.
   - Shift drum segment “1”
     Damage/wear → Replace the shift drum assembly.
   - Shift drum bearing “2”

Damage/pitting → Replace the shift drum assembly.

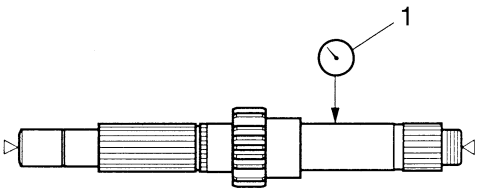


I1530101

EAS26300
CHECKING THE TRANSMISSION

1. Measure:
   - Main axle runout
     (with a centering device and dial gauge "1")
     Out of specification → Replace the main axle.

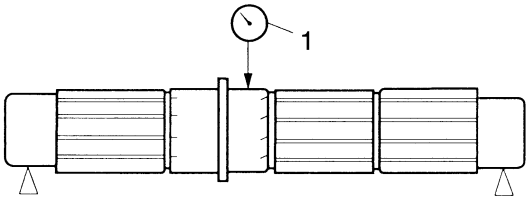
Main axle runout limit
0.02 mm (0.0008 in)



I1650702

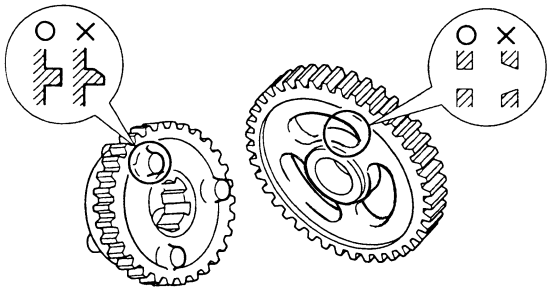
2. Measure:
   - Drive axle runout
     (with a centering device and dial gauge "1")
     Out of specification → Replace the drive axle.

Drive axle runout limit
0.02 mm (0.0008 in)



I1650701

3. Check:
   - Transmission gears
     Blue discoloration/pitting/wear → Replace the defective gear(s).
   - Transmission gear dogs
     Cracks/damage/rounded edges → Replace the defective gear(s).



4. Check:
   - Transmission gear engagement
     (each pinion gear to its respective wheel gear)
     Incorrect → Reassemble the transmission axle assemblies.
5. Check:
   - Transmission gear movement
     Rough movement → Replace the defective part(s).
6. Check:
   - Circlips
     Bends/damage/looseness → Replace.

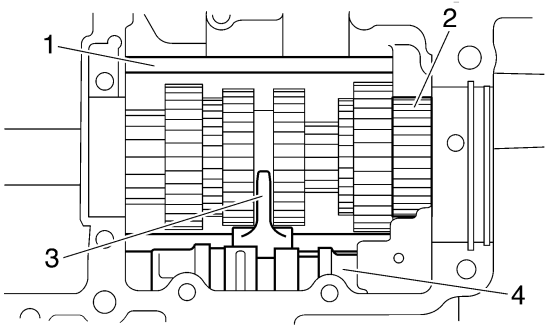
EAS26350
INSTALLING THE TRANSMISSION

1. Install:
   - Oil pipe "1"
   - Main axle assembly "2"
     (with the Torx® wrench)

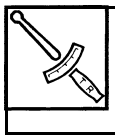
NOTE:
Make sure to caulk the bolts at three positions after installing the bearing housing.

2. Install:
   - Shift fork-C "3"
   - Shift drum assembly "4"
   - Shift fork guide bar

NOTE:
- The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: "R", "C", "L".
- Carefully position the shift forks so that they are installed correctly into the transmission gears.
- Install shift fork-C into the groove in the 3rd and 4th pinion gear on the main axle.

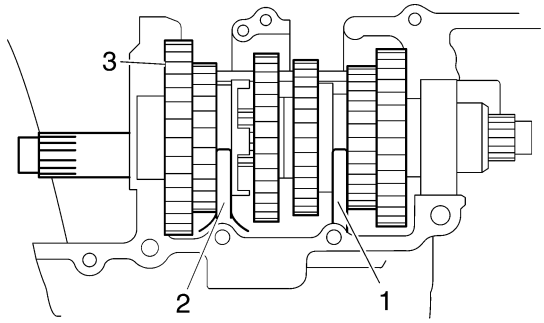


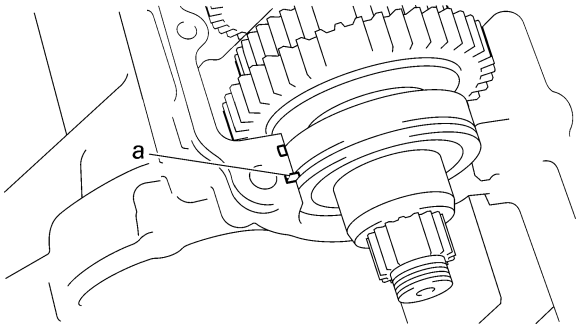
3. Install:
   - Shift fork-R “1”
   - Shift fork-L “2”
   - Drive axle “3”
   - Shift fork guide bar
   - Shift drum retainer



Shift drum retainer bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)
LOCTITE®

NOTE:
- Install shift fork-L into the groove in the 6th wheel gear and shift fork-R into the groove in the 5th wheel gear on the drive axle.
- Make sure that the drive axle bearing circlip “a” is inserted into the grooves in the upper crankcase.





4. Check:
   - Transmission

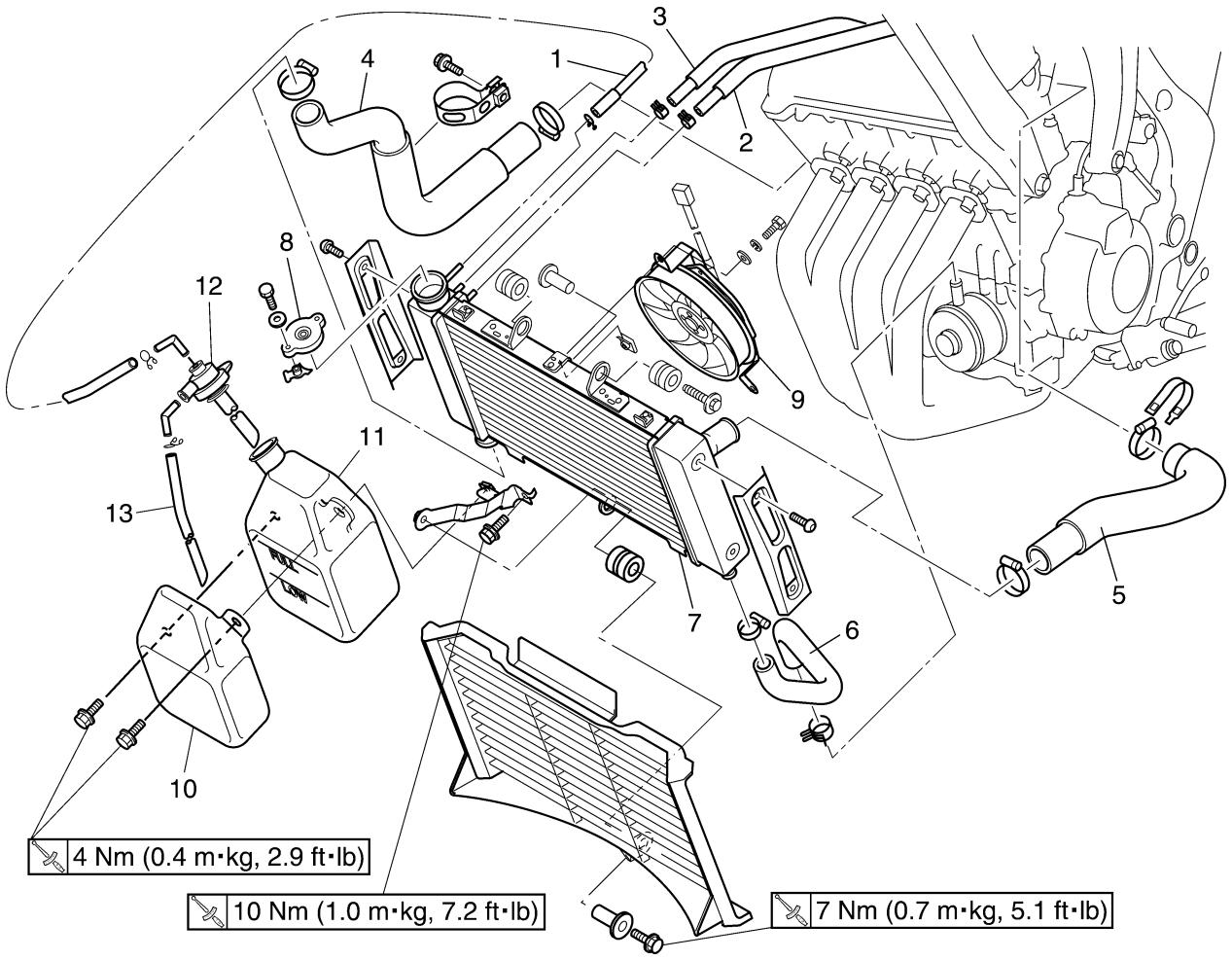
Rough movement → Repair.

NOTE:
Oil each gear, shaft, and bearing thoroughly.

COOLING SYSTEM

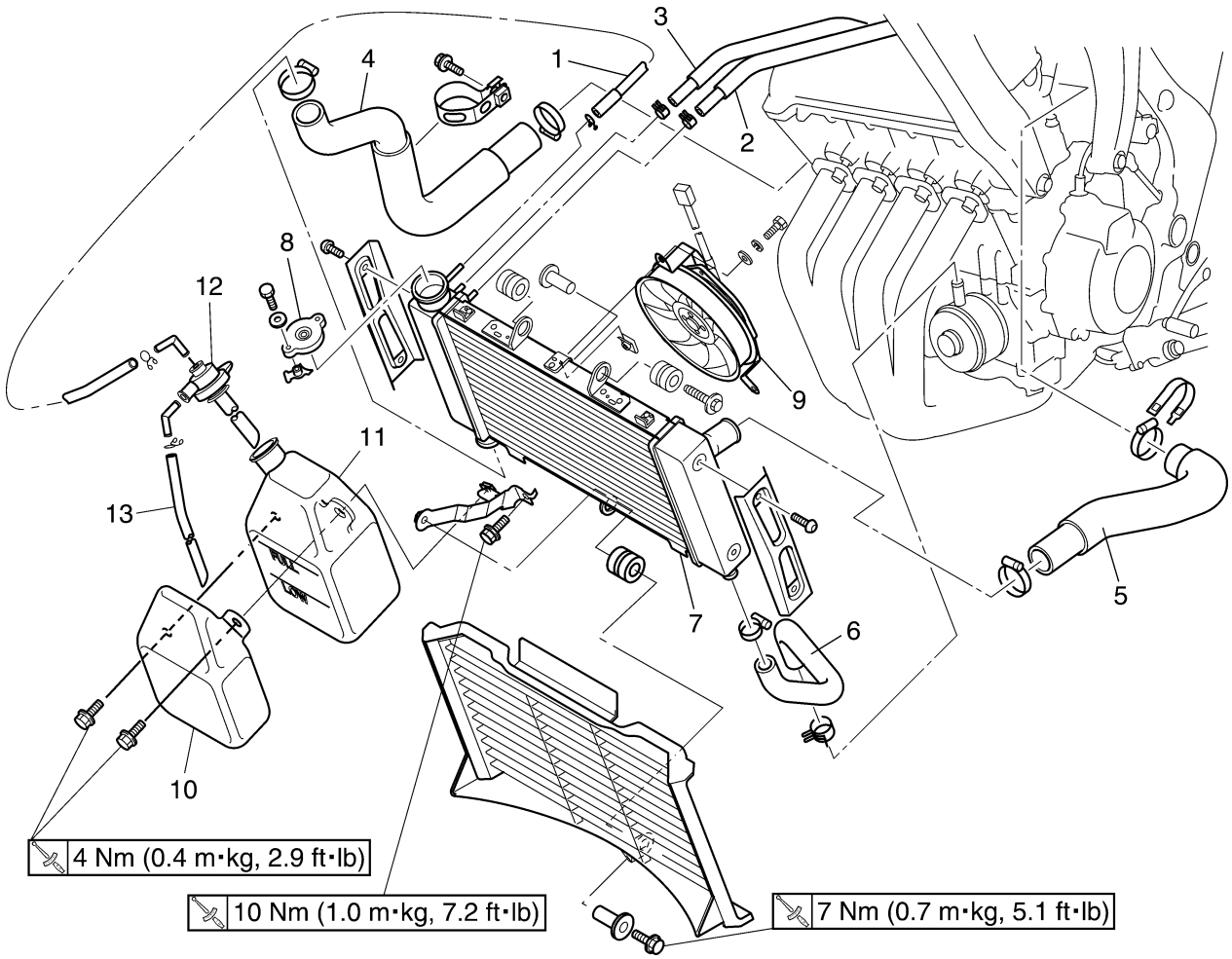
EAS26380
RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-20.
1	Coolant reservoir hose	1	
2	Thermo wax outlet hose	1	
3	Water pump breather hose	1	
4	Radiator outlet hose	1	
5	Radiator inlet hose	1	
6	Oil cooler outlet hose	1	
7	Radiator	1	
8	Radiator cap	1	
9	Radiator fan	1	
10	Coolant reservoir cover	1	
11	Coolant reservoir	1	
12	Coolant reservoir cap	1	

Removing the radiator

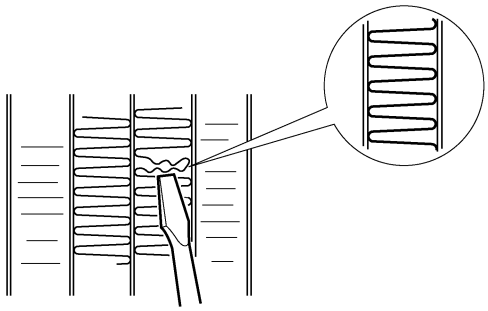


Order	Job/Parts to remove	Q'ty	Remarks
13	Coolant reservoir drain hose	1	
			For installation, reverse the removal procedure.

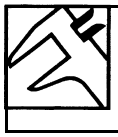
EAS26390
CHECKING THE RADIATOR

1. Check:
   - Radiator fins
     Obstruction → Clean.
     Apply compressed air to the rear of the radiator.
     Damage → Repair or replace.

NOTE:
Straighten any flattened fins with a thin, flat-head screwdriver.



2. Check:
   - Radiator hoses
   - Radiator pipes
     Cracks/damage → Replace.
3. Measure:
   - Radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.



Radiator cap opening pressure
93–123 kPa (13.2–17.5 psi)
(0.93–1.23 kgf/cm²)

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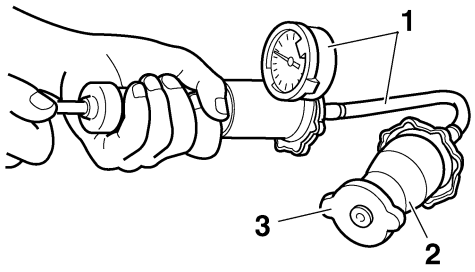
a. Install the radiator cap tester “1” and radiator cap tester adapter “2” to the radiator cap “3”.

Radiator cap tester
90890-01325
Radiator pressure tester
YU-24460-01
Radiator cap tester adapter
90890-01352
Radiator pressure tester adapter
YU-33984



b. Apply the specified pressure for ten seconds and make sure there is no drop in pressure.

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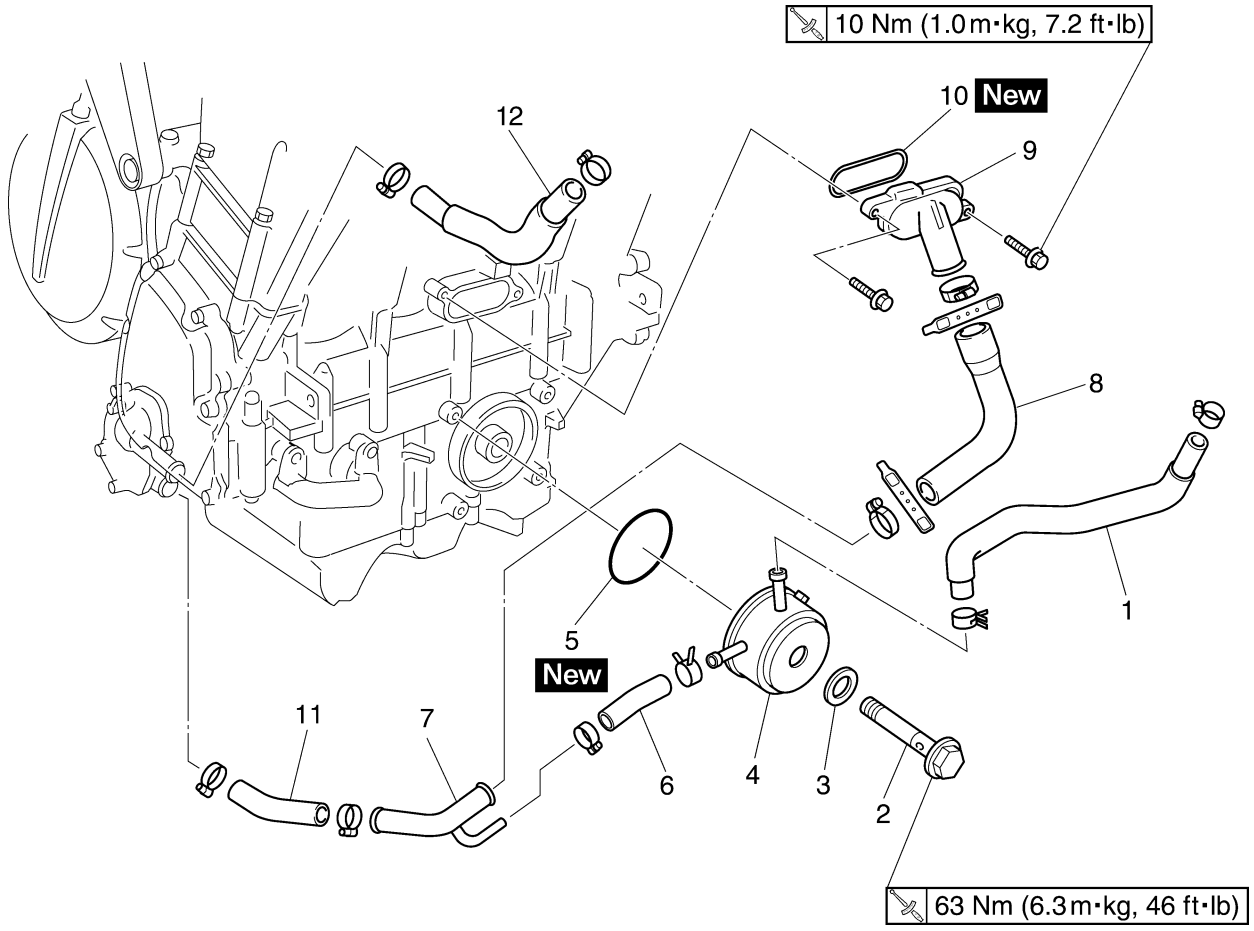
4. Check:
   - Radiator fan
     Damage → Replace.
     Malfunction → Check and repair.
     Refer to "ELECTRICAL COMPONENTS" on page 8-100.

EAS26400
INSTALLING THE RADIATOR

1. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT" on page 3-20.
2. Check:
   - Cooling system
     Leaks → Repair or replace any faulty part.
3. Measure:
   - Radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to "CHECKING THE RADIATOR" on page 6-3.

EAS26410
OIL COOLER

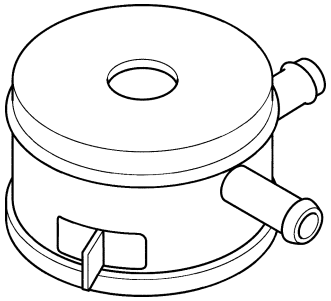
Removing the oil cooler



Order	Job/Parts to remove	Q'ty	Remarks
	Radiator assembly		Refer to "RADIATOR" on page 6-1.
	Coolant reservoir		Refer to "RADIATOR" on page 6-1.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-14.
1	Oil cooler outlet hose	1	
2	Union bolt	1	
3	Washer	1	
4	Oil cooler	1	
5	O-ring	1	
6	Oil cooler inlet hose	1	
7	Oil cooler inlet pipe	1	
8	Water jacket joint hose	1	
9	Water jacket joint	1	
10	O-ring	1	
11	Water pump outlet hose	1	
12	Radiator outlet hose	1	
			For installation, reverse the removal procedure.

EAS26420
CHECKING THE OIL COOLER

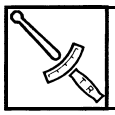
1. Check:
   - Oil cooler
     Cracks/damage → Replace.



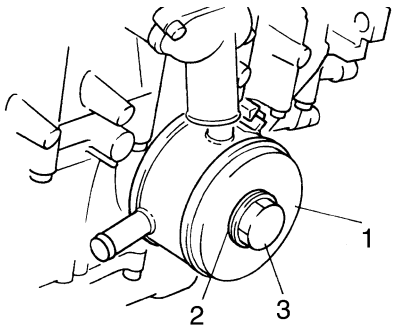
2. Check:
   - Oil cooler inlet hose
   - Oil cooler outlet hose
     Cracks/damage/wear → Replace.

EAS26430
INSTALLING THE OIL COOLER

1. Clean:
   - Mating surfaces of the oil cooler and the crankcase
     (with a cloth dampened with lacquer thinner)
2. Install:
   - O-ring New
   - Oil cooler "1"
   - Washer "2"
   - Union bolt "3"

	**Oil cooler** **63 Nm (6.3 m·kg, 46 ft·lb)**

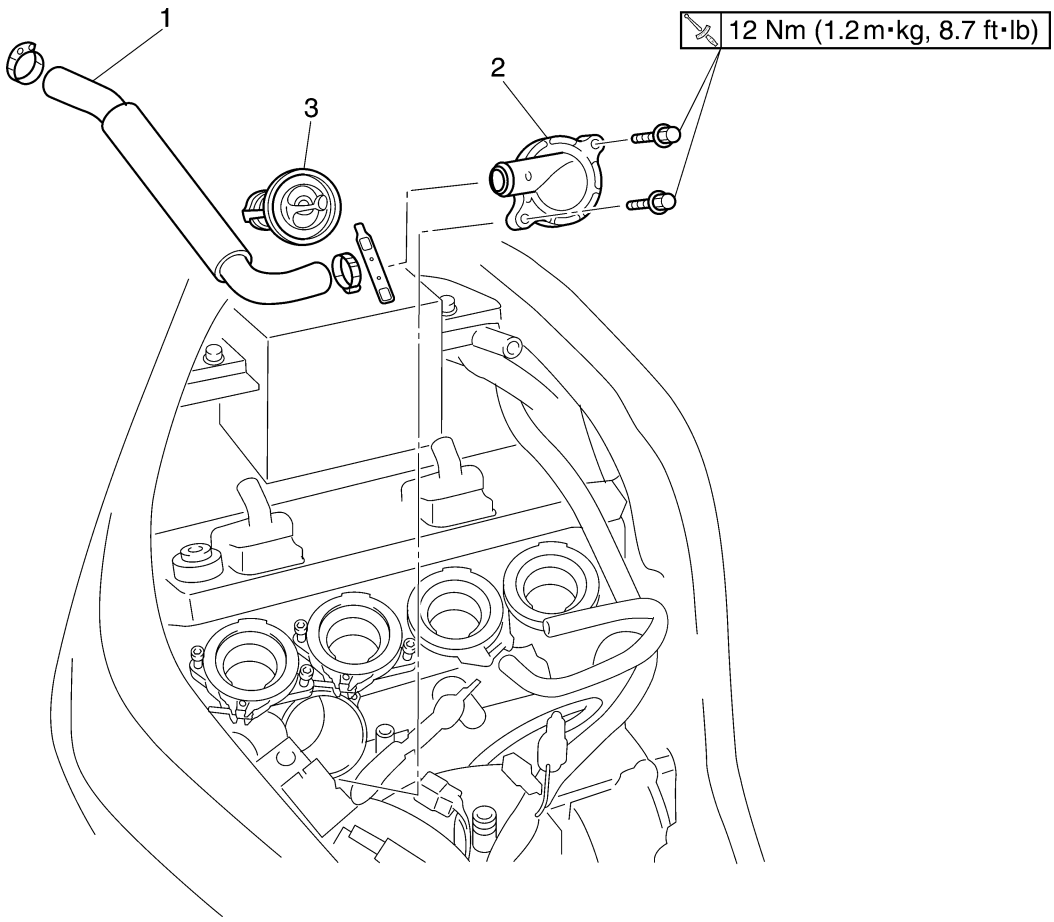
NOTE:
- Before installing the oil cooler, lubricate the oil cooler bolt and O-ring with a thin coat of engine oil.
- Make sure the O-ring is positioned properly.



3. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT" on page 3-20.
   - Crankcase
     (with the specified amount of the recommended engine oil)
     Refer to "CHANGING THE ENGINE OIL" on page 3-14.
4. Check:
   - Cooling system
     Leaks → Repair or replace any faulty part.
5. Measure:
   - Radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to "CHECKING THE RADIATOR" on page 6-3.

EAS26440
THERMOSTAT

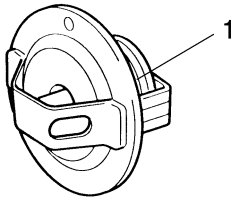
Removing the thermostat



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)+		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Coolant		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-14.
	Throttle body assembly		Refer to "THROTTLE BODIES" on page 7-4.
1	Radiator inlet hose	1	
2	Thermostat cover	1	
3	Thermostat	1	
			For installation, reverse the removal procedure.

EAS26450
CHECKING THE THERMOSTAT

1. Check:
   - Thermostat "1"
     Does not open at 71–85°C (160–185°F) → Replace.



I4250202

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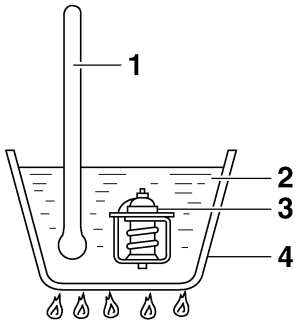
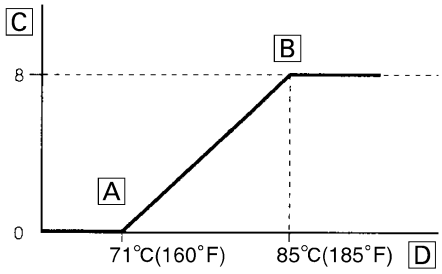
a. Suspend the thermostat "3" in a container "4" filled with water.
b. Slowly heat the water "2".
c. Place a thermometer "1" in the water.
d. While stirring the water, observe the thermostat and thermometer's indicated temperature.





A. Fully closed
B. Fully open
C. Opening (mm)
D. Temperature

NOTE:
If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

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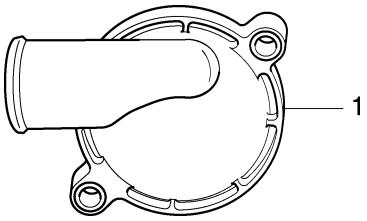
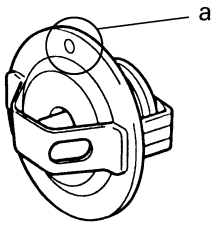
2. Check:
   - Thermostat housing cover "1"
   - Cracks/damage → Replace.



EAS26490
INSTALLING THE THERMOSTAT ASSEMBLY

1. Install:
   - Thermostat

NOTE:
Install the thermostat with its breather hole "a" facing up.



I4250202

2. Install:
   - Thermostat cover

Water jacket outlet joint bolt
12 Nm (1.2 m·kg, 8.7 ft·lb)

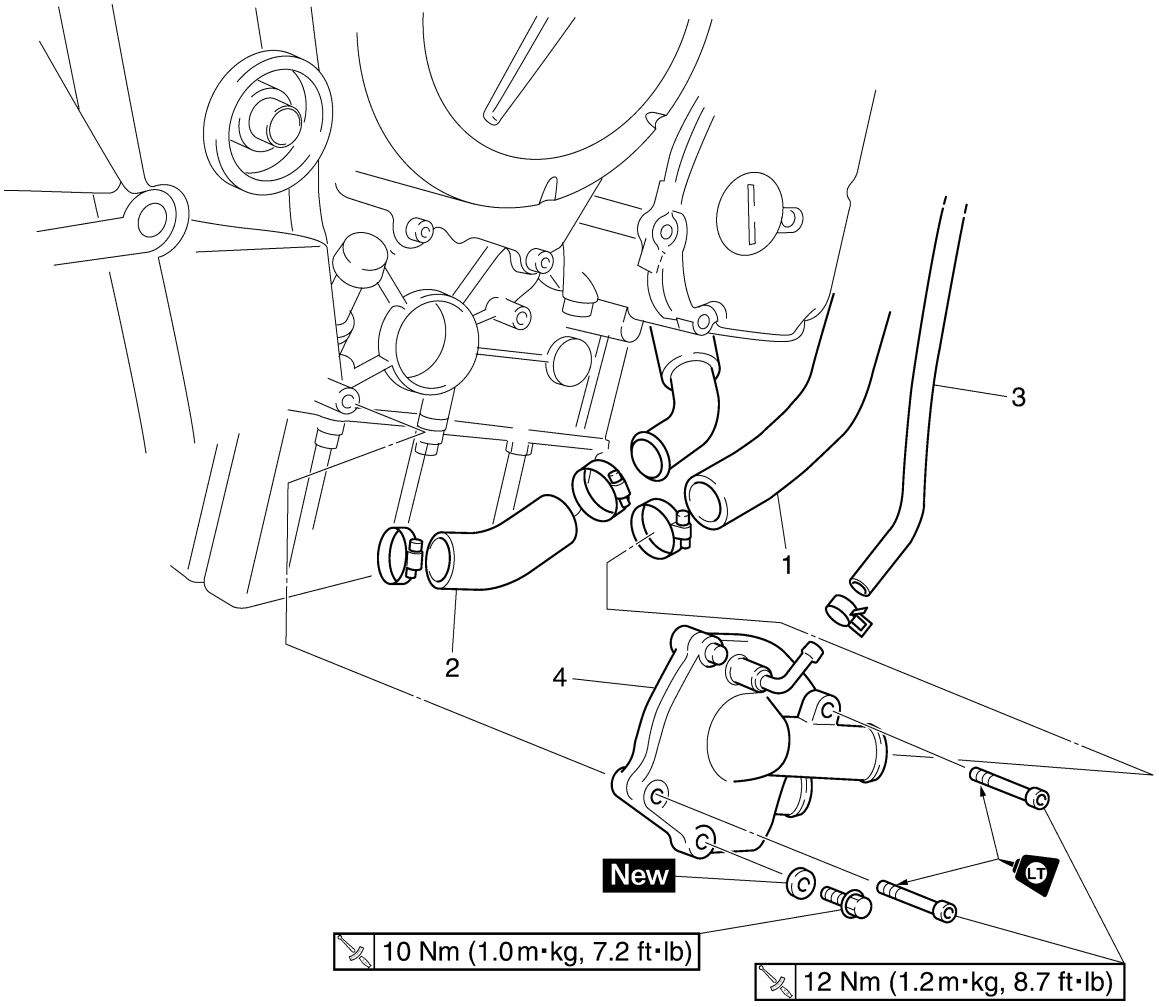
NOTE:
Before installing the thermostat cover to the cylinder head, lubricate the O-rings with a thin coat of lithium-soap-based grease.

3. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT" on page 3-20.
4. Check:
   - Cooling system
     Leaks → Repair or replace any faulty part.
5. Measure:
   - Radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.

Refer to "CHECKING THE RADIATOR" on page 6-3.

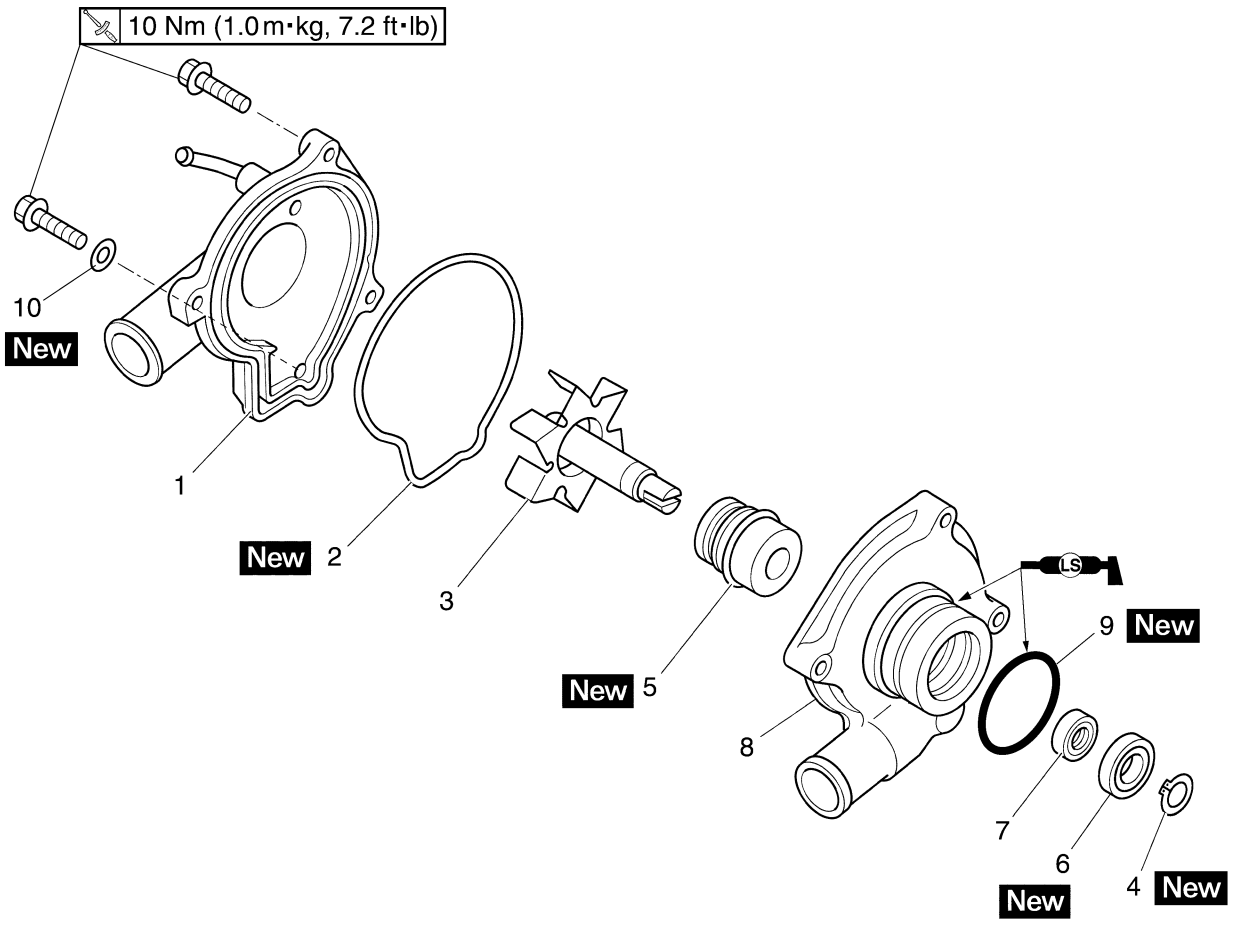
EAS26500
WATER PUMP

Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
			It is not necessary to remove the water pump unless the coolant level is extremely low or the coolant contains engine oil.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-20.
1	Radiator outlet hose	1	Disconnect.
2	Water pump outlet hose	1	
3	Water pump breather hose	1	Disconnect.
4	Water pump	1	
			For installation, reverse the removal procedure.

Disassembling the water pump

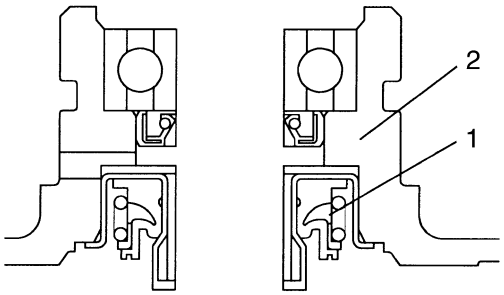


Order	Job/Parts to remove	Q'ty	Remarks
1	Water pump cover	1	
2	O-ring	1	
3	Impeller shaft	1	
4	Circlip	1	
5	Water pump seal	1	
6	Oil seal	1	
7	Bearing	1	
8	Water pump housing	1	
9	O-ring	1	
10	Copper washer	1	
			For assembly, reverse the disassembly procedure.

EAS26510
DISASSEMBLING THE WATER PUMP

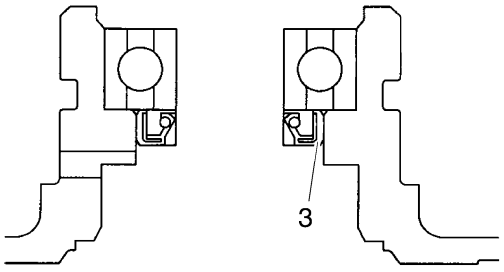
1. Remove:
   - Water pump cover
   - O-ring
   - Circlip
   - Impeller shaft
2. Remove:
   - Water pump seal “1”

NOTE:
Remove the water pump seal from the inside of the water pump housing “2”.



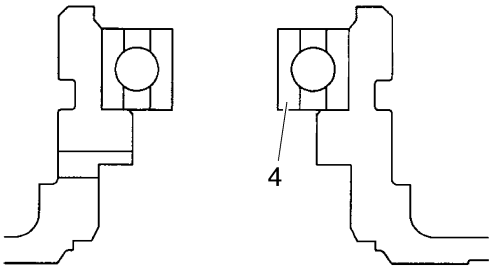
3. Remove:
   - Oil seal “3”
     (with a thin, flat-head screwdriver)

NOTE:
Remove the oil seal from the outside of the water pump housing.



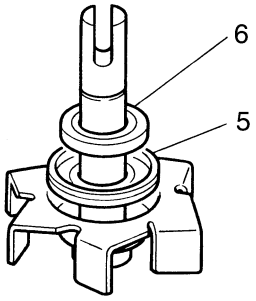
4. Remove:
   - Bearing “4”

NOTE:
Remove the bearing from inside of the water pump housing.



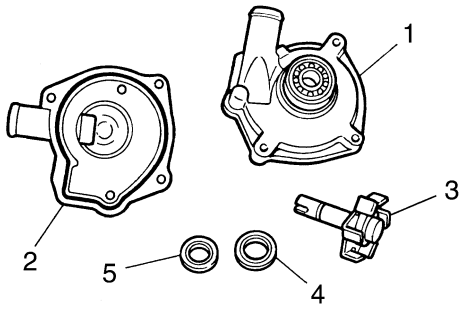
5. Remove:
   - Rubber damper holder “5”
   - Rubber damper “6”
     (from the impeller, with a thin, flat-head screwdriver)

NOTE:
Do not scratch the impeller shaft.



EAS26540
CHECKING THE WATER PUMP

1. Check:
   - Water pump housing cover “1”
   - Water pump housing cover “2”
   - Impeller “3”
   - Rubber damper “4”
   - Rubber damper holder “5”
   - Water pump seals
   - Oil seal
     Cracks/damage/wear → Replace.



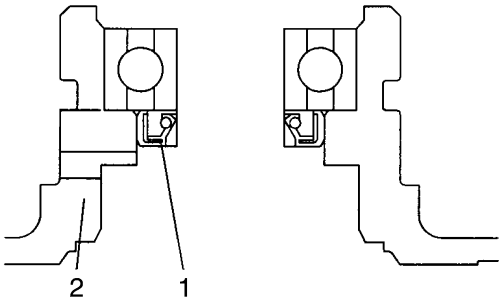
2. Check:
   - Bearing
     Rough movement → Replace.

3. Check:
   - Water pump outlet pipe
   - Radiator outlet hose
   Cracks/damage/wear → Replace.

EAS26560
ASSEMBLING THE WATER PUMP

1. Install:
   - Bearing
   - Oil seal "1" New
   (into the water pump housing "2")

NOTE:
- Before installing the oil seal, apply tap water or coolant onto its out surface.
- Install the oil seal with a socket that matches its outside diameter.

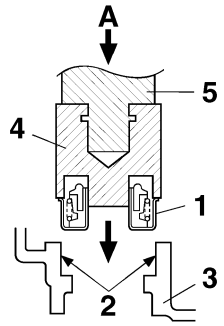


2. Install:
   - Water pump seal "1" New

ECA14080
CAUTION:
Never lubricate the water pump seal surface with oil or grease.

NOTE:
- Install the water pump seal with the special tools.
- Before installing the water pump seal, apply Yamaha bond No.1215 or Quick Gasket "2" to the water pump housing "3".

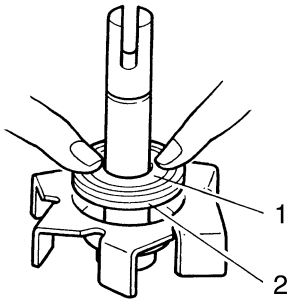
Mechanical seal installer
90890-04078
Water pump seal installer
YM-33221-A
Middle driven shaft bearing driver
90890-04058
Bearing driver 40 mm
YM-04058
Yamaha bond No. 1215 (Three bond No. 1215®)
90890-85505



A. Push down
4. Mechanical seal installer
5. Middle driven shaft bearing driver

3. Install:
   - Rubber damper "1" New
   - Rubber damper holder "2" New

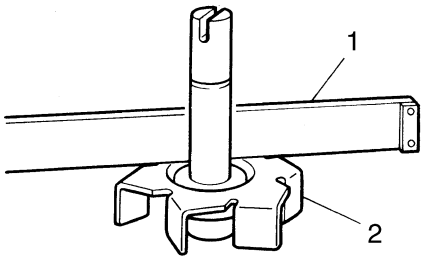
NOTE:
Before installing the rubber damper, apply tap water or coolant onto its outer surface.



4. Measure:
   - Impeller shaft tilt
   Out of specification → Repeat steps (3) and (4).

ECA14090
CAUTION:
Make sure the rubber damper and rubber damper holder are flush with the impeller.

Impeller shaft tilt limit
0.15 mm (0.006 in)



1. Straightedge
2. Impeller

5. Install:
   - Impeller shaft
   - Circlip New
   - O-ring New
   - Water pump cover

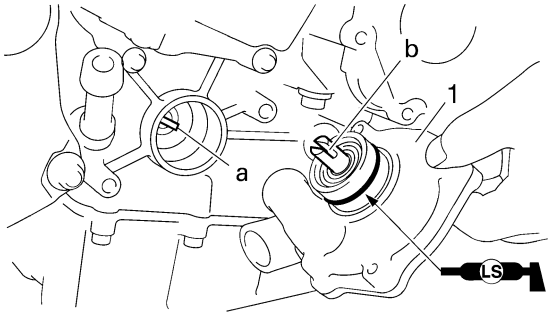
	Water pump cover bolt 10 Nm (1.0 m·kg, 7.2 ft·lb)

EAS26590
INSTALLING THE WATER PUMP

1. Install:
   - O-ring
   - Copper washer New
   - Water pump assembly "1"

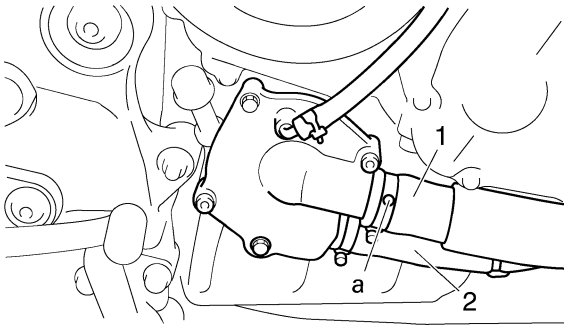
NOTE:
- Align the slit "a" on the impeller shaft with the projection "b" on the oil pump shaft.
- Lubricate the O-ring with a thin coat of lithium-soap-based grease.

	Water pump assembly bolt 10 Nm (1.0 m·kg, 7.2 ft·lb)



2. Install:
   - O-ring New
   - Water pump inlet hose "1"
   - O-rings New
   - Water pump outlet hose "2"
   - Copper washer New

NOTE:
- Install the radiator outlet hose with white "a" mark positioned outside.
- Install the hose clamp with its screw head pointed to the inner side.

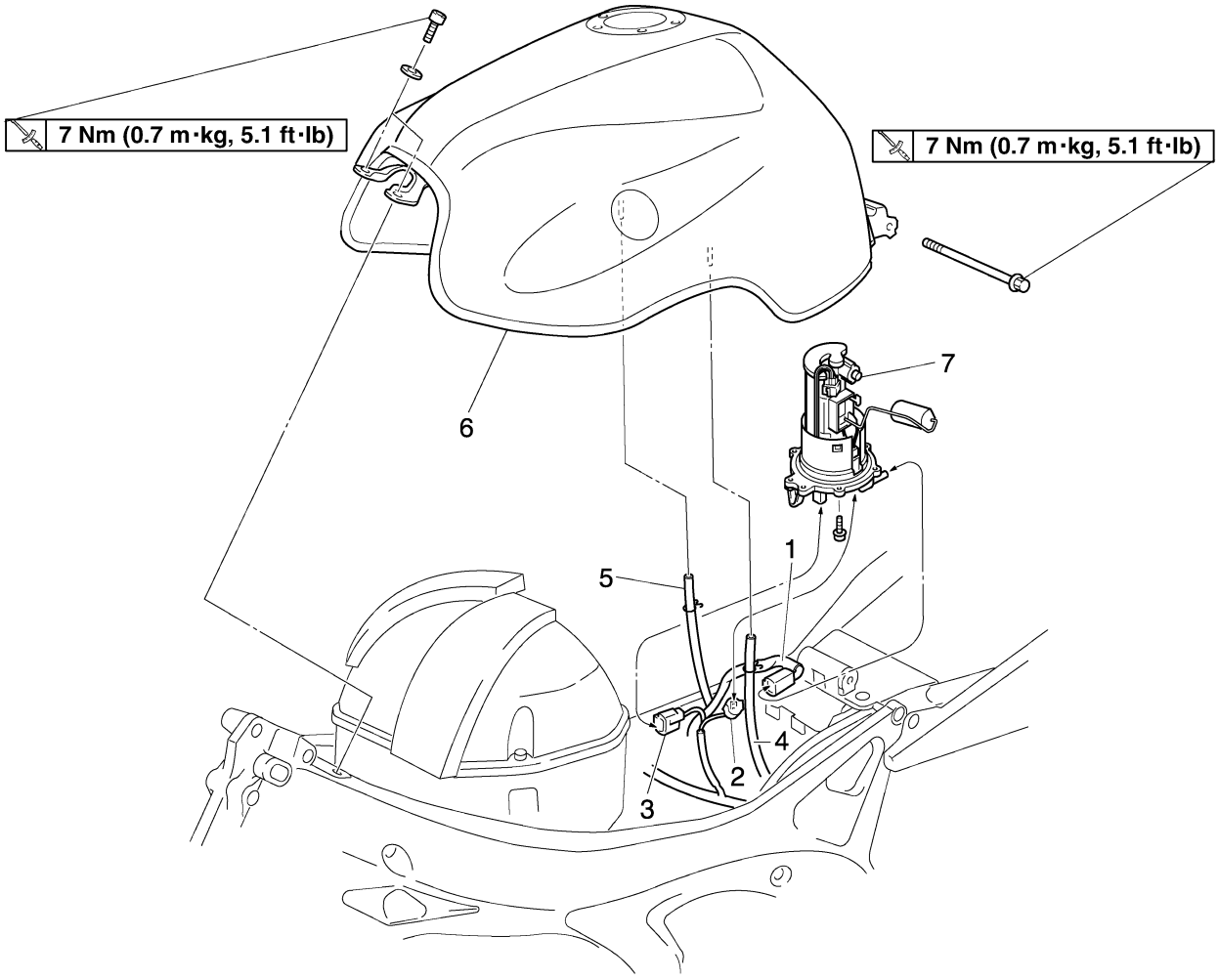


3. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT" on page 3-20.
4. Check:
   - Cooling system
     Leaks → Repair or replace the faulty part.
5. Measure:
   - Radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to "CHECKING THE RADIATOR" on page 6-3.

FUEL SYSTEM

EAS26620
FUEL TANK

Removing the fuel tank



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel hose	1	
2	Fuel sender coupler	1	Disconnect.
3	Fuel pump coupler	1	Disconnect.
4	Fuel tank drain hose	1	
5	Fuel tank breather hose	1	
6	Fuel tank	1	
7	Fuel pump	1	
			For installation, reverse the removal procedure.

EAS26630
REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
   - Fuel return hose
   - Fuel hose

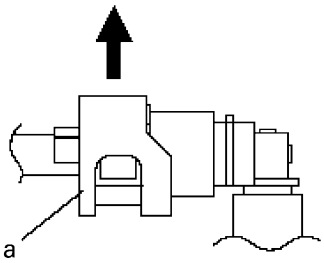
ECA4S81003

CAUTION:

- **Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.**
- **Although the fuel has been removed from the fuel tank, be careful when removing the fuel hoses, since there may be fuel remaining in it.**

NOTE:

- To remove the fuel hose from the fuel injection pipe, slide the cover "a" on the end of the hose in the direction of the arrow shown and then remove the hose.
- Before removing the hoses, place a few rags in the area under where it will be removed.



3. Remove:
   - Fuel tank

NOTE:

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

EAS26640
REMOVING THE FUEL PUMP

1. Remove:
   - Fuel pump

ECA14720

CAUTION:

- **Do not drop the fuel pump or give it a strong shock.**
- **Do not touch the base section of the fuel sender.**

EAS26670
CHECKING THE FUEL PUMP BODY

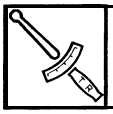
1. Check:
   - Fuel pump body
     Obstruction → Clean.
     Cracks/damage → Replace fuel pump assembly.
2. Check:
   - Diaphragms and gaskets
     Turn/fatigue/cracks → Replace fuel pump assembly.
3. Check:
   - Valves
     Cracks/damage → Replace fuel pump assembly.

EAS26690
CHECKING THE FUEL PUMP OPERATION

1. Check:
   - Fuel pump operation
     Refer to "CHECKING THE FUEL PRESSURE" on page 7-6.

EAS26710
INSTALLING THE FUEL PUMP

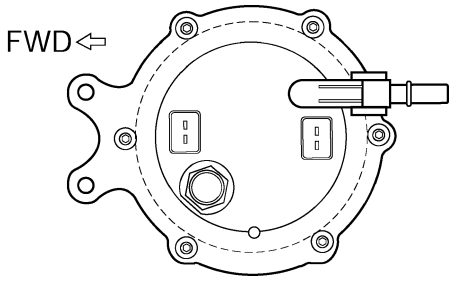
1. Install:
   - Fuel pump
   - Fuel pump bolts



Fuel pump bolts
4 Nm (0.4 m·kg, 2.9 ft·lb)

NOTE:

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Install the fuel pump as shown in the illustration.
- Tighten the fuel pump bolts in stages in a crisscross pattern and to the specified torque.



EAS4S81001
INSTALLING THE FUEL TANK

1. Install:
   - Fuel hose

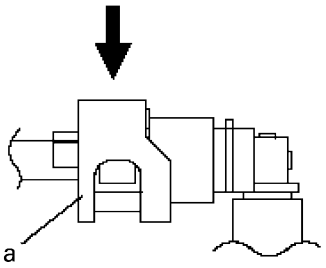
ECA4S81001

CAUTION:

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

NOTE:

Install the fuel hose connector securely onto the fuel tank until a distinct “click” is heard, and then make sure that it doed not come loose.
To install the fuel hose from the fuel injection hose, slide the cover “a” on the end of the hose in the direction of arrow shown.



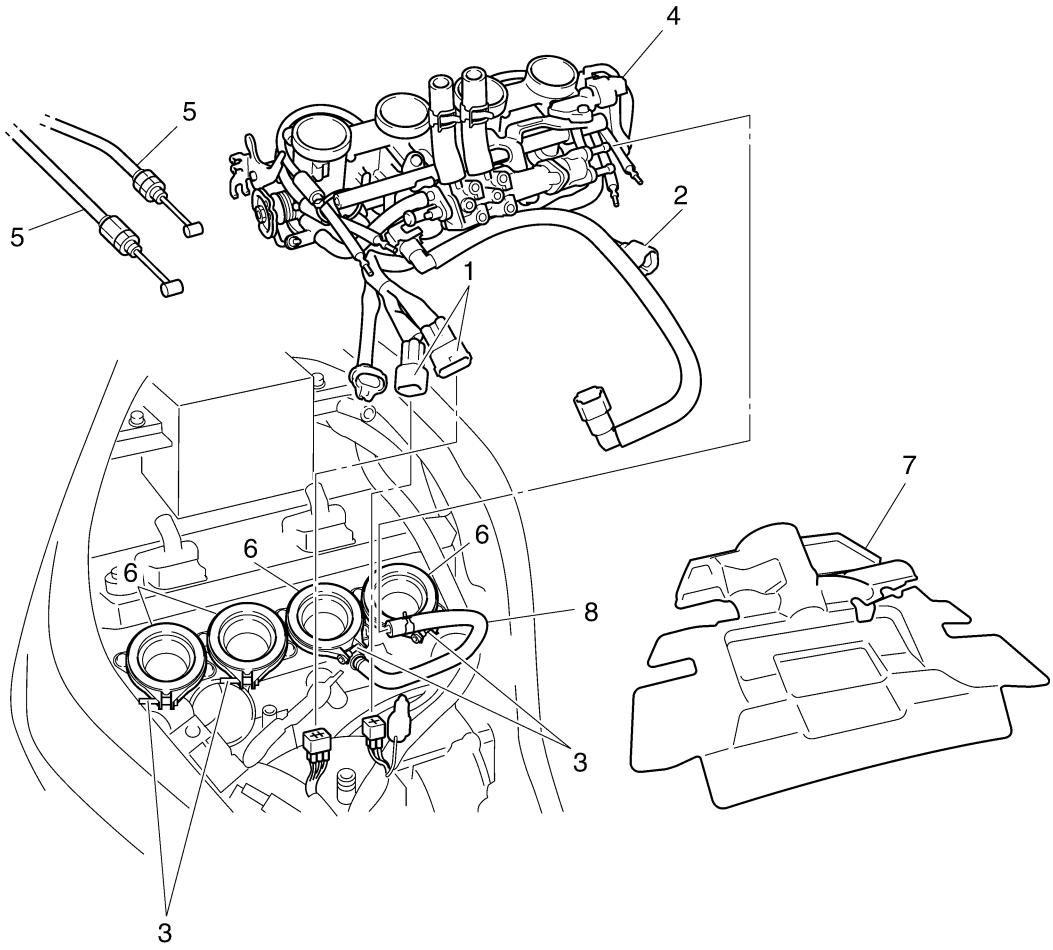
2. Install:
   - Fuel sender coupler
   - Fuel pump coupler
   - Fuel tank breather hose
   - Fuel tank drain hose

NOTE:

There is a white paint mark on the fuel tank breather hose.
Refer to "CABLE ROUTING" on page 2-47.

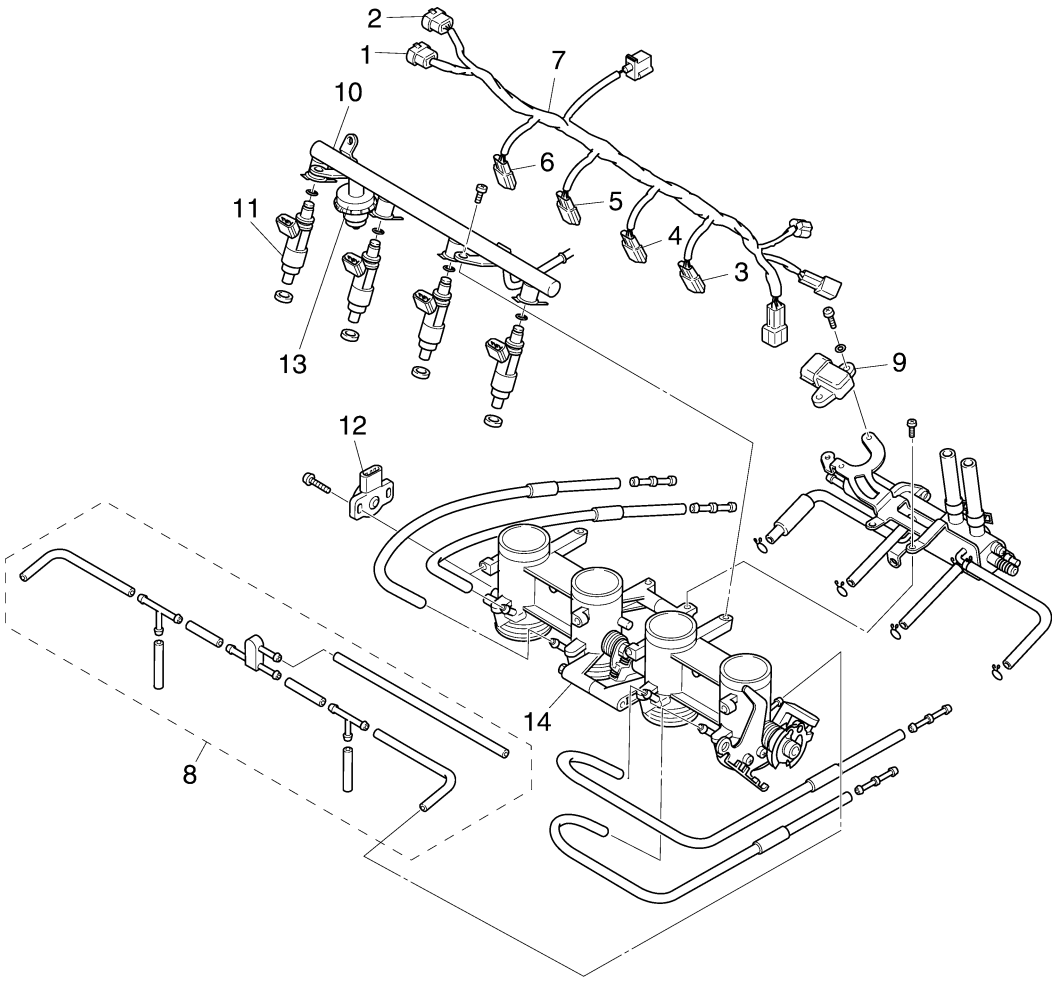
EAS26970
THROTTLE BODIES

Removing the throttle bodies



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Battery		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery box and battery box bracket		Refer to "GENERAL CHASSIS" on page 4-1.
1	Sub-wire harness coupler	2	Disconnect.
2	Coolant temperature sensor coupler	1	Disconnect.
3	Throttle body joint clamp screw	4	
4	Throttle bodies	1	
5	Throttle cable	2	Disconnect.
6	Throttle body joint	4	
7	Heat protector	1	
			For installation, reverse the removal procedure.

Removing the injectors



Order	Job/Parts to remove	Q'ty	Remarks
1	Throttle position sensor coupler	1	Disconnect.
2	Intake air pressure sensor coupler	1	Disconnect.
3	Cylinder #1 injector coupler	1	Disconnect.
4	Cylinder #2 injector coupler	1	Disconnect.
5	Cylinder #3 injector coupler	1	Disconnect.
6	Cylinder #4 injector coupler	1	Disconnect.
7	Sub-wire harness	1	
8	Negative pressure hose	1	
9	Intake air pressure sensor	1	
10	Fuel distributor	1	
11	Injector	4	
12	Throttle position sensor	1	
13	Fuel pulsation damper	1	
14	Throttle bodies	1	
			For installation, reverse the removal procedure.

EAS26980
CHECKING THE INJECTORS

1. Check:
   • Injectors
   Damage → Replace.

EAS26990
CHECKING THE THROTTLE BODIES

1. Check:
   • Throttle bodies
   Cracks/damage → Replace the throttle bodies as a set.
2. Check:
   • Fuel passages
   Obstructions → Clean.

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a. Wash the throttle bodies in a petroleum-based solvent.
   Do not use any caustic carburetor cleaning solution.
b. Blow out all of the passages with compressed air.

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3. Check:
   • Fuel pulsation damper

ECA4S81002
CAUTION:

Do not adjust the fuel pulsation damper.

EAS4S81043
CHECKING THE FUEL PRESSURE

1. Check:
   • Fuel pressure

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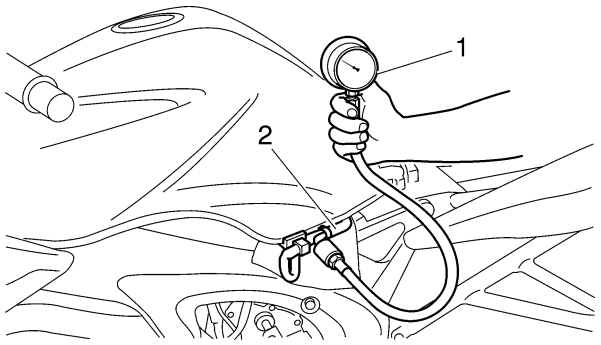
a. Remove the seat.
   Refer to "GENERAL CHASSIS" on page 4-1.
b. Disconnect the fuel hose (fuel tank to primary injector fuel rail) from the primary

EWA4S81015
⚠ WARNING

Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

c. Connect the pressure gauge “1” and adapter “2” to the fuel hose (fuel tank to primary injector fuel rail).

Pressure gauge
90890-03153
YU-03153
Fuel pressure adapter
90890-03176
YM-03176



d. Start the engine.
e. Measure the fuel pressure.

Fuel pressure
250 kPa (36.3 psi) (2.5 kgf/cm²)

Faulty → Replace the fuel pump.

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EAS27030
ADJUSTING THE THROTTLE POSITION SENSOR

NOTE:
Before adjusting the throttle position sensor, the engine idling speed should be properly adjusted.

1. Check:
   • Throttle position sensor
   Refer to "CHECKING THE THROTTLE POSITION SENSOR" on page 8-123.
2. Adjust:
   • Throttle position sensor angle

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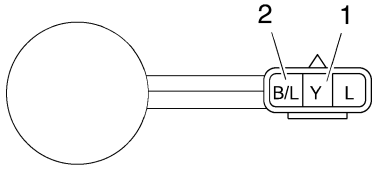
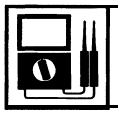
a. Connect the throttle position sensor coupler to the wire harness.
b. Connect the digital circuit tester to the throttle position sensor.



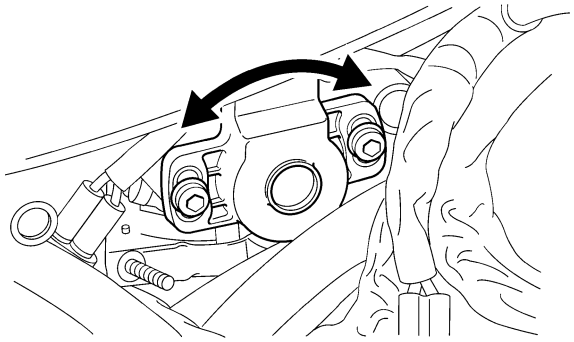
- Positive tester probe
  Yellow “1”
- Negative tester probe
  Black/Blue “2”

Digital circuit tester
90890-03174
Model 88 maltimeter with tachometer
YU-A1927

c. Measure the throttle position sensor voltage.
d. Adjust the throttle position sensor angle so that the voltage is within the specified range.



Output voltage (at idle)
Adjusted by tachometer



e. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws.

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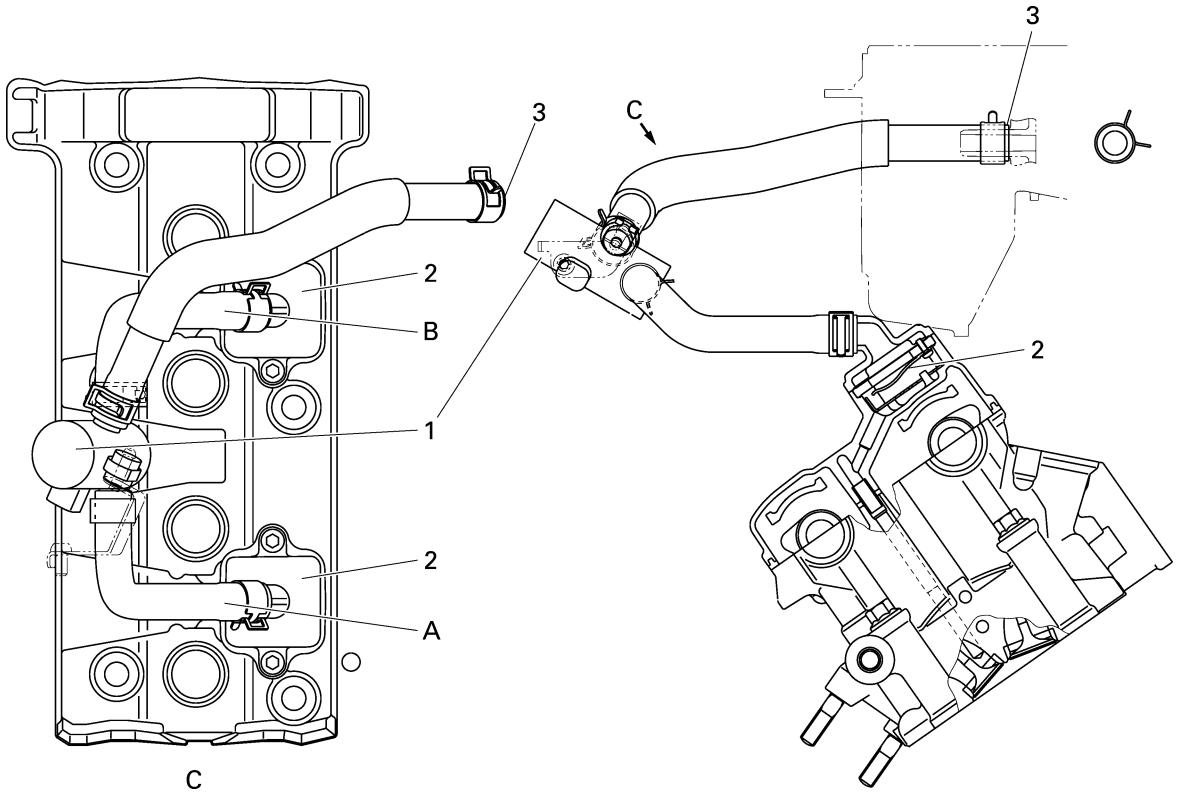
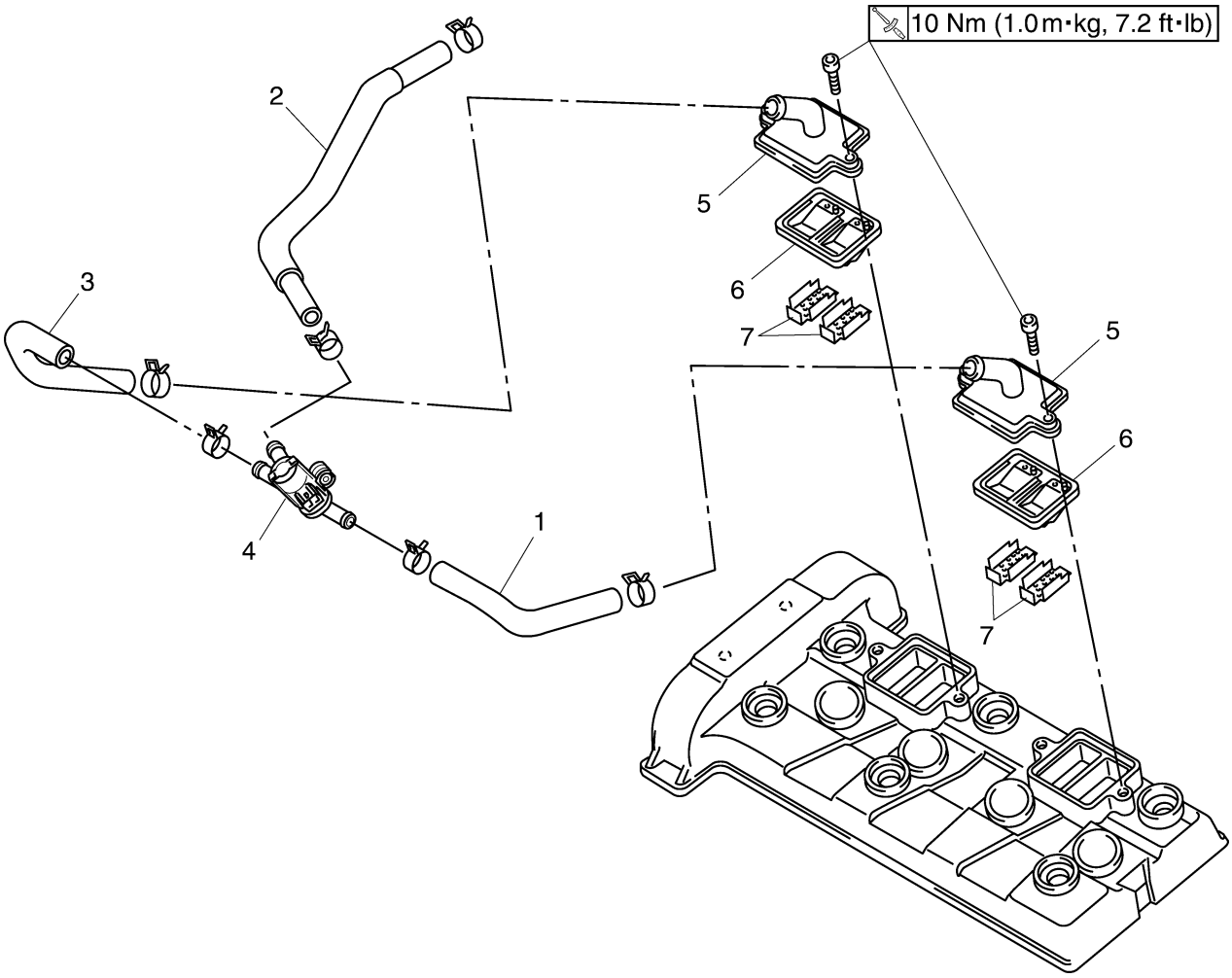
EAS27040
AIR INDUCTION SYSTEM



1. Air cut-off valve
2. Reed valve
3. To air filter case

A. To cylinder #1 and #2
B. To cylinder #3 and #4

Removing the air cut-off valve assembly and hoses

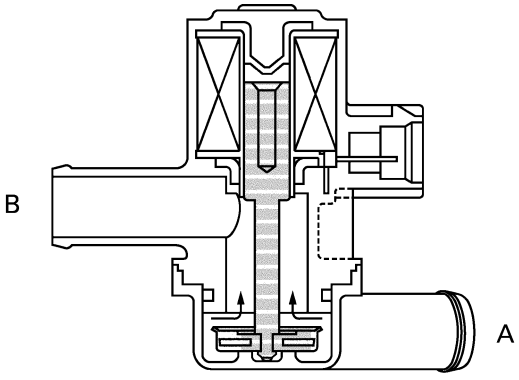


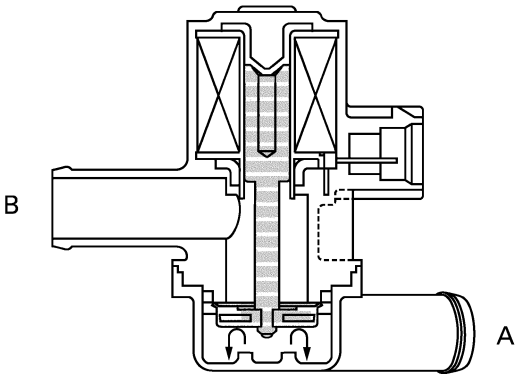
Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Battery		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Battery box and battery box bracket		Refer to "GENERAL CHASSIS" on page 4-1.
1	Air cut-off valve hose 1	1	Disconnect.
2	Air cut-off valve hose 2	1	Disconnect.
3	Air cut-off valve hose 3	1	Disconnect.
4	Air cut-off valve	1	
5	Reed valve cap	2	
6	Reed valve assembly	2	
7	Plate	4	
			For installation, reverse the removal procedure.

EAS27060
CHECKING THE AIR INDUCTION SYSTEM

Air injection
The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of hydrocarbons. When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700°C.

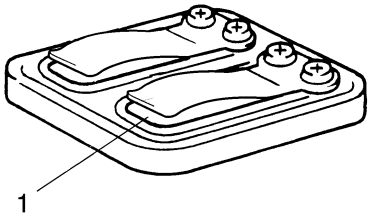
Air cut-off valve
The air cut-off valve is controlled by the signals from the ECU in accordance with the combustion conditions. Ordinarily, the air cut-off valve opens to allow the air to flow during idle and closes to cut-off the flow when the vehicle is being driven. However, if the coolant temperature 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.





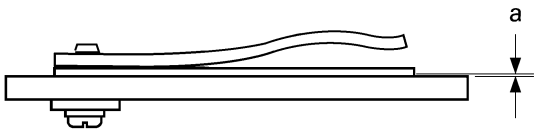
A. From the air filter case
B. To the reed valve

1. Check:
   - Hoses
     Loose connections → Connect properly.
     Cracks/damage → Replace.
   - Pipes
     Cracks/damage → Replace.
2. Check:
   - Reed valve “1”
   - Reed valve stopper
   - Reed valve seat
     Cracks/damage → Replace the reed valve.



3. Measure:
   - Reed valve bending limit “a”
     Out of specification → Replace the reed valve.

Reed valve bending limit
0.4 mm (0.016 in)



I4710301

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 8-129.

EAS27070
INSTALLING THE AIR INDUCTION SYSTEM
1. Install:
   - Plate
   - Reed valves

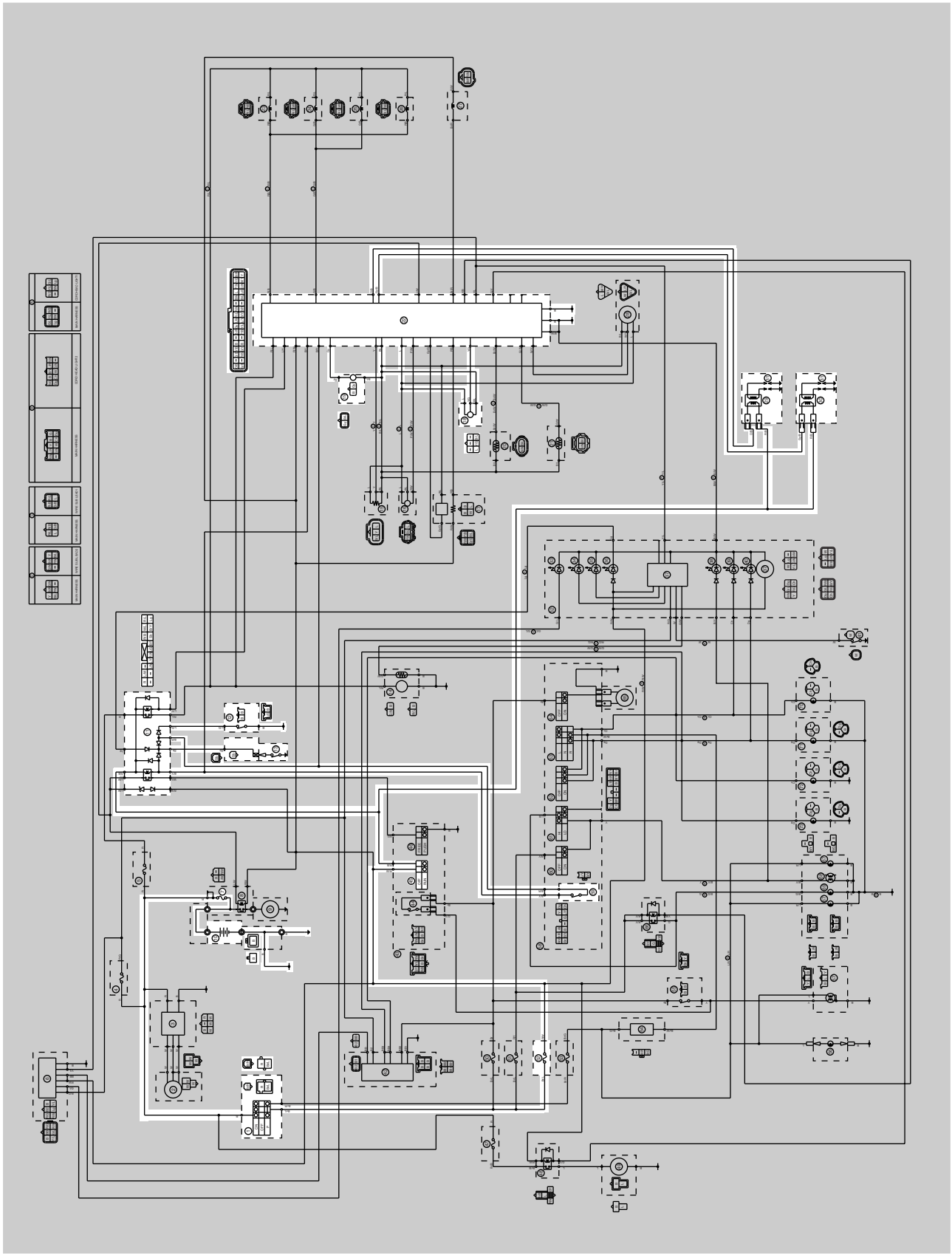
2. Install:
   - Reed valve cover

ELECTRICAL SYSTEM

8

EAS27090
IGNITION SYSTEM

EAS27110
CIRCUIT DIAGRAM



1. Main switch
7. Main fuse
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
18. Lean angle sensor
19. Crankshaft position sensor
22. ECU (engine control unit)
29. Cylinder-#1/#4 ignition coil
30. Cylinder-#2/#3 ignition coil
31. Spark plugs
45. Engine stop switch
52. Ignition fuse
59. Clutch switch

EAS27140
TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

NOTE:
- Before troubleshooting, remove the following part(s):

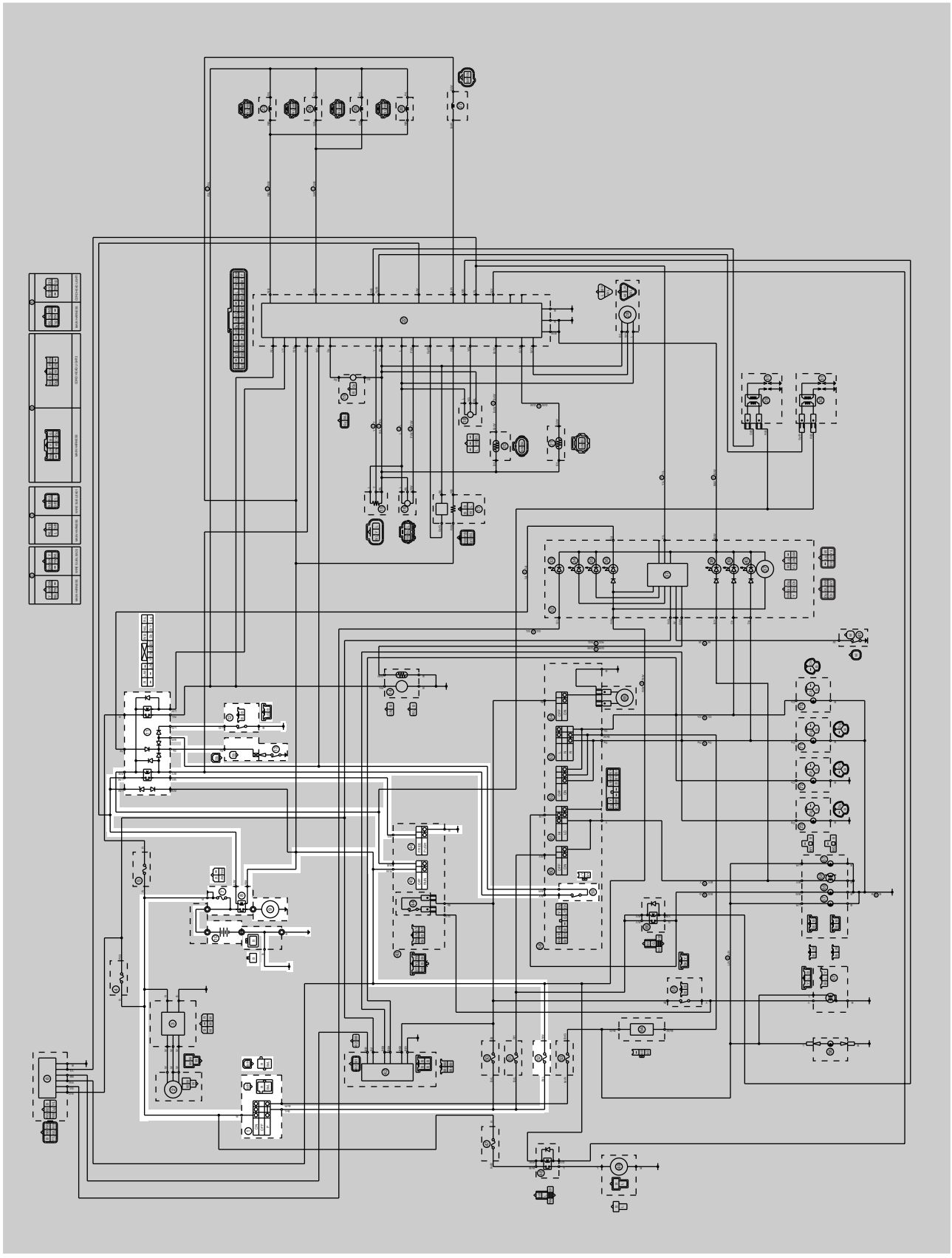
1.Seat
2.Fuel tank
3.Side cowlings

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-108.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-109.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the spark plugs. Refer to "CHECKING THE SPARK PLUGS" on page 3-11.	NG→	Re-gap or replace the spark plugs.
OK↓		
4. Check the spark plug caps. Refer to "CHECKING THE SPARK PLUG CAPS" on page 8-116.	NG→	Replace the spark plug caps.
OK↓		
5. Check the ignition coils. Refer to "CHECKING THE IGNITION COILS" on page 8-116.	NG→	Replace the ignition coils.
OK↓		
6. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-117.	NG→	Replace the crankshaft position sensor.
OK↓		
7. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the main switch.
OK↓		

8. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the right handlebar switch.
OK↓		
9. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the neutral switch.
OK↓		
10. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the sidestand switch.
OK↓		
11. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the clutch switch.
OK↓		
12. Check the starting circuit cut-off relay. Refer to "CHECKING THE RELAYS" on page 8-112.	NG→	Replace the starting circuit cut-off relay.
OK↓		
13. Check the lean angle sensor. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-118.	NG→	Replace the lean angle sensor.
OK↓		
14. Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the ignition system's wiring
OK↓		
Replace the ECU (engine control unit).		

EAS27160
ELECTRIC STARTING SYSTEM

EAS27170
CIRCUIT DIAGRAM



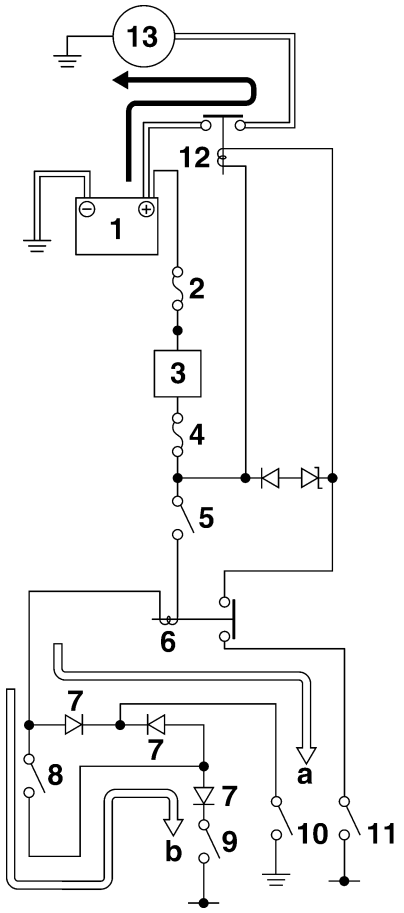
1. Main switch
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
45. Engine stop switch
46. Start switch
52. Ignition fuse
59. Clutch switch

EAS27180
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to "○" and the main switch is set to "ON" (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cut-off relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met the starting circuit cut-off relay is closed and the engine can be started by pressing the starter switch.



a. WHEN THE TRANSMISSION IS IN NEUTRAL
b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR
1. Battery
2. Main fuse
3. Main switch
4. Ignition fuse
5. Engine stop switch
6. Starting circuit cut-off relay
7. Diode
8. Clutch switch
9. Sidestand switch
10. Neutral switch
11. Start switch
12. Starter relay
13. Starter motor

EAS27190
TROUBLESHOOTING

The starter motor fails to turn.

NOTE:

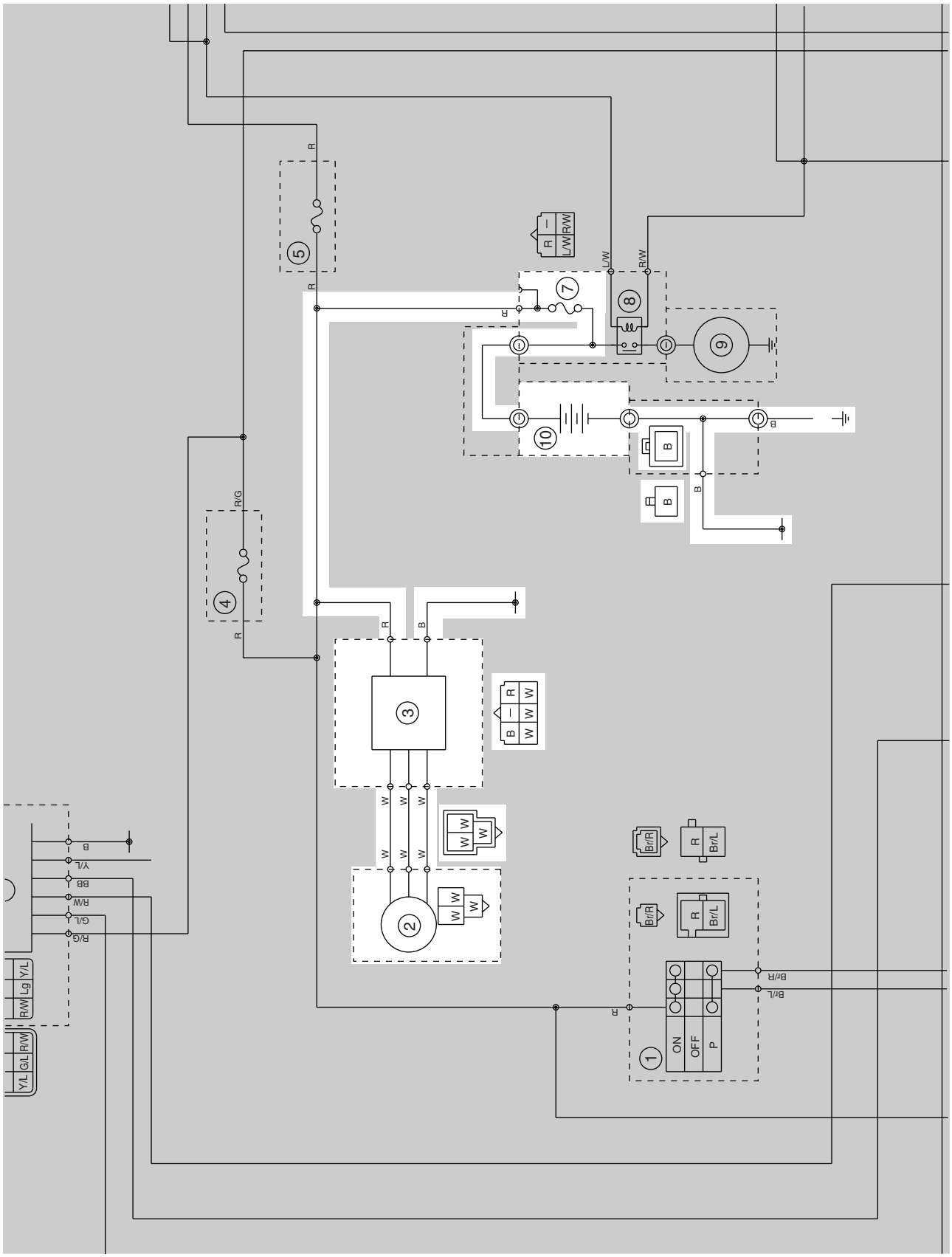
• Before troubleshooting, remove the following part(s):
1.Seat
2.Front cowling inner panel
3.Fuel tank
4.Left side cover

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-108.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-109.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the starter motor. Refer to "CHECKING THE STARTER MOTOR" on page 5-38.	NG→	Repair or replace the starter motor.
OK↓		
4. Check the starting circuit cut-off relay. Refer to "CHECKING THE RELAYS" on page 8-112.	NG→	Replace the starting circuit cut-off relay.
OK↓		
5. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-112.	NG→	Replace the starter relay.
OK↓		
6. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the main switch.
OK↓		
7. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the right handlebar switch.
OK↓		

8. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the neutral switch.
OK↓		
9. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the sidestand switch.
OK↓		
10. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the clutch switch.
OK↓		
11. Check the start switch. Refer to "CHECKING THE SWITCHES" on page 8-104.	NG→	Replace the right handlebar switch.
OK↓		
12. Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the starting system's wiring.
OK↓		
The starting system circuit is OK.		

EAS27200
CHARGING SYSTEM

EAS27210
CIRCUIT DIAGRAM



2. AC magneto
3. Rectifier/regulator
7. Main fuse
10. Battery

EAS27230
TROUBLESHOOTING

The battery is not being charged.

NOTE:

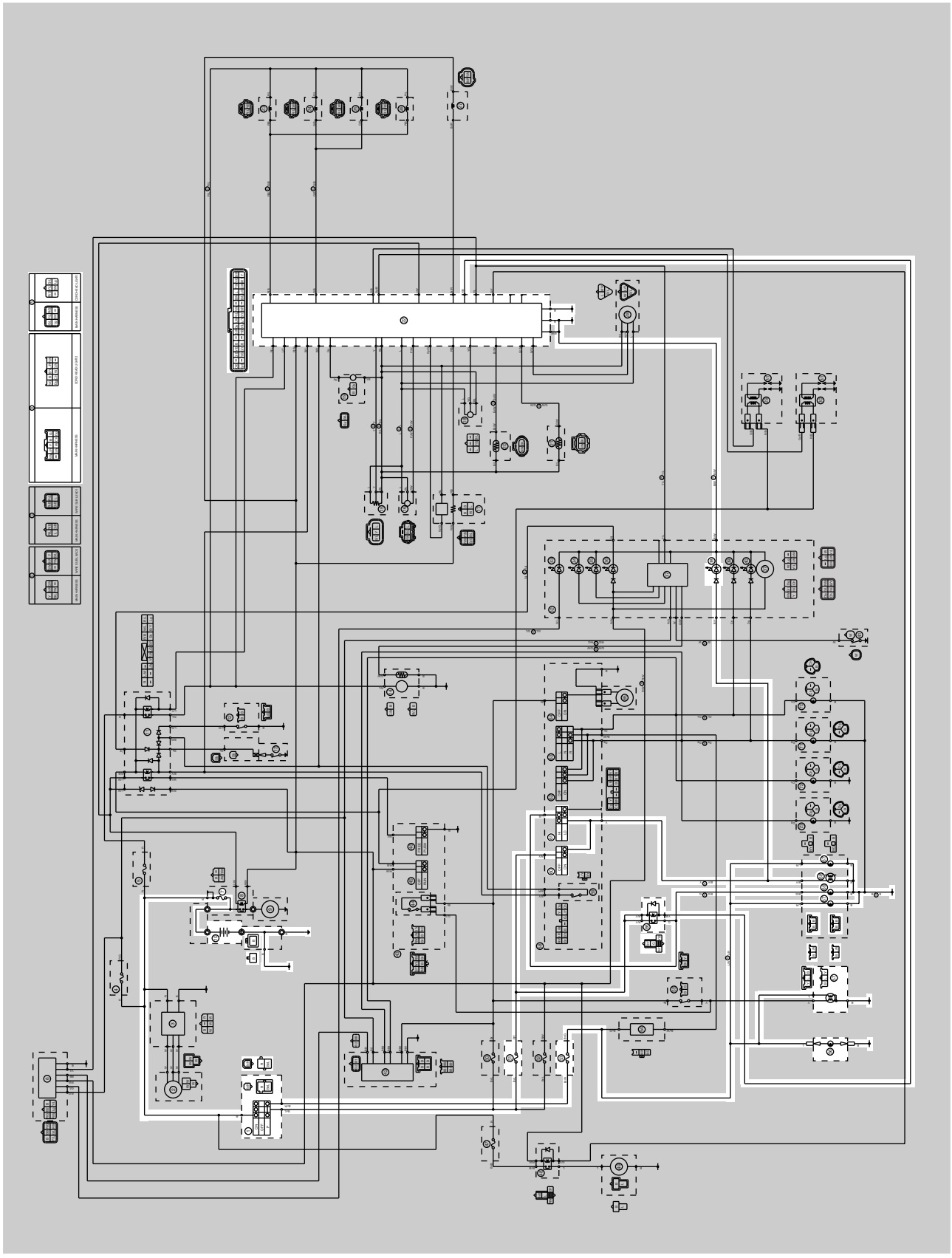
- Before troubleshooting, remove the following part(s):

1. Seat
2. Front cowling inner panel
3. Fuel tank

1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 8-113.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-114.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 8-124.	NG→	Replace the stator coil assembly.
OK↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 8-124.	NG→	Replace the rectifier/regulator.
OK↓		
5. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the charging system's wiring.
OK↓		
Replace the rectifier/regulator.		

EAS27240
LIGHTING SYSTEM

EAS27250
CIRCUIT DIAGRAM



1. Main switch
7. Main fuse
10. Battery
22. ECU (engine control unit)
38. High beam indicator light
51. Headlight fuse
53. Tail fuse
56. License plate light
57. Tail/brake light
60. Pass switch
61. Dimmer switch
66. Headlight relay
67. Auxiliary light
68. Headlight (high beam)
69. Headlight (low beam)

EAS27260
TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, license light or meter light.

NOTE:

- Before troubleshooting, remove the following part(s):

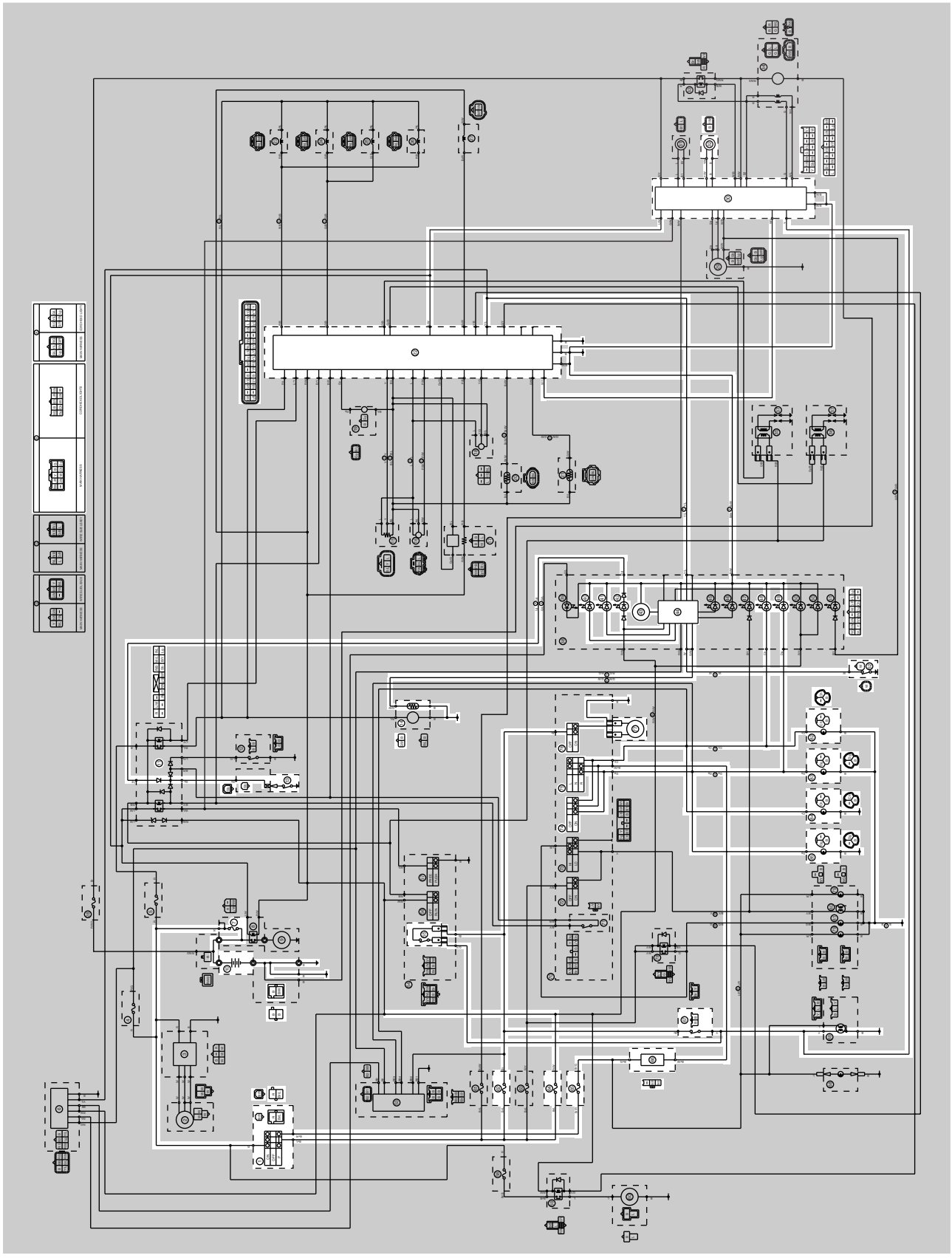
1.Seat
2.Front cowling inner panel
3.Fuel tank
4.Side cover

1. Check the each bulbs and bulb sockets condition. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-112.	NG→	Replace the bulb(s) and bulb socket(s).
OK↓		
2. Check the fuses. (Main, headlight and tail) Refer to "CHECKING THE FUSES" on page 8-113.	NG→	Replace the fuse(s).
OK↓		
3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-114.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the main switch.
OK↓		
5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	The dimmer switch is faulty. Replace the left handlebar switch.
OK↓		
6. Check the pass switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	The pass switch is faulty. Replace the left handlebar switch.
OK↓		
7. Check the headlight relay. Refer to "CHECKING THE RELAYS" on page 8-117.	NG→	Replace the headlight relay.
OK↓		

8. Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the lighting system's wiring.
OK↓		
This circuit is OK.		

EAS27270
SIGNALING SYSTEM

EAS27280
CIRCUIT DIAGRAM



1. Main switch
7. Main fuse
10. Battery
11. Starting circuit cut-off relay
13. Neutral switch
14. Fuel pump
22. ECU (engine control unit)
30. ABS ECU
32. Rear wheel sensor
40. Fuel level warning light
41. Oil level warning light
42. Neutral indicator light
43. Tachometer
44. Multi-function meter
46. Coolant temperature warning light
48. Left turn signal indicator light
49. Right turn signal indicator light
50. Meter light
52. Oil level switch
55. Front brake light switch
62. Signal fuse
64. Ignition fuse
65. Tail fuse
66. Turn signal relay
67. Rear brake light switch
69. Tail/brake light
74. Hazard switch
75. Turn signal switch
76. Horn switch
77. Horn
82. Front left turn signal light
83. Front right turn signal light
84. Rear left turn signal light
85. Rear right turn signal light

EAS27290
TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or an indicator light.
- The horn fails to sound.

NOTE:

- Before troubleshooting, remove the following part(s):

1.Seat
2.Front cowling inner panel
3.Fuel tank
4.Side cover

1. Check the fuses. (Main, ignition, signaling and tail) Refer to "CHECKING THE FUSES" on page 8-113.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-114.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the main switch.
OK↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
This circuit is OK.		

Check the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the left handlebar switch.
OK↓		
2. Check the horn. Refer to "CHECKING THE HORN" on page 8-125.	NG→	Replace the horn.
OK↓		

3. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The tail/brake light fails to come on.

1. Check the tail/brake light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-112.	NG→	Replace the tail/brake light bulb, socket or both.

OK↓

2. Check the front brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the front brake light switch.

OK↓

3. Check the rear brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the rear brake light switch.

OK↓

4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The turn signal light, turn signal indicator light or both fail to blink.

1. Check the turn signal indicator light bulb and socket. Refer to "CHECKING THE LEDS" on page 8-113.	NG→	Replace the turn signal indicator light bulb, socket or both.

OK↓

2. Check the turn signal switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the left handlebar switch.

OK↓

3. Check the hazard switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the left handlebar switch.
OK↓		
4. Check the turn signal/hazard relay. Refer to "CHECKING THE RELAYS" on page 8-117.	NG→	The turn signal relay is faulty and must be replaced.
OK↓		
5. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
This circuit is OK.		

The neutral indicator light fails to come.

1. Check the neutral indicator light bulb and socket. Refer to "CHECKING THE LEDS" on page 8-113.	NG→	Replace the neutral indicator light bulb, socket or both.
OK↓		
2. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the neutral switch.
OK↓		
3. Check the starting circuit cut-off relay. Refer to "CHECKING THE RELAYS" on page 8-117.	NG→	Replace the starting circuit cut-off relay.
OK↓		

4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The oil level warning light fails to come.

1. Check the oil level warning light bulb and socket. Refer to "CHECKING THE LEDS" on page 8-113.	NG→	Replace the oil level warning light bulb, socket or both.

OK↓

2. Check the oil level switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the oil level switch.

OK↓

3. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The fuel level warning light fails to come.

1. Check the fuel level warning light bulb and socket. Refer to "CHECKING THE LEDS" on page 8-113.	NG→	Replace the fuel level warning light bulb, socket or both.

OK↓

2. Check the fuel sender. Refer to "CHECKING THE FUEL SENDER" on page 8-126.	NG→	Replace the fuel pump assembly.

OK↓

3. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The speedometer fails to operate.

1. Check the speed sensor. Refer to "CHECKING THE SPEED SENSOR" on page 8-126.	NG→	Replace the speed sensor.

OK↓

2. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

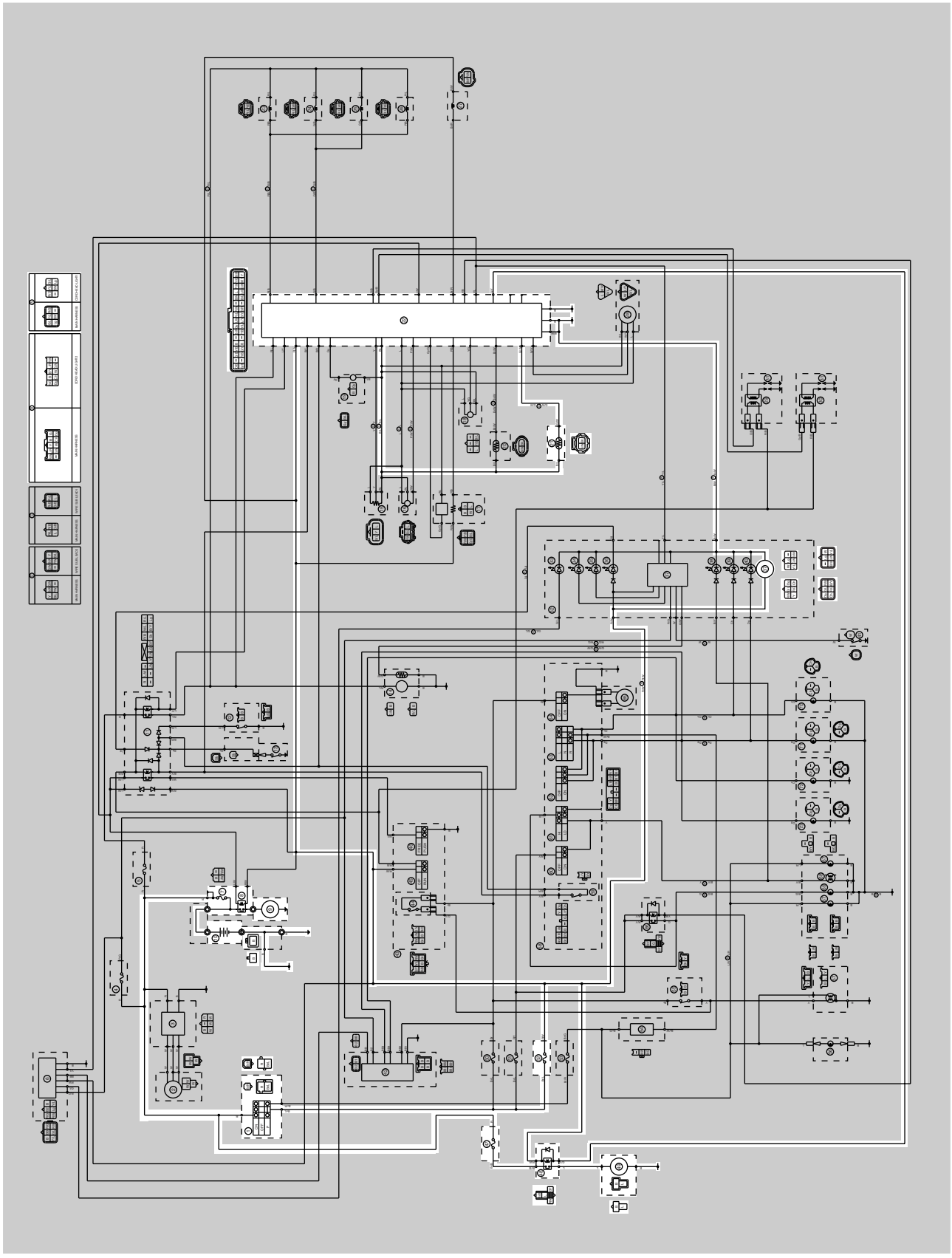
NOTE:

Repair or replace if there is an open or short circuit.

- Between rear wheel sensor and ABS ECU coupler.
  (yellow/white-yellow/white)
  (black-black)
- Between ABS ECU coupler and ECU coupler.
  (white/yellow-white/yellow)
- Between ECU coupler and meter assembly.
  (yellow/blue-yellow/blue)

EAS27300
COOLING SYSTEM

EAS27310
CIRCUIT DIAGRAM



1. Main switch
7. Main fuse
10. Battery
21. Coolant temperature sensor
22. ECU (engine control unit)
37. Multi-function meter
47. Radiator fan motor fuse
48. Radiator fan motor relay
49. Radiator fan motor
52. Ignition fuse

EAS27320
TROUBLESHOOTING

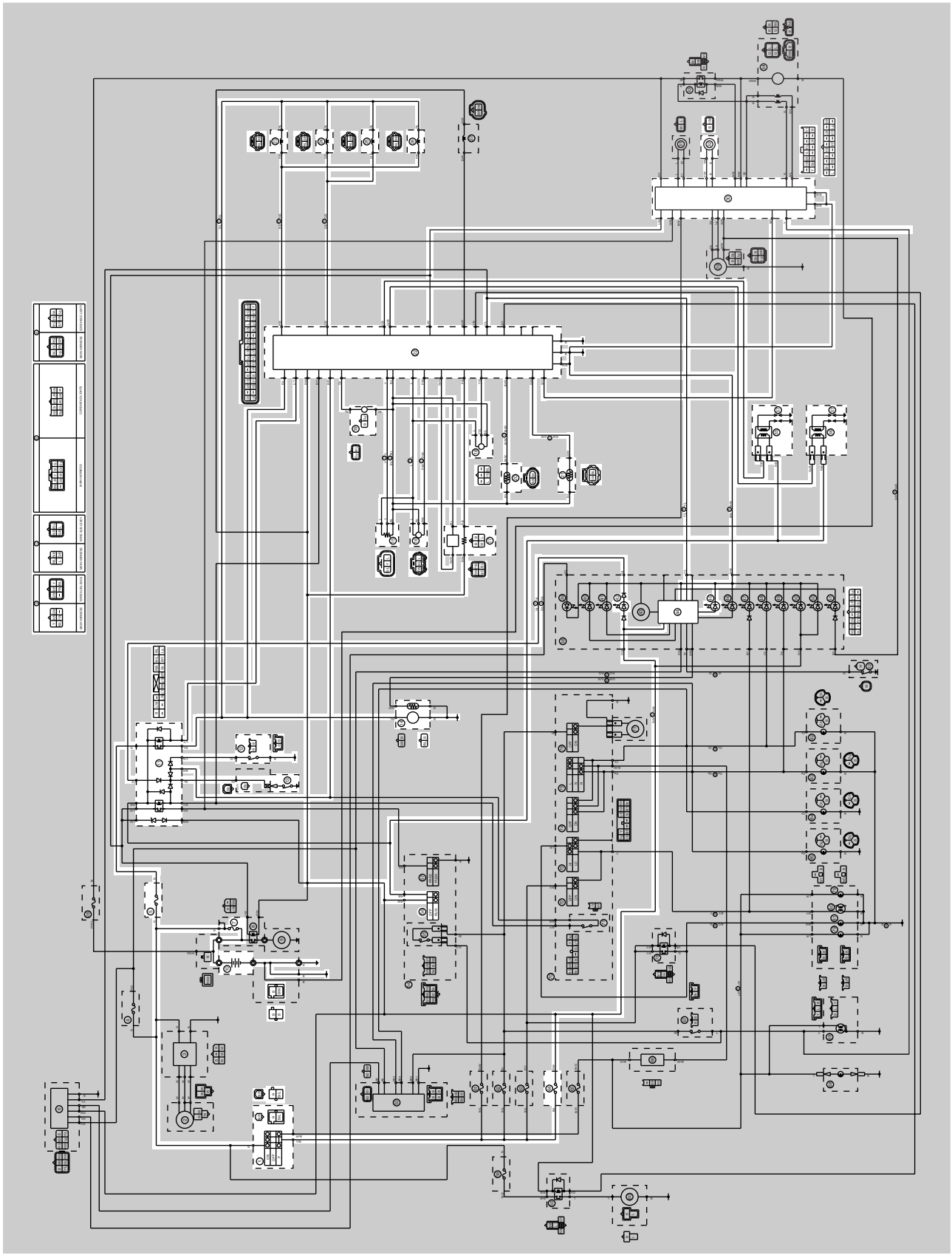
NOTE:
• Before troubleshooting, remove the following part(s):
1.Seat
2.Front cowling inner panel
3.Fuel tank
4.Side cover

1. Check the fuses. (Main, ignition and radiator fan motor) Refer to "CHECKING THE FUSES" on page 8-113.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-114.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the main switch.
OK↓		
4. Check the radiator fan motor. Refer to "CHECKING THE RADIATOR FAN MOTOR" on page 8-127.	NG→	The radiator fan motor is faulty and must be replaced.
OK↓		
5. Check the radiator fan motor relay. Refer to "CHECKING THE RELAYS" on page 8-117.	NG→	Replace the radiator fan motor relay.
OK↓		
6. Check the coolant temperature. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-127.	NG→	Replace the coolant temperature sensor.
OK↓		

7. Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the cooling system's wiring.
OK↓		
This circuit is OK.		

EAS27330
FUEL INJECTION SYSTEM

EAS27340
CIRCUIT DIAGRAM



1. Main switch
3. Backup fuse
5. Fuel injection system fuse
7. Main fuse
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
14. Fuel pump
15. Throttle position sensor
16. Intake air pressure sensor
17. O_2 sensor
18. Lean angle sensor
19. Crankshaft position sensor
20. Intake air temperature sensor
21. Coolant temperature sensor
22. ECU (engine control unit)
23. Injector #1
24. Injector #2
25. Injector #3
26. Injector #4
30. ABS ECU
32. Rear wheel sensor
35. Cylinder-#1/#4 ignition coil
36. Cylinder-#2/#3 ignition coil
37. Spark plug
42. Neutral indicator light
44. Multi-function meter
45. Engine trouble warning light
56. Engine stop switch
64. Ignition fuse

EAS27350
ECU SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning, the engine trouble warning light flashes when the start switch is being pushed to start the engine.
- If a malfunction is detected in the system by the self-diagnostic function, the ECU provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating the engine trouble warning light.
- After the engine has been stopped, the lowest fault code number appears on the clock LCD. Once a fault code has been displayed, it remains stored in the memory of the ECU until it is deleted.

Engine trouble warning light indication and FI system operation

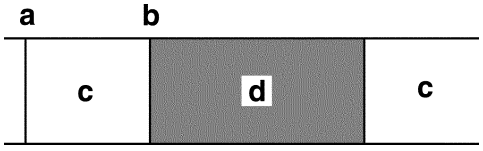
Warning light indication	ECU operation	FI operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Cannot be operated
Remains on	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	Can or cannot be operated depending on the fault code

* The warning light flashes when any one of the conditions listed below is present and the start switch is pushed:

12:	Crankshaft position sensor	41:	Lean angle sensor (open or short-circuit)
19:	Sidestand switch (open circuit in the wire to the ECU)	50:	ECU internal malfunction (faulty ECU memory)
30:	Lean angle sensor (latch up detected)		

Checking for a defective engine trouble warning light bulb

The engine trouble warning light comes on for 1.4 seconds after the main switch has been turned to “ON” and when the start switch is being pushed. If the warning light does not come on under these conditions, the warning light bulb may be defective.



a. Main switch “OFF”
b. Main switch “ON”
c. Engine trouble warning light off
d. Engine trouble warning light on for 1.4 seconds

EAS27362
FAIL-SAFE ACTIONS (SUBSTITUTE CHARACTERISTICS OPERATION CONTROL)
If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.
When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue to operate or stop operating, depending on the conditions.
The ECU takes fail-safe actions in two ways: one in which the sensor output is set to a prescribed value, and the other in which the ECU directly operates an actuator. Details on the fail-safe actions are given in the table below.

Self-Diagnostic Function

Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
12	Crankshaft position sensor	No normal signals are received from the crankshaft position sensor.	Unable	Unable
13	Intake air pressure sensor (open or short circuit)	Intake air pressure sensor-open or short circuit detected.	Able	Able
14	Intake air pressure sensor (pipe system)	Intake air pressure sensor-pipe system malfunction (clogged or detached hose).	Able	Able
15	Throttle position sensor (open or short circuit)	Throttle position sensor-open or short circuit detected.	Able	Able
16	Throttle position sensor (stuck)	The throttle position sensor is stuck.	Able	Able
19	Sidestand switch (open circuit wire harness to ECU)	Open circuit is detected in the input line from the sidestand switch to the ECU.	Unable	Unable
21	Coolant temperature sensor	Coolant temperature sensor-open or short circuit detected.	Able	Able
22	Intake air temperature sensor	Intake air temperature sensor-open or short circuit detected.	Able	Able
24	O_2 sensor	No normal signal is received from the O_2 sensor.	Able	Able
30	Lean angle sensor	Latch up detected. No normal signal is received from the lean angle sensor.	Unable	Unable
33	Ignition coil (#1, #4) (faulty ignition)	Malfunction detected in the primary wire of the ignition coil (#1, #4).	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)

Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
34	Ignition coil (#2, #3) (faulty ignition)	Malfunction detected in the primary wire of the ignition coil (#2, #3).	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)
41	Lean angle sensor (open or short circuit)	Lean angle sensor-open or short circuit detected.	Unable	Unable
42	Speed sensor Neutral switch	No normal signals are received from the speed sensor. Open or short circuit is detected in the neutral switch.	Able	Able
43	Fuel system voltage (monitor voltage)	The ECU is unable to monitor the battery voltage (an open circuit in the line to the ECU).	Able	Able
44	Error in writing the amount of CO adjustment on EEPROM	Error is detected while reading or writing on EEPROM (CO adjustment value).	Able	Able
46	Vehicle system power supply (Monitoring voltage)	Power supply to the fuel injection system is not normal.	Able	Able
50	ECU internal malfunction (memory check error)	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	Unable	Unable
—	Start unable warning	Engine trouble warning light flashes when the start switch is turned ON. Relay is not turned ON even if the crank signal is input while the start switch is turned ON. When the start switch is turned ON while an error is detected with the fault code of No.12, 19, 30, 41, 43 or 50.	Unable	Unable

Communication error with the meter

Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
Er-1	ECU internal malfunction (output signal error)	No signals are received from the ECU.	Unable	Unable
Er-2	ECU internal malfunction (output signal error)	No signals are received from the ECU within the specified duration.	Unable	Unable

Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
Er-3	ECU internal malfunction (output signal error)	Data from the ECU cannot be received correctly.	Unable	Unable
Er-4	ECU internal malfunction (input signal error)	Non-registered data has been received from the meter.	Unable	Unable

EAS27400
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 number displayed on the meter.
b. Identify the system with the malfunction. Refer to “Self-Diagnostic Function table”.
c. Identify the probable cause of malfunction. Refer to “Diagnostic monitoring code table”.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

2. Checking and repair the probable case of malfunction.

Fault code No. YES	Fault code No. NO
Check and repair. Refer to "TROUBLESHOOTING DETAILS" on page 8-43. Monitor the operation of the sensors and actuators in the diagnostic mode. Refer to “Sensor operation table”.	Check and repair. Refer to Self Diagnostic Function.

3. Perform ECU reinstatement action. Refer to “Reinstatement method” of table in “TROUBLESHOOTING DETAILS”.
4. Turn the main switch to “OFF” and back to “ON”, then check the fault code number is not displayed.

NOTE:
If other fault code displayed, repeat steps (1) to (4) until all fault code number is not displayed.

5. The Malfunction history is stored even if the main switch is turned OFF. The malfunction history must be erased in the diagnostic mode. Refer to “Sensor operation table (Diagnostic code No.62)”.

The engine operation is not normal but the engine trouble warning light does not come on.

1. Check the operation of following sensors and actuators in the Diagnostic mode. Refer to “Sensor operation table”.

01: Throttle position sensor (throttle angle)
30: Ignition coil #1, #4
31: Ignition coil #2, #3
36: Injector #1, #4
37: Injector #2, #3
48: AI system solenoid

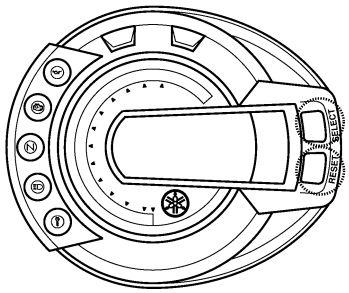
If malfunction the sensors or actuators, repair or replace it.
If not malfunction the sensors and actuators, check and repair the engine inner parts.

EAS27411
DIAGNOSTIC MODE

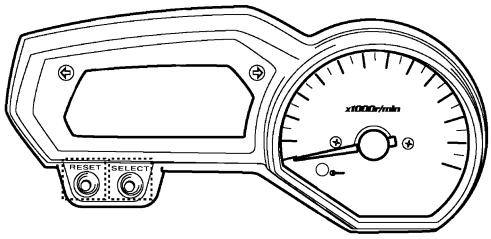
Setting the diagnostic mode

1. Turn the main switch to “OFF” and set the engine stop switch to “ ”.
2. Disconnect the wire harness coupler from the fuel pump.
3. Simultaneously press and hold the “SELECT” and “RESET” buttons, turn the main switch to “ON”, and continue to press the buttons for 8 seconds or more.

A



B



A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/ FZ6-SAHG

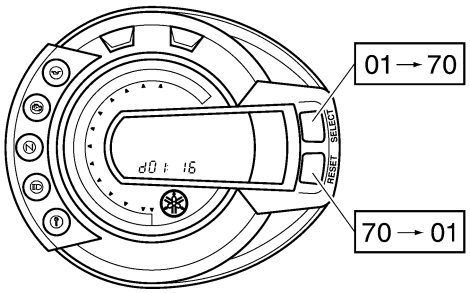
NOTE:
- All displays on the meter disappear except the clock and tripmeter displays.
- “dIAG” appears on the clock LCD.

4. Press the “SELECT” button to select the CO adjustment mode “CO” or the diagnostic monitoring mode “dIAG”.
5. After selecting “dIAG”, simultaneously press the “SELECT” and “RESET” buttons for 2 seconds or more to execute the selection.
6. Set the engine stop switch to “OFF”.
7. Select the diagnostic code number that applies to the item that was verified with the fault code number by pressing the “SELECT” and “RESET” buttons.

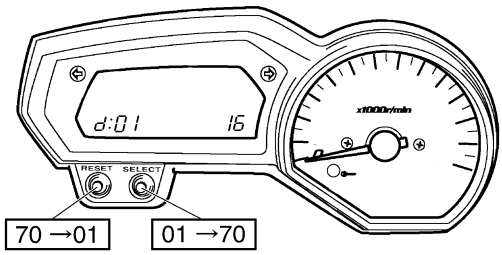
NOTE:

The diagnostic code number appears on the clock LCD (01–70).
- To decrease the selected diagnostic code number, press the “RESET” button. Press the “RESET” button for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the “SELECT” button. Press the “SELECT” button for 1 second or longer to automatically increase the diagnostic code numbers.

A



B



A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/ FZ6-SAHG

8. Verify the operation of the sensor or actuator.
   - Sensor operation
     The data representing the operating conditions of the sensor appears on the trip LCD.
   - Actuator operation
     Set the engine stop switch to "○" to operate the actuator.

NOTE:
If the engine stop switch is set to "○", set it to "⊗", and then set it to "○" again.

9. Turn the main switch to "OFF" to cancel the diagnostic mode.

Diagnostic code table

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
12	No normal signals are received from the crankshaft position sensor.	• Open or short circuit in wire harness. • Defective crankshaft position sensor. • Malfunction in pickup rotor. • Malfunction in ECU. • Improperly installed sensor.	—
13	Intake air pressure sensor-open or short circuit detected.	• Open or short circuit in wire sub lead. • Open or short circuit in wire harness. • Defective intake air pressure sensor. • Malfunction in ECU.	03

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
14	Intake air pressure sensor-pipe system malfunction (clogged or detached hose). • Detected hose • Clogged hose	• Intake air pressure sensor hose is detached, clogged, kinked, or pinched. • Malfunction in ECU.	03
15	Throttle position sensor-open or short circuit detected.	• Open or short circuit in wire sub lead. • Open or short circuit in wire harness. • Defective throttle position sensor. • Malfunction in ECU. • Improperly installed throttle position sensor.	01
16	Stuck throttle position sensor detected.	• Defective sensor (stuck throttle position sensor). • Malfunction in ECU.	01
19	Open circuit is detected in the input line from the start switch to the ECU.	• Open or short circuit in wire harness. • Malfunction in ECU.	20
21	Coolant temperature sensor-open or short circuit detected.	• Open or short circuit in wire harness. • Defective coolant temperature sensor. • Malfunction in ECU. • Improperly installed coolant temperature sensor.	06
22	Intake air temperature sensor-open or short circuit detected.	• Open or short circuit in wire harness. • Defective intake temperature sensor. • Malfunction in ECU. • Improperly installed intake air temperature sensor.	05
24	No normal signal is received from the O_2 sensor.	• Open or short circuit in wire harness. • Defective O_2 sensor. • Malfunction in ECU. • Improperly installed O_2 sensor.	—
30	Latch up detected. No normal signal is received from the lean angle sensor.	• The vehicle has overturned. • Defective lean angle sensor. • Malfunction in ECU. • Improperly installed lean angle sensor.	08
33	Malfunction detected in the primary wire of the ignition coil (#1and #4).	• Open or short circuit in wire harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	30
34	Malfunction detected in the primary wire of the ignition coil (#2 and #3).	• Open or short circuit in wire harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	31
41	Lean angle sensor-open or short circuit detected.	• Open or short circuit in wire harness. • Defective lean angle sensor. • Malfunction in ECU.	08

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
42	No normal signals are received from the speed sensor. Open or short circuit is detected in the neutral switch.	• Open or short circuit in wire harness. • Defective speed sensor. • Malfunction in vehicle speed sensor detected unit. • Defective neutral switch. • Malfunction in the engine side of the neutral switch. • Malfunction in ECU.	07 21
43	The ECU is unable to monitor the battery voltage (an open circuit in the line to the ECU).	• Open circuit in wire harness. • Malfunction in ECU.	09
44	Error is detected while reading or writing on EEPROM (CO adjustment value).	• Malfunction in ECU. (The CO adjustment value is not properly written on or read from the internal memory).	60
46	Power supply to the fuel injection system is not normal.	• Malfunction in the charging system. Refer to "CHARGING SYSTEM" on page 8-11.	—
50	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	• Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.)	—
Er-1	No signals are received from the ECU.	• Open or short circuit in communication line. • Malfunction in meter unit. • Malfunction in ECU.	—
Er-2	No signals are received from the ECU within the specified duration.	• Open or short circuit in communication line. • Malfunction in meter unit. • Malfunction in ECU.	—
Er-3	Data from the ECU cannot be received correctly.	• Open or short circuit in communication line. • Malfunction in meter unit. • Malfunction in ECU.	—
Er-4	Non-registered data has been received from the meter.	• Open or short circuit in communication line. • Malfunction in meter unit. • Malfunction in ECU.	—

Sensor operation table

Diagnostic code No.	Item	Meter display	Checking method
01	Throttle angle • Fully closed position • Fully opened position	 15–17 97–100	 Check with throttle fully closed. Check with throttle fully open.

Diagnostic code No.	Item	Meter display	Checking method
03	Pressure difference (intake air pressure)	Displays the intake air pressure.	Turn On the engine stop switch, then operate the throttle while pressing the start switch. (If the display value changes, the performance is OK.)
05	Intake air temperature	Displays the intake air temperature.	Compare the actually measured intake air temperature with the meter display value. (*)
06	Coolant temperature	Displays the coolant temperature.	Compare the actually measured coolant temperature with the meter display value.
07	Vehicle speed pulse	0–999	Check that the number changes (integrating) when the rear wheels are rotated.
08	Lean angle sensor • Upright • Overturned	 0.4–1.4 3.8–4.2	Remove the lean angle sensor and incline it more than 65 degrees.
09	Fuel system voltage (battery voltage)	Approximately 12.0	Compare with the actually measured battery voltage. (If the battery voltage is lower, perform recharging.)
20	Sidestand switch • Stand retracted • Stand extended	 ON OFF	Turn ON/OFF the Sidestand switch.
21	Neutral switch • Neutral • In gear	 ON OFF	Perform the shift operation of transmission.
60	EEPROM fault code display • Not fault • Fault detected	 00 01 to 02 (Fault detection cylinder) 01: #1 and #4 02: #2 and #3 • (If plural cylinders are defective, the display alternates every two seconds.)	—

Diagnostic code No.	Item	Meter display	Checking method
61	Malfunction history code display • No history • History exists	00 12-50 (Fault detection code) • (If code numbers more than one are detected, the display alternates every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.)	—
62	Malfunction history code erasure • No history • History exists	00 00–17 (Memory numbers of the fault detection)	— To erase the history, turn ON the engine stop switch.
63	Malfunction code reinstate • No malfunction code • Malfunction code exists	00 Fault code 24 • (If more than one code number is detected, the display changes every two seconds to show all the detected code numbers are shown, the display repeats.)	— To reinstate, set the engine stop switch to "○".
70	Control number	00–255	—

* If it is not possible to check the intake temperature, use the ambient temperature as reference (use the compared values for reference).

Actuator operation table

Diagnostic code No.	Item	Actuation	Checking method
30	Ignition coil #1/#4	Actuates the ignition coils #1, #4 for five times every second. Illuminates the engine trouble warning light.	Check the spark five times. • Connect an ignition checker.
31	Ignition coil #2/#3	Actuates the ignition coils #2, #3 for five times every second. Illuminates the engine trouble warning light.	Check the spark five times. • Connect an ignition checker.

Diagnostic code No.	Item	Actuation	Checking method
36	Injector #1/#4	Actuates the injector #1/#4 for five times every second. Illuminates the engine trouble warning light.	Check the operating sound of the injector #1/#4 five times.
37	Injector #2/#3	Actuates the injector #2/#3 for five times every second. Illuminates the engine trouble warning light.	Check the operating sound of the injector #2/#3 five times.
48	AI system solenoid	Actuates the AI system solenoid for five times every second. Illuminates the engine trouble warning light.	Check the operating sound of the AI system solenoid five times.
50	Fuel injection system relay	Actuates the fuel injection system relay for five times every second. Illuminates the engine trouble warning light. (The engine trouble warning light is OFF when the relay is ON, and the engine trouble warning light is ON when the relay is OFF).	Check the operating sound of the fuel injection system relay five times.
51	Radiator fan motor relay	Actuates the radiator fan motor relay for five cycles every five-second. (ON 2 seconds, OFF 3 seconds) Illuminates the engine trouble warning light.	Check the operating sound of the Radiator fan motor relay five times.
52	Headlight relay	Actuates the headlight relay for five times every five-second. (ON 2 seconds, OFF 3 seconds) Illuminates the engine trouble warning light.	Check the operating sound of the headlight relay five times.

EAS27451
TROUBLESHOOTING DETAILS

This section describes the measures per fault code number displayed on the meter. Check and service the items or components that are the probable cause of the malfunction following the order given.

After the check and service of the malfunctioning part has been completed, reset the meter display according to the reinstatement method.

Fault code No.:

Code number displayed on the meter when the engine failed to work normally. Refer to “Self-Diagnostic Function table”.

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "DIAGNOSTIC MODE" on page 8-37.

Fault code No.	12	Symptom	No normal signals are received from the crankshaft position sensor.
Diagnostic code No.			

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Installed condition of crankshaft position sensor	Check the installed area for looseness or pinching.	Cranking the engine.
2	Connected state of connector • Crankshaft position sensor coupler • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	
3	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Between the crankshaft position sensor coupler and ECU coupler. (Gray–Gray) (Black/Blue–Black/Blue)	
4	Defective crankshaft position sensor.	• Replace if defective. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-122.	

Fault code No.	13	Symptom	Intake air pressure sensor-open or short circuit detected.
Diagnostic code No.		03	Intake air pressure sensor

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector • Intake air pressure sensor coupler • Main wire harness ECU coupler • Sub-wire harness coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Turning the main switch ON.
2	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Between intake air pressure sensor coupler and ECU coupler (Black/Blue–Black/Blue) (Pink/White–Pink/White) (Blue–Blue)	
3	Defective intake air pressure sensor	• Execute the diagnostic monitoring mode. (Code No.03) • Replace if defective. Refer to "CHECKING THE INTAKE AIR PRESSURE SENSOR" on page 8-129.	

Fault code No.	14	Symptom	**A. Intake air pressure sensor-pipe system malfunction (clogged or detached hose).** **B. Intake air pressure sensor-open or short circuit detected.** **C. Stuck throttle position sensor detected.**
Diagnostic code No.		**03**	**Intake air pressure sensor**

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Intake air pressure sensor hose	• Check the intake air pressure sensor hose condition. • Repair or replace the sensor hose.	Starting the engine and operating it at idle.
2	Intake air pressure sensor malfunction at intermediate electrical potential.	• Check and repair the connection. • Replace it if there is a malfunction.	
3	Connected state of connector • Intake air pressure sensor coupler • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	
4	Defective intake air pressure sensor	• Execute the diagnostic monitoring mode. (Code No.03) • Replace if defective. Refer to "CHECKING THE INTAKE AIR PRESSURE SENSOR" on page 8-129.	

Fault code No.	15	Symptom	Throttle position sensor-open or short circuit detected.
Diagnostic code No.		01	Throttle position sensor

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Installed condition of throttle position sensor.	Check the installed area for looseness or pinching.	Turning the main switch ON.
2	Connected state of connector • Throttle position sensor coupler • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	
3	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Between throttle position sensor coupler and ECU coupler (Black/Blue–Black/Blue) (Yellow–Yellow) (Blue–Blue)	
4	Throttle position sensor lead wire open circuit output voltage check.	• Check for open circuit and replace the throttle position sensor. (Black/Blue–Yellow)	
		Open circuit item: Ground wire open circuit — Output voltage: 5 V	
		Open circuit item: Output wire open circuit — Output voltage: 0 V	
		Open circuit item: Power supply wire open circuit — Output voltage: 0 V	
5	Defective throttle position sensor.	• Execute the diagnostic monitoring mode. (Code No.01) • Replace if defective. Refer to "CHECKING THE THROTTLE POSITION SENSOR" on page 8-128.	

Fault code No.	16	Symptom	AStuck throttle position sensor detected.
Diagnostic code No.		01	Throttle position sensor

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Installed condition of throttle position sensor.	Check the installed area for looseness or pinching.	Starting the engine and operating it at idle, and then by racing it.
2	Defective throttle position sensor.	• Execute the diagnostic monitoring mode. (Code No.01) • Replace if defective. Refer to "CHECKING THE THROTTLE POSITION SENSOR" on page 8-128.	

Fault code No.	19	Symptom	Open circuit is detected in the input line from the sidestand switch to the ECU.
Diagnostic code No.		20	Sidestand switch

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector • Main wire harness ECU coupler (No. 13 and 30 pin, black) • Alarm coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	If the transmission is in gear, retracting the sidestand. If the transmission is in neutral, reconnecting the wiring.
2	Open or short circuit in wire harness or sub lead.	• Repair or replace if there is an open or short circuit. • Between ECU and sidestand switch (Black/Red–Blue/Green)	
3	Defective sidestand switch	• Execute the diagnostic monitoring mode. (Code No.20) • Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-109.	

Fault code No.	21	Symptom	Coolant temperature sensor-open or short circuit detected.
Diagnostic code No.		06	Coolant temperature sensor

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Installed condition of coolant temperature sensor	Check the installed area for looseness or pinching.	Turning the main switch ON.
2	Connected state of connector • Coolant temperature sensor coupler • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	
3	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Main wire harness (Black/Blue–Black/Blue) (Green/White–Green/White)	
4	Defective coolant temperature sensor.	• Execute the diagnostic monitoring mode. (Code No.06) • Replace if defective. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-127.	

Fault code No.	22	Symptom	Intake air temperature sensor-open or short circuit detected.
Diagnostic code No.		05	Intake air temperature sensor

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Installed condition of intake air temperature sensor	Check the installed area for looseness or pinching.	Turning the main switch ON.
2	Connected state of connector • Intake air temperature sensor coupler • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	
3	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Main wire harness (Black/Blue–Black/Blue) (Brown/White–Brown/White)	
4	Defective intake air temperature sensor.	• Execute the diagnostic monitoring mode. (Code No.05) • Replace if defective. Refer to "CHECKING THE INTAKE AIR TEMPERATURE SENSOR" on page 8-130.	

Fault code No.	24	Symptom	No normal signal is received from the O_2 sensor.
Diagnostic code No.			

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Installed condition of O_2 sensor	Check the installed area for looseness or pinching.	Starting the engine, warming it up until the coolant temperature is 60°C or more, and then running it between 2000–3000 r/min until the engine trouble indicator turns off.
2	Connected state of connector • O_2 sensor coupler • Main wire harness ECU coupler • Sub-wire harness coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	
3	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Main wire harness (Gray/Green–Gray/Green) (Black/Blue–Black/Blue) (Red/White–Red/White) (Pink/Black–Pink/Black)	
4	Check fuel pressure.	Refer to "CHECKING THE FUEL PRESSURE" on page 7-6.	
5	Defective O_2 sensor	Replace if defective.	

Fault code No.	30	Symptom	Latch up detected. No normal signal is received from the lean angle sensor.
Diagnostic code No.		08	Lean angle sensor

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	The vehicle has overturned.	Raise the vehicle upright.	Turning the main switch ON (however, the engine cannot be restarted unless the main switch is first turned OFF).
2	Installed state of the lean angle sensor.	Check the installed direction and condition of the sensor.	
3	Defective lean angle sensor.	• Execute the diagnostic monitoring mode. (Code No.08) • Replace if defective. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-123.	

Fault code No.	33	Symptom	Malfunction detected in the primary wire of the ignition coil (#1/#4).
Diagnostic code No.		30	Ignition coil (#1/#4)

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector • Ignition coil primary side coupler (Orange/Black) • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Starting the engine and operating it at idle.
2	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Between ignition coil coupler (#1/#4) and ECU coupler/main wire harness. (Orange/Black–Orange/Black) (Red/Black–Red/Black)	
3	Defective ignition coil (#1/#4)	• Execute the diagnostic monitoring mode. (Code No.30) • Test the primary and secondary coils for continuity. • Replace if defective. Refer to "CHECKING THE IGNITION COILS" on page 8-121.	

Fault code No.	34	Symptom	Malfunction detected in the primary wire of the ignition coil (#2/#3).
Diagnostic code No.		31	Ignition coil (#2/#3)

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector • Ignition coil primary side coupler (Gray/Black) • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Starting the engine and operating it at idle.
2	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Between ignition coil coupler (#2/#3) and ECU coupler/main wire harness. (Gray/Black–Gray/Black) (Red/Black–Red/Black)	
3	Defective ignition coil (#2/#3)	• Execute the diagnostic monitoring mode. (Code No.31) • Test the primary and secondary coils for continuity. • Replace if defective. Refer to "CHECKING THE IGNITION COILS" on page 8-121.	

Fault code No.	41	Symptom	Lean angle sensor-open or short circuit detected.
Diagnostic code No.		08	Lean angle sensor

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector • Lean angle sensor coupler • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Turning the main switch ON.
2	Open or short circuit in wire harness and/or sub lead.	• Repair or replace if there is an open or short circuit. • Between lean angle sensor coupler and ECU coupler. (Black/Blue–Black/Blue) (Yellow/Green–Yellow/Green) (Blue–Blue)	
3	Defective lean angle sensor	• Execute the diagnostic monitoring mode. (Code No.08) • Replace if defective.	

Fault code No.	42	Symptom		A. No normal signals are received from the rear wheel sensor. (with ABS) B. Open or short circuit is detected in the neutral switch.
Diagnostic code No.		A	07	Speed sensor
		B	21	Neutral switch

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
A-1	Connected state of connector (with out ABS) • Speed sensor coupler • Main wire harness ECU coupler Connections (with ABS) • Rear wheel sensor coupler • Wire harness ECU coupler • ABS ECU coupler • ABS wire harness coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.	Starting the engine, and inputting the vehicle speed signals by operating the vehicle at a 20 to 30 km/h.
A-2	Open or short circuit in speed sensor lead. (with out ABS) Open or short circuit in wire harness and/or ABS wire harness. (with ABS)	• Repair or replace if there is an open or short circuit. • Between speed sensor coupler and ECU coupler. (with out ABS) (Blue–Blue) (White/Yellow–White/Yellow) (Black/Blue–Black/Blue) • Between rear wheel sensor coupler and ABS ECU coupler. (with ABS) (Yellow/White–Yellow/White) (Black–Black) • Between ABS ECU coupler and ECU coupler. (with ABS) (White/Yellow–White/Yellow)	
A-3	Gear for detecting vehicle speed has broken. (with out ABS) Sensor roter for detecting vehicle speed has broken.	• Replace if defective. (with out ABS) Refer to "CHECKING THE SPEED SENSOR" on page 8-126. • Replace the rear wheel. (with ABS) Refer to "REAR WHEEL" on page 4-15.	
A-4	Defective speed sensor (with out ABS) Defective rear wheel sensor (with ABS)	• Execute the diagnostic mode. (Code No.07) • Replace if defective. (with out ABS) Refer to "CHECKING THE SPEED SENSOR" on page 8-126. • Replace if defective. (with ABS) Refer to "[D-4] MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-20.	

Fault code No.	42	Symptom	A. No normal signals are received from the rear wheel sensor. (with ABS) B. Open or short circuit is detected in the neutral switch.
Diagnostic code No.		A 07	Speed sensor
		B 21	Neutral switch

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
B-1	Connected state of connector • Neutral switch coupler • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.	Starting the engine, and inputting the vehicle speed signals by operating the vehicle at a 20 to 30 km/h.
B-2	Open or short circuit in neutral switch lead.	• Repair or replace if there is an open or short circuit. • Between neutral switch connector and relay unit coupler (Sky blue–Sky blue)	
B-3	Faulty shift drum (neutral detection area)	• Replace if defective. Refer to "TRANSMISSION" on page 5-74.	
B-4	Defective neutral switch.	• Execute the diagnostic mode. (Code No.21) • Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-109.	

Fault code No.	43	Symptom	The ECU is unable to monitor the battery voltage.
Diagnostic code No.		50	Fuel injection system relay

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector • Fuel injection system relay coupler • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Starting the engine and operating it at idle.
2	Open or short circuit in the wire harness.	• Repair or replace if there is an open or short circuit. • Main wire harness (Red–Red) (Red/Black–Red/Black) (Red/Blue–Red/Blue) (Blue/Yellow–Blue/Yellow)	
3	Malfunction or open circuit in fuel injection system relay	• Execute the diagnostic monitoring mode. (Code No. 50) • Replace if defective. • If there is no malfunction with the fuel injection system relay, replace the ECU.	

Fault code No.	44	Symptom	An error is detected while reading or writing on EEPROM (CO adjustment value).
Diagnostic code No.		60	EEPROM fault cylinder No.

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Malfunction in ECU	• Set the faulty cylinder's exhaust gas volume. 1 Execute the diagnostic mode (Code No. 60) to check the faulty cylinder number. (If multiple cylinders are defective, the numbers of the faulty cylinders are displayed alternately at 2-second intervals.) 2 Execute the CO adjustment mode and set the exhaust gas volume of the faulty cylinder to "0". If "0" is displayed, set the numerical value other than "0". When the malfunction is recovered, reset "0". Refer to "ADJUSTING THE EXHAUST GAS VOLUME (FZ6-N/FZ6-NA/FZ6-S/FZ6-SA)" on page 3-8. • Replace ECU if it does not recover from the malfunction.	Turning the main switch to "ON". (Readjust the exhaust gas volume after it is reinstated.)

Fault code No.	46	Symptom	Power supply to the FI system relay is not normal.
Diagnostic monitoring code No.		—	—

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector. • Main wire harness ECU coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Starting the engine and operating it at idle.
2	Faulty battery	• Replace or change the battery Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-114.	
3	The malfunction of the rectifier/regulator	• Replace if defective. Refer to "CHARGING SYSTEM" on page 8-11.	
4	Open or short circuit in wire harness.	• Repair or replace if there is an open or short circuit. • Between battery and main switch Red–Red • Between main switch and Fuse (ignition) (Brown/Blue–Brown/Blue) • Between Fuse (ignition) and ECU (Red/White–Red/White)	

Fault code No.	50	Symptom	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)
Diagnostic code No.		—	—

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Malfunction in ECU	Replace the ECU.	Turning the main switch ON.

Fault code No.	Er-1	Symptom	No signals are received from the ECU.
Diagnostic code No.		—	—

Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector • Main wire harness ECU coupler • Main wire harness meter coupler • Sub-wire harness coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Reinstated automatically when it receives a normal signal.
2	Open or short circuit in wire harness and/or sub lead	• Repair or replace if there is an open or short circuit. • Between meter coupler and ECU coupler (Yellow/Blue–Yellow/Blue) (Black/White–Black/White)	
3	Malfunction in meter unit	Replace the meter unit.	
4	Malfunction in ECU	Replace the ECU.	

Fault code No.	Er-2	Symptom	No signals are received from the ECU within the specified duration.
Diagnostic code No.		—	—

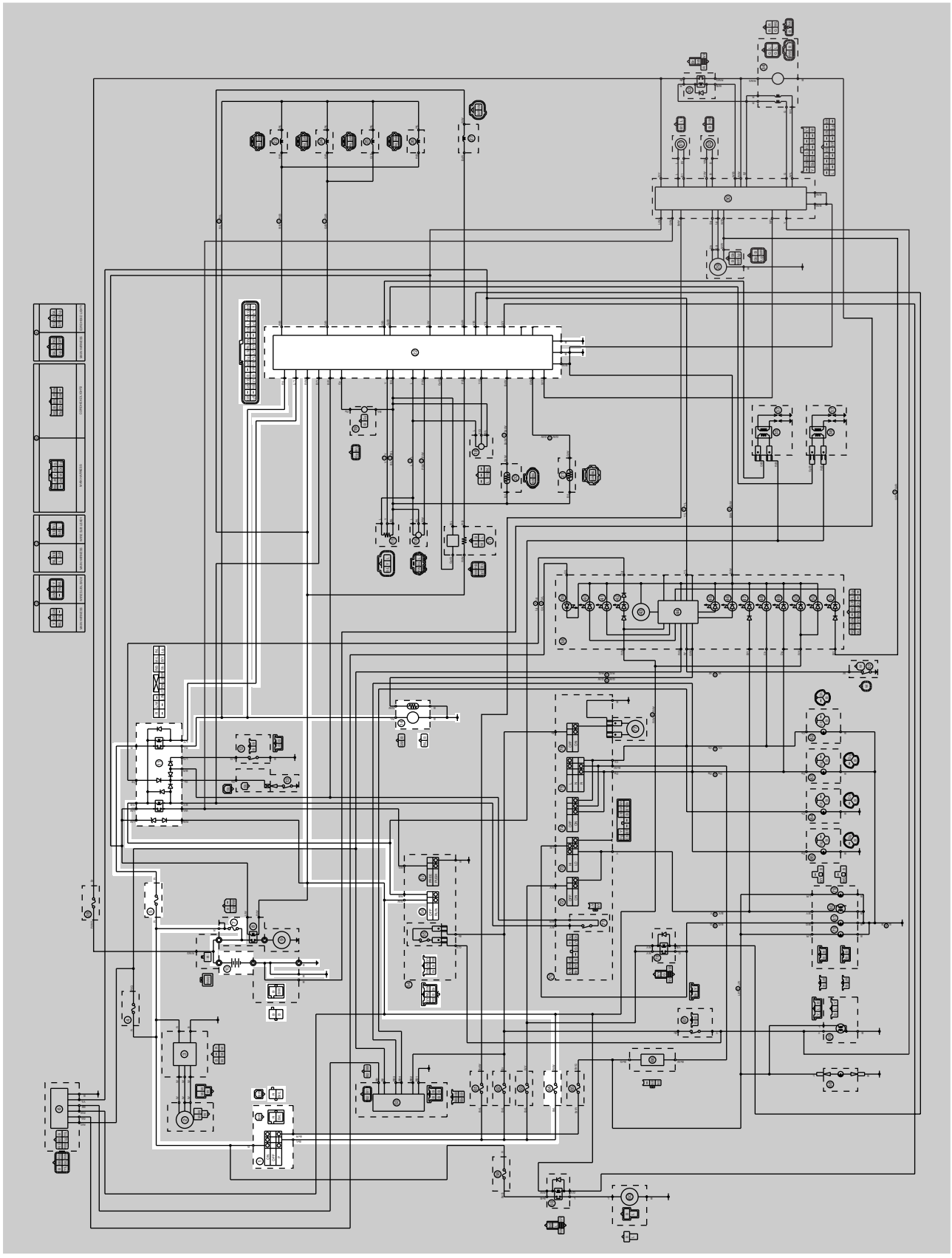
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method
1	Connected state of connector • Main wire harness ECU coupler • Main wire harness meter coupler • Sub-wire harness coupler	• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Reinstated automatically when it receives a normal signal.
2	Open or short circuit in wire harness and/or sub lead	• Repair or replace if there is an open or short circuit. • Between meter coupler and ECU coupler (Yellow/Blue–Yellow/Blue) (Black/White–Black/White)	
3	Malfunction in meter unit	Replace the meter unit.	
4	Malfunction in ECU	Replace the ECU.	

Fault code No.	Er-3	Symptom	Data from the ECU cannot be received correctly.	
Diagnostic code No.		—	—	
Order	**Item/components and probable cause**		**Check or maintenance job**	**Reinstatement method**
1	Connected state of connector • Main wire harness ECU coupler • Main wire harness meter coupler • Sub-wire harness coupler		• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Reinstated automatically when it receives a normal signal.
2	Open or short circuit in wire harness and/or sub lead		• Repair or replace if there is an open or short circuit. • Between meter coupler and ECU coupler (Yellow/Blue–Yellow/Blue) (Black/White–Black/White)	
3	Malfunction in meter unit		Replace the meter unit.	
4	Malfunction in ECU		Replace the ECU.	

Fault code No.	Er-4	Symptom	Non-registered data has been received from the meter.	
Diagnostic code No.		—	—	
Order	**Item/components and probable cause**		**Check or maintenance job**	**Reinstatement method**
1	Connected state of connector • Main wire harness ECU coupler • Main wire harness meter coupler • Sub-wire harness coupler		• Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely.	Reinstated automatically when it receives a normal signal.
2	Open or short circuit in wire harness and/or sub lead		• Repair or replace if there is an open or short circuit. • Between meter coupler and ECU coupler (Yellow/Blue–Yellow/Blue) (Black/White–Black/White)	
3	Malfunction in meter unit		Replace the meter unit.	
4	Malfunction in ECU		Replace the ECU.	

EAS27550
FUEL PUMP SYSTEM

EAS27560
CIRCUIT DIAGRAM



1. Main switch
5. Fuel injection system fuse
7. Main fuse
10. Battery
11. Starting circuit cut-off relay
14. Fuel pump
22. ECU (engine control unit)
56. Engine stop switch
64. Ignition fuse

EAS27570
TROUBLESHOOTING

If the fuel pump fails to operate.

NOTE:

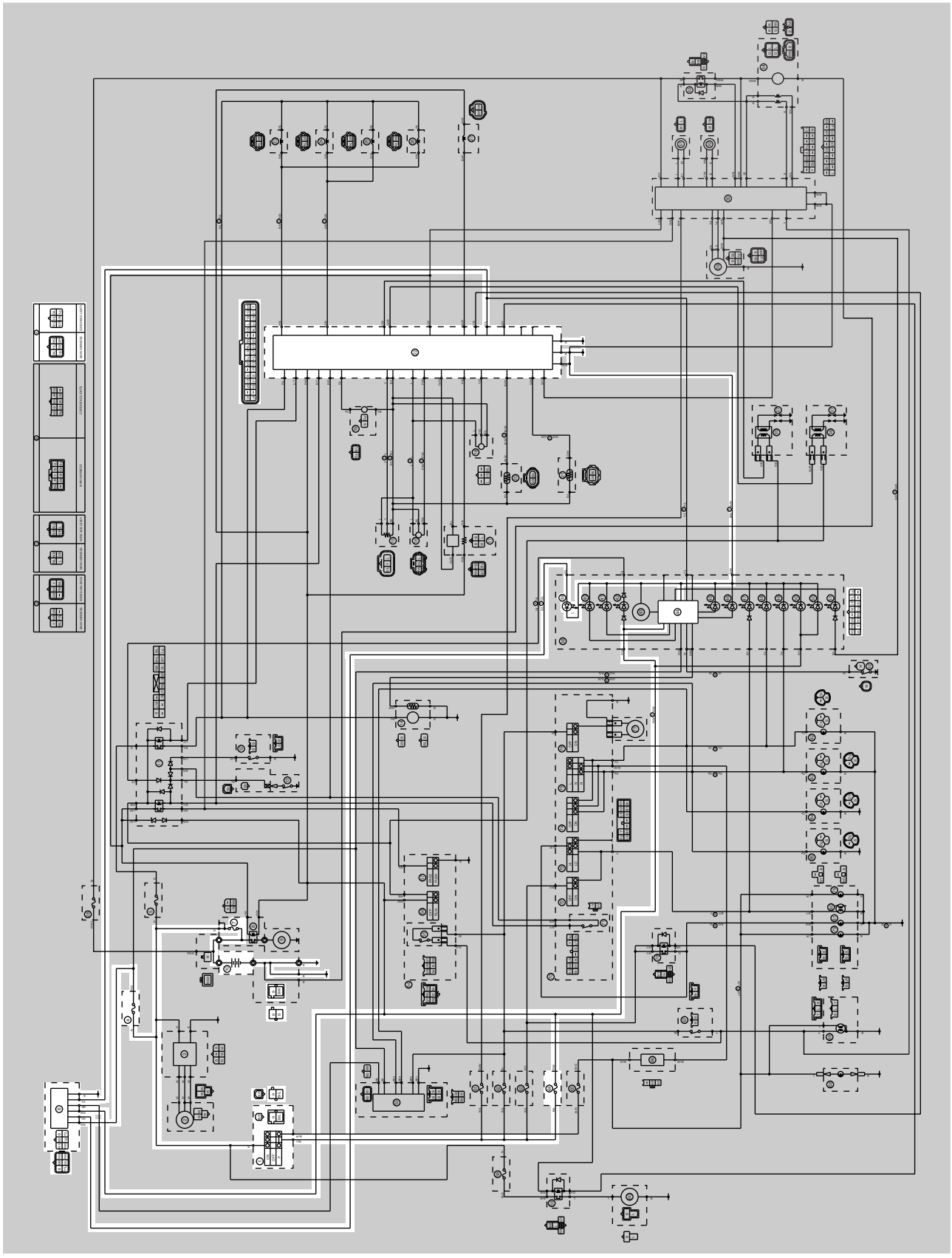
- Before troubleshooting, remove the following part(s):

1.Seat
2.Front cowling inner panel3
3.Fuel tank

1. Check the fuses. (Main, ignition and fuel injection system) Refer to "CHECKING THE FUSES" on page 8-113.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-114.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the main switch.
OK↓		
4. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the right handlebar switch.
OK↓		
5. Check the starting circuit cut-off relay. Refer to "CHECKING THE RELAYS" on page 8-117.	NG→	Replace the starting circuit cut-off relay.
OK↓		
6. Check the fuel pump. Refer to "CHECKING THE FUEL PRESSURE" on page 7-6.	NG→	Replace the fuel pump.
OK↓		
7. Check the entire fuel pump system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the fuel pump system's wiring.
OK↓		
Replace the ECU.		

EAS27640
IMMOBILIZER SYSTEM

EAS27650
CIRCUIT DIAGRAM



1. Main switch
4. Backup fuse
6. Immobilizer unit
7. Main fuse
10. Battery
22. ECU (engine control unit)
39. Immobilizer indicator light
44. Multi-function meter
64. Ignition fuse

EAS27671
GENERAL INFORMATION

This vehicle is equipped with an immobilizer system to help prevent theft by re-registering codes in the standard keys. This system consists of the following:
- a code re-registering key (with a red bow)
- two standard keys (with a black bow) that can be re-registered with new codes
- a transponder (installed in the red key bow)
- an immobilizer unit
- the ECU
- an immobilizer system indicator light

The key with the red bow is used to register codes in each standard key. Do not use the key with the red bow for driving. It should only be used for re-registering new codes in the standard keys. The immobilizer system cannot be operated with a new key until the key registered with a code. If you lose the code re-registering key, the ECU and main switch (equipped with the immobilizer unit) need to be replaced.
Therefore, always use a standard key for driving. (See caution below.)

NOTE:
Each standard key is registered during production, therefore re-registering at purchase is not necessary.

ECA14971
CAUTION:
- **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.**

EAS27691
PART REPLACEMENT AND KEY CODE REGISTRATION REQUIREMENTS

In the course of use, you may encounter the following cases where replacement of parts and registration of code re-registering/standard keys are required.

NOTE:
Each standard key is registered during production, therefore re-registering at purchase is not necessary.

	Parts to be replaced					Key registration requirement
	Main switch/ immobilizer unit		Standard key	ECU	Accessory lock* and key	
	Main switch	Immobilizer unit				
Standard key is lost			√			New standard key
All keys have been lost (including code re-registering key)	√		√	√	√	Code re-registering key and standard keys
ECU is defective				√		Code re-registering key and standard keys
Immobilizer unit is defective		√				Code re-registering key and standard keys
Main switch is defective	√		√	√	√	Code re-registering key and standard keys
Accessory lock* is defective					√	Not required

* Accessory locks mean the seat lock and fuel tank cap.

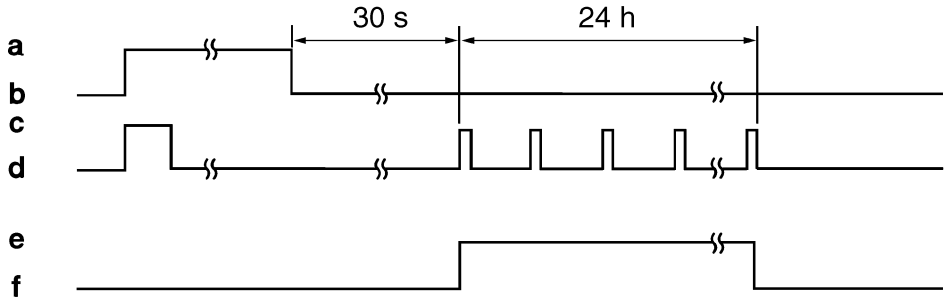
Code re-registering key registration:
When the immobilizer unit or ECU is replaced, the code re-registering key must be registered to the unit.
To register a code re-registering key:
1. Turn the main switch to “ON” with the code re-registering key.

NOTE:
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.

NOTE:
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 8-67).

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.

NOTE:
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.

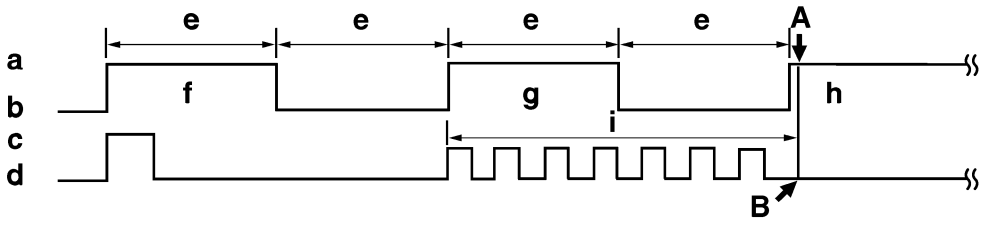
NOTE:
If he immobilizer system indicator light stops flashing 5 seconds after the first standard key is registered, the registration mode is deactivated. If this occurs, the second standard key cannot be registered, and steps 2 to 4 need to be repeated to register both standard keys.

5. Turn the main switch to “ON”.

NOTE:
When the indicator light goes off, the registration is complete.

6. Check that the engine can be started with the two registered standard keys.

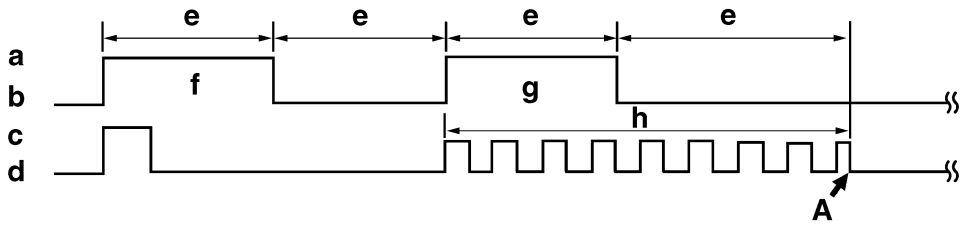
Standard key registration



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.

EAS27701
TROUBLESHOOTING

When the main switch is turned to “ON”, the immobilizer system indicator light does not come on nor flashes.

1. Check the fuses. (Main, ignition and backup) Refer to "CHECKING THE FUSES" on page 8-113.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-114.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-109.	NG→	Replace the main switch/immobilizer unit.
OK↓		
4. Check the entire immobilizer system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	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 8-67.		

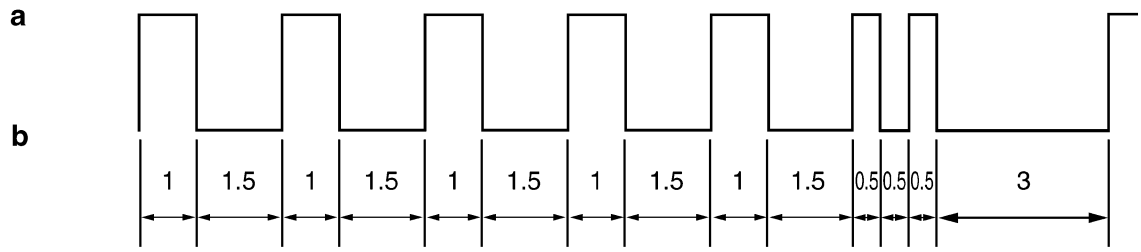
EAS27721
SELF-DIAGNOSIS FAULT CODE INDICATION

When a system failure occurrs, the error code number is indicated in the LCD display of meter and the immobilizer system indicator light blinks at the same time. The pattern of blinking also shows the error code.

Fault code	Part	Symptom	Cause	Action
51	IMMOBILIZER UNIT	Code cannot be transmitted between the key and immobilizer unit.	1.Radio wave interference caused by objects around the keys and antennas. 2.Immobilizer unit malfunction. 3.Key malfunction.	1.Keep magnets, metal objects, and other immobilizer system keys away form the keys and antennas. 2.Replace the main switch/immobilizer unit. 3.Replace the key.

Fault code	Part	Symptom	Cause	Action
52	IMMOBILIZER UNIT	Codes between the key and immobilizer unit do not match.	1.Signal received from other transponder (failed to recognize code after ten consecutive attempts). 2.Signal received from unregistered standard key.	1.Place the immobilizer unit at least 50 mm away from the transponder of other vehicles. 2.Register the standard key.
53	IMMOBILIZER UNIT	Codes cannot be transmitted between the ECU and the immobilizer unit.	Noise interference or disconnected lead/cable. 1.Interference due to radio wave noise. 2.Disconnected communication harness. 3.Immobilizer unit malfunction. 4.ECU malfunction.	1.Check the wire harness and connector. 2.Replace the main switch/immobilizer unit. 3.Replace the ECU.
54	IMMOBILIZER UNIT	Codes transmitted between the ECU and the immobilizer unit do not match.	Noise interference or disconnected lead/cable. 1.Interference due to radio wave noise. 2.Disconnected communication harness. 3.Immobilizer unit malfunction. 4.ECU failure. (The ECU or immobilizer unit was replaced with a used unit from another vehicle.)	1.Register the code re-registering key. 2.Check the wire harness and connector. 3.Replace the main switch/immobilizer unit. 4.Replace the ECU.
55	IMMOBILIZER UNIT	Key code registration malfunction.	Same standard key was attempted to be registered two consecutive times.	Register another standard key.
56	ECU	Undefinition code is received.	Noise interference or disconnected lead/cable.	1.Check the wire harness and connector. 2.Replace the main switch/immobilizer unit. 3.Replace the ECU.

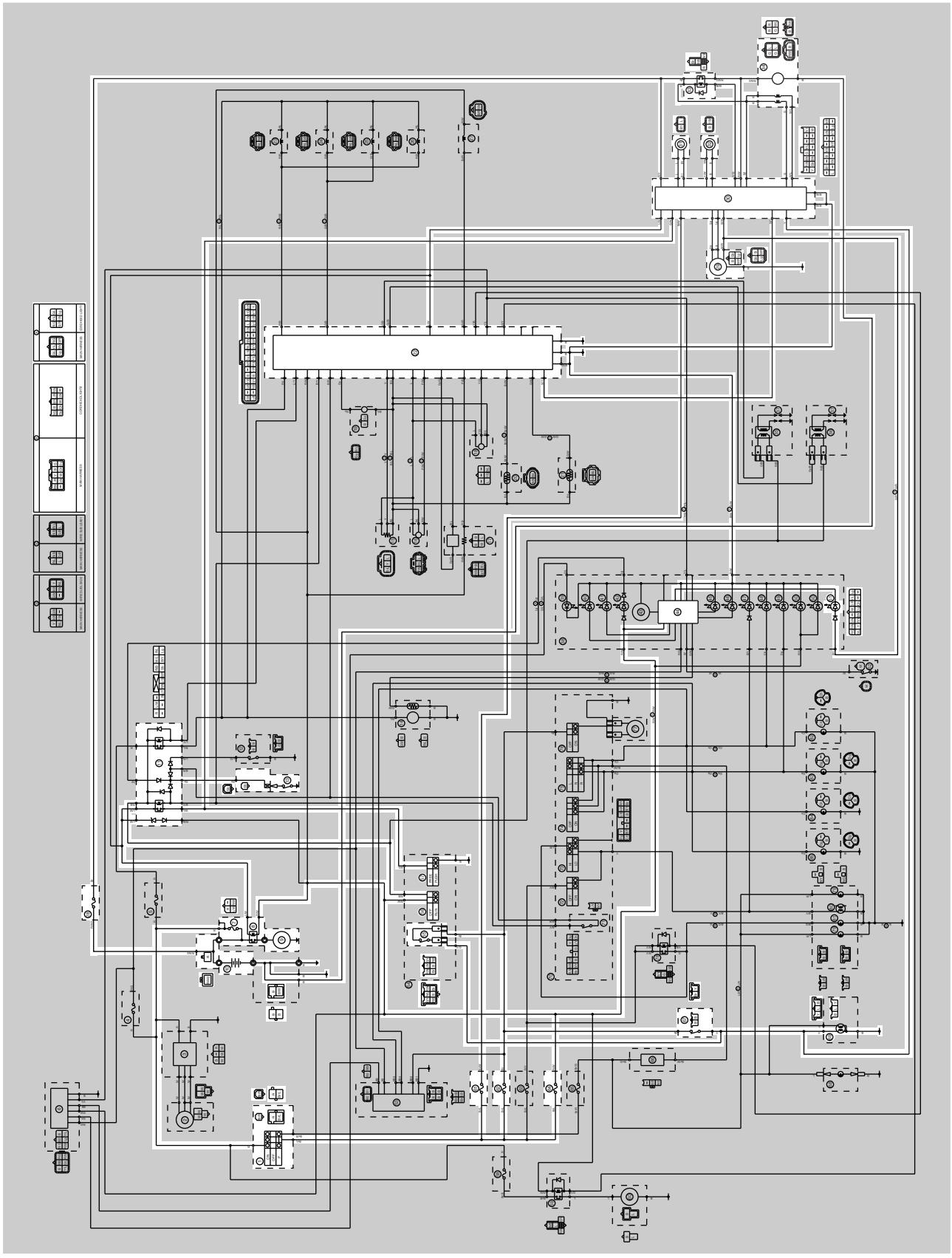
Immobilizer system indicator light fault code indication
Digit of 10 : Cycles of 1 sec. ON and 1.5 sec. OFF.
Digit of 1 : Cycles of 0.5 sec. ON and 0.5 sec. OFF.
Example: fault code 52



a. Light on
b. Light off

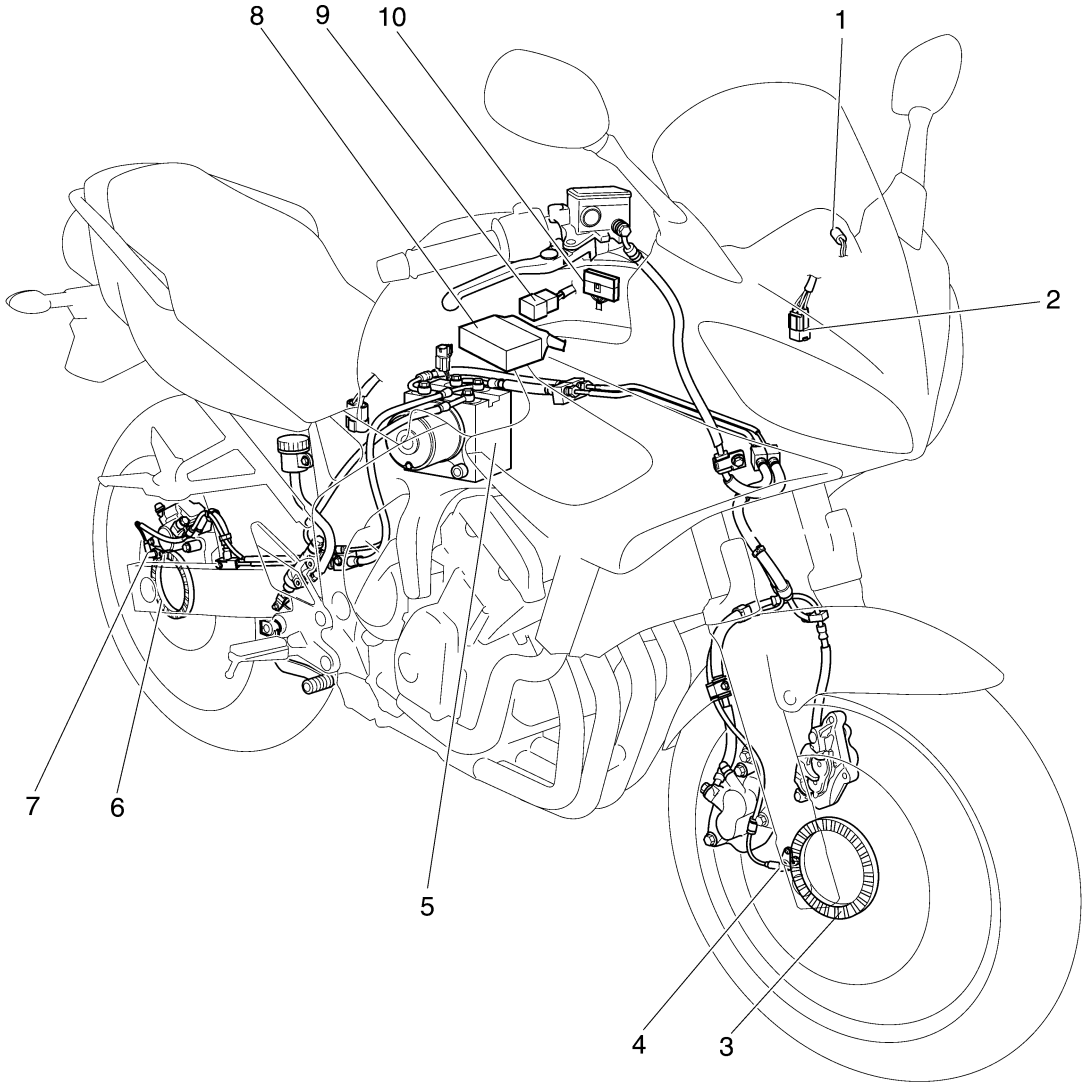
EAS28790
ABS (ANTI-LOCK BRAKE SYSTEM)

EAS27730
CIRCUIT DIAGRAM



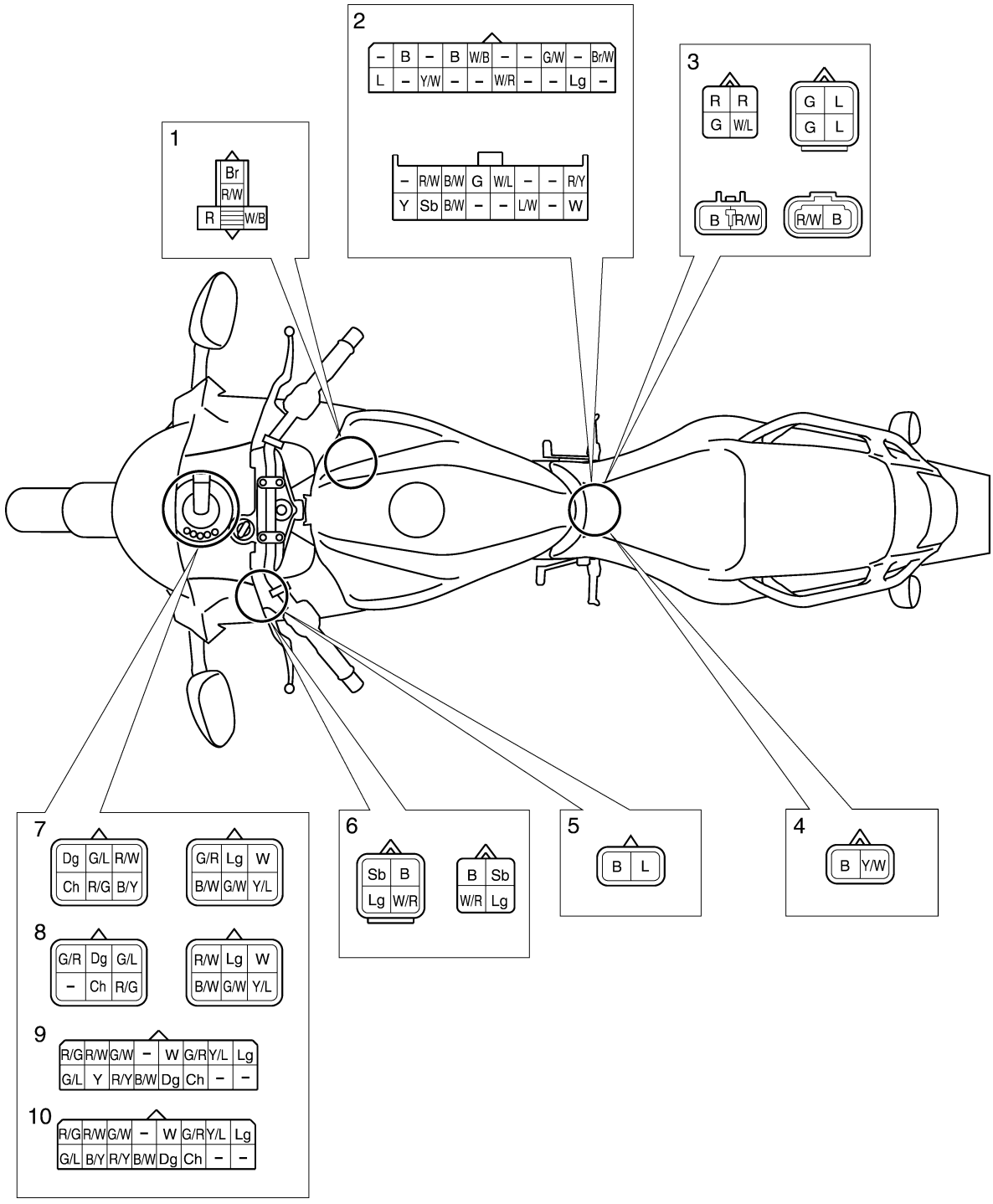
1. Main switch
7. Main Fuse
8. Strter relay
9. Starter motor
10. Battery
11. Starting circuit cut-off relay
13. Neutral switch
22. ECU (engine control unit)
28. ABS motor fuse
29. ABS test coupler
30. ABS ECU
31. Front wheel sensor
32. Rear wheel sensor
33. ABS motor relay
34. Hydraulic unit
44. Multi-function meter
51. ABS warning light
55. Front brake light switch
56. Engine stop switch
57. Start switch
61. ABS fuse
62. Signal fuse
64. Ignition fuse
67. Rear brake light switch
69. Tail/brake light

EAS27740
ABS COMPONENTS CHART



1. ABS warning light
2. ABS test coupler
3. Front sensor rotor
4. Front wheel sensor
5. Hydraulic unit
6. Rear sensor rotor
7. Rear wheel sensor
8. ABS ECU
9. ABS motor relay
10. Fuse box

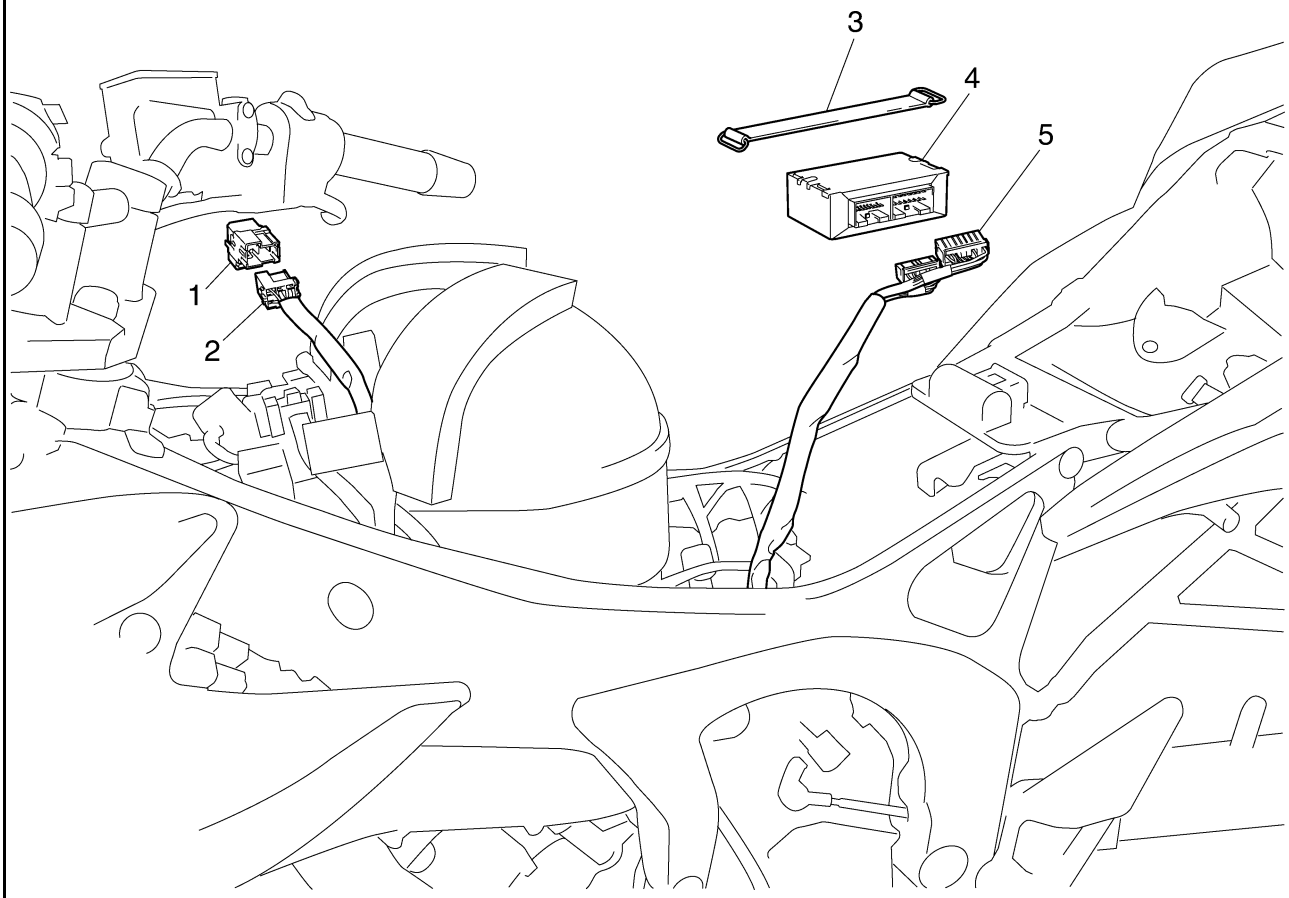
EAS27750
ABS CONNECTOR LOCATION CHART



1. ABS motor relay
2. ABS ECU coupler
3. Hydraulic unit coupler
4. Rear wheel sensor coupler
5. Front wheel sensor coupler
6. ABS test coupler
7. Multi-function coupler (FZ6-SA)
8. Multi-function coupler (FZ6-NA)
9. Multi-function coupler (FZ6-SAHG)
10. Multi-function coupler (FZ6-NAHG)

EAS27760
ABS ECU AND ABS MOTOR RELAY

Removing the ABS ECU and ABS motor relay

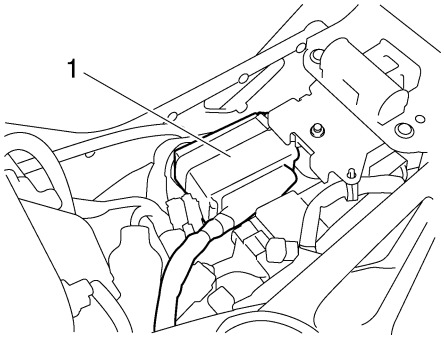


Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Left front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Right front cowling inner panel (with cowling)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	ABS motor relay	1	
2	ABS motor relay coupler	1	Disconnect.
3	Band	1	
4	ABS ECU	1	
5	ABS ECU coupler	1	Disconnect.
			For installation, reverse the removal procedure.

EAS27770
[D-1] MAINTENANCE OF THE ABS ECU

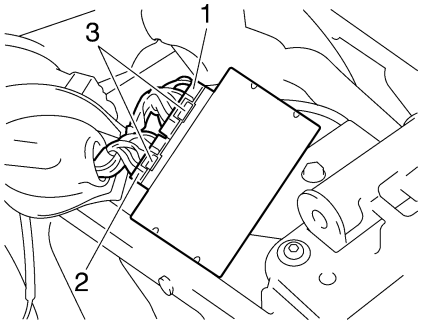
Removing the ABS ECU
1. Remove:
   - ABS ECU “1”

NOTE:
When removing the ABS ECU, take care not to damage the ABS ECU or ABS ECU couplers.



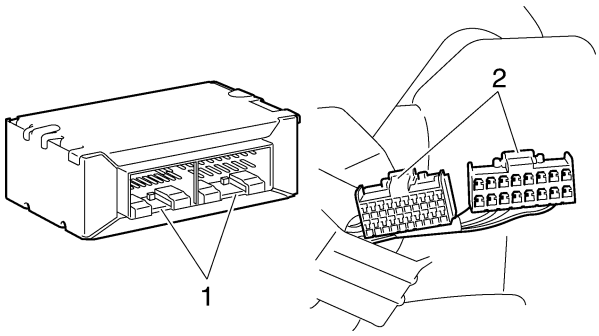
2. Remove:
   - ABS ECU coupler “1”
   - ABS ECU coupler “2”

NOTE:
- Do not pull the ABS ECU leads to remove the ABS ECU couplers.
- Always press on the locks “3” to disconnect the ABS ECU couplers from the ABS ECU.



Checking the ABS ECU
1. Check:
   - Terminals “1” of the ABS ECU
     Cracks/damages → Replace ABS ECU
   - Terminals “2” of the ABS ECU coupler
     Connection defective, contaminated, come-off → Correct or clean.

NOTE:
If the ABS ECU couplers are clogged with mud or dirt, clean with compressed air.



EAS27780
[D-2] MAINTENANCE OF THE ABS MOTOR RELAY

Removing the ABS motor relay
1. Remove:
   - ABS motor relay coupler

NOTE:
Do not pull the ABS motor relay leads to remove the ABS motor relay coupler.
Always press on the lock to disconnect the ABS motor relay coupler from the ABS motor relay.

EAS27790
ABS TROUBLESHOOTING OUTLINE
This section describes the troubleshooting about ABS in details. Read carefully this service manual before repairing various malfunctions, understand and perform the service.
Electronic control unit (ECU) has the self diagnostic function. When failures occur in the system, the ABS warning light on the meter assembly indicates a malfunction.
Troubleshooting mentioned below describes the cause pursuing and service method according to the indication by the maltifunction display. For troubleshooting other than these items, perform by following the normal service method.

EWA13880
⚠ 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.

(Refer to "[D-6] FINAL CHECK" on page 8-104.)

ABS warning light goes on and the ABS condition

1.When the ABS warning light keeps going on → It works as a normal brake.
- Detecting the malfunction by means of the ABS self diagnostic function.

2.Light goes on and off at the time of starting → ABS operation is normal.
- ABS warning light goes on for 2 seconds every time the main switch is turned on and goes off afterward.
- ABS warning lights go on while the starter switch is pushed.

3.When the ABS warning light flashes → ABS operation is normal.
- Brake switch is defective or improperly adjusted.
- Rear wheel is racing.
- Continuous riding on extremely uneven roads.
- Other defective

Self diagnosis and services

The ABS ECU has a self diagnostic function. By utilizing this function, quick and secure services are possible. Previously occurred error phenomenon can be checked since it also installs the memory for storing malfunction history.

“In case malfunctions are detected”

It is disabled to call the malfunction code by using the malfunction display since the ABS warning light already goes on. Connect the test coupler adapter to the test connector, connect a pocket tester to the terminal of light green lead and check by its pointing needle movement.

Refer to "[B-5] MALFUNCTION CHECK BY THE ABS SELF DIAGNOSIS (PRESENT MALFUNCTION)" on page 8-85.

“In case any malfunctions are not detected”

The multifunction display indicates all the malfunction codes recorded in the ABS ECU. You can check it by using a pocket tester. Note everything if more than two items of malfunction codes are recorded.

“Deleting the malfunction code”

When the malfunction service is finished, check the normal operation of vehicle then delete the malfunction code. By deleting the malfunction code memory, it is possible to pursue the cause correctly if the next defective phenomenon occurred.

Self diagnosis by ABS ECU

ABS ECU performs the static check for whole system when the main switch is turned on. It is also possible to check the malfunction while riding. It is possible to check the recorded malfunction data by using a pocket tester or the maltifunction display of meter by setting the ABS ECU to the self diagnostic mode since all malfunctions which has been once detected are recorded.

Differences between the normal handling and services on a vehicle

- Care should be taken not to damage components by shocks and pulling too much since the ABS components are precisely adjusted.
- ABS ECU, HU, Wheel sensors and ABS motor relay cannot be disassembled.
- Malfunction history in ABS ECU is recorded. Delete it when the service is finished. (This is because the past malfunction contents will be redundantly displayed when the same malfunction occurred again.)

EAS27800

BASIC INSTRUCTION FOR TROUBLESHOOTING

EWA14030

⚠ WARNING

- **Execute the troubleshooting on each malfunction from [A] to [D] in sequence.**
- **Use the sufficiently charged regular batteries only.**

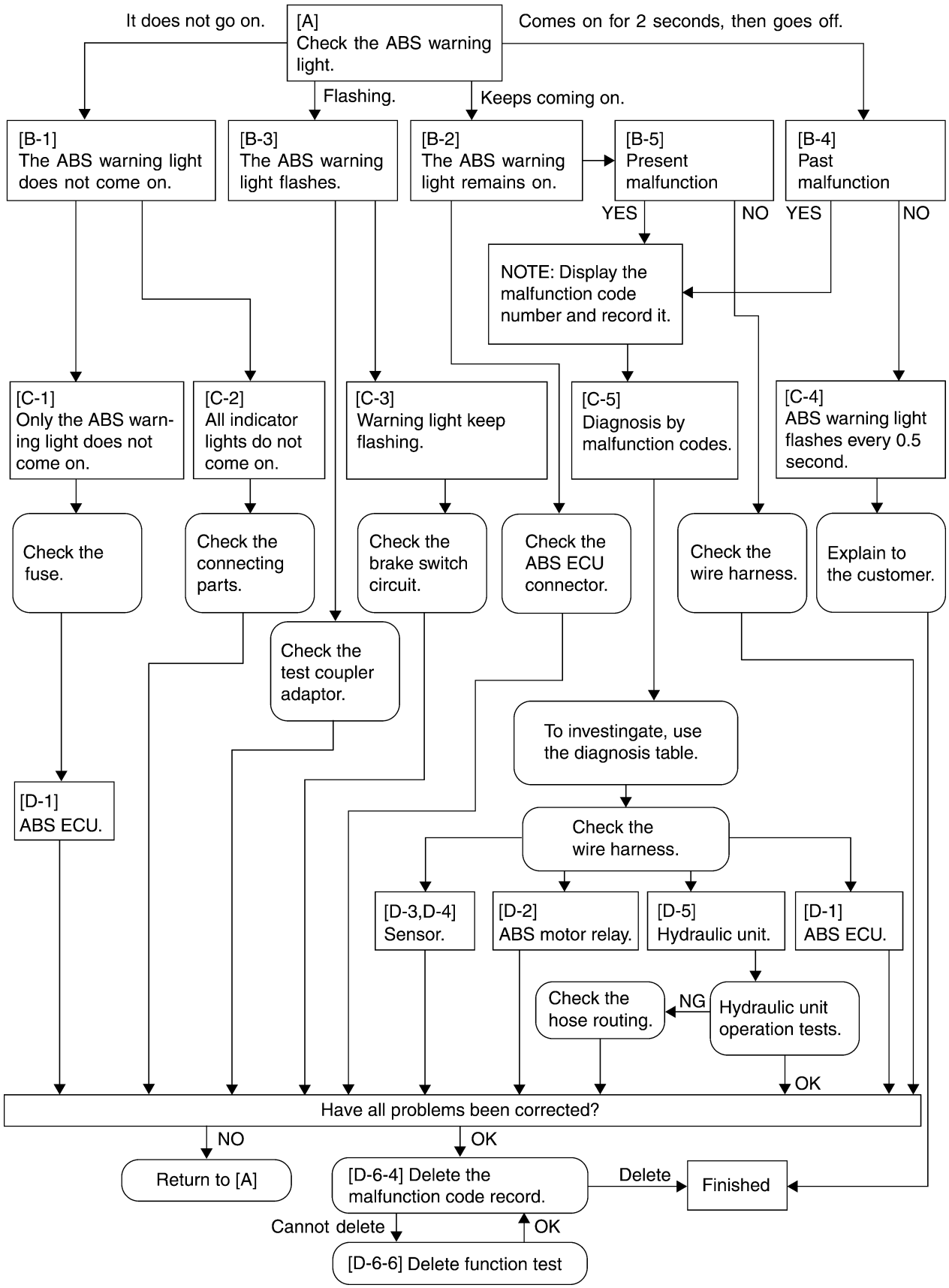
[A] Malfunction check by the ABS warning light
[B] Detail check of malfunction
Results by self diagnosis are displayed by the multifunction display or a pocket tester according to the ECU's operation.
[C] Supposing the malfunction cause and position
Find the malfunction cause by reasoning the place and situation where it occurred.
[D] ABS system services
Execute the final check after disassembly and assembly.

EWA14040

⚠ WARNING

Perform the troubleshooting [A] → [B] → [C] → [D] in order. Be sure to follow the order since it results in the wrong diagnosis if the order is differently taken or omitted.

EAS27810
BASIC PROCESS FOR TROUBLESHOOTING



NOTE:
Do not delete the malfunction code during the troubleshooting procedures. Be sure to delete it when the service is finished.

EWA14050

⚠ WARNING

Always execute the "final check" when the components related to ABS are checked and serviced.

EAS27830

[A] ABS MALFUNCTION CHECK USING THE ABS WARNING LIGHT

Turn the main switch to "ON". (Do not start the engine.)

1. The ABS warning light does not come on. [B-1]
2. The ABS warning light remains on. [B-2]
3. The ABS warning light flashes. [B-3]
4. The ABS warning light comes on for 2 seconds, then goes off. [B-4]

EAS4S81017

[B] DETAILED ABS MALFUNCTION CHECK

EAS4S81018

[B-1] THE ABS WARNING LIGHT DOES NOT COME ON

Do other indicators operate normally?

1. Yes [C-1]
2. No [C-2]

EAS4S81019

[B-2] THE ABS WARNING LIGHT REMAINS ON

NOTE:
Check following the steps in sequence.

1. Battery voltage low
   Charge, inspect or replace the battery.
2. Malfunction codes displayed. Check the malfunction codes using the ABS test coupler adaptor.
   Perform troubleshooting corresponding to the malfunction codes. [B-5]
3. Wire harness, ABS ECU and meter coupler are disconnected.
   Connect the coupler securely until a "click" sound is heard.
4. Check the disconnection between the ABS ECU and meter (ABS warning light).
   Check the conductivity of the wire harness and repair or replace the failure part.
5. Meter circuit malfunction
   Check by the following procedures.
   1. Remove the ABS ECU and connect the ABS test coupler adaptor.
   2. Connect the white/red lead from the test coupler adaptor to the GND terminal and set the main switch to "ON".
   3. Does the ABS warning light go off?
      1. Yes → Replace the ABS ECU.
      2. No → Replace the meter.

EAS4S81020
[B-3] THE ABS WARNING LIGHT FLASHES

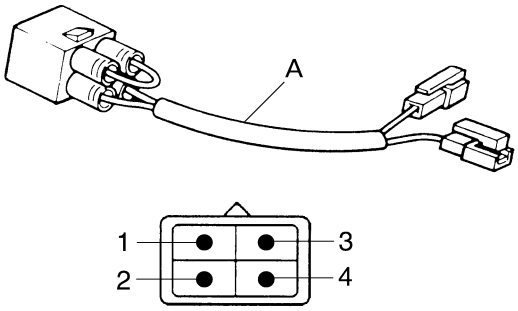
NOTE:
Check the battery voltage before proceeding.

Check the test coupler located in the left inner panel (front cowling). Is the T/C terminal ground?
1. Yes → Disconnect the grounding lead from the T/C terminal and install the protective cap onto the test coupler.

NOTE:
When the test coupler adaptor is connected to test coupler, the T/C terminal is grounded.

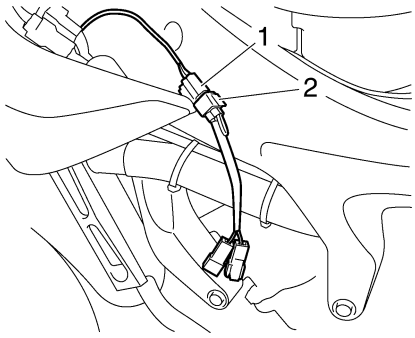
2. No → [C-3]

Arrangement and the function of test couplers
- ECU becomes the malfunction diagnostic mode when the T/C terminal is grounded.
- Malfunction code which the ECU generated in the malfunction diagnostic mode (rise and fall of voltage) is output at the T/F terminal.
- ABS warning light terminal is used when checking the ABS warning light circuit.
- To ground the T/C terminal, connect the test coupler adapter “A” with the test coupler. Before connecting, check if the battery is sufficiently charged.



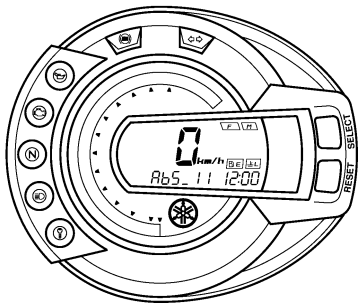
EAS27860
[B-4] MALFUNCTION CHECK BY THE ABS SELF DIAGNOSIS (PAST MALFUNCTION)

Remove the side cowling (right) and check the location of test coupler “1”. Remove the protective cap and connect the ABS test coupler adapter “2” to the test coupler. The T/C terminal (sky-blue) is now connected to the ground.

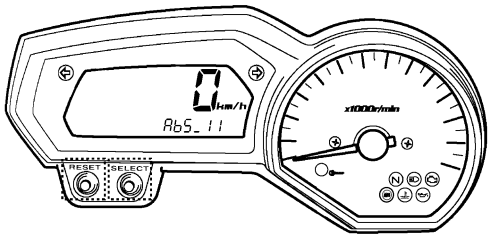


1.Indicate the malfunction code (Example: malfunction code 11)

A



B



A. FZ6-N/FZ6-NA/FZ6-S/FZ6-SA
B. FZ6-NHG(W)/FZ6-NAHG/FZ6-SHG(W)/ FZ6-SAHG

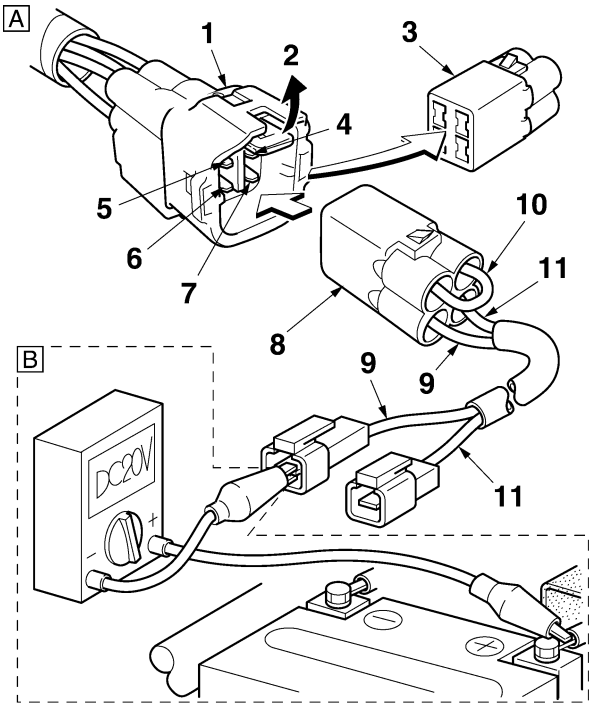
2.ABS warning light flashes every 0.5 second for more than 6 seconds. → [C-4, C-5]
If the ABS warning light flashes every 0.5 second, the malfunction code of a past malfunction has not been stored in the memory of the ECU (ABS). If a malfunction code is displayed on the multi-function display, the ABS warning light flashes. Make sure that the customer understands the possible conditions when the ABS warning light comes on.

EAS27870
[B-5] MALFUNCTION CHECK BY THE ABS SELF DIAGNOSIS (PRESENT MALFUNCTION)

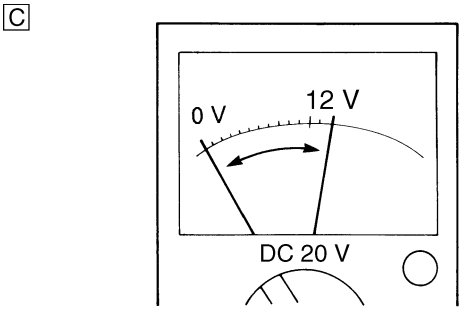
NOTE:
Before proceeding to read the part of “Arrangement and the function of test coupler”.

Remove the side cowling (right) and check the location of test coupler. Connect the test coupler adapter with the test coupler in order to ground the T/C terminal (sky-blue). (Figure-“A”)
Set the range of pocket tester to DC 20 V. Connect the negative (-) terminal of tester to the T/F terminal (light green) and positive (+) terminal to the positive (+) terminal of battery. (Figure-“B”) Read the tester indication. (Figure-“C”)

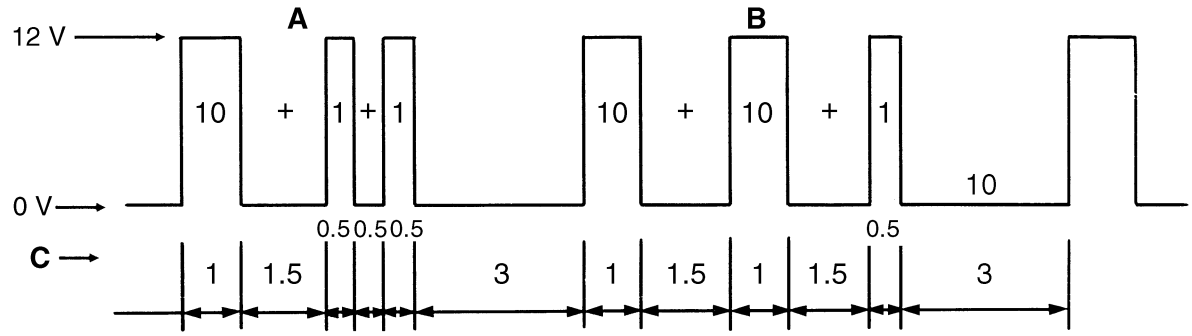
NOTE:
Read the code through this means so that the “currently malfunction” code is not indicated on the meter.



1. ABS test coupler
2. Lock plate
3. Protective cap
4. Grounding
5. T/C terminal
6. T/F terminal
7. ABS warning light terminal (white/red)
8. Test coupler adapter
9. (light green)
10. (black)
11. (white/red)



As an example, “10 digits/1 digit pattern” of tester reading is shown below.



A. This example is the pattern which shows malfunction code 12.
B. This example is the pattern which shows malfunction code 21.
C. Time (second)

EAS4S81021
[C] DETERMINING THE CAUSE AND LOCATION OF THE MALFUNCTION

EAS4S81022
[C-1] ONLY THE ABS WARNING LIGHT DOES NOT COME ON WHEN THE MAIN SWITCH IS SET TO “ON”

1. Confirmation using the test coupler adaptor
   Connect the test coupler adapter to the test coupler.

NOTE:
Check following the steps in sequence.

   1. Wire harness is short-circuited to GND between the ABS ECU and meter (ABS warning light).
      Check by the following procedures.
      1. Remove the ABS ECU and meter, and connect the ABS test coupler adaptor.
      2. Check the conductivity between the white/red lead of test adaptor and GND.
      3. If there is conductivity, the trouble is caused by the wire harness short-circuit. Repair or replace the failure part.
   2. Meter circuit malfunction
      1. Remove only the ABS ECU from the connector.
      2. If the ABS warning light comes on when the main switch is turned “ON”, the meter is normal. It means the ABS ECU malfunction. Replace the ECU.

EAS4S81023
[C-2] ABS WARNING LIGHT AND ALL OTHER INDICATORS DO NOT COME ON

NOTE:
Check following the steps in sequence.

1. Check the power supply system.
   1. Check that the battery is connected correctly.
   2. Check the battery voltage. (Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-114.)
   3. Check if the main fuse is blown. If the main fuse is blown, determine the cause and repair. Replace with a new fuse. (Refer to "CHECKING THE FUSES" on page 8-113.)
2. Check the connections.
   1. Check that the main fuse coupler is securely connected.

2. Check that the main switch coupler is securely connected.
3. Check that the meter assembly coupler is securely connected. (Refer to "ABS CONNECTOR LOCATION CHART" on page 8-75.)
   When these checks are finished, return to [A] and check the ABS again.

EAS4S81024
[C-3] ABS WARNING LIGHT FLASHES

1. When the warning light flashes “ON” for 0.25 seconds and “OFF” for 0.75 seconds, check the stop switch or 3-4), 5).
2. When the warning light flashes “ON” for 0.75 seconds and “OFF” for 0.25 seconds, the starter motor monitor is defective. Same as the error code 22 or 3-1), 2), 3).
3. When the warning light flashes “ON” for 1 second and “OFF” for 1 second, it is another malfunction. Same as the error code 28.
   The following are probable causes to explain why the ABS warning light flashed while riding and then stopped flashing or stopped flashing when main switch was set “OFF” to “ON”.
   1. The rear wheel was rotated with the vehicle on the centerstand. → The system is normal.
   2. The rear wheel was raced. → The system is normal.
   3. The vehicle was ridden on the rear wheel with the front wheel elevated. → The system is normal.
   4. The vehicle was ridden on extremely uneven roads continuously. → The system is normal.
   5. The brake switch is defective or improperly adjusted. → Replace or adjust.

EAS4S81025
[C-4] ABS WARNING LIGHT FLASHES EVERY 0.5 SECOND

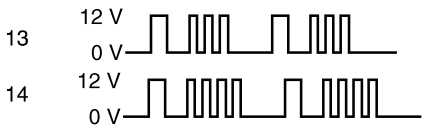
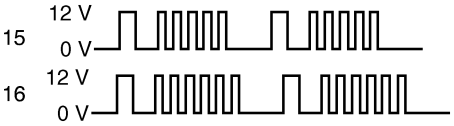
If the ABS warning light flashes every 0.5 second, the malfunction code of a past malfunction has not been stored in the memory of the ABS ECU. If a malfunction code is displayed on the multifunction display, the ABS warning light flashes. Make sure that the customer understands the possible conditions when the ABS warning light comes on.

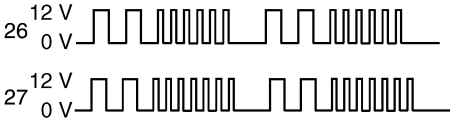
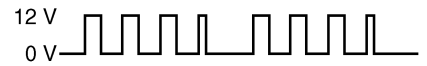
1. Voltage drop
   For the ABS to operate correctly, the voltage should be always higher than the specified voltage. If the voltage drops to lower than 10 V, the ABS warning light comes on and the ABS does not operate. When the voltage recovers to higher than 10 V, the ABS operates. However, the magneto, battery and rectifier/regulator must be checked. Follow the regular procedures for service of the power supply system.
2. ABS is stopped by the ABS ECU
   The ABS ECU may stop the ABS operation if it is exposed to extremely strong electromagnetic waves or static electricity.
   When the ABS ECU is no longer exposed to the electromagnetic waves, static electricity, and the ABS warning light is not flashing, there is no effect on the operation of the ABS. Explain to the customer that the ABS will operate normally.

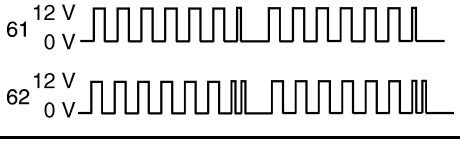
EAS27880
[C-5] DIAGNOSIS BY THE MALFUNCTION CODE

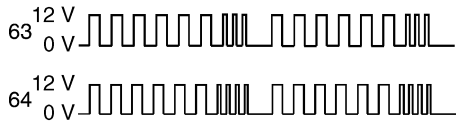
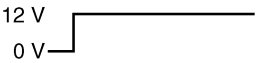
Malfunction codes are used to determine the malfunctions that have occurred. (Refer to "[B-4] MALFUNCTION CHECK BY THE ABS SELF-DIAGNOSIS (PAST MALFUNCTION)" and "[B-5] MALFUNCTION CHECK BY THE ABS SELF-DIAGNOSIS (PRESENT MALFUNCTION)".) The malfunction codes are explained in the following table.

NOTE:
Record all of the malfunction codes displayed and check the check points.

Malfunction code	Problem	Check point	Reference
11*	Front wheel sensor signal is not received properly. 	• Installation of the front wheel sensor • Front wheel sensor lead and coupler • ABS wire harness circuit • Front wheel sensor rotor	Malfunction code 11
12	Rear wheel sensor signal is not received properly. 	• Installation of the rear wheel sensor • Rear wheel sensor lead and coupler • ABS wire harness circuit • Rear wheel sensor rotor	Malfunction code 12
13 (front) 14 (rear)	Incorrect signal is detected by the front (13) or rear (14) wheel sensor. 	• Wheel sensor installation • Wheel sensor housings • Wheel sensor rotors	Malfunction codes 13 (front wheel) and 14 (rear wheel)
15 (front) 16 (rear)	No continuity in the front or rear wheel sensor circuits 	• Continuity of sensor circuits • ABS wire harness circuit • Connection of sensor coupler	Malfunction codes 15 (front wheel sensor) and 16 (rear wheel sensor)
18	Missing serration of sensor rotor 	• Sensor rotor	Malfunction code 18
21	Disconnection and short-circuit of hydraulic unit solenoid 	• Wire harness circuit • Hydraulic unit solenoid coupler • Hydraulic unit solenoid • Battery terminal is disconnecte	Malfunction code 21
22	Starter motor monitor malfunction 	• Wire harness circuit • Replace the ABS ECU.	Malfunction code 22

Malfunction code	Problem	Check point	Reference
24	Stop light failure (Brake system circuit has failure.) 	• Adjust the brake light switch. • Brake light switch • Bulb has burned out. • Check the wire harness for the brake light system circuit.	Malfunction code 24
25	At the beginning of running, there is no pulse from the front wheel sensor. 	• Rear wheel was rotated with the vehicle on the centerstand. • Rear wheel was wheel-spin. • Wheelie tried • Defective installation of the wheel speed sensor for the front wheel	Malfunction code 25
26 (front) 27 (rear)	Same as malfunction code 13 and 14 (Running on extremely uneven roads) 	• Same as malfunction code 13 and 14	Malfunction code 26 (front) and 27 (rear)
28	Other mulfunctions (Malfunction of the memory in ABS ECU) 	• Replace the ABS ECU	Malfunction code 28
31	Disconnection is detected between the battery and ABS ECU system. 	• ABS motor fuse • ABS wire harness circuit (between the battery and ABS ECU) • ABS ECU coupler	Malfunction code 31
32	Circuit malfunction of ABS ECU is detected. Upstream side of the solenoid relay 	• Wire harness circuit • Replace the ABS ECU.	Malfunction code 32
33	Defective operation of the ABS motor is detected. (ABS motor stops and will not rotate.) 	• ABS wire harness circuit • ABS motor coupler • ABS motor relay • ABS motor circuit • ABS motor fuse	Malfunction code 33
34	Defective operation of the ABS motor is detected. (ABS motor keeps running and will not stop.) 	• ABS motor relay • ABS wire harness circuit • ABS motor circuit	Malfunction code 34

Malfunction code	Problem	Check point	Reference
35	Disconnection is detected between the ABS ECU and solenoid system. Downstream side of the solenoid relay 	• ABS harness circuit (from ABS ECU to the solenoid) • Solenoid coupler • Battery terminal is disconnected.	Malfunction code 35
41	Front wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic state (when the battery voltage is normal). 	• Brake dragging • Hydraulic unit operation test 2 • Front wheel brake line	Malfunction code 41
42	Rear wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic state (when the battery voltage is normal). 	• Brake dragging • Hydraulic unit operation test • Rear wheel brake line	Malfunction code 42
51	Front wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic state (when the battery voltage is low). 	• Brake dragging • Hydraulic unit operation test 2 • Front wheel brake line • Battery voltage	Malfunction code 51
52	Rear wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic state (when the battery voltage is low). 	• Brake dragging • Hydraulic unit operation test 2 • Rear wheel brake line • Battery voltage	Malfunction code 52
61 (front) 62 (rear)	Sensor power supply is low 	• Battery voltage low • Battery terminal is disconnected	Malfunction code 61 (front) and 62 (rear)

Malfunction code	Problem	Check point	Reference
63 (front) 64 (rear)	Sensor power supply failure 	• Wire harness circuit • Battery terminal is disconnected • Replace the ABS ECU	Malfunction code 63 (front) and 64 (rear)
Present malfunction (test always indicates 12 V)	ABS ECU may be malfunctioning 	• ABS wire harness circuit (test coupler circuits) • ABS ECU (Replace)	Maintenance of the ABS ECU [D-1]

* Malfunction code 11 is indicated if the rear wheel rotates for more than 20 seconds with the front wheel stopped.

NOTE:
Malfunction code 15 (front wheel sensor) or 16 (rear wheel sensor) is displayed if a defective connection to either the front or rear sensor is detected whether or not the vehicle is ridden.

Malfunction code 11 (Front wheel sensor signal is not received properly.)
Turn the main switch to “OFF”, then back to “ON” after removing the test coupler adapter.
1. ABS warning light remains on.
   → Defective connection in the front wheel sensor circuit.
   - Front wheel sensor coupler is disconnected. → [D-3]
   - Front wheel sensor lead or internal circuit is broken. → [D-3]
   - Wire harness (ABS) sensor circuit is broken. → (Refer to "CIRCUIT DIAGRAM" on page 8-71.)
   - ABS ECU coupler terminal is disconnected. → [D-1]
2. ABS warning light goes on for 2 seconds then goes off.
   1. With the front wheel stopped, the rear wheel was rotated for more than 20 seconds. This is not a malfunction.
   2. Signal is not generated at the front wheel sensor.
      - Front wheel sensor is not installed properly. → [D-3]
      - Front wheel sensor rotor is defective. → [D-3]
   3. Front wheel sensor circuit is short-circuited.
      - Front wheel sensor or lead is short-circuited. → [D-3]
      - Wire harness (ABS) sensor circuit is short-circuited. → (Refer to "CIRCUIT DIAGRAM" on page 8-71.)
   4. Front wheel sensor output drops.
      - Sensor signal output may drop due to failure on bearings, wheel axle, wheel or sensor housing of front wheel. Check these components when installed for looseness, distortion, and bends.

Malfunction code 12 (Rear wheel sensor signal is not received properly.)
Turn the main switch to “OFF”, then back to “ON” after removing the test coupler adapter.
1. ABS warning light remains on.
   → Defective connection in the rear wheel sensor circuit.
   - Rear wheel sensor coupler is disconnected. → [D-4]
   - Rear wheel sensor lead or internal circuit is broken. → [D-4]
   - Wire harness (ABS) sensor circuit is disconnected. → (Refer to "CIRCUIT DIAGRAM" on page 8-71.)
   - ABS ECU coupler terminal is disconnected. → [D-1]

2. ABS warning light goes on for 2 seconds then goes off.
   1. With the rear wheel stopped, the front wheel was rotated at a speed faster than 11 km/h. This is not a malfunction.
   2. Signal is not generated at the rear wheel sensor.
      - Rear wheel sensor is not installed properly. → [D-4]
      - Rear wheel sensor rotor is defective. → [D-4]
   3. Rear wheel sensor circuit is short-circuited.
      - Rear sensor or lead is short-circuited. → [D-4]
      - Wire harness (ABS) sensor circuit is short-circuited. → (Refer to "CIRCUIT DIAGRAM" on page 8-71.)
   4. Rear wheel sensor output drops.
      - Sensor signal output may drop due to failure of the bearing, wheel, or brake caliper bracket of the rear wheel. Check these components when installed for loosenes, distortion, and bends.

NOTE:
If the vehicle is ridden on extremely uneven roads continuously, the ABS warning light may flash and malfunction code 11 or 12 may be recorded depending on the condition.

Malfunction code 13 (front wheel) and malfunction code 14 (rear wheel) (Incorrect signal is detected by the front (13) or rear (14) wheel sensor.)

1. The wheel sensors or sensor rotors are not properly installed.
   1. Installation of the front or rear wheel sensor
      - Check that the wheel sensor is properly installed in the housing. → [D-3, 4]
      - Check if there is looseness between the housing and the front wheel. → [D-3, 4]
      - Check if there is looseness rear brake caliper bracket and the rear wheel. → [D-3, 4]
   2. Installation of the front or rear wheel sensor rotor
      - Check that the sensor rotor is correctly pressed in the front wheel. → [D-3, 4]
      - Check that the sensor rotor is correctly install to the rear wheel. → [D-3, 4]
      - Check the rotor and inside the rotor housing for foreign materials. → [D-3, 4]
2. Teeth surfaces of the sensor rotors are defective.
   - Check for flaws on the teeth surfaces of the front or rear wheel sensor rotors. Also, check for any foreign materials. → [D-3, 4]
3. Sensor output has dropped.
   - Sensor signal output may drop due to failure of the bearings, wheel axle, rear brake caliper bracket wheel or sensor housing of (front) the front or rear wheel. Check these components when installed for looseness, distortion, and bends.

Malfunction code 15 (front wheel sensor) and malfunction code 16 (rear wheel sensor) (No continuity in the front or rear wheel sensor circuits.)

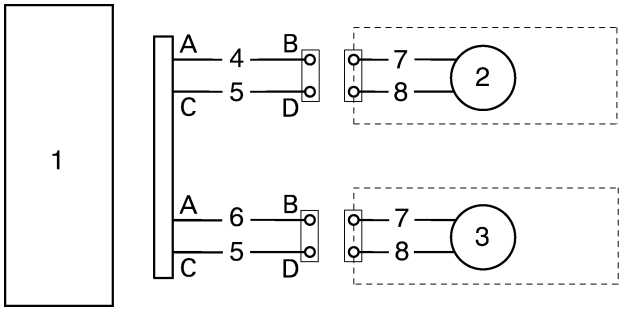
Broken front or rear wheel sensor circuit is detected.

- Front or rear wheel sensor coupler is broken. → [D-3, 4]
- Front or rear wheel sensor or lead is broken. → [D-3, 4]
- Sub-wire harness (ABS) sensor circuit is broken. → (Refer to "CIRCUIT DIAGRAM" on page 8-71.)
- Sub-wire harness (ABS) is disconnected from the ABS ECU coupler terminal. → [D-1]

NOTE:
- Check that both the front and rear wheel sensor couplers are connected securely.
- If the vehicle is ridden after malfunction code 15 (front wheel sensor) or 16 (rear wheel sensor) is displayed, the malfunction code will be overwritten from 15 to 11 (front wheel sensor signal) or from 16 to 12 (rear wheel sensor signal).

1. Check the wheel sensor signal
   Measure the wheel sensor signal output voltage.
   Refer to "CHECKING THE WHEEL SENSOR" on page 8-123.

2. Check the appearance.
3. Check the wire harness.
   1. Disconnection of the ABS ECU coupler terminal
   2. Remove the ABS ECU coupler and wheel sensor coupler and check the conductivity, short-circuit to GND and short-circuit to SSR-VCC from the wire harness.
      - Conductivity of the wire harness
        Check the conductivity between “A”–“B”, and “C”–“D”.
      - GND short-circuit
        Check the short-circuit to GND between “A”–“B”, and “C”–“D”.
      - Short-circuit between the wire harnesses
        Check the short-circuit between “A”–“C”, and “B”–“D”.



1. ABS ECU
2. Front wheel sensor
3. Rear wheel sensor
4. Blue
5. Black
6. Yellow/White
7. White
8. Gray

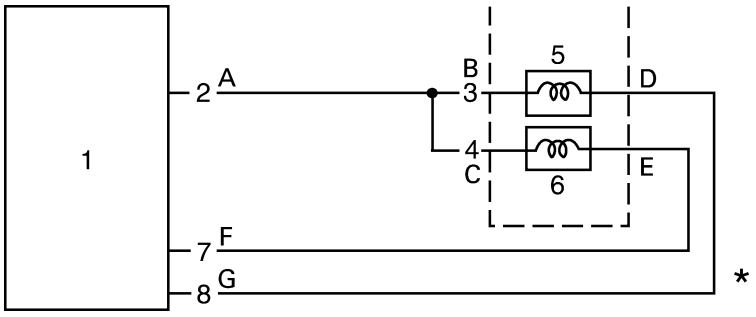
4. When the items “1” to “4” are normal, replace the wheel sensor.
5. Replace the ABS ECU if the condition does not become normal even if the wheel sensor is replaced.

Malfunction code 18 (Missing serration of sensor rotor)

1. Missing serration of the rear sensor rotor.
   - Replace the rear sensor rotor.

Malfunction code 21 (Disconnection and short-circuit of hydraulic unit solenoid.)

1. Hydraulic unit solenoid coupler
   - Check if the hydraulic unit solenoid coupler terminal is disconnected. (Refer to "ABS CONNECTOR LOCATION CHART" on page 8-75.)
2. Hydraulic unit solenoid
   - Check the front and rear wheel solenoids for continuity → [D-5]
   - Check the insulation of all solenoid terminals and the negative battery terminal. → [D-5]
3. Wire harness (ABS)
   - Check the hydraulic unit solenoid circuits for continuity. (See the illustration below.)



1. ABS ECU
2. White
3. Red
4. Red
5. Front solenoid
6. Rear solenoid
7. Green
8. White/Blue

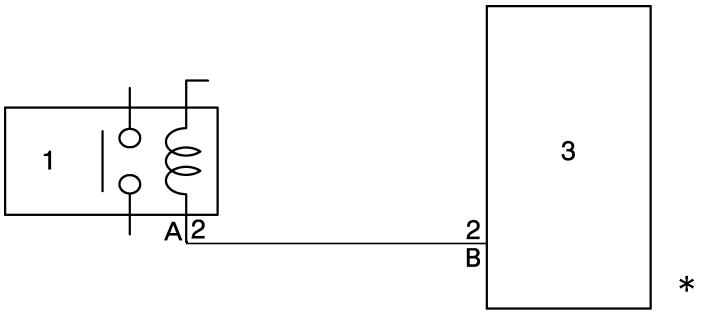
*Continuity between: “A”–“B”, “A”–“C”, “D”–“G”, “E”–“F”

- Check the insulation of the hydraulic unit solenoid circuits and the negative battery terminal.

4. Battery
   - Battery terminal is disconnected

Malfunction code 22 (Starter motor monitor malfunction)

1. Disconnection of the wire harness for the start system circuit
   → Check the conductivity of the wire harness and repair or replace the failure part.
2. Disconnection of the starter motor monitor
   → Check the conductivity of the wire harness and repair or replace the failure part.



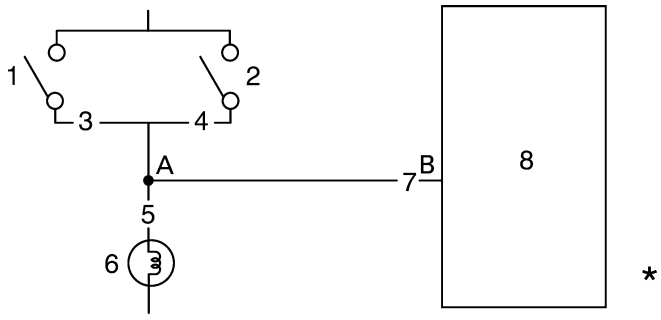
1. Starter relay
2. Blue/White
3. ABS ECU

*Continuity between: “A”–“B”

NOTE:
If you do not start the engine with the starter switch but repeat push-starting the engine excessively, this code may be input.

Malfunction code 24 (Step light failure [Brake system circuit has failure].)

1. Disconnection of the wire harness for the brake circuit
   → Check the conductivity of the wire harness and repair or replace the failure part.
2. Disconnection of the stop lamp monitor
   → Check the conductivity of the wire harness and repair or replace the failure part.



1. Front brake light switch
2. Rear brake light switch
3. Green/Yellow
4. Yellow
5. Yellow
6. Brake light
7. Yellow
8. ABS ECU

*Continuity between: “A”–“B”

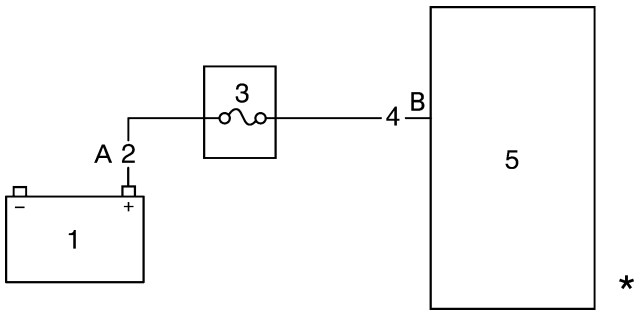
Malfunction code 25 (At the beginning of running, there is no pulse from the front wheel sensor.)
- Rear wheel was rotated with the vehicle on the stand.
- Rear wheel was wheel-spin.
- Wheel tried.
- Defective installation of the wheel speed sensor for the front wheel.

Malfunction code 28 (Other malfunctions [Malfunction of the memory in ABS ECU].)
1 Other malfunctions
→ Replace the ABS ECU.

Malfunction code 31 (Disconnection is detected between the battery and the ABS ECU system.)

NOTE:
Check following the steps in sequence.

1. ABS motor fuse blown
   - Replace the ABS motor fuse.
2. Coupler joint between the battery and ABS ECU.
   - Connect the coupler securely until a “click” sound is heard.
3. Disconnection of the wire harness between the battery and ABS ECU
   - Check the conductivity of the wire harness and repair or replace the failure part.



1. Battery
2. Red/White
3. ABS motor fuse
4. Red/Yellow
5. ABS ECU

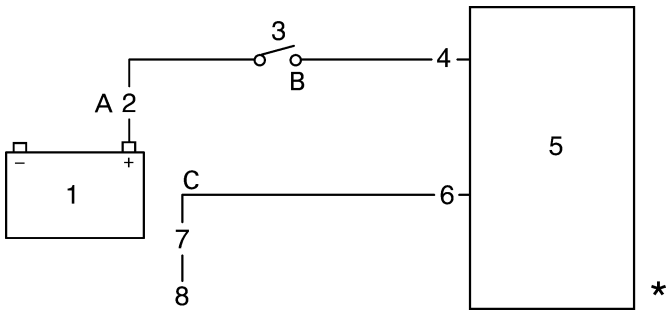
*Continuity between: “A”–“B”

4. When the items 1 to 3 are normal, replace the ABS ECU.

Malfunction code 32 (Circuit malfunction of ABS ECU is detected. Upstream side of the solenoid relay.)

NOTE:
Check following the steps in sequence.

1. Short-circuit between the battery positive terminal and fail safe relay monitor terminal
   - Check the conductivity of the wire harness and repair or replace the failure part.
2. Short-circuit between the battery ignition terminal and fail safe relay monitor terminal
   - Check the conductivity of the wire harness and repair or replace the failure part.



1. Battery
2. Red
3. Main switch
4. Brown/White
5. ABS ECU
6. White
7. Red
8. To HU

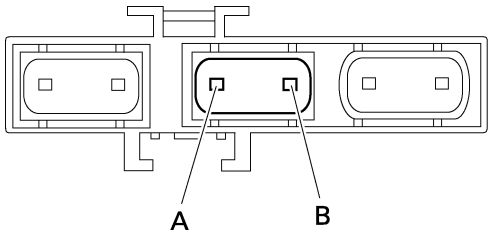
*Continuity between: “A”–“C”, “B”–“C”

3. When the items 1 to 2 are normal, replace the ABS ECU.

Malfunction code 33 (Defective operation of the ABS motor is detected. [ABS motor stops and will not rotate.])

NOTE:
Check following the steps in sequence.

1. ABS motor fuse
   - Check if the ABS motor fuse beside the battery is blown.
2. ABS motor relay
   - Check if the ABS motor relay operates correctly. → [D-2]
3. Wire harness
   - Remove the ABS motor relay and the ABS motor fuse, and then check for continuity between the brown (Refer to "ABS CONNECTOR LOCATION CHART" on page 8-75 in ABS motor relay coupler drawing.) terminal of the wire harness (ABS) and the wire harness (ABS) end (terminal A shown in the illustration) of the ABS motor fuse terminal beside the battery. (Refer to "CIRCUIT DIAGRAM" on page 8-71.)



A. Terminal A
B. Terminal B

- Check for continuity between the positive battery terminal and the battery end of the ABS motor fuse terminal (terminal B shown in the above illustration).
- Remove the ABS ECU and the ABS motor relay from the wire harness (ABS), and then check for continuity between the white/black lead terminals of ABS ECU coupler and the white/red lead terminals of ABS motor coupler.

Malfunction code 34 (Defective operation of the ABS motor is detected. [ABS motor keeps running and will not stop.])

Check the following:

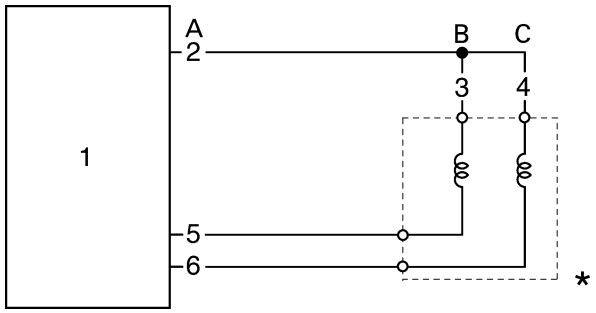
1. ABS motor

- Check if the ABS motor coupler located under the fuel tank is connected properly.
- Check the ABS motor for continuity. → [D-5]

2. Wire harness (ABS)
   - Remove the ABS motor coupler and check for continuity between the black terminal of the ABS motor coupler of the wire harness (ABS) and the negative battery terminal.
   - Remove the ABS ECU coupler and check for continuity between the red/white terminal of the ABS ECU coupler and the red/white terminal of the ABS motor coupler. → [D-1]
   - Remove the ABS motor relay and check for continuity between the red/white terminal of the ABS motor coupler of the wire harness (ABS) and the positive battery terminal.
3. ABS motor relay
   - Check if the ABS motor relay operates correctly. → [D-2]

Malfunction code 35 (Disconnection is detected between the ABS ECU and solenoid system. Downstream side of the solenoid relay.)

1. Disconnected coupler between the ABS ECU and HU solenoid
   Connect the coupler securely until a “click” sound is heard.
2. Disconnection of the wire harness between the ABS ECU and HU solenoid
   Check the conductivity of the wire harness and repair or replace the failure part.



1. ABS ECU
2. White
3. Red
4. Red
5. Green
6. White/Blue

*Continuity between: “A”–“B”, “A”–“C”

3. Battery terminal is disconnected.
4. When the items 1 to 3 are normal, replace the ABS ECU

Malfunction code 41 (Front wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic state [when the battery voltage is normal].)

Check the following:

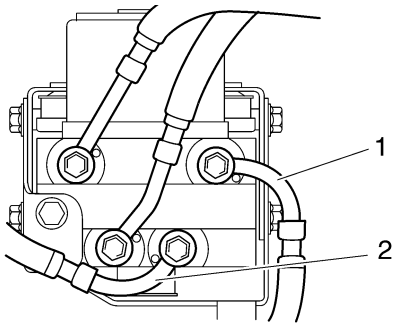
1. Rotation of the front wheel
   - Check that there is no brake disc drag on the front wheel and make sure it rotates smoothly.
   - Check the front wheel axle for loose bearings and bends, and the brake disc for distortion.
2. Brake master cylinder and brake caliper
   - Check that the brake fluid pressure is correctly transmitted to the brake caliper when the brake lever is operated and that the pressure decreases when the lever is released.
3. Brake fluid
   - Visually check the brake fluid in the brake master cylinder reservoir and the fluid for water, foreign materials, solidification and contamination.
   - Check for air in the brake hose lines.
4. Brake hose lines
   - Check the brake hose lines for kinks and deterioration.

EWA4S81009

⚠ WARNING

Only use genuine Yamaha parts. Using other brake pipes, hoses and union bolts may close the brake hose lines.

- Check that the connections of the brake hose lines from the brake master cylinder to the hydraulic unit and to the front brake caliper from the hydraulic unit are correct.



EWA4S81010

⚠ WARNING

The front brake will not function properly if the connections are reversed.
- **Front brake hose "1" inlet: from the front brake master cylinder**
- **Front brake hose "2" outlet: to the front brake caliper**

NOTE:
- If the front brake hose inlet and outlet connections are reversed on the hydraulic unit, the brake lever is pulled to full stroke without responding and will be pushed back slowly without pulsating when the final check in [D-6] is performed.
- If the front and rear brake hose connections are reversed on the hydraulic unit, the pulsating action in the brake lever and brake pedal will be performed in the reverse order when the final check in [D-6] is performed.

5. Hydraulic unit solenoid coupler terminal
   - Check if the front and rear hydraulic unit solenoid coupler terminals (hydraulic unit and wire harness [ABS]) are reversed.

	Terminal color	
	Solenoid side	Wire harness side (ABS)
Front	Red, Green	Red, White/Blue
Rear	Red, Blue	Red, White/Green

6. Hydraulic unit
   If the malfunction is not corrected after performing steps 1 to 5, replace the hydraulic unit. Be sure to connect the brake hoses and couplers correctly and securely. Check the hydraulic unit operation. (Refer to "[D-6] FINAL CHECK" on page 8-104.)

Malfunction code 42 (Rear wheel not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic state [when the battery voltage is normal].)

Check the following:
1. Rotation of the rear wheel
   - Check that there is no brake drag on the rear wheel and make sure it rotates smoothly.
   - Check for brake disc distortion.
2. Brake master cylinder and brake caliper

- Check that the brake fluid pressure is correctly transmitted to the brake disc when the brake pedal is operated and that the pressure decreases when the pedal is released.

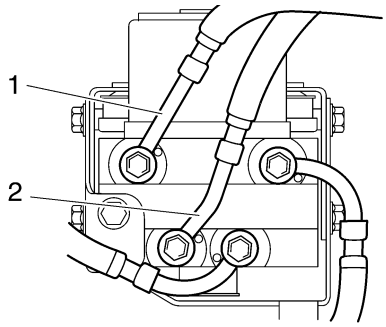
3. Brake fluid
   - Visually check the brake fluid in the brake master cylinder reservoir and check the fluid for water, foreign materials, solidification and contamination.
   - Check for air in the brake hose lines.
4. Brake hose lines
   - Check the brake hose lines for kinks and deterioration (particularly between the hydraulic unit and the rear brake caliper).

EWA4S81011

⚠ WARNING

Only use genuine Yamaha parts. Using other brake pipes, hoses and union bolts may close the brake hose lines.

- Check that the connections of the brake hose lines from the brake master cylinder to the hydraulic unit and to the rear brake caliper from the hydraulic unit are correct.



EWA4S81012

⚠ WARNING

The rear brake will not function properly if the connections are reversed.
- **Rear brake hose "1" inlet: from the rear brake master cylinder**
- **Rear brake hose "2" outlet: to the rear brake caliper**

NOTE:
- If the rear brake hose inlet and outlet connections are reversed on the hydraulic unit, the brake pedal is pressed down to full stroke without responding and will be pushed back slowly without pulsating when the final check is performed.
- If the front and rear brake hose connections are reversed on the hydraulic unit, the pulsating action in the brake lever and brake pedal will be performed in the reverse order when the final check is performed.

5. Hydraulic unit solenoid coupler terminal
   - Check if the front and rear hydraulic unit solenoid coupler terminals (hydraulic unit and wire harness [ABS]) are reversed.

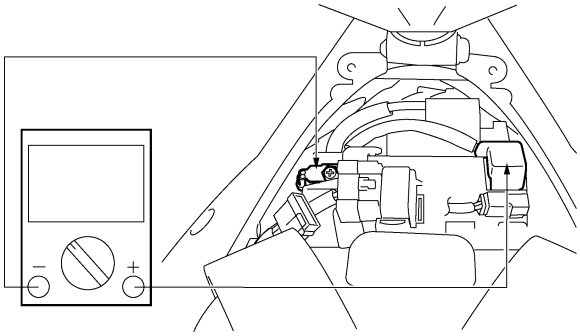
	Terminal color	
	Solenoid side	Wire harness side (ABS)
Front	Red, Green	Red, White/Blue
Rear	Red, Blue	Red, White/Green

6. Hydraulic unit
   If the malfunction is not corrected after performing steps 1 to 5, replace the hydraulic unit. Be sure to connect the brake hose lines and couplers correctly and securely. Check the hydraulic unit operation. (Refer to "[D-6] FINAL CHECK" on page 8-104.)

Malfunction code 51 (Front wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic state [when the battery voltage is low].)

Check the following:

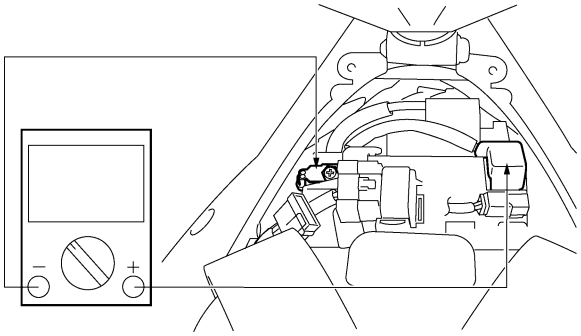
1. Rotation of the front wheel
   Refer to “Malfunction code 41”.
2. Brake master cylinder and brake caliper
   Refer to “Malfunction code 41”.
3. Brake fluid
   Refer to “Malfunction code 41”.
4. Brake hose lines
   Refer to “Malfunction code 41”.
5. Hydraulic unit solenoid coupler terminals
   Refer to “Malfunction code 41”.
6. Hydraulic unit
   Refer to “Malfunction code 41”.
7. Battery voltage
   Measure the battery voltage.



Malfunction code 52 (Rear wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic state [when the battery voltage is low].)

Check the following:

1. Rotation of the rear wheel
   Refer to “Malfunction code 42”.
2. Brake master cylinder and brake caliper
   Refer to “Malfunction code 42”.
3. Brake fluid
   Refer to “Malfunction code 42”.
4. Brake hose lines
   Refer to “Malfunction code 42”.
5. Hydraulic unit solenoid coupler terminals
   Refer to “Malfunction code 42”.
6. Hydraulic unit
   Refer to “Malfunction code 42”.
7. Battery voltage
   Measure the battery voltage.

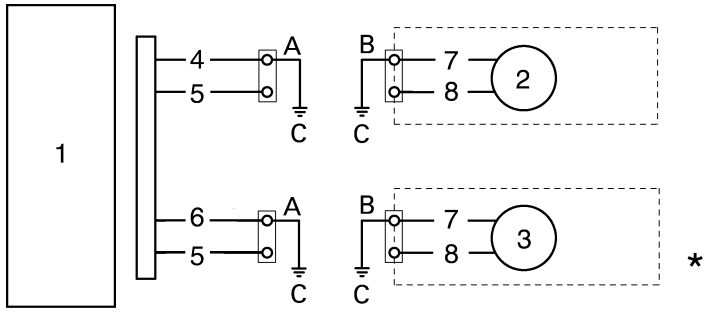


Malfunction code 61 (front), 62 (rear) (Sensor power supply is low)

1. Battery voltage low
   Charge, check or replace the battery.
2. Battery terminal is disconnected.

Malfunction code 63 (front), 64 (rear) (Sensor power supply failure)

1. GND short-circuit of the wire harness
   Remove the ABS ECU coupler and wheel sensor coupler and check the conductivity between the wire harness and GND.
   If short-circuit is detected, replace the wire harness because the cause is the wire harness failure.



1. ABS ECU
2. Front wheel sensor
3. Rear wheel sensor
4. Blue
5. Black
6. Yellow/White
7. White
8. Gray

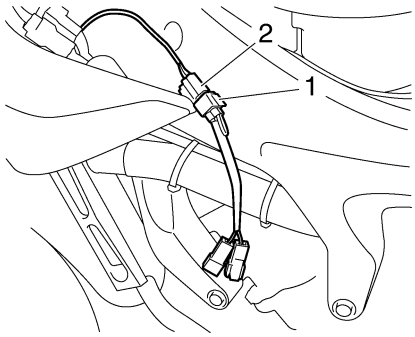
*Continuity between: “A”–“C”, “B”–“C”

2. Wheel sensor malfunction
   Check the conductivity between the wheel sensor leads (white) and GND.
   If short-circuit is detected, replace the wheel sensor because the cause is the wheel sensor failure.
3. Battery terminal is disconnected.
4. When the items 1 to 3 are normal, replace the ABS ECU.

EAS4S81027

[D-6-4] DELETING THE MALFUNCTION CODE

1. Connect the test coupler adapter “1” to the test coupler “2”. Refer to “[B-5] MALFUNCTION CHECK BY THE ABS SELF DIAGNOSIS (PRESENT MALFUNCTION)”



2. Turn the main switch on.
   - The multifunction display indicates previously recorded malfunction codes.

NOTE:
The ABS error code is not displayed during the diagnosis of the fuel injection.

3. Turn the engine stop switch off.

ECA4S81019

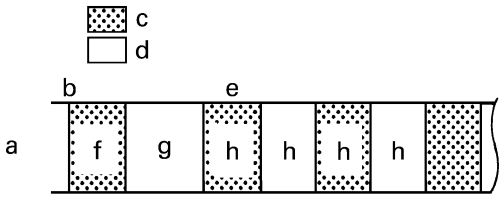
CAUTION:

If the starter switch is pushed without turning the engine stop switch off, it may damage the starting motor gears or other parts, therefore be sure to turn it off.

4. Push the starter switch more than 10 times in 4 seconds to delete the malfunction codes.

NOTE:
If the malfunction codes cannot be cleared, the disconnection of the starter switch monitor leads could be a cause.

5. Turn the main switch off.
6. Turn the main switch on again.
   - Check that the ABS warning light goes on for 2 seconds, then goes out for 3 seconds and starts flashing.



a. ABS warning light
b. ON
c. Main switch on
d. Main switch off
e. Flashing
f. 2 seconds
g. 3 seconds
h. 0.5 seconds

7. Turn the main switch off.
8. Disconnect the test coupler adapter from the test coupler, and install the protective cap with the test coupler adapter. Deleting the malfunction code is now finished.

NOTE:
Do not forget to install the protective cap.

ECA4S81020

CAUTION:

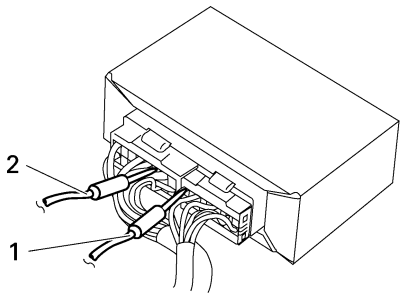
Since the ECU remains in the memory until the malfunction code is deleted, always delete the malfunction code when the service work is finished.

EAS4S81033
[D-6-6] DELETE FUNCTION TEST

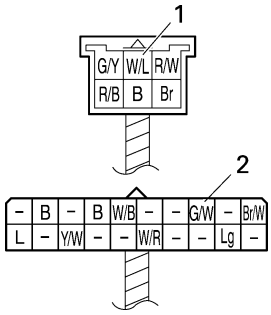
1. Place the vehicle on the sidestand.
2. Set the main switch to “OFF”.
3. Connect the test coupler adapter to the test coupler.
4. Set the main switch to “ON”.
5. Check:
   - ECU voltage
     Connect the pocket tester (DC 20 V) to the ECU coupler.
     Tester positive probe → Brown/White “1”
     Tester negative probe → Black/White “2”

	Battery voltage **Higher than 12.8 V**

Lower than 12.8 V → Charge or replace the battery.



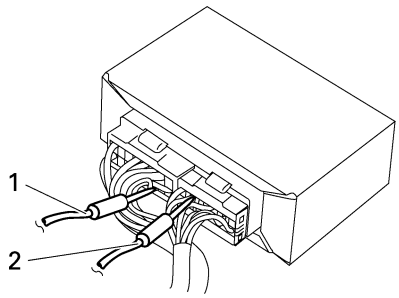
6. Check:
   - ECU-to-start-switch-lead continuity
     Connect the pocket tester (Ω × 1) to the ECU coupler and start switch coupler.
     Tester positive probe → White/Blue “1” (start switch)
     Tester negative probe → Green/White “2” (ECU)
     No continuity → Replace or repair the wire harness.



7. Check:
   - ECU voltage
     Connect the pocket tester (DC 20 V) to the ECU coupler.
     Tester positive probe → Green/Blue “2”
     Tester negative probe → Black/White “1”
     Push the start switch.

	Start switch ON: less than 1 V **Start switch OFF: more than 12 V**

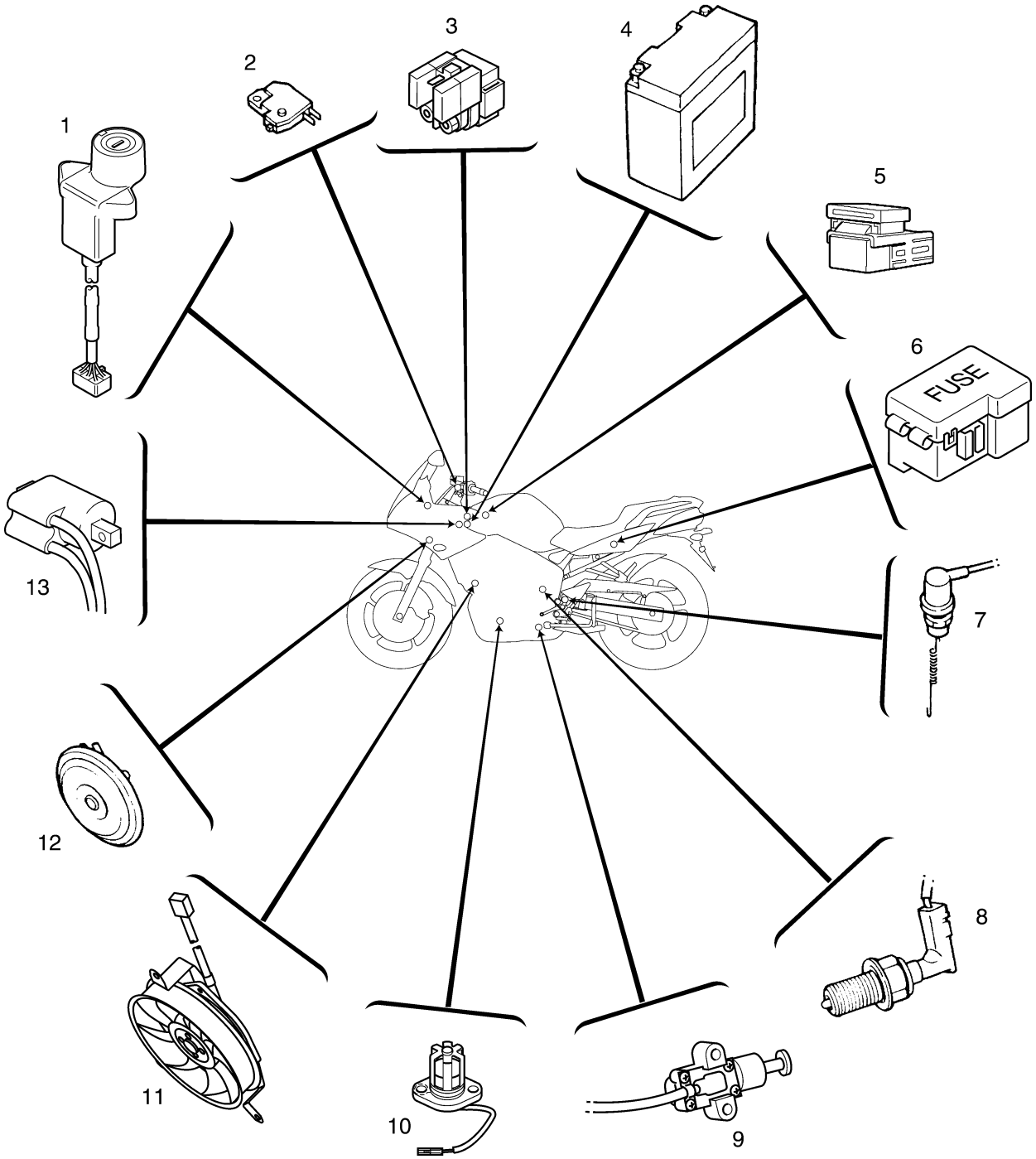
Out of specification → Replace the handlebar switch.



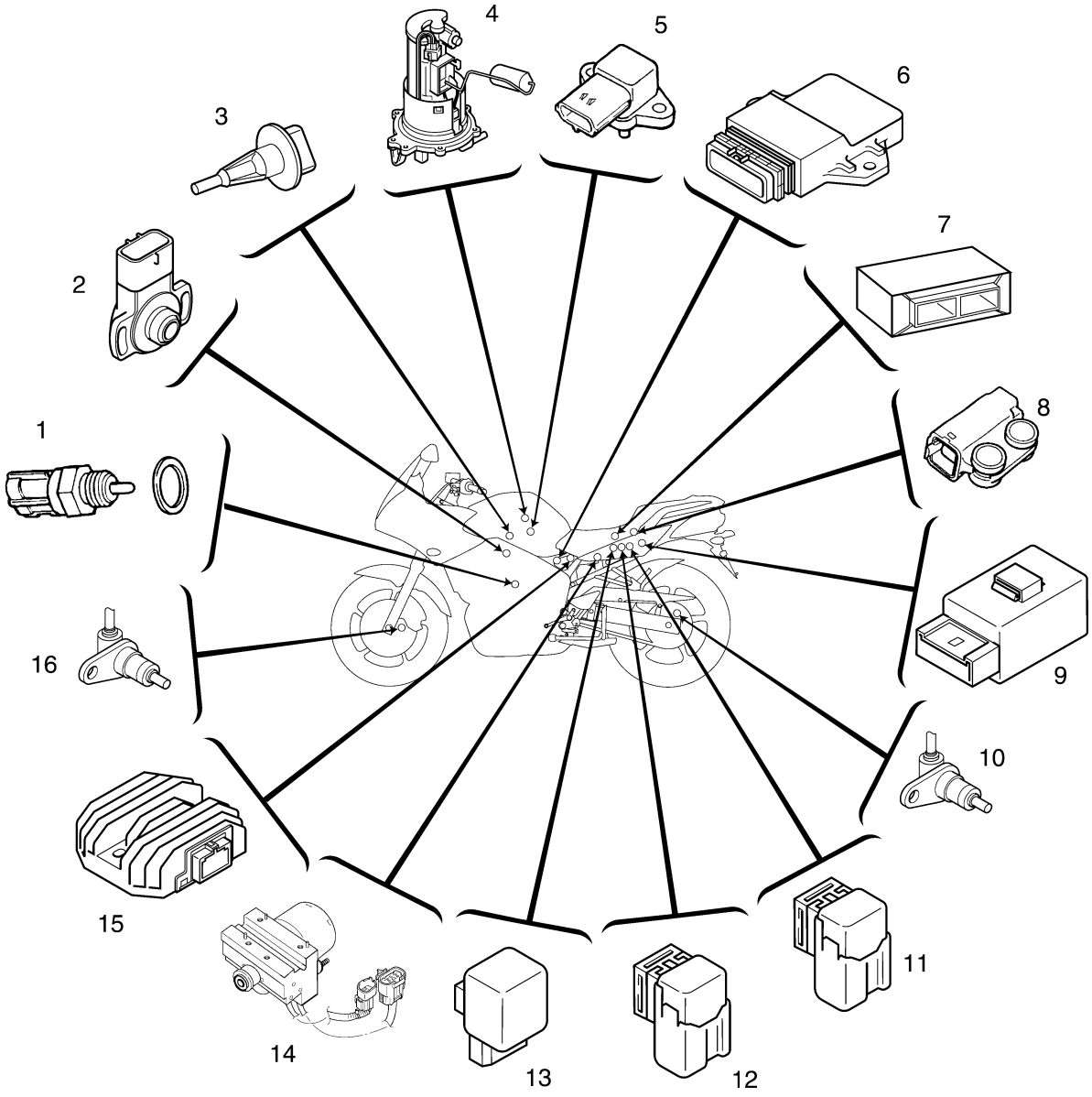
8. If the above-mentioned check are within specification, replace the ECU.

EAS4S81028
[D-6] FINAL CHECK
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 3-24.
2. Check the wheel sensor housings and wheel sensors for proper installation.
   Refer to "INSTALLING THE FRONT WHEEL" on page 4-14 and "INSTALLING THE REAR WHEEL" on page 4-22.
3. Perform hydraulic unit operation test 1 or 2.
   Refer to "HYDRAULIC UNIT OPERATION TEST" on page 4-56.
4. Delete the malfunction codes.
   Refer to "[D-6-4] DELETING THE MALFUNCTION CODE" on page 8-101.
5. Perform a trial run.
   Refer to "[D-6-5] TRIAL RUN" on page 4-59.

EAS27970
ELECTRICAL COMPONENTS

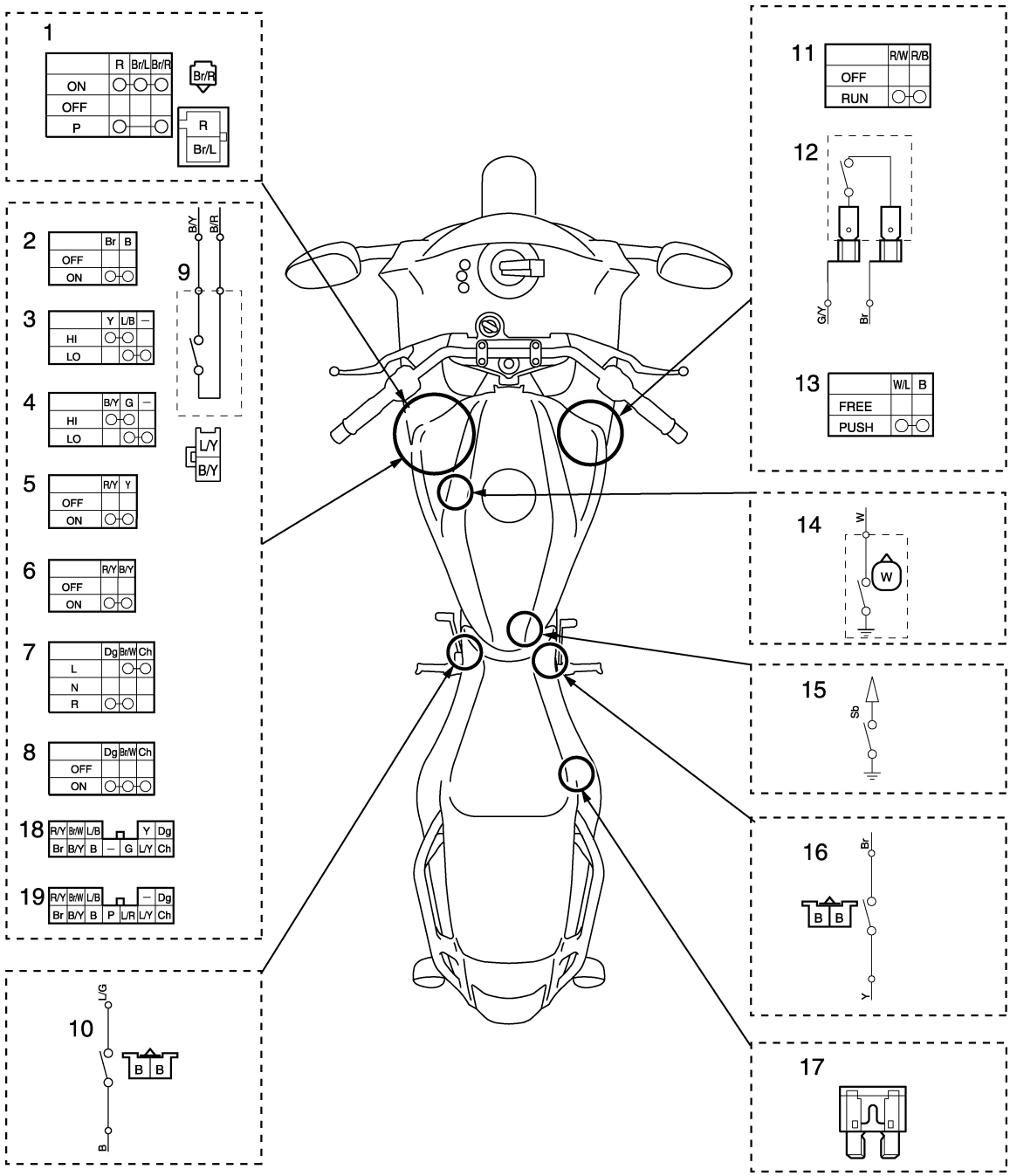


1. Main switch
2. Front brake light switch
3. Starter relay
4. Battery
5. ABS motor relay (FZ6-NA/FZ6-NAHG/FZ6-SA/FZ6-SAHG)
6. Fuse box
7. Rear brake light switch
8. Neutral switch
9. Sidestand switch
10. Oil level switch
11. Radiator fan motor
12. Horn
13. Ignition coil



1. Coolant temperature sensor
2. Throttle position sensor
3. Intake air temperature sensor
4. Fuel pump
5. Intake air pressure sensor
6. ECU (engine control unit)
7. ABS ECU (FZ6-NA/FZ6-NAHG/FZ6-SA/ FZ6-SAHG)
8. Lean angle sensor
9. Starting circuit cut-off relay
10. Rear wheel sensor
11. Dimmer relay
12. Radiator fan motor relay
13. Turn signal relay
14. Hydraulic unit
15. Rectifier/regulator
16. Front wheel sensor

EAS27980
CHECKING THE SWITCHES



1. Main switch
2. Horn switch
3. Dimmer switch (FZ6-S/FZ6-NA/FZ6-SA/FZ6-SHG(W)/FZ6-SAHG)
4. Dimmer switch (FZ6-N/FZ6-NHG(W))
5. Pass switch (FZ6-S/FZ6-NA/FZ6-SA/FZ6-SHG(W)/FZ6-SAHG)
6. Pass switch (FZ6-N/FZ6-NHG(W)/FZ6-NAHG)
7. Turn signal switch
8. Hazard switch
9. Clutch switch
10. Sidestand switch
11. Engine stop switch
12. Front brake light switch
13. Start switch
14. Oil level switch
15. Neutral switch
16. Rear brake light switch
17. Fuse
18. Left handlebar switch lead coupler (FZ6-S/FZ6-SA/FZ6-SHG(W)/FZ6-SAHG)
19. Left handlebar switch lead coupler (FZ6-S/FZ6-SA/FZ6-SHG(W)/FZ6-SAHG)

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

ECA14370

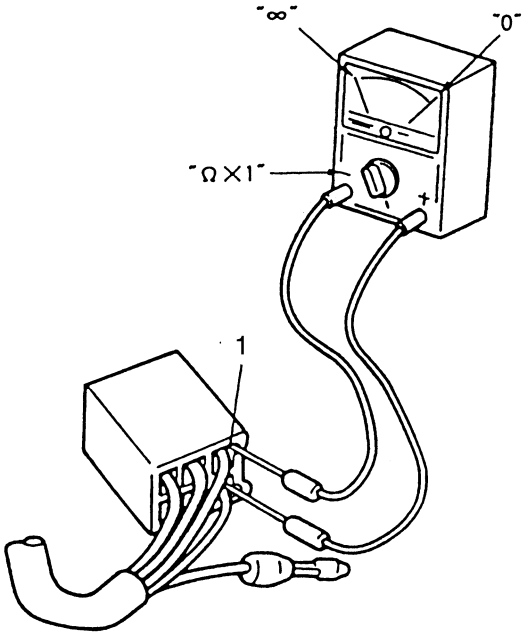
CAUTION:

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

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

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

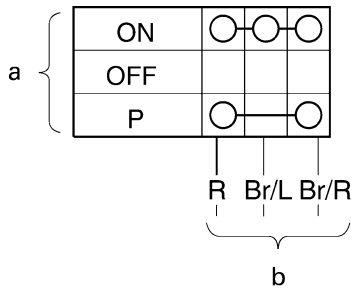


The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.
The switch positions "a" are shown in the far left column and the switch lead colors "b" are shown in the top row in the switch illustration.

NOTE:

" ○——○ " indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:
There is continuity between black and black/white when the switch is set to "OFF".
There is continuity between red and brown when the switch is set to "ON".



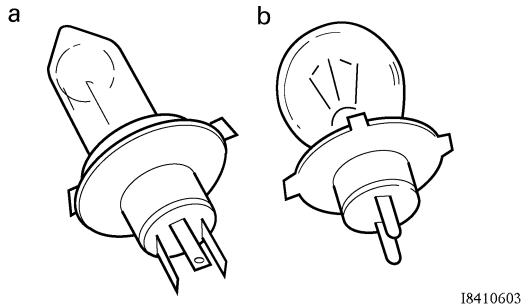
EAS27990
CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.
Damage/wear → Repair or replace the bulb, bulb socket or both.
Improperly connected → Properly connect.
No continuity → Repair or replace the bulb, bulb socket or both.

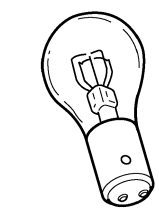
Types of bulbs

The bulbs used on this vehicle are shown in the illustration on the left.

- Bulbs "a" and "b" are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulbs "c" is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.



I8410603



Checking the condition of the bulbs

The following procedure applies to all of the bulbs.

1. Remove:
   - Bulb

EWA13320

⚠ WARNING

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

ECA14380

CAUTION:

- **Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.**
- **Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly it with a cloth moistened with alcohol or lacquer thinner.**

2. Check:
   - Bulb (for continuity)
     (with the pocket tester)
     No continuity → Replace.

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

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the positive tester probe to terminal "1" and the negative tester probe to terminal "2", and check the continuity.

b. Connect the positive tester probe to terminal "1" and the negative tester probe to terminal "3", and check the continuity.
c. If either of the readings indicate no continuity, replace the bulb.

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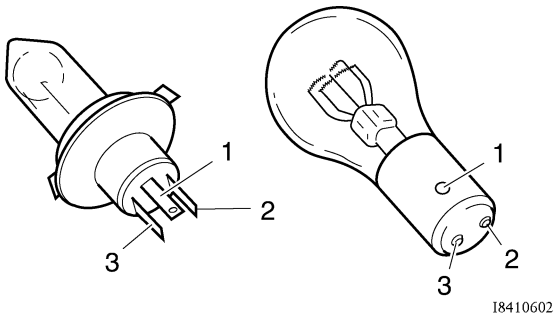

Checking the condition of the bulb sockets
The following procedure applies to all of the bulb sockets.
1. Check:
   • Bulb socket (for continuity)
   (with the pocket tester)
   No continuity → Replace.

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

NOTE:
Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

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a. Install a good bulb into the bulb socket.
b. Connect the pocket tester probes to the respective leads of the bulb socket.
c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

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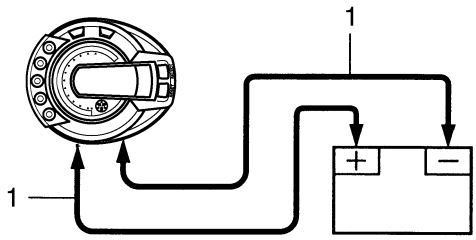
EAS4S81029
CHECKING THE LEDS
The following procedures applies to all of the LEDs.
1. Check:
   • LED (for proper operation)
   Improper operation → Replace.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Disconnect the meter assembly coupler (meter assembly side).
b. Connect two jumper leads "1" from the battery terminals to the respective coupler terminal as shown.

EWA4S81013
⚠ WARNING
- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.**



c. When the jumper leads are connected to the terminals the respective LED should illuminate.
   Does not light → Replace the meter assembly.

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EAS28000
CHECKING THE FUSES
The following procedure applies to all of the fuses.

ECA13680
CAUTION:
To avoid a short circuit, always set the main switch to "OFF" when checking or replacing a fuse.

1. Remove:
   • Seat
   • Front cowling inner panel
   • Fuel tank (with ABS)
2. Check:
   • Fuse

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

NOTE:
Set the pocket tester selector to "Ω × 1".

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

b. If the pocket tester indicates "∞", replace the fuse.

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3. Replace:
   • Blown fuse

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

Fuses	Amperage rating	Q'ty
Main	30 A	1
Headlight	20 A	1
Signal	10 A	1
Ignition	10 A	1
Tail	10 A	1
Radiator fan motor	20 A	1
Fuel injection system	10 A	1
Backup	10 A	1
ABS (with ABS)	10 A	1
ABS motor (with ABS)	30 A	1
Reserve	10 A	1
Reserve	20 A	1
Reserve	30 A	1

EWA13310

⚠ WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

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4. Install:
   • Fuel tank (with ABS)
   • Front cowling inner panel
   • Seat

EAS28030

CHECKING AND CHARGING THE BATTERY

EWA13290

⚠ WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- **Wear protective eye gear when handling or working near batteries.**
- **Charge batteries in a well-ventilated area.**
- **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.**

ECA13660

CAUTION:

- **This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.**
- **Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.**

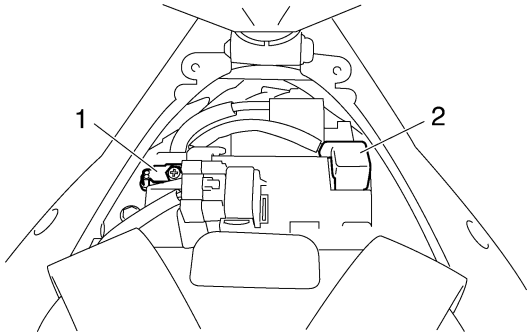
NOTE:
Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
   - Seat
   - Front cowling inner panel
   - Fuel tank
2. Disconnect:
   - Battery leads
     (from the battery terminals)

ECA13640

CAUTION:

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



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

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a. Connect a pocket tester to the battery terminals.

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

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

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

Example
Open-circuit voltage = 12.0 V
Charging time = 6.5 hours
Charge of the battery = 20–30%

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5. Charge:
   - Battery
     (refer to the appropriate charging method illustration)

EWA13300

⚠ WARNING

Do not quick charge a battery.

ECA13670

CAUTION:

- **Never remove the MF battery sealing caps.**
- **Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.**
- **If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.**
- **When charging a battery, be sure to remove it from the 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 an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30**

minutes after charging is completed before measuring the open-circuit voltage.

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Charging method using a variable-current (voltage) charger

a. Measure the open-circuit voltage prior to charging.

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

b. Connect a charged and AMP meter to the battery and start charging.

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

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

NOTE:
If the current is lower than the standard charging current written on the battery, set the charging voltage adjust dial at 20–24 V and monitor the amperage for 3–5 minutes to check the battery.

- Reach the standard charging current
  Battery is good.
- Does not reach the standard charging current
  Replace the battery.

d. Adjust the voltage so that the current is at the standard charging level.
e. Set the time according to the charging time suitable for the open-circuit voltage.
   Refer to “Battery condition checking steps”.
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.

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Charging method using a constant voltage charger

a. Measure the open-circuit voltage prior to charging.

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

b. Connect a charger and AMP meter to the battery and start charging.
c. Make sure that the current is higher than the standard charging current written on the battery.

NOTE:
If the current is lower than the standard charging current written on the battery, This type of battery charger cannot charge the MF battery. A variable voltage charger is recommended.

d. Charge the battery until the battery’s charging voltage is 15 V.

NOTE:
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.

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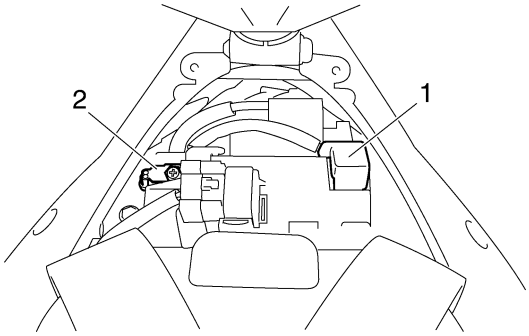
6. Install:
   - Battery
7. Connect:
   - Battery leads
     (to the battery terminals)

ECA13630
CAUTION:
First, connect the positive battery lead “1”, and then the negative battery lead “2”.



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

Recommended lubricant
Dielectric grease

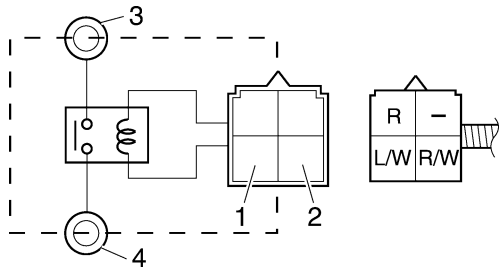
10. Install:
    - Fuel tank
    - Front cowling inner panel
    - Seat

EAS28040
CHECKING THE RELAYS

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.

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

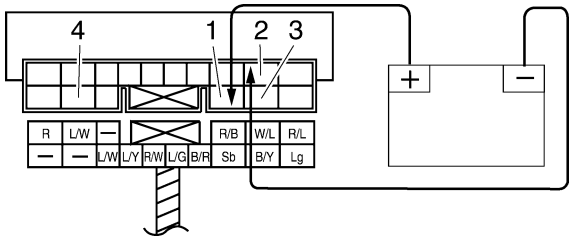
1. Disconnect the relay from the wire harness.
2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown.
   Check the relay operation.
   Out of specification → Replace.



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Relay operation
Continuity/No continuity
(between “3” to “4”)

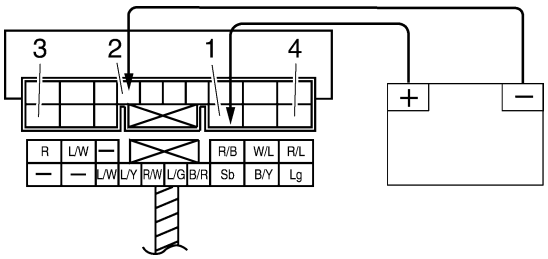
Relay unit (starting circuit cut-off relay)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity/No continuity
(between “3” to “4”)

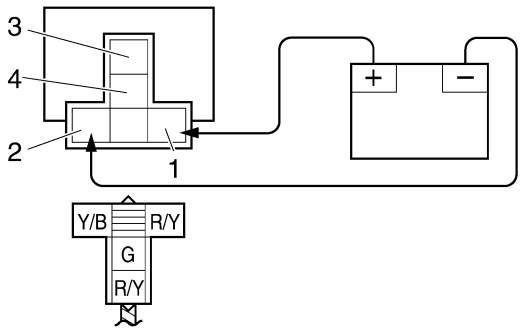
Relay unit (fuel pump relay)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity/No continuity
(between “3” to “4”)

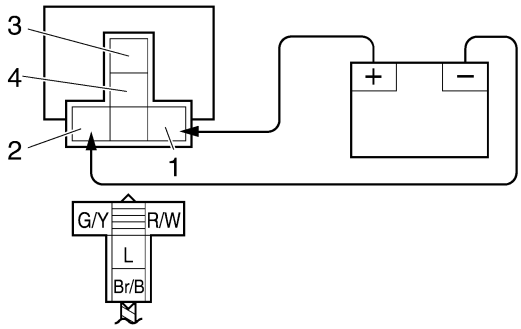
Headlight relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity/No continuity
(between "3" to "4")

Radiator fan motor



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity/No continuity
(between "3" to "4")

EAS4S81030
CHECKING THE ABS MOTOR RELAY

1. Check:
   - ABS motor relay for continuity
     Connect the pocket tester (Ω × 1) to the terminals of ABS motor relay.
     Check for continuity between terminals "1" and "2" of the ABS motor relay.

ABS motor relay resistance
50–150 Ω

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

- Tester positive probe →Terminal "2"
- Tester negative probe → Terminal "1"

Tester reading is "∞". → Replace the ABS motor relay.

ECA4S81021

CAUTION:

Do not reverse the connections. If the pocket tester leads are connected in reverse to terminals "1" and "2", a correct pocket tester reading cannot be obtained.

- Connect the positive battery terminal to terminal "2" and the negative battery terminal to terminal "1", and then check for continuity between terminals "3" and "4" of the ABS motor relay.

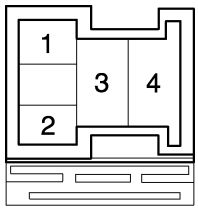
- Tester positive probe →Terminal "3"
- Tester negative probe → Terminal "4"

Tester reading is "∞". → Replace the ABS motor relay.

ECA4S81022

CAUTION:

- **Be sure to connect the pocket tester positive and negative probes correctly. If the pocket tester probes are connected in reverse, the diode of the ABS motor relay will be broken.**
- **When connecting the ABS motor relay and battery terminals, be careful not to short-circuit the positive and negative battery terminals.**



EAS4S81031
CHECKING THE SOLENOID VALVES AND MOTOR

ECA4S81023
CAUTION:

When check the hydraulic unit solenoid relay and ABS motor, do not remove the brake hoses.

1. Check:
   - Solenoid valve resistance (front)
     Out of specification → Replace the hydraulic unit.

Solenoid valve resistance
2.96–3.20 Ω at 20°C (68°F)

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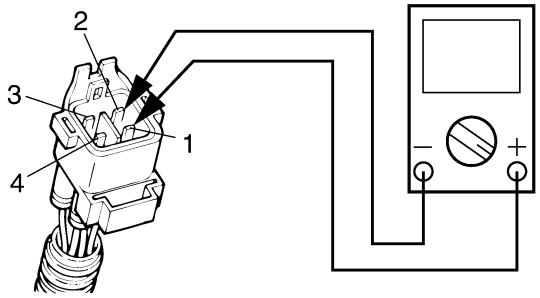
a. Connect the pocket tester (Ω × 1) to the solenoid valve (front) terminal as shown.

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

- Positive tester probe → terminal "1"
- Negative tester probe → terminal "2"



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2. Check:
   - Solenoid valve resistance (rear)
     Out of specification → Replace the hydraulic unit.

Solenoid valve resistance
2.96–3.20 Ω at 20°C (68°F)

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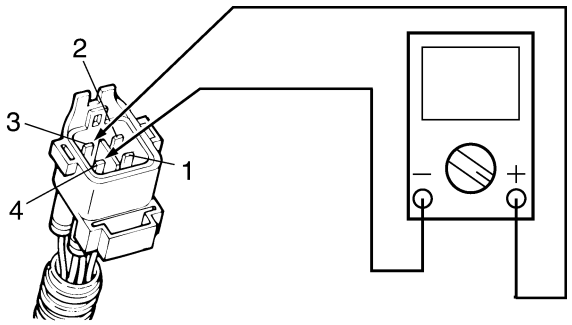
a. Connect the pocket tester (Ω × 1) to the solenoid valve (rear) terminal as shown.

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

- Positive tester probe → terminal "3"
- Negative tester probe → terminal "4"



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3. Check:
   - ABS motor continuity
     No continuity → Replace the hydraulic unit.

There is continuity.

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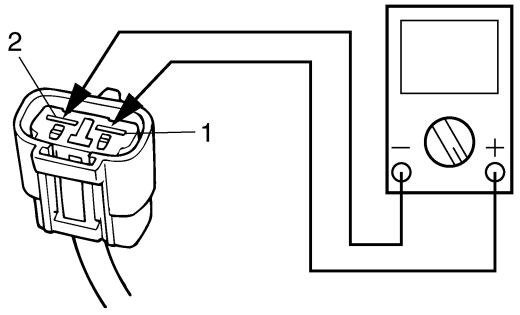
a. Connect the pocket tester (Ω × 1) to the ABS motor coupler terminal as shown.

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

- Positive tester probe → terminal "1"
- Negative tester probe → terminal "2"



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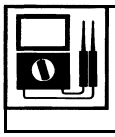
EAS4S81032
CHECKING THE TURN SIGNAL/HAZARD RELAY

1. Check:
   - Turn signal/hazard relay input voltage
     Out of specification → The wiring circuit from the main switch to the turn signal/hazard relay coupler is faulty and must be repaired.



Turn signal/hazard relay input voltage
DC 12 V

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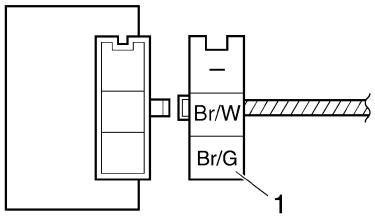
a. Connect the pocket tester (DC 20 V) to the turn signal/hazard relay terminal as shown.

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

- Positive tester probe → Brown/Green “1”
- Negative tester probe → Ground



b. Turn the main switch to “ON”.
c. Measure the turn signal/hazard relay input voltage.

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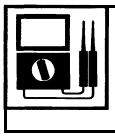
2. Check:
   - Turn signal/hazard relay output voltage
     Out of specification → Replace.



Turn signal/hazard relay output voltage
DC 12 V

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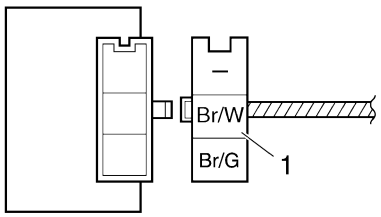
a. Connect the pocket tester (DC 20 V) to the turn signal/hazard relay terminal as shown.

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

- Positive tester probe → Brown/White “1”
- Negative tester probe → Ground



b. Turn the main switch to “ON”.
c. Measure the turn signal/hazard relay output voltage.

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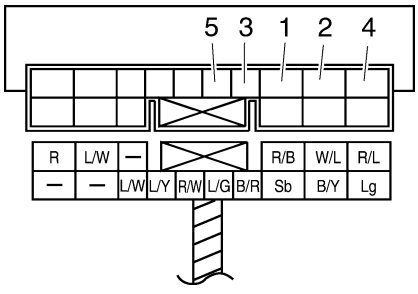
EAS28050
CHECKING THE RELAY UNIT (DIODE)

1. Check:
   - Relay unit (diode)
     Out of specification → Replace.

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

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 → Black/Red "3"
No continuity
Positive tester probe → Black/Red "3"
Negative tester probe → Sky blue "1"
Continuity
Positive tester probe → Sky blue "1"
Negative tester probe → Light green "4"
No continuity
Positive tester probe → Light green "4"
Negative tester probe → Sky blue "1"
Continuity
Positive tester probe → Blue/Green "5"
Negative tester probe → Black/Red "3"
No continuity
Positive tester probe → Black/Red "3"
Negative tester probe → Blue/Green "5"



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a. Disconnect the relay unit coupler from the wire harness.
b. Connect the pocket tester (Ω × 1) to the relay unit terminal as shown.
c. Check the relay unit (diode) for continuity.
d. Check the relay unit (diode) for no continuity.

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EAS28070
CHECKING THE SPARK PLUG CAPS

The following procedure applies to all of the spark plug caps.

1. Check:
   - Spark plug cap resistance
     Out of specification → Replace.

Resistance
10.0 kΩ

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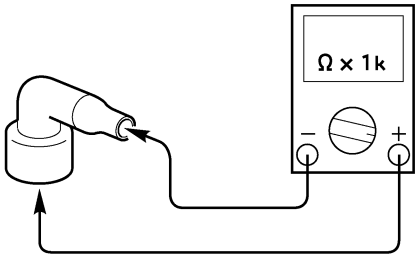
a. Remove the spark plug cap from the spark plug lead.
b. Connect the pocket tester (Ω × 1k) to the spark plug cap as shown.

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



c. Measure the spark plug cap resistance.

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EAS28100
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
1.53–2.07 Ω at 20°C (68°F)

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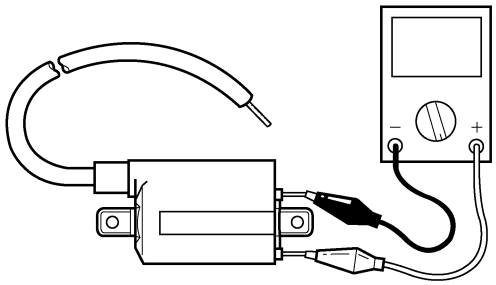
a. Disconnect the ignition coil connectors from the ignition coil terminals.
b. Connect the pocket tester (Ω × 1) to the ignition coil as shown.

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

- Positive tester probe
  Red/black
- Negative tester probe
  Orange/Black (Gray/Black)



c. Measure the primary coil resistance.

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2. Check:
   - Secondary coil resistance
     Out of specification → Replace.

Secondary coil resistance
12.0–18.0 kΩ at 20°C (68°F)

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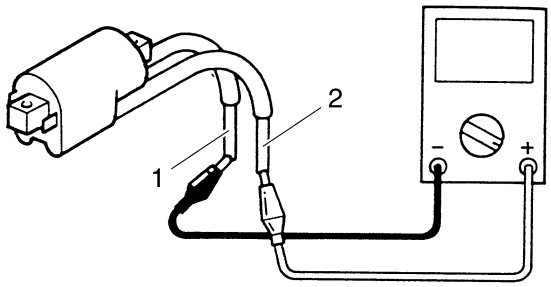
a. Disconnect the spark plug cap from the ignition coil.
b. Connect the pocket tester (Ω × 1k) to the ignition coil as shown.

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

- Negative tester probe
  Spark plug lead “1”
- Positive tester probe
  Spark plug lead “2”



c. Measure the secondary coil resistance.

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3. Check:
   - Ignition spark gap
     Out of specification → Replace.

Minimum ignition spark gap
6.0 mm (0.24 in)

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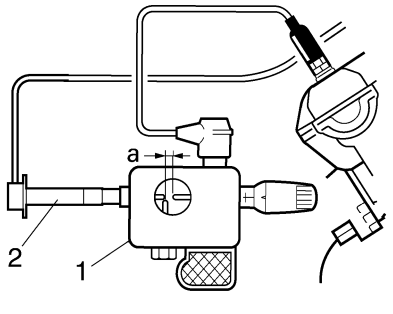
a. Disconnect the spark plug cap from the spark plug.
b. Connect the ignition checker/dynamic spark tester “1” as shown.

Ignition checker
90890-06754
Opama pet-4000 spark checker
YM-34487



I8110202

2. Spark plug cap

c. Set the main switch to “ON”.
d. Measure the ignition spark gap “a”.
e. Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.

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EAS28120
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
248–372 Ω at 20°C (68°F)

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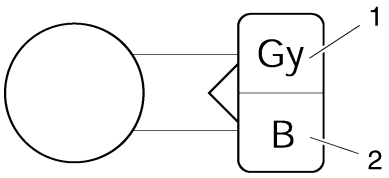
a. Connect the pocket tester (Ω × 100) to the crankshaft position sensor coupler as shown.

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

• Positive tester probe
Gray "1"
• Negative tester probe
Black "2"



b. Measure the crankshaft position sensor resistance.

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EAS28130
CHECKING THE LEAN ANGLE SENSOR

1. Remove:
   • Lean angle sensor
   (from the bracket.)
2. Check:
   • Lean angle sensor output voltage
   Out of specification → Replace.

Lean angle sensor output voltage
65°: 1.0–4.0 V

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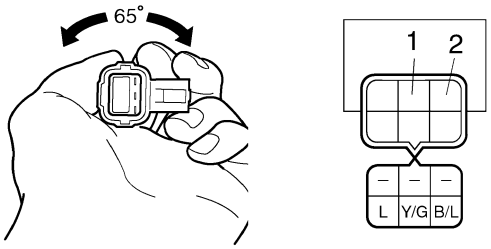
a. Connect the lean angle sensor coupler to the wireharness.
b. Connect the pocket tester (DC 20 V) to the lean angle sensor coupler as shown.

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

• Positive tester probe
Yellow/Green "1"
• Negative tester probe
Black/Blue "2"



c. When turn the lean angle sensor to 65°.
d. Measure the lean angle sensor out put voltage.

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EAS4S81036
CHECKING THE WHEEL SENSOR

1. Check:
   • Front wheel sensor output voltage
   Out of specification → Replace

Output voltage reading cycle
Hi: 1.1 V–1.7 V
Lo: 0.5 V–0.9V

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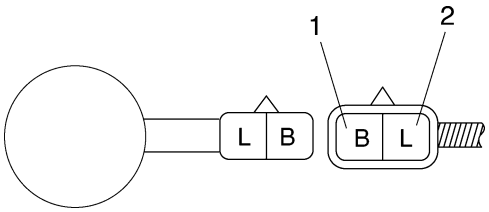
a. Connect the pocket tester (DC20 V) to the front wheel sensor coupler as shown.

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

• Positive tester probe
Black "1"
• Negative tester probe
Blue "2"



b. Turn the main switch to “ON”.
c. Elevate the front wheel and slowly rotate it.
d. Measure the voltage with each full rotation of the front wheel, the voltage reading should cycle from Lo (0.5–0.9 V) to Hi (1.1–1.7 V) to Lo to Hi.

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EAS4S81035
CHECKING THE STARTOR MOTOR OPERATION

1. Check:
   • Starter motor operation
   Does not operate → Perform the electric starting system troubleshooting, starting with step 5.
   Refer to "TROUBLESHOOTING" on page 9-1.

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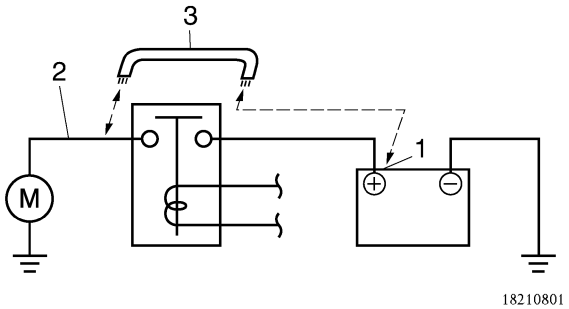
a. Connect the positive battery terminal “1” and starter motor lead “2” with a jumper lead “3”.

EWA13810
⚠ WARNING

- **A wire that is used as a jumper lead must have at least the same capacity of the battery, 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.

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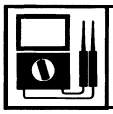
2. Check:
   • Stator coil resistance
   Out of specification → Replace the stator coil.

EAS28150
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
0.22–0.34 Ω at 20°C (68°F)

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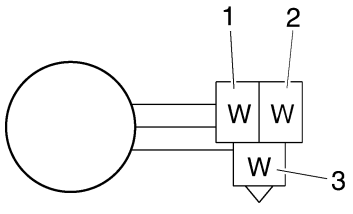
a. Connect the pocket tester (Ω × 1) to the stator coil coupler as shown.

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

- Positive tester probe
  White “1”
- Negative tester probe
  White “2”

- Positive tester probe
  White “1”
- Negative tester probe
  White “3”

- Positive tester probe
  White “2”
- Negative tester probe
  White “3”



b. Measure the stator coil resistance.

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EAS28170
CHECKING THE RECTIFIER/REGULATOR

1. Check:
   • Charging voltage

Out of specification → Replace the rectifier/ regulator.

Charging voltage
above 14 V at 5000 r/min

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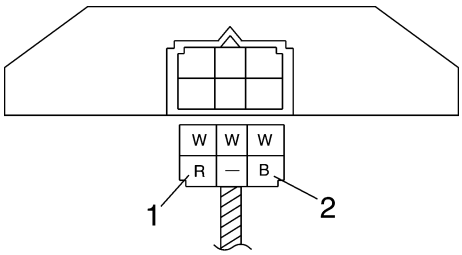
a. Set the engine tachometer to the ignition coil of cylinder #1.
b. Connect the pocket tester (AC 20 V) to the rectifier/regulator coupler as shown.

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

- Positive tester probe
  Red "1"
- Negative tester probe
  Black "2"



c. Start the engine and let it run at approximately 5000 r/min.
d. Measure the rectifier/regulator input voltage.

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EAS28180
CHECKING THE HORN

1. Check:
   - Horn resistance
     Out of specification → Replace.

Horn resistance
1.01–1.11 Ω at 20°C (68°F)

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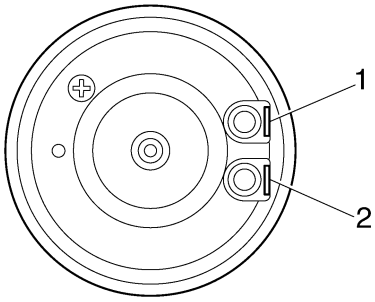
a. Disconnect the horn leads from the horn terminals.
b. Connect the pocket tester (Ω × 1) to the horn terminals.

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

- Positive tester probe
  Horn terminal "1"
- Negative tester probe
  Horn terminal "2"



c. Measure the horn resistance.

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2. Check:
   - Horn sound
     Faulty sound → Adjust or replace.

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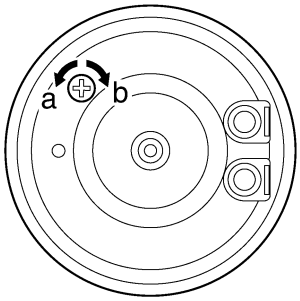
a. Connect a battery (12 V) to the horn.
b. Turn the adjusting screw in direction "a" or "b" until the specified horn sound is obtained.



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EAS28190
CHECKING THE ENGINE OIL LEVEL GAUGE

1. Drain:
   - Engine oil
2. Remove:
   - Engine oil level gauge
     (from the oil pan)
3. Check:
   - Engine oil level gauge resistance

Engine oil level gauge
Maximum level position resistance
114–126 Ω at 20°C (68°F)
Minimum level position resistance
484–536 Ω at 20°C (68°F)

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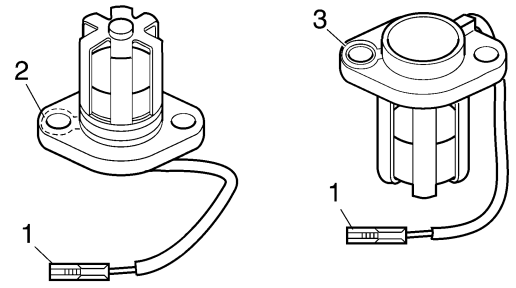
a. Connect the pocket tester (Ω × 100) to the engine oil level gauge terminal as shown.

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

Maximum level position "A"
- Positive tester probe
  Connector (white) "1"
- Negative tester probe
  Body earth "2"

Minimum level position "B"
- Positive tester probe
  Connector (white) "1"
- Negative tester probe
  Body earth "3"

A B



b. Measure the pickup coil resistance.

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EAS28230
CHECKING THE FUEL SENDER

1. Remove:
   - Fuel tank
2. Disconnect:
   - Fuel pump coupler
   - Fuel sender coupler
     (from the wire harness)
3. Remove:
   - Fuel pump
     (from the fuel tank)
4. Check:
   - Fuel sender resistance
     Out of specification → Replace the fuel pump assembly.

Fuel sender resistance (full)
20–26 Ω at 20°C (68°F)
Fuel sender resistance (empty)
134–140 Ω at 20°C (68°F)

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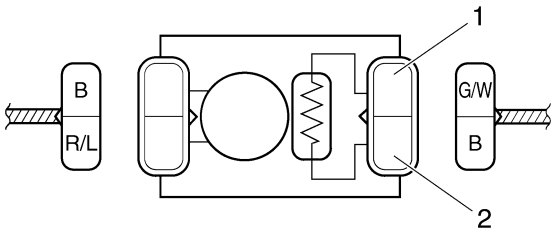
a. Connect the pocket tester (Ω × 10) to the fuel sender terminal as shown.

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

- Positive tester probe
  Green/White "1"
- Negative tester probe
  Black "2"



b. Measure the fuel sender resistance.

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EAS28240
CHECKING THE SPEED SENSOR

(except for ABS)

1. Check:
   - Speed sensor output voltage
     Out of specification → Replace.

Output voltage reading cycle
0.6 V–4.8 V–0.6 V–4.8 V

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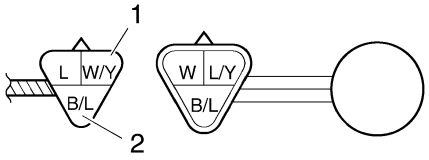
a. Connect the pocket tester (DC 20 V) to the speed sensor coupler (wire harness side) as shown.

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

• Positive tester probe White/Yellow “1” • Negative tester probe Black/Blue “2”



b. Set the main switch to “ON”.
c. Elevate the rear wheel and slowly rotate it.
d. Measure the voltage (DC 5 V) of White/Yellow and Black/Blue. With each full rotation of the rear wheel, the voltage reading should cycle from 0.6 V to 4.8 V to 0.6 V to 4.8 V.

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EAS28250

CHECKING THE RADIATOR FAN MOTOR

1. Check:
   • Radiator fan motor
   Faulty/rough movement → Replace.

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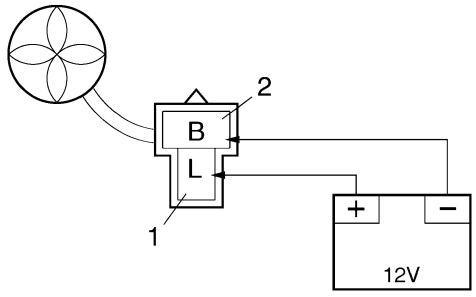
a. Disconnect the radiator fan motor coupler from the wire harness.
b. Connect the battery (DC 12 V) as shown.

• Positive tester probe Blue “1” • Negative tester probe Black “2”



c. Measure the radiator fan motor movement.

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EAS28260

CHECKING THE COOLANT TEMPERATURE SENSOR

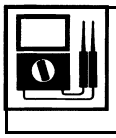
1. Remove:
   • Coolant temperature sensor

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
5.21–6.37 kΩ at 0°C (32°F)
0.29–0.35 kΩ at 80°C (176°F)

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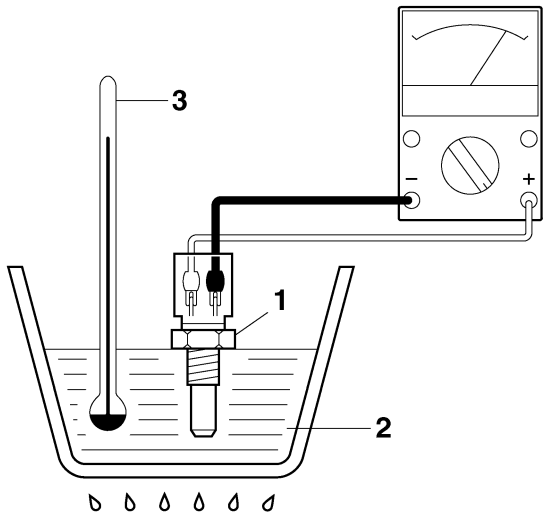
a. Connect the pocket tester (Ω × 100) to the coolant temperature sensor “1” as shown.

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



b. Immerse the coolant temperature sensor in a container filled with coolant “2”.

NOTE:

Make sure the coolant temperature sensor terminals do not get wet.

c. Place a thermometer “3” in the coolant.
d. Slowly heat the coolant, and then let it cool to the specified temperature indicated in the table.

e. Check the coolant temperature sensor for continuity at the temperatures indicated in the table.

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EAS28300
CHECKING THE THROTTLE POSITION SENSOR

1. Remove:
   - Throttle position sensor (from the throttle body)
2. Check:
   - Throttle position sensor

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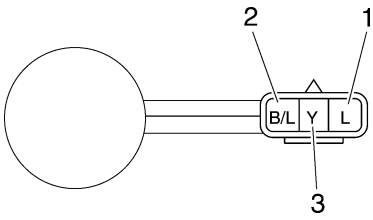
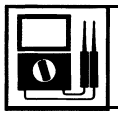
a. Connect the pocket tester (Ω × 1k) to the throttle position sensor as shown.

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

- Tester positive lead → Blue "1"
- Tester negative lead → Black/Blue "2"



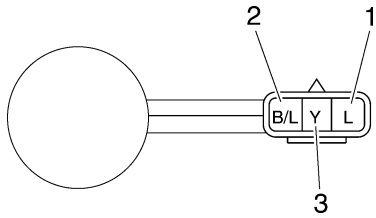
b. Check the throttle position sensor maximum resistance.
Out of specification → Replace the throttle position sensor.



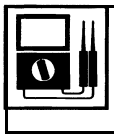
Resistance
4.0–6.0 kΩ

c. Connect the pocket tester (Ω × 1k) to the throttle position sensor as shown.

- Tester positive lead → Yellow "3"
- Tester negative lead → Black/Blue "2"



d. While slowly turning the throttle position sensor shaft, check that the throttle position sensor resistance is within the specified range.
The resistance does not change or it changes abruptly → Replace the throttle position sensor.



Throttle position sensor resistance
0 to 3.5–6.5 kΩ at 20°C (68°F)

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3. Install:
   - Throttle position sensor

NOTE:
When installing the throttle position sensor, adjust its angle properly. Refer to "ADJUSTING THE THROTTLE POSITION SENSOR" on page 7-6.

EAS28350
CHECKING THE FUEL PUMP

EWA13850

⚠ WARNING

Gasoline is extremely flammable and under certain circumstances there can be a danger of an explosion or fire. Be extremely careful and note the following points:
- **Stop the engine before refueling.**
- **Do not smoke, and keep away from open flames, sparks, or any other source of fire.**
- **If you do accidentally spill gasoline, wipe it up immediately with dry rags.**
- **If gasoline touches the engine when it is hot, a fire may occur. Therefore, make sure the engine is completely cool before performing the following test.**

1. Disconnect:
   - Fuel pump coupler (from the wire harness)
2. Check:
   - Fuel pump resistance
     Out of specification → Replace.

Fuel pump resistance
0.2–3.0 Ω at 20°C (68°F)

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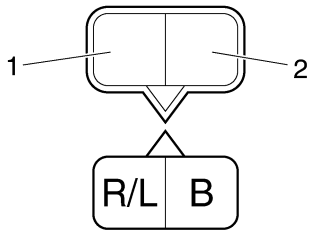
a. Connect the pocket tester (Ω × 1) to the fuel pump coupler as shown.

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

- Positive tester probe
  Red/blue "1"
- Negative tester probe
  Black "2"



b. Measure the fuel pump resistance.

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EAS28370

CHECKING THE AIR INDUCTION SYSTEM SOLENOID

1. Check:
   - Air induction system solenoid resistance
     Out of specification → Replace.

Air induction system solenoid resistance
18–22 Ω at 20°C (68°F)

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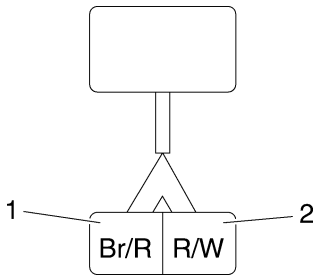
a. Remove the air induction system solenoid coupler from the wire harness.
b. Connect the pocket tester (Ω × 1) to the air induction system solenoid terminal as shown.

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

- Positive tester probe
  Brown/Red "1"
- Negative tester probe
  Red/White "2"



c. Measure the air induction system solenoid resistance.

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EAS28410

CHECKING THE INTAKE AIR PRESSURE SENSOR

1. Check:
   - Intake air pressure sensor output voltage
     Out of specification → Replace.

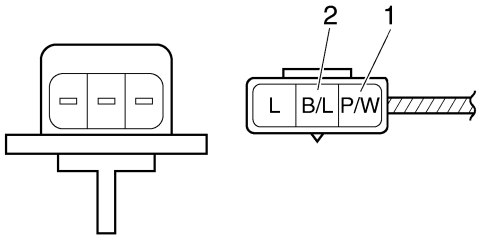
Intake air pressure sensor output voltage
3.75–4.25 V

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the pocket tester (DC 20 V) to the intake air pressure sensor coupler (wire harness side) as shown.

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

- Positive tester probe
  Pink/White "1"
- Negative tester probe
  Black/Blue "2"



b. Set the main switch to "ON".

c. Measure the intake air pressure sensor output voltage.

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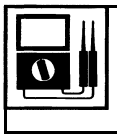
EAS28420
CHECKING THE INTAKE AIR TEMPERATURE SENSOR

1. Remove:
   - Intake air temperature sensor (from the air filter case.)

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 pressure sensor resistance
2.2–2.7 kΩ at 20°C (68°F)

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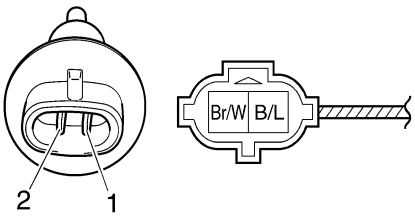
a. Connect the pocket tester (Ω × 100) to the intake air temperature sensor terminal as shown.

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

- Positive tester probe
  Brown/White "1"
- Negative tester probe
  Balck/Blue "2"



b. Measure the intake air temperature sensor resistance.

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TROUBLESHOOTING

EAS28450
TROUBLESHOOTING

EAS28460
GENERAL INFORMATION

NOTE:
The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

EAS28470
STARTING FAILURES

Engine
1. Cylinder(s) and cylinder head(s)
   - Loose spark plug
   - Loose cylinder head or cylinder
   - Damaged cylinder head gasket
   - Damaged cylinder gasket
   - Worn or damaged cylinder
   - Incorrect valve clearance
   - Improperly sealed valve
   - Incorrect valve-to-valve-seat contact
   - Incorrect valve timing
   - Faulty valve spring
   - Seized valve
2. Piston(s) and piston ring(s)
   - Improperly installed piston ring
   - Damaged, worn or fatigued piston ring
   - Seized piston ring
   - Seized or damaged piston
3. Air filter
   - Improperly installed air filter
   - Clogged air filter element
4. Crankcase and crankshaft
   - Improperly assembled crankcase
   - Seized crankshaft

Fuel system
1. Fuel tank
   - Empty fuel tank
   - Clogged fuel filter
   - Clogged fuel tank drain hose
   - Deteriorated or contaminated fuel
2. Fuel pump
   - Faulty fuel pump
   - Faulty fuel pump relay
3. Throttle body(-ies)
   - Deteriorated or contaminated fuel
   - Sucked-in air

Electrical system
1. Battery
   - Discharged battery
   - Faulty battery
2. Fuse(s)
   - Blown, damaged or incorrect fuse
   - Improperly installed fuse
3. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
   - Fouled spark plug
   - Worn or damaged electrode
   - Worn or damaged insulator
   - Faulty spark plug cap
4. Ignition coil(s)
   - Cracked or broken ignition coil body
   - Broken or shorted primary or secondary coils
   - Faulty spark plug lead
5. Ignition system
   - Faulty ECU
   - Faulty crankshaft position sensor
6. Switches and wiring
   - Faulty main switch
   - Faulty engine stop switch
   - Broken or shorted wiring
   - Faulty neutral switch
   - Faulty start switch
   - Faulty sidestand switch
   - Faulty clutch switch
   - Improperly grounded circuit
   - Loose connections
7. Starting system
   - Faulty starter motor
   - Faulty starter relay
   - Faulty starting circuit cut-off relay
   - Faulty starter clutch

EAS28490
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 carburetors
   - Improperly adjusted engine idling speed (throttle stop screw)

- Improper throttle cable free play
- Flooded throttle body
- Faulty air induction system

Electrical system

1. Battery
   - Discharged battery
   - Faulty battery
2. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
   - Fouled spark plug
   - Worn or damaged electrode
   - Worn or damaged insulator
   - Faulty spark plug cap
3. Ignition coil(s)
   - Broken or shorted primary or secondary coils
   - Faulty spark plug lead
   - Cracked or broken ignition coil
4. Ignition system
   - Faulty ECU
   - Faulty crankshaft position sensor

EAS28510
POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING FAILURES" on page 9-1.

Engine

1. Air filter
   - Clogged air filter element

Fuel system

1. Fuel pump
   - Faulty fuel pump

EAS28530
FAULTY GEAR SHIFTING

Shifting is difficult

Refer to “Clutch drags”.

EAS28540
SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Foreign object between transmission gears
- Improperly assembled transmission

EAS28550
JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

EAS28560
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 push rod
   - Damaged clutch boss
   - Burnt primary driven gear bushing
   - Match marks not aligned
2. Engine oil
   - Incorrect oil level
   - Incorrect oil viscosity (high)
   - Deteriorated oil

EAS28600
OVERHEATING

Engine

1. Clogged coolant passages
   - Cylinder head(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
   - Thermostat
   - Thermostat stays closed
   - Oil cooler
   - Clogged or damaged oil cooler
   - Hose(s) and pipe(s)
   - Damaged hose
   - Improperly connected hose
   - Damaged pipe
   - Improperly connected pipe

Fuel system

1. Throttle body(-ies)
   - Damaged or loose throttle body joint
2. Air filter
   - Clogged air filter element

Chassis

1. Brake(s)
   - Dragging brake

Electrical system

1. Spark plug(s)
   - Incorrect spark plug gap
   - Incorrect spark plug heat range
2. Ignition system
   - Faulty ECU
3. Cooling system
   - Faulty radiator fan motor relay
   - Faulty coolant temperature sensor
   - Faulty ECU

EAS28610
OVERCOOLING

Cooling system

1. Thermostat
   - Thermostat stays open

EAS28620
POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EAS28660
FAULTY FRONT FORK LEGS

Leaking oil

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged cap bolt O-ring

Malfunction

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS28670
UNSTABLE HANDLING

1. Handlebar
   - Bent or improperly installed handlebar
2. Steering head components
   - Improperly installed upper bracket
   - Improperly installed lower bracket (improperly tightened ring nut)
   - Bent steering stem
   - Damaged ball bearing or bearing race
3. Front fork leg(s)
   - Uneven oil levels (both front fork legs)
   - Unevenly tensioned fork spring (both front fork legs)
   - Broken fork spring
   - Bent or damaged inner tube
   - Bent or damaged outer tube
4. Swingarm
   - Worn bearing or bushing
   - Bent or damaged swingarm
5. Rear shock absorber assembly(-ies)

- Faulty rear shock absorber spring
- Leaking oil or gas

6. Tire(s)
   - Uneven tire pressures (front and rear)
   - Incorrect tire pressure
   - Uneven tire wear
7. Wheel(s)
   - Incorrect wheel balance
   - Deformed cast wheel
   - Damaged wheel bearing
   - Bent or loose wheel axle
   - Excessive wheel runout
8. Frame
   - Bent frame
   - Damaged steering head pipe
   - Improperly installed bearing race

EAS28710
FAULTY LIGHTING OR SIGNALING SYSTEM

Headlight does not come on
- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

Headlight bulb burnt out
- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Faulty light switch
- Headlight bulb life expired

Tail/brake light does not come on
- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

Tail/brake light bulb burnt out
- Wrong tail/brake light bulb
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

Turn signal does not come on
- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

Turn signal blinks slowly
- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

Turn signal remains lit
- Faulty turn signal relay
- Burnt-out turn signal bulb

Turn signal blinks quickly
- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

Horn does not sound
- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

EAS4S81006
TROUBLESHOOTING AT THE ABS WARNING LIGHT

When the main switch is turned “ON”. (Engine does not start.)

Only the ABS warning light does not come on
- Defective connection of the ABS wire harness and the wire harness
- Defective connection of the ABS wire harness and the ABS ECU
- ABS warning light bulb is burnt out or the bulb contact is defective
- ABS ECU defective

All indicators do not come on
- Battery defective
- Blown, damaged, or incorrect fuse (main fuse)
- Defective connection of the main fuse coupler
- Defective connection of the wire harness
- Defective connection of the main switch coupler

- Defective connection of the meter coupler

ABS warning light continues to flashes
- Brake light switch (front or rear) is defective
- Brake light switch front or rear coupler has come off
- Defective starter motor monitor
- Other defective

ABS warning light flashes every 0.5 seconds
- Voltage drop (Less than 10 V)
  - Battery
  - Rectifier/regulator
  - AC magneto
- Strong radio waves or static electricity
- Test coupler adapter is connected to test coupler

ABS Warning light continues to come on
- Defective connection of the wheel sensor (front or rear) circuit
- Wheel sensor lead (front or rear) coupler has come off
- Wheel sensor lead (front or rear) or the IC internal circuit is disconnected
- Sensor circuit of the ABS harness is disconnected
- ABS ECU coupler terminal has come off

EAS28740
WIRING DIAGRAM
FZ6-N 2007

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Backup fuse
5. Fuel injection system fuse
6. Immobilizer unit
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
14. Fuel pump
15. Throttle position sensor
16. Intake air pressure sensor
17. O_2 sensor
18. Lean angle sensor
19. Crankshaft position sensor
20. Intake air temperature sensor
21. Coolant temperature sensor
22. ECU (engine control unit)
23. Injector #1
24. Injector #2
25. Injector #3
26. Injector #4
27. Air induction system solenoid
28. Speed sensor
29. Cylinder-#1/#4 ignition coil
30. Cylinder-#2/#3 ignition coil
31. Spark plug
32. Meter assembly
33. Immobilizer indicator light
34. Fuel level warning light
35. Engine trouble warning light
36. Neutral indicator light
37. Multi-function meter
38. High beam indicator light
39. Left turn signal indicator light
40. Right turn signal indicator light
41. Oil level switch
42. Anti-theft alarm
43. Right handlebar switch
44. Front brake light switch
45. Engine stop switch
46. Start switch
47. Radiator fan motor fuse
48. Radiator fan motor relay
49. Radiator fan motor
50. Signal fuse
51. Headlight fuse
52. Ignition fuse
53. Tail fuse
54. Turn signal relay
55. Rear brake light switch
56. License plate light
57. Tail/brake light
58. Left handlebar switch
59. Clutch switch
60. Pass switch
61. Dimmer switch
62. Hazard switch
63. Turn signal switch
64. Horn switch
65. Horn
66. Headlight relay
67. Auxiliary light
68. Headlight
69. Front left turn signal light
70. Front right turn signal light
71. Rear left turn signal light
72. Rear right turn signal light

EAS4S81047
COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

FZ6-NA 2007

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Backup fuse
5. Fuel injection system fuse
6. Immobilizer unit
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. ABS motor fuse
12. Starting circuit cut-off relay
13. Sidestand switch
14. Neutral switch
15. Fuel pump
16. Throttle position sensor
17. Intake air pressure sensor
18. O_2 sensor
19. Lean angle sensor
20. Crankshaft position sensor
21. Intake air temperature sensor
22. Coolant temperature sensor
23. ECU (engine control unit)
24. Injector #1
25. Injector #2
26. Injector #3
27. Injector #4
28. Air induction system solenoid
29. ABS test terminal
30. ABS ECU
31. Front wheel sensor
32. Rear wheel sensor
33. ABS motor relay
34. Hydraulic unit
35. Cylinder-#1/#4 ignition coil
36. Cylinder-#2/#3 ignition coil
37. Spark plug
38. Meter assembly
39. Immobilizer indicator light
40. Fuel level warning light
41. Engine trouble warning light
42. Neutral indicator light
43. Multi-function meter
44. High beam indicator light
45. Turn signal indicator light
46. ABS warning light
47. Oil level switch
48. Anti-theft alarm
49. Right handlebar switch
50. Front brake light switch
51. Engine stop switch
52. Start switch
53. Radiator fan motor fuse
54. Radiator fan motor relay
55. Radiator fan motor
56. ABS fuse
57. Signal fuse
58. Headlight fuse
59. Ignition fuse
60. Tail fuse
61. Turn signal relay
62. Rear brake light switch
63. License plate light
64. Tail/brake light
65. Left handlebar switch
66. Clutch switch
67. Pass switch
68. Dimmer switch
69. Hazard switch
70. Turn signal switch
71. Horn switch
72. Horn
73. Headlight relay
74. Auxiliary light
75. Headlight
76. Front left turn signal light
77. Front right turn signal light
78. Rear left turn signal light
79. Rear right turn signal light

EAS4S81049

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

FZ6-NHG(W) 2007

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Backup fuse
5. Fuel injection system fuse
6. Immobilizer unit
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
14. Fuel pump
15. Throttle position sensor
16. Intake air pressure sensor
17. O_2 sensor
18. Lean angle sensor
19. Crankshaft position sensor
20. Intake air temperature sensor
21. Coolant temperature sensor
22. ECU (engine control unit)
23. Injector #1
24. Injector #2
25. Injector #3
26. Injector #4
27. Air induction system solenoid
28. Speed sensor
29. Cylinder-#1/#4 ignition coil
30. Cylinder-#2/#3 ignition coil
31. Spark plug
32. Meter assembly
33. Immobilizer indicator light
34. Fuel level warning light
35. Oil level warning light
36. Neutral indicator light
37. Tachometer
38. Multi-function meter
39. Engine trouble warning light
40. Coolant temperature warning light
41. High beam indicator light
42. Left turn signal indicator light
43. Right turn signal indicator light
44. Meter light
45. Oil level switch
46. Anti-theft alarm
47. Right handlebar switch
48. Front brake light switch
49. Engine stop switch
50. Start switch
51. Radiator fan motor fuse
52. Radiator fan motor relay
53. Radiator fan motor
54. Signal fuse
55. Headlight fuse
56. Ignition fuse
57. Tail fuse
58. Turn signal relay
59. Rear brake light switch
60. License plate light
61. Tail/brake light
62. Left handlebar switch
63. Clutch switch
64. Pass switch
65. Dimmer switch
66. Hazard switch
67. Turn signal switch
68. Horn switch
69. Horn
70. Headlight relay
71. Auxiliary light
72. Headlight
73. Front left turn signal light
74. Front right turn signal light
75. Rear left turn signal light
76. Rear right turn signal light

EAS4S81048

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

FZ6-NAHG 2007

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Backup fuse
5. Fuel injection system fuse
6. Immobilizer unit
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
14. Fuel pump
15. Throttle position sensor
16. Intake air pressure sensor
17. O_2 sensor
18. Lean angle sensor
19. Crankshaft position sensor
20. Intake air temperature sensor
21. Coolant temperature sensor
22. ECU (engine control unit)
23. Injector #1
24. Injector #2
25. Injector #3
26. Injector #4
27. Air induction system solenoid
28. ABS motor fuse
29. ABS test terminal
30. ABS ECU
31. Front wheel sensor
32. Rear wheel sensor
33. ABS motor relay
34. Hydraulic unit
35. Cylinder-#1/#4 ignition coil
36. Cylinder-#2/#3 ignition coil
37. Spark plug
38. Meter assembly
39. Immobilizer indicator light
40. Fuel level warning light
41. Oil level warning light
42. Neutral indicator light
43. Tachometer
44. Multi-function meter
45. Engine trouble warning light
46. Coolant temperature warning light
47. High beam indicator light
48. Left turn signal indicator light
49. Right turn signal indicator light
50. Meter light
51. ABS warning light
52. Oil level switch
53. Anti-theft alarm
54. Right handlebar switch
55. Front brake light switch
56. Engine stop switch
57. Start switch
58. Radiator fan motor fuse
59. Radiator fan motor relay
60. Radiator fan motor
61. ABS fuser
62. Signal fuse
63. Headlight fuse
64. Ignition fuse
65. Tail fuse
66. Turn signal relay
67. Rear brake light switch
68. License plate light
69. Tail/brake light
70. Left handlebar switch
71. Clutch switch
72. Pass switch
73. Dimmer switch
74. Hazard switch
75. Turn signal switch
76. Horn switch
77. Horn
78. Headlight relay
79. Auxiliary light
80. Headlight
81. Front left turn signal light
82. Front right turn signal light
83. Rear left turn signal light
84. Rear right turn signal light

EAS4S81050

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

FZ6-S 2007

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Backup fuse
5. Fuel injection system fuse
6. Immobilizer unit
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
14. Fuel pump
15. Throttle position sensor
16. Intake air pressure sensor
17. O_2 sensor
18. Lean angle sensor
19. Crankshaft position sensor
20. Intake air temperature sensor
21. Coolant temperature sensor
22. ECU(engine control unit)
23. Injector #1
24. Injector #2
25. Injector #3
26. Injector #4
27. Air induction system solenoid
28. Speed sensor
29. Cylinder-#1/#4 ignition coil
30. Cylinder-#2/#3 ignition coil
31. Spark plug
32. Meter assembly
33. Immobilizer indicator light
34. Fuel level warning light
35. Engine trouble warning light
36. Neutral indicator light
37. Multi-function meter
38. High beam indicator light
39. Left turn signal indicator light
40. Right turn signal indicator light
41. Oil level switch
42. Anti-theft alarm
43. Right handlebar switch
44. Front brake light switch
45. Engine stop switch
46. Start switch
47. Radiator fan motor fuse
48. Radiator fan motor relay
49. Radiator fan motor
50. Signal fuse
51. Headlight fuse
52. Ignition fuse
53. Tail fuse
54. Turn signal relay
55. Rear brake light switch
56. License plate light
57. Tail/brake light
58. Left handlebar switch
59. Clutch switch
60. Pass switch
61. Dimmer switch
62. Hazard switch
63. Turn signal switch
64. Horn switch
65. Horn
66. Headlight relay
67. Auxiliary light
68. Headlight (high beam)
69. Headlight (low beam)
70. Front left turn signal light
71. Front right turn signal light
72. Rear left turn signal light
73. Rear right turn signal light

EAS28750

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

FZ6-SA 2007

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Backup fuse
5. Fuel injection system fuse
6. Immobilizer unit
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. ABS motor fuse
12. Starting circuit cut-off relay
13. Sidestand switch
14. Neutral switch
15. Fuel pump
16. Throttle position sensor
17. Intake air pressure sensor
18. O_2 sensor
19. Lean angle sensor
20. Crankshaft position sensor
21. Intake air temperature sensor
22. Coolant temperature sensor
23. ECU (engine control unit)
24. Injector #1
25. Injector #2
26. Injector #3
27. Injector #4
28. Air induction system solenoid
29. ABS test terminal
30. ABS ECU
31. Front wheel sensor
32. Rear wheel sensor
33. ABS motor relay
34. Hydraulic unit
35. Cylinder-#1/#4 ignition coil
36. Cylinder-#2/#3 ignition coil
37. Spark plug
38. Meter assembly
39. Immobilizer indicator light
40. Fuel level warning light
41. Engine trouble warning light
42. Neutral indicator light
43. Multi-function meter
44. High beam indicator light
45. Turn signal indicator light
46. ABS warning light
47. Oil level switch
48. Anti-theft alarm
49. Right handlebar switch
50. Front brake light switch
51. Engine stop switch
52. Start switch
53. Radiator fan motor fuse
54. Radiator fan motor relay
55. Radiator fan motor
56. ABS fuse
57. Signal fuse
58. Headlight fuse
59. Ignition fuse
60. Tail fuse
61. Turn signal relay
62. Rear brake light switch
63. License plate light
64. Tail/brake light
65. Left handlebar switch
66. Clutch switch
67. Pass switch
68. Dimmer switch
69. Hazard switch
70. Turn signal switch
71. Horn switch
72. Horn
73. Headlight relay
74. Auxiliary light
75. Headlight (high beam)
76. Headlight (low beam)
77. Front left turn signal light
78. Front right turn signal light
79. Rear left turn signal light
80. Rear right turn signal light

EAS4S81045

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

FZ6-SHG(W) 2007

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Backup fuse
5. Fuel injection system fuse
6. Immobilizer unit
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
14. Fuel pump
15. Throttle position sensor
16. Intake air pressure sensor
17. O_2 sensor
18. Lean angle sensor
19. Crankshaft position sensor
20. Intake air temperature sensor
21. Coolant temperature sensor
22. ECU (engine control unit)
23. Injector #1
24. Injector #2
25. Injector #3
26. Injector #4
27. Air induction system solenoid
28. Speed sensor
29. Cylinder-#1/#4 ignition coil
30. Cylinder-#2/#3 ignition coil
31. Spark plug
32. Meter assembly
33. Immobilizer indicator light
34. Fuel level warning light
35. Oil level warning light
36. Neutral indicator light
37. Tachometer
38. Multi-function meter
39. Engine trouble warning light
40. Coolant temperature warning light
41. High beam indicator light
42. Left turn signal indicator light
43. Right turn signal indicator light
44. Meter light
45. Oil level switch
46. Anti-theft alarm
47. Right handlebar switch
48. Front brake light switch
49. Engine stop switch
50. Start switch
51. Radiator fan motor fuse
52. Radiator fan motor relay
53. Radiator fan motor
54. Signal fuse
55. Headlight fuse
56. Ignition fuse
57. Tail fuse
58. Turn signal relay
59. Rear brake light switch
60. License plate light
61. Tail/brake light
62. Left handlebar switch
63. Clutch switch
64. Pass switch
65. Dimmer switch
66. Hazard switch
67. Turn signal switch
68. Horn switch
69. Horn
70. Headlight relay
71. Auxiliary light
72. Headlight (high beam)
73. Headlight (low beam)
74. Front left turn signal light
75. Front right turn signal light
76. Rear left turn signal light
77. Rear right turn signal light

EAS4S81044

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

FZ6-SAHG 2007

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Backup fuse
5. Fuel injection system fuse
6. Immobilizer unit
7. Main fuse
8. Starter relay
9. Starter motor
10. Battery
11. Starting circuit cut-off relay
12. Sidestand switch
13. Neutral switch
14. Fuel pump
15. Throttle position sensor
16. Intake air pressure sensor
17. O_2 sensor
18. Lean angle sensor
19. Crankshaft position sensor
20. Intake air temperature sensor
21. Coolant temperature sensor
22. ECU (engine control unit)
23. Injector #1
24. Injector #2
25. Injector #3
26. Injector #4
27. Air induction system solenoid
28. ABS motor fuse
29. ABS test terminal
30. ABS ECU
31. Front wheel sensor
32. Rear wheel sensor
33. ABS motor relay
34. Hydraulic unit
35. Cylinder-#1/#4 ignition coil
36. Cylinder-#2/#3 ignition coil
37. Spark plug
38. Meter assembly
39. Immobilizer indicator light
40. Fuel level warning light
41. Oil level warning light
42. Neutral indicator light
43. Tachometer
44. Multi-function meter
45. Engine trouble warning light
46. Coolant temperature warning light
47. High beam indicator light
48. Left turn signal indicator light
49. Right turn signal indicator light
50. Meter light
51. ABS warning light
52. Oil level switch
53. Anti-theft alarm
54. Right handlebar switch
55. Front brake light switch
56. Engine stop switch
57. Start switch
58. Radiator fan motor fuse
59. Radiator fan motor relay
60. Radiator fan motor
61. ABS fuser
62. Signal fuse
63. Headlight fuse
64. Ignition fuse
65. Tail fuse
66. Turn signal relay
67. Rear brake light switch
68. License plate light
69. Tail/brake light
70. Left handlebar switch
71. Clutch switch
72. Pass switch
73. Dimmer switch
74. Hazard switch
75. Turn signal switch
76. Horn switch
77. Horn
78. Headlight relay
79. Auxiliary light
80. Headlight (high beam)
81. Headlight (low beam)
82. Front left turn signal light
83. Front right turn signal light
84. Rear left turn signal light
85. Rear right turn signal light

EAS4S81046

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

YAMAHA MOTOR CO., LTD.
2500 SHINGAI IWATA SHIZUOKA JAPAN

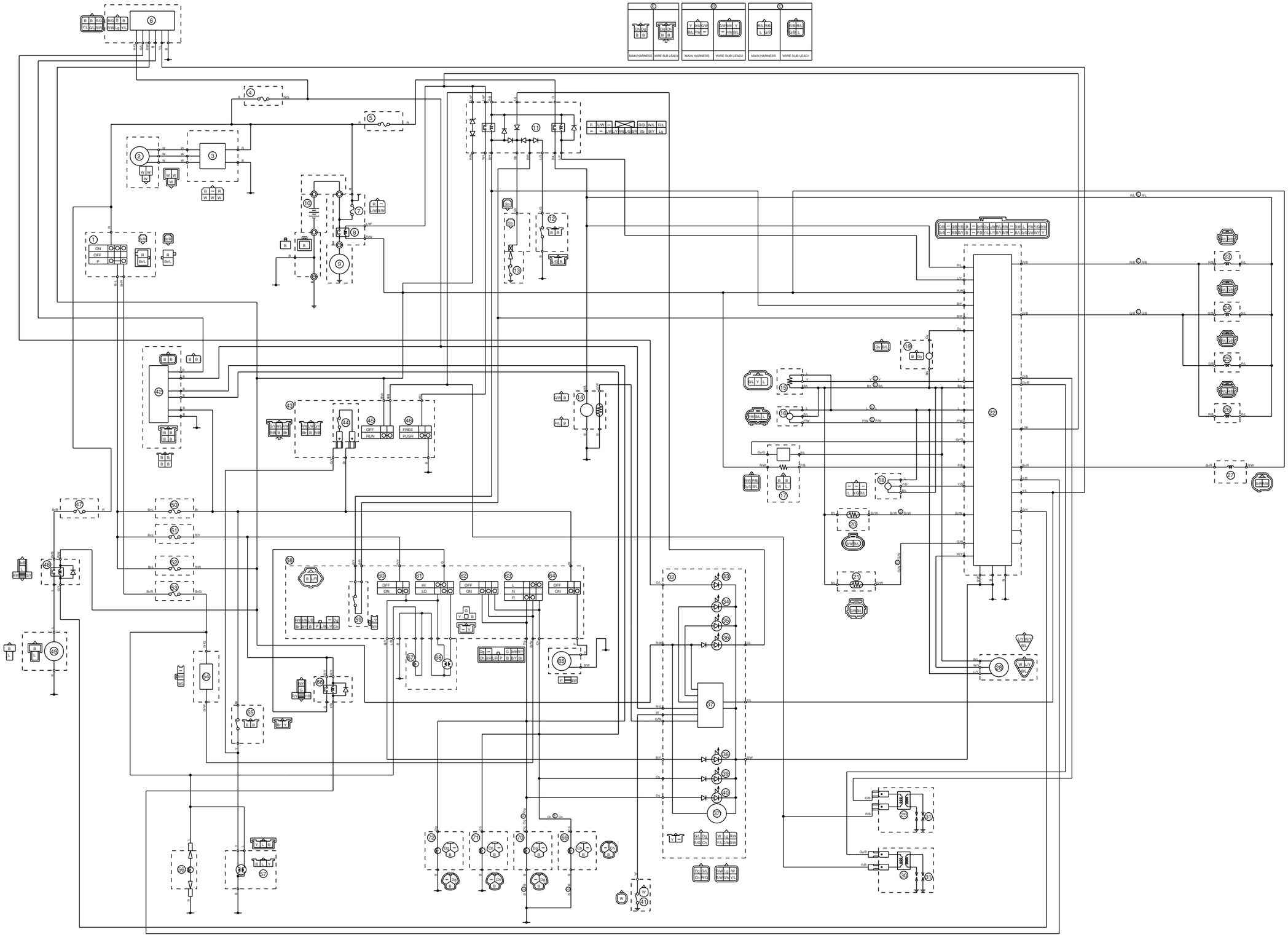
FZ6-N 2007
WIRING DIAGRAM

FZ6-N 2007
SCHEMA DE CABLAGE

FZ6-N 2007
SCHALTPLAN

FZ6-N 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-N 2007



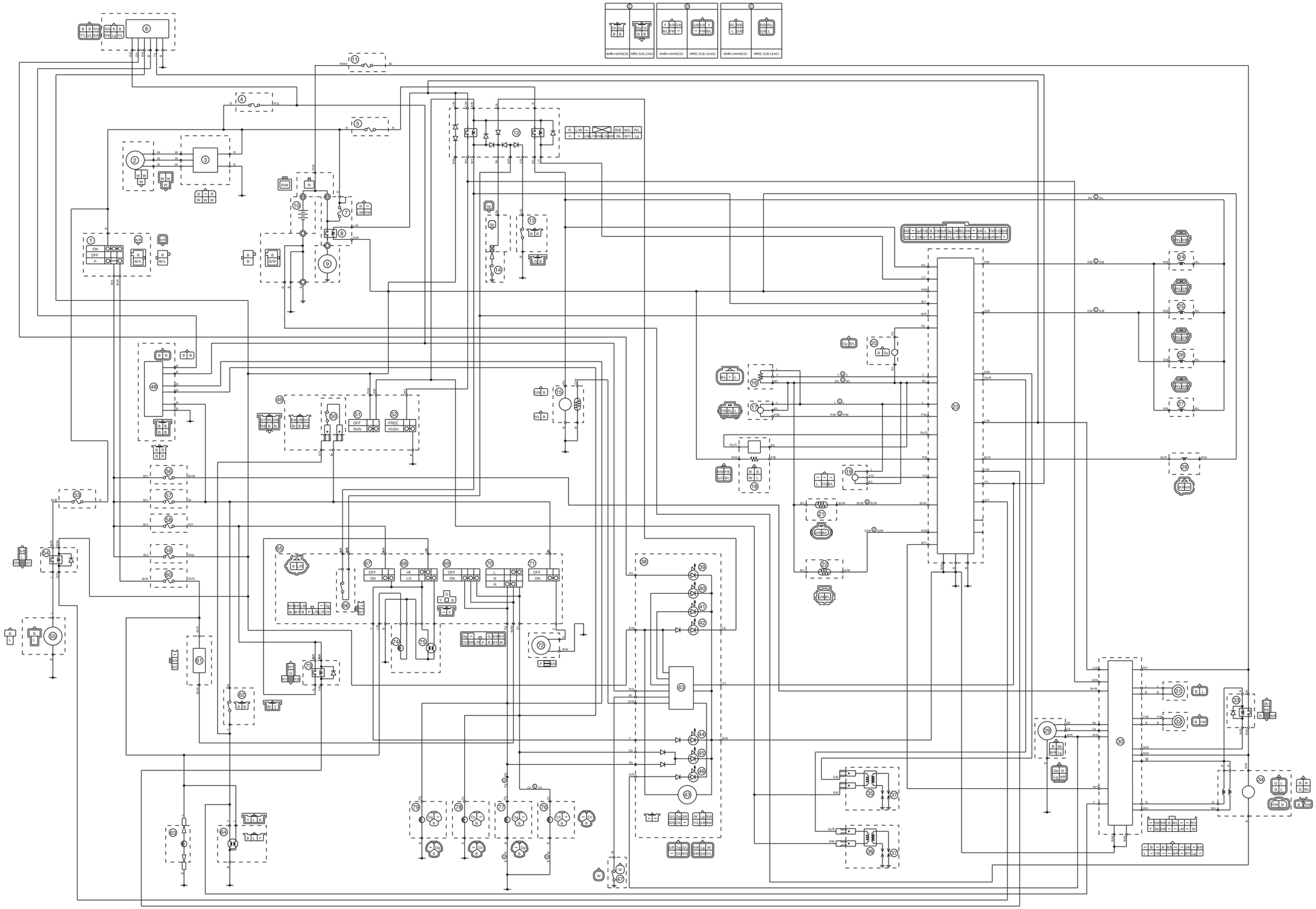
FZ6-NA 2007
WIRING DIAGRAM

FZ6-NA 2007
SCHEMA DE CABLAGE

FZ6-NA 2007
SCHALTPLAN

FZ6-NA 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-NA 2007



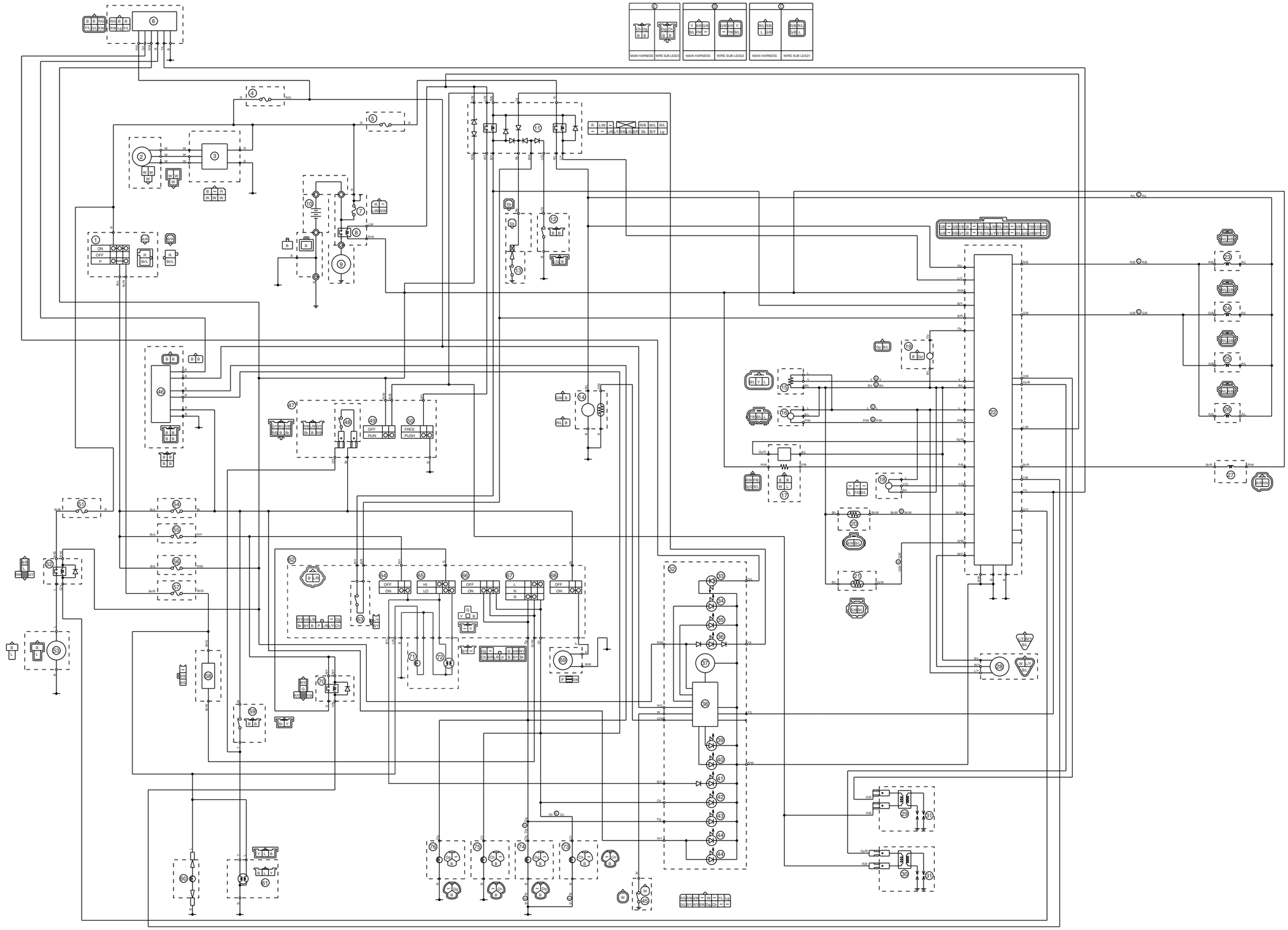
FZ6-NHG(W) 2007
WIRING DIAGRAM

FZ6-NHG(W) 2007
SCHEMA DE CABLAGE

FZ6-NHG(W) 2007
SCHALTPLAN

FZ6-NHG(W) 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-NHG(W) 2007



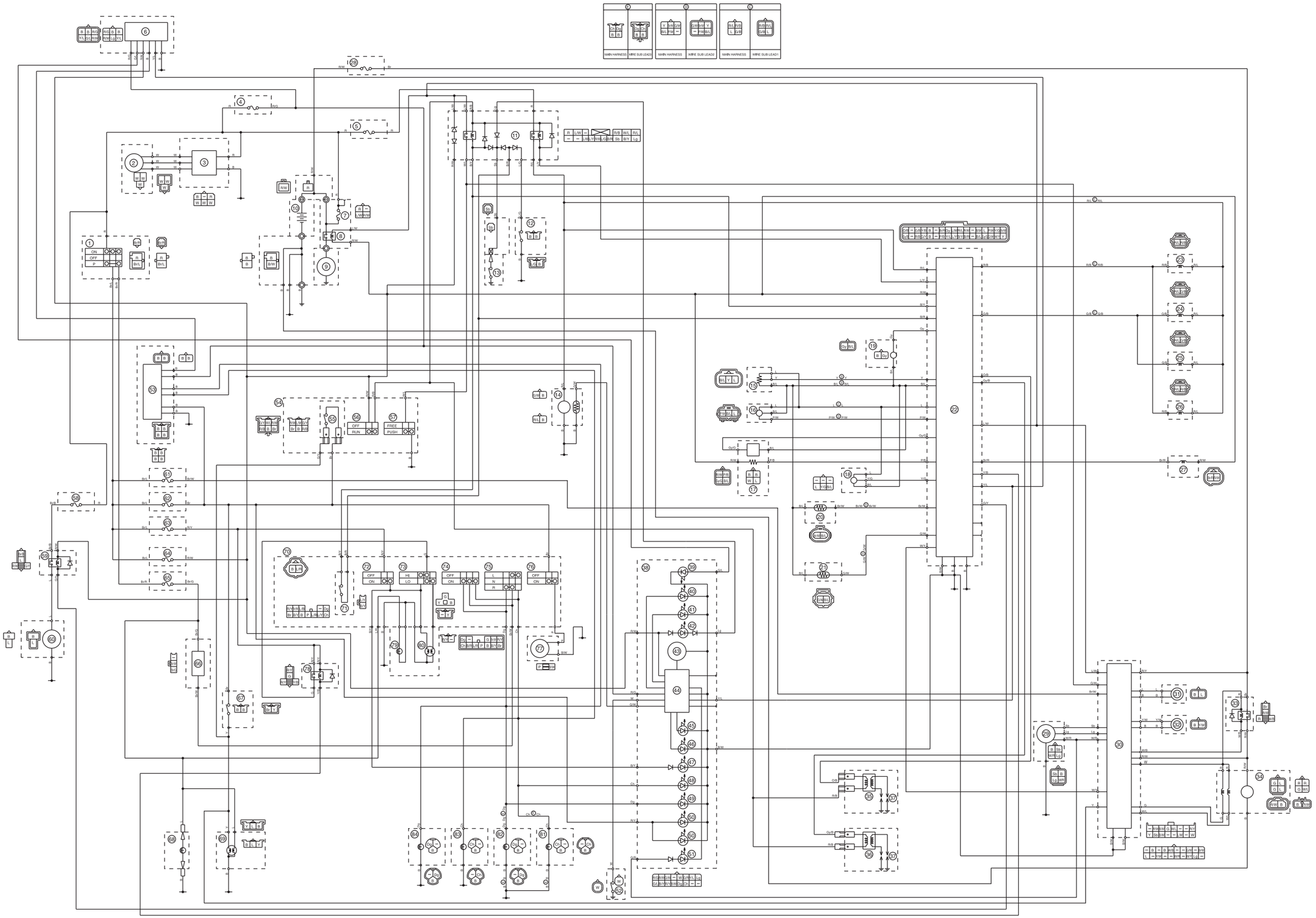
FZ6-NAHG 2007
WIRING DIAGRAM

FZ6-NAHG 2007
SCHEMA DE CABLAGE

FZ6-NAHG 2007
SCHALTPLAN

FZ6-NAHG 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-NAHG 2007



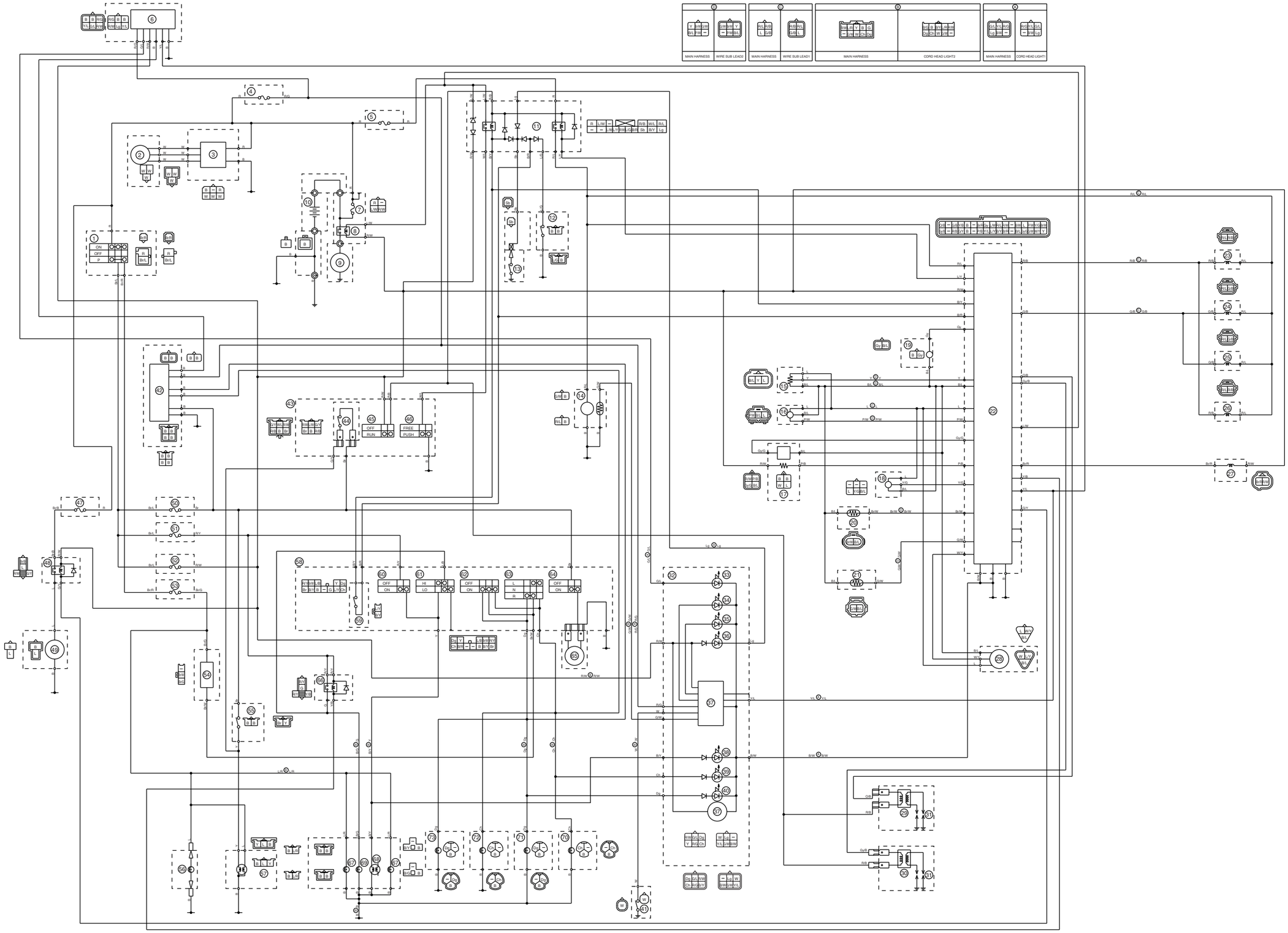
FZ6-S 2007
WIRING DIAGRAM

FZ6-S 2007
SCHEMA DE CABLAGE

FZ6-S 2007
SCHALTPLAN

FZ6-S 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-S 2007



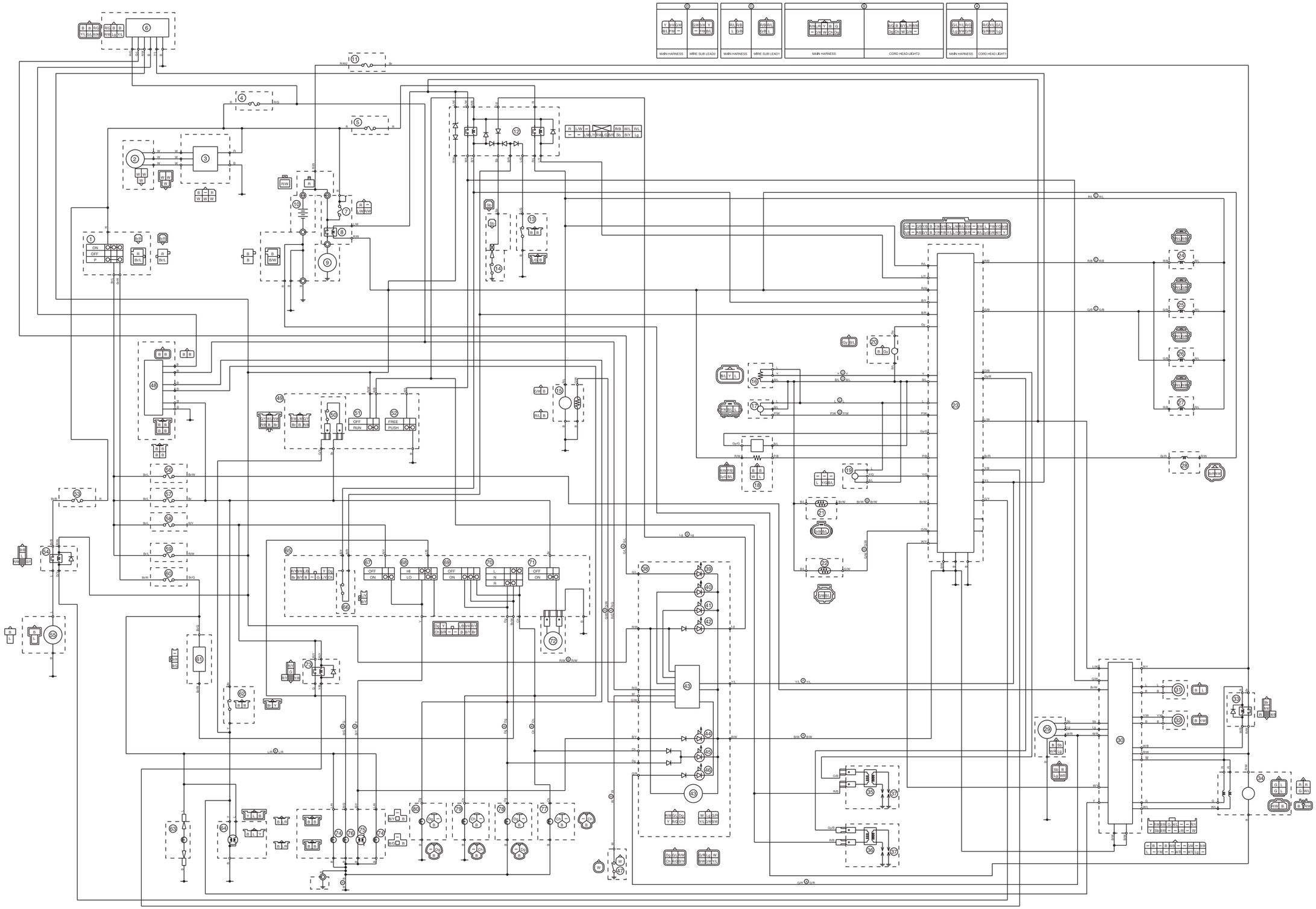
FZ6-SA 2007
WIRING DIAGRAM

FZ6-SA 2007
SCHEMA DE CABLAGE

FZ6-SA 2007
SCHALTPLAN

FZ6-SA 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-SA 2007



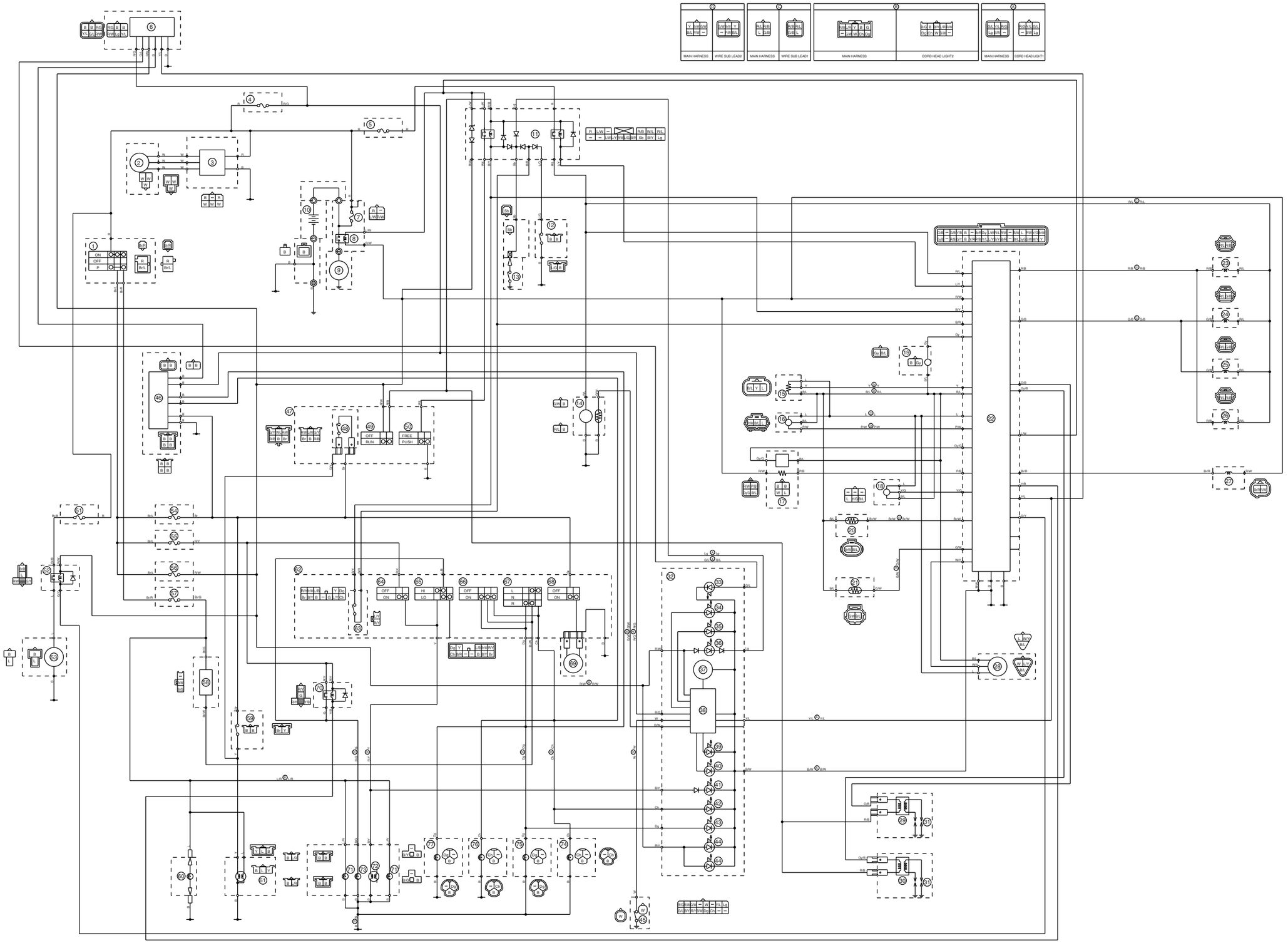
FZ6-SHG(W) 2007
WIRING DIAGRAM

FZ6-SHG(W) 2007
SCHEMA DE CABLAGE

FZ6-SHG(W) 2007
SCHALTPLAN

FZ6-SHG(W) 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-SHG(W) 2007



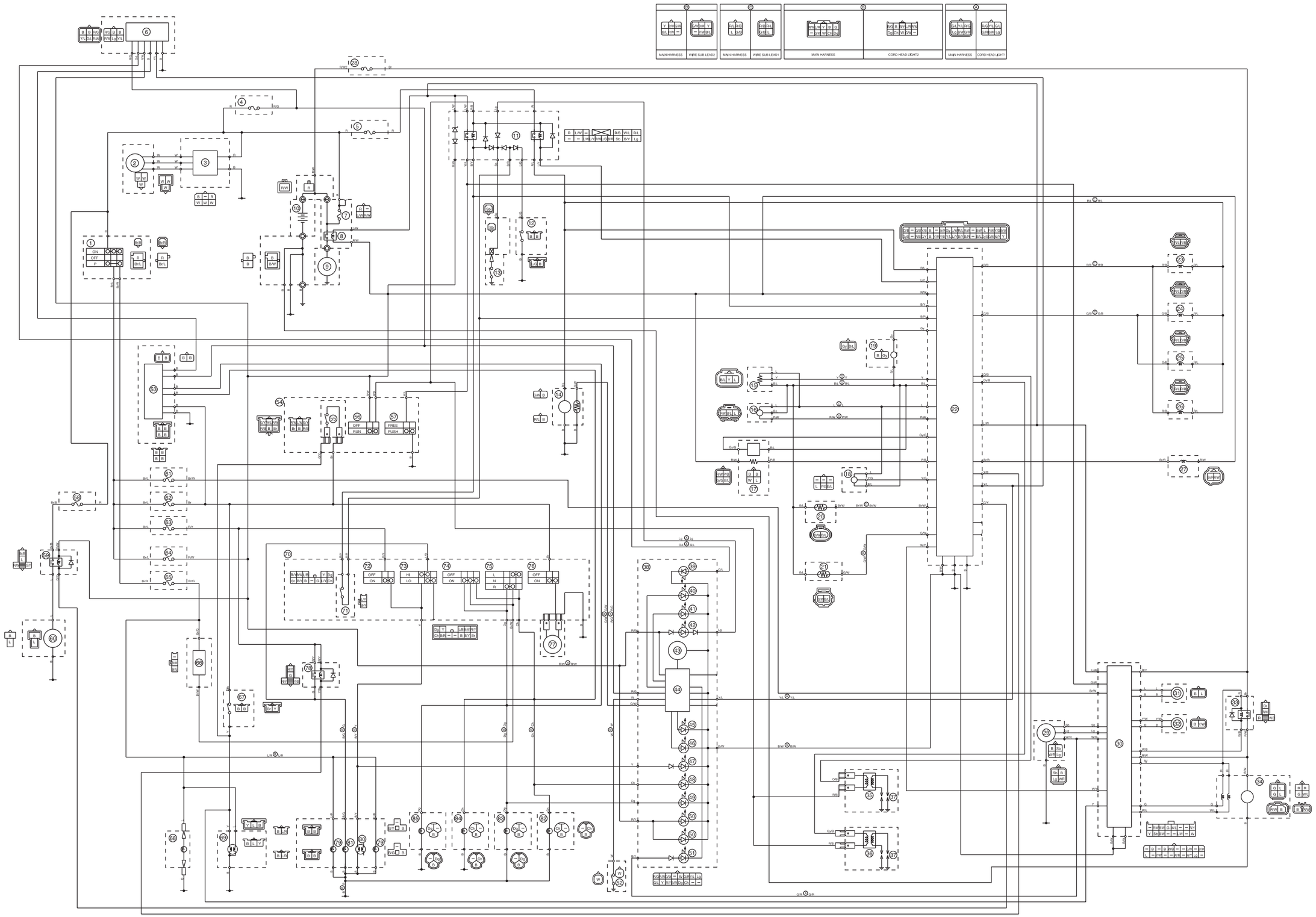
FZ6-SAHG 2007
WIRING DIAGRAM

FZ6-SAHG 2007
SCHEMA DE CABLAGE

FZ6-SAHG 2007
SCHALTPLAN

FZ6-SAHG 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-SAHG 2007



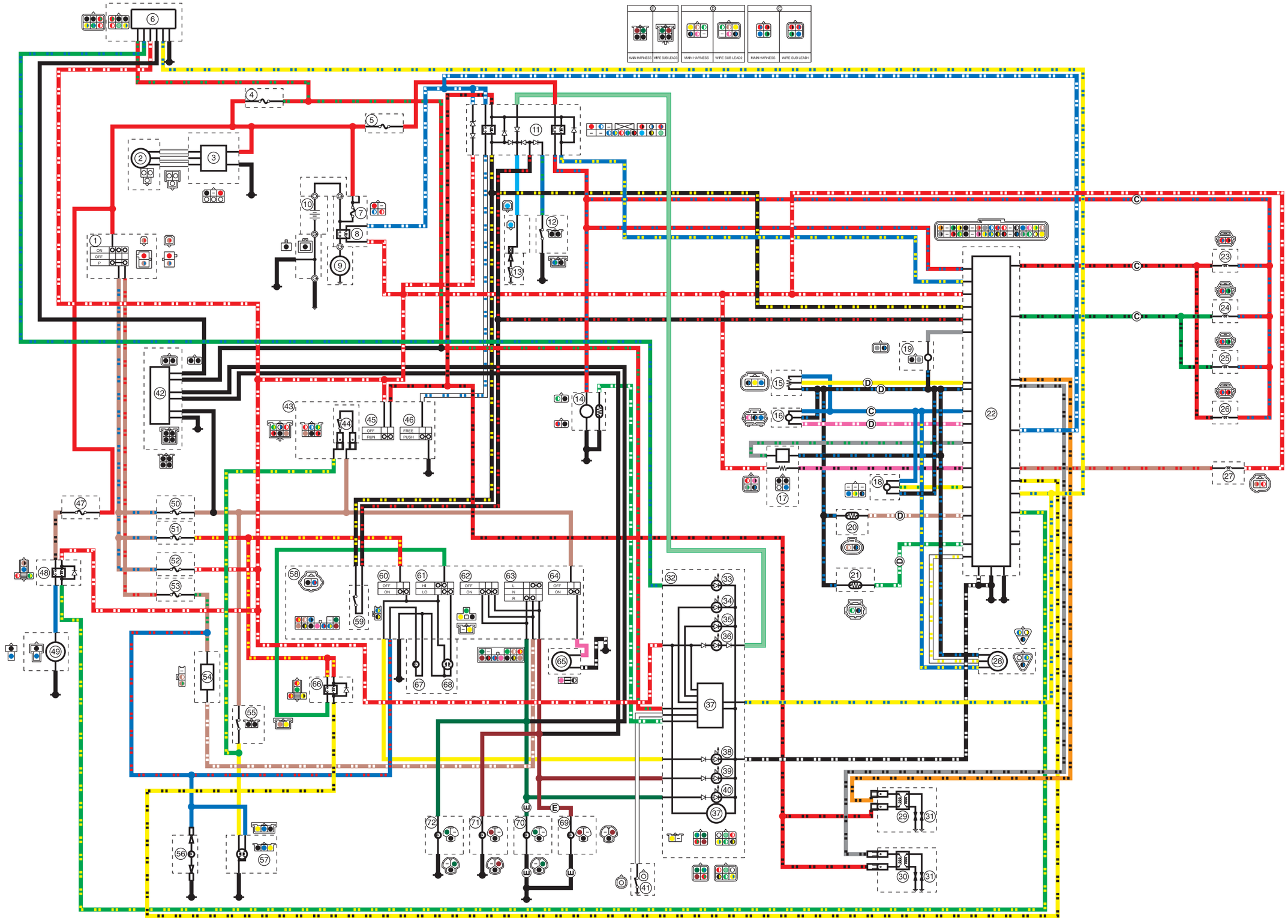
FZ6-N 2007
WIRING DIAGRAM

FZ6-N 2007
SCHEMA DE CABLAGE

FZ6-N 2007
SCHALTPLAN

FZ6-N 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-N 2007



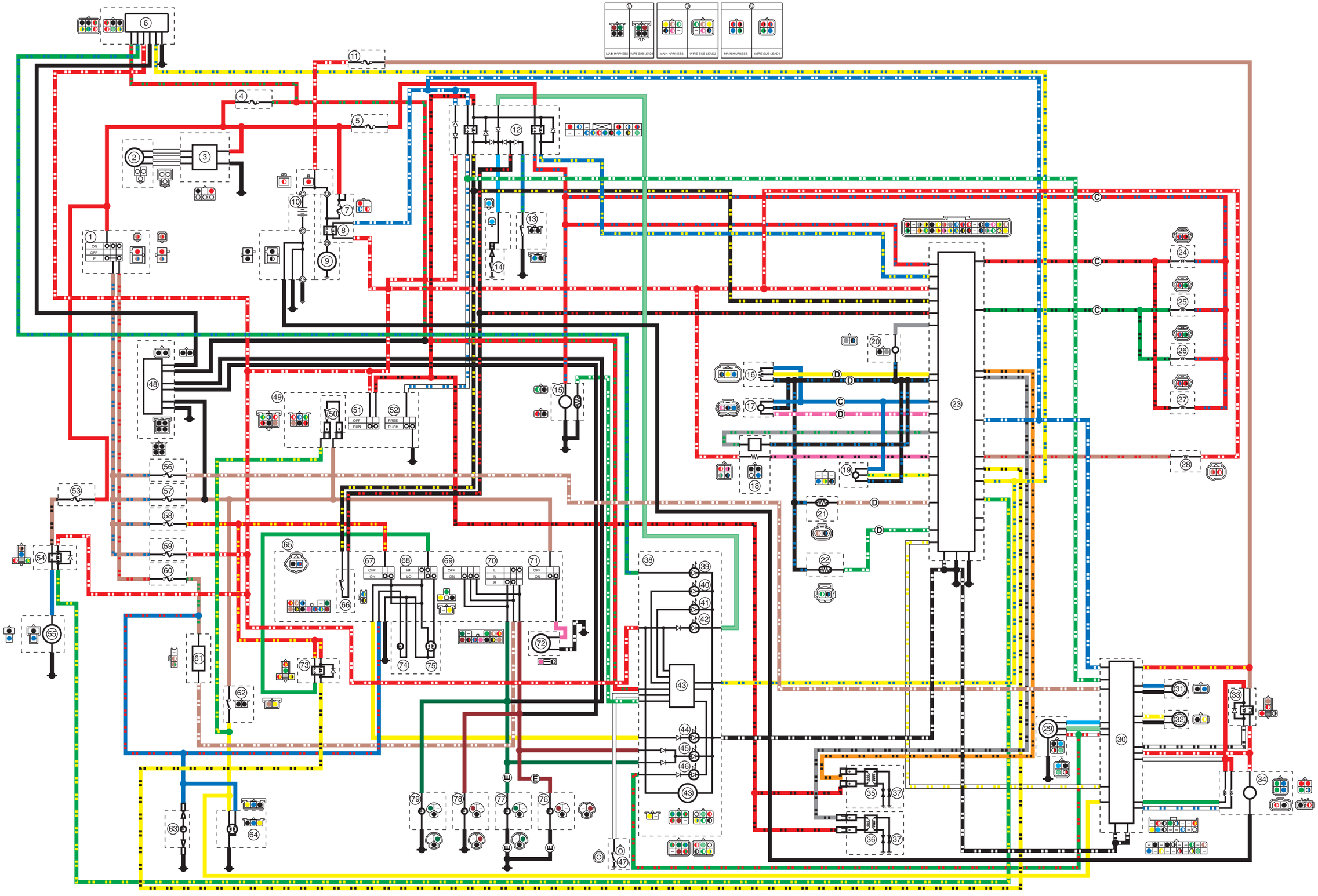
FZ6-NA 2007
WIRING DIAGRAM

FZ6-NA 2007
SCHEMA DE CABLAGE

FZ6-NA 2007
SCHALTPLAN

FZ6-NA 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-NA 2007



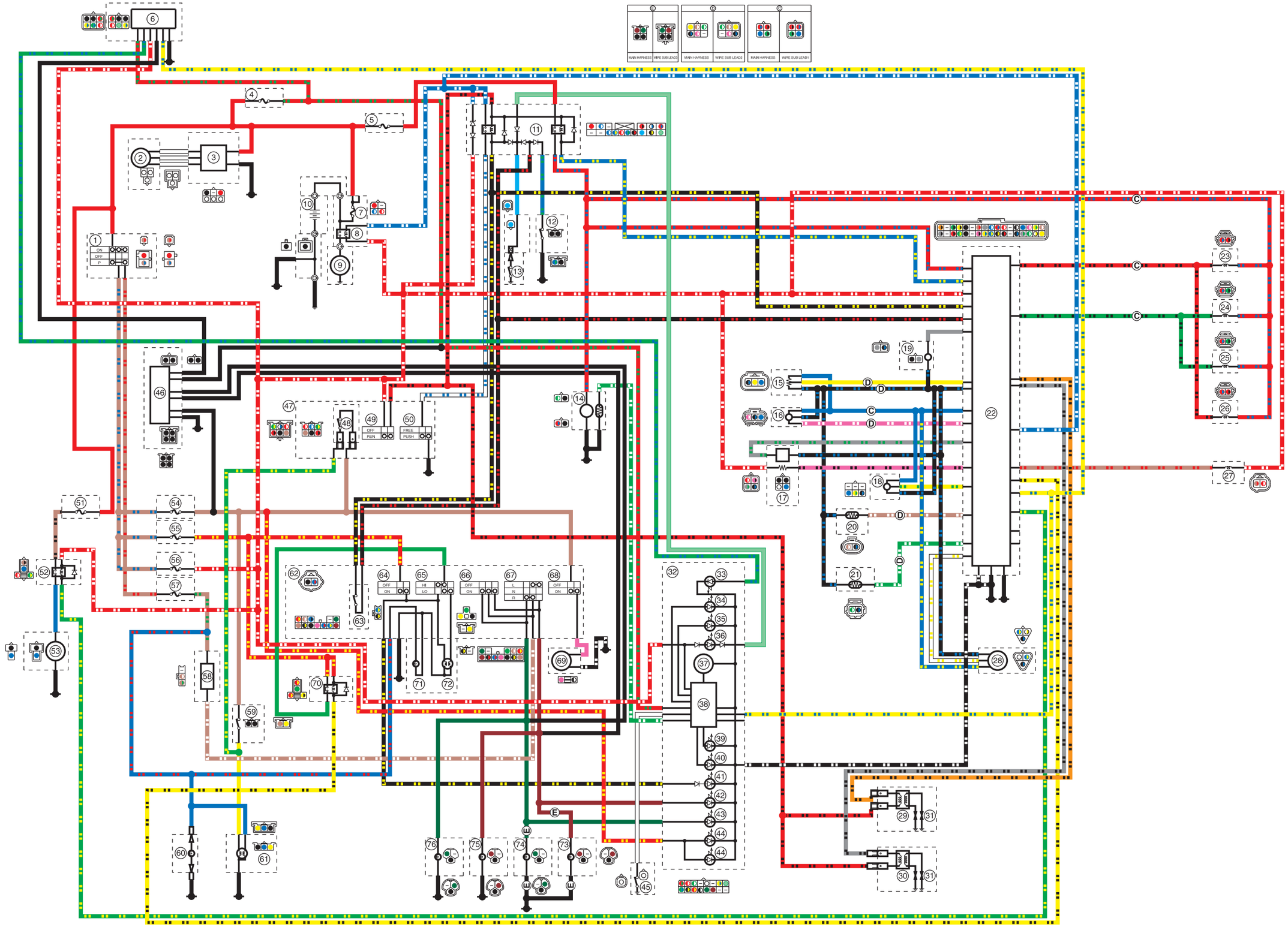
FZ6-NHG(W) 2007
WIRING DIAGRAM

FZ6-NHG(W) 2007
SCHEMA DE CABLAGE

FZ6-NHG(W) 2007
SCHALTPLAN

FZ6-NHG(W) 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-NHG(W) 2007



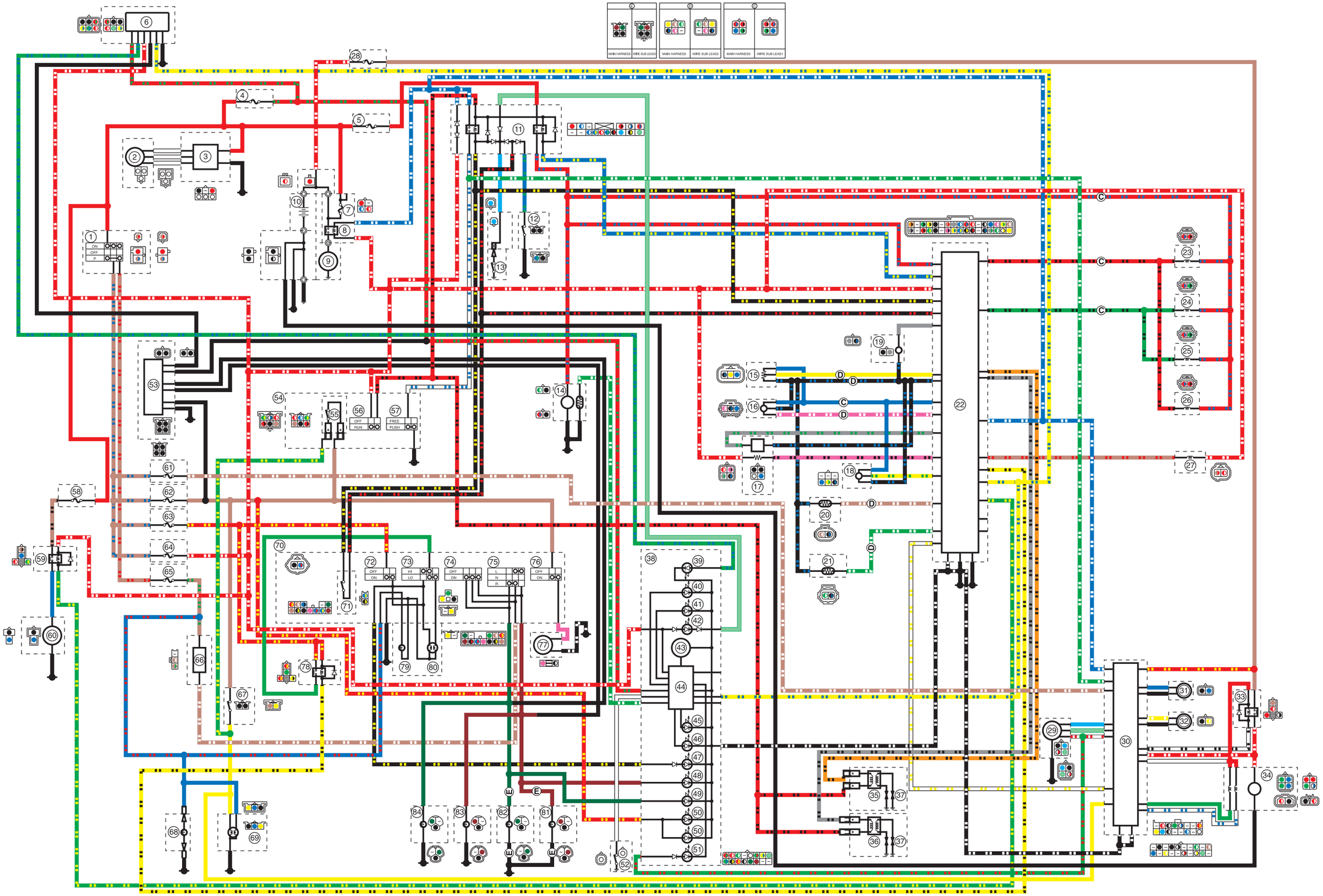
FZ6-NAHG 2007
WIRING DIAGRAM

FZ6-NAHG 2007
SCHEMA DE CABLAGE

FZ6-NAHG 2007
SCHALTPLAN

FZ6-NAHG 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-NAHG 2007



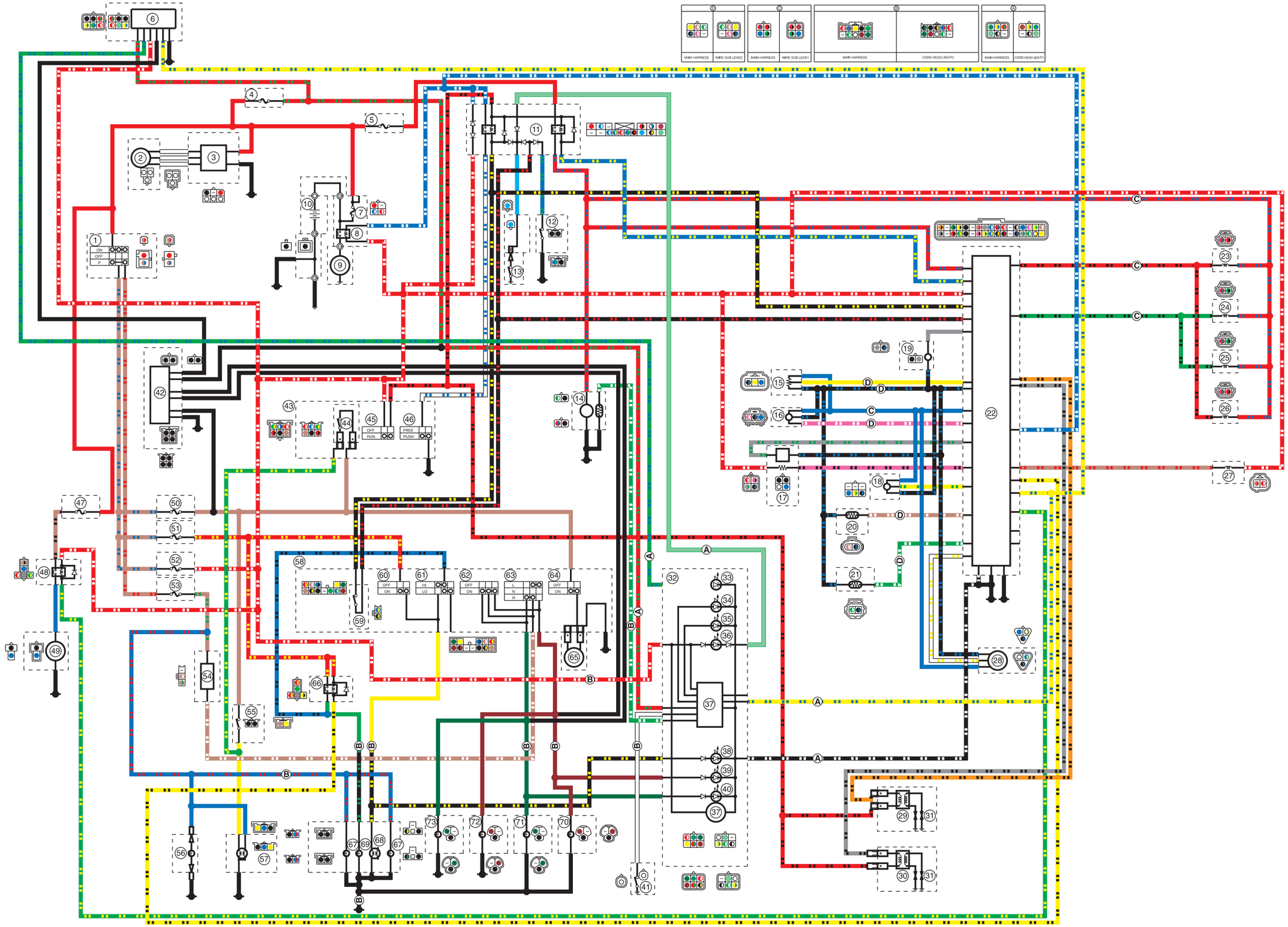
FZ6-S 2007
WIRING DIAGRAM

FZ6-S 2007
SCHEMA DE CABLAGE

FZ6-S 2007
SCHALTPLAN

FZ6-S 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-S 2007



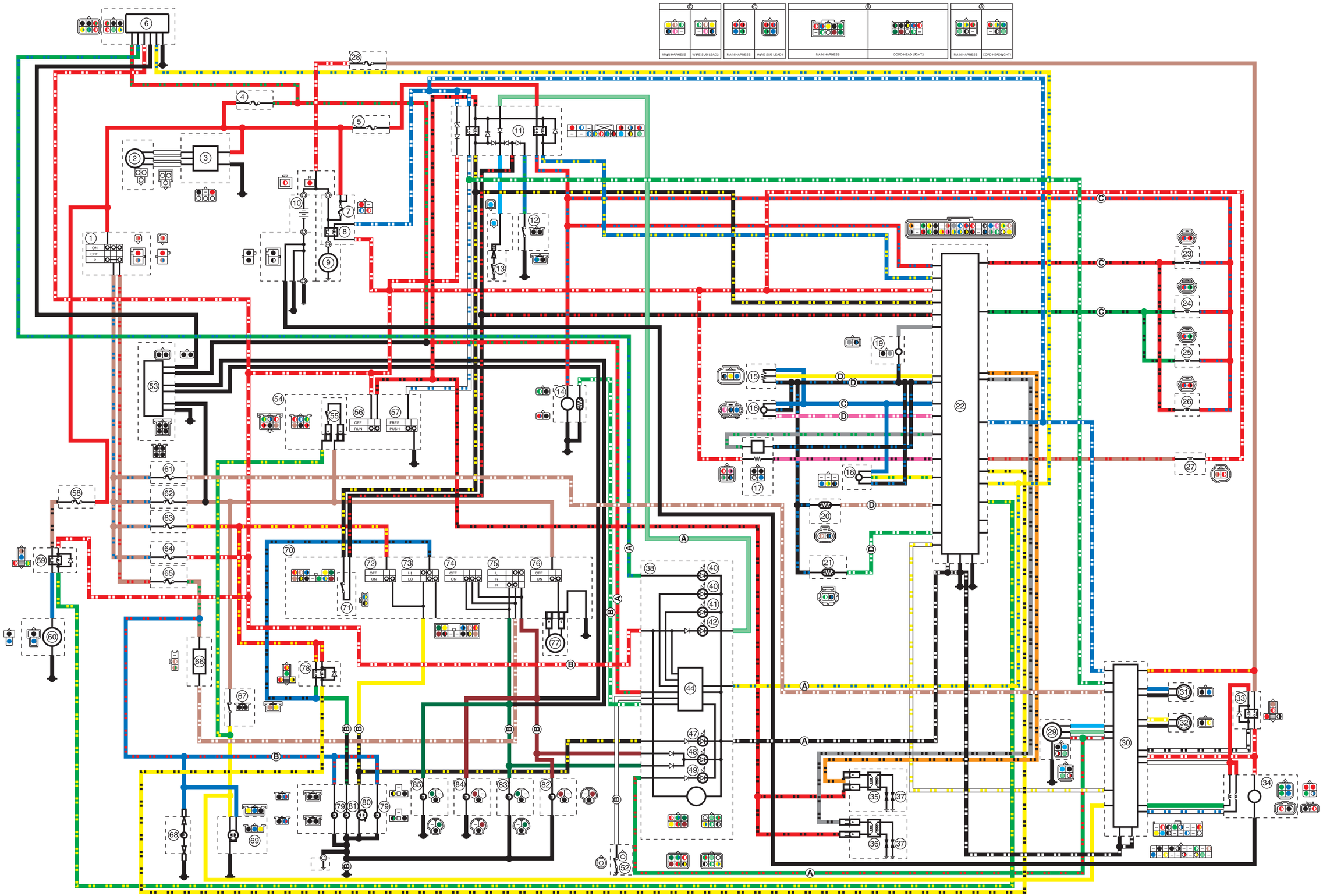
FZ6-SA 2007
WIRING DIAGRAM

FZ6-SA 2007
SCHEMA DE CABLAGE

FZ6-SA 2007
SCHALTPLAN

FZ6-SA 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-SA 2007



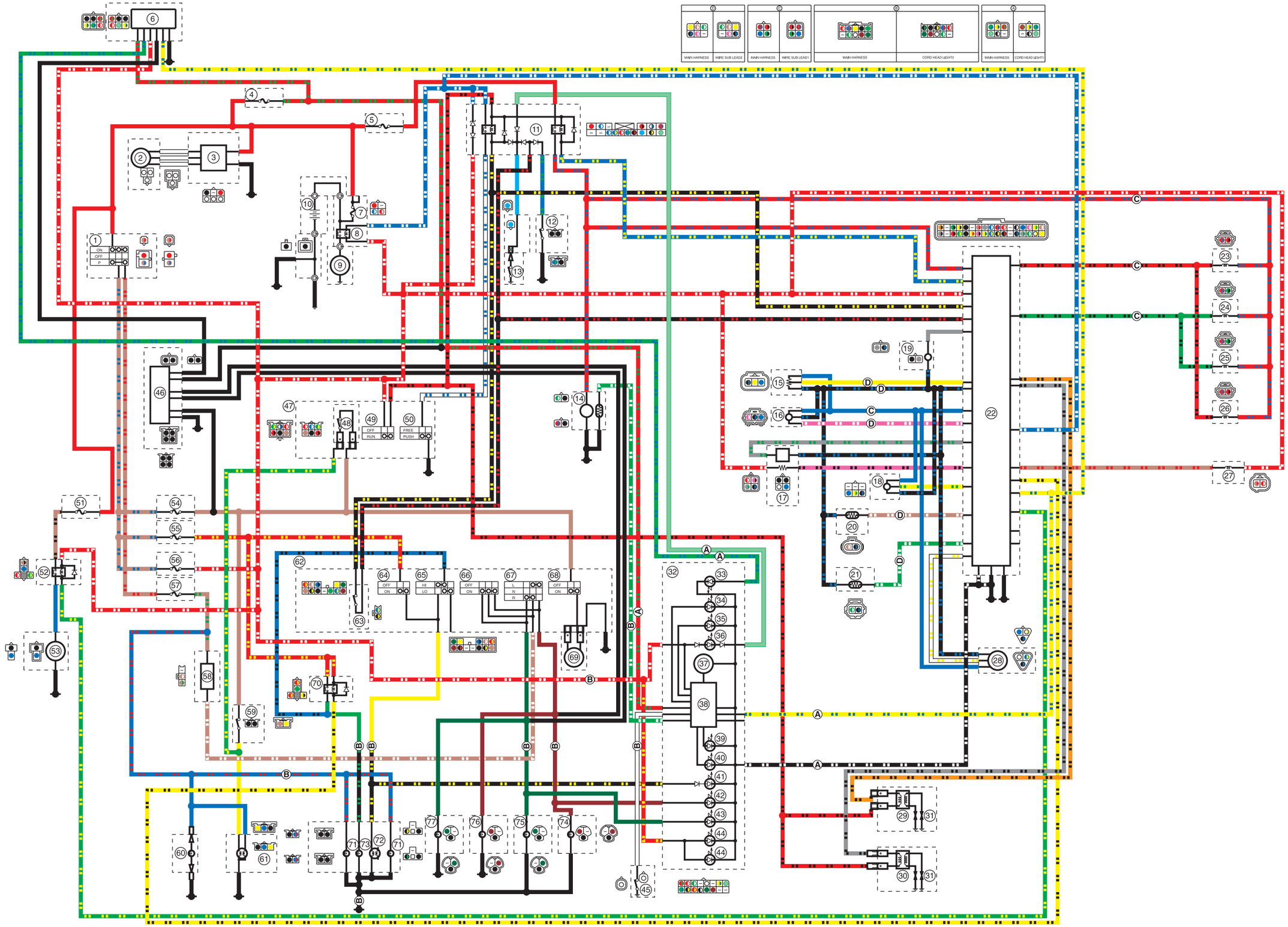
FZ6-SHG(W) 2007
WIRING DIAGRAM

FZ6-SHG(W) 2007
SCHEMA DE CABLAGE

FZ6-SHG(W) 2007
SCHALTPLAN

FZ6-SHG(W) 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-SHG(W) 2007



FZ6-SAHG 2007
WIRING DIAGRAM

FZ6-SAHG 2007
SCHEMA DE CABLAGE

FZ6-SAHG 2007
SCHALTPLAN

FZ6-SAHG 2007
SCHEMA ELETTRICO

DIAGRAMA DE CONEXIONES
DE FZ6-SAHG 2007