YAMAHA 2019

SUPPLEMENTARY SERVICE MANUAL

YZF-R15A

YZF155A

B9E-F8197-E0

FOREWARD

This supplementary service manual has been prepared to introduce new service and data for the YZF-R15A 2019. For complete service information procedures it is necessary to use this Supplementary Service Manual together with the following manual.

YZF-R15 2018 SERVICE MANUAL : BK7-F8197-E0

EAS00000

YZF-R15A
SUPPLEMENTARY SERVICE MANUAL

First edition, January 2019

EAS200071

IMPORTANT

This manual was produced by the India Yamaha Motor Pvt. 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.

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

TIP

Designs and specifications are subject to change without notice.

EAS20081

IMPORTANT MANUAL INFORMATION

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

⚠	**This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**

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

NOTICE	**A NOTICE indicates special precautions that must be taken to avoid damage to the vehicle or other property.**

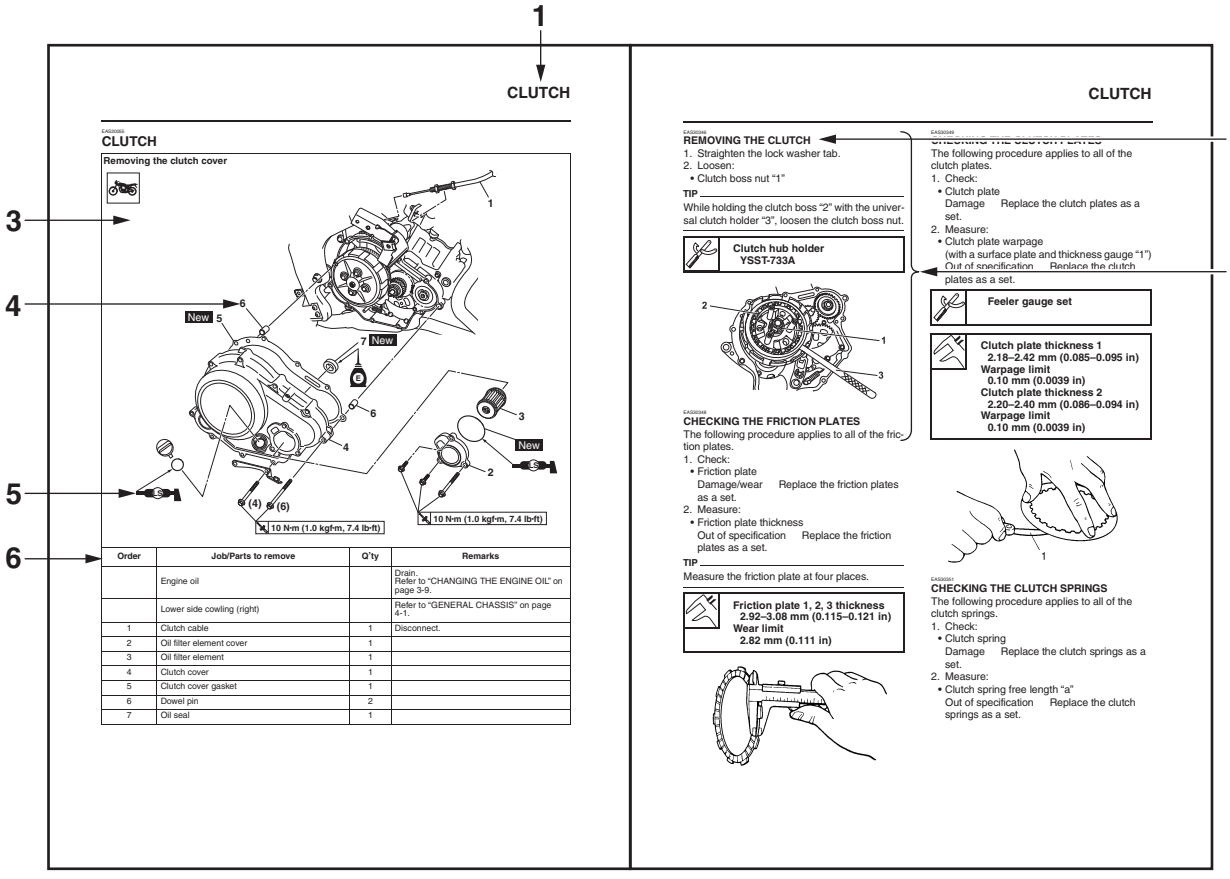
TIP	A TIP provides key information to make procedures easier or clearer.

EAS20004

HOW TO USE THIS MANUAL

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

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



EAS20005
SYMBOLS

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

TIP

The following symbols are not relevant to every vehicle.

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

EAS10003

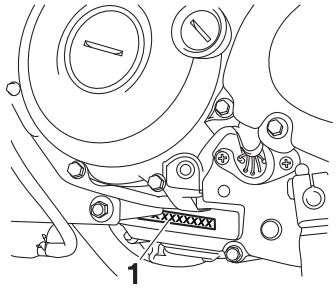
TABLE OF CONTENTS

GENERAL INFORMATION

EAS20007
IDENTIFICATION

EAS30002
VEHICLE IDENTIFICATION NUMBER
The vehicle identification number “1” is stamped into the steering head pipe.

EAS30004
ENGINE SERIAL NUMBER
The engine serial number “1” is stamped into the crankcase.

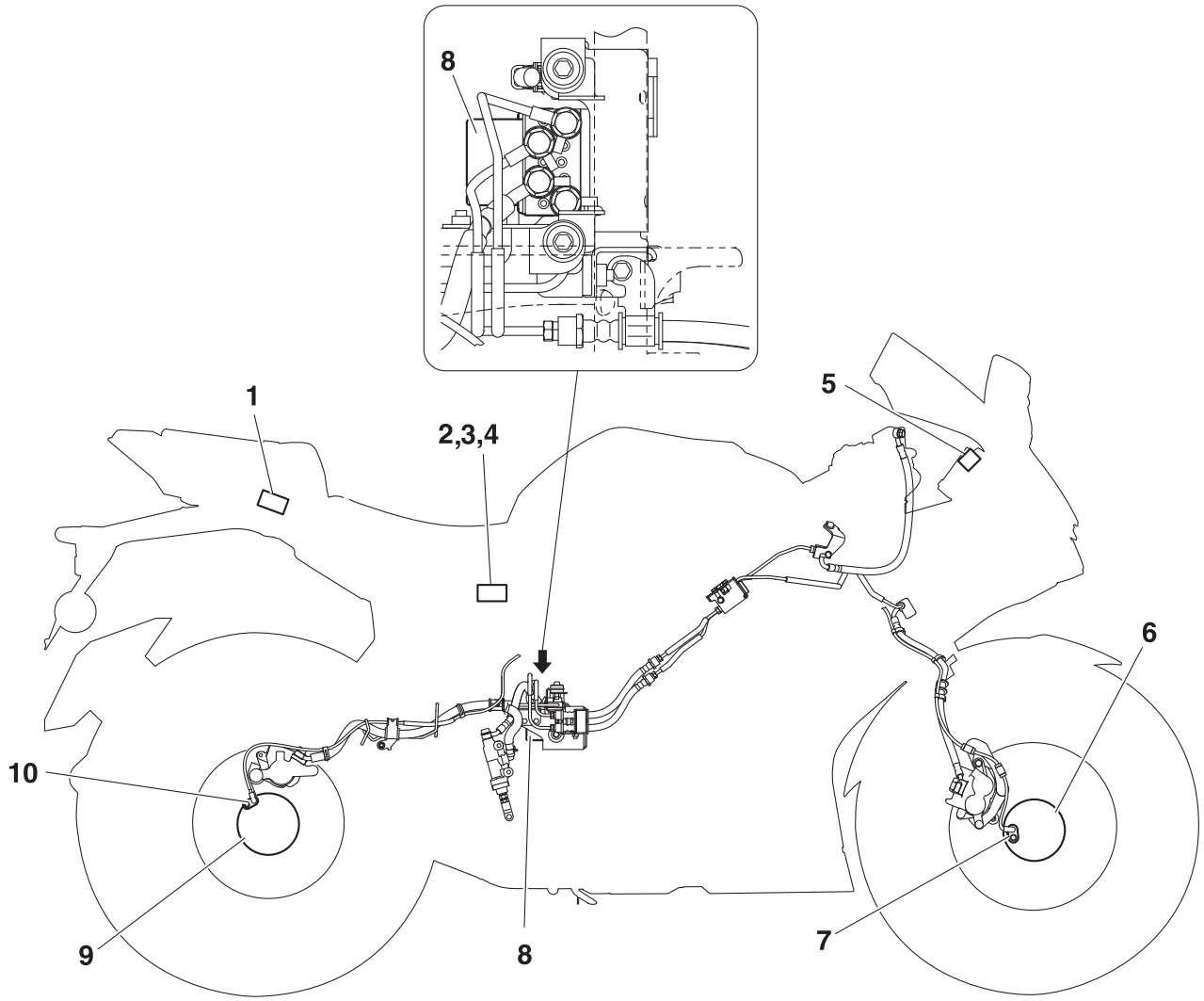


EAS20008
FEATURES

EAS30683
OUTLINE OF THE ABS

1. The Yamaha ABS (anti-lock brake system) features an 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 assembly, which is the main component of the ABS, is centrally located on the vehicle to increase mass centralization.

ABS layout



1. ABS test coupler
2. ABS control unit fuse
3. ABS solenoid fuse
4. ABS motor fuse
5. ABS warning light
6. Front wheel sensor rotor
7. Front wheel sensor
8. Hydraulic unit assembly
9. Rear wheel sensor rotor
10. Rear wheel sensor

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 braking, hydraulic control is performed by the hydraulic system on the front and rear brakes independently.

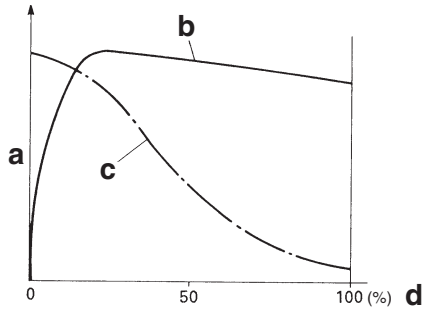
Useful terms

- 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.
  Slip ratio = (Chassis speed – Wheel speed)/Chassis speed × 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

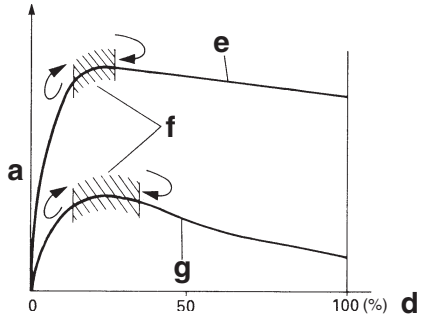
When the brake pressure is increased, wheel speed is reduced. Slipping occurs between the tire and the road surface and brake force is generated. The limit of this brake force is determined by the friction force between the tire and the road surface and is closely related to wheel slippage. Wheel slippage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



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

B



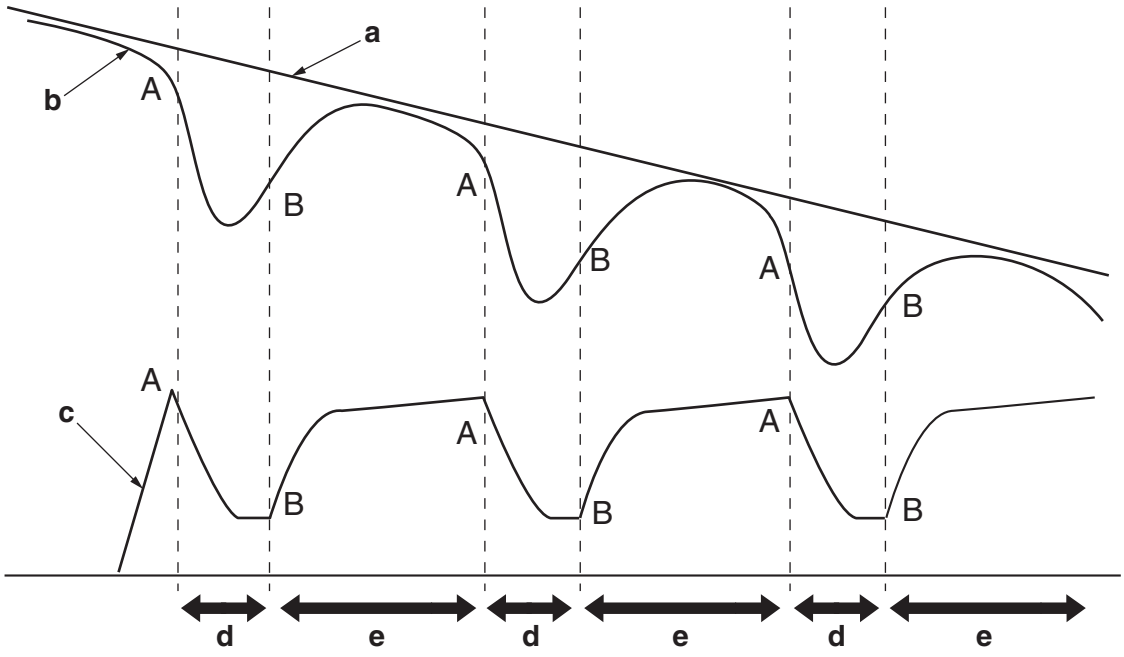
e. Less slippery road surface
f. Controlling zone
g. Slippery road surface

Wheel slip and hydraulic control

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

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

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



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

ABS operation and vehicle control

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

TIP

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

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

EWA16510

⚠ WARNING

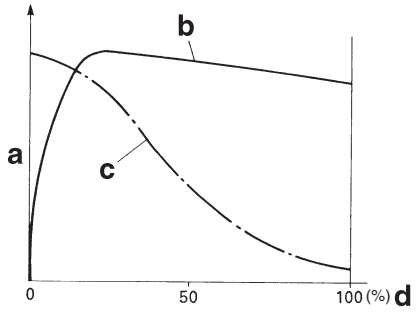
The braking of the vehicle, even in the worst case, is principally executed when the vehicle is advancing straight ahead. During a turn, sudden braking is liable to cause a loss of traction of the tires. Even in vehicles equipped with ABS, overturning of the vehicle cannot be prevented if it is braked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

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

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.

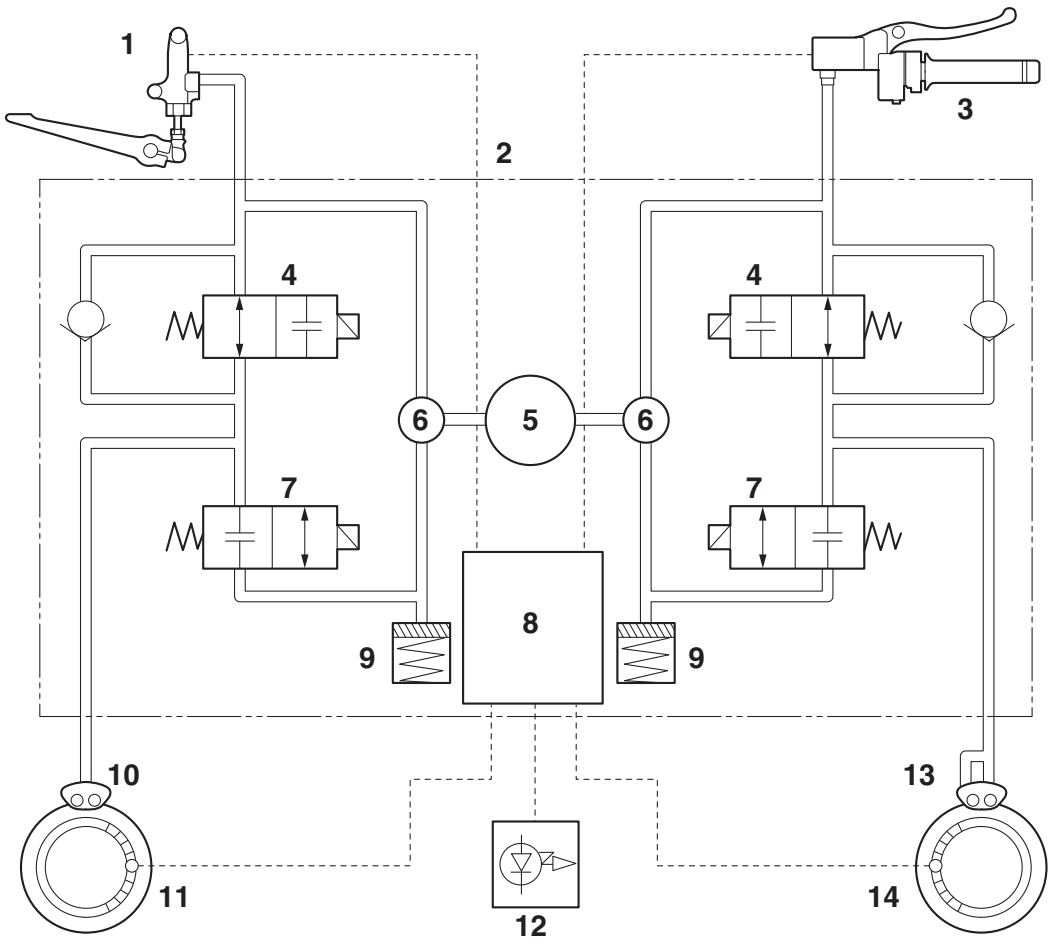


a. Friction force between the tire and road surface
b. Brake force
c. Side force
d. Slip ratio

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 fault 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 assembly
3. Front brake master cylinder
4. Inlet solenoid valve
5. ABS motor
6. Hydraulic pump
7. Outlet solenoid valve
8. ABS ECU
9. Buffer chamber
10. Rear brake caliper
11. Rear wheel sensor
12. ABS warning light
13. Front brake caliper
14. Front wheel sensor

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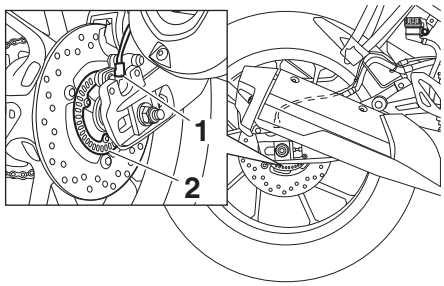
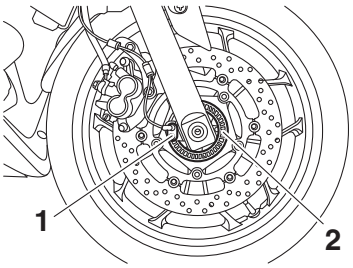
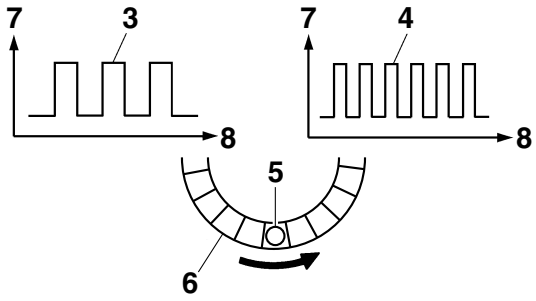
ABS COMPONENT FUNCTIONS

Wheel sensors and wheel sensor rotors

Wheel sensors “1” detect the wheel speed and transmit the rotation signal to the ABS ECU.
Each wheel sensor is composed of a permanent magnet and a hall IC. The sensor rotors “2” rotate with the wheels. The sensor rotors “2” have 40 slots and are installed close to the wheel sensors. As the sensor rotor rotates, the hall element in the hall IC installed in the wheel sensor generates pulses. The pulse frequency, which is proportional to the wheel speed, is converted into a wave in the hall IC so that it can be output.
The ABS ECU calculates the wheel rotation speed by detecting the pulse frequency.







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

ABS warning light

The ABS warning light "1" comes on to warn the rider if a malfunction in the ABS occurs.
When the main switch is turned to "ON", the ABS warning light comes on to check the electrical circuit and the system function (ABS self-diagnosis), and goes off when the vehicle is operated (the function check is properly completed at a speed of about 10 km/h (6.3 mi/h)).

TIP

After all checks and servicing are completed, the ABS warning light will go off when the vehicle is ridden or pushed at a speed of 10 km/h (6.3 mi/h) or faster.

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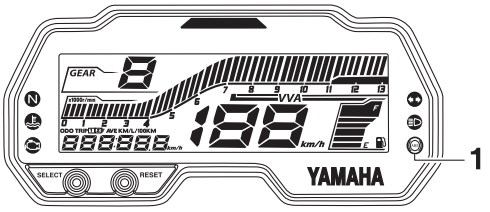
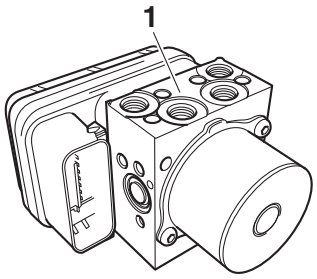
NOTICE

If the rear wheel is raced with the vehicle on a 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 goes off after the vehicle starts off. If the fault codes are not deleted, the ABS warning light goes off after the vehicle is ridden at a speed of about 30 km/h (19 mi/h).



Hydraulic unit assembly

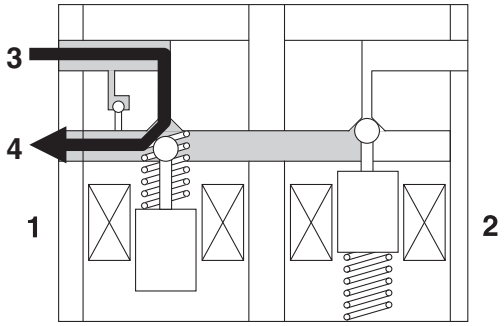
The hydraulic unit assembly "1" is composed of hydraulic control valves (each with a outlet solenoid valve and inlet solenoid valve), buffer chambers, hydraulic pumps, an ABS motor, and ABS ECU. The hydraulic unit adjusts the front and rear wheel brake fluid pressure to control the wheel speed according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



Hydraulic control valve

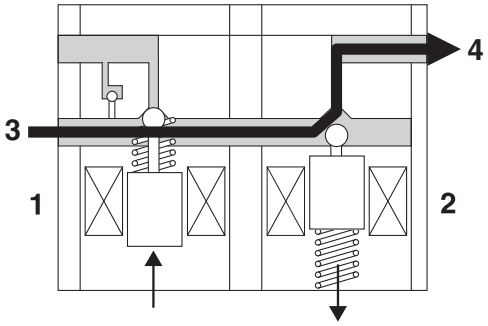
The hydraulic control valve is composed of a inlet solenoid valve and outlet solenoid valve.
The electromagnetic force generated in the inlet solenoid valve varies proportionally with the duty cycle control voltage that is supplied to it. Since this voltage is continuously variable, the solenoid valve moves smoothly and the hydraulic pressure is adjusted linearly.

1. When the brakes are operated normally, the inlet solenoid valve "1" is open and the outlet solenoid valve "2" is closed. The brake line between the brake master cylinder and brake caliper is open.



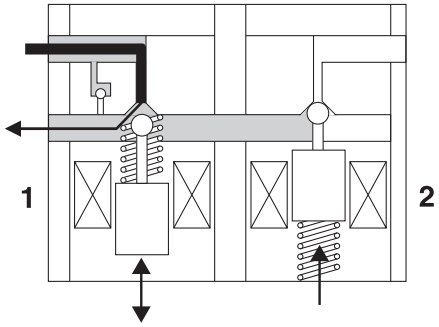
3. Brake master cylinder
4. Brake caliper

2. When the ABS is activated, the inlet solenoid valve "1" closes and the outlet solenoid valve "2" opens using the power supplied from the ABS ECU signals. This reduces the hydraulic pressure.

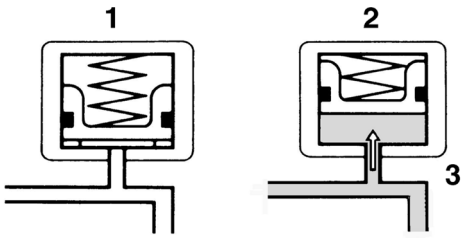


3. Brake caliper
4. ABS motor

3. When the ABS ECU sends a signal to stop reducing the hydraulic pressure, the outlet solenoid valve "2" closes and the brake fluid is pressurized again. The inlet solenoid valve "1" controls the hydraulic pressure difference between the brake fluid in the upper brake lines (brake master cylinder side) and the brake fluid in the lower brake lines (brake caliper side).

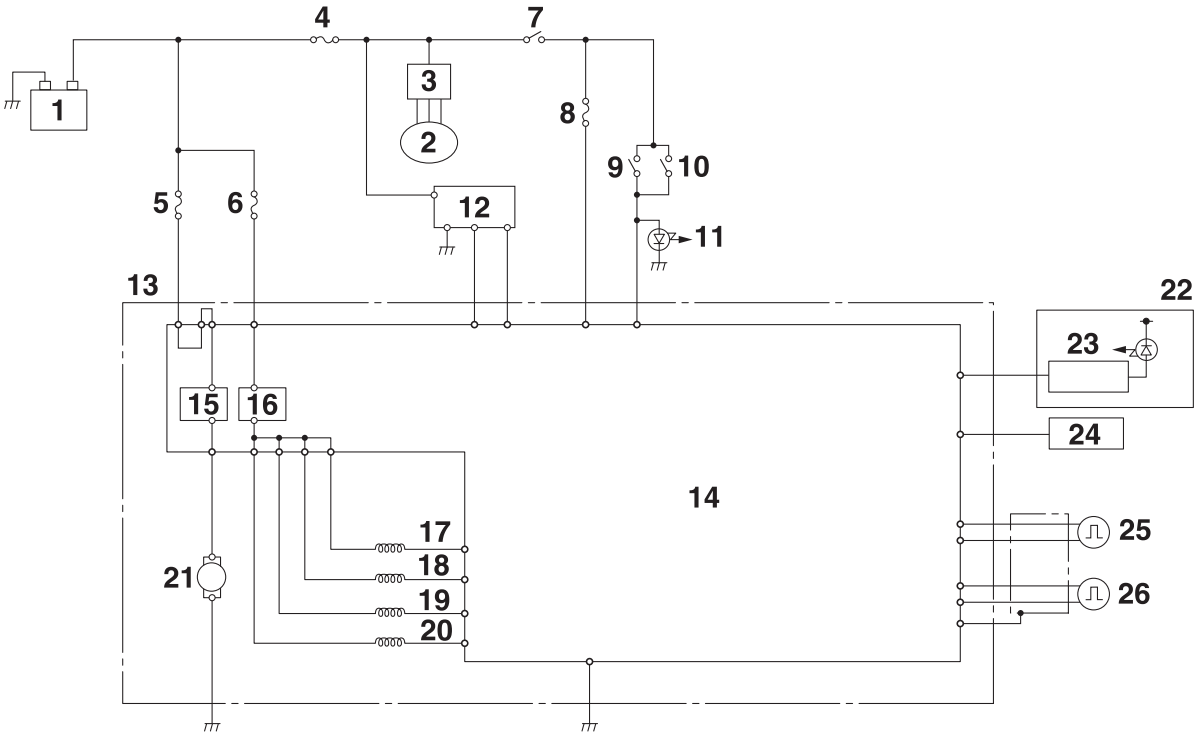


Buffer chamber
The buffer chamber accumulates the brake fluid that is depressurized while the ABS is operating.



1. Buffer chamber (pressurizing phase)
2. Buffer chamber (depressurizing phase)
3. Raised piston

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



1. Battery
2. AC magneto
3. Rectifier/regulator
4. Main fuse
5. ABS motor fuse
6. ABS solenoid fuse
7. Main switch
8. ABS control unit fuse
9. Rear brake light switch
10. Front brake light switch
11. Tail/brake light
12. ABS test coupler
13. Hydraulic unit assembly
14. ABS ECU
15. ABS motor relay
16. Solenoid relay
17. Front brake outlet solenoid
18. Front brake inlet solenoid
19. Rear brake outlet solenoid
20. Rear brake inlet solenoid
21. ABS motor
22. Meter assembly
23. ABS warning light
24. ECU (Engine Control Unit)
25. Front wheel sensor
26. Rear wheel sensor

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

ABS control operation

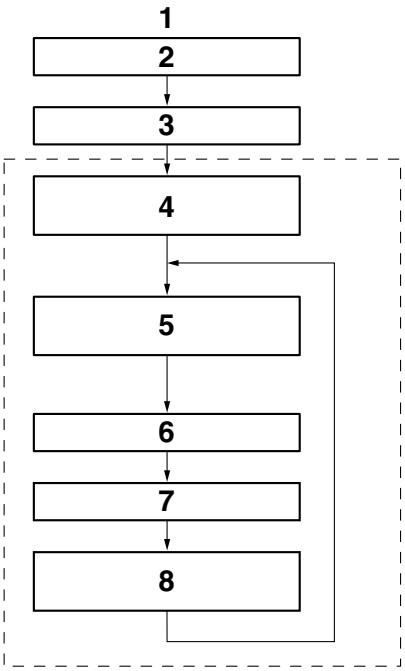
The ABS control operation performed in the ABS ECU is divided into the following two parts.

- Hydraulic control
- Self-diagnosis

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

TIP

- Some types of malfunctions are not recorded in the memory of the ABS ECU (e.g., a blown ABS control unit fuse).
- The ABS performs a self-diagnosis test for a few seconds each time the vehicle first starts off after the main switch was turned on. During this test, a "clicking" noise can be heard from under the seat, and if the brake lever or brake pedal is even slightly operated, a vibration can be felt at the lever and pedal, but these do not indicate a malfunction.



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

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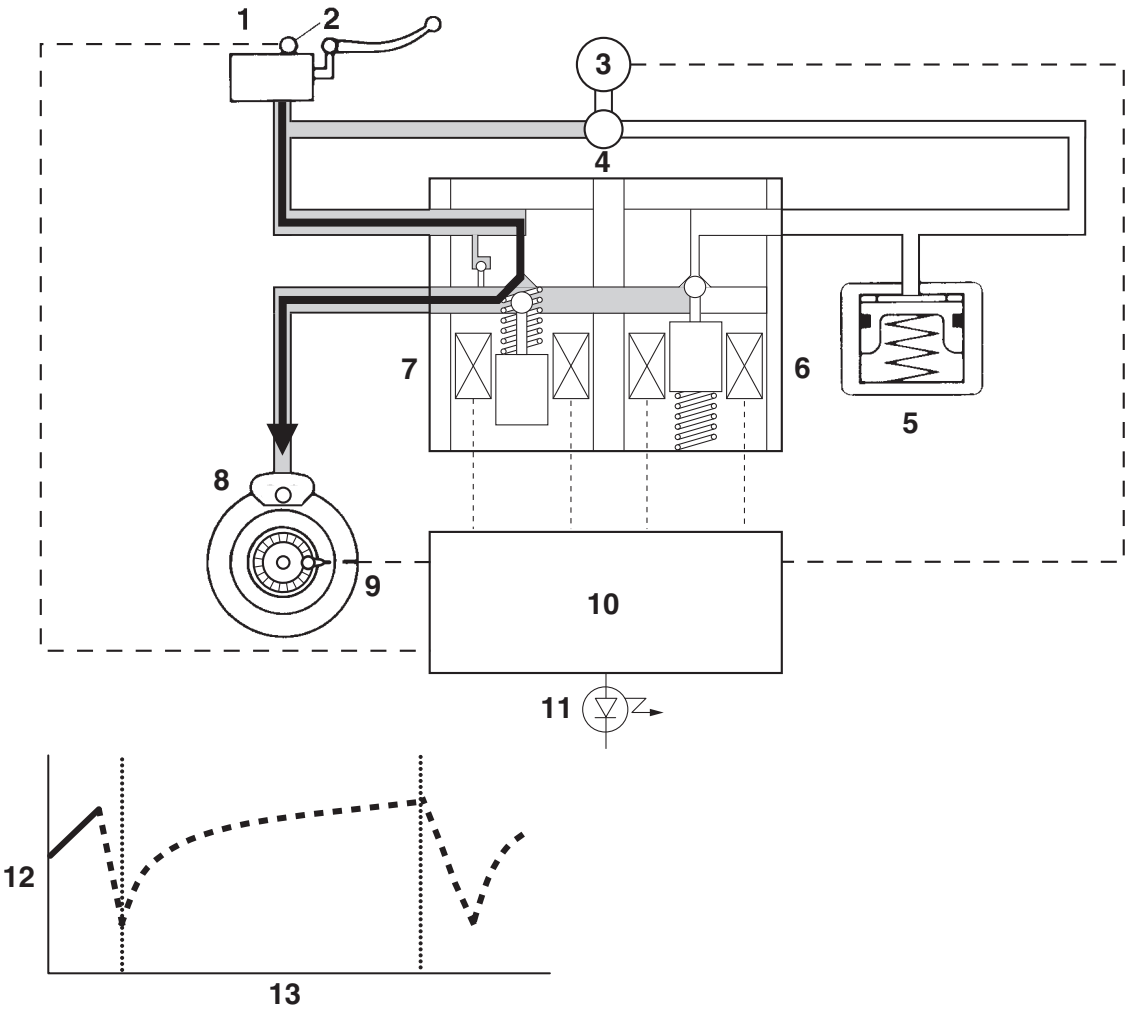
ABS OPERATION

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

Normal braking (ABS not activated)

When the ABS is not activated, the inlet solenoid valve is open and the outlet solenoid valve is closed because a control signal has not been transmitted from the ABS ECU. Therefore, when the brake lever is squeezed, the hydraulic pressure in the brake master cylinder increases and the brake fluid is sent to the brake caliper.

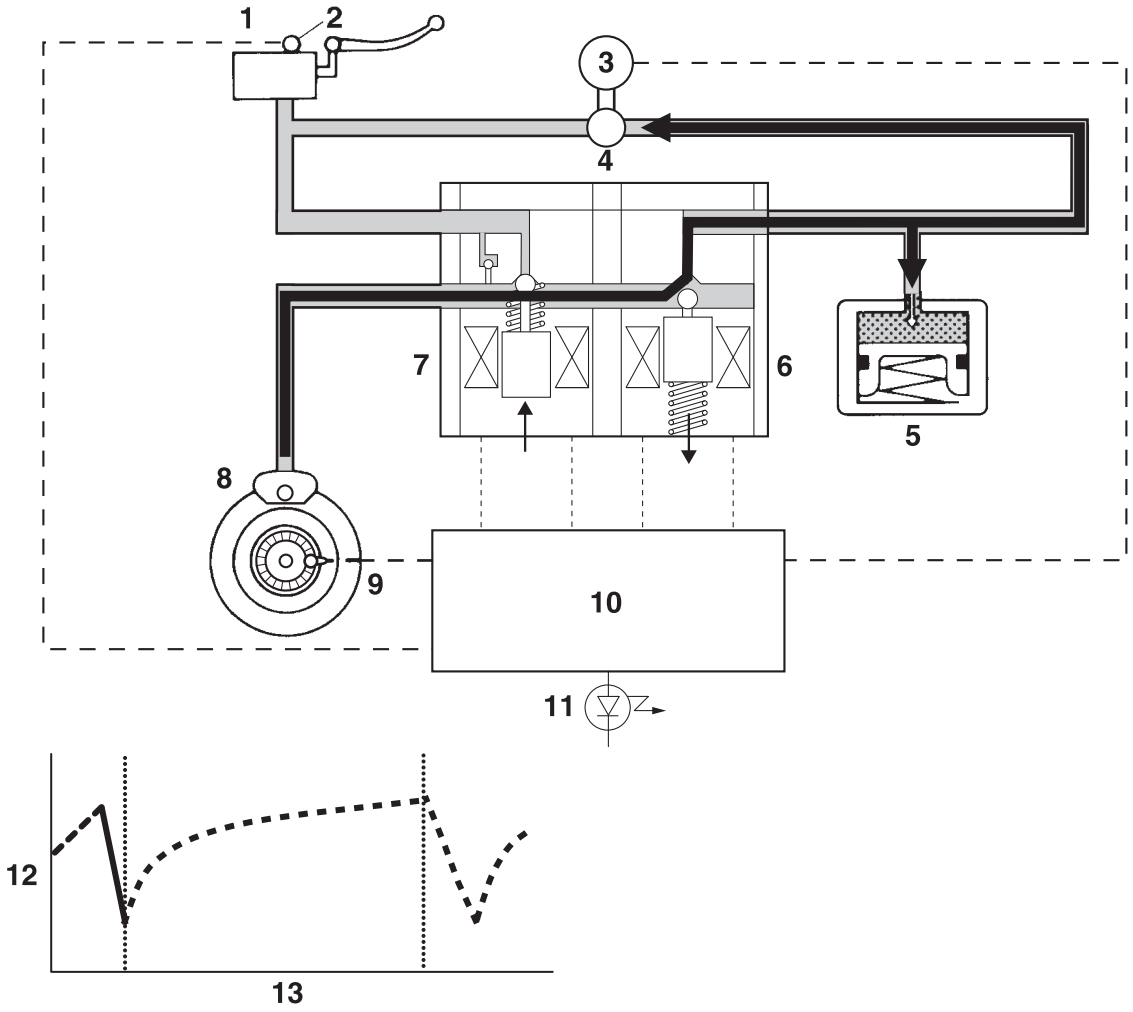
At this time, the inlet and outlet check valves of the hydraulic pump are closed. As a result of eliminating the orifice, the brake master cylinder directly pressurizes the brake caliper during normal braking. When the brake lever is released, the brake fluid in the brake caliper returns to the brake master cylinder.



1. Brake master cylinder
2. Brake light switch
3. ABS motor
4. Hydraulic pump
5. Buffer chamber
6. Outlet solenoid valve
7. Inlet solenoid valve
8. Brake caliper
9. Wheel sensor
10. ABS ECU
11. ABS warning light
12. Brake fluid pressure
13. Time

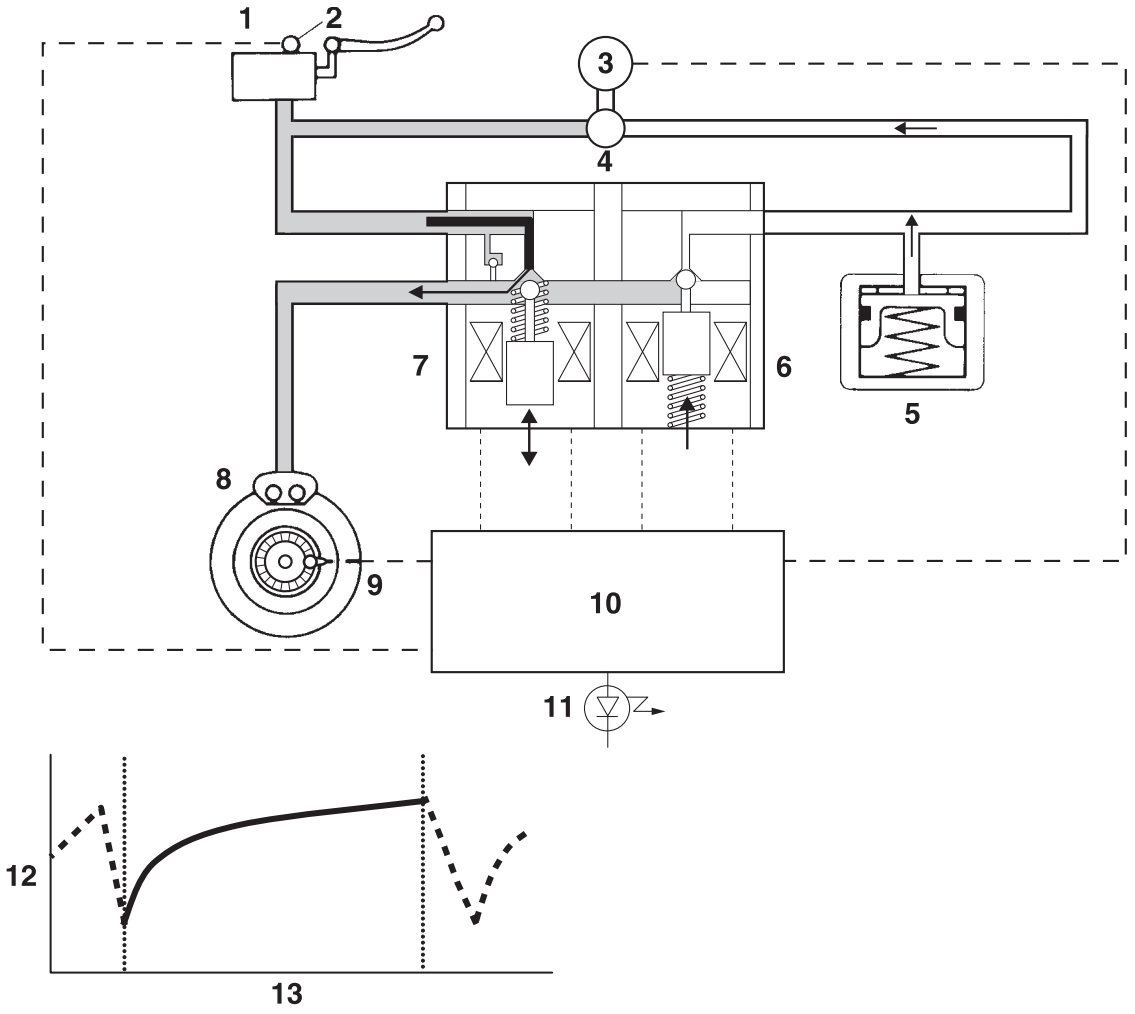
Emergency braking (ABS activated)

1. Depressurizing phase
   When the front wheel is about to lock, the outlet solenoid valve is opened by the “depressurization” signal transmitted from the ABS ECU. When this occurs, the inlet solenoid valve compresses the spring and closes the brake line from the brake master cylinder. Because the outlet solenoid valve is open, the brake fluid is sent to the buffer chamber. As a result, the hydraulic pressure in the brake caliper is reduced.
   The brake fluid stored in the buffer chamber is pumped back to the brake master cylinder by the hydraulic pump linked to the ABS motor.



1. Brake master cylinder
2. Brake light switch
3. ABS motor
4. Hydraulic pump
5. Buffer chamber
6. Outlet solenoid valve
7. Inlet solenoid valve
8. Brake caliper
9. Wheel sensor
10. ABS ECU
11. ABS warning light
12. Brake fluid pressure
13. Time

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



1. Brake master cylinder
2. Brake light switch
3. ABS motor
4. Hydraulic pump
5. Buffer chamber
6. Outlet solenoid valve
7. Inlet solenoid valve
8. Brake caliper
9. Wheel sensor
10. ABS ECU
11. ABS warning light
12. Brake fluid pressure
13. Time

EAS30712
ABS WARNING LIGHT AND OPERATION

ABS warning light

- If the ABS warning light comes on while riding, stop the vehicle, and then turn the main switch to “OFF”, then back to “ON”. The ABS operation is normal if the ABS warning light goes off after the vehicle starts off.
- If the rear wheel is raced with the vehicle on a 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 goes off after the vehicle starts 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

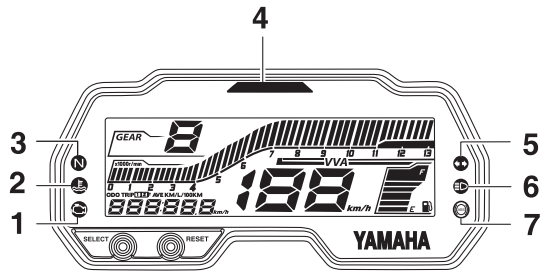
EWA16521

WARNING

- **When hydraulic control is performed by the ABS, the brake system alerts the rider that the wheels have a tendency to lock by generating a reaction-force pulsating action in the brake lever or brake pedal. When the ABS is activated, the grip between the road surface and tires is close to the limit. The ABS cannot prevent wheel lock* on slippery surfaces, such as ice, when it is caused by engine braking, even if the ABS is activated.**
  Use extreme care when operating the vehicle under these conditions.
- **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.**

EAU4939D
INDICATOR LIGHTS AND WARNING LIGHTS



1. Engine trouble warning light "⚙"
2. Coolant temperature warning light "🌡"
3. Neutral indicator light "**N**"
4. Shift timing indicator light
5. Turn signal indicator light "⇦ ⇨"
6. High beam indicator light "≡D"
7. Anti-lock Brake System (ABS) warning light "(ABS)"

EAU51662
ABS WARNING LIGHT "(ABS)"
In normal operation, the ABS warning light comes on when the key is turned to "ON", and goes off after traveling at a speed of 10 km/h (6.3 mi/h) or higher. If the ABS warning light:
- does not come on when the key is turned to "ON"
- comes on or flashes while riding
- does not go off after traveling at a speed of 10 km/h (6.3 mi/h) or higher

The ABS may not work correctly. If any of the above occurs, have a Yamaha dealer check the system as soon as possible. (See page 1-14 for an explanation of the ABS.)

EWA16041
⚠ WARNING

If the ABS warning light does not go off after traveling at a speed of 10 km/h (6.3 mi/h) or higher, or if the warning light comes on or flashes while riding, the brake system reverts to conventional braking. If either of the above occurs, or if the warning light does not come on at all, use extra caution to avoid possible wheel lock during emergency braking. Have a Yamaha dealer check the brake system and electrical circuits as soon as possible.

SPECIFICATIONS

EAS20013
GENERAL SPECIFICATIONS

Model	
Model	B9E1
Dimensions	
Overall length	1990 mm (78.3 in)
Overall width	725 mm (28.5 in)
Overall height	1135 mm (44.7 in)
Wheelbase	1325 mm (52.2 in)
Ground clearance	170 mm (6.69 in)
Minimum turning radius	2.8 m (9.19 ft)
Weight	
Curb weight	142 kg (313 lb)
Loading	
Maximum load	166 kg (366 lb)
Riding capacity	2 persons

EAS20014
ENGINE SPECIFICATIONS

Engine	
Combustion cycle	4-stroke
Cooling system	Liquid cooled
Valve train	SOHC
Displacement	155 cm^3
Number of cylinders	Single cylinder
Bore × stroke	58.0 × 58.7 mm (2.28 × 2.31 in)
Compression ratio	11.6 : 1
Compression pressure	696–896 kPa/550 r/min (7.0–9.0 kgf/cm^2/550 r/min, 99.0–127.4 psi/550 r/min)
Starting system	Electric starter
Fuel	
Recommended fuel	Regular unleaded gasoline only
Fuel tank capacity	11 L (2.9 US gal, 2.4 Imp.gal)
Fuel reserve amount	1.9 L (0.50 US gal, 0.42 Imp.gal)
Engine oil	
Recommended brand	YAMALUBE
SAE viscosity grades	10W-40
Recommended engine oil grade	API service SL type, JASO standard MA
Lubrication system	Wet sump
Engine oil quantity	
Oil change	0.85 L (0.90 US qt, 0.75 Imp.qt)
With oil filter removal	0.95 L (1.00 US qt, 0.84 Imp.qt)
Quantity (disassembled)	1.05 L (1.11 US qt, 0.92 Imp.qt)
Oil filter	
Oil filter type	Paper
Oil pump	
Inner-rotor-to-outer-rotor-tip clearance	0.000–0.150mm
Limit	0.23 mm (0.0091 in)
Outer-rotor-to-oil-pump-housing clearance	0.13–0.19 mm (0.0051–0.0075 in)
Limit	0.26 mm (0.0102 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.06–0.11 mm (0.0024–0.0043 in)
Limit	0.18 mm (0.0071 in)
Relief valve operating pressure	39.2 kPa (0.39 kgf/cm^2, 5.7 psi)
Cooling system	
Coolant quantity	
Radiator (including all routes)	0.49 L (0.52 US qt, 0.43 Imp.qt)
Coolant reservoir (up to the maximum level mark)	0.15 L (0.16 US qt, 0.13 Imp.qt)
Radiator cap valve opening pressure	108.0–137.4 kPa (1.08–1.37 kgf/cm^2, 15.7–19.9 psi)

Thermostat	
Valve opening temperature	74.0–78.0 °C (165.20–172.40 °F)
Valve full open temperature	90.0 °C (194.00 °F)
Valve lift (full open)	7.0 mm (0.28 in)
Spark plug(s)	
Manufacturer/model	NGK/MR8E9
Spark plug gap	0.8–0.9 mm (0.031–0.035 in)
Cylinder head	
Warpage limit	0.05 mm (0.0020 in)
Camshaft	
Camshaft lobe dimensions	
Lobe height (Intake)	32.368–32.468 mm (1.2743–1.2783 in)
Limit	32.268 mm (1.2704 in)
Lobe height (Intake high speed)	32.432–32.532 mm (1.2768–1.2808 in)
Limit (Intake high speed)	32.332 mm (1.2729 in)
Lobe height (Exhaust)	29.616–29.716 mm (1.1660–1.1699 in)
Limit	29.516 mm (1.1620 in)
Rocker arm/rocker arm shaft	
Rocker arm inside diameter	13.985–14.000 mm (0.5506–0.5512 in)
Limit	14.015 mm (0.5518 in)
Rocker arm shaft outside diameter	13.966–13.976 mm (0.5498–0.5502 in)
Limit	13.935 mm (0.5486 in)
Valve, valve seat, valve guide	
Valve clearance (cold)	
Intake	0.10–0.14 mm (0.0039–0.0055 in)
Exhaust	0.21–0.25 mm (0.0083–0.0098 in)
Valve dimensions	
Valve seat contact width (intake)	0.60–0.85 mm (0.0236–0.0335 in)
Limit	1.3 mm (0.05 in)
Valve seat contact width (exhaust)	0.90–1.20 mm (0.0354–0.0472 in)
Limit	1.7 mm (0.07 in)
Valve stem diameter (intake)	4.975–4.990 mm (0.1959–0.1965 in)
Limit	4.945 mm (0.1947 in)
Valve stem diameter (exhaust)	4.960–4.975 mm (0.1953–0.1959 in)
Limit	4.930 mm (0.1941 in)
Valve guide inside diameter (intake)	5.000–5.012 mm (0.1969–0.1973 in)
Valve guide inside diameter (exhaust)	5.000–5.012 mm (0.1969–0.1973 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	0.010 mm (0.0004 in)

Valve spring	
Free length (intake)	33.81 mm (1.33 in)
Limit	32.11 mm (1.26 in)
Free length (exhaust)	33.81 mm (1.33 in)
Limit	32.11 mm (1.26 in)
Cylinder	
Bore	58.000–58.010 mm (2.2835–2.2839 in)
Wear limit	58.060 mm (2.2858 in)
Piston	
Diameter	57.962–57.985 mm (2.2820–2.2829 in)
Measuring point (from piston skirt bottom)	6.0 mm (0.24 in)
Piston-to-cylinder clearance	0.015–0.048 mm (0.0006–0.0019 in)
Piston pin bore inside diameter	14.002–14.013 mm (0.5513–0.5517 in)
Limit	14.043 mm (0.5529 in)
Piston pin outside diameter	13.995–14.000 mm (0.5510–0.5512 in)
Limit	13.975 mm (0.5502 in)
Piston-pin-to-piston-pin-bore clearance	0.002–0.018 mm (0.0001–0.0007 in)
Piston ring	
Top ring	
Ring type	Barrel
End gap limit	0.50 mm (0.0197 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
Side clearance limit	0.115 mm (0.0045 in)
2nd ring	
Ring type	Taper
End gap limit	0.85 mm (0.0335 in)
Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)
Side clearance limit	0.115 mm (0.0045 in)
Crankshaft	
Crank assembly width	47.95–48.00 mm (1.888–1.890 in)
Runout limit	0.050 mm (0.0020 in)
Clutch	
Clutch type	Wet, multiple-disc
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Assembly width	13.0–14.0 mm (0.51–0.55 in)
Friction plate thickness	2.92–3.08 mm (0.115–0.121 in)
Plate quantity	1 pcs
Wear limit	2.82 mm (0.111 in)
Friction plate thickness	2.92–3.08 mm (0.115–0.121 in)
Plate quantity	1 pcs
Wear limit	2.82 mm (0.111 in)
Friction plate thickness	2.92–3.08 mm (0.115–0.121 in)
Plate quantity	1 pcs
Wear limit	2.82 mm (0.1110 in)
Clutch plate thickness	2.18–2.42 mm (0.086–0.095 in)

Plate quantity	1 pcs
Warpage limit	0.10 mm (0.004 in)
Clutch plate thickness	2.20–2.40 mm (0.087–0.094 in)
Plate quantity	1 pcs
Warpage limit	0.10 mm (0.004 in)
Clutch spring free length	41.59 mm (1.64 in)
Limit	39.51 mm (1.56 in)
Push rod bending limit	0.30 mm (0.012 in)
Drivetrain	
Primary reduction ratio	3.042 (73/24)
Transmission type	Constant mesh 6-speed
Gear ratio	
1st	2.833 (34/12)
2nd	1.875 (30/16)
3rd	1.364 (30/22)
4th	1.143 (24/21)
5th	0.957 (22/23)
6th	0.840 (21/25)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)
Main axle assembly width	106.85–107.05 mm (4.21–4.21 in)
Secondary reduction ratio	3.429 (48/14)
Final drive	Chain
Shifting mechanism	
Installed shift rod length	243.5–244.5 mm (9.59–9.63 in)
Air filter	
Air filter element	Dry element
Fuel pump	
Pump type	Electrical
Maximum consumption amperage	0.7 A
Fuel injector	
Resistance	12.2 Ω
Throttle body	
ID mark	BK71 00
Idling condition	
Engine idling speed	1300–1500 r/min
O2 feedback control	Active
Coolant temperature	80–100 °C (176–212 °F)
CO%	0.0–1.3 %
Fuel line pressure (at idle)	220–300 kPa (2.2–3.0 kgf/cm², 31.9–43.5 psi)
Throttle grip free play	3.0–5.0 mm (0.12–0.20 in)

EAS20015
CHASSIS SPECIFICATIONS

Chassis	
Frame type	Diamond
Caster angle	25.5 °
Trail	88 mm (3.5 in)
Front wheel	
Wheel type	Cast wheel
Rim size	17M/C × MT2.5
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Wheel axle bending limit	0.25 mm (0.01 in)
Rear wheel	
Wheel type	Cast wheel
Rim size	17M/C × MT4.0
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Wheel axle bending limit	0.25 mm (0.01 in)
Front tire	
Type	Tubeless
Size	100/80–17M/C 52P
Manufacturer/model	MRF/NYLOGRIP ZAPPER-FX1
Rear tire	
Type	Tubeless
Size	140/70–17M/C 66H
Manufacturer/model	MRF/NYLOGRIP ZAPPER-S
Tire air pressure (measured on cold tires)	
1 person	
Front	200 kPa (2.00 kgf/cm², 29 psi)
Rear	225 kPa (2.25 kgf/cm², 33 psi)
2 persons	
Front	200 kPa (2.00 kgf/cm², 29 psi)
Rear	225 kPa (2.25 kgf/cm², 33 psi)
Front brake	
Type	Hydraulic single disc brake
Disc outside diameter × thickness	282.0 × 4.0 mm (11.10 × 0.16 in)
Brake disc thickness limit	3.5 mm (0.14 in)
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059 in)
Brake pad lining thickness limit	0.8 mm (0.03 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter (Right)	28.00 mm, 28.00 mm (1.10 in, 1.10 in)
Specified brake fluid	DOT 4
Rear brake	
Type	Hydraulic single disc brake
Disc outside diameter × thickness	220.0 × 4.5 mm (8.66 × 0.18 in)

Brake disc thickness limit	4.0 mm (0.16 in)
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059 in)
Brake pad lining thickness limit	1.5 mm (0.06 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	30.20 mm (1.19 in)
Specified brake fluid	DOT 4

Front suspension

Type	Telescopic fork
Spring	Coil spring
Shock absorber	Hydraulic damper
Wheel travel	130 mm (5.1 in)
Fork spring free length	267.6 mm (10.54 in)
Limit	262.2 mm (10.32 in)
Recommended oil	Yamaha Suspension Oil G10
Quantity (left)	460.0 cm³ (15.55 US oz, 16.22 Imp.oz)
Quantity (right)	460.0 cm³ (15.55 US oz, 16.22 Imp.oz)
Level (left)	84 mm (3.3 in)
Level (right)	84 mm (3.3 in)
Inner tube diameter	41 mm (1.61 in)

Rear suspension

Type	Swingarm (link suspension)
Spring	Coil spring
Shock absorber	Hydraulic damper
Wheel travel	97 mm (3.8 in)

Drive chain

Chain type	Sealed type
Number of links	128 (Incluiding chain joint)
Drive chain slack	30.0–40.0 mm (1.18–1.57 in)
15-link length limit	191.4 mm (7.54 in)

EAS20016
ELECTRICAL SPECIFICATIONS

Voltage	
System voltage	12 V
Ignition system	
Ignition system	TCI
Advancer type	Digital
Ignition timing (B.T.D.C.)	2.0 °/1400 r/min
Engine control unit	
Model	B9E0
Ignition coil	
Primary coil resistance	2.16–2.64 Ω
Secondary coil resistance	8.64–12.96 kΩ
Spark plug cap	
Resistance	3.75–6.25 kΩ
Lean angle sensor output voltage	
Operating angle	50 °
Output voltage up to operating angle	0.4–1.4 V
Output voltage over operating angle	3.7–4.4 V
Charging system	
Charging system	AC magneto
Standard output	14.0 V, 10.7 A at 5000 r/min
Stator coil resistance	0.360–0.540 Ω
Rectifier/regulator	
Regulator type	Single-phase
Regulated voltage (DC)	14.0–14.8 V
Rectifier capacity (DC)	16.0 A
Battery	
Model	ETZ-5
Voltage, capacity	12 V, 4.0 Ah (10 HR)
Bulb wattage	
Headlight	LED
Brake/tail light	LED
Front turn signal light	10.0 W
Rear turn signal light	10.0 W
Auxiliary light	LED
License plate light	5.0 W
Meter lighting	LED

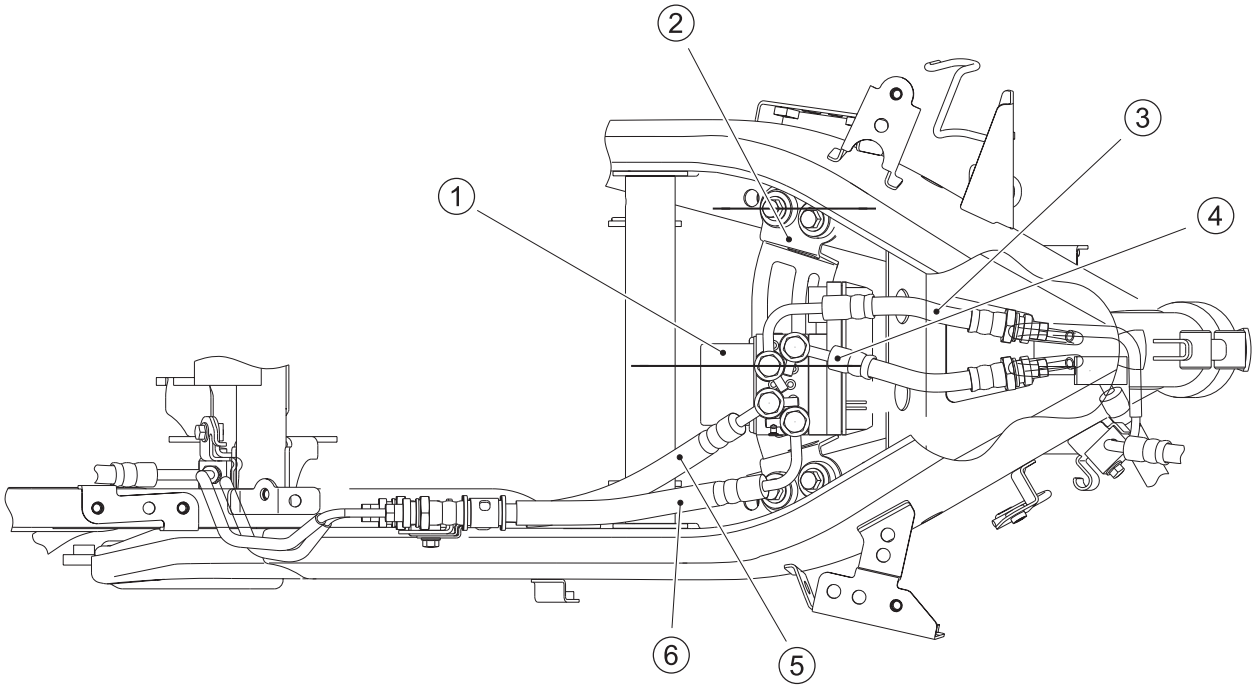
Indicator light	
Neutral indicator light	LED
High beam indicator light	LED
Turn signal indicator light	LED
Coolant temperature warning light	LED
Engine trouble warning light	LED
ABS warning light	LED
Starter motor	
Power output	0.30 kW
Armature coil resistance	0.028–0.034 Ω
Brush overall length limit	3.5 mm (0.14 in)
Commutator diameter limit	16.6 mm (0.65 in)
Mica undercut (depth)	1.35 mm (0.05 in)
Fuel sender unit	
Sender unit resistance (full)	10.0–14.0 Ω
Sender unit resistance (empty)	267.0–273.0 Ω
Fuel injection sensor	
Crankshaft position sensor resistance	228–342 Ω
Intake air temperature sensor resistance	5700–6300 Ω at 0 °C (5700–6300 Ω at 32 °F)
Coolant temperature sensor resistance	2513–2777 Ω at 20 °C (2513–2777 Ω at 68 °F)
Coolant temperature sensor resistance	210–221 Ω at 100 °C (210–221 Ω at 212 °F)
Fuse(s)	
Main fuse	15.0 A
ABS control unit fuse	2 A
ABS motor fuse	30.0 A
ABS solenoid fuse	15 A
Accessory fuse	2.0 A

EAS20017
TIGHTENING TORQUES

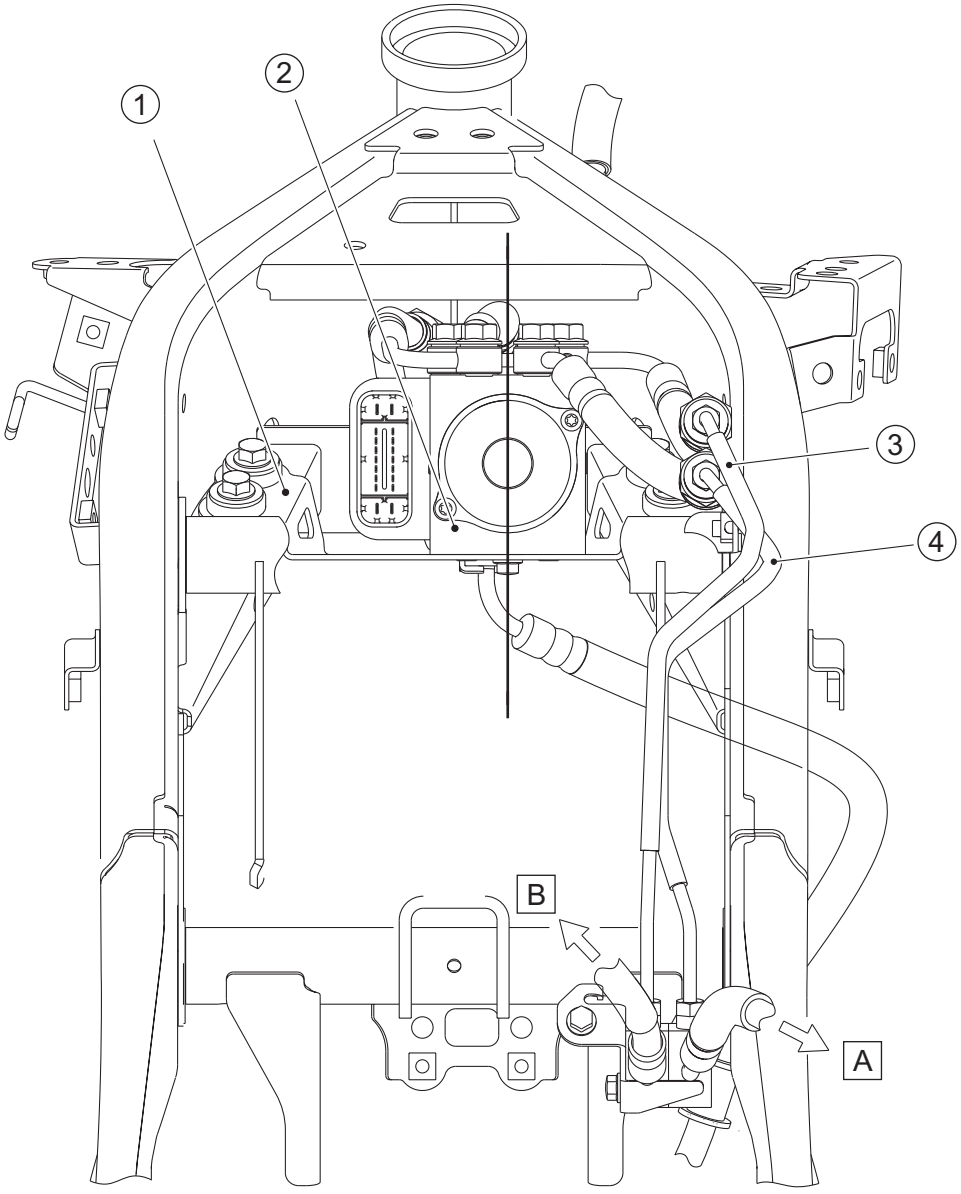
EAS30017
CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Hydraulic unit assembly bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Front wheel sensor rotor screw	M5	3	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Front wheel sensor bolt	M6	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Rear wheel sensor rotor screw	M5	3	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Rear wheel sensor bolt	M6	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Front brake hose union bolt (Hydraulic unit to master cylinder)	M10	2	29 N·m (2.9 kgf·m, 21 lb·ft)	
Front brake hose union bolt (Hydraulic unit to brake caliper)	M10	2	29 N·m (2.9 kgf·m, 21 lb·ft)	
Rear brake hose union bolt (Hydraulic unit to master cylinder)	M10	2	29 N·m (2.9 kgf·m, 21 lb·ft)	
Rear brake hose union bolt (Hydraulic unit to brake caliper)	M10	2	29 N·m (2.9 kgf·m, 21 lb·ft)	
Hydraulic unit bracket bolt	M6	4	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Front brake hose holder bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Rear brake hose holder bolt	M6	3	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Front brake hose holder bolt (Front fork)	M10	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Front brake fluid reservoir cap screw	-	2	1.5 N·m (0.15 kgf·m, 1.1 lb·ft)	
Front brake master cylinder holder bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Rear brake hose holder bolt (Rear fender)	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Drive chain seal guard bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Rear fender cover bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Drive chain case bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	

EAS20021
CABLE ROUTING



1. ABS hydraulic unit
2. ABS hydraulic unit bracket
3. Front brake hose (ABS hydraulic unit to master cylinder)
4. Front brake hose (ABS hydraulic unit to brake caliper)
5. Rear brake hose (ABS hydraulic unit to brake master cylinder)
6. Rear brake hose (ABS hydraulic unit to brake caliper)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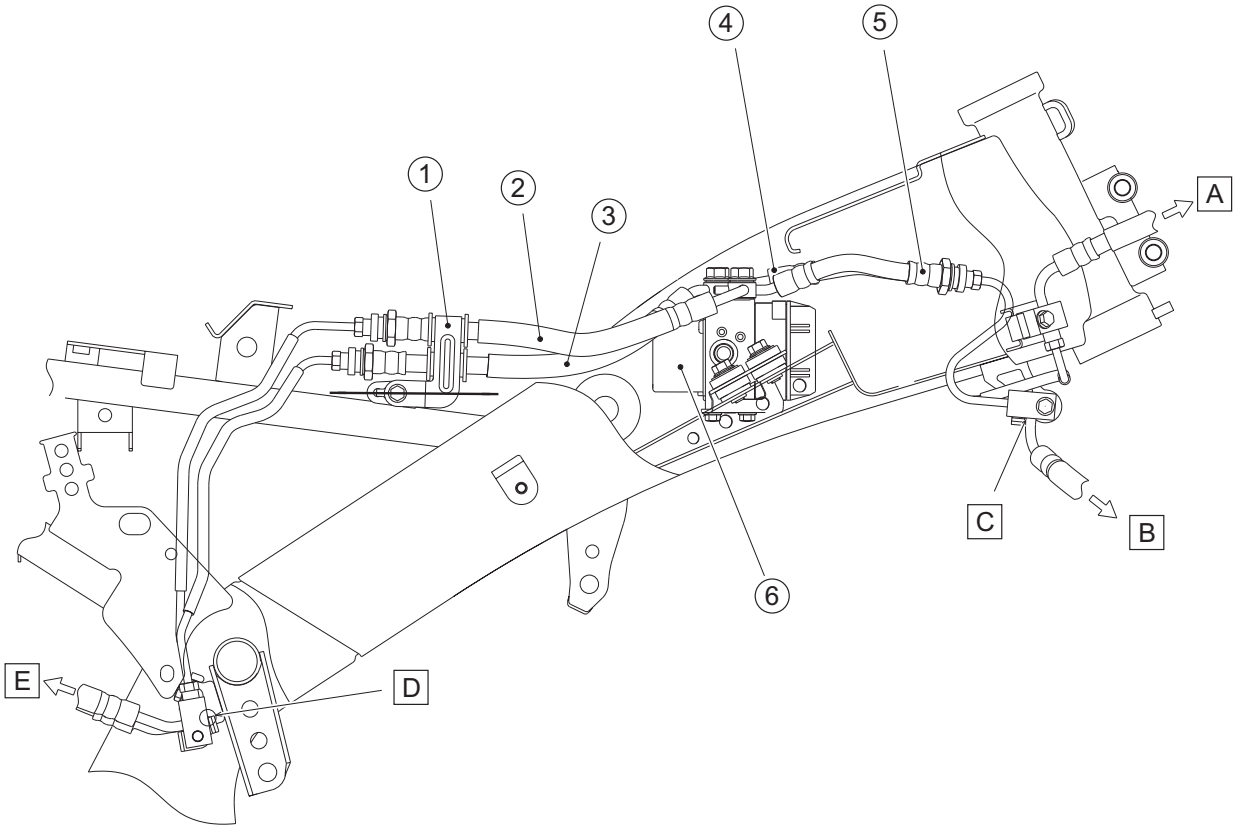
1. ABS hydraulic unit bracket
2. ABS hydraulic unit
3. Rear brake hose (ABS hydraulic unit to brake caliper)
4. Rear brake hose (ABS hydraulic unit to brake master cylinder)

A. To rear brake master cylinder.
B. To rear brake caliper.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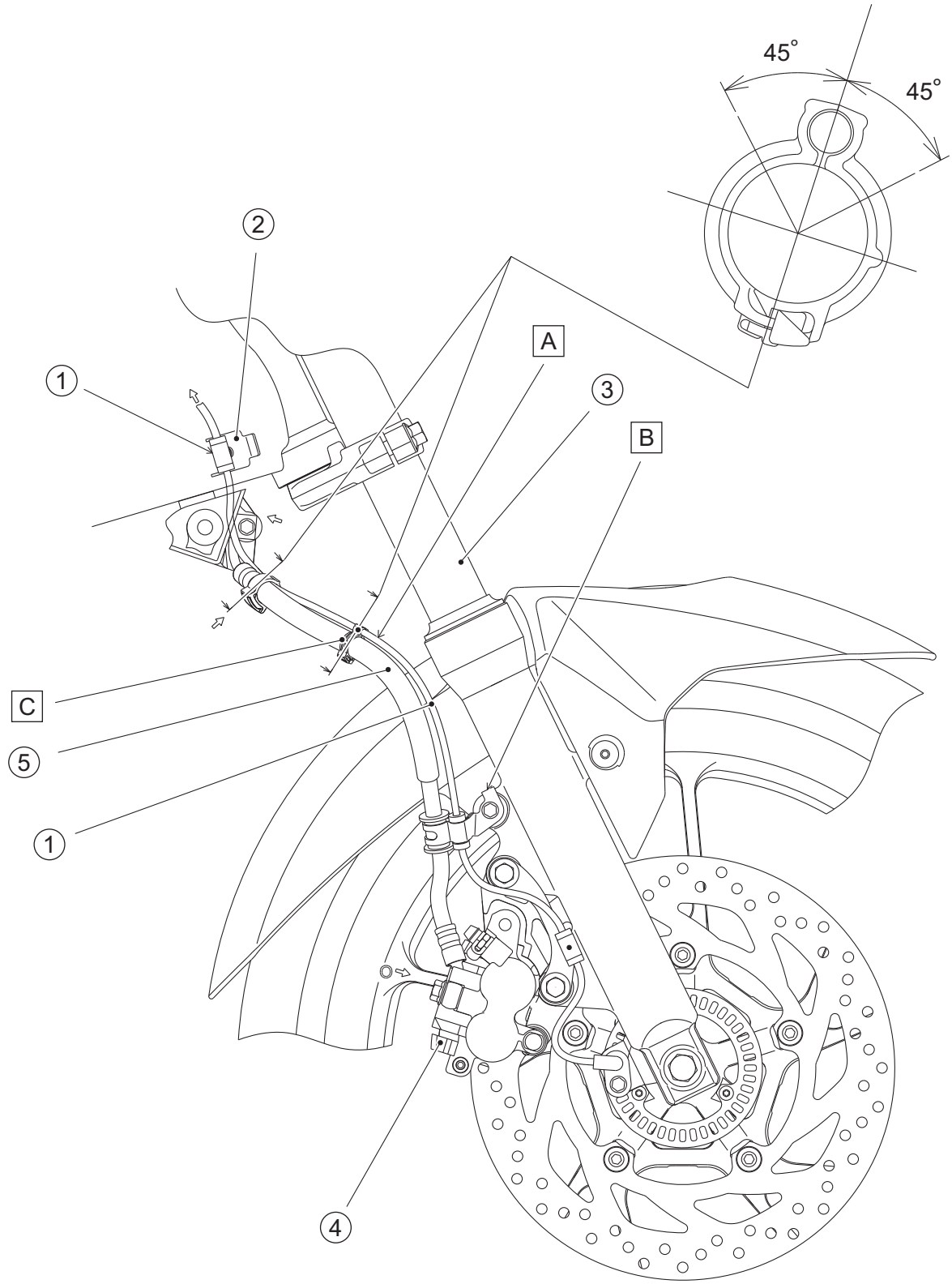
1. Rear brake hose holder
2. Rear brake hose (ABS hydraulic unit to brake caliper)
3. Rear brake hose (ABS hydraulic unit to master cylinder)
4. Front brake hose (ABS hydraulic unit to master cylinder)
5. Front brake hose (ABS hydraulic unit to brake caliper)
6. ABS hydraulic unit

A. To front brake master cylinder.
B. To front brake caliper assembly.
C. Front brake hose shall be touched with frame assembly.
D. Both rear brake hose shall be touched with brake hose holder.
E. To rear brake master cylinder.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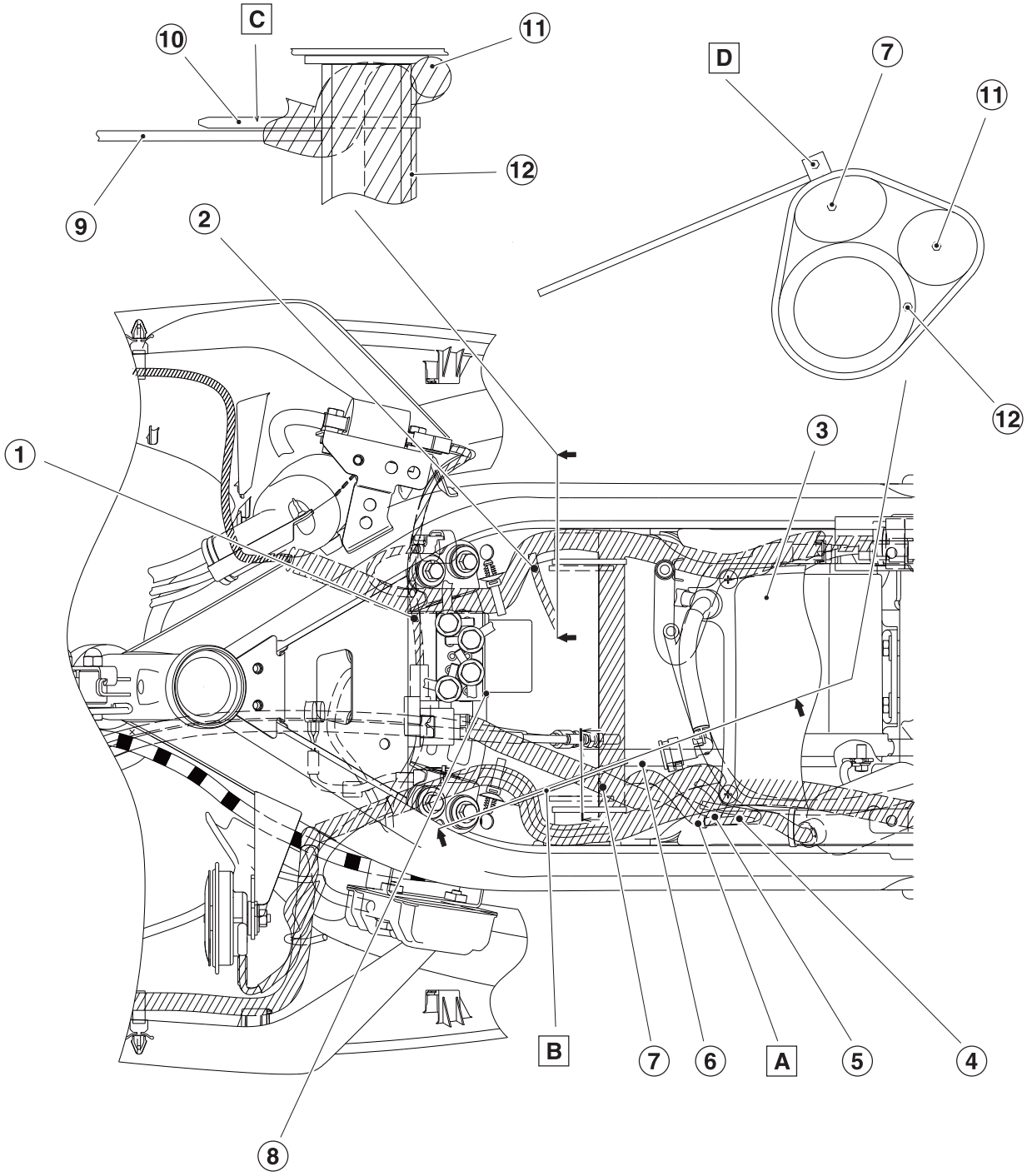
1. Front wheel sensor assembly
2. Frame
3. Front fork assembly
4. Front brake caliper
5. Front brake hose assembly

A. Front wheel sensor assembly shall pass to fit the brake hose assembly.
B. Front brake hose holder shall be touched to front fork assembly.
C. Fix the clamp on white tape of front wheel sensor assembly.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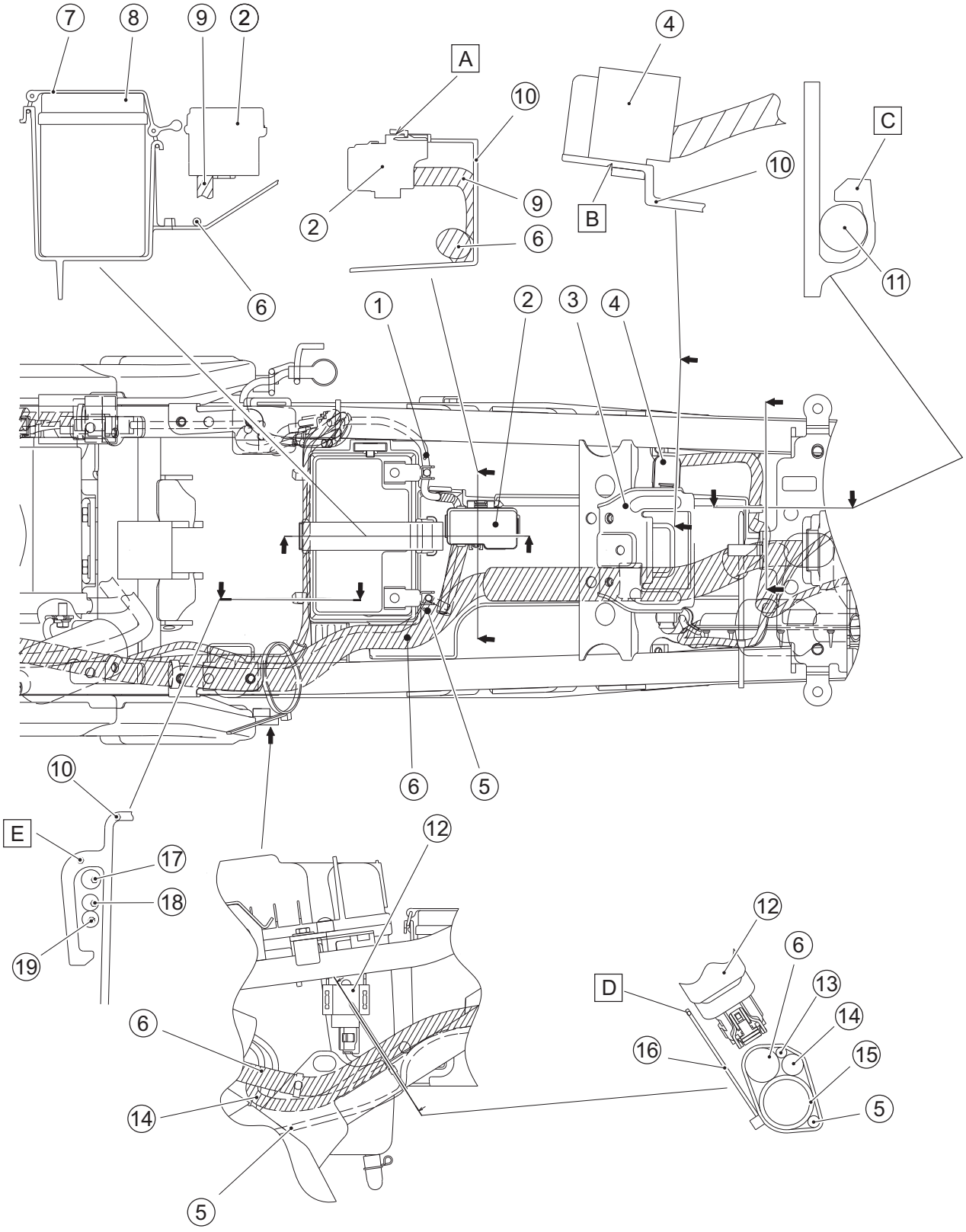
1. O_2 sensor lead
2. Injector assembly lead
3. Air filter assembly
4. Fuel pump assembly lead
5. Fuel sender lead
6. Breather pipe
7. ABS hydraulic unit lead
8. ABS hydraulic unit
9. Engine stay
10. Clamp
11. Wire harness assembly
12. Frame assembly

A. Fuel pump assembly lead and fuel sender lead shall pass through upper ABS hydraulic unit lead.
B. Clamp between engine stay and breather hose.
C. Clamp the harness assembly to outside of engine stay, do not cut the clamp, set the tip of clamp to lower side of motorcycle.
D. Do not cut clamp and set tip of clamp to front side of motorcycle.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1. Positive lead
2. Fuse box
3. Bracket
4. ABS test coupler
5. Negative lead
6. Wire harness assembly
7. Band
8. Battery
9. Fuse box lead
10. Battery box
11. ABS test coupler lead
12. Lean angle sensor
13. Lean angle sensor lead
14. Wire harness assembly (To rear brake light switch lead, starter relay lead, rear wheel sensor lead)
15. Frame assembly
16. Clamp
17. Rear brake light switch lead
18. Starter relay lead
19. Rear wheel sensor lead

A. Hook of fuse box shall be inserted into box.
B. Slit of ABS test coupler shall be inserted hook of box.
C. Clamp lead to box at the hook.
D. Negative lead shall be clamped at the lower side of frame assembly.
After clamping each lead shall avoid the contact with lean angle sensor.
Do not cut the clamp, set tip of the clamp to upper side of motorcycle.
E. Clamp lead to box at the hook both side (LH & RH).

PERIODIC CHECKS AND ADJUSTMENTS

EAS20022
PERIODIC MAINTENANCE

EAS30022
INTRODUCTION
This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

EAUE3700
TIP

- From 19000 km (11800 mi), repeat the maintenance intervals starting from 4000 km (2400 mi).
- Items marked with an asterisk (*) should be performed by a Yamaha dealer as they require special tools, data and technical skills.
- Maintenance intervals marked with a double asterisk (**) would be paid service.

EAUE3710
PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					
				1000 km (600 mi)	4000 km (2400 mi)	7000 km (4200 mi)	10000 km (6000 mi)	13000 km (7800 mi)	16000 km** (9600 mi)
1	*	Fuel line	• Check fuel hoses for cracks or damage.	√	√	√	√	√	√
2	*	Fuel filter	• Check condition. • Replace if necessary.	Every 7000 km (4200 mi)					
3		Spark plug	• Check condition. • Clean and regap.	√	√	√	√		√
			• Replace.					√	
4	*	Valves	• Check valve clearance. Adjust if necessary.	√	√	√	√	√	√
5	*	Fuel injection	• Adjust engine idling speed.	√	√	√	√	√	√
6	*	Evaporative emission control system	• Check control system for damage. • Replace if necessary.				√		√

EAUE3720
GENERAL MAINTENANCE AND LUBRICATION CHART

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					
				1000 km (600 mi)	4000 km (2400 mi)	7000 km (4200 mi)	10000 km (6000 mi)	13000 km (7800 mi)	16000 km** (9600 mi)
1	*	Diagnostic system check	• Perform dynamic inspection using Yamaha diagnostic tool. • Check the error codes.	√	√	√	√	√	√
2		Air filter element	• Clean.	√	√	√	√	√	√
			• Replace.	Every 10000 km (6200 mi)					
3	*	Battery	• Check voltage. • Charge if necessary.	√	√	√	√	√	√
4		Clutch	• Check operation. • Adjust.	√	√	√	√	√	√
5	*	Front brake	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
			• Replace brake pads.	Whenever worn to the limit					
6	*	Rear brake	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
			• Replace brake pads.	Whenever worn to the limit					

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					
				1000 km (600 mi)	4000 km (2400 mi)	7000 km (4200 mi)	10000 km (6000 mi)	13000 km (7800 mi)	16000 km** (9600 mi)
7	*	**Brake hose**	• Check for cracks or damage. • Check for correct routing and clamping.	√	√	√	√	√	√
			• Replace.	Every 4 years					
8	*	**Brake fluid**	• Change.	Every 2 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. Replace if necessary.	√	√	√	√	√	√
			• Lubricate with lithium-soap-based grease.	Every 10000 km (6000 mi)					
12	*	**Swingarm**	• Check operation and for excessive play.	√	√	√	√	√	√
			• Lubricate with lithium-soap-based grease.	Every 13000 km (7800 mi)					
13		**Drive chain**	• Check chain slack, alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 500 km (300 mi) and after washing the motorcycle, riding in the rain or riding in wet areas					
14	*	**Steering bearings**	• Check bearing play and steering for roughness.	√	√	√	√	√	√
			• Lubricate with lithium-soap-based grease.	Every 13000 km (7800 mi)					
15	*	**Chassis fasteners**	• Make sure that all nuts, bolts and screws are properly tightened.	√	√	√	√	√	√
16		**Brake lever pivot shaft**	• Lubricate with silicone grease.	√	√	√	√	√	√
17		**Brake pedal pivot shaft**	• Lubricate with lithium-soap-based grease.	√	√	√	√	√	√
18		**Clutch lever pivot shaft**	• Lubricate with lithium-soap-based grease.	√	√	√	√	√	√
19		**Shift pedal pivot shaft**	• Lubricate with lithium-soap-based grease.	√	√	√	√	√	√
20		**Sidestand**	• Check operation. • Lubricate with lithium-soap-based grease.	√	√	√	√	√	√
21	*	**Front fork**	• Check operation and for oil leakage. Repair if necessary.	√	√	√	√	√	√
			• Replace oil.	Every 10000 km (6000 mi)					
22	*	**Shock absorber assembly**	• Check operation and shock absorber for oil leakage.	√	√	√	√	√	√
23		**Engine oil**	• Change. (See page x-xx.) • Check oil level and vehicle for oil leakage.	√	Every 3000 km (1800 mi)				
24		**Engine oil filter element**	• Replace.	√	√	√	√	√	√
25	*	**Cooling system**	• Check coolant level and vehicle for coolant leakage.	√	√	√	√	√	√
			• Change coolant.	Every 2 years					
26	*	**Front and rear brake switches**	• Check operation.	√	√	√	√	√	√

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					
				1000 km (600 mi)	4000 km (2400 mi)	7000 km (4200 mi)	10000 km (6000 mi)	13000 km (7800 mi)	16000 km** (9600 mi)
27		**Moving parts and cable ends**	• Lubricate.	√	√	√	√	√	√
28	*	**Throttle grip**	• Check operation. • Check throttle grip free play, and adjust if necessary. • Lubricate cable and grip housing.	√	√	√	√	√	√
29	*	**Lights, signals and switches**	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

EAU18662

TIP

- The air filter needs more frequent service if you are 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 cylinder and caliper, and change the brake fluid.
  - Replace the brake hoses every four years and if cracked or damaged.

EAS20024
CHASSIS

EAS30893
BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)

EWA13100
⚠ WARNING

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

ECA18050
NOTICE

- **Bleed the brake system in the following order.**
- **1st step: Front brake calipers**
- **2nd step: Rear brake caliper**

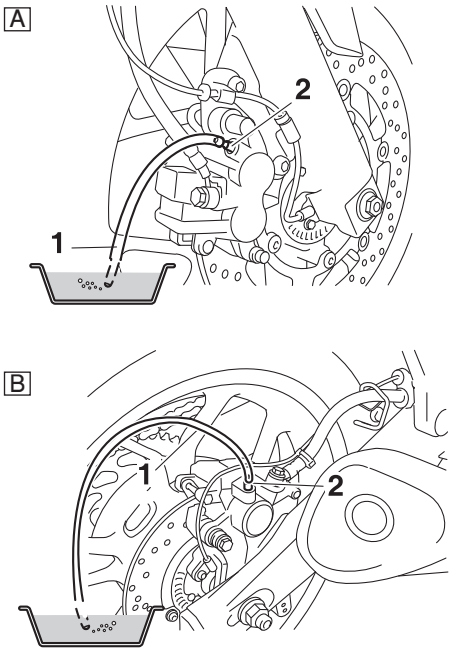
EWA15740
⚠ WARNING

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

TIP

- Be careful not to spill any brake fluid or allow the brake 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:
   - ABS
     a. Fill the brake fluid reservoir to the proper level with the specified 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 several times.
     f. Fully pull the brake lever or fully press down the brake pedal and hold it in position.
     g. Loosen the bleed screw.

TIP

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

     h. Tighten the bleed screw, and then release the brake lever or brake pedal.
     i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
     j. Check the operation of the hydraulic unit. Refer to “HYDRAULIC UNIT OPERATION TESTS” on page 4-20.

ECA18060

NOTICE

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

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

Front brake caliper bleed screw
14 N·m (1.4 kgf·m, 10.0 lb·ft)
Rear brake caliper bleed screw
6 N·m (0.6 kgf·m, 4.4 lb·ft)

m. Fill the brake master cylinder or brake fluid reservoir to the proper level with the specified brake fluid.
Refer to "CHECKING THE BRAKE FLUID LEVEL" in base service manual BK7-F8197-E0 on page 3-16.

Specified brake fluid
DOT 4

EWA13110

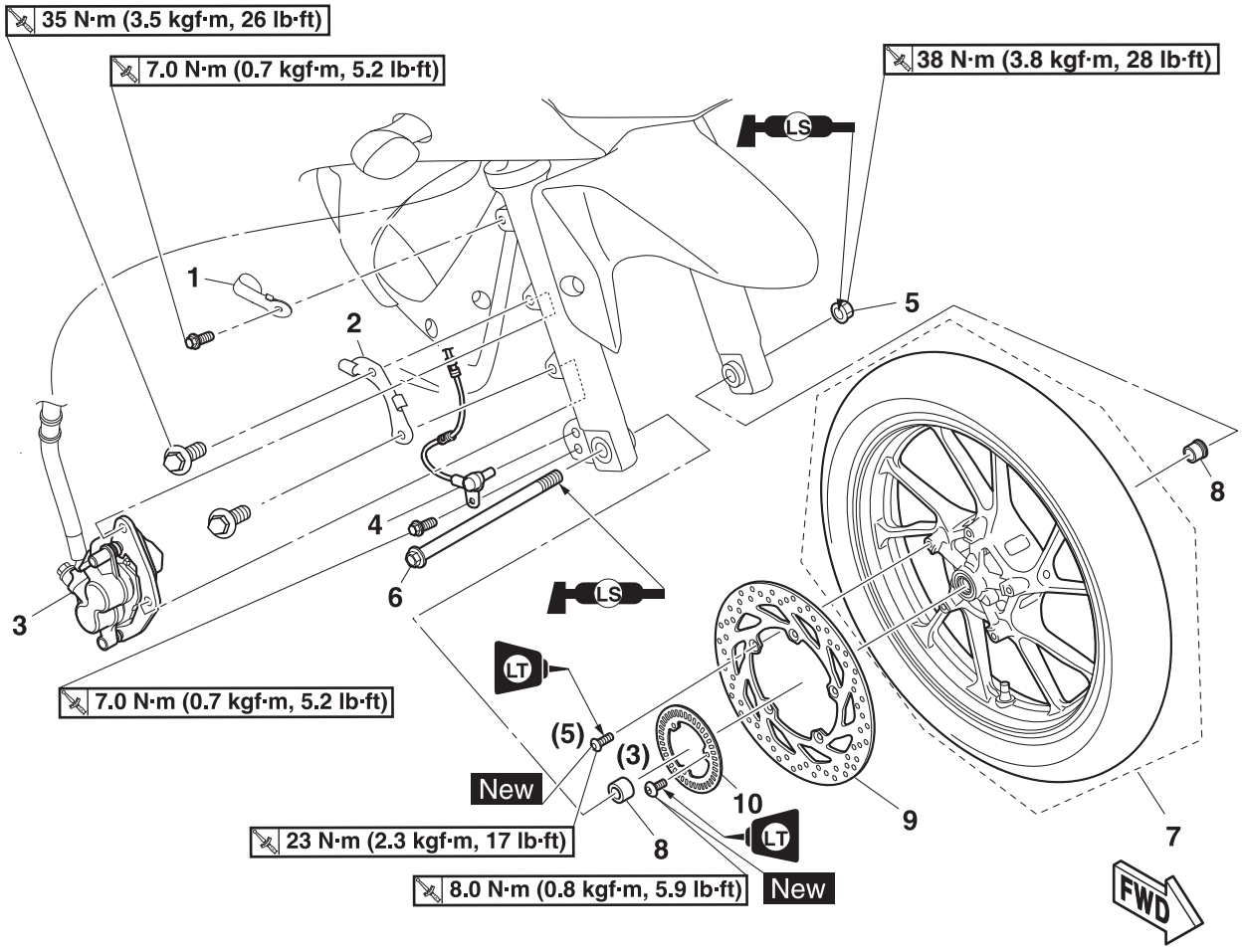
⚠ WARNING

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

CHASSIS

EAS20028
FRONT WHEEL

Removing the front wheel and brake disc



Order	Job/Parts to remove	Q'ty	Remarks
1	Front brake hose holder	1	
2	Sensor lead holder	1	
3	Front brake caliper	1	
4	Front wheel sensor	1	
5	Front wheel axle nut	1	
6	Front wheel axle	1	
7	Front wheel	1	
8	Collar	2	
9	Front brake disc	1	
10	Front wheel sensor rotor	1	

EAS30145
REMOVING THE FRONT WHEEL

1. Stand the vehicle on a level surface by using suitable rear wheel stand.
2. Install suitable front wheel stand.

EWA13120
WARNING

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

3. Remove:
   - Front brake hose holder
   - Front wheel sensor
   - Front brake caliper

ECA20981
NOTICE

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

ECA21700
NOTICE

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

4. Elevate:
   - Front wheel

TIP

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

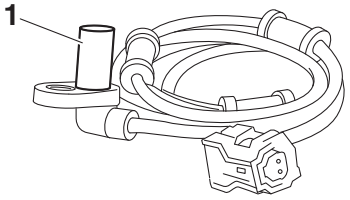
5. Remove:
   - Front wheel axle nut
   - Front wheel axle
   - Front wheel

EAS31151
MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR

ECA21070
NOTICE

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

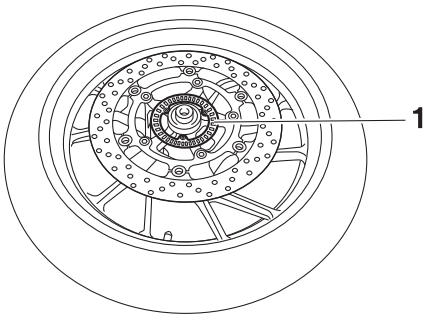
1. Check:
   - Wheel sensor “1”
     Cracks/bends/distortion → Replace.
     Iron powder/dust → Clean.



2. Check:
   - Wheel sensor rotor “1”
     Cracks/damage/scratches → Replace the wheel sensor rotor.
     Iron powder/dust/solvent → Clean.

TIP

- The wheel sensor rotor is installed on the inner side of the wheel hub.
- When cleaning the wheel sensor rotor, be careful not to damage the surface of the sensor rotor.



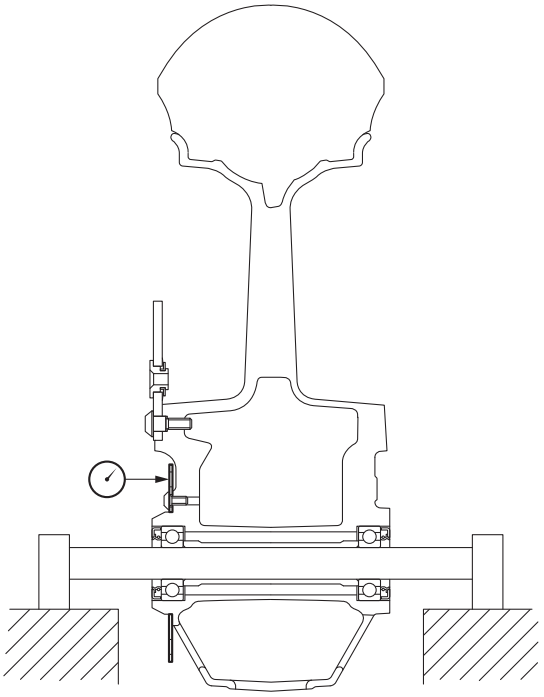
3. Measure:
   • Wheel sensor rotor deflection
   Out of specification → Clean the installation surface of the wheel sensor rotor and correct the wheel sensor rotor deflection, or replace the wheel sensor rotor.

Wheel sensor rotor deflection limit
0.25 mm (0.0098 in)

   a. Hold the dial gauge at a right angle against the wheel sensor rotor surface.
   b. Measure the wheel sensor rotor deflection.

TIP

Do not touch the surface of the wheel sensor rotor with a sharp object.



   c. If the deflection is above specification, remove the sensor rotor from the wheel, rotate it by one or two bolt holes, and then install it.

Front wheel sensor rotor bolt
8 N·m (0.8 kgf·m, 5.9 lb·ft)
LOCTITE®

ECA18100

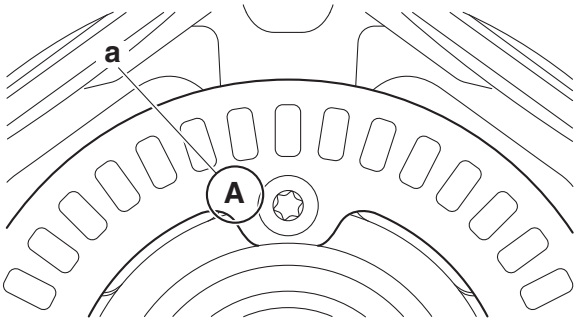
NOTICE

Replace the wheel sensor rotor bolts with new ones.

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

TIP

• Install the wheel sensor rotor with the stamped mark “a” facing outward.
• Use "Torx bit T-25" for opening/tightening wheel sensor rotor bolt.



EAS30932

INSTALLING THE FRONT WHEEL

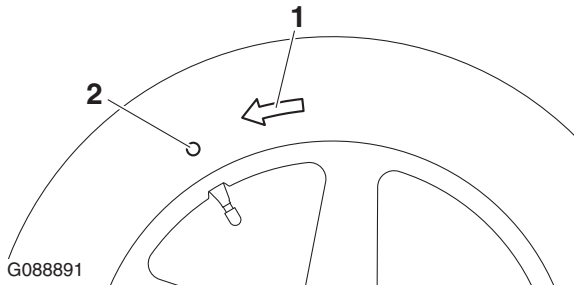
1. Lubricate:
   • Oil seal lips

Recommended lubricant
Lithium-soap-based grease

2. Install:
   • Collars
   • Front wheel
   • Front wheel axle
   • Front wheel axle nut

TIP

• Install the tire and wheel with the mark “1” pointing in the direction of wheel rotation.
• Align the DOT mark “2” with the tire air valve installation point.
• Apply lithium-soap-based grease to the contact surface and threads of the front wheel axle nut.



3. Tighten:
   • Front wheel axle nut

	Front wheel axle nut **38 N·m (3.8 kgf·m, 28 lb·ft)**

ECA14140

NOTICE

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

4. Install:
   • Front wheel sensor

	Front wheel sensor bolt **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

ECA21020

NOTICE

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

TIP

- When installing the front wheel sensor, check the wheel sensor lead for twists.
- To route the front wheel sensor lead, refer to "CABLE ROUTING" on page 2-11.

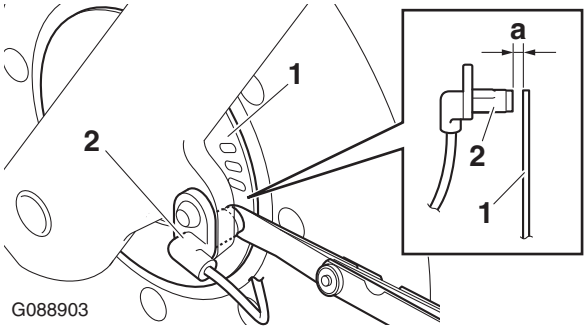
5. Measure:
   • Distance "a"
   (between the front wheel sensor rotor "1" and front wheel sensor "2")
   Out of specification → Check the wheel bearing for looseness, and the front wheel sensor and sensor rotor installation conditions (warpage caused by overtorque, wrong installation direction, rotor decentering, LOCTITE® on the mounting surface of the rotor, deformation caused by an impact during service and caught foreign materials). If there is any defective part, repair or replace the defective part.

	Distance "a" (between the front wheel sensor rotor and front wheel sensor) **1.29 mm (0.050 in)**

TIP

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

	Feeler gauge (Thickness gauge)

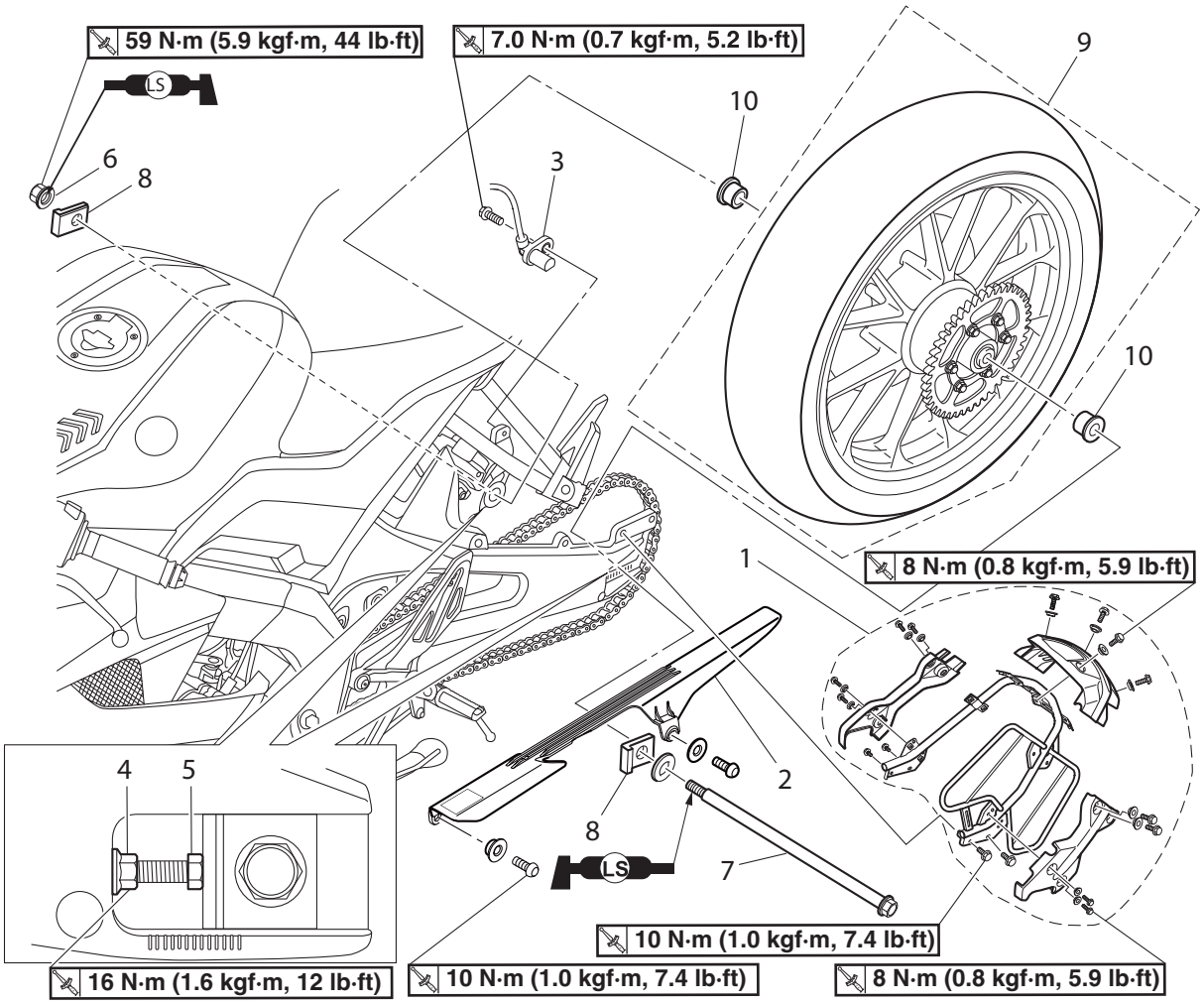


6. Install:
   • Front brake caliper
   • Front brake hose holder "1"

	Front brake caliper bolt **35 N·m (3.5 kgf·m, 26 lb·ft)** **Front brake hose holder bolt** **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

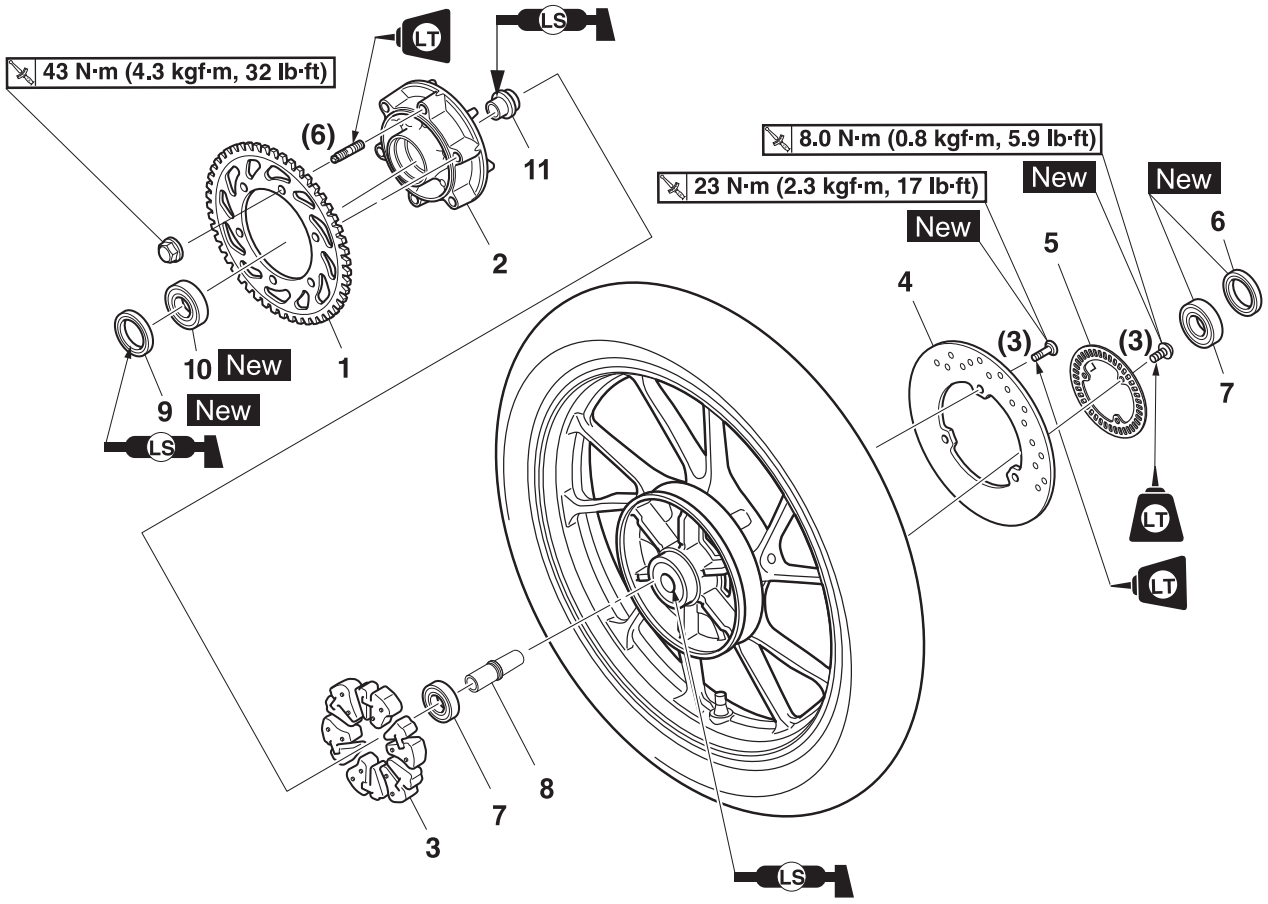
EAS20029
REAR WHEEL

Removing the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
		1	**TIP** Place the vehicle on a suitable stand so that the rear wheel is elevated.
1	Mud protector assembly	1	
2	Drive chain case	1	
3	Rear wheel sensor	1	
4	Drive chain adjusting locknut	2	Loosen.
5	Drive chain adjusting bolt	2	Loosen.
6	Rear wheel axle nut	1	
7	Rear wheel axle	1	
8	Drive chain puller	2	
9	Rear wheel	1	
10	Collar	2	
			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 wheel sprocket	1	
2	Rear wheel drive hub	1	
3	Rear wheel drive hub damper	6	
4	Rear brake disc	1	
5	Rear wheel sensor rotor	1	
6	Oil seal	1	
7	Bearing	1	
8	Spacer	1	
9	Oil seal	1	
10	Bearing	1	
11	Collar	1	

EAS30156
REMOVING THE REAR WHEEL

ECA21030
NOTICE

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

1. Stand the vehicle on a level surface by using suitable rear wheel stand.

EWA13120
⚠ WARNING

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

TIP

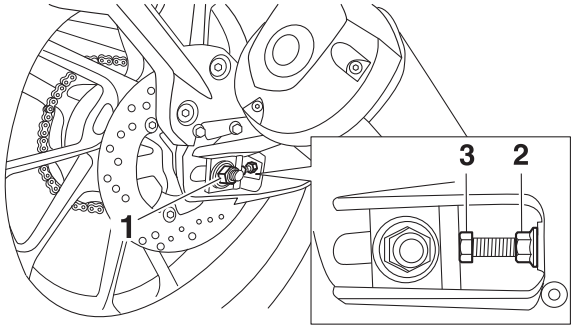
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   • Rear wheel sensor

ECA21470
NOTICE

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

3. Loosen:
   • Wheel axle nut “1”
   • Drive chain puller locknuts “2”
   • Drive chain adjusting bolts “3”



4. Remove:
   • Rear wheel axle nut
   • Washer
   • Rear wheel axle along with washer
   • Drive chain puller
   • Collars
   • Rear wheel along with rear brake caliper

TIP

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

MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR

NOTICE

• Handle the ABS components with care since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.
• The wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.
• Keep any type of magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the wheel sensor or wheel sensor rotor.
• Do not drop or shock the wheel sensor or the wheel sensor rotor.
Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.

EAS30165
INSTALLING THE REAR WHEEL

1. Install:
   • Rear wheel sensor rotor
   • Rear brake disc

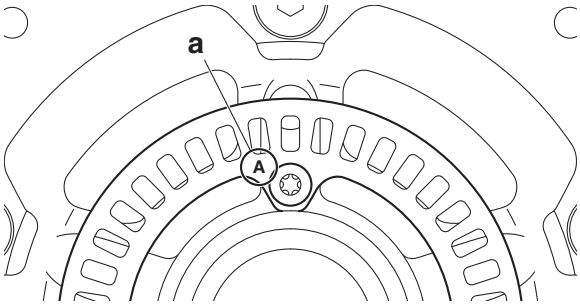
Rear wheel sensor rotor bolt
8 N·m (0.8 kgf·m, 5.9 lb·ft)
LOCTITE®
Rear brake disc bolt
23 N·m (2.3 kgf·m, 17 lb·ft)
LOCTITE®

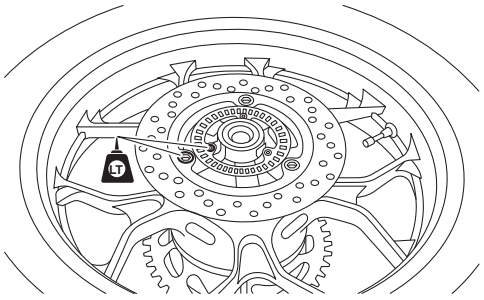
ECA21011
NOTICE

• Do not drop the wheel sensor rotor or subject it to shocks.
• If any solvent gets on the wheel sensor rotor, wipe it off immediately.
• Replace the brake disc bolts and wheel sensor rotor bolts with new ones.

TIP

• Install the wheel sensor rotor with the stamped mark “a” facing outward.
• Tighten the brake disc bolts in stages and in a crisscross pattern.





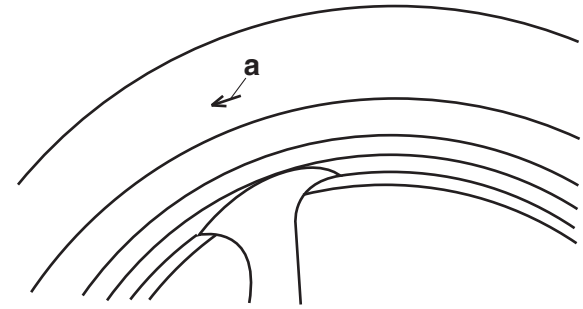
1. Install:
   • Rear wheel sprocket
   Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" in base service manual BK7-F8197-E0 on page 4-16.
2. Check:
   • Rear brake disc
   Refer to "CHECKING THE FRONT BRAKE DISC" in base service manual BK7-F8197-E0 on page 4-23.
3. Lubricate:
   • Oil seal lips

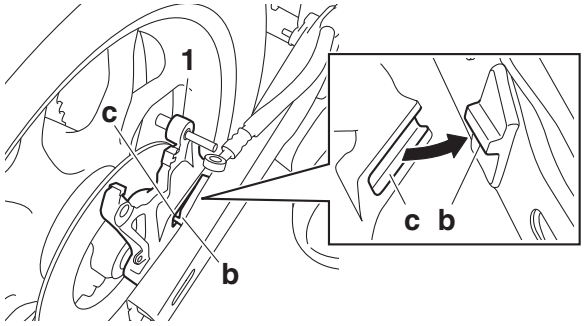
	Recommended lubricant **Lithium-soap-based grease**

4. Install:
   • Collar (right)
   • Collar (left)
   • Brake caliper
   • Rear wheel
   • Rear wheel axle
   • Washers
   • Rear wheel axle nut

TIP

- Install the rear wheel with the mark "a" on the rear tire pointing in the direction of wheel rotation.
- Align the projection "b" in the swingarm with the slot "c" of the brake caliper bracket.
- Apply lithium-soap-based grease to the contact surface and threads of the rear wheel axle nut.





5. Lubricate:
   • Rear brake caliper bolt

	Recommended lubricant **Silicone grease**

6. Install:
   • Rear brake caliper
7. Adjust:
   • Drive chain slack
   Refer to "ADJUSTING THE DRIVE CHAIN SLACK" in base service manual BK7-F8197-E0 on page 3-19.

	Drive chain slack **30.0–40.0 mm (1.18–1.57 in)**

8. Tighten:
   • Rear wheel axle nut
   • Rear brake caliper bolt

	Rear wheel axle nut **59 N·m (5.9 kgf·m, 44 lb·ft)**

EWA13500

⚠ WARNING

Make sure the brake hose is routed properly.

9. Install:
   • Rear wheel sensor

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

ECA21080

NOTICE

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

TIP

To route the rear wheel sensor lead, refer to "CABLE ROUTING" on page 2-11.

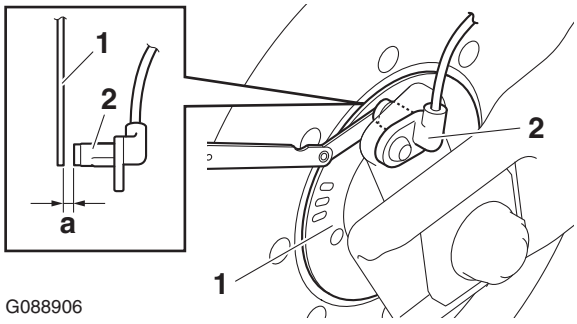
10.Measure:
- Distance "a"
  (between the rear wheel sensor rotor "1" and rear wheel sensor "2")
  Out of specification → Check the wheel bearing for looseness, and the rear wheel sensor and sensor rotor installation conditions (warpage caused by overtorque, wrong installation direction, rotor decentering, LOCTITE® on the mounting surface of the rotor, deformation caused by an impact during service and caught foreign materials). If there is any defective part, repair or replace the defective part.

	Distance "a" (between the rear wheel sensor rotor and rear wheel sensor) **1.29 mm (0.050 in)**

TIP

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

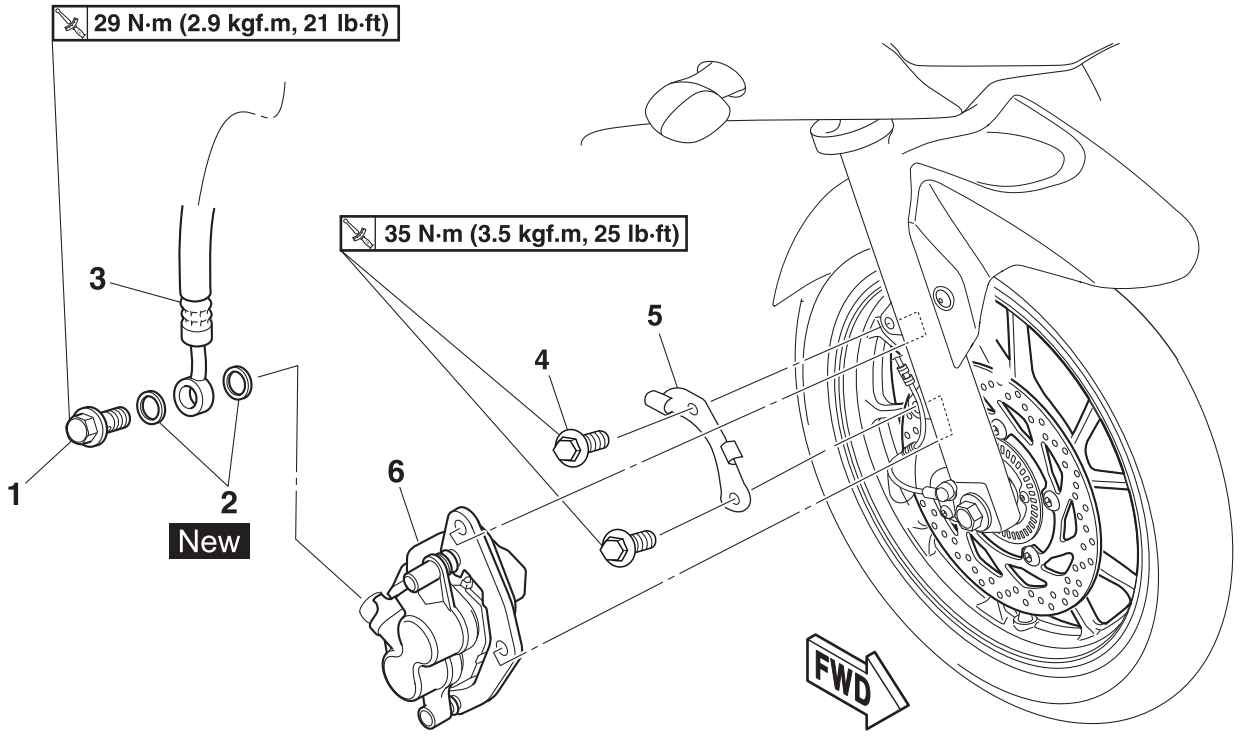
	Feeler gauge (Thickness gauge)



G088906

EAS20030
FRONT BRAKE

Removing the front brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-4.
1	Front brake hose union bolt (brake caliper side)	1	
2	Brake hose gasket	2	
3	Front brake hose (brake hose joint to brake caliper)	1	
4	Front brake caliper bolt	2	
5	Sensor lead holder	1	
6	Front brake caliper	1	

EAS30724
REMOVING THE FRONT BRAKE CALIPER

TIP

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

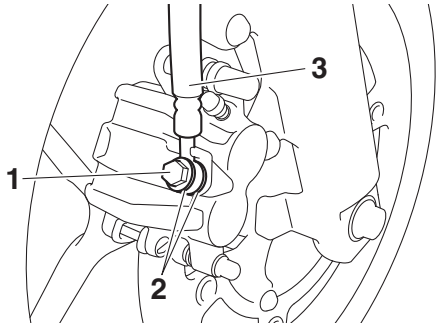
ECA20981
NOTICE

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

1. Remove:
   - Brake hose union bolt “1”
   - Brake hose gaskets “2”
   - Front brake hose (brake hose joint to brake caliper) “3”
   - Wheel sensor holder
   - Brake caliper

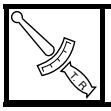
TIP

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



EAS30934
INSTALLING THE FRONT BRAKE CALIPER

1. Install:
   - Front brake caliper “1” (temporarily) along with wheel sensor holder
   - Brake hose gaskets “2” New
   - Front brake hose (brake hose joint to brake caliper) “3”
   - Brake hose union bolt “4”



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

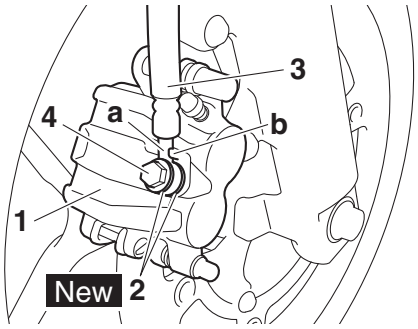
Front brake hose union bolt (brake caliper side)
29 N·m (2.9 kgf·m, 21 lb·ft)

EWA13531
⚠ WARNING

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

ECA18220
NOTICE

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



Refer to “REPLACING THE FRONT BRAKE PADS” in base service manual BK7-F8197-E0 on page 4-24.

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

Specified brake fluid
DOT 4

EWA13090
⚠ WARNING

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

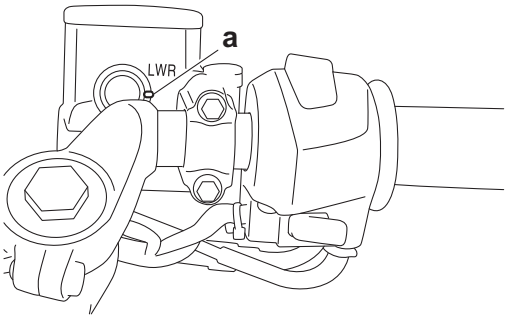
• When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

ECA13540

NOTICE

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

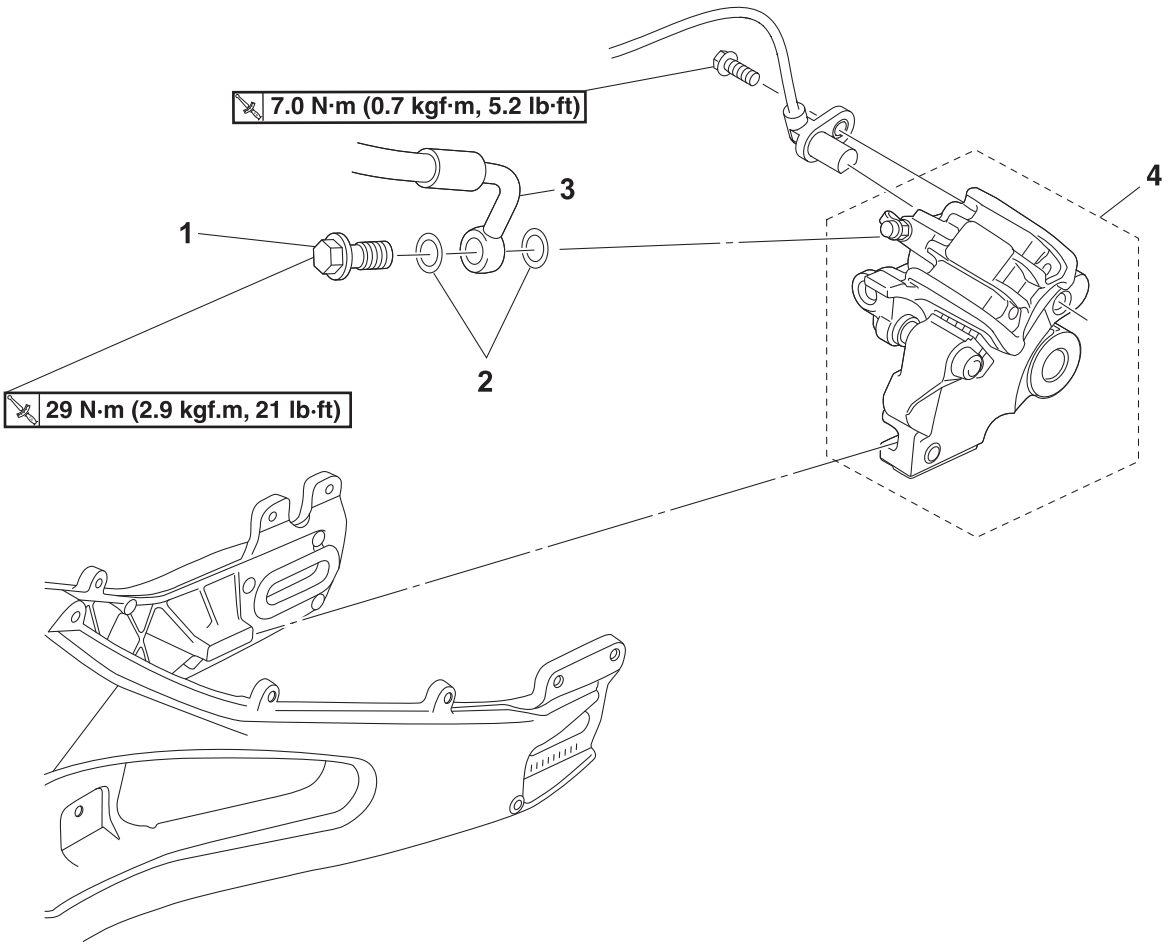
3. Bleed:
   • Brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-4.
4. Check:
   • Brake fluid level
   Below the minimum level mark "a" → Add the specified brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in base service manual BK7-F8197-E0 on page 3-16.



5. Check:
   • Brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-4.

EAS20031
REAR BRAKE

Removing the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel sensor		Refer to "REAR WHEEL" on page 4-5.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-4.
	Rear wheel		Refer to "REAR WHEEL" on page 4-5.
1	Rear brake hose union bolt	1	
2	Brake hose gasket	2	
3	Rear brake hose	1	
4	Rear brake caliper	1	
			For installation, reverse the removal procedure.

EAS30186
REMOVING THE REAR BRAKE CALIPER

TIP

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

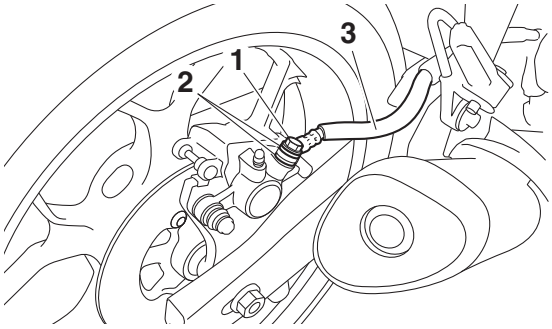
ECA20981
NOTICE

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

1. Remove:
   - Rear wheel sensor
   - Rear brake hose union bolt “1”
   - Brake hose gaskets “2”
   - Rear brake hose (hydraulic unit to brake caliper) “3”
   - Rear wheel along with caliper

TIP

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



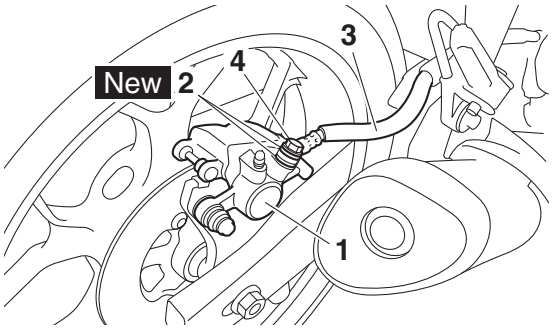
EAS30190
INSTALLING THE REAR BRAKE CALIPER

1. Lubricate:
   - Rear brake caliper bolt

	Recommended lubricant **Silicone grease**

2. Install:
   - Brake pad shims (onto the brake pads)
   - Brake pads
   - Rear brake caliper “1” along with rear wheel
   - Rear wheel sensor
     Refer to “REPLACING THE REAR BRAKE PADS” in base service manual BK7-F8197-E0 on page 4-34.
   - Brake hose gaskets “2” New
   - Rear brake hose (hydraulic unit to brake caliper) “3”
   - Rear brake hose union bolt “4”

	Rear brake hose union bolt (brake caliper side) **29 N·m (2.9 kgf·m, 21 lb·ft)**

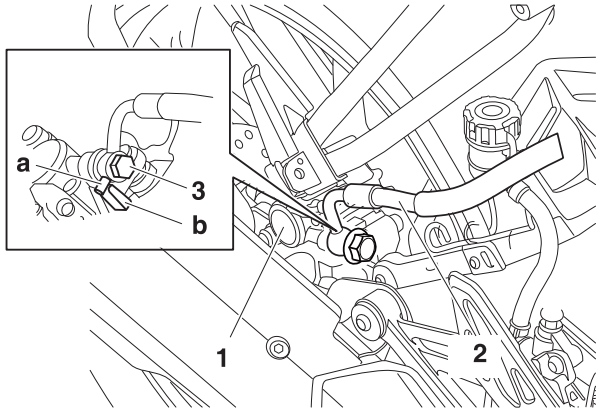


EWA13531
⚠ WARNING

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

ECA19080
NOTICE

When installing the brake hose onto the brake caliper, be sure to position the brake pipe “a” touches the projection “b” in the brake caliper.



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

Specified brake fluid
DOT 4

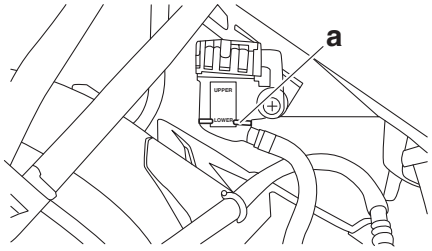
EWA13090
WARNING

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

ECA13540
NOTICE

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

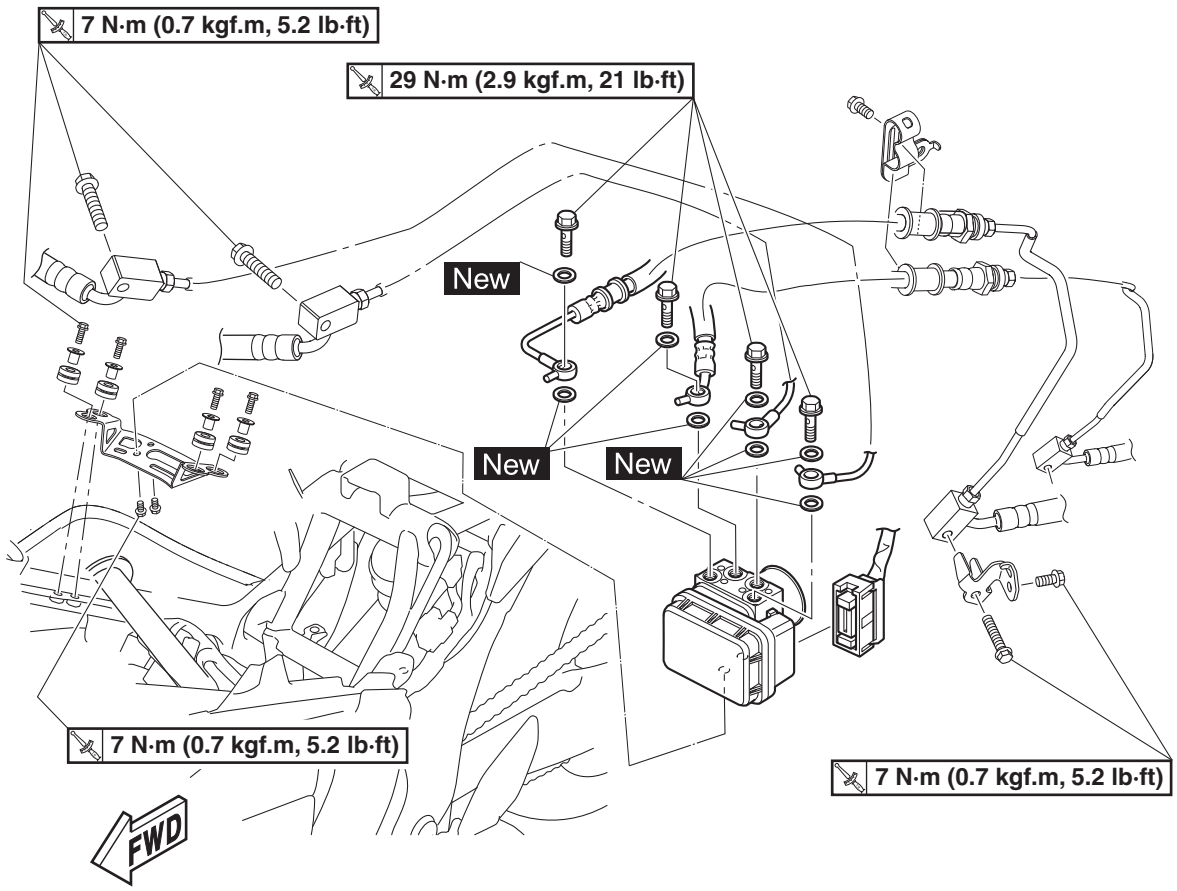
4. Bleed:
   • Brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-4.
5. Check:
   • Brake fluid level
   Below the minimum level mark "a" → Add the specified brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in base service manual BK7-F8197-E0 on page 3-16.



6. Check:
   • Brake pedal operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-4.

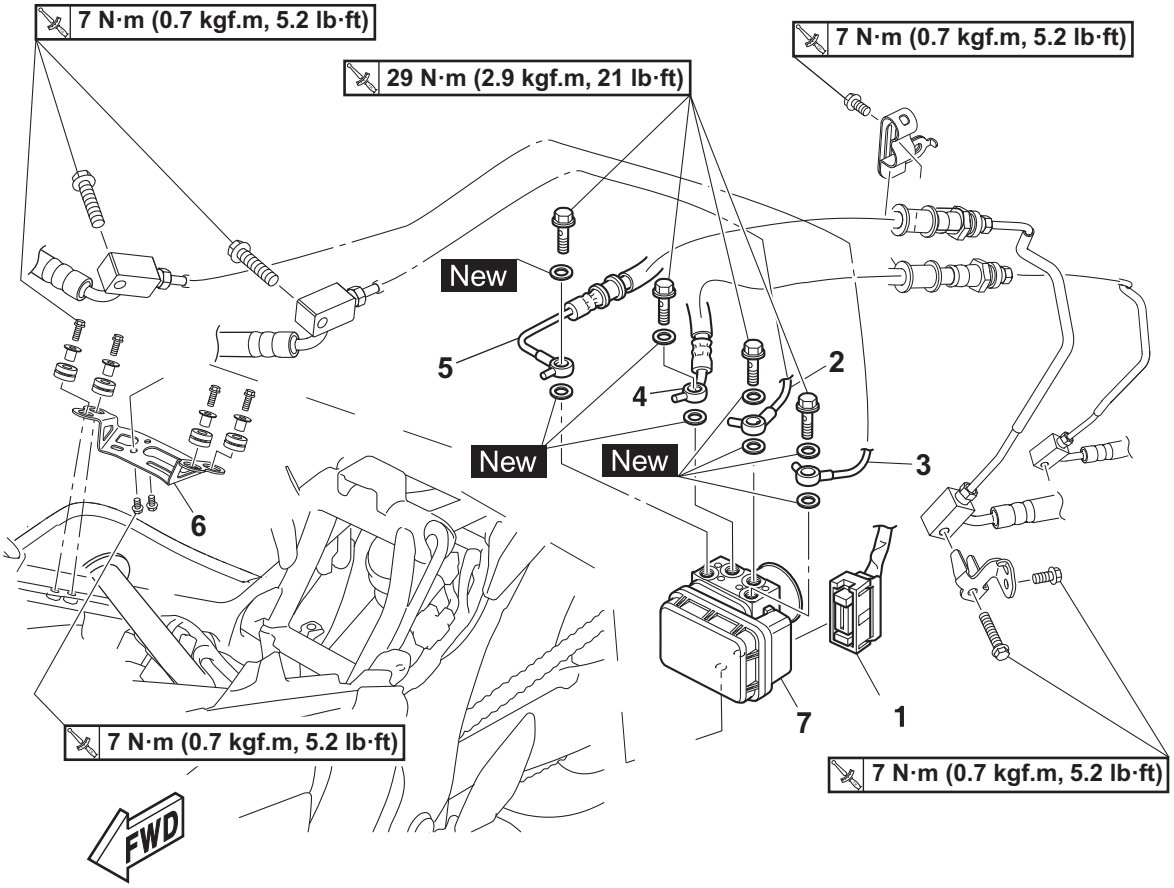
EAS20033
ABS (ANTI-LOCK BRAKE SYSTEM)

Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to"BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-4.
	Rider seat		Refer to "GENERAL CHASSIS (1)" in base service manual BK7-F8197-E0 on page 4-1.
	Side panel/side cover assembly LH &RH		Refer to "GENERAL CHASSIS (2)" in base service manual BK7-F8197-E0 on page 4-2.
	Fuel tank side covers/Fuel tank top cover		Refer to "GENERAL CHASSIS (3)" in base service manual BK7-F8197-E0 on page 4-2.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.

Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	ABS ECU coupler	1	
2	Front brake hose (hydraulic unit to front brake master cylinder)	1	
3	Front brake hose (hydraulic unit to front brake caliper)	1	
4	Rear brake hose (hydraulic unit to rear brake master cylinder)	1	
5	Rear brake hose (hydraulic unit to rear brake caliper)	1	
6	Hydraulic unit bracket	1	
7	Hydraulic unit assembly	1	

EAS30197
REMOVING THE HYDRAULIC UNIT ASSEMBLY

ECA21091
NOTICE

Unless necessary, avoid removing and installing the brake hoses of the hydraulic unit assembly.

EWA13930
⚠ WARNING

Refill with the same type of brake fluid that is already in the system. Mixing fluids may result in a harmful chemical reaction, leading to poor braking performance.

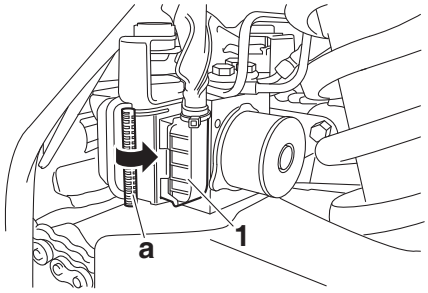
ECA18241
NOTICE

- **Handle the ABS components with care since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.**
- **Do not turn the main switch to "ON" when removing the hydraulic unit assembly.**
- **Do not clean with compressed air.**
- **Do not reuse the brake fluid.**
- **Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.**
- **Do not allow any brake fluid to contact the couplers. Brake fluid may damage the couplers and cause bad contacts.**
- **If the union bolts for the hydraulic unit assembly have been removed, be sure to tighten them to the specified torque and bleed the brake system.**

1. Disconnect:
   - ABS ECU coupler "1"

TIP

Pull the lock lever "a" of the ABS ECU coupler in the direction of the arrow shown, and then disconnect the coupler.



2. Remove:
   - Brake hoses

TIP

Do not operate the brake lever and brake pedal while removing the brake hoses.

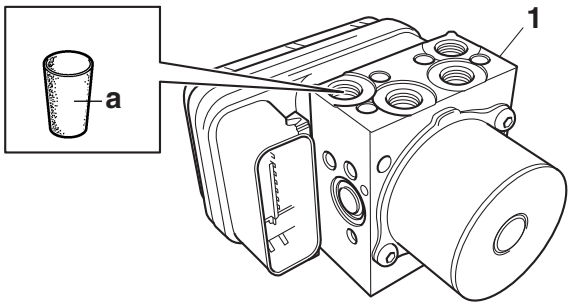
ECA14530
NOTICE

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.

3. Remove:
   - Hydraulic unit assembly "1"

TIP

- To avoid brake fluid leakage and to prevent foreign materials from entering the hydraulic unit assembly, insert a rubber plug "a" or a bolt (M10 × 1.25) into each brake hose union bolt hole.
- When using a bolt, do not tighten the bolt until the bolt head touches the hydraulic unit. Otherwise, the brake hose union bolt seating surface could be deformed.



EAS30198
CHECKING THE HYDRAULIC UNIT ASSEMBLY

1. Check:
   - Hydraulic unit assembly
     Cracks/damage → Replace the hydraulic unit assembly and the brake hoses that are connected to the assembly as a set.

EAS30200
INSTALLING THE HYDRAULIC UNIT ASSEMBLY

1. Install:
   • Hydraulic unit assembly

	Hydraulic unit assembly bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP

Do not allow any foreign materials to enter the hydraulic unit assembly or the brake hoses when installing the hydraulic unit assembly.

ECA21110
NOTICE

Do not remove the rubber plugs or bolts (M10 × 1.25) installed in the brake hose union bolt holes before installing the hydraulic unit assembly.

2. Remove:
   • Rubber plugs or bolts (M10 × 1.25)
3. Install:
   • Rear brake hose (brake master cylinder to hydraulic unit) “1”
   • Front brake hose (brake hose joint to hydraulic unit) “2”
   • Front brake hose (hydraulic unit to brake hose joint) “3”
   • Rear brake hose (hydraulic unit to brake caliper) “4”

	Front brake hose union bolt 29 N·m (2.9 kgf·m, 21 lb·ft) **Rear brake hose union bolt 29 N·m (2.9 kgf·m, 21 lb·ft)**

ECA21121
NOTICE

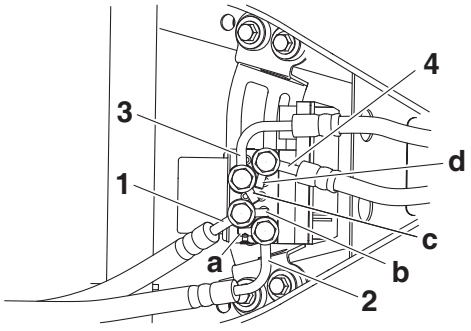
If the brake hose union bolt does not turn easily, replace the hydraulic unit assembly, brake hoses, and related parts as a set.

a. Temporarily install the brake hoses as shown in the illustration.
b. Position the front brake hose (brake master cylinder to hydraulic unit) “2” so that its projection “a” contacts the rear brake hose (brake master cylinder to hydraulic unit) “1” also position the rear brake hose (brake master cylinder to hydraulic unit) “1” so that its projection “b” contacts the front brake hose (brake master cylinder to hydraulic unit) “2”, and then temporarily tighten the union bolt for the brake hose (front brake master cylinder to hydraulic unit).
c. Temporarily tighten the union bolt for the rear brake hose (brake master cylinder to hydraulic unit) “1”.

TIP

Make sure that the pipe section “b” of the brake hose (rear brake master cylinder to hydraulic unit) does not contact the hydraulic unit.

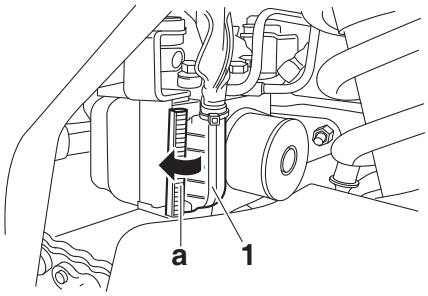
d. Position the front brake hose (hydraulic unit to brake caliper) “3” so that its projection “c” contacts the rear brake hose (brake master cylinder to hydraulic unit) “1”, and then temporarily tighten the union bolt for the front brake hose (hydraulic unit to brake caliper).
e. Position the rear brake hose (hydraulic unit to brake caliper) “4” so that its projection “d” contacts the front brake hose (hydraulic unit to brake hose joint) “3”, and then temporarily tighten the union bolt for the rear brake hose (hydraulic unit to brake caliper).
f. Tighten the brake hose union bolts to specification.

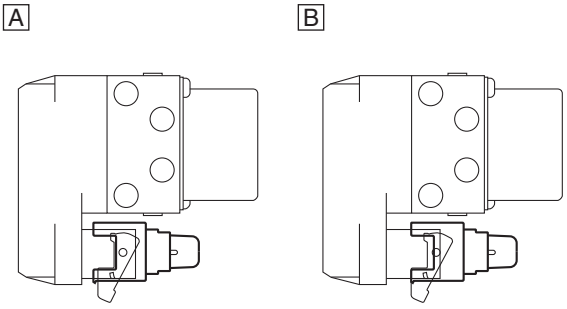


4. Connect:
   • ABS ECU coupler “1”

TIP

- Connect the ABS ECU coupler, and then push the lock lever “a” of the coupler in the direction of the arrow shown.
- Make sure that the ABS ECU coupler is connected in the correct position as shown in illustration “A”.





A. The ABS ECU coupler is connected correctly.
B. The ABS ECU coupler is not connected.

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

Specified brake fluid
DOT 4

EWA13090
⚠ WARNING

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

ECA13540
NOTICE

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

6. Bleed:
   • Brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-4.
7. Check the operation of the hydraulic unit according to the brake lever and the brake pedal response. (Refer to "HYDRAULIC UNIT OPERATION TESTS" on page 4-20.)

ECA14770
NOTICE

Always check the operation of the hydraulic unit according to the brake lever and the brake pedal response.

8. Delete the fault codes. (Refer to "[B-3] DELETING THE FAULT CODES" on page 6-67.)
9. Perform a trial run. (Refer to "CHECKING THE ABS WARNING LIGHT" on page 4-24.)

EAS30930
HYDRAULIC UNIT OPERATION TESTS

The reaction-force pulsating action generated in the brake lever and brake pedal when the ABS is activated can be tested when the vehicle is stopped.
The hydraulic unit operation can be tested using the following two methods.

- Brake line routing confirmation: this test checks the function of the ABS after the system was disassembled, adjusted, or serviced.
- ABS reaction-force confirmation: this test generates the same reaction-force pulsating action that is generated in the brake lever and brake pedal when the ABS is activated.

Brake line routing confirmation

EWA13120
⚠ WARNING

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

TIP

- For the brake line routing confirmation, use the diagnosis mode of the Yamaha diagnostic tool.
- Before performing the brake line routing confirmation, make sure that no malfunctions have been detected in the ABS ECU and that the wheels are not rotating.

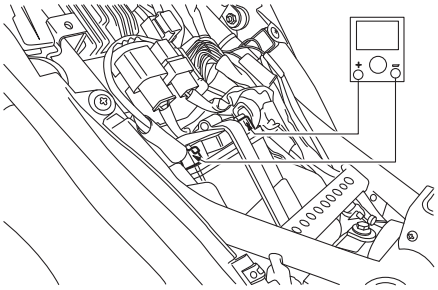
1. Place the vehicle on a suitable stand.
2. Turn the main switch to "OFF".
3. Remove:
   • Rider seat
   Refer to "GENERAL CHASSIS (1)" in base service manual BK7-F8197-E0 on page 4-1.

4. Check:
   • Battery voltage
   Lower than 12.8 V → Charge or replace the battery.

Battery voltage
Higher than 12.8 V

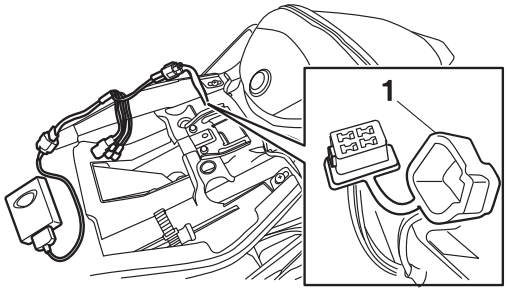
TIP

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



5. Removing the protective cap “1”, and then connect the Yamaha diagnostic tool to the ABS test coupler (4 Pin).

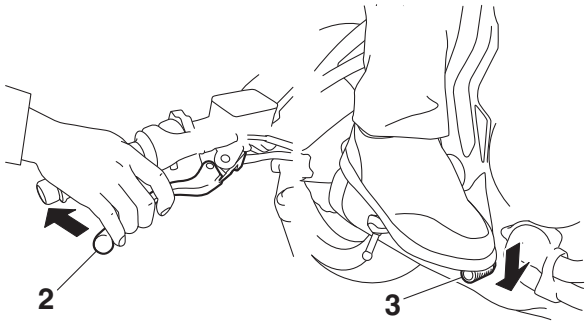
Yamaha diagnostic tool USB
INS-018
90890-03267
INS-019
90890-03262



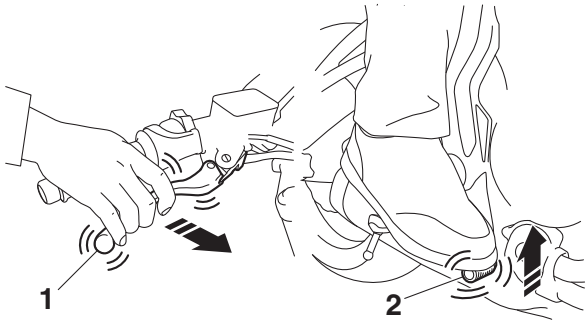
6. Start the Yamaha diagnostic tool and display the diagnosis mode screen.
7. Select code No. 2, “Brake line routing confirmation”.
8. Click “Actuator check” “1”, and then operate the brake lever “2” and brake pedal “3” simultaneously.

TIP

- The hydraulic unit operates 1 second after the brake lever and brake pedal are operated simultaneously and continues for approximately 5 seconds.
- The operation of the hydraulic unit can be confirmed using the indicator.
  On: The hydraulic unit is operating.
  Flashing: The conditions for operating the hydraulic unit have not been met.
  Off: The brake lever and brake pedal are not being operated.



9. Check:
   • Hydraulic unit operation
   Click “Actuator check”, a single pulse will be generated in the brake lever “1”, brake pedal “2”, and again in the brake lever “1”, in this order.



TIP

"ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.

ECA18280

NOTICE

- **Check that the pulse is felt in the brake lever, brake pedal, and again in the brake lever, in this order.**
- **If the pulse is felt in the brake pedal before it is felt in the brake lever, check that the brake hoses and brake pipes are connected correctly to the hydraulic unit assembly.**
- **If the pulse is hardly felt in either the brake lever or brake pedal, check that the brake hoses and brake pipes are connected correctly to the hydraulic unit assembly.**

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

ABS reaction-force confirmation

EWA13120

WARNING

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

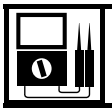
TIP

- For the ABS reaction-force confirmation, use the diagnosis mode of the Yamaha diagnostic tool. For more information, refer to the operation manual of the Yamaha diagnostic tool.
- Before performing the ABS reaction-force confirmation, make sure that no malfunctions have been detected in the ABS ECU and that the wheels are not rotating.

1. Place the vehicle on a suitable stand.
2. Turn the main switch to "OFF".
3. Remove:
   - Passenger seat
   - Rider seat

   Refer to "GENERAL CHASSIS (1)" in base service manual BK7-F8197-E0 on page 4-1.
4. Check:
   - Battery voltage

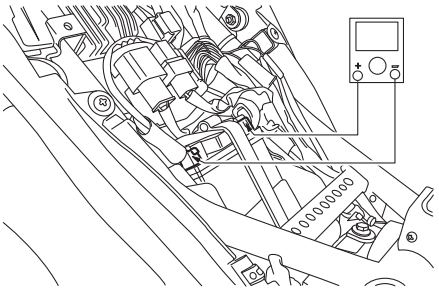
   Lower than 12.8 V → Charge or replace the battery.



Battery voltage
Higher than 12.8 V

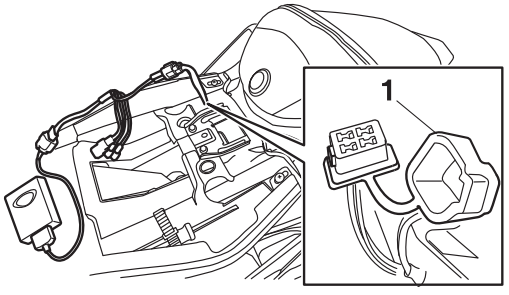
TIP

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



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

Yamaha diagnostic tool
INS-018
90890-03267
INS-019
90890-03262

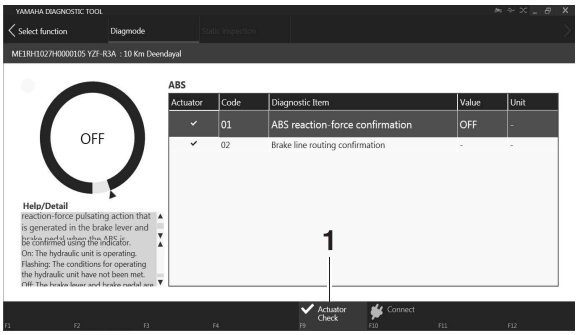


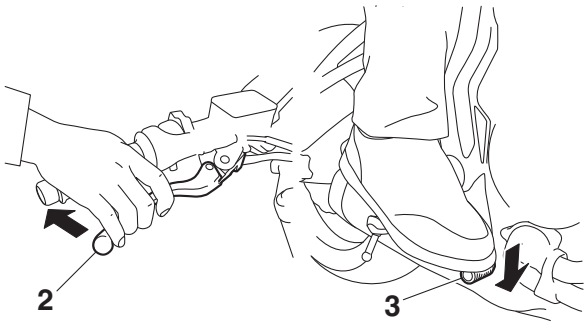
6. Start the Yamaha diagnostic tool and display the diagnosis mode screen.
7. Select code No. 1, "ABS reaction-force confirmation".
8. Click "Actuator check" "1", and then operate the brake lever "2" and brake pedal "3" simultaneously.

TIP

- The hydraulic unit operates 1 second after the brake lever and brake pedal are operated simultaneously and continues for approximately 5 seconds.

• The operation of the hydraulic unit can be confirmed using the indicator.
On: The hydraulic unit is operating.
Flashing: The conditions for operating the hydraulic unit have not been met.
Off: The brake lever and brake pedal are not being operated.

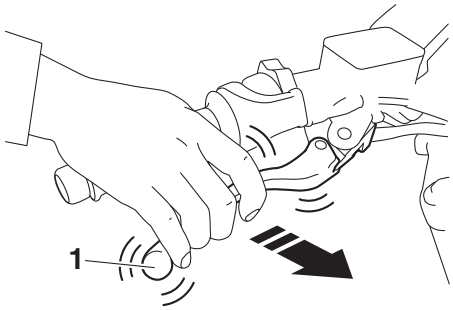




9. A reaction-force pulsating action is generated in the brake lever "1" and continues for a few seconds.

TIP

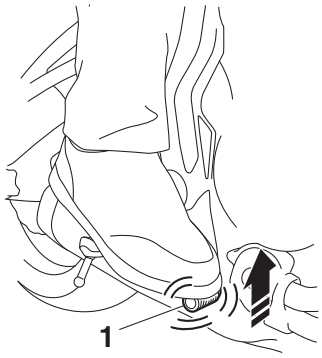
- The reaction-force pulsating action consists of quick pulses.
- Be sure to continue operating the brake lever and brake pedal even after the pulsating action has stopped.
- "ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.



10. After the pulsating action has stopped in the brake lever, it is generated in the brake pedal "1" and continues for a few seconds.

TIP

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



11. After the pulsating action has stopped in the brake pedal, it is generated in the brake lever and continues for a few seconds.

TIP

- The reaction-force pulsating action consists of quick pulses.
- "ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.

ECA18280

NOTICE

- **Check that the pulse is felt in the brake lever, brake pedal, and again in the brake lever, in this order.**
- **If the pulse is felt in the brake pedal before it is felt in the brake lever, check that the brake hoses and brake pipes are connected correctly to the hydraulic unit assembly.**
- **If the pulse is hardly felt in either the brake lever or brake pedal, check that the brake hoses and brake pipes are connected correctly to the hydraulic unit assembly.**

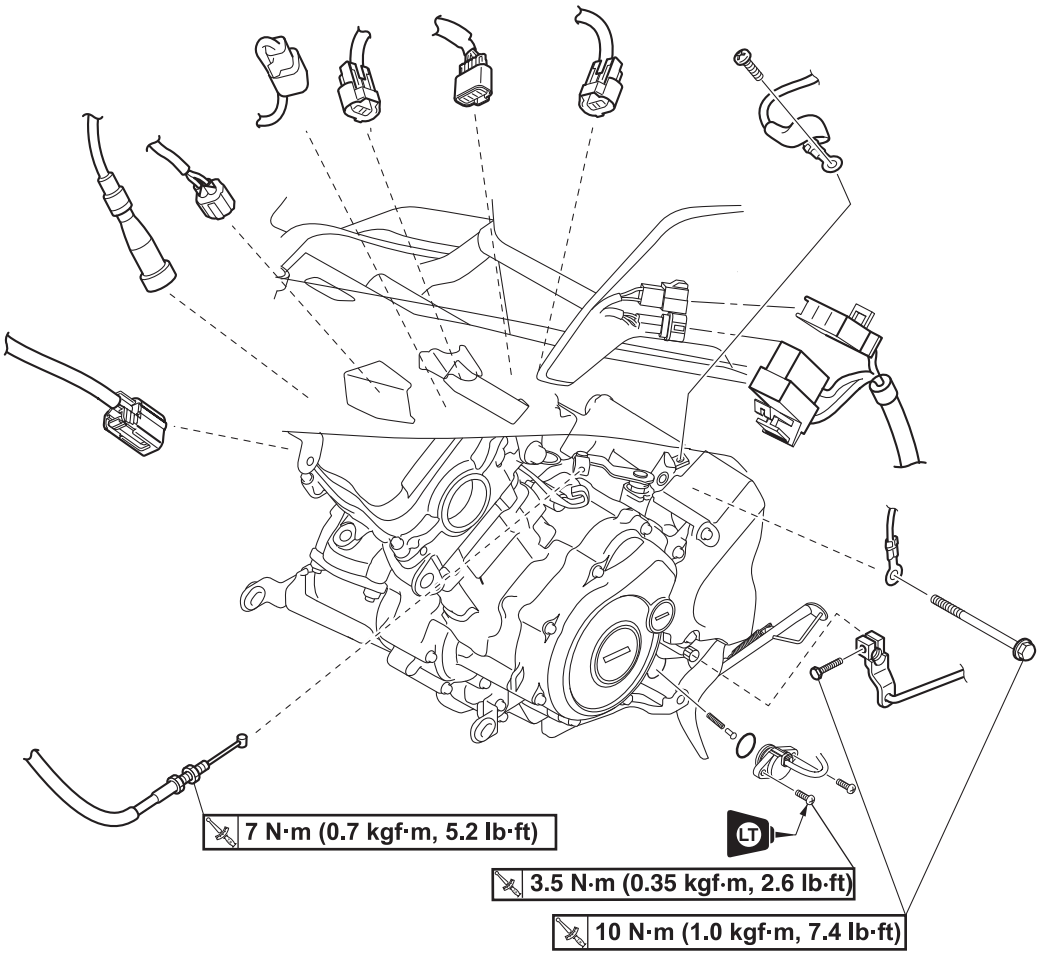
12.Turn the main switch to “OFF”.
13.Remove the Yamaha diagnostic tool from the Yamaha diagnostic tool coupler, and then install the protective cap.
14.Turn the main switch to “ON”.
15.Set the start/engine stop switch to “ ”.
16.Check for brake fluid leakage around the hydraulic unit.
Brake fluid leakage → Replace the hydraulic unit, brake hoses, and related parts as a set.
17.If the operation of the hydraulic unit is normal, delete all of the fault codes.

EAS30202
CHECKING THE ABS WARNING LIGHT
After all checks and servicing are completed, ensure that the ABS warning light goes off by walking the vehicle at a speed of faster than 10 km/h (6.3 mi/h) or performing a trial run.

ENGINE

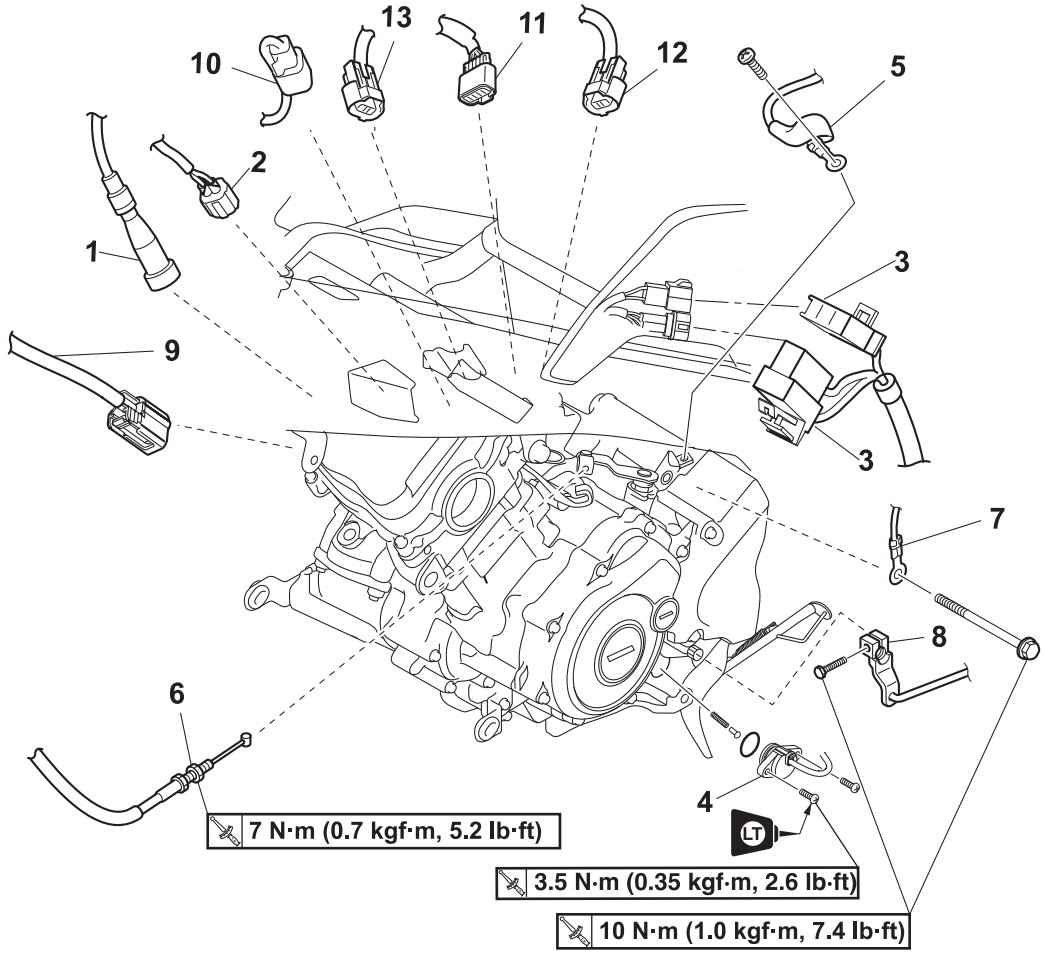
EAS20042
ENGINE REMOVAL

Disconnecting the leads and couplers



Order	Job/Parts to remove	Q'ty	Remarks
			NOTICE **First, disconnect the negative battery lead, and then the positive battery lead.**
	Negative battery lead/Positive battery lead		Refer to "CHECKING AND CHARGING THE BATTERY" in base service manual BK7-F8197-E0 on page 8-62.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in base service manual BK7-F8197-E0 on page 3-9.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in base service manual BK7-F8197-E0 on page 3-14.
	Rider seat/Upper covers/Side covers/Lower side cowlings/Bottom cowling/Air filter case		Refer to "GENERAL CHASSIS" in base service manual BK7-F8197-E0 on page 4-1.
	Fuel tank		Refer to "FUEL TANK" in base service manual BK7-F8197-E0 on page 7-1.
	Throttle body/Intake manifold		Refer to "THROTTLE BODY" in base service manual BK7-F8197-E0 on page 7-5.
	Water pump breather hose/Radiator outlet hose/Radiator inlet hose/Radiator/Coolant reservoir		Refer to "RADIATOR" in base service manual BK7-F8197-E0 on page 6-1.

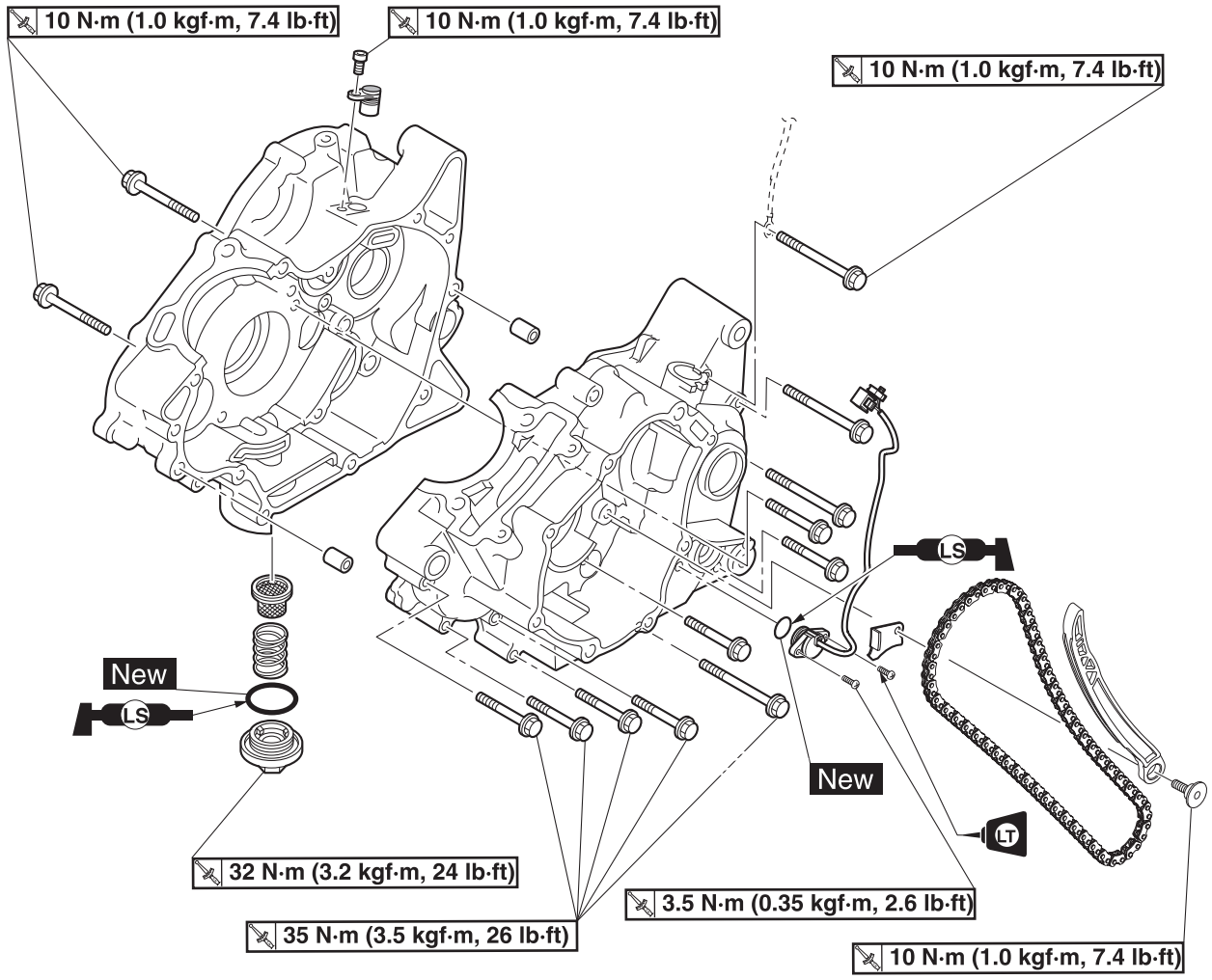
Disconnecting the leads and couplers



Order	Job/Parts to remove	Q'ty	Remarks
	Canister hose		Refer to "FUEL TANK" in base service manual BK7-F8197-E0 on page 7-1.
	Drive sprocket cover/Drive sprocket		Refer to "CHAIN DRIVE" in base service manual BK7-F8197-E0 on page 4-63.
1	Spark plug cap	1	Disconnect.
2	Coolant temperature sensor coupler	1	Disconnect.
3	Stator coil coupler/Crankshaft position sensor coupler	1/1	Disconnect.
4	Gear position switch coupler	1	Disconnect.
5	Starter motor lead	1	Disconnect.
6	Clutch cable	1	Disconnect.
7	Negative battery lead	1	Disconnect.
8	Shift arm	1	Disconnect.
9	O_2 sensor lead	1	Disconnect.
10	Injector lead	1	Disconnect.
11	Throttle position sensor lead	1	Disconnect.
12	FID (fast idle solenoid) coupler	1	Disconnect.
13	VVA (variable valve actuation) solenoid lead	1	Disconnect.
			For installation, reverse the removal procedure.

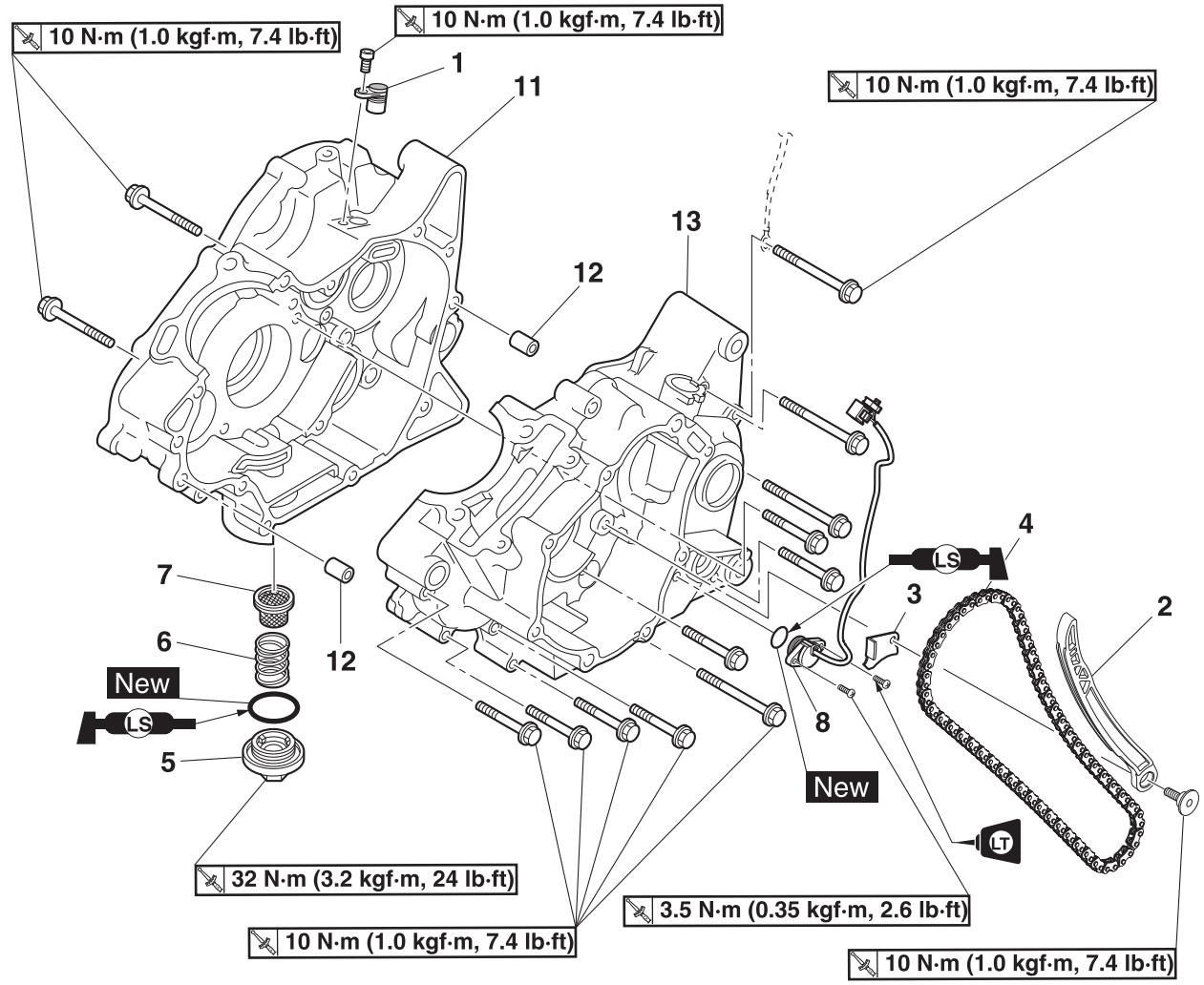
EAS20059
CRANKCASE

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" in base service manual BK7-F8197-E0 on page 5-7.
	Cylinder/Piston		Refer to "CYLINDER AND PISTON" in base service manual BK7-F8197-E0 on page 5-25.
	Clutch housing		Refer to "CLUTCH" in base service manual BK7-F8197-E0 on page 5-39.
	Oil pump assembly		Refer to "OIL PUMP" in base service manual BK7-F8197-E0 on page 5-48.
	Shift shaft		Refer to "SHIFT SHAFT" in base service manual BK7-F8197-E0 on page 5-50.
	Starter motor		Refer to "ELECTRIC STARTER" in base service manual BK7-F8197-E0 on page 5-35.
	Balancer gears		Refer to "BALANCER GEAR" in base service manual BK7-F8197-E0 on page 5-52.
	Magneto rotor		Refer to "MAGNETO AND STARTER CLUTCH" in base service manual BK7-F8197-E0 on page 5-7.

Separating the crankcase

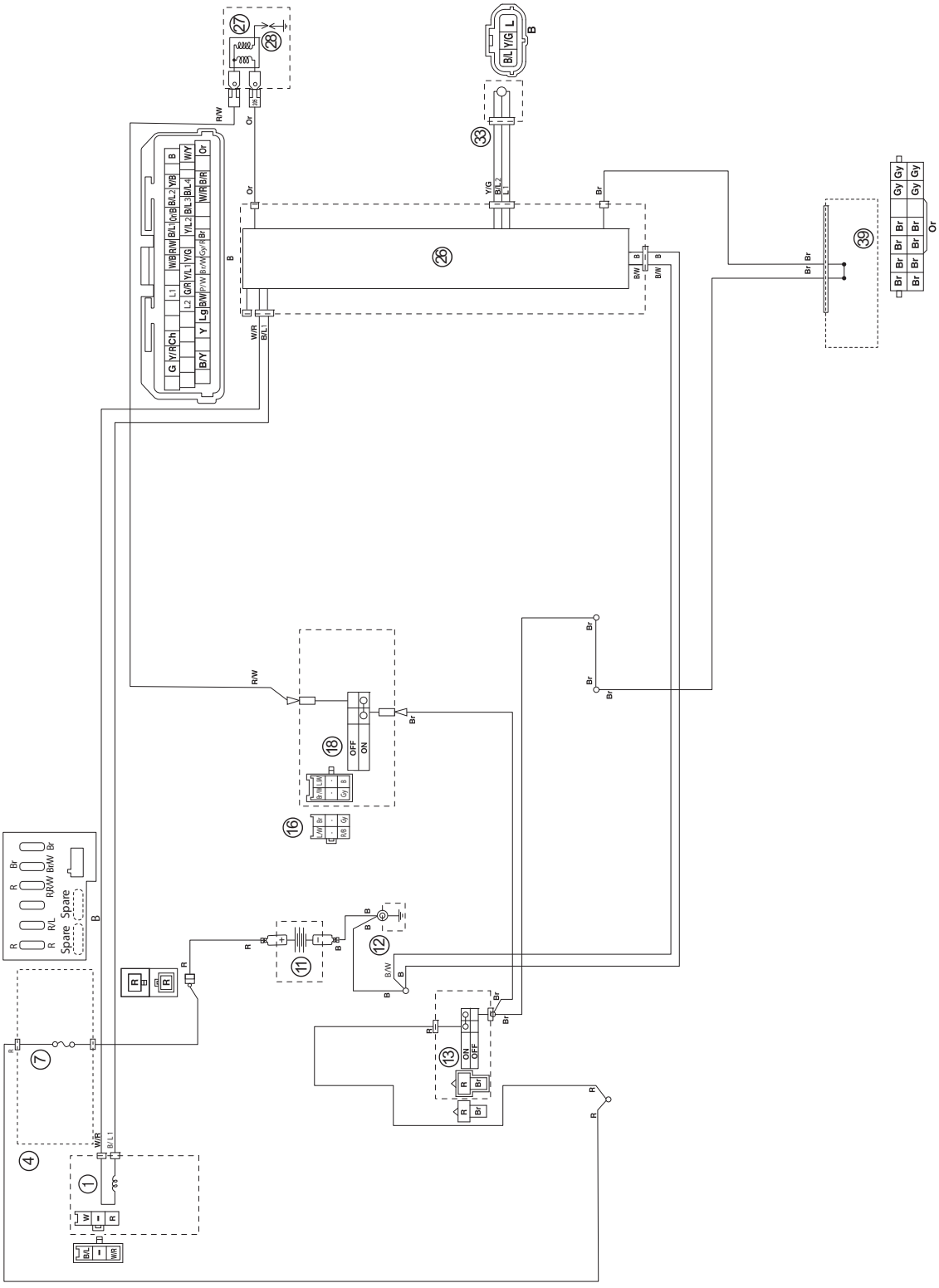


Order	Job/Parts to remove	Q'ty	Remarks
1	Plug with "O" ring	1	
2	Timing chain guide (intake side)	1	
3	Chain cover	1	
4	Timing chain	1	
5	Engine oil drain plug	1	
6	Spring	1	
7	Engine oil strainer	1	
8	Neutral switch	1	
9	Circlip	2	
10	Spacer	1	
11	Crankcase (right)	1	
12	Dowel pin	2	
13	Crankcase (left)	1	
			For installation, reverse the removal procedure.

ELECTRICAL SYSTEM

EAS20072
IGNITION SYSTEM

EAS30490
CIRCUIT DIAGRAM



1. Crankshaft position sensor
4. Fuse box
7. Main fuse
11. Battery
12. Engine ground
13. Main switch
16. Handlebar switch (right)
18. Engine stop switch
26. ECU (Engine Control unit)
27. Ignition coil
28. Spark plug
33. Lean angle sensor
39. Junction 1

EAS30492
TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

TIP

• Before troubleshooting, remove the following part(s):
1. Rider seat
2. Upper panel (right and left)
3. Side panel (right and left)
4. Side cover (right and left)

1. Check the fuses. (Main and ignition) Refer to “CHECKING THE FUSES” on page 6-71.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the spark plug. Refer to “CHECKING THE SPARK PLUG” in base service manual BK7-F8197-E0 on page 3-6.	NG →	Re-gap or replace the spark plug.
OK ↓		
4. Check the ignition spark gap. Refer to “CHECKING THE IGNITION SPARK GAP” in base service manual BK7-F8197-E0 on page 8-65.	OK →	Ignition system is OK.
NG ↓		
5. Check the spark plug cap. Refer to “CHECKING THE SPARK PLUG CAP” in base service manual BK7-F8197-E0 on page 8-64.	NG →	Replace the spark plug cap.
OK ↓		
6. Check the ignition coil. Refer to “CHECKING THE IGNITION COIL” in base service manual BK7-F8197-E0 on page 8-65.	NG →	Replace the ignition coil.
OK ↓		

7. Check the crankshaft position sensor.
   Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” in base service manual BK7-F8197-E0 on page no. 8-66.

NG → Replace the crankshaft position sensor/ stator assembly.

OK ↓

8. Check the main switch.
   Refer to “CHECKING THE SWITCHES” on page 6-70.

NG → Replace the main switch.

OK ↓

9. Check the engine stop switch.
   Refer to “CHECKING THE SWITCHES” on page 6-70.

NG → The engine stop switch is faulty. Replace the right handlebar switch.

OK ↓

10. Check the lean angle sensor.
    Refer to “CHECKING THE LEAN ANGLE SENSOR” in base service manual BK7-F8197-E0 on page 8-66.

NG → Replace the lean angle sensor.

OK ↓

11. Check the entire ignition system wiring.
    Refer to “CIRCUIT DIAGRAM” on page 6-1.

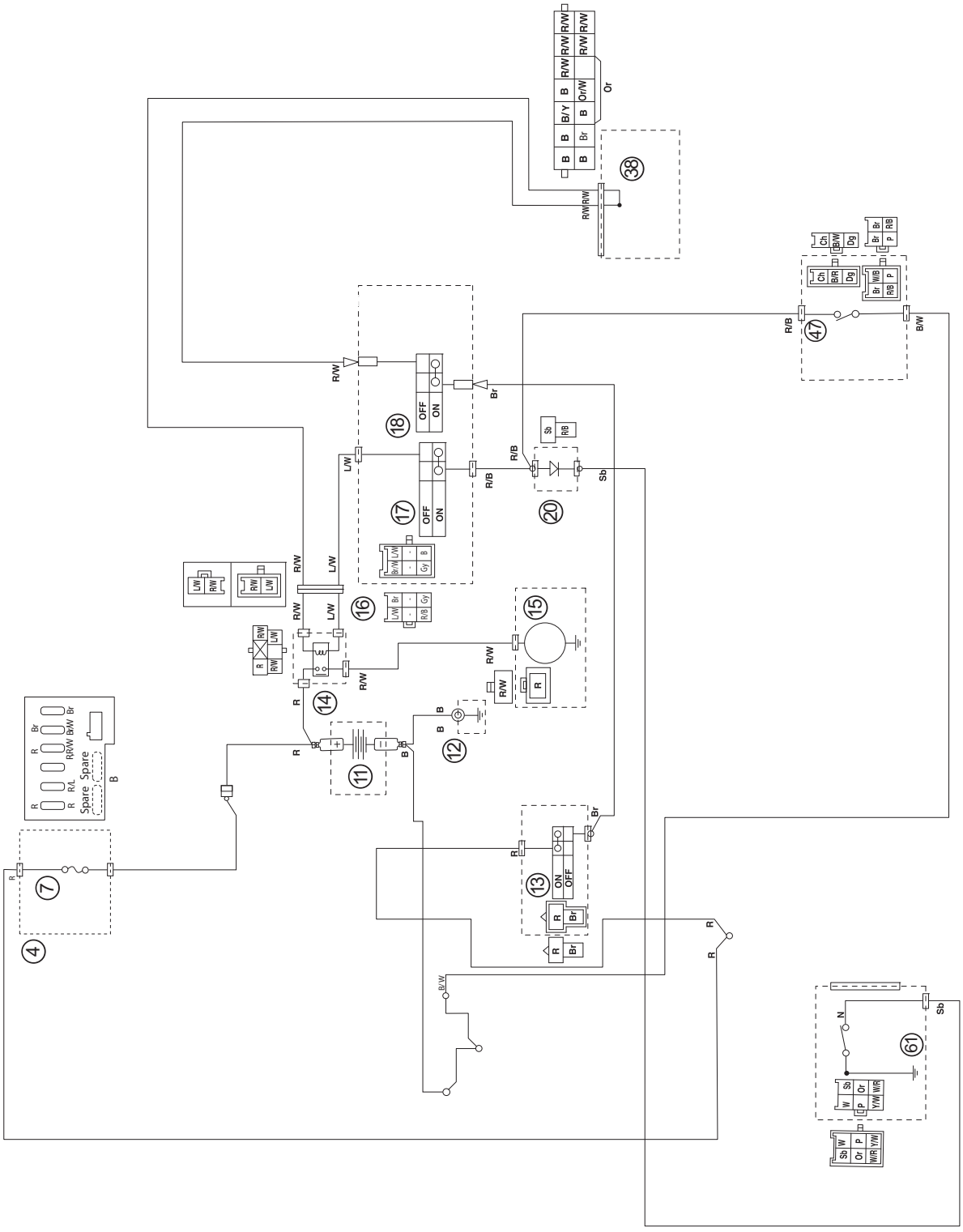
NG → Properly connect or replace the wire harness.

OK ↓

Replace the ECU.

EAS20073
ELECTRIC STARTING SYSTEM

EAS30493
CIRCUIT DIAGRAM



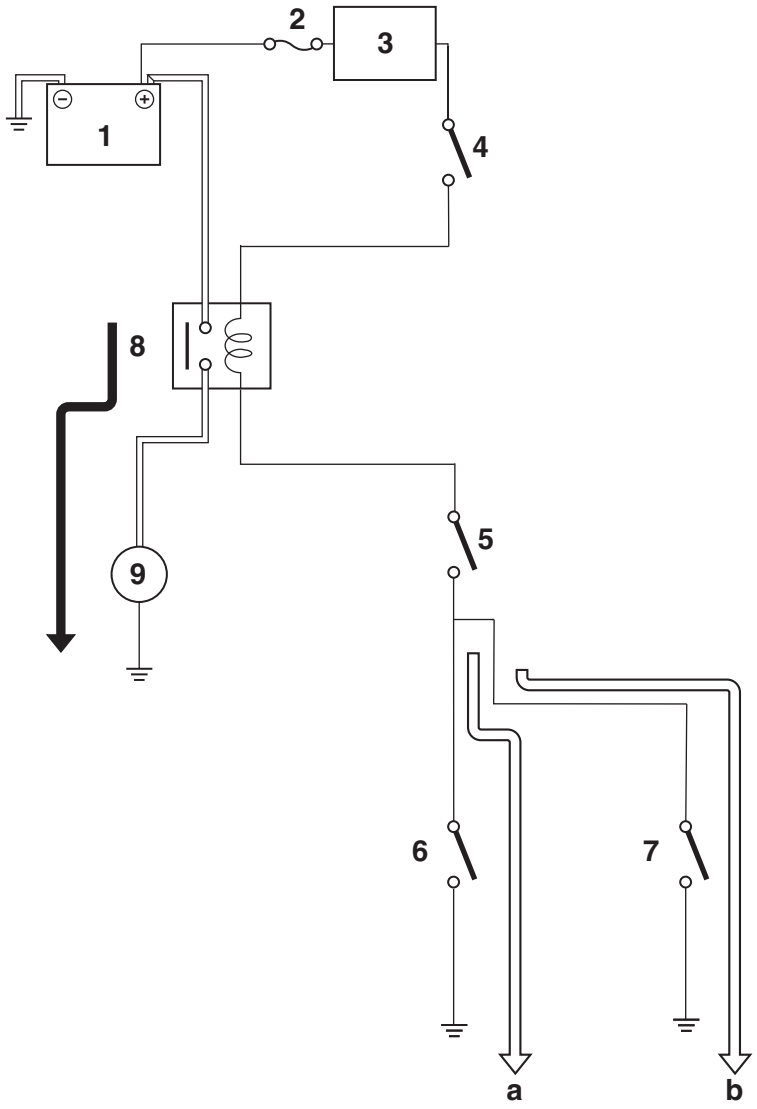
4. Fuse box
7. Main fuse
11. Battery
12. Engine ground
13. Main switch
14. Starter relay
15. Starter motor
16. Handlebar switch (right)
17. Starter switch
18. Engine stop switch
20. Diode 1
38. Junction 2
47. Clutch switch
61. Gear position switch

EAS30494
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to "○" and the main switch is set to "ON" (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed).

The starting circuit cut-off relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met, the starting circuit cut-off relay is closed and the engine can be started by pressing the start switch "⊜".



a. WHEN THE TRANSMISSION IS IN NEUTRAL
b. WHEN CLUTCH LEVER IS PULLED TO THE HANDLEBAR
1. Battery
2. Main fuse
3. Main switch
4. Engine stop switch
5. Starter switch
6. Neutral switch
7. Clutch switch
8. Starter relay
9. Starter motor

EAS30495
TROUBLESHOOTING

The starter motor fails to turn.

TIP

• Before troubleshooting, remove the following part(s):
1. Rider seat
2. Upper panel (right and left)
3. Side panel (right and left)
4. Side cover (right and left)
5. Fuel tank

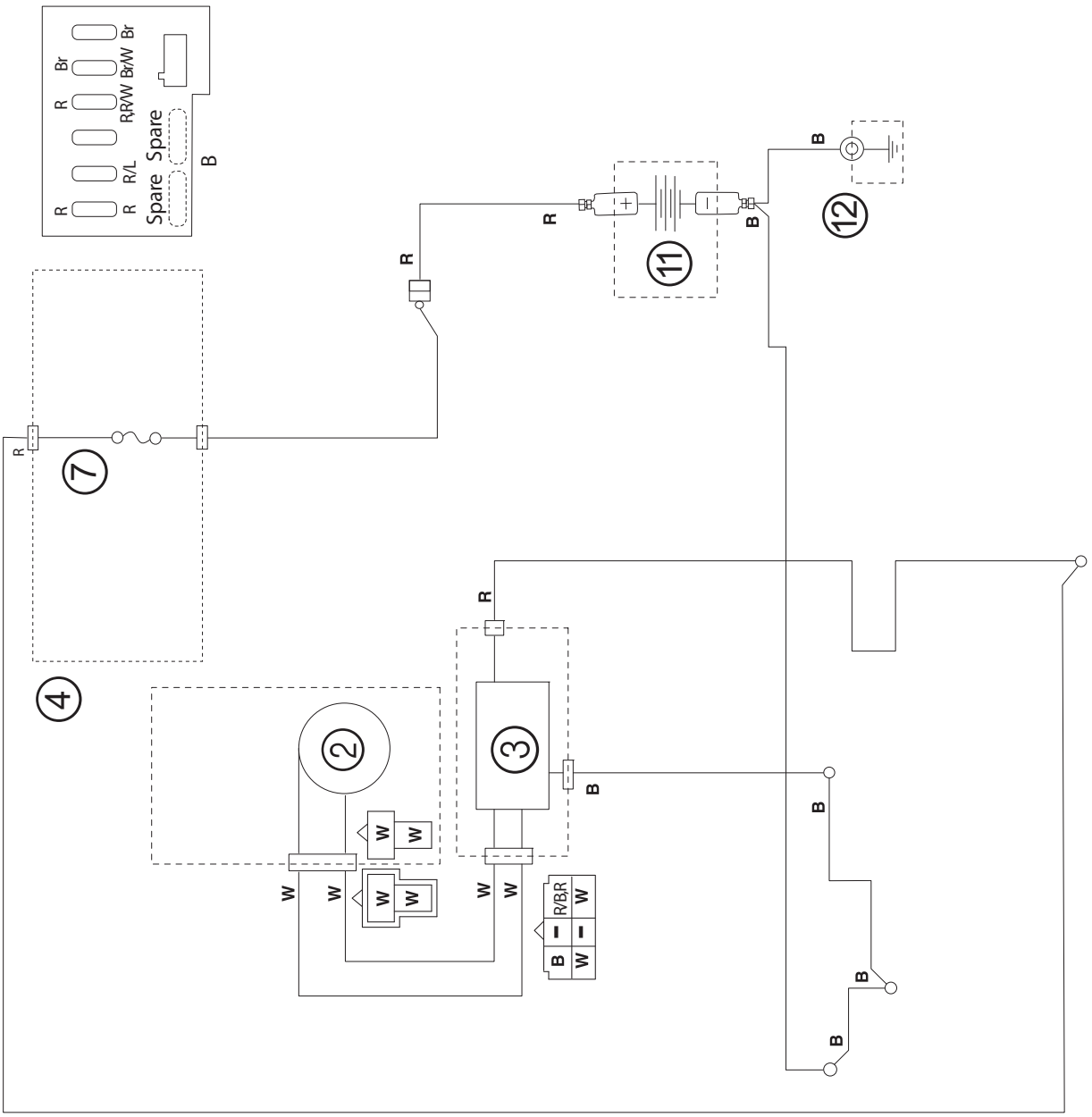
1. Check the fuses. (Main and ignition) Refer to “CHECKING THE FUSES” on page 6-71.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the starter motor operation. Refer to “CHECKING THE STARTER MOTOR OPERATION” in base service manual BK7-F8197-E0 on page 8-67.	OK →	Starter motor is OK. Perform the electric starting system troubleshooting, starting with step 5.
NG ↓		
4. Check the starter motor. Refer to “CHECKING THE STARTER MOTOR” in base service manual BK7-F8197-E0 on page 5-37.	NG →	Repair or replace the starter motor.
OK ↓		
5. Check the starter relay. Refer to “CHECKING THE RELAYS” in base service manual BK7-F8197-E0 on page 8-63.	NG →	Replace the starter relay.
OK ↓		
6. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	Replace the main switch.
OK ↓		

7. Check the engine stop switch.
   Refer to “CHECKING THE SWITCHES” on page 6-70.
   NG → The engine stop switch is faulty. Replace the right handlebar switch.
   OK ↓
8. Check the neutral switch.
   Refer to “CHECKING THE SWITCHES” on page 6-70.
   NG → Replace the neutral switch.
   OK ↓
9. Check the clutch switch.
   Refer to “CHECKING THE SWITCHES” on page 6-70.
   NG → Replace the clutch switch.
   OK ↓
10. Check the start switch.
    Refer to “CHECKING THE SWITCHES” on page 6-70.
    NG → The start switch is faulty. Replace the right handlebar switch.
    OK ↓
11. Check the entire starting system wiring.
    Refer to “CIRCUIT DIAGRAM” on page 6-5.
    NG → Properly connect or replace the wire harness.
    OK ↓

The starting system circuit is OK.

EAS20074
CHARGING SYSTEM

EAS30496
CIRCUIT DIAGRAM



2. AC magneto
3. Rectifier/regulator
4. Fuse box
7. Main fuse
11. Battery
12. Engine ground

EAS30497
TROUBLESHOOTING
The battery is not being charged.

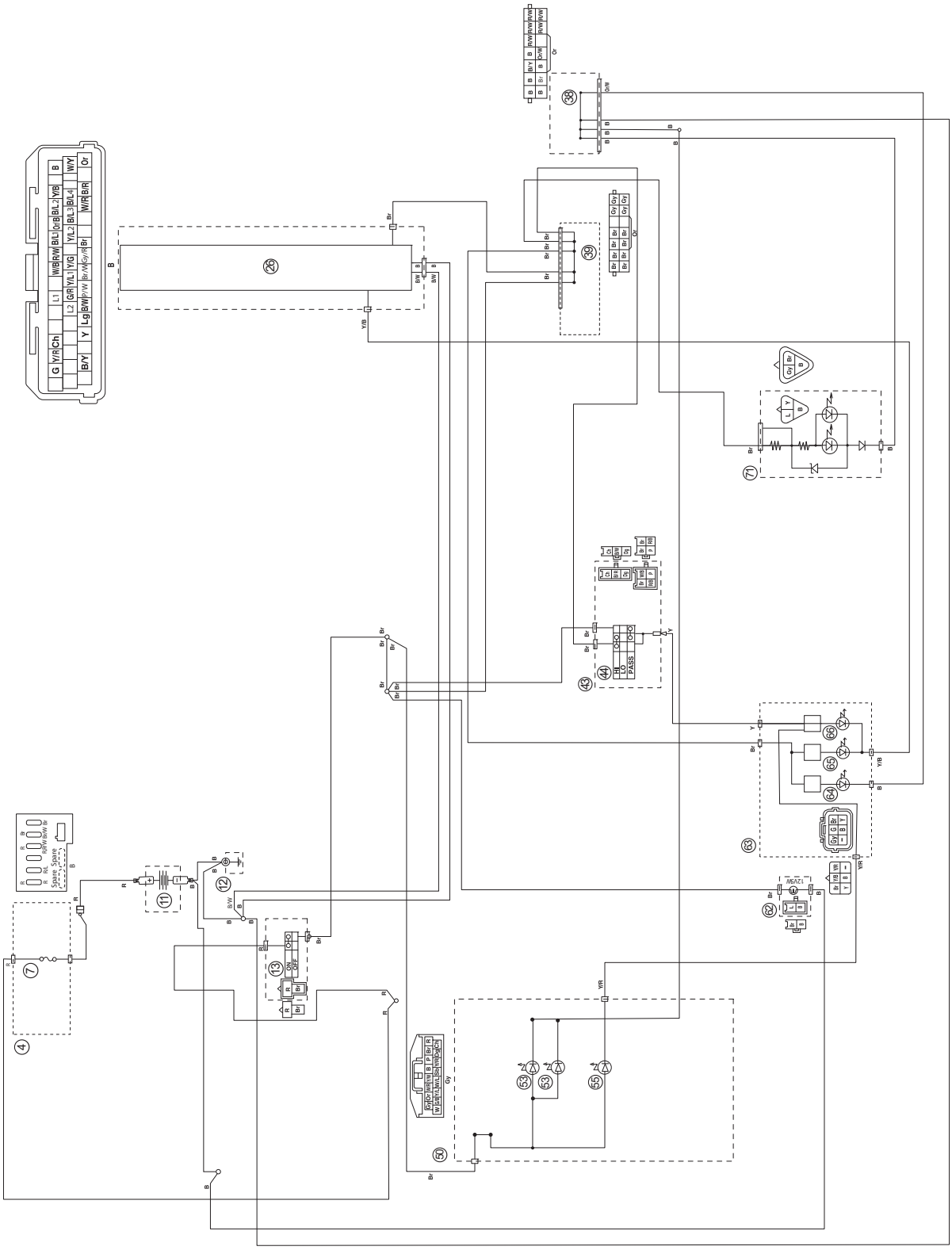
TIP

• Before troubleshooting, remove the following part(s):
1. Rider seat
2. Upper panel (left)
3. Side panel (left)
4. Side cover (left)

1. Check the fuse. (Main) Refer to “CHECKING THE FUSES” on page 6-71.	NG →	Replace the fuse.
OK ↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the stator coil. Refer to “CHECKING THE STATOR COIL” in base service manual BK7-F8197-E0 on page 8-64.	NG →	Replace the crankshaft position sensor/ stator assembly.
OK ↓		
4. Check the rectifier/regulator. Refer to “CHECKING THE RECTIFIER/REGULATOR” in base service manual BK7-F8197-E0 on page 8-64.	NG →	Replace the rectifier/regulator.
OK ↓		
5. Check the entire charging system wiring. Refer to “CIRCUIT DIAGRAM” on page 6-11.	NG →	Properly connect or replace the wire harness.
OK ↓		
The charging system circuit is OK.		

EAS20075
LIGHTING SYSTEM

EAS30498
CIRCUIT DIAGRAM



4. Fuse box
7. Main fuse
11. Battery
12. Engine ground
13. Main switch
26. ECU (Engine Control unit)
38. Junction 2
39. Junction 1
43. Handlebar switch (left)
44. Dimmer and pass switch
50. Meter assembly
53. Meter light
55. High beam indicator light
62. License plate light
63. Headlight unit
64. Auxiliary light
65. Headlight (high)
66. Headlight (low)
71. Brake/Tail light assembly

EAS30499
TROUBLESHOOTING

Any of the following fail to light: headlights, high beam indicator light, taillight, license plate light, auxiliary light or meter lights.

TIP

• Before troubleshooting, remove the following part(s):
1. Rider and passenger seat
2. Upper panel (right and left)
3. Side panel (right and left)
4. Side cover (right and left)
5. Rear cover (right and left)

1. Check the condition of each LED/ bulb and bulb socket. Refer to “CHECKING THE LED/ BULBS AND BULB SOCKETS” in “BASIC INFORMATION” (separate volume).	NG →	Replace the LED/bulb(s) and bulb socket(s).
OK ↓		
2. Check the fuses. Refer to “CHECKING THE FUSES” on page 6-71.	NG →	Replace the fuse(s).
OK ↓		
3. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
4. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	Replace the main switch.
OK ↓		
5. Check the dimmer switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	The dimmer switch is faulty. Replace the left handlebar switch.
OK ↓		
6. Check the pass switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	The pass switch is faulty. Replace the left handlebar switch.
OK ↓		

7. Check the entire lighting system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 6-15.

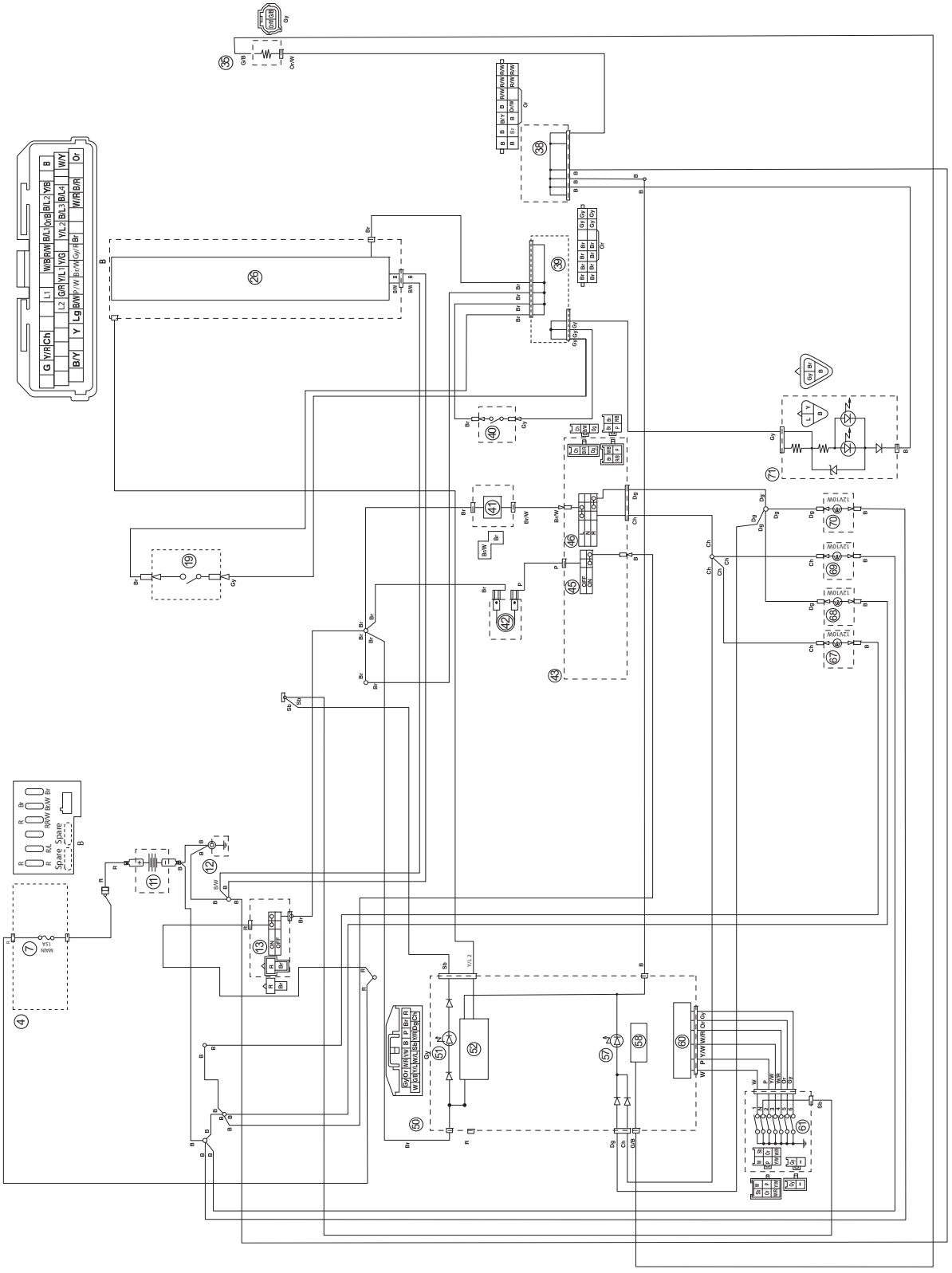
NG → Properly connect or replace the wire harness.

OK ↓

Replace the ECU, meter assembly, or tail/brake light assembly.

EAS20076
SIGNALING SYSTEM

EAS30500
CIRCUIT DIAGRAM



4. Fuse box
7. Main fuse
11. Battery
12. Engine ground
13. Main switch
19. Front brake light switch
26. ECU (Engine Control Unit)
35. Fuel sender
38. Junction 2
39. Junction 1
40. Rear brake light switch
41. Turn signal relay
42. Horn
43. Handlebar switch (left)
45. Horn switch
46. Turn signal switch
50. Meter assembly
51. Neutral indicator light
52. Multi-function display
57. Turn signal indicator light
58. Fuel meter
60. Gear position indicator
61. Gear position switch
67. Front turn signal light (left)
68. Front turn signal light (right)
69. Rear turn signal light (left)
70. Rear turn signal light (right)
71. Brake/Tail light assembly

EAS30501
TROUBLESHOOTING

- Any of the following fail to light: turn signal lights, brake light or indicator lights.
- The horn fails to sound.
- The fuel gauge fails to operate.
- The speedometer fails to operate.

TIP

- Before troubleshooting, remove the following part(s):

1. Rider and passenger seat
2. Side covers (left and right)
3. Side panels (left and right)
4. Fuel tank

1. Check the fuses. (Main, ignition, and signaling system) Refer to “CHECKING THE FUSES” on page 6-71.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	Replace the main switch.
OK ↓		
4. Check the entire signaling system wiring. Refer to “CIRCUIT DIAGRAM” on page 6-19.	NG →	Properly connect or replace the wire harness.
OK ↓		
Check the condition of each of the signaling system circuits. Refer to “Checking the signaling system” on page 6-21.		

Checking the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	The horn switch is faulty. Replace the left handlebar switch.
OK ↓		

2. Check the entire signaling system wiring. Refer to “CIRCUIT DIAGRAM” on page 6-19.	NG →	Properly connect or replace the wire harness.
OK ↓		
This circuit is OK.		

The tail/brake light fails to come on.

1. Check the front brake light switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	Replace the front brake light switch.
OK ↓		
2. Check the rear brake light switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	Replace the rear brake light switch.
OK ↓		
3. Check the entire signaling system wiring. Refer to “CIRCUIT DIAGRAM” on page 6-19.	NG →	Properly connect or replace the wire harness.
OK ↓		
Replace the tail/brake light assembly.		

The turn signal light, turn signal indicator light or both fail to blink.

1. Check the turn signal light bulb and socket. Refer to “CHECKING THE BULBS AND BULB SOCKETS” in “BASIC INFORMATION” (separate volume).	NG →	Replace the turn signal light bulb, socket or both.
OK ↓		
2. Check the turn signal switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	The turn signal switch is faulty. Replace the left handlebar switch.
OK ↓		
3. Check the turn signal relay. Refer to “CHECKING THE TURN SIGNAL RELAY” in base service manual BK7-F8197-E0 on page 8-63.	NG →	Replace the turn signal relay.
OK ↓		

4. Check the entire signaling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 6-19.
   NG → Properly connect or replace the wire harness.
   OK ↓
   Replace the meter assembly.

The neutral indicator light fails to come on.

1. Check the neutral switch.
   Refer to “CHECKING THE SWITCHES” on page 6-70.
   NG → Replace the neutral switch.
   OK ↓
2. Check the entire signaling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 6-19.
   NG → Properly connect or replace the wire harness.
   OK ↓
   Replace the meter assembly.

The fuel meter fails to operate.

1. Check the fuel sender.
   Refer to “CHECKING THE FUEL SENDER” in base service manual BK7-F8197-E0 on page 8-68.
   NG → The fuel sender is faulty. Replace the fuel pump assembly.
   OK ↓
2. Check the entire signaling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 6-19.
   NG → Properly connect or replace the wire harness.
   OK ↓
   Replace the meter assembly.

The speedometer fails to operate.

1. Check the speed sensor.
   Refer to “CHECKING THE SPEED SENSOR” in base service manual BK7-F8197-E0 on page 8-68.
   NG → Replace the speed sensor.
   OK ↓

2. Check the entire signaling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 6-19.

NG → Properly connect or replace the wire harness.

OK ↓

Replace the ECU or meter assembly.

The tachometer fails to operate.

1. Check the crankshaft position sensor.
   Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” in base service manual BK7-F8197-E0 on page 8-66.

NG → Replace the crankshaft position sensor/ stator assembly.

OK ↓

2. Check the entire signaling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 6-19.

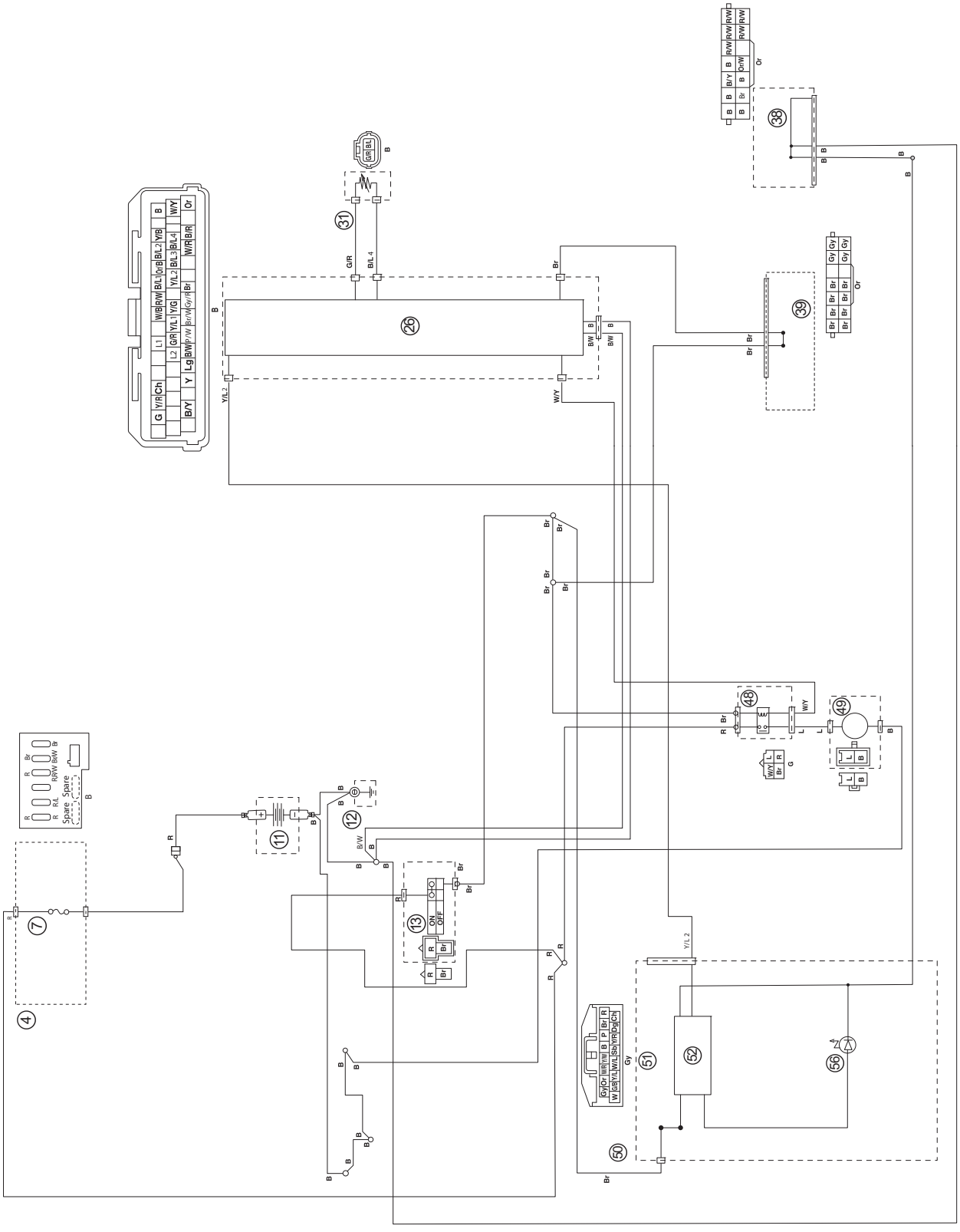
NG → Properly connect or replace the wire harness.

OK ↓

Replace the ECU or meter assembly.

EAS20077
COOLING SYSTEM

EAS30502
CIRCUIT DIAGRAM



4. Fuse box
7. Main fuse
11. Battery
12. Engine ground
13. Main switch
26. ECU (Engine Control Unit)
31. Coolant temperature sensor
38. Junction 2
39. Junction 1
48. Radiator fan motor relay
49. Radiator fan motor
50. Meter assembly
51. Neutral indicator light
52. Multi-function display
56. Coolant temperature warning light

EAS30503
TROUBLESHOOTING

TIP

• Before troubleshooting, remove the following part(s):
1. Rider and passenger seat
2. Side covers (left and right)
3. Front panels (left and right)
4. Front covers (left and right)

1. Check the fuses. (Main, ignition, radiator fan motor and signaling system) Refer to “CHECKING THE FUSES” on page 6-71.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	Replace the main switch.
OK ↓		
4. Check the radiator fan motor. Refer to “CHECKING THE RADIATOR FAN MOTOR” in base service manual BK7-F8197-E0 on page 8-68.	NG →	Replace the radiator fan motor.
OK ↓		
5. Check the radiator fan motor relay. Refer to “CHECKING THE RELAYS” in base service manual BK7-F8197-E0 on page 8-63.	NG →	Replace the radiator fan motor relay.
OK ↓		
6. Check the coolant temperature sensor. Refer to “CHECKING THE COOLANT TEMPERATURE SENSOR” in base service manual BK7-F8197-E0 on page 8-69.	NG →	Replace the coolant temperature sensor.
OK ↓		

7. Check the entire cooling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 6-25.

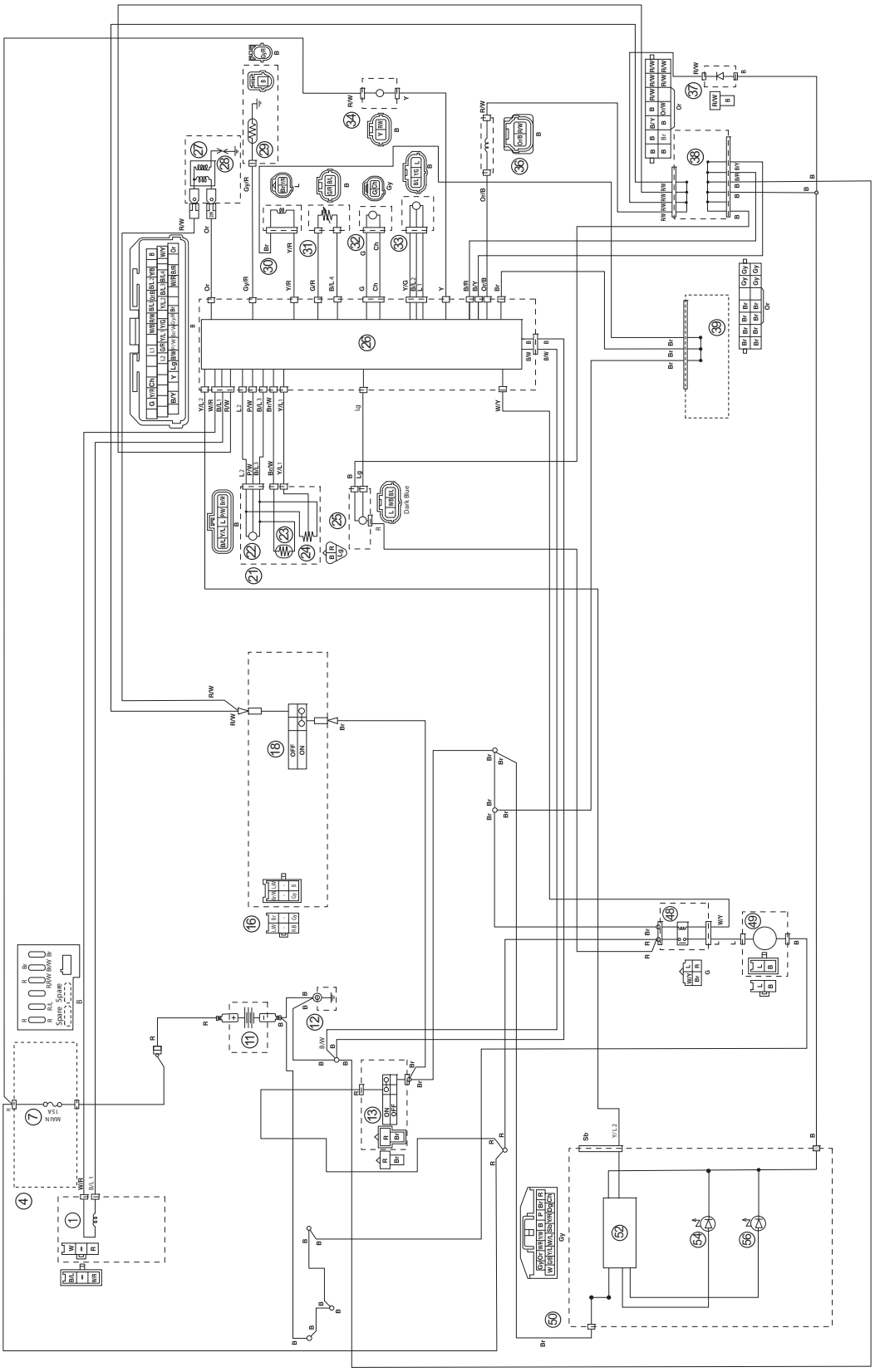
NG → Properly connect or replace the cooling system wiring.

OK ↓

Replace the ECU or meter assembly.

EAS20078
FUEL INJECTION SYSTEM

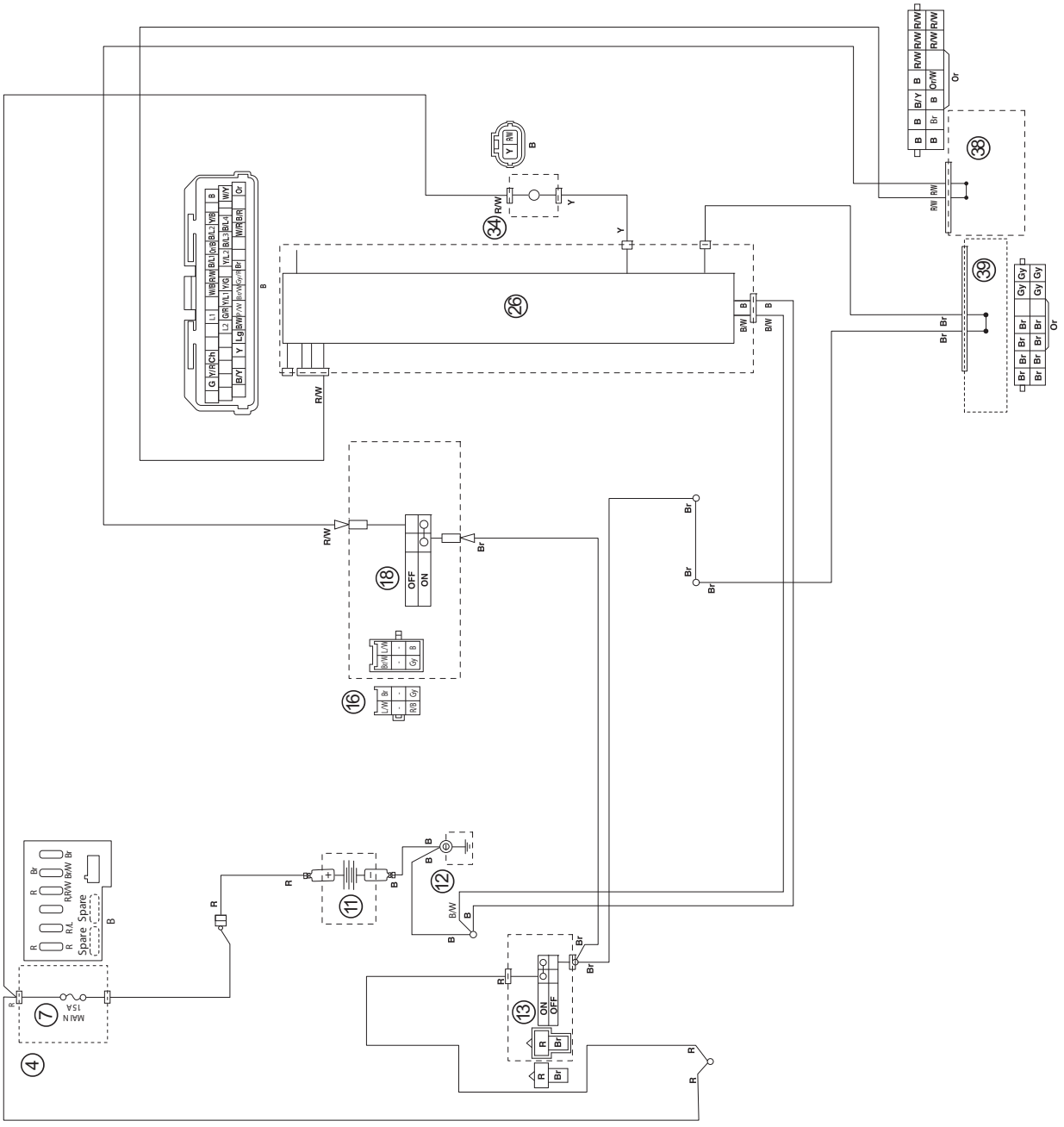
EAS30504
CIRCUIT DIAGRAM



1. Crankshaft position sensor
4. Fuse box
7. Main fuse
11. Battery
12. Engine ground
13. Main switch
16. Handlebar switch (right)
18. Engine stop switch
21. Throttle body sensor assembly
22. Intake air pressure assembly
23. Intake air temperature sensor
24. Throttle position sensor
25. Yamaha diagnostic tool coupler
26. ECU (Engine Control Unit)
27. Ignition coil
28. Spark plug
29. O_2 sensor
30. FID (fast idle solenoid)
31. Coolant temperature sensor
32. VVA (variable valve actuation) solenoid
33. Lean angle sensor
34. Fuel pump
36. Fuel injector
37. Diode 2
38. Junction 2
39. Junction 1
48. Radiator fan motor relay
49. Radiator fan motor
50. Meter assembly
52. Multi-function display
54. Engine trouble warning light
56. Coolant temperature warning light

EAS20081
FUEL PUMP SYSTEM

EAS30513
CIRCUIT DIAGRAM



4. Fuse box
7. Main fuse
11. Battery
12. Engine ground
13. Main switch
16. Handlebar switch (right)
18. Engine stop switch
26. ECU (Engine Control Unit)
34. Fuel pump
38. Junction 2
39. Junction 1

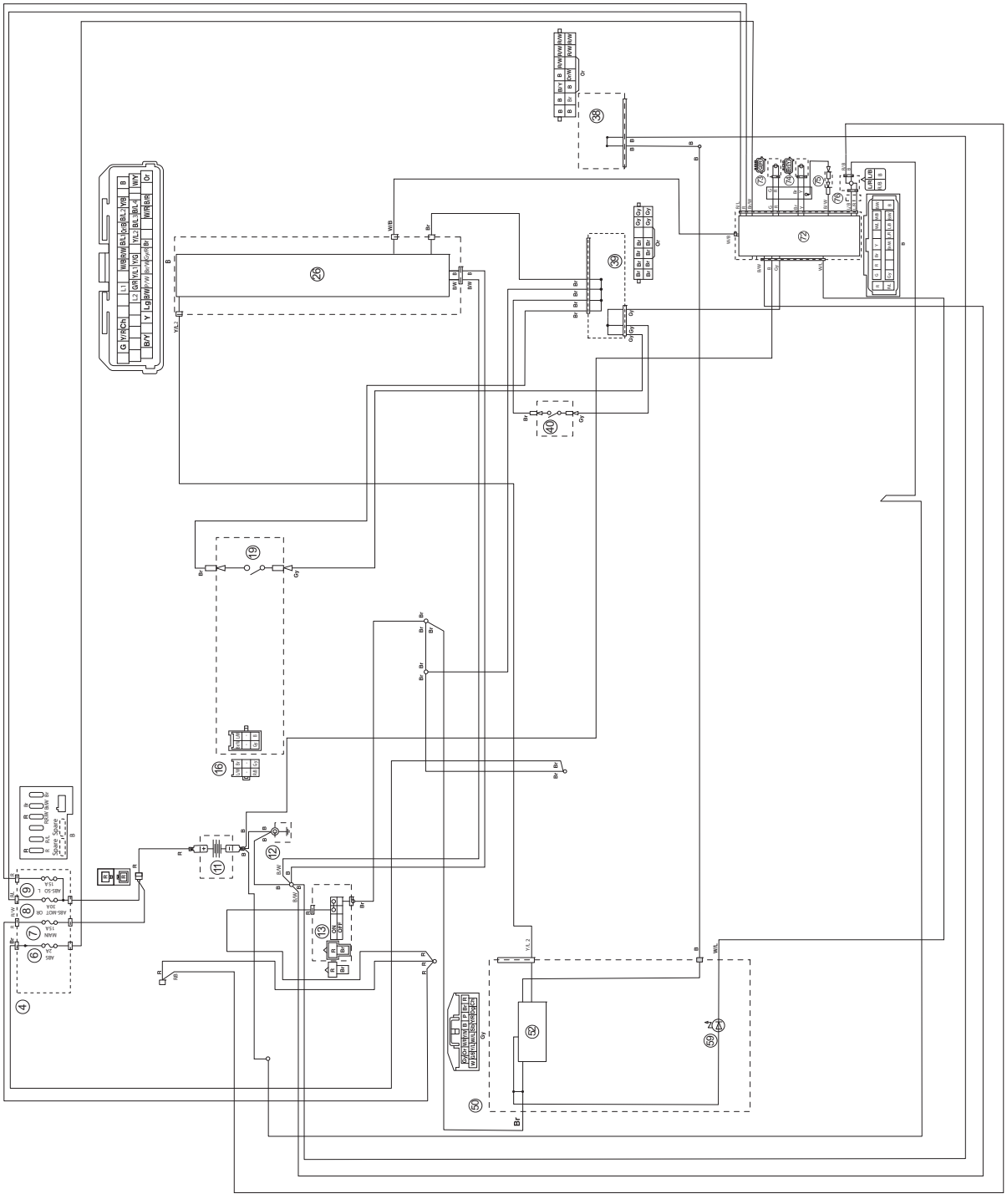
EAS30514
TROUBLESHOOTING

If the fuel pump fails to operate.

1. Check the fuses. (Main and ignition) Refer to “CHECKING THE FUSES” on page 6-71.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.	NG →	• Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	Replace the main switch.
OK ↓		
4. Check the engine stop switch. Refer to “CHECKING THE SWITCHES” on page 6-70.	NG →	The engine stop switch is faulty. Replace the right handlebar switch.
OK ↓		
5. Check the fuel pump operation. Refer to “CHECKING THE FUEL PRESSURE” in base service manual BK7-F8197-E0 on page 7-4.	NG →	Replace the fuel pump assembly.
OK ↓		
6. Check the entire fuel pump system wiring. Refer to “CIRCUIT DIAGRAM” on page 6-29.	NG →	Properly connect or replace the wire harness.
OK ↓		
Replace the ECU.		

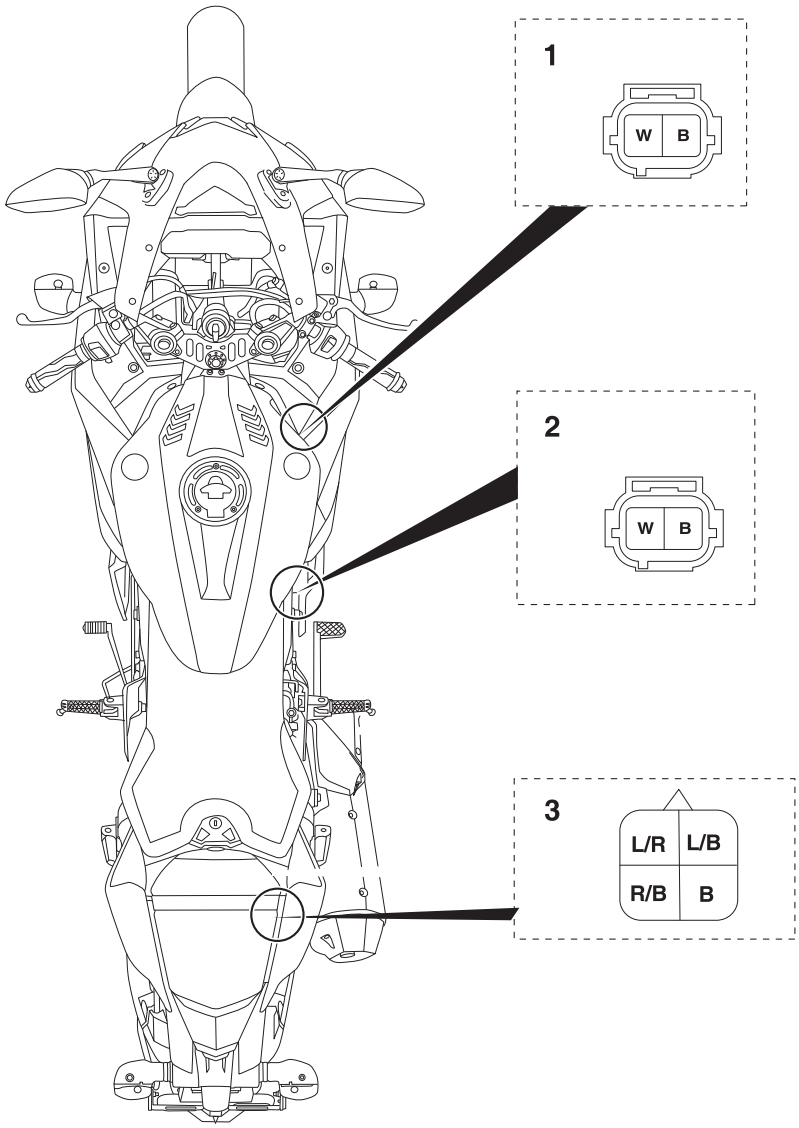
EAS20085
ABS (ANTI-LOCK BRAKE SYSTEM)

EAS30843
CIRCUIT DIAGRAM



4. Fuse box
6. ABS control unit fuse
7. Main fuse
8. ABS motor fuse
9. ABS solenoid fuse
11. Battery
12. Engine ground
13. Main switch
16. Handlebar switch (right)
19. Front brake light switch
26. ECU (Engine Control Unit)
38. Junction 2
39. Junction 1
40. Rear brake light switch
50. Meter assembly
52. Multi-function display
59. ABS warning light
72. ABS ECU (electric control unit)
73. Front wheel sensor
74. Rear wheel sensor
75. ABS ground connector
76. ABS test coupler

EAS30844
ABS COUPLER LOCATION CHART



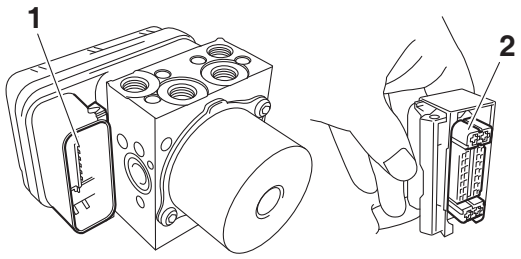
1. Front wheel sensor coupler
2. Rear wheel sensor coupler
3. ABS test coupler

EAS30845
MAINTENANCE OF THE ABS ECU

Checking the ABS ECU
1. Check:
   - Terminals “1” of the ABS ECU
     Cracks/damages → Replace the hydraulic unit assembly, brake hoses, and brake pipes that are connected to the assembly as a set.
   - Terminals “2” of the ABS ECU coupler
     Connection defective, contaminated, come-off → Correct or clean.

TIP

If the ABS ECU coupler is clogged with mud or dirt, clean with compressed air.



EAS30528
ABS TROUBLESHOOTING OUTLINE
This section describes the troubleshooting for the ABS in detail. Read this service manual carefully and make sure you fully understand the information provided before repairing any malfunctions or performing service.
The ABS ECU (electronic control unit) has a self-diagnosis function. When failures occur in the system, the ABS warning light on the meter assembly indicates a malfunction.
The following troubleshooting describes the problem identification and service method using the Yamaha diagnostic tool. For information about using the Yamaha diagnostic tool, refer to “[B-2] DIAGNOSIS USING THE FAULT CODES” on page 6-43. For troubleshooting items other than the following items, follow the normal service method.

EWA16710
⚠ WARNING

When maintenance or checks have been performed on components related to the ABS, be sure to perform a final check before delivering the vehicle to the customer.

TIP

To final check, refer to “[C-1] FINAL CHECK” on page 6-67.

ABS operation when the ABS warning light comes on
1. The ABS warning light remains on → ABS operates as a normal brake system.
   - A malfunction was detected using the ABS self-diagnosis function.
   - The ABS self-diagnosis has not been completed.
     The ABS self-diagnosis starts when the main switch is turned to “ON” and finishes when the vehicle has traveled at a speed of approximately 10 km/h (6.3 mi/h).
2. The ABS warning light comes on after the engine starts, and then goes off when the vehicle starts moving (traveling at a speed of approximately 10 km/h (6.3 mi/h)). → ABS operation is normal.
3. The ABS warning light flashes → ABS operation is normal.
   - Refer to “BASIC INSTRUCTIONS FOR TROUBLESHOOTING” on page 6-39.

Self-diagnosis and servicing
The ABS ECU has a self-diagnosis function. By utilizing this function, quick problem identification and service are possible. Previous malfunctions can be checked since the ABS ECU also stores the malfunction history.
The fault codes recorded in the ABS ECU can be checked using the Yamaha diagnostic tool. When the service is finished, check the normal operation of the vehicle, and then delete the fault code(s). For information about deleting the fault codes, refer to "[B-3] DELETING THE FAULT CODES" on page 6-67.
By deleting the fault codes stored in the ABS ECU memory, it is possible to pursue the cause correctly if another malfunction occurs.

TIP

The ABS performs a self-diagnosis test for a few seconds each time the vehicle first starts off after the main switch was turned to "ON". During this test, a "clicking" noise can be heard from inside of the right air scoop, and if the brake lever or brake pedal are even slightly applied, a vibration can be felt at the lever and pedal, but these do not indicate a malfunction.

Self-diagnosis using the ABS ECU
The ABS ECU performs a static check of the entire system when the main switch is turned to "ON". It also checks for malfunctions while the vehicle is ridden. Since all malfunctions are recorded after they are detected, it is possible to check the recorded malfunction data by utilizing the Yamaha diagnostic tool when the ABS ECU has entered the self-diagnosis mode.

Special precautions for handling and servicing a vehicle equipped with ABS

ECA18490

NOTICE

Care should be taken not to damage components by subjecting them to shocks or pulling on them with too much force since the ABS components are precisely adjusted.

- The ABS ECU and hydraulic unit are united assemblies and cannot be disassembled.
- The malfunction history is stored in the memory of the ABS ECU. Delete the fault codes when the service is finished. (This is because the past fault codes will be displayed again if another malfunction occurs.)

EAS30529

BASIC INSTRUCTIONS FOR TROUBLESHOOTING

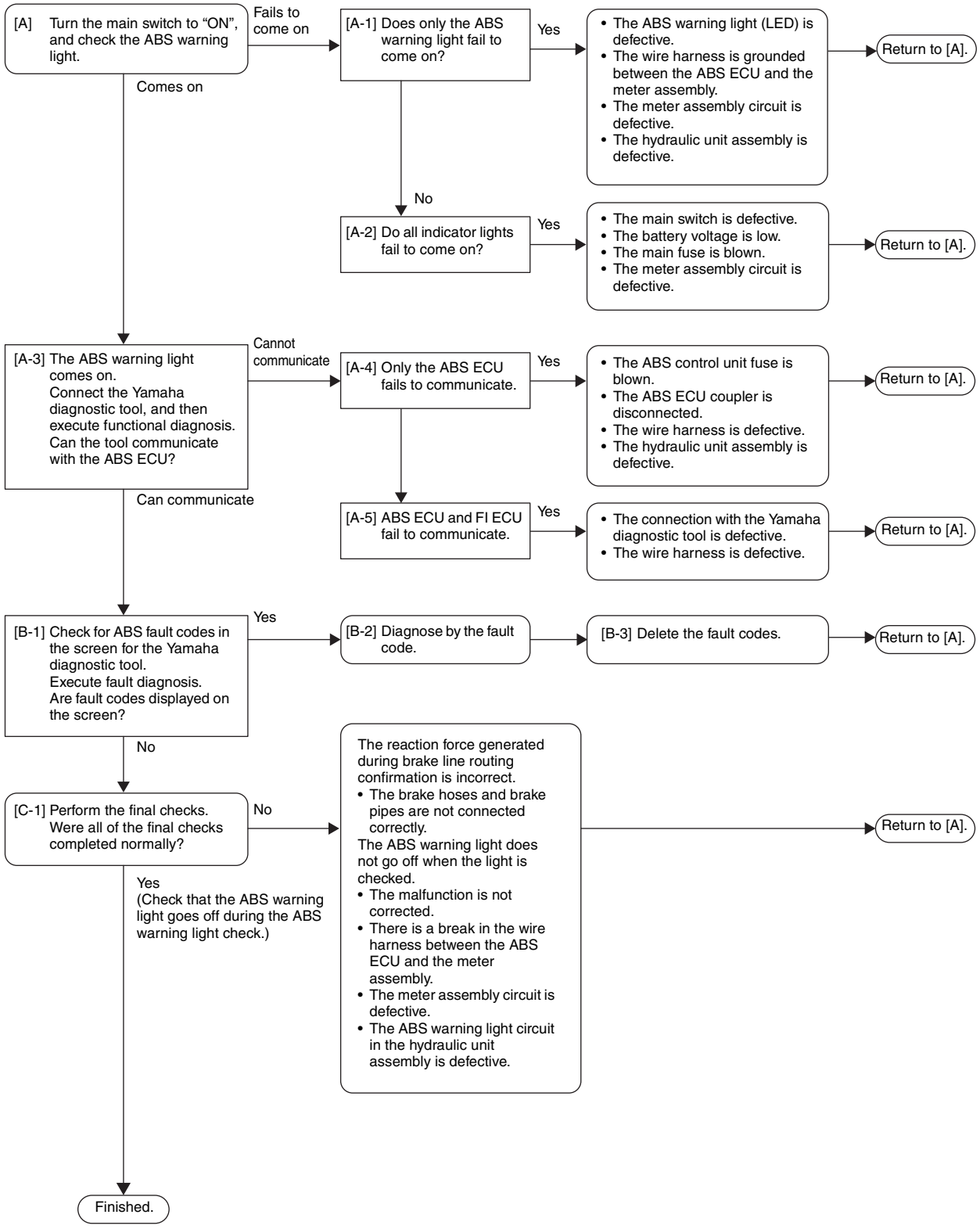
EWA17420

⚠ WARNING

- **Perform the troubleshooting [A]→[B]→[C] in order. Be sure to follow the order since a wrong diagnosis could result if the steps are followed in a different order or omitted.**
- **Use sufficiently charged regular batteries only.**

[A] Malfunction check using the ABS warning light
[B] Use the Yamaha diagnostic tool and determine the location of the malfunction and the cause from the recorded fault code.
Determine the cause of the malfunction from the condition and place where the malfunction occurred.
[C] Servicing the ABS
Execute the final check after disassembly and assembly.

EAS30530
BASIC PROCESS FOR TROUBLESHOOTING



EWA16710

⚠ WARNING

When maintenance or checks have been performed on components related to the ABS, be sure to perform a final check before delivering the vehicle to the customer.

TIP

To final check, refer to "[C-1] FINAL CHECK" on page 6-67.

EAS30531

[A] CHECKING THE ABS WARNING LIGHT

Turn the main switch to "ON". (Do not start the engine.)

1. The ABS warning light does not come on.
   - Only the ABS warning light fails to come on. [A-1]
   - The ABS warning light and all other indicator lights fail to come on. [A-2]
2. The ABS warning light comes on. [A-3]

EAS30532

[A-1] ONLY THE ABS WARNING LIGHT FAILS TO COME ON

1. Check for a short circuit to the ground between the white/blue terminal of the ABS ECU coupler and white/blue terminal of the meter assembly.
   - If there is short circuit to the ground, the wire harness is defective. Replace the wire harness.
2. Disconnect the ABS ECU coupler and check that the ABS warning light comes on when the main switch is turned to "ON".
   - If the ABS warning light does not come on, the meter assembly circuit (including the ABS warning light [LED]) is defective. Replace the meter assembly.
   - If the ABS warning light comes on, the ABS ECU is defective. Replace the hydraulic unit assembly.

EAS30964

[A-2] ALL INDICATOR LIGHTS FAIL TO COME ON

1. Main switch
   - Check the main switch for continuity.
     Refer to "CHECKING THE SWITCHES" on page 6-70.
   - If there is no continuity, replace the main switch.
2. Battery
   - Check the condition of the battery.
     Refer to "CHECKING AND CHARGING THE BATTERY" in base service manual BK7-F8197-E0 on page 8-62.
   - If the battery is defective, clean the battery terminals and recharge it, or replace the battery.
3. Main fuse
   - Check the fuse for continuity.
     Refer to "CHECKING THE FUSES" on page 6-71.
   - If the main fuse is blown, replace the fuse.
4. Circuit
   - Check the meter assembly circuit.
     Refer to "CIRCUIT DIAGRAM" on page 6-35.
   - If the meter assembly circuit is open, replace the wire harness.

EAS31162

[A-3] THE ABS WARNING LIGHT COMES ON

Connect the Yamaha diagnostic tool to the ABS test coupler and execute functional diagnosis. (For information about how to execute functional diagnosis, refer to the operation manual that is included with the tool.)

Check that communication with the ABS ECU is possible.

- Only the ABS ECU fails to communicate. [A-4]

• ABS ECU and FI ECU fail to communicate. [A-5]
• Communication is possible with the ABS ECU. [B-1] (The ABS is displayed on the select unit screen.)

EAS31163
[A-4] ONLY THE ABS ECU FAILS TO COMMUNICATE (The select unit screen does not appear.)
1. ABS control unit fuse
   • Check the ABS control unit fuse for continuity.
   Refer to "CHECKING THE FUSES" on page 6-71.
   • If the ABS control unit fuse is blown, replace the fuse.
2. ABS ECU coupler
   • Check that the ABS ECU coupler is connected properly.
   For information about connecting the ABS ECU coupler properly, refer to "INSTALLING THE HYDRAULIC UNIT ASSEMBLY" on page 4-19.
3. Wire harness
   • Open circuit between the main switch and the ABS ECU, or between the ABS ECU and the ground.
   Check for continuity between brown/red terminal of the main switch coupler and brown/red terminal of the ABS ECU coupler.
   Check for continuity between black/white terminal of the ABS ECU coupler and the ground, and between the black terminal of the ABS ECU coupler and ground.
   If there is no continuity, the wire harness is defective. Replace the wire harness.
   • Open circuit in the wire harness between the ABS ECU coupler and the ABS test coupler.
   Check for continuity between blue/red terminal of the ABS ECU coupler and blue/red terminal of the ABS test coupler.
   Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the ABS test coupler.
4. ABS ECU malfunction
   Replace the hydraulic unit assembly.

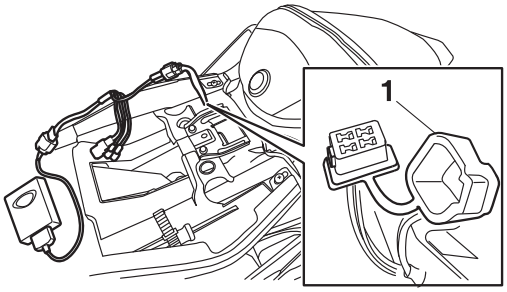
EAS31164
[A-5] ABS ECU AND FI ECU FAIL TO COMMUNICATE (Cannot connect due to a tool error.)
1. Yamaha diagnostic tool
   Check that the Yamaha diagnostic tool is properly connected.
2. Wire harness
   • Open circuit in the wire harness between the ABS ECU coupler and the ABS test coupler.
   Check for continuity between blue/red terminal of the ABS ECU coupler and blue/red terminal of the ABS test coupler.
   Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the ABS test coupler.

EAS31165
[B-1] MALFUNCTION ARE CURRENTLY DETECTED
When the Yamaha diagnostic tool is connected to the ABS test coupler, the fault codes will be displayed on the computer screen.
• A fault code is displayed. [B-2]
• A fault code is not displayed. [C-1]

EAS31166
[B-2] DIAGNOSIS USING THE FAULT CODES
This model uses the Yamaha diagnostic tool to identify malfunctions.
For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.

Yamaha diagnostic tool USB
90890-03267
Yamaha diagnostic tool (A/I)
90890-03262

Connecting the Yamaha diagnostic tool
Removing the passenger seat. Refer to “GENERAL CHASSIS (1)” in base service manual BK7-F8197-E0 on page 4-1.
Removing the protective cap “1”, and then connect the Yamaha diagnostic tool to the coupler.

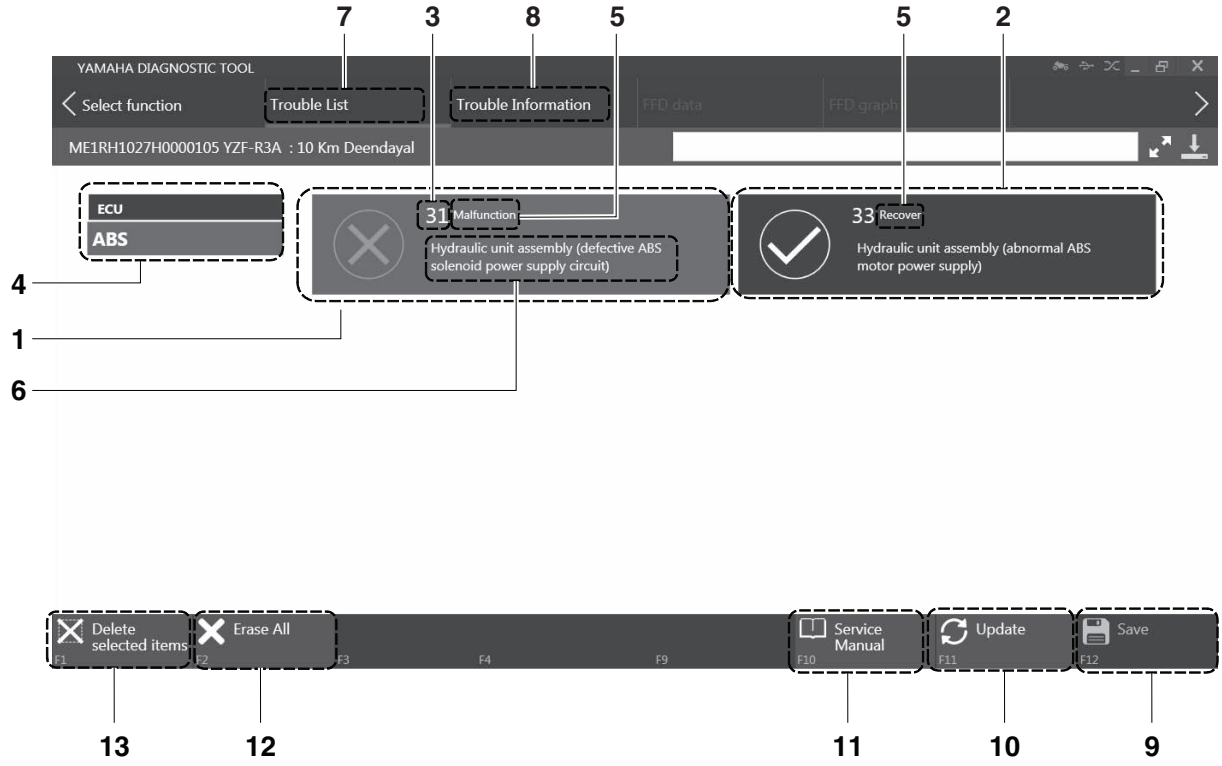


Details about the displayed fault codes are shown in the following chart. Refer to this chart and check the vehicle.
Once all the work is complete, delete the fault codes. [B-3]

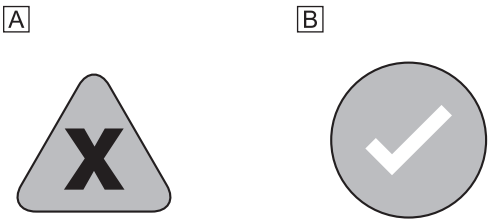
TIP

Check the inspection points after terminating the connection with the Yamaha diagnostic tool and turning the main switch off.

Operation of the Yamaha diagnostic tool (Fault diagnosis mode)
Malfunction results are displayed in the top part of the window area.



1. Detected
   The malfunction currently occurred are displayed.
2. Recovered
   The malfunction detected in the past (already recovered) are displayed.
3. Diagnosis code the diagnosis codes related to the detected malfunction are displayed.



A. Detected malfunction
B. Recovered malfunction

4. ECU
   The types of the control units are displayed. (e.g., FI, ABS)
5. Status of malfunction
   The current conditions are displayed. (Malfunction/Recover)
6. Item
   If a fault code is detected, the symptoms are displayed along with the item name.
7. Trouble list
   The item list of the “detected malfunction” or “recover malfunction” are displayed.
8. Trouble Information
   This appears to click on “detected malfunction (1)” for the details of the diagnosis are displayed.
   Click [Service Manual/F10] to open the service manual and check the details of the fault.
9. Save
   To save the result of diagnosis of malfunction, click [Save/F12].
   Note:- Must save the result for future reference.
10. Update
    To run the diagnosis of malfunction again, click [Update/F11].
11. Service Manual
    To view the service manual, click [Service Manual/F10].
    Note:- Service Manual of related model can be downloaded when system is connected with YMC server.
12. Erase all (Only recovered item can be Erased)
    To delete all of the fault codes, click [Erase All/F2].
13. Delete selected items (Only recovered item can be Deleted)
    To delete the selected fault codes, click [Delete selected items/F1].

Fault code table

TIP

Record all of the fault codes displayed and inspect the check points.

Fault code No.	Item	Symptom	Check point
11* 25*	Front wheel sensor (intermittent pulses or no pulses)	Front wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	• Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
12	Rear wheel sensor (intermittent pulses or no pulses)	Rear wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	• Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
13* 26*	Front wheel sensor (abnormal pulse period)	Front wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	• Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
14* 27*	Rear wheel sensor (abnormal pulse period)	Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	• Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor

Fault code No.	Item	Symptom	Check point
15	Front wheel sensor (open or short circuit)	Open or short circuit is detected in the front wheel sensor.	• Defective coupler between the front wheel sensor and the hydraulic unit assembly • Open or short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly • Defective front wheel sensor or hydraulic unit assembly
16	Rear wheel sensor (open or short circuit)	Open or short circuit is detected in the rear wheel sensor.	• Defective coupler between the rear wheel sensor and the hydraulic unit assembly • Open or short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly • Defective rear wheel sensor or hydraulic unit assembly
17* 45*	Front wheel sensor (missing pulses)	Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	• Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
18* 46*	Rear wheel sensor (missing pulses)	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	• Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
21	Hydraulic unit assembly (defective solenoid drive circuit)	Solenoid drive circuit in the hydraulic unit assembly is open or short-circuited.	• Defective hydraulic unit assembly

Fault code No.	Item	Symptom	Check point
24	Brake light switch or tail/ brake light	Brake light signal is not received properly while the vehicle is traveling. (Brake light circuit, or front or rear brake light switch circuit)	• Defective signaling system (tail/brake light or brake light switch) • Defective coupler between the signaling system (tail/ brake light or brake light switch) and the hydraulic unit assembly • Open or short circuit in the wire harness between the signaling system (tail/brake light or brake light switch) and the hydraulic unit assembly • Defective hydraulic unit assembly
31	Hydraulic unit assembly (abnormal ABS solenoid power supply)	Power is not supplied to the solenoid circuit in the hydraulic unit assembly.	• Blown ABS solenoid fuse • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective hydraulic unit assembly
32	Hydraulic unit assembly (short circuit in ABS solenoid power supply circuit)	Short circuit is detected in the solenoid power supply circuit in the hydraulic unit assembly.	• Defective hydraulic unit assembly
33	Hydraulic unit assembly (abnormal ABS motor power supply)	Power is not supplied to the motor circuit in the hydraulic unit assembly.	• Blown ABS motor fuse • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective hydraulic unit assembly
34	Hydraulic unit assembly (short circuit in ABS motor power supply circuit)	Short circuit is detected in the motor power supply circuit in the hydraulic unit assembly.	• Defective hydraulic unit assembly
41	Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	• Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. • Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.	• Incorrect installation of the front wheel sensor • Incorrect rotation of the front wheel • Front brake dragging • Defective hydraulic unit assembly

Fault code No.	Item	Symptom	Check point
42 47	Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	• Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. (for fault code No. 42) • Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.	• Incorrect installation of the rear wheel sensor (for fault code No. 42) • Incorrect rotation of the rear wheel • Rear brake dragging • Defective hydraulic unit assembly
43	Front wheel sensor (missing pulses)	Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	• Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
44	Rear wheel sensor (missing pulses)	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	• Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
51 52	• Vehicle system power supply (voltage of ABS ECU power supply is high) (for fault code No. 51) • Vehicle system power supply (voltage of wheel sensor power supply is high) (for fault code No. 52)	• Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too high. (for fault code No. 51) • Power voltage supplied to the wheel sensor is too high. (for fault code No. 52)	• Defective battery • Disconnected battery terminal • Defective charging system
53	Vehicle system power supply (voltage of ABS ECU power supply is low)	Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too low.	• Defective battery • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective charging system

Fault code No.	Item	Symptom	Check point
54	Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)	Abnormality is detected in the solenoid or motor power supply circuit in the hydraulic unit assembly.	• Defective battery • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective charging system • Defective hydraulic unit assembly
55	Hydraulic unit assembly (defective ABS ECU)	Abnormal data is detected in the hydraulic unit assembly.	• Defective hydraulic unit assembly
56	Hydraulic unit assembly (abnormal internal power supply)	Abnormality is detected in the power supply circuit in the hydraulic unit assembly.	• Defective hydraulic unit assembly
63	Front wheel sensor power supply (voltage of power supply is low)	Power voltage supplied from the ABS ECU to the front wheel sensor is too low.	• Short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly • Defective front wheel sensor • Defective hydraulic unit assembly
64	Rear wheel sensor power supply (voltage of power supply is low)	Power voltage supplied from the ABS ECU to the rear wheel sensor is too low.	• Short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly • Defective rear wheel sensor • Defective hydraulic unit assembly

* The fault code number varies according to the vehicle conditions.

Fault code No. 11, 25

TIP

With the front wheel stopped, the rear wheel was rotated for longer than about 20 seconds (fault code No. 11) or for longer than about 2 seconds (fault code No. 25).

Fault code No.	**11** **25**
Item	**Front wheel sensor (intermittent pulses or no pulses)**
Symptom	**Front wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)**

Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the front wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE FRONT WHEEL” in base service manual BK7-F8197-E0 on page 4-10.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.
4	Defective front wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.

Fault code No. 12

Fault code No.	**12**
Item	**Rear wheel sensor (intermittent pulses or no pulses)**
Symptom	**Rear wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)**

Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the rear wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the rear wheel	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE REAR WHEEL” in base service manual BK7-F8197-E0 on page 4-16.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.
4	Defective rear wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2

Fault code No. 13, 26

TIP

- If the front brake ABS operates continuously for 20 seconds or more, fault code No. 26 will be recorded. If the front brake ABS operates continuously for 36 seconds or more, fault code No. 13 will be recorded.
- Vehicle possibly ridden on uneven roads.

Fault code No.		**13** **26**
Item		**Front wheel sensor (abnormal pulse period)**
Symptom		**Front wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)**
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Foreign material adhered around the front wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE FRONT WHEEL” in base service manual BK7-F8197-E0 on page 4-10.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.
4	Defective front wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.

Fault code No. 14, 27

TIP

- If the rear brake ABS operates continuously for 20 seconds or more, fault code No. 27 will be recorded. If the rear brake ABS operates continuously for 36 seconds or more, fault code No. 14 will be recorded.
- Vehicle possibly ridden on uneven roads.

Fault code No.		**14** **27**
Item		**Rear wheel sensor (abnormal pulse period)**
Symptom		**Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)**
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Foreign material adhered around the rear wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.

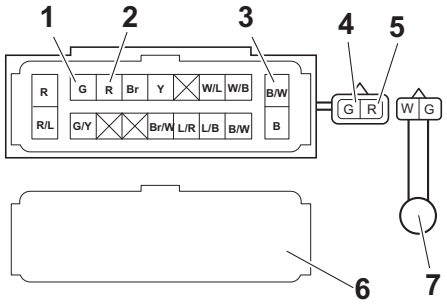
Fault code No.	14 27	
Item	Rear wheel sensor (abnormal pulse period)	
Symptom	Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	
Order	**Item/components and probable cause**	**Check or maintenance job**
2	Incorrect installation of the rear wheel	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE REAR WHEEL” in base service manual BK7-F8197-E0 on page 4-16.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2
4	Defective rear wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2

Fault code No. 15

TIP

Turn the main switch to “OFF” before disconnecting or connecting a coupler.

Fault code No.	15	
Item	Front wheel sensor (open or short circuit)	
Symptom	Open or short circuit is detected in the front wheel sensor.	
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Defective coupler between the front wheel sensor and the hydraulic unit assembly	• Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. See TIP.

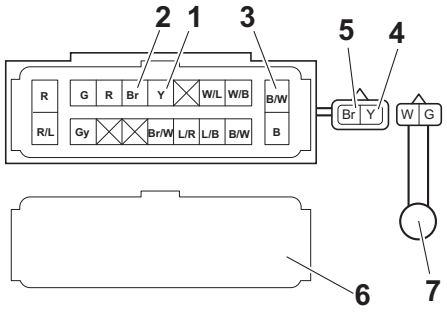
Fault code No.	15	
Item	Front wheel sensor (open or short circuit)	
Symptom	Open or short circuit is detected in the front wheel sensor.	
Order	**Item/components and probable cause**	**Check or maintenance job**
2	Open or short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly	• Check for continuity between the green terminal “1” and the green terminal “4” and between the red terminal “2” and the red terminal “5”. • If there is no continuity, the wire harness is defective. Replace the wire harness. • Check that there is no short circuit between the green terminal “1” and the red terminal “2” and between the green terminal “4” and the blue terminal “5”. • If there is short circuit, the wire harness is defective. Replace the wire harness. • Check that there is no short circuit between the black/white terminal “3” and the green terminal “4” and between the black/white terminal “3” and the blue terminal “5”. • If there is short circuit, the wire harness is defective. Replace the wire harness.  6. ABS ECU 7. Front wheel sensor
3	Defective front wheel sensor or hydraulic unit assembly	If the above items were performed and no malfunctions were found, the wheel sensor or hydraulic unit assembly is defective. Replace the wheel sensor or hydraulic unit assembly. Refer to “FRONT WHEEL” on page 4-1 and “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 16

TIP

Turn the main switch to “OFF” before disconnecting or connecting a coupler.

Fault code No.	**16**
Item	**Rear wheel sensor (open or short circuit)**
Symptom	**Open or short circuit is detected in the rear wheel sensor.**

Order	**Item/components and probable cause**	**Check or maintenance job**
1	Defective coupler between the rear wheel sensor and the hydraulic unit assembly	• Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. See TIP.
2	Open or short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly	• Check for continuity between the yellow terminal “1” and the yellow terminal “4” and between the brown terminal “2” and the brown terminal “5”. • If there is no continuity, the wire harness is defective. Replace the wire harness. • Check that there is no short circuit between the yellow terminal “1” and the brown terminal “2” and between the yellow terminal “4” and the brown terminal “5”. • If there is short circuit, the wire harness is defective. Replace the wire harness. • Check that there is no short circuit between the black/white terminal “3” and the yellow terminal “4” and between the black/white terminal “3” and the brown terminal “5”. • If there is short circuit, the wire harness is defective. Replace the wire harness.  6. ABS ECU 7. Rear wheel sensor
3	Defective rear wheel sensor or hydraulic unit assembly	If the above items were performed and no malfunctions were found, the wheel sensor or hydraulic unit assembly is defective. Replace the wheel sensor or hydraulic unit assembly. Refer to “REAR WHEEL” on page 4-5 and “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 17, 45

TIP

If pulse gaps are detected when the vehicle is traveling at a speed of 30 km/h (19 mi/h) or more, fault code No. 17 will be recorded. If the vehicle is traveling at a speed of 29 km/h (18 mi/h) or less, fault code No. 45 will be recorded first and fault code No. 17 will be recorded if the condition continues.

Fault code No.	**17** **45**	
Item	**Front wheel sensor (missing pulses)**	
Symptom	**Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)**	
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Foreign material adhered around the front wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE FRONT WHEEL” in base service manual BK7-F8197-E0 on page 4-10.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.
4	Defective front wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.

Fault code No. 18, 46

TIP

If pulse gaps are detected when the vehicle is traveling at a speed of 30 km/h (19 mi/h) or more, fault code No. 18 will be recorded. If the vehicle is traveling at a speed of 29 km/h (18 mi/h) or less, fault code No. 46 will be recorded first and fault code No. 18 will be recorded if the condition continues.

Fault code No.	**18** **46**	
Item	**Rear wheel sensor (missing pulses)**	
Symptom	**Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)**	
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Foreign material adhered around the rear wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the rear wheel	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE REAR WHEEL” in base service manual BK7-F8197-E0 on page 4-16.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2

Fault code No.		18 46
Item		Rear wheel sensor (missing pulses)
Symptom		Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
4	Defective rear wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2

Fault code No. 21

Fault code No.		21
Item		Hydraulic unit assembly (defective solenoid drive circuit)
Symptom		Solenoid drive circuit in the hydraulic unit assembly is open or short-circuited.
Order	Item/components and probable cause	Check or maintenance job
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 24

Fault code No.		24
Item		Brake light switch or tail/brake light
Symptom		Brake light signal is not received properly while the vehicle is traveling (Brake light circuit, or front or rear brake light switch circuit).
Order	Item/components and probable cause	Check or maintenance job
1	Defective signaling system (tail/brake light or brake light switch)	Check the brake light switches. Refer to “CHECKING THE SWITCHES” on page 6-70.
2	Defective coupler between the signaling system (tail/brake light or brake light switch) and the hydraulic unit assembly	• Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
3	Open or short circuit in the wire harness between the signaling system (tail/brake light or brake light switch) and the hydraulic unit assembly	• Between ABS ECU coupler and front brake light switch coupler. (gray–gray) • Between ABS ECU coupler and rear brake light switch coupler. (gray–gray)
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 31

TIP

Turn the main switch to “OFF” before disconnecting or connecting a coupler.

Fault code No.	**31**	
Item	**Hydraulic unit assembly (abnormal ABS solenoid power supply)**	
Symptom	**Power is not supplied to the solenoid circuit in the hydraulic unit assembly.**	
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Blown ABS solenoid fuse	Check the ABS solenoid fuse. If the ABS solenoid fuse is blown, replace the fuse and check the wire harness. Refer to “CHECKING THE SWITCHES” on page 6-70.
2	Defective coupler between the battery and the hydraulic unit assembly	• Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. See TIP.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly	• Replace if there is an open or short circuit. • Between ABS ECU coupler and ABS solenoid fuse. (red/red)
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 32

Fault code No.	**32**	
Item	**Hydraulic unit assembly (short circuit in ABS solenoid power supply circuit)**	
Symptom	**Short circuit is detected in the solenoid power supply circuit in the hydraulic unit assembly.**	
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 33

TIP

Turn the main switch to “OFF” before disconnecting or connecting a coupler.

Fault code No.	**33**	
Item	**Hydraulic unit assembly (abnormal ABS motor power supply)**	
Symptom	**Power is not supplied to the motor circuit in the hydraulic unit assembly.**	
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Blown ABS motor fuse	Check the ABS motor fuse. If the ABS motor fuse is blown, replace the fuse and check the wire harness. Refer to “CHECKING THE FUSES” on page 6-71.

Fault code No.		33
Item		Hydraulic unit assembly (abnormal ABS motor power supply)
Symptom		Power is not supplied to the motor circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
2	Defective coupler between the battery and the hydraulic unit assembly	• Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. See TIP.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly	• Replace if there is an open or short circuit. • Between ABS ECU coupler and ABS motor fuse. (red/blue–red/blue) • Between ABS ECU coupler and ground. (black–black)
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 34

Fault code No.		34
Item		Hydraulic unit assembly (short circuit in ABS motor power supply circuit)
Symptom		Short circuit is detected in the motor power supply circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 41

Fault code No.		41
Item		Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)
Symptom		• Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. • Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.
Order	Item/components and probable cause	Check or maintenance job
1	Incorrect installation of the front wheel sensor	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE FRONT WHEEL” in base service manual BK7-F8197-E0 on page 4-10.

Fault code No.	41
Item	Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)
Symptom	• Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. • Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.

Order	Item/components and probable cause	Check or maintenance job
2	Incorrect rotation of the front wheel	Check that there is no brake disc drag on the front wheel and make sure that it rotates smoothly. Refer to “CHECKING THE FRONT WHEEL” in base service manual BK7-F8197-E0 on page 4-10. and “CHECKING THE FRONT BRAKE DISC” in base service manual BK7-F8197-E0 on page 4-23.
3	Front brake dragging	Check that the brake fluid pressure is correctly transmitted to the brake caliper when the brake lever is operated and that the pressure decreases when the lever is released. Refer to “CHECKING THE FRONT BRAKE DISC” in base service manual BK7-F8197-E0 on page 4-23.
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 42, 47

Fault code No.	42 47
Item	Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)
Symptom	• Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. (for fault code No. 42) • Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.

Order	Item/components and probable cause	Check or maintenance job
1	Incorrect installation of the rear wheel sensor (for fault code No. 42)	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE REAR WHEEL” in base service manual BK7-F8197-E0 on page 4-16.
2	Incorrect rotation of the rear wheel	Check that there is no brake disc drag on the wheel and make sure that it rotates smoothly. Refer to “CHECKING THE REAR WHEEL” in base service manual BK7-F8197-E0 on page 4-16.
3	Rear brake dragging	Check that the brake fluid pressure is correctly transmitted to the brake caliper when the brake pedal is operated and that the pressure decreases when the pedal is released. Refer to “CHECKING THE REAR BRAKE DISC” in base service manual BK7-F8197-E0 on page 4-34.

Fault code No.	**42** **47**
Item	**Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)**
Symptom	**• Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. (for fault code No. 42)** **• Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.**

Order	Item/components and probable cause	Check or maintenance job
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 43

Fault code No.	**43**
Item	**Front wheel sensor (missing pulses)**
Symptom	**Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)**

Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the front wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE FRONT WHEEL” in base service manual BK7-F8197-E0 on page 4-10.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.
4	Defective front wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2.

Fault code No. 44

Fault code No.	**44**
Item	**Rear wheel sensor (missing pulses)**
Symptom	**Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)**

Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the rear wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.

Fault code No.	44
Item	Rear wheel sensor (missing pulses)
Symptom	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)

Order	Item/components and probable cause	Check or maintenance job
2	Incorrect installation of the rear wheel	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE REAR WHEEL” in base service manual BK7-F8197-E0 on page 4-16.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2
4	Defective rear wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to “MAINTENANCE OF THE WHEEL SENSOR AND SENSOR ROTOR” on page 4-2

Fault code No. 51, 52

Fault code No.	51 52
Item	• Vehicle system power supply (voltage of ABS ECU power supply is high) (for fault code No. 51) • Vehicle system power supply (voltage of wheel sensor power supply is high) (for fault code No. 52)
Symptom	• Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too high. (for fault code No. 51) • Power voltage supplied to the wheel sensor is too high. (for fault code No. 52)

Order	Item/components and probable cause	Check or maintenance job
1	Defective battery	Recharge or replace the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.
2	Disconnected battery terminal	Check the connection. Replace or reconnect the terminal if necessary.
3	Defective charging system	Check the charging system. Refer to “CHARGING SYSTEM” on page 6-11.

Fault code No. 53

TIP

Turn the main switch to “OFF” before disconnecting or connecting a coupler.

Fault code No.	**53**	
Item	**Vehicle system power supply (voltage of ABS ECU power supply is low)**	
Symptom	**Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too low.**	
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Defective battery	Recharge or replace the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.
2	Defective coupler between the battery and the hydraulic unit assembly	• Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. See TIP.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly	• Replace if there is an open or short circuit. • Between ABS ECU coupler and ABS control unit fuse. (brown/white–brown/white)
4	Defective charging system	Check the charging system. Refer to “CHARGING SYSTEM” on page 6-11.

Fault code No. 54

TIP

Turn the main switch to “OFF” before disconnecting or connecting a coupler.

Fault code No.	**54**	
Item	**Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)**	
Symptom	**Abnormality is detected in the solenoid or motor power supply circuit in the hydraulic unit assembly.**	
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Defective battery	Recharge or replace the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in base service manual BK7-F8197-E0 on page 8-62.
2	Defective coupler between the battery and the hydraulic unit assembly	• Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. See TIP.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly	• Replace if there is an open or short circuit. • Between ABS ECU coupler and ABS motor fuse. (red/blue–red/blue) • Between ABS ECU coupler and ABS solenoid fuse. (red–red)

Fault code No.		54
Item		Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)
Symptom		Abnormality is detected in the solenoid or motor power supply circuit in the hydraulic unit assembly.
Order	**Item/components and probable cause**	**Check or maintenance job**
4	Defective charging system	Check the charging system. Refer to “CHARGING SYSTEM” on page 6-11.
5	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 55

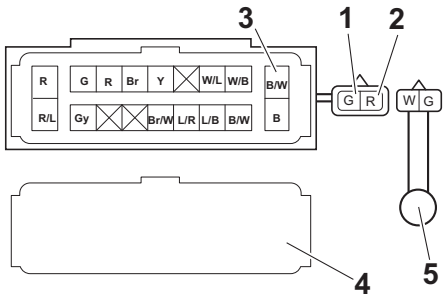
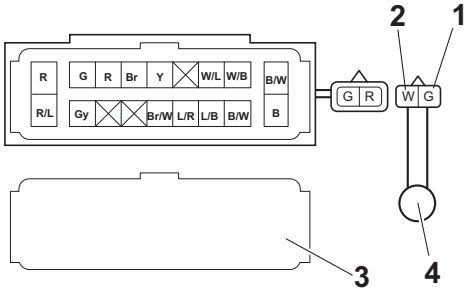
Fault code No.		55
Item		Hydraulic unit assembly (defective ABS ECU)
Symptom		Abnormal data is detected in the hydraulic unit assembly.
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 56

Fault code No.		56
Item		Hydraulic unit assembly (abnormal internal power supply)
Symptom		Abnormality is detected in the power supply circuit in the hydraulic unit assembly.
Order	**Item/components and probable cause**	**Check or maintenance job**
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

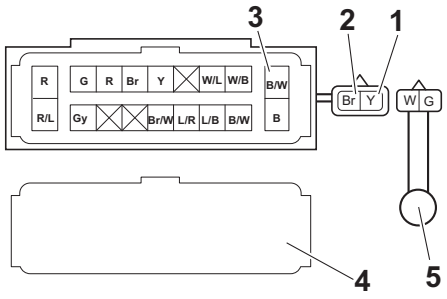
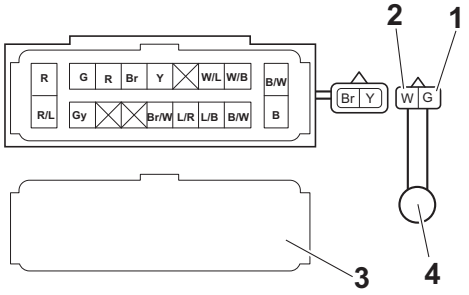
Fault code No. 63

Fault code No.	**63**
Item	**Front wheel sensor power supply (voltage of power supply is low)**
Symptom	**Power voltage supplied from the ABS ECU to the front wheel sensor is too low.**

Order	Item/components and probable cause	Check or maintenance job
1	Short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly	• Check that there is no short circuit between the green terminal “1” and the red terminal “2”. • Check that there is no short circuit between the black/white terminal “3” and the green terminal “1”. • If there is a short circuit, the wire harness is defective. Replace the wire harness.  4. ABS ECU 5. Front wheel sensor
2	Defective front wheel sensor	• Check that there is no short circuit between the green terminal “1” and the white terminal “2”. • If there is a short circuit, the wheel sensor is defective. Repair or replace the wheel sensor.  3. ABS ECU 4. Front wheel sensor
3	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

Fault code No. 64

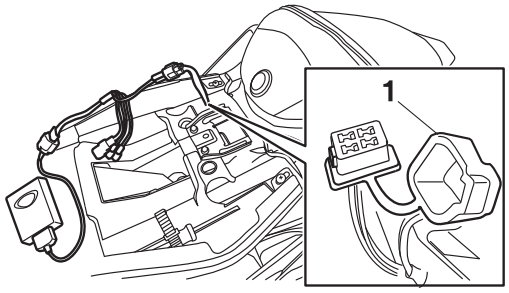
Fault code No.	**64**
Item	**Rear wheel sensor power supply (voltage of power supply is low)**
Symptom	**Power voltage supplied from the ABS ECU to the rear wheel sensor is too low.**

Order	Item/components and probable cause	Check or maintenance job
1	Short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly	• Check that there is no short circuit between the yellow terminal “1” and the brown terminal “2”. • Check that there is no short circuit between the black/white terminal “3” and the yellow terminal “1”. • If there is a short circuit, the wire harness is defective. Replace the wire harness.  4. ABS ECU 5. Rear wheel sensor
2	Defective rear wheel sensor	• Check that there is no short circuit between the green terminal “1” and the white terminal “2”. • If there is a short circuit, the wheel sensor is defective. Repair or replace the wheel sensor.  3. ABS ECU 4. Rear wheel sensor
3	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-16.

EAS31167
[B-3] DELETING THE FAULT CODES
To delete the fault codes, use the Yamaha diagnostic tool. For information about deleting the fault codes, refer to the operation manual of the Yamaha diagnostic tool.
Check that all the displayed fault codes are deleted.

Yamaha diagnostic tool USB
NS-018
90890-03267
INS-019
90890-03262

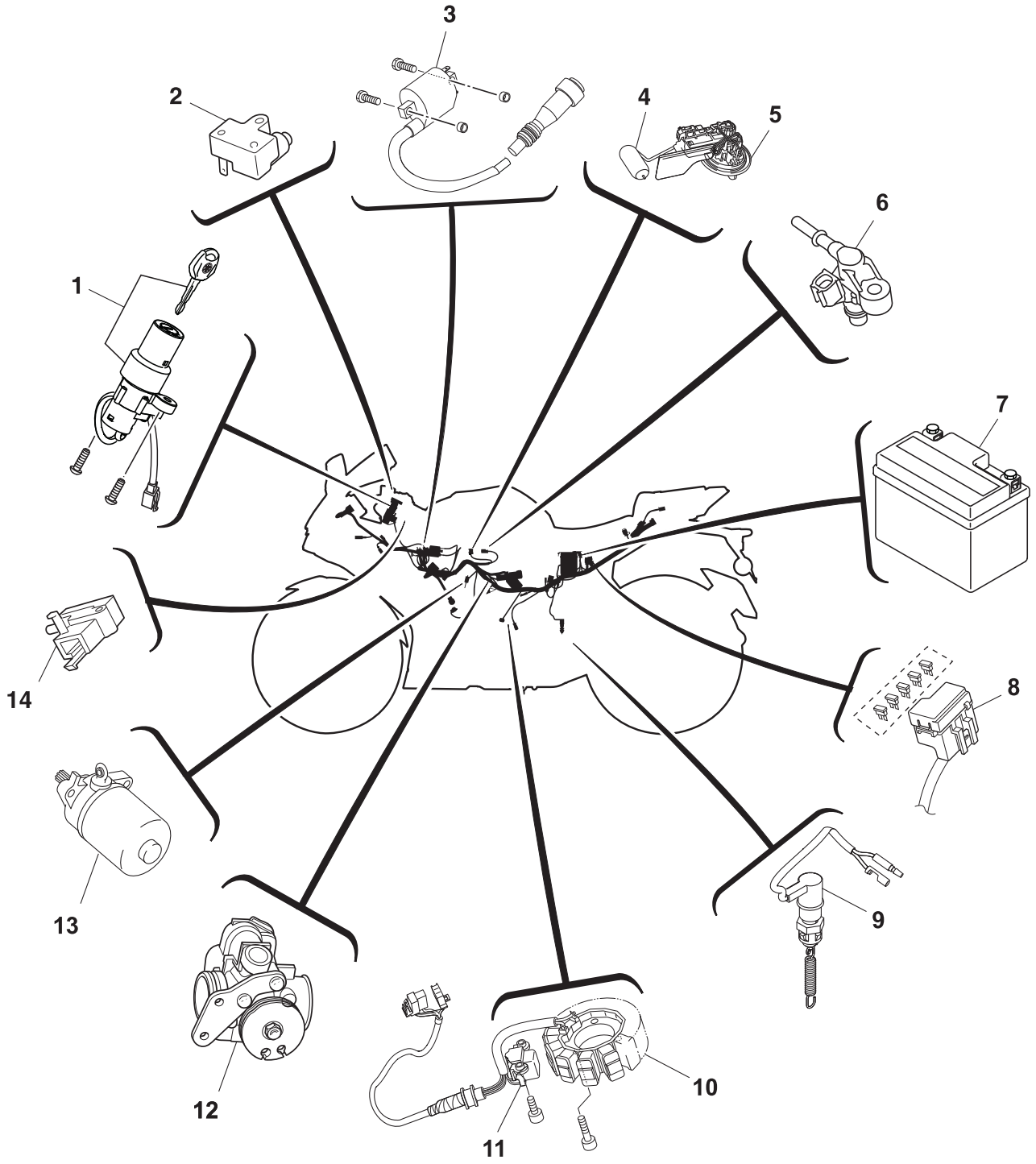
Connecting the Yamaha diagnostic tool
Remove the protective cap “1”, and then connect the Yamaha diagnostic tool to the coupler.



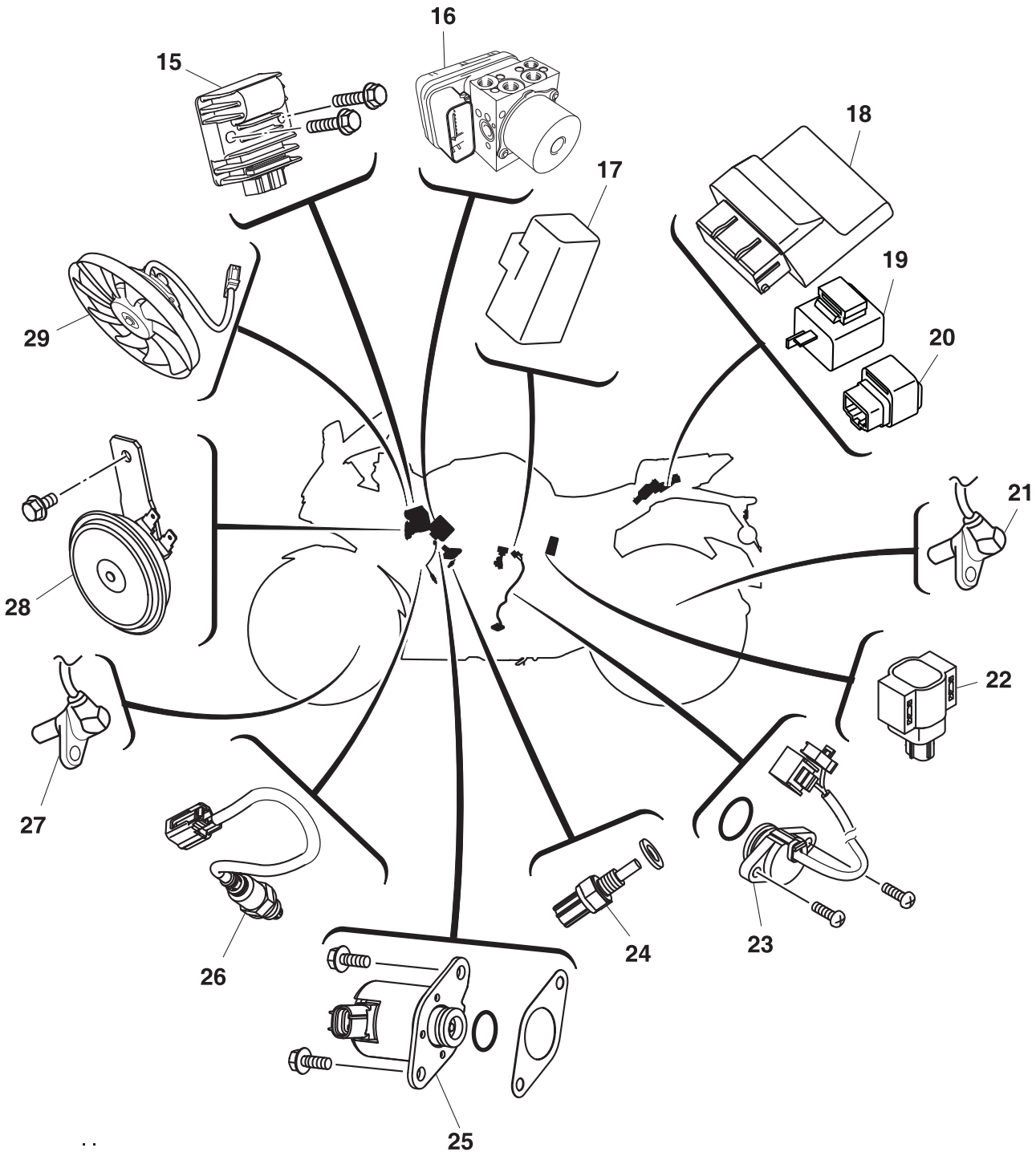
EAS31168
[C-1] FINAL CHECK
Check all the following items to complete the inspection.
If the process is not completed properly, start again from the beginning.

Checking procedures
1. Check the brake fluid level in the brake master cylinder reservoir and brake fluid reservoir.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in base service manual BK7-F8197-E0 on page 3-16.
2. Check the wheel sensors for proper installation.
   Refer to “INSTALLING THE FRONT WHEEL” on page 4-3 and “INSTALLING THE REAR WHEEL” on page 4-7.
3. Perform brake line routing confirmation.
   Refer to “HYDRAULIC UNIT OPERATION TESTS” on page 4-20.
   If it does not have reaction-force properly, the brake hose is not properly routed or connected.
4. Delete the fault codes.
   Refer to “[B-3] DELETING THE FAULT CODES” on page 6-67.
5. Checking the ABS warning light.
   Check that the ABS warning light goes off.
   If ABS warning light does not come on or if it does not goes off, refer to “CHECKING THE ABS WARNING LIGHT” on page 4-24.
   - The problem is not solved.
   - Open circuit between the ABS ECU and the meter assembly.
     Check for continuity between green/red terminal of the ABS ECU coupler and green/red terminal of the meter assembly coupler.
   - Malfunction in the meter assembly circuit.
   - Malfunction in the ABS warning light circuit in the hydraulic unit assembly.

EAS20089
ELECTRICAL COMPONENTS

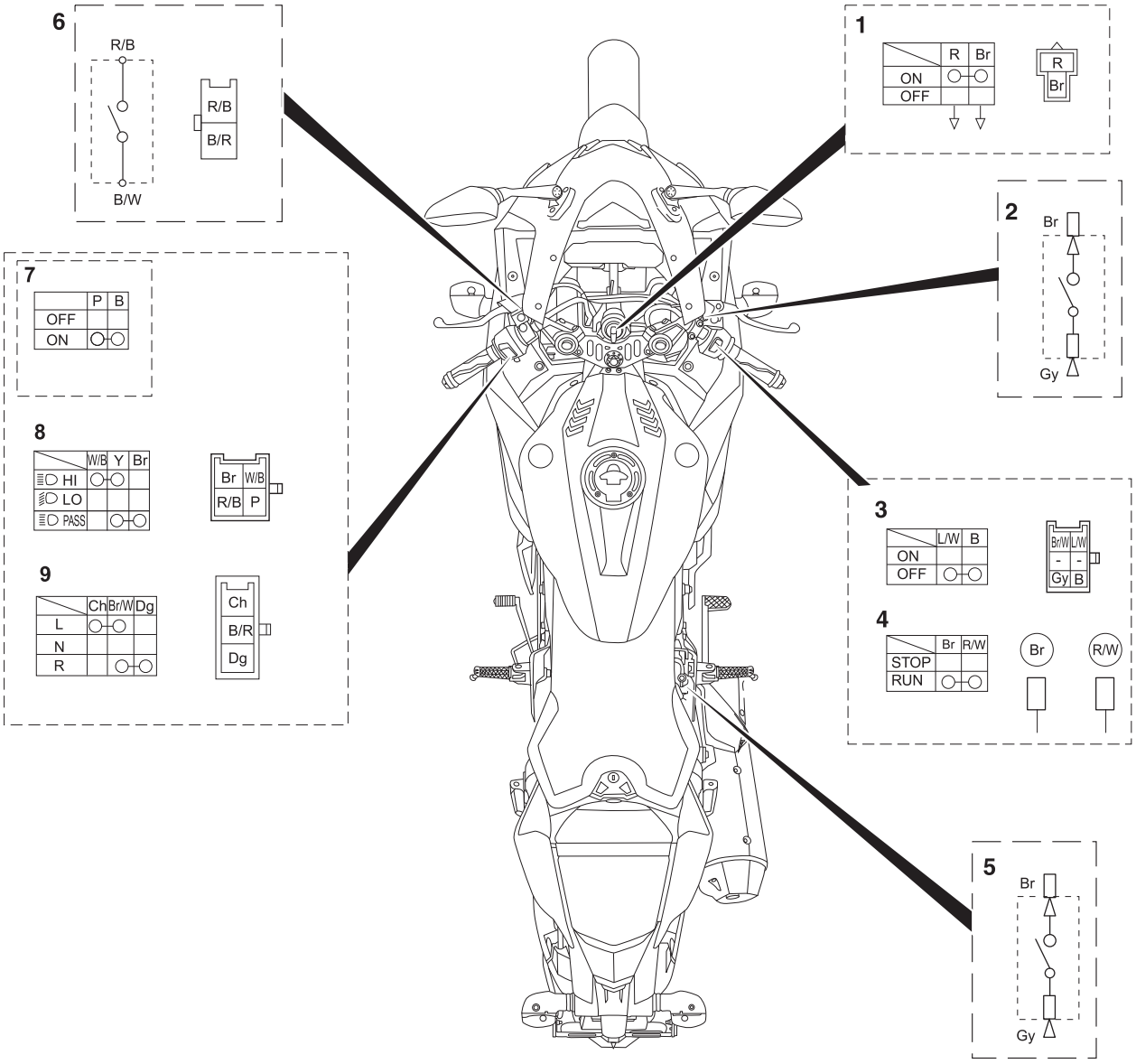


1. Main switch
2. Front brake light switch
3. Ignition coil
4. Fuel sender
5. Fuel pump
6. Fuel injector
7. Battery
8. Fuse box
9. Rear brake light switch
10. AC magneto
11. Crankshaft position sensor
12. Throttle body sensor assembly
13. Starter motor
14. Clutch switch



15. Rectifier/regulator
16. Hydraulic unit assembly
17. Starter relay
18. ECU (Engine Control Unit)
19. Turn signal relay
20. Radiator fan motor relay
21. Rear wheel sensor
22. Lean angle sensor
23. Gear position switch
24. Coolant temperature sensor
25. VVA (Variable Valve Actuator) solenoid
26. O_2 sensor
27. Front wheel sensor
28. Horn
29. Radiator fan motor

EAS30549
CHECKING THE SWITCHES
Check each switch for continuity with the multimeter. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.



1. Main switch
2. Front brake light switch
3. Starter switch
4. Engine stop switch
5. Rear brake light switch
6. Clutch switch
7. Horn switch
8. Dimmer/Pass switch
9. Turn signal light switch

EAS30551
CHECKING THE FUSES

The following procedure applies to all of the fuses.

ECA20520
NOTICE

To avoid a short circuit, always turn the main switch to "OFF" when checking or replacing a fuse.

1. Remove:
   - Rider seat
     Refer to "GENERAL CHASSIS" in base service manual BK7-F8197-E0 on page 4-1.
2. Check:
   - Fuse
     a. Connect the multimeter to the fuse and check the continuity.

TIP

Set the multimeter selector to "Ω × 1".

Multimeter
INS-003
(90890-03189)

   b. If the multimeter indicates "∞", replace the fuse.
3. Replace:
   - Blown fuse
     a. Set the main switch to "OFF".
     b. Install a new fuse of the correct amperage rating.
     c. Set on the switches to verify if the electrical circuit is operational.
     d. If the fuse immediately blows again, check the electrical circuit.

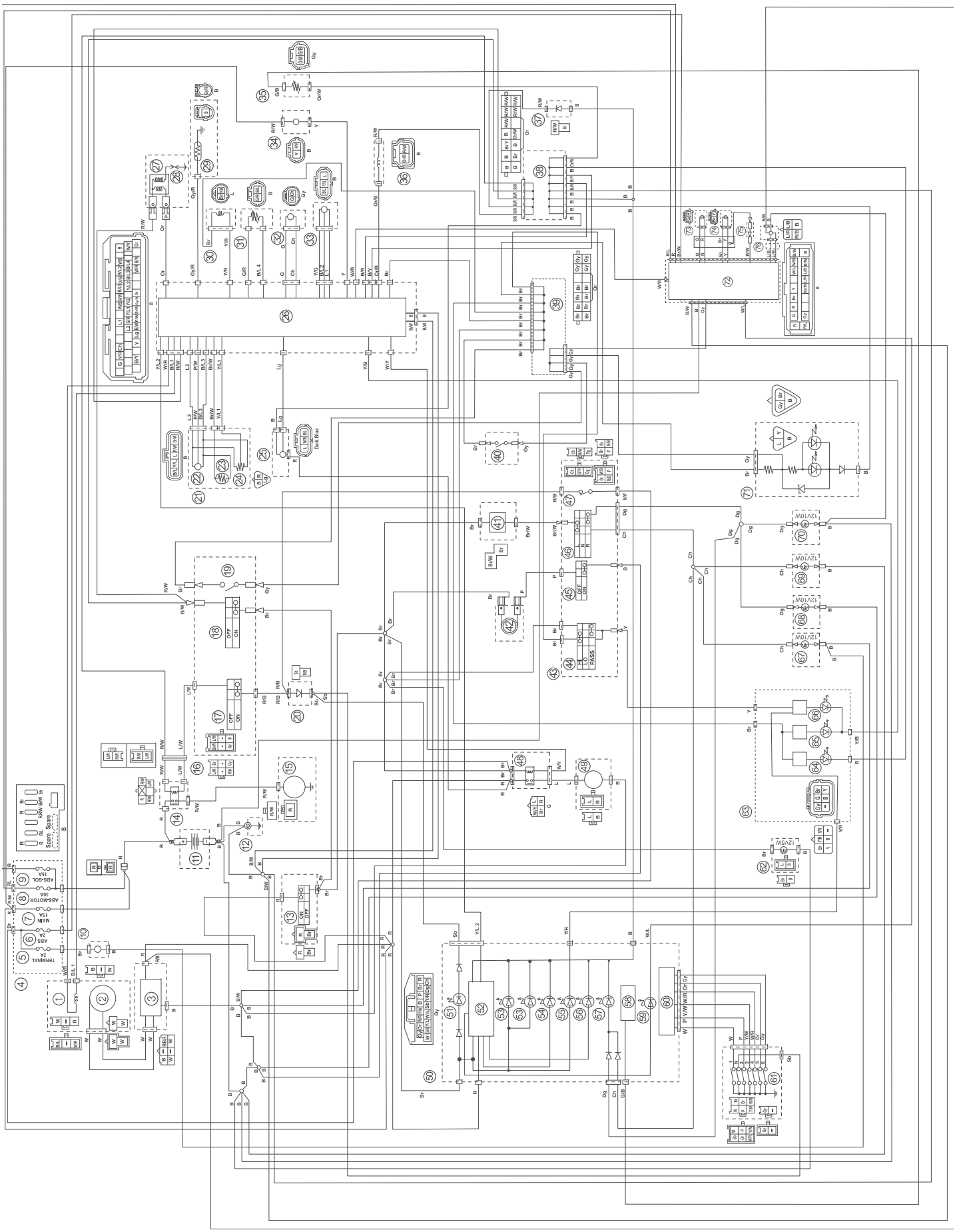
Fuses	Amperage rating	Q'ty
Main	15 A	1
Accessories fuse	15 A	1
ABS solenoid	15 A	1
ABS motor	30 A	1
ABS control unit	2 A	1
Spare	30 A	1
Spare	15 A	1
Spare	2 A	1

EWA13310
⚠ WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

4. Install:
   - Rider seat
     Refer to "GENERAL CHASSIS" in base service manual BK7-F8197-E0 on page 4-1.

YZF155A 2019
WIRING DIAGRAM



EAS20091

WIRING DIAGRAM

YZF155 2019

1. Crankshaft position sensor
2. AC magneto
3. Rectifier/regulator
4. Fuse box
5. Accessories fuse
6. ABS control unit fuse
7. Main fuse
8. ABS motor fuse
9. ABS solenoid fuse
10. Accessories socket
11. Battery
12. Engine ground
13. Main switch
14. Starter relay
15. Starter motor
16. Handlebar switch (right)
17. Starter switch
18. Engine stop switch
19. Front brake light switch
20. Diode 1
21. Throttle body sensor assembly
22. Intake air pressure assembly
23. Intake air temperature sensor
24. Throttle position sensor
25. Yamaha diagnostic tool coupler
26. ECU (Engine Control Unit)
27. Ignition coil
28. Spark plug
29. O_2 sensor
30. FID (fast idle solenoid)
31. Coolant temperature sensor
32. VVA (variable valve actuation) solenoid
33. Lean angle sensor
34. Fuel pump
35. Fuel sender
36. Fuel injector
37. Diode 2
38. Junction 2
39. Junction 1
40. Rear brake light switch
41. Turn signal relay
42. Horn
43. Handlebar switch (left)
44. Dimmer and pass switch
45. Horn switch
46. Turn signal switch
47. Clutch switch
48. Radiator fan motor relay
49. Radiator fan motor
50. Meter assembly
51. Neutral indicator light
52. Multi-function display
53. Meter light
54. Engine trouble warning light
55. High beam indicator light
56. Coolant temperature warning light
57. Turn signal indicator light
58. Fuel meter
59. ABS warning light
60. Gear position indicator
61. Gear position switch
62. License plate light
63. Headlight unit
64. Auxiliary light
65. Headlight (high)
66. Headlight (low)
67. Front turn signal light (left)
68. Front turn signal light (right)
69. Rear turn signal light (left)
70. Rear turn signal light (right)
71. Brake/Tail light assembly
72. ABS ECU (electric control unit)
73. Front wheel sensor
74. Rear wheel sensor
75. ABS ground connector
76. ABS test coupler

EAS30613

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
Lg	Light green
Or	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/L	Black/Blue
B/R	Black/Red
B/Y	Black/Yellow
B/W	Black/White
Br/W	Brown/White
G/B	Green/Black
G/L	Green/Blue
G/R	Green/Red
Gy/R	Gray/Red
L/W	Blue/White
Or/B	Orange/Black
Or/W	Orange/White
P/W	Pink/White
R/B	Red/Black
R/W	Red/White
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red
Y/W	Yellow/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow

YAMAHA

YZF-R15A

SUPPLEMENTARY SERVICE MANUAL 2019

YAMAHA

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Surajpur – 201 306, Distt. – Gautam Budh Nagar, (U.P)

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