YAMAHA 2010

SERVICE MANUAL

XT1200Z(Z)

SUPER TÉNÉRÉ

23P-28197-E0

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EAS20170
FEATURES

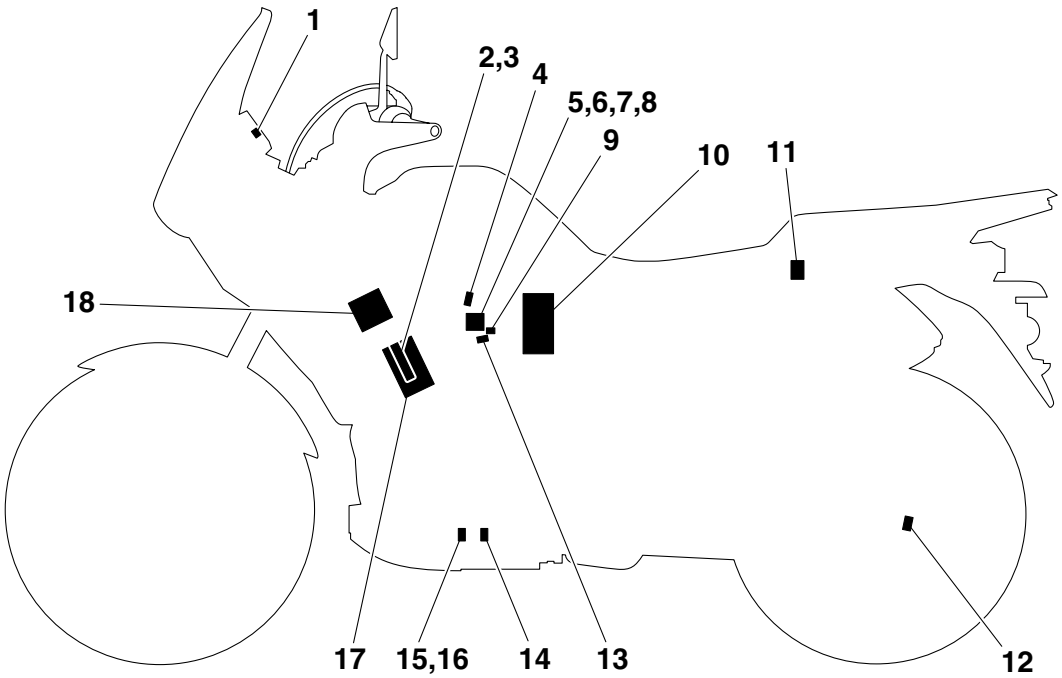
EAS30340
OUTLINE OF THE FI SYSTEM

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

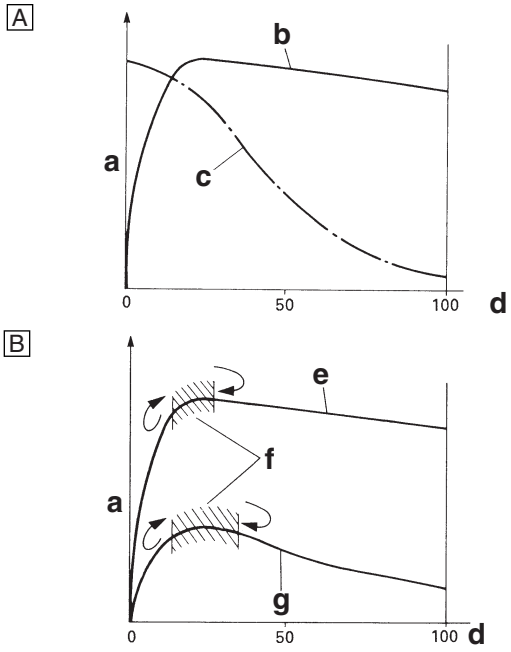
Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operating under a heavy load. Carburetors that meter the fuel through the use of jets have been provided with various auxiliary devices, so that an optimum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

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

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



1. Engine trouble warning light
2. Ignition coils
3. Spark plugs
4. Intake air temperature sensor
5. Throttle position sensor
6. Accelerator position sensor
7. Intake air pressure sensor
8. Throttle servo motor
9. Fuel injectors
10. Fuel pump
11. Lean angle sensor
12. Rear wheel sensor
13. Coolant temperature sensor
14. Crankshaft position sensor
15. O_2 sensor #1
16. O_2 sensor #2
17. Battery
18. ECU (engine control unit)



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

Wheel slip and hydraulic control

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

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

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

UBS (ABS not activated and UBS activated)

Brake lever input only

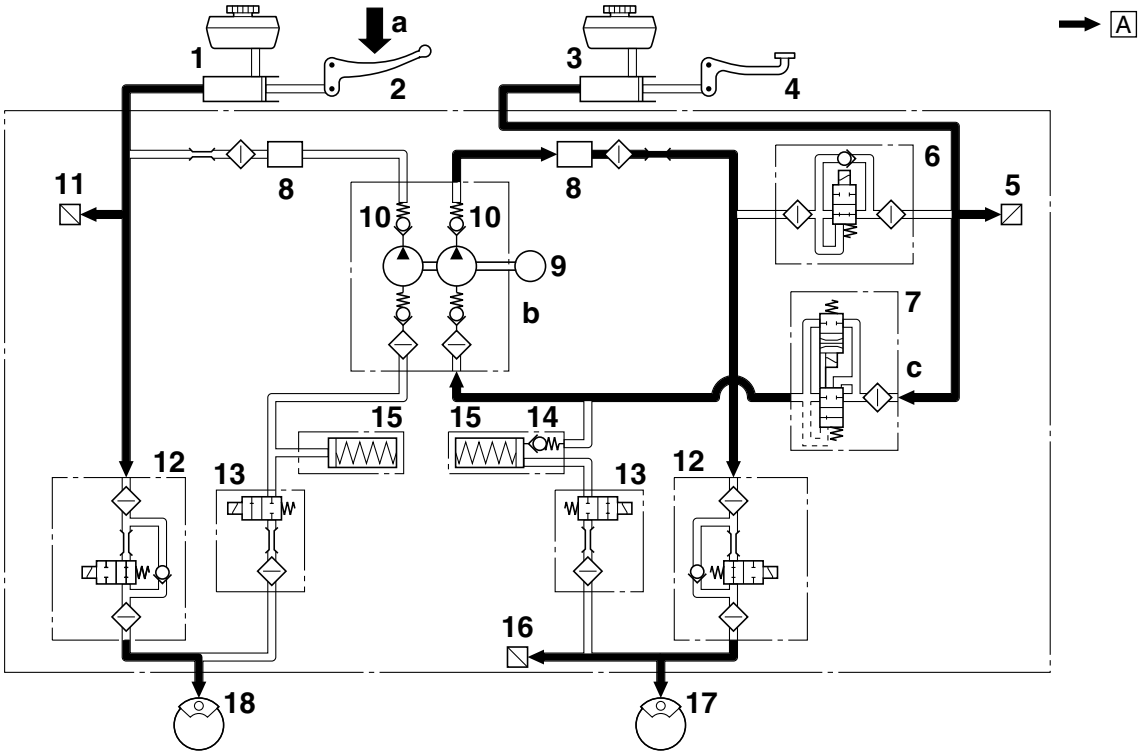
Front brakes:

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

Rear brake:

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

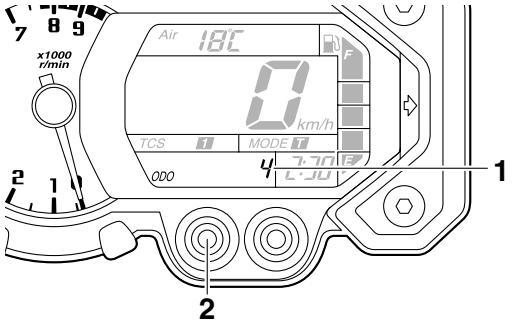
If the brake pedal is depressed, the UBS automatic pressurization stops. The ABS ECU detects and controls the hydraulic pressure in the rear brake caliper using the front brake master cylinder pressure sensor, rear brake master cylinder pressure sensor, and rear brake caliper pressure sensor.



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

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

Odometer and tripmeter modes



1. Odometer/tripmeter/fuel reserve tripmeter
2. Left set button

Pushing the left button switches the display between the odometer mode “ODO” and the tripmeter modes “TRIP 1” and “TRIP 2” in the following order:
ODO → TRIP 1 → TRIP 2 → ODO

TIP

When selecting “TRIP 1” or “TRIP 2”, the display flashes for five seconds.

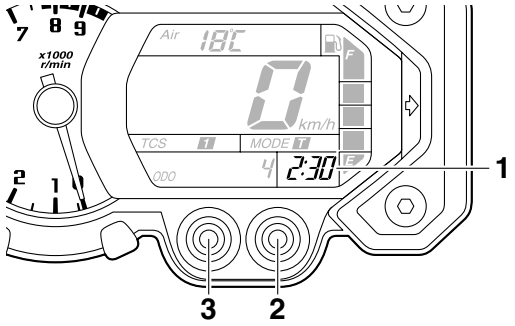
When approximately 3.9 L (1.03 US gal, 0.86 Imp.gal) of fuel remains in the fuel tank, the display automatically changes to the fuel reserve tripmeter mode “TRIP F” and starts counting the distance traveled from that point. In that case, pushing the left button switches the display between the various tripmeter and odometer modes in the following order:
TRIP F → ODO → TRIP 1 → TRIP 2 → TRIP F

TIP

When selecting “TRIP 1”, “TRIP 2” or “TRIP F”, the display flashes for five seconds.

To reset a tripmeter, select it by pushing the left button, and then push this button for at least one second while the display is flashing. If you do not reset the fuel reserve tripmeter manually, it resets itself automatically and the display returns to the prior mode after refueling and traveling 5 km (3 mi).

Clock

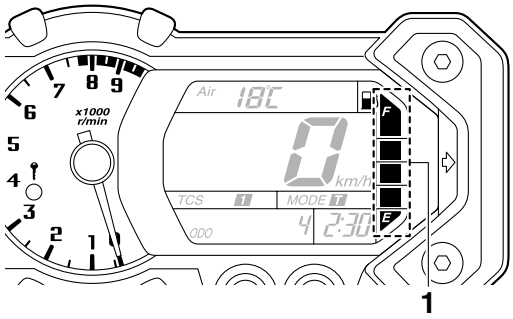


1. Clock
2. Right set button
3. Left set button

The clock displays when the key is turned to “ON”. In addition, the clock can be displayed for 10 seconds by pushing the left button when the main switch is in the “OFF”, “LOCK” or “Parking” position.
To set the clock:

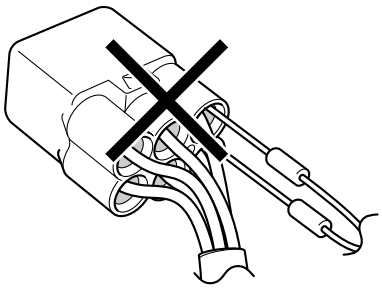
1. Push the left button and right button together for at least three seconds.
2. When the hour digits start flashing, push the right button to set the hours.
3. Push the left button; the minute digits start flashing.
4. Push the right button to set the minutes.
5. Push the left button; the clock starts after the button is released.

Fuel meter



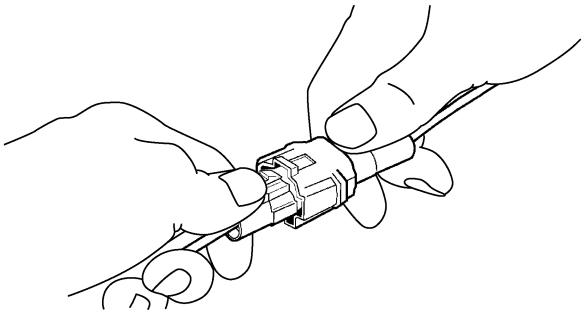
1. Fuel meter

The fuel meter indicates the amount of fuel in the fuel tank. The display segments of the fuel meter disappear towards “E” (Empty) as the fuel level decreases. When the last segment starts flashing, refuel as soon as possible.
When the key is turned to “ON”, all display segments come on once in order to test the electrical circuit.

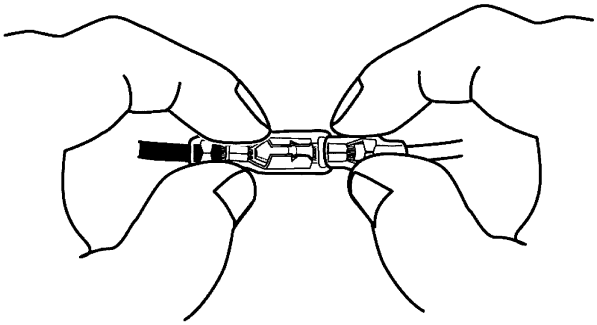


Checking the connections
Check the leads, couplers, and connectors for stains, rust, moisture, etc.
1. Disconnect:
   • Lead
   • Coupler
   • Connector

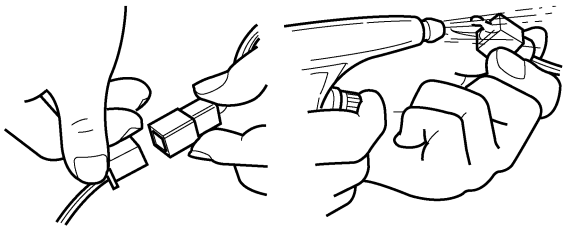
ECA16780
NOTICE
• When disconnecting a coupler, release the coupler lock, hold both sections of the coupler securely, and then disconnect the coupler.
• There are many types of coupler locks; therefore, be sure to check the type of coupler lock before disconnecting the coupler.



ECA16790
NOTICE
When disconnecting a connector, do not pull the leads. Hold both sections of the connector securely, and then disconnect the connector.

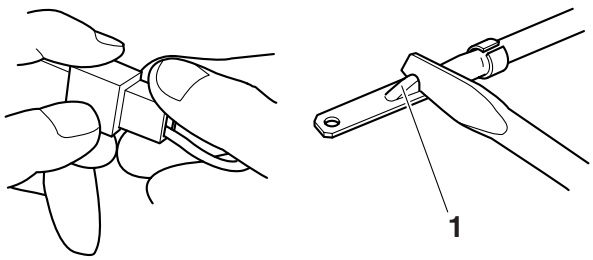


2. Check:
   • Lead
   • Coupler
   • Connector
   Moisture → Dry with an air blower.
   Rust/stains → Connect and disconnect several times.



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

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



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EAS20300
CHASSIS SPECIFICATIONS

Chassis	
Frame type	Steel tube backbone
Caster angle	28.00°
Trail	126.0 mm (4.96 in)
Front wheel	
Wheel type	Spoke wheel
Rim size	19M/C × MT2.50
Rim material	Aluminum
Wheel travel	190.0 mm (7.48 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Rear wheel	
Wheel type	Spoke wheel
Rim size	17M/C × MT4.00
Rim material	Aluminum
Wheel travel	190.0 mm (7.48 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Front tire	
Type	Tubeless
Size	110/80R19M/C 59V
Manufacturer/model	BRIDGESTONE/BW-501 METZELER/TOURANCE EXP FRONT C
Wear limit (front)	1.6 mm (0.06 in) (Europe) 1.0 mm (0.04 in) (AUS)
Rear tire	
Type	Tubeless
Size	150/70R17M/C 69V
Manufacturer/model	BRIDGESTONE/BW-502 METZELER/TOURANCE EXP C
Wear limit (rear)	1.6 mm (0.06 in) (Europe) 1.0 mm (0.04 in) (AUS)
Tire air pressure (measured on cold tires)	
Loading condition	0–90 kg (0–198 lb)
Front	225 kPa (2.25 kgf/cm², 33 psi)
Rear	250 kPa (2.50 kgf/cm², 36 psi)
Loading condition	90–209 kg (198–461 lb)
Front	225 kPa (2.25 kgf/cm², 33 psi)
Rear	290 kPa (2.90 kgf/cm², 42 psi)
Front brake	
Type	Dual disc brake
Operation	Right hand operation
Front disc brake	
Disc outside diameter × thickness	310.0 × 4.5 mm (12.20 × 0.18 in)

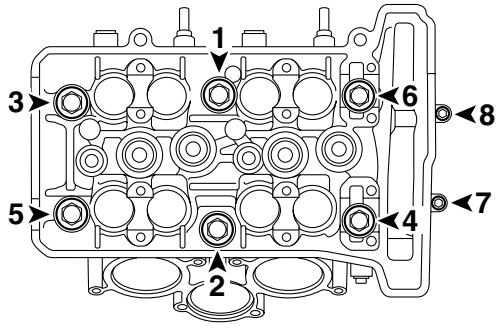
Item	Thread size	Q'ty	Tightening torque	Remarks
Oil pipe bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	LT
Oil pump assembly bolt	M6	3	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Oil pump housing cover bolt	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil strainer (oil pump) bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Main axle assembly bolt	M6	3	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	LT
Shift drum retainer screw	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	LT
Shift shaft spring stopper bolt	M8	1	22 Nm (2.2 m·kgf, 16 ft·lbf)	LT
Connecting rod nut	M9	4	See TIP.	M
Middle gear side cover screw	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	LT
Middle gear side cover damper plate screw	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	LT
Engine oil drain bolt (middle gear)	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Middle driven pinion gear bearing housing bolt	M8	4	33 Nm (3.3 m·kgf, 24 ft·lbf)	LT
Middle drive pinion gear bearing retainer bolt	M8	4	28 Nm (2.8 m·kgf, 20 ft·lbf)	LT
Middle drive pinion gear nut	M44	1	110 Nm (11 m·kgf, 80 ft·lbf)	Stake.
Starter motor assembly bolt	M6	2	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Starter motor terminal nut	M6	1	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Starter motor front cover bolt	M5	2	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Starter motor terminal and rear cover nut	M6	1	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	

TIP

Cylinder head bolt

Tighten the cylinder head bolts "1"–"8" in the proper tightening sequence as follows:

- Tighten the cylinder head bolts "1"–"6" to 20 Nm (2.0 m·kgf, 14 ft·lbf).
- Tighten the cylinder head bolts "1"–"6" to 30 Nm (3.0 m·kgf, 22 ft·lbf), and then tighten them further to reach the specified angle. Tighten each bolt to the specified angle before tightening the next bolt to 30 Nm (3.0 m·kgf, 22 ft·lbf).
  "1", "2", "4": 215–225°
  "3", "5", "6": 180–190°
- Tighten the cylinder head bolts "7" and "8" to 10 Nm (1.0 m·kgf, 7.2 ft·lbf).



EAS20380
CHASSIS

Lubrication point	Lubricant
Steering bearings	LS
Steering bearing oil seal lips	LS
Steering shaft and nut thread	LS
Front wheel oil seal lips (right and left)	LS
Rear wheel oil seal lip	LS
Rear wheel drive hub mating surface	LS
Rear brake pedal pivoting point and metal-to-metal moving parts	LS
Passenger footrest pivoting point and ball	LS
Shift pedal pivoting point and metal-to-metal moving parts	LS
Centerstand pivoting point and metal-to-metal moving parts	LS
Centerstand spring hook metal-to-metal moving parts	LS
Sidestand pivoting point and metal-to-metal moving parts	LS
Link and sidestand switch contact point	LS
Sidestand hook and link contact point	LS
Tube guide (throttle grip) inner surface and throttle cables	LS
Brake lever pivoting point, brake master cylinder push rod contact surface, and metal-to-metal moving parts	S
Clutch lever pivoting point, clutch master cylinder push rod contact surface, and metal-to-metal moving parts	S
Pivot shaft and pivot shaft thread	LS
Pivot shaft bearing	LS
Pivot shaft dust cover inner surface	LS
Relay arm bearings and oil seal lips	LS

1. Oil pump assembly
2. Oil filter cartridge
3. Oil strainer cover
4. Oil strainer (oil pan)
5. Oil pan
6. Lower crankcase
7. Upper crankcase
8. Rear balancer shaft

AA. Route the immobilizer unit lead to the inside of the throttle cables.

AB. Position the immobilizer unit coupler below the brake hose (front brake master cylinder to hydraulic unit).

AC. Upward

AD. Route the throttle cables between the brake hose (front brake master cylinder to hydraulic unit) and the clutch hose.

AE. Route the front wheel sensor lead to the outside of the brake hose (front brake master cylinder to hydraulic unit), clutch hose, and throttle cables.

AF. Route the radiator fan motor lead over the front wheel sensor lead.

AG. Route the horn lead between the brake hose (front brake master cylinder to hydraulic unit) and the clutch hose, and to the inside of the throttle cables.

AH. Forward

AI. Face the buckle of the plastic band rearward with the end pointing downward. Do not cut off the excess end of the plastic locking tie.

AJ. Fasten the immobilizer unit lead at the white tape to the brake hose (front brake master cylinder to hydraulic unit) with a plastic locking tie. Face the buckle of the plastic locking tie forward with the end pointing downward. Do not cut off the excess end of the plastic locking tie.

1. Headlight relay
2. Turn signal/hazard relay
3. Radiator fan motor relay
4. Main fuse
5. Starting circuit cut-off relay
6. Rectifier/regulator coupler
7. Stator coil coupler
8. Joint connector
9. Battery
10. Positive battery lead
11. Crankshaft position sensor coupler
12. Negative battery lead coupler
13. Negative battery lead
14. Starter relay
15. Fuse box 1
16. Fuse box 2
17. Grip warmer coupler
18. Accessory light coupler
19. Left handlebar switch coupler
20. Stator coil lead
21. ECU leads
22. O_2 sensor #1 coupler
23. Right handlebar switch couplers
24. Wire harness (turn signal/hazard relay lead and radiator fan motor relay lead)
25. Starting circuit cut-off relay lead
26. Starter relay lead
27. Rectifier/regulator lead
28. Fuse box 2 lead
29. Fuse box 1 lead
30. Wire harness
31. Wire harness (starting circuit cut-off relay lead and starter relay lead)
32. Wire harness (rectifier/regulator lead and stator coil lead)
33. Left handlebar switch lead
34. O_2 sensor #1 lead
35. Right handlebar switch lead
36. Main switch lead
37. O_2 sensor #2 lead

A. Route the main fuse leads to the outside of the headlight relay lead and turn signal/hazard relay lead.
B. Fasten the main fuse leads with the holder on the ECU bracket.
C. Route the main fuse leads between the starter relay and the joint connector.
D. Slide the rubber cover over the couplers, making sure that the couplers are covered completely.
E. Either coupler, the crankshaft position sensor coupler or negative battery lead coupler, may be positioned to the outside.
F. Install the starter relay rubber holder completely onto the tabs on the ECU bracket.
G. Make sure that the terminal covers for the positive battery lead and negative battery lead are not fitted over the rib on the starter relay.
H. Fit the joint connector into the holder on the ECU bracket.
I. Route the starter relay lead to the outside of the main fuse leads.
J. Install the positive battery lead terminal and negative battery lead terminal to the starter relay so that the terminals are parallel to the relay as shown in the illustration.
K. Route the fuse box 1 lead and fuse box 2 lead to the inside of the wire harness (starting circuit cut-off relay lead and starter relay lead).
L. Install the grip warmer coupler so that the coupler cap is facing inward.
M. Install the accessory light coupler so that the coupler cap is facing inward.
N. Route the leads that pass through the rubber cover to the inside of the fuse box 1 lead and fuse box 2 lead.
O. Route the leads that pass through the rubber cover to the inside of the wire harness (starting circuit cut-off relay lead and starter relay lead).
P. Route the wire harness (turn signal/hazard relay lead, radiator fan motor relay lead, and headlight relay lead) and ECU leads upward, making sure to route the ECU leads to the rear of the wire harness.
Q. Route the stator coil lead to the rear of the wire harness.
R. Fasten the wire harness with the holder on the electrical components tray.
S. Route the leads that pass through the rubber cover to the outside of the ECU leads.
T. Fasten the headlight relay lead, turn signal/hazard relay lead, radiator fan motor relay lead and starting circuit cut-off relay lead with the holders on the ECU bracket.
U. Install the rubber holder on each relay completely onto its respective tab on the ECU bracket.
V. Face the catch of the holder forward.
W. Route the starting circuit cut-off relay lead to the front of the wire harness (turn signal/hazard relay lead, radiator fan motor relay lead, and headlight relay lead).
X. Route the starter relay lead to the front of the wire harness (turn signal/hazard relay lead, radiator fan motor relay lead, and headlight relay lead).
Y. Route the rectifier/regulator lead and fuse box 2 lead as shown in the illustration.
Z. Route the stator coil lead to the outside and to the front of the fuse box 1 lead.

1. Engine ground lead
2. Wire harness
3. ABS ECU lead
4. ABS test coupler
5. ABS test coupler lead
6. Hydraulic unit assembly
7. Coolant reservoir hose
8. Oil level switch lead
9. Sidestand switch lead
10. Fuel hose
11. Rear brake light switch lead
12. Neutral switch lead
13. Fuel pump lead
14. Rear right turn signal light lead
15. Lean angle sensor sub-wire harness/frame ground lead
16. Tail/brake light lead
17. License plate light lead
18. Rear left turn signal light lead
19. Fuel pump coupler

A. Make sure that the engine ground lead terminal contacts the stopper on the crankcase.
B. Position the plastic band between the rubber cover and the split in the wire harness.
C. Insert the projection on the plastic band into the hole in the rear fender, and then fasten the ABS ECU lead and wire harness with the band. Route the wire harness to the outside of the ABS ECU lead. Point the end of the plastic band to the right and insert it into the hole in the frame. Do not cut off the excess end of the plastic band.
D. Slide the rubber cover over the rear turn signal light connectors, license plate light coupler, tail/brake light coupler, lean angle sensor sub-wire harness coupler, and alarm couplers, making sure that the connectors and couplers are covered completely.
E. Slide the rubber cover over the sidestand switch coupler, rear brake light switch coupler, neutral switch coupler, rear wheel sensor coupler, and oil level switch coupler, making sure that the couplers are covered completely.
F. Route the sidestand switch lead and oil level switch lead over the coolant reservoir hose.
G. Connect the ABS ECU coupler, and then fasten the wire harness at the white tape with the plastic band. Point the end of the plastic band downward. Do not cut off the excess end of the plastic band.
H. Point the end of the plastic band rearward. Do not cut off the excess end of the plastic band.
I. Fold the ABS test coupler lead, and then fasten the ABS test coupler lead, lean angle sensor sub-wire harness, rear right turn signal light lead, rear left turn signal light lead, tail/brake light lead, and license plate light lead with the plastic locking tie.
J. Position the plastic locking tie 40–60 mm (1.57–2.36 in) from the edge of the holder.
K. Fit the ABS test coupler in between the ABS unit cover and the holder.
L. Face the catch of the holder forward or rearward.
M. Route the fuel pump lead above and to the rear of the fuel hose.
N. Forward

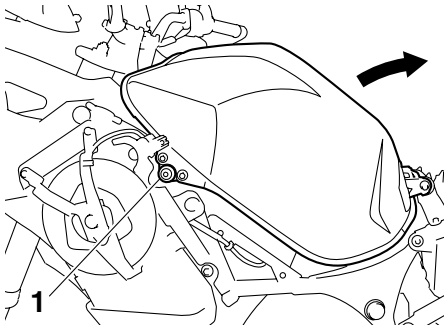
EAS21030
CHECKING THE FUEL LINE
1. Remove:
   • Rider seat
   • Left side cowling
   • Right side panel
   Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
   • Fuel tank bolts "1"

TIP

After removing the fuel tank bolts, lift up the front of the fuel tank.

ECA23P1003
NOTICE

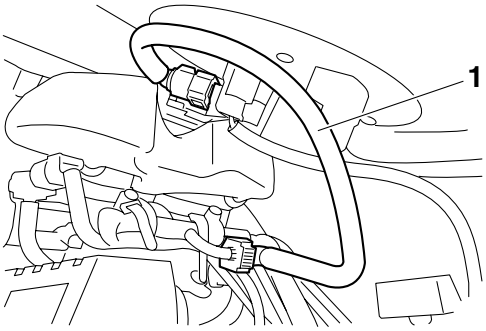
When lifting up the fuel tank, be careful not to pull the fuel tank overflow hose and fuel tank breather hose.

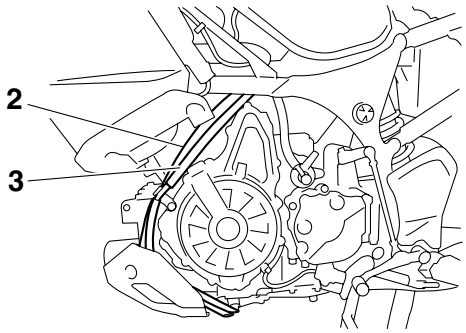


3. Check:
   • Fuel hose "1"
   • Fuel tank breather hose "2"
   • Fuel tank overflow hose "3"
   Cracks/damage → Replace.
   Loose connection → Connect properly.

ECA23P1078
NOTICE

Make sure the fuel tank breather/overflow hose is routed correctly.





4. Install:
   • Fuel tank bolts

	Fuel tank bolt **10 Nm (1.0 m·kgf, 7.2 ft·lbf)**

5. Install:
   • Right side panel
   • Left side cowling
   • Rider seat
   Refer to "GENERAL CHASSIS" on page 4-1.

EAS20680
CHECKING THE SPARK PLUGS
The following procedure applies to all of the spark plugs.
1. Remove:
   • Air filter case
   Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
   • Ignition coil
3. Remove:
   • Spark plug

ECA13320
NOTICE

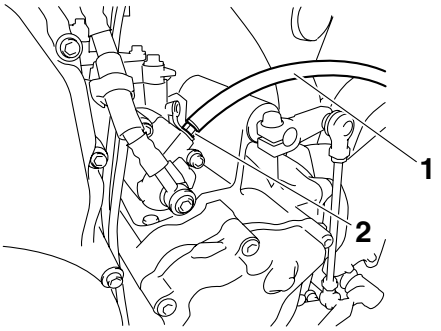
Before removing the spark plugs, blow away any dirt accumulated in the spark plug wells with compressed air to prevent it from falling into the cylinders.

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

	Manufacturer/model **NGK/CPR8EB9**

5. Check:
   • Electrode "1"
   Damage/wear → Replace the spark plug.
   • Insulator "2"
   Abnormal color → Replace the spark plug.
   Normal color is medium-to-light tan.

b. Install the clutch master cylinder reservoir diaphragm.
c. Connect a clear plastic hose "1" tightly to the bleed screw "2".



d. Place the other end of the hose into a container.
e. Slowly squeeze the clutch lever several times.
f. Fully squeeze the clutch lever without releasing it.
g. Loosen the bleed screw. This will release the tension and cause the clutch lever to contact the handlebar grip.
h. Tighten the bleed screw and then release the clutch lever.
i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the clutch fluid in the plastic hose.
j. Tighten the bleed screw to specification.

Bleed screw
6 Nm (0.6 m·kgf, 4.3 ft·lbf)

k. Fill the clutch master cylinder reservoir to the proper level with the recommended clutch fluid.
Refer to "CHECKING THE CLUTCH FLUID LEVEL" on page 3-13.

EWA13010
⚠ WARNING

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

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS21160
ADJUSTING THE FRONT DISC BRAKE

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

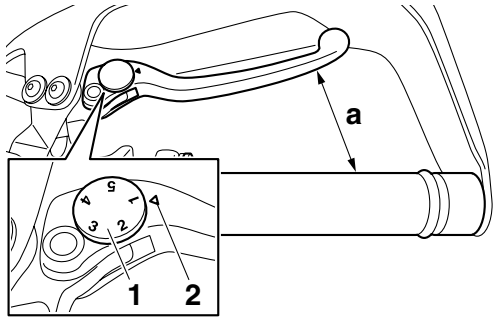
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a. While pushing the brake lever forward, turn the adjusting dial "1" until the brake lever is in the desired position.

TIP

Be sure to align the setting on the adjusting dial with the arrow mark "2" on the brake lever.

Position #1
Distance "a" is the largest.
Position #5
Distance "a" is the smallest.



EWA13050
⚠ WARNING

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

ECA13490
NOTICE

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

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EAS21240
CHECKING THE BRAKE FLUID LEVEL

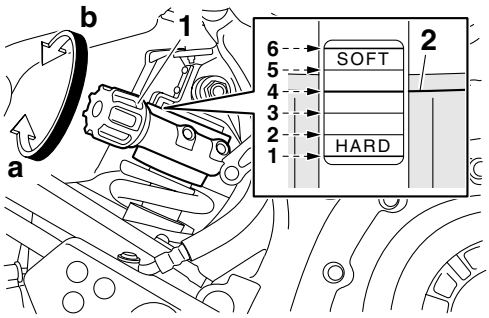
1. Stand the vehicle on a level surface.

TIP

• Place the vehicle on the centerstand.
• Make sure the vehicle is upright.

2. Check:
   • Brake fluid level
   Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.

Recommended fluid
DOT 4



▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

Rebound damping

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

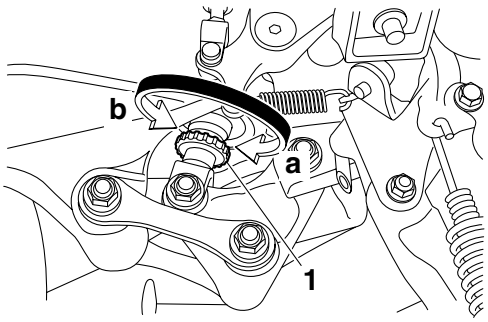
1. Adjust:
   • Rebound damping

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

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

Rebound damping adjusting positions
Minimum
20 click(s) out*
Standard
10 click(s) out*
Maximum
3 click(s) out*
***With the adjusting knob fully turned in**



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EAS20731

CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

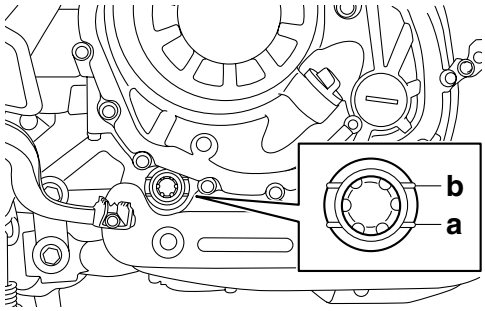
TIP

• Place the vehicle on the centerstand.
• Make sure the vehicle is upright.

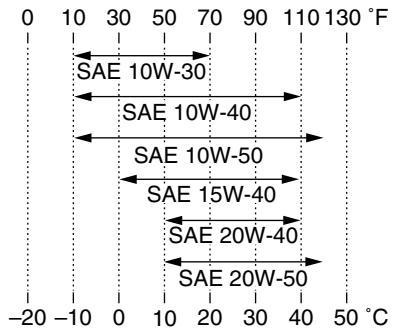
2. Start the engine and warm it up for ten minutes until the engine oil has reached a normal temperature of 60 °C (140 °F), and then turn the engine off.
3. Check:
   • Engine oil level
   The engine oil level should be between the minimum level mark "a" and maximum level mark "b".
   Below the minimum level mark → Add the recommended engine oil to the proper level.

TIP

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



Recommended brand
YAMALUBE
Type
SAE 10W-30, 10W-40, 10W-50, 15W-40, 20W-40 or 20W-50
Recommended engine oil grade
API service SG type or higher, JASO standard MA



CHASSIS

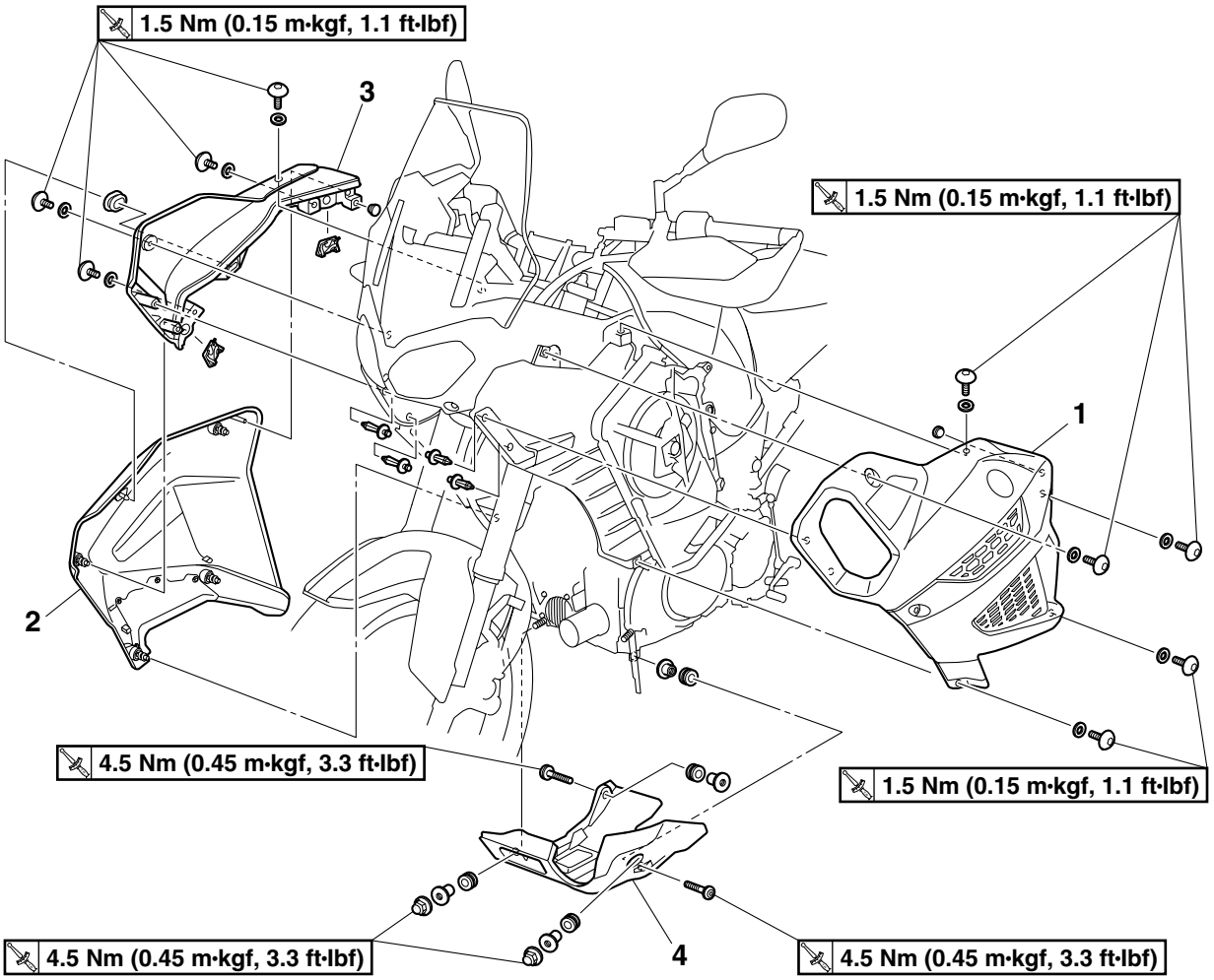
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- INSTALLING THE CARRIERS 4-2
- REMOVING THE ABS UNIT COVER 4-7
- INSTALLING THE ABS UNIT COVER 4-7
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- ASSEMBLING THE REAR WHEEL 4-33
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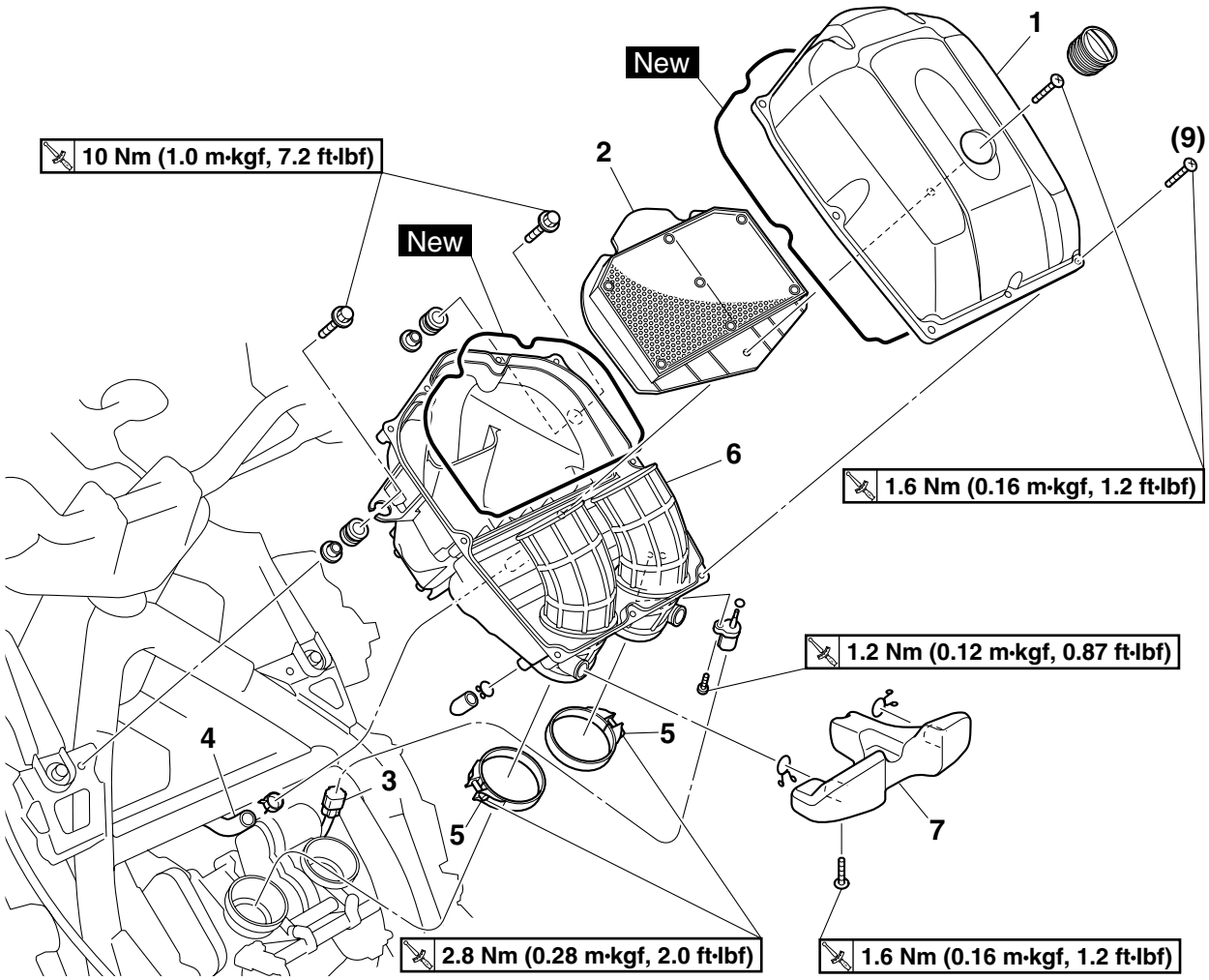
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Removing the side cowlings, side panel, and engine guard



Order	Job/Parts to remove	Q'ty	Remarks
1	Left side cowling	1	
2	Right side cowling	1	
3	Right side panel	1	
4	Engine guard	1	
			For installation, reverse the removal procedure.

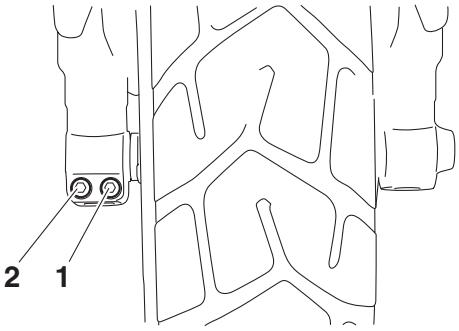
Removing the air filter case



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "Removing the seats and carriers".
	Left side cowling/Right side panel		Refer to "Removing the side cowlings, side panel, and engine guard".
1	Air filter case cover	1	
2	Air filter element	1	
3	Intake air temperature sensor coupler	1	Disconnect.
4	Cylinder head breather hose	1	Disconnect.
5	Air filter case joint clamp screw	2	Loosen.
6	Air filter case	1	
7	Air chamber	1	
			For installation, reverse the removal procedure.

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a. Insert the front wheel axle from the right side and tighten it to 72 Nm (7.2 m·kgf, 52 ft·lbf).
b. In the order pinch bolt "1" → pinch bolt "2" → pinch bolt "1", tighten each bolt to 21 Nm (2.1 m·kgf, 15 ft·lbf) without performing temporary tightening.



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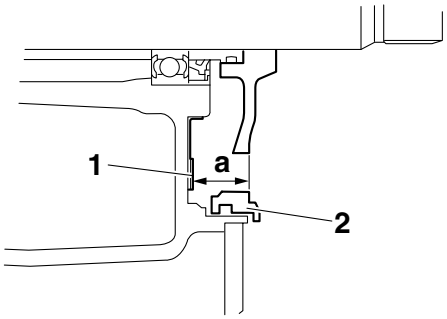
6. Measure:

TIP

Measure the distance "a" only if the wheel bearings, wheel sensor rotor, or both were replaced.

- Distance "a"
  (between the wheel sensor rotor "1" and wheel sensor housing "2")
  Out of specification → Reinstall the bearing or replace the wheel sensor rotor.

Distance "a" (between the wheel sensor rotor and wheel sensor housing)
18.0–18.2 mm (0.71–0.72 in)



7. Install:
   - Front brake calipers
   - Front reflectors (for Oceania)
   - Front wheel sensor lead guide (for Europe)
   - Front wheel sensor lead holder
   - Front wheel sensor
   - Front brake hose holder

Front brake caliper bolt
40 Nm (4.0 m·kgf, 29 ft·lbf)
Front wheel sensor bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)
Front brake hose holder bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

TIP

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

ECA23P1012

NOTICE

- **Make sure there are no foreign materials in the wheel hub. Foreign materials cause damage to the inner sensor rotor and wheel sensor.**
- **To route the front wheel sensor lead, refer to "CABLE ROUTING" on page 2-43.**

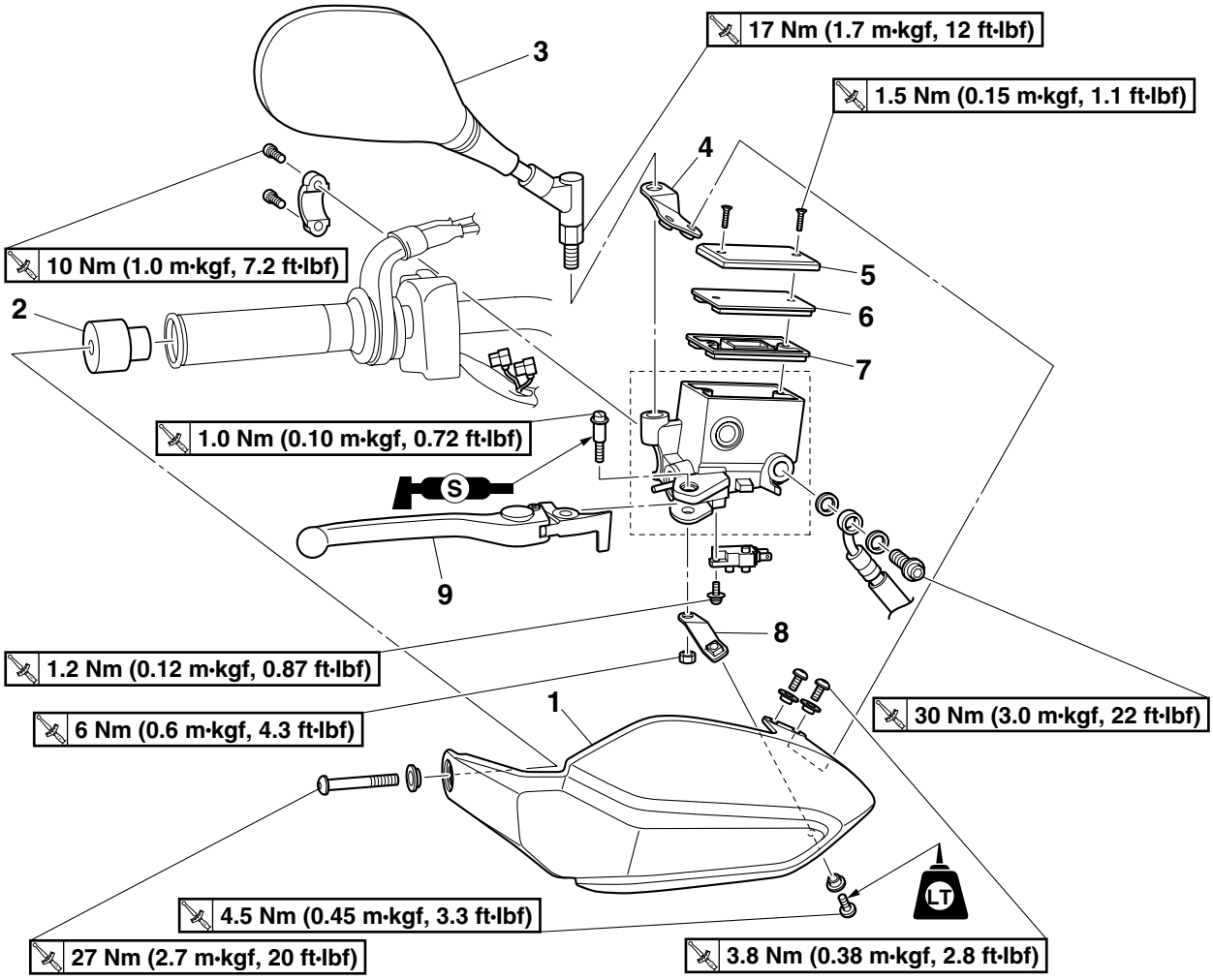
EWA13500

⚠ WARNING

Make sure the brake hose is routed properly.

8. Check:
   - Front wheel sensor installation
     Check if the wheel sensor housing is installed properly.

Removing the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-15.
1	Hand shield	1	
2	Grip end	1	
3	Rearview mirror	1	
4	Upper hand shield bracket	1	
5	Brake master cylinder reservoir cap	1	
6	Brake master cylinder reservoir diaphragm holder	1	
7	Brake master cylinder reservoir diaphragm	1	
8	Lower hand shield bracket	1	
9	Brake lever	1	

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

Recommended fluid
DOT 4

EAS22440
INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

1. Install:
   - Front brake caliper (temporarily)
   - Brake hose gaskets New
   - Brake hose (hydraulic unit to left front brake caliper) "1"
   - Brake hose (left front brake caliper to right front brake caliper) "2"
   - Brake hose union bolt "3"

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

EWA13530
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-43.

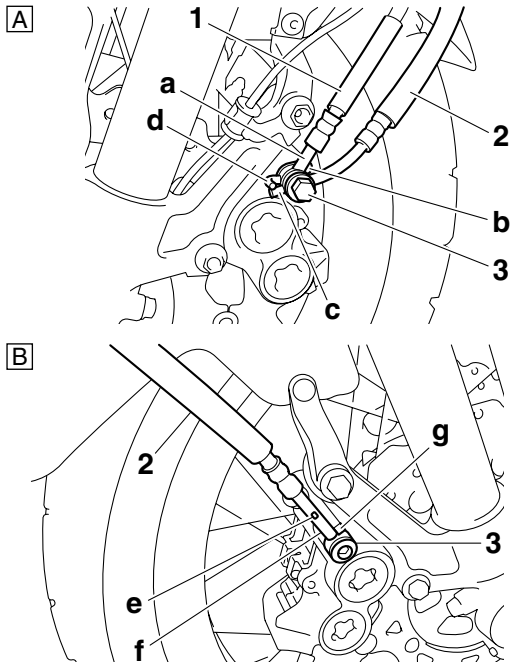
ECA23P1020
NOTICE

Left side

• When installing the brake hose "1" onto the brake caliper, make sure that the brake pipe "a" contacts the projection "b" on the brake caliper.
• When installing the brake hose "2" onto the brake caliper, make sure that the projection "c" on the brake hose "2" contacts the projection "d" on the brake hose "1".

Right side

• When installing the brake hose "2" onto the brake caliper, make sure that the paint mark "e" on the brake hose "2" faces outward and that the brake pipe "f" contacts the projection "g" on the brake caliper.



A. Left side
B. Right side

2. Remove:
   - Front brake caliper
3. Install:
   - Brake pads
   - Brake pad spring
   - Brake pad pin
   - Brake pad clips
   - Front brake caliper
   Refer to "REPLACING THE FRONT BRAKE PADS" on page 4-45.

Front brake caliper bolt
40 Nm (4.0 m·kgf, 29 ft·lbf)

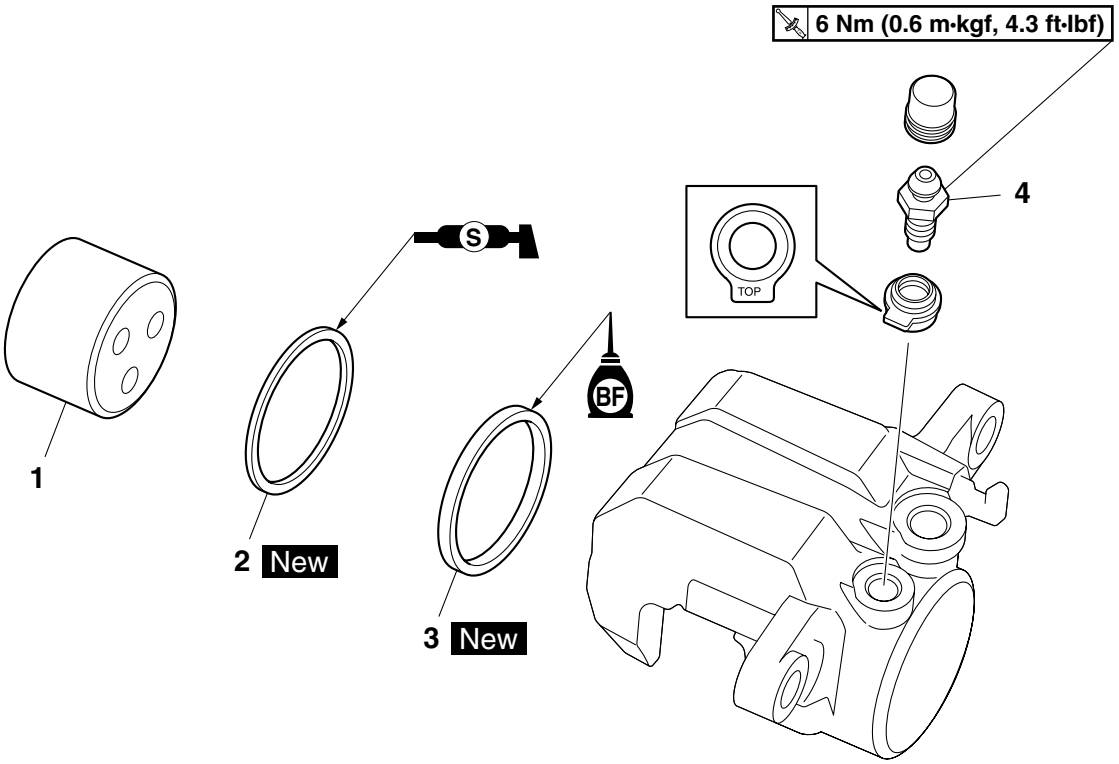
4. Fill:
   - Brake master cylinder reservoir (with the specified amount of the recommended brake fluid)

Recommended fluid
DOT 4

EWA13090
WARNING

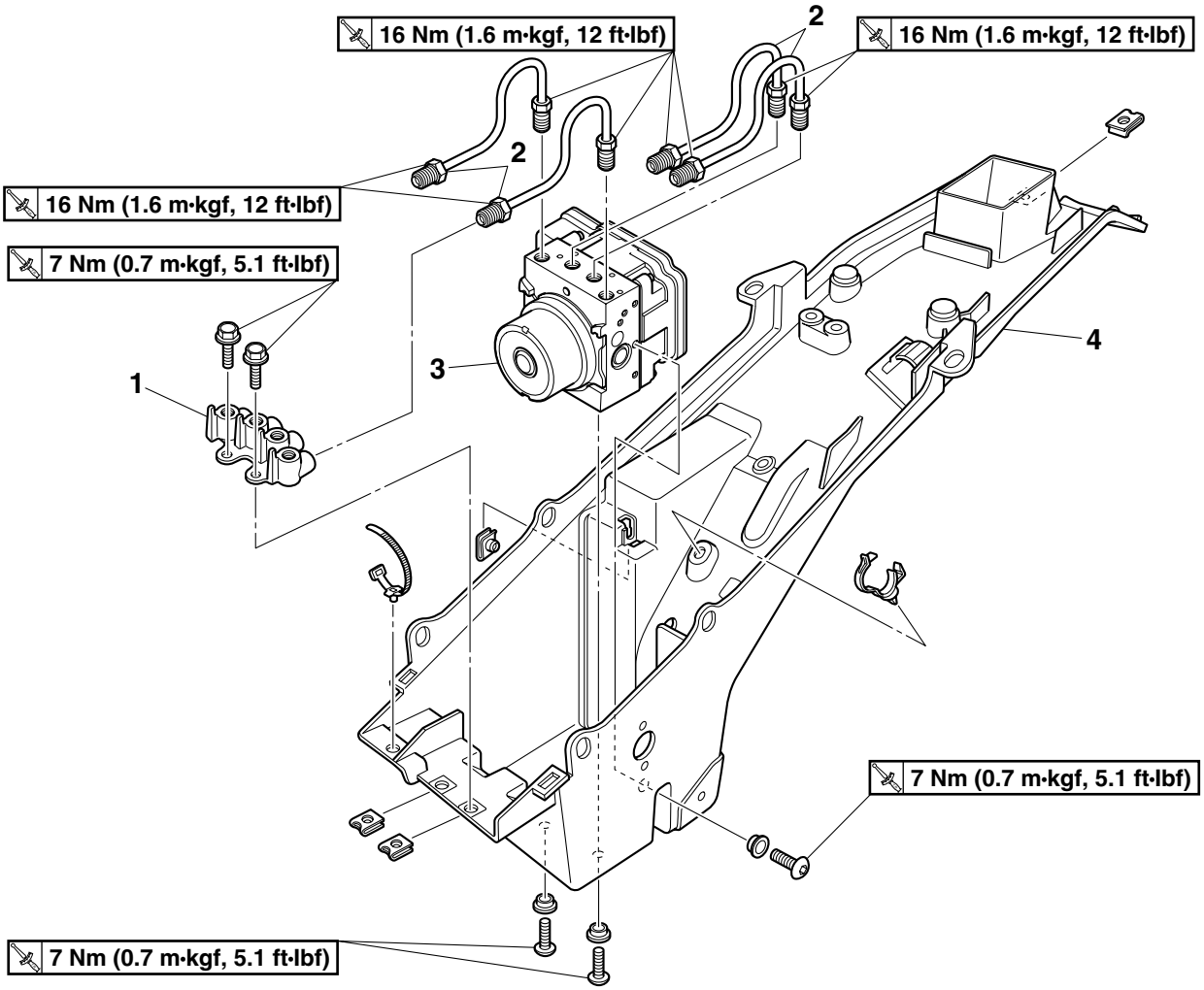
• Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.

Disassembling the rear brake caliper



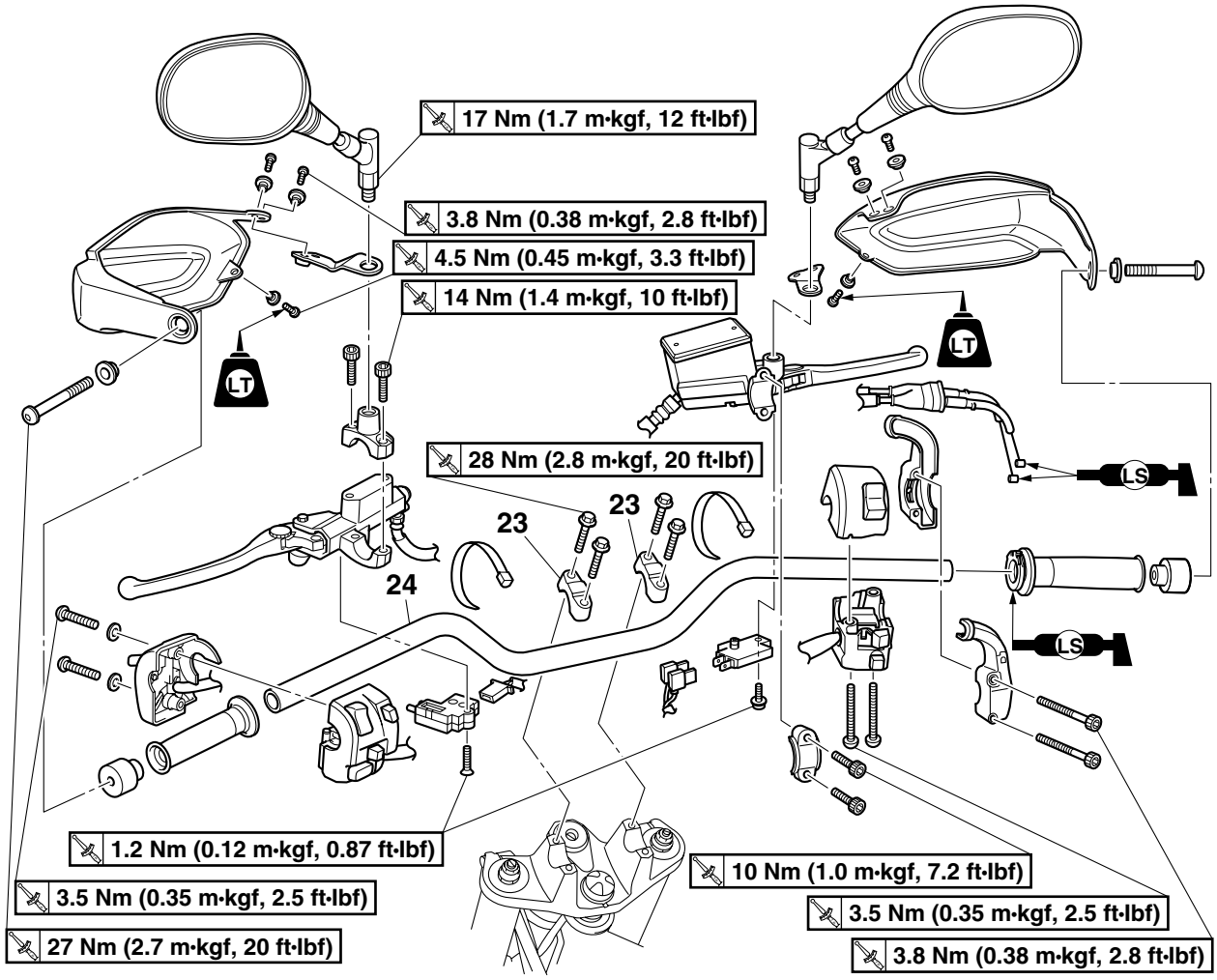
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake caliper piston	1	
2	Brake caliper piston dust seal	1	
3	Brake caliper piston seal	1	
4	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Hydraulic unit brake pipe joint	1	
2	Hydraulic unit brake pipe	4	
3	Hydraulic unit assembly	1	
4	Rear fender	1	
			For installation, reverse the removal procedure.

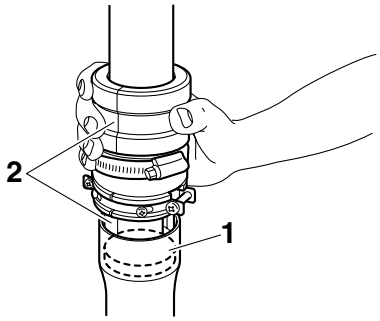
Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
23	Upper handlebar holder	2	
24	Handlebar	1	
			For installation, reverse the removal procedure.

5. Install:
   • Oil seal “1”
   (with the fork seal driver “2”)

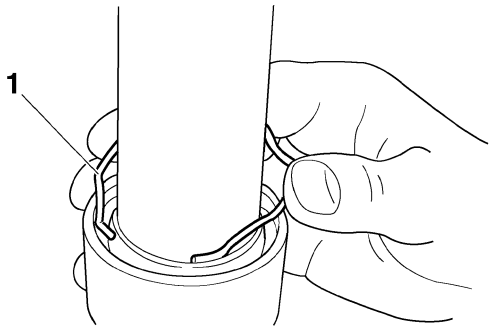
	**Fork seal driver** **90890-01442** **Adjustable fork seal driver (36–46 mm)** **YM-01442**



6. Install:
   • Oil seal clip “1”

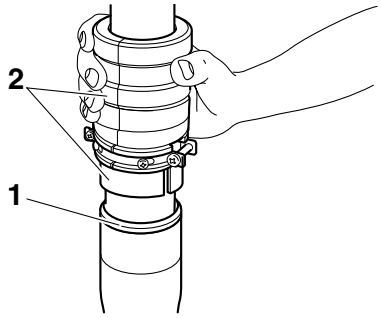
TIP

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



7. Install:
   • Dust seal “1”
   (with the fork seal driver “2”)

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

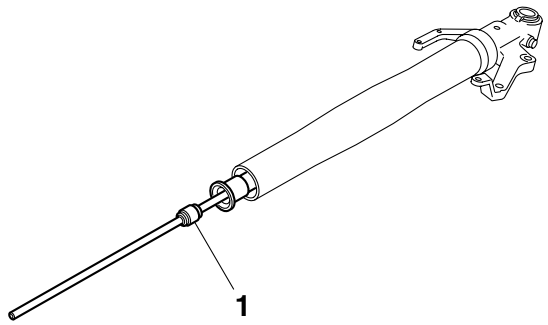


8. Install:
   • Damper rod assembly “1”
   • Inner tube

ECA23P1063

NOTICE

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



9. Tighten:
   • Damper rod assembly bolt “1”

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

TIP

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

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

EAS23180
HANDLING THE REAR SHOCK ABSORBER

EWA13740
⚠ WARNING

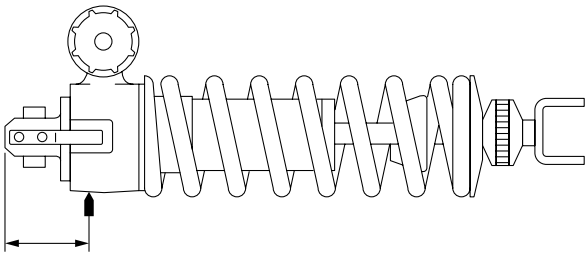
This rear shock absorber contains highly compressed nitrogen gas. Before handling the rear shock absorber, read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear shock absorber.
- **Do not tamper or attempt to open the rear shock absorber.**
- **Do not subject the rear shock absorber to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.**
- **Do not deform or damage the rear shock absorber in any way. Rear shock absorber damage will result in poor damping performance.**

EAS23190
DISPOSING OF A REAR SHOCK ABSORBER

1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3 mm (0.08–0.12 in) hole through the rear shock absorber at a point 50–55 mm (1.97–2.17 in) from its end as shown.

EWA13760
⚠ WARNING

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



EAS23230
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

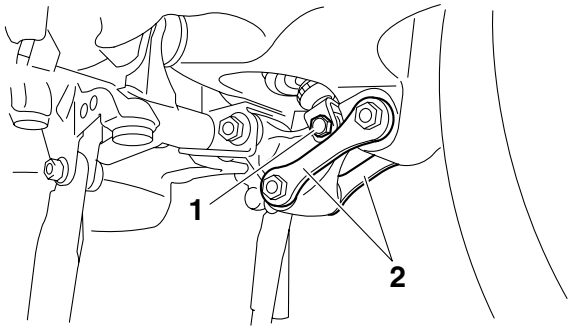
TIP

Place the vehicle on the centerstand so that the rear wheel is elevated.

2. Remove:
   - Rear shock absorber assembly lower bolt “1”
   - Connecting arms “2”

TIP

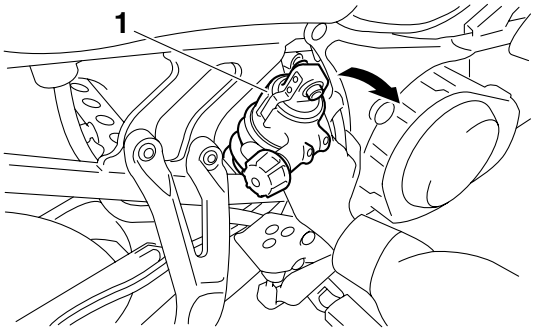
While removing the connecting arm bolts, hold the swingarm so that it does not drop down.



3. Remove:
   - Rear shock absorber assembly upper bolt
   - Rear shock absorber assembly “1”

TIP

Remove the rear shock absorber assembly from between the main frame and sub frame.



EAS23240
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:
   - Rear shock absorber rod
     Bends/damage → Replace the rear shock absorber assembly.
   - Rear shock absorber
     Gas leaks/oil leaks → Replace the rear shock absorber assembly.
   - Spring
     Damage/wear → Replace the rear shock absorber assembly.
   - Bushings
     Damage/wear → Replace.

EAS23560
TROUBLESHOOTING

Symptom	Possible cause
1. A pronounced hesitation or jerky movement during acceleration, deceleration or sustained speeds (not to be confused with engine surging or transmission-related movements) 2. A rolling “rumble” noticeable at low speeds, a high-pitched whine or a “clunk” from a shaft drive component, or from the vicinity of the shaft drive 3. The shaft drive is locked up or no power is transmitted from the engine to the rear wheel.	A. Bearing damage B. Improper gear backlash C. Damaged gear teeth D. Broken drive shaft E. Broken gear teeth F. Seizure due to lack of lubrication G. Small foreign objects lodged between moving parts

TIP

Causes A, B, and C may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from normal operating noises. If there is reason to believe that these components are damaged, remove them and check them individually.

Inspection notes

1. Investigate any unusual noises.

▼▼

The following noises may indicate a mechanical defect:

a. A rolling “rumble” during coasting, acceleration or deceleration (increases with the rear wheel speed, but does not increase with higher engine or transmission speeds)
   Wheel bearing damage
b. A whining noise that varies with acceleration and deceleration
   Incorrect reassembly or too little gear backlash

EWA13780

⚠ WARNING

Insufficient gear backlash is extremely destructive to the gear teeth. If a test ride, following reassembly, indicates these symptoms, stop riding immediately to minimize gear damage.

c. A slight “clunk” evident at low speed operation (not to be confused with normal vehicle operation)
   Broken gear teeth

EWA13790

⚠ WARNING

Stop riding immediately if broken gear teeth are suspected. This condition could result in the shaft drive assembly locking up, causing a loss of control and possible injury to the rider.

▲▲

Troubleshooting chart

When causes (A) or (B) shown in the table at the beginning of the “TROUBLESHOOTING” section exist, check the following points.

1. Place the vehicle on a suitable stand so that the front wheel is elevated and then spin the front wheel. Is the wheel bearing damaged?

YES →
- Replace the wheel bearing.
- Refer to “FRONT WHEEL” on page 4-20.

NO ↓

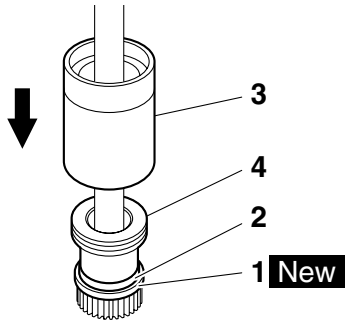
Recommended lubricant
Molybdenum disulfide grease

2. Lubricate:
   • Drive shaft spline (universal joint side)

Recommended lubricant
Lithium-soap-based grease

3. Install:
   • Oil seal “1” New
   • Washer “2”
   (to the drive shaft with the fork seal driver weight “3” and fork seal driver attachment (ø 30) “4”)

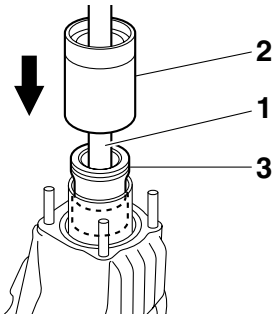
Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø30)
90890-01400

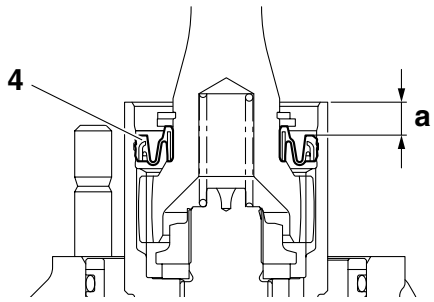


4. Install:
   • Circlips New
5. Install:
   • Drive shaft assembly “1”
   (to the final gear case with the fork seal driver weight “2” and fork seal driver attachment (ø38) “3”)

Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø38)
90890-01372
Replacement 38 mm
YM-A5142-1

Installed depth “a”
8.5–10.0 mm (0.33–0.39 in)





4. Oil seal

6. Install:
   • Final drive assembly

TIP

Align the drive shaft splines with the driven yoke of the universal joint.

7. Tighten:
   • Final drive assembly nuts

Final drive assembly nut
42 Nm (4.2 m·kgf, 30 ft·lbf)

8. Install:
   • Rear wheel
   Refer to “REAR WHEEL” on page 4-29.
9. Fill:
   • Final gear case
   Refer to “CHECKING THE FINAL GEAR OIL LEVEL” on page 3-29.

CLICK HERE TO DOWNLOAD THE COMPLETE MANUAL

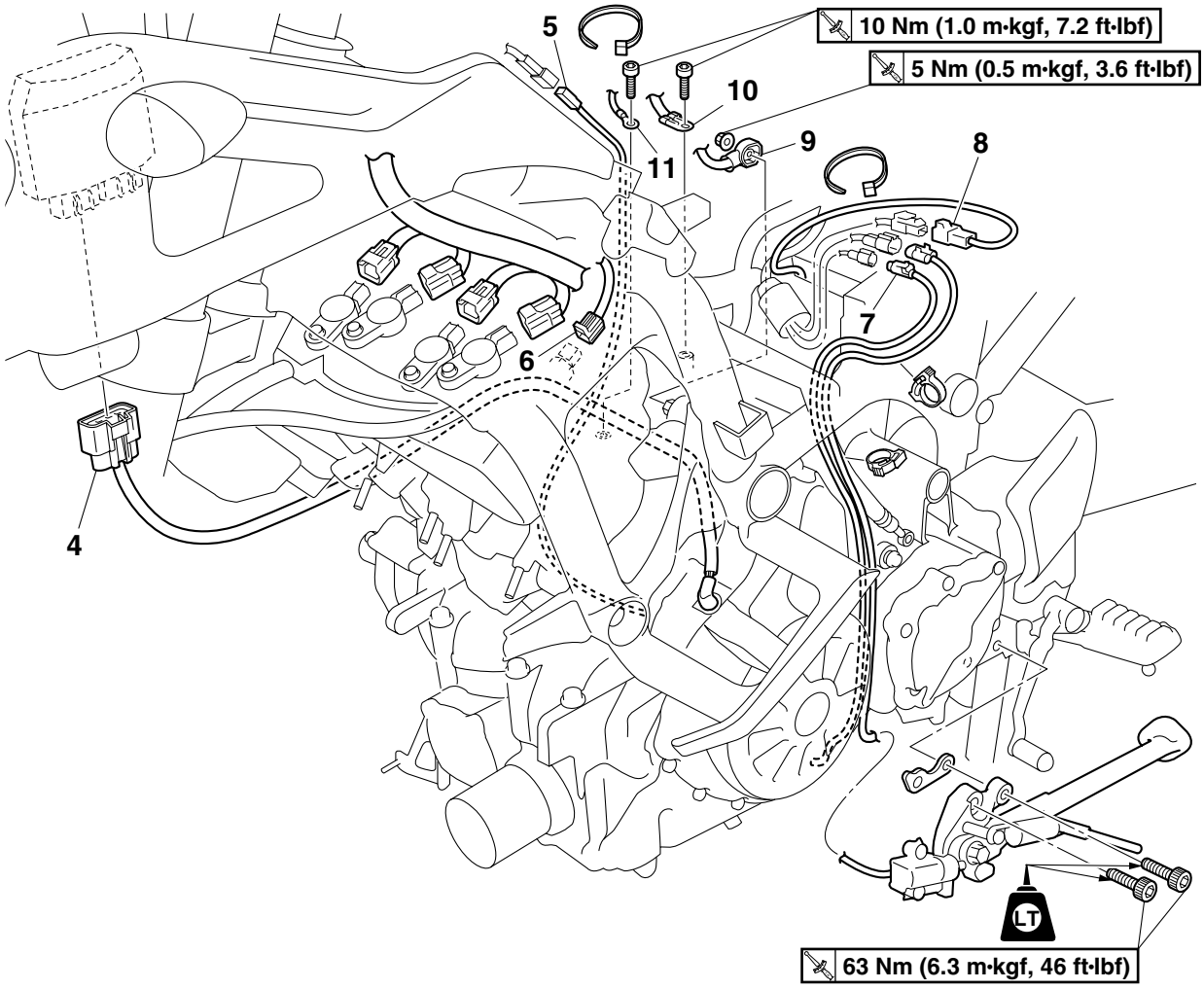
- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

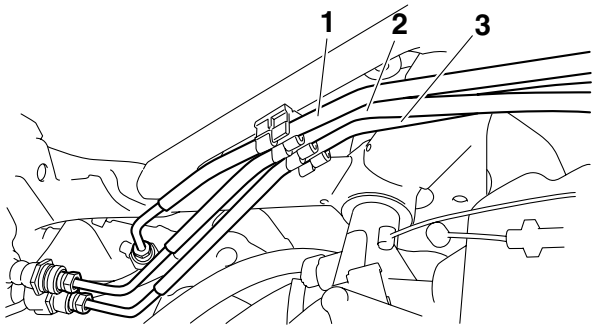
CLICK HERE TO DOWNLOAD THE COMPLETE MANUAL

Disconnecting the leads



Order	Job/Parts to remove	Q'ty	Remarks
4	Stator coil coupler	1	Disconnect.
5	Crankshaft position sensor coupler	1	Disconnect.
6	Coolant temperature sensor coupler	1	Disconnect.
7	Oil level switch coupler	1	Disconnect.
8	Neutral switch coupler	1	Disconnect.
9	Starter motor lead	1	Disconnect.
10	Engine ground lead	1	Disconnect.
11	Negative battery lead	1	Disconnect.
			For installation, reverse the removal procedure.

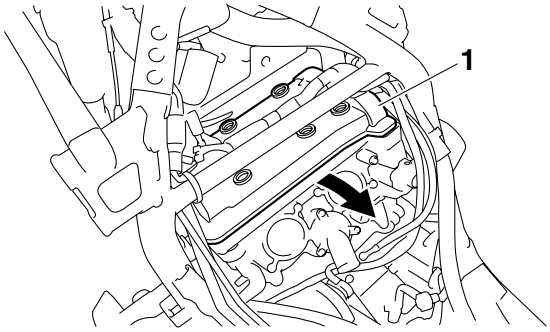
• Brake pipe (hydraulic unit to left front brake caliper) “3”



9. Remove:
   • Cylinder head cover “1”
   • Cylinder head cover gasket

TIP

Lift up the wire harness, brake pipes, clutch pipe, and clutch hose, and then pull the cylinder head cover rearward to remove it.



EAS23810

REMOVING THE CAMSHAFTS

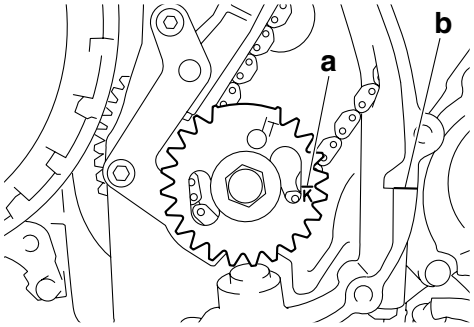
1. Align:
   • “K” mark “a” on the pickup rotor (with the crankcase mating surface “b”)

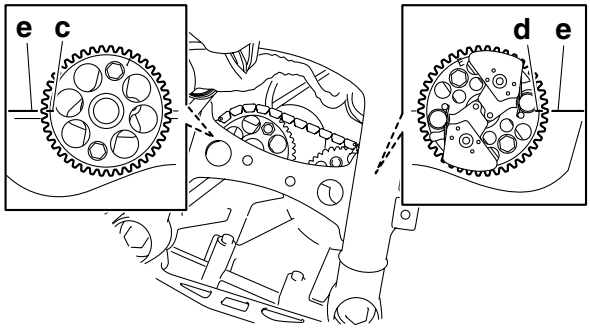
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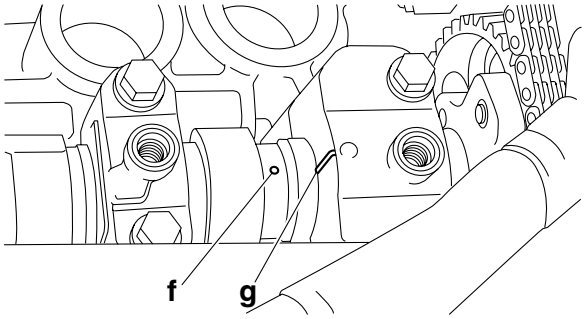
a. Turn the crankshaft clockwise.
b. Align the “K” mark “a” with the crankcase mating surface “b”.

TIP

When the “K” mark “a” is aligned with the crankcase mating surface “b”, check that the match mark “c” on the intake camshaft sprocket and match mark “d” on the exhaust camshaft sprocket are aligned with the cylinder head surface “e”. Also, check that the hole “f” in the intake camshaft is aligned with the match mark “g” on the intake camshaft cap. If the match marks or hole are not aligned, turn the crankshaft clockwise 360 degrees.

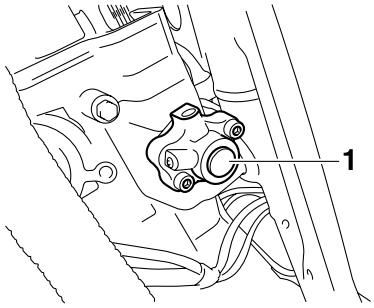






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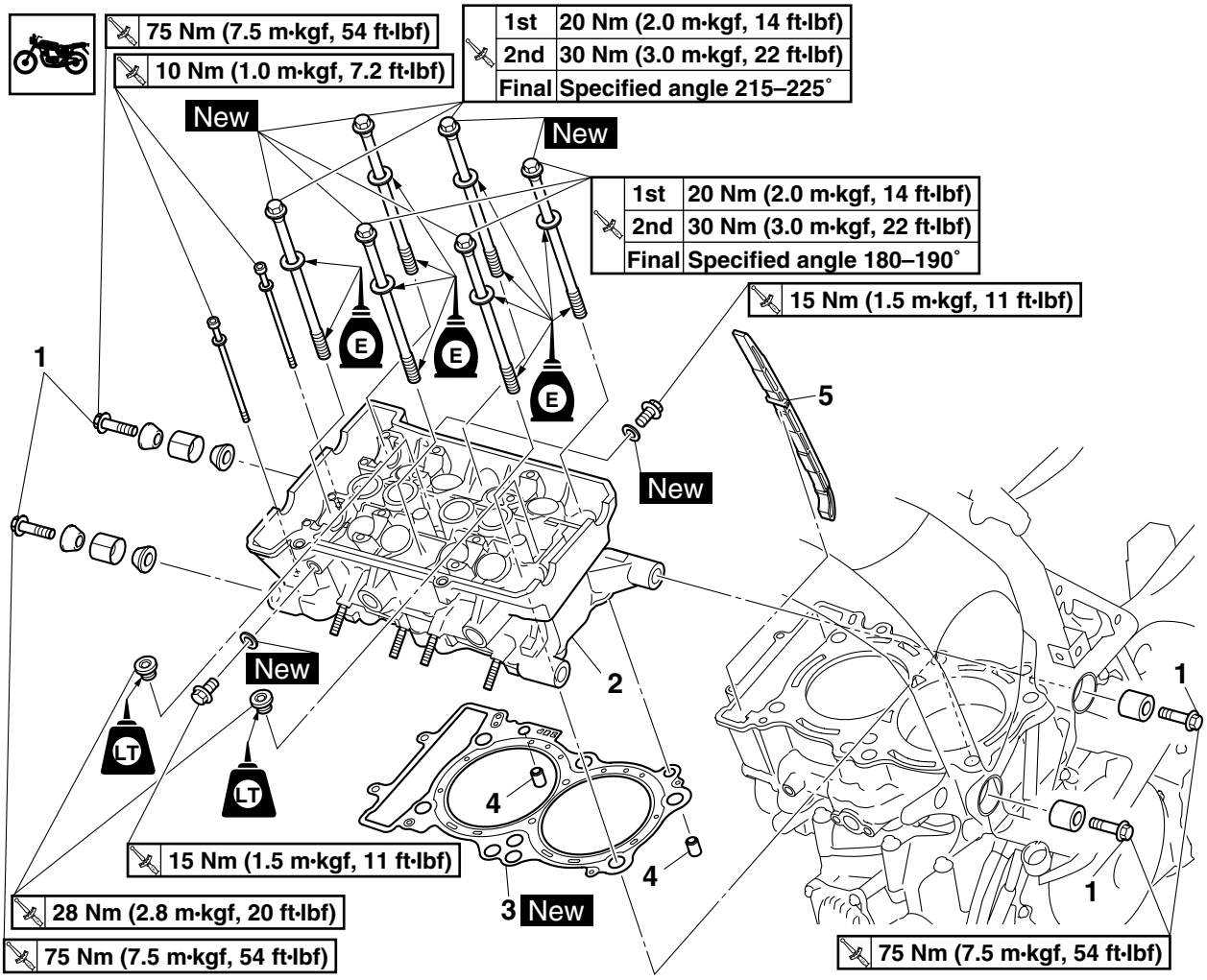
2. Remove:
   • Timing chain tensioner “1”
   • Timing chain tensioner gasket



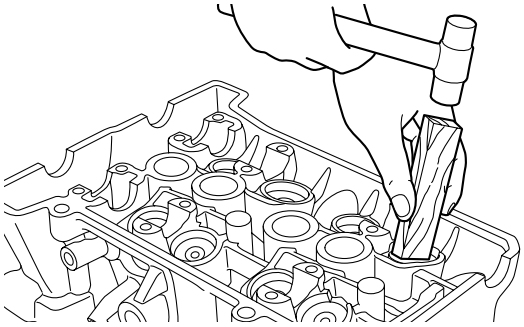
3. Remove:
   • Camshaft caps

EAS24100
CYLINDER HEAD

Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
			TIP Place a suitable stand under the engine.
	Exhaust pipe/Muffler		Refer to "ENGINE REMOVAL" on page 5-3.
	Intake camshaft/Exhaust camshaft		Refer to "CAMSHAFTS" on page 5-11.
	Thermostat/Coolant temperature sensor		Refer to "THERMOSTAT" on page 6-4.
1	Engine mounting bolt (front side)	4	
2	Cylinder head	1	
3	Cylinder head gasket	1	
4	Dowel pin	2	
5	Timing chain guide (exhaust side)	1	
			For installation, reverse the removal procedure.



6. Lubricate:
   • Valve pad
   (with the recommended lubricant)

	Recommended lubricant **Molybdenum disulfide oil**

   • Valve lifter
   (with the recommended lubricant)

	Recommended lubricant **Engine oil**

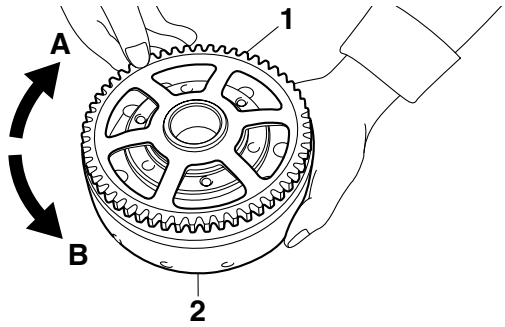
7. Install:
   • Valve pad
   • Valve lifter

TIP

- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in their original position.

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a. Install the starter clutch gear "1" onto the generator rotor "2" and hold the generator rotor.
b. When turning the starter clutch gear clockwise "A", the starter clutch and the starter clutch gear should engage, otherwise the starter clutch is faulty and must be replaced.
c. When turning the starter clutch gear counterclockwise "B", it should turn freely, otherwise the starter clutch is faulty and must be replaced.



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EAS3D81022
CHECKING THE TORQUE LIMITER

1. Check:
   • Torque limiter
   Damage/wear → Replace.

TIP

Do not disassemble the torque limiter.

EAS24600
INSTALLING THE STARTER CLUTCH

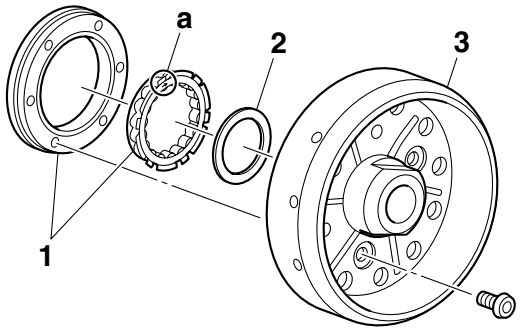
1. Install:
   • Starter clutch "1"
   • Washer "2"

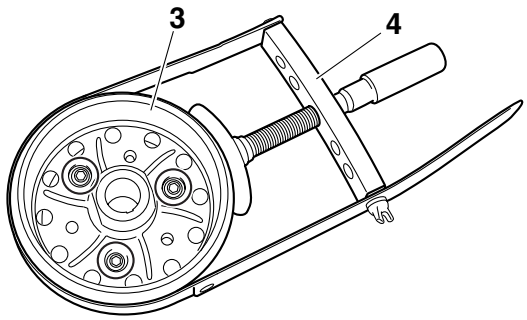
	Starter clutch bolt **32 Nm (3.2 m·kgf, 23 ft·lbf)** **LOCTITE®**

TIP

- Install the starter clutch so that the side of the starter clutch roller assembly with the arrow mark "a" is toward the generator rotor "3".
- While holding the generator rotor with the sheave holder "4", tighten the starter clutch bolts.

	Sheave holder **90890-01701** **Primary clutch holder** **YS-01880-A**





EAS24500
INSTALLING THE GENERATOR

1. Install:
   • Woodruff key
   • Generator rotor
   • Washer
   • Generator rotor bolt

TIP

- Clean the tapered portion of the crankshaft and the generator rotor hub.
- When installing the generator rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft.
- Lubricate the generator rotor bolt threads and washer mating surfaces with engine oil.

2. Tighten:
   • Generator rotor bolt "1"

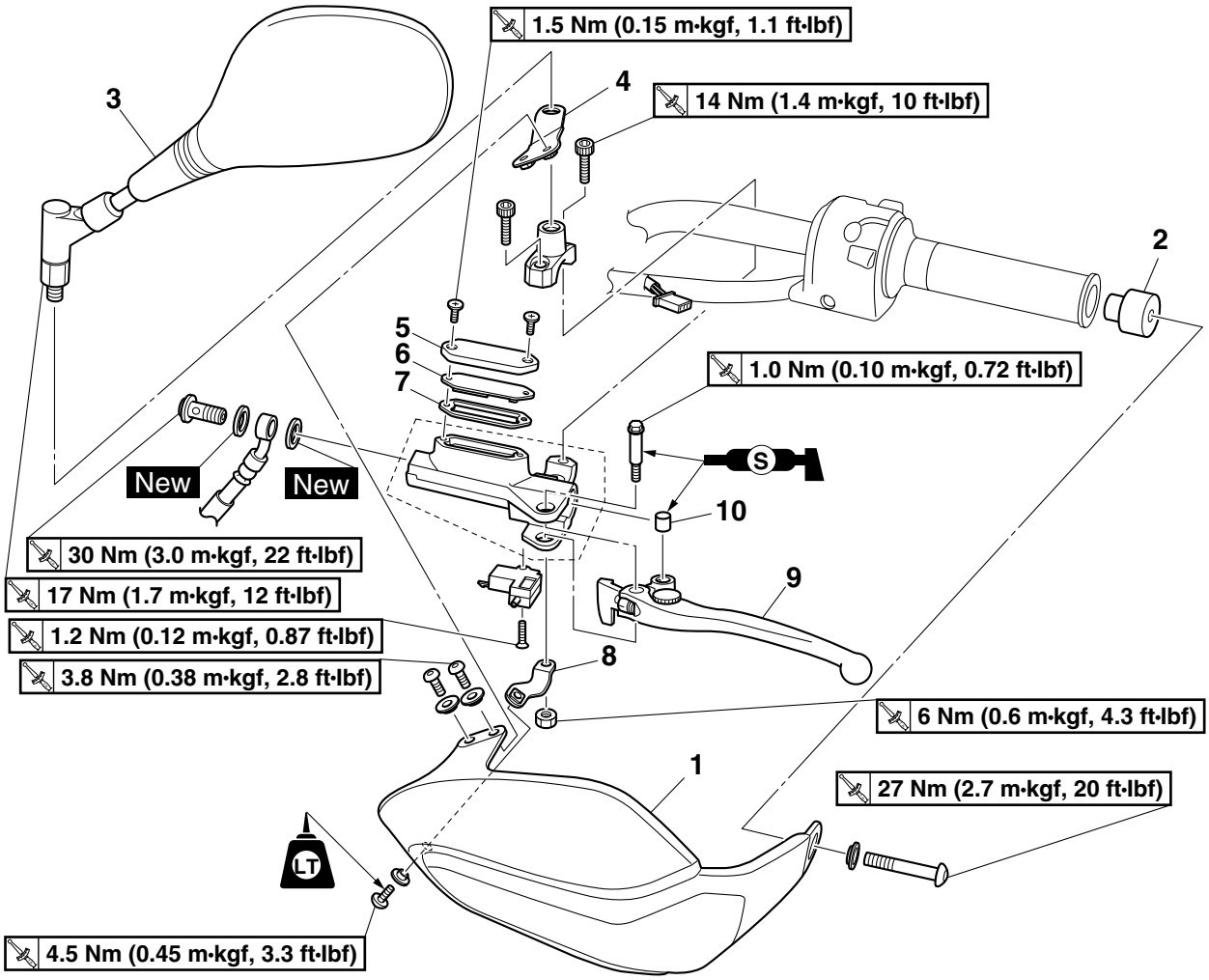
	Generator rotor bolt **130 Nm (13 m·kgf, 94 ft·lbf)**

TIP

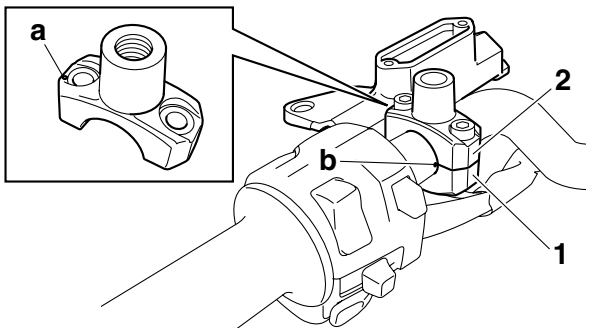
While holding the generator rotor "2" with the sheave holder "3", tighten the generator rotor bolt.

	Sheave holder **90890-01701** **Primary clutch holder** **YS-01880-A**

Removing the clutch master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch fluid		Drain. Refer to "BLEEDING THE HYDRAULIC CLUTCH SYSTEM" on page 3-13.
1	Hand shield	1	
2	Grip end	1	
3	Rearview mirror	1	
4	Upper hand shield bracket	1	
5	Clutch master cylinder reservoir cap	1	
6	Clutch master cylinder reservoir diaphragm holder	1	
7	Clutch master cylinder reservoir diaphragm	1	
8	Lower hand shield bracket	1	
9	Clutch lever	1	
10	Bushing	1	



2. Install:
   - Clutch hose gaskets "1" New
   - Clutch hose "2"
   - Clutch hose union bolt "3"

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

EWA23P1014
WARNING

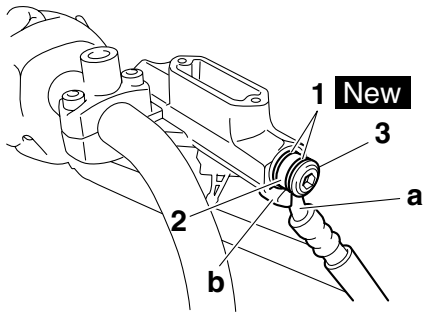
Proper clutch hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-43.

ECA23P1041
NOTICE

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

TIP

Turn the handlebars to the left and to the right to make sure the clutch hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.



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

Recommended fluid
DOT 4

EWA13370
WARNING

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

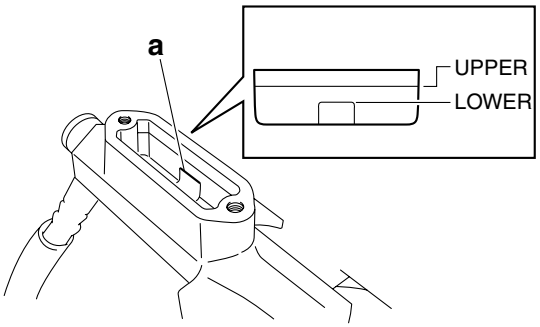
ECA13420
NOTICE

Clutch fluid may damage painted surfaces or plastic parts. Therefore, always clean up any spilt clutch fluid immediately.

TIP

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

4. Bleed:
   - Clutch system
     Refer to "BLEEDING THE HYDRAULIC CLUTCH SYSTEM" on page 3-13.
5. Check:
   - Clutch fluid level
     Below the minimum level mark "a" → Add the recommended clutch fluid to the proper level. Refer to "CHECKING THE CLUTCH FLUID LEVEL" on page 3-13.

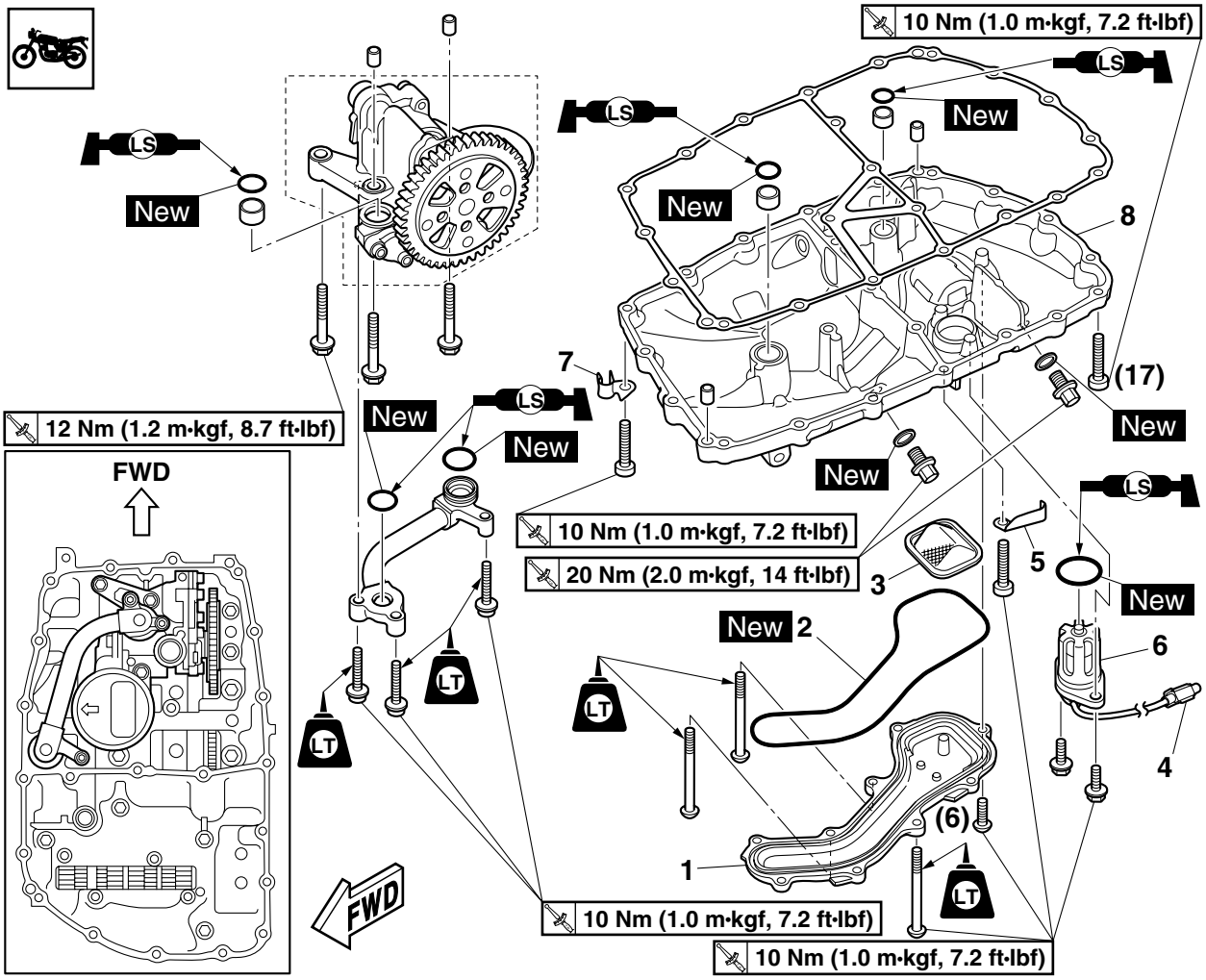


EAS23P1097
REMOVING THE CLUTCH RELEASE CYLINDER

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

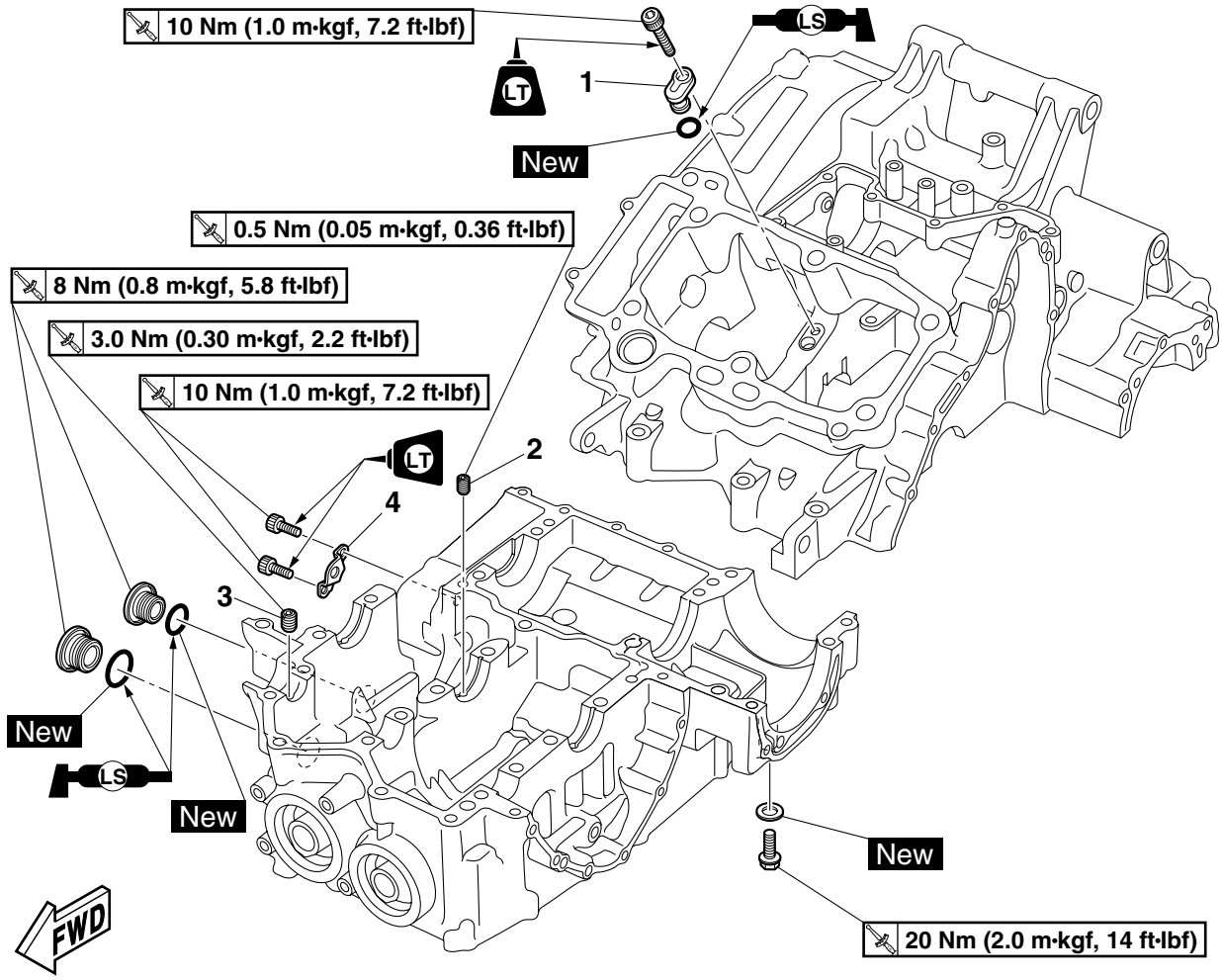
EAS24921
OIL PUMP

Removing the oil pan and oil pump assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-25.
	Engine guard		Refer to "GENERAL CHASSIS" on page 4-1.
1	Oil strainer cover	1	
2	Oil strainer cover gasket	1	
3	Oil strainer (oil pan)	1	
4	Oil level switch coupler	1	Disconnect.
5	Oil level switch lead holder	1	
6	Oil level switch	1	
7	Water pump breather hose holder	1	
8	Oil pan	1	

Removing the oil nozzle

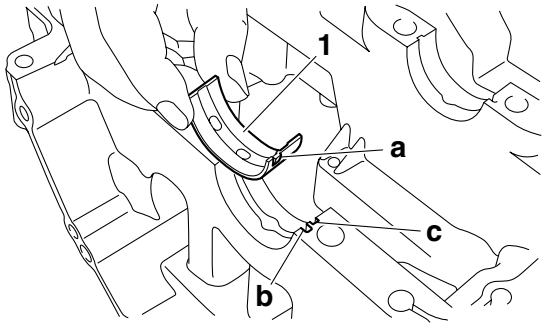


Order	Job/Parts to remove	Q'ty	Remarks
	Rear balancer		Refer to "Removing the rear balancer".
	Crankshaft/Front balancer		Refer to "CRANKSHAFT AND BALANCER" on page 5-93.
	Transmission		Refer to "TRANSMISSION" on page 5-103.
1	Oil nozzle 1	1	
2	Oil nozzle 2	1	
3	Oil nozzle 3	1	
4	Oil plug holder	1	
			For installation, reverse the removal procedure.

b. Install the crankshaft journal lower bearings "1" and the crankshaft into the lower crankcase.

TIP

Align the projections "a" on the crankshaft journal lower bearings with the notches "b" in the lower crankcase.

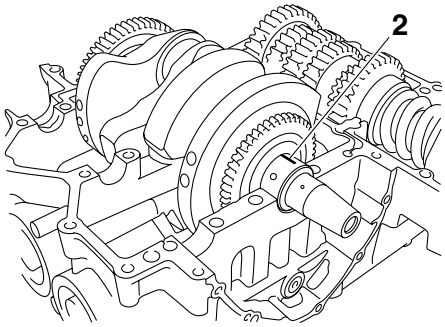


c. Oil groove

c. Put a piece of Plastigauge® "2" on each crankshaft journal.

TIP

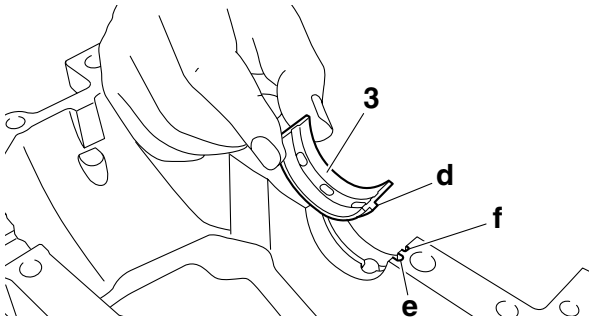
Do not put the Plastigauge® over the oil hole in the crankshaft journal.



d. Install the crankshaft journal upper bearings "3" into the upper crankcase and assemble the crankcase halves.

TIP

- Align the projections "d" of the crankshaft journal upper bearings with the notches "e" in the upper crankcase.
- Do not move the crankshaft until the clearance measurement has been completed.

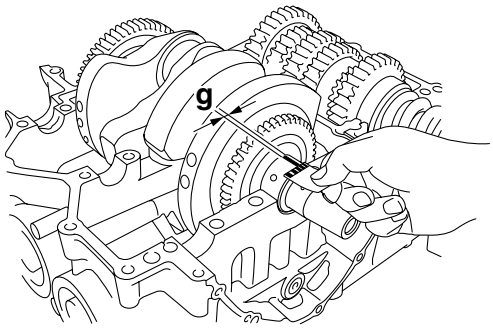


f. Oil groove

e. Tighten the bolts to specification in the tightening sequence cast on the crankcase.
Refer to "CRANKCASE" on page 5-82.

f. Remove the upper crankcase and the crankshaft journal upper bearings.

g. Measure the compressed Plastigauge® width "g" on each crankshaft journal.
If the crankshaft-journal-to-crankshaft-journal-bearing clearance is out of specification, select replacement crankshaft journal bearings.



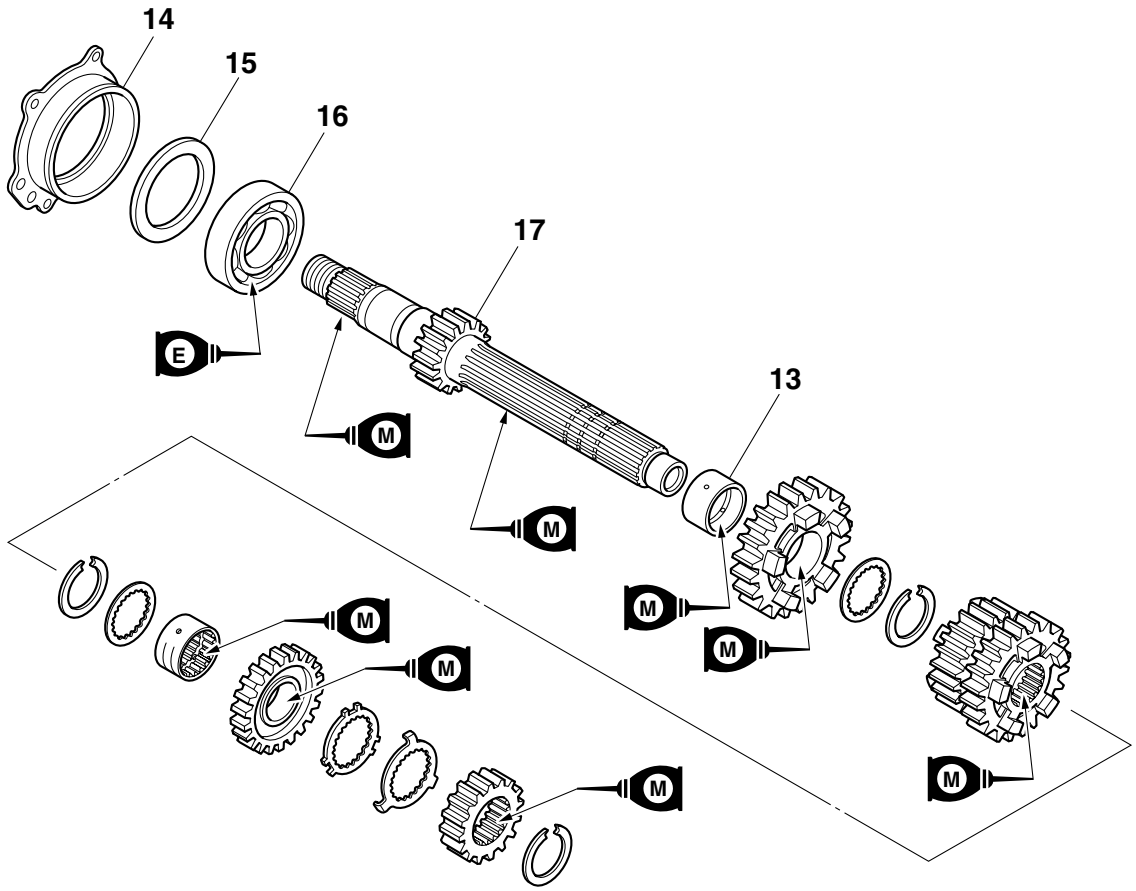
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4. Select:
   - Crankshaft journal bearings (J_1–J_3)

TIP

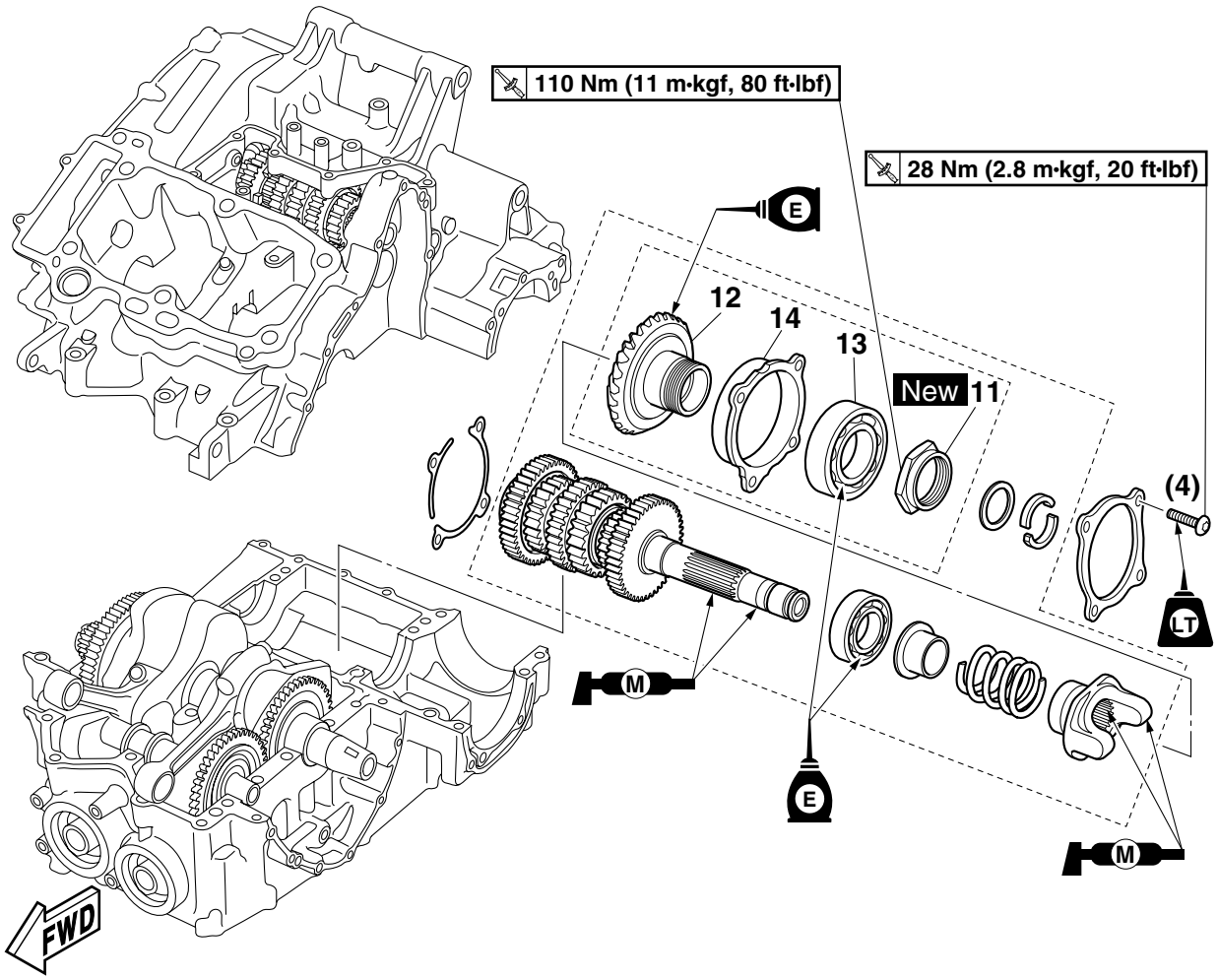
- The numbers "A" stamped into the lower crankcase and the numbers "B" stamped into the crankshaft web are used to determine the replacement crankshaft journal bearing sizes.
- J_1–J_3 refer to the bearings shown in the lower crankcase and crankshaft web illustration.
- If J_1–J_3 are the same, use the same size for all of the bearings.

Disassembling the main axle



Order	Job/Parts to remove	Q'ty	Remarks
13	Collar	1	
14	Bearing housing	1	
15	Spacer	1	
16	Bearing	1	
17	Main axle/1st pinion gear	1	
			For assembly, reverse the disassembly procedure.

Removing the middle drive pinion gear



Order	Job/Parts to remove	Q'ty	Remarks
11	Middle drive pinion gear nut	1	
12	Middle drive pinion gear	1	
13	Bearing	1	
14	Middle drive pinion gear bearing housing	1	
			For installation, reverse the removal procedure.

COOLING SYSTEM

RADIATOR 6-1
CHECKING THE RADIATOR 6-3
INSTALLING THE RADIATOR 6-3

THERMOSTAT 6-4
CHECKING THE THERMOSTAT 6-5
INSTALLING THE THERMOSTAT 6-5

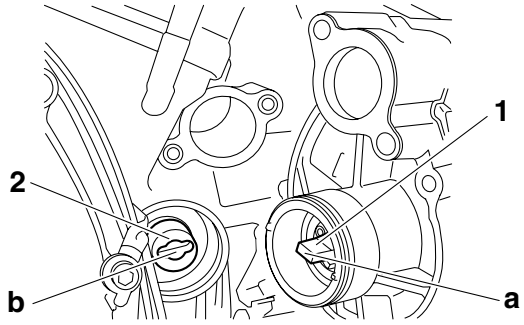
WATER PUMP 6-6
DISASSEMBLING THE WATER PUMP 6-8
CHECKING THE WATER PUMP 6-8
ASSEMBLING THE WATER PUMP 6-8
INSTALLING THE WATER PUMP 6-10

EAS26590
INSTALLING THE WATER PUMP

1. Install:
   • Water pump assembly

TIP

Align the projection “a” on the impeller shaft “1” with the slot “b” in the front balancer shaft “2”.



2. Fill:
   • Cooling system
   (with the specified amount of the recommended coolant)
   Refer to “CHANGING THE COOLANT” on page 3-28.
3. Check:
   • Cooling system
   Leaks → Repair or replace the faulty part.
4. Measure:
   • Radiator cap opening pressure
   Below the specified pressure → Replace the radiator cap.
   Refer to “CHECKING THE RADIATOR” on page 6-3.

EAS23P1077
CHECKING THE INJECTORS (BEFORE REMOVING)

1. Check:
   • Injectors
   Use the diagnostic code number “d:36–d:37”.
   Refer to “DIAGNOSTIC MODE” on page 8-34.

EAS23P1078
REMOVING THE INJECTORS

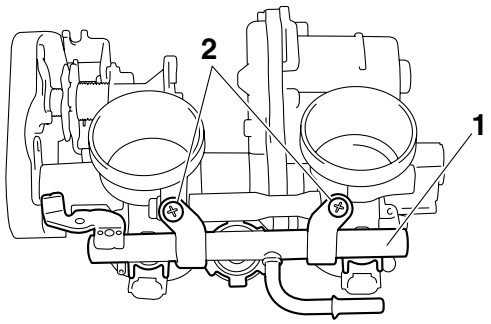
EWA23P1029
⚠ WARNING

- **Check the injectors in a well-ventilated area free of combustible materials. Make sure that there is no smoking or use of electric tools in the vicinity of the injectors.**
- **Be careful when disconnecting the fuel hose. Any remaining pressure in the fuel hose may cause the fuel to spray out. Place a container or rag under the hose to catch any fuel that spills. Always clean up any spilt fuel immediately.**
- **Turn the main switch to “OFF” and disconnect the negative battery lead from the battery terminal before removing the injectors.**

1. Remove:
   • Fuel rail “1”

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the fuel rail screws “2” as shown.



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EAS23P1079
CHECKING THE INJECTORS

1. Check:
   • Injectors
   Obstruction → Replace and check the fuel pump/fuel supply system.
   Deposit → Replace.
   Damage → Replace.
2. Check:
   • Injector resistance
   Refer to “CHECKING THE FUEL INJECTORS” on page 8-155.

EAS23P1080
CHECKING AND CLEANING THE THROTTLE BODIES

TIP

Clean the throttle bodies only if they cannot be synchronized using the bypass air screws. Before cleaning the throttle bodies, check the following items:
- Valve clearance
- Spark plugs
- Air filter element
- Throttle body joints
- Fuel hose
- Exhaust system
- Cylinder head breather hose

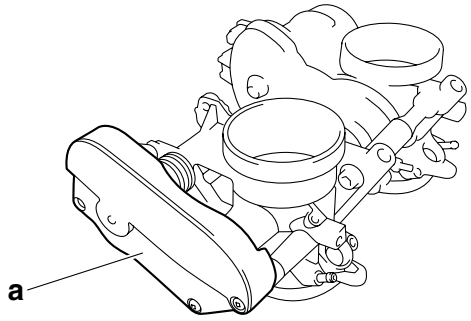
EWA23P1030
⚠ WARNING

If the throttle bodies are subjected to strong shocks or dropped during cleaning, replace them as a set.

1. Check:
   • Throttle bodies
   Cracks/damage → Replace the throttle bodies.

TIP

If the protector “a” is scratched or damaged, replace the throttle bodies.



2. Clean:
   • Throttle bodies

ECA23P1066
NOTICE

- **Observe the following precautions; otherwise, the throttle bodies may not operate properly.**
- **Do not open the throttle valves quickly.**
- **Do not subject the throttle bodies to excessive force.**
- **Wash the throttle bodies in a petroleum-based solvent.**
- **Do not use any caustic carburetor cleaning solution.**

3. Main fuse
4. Battery
5. Engine ground
9. Main switch
18. Ignition fuse
21. Relay unit
24. Neutral switch
25. Sidestand switch
28. Crankshaft position sensor
34. Lean angle sensor
39. ECU (engine control unit)
40. Cylinder-#1 left ignition coil
41. Cylinder-#1 right ignition coil
42. Cylinder-#2 left ignition coil
43. Cylinder-#2 right ignition coil
44. Spark plug
54. Frame ground
99. Engine stop switch

3. Main fuse
4. Battery
5. Engine ground
9. Main switch
17. ABS ECU fuse
18. Ignition fuse
21. Relay unit
24. Neutral switch
27. Fuel sender
32. Coolant temperature sensor
39. ECU (engine control unit)
49. Rear wheel sensor
51. Rear wheel sensor lead shield
52. ABS ECU (electronic control unit)
54. Frame ground
57. Oil level warning light
58. Neutral indicator light
60. Multi-function meter
62. Coolant temperature warning light
64. Left turn signal indicator light
65. Right turn signal indicator light
69. Turn signal/hazard relay
75. Horn switch
76. Hazard switch
77. Turn signal switch
78. Horn
79. Oil level switch
80. Front right turn signal light
81. Front left turn signal light
82. Rear right turn signal light
83. Rear left turn signal light
88. Rear brake light switch
89. Tail/brake light
92. Signaling system fuse
93. Taillight fuse
98. Front brake light switch

3. Main fuse
4. Battery
5. Engine ground
7. Starter relay
9. Main switch
10. Fuel injection system fuse
11. Electric throttle valve fuse
13. Headlight fuse
17. ABS ECU fuse
18. Ignition fuse
21. Relay unit
22. Starting circuit cut-off relay
23. Fuel pump relay
24. Neutral switch
25. Sidestand switch
26. Fuel pump
28. Crankshaft position sensor
29. Intake air pressure sensor
30. O_2 sensor #1
31. O_2 sensor #2
32. Coolant temperature sensor
33. Intake air temperature sensor
34. Lean angle sensor
35. Accelerator position sensor
36. Throttle position sensor
37. Accelerator position sensor lead shield
38. Throttle position sensor lead shield
39. ECU (engine control unit)
40. Cylinder-#1 left ignition coil
41. Cylinder-#1 right ignition coil
42. Cylinder-#2 left ignition coil
43. Cylinder-#2 right ignition coil
44. Spark plug
45. Injector #1
46. Injector #2
47. Throttle servo motor
48. Front wheel sensor
49. Rear wheel sensor
50. Front wheel sensor lead shield
51. Rear wheel sensor lead shield
52. ABS ECU (electronic control unit)
54. Frame ground
60. Multi-function meter
61. Engine trouble warning light
66. Traction control system indicator light
70. Headlight relay
72. Clutch switch
91. Radiator fan motor relay
99. Engine stop switch
100. Start switch

Fault code No.		19	
Item		Sidestand switch: a break or disconnection of the black/red lead of the ECU is detected.	
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or repair/replace the wire harness.	Set the main switch to "ON", and then extend and retract the sidestand. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 3.
3	Connection of main switch coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or repair/replace the wire harness.	Set the main switch to "ON", and then extend and retract the sidestand. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 4.
4	Wire harness continuity.	Open or short circuit → Replace the wire harness. A break or disconnection of the black/red lead of the ECU is detected.	Set the main switch to "ON", and then extend and retract the sidestand. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 5.
5	Defective sidestand switch.	Execute the diagnostic mode. (Code No.d:20) Shift the transmission into gear. Stand retracted: on Stand extended: oFF Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-137.	Set the main switch to "ON", and then extend and retract the sidestand. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 6.
6	Malfunction in ECU.	Replace the ECU.	

Fault code No.		21	
Item		Coolant temperature sensor: open or short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		d:06	
Meter display		Displays the coolant temperature.	
Procedure		Compare the actually measured coolant temperature with the meter display value.	
Item	**Probable cause of malfunction and check**	**Maintenance job**	**Confirmation of service completion**

Fault code No.	39		
Item	Injector: open or short circuit detected.		
Item	**Probable cause of malfunction and check**	**Maintenance job**	**Confirmation of service completion**
1	Identify the malfunctioning injector	Execute the diagnostic mode (Code No. d:36, 37). Identify the injector that does not produce an operating sound. Perform the following procedures for the defective injector. Refer to “CHECKING THE FUEL INJECTORS” on page 8-155.	—
2	Connection of injector #1 and/or injector #2 coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or repair/replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 3.
3	Defective injector #1 and/or injector #2.	Measure the injector resistance. If the resistance is not 12 Ω, replace the injector.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 4.
4	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or repair/replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 5.
5	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between injector coupler and ECU coupler. Injector #1 red/black–red/black red/blue–red/blue Injector #2 green/black–green/black red/blue–red/blue	Start the engine and let it idle for approximately 5 seconds. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 6.
6	Malfunction in ECU.	Replace the ECU.	

Fault code No.		46	
Item		Charging voltage is abnormal.	
Meter display		—	
Procedure		—	
Item	**Probable cause of malfunction and check**	**Maintenance job**	**Confirmation of service completion**
1	Malfunction in charging system.	Check the charging system. Refer to “CHARGING SYSTEM” on page 8-13. Defective rectifier/regulator or AC magneto → Replace. Defective connection in the charging system circuit → Properly connect or repair the charging system wiring.	Start the engine and let it idle for approximately 5 seconds. Fault code number is not displayed → Service is finished. Fault code number is displayed → Repeat the procedure in item 1.

Fault code No.		50	
Item		Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	
Fail-safe system		Able/Unable to start engine	
		Able/Unable to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	**Probable cause of malfunction and check**	**Maintenance job**	**Confirmation of service completion**
1	Malfunction in ECU.	Replace the ECU. **TIP** Do not perform this procedure with the main switch turned to “ON”.	Set the main switch to “ON”. Check that the fault code number is not displayed.

Fault code No.		59
Item		Accelerator position sensor: open or short circuit detected.
Fail-safe system		Able/Unable to start engine
		Able/Unable to drive vehicle
Diagnostic code No.		d:14, d:15
d:14	Meter display	Accelerator position sensor signal 1 • 12–22 (fully closed position) • 97–113 (fully open position)
	Procedure	• Check with throttle grip in fully closed position. • Check with throttle grip in fully open position.

Fault code No.		Er-3	
Item		ECU internal malfunction (output signal error): data from the ECU cannot be received correctly.	
1	Connection of multi-function meter coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or repair/replace the wire harness.	Set the main switch to “ON”. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 2.
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or repair/replace the wire harness.	Set the main switch to “ON”. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness. yellow/blue–yellow/blue	Set the main switch to “ON”. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 4.
4	Abnormal meter unit operation	Replace the meter assembly.	Set the main switch to “ON”. Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 5.
5	Malfunction in ECU.	Replace the ECU.	

Fault code No.		Er-4	
Item		ECU internal malfunction (input signal error): non-registered data has been received from the meter.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Meter display		—	
Procedure		—	
Item	**Probable cause of malfunction and check**	**Maintenance job**	**Confirmation of service completion**

	Parts to be replaced					Key registration requirement
	Main switch/immobilizer unit		Standard key	ECU	Accessory lock* and key	
	Main switch	Immobilizer unit				
Standard key is lost			√			New standard key
All keys have been lost (including code re-registering key)	√		√	√	√	Code re-registering key and standard keys
ECU is defective				√		Code re-registering key and standard keys
Immobilizer unit is defective		√				Code re-registering key and standard keys
Main switch is defective	√		√	√	√	Code re-registering key and standard keys
Accessory lock* is defective					√	Not required

* Accessory locks mean the seat lock and fuel tank cap.

Code re-registering key registration:
When the immobilizer unit or ECU is replaced, the code re-registering key must be registered to the unit.
To register a code re-registering key:
1. Turn the main switch to “ON” with the code re-registering key.

TIP

Check that the immobilizer system indicator light comes on for one second, then goes off. When the immobilizer system indicator light goes off, the code re-registering key has been registered.

2. Check that the engine can be started.
3. Register the standard key, following the instructions in the section below.

Standby mode:
To enable the immobilizer system, turn the ignition key to “OFF”. 30 seconds later, the indicator light will start flashing continuously in the standby flashing mode pattern for up to 24 hours. After that time, the indicator light will stop flashing, but the immobilizer system is still enabled.

Fault code No.	Symptom	Check point
16	Rear wheel sensor circuit is short-circuited.	• Rear wheel sensor circuit • Wire harness (ABS circuit) • Connection of the rear wheel sensor coupler and ABS ECU coupler • Rear wheel sensor
17	Missing pulses detected in the front wheel sensor signal.	• Front wheel sensor rotor • Front wheel sensor housing • Front wheel
18	Missing pulses detected in the rear wheel sensor signal.	• Rear wheel sensor rotor • Rear wheel sensor housing • Rear wheel
21	Hydraulic unit solenoid circuit is open or short-circuited.	• Hydraulic unit assembly
22	Start switch signal is not received properly (start switch circuit or start switch monitor circuit).	• Wire harness • Connection of the starter relay coupler, ABS ECU coupler, and right handlebar switch coupler.
31	Solenoid relay is defective. Power is not supplied to the solenoid relay.	• Battery voltage • Hydraulic unit assembly
33	ABS motor is defective. Power is not supplied to the ABS motor.	• Battery voltage • ABS motor fuse • Wire harness (ABS circuit) • Connection of the ABS ECU coupler and starter relay coupler • Hydraulic unit assembly
34	Hydraulic unit ABS motor is short-circuited.	• Hydraulic unit assembly
41	Front wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic pressure (when the battery voltage is normal).	• Brake dragging • Brake fluid • Hydraulic unit operation tests • Front wheel brake lines • Hydraulic unit assembly
42	Rear wheel will not recover from the locking tendency even though the signal is continuously transmitted from the ABS ECU to release the hydraulic pressure (when the battery voltage is normal).	• Brake dragging • Brake fluid • Hydraulic unit operation tests • Rear wheel brake lines • Hydraulic unit assembly
51	Power voltage is too high.	• Battery voltage • Refer to “CHARGING SYSTEM” on page 8-13.
53	Power voltage is too low.	• Battery voltage • Connection of the ABS ECU coupler • Wire harness • Refer to “CHARGING SYSTEM” on page 8-13.
56	ABS ECU has internal malfunction.	• Hydraulic unit assembly

Fault code No.	16	Symptom	Rear wheel sensor circuit is short-circuited.	
Order	**Item/components and probable cause**		**Check or maintenance job**	**Reinstatement confirmation method**
3	Defective wheel sensor.		If the above items were performed and no malfunctions were found, connect the ABS ECU coupler and rear wheel sensor coupler, and then delete the fault codes. If fault code No. 16 could not be deleted, the rear wheel sensor is defective. Replace the rear wheel sensor. **TIP** Before deleting the fault codes, record all of the fault codes and perform the related checks and maintenance.	

Fault code No.	17	Symptom	Missing pulses detected in the front wheel sensor signal.	
Order	**Item/components and probable cause**		**Check or maintenance job**	**Reinstatement confirmation method**
1	Installed condition of wheel bearings, axle, sensor housing, and sensor rotor.		Check the components for looseness, distortion, and bends. Refer to “CHECKING THE FRONT WHEEL” on page 4-23.	• Set the main switch to “ON” and check that the ABS warning light comes on for 2 seconds, then goes off. • Perform a trial run at a constant speed of 30 km/h and check that the ABS warning light does not come on.
2	Foreign material inside sensor housing.		Check the interior of the sensor housing and the surface of the sensor rotor for foreign material, such as metal particles. Clean the sensor housing and sensor rotor if necessary. Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-24.	
3	Defective sensor rotor.		• Check the surface of the sensor rotor for damage. • If there is visible damage, replace the sensor rotor. Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-24.	

Fault code No.	56	Symptom	ABS ECU has internal malfunction.	
Order	**Item/components and probable cause**		**Check or maintenance job**	**Reinstatement confirmation method**
1	Hydraulic unit assembly internal malfunction.		Replace the hydraulic unit assembly.	• Set the main switch to “ON” and check that the ABS warning light comes on for 2 seconds, then goes off. • Perform hydraulic unit operation test 1 and check that the operation of the hydraulic unit is normal.

Fault code No.	59	Symptom	Solenoid valve data is abnormal.	
Order	**Item/components and probable cause**		**Check or maintenance job**	**Reinstatement confirmation method**
1	Hydraulic unit assembly internal malfunction.		Replace the hydraulic unit assembly.	• Set the main switch to “ON” and check that the ABS warning light comes on for 2 seconds, then goes off. • Perform hydraulic unit operation test 1 and check that the operation of the hydraulic unit is normal.

cal system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

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4. Install:
   - Right side panel
   - Right side cowling
   Refer to "GENERAL CHASSIS" on page 4-1.

EAS28031
CHECKING AND CHARGING THE BATTERY

EWA13290
⚠ WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:
- **Wear protective eye gear when handling or working near batteries.**
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).**
- **DO NOT SMOKE when charging or handling batteries.**
- **KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.**
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**

FIRST AID IN CASE OF BODILY CONTACT:
EXTERNAL
- **Skin — Wash with water.**
- **Eyes — Flush with water for 15 minutes and get immediate medical attention.**

INTERNAL
- **Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.**

ECA13661
NOTICE

- **This is a VRLA (Valve Regulated Lead Acid) battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.**
- **Charging time, charging amperage and charging voltage for a VRLA (Valve Regulated Lead Acid) battery are different from those of conventional batteries. The VRLA (Valve Regulated Lead Acid) battery should be charged according to the appropriate charging method. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.**

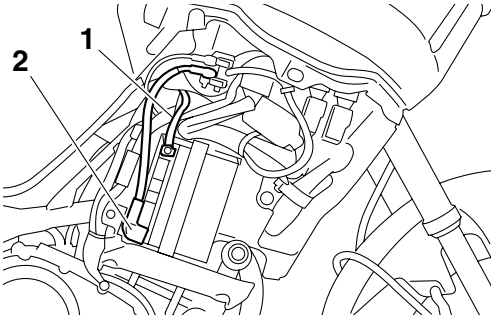
TIP

Since VRLA (Valve Regulated Lead Acid) batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
   - Right side cowling
   Refer to "GENERAL CHASSIS" on page 4-1.
2. Disconnect:
   - Battery leads
   (from the battery terminals)

ECA13640
NOTICE

First, disconnect the negative battery lead "1", and then positive battery lead "2".



3. Remove:
   - Battery
   Refer to "GENERAL CHASSIS" on page 4-1.
4. Check:
   - Battery charge

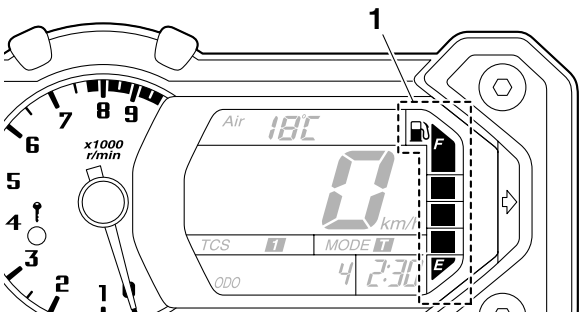
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a. Connect a pocket tester to the battery terminals.

• Positive tester probe → positive battery terminal • Negative tester probe → negative battery terminal

TIP

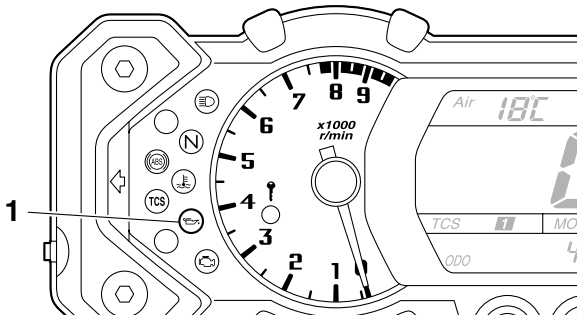
- The charge state of a VRLA (Valve Regulated Lead Acid) battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).



EAS29050
CHECKING THE OIL LEVEL WARNING LIGHT

This model is equipped with a self-diagnosis device for the oil level detection circuit.

1. Check:
   - Oil level warning light "1"
     (Turn the main switch to "ON".)
     Warning light comes on for a few seconds, then goes off → Warning light is OK.
     Warning light does not come on → Replace the meter assembly.
     Warning light flashes ten times, then goes off for 3 seconds in a repeated cycle (malfunction detected in oil level switch) → Replace the oil level switch.



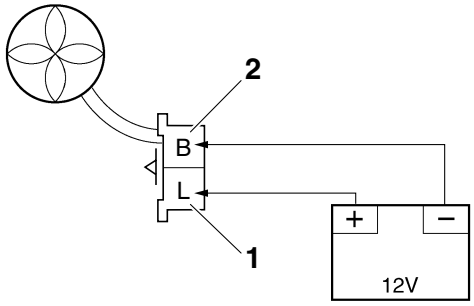
EAS28250
CHECKING THE RADIATOR FAN MOTOR

1. Check:
   - Radiator fan motor
     Faulty/rough movement → Replace.

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a. Disconnect the radiator fan motor coupler from the wire harness.
b. Connect the battery (DC 12 V) as shown.

• Positive tester probe Blue "1" • Negative tester probe Black "2"



c. Measure the radiator fan motor movement.

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EAS28261
CHECKING THE COOLANT TEMPERATURE SENSOR

1. Remove:
   - Coolant temperature sensor
     Refer to "THERMOSTAT" on page 6-4.

EWA14130

⚠ WARNING

• Handle the coolant temperature sensor with special care.
• Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.

2. Check:
   - Coolant temperature sensor resistance
     Out of specification → Replace.

Coolant temperature sensor resistance
5.21–6.37 kΩ at 0 °C (32 °F)
290–354 Ω at 80 °C (176 °F)

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a. Connect the pocket tester (Ω × 1k/ × 100) to the coolant temperature sensor terminals as shown.

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

b. Immerse the coolant temperature sensor "1" in a container filled with coolant "2".

TIP

Make sure the coolant temperature sensor terminals do not get wet.

c. Place a thermometer "3" in the coolant.

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