



YAMAHA

2009

SERVICE MANUAL

**XVS95Y(C)
XVS95CTY(C)**



Star

EAS20050

XVS95Y(C)/XVS95CTY(C)
SERVICE MANUAL
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NOTICE

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

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the vehicle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his vehicle and to conform to federal environmental quality objectives.



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

TIP

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

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.

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.

CLUTCH

Removing the clutch

Order	Job/Parts to remove	Qty	Remarks
1	Clutch spring plate retainer	1	
2	Clutch spring plate	1	
3	Clutch spring plate seat	1	
4	Pressure plate	1	
5	Pull rod	1	
6	Bearing	1	
7	Friction plate 1	2	Inside diameter: 124 mm (4.88 in)
8	Clutch plate	8	
9	Friction plate 2	7	Inside diameter: 124 mm (4.88 in)
10	Clutch boss nut	1	
11	Conical spring washer	1	
12	Clutch boss	1	
13	Thrust washer 1	1	
14	Clutch housing	1	
15	Bearing	1	
16	Collar	1	
17	Oil pump drive chain	1	
18	Oil pump drive sprocket	1	
19	Thrust washer 2	1	

For installation, reverse the removal procedure.

CLUTCH

**EAS20090
REMOVING THE CLUTCH**

1. Loosen:

- Clutch boss nut "1"

TIP
While holding the clutch boss "2" with the universal clutch holder "3", loosen the clutch boss nut.

Universal clutch holder
90890-04086
YM-91042

2. Remove:

- Clutch boss nut "1"
- Conical spring washer "2"
- Clutch boss "3"

**EAS20090
REMOVING THE PRIMARY DRIVE GEAR**

1. Straighten the lock washer tab.

2. Remove:

- Primary drive gear nut "1"
- Lock washer "2"

TIP
• While holding the generator rotor "3" with the sheave holder "4", loosen the primary drive gear nut.
• Do not allow the sheave holder to touch the projection on the generator rotor.

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

**EAS20100
CHECKING THE FRICTION PLATES**
The following procedure applies to all of the friction plates.

1. Check:

- Friction plate
Damage/wear → Replace the friction plates as a set.

2. Measure:

- Friction plate thickness
Out of specification → Replace the friction plates as a set.

TIP
Measure each friction plate at four places.

Friction plate 1 thickness 2.90–3.10 mm (0.114–0.122 in) Wear limit 2.80 mm (0.1102 in)
Friction plate 2 thickness 2.92–3.08 mm (0.115–0.121 in) Wear limit 2.80 mm (0.1102 in)

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 (LOC-TITE®).
	Engine oil		Replace the part with a new one.

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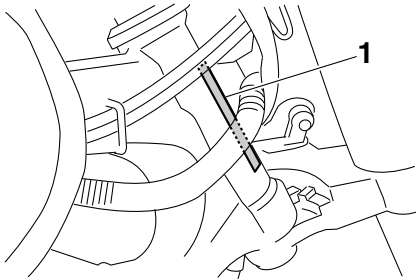
EAS20130

IDENTIFICATION

EAS20140

VEHICLE IDENTIFICATION NUMBER

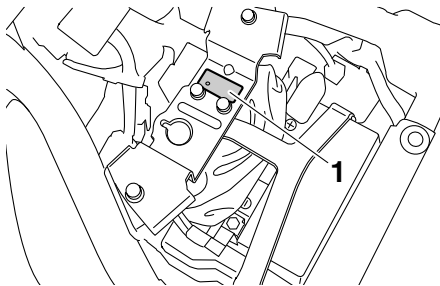
The vehicle identification number “1” is stamped into the right side of the steering head pipe.



EAS20150

MODEL LABEL

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



EAS20170

FEATURES

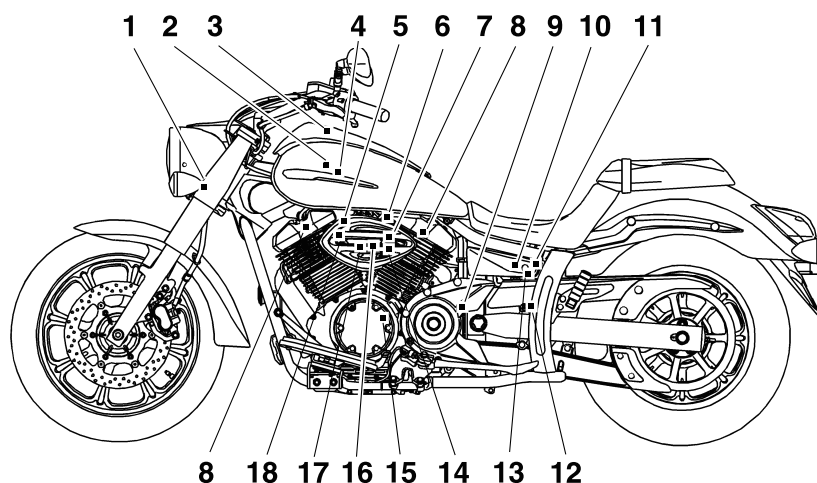
EAS5S71022

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. Air temperature sensor | 17. Front cylinder ignition coil |
| 2. Intake air pressure sensor | 18. Engine temperature sensor |
| 3. Engine trouble warning light | |
| 4. Fuel pump | |
| 5. Front cylinder injector | |
| 6. Rear cylinder injector | |
| 7. Throttle position sensor | |
| 8. Spark plug | |
| 9. Speed sensor | |
| 10. Relay unit (fuel pump relay) | |
| 11. ECU (engine control unit) | |
| 12. O ₂ sensor | |
| 13. Lean angle sensor | |
| 14. ISC (idle speed control) unit | |
| 15. Crankshaft position sensor | |
| 16. Rear cylinder ignition coil | |

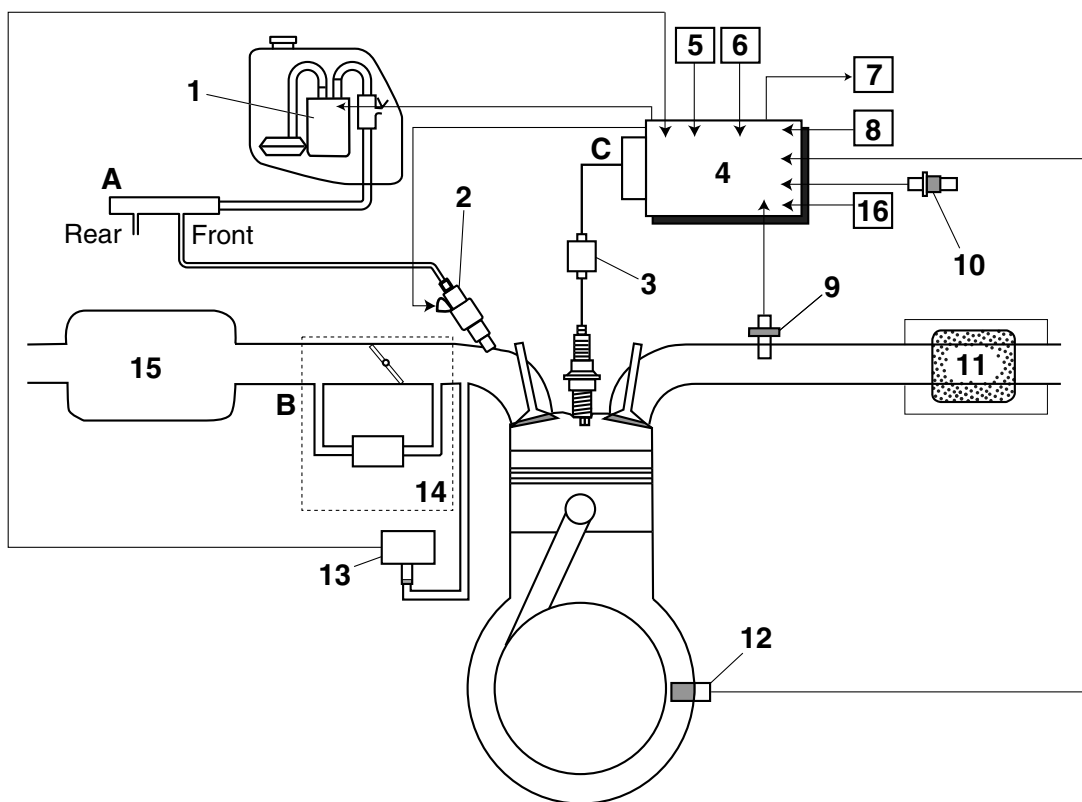
EAS5S71020

FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the fuel injector at only 392 kPa (3.92 kg/cm², 56.9 psi). Accordingly, when the energizing signal from the ECU energizes the fuel injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remains open. Therefore, the longer the length of time the fuel injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the fuel injector is energized (injection duration), the lesser the volume of fuel that is supplied.

The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, crankshaft position sensor, intake air pressure sensor, air temperature sensor, engine temperature sensor, lean angle sensor, speed sensor and O₂ sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions.

Illustration is for reference only.



1. Fuel pump
2. Fuel injector
3. Ignition coil
4. ECU (engine control unit)
5. Air temperature sensor
6. Lean angle sensor
7. ISC (idle speed control) unit
8. Throttle position sensor
9. O₂ sensor
10. Engine temperature sensor
11. Catalytic converter
12. Crankshaft position sensor
13. Intake air pressure sensor

14. Throttle body
 15. Air filter case
 16. Speed sensor
- A. Fuel system
B. Air system
C. Control system

EAS5S71021

INSTRUMENT FUNCTIONS

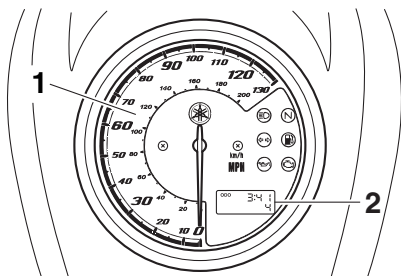
Multi-function meter unit

EWA5S71001



WARNING

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



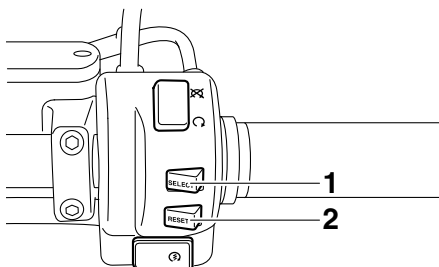
1. Speedometer
2. Odometer/tripmeter/fuel reserve tripmeter/clock

The multi-function meter unit is equipped with the following:

- a speedometer (which shows the riding speed)
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled on the fuel reserve)
- a clock
- a self-diagnosis device
- a brightness control mode

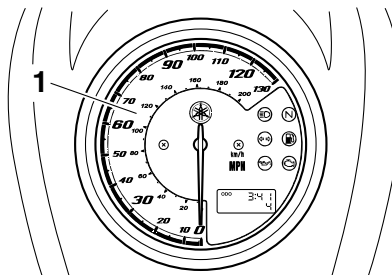
TIP

Be sure to turn the key to “ON” before using the “SELECT” switch and “RESET” switch, except for setting the brightness control mode.



1. “SELECT” switch
2. “RESET” switch

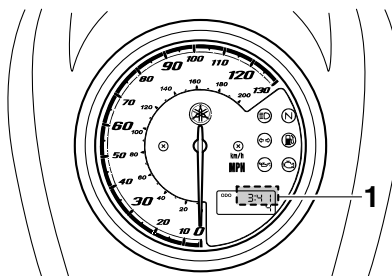
Speedometer



1. Speedometer

The speedometer shows the riding speed. When the key is turned to “ON”, the speedometer needle will sweep once across the speed range and then return to zero in order to test the electrical circuit.

Clock

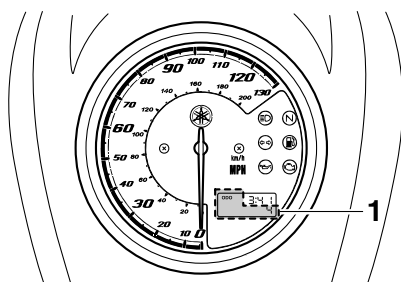


1. Clock

To set the clock:

1. Push the “SELECT” switch and the “RESET” switch together for at least three seconds.
2. When the hour digits start flashing, push the “RESET” switch to set the hours.
3. Push the “SELECT” switch, and the minute digits will start flashing.
4. Push the “RESET” switch to set the minutes.
5. Push the “SELECT” switch and then release it to start the clock.

Odometer, tripmeter, and fuel reserve tripmeter modes



1. Odometer/tripmeter/fuel reserve tripmeter

Push the “SELECT” switch to change the display between the odometer mode “ODO”, the tripmeter modes “TRIP A” and “TRIP B” in the following order:

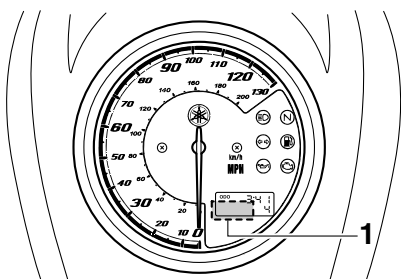
ODO → TRIP A → TRIP B → ODO

If the fuel level warning light comes on, the odometer display will automatically change to the fuel reserve tripmeter mode “TRIP F” and start counting the distance traveled from that point. In that case, push the “SELECT” switch to change the display between the various tripmeter and odometer modes in the following order:

TRIP F → TRIP A → TRIP B → ODO → TRIP F

To reset a tripmeter, select it by pushing the “SELECT” switch, and then push the “RESET” switch for at least one second. If you do not reset the fuel reserve tripmeter manually, it will reset itself automatically, and the display will return to the prior mode after refueling and traveling 5 km (3 mi).

Self-diagnosis device



1. Error code display

This model is equipped with a self-diagnosis device for various electrical circuits.

If any of those circuits are defective, the engine trouble warning light will come on, and then the

odometer/tripmeter/clock display will indicate a two-digit error code (e.g., 12, 13, 14).

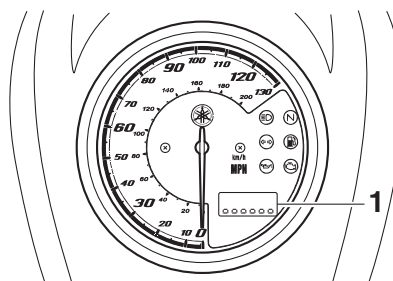
If the odometer/tripmeter/clock display indicates any error codes, note the code number, and then check the vehicle. Refer to “FUEL INJECTION SYSTEM” on page 7-27.

ECA5S71001

NOTICE

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

Brightness control mode



1. Brightness level

This function allows you to adjust the brightness of the multi-function meter unit panel to suit the outside lighting conditions.

To set the brightness:

1. Turn the key to “OFF”.
2. Push and hold the “SELECT” switch.
3. Turn the key to “ON”, and then release the “SELECT” switch after five seconds.
4. Adjust the multi-function meter unit panel brightness level by pushing the “SELECT” switch.
5. Push the “RESET” switch.

The odometer/tripmeter/clock display will return to the prior mode.

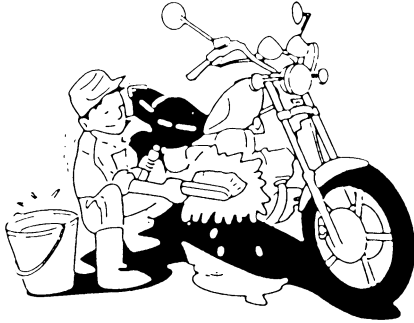
EAS20180

IMPORTANT INFORMATION

EAS20190

PREPARATION FOR REMOVAL AND DISASSEMBLY

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



2. Use only the proper tools and cleaning equipment. Refer to "SPECIAL TOOLS" on page 1-9.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.

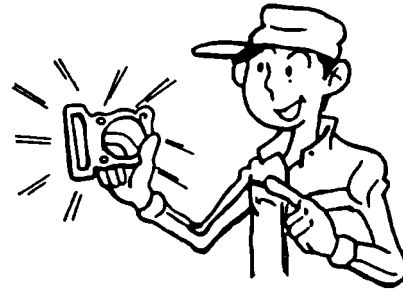


4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS20200

REPLACEMENT PARTS

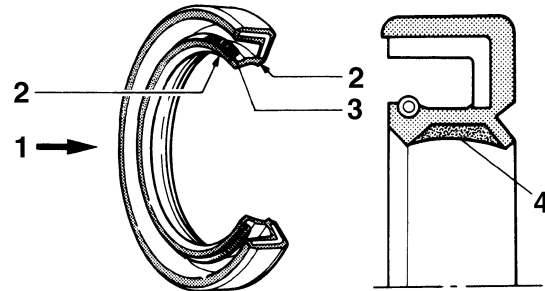
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS20210

GASKETS, OIL SEALS AND O-RINGS

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

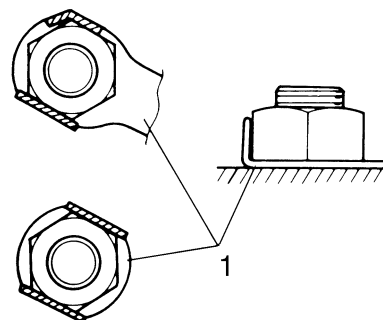


1. Oil
2. Lip
3. Spring
4. Grease

EAS20220

LOCK WASHERS/PLATES AND COTTER PINS

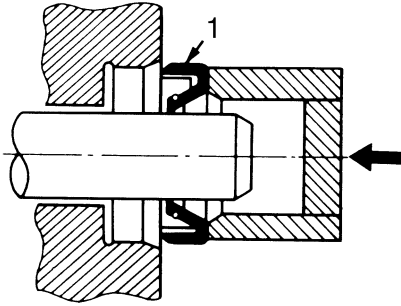
After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS20230

BEARINGS AND OIL SEALS

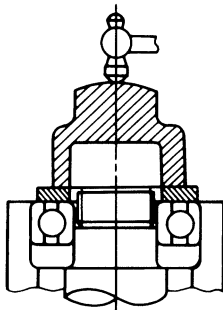
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals "1", lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.



ECA13300

NOTICE

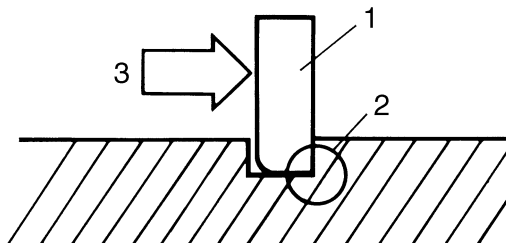
Do not spin the bearing with compressed air because this will damage the bearing surfaces.



EAS20240

CIRCLIPS

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



EAS20250

CHECKING THE CONNECTIONS

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

1. Disconnect:

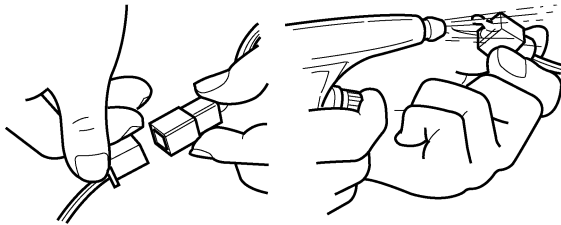
- Lead
- Coupler
- Connector

2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



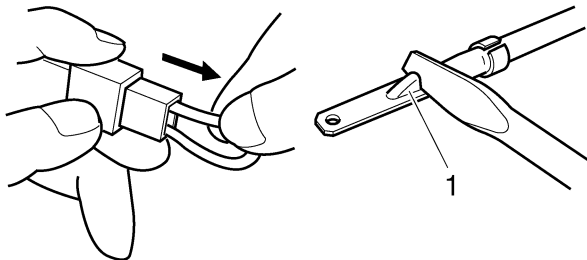
3. Check:

- All connections

Loose connection → Connect properly.

TIP

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



4. Connect:

- Lead
- Coupler
- Connector

TIP

Make sure all connections are tight.

5. Check:

- Continuity
(with the pocket tester)



Pocket tester

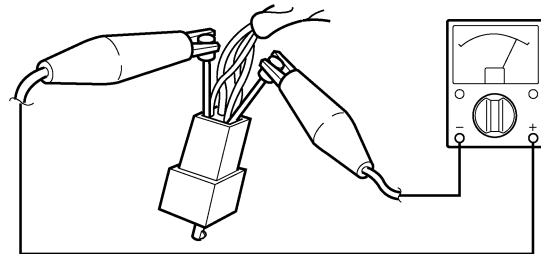
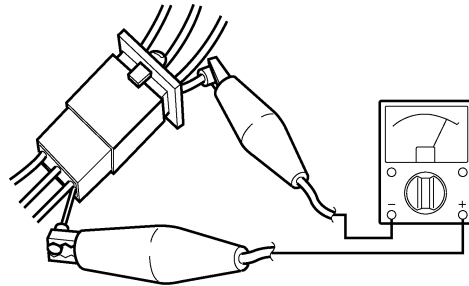
90890-03112

Analog pocket tester

YU-03112-C

TIP

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



EAS20260

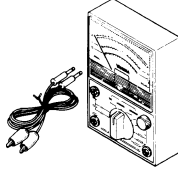
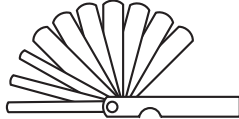
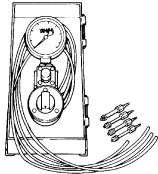

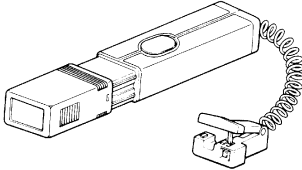
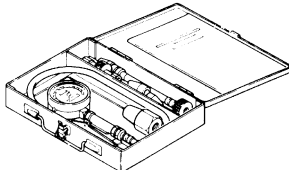
SPECIAL TOOLS

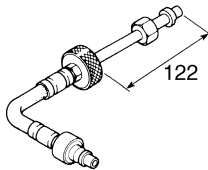
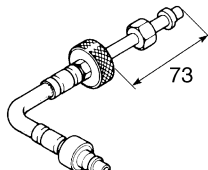
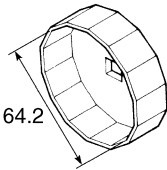

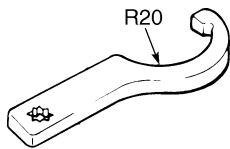
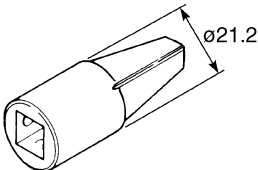
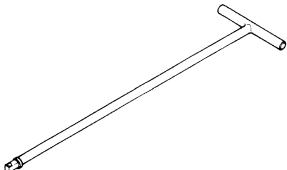
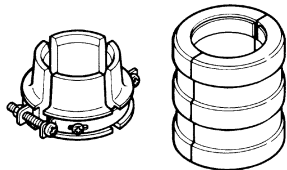
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.

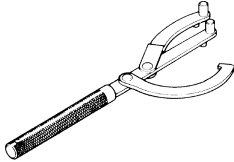
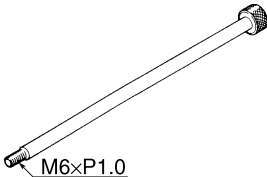
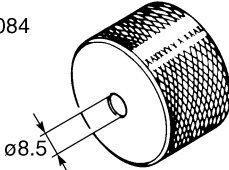
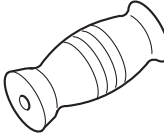
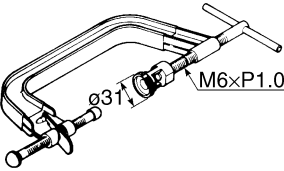
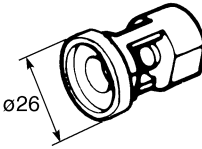
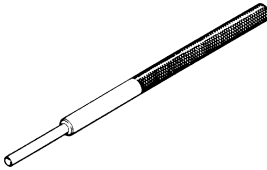
When placing an order, refer to the list provided below to avoid any mistakes.

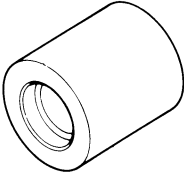
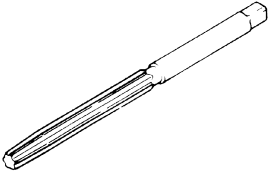
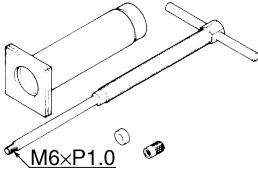
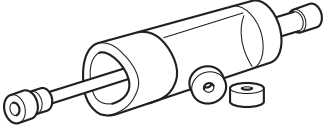
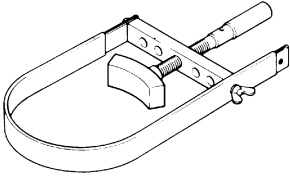
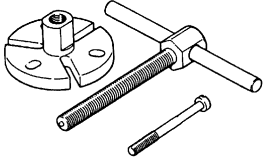
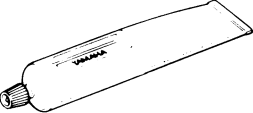
TIP

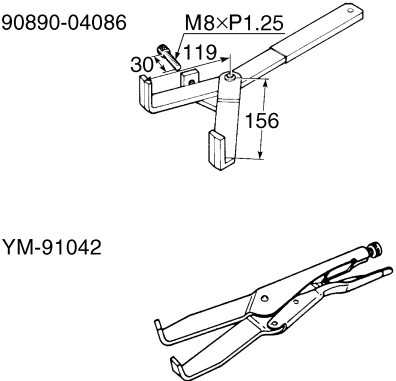
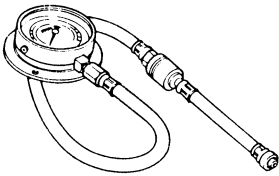
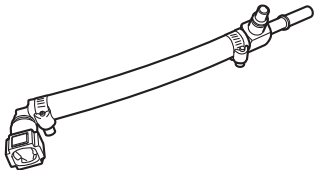
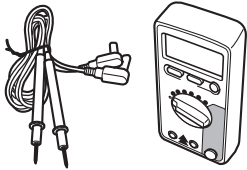
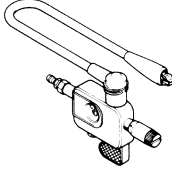
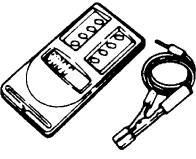
- For U.S.A. and Canada, use part numbers starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part numbers starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-8, 7-79, 7-80, 7-81, 7-85, 7-86, 7-87, 7-88, 7-89, 7-90, 7-91, 7-92, 7-93, 7-94, 7-95
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-7
Vacuum gauge 90890-03094 Carburetor synchronizer YU-44456	<div>90890-03094 </div> <div>YU-44456 </div>	3-9
Timing light 90890-03141 Inductive clamp timing light YU-03141		3-5
Compression gauge 90890-03081 Engine compression tester YU-33223		5-22

Tool name/Tool No.	Illustration	Reference pages
Extension 90890-04136		5-22
Extension 90890-04082		5-22
Oil filter wrench 90890-01426 YU-38411		3-24
Belt tension gauge 90890-03170 Rear drive belt tension gauge YM-03170		3-18
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472		3-20, 4-58
Damper rod holder 90890-01460		4-51, 4-53
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-51, 4-53
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-53, 4-54

Tool name/Tool No.	Illustration	Reference pages
Rotor holding tool 90890-01235 Universal magneto & rotor holder YU-01235		5-13, 5-17, 5-18
Slide hammer bolt 90890-01083 Slide hammer bolt 6 mm YU-01083-1		5-14
Weight 90890-01084 YU-01083-3	<p>90890-01084</p>  <p>YU-01083-3</p> 	5-14
Valve spring compressor 90890-04019 YM-04019		5-25, 5-30
Valve spring compressor attachment 90890-01243 Valve spring compressor adapter (26 mm) YM-01253-1		5-25, 5-30
Valve guide remover (ø6) 90890-04064 Valve guide remover (6.0 mm) YM-04064-A		5-27

Tool name/Tool No.	Illustration	Reference pages
Valve guide installer (ø6) 90890-04065 Valve guide installer (6.0 mm) YM-04065-A		5-27
Valve guide reamer (ø6) 90890-04066 Valve guide reamer (6.0 mm) YM-04066		5-27
Piston pin puller set 90890-01304 Piston pin puller YU-01304	<p>90890-01304</p>  <p>M6xP1.0</p> <p>YU-01304</p> 	5-33
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-41, 5-42, 5-48, 5-50
Flywheel puller set 90890-01468 Heavy duty puller YU-33270-B		5-41
Yamaha bond No. 1215 90890-85505 (Three Bond No.1215®)		5-42, 5-63

Tool name/Tool No.	Illustration	Reference pages
Universal clutch holder 90890-04086 YM-91042		5-48, 5-51
Pressure gauge 90890-03153 YU-03153		6-10
Fuel pressure adapter 90890-03176 YM-03176		6-10
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		5-57, 6-11
Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487		7-88
Digital tachometer 90890-06760 YU-39951-B		3-5, 3-9

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GENERAL SPECIFICATIONS

EAS20280

GENERAL SPECIFICATIONS

Model

Model	XVS95Y 49B1 (U49) XVS95Y 5S71 (U49) XVS95YC 49B2 (CAL) XVS95YC 5S72 (CAL) XVS95CTY 49C1 (U49) XVS95CTY 26S1 (U49) XVS95CTYC 49C2 (CAL) XVS95CTYC 26S2 (CAL)
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Dimensions

Overall length	2435 mm (95.9 in)
Overall width	1000 mm (39.4 in)
Overall height	XVS95Y/XVS95YC 1080 mm (42.5 in) XVS95CTY/XVS95CTYC 1340 mm (52.8 in)
Seat height	675 mm (26.6 in)
Wheelbase	1685 mm (66.3 in)
Ground clearance	145 mm (5.71 in)
Minimum turning radius	3500 mm (137.8 in)

Weight

With oil and fuel	XVS95Y/XVS95YC 278.0 kg (613 lb) XVS95CTY/XVS95CTYC 298.0 kg (657 lb)
Maximum load	XVS95Y/XVS95YC 210 kg (463 lb) XVS95CTY/XVS95CTYC 190 kg (419 lb)

EAS20290

ENGINE SPECIFICATIONS

Engine

Engine type	Air cooled 4-stroke, SOHC
Displacement	942.0 cm ³
Cylinder arrangement	V-type 2-cylinder
Bore × stroke	85.0 × 83.0 mm (3.35 × 3.27 in)
Compression ratio	9.00 : 1
Standard compression pressure (at sea level)	1400 kPa/400 r/min (14.0 kgf/cm ² /400 r/min, 199.1 psi/400 r/min)
Minimum–maximum	1250–1500 kPa (12.5–15.0 kgf/cm ² , 177.8–213.3 psi)
Starting system	Electric starter

Fuel

Recommended fuel	Unleaded gasoline only
Fuel tank capacity	16.7 L (4.41 US gal, 3.67 Imp.gal)
Fuel reserve amount	3.4 L (0.90 US gal, 0.75 Imp.gal)

Engine oil

Lubrication system	Wet sump
Type	YAMALUBE 4 10W-40 or 20W-50, SAE 10W-40 or SAE 20W-50
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Engine oil quantity	
Total amount	4.30 L (4.55 US qt, 3.78 Imp.qt)
Without oil filter cartridge replacement	3.70 L (3.91 US qt, 3.26 Imp.qt)
With oil filter cartridge replacement	4.00 L (4.23 US qt, 3.52 Imp.qt)

Oil filter

Oil filter type	Wire mesh
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Oil pump

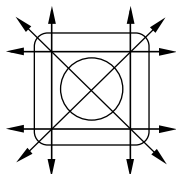
Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	Less than 0.12 mm (0.0047 in)
Limit	0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.09–0.19 mm (0.0035–0.0075 in)
Limit	0.26 mm (0.0102 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.03–0.10 mm (0.0012–0.0039 in)
Limit	0.17 mm (0.0067 in)
Bypass valve opening pressure	78.4–117.6 kPa (0.78–1.18 kgf/cm ² , 11.4–17.1 psi)
Relief valve operating pressure	391.0–489.0 kPa (3.91–4.89 kgf/cm ² , 56.7–70.9 psi)

Spark plug(s)

Manufacturer/model	NGK/CPR7EA-9
Spark plug gap	0.8–0.9 mm (0.031–0.035 in)

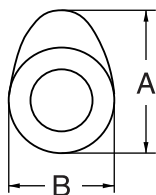
Cylinder head

Volume	40.50–42.70 cm ³ (2.47–2.61 cu.in)
Warpage limit	0.05 mm (0.0020 in)



Camshaft

Drive system	Chain drive (left and right)
Camshaft journal diameter	20.959–20.980 mm (0.8252–0.8260 in)
Camshaft lobe dimensions	
Intake A	42.470–42.570 mm (1.6720–1.6760 in)
Limit	42.370 mm (1.6681 in)
Intake B	37.041–37.141 mm (1.4583–1.4622 in)
Limit	36.941 mm (1.4544 in)
Exhaust A	42.138–42.238 mm (1.6590–1.6629 in)
Limit	42.038 mm (1.6550 in)
Exhaust B	37.015–37.115 mm (1.4573–1.4612 in)
Limit	36.915 mm (1.4533 in)



Camshaft runout limit	0.030 mm (0.0012 in)
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Timing chain

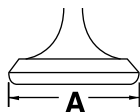
Tensioning system	Automatic
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Rocker arm/rocker arm shaft

Rocker arm inside diameter	12.000–12.018 mm (0.4724–0.4731 in)
Rocker arm shaft outside diameter	11.981–11.991 mm (0.4717–0.4721 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.009–0.037 mm (0.0004–0.0015 in)
Limit	0.095 mm (0.0037 in)

Valve, valve seat, valve guide

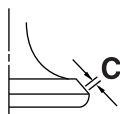
Valve clearance (cold)	
Intake	0.08–0.12 mm (0.0032–0.0047 in)
Exhaust	0.22–0.26 mm (0.0087–0.0102 in)
Valve dimensions	
Valve head diameter A (intake)	31.40–31.60 mm (1.2362–1.2441 in)
Valve head diameter A (exhaust)	27.90–28.10 mm (1.0984–1.1063 in)



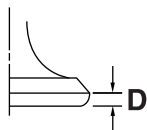
Valve seat width C (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)

ENGINE SPECIFICATIONS

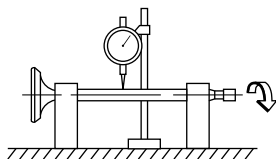
Valve seat width C (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)



Valve margin thickness D (intake)	1.00 mm (0.0394 in)
Valve margin thickness D (exhaust)	1.00 mm (0.0394 in)



Valve stem diameter (intake)	5.975–5.990 mm (0.2352–0.2358 in)
Limit	5.945 mm (0.2341 in)
Valve stem diameter (exhaust)	5.960–5.975 mm (0.2346–0.2352 in)
Limit	5.930 mm (0.2335 in)
Valve guide inside diameter (intake)	6.000–6.012 mm (0.2362–0.2367 in)
Limit	6.050 mm (0.2382 in)
Valve guide inside diameter (exhaust)	6.000–6.012 mm (0.2362–0.2367 in)
Limit	6.050 mm (0.2382 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)



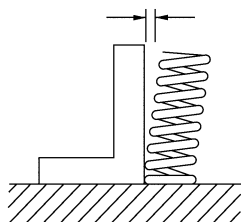
Valve guide position	12.7–13.1 mm (0.500–0.515 in)
Cylinder head valve seat width (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)
Cylinder head valve seat width (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)

Valve spring

Free length (intake)	42.43 mm (1.67 in)
Limit	40.31 mm (1.59 in)
Free length (exhaust)	42.43 mm (1.67 in)
Limit	40.31 mm (1.59 in)
Installed length (intake)	35.00 mm (1.38 in)
Installed length (exhaust)	35.00 mm (1.38 in)
Spring rate K1 (intake)	24.75 N/mm (2.52 kgf/mm, 141.35 lbf/in)
Spring rate K2 (intake)	33.32 N/mm (3.40 kgf/mm, 190.30 lbf/in)
Spring rate K1 (exhaust)	24.75 N/mm (2.52 kgf/mm, 141.35 lbf/in)
Spring rate K2 (exhaust)	33.32 N/mm (3.40 kgf/mm, 190.30 lbf/in)
Installed compression spring force (intake)	171–197 N (17.44–20.09 kgf, 38.45–44.30 lbf)
Installed compression spring force (exhaust)	171–197 N (17.44–20.09 kgf, 38.45–44.30 lbf)

ENGINE SPECIFICATIONS

Spring tilt (intake)	2.5°/1.9 mm (0.075 in)
Spring tilt (exhaust)	2.5°/1.9 mm (0.075 in)



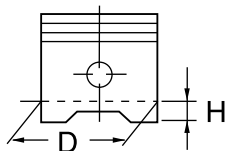
Winding direction (intake)	Clockwise
Winding direction (exhaust)	Clockwise

Cylinder

Bore	85.000–85.010 mm (3.3465–3.3468 in)
Wear limit	85.100 mm (3.3504 in)
Out of round limit	0.050 mm (0.0020 in)

Piston

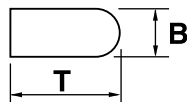
Piston-to-cylinder clearance	0.030–0.055 mm (0.0012–0.0022 in)
Limit	0.15 mm (0.0059 in)
Diameter D	84.955–84.970 mm (3.3447–3.3453 in)
Height H	8.0 mm (0.31 in)



Offset	0.50 mm (0.0197 in)
Piston pin bore inside diameter	21.004–21.015 mm (0.8269–0.8274 in)
Limit	21.045 mm (0.8285 in)
Piston pin outside diameter	20.991–21.000 mm (0.8264–0.8268 in)
Limit	20.971 mm (0.8256 in)
Piston-pin-to-piston-pin-bore clearance	0.004–0.024 mm (0.00016–0.00094 in)

Piston ring

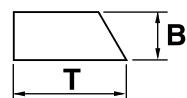
Top ring	
Ring type	Barrel
Dimensions (B × T)	1.20 × 2.90 mm (0.05 × 0.11 in)



End gap (installed)	0.15–0.30 mm (0.0059–0.0118 in)
Limit	0.55 mm (0.0217 in)
Ring side clearance	0.040–0.080 mm (0.0016–0.0032 in)
Limit	0.130 mm (0.0051 in)

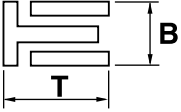
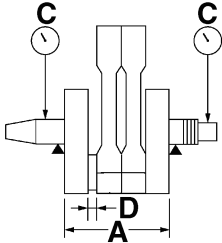
2nd ring

Ring type	Taper
Dimensions (B × T)	1.20 × 3.30 mm (0.05 × 0.13 in)



End gap (installed)	0.30–0.45 mm (0.0118–0.0177 in)
Limit	0.80 mm (0.0315 in)

ENGINE SPECIFICATIONS

Ring side clearance	0.030–0.070 mm (0.0012–0.0028 in)
Limit	0.130 mm (0.0051 in)
Oil ring	
Dimensions (B × T)	2.00 × 2.50 mm (0.08 × 0.10 in)
	
End gap (installed)	0.20–0.70 mm (0.0079–0.0276 in)
Connecting rod	
Oil clearance (using plastigauge®)	0.022–0.046 mm (0.0009–0.0018 in)
Limit	0.09 mm (0.0035 in)
Bearing color code	4.Black 5.Brown 6.Green
Small end inside diameter	21.015–21.028 mm (0.8274–0.8279 in)
Crankshaft	
Width A	97.95–98.00 mm (3.856–3.858 in)
Runout limit C	0.020 mm (0.0008 in)
Big end side clearance D	0.320–0.474 mm (0.0126–0.0187 in)
	
Crankshaft journal diameter	49.968–49.980 mm (1.9672–1.9677 in)
Crankshaft journal bearing inside diameter	50.010–50.030 mm (1.9689–1.9697 in)
Crankshaft-journal-to-crankshaft-journal-bearing clearance	0.030–0.062 mm (0.0012–0.0024 in)
Clutch	
Clutch type	Wet, multiple-disc
Clutch release method	Outer pull, rack and pinion pull
Operation	Left hand operation
Clutch lever free play	5.0–10.0 mm (0.20–0.39 in)
Friction plate 1 thickness	2.90–3.10 mm (0.114–0.122 in)
Wear limit	2.80 mm (0.1102 in)
Plate quantity	2 pcs
Friction plate 2 thickness	2.92–3.08 mm (0.115–0.121 in)
Wear limit	2.80 mm (0.1102 in)
Plate quantity	7 pcs
Clutch plate thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	8 pcs
Warpage limit	0.20 mm (0.0079 in)
Clutch spring height	7.40 mm (0.29 in)
Minimum height	6.70 mm (0.26 in)
Spring quantity	1 pc
Clutch housing thrust clearance	0.050–0.450 mm (0.0020–0.0177 in)
Clutch housing radial clearance	0.010–0.046 mm (0.0004–0.0018 in)

ENGINE SPECIFICATIONS

Transmission

Transmission type	Constant mesh 5-speed
Primary reduction system	Spur gear
Primary reduction ratio	72/43 (1.674)
Secondary reduction system	Belt drive
Secondary reduction ratio	70/30 (2.333)
Operation	Left foot operation
Gear ratio	
1st	46/15 (3.067)
2nd	33/16 (2.063)
3rd	30/19 (1.579)
4th	34/27 (1.259)
5th	25/24 (1.042)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)

Shifting mechanism

Shift mechanism type	Guide bar
Shift fork thickness	6.26–6.39 mm (0.2465–0.2516 in)

Air filter

Air filter element	Oil-coated paper element
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Fuel pump

Pump type	Electrical
Maximum consumption amperage	5.5 A
Fuel pressure	392.0 kPa (3.92 kgf/cm ² , 56.9 psi)

Fuel injector

Model/quantity	1450/2
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Throttle body

Type/quantity	ACW35/1
ID mark	XVS95Y/XVS95CTY 5S71 00 (U49) XVS95YC/XVS95CTYC 5S72 10 (CAL)
Throttle valve size	#100

Throttle position sensor

Resistance	3.08–5.72 k Ω
Output voltage (at idle)	0.63–0.73 V

Fuel injection sensor

Crankshaft position sensor resistance	248–372 Ω
Intake air pressure sensor output voltage	3.594–3.684 V at 25 °C (77 °F)
Intake air temperature sensor resistance	290–390 Ω at 80 °C (176 °F)
Engine temperature sensor resistance	210.21–221.00 Ω at 100 °C (212 °F)

Idling condition

Engine idling speed	950–1050 r/min
Intake vacuum	30.7–36.0 kPa (230–270 mmHg, 9.1–10.6 inHg)
Oil temperature	60.0–70.0 °C (140.00–158.00 °F)
Throttle cable free play	4.0–6.0 mm (0.16–0.24 in)

CHASSIS SPECIFICATIONS

EAS20300

CHASSIS SPECIFICATIONS

Chassis

Frame type	Double cradle
Caster angle	32.10°
Trail	145.0 mm (5.71 in)

Front wheel

Wheel type	Cast wheel
Rim size	18M/C × MT3.50
Rim material	Aluminum
Wheel travel	135.0 mm (5.31 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)

Rear wheel

Wheel type	Cast wheel
Rim size	16M/C × MT4.50
Rim material	Aluminum
Wheel travel	110.0 mm (4.33 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)

Front tire

Type	Tubeless
Size	130/70-18M/C 63H
Manufacturer/model	BRIDGESTONE/EXEDRA G721 J
Manufacturer/model	DUNLOP/D404F
Wear limit (front)	1.0 mm (0.04 in)

Rear tire

Type	Tubeless
Size	170/70B 16M/C 75H
Manufacturer/model	BRIDGESTONE/EXEDRA G722 J
Manufacturer/model	DUNLOP/K555
Wear limit (rear)	1.0 mm (0.04 in)

Tire air pressure (measured on cold tires)

Loading condition	0-90 kg (0-198 lb)
Front	225 kPa (2.25 kgf/cm ² , 33 psi)
Rear	250 kPa (2.50 kgf/cm ² , 36 psi)
Loading condition	XVS95Y/XVS95YC 90-210 kg (198-463 lb)
	XVS95CTY/XVS95CTYC 90-190 kg (198-419 lb)
Front	225 kPa (2.25 kgf/cm ² , 33 psi)
Rear	250 kPa (2.50 kgf/cm ² , 36 psi)

Front brake

Type	Single disc brake
Operation	Right hand operation
Front brake lever free play	10.0-15.0 mm (0.39-0.59 in)
Front disc brake	
Disc outside diameter × thickness	320.0 × 4.5 mm (12.60 × 0.18 in)
Brake disc thickness limit	4.0 mm (0.16 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	6.0 mm (0.24 in)
Limit	0.8 mm (0.03 in)

CHASSIS SPECIFICATIONS

Brake pad lining thickness (outer)	6.0 mm (0.24 in)
Limit	0.8 mm (0.03 in)
Master cylinder inside diameter	12.70 mm (0.50 in)
Caliper cylinder inside diameter	30.16 mm (1.19 in)
Caliper cylinder inside diameter	33.34 mm (1.31 in)
Recommended fluid	DOT 4
Rear brake	
Type	Single disc brake
Operation	Right foot operation
Brake pedal position	90.0 mm (3.54 in)
Rear disc brake	
Disc outside diameter × thickness	298.0 × 6.0 mm (11.73 × 0.24 in)
Brake disc thickness limit	5.5 mm (0.22 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	5.8 mm (0.23 in)
Limit	0.8 mm (0.03 in)
Brake pad lining thickness (outer)	5.8 mm (0.23 in)
Limit	0.8 mm (0.03 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	41.30 mm (1.63 in)
Recommended fluid	DOT 4
Steering	
Steering bearing type	Angular bearing
Center to lock angle (left)	35.0°
Center to lock angle (right)	35.0°
Front suspension	
Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	135.0 mm (5.31 in)
Fork spring free length	366 mm (14.41 in)
Limit	359 mm (14.13 in)
Spacer length	183.0 mm (7.20 in)
Installed length	339.4 mm (13.36 in)
Spring rate K1	5.41 N/mm (0.55 kgf/mm, 30.90 lbf/in)
Spring stroke K1	0.0–135.0 mm (0.00–5.31 in)
Inner tube outer diameter	41.0 mm (1.61 in)
Optional spring available	No
Recommended oil	Yamaha fork oil 10WT
Quantity	488.0 cm ³ (16.50 US oz, 17.21 Imp oz)
Level	107.0 mm (4.21 in)
Rear suspension	
Type	Swingarm
Spring/shock absorber type	Coil spring/gas-oil damper
Rear shock absorber assembly travel	48.0 mm (1.89 in)
Spring free length	177.6 mm (6.99 in)
Installed length	166.0 mm (6.54 in)
Spring rate K1	182.00 N/mm (18.56 kgf/mm, 1039.43 lbf/in)
Spring stroke K1	0.0–48.0 mm (0.00–1.89 in)
Optional spring available	No
Enclosed gas/air pressure (STD)	1200 kPa (12.0 kgf/cm ² , 174.0 psi)

CHASSIS SPECIFICATIONS

Spring preload adjusting positions	
Minimum	1
Standard	4
Maximum	9

Swingarm	
Swingarm end free play limit (radial)	1.0 mm (0.04 in)
Swingarm end free play limit (axial)	1.0 mm (0.04 in)

Drive belt	
Model/manufacture	MD01/MITSUBOSHI
Drive belt slack (on the sidestand)	3.0–5.0 mm (0.12–0.20 in)
Drive belt slack (on a suitable stand)	3.0–5.0 mm (0.12–0.20 in)

Shift pedal	
Installed shift rod length	278.7–280.7 mm (10.97–11.05 in)

ELECTRICAL SPECIFICATIONS

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ELECTRICAL SPECIFICATIONS

Voltage

System voltage	12 V
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Ignition system

Ignition system	TCI (digital)
Advancer type	Throttle position sensor and electrical
Ignition timing (B.T.D.C.)	5.0°/1000 r/min

Engine control unit

Model/manufacture	FUA0028/MITSUBISHI
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Ignition coil

Minimum ignition spark gap	6.0 mm (0.24 in)
Primary coil resistance	2.16–2.64 Ω
Secondary coil resistance	8.64–12.96 k Ω

Spark plug cap

Material	Rubber
Resistance	10.0 k Ω

Lean angle sensor

Lean angle sensor output voltage	
Less than 45°	0.4–1.4 V
More than 45°	3.7–4.4 V

AC magneto

Standard output	14.0 V 32.9 A at 5000 r/min
Standard output	14.0 V 460 W at 5000 r/min
Stator coil resistance	0.128–0.192 Ω

Rectifier/regulator

Regulator type	Semiconductor, short circuit
Charging voltage	14 V at 5000 r/min
Regulated voltage (DC)	14.2–14.8 V
Rectifier capacity (DC)	50.0 A
Withstand voltage	40.0 V

Battery

Model	YTZ14S
Specific gravity	1.31
Voltage, capacity	12 V, 11.2 Ah
Manufacturer	GS YUASA
Ten hour rate amperage	1.12 A

Headlight

Bulb type	Halogen bulb
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Bulb voltage, wattage × quantity

Headlight	12 V, 60 W/55.0 W × 1
Tail/brake light	12 V, 21.0 W/5.0 W × 1
Front turn signal light	12 V, 21.0 W/5.0 W × 2
Rear turn signal light	12 V, 21.0 W × 2
License plate light	12 V, 3.8 W × 2
Meter lighting	LED

ELECTRICAL SPECIFICATIONS

Indicator light

Neutral indicator light	LED
Turn signal indicator light	LED
Oil level warning light	LED
High beam indicator light	LED
Fuel level warning light	LED
Engine trouble warning light	LED

Electric starting system

System type	Constant mesh
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Starter motor

Power output	0.80 kW
Commutator resistance	0.0050–0.0150 Ω at 20 °C (68 °F)
Insulation resistance	Above 1 M Ω at 20 °C (68 °F)
Brush overall length	12.0 mm (0.47 in)
Limit	6.50 mm (0.26 in)
Brush spring force	6.03–6.52 N (614–664 gf, 21.67–23.43 ozf)
Mica undercut (depth)	0.70 mm (0.03 in)

Starter relay

Amperage	180.0 A
Coil resistance	4.18–4.62 Ω

Horn

Horn type	Plane
Quantity	1 pc
Maximum amperage	3.0 A
Coil resistance	1.07–1.11 Ω
Performance	108–116 dB/2 m

Turn signal relay

Relay type	Semi transistor
Built-in, self-canceling device	Yes
Turn signal relay input voltage	DC 12 V
Turn signal relay output voltage	DC 12 V
Turn signal blinking frequency	75.0–95.0 cycles/min
Wattage	21/5 W \times 2 + 21 W \times 2

Relay unit (starting circuit cut-off relay)

Coil resistance	162.0–198.0 Ω
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Headlight relay

Coil resistance	86.40–105.60 Ω
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Relay unit (fuel pump relay)

Coil resistance	162.0–198.0 Ω
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Oil level switch

Minimum level position resistance	114–126 Ω
Maximum level position resistance	484–536 Ω

Fuel gauge

Fuel sender resistance	830–1720 Ω at 25 °C (77 °F)
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Speed sensor

Output voltage reading cycle	0.6 V to 4.8 V to 0.6 V to 4.8 V
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ELECTRICAL SPECIFICATIONS

Fuses

Main fuse	40.0 A
Headlight fuse	20.0 A
Taillight fuse	10.0 A
Signaling system fuse	10.0 A
Ignition fuse	15.0 A
Fuel injection system fuse	10.0 A
Backup fuse	10.0 A
Reserve fuse	20.0 A
Reserve fuse	15.0 A
Reserve fuse	10.0 A

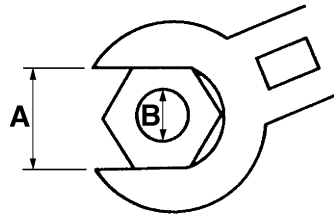
EAS20320

TIGHTENING TORQUES

EAS20330

GENERAL TIGHTENING TORQUE SPECIFICATIONS

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
















- A. Distance between flats
- B. Outside thread diameter

A (nut)	B (bolt)	General tightening torques		
		Nm	m·kgf	ft·lbf
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13	94


















TIGHTENING TORQUES

EAS20340


ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Cylinder head stud bolt (exhaust pipe)	M8	4	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Oil check bolt	M8	2	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Cylinder head nut	M12	8	65 Nm (6.5 m·kgf, 47 ft·lbf)	 See TIP
Cylinder head bolt	M8	4	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Spark plug	M10	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Front cylinder lower plastic cover bolt	M8	4	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Front cylinder upper plastic cover screw	M6	4	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Rear cylinder plastic cover bracket bolt	M8	4	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Engine temperature sensor	M10	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Cylinder side cover bolt	M6	10	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Connecting rod bolt (1st)	M8	4	15 Nm (1.5 m·kgf, 11 ft·lbf)	 See TIP
Connecting rod bolt (final)	M8	4	Specified angle 125–135°	 See TIP
Generator rotor bolt	M12	1	90 Nm (9.0 m·kgf, 65 ft·lbf)	
Timing chain tensioner bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Locknut (rocker arm adjusting screw)	M8	8	27 Nm (2.7 m·kgf, 19 ft·lbf)	
Timing chain guide stopper bolt	M6	4	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Camshaft sprocket bolt	M10	2	55 Nm (5.5 m·kgf, 40 ft·lbf)	
Timing chain tensioner cap bolt	M11	2	24 Nm (2.4 m·kgf, 17 ft·lbf)	
Oil pump assembly bolt	M8	3	24 Nm (2.4 m·kgf, 17 ft·lbf)	
Oil filter cartridge	M20	1	17 Nm (1.7 m·kgf, 12 ft·lbf)	
Oil filter cartridge union bolt	M20	1	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Oil level switch bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Engine oil drain bolt	M14	1	43 Nm (4.3 m·kgf, 31 ft·lbf)	
Oil delivery pipe 1 bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil delivery pipe 2 bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Throttle body bolt	M5	3	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Front cylinder intake manifold joint bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Rear cylinder intake manifold joint bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Air filter case cover bolt	M5	4	2 Nm (0.2 m·kgf, 1.4 ft·lbf)	
Intake air pressure sensor bolt	M5	1	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Air filter case stay nut	M6	1	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Exhaust pipe nut	M8	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Muffler band bolt	M8	1	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Muffler and muffler bracket bolt	M10	2	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Rear exhaust pipe joint nut	M8	2	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Exhaust pipe bolt	M8	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Rear exhaust pipe joint cover bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Exhaust pipe stay and exhaust pipe bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Exhaust pipe stay and frame bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
O ₂ sensor	M10	1	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Crankcase stud bolt (long)	M12	6	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Crankcase stud bolt (short)	M12	2	15 Nm (1.5 m·kgf, 11 ft·lbf)	
Left crankcase bolt	M6	19	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Right crankcase bolt	M10	3	36 Nm (3.6 m·kgf, 25 ft·lbf)	
Right crankcase bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Generator cover bolt	M6	12	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Primary drive gear cover bolt	M6	12	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	l = 40 mm (1.57 in) 
Primary drive gear cover bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	l = 65 mm (2.56 in) 
Oil nozzle	M6	1	0.5 Nm (0.05 m·kgf, 0.35 ft·lbf)	
Stator coil bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Crankshaft position sensor bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil baffle plate 1 bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil baffle plate 2 bolt	M6	5	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Primary drive gear bearing plate bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Drive pulley cover bolt	M6	5	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Primary drive gear plastic cover 1 bolt	M6	3	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Primary drive gear plastic cover 2 bolt	M6	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Starter clutch bolt	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Primary drive gear nut	M18	1	100 Nm (10 m·kgf, 72 ft·lbf)	 Use a lock washer.
Clutch boss nut	M20	1	125 Nm (12.5 m·kgf, 90 ft·lbf)	Stake.
Clutch spring plate retainer bolt	M6	6	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Drive pulley nut	M22	1	140 Nm (14 m·kgf, 100 ft·lbf)	 Stake.
Bearing retainer bolt	M6	4	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Shift shaft spring stopper	M8	1	22 Nm (2.2 m·kgf, 16 ft·lbf)	
Neutral switch	M10	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Starter motor bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	

TIGHTENING TORQUES

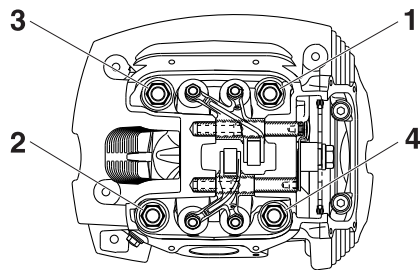
Item	Thread size	Q'ty	Tightening torque	Remarks
Speed sensor bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Speed sensor bracket bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Speed sensor lead bracket screw	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	

TIP

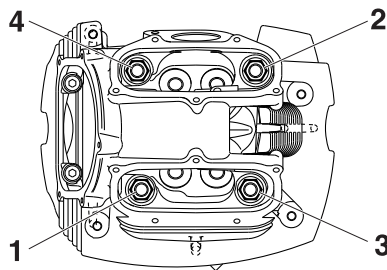
Cylinder head nut

1. Apply engine oil on the screw part of the bolt and both sides of the washer well.
2. Follow the tightening direction and tighten to 15 Nm (1.5 m·kgf, 11 ft·lbf).
3. Follow the tightening direction and tighten to 25 Nm (2.5 m·kgf, 18 ft·lbf).
4. Follow the tightening direction and tighten to 65 Nm (6.5 m·kgf, 47 ft·lbf).

Front cylinder head



Rear cylinder head



TIP






Connecting rod bolt

Tighten the connecting rod bolts to 15 Nm (1.5 m·kgf, 11 ft·lbf), and then tighten them further to reach the specified angle 125–135°.

TIGHTENING TORQUES

EAS20350









CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Engine mounting nut (front upper side)	M12	1	88 Nm (8.8 m·kgf, 64 ft·lbf)	
Engine mounting nut (front lower side)	M12	1	88 Nm (8.8 m·kgf, 64 ft·lbf)	
Engine mounting nut (rear upper side)	M12	1	88 Nm (8.8 m·kgf, 64 ft·lbf)	
Engine mounting nut (rear lower side)	M12	1	88 Nm (8.8 m·kgf, 64 ft·lbf)	
Engine bracket bolt (front upper side)	M10	2	48 Nm (4.8 m·kgf, 35 ft·lbf)	
Engine bracket bolt (rear upper side)	M10	2	48 Nm (4.8 m·kgf, 35 ft·lbf)	
Engine bracket bolt (rear lower side)	M10	2	48 Nm (4.8 m·kgf, 35 ft·lbf)	
Down tube and frame bolt	M10	4	48 Nm (4.8 m·kgf, 35 ft·lbf)	
Muffler bracket and flame bolt	M10	3	53 Nm (5.3 m·kgf, 38 ft·lbf)	
Ignition coil bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Clutch cable locknut (engine side)	M8	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Clutch cable locknut (middle side)	M8	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rectifier/regulator bracket bolt	M8	4	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Rectifier/regulator bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Clutch cable guide bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Clutch cable holder bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Throttle cable guide bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear shock absorber assembly lower nut	M10	1	48 Nm (4.8 m·kgf, 35 ft·lbf)	
Rear shock absorber assembly upper nut	M10	1	48 Nm (4.8 m·kgf, 35 ft·lbf)	
Pivot shaft nut	M16	1	85 Nm (8.5 m·kgf, 61 ft·lbf)	
Relay arm nut	M10	1	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Connecting arm and relay arm nut	M12	1	59 Nm (5.9 m·kgf, 43 ft·lbf)	
Connecting arm and swingarm nut	M12	1	59 Nm (5.9 m·kgf, 43 ft·lbf)	
Drive belt upper guard bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Drive belt lower guard and swing-arm bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Drive belt lower guard plate bolt (upper side)	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Drive belt lower guard plate bolt (lower side)	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel pump bolt	M5	6	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	See TIP
Fuel sender bolt	M6	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Fuel tank bracket bolt	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Seat lock bracket bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Seat bracket bolt	M8	2	19 Nm (1.9 m·kgf, 13 ft·lbf)	
Passenger seat bracket bolt	M8	2	16 Nm (1.6 m·kgf, 11 ft·lbf)	
Passenger seat guide bolt	M8	2	16 Nm (1.6 m·kgf, 11 ft·lbf)	
Passenger seat bolt	M8	2	16 Nm (1.6 m·kgf, 11 ft·lbf)	See TIP
Intake air pressure sensor bracket bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front wheel axle	M16	1	59 Nm (5.9 m·kgf, 43 ft·lbf)	
Front wheel axle pinch bolt	M8	2	20 Nm (2.0 m·kg, 14 ft·lb)	See TIP
Front brake caliper bracket bolt	M10	2	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Front brake caliper retaining bolt	M10	2	27 Nm (2.7 m·kgf, 19 ft·lbf)	
Front brake disc bolt	M8	6	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Bleed screw (front brake caliper)	M7	1	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Rear wheel axle nut	M18	1	150 Nm (15 m·kgf, 110 ft·lbf)	
Rear brake caliper retaining bolt	M10	2	27 Nm (2.7 m·kgf, 19 ft·lbf)	
Rear brake disk bolt	M8	6	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Bleed screw (rear brake caliper)	M7	1	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Rear wheel pulley bolt	M6	5	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	
Rear wheel pulley self-locking nut	M12	5	95 Nm (9.5 m·kgf, 68 ft·lbf)	
Rear wheel drive hub stud bolt	M12	5	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Upper bracket pinch bolt	M8	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Steering stem nut	M22	1	110 Nm (11 m·kgf, 80 ft·lbf)	
Lower ring nut (initial tightening torque)	M25	1	52 Nm (5.2 m·kgf, 37 ft·lbf)	See TIP
Lower ring nut (final tightening torque)	M25	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	See TIP
Lower bracket pinch bolt	M8	4	45 Nm (4.5 m·kgf, 32 ft·lbf)	
Lower front fork cover bolt	M6	4	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Damper rod bolt	M38	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Cap bolt	M10	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Front brake master cylinder cap screw	M4	2	2 Nm (0.2 m·kgf, 1.4 ft·lbf)	
Lower handlebar holder nut	M12	2	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Upper handlebar holder bolt	M8	4	28 Nm (2.8 m·kgf, 20 ft·lbf)	See TIP
Clutch lever holder bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Front brake master cylinder holder bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	See TIP
Front brake hose union bolt	M10	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Front brake hose holder and lower bracket bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Front brake hose holder bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front brake hose joint bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Front fender bolt	M8	4	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Headlight bracket bolt	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	

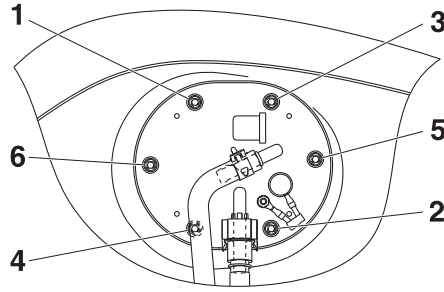
TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Headlight body screw	M5	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Headlight stay bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front turn signal light nut	M10	2	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	
Air temperature sensor screw	M5	1	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Throttle cable locknut	M6	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Rear fender and frame bolt (front side)	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Rear fender and frame bolt (rear side)	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Taillight and rear fender nut	M6	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
License plate bracket and rear fender bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear turn signal light nut	M10	2	11 Nm (1.1 m·kgf, 8.0 ft·lbf)	
Left side cover bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Right side cover bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Right side cover (lower) bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Positive battery lead bolt (starter relay side)	M6	1	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Starter motor lead bolt (starter relay side)	M6	1	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Battery box bolt	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Lean angle sensor bracket bolt	M4	2	2 Nm (0.2 m·kgf, 1.4 ft·lbf)	
Sidestand bracket bolt	M10	2	56 Nm (5.6 m·kgf, 40 ft·lbf)	
Sidestand switch bolt	M5	2	4 Nm (0.4 m·kgf, 2.9 ft·lbf)	
Sidestand nut	M10	1	64 Nm (6.4 m·kgf, 46 ft·lbf)	
Rider footrest assembly nut (left)	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Rider footrest assembly nut (right)	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Passenger footrest bolt (left and right)	M8	4	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Rear brake master cylinder bracket bolt	M8	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Brake fluid reservoir bolt	M6	1	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Rear brake hose guide bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Rear brake hose union bolt	M10	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Rear brake hose holder bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rider footrest assembly bolt (left and right)	M10	4	48 Nm (4.8 m·kgf, 35 ft·lbf)	
Horn bracket and down tube bolt	M8	1	30 Nm (3.0 m·kgf, 22 ft·lbf)	

TIP

Fuel pump bolt

Tighten the fuel pump bolts in the proper tightening sequence as shown in the illustration.



TIP**Passenger seat bolt**

Tighten the left side first, then the right side.

TIP**Front wheel axle pinch bolt**

Tighten the front wheel axle pinch bolts to specification twice. Tighten the inside and outside bolts alternately, starting with the inside bolt.

TIP**Lower ring nut**

1. First, tighten the lower ring nut to approximately 52 Nm (5.2 m·kgf, 37 ft·lbf) with a torque wrench, then loosen the lower ring nut completely.
 2. Retighten the lower ring nut to 18 Nm (1.8 m·kgf, 13 ft·lbf) with a torque wrench.
-

TIP**Upper handlebar holder bolt**

First, tighten the bolts on the front side of the upper handlebar holder, and then on the rear side.

TIP**Front brake master cylinder holder bolt**

First, tighten the upper bolt, then the lower bolt.






























LUBRICATION POINTS AND LUBRICANT TYPES

EAS20360

LUBRICATION POINTS AND LUBRICANT TYPES

EAS20370























ENGINE

Lubrication point	Lubricant
Oil seals (lip)	
O-rings	
Bearings	
Cylinder head nuts and washers	
Connecting rods (small end and big end)	
Crankshaft journals	
Pistons	
Piston pins (outer surface)	
Camshaft cam lobes and camshaft journals	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Rocker arm shafts	
Oil strainer	
Cylinder head bolts	
Starter clutch idle gear 1 shaft	
Starter clutch idle gear 1	
Starter clutch gear (inner and outer surfaces)	
Starter clutch and metal-to-metal moving parts	
Starter clutch idle gear 2	
Primary driven gear (inner surface)	
Clutch pull rod	
Oil pump drive sprocket (inner surface)	
Clutch thrust washers	
Clutch boss nut and washer	
Transmission gears (wheel and pinion) and collar	
Shift forks and shift fork guide bars	
Shift drum	
Shift shaft and shift shaft oil seal (lip)	
Crankcase (mating surface)	Yamaha bond No.1215 (Three Bond No.1215®)
Crankshaft position sensor lead grommet	Yamaha bond No.1215 (Three Bond No.1215®)
Crankcase breather pipe	

LUBRICATION POINTS AND LUBRICANT TYPES

EAS20380

CHASSIS

Lubrication point	Lubricant
Steering bearings and upper bearing race cover (lip)	
Lower bearing steering seal (lip)	
Front wheel oil seals (lip)	
Rear wheel oil seal (lip)	
Rear wheel drive hub (mating surface)	
Brake pedal shaft (pivoting point)	
Shift pedal (pivoting point)	
Sidestand (pivoting point) and metal-to-metal moving parts	
Throttle grip tube guide (inner surface) and throttle cables	
Brake lever (pivoting point) and metal-to-metal moving parts	
Brake master cylinder push rod (contact surface)	
Clutch lever (pivoting point) and metal-to-metal moving parts	
Swingarm pivot bearings (inner surface)	
Swingarm pivot oil seals (lip)	
Rear shock absorber assembly upper bolt	
Connecting arm and swingarm collar (outer surface)	
Relay arm bearings (inner surface)	
Relay arm oil seals (lip)	
Pivot shaft (outer surface)	
Rear wheel axle (outer surface)	
Engine mounting bolt (front lower side) (thread part)	
Relay arm bolt (thread part)	

LUBRICATION POINTS AND LUBRICANT TYPES

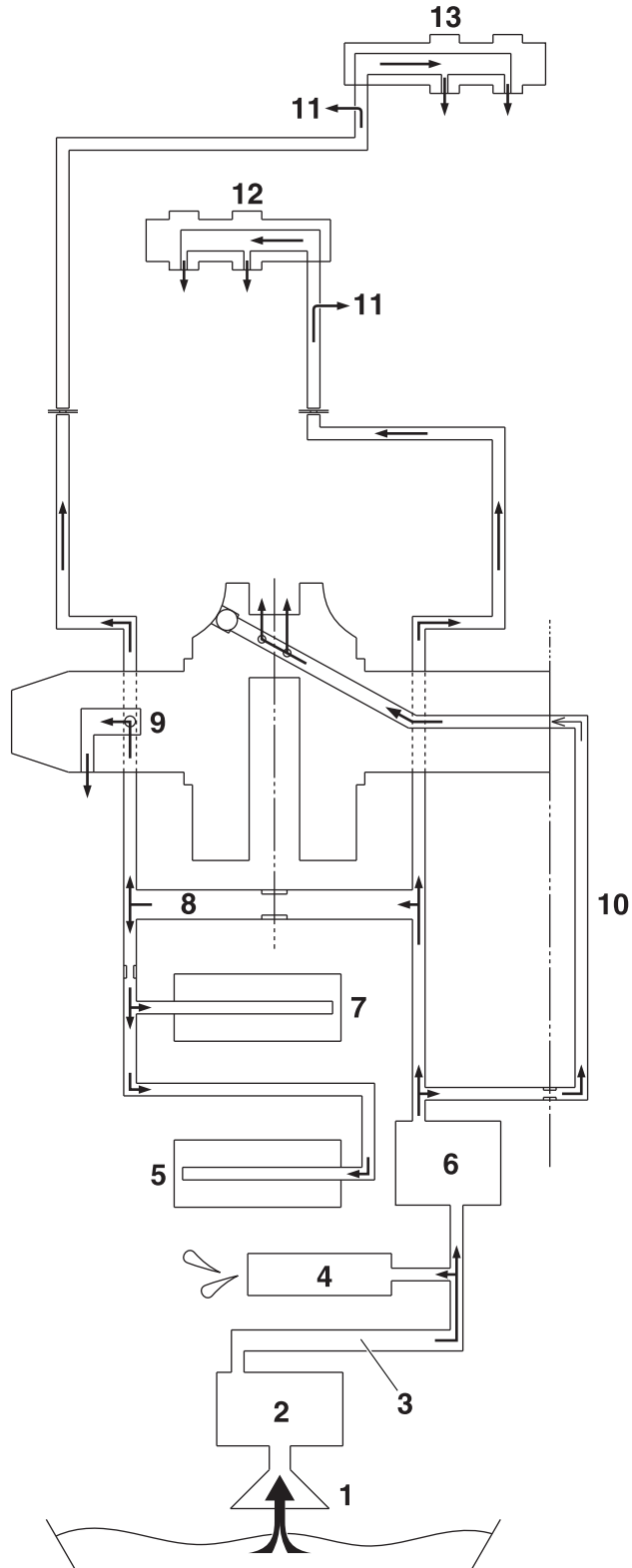
LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20390

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20400

ENGINE OIL LUBRICATION CHART



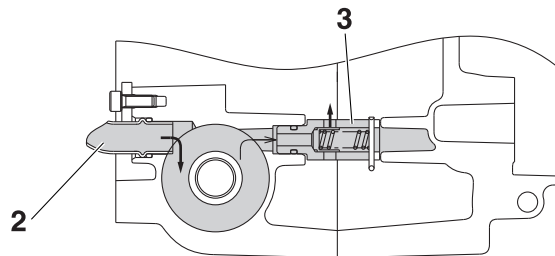
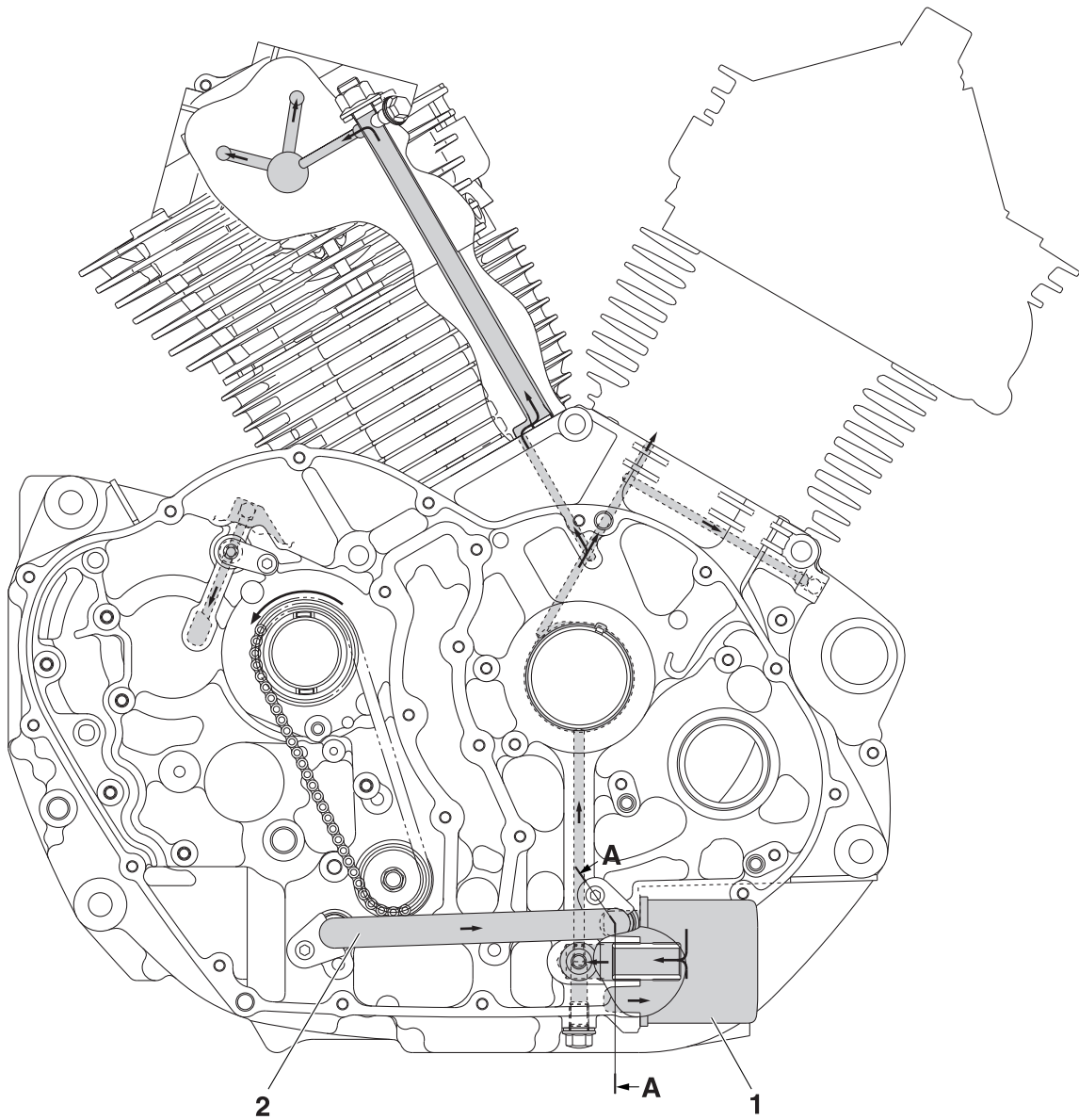
LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil strainer
2. Oil pump assembly
3. Oil delivery pipe 2
4. Relief valve assembly
5. Drive axle
6. Oil filter cartridge
7. Main axle
8. Main gallery
9. Crankshaft
10. Clutch cover
11. Valve stem end (intake side)
12. Rear cylinder camshaft
13. Front cylinder camshaft

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20410

LUBRICATION DIAGRAMS

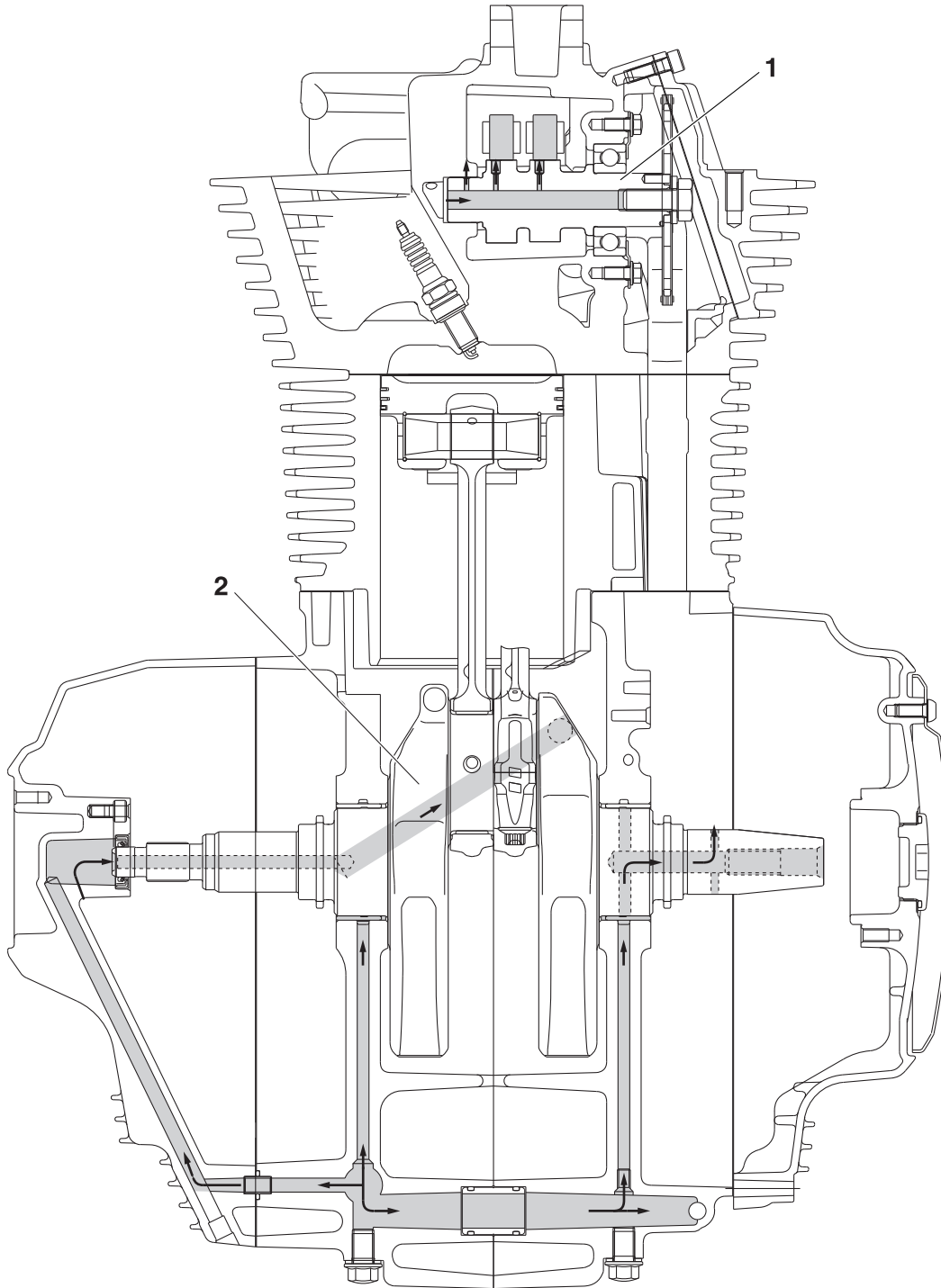


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LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil filter cartridge
2. Oil delivery pipe 2
3. Relief valve assembly

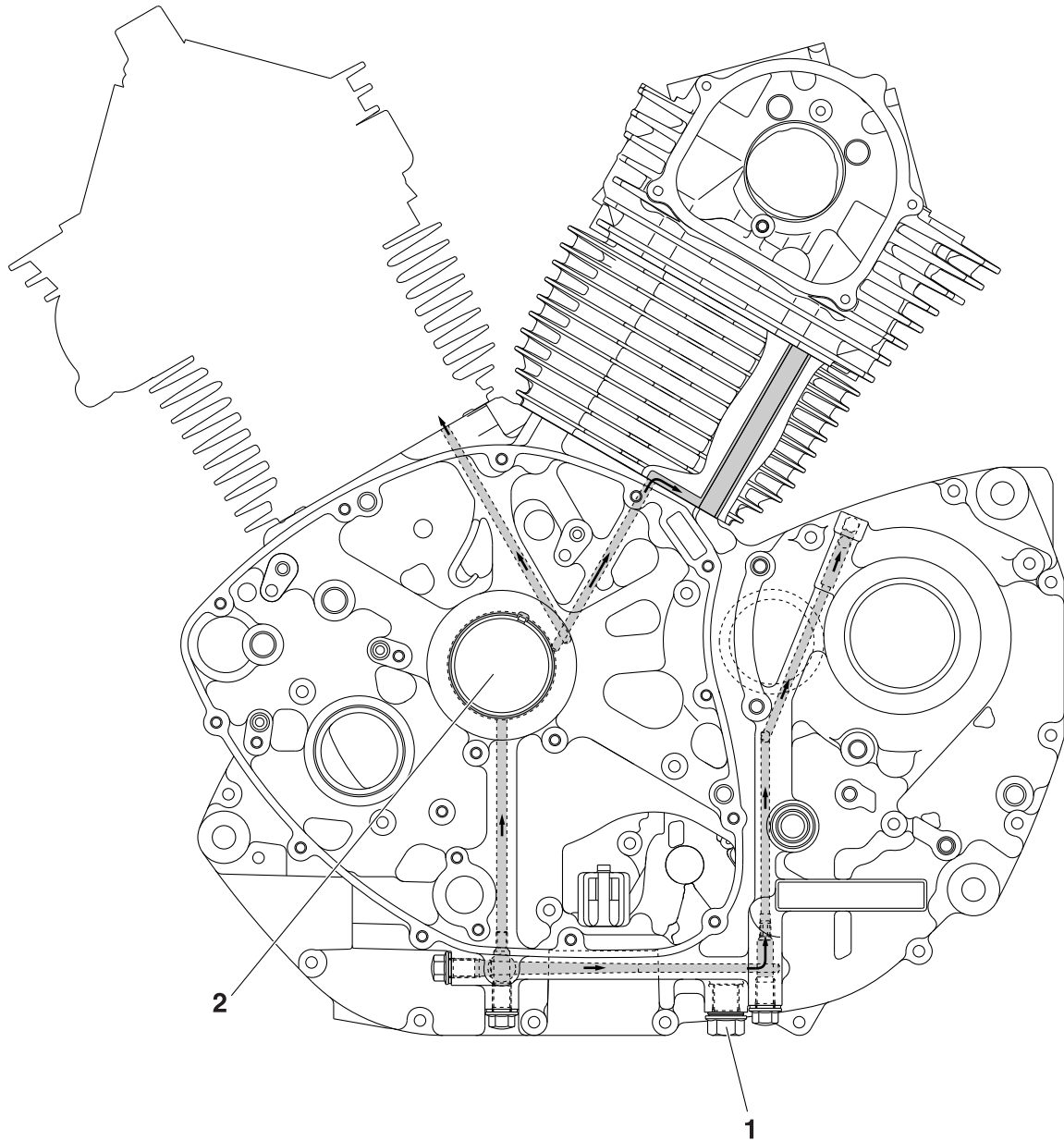
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Camshaft
2. Crankshaft

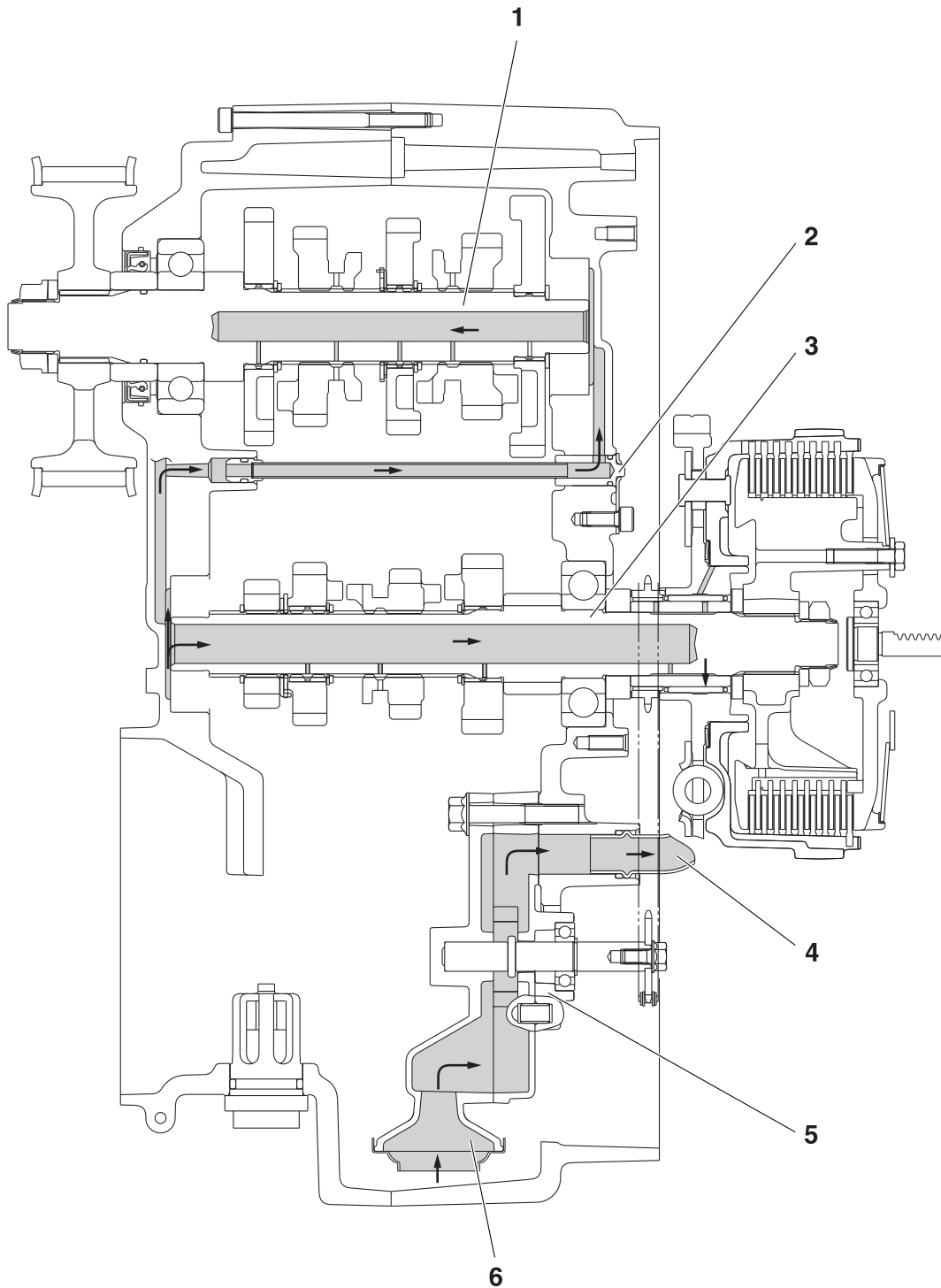
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil drain bolt
2. Crankshaft

LUBRICATION SYSTEM CHART AND DIAGRAMS

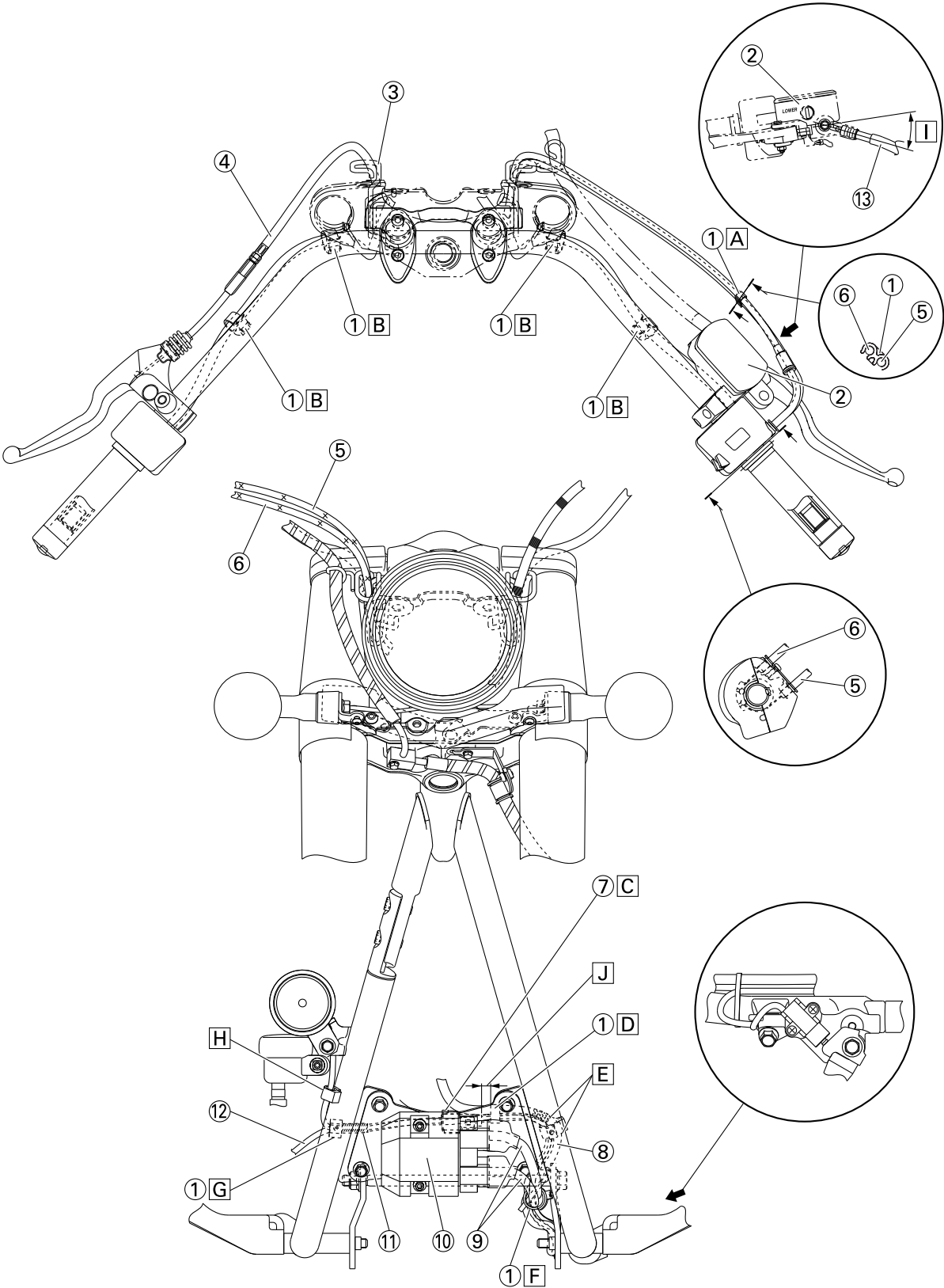


LUBRICATION SYSTEM CHART AND DIAGRAMS

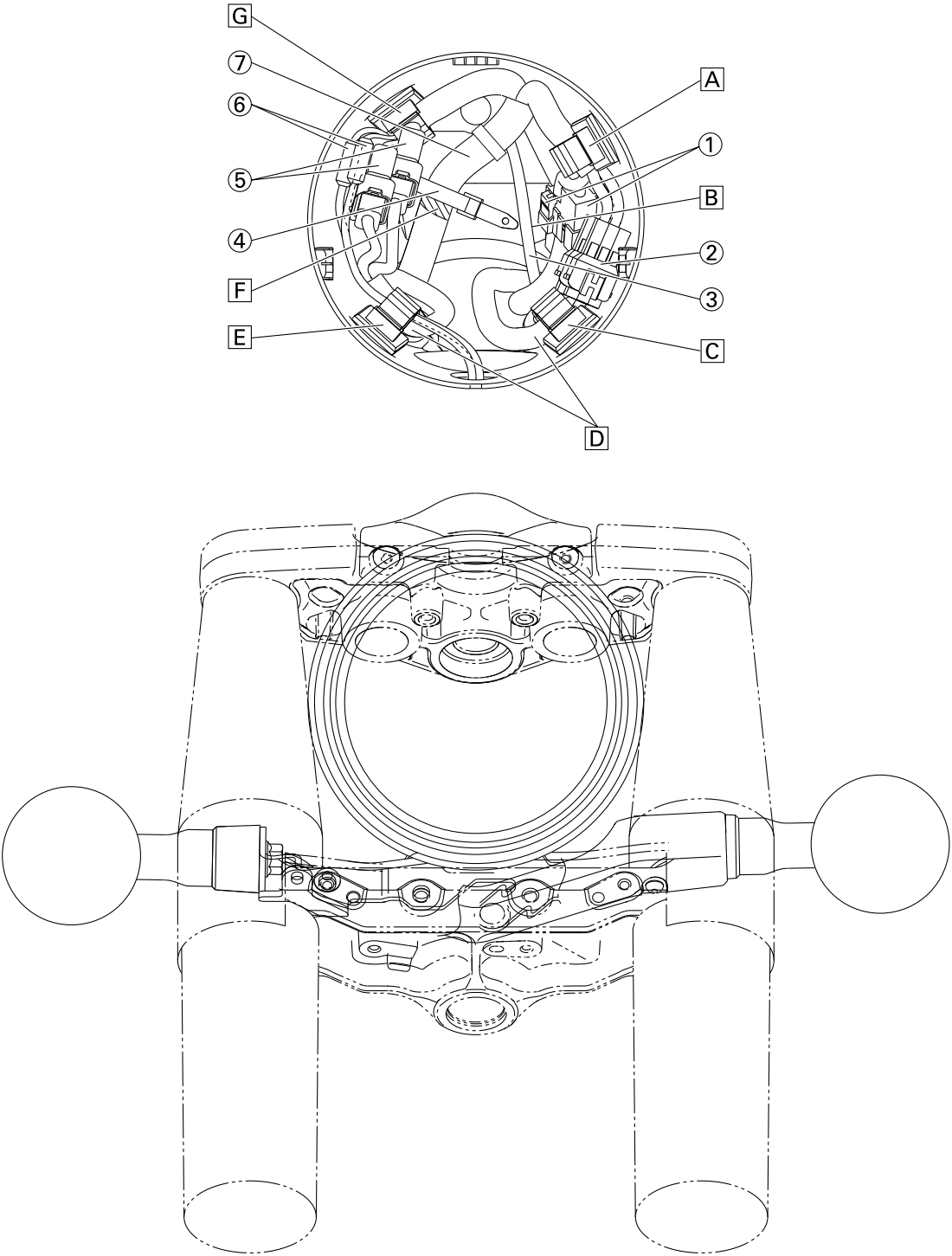
1. Drive axle
2. Oil delivery pipe 1
3. Main axle
4. Oil delivery pipe 2
5. Oil pump assembly
6. Oil strainer

EAS20430

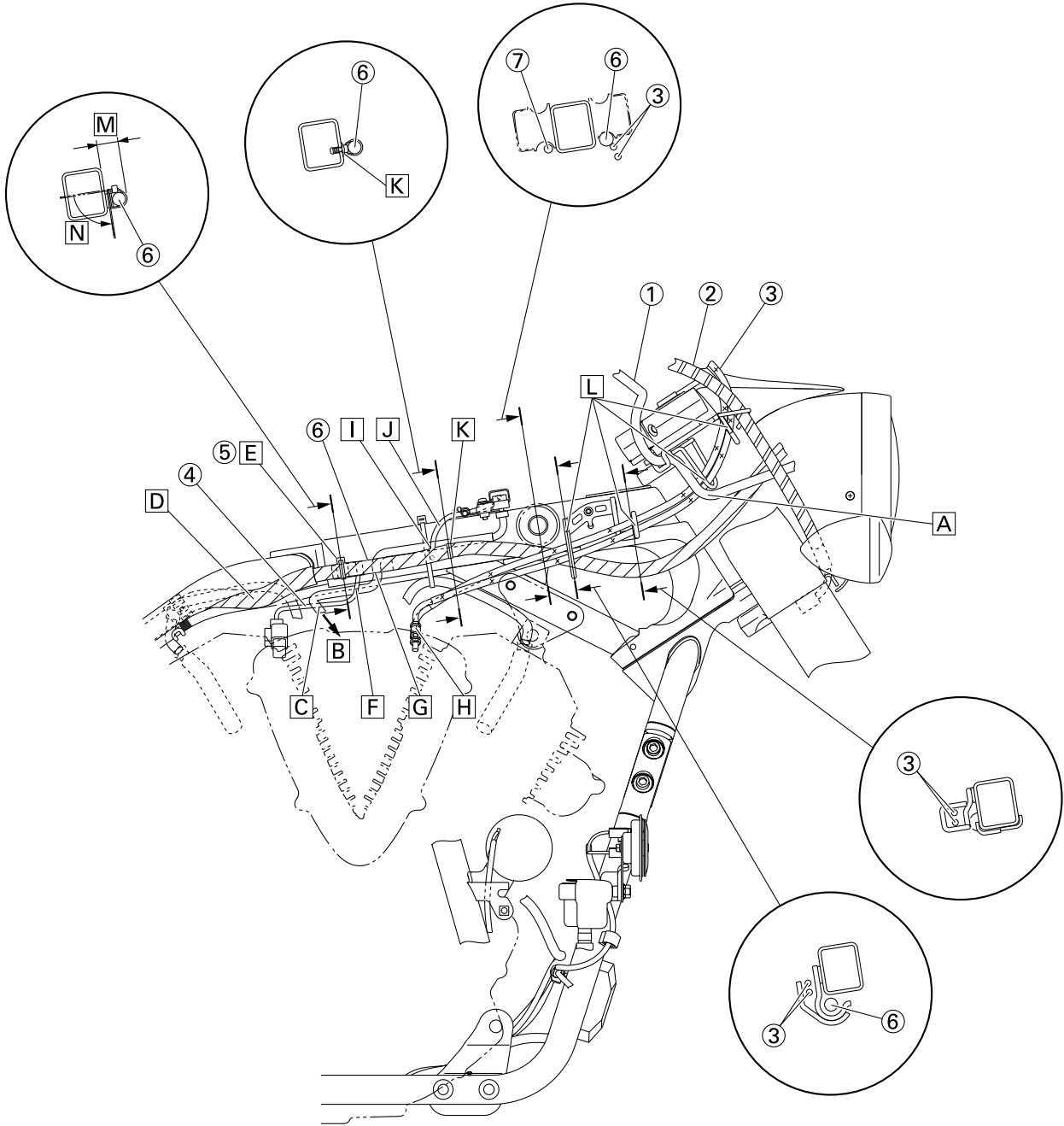
CABLE ROUTING



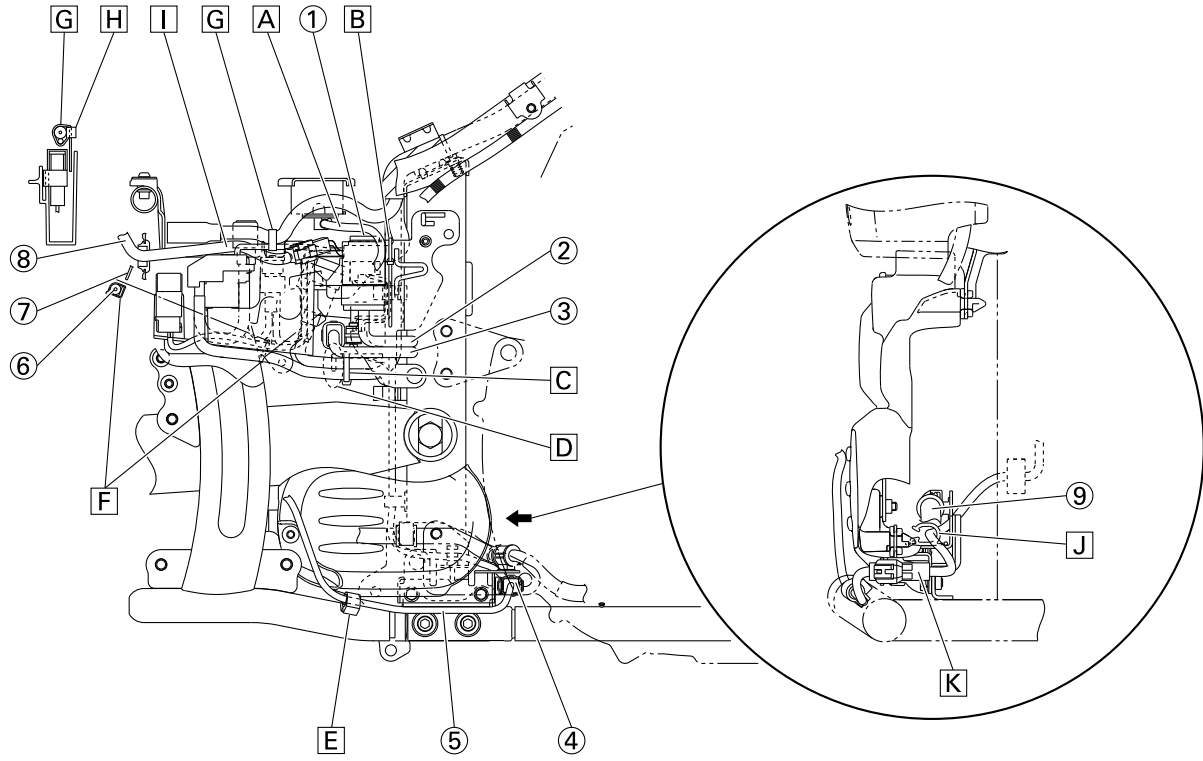
1. Clamp
 2. Front brake master cylinder
 3. Clutch cable guide
 4. Clutch cable
 5. Throttle cable (pull side)
 6. Throttle cable (return side)
 7. Rear brake light switch coupler
 8. Starter motor lead
 9. Rectifier/regulator lead
 10. Rectifier/regulator
 11. Corrugate tube
 12. Rear brake light switch lead
 13. Front brake hose
-
- A. Install the clamp by adjusting to the front brake hose union bolt position.
 - B. Clamp the handlebar switch lead. Face the clamp opening to the back of the vehicle.
 - C. Insert the rear brake light switch coupler into the rectifier/regulator bracket completely.
 - D. Clamp the starter motor lead, horn lead and rear brake light switch lead. Opening can face any direction.
 - E. The lower end of the mark (gray) on the starter motor lead should be above the lower end of the clamp.
 - F. Clamp the AC magneto lead and rectifier/regulator lead. Face the ends of the hose clamp up.
 - G. Clamp the horn lead and rear brake light switch lead at the edge of the corrugate tube. Face the ends of the hose clamp down.
 - H. Clamp the horn lead. Face the opening to the front.
 - I. Make sure the front brake hose positioned within 25° as shown in the illustration.
 - J. 10–20 mm (0.39–0.79 in)



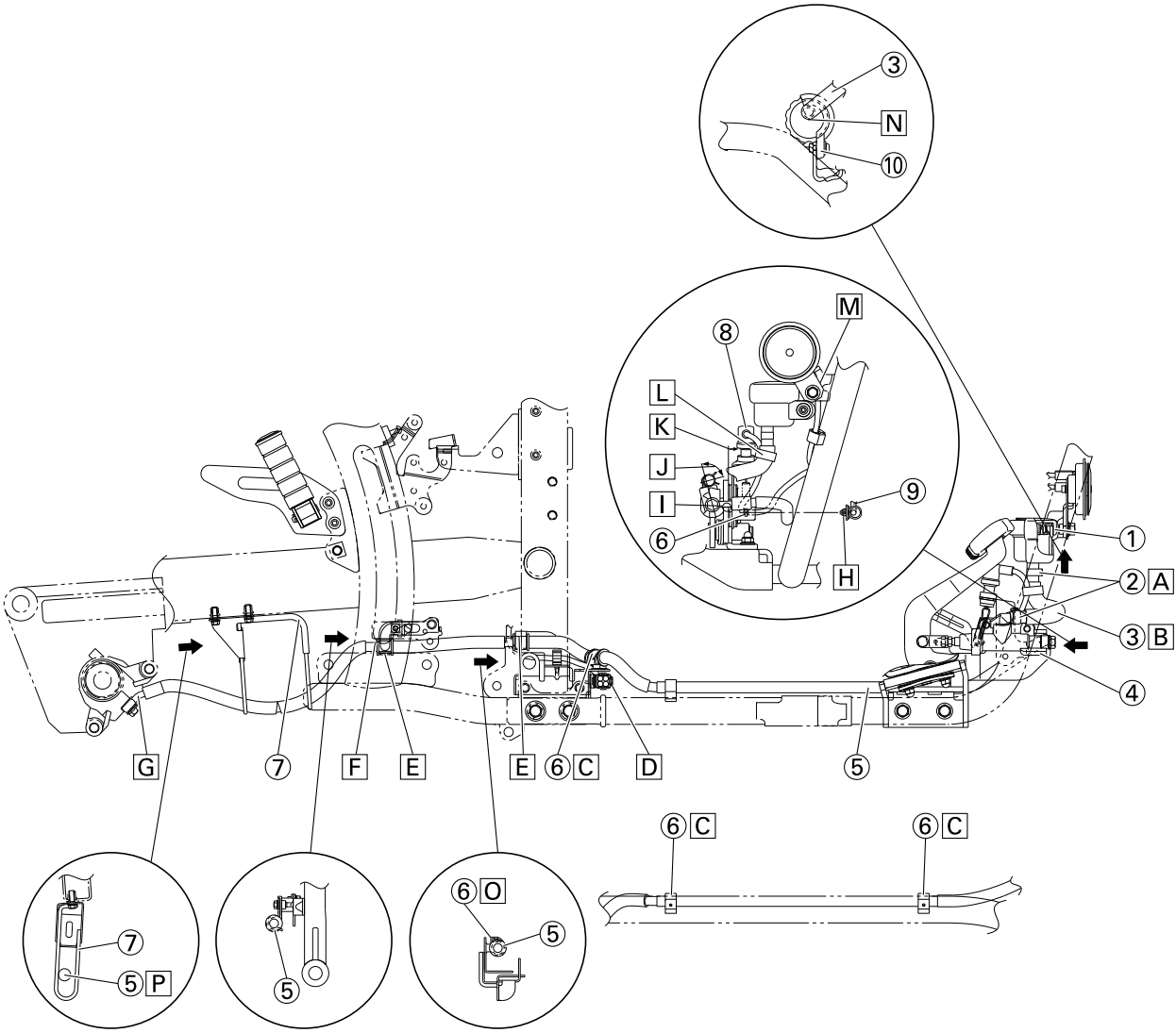
1. Main switch couplers
 2. Left handlebar switch couplers
 3. Intake air temperature sensor lead
 4. Clamp
 5. Right handlebar switch couplers
 6. Front turn signal light coupler
 7. Wire harness
-
- A. Route the main switch and left handlebar switch lead.
 - B. Route the intake air temperature sensor lead above the main switch lead and left handlebar switch lead.
 - C. Route the left handlebar switch lead.
 - D. Clamp the handlebar switch lead at the positioning tape.
 - E. Route the right handlebar switch lead and front turn signal light lead.
 - F. Clamp inside the positioning taped area.
 - G. Route the right handlebar switch lead, front turn signal light lead, joint coupler lead and passing coupler lead.



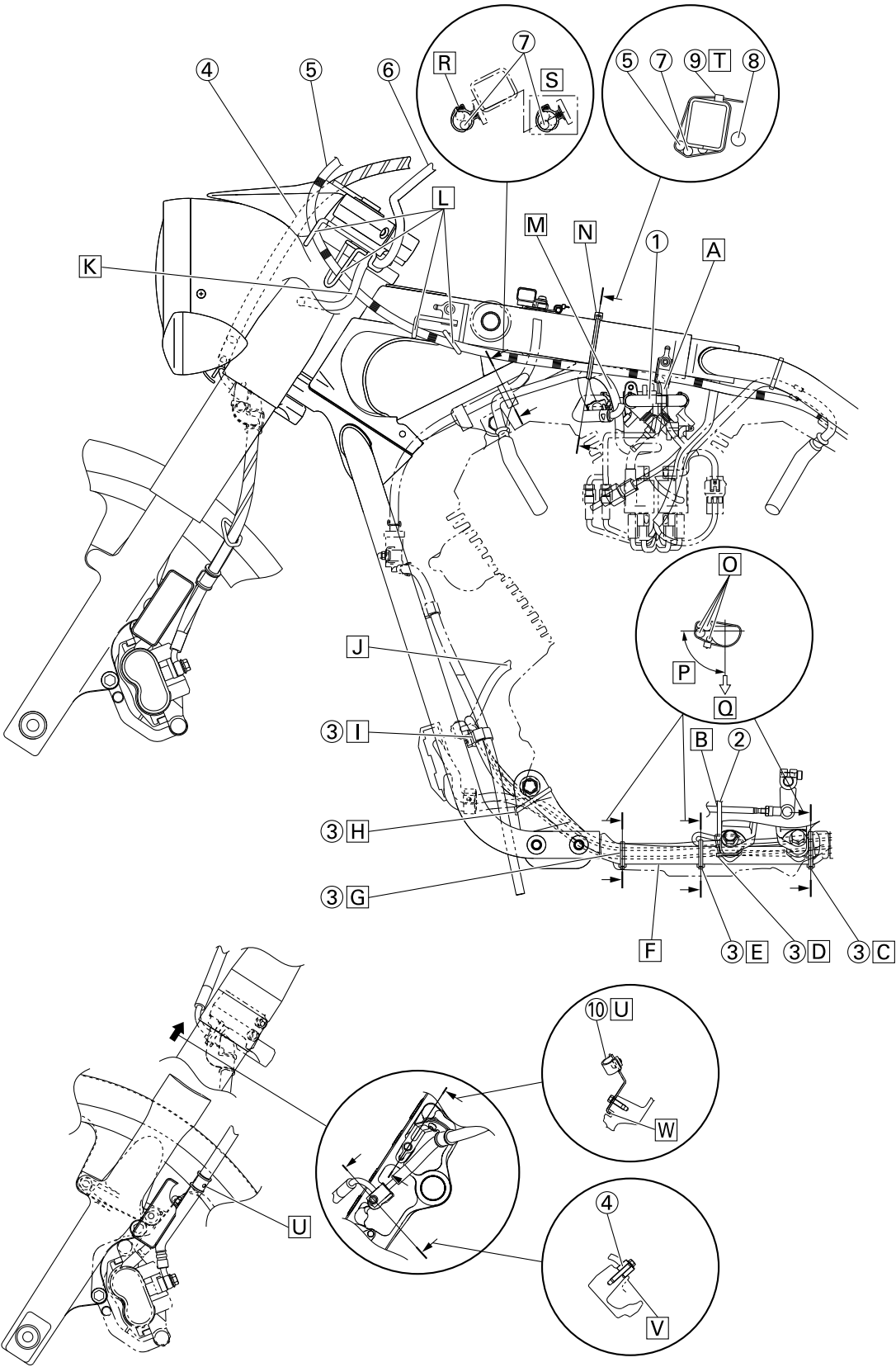
1. Handlebar switch lead
 2. Front brake hose
 3. Throttle cable
 4. TPS (throttle position sensor) lead
 5. Plastic band
 6. Wire harness
 7. Clutch cable
-
- A. Route the handlebar switch lead outside of the throttle cable.
 - B. To the throttle bodies
 - C. Route the throttle position sensor lead under the intake air pressure sensor air hose.
 - D. Route the clutch cable under the wire harness.
 - E. Clamp the wire harness to the bracket, behind the branched section of the throttle position sensor lead.
 - F. Route the throttle position sensor lead outside of the intake air pressure sensor air hose.
 - G. Branch to throttle position sensor
 - H. Put the marking of the throttle cable (return side) between the tabs of throttle body.
 - I. Branch to intake air pressure sensor
 - J. Route the intake air pressure sensor lead outside of the hose.
 - K. Make sure to insert the wire harness clamp to the frame hole.
 - L. Pass the throttle cable through the guide.
 - M. Face the lock within this area.
 - N. Face the end inside and route the clamp through the clearance with the frame.



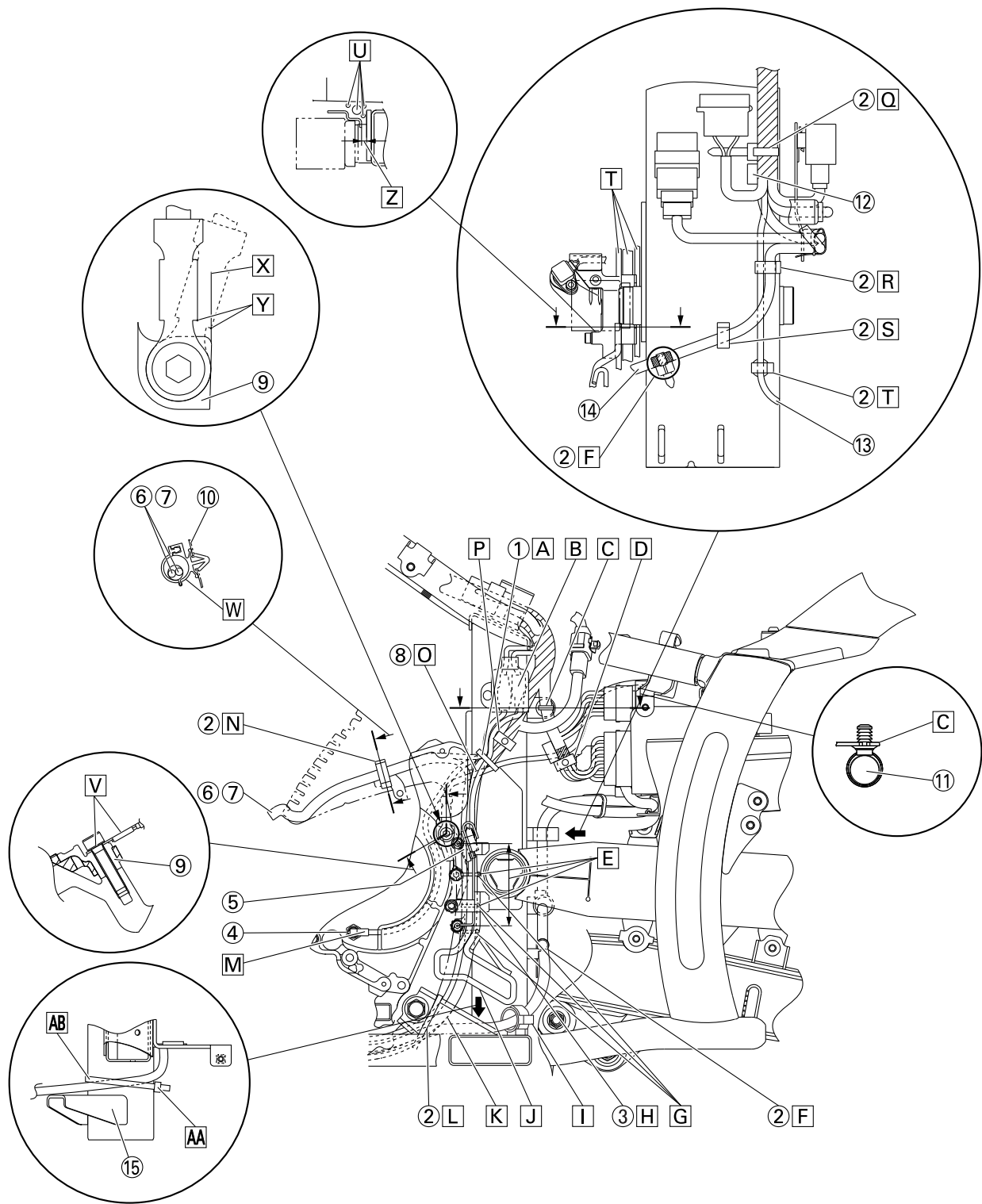
1. Relay unit
 2. Relay unit lead
 3. Lean angle sensor lead
 4. O₂ sensor lead coupler
 5. O₂ sensor lead
 6. Starter motor lead
 7. Bracket
 8. Taillight lead
 9. Rear brake hose
-
- A. Route the seat lock cable under the joint coupler lead.
 - B. Clamp the taillight lead, starter motor lead, main fuse lead and headlight relay lead with the bracket. Face the end down.
 - C. Clamp the rear right turn signal light lead and starter motor lead with the bracket. Face the end inside.
 - D. Route the rear right turn signal light lead and starter motor lead outside of the guide wire.
 - E. Clamp the O₂ sensor lead. Face the opening outside.
 - F. Clamp the starter motor lead to the bracket with the sheet dropping key rotor. Face the lock inside and down. Cut off the excess end.
 - G. Clamp the joint coupler lead and starter motor lead.
 - H. Face the lock of the clamp toward outside.
 - I. Route the taillight lead inner side of the starter motor lead.
 - J. Clamp the O₂ sensor lead. Face the clamp opening to outside.
 - K. Insert the coupler on the harness side of the O₂ sensor lead to the rear brake hose bracket clamp.



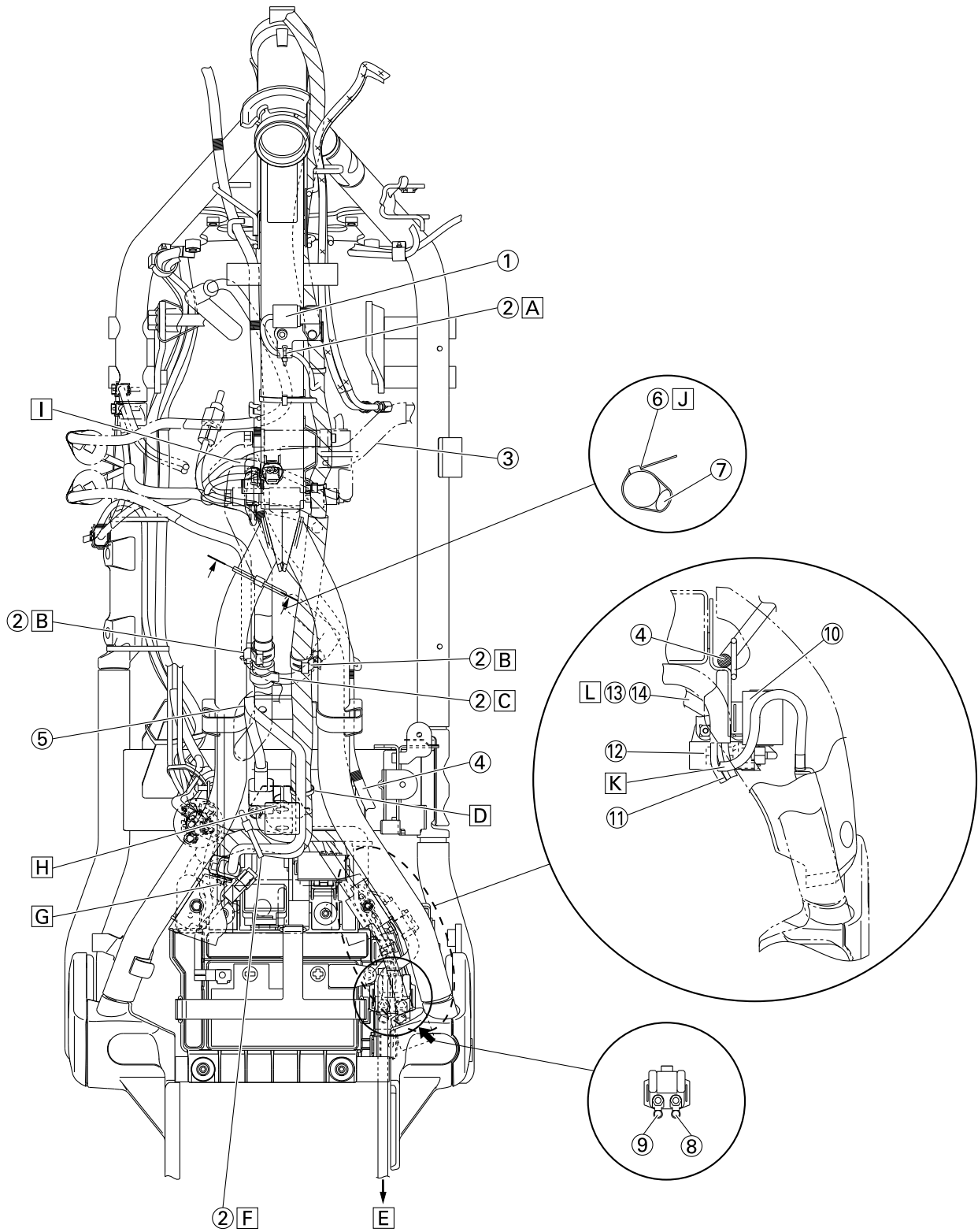
1. Brake fluid reservoir
 2. Clip
 3. Brake fluid reservoir hose
 4. Rear brake master cylinder
 5. Rear brake hose
 6. Clamp
 7. Rear brake hose holder
 8. Rear brake light switch
 9. Rear brake light switch lead
 10. Brake fluid reservoir cover
-
- A. Face the clip's knob of the reservoir tank side to front and master cylinder side to inside.
 - B. Make sure to insert the reservoir hose to the brake fluid reservoir and rear brake master cylinder.
 - C. Face the opening of the hose clamp outward.
 - D. Make sure to insert the O₂ sensor coupler to the clamp.
 - E. When installing the grommet, soapsuds can be applied.
 - F. Install the rear brake hose with its paint mark facing up.
 - G. Install the rear brake hose onto the rear brake caliper, making sure that the brake pipe touches the projection on the caliper.
 - H. Make sure to insert the clamp.
 - I. Install the rear brake hose onto the rear brake master cylinder, making sure that the brake pipe touches the projection on the rear brake master cylinder bracket.
 - J. 90°
 - K. Install the clamp under the reservoir tank ahead of the line and toward the direction of the arrow.
 - L. Clamp the rear brake light switch lead and reservoir hose protector. Face the opening in any direction.
 - M. Make sure to put the horn stay against the stopper.
 - N. When installing the brake fluid reservoir hose, face the paint (ø5) inside.
 - O. Face the opening of the hose clamp upward.
 - P. Make sure to route the rear brake hose through the rear brake hose holder.



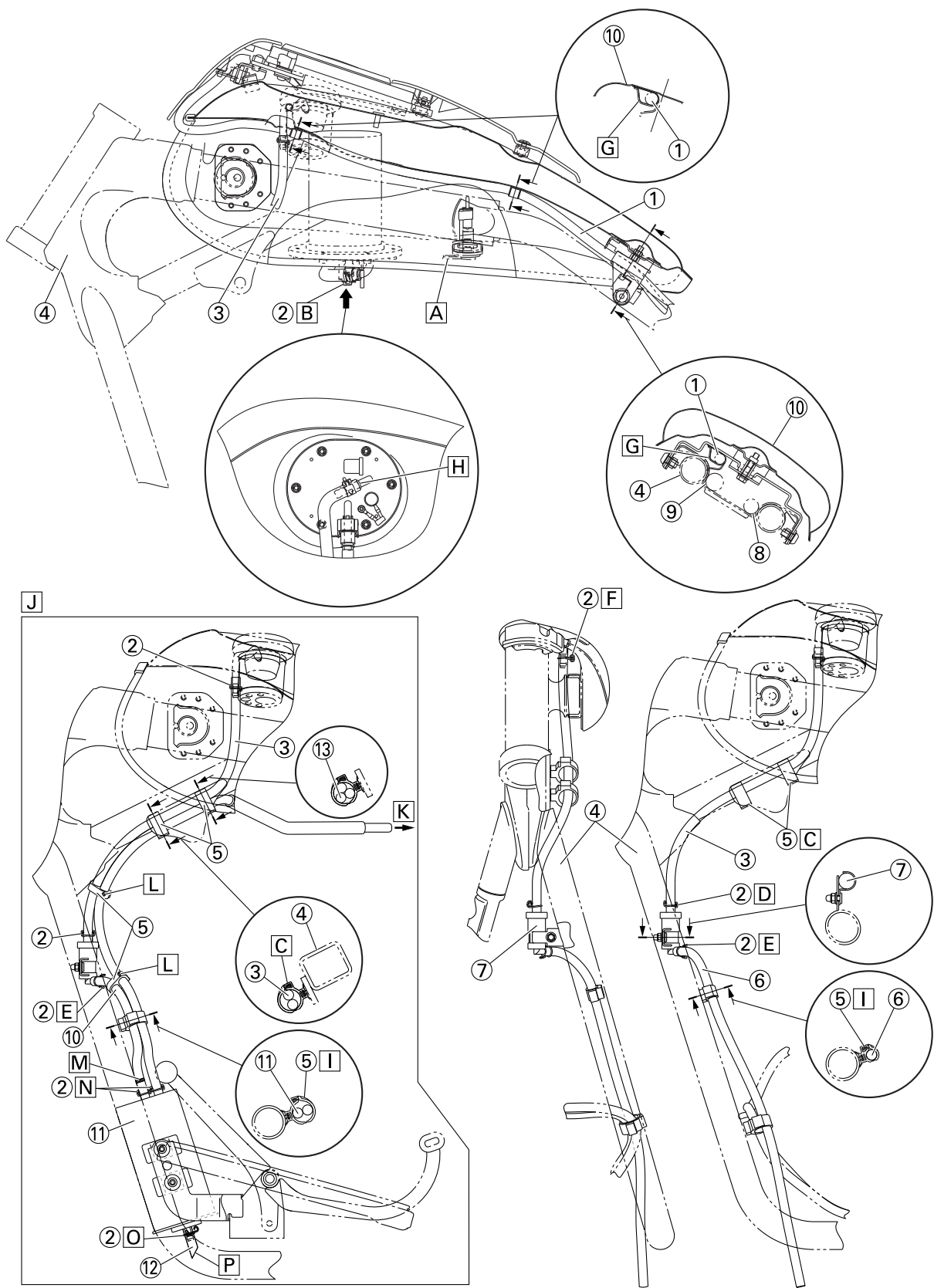
1. Fuel delivery hose
 2. Sidestand switch lead
 3. Clamp
 4. Front brake hose
 5. Clutch cable
 6. Handlebar switch lead
 7. Spark plug lead
 8. Wire harness
 9. Plastic band
 10. Front brake hose holder
-
- A. With white tape
 - B. Route the sidestand switch lead outside of the shift rod.
 - C. Clamp the starter motor lead, sidestand switch lead, AC magneto lead, oil level switch lead, rectifier/regulator lead, rear brake switch lead and horn lead. Face the lock down and cut off the excess end.
 - D. Clamp the sidestand switch lead. Face the lock down and cut off the excess end.
 - E. Clamp the starter motor lead, sidestand switch lead, AC magneto lead, rectifier/regulator lead, rear brake switch lead and horn lead. Face the lock down and cut off the excess end.
 - F. Make sure that the lead and harness not protrude out from bottom of the frame.
 - G. Clamp the starter motor lead, AC magneto lead, rectifier/regulator lead, rear brake switch lead and horn lead. Face the lock down and cut off the excess end.
 - H. Clamp the starter motor lead, rectifier/regulator lead, rear brake switch lead and horn lead to the engine mount boss. Face the lock to the front and cut off the excess end. Make sure to fasten the band to the engine boss.
 - I. Clamp the starter motor lead, rear brake switch lead, horn lead and fuel tank breather hose. Face the ends of the hose clamp outside.
 - J. To the starter motor
 - K. Route the handlebar switch lead outside of the clutch cable.
 - L. Pass the clutch cable through the guide.
 - M. Route the spark plug lead inner side of the fuel return hose and fuel hose.
 - N. Clamp 30 mm within where the frame is glued.
 - O. Lead, harness (order insignificant)
 - P. Face the clamp lock in this area.
 - Q. Bottom of the vehicle
 - R. Face the opening of the hose clamp upward.
 - S. For California
 - T. Clamp the spark plug lead and clutch cable. Face the clamp lock upward. Face the clamp end to the right.
 - U. When fitting to the front brake hose, soap-suds or silicon fluid can be applied.
 - V. Press the brake hose against the stopper and tighten.
 - W. Insert the front brake hose holder tab into the stopper hole.



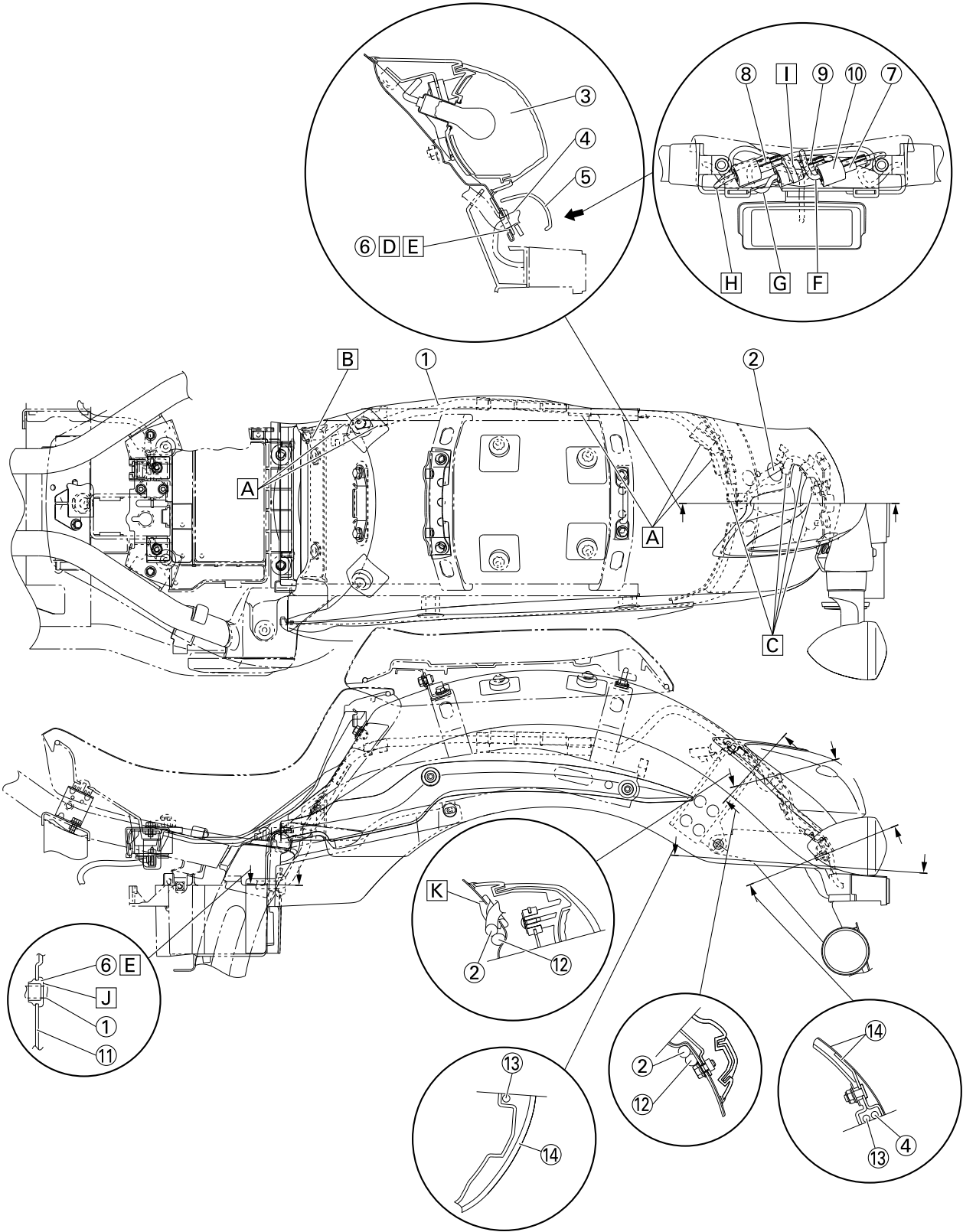
-
1. Plastic band
 2. Clamp
 3. Speed sensor lead bracket
 4. Neutral switch
 5. Speed sensor
 6. AC magneto lead
 7. Crankshaft position sensor
 8. Negative battery lead
 9. Drive pulley housing
 10. Engine
 11. Wire harness
 12. Joint connector
 13. O₂ sensor lead
 14. Starter motor lead
 15. Engine stay
- A. Clamp the speed sensor lead, negative battery lead, neutral switch lead, oil level switch lead, sidestand switch lead, crankshaft position sensor lead and wire harness. Face the lock upward and cut off the excess end.
 - B. Make sure to put the connector cover over the speed sensor coupler, neutral switch coupler, oil level switch coupler, sidestand switch coupler and crankshaft position sensor coupler.
 - C. Make sure to insert the clamp on harness side to the bracket hole.
 - D. Clamp the ECU lead (white tape side). Face the opening to the front.
 - E. Clamp around this section.
 - F. Clamp the starter motor lead. Face the end down (white tape is a guide for installation).
 - G. Clamp the sidestand switch lead, AC magneto lead, oil level switch lead, rectifier/regulator lead and horn lead. Cut off the excess end. Face the clamp's lock in any direction.
 - H. Fix the sidestand switch lead, AC magneto lead, oil level switch lead, rectifier/regulator lead, rear brake switch lead and horn lead with the speed sensor lead bracket.
 - I. Clamp the starter motor lead. Face the clamp's opening to outside.
 - J. Pass them inside the cable guide.
 - K. Route inside of the engine bracket.
 - L. Clamp the starter motor lead, sidestand switch lead, AC magneto lead, oil level switch lead, rectifier/regulator lead, rear brake switch lead and horn lead to the bracket. Face the lock down and cut off the excess end.
 - M. No slack of harness and face the end to the back.
 - N. Clamp the crankshaft position sensor.
 - O. Route through the innermost side.
 - P. Clamp the wire harness. Face the clamp's opening to front.
 - Q. Clamp the wire harness. Face the end inside.
 - R. Clamp the starter motor lead and O₂ sensor lead. Face the opening outside.
 - S. Clamp the starter motor lead. Face the opening up.
 - T. Clamp the O₂ sensor lead. Face the opening outside.
 - U. Lead, harness (order insignificant)
 - V. Tighten together with the drive pulley housing. Face the stake convex inside.
 - W. Direction of the opening is insignificant.
 - X. Side of the drive pulley housing.
 - Y. Make sure that these points are front of the side of the drive pulley housing.
 - Z. Leads other than rectifier/regulator lead, rear brake switch lead and horn lead can protrude from this space.
 - AA. Clamp the starter motor lead inner side of the engine stay.
 - AB. Route the clamp inner side of the starter motor lead at the front of the vehicle.



1. Intake air pressure sensor
 2. Clamp
 3. Crankcase breather hose
 4. Clutch cable
 5. Meter lead
 6. Plastic band
 7. Spark plug lead
 8. Starter motor lead (black)
 9. Battery lead (red)
 10. Relay unit
 11. Wire lead
 12. Lean angle sensor
 13. Lean angle sensor lead
 14. Relay unit lead
-
- A. Clamp the intake air pressure sensor lead with the bracket. Clamp by aligning to the white paint mark on the lead. Face the lock to the back and cut off the excess end.
 - B. Install with the opening facing up.
 - C. Clamp the crankcase breather hose and high tension code.
 - D. Make sure to insert the wire harness clamp to the frame hole.
 - E. To tail/brake light assembly
 - F. Clamp the wire harness, meter lead and battery negative lead.
Face the end to the front.
 - G. Make sure that a nail can be hooked in the seat lock bracket hole and insert until firmly fixed.
 - H. Make sure that a nail can be hooked in the frame hole and insert until firmly fixed.
 - I. Route the ISC (Idle Speed Control) valve sub lead in front of the crankcase breather hose.
 - J. Clamp the spark plug lead to the frame.
Face the lock and the end to inside.
 - K. Route above the wire lead.
 - L. To the wire harness



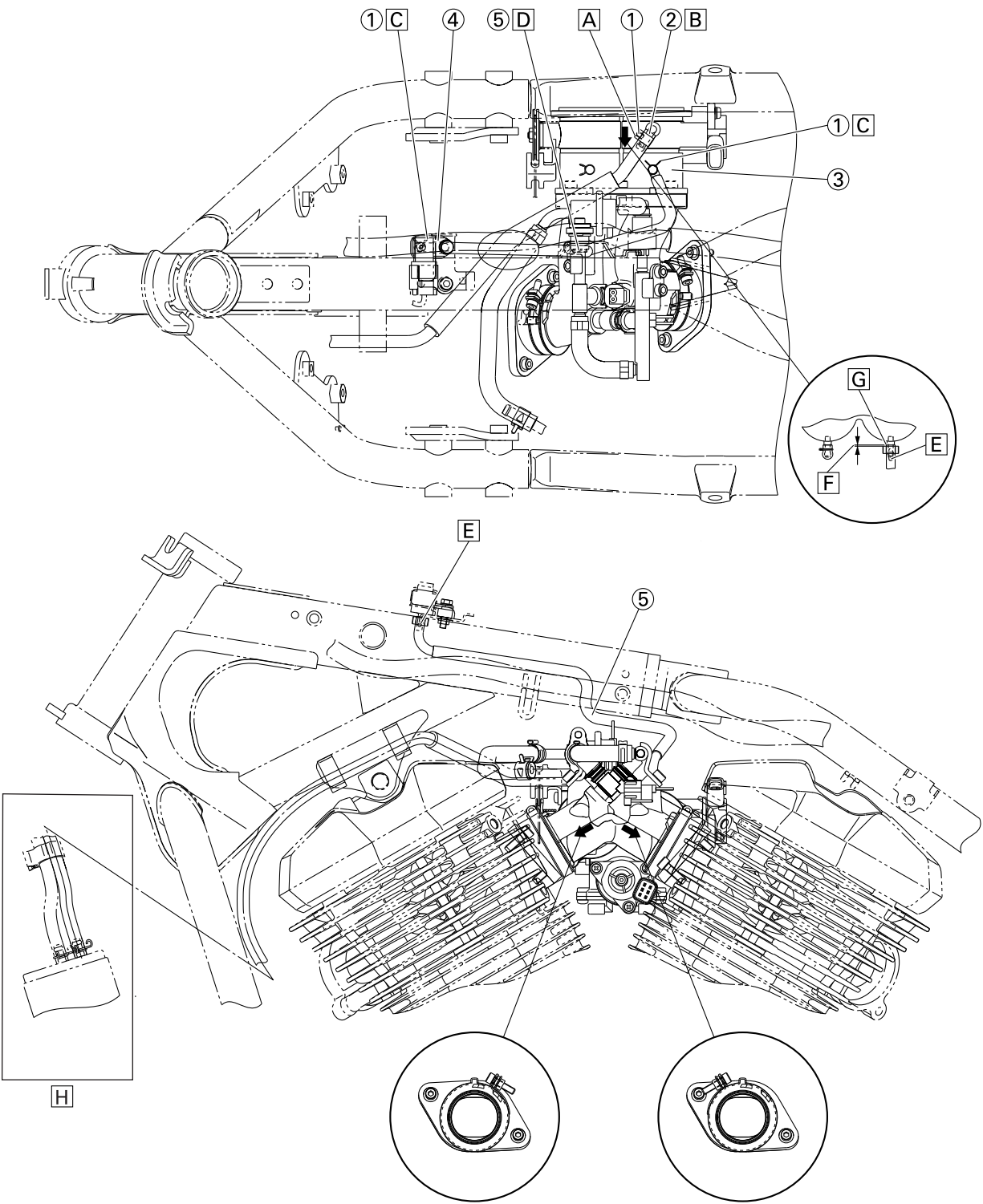
1. Meter lead
 2. Clip
 3. Fuel tank drain hose
 4. Frame
 5. Clamp
 6. Fuel tank breather hose
 7. Rollover valve
 8. Wire harness
 9. Crankcase breather hose
 10. Fuel tank
 11. Canister
 12. Canister breather hose
 13. Spark plug lead
-
- A. Face the fuel sender lead to the front.
 - B. Install the clip by adjusting its knob to the mark.
 - C. Face the ends of the hose clamp upward.
 - D. Face the clip's knob to the right.
 - E. Face the clip's knob to the back.
 - F. Face the clip's knob to the left.
 - G. After routing the meter lead, bend the clamp and fasten.
 - H. Press the hose against the spool. Soap-suds can be applied when installing.
 - I. Face the ends of the hose clamp outward.
 - J. For California
 - K. To throttle body
 - L. Align the clamp with the paint.
 - M. White paint
 - N. Face the clip's knob inside.
 - O. Face the clip's knob outside.
 - P. Face the hose opening to the back.



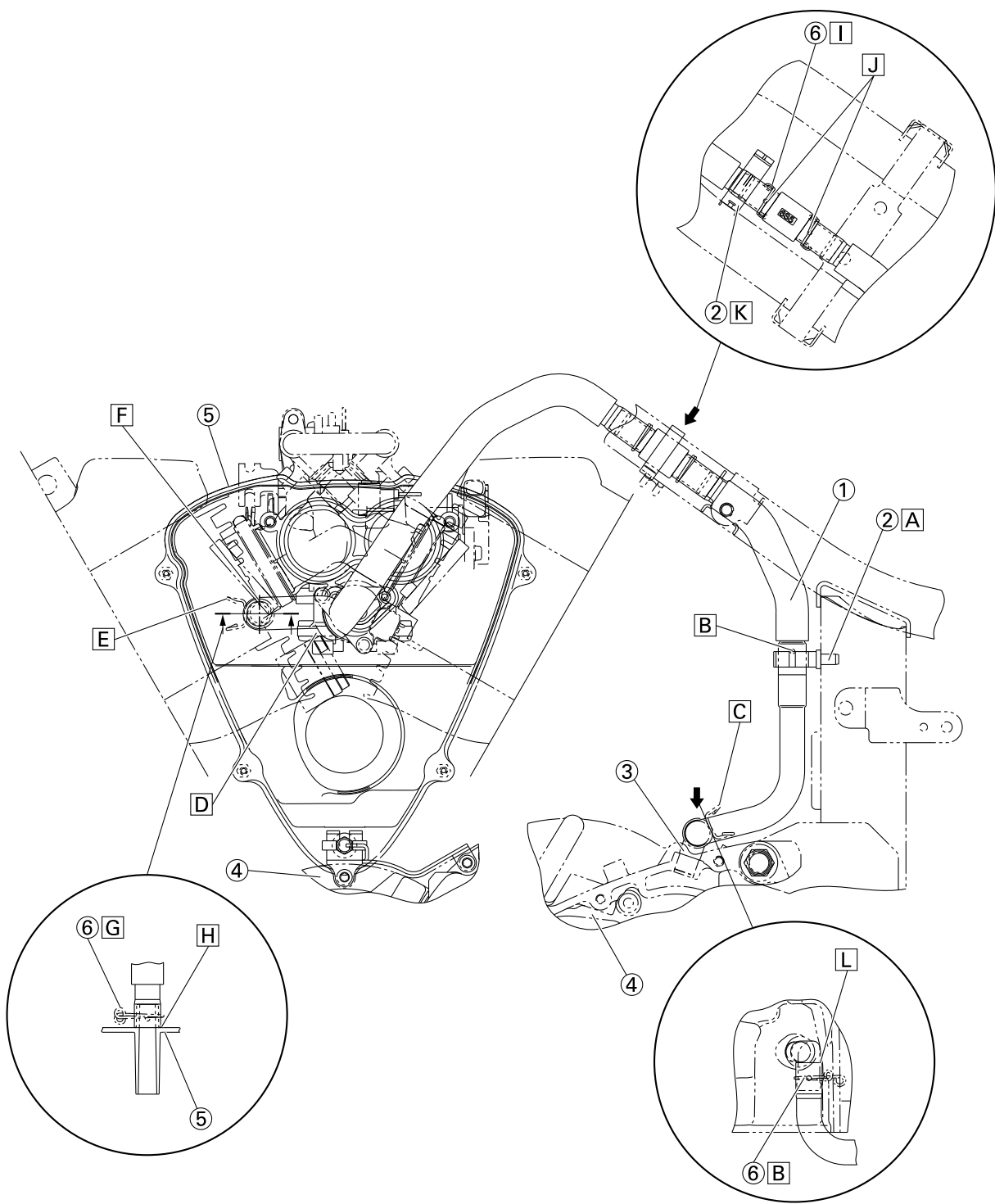
1. Tail/brake light wire harness
2. Tail/brake light wire harness (from taillight)
3. Tail/brake light assembly
4. Rear turn signal light lead
5. Rear turn signal light bracket cover
6. Grommet
7. License plate light coupler
8. Rear right turn signal light coupler
9. Rear left turn signal light coupler
10. Clamp coupler
11. Mudguard (front)
12. Tail/brake light wire harness (from rear turn signal)
13. License plate light lead
14. Rear fender

- A. Route the tail/brake light wire harness through each clamp. Make sure that no leads come out of the clamp after bending it.
- B. Make sure to hang the tail/brake light wire harness on the mudguard's hook.
- C. Route the tail/brake light wire harness (rear turn signal lead, license plate light lead) through each clamp. Make sure that no leads come out of the clamp after bending it.
- D. The slit can face any direction.
- E. Silicon fluid or soapsuds can be applied when installing.
- F. Route the license plate light lead above the clamp coupler.
- G. Route the rear left turn signal light lead under the clamp coupler.
- H. Route the rear right turn signal light lead next to the clamp coupler.
- I. Fit the clamp coupler's projection inside the rear turn signal light bracket cover.
- J. Install by facing the dent side to the front.
- K. Install the grommet on the Taillight lead to the rear fender hole. Silicon fluid or soapsuds can be applied when installing.

1. ISC (idle speed control) lead
 2. Clamp
 3. Engine temperature sensor lead
 4. ISC (idle speed control) coupler
 5. Fuel sender coupler (natural)
 6. Fuel pump coupler (black)
 7. Side cover (cylinder head)
 8. Rear cylinder ignition coil
 9. Plastic band
 10. Wire harness
 11. Front cylinder ignition coil
-
- A. These can be crossed.
 - B. Install with the opening facing front.
 - C. To the ignition coil
 - D. Make sure that a nail can be hooked and insert until firmly fixed.
 - E. Install with the opening facing out.
 - F. Fuel pump lead, fuel sender lead (order insignificant)
 - G. Route the fuel pump lead and fuel sender lead above the spark plug lead.
 - H. When clamping the branch section of the engine temperature sensor lead, put it inside of the clamp.
 - I. To the fuel tank
 - J. Spark plug and wire harness
 - K. Install with the opening facing back.
 - L. To the rear cylinder
 - M. Route the ISC (Idle Speed Control) lead inside of the spark plug lead.
 - N. To the front cylinder
 - O. To the wire harness
 - P. To the ISC (idle speed control) valve
 - Q. Install with the opening facing up.
 - R. ISC (Idle Speed Control) lead and wire harness branch lead/sub lead (order insignificant)
 - S. Flap can be in any position.
 - T. "5S7" sealing side
 - U. Black connector with white tape
 - V. Face the lock outside and cut off the excess end.
 - W. White connector with white tape
 - X. White connector
 - Y. Black connector
 - Z. Install the spark plug lead's long side to the front.



1. Clip
 2. Canister purge hose (for california)
 3. Throttle body
 4. Intake air pressure sensor
 5. Intake air pressure hose
-
- A. Face the knob to the front and install at the white paint mark. (for California)
 - B. Face the white paint upward and insert until contacting with the throttle body nipple. (for California)
 - C. Face the knob to the right and install.
 - D. Route the intake air pressure hose inside of the frame bracket.
 - E. Face the white paint mark to the right and install.
 - F. Projection from the clip of the intake air pressure hose (2 locations)
 - G. Install the side of the intake air pressure hose to the side of the throttle body boss. Engine oil can be applied when installing.
 - H. For California



1. Crankcase breather hose
 2. Clamp
 3. Crankcase breather pipe
 4. Right crankcase
 5. Air filter case
 6. Clip
-
- A. The opening can face either right or left.
 - B. Install by aligning with the white paint.
 - C. Adjust the knob diagonally to the back.
 - D. Route the crankcase breather hose above the tensioner assembly.
 - E. Adjust the knob to the front.
 - F. Yellow paint position
 - G. Install by adjusting to the yellow paint mark.
 - H. Insert until contacting the air filter case (insert 15 mm).
 - I. Adjust to the Crankcase breather hose paint and then adjust the knob to the back.
 - J. Route the crankcase breather hose above the fuel tank bracket, adjust the paint to the "6S5" on the hose joint and then install.
 - K. Clamp the frame and Crankcase breather hose.
 - L. Insert until contacting the crankcase breather pipe (insert 18 mm). (Silicon fluid can be applied only to the engine.)

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EAS20450

PERIODIC MAINTENANCE

EAS20460

INTRODUCTION

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

EAS5S71018

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months	
1	*	Fuel line	<ul style="list-style-type: none">• Check fuel hoses for cracks or damage.• Replace if necessary.		√	√	√	√	√	
2	*	Spark plugs	<ul style="list-style-type: none">• Check condition.• Adjust gap and clean.• Replace every 8000 mi (13000 km) or 12 months.		√	Replace.	√	Replace.	√	
3	*	Valve clearance	<ul style="list-style-type: none">• Check and adjust valve clearance when engine is cold.• Adjust if necessary.	Every 16000 mi (25000 km)						
4	*	Crankcase breather system	<ul style="list-style-type: none">• Check breather hose for cracks or damage.• Replace if necessary.		√	√	√	√	√	
5	*	Fuel injection	<ul style="list-style-type: none">• Adjust synchronization.		√	√	√	√	√	
6	*	Exhaust system	<ul style="list-style-type: none">• Check for leakage.• Tighten if necessary.• Replace gasket(s) if necessary.	√	√	√	√	√	√	
7	*	Evaporative emission control system (For California only)	<ul style="list-style-type: none">• Check control system for damage.• Replace if necessary.				√			

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

PERIODIC MAINTENANCE

EAS5S71019

GENERAL MAINTENANCE AND LUBRICATION CHART

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months	
1	*	Air filter element	• Replace.	Every 24000 mi (37000 km)						
2	*	Clutch	• Check operation. • Adjust or replace cable.	✓	✓	✓	✓	✓	✓	
3	*	Front brake	• Check operation, fluid level, and for fluid leakage. • Adjust brake lever free play and replace brake pads if necessary.	✓	✓	✓	✓	✓	✓	
4	*	Rear brake	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	✓	✓	✓	✓	✓	✓	
5	*	Brake hoses	• Check for cracks or damage. • Replace.		✓	✓	✓	✓	✓	
6	*	Wheels	• Check runout and for damage. • Replace if necessary.		✓	✓	✓	✓	✓	
7	*	Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		✓	✓	✓	✓	✓	
8	*	Wheel bearings	• Check bearings for smooth operation. • Replace if necessary.		✓	✓	✓	✓	✓	
9	*	Swingarm pivot bearings	• Check bearing assemblies for looseness.		✓	✓	✓	✓	✓	
10	*	Drive belt	• Check belt tension. • Adjust if necessary.	✓	Every 2500 mi (4000 km)					
11	*	Steering bearings	• Check bearing assemblies for looseness. • Moderately repack with lithium-soap-based grease.	✓	✓	✓	✓	✓	✓	
12	*	Chassis fasteners	• Check all chassis fitting and fasteners. • Correct if necessary.		✓	✓	✓	✓	✓	
13		Brake lever pivot shaft	• Apply silicone grease lightly.		✓	✓	✓	✓	✓	
14		Brake pedal pivot shaft	• Apply lithium-soap-based grease lightly.		✓	✓	✓	✓	✓	
15		Clutch lever pivot shaft	• Apply lithium-soap-based grease lightly.		✓	✓	✓	✓	✓	
16		Shift pedal pivot shaft	• Apply lithium-soap-based grease lightly.		✓	✓	✓	✓	✓	
17		Sidestand pivot	• Check operation. • Apply lithium-soap-based grease lightly.		✓	✓	✓	✓	✓	
18	*	Sidestand switch	• Check operation and replace if necessary.	✓	✓	✓	✓	✓	✓	
19	*	Front fork	• Check operation and for oil leakage. • Replace if necessary.		✓	✓	✓	✓	✓	
20	*	Shock absorber assembly	• Check operation and for oil leakage. • Replace if necessary.		✓	✓	✓	✓	✓	
21	*	Rear suspension link pivots	• Apply lithium-soap-based grease lightly.					✓		

PERIODIC MAINTENANCE

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
22		Engine oil	• Change (warm engine before draining).	√	√	√	√	√	√
23	*	Engine oil filter cartridge	• Replace.	√		√		√	
24	*	Front and rear brake switches	• Check operation.	√	√	√	√	√	√
25	*	Control cables	• Apply Yamaha chain and cable lube or engine oil thoroughly.	√	√	√	√	√	√
26	*	Throttle grip housing and cable	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		√	√	√	√	√
27	*	Lights, signals and switches	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

TIP

From 24000 mi (37000 km) or 36 months, repeat the maintenance intervals starting from 8000 mi (13000 km) or 12 months.

TIP

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

EAS21030

CHECKING THE FUEL LINE

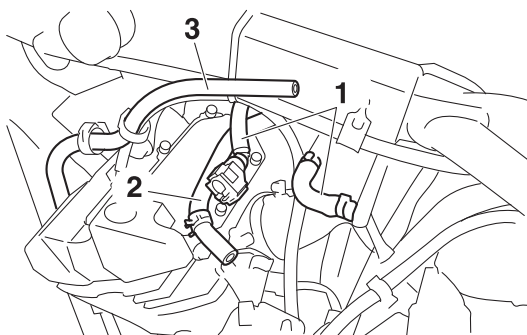
The following procedure applies to all of the fuel and breather hoses.

1. Remove:
 - Rider seat
 - Side cover (cylinder head)
Refer to “GENERAL CHASSIS” on page 4-1.
 - Fuel tank
Refer to “FUEL TANK” on page 6-1.
2. Check:
 - Fuel hoses “1”
 - Fuel return hose “2”
 - Fuel tank breather hose “3”
 - Cracks/damage → Replace.
 - Loose connection → Connect properly.

ECA5S71012

NOTICE

Make sure the fuel tank breather hose are routed correctly.



3. Install:
 - Fuel tank
Refer to “FUEL TANK” on page 6-1.
 - Side cover (cylinder head)
 - 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:
 - Rear cylinder right plastic cover
Refer to “ENGINE REMOVAL” on page 5-1.
2. Disconnect:
 - Spark plug cap
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.

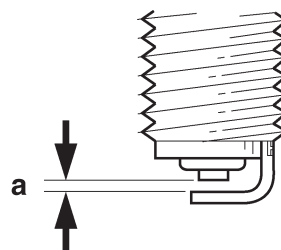


Manufacturer/model
NGK/CPR7EA-9

5. Check:
 - Electrode
Damage/wear → Replace the spark plug.
 - Insulator
Abnormal color → Replace the spark plug.
Normal color is medium-to-light tan.
6. Clean:
 - Spark plug
(with a spark plug cleaner or wire brush)
7. Measure:
 - Spark plug gap “a”
(with a wire thickness gauge)
Out of specification → Regap.



Spark plug gap
0.8–0.9 mm (0.031–0.035 in)



8. Install:
 - Spark plug



Spark plug
13 Nm (1.3 m·kgf, 9.4 ft·lbf)

TIP

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

9. Connect:
 - Spark plug cap

10. Install:

- Rear cylinder right plastic cover
Refer to “ENGINE REMOVAL” on page 5-1.

EAS20700

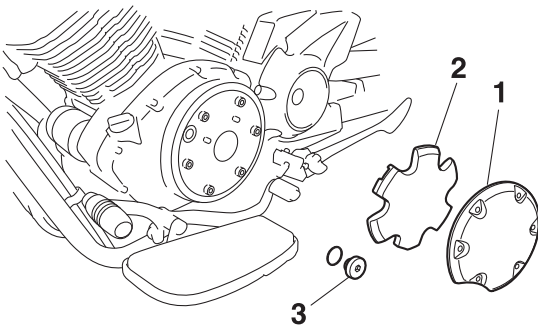
CHECKING THE IGNITION TIMING

TIP

Prior to checking the ignition timing, check the wiring connections of the entire ignition system. Make sure all connections are tight and free of corrosion.

1. Remove:

- Damper cover “1”
- Generator cover damper “2”
- Timing mark accessing screw “3”
(along with the O-ring)

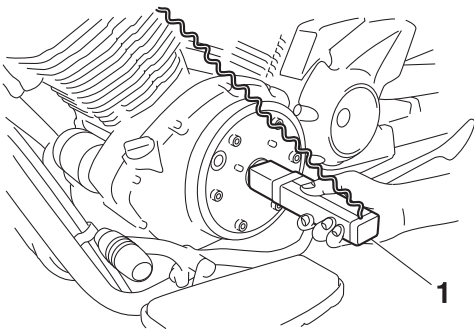


2. Connect:

- Timing light “1”
- Digital tachometer



Timing light
90890-03141
Inductive clamp timing light
YU-03141
Digital tachometer
90890-06760
YU-39951-B



3. Check:

- Ignition timing

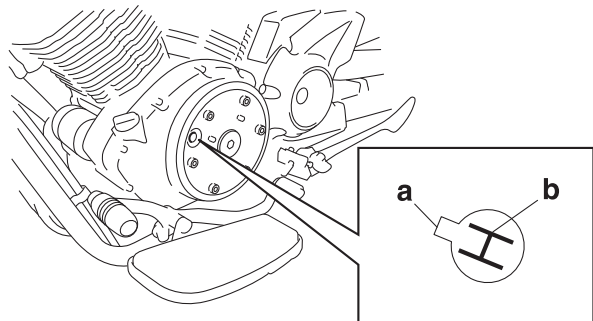


- Start the engine, warm it up for several minutes, and then let it run at the specified engine idling speed.



Engine idling speed
950–1050 r/min

- Check that slot “a” in the generator cover is within the firing range “b” on the generator rotor.
Incorrect firing range → Check the ignition system.



TIP

The ignition timing is not adjustable.



4. Install:

- Timing mark accessing screw
(along with the O-ring **New**)
- Generator cover damper
- Damper cover



Damper cover bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

EAS20530

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

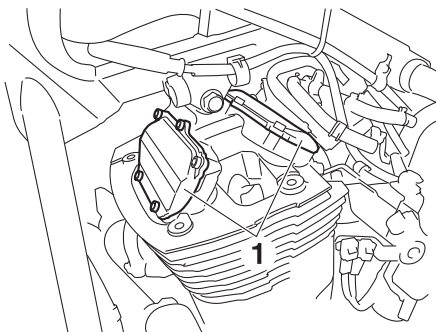
TIP

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

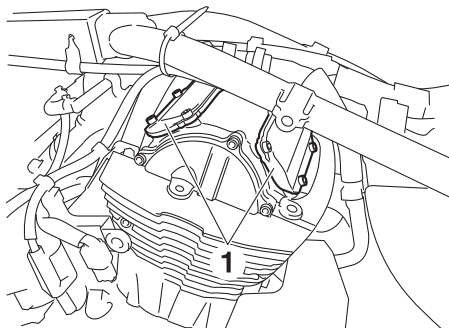
1. Remove:

- Rider seat
- Side cover (cylinder head)
Refer to “GENERAL CHASSIS” on page 4-1.

- Fuel tank
Refer to “FUEL TANK” on page 6-1.
 - Front cylinder upper plastic cover
 - Front cylinder lower plastic cover
 - Rear cylinder left plastic cover
 - Rear cylinder right plastic cover
 - Rear cylinder left plastic cover bracket
 - Rear cylinder right plastic cover bracket
Refer to “ENGINE REMOVAL” on page 5-1.
2. Disconnect:
 - Spark plug caps
Refer to “ENGINE REMOVAL” on page 5-1.
 3. Remove:
 - Spark plugs
Refer to “CAMSHAFTS” on page 5-11.
 4. Remove:
 - Damper cover
 - Generator cover damper
 - Timing mark accessing screw
 - Crankshaft end accessing screw
Refer to “GENERATOR AND STARTER CLUTCH” on page 5-38.
 5. Remove:
 - Front cylinder tappet covers “1”



6. Remove:
 - Rear cylinder tappet covers “1”



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



Valve clearance (cold)

Intake

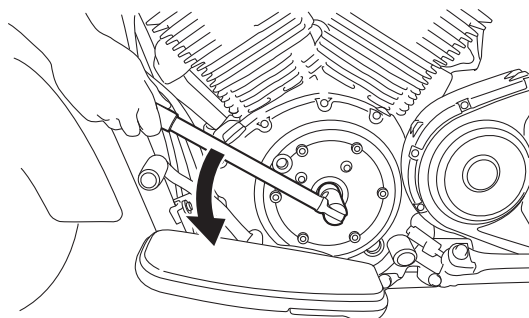
0.08–0.12 mm (0.0032–0.0047 in)

Exhaust

0.22–0.26 mm (0.0087–0.0102 in)

Front cylinder

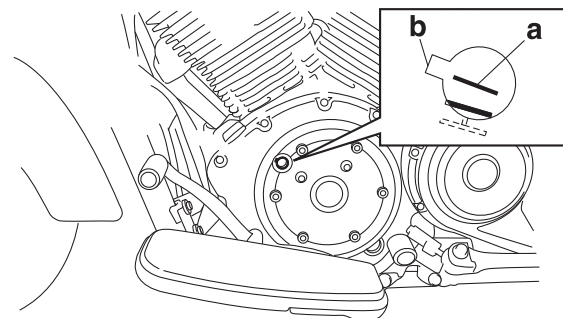
- a. Turn the crankshaft counterclockwise.



- b. When the front cylinder piston is at TDC on the compression stroke, align the TDC mark “a” on the generator rotor with the slot “b” in the generator cover.

TIP

- When the piston is at TDC on the compression stroke, there should be clearance between the valve stem tips and their respective rocker arm adjusting screws.
- If there is no clearance, rotate the crankshaft counterclockwise one turn.



- c. Measure the valve clearance with a thickness gauge.



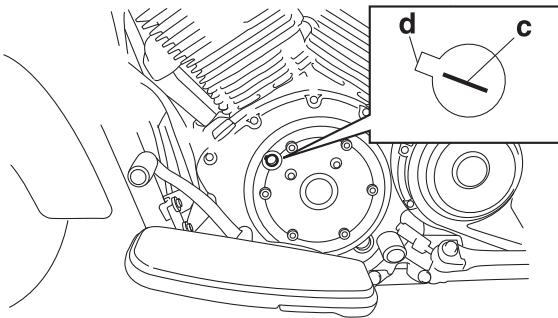
Thickness gauge
90890-03180
Feeler gauge set
YU-26900-9

Rear cylinder

- Turn the crankshaft counterclockwise from the front cylinder piston TDC by 300 degrees.
- When the rear cylinder piston is at TDC on the compression stroke, align the TDC mark "c" on the generator rotor with the slot "d" in the generator cover.

TIP

- When the piston is at TDC on the compression stroke, there should be clearance between the valve stem tips and their respective rocker arm adjusting screws.
- If there is no clearance, rotate the crankshaft counterclockwise one turn.



- Measure the valve clearance with a thickness gauge.

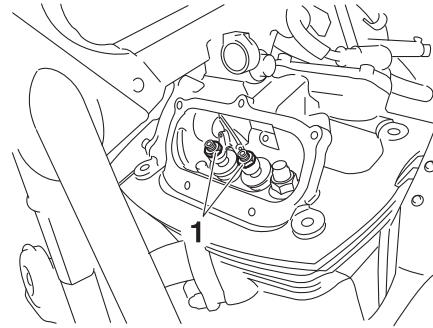


Thickness gauge
90890-03180
Feeler gauge set
YU-26900-9

8. Adjust:

- Valve clearance

- Loosen the locknuts "1".



- Insert a thickness gauge "2" between the end of the adjusting screw "3" and the valve tip.



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

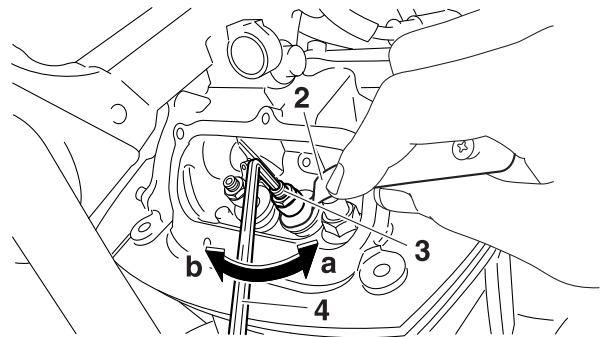
- Turn the adjusting screw in direction "a" or "b" with the hexagon wrench "4" until the specified valve clearance is obtained.

Direction "a"

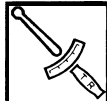
Valve clearance is increased.

Direction "b"

Valve clearance is decreased.



- Hold the adjusting screw to prevent it from moving and tighten the locknut to specification.



Locknut (rocker arm adjusting screw)
27 Nm (2.7 m·kgf, 19 ft·lbf)

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

9. Install:

- Rear cylinder tappet covers
- Front cylinder tappet covers



Rear cylinder tappet cover bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
Front cylinder tappet cover bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

10. Install:

- Crankshaft end accessing screw
 (along with the O-ring **New**)
 - Timing mark accessing screw
 (along with the O-ring **New**)
 - Generator cover damper
 - Damper cover
- Refer to "GENERATOR AND STARTER CLUTCH" on page 5-38.



Damper cover bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

11. Install:

- All removed parts

TIP

For installation, reverse the removal procedure.

EAS21070

CHECKING THE CRANKCASE BREATHER HOSE

1. Remove:

- Rider seat
- Side cover (cylinder head)
- Air filter case
 Refer to "GENERAL CHASSIS" on page 4-1.
- Air duct
- Drive pulley cover
 Refer to "BELT DRIVE" on page 4-67.
- Fuel tank
 Refer to "FUEL TANK" on page 6-1.

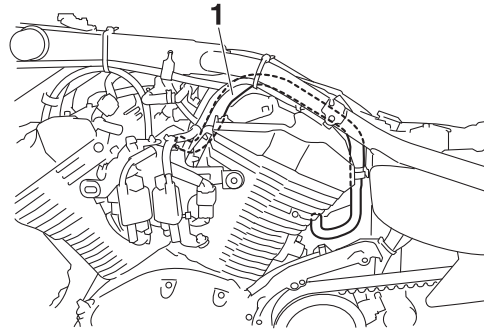
2. Check:

- Crankcase breather hose "1"
 Cracks/damage → Replace.
 Loose connection → Connect properly.

ECA13450

NOTICE

Make sure the crankcase breather hose is routed correctly.



3. Install:

- Fuel tank
 Refer to "FUEL TANK" on page 6-1.
- Drive pulley cover
- Air duct
 Refer to "BELT DRIVE" on page 4-67.
- Air filter case
- Side cover (cylinder head)
- Rider seat
 Refer to "GENERAL CHASSIS" on page 4-1.

EAS20570

SYNCHRONIZING THE THROTTLE BODIES

TIP

Before synchronizing the throttle bodies, check the following items:

- Valve clearance
- Spark plugs
- Air filter element
- Throttle body joints
- Fuel hoses
- Exhaust system
- Canister purge hoses (for California only)
- Breather hoses

1. Stand the vehicle on a level surface.

TIP

Place the vehicle on a suitable stand.

2. Check:

- Engine idling speed



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



Engine idling speed
950–1050 r/min

Out of specification → Clean or replace.



9. Connect:
 - Intake air pressure sensor hose
 - Cap
10. Adjust:
 - Throttle cable free play
 Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-27.



Throttle cable free play
4.0–6.0 mm (0.16–0.24 in)

11. Install:
 - Side cover (cylinder head)
 - Rider seat
 Refer to “GENERAL CHASSIS” on page 4-1.

EAS21080

CHECKING THE EXHAUST SYSTEM

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

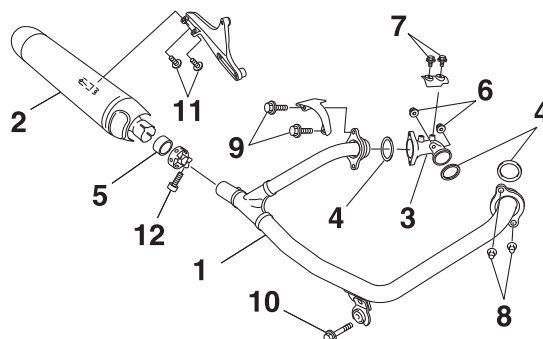
1. Check:
 - Exhaust pipe “1”
 - Muffler “2”
 - Rear exhaust pipe joint “3”
Cracks/damage → Replace.
 - Gaskets “4”
 - Gasket “5”
Exhaust gas leaks → Replace.
2. Check:

Tightening torque

 - Rear exhaust pipe joint nuts “6”
 - Rear exhaust pipe joint cover bolts “7”
 - Exhaust pipe nuts “8”
 - Exhaust pipe bolts “9”
 - Exhaust pipe stay bolt “10”
 - Muffler bolts “11”
 - Muffler band bolt “12”



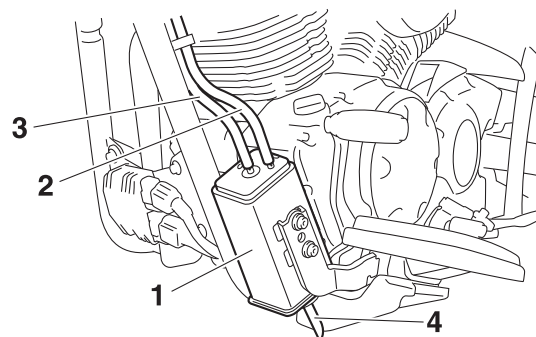
Rear exhaust pipe joint nut
15 Nm (1.5 m·kgf, 11 ft·lbf)
Rear exhaust pipe joint cover bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)
Exhaust pipe nut
20 Nm (2.0 m·kgf, 14 ft·lbf)
Exhaust pipe bolt
20 Nm (2.0 m·kgf, 14 ft·lbf)
Exhaust pipe stay bolt
20 Nm (2.0 m·kgf, 14 ft·lbf)
Muffler bolt
53 Nm (5.3 m·kgf, 38 ft·lbf)
Muffler band bolt
12 Nm (1.2 m·kgf, 8.7 ft·lbf)



EAS21090

CHECKING THE CANISTER (CALIFORNIA ONLY)

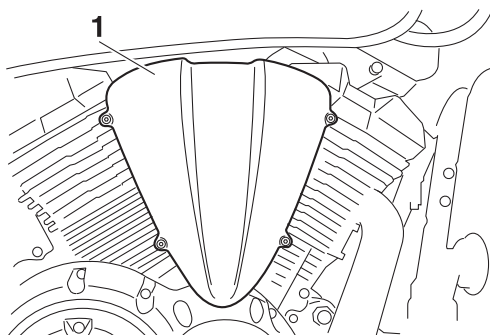
1. Check:
 - Canister “1”
 - Canister purge hose “2”
 - Canister charge hose “3”
 - Canister breather hose “4”
Cracks/damage → Replace.



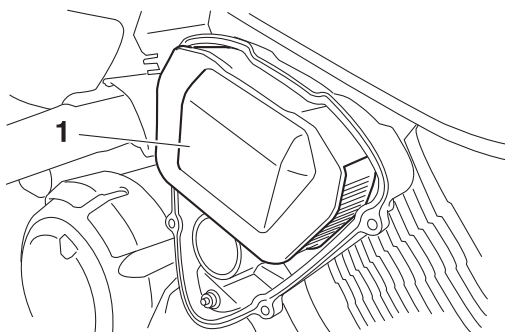
EAS20960

REPLACING THE AIR FILTER ELEMENT

1. Remove:
 - Air filter case cover “1”



2. Remove:
 - Air filter element “1”



3. Check:
 - Air filter element
Damage → Replace.

TIP

The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

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



Air filter case cover bolt
2 Nm (0.2 m·kgf, 1.4 ft·lbf)

ECA5S71009

NOTICE

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

TIP

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

EAS5S71032

CHECKING THE CLUTCH OPERATION

1. Check:
 - Clutch operation
Dysfunctional → Check the clutch system.
Refer to “CLUTCH” on page 5-44.



EWA5S71009



WARNING

Before checking the clutch operation, check the brake system and make sure that the brake is operating at all times during

the check-up. While checking the clutch operation, do not rev up the engine.

- a. Place the vehicle on a level surface, and start the engine.
- b. Grab the clutch lever and make sure that you can shift the gear smoothly.
- c. Grab the clutch lever and shift to first gear.
- d. Operate both the front and rear brakes, release the clutch lever slowly and make sure that the engine stops.



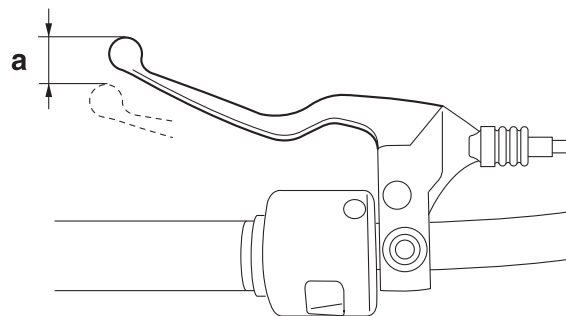
EAS20870

ADJUSTING THE CLUTCH LEVER FREE PLAY

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



Clutch lever free play
5.0–10.0 mm (0.20–0.39 in)



2. Adjust:
 - Clutch lever free play



Handlebar side

- a. Slide back the rubber cover “1”
- b. Loosen the locknut “2”.
- c. Turn the adjusting bolt “3” in direction “a” or “b” until the specified clutch lever free play is obtained.

Direction “a”

Clutch lever free play is increased.

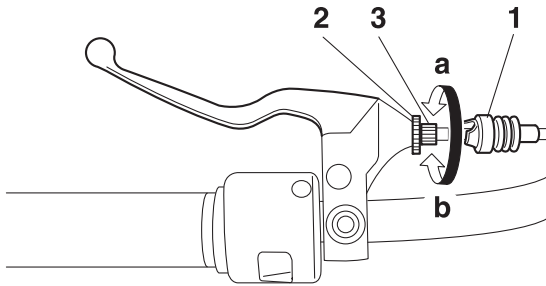
Direction “b”

Clutch lever free play is decreased.

- d. Tighten the locknut.
- e. Slide the rubber cover to its original position.

TIP

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



Engine side

- Slide back the rubber covers "1".
- Loosen the locknut "2".
- Turn the adjusting nut "3" in direction "a" or "b" until the specified clutch lever free play is obtained.

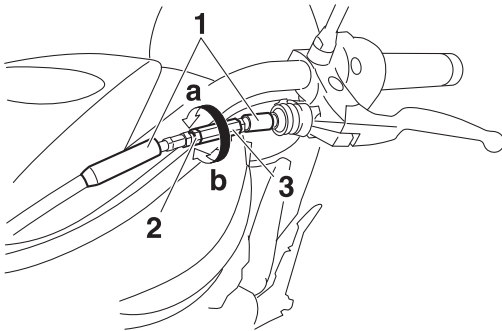
Direction "a"

Clutch cable free play is increased.

Direction "b"

Clutch cable free play is decreased.

- Tighten the locknut.
- Slide the rubber covers to its original position.



EAS5S71033

CHECKING THE BRAKE OPERATION

- Check:
 - Brake operation
Brake not working properly → Check the brake system.
Refer to "FRONT BRAKE" on page 4-21 and "REAR BRAKE" on page 4-33.

TIP

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

EAS21240

CHECKING THE BRAKE FLUID LEVEL

- Stand the vehicle on a level surface.

TIP

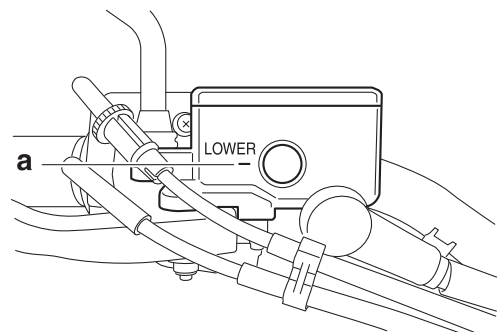
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.

- Check:
 - Brake fluid level

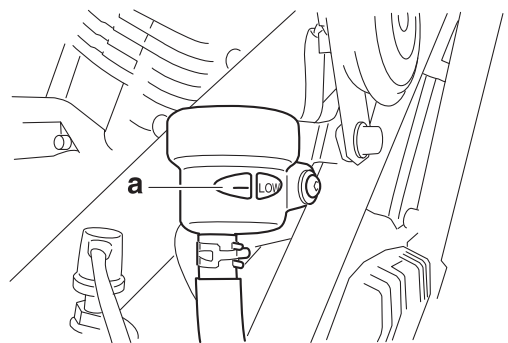
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.



A



B



A. Front brake

B. Rear brake

EWA5S71007

WARNING

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

- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake master cylinder reservoir and 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.

TIP

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

EAS21150

ADJUSTING THE FRONT BRAKE LEVER FREE PLAY

1. Check:
 - Front brake lever free play "a"
 Out of specification → Adjust.



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

2. Adjust:
 - Front brake lever free play



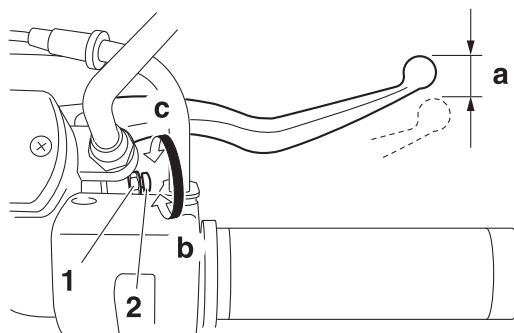
- a. Loosen the locknut "1".
- b. Turn the adjusting screw "2" in direction "b" or "c" until the specified brake lever free play is obtained.

Direction "b"

Brake lever free play is increased.

Direction "c"

Brake lever free play is decreased.



- c. Tighten the locknut.

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.

ECA5S71010

NOTICE

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

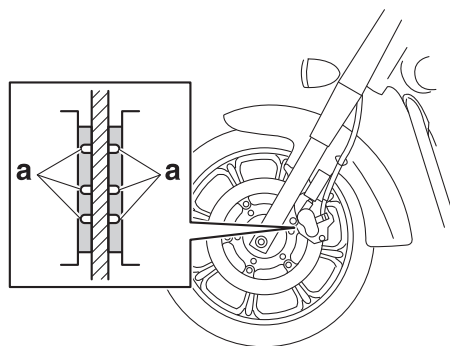


EAS21250

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
 - Front brake pad
 Wear indicators "a" almost touch the brake disc → Replace the brake pads as a set.
Refer to "FRONT BRAKE" on page 4-21.

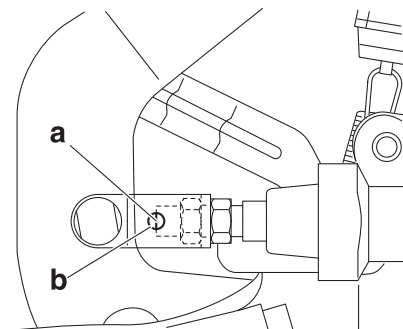


EAS21190

ADJUSTING THE REAR DISC BRAKE

1. Check:

- Brake pedal adjusting bolt position
Adjust the end of the brake pedal adjusting bolt "a" so that it is positioned at the center of the hole "b".
Incorrect → Adjust.

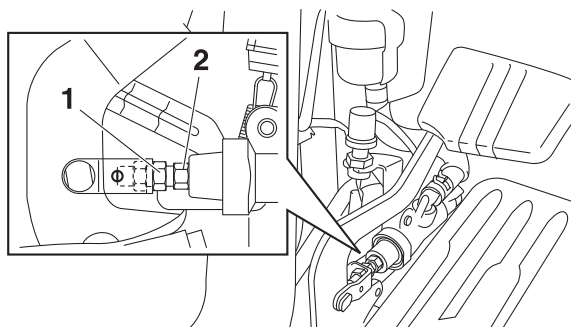


2. Adjust:

- Brake pedal adjusting bolt position

a. Loosen the locknut "1".

b. Turn and adjust the brake pedal adjusting bolt "2" so that its end is at the center of the hole.



c. Tighten the locknut to specification.



Locknut
18 Nm (1.8 m·kgf, 13 ft·lbf)

EWA5S71006



WARNING

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

ECA5S71011

NOTICE

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

3. Adjust:

- Rear brake light switch
Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-26.

EAS21260

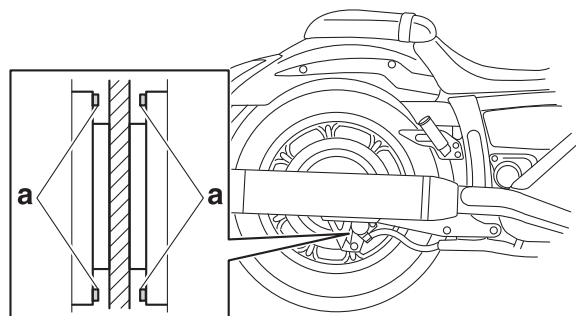
CHECKING THE REAR BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.

2. Check:

- Rear brake pad
Wear indicators "a" almost touch the brake disc → Replace the brake pads as a set.
Refer to "REAR BRAKE" on page 4-33.



EAS21350

BLEEDING THE HYDRAULIC BRAKE SYSTEM

EWA13100



WARNING

Bleed the hydraulic brake system whenever:

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

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.

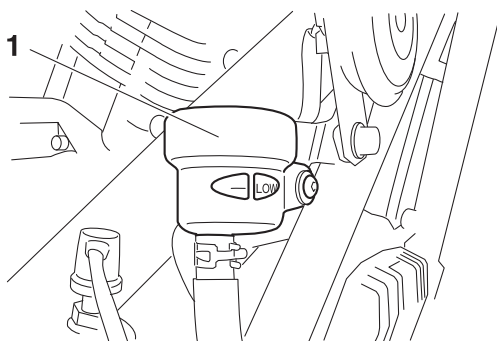
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.

1. Remove:

- Brake fluid reservoir cover “1”

TIP

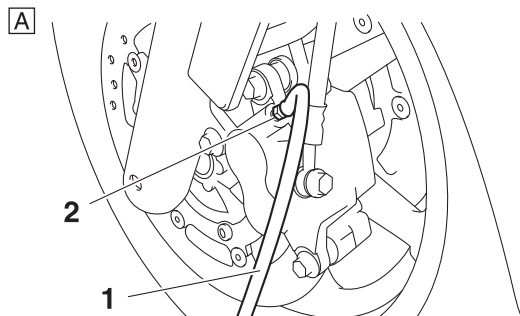
After removing the brake fluid reservoir cover, install the brake fluid reservoir temporarily.



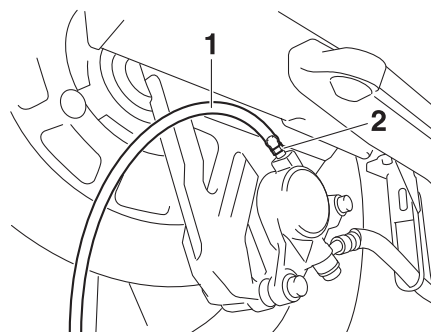
2. Bleed:

- Hydraulic brake system

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



B



A. Front

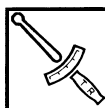
B. Rear

- Put the other end of the hose into an open container.
- Slowly apply the brake several times.
- Fully pull the brake lever or fully press down the brake pedal and hold it in position.
- 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.

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



Bleed screw (front brake caliper)

6 Nm (0.6 m·kgf, 4.3 ft·lbf)

Bleed screw (rear brake caliper)

6 Nm (0.6 m·kgf, 4.3 ft·lbf)

- Fill the brake master cylinder reservoir or brake fluid reservoir to the proper level with the recommended brake fluid. Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-12.

EWA13110

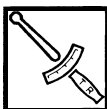


WARNING

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

3. Install:

- Brake fluid reservoir cover

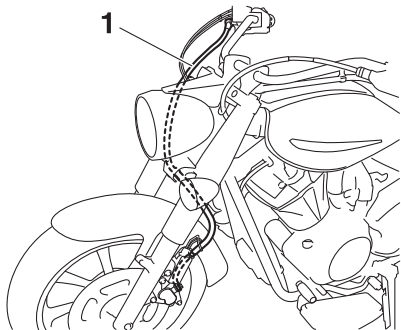


Brake fluid reservoir bolt
9 Nm (0.9 m·kgf, 6.5 ft·lbf)

EAS21280

CHECKING THE FRONT BRAKE HOSE

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



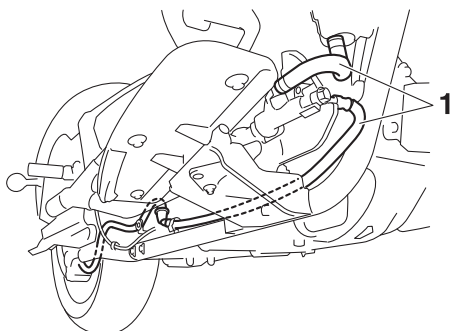
2. Check:
 - Brake hose clamp
 Loose → Tighten the clamp bolt.
3. Hold the vehicle upright and apply the brake several times.
4. Check:
 - Brake hose
 Brake fluid leakage → Replace the brake hose.
Refer to "FRONT BRAKE" on page 4-21.

EAS21290

CHECKING THE REAR BRAKE HOSES

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

1. Remove:
 - Muffler
Refer to "ENGINE REMOVAL" on page 5-1.
 - Right side cover (lower)
Refer to "SWINGARM" on page 4-64.
2. Check:
 - Brake hoses "1"
 Cracks/damage/wear → Replace.



3. Check:
 - Brake hose clamp
 Loose → Tighten the clamp bolt.
4. Hold the vehicle upright and apply the brake several times.
5. Check:
 - Brake hoses
 Brake fluid leakage → Replace the damaged hose.
Refer to "REAR BRAKE" on page 4-33.
6. Install:
 - Right side cover (lower)
Refer to "SWINGARM" on page 4-64.
 - Muffler
Refer to "ENGINE REMOVAL" on page 5-1.

EAS21670

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

1. Check:
 - Wheel
 Damage/out-of-round → Replace.

EWA13260



WARNING
Never attempt to make any repairs to the wheel.

TIP

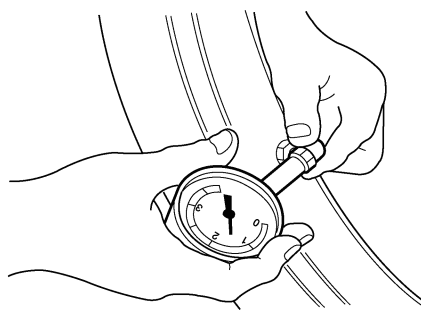
After a tire or wheel has been changed or replaced, always balance the wheel.

EAS21650

CHECKING THE TIRES

The following procedure applies to both of the tires.

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



EWA13180

WARNING

- The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.
- The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.
- Operation of an overloaded vehicle could cause tire damage, an accident or an injury.

NEVER OVERLOAD THE VEHICLE.



Tire air pressure (measured on cold tires)

Loading condition
0–90 kg (0–198 lb)

Front

225 kPa (2.25 kgf/cm², 33 psi)

Rear

250 kPa (2.50 kgf/cm², 36 psi)

Loading condition

XVS95Y/XVS95YC 90–210 kg
(198–463 lb)

XVS95CTY/XVS95CTYC 90–
190 kg (198–419 lb)

Front

225 kPa (2.25 kgf/cm², 33 psi)

Rear

250 kPa (2.50 kgf/cm², 36 psi)

Maximum load

XVS95Y/XVS95YC 210 kg (463
lb)

XVS95CTY/XVS95CTYC 190
kg (419 lb)

* Total weight of rider, passenger, cargo and accessories

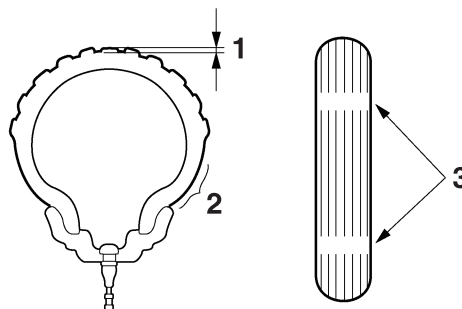
EWA13190

WARNING

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

2. Check:

- Tire surfaces
Damage/wear → Replace the tire.



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



Wear limit (front)

1.0 mm (0.04 in)

Wear limit (rear)

1.0 mm (0.04 in)

EWA14090

WARNING

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



Front tire

Size

130/70–18M/C 63H

Manufacturer/model

BRIDGESTONE/EXEDRA G721

J

Manufacturer/model

DUNLOP/D404F



Rear tire

Size

170/70B 16M/C 75H

Manufacturer/model

BRIDGESTONE/EXEDRA G722

J

Manufacturer/model

DUNLOP/K555

EWA5S71008

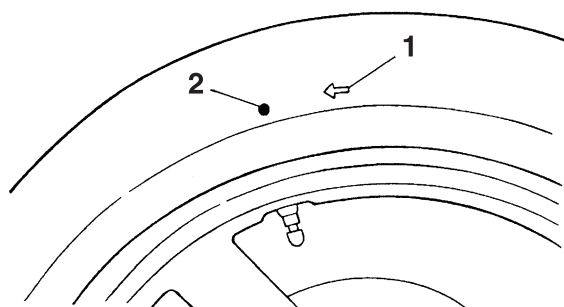
WARNING

New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km (60 mi) should be traveled at normal speed before any high-speed riding is done.

TIP

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

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



EAS5S71024

CHECKING THE WHEEL BEARINGS

The following procedure applies to all of the wheel bearings.

1. Check:
 - Wheel bearings

Refer to “CHECKING THE FRONT WHEEL” on page 4-11 and “CHECKING THE REAR WHEEL” on page 4-19.

EAS5S71028

CHECKING THE SWINGARM PIVOT SHAFT BEARINGS

1. Check:
 - Swingarm pivot shaft bearings

Refer to “SWINGARM” on page 4-64.

EAS21430

ADJUSTING THE DRIVE BELT SLACK

TIP

The drive belt slack must be checked at the tightest point on the belt.

ECA14950

NOTICE

A drive belt that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore,

keep the drive belt slack within the specified limits.

TIP

Measure the drive belt slack when the engine is cold, and when the drive belt is dry.

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 sidestand or on a suitable stand so that the rear wheel is elevated.

2. Check:
 - Drive belt slack “a”

Out of specification → Adjust.



Drive belt slack (on the side-stand)

3.0–5.0 mm (0.12–0.20 in)

Drive belt slack (on a suitable stand)

3.0–5.0 mm (0.12–0.20 in)

TIP

- The level marks “1” of the level window on the lower drive belt cover are in units of 5 mm (0.20 in). Use them as a standard for measuring the drive belt slack.
- Measure the drive belt slack when the drive belt has been pushed with 45 N (4.5 kgf, 10 lbf) of pressure using a belt tension gauge “2”.

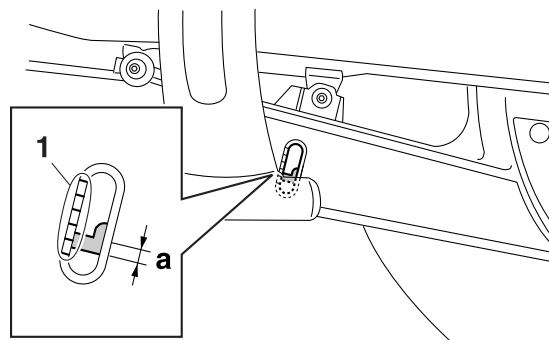


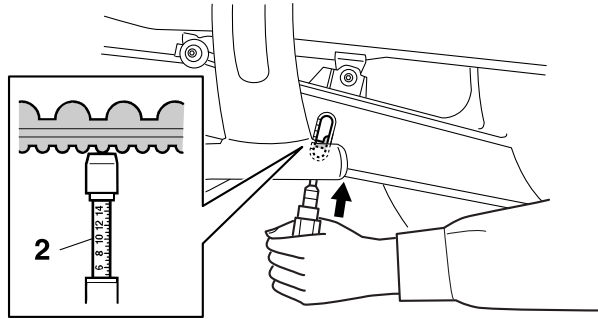
Belt tension gauge

90890-03170

Rear drive belt tension gauge

YM-03170





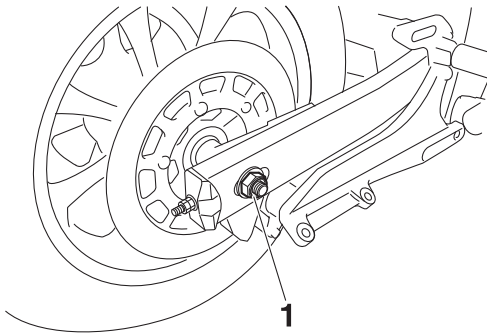
3. Remove:
 - Muffler
 Refer to “ENGINE REMOVAL” on page 5-1.
4. Adjust:
 - Drive belt slack



TIP

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

- a. Loosen the rear wheel axle nut “1”.

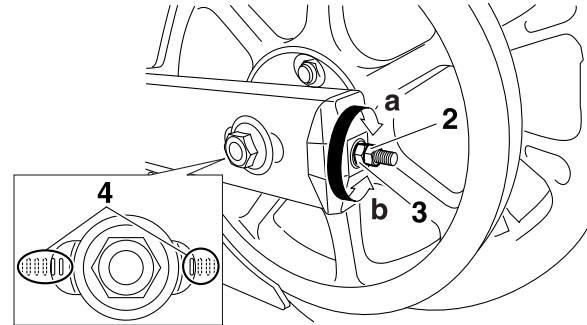


- b. Loosen both locknuts “2”.
- c. Turn both adjusting nuts “3” in direction “a” or “b” until the specified drive belt slack is obtained.

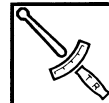
Direction “a”
Drive belt is tightened.
Direction “b”
Drive belt is loosened.

TIP

Using the alignment marks “4” on each side of the swingarm, make sure that both belt pullers are in the same position for proper wheel alignment.

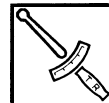


- d. Tighten the locknuts to specification.



Locknut
16 Nm (1.6 m·kgf, 11 ft·lbf)

- e. Tighten the rear wheel axle nut to specification.



Rear wheel axle nut
150 Nm (15.0 m·kgf, 110 ft·lbf)



5. Install:
 - Muffler
 Refer to “ENGINE REMOVAL” on page 5-1.

EAS21510

CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

EWA13120

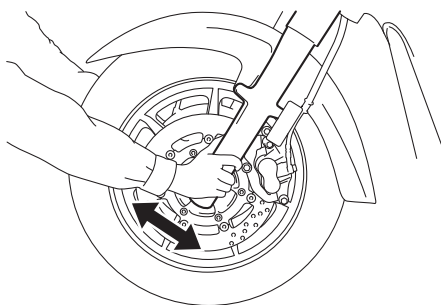
⚠ WARNING

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

TIP

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

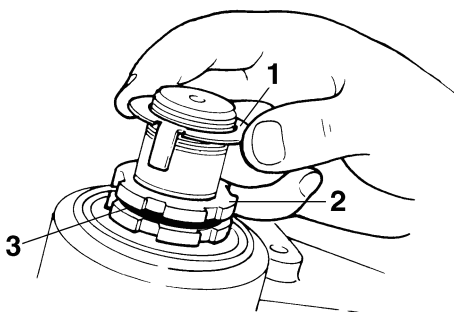
2. Check:
 - Steering head
 Grasp the bottom of the front fork legs and gently rock the front fork.
Blinding/looseness → Adjust the steering head.



3. Remove:
 - Upper bracket
 Refer to "FRONT FORK" on page 4-48.
4. Adjust:
 - Steering head



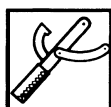
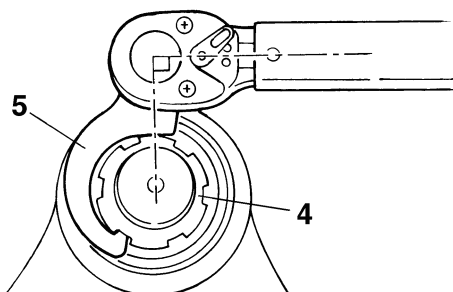
- a. Remove the lock washer "1", the upper ring nut "2", and the rubber washer "3".



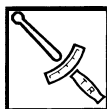
- b. Tighten the lower ring nut "4" to specification with a steering nut wrench "5".

TIP

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



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



Lower ring nut (initial tightening torque)

52 Nm (5.2 m·kgf, 37 ft·lbf)

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

EWA13140

WARNING

Do not overtighten the lower ring nut.



Lower ring nut (final tightening torque)

18 Nm (1.8 m·kgf, 13 ft·lbf)

- d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings. Refer to "STEERING HEAD" on page 4-56.
- e. Install the rubber washer "3".
- f. Install the upper ring nut "2".

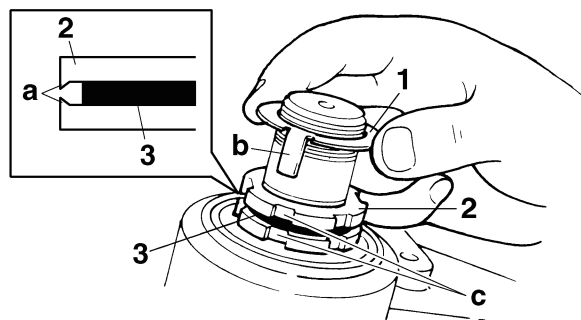
TIP

Install the upper ring nut and lower ring nut with their sharp-edged sides "a" facing each other.

- g. Finger tighten the upper ring nut "2", and then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
- h. Install the lock washer "1".

TIP

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



5. Install:
 - Upper bracket
 Refer to "FRONT FORK" on page 4-48.

EAS5S71029

LUBRICATING THE STEERING BEARINGS

Lubricate the steering bearings.



Recommended lubricant
Lithium-soap-based grease

EAS5S7102

CHECKING THE CHASSIS FASTENERS

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

Refer to “CHASSIS TIGHTENING TORQUES” on page 2-18.

EAS21700

LUBRICATING THE BRAKE LEVER

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



Recommended lubricant
Silicone grease

EAS21710

LUBRICATING THE BRAKE PEDAL

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



Recommended lubricant
Lithium-soap-based grease

EAS3D84001

LUBRICATING THE CLUTCH LEVER

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



Recommended lubricant
Lithium-soap-based grease

EAS21380

ADJUSTING THE SHIFT PEDAL

TIP

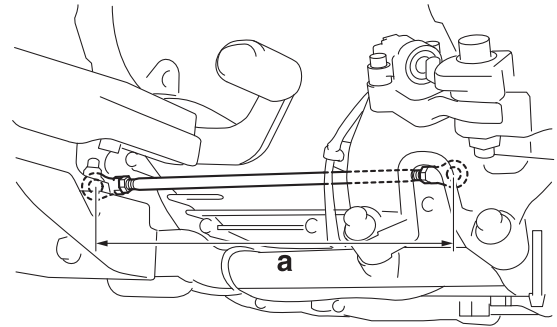
The shift pedal position is determined by the installed shift rod length “a”.

1. Measure:

- Installed shift rod length “a”
- Incorrect → Adjust.



Installed shift rod length
278.7–280.7 mm (10.97–11.05 in)



2. Adjust:

- Installed shift rod length



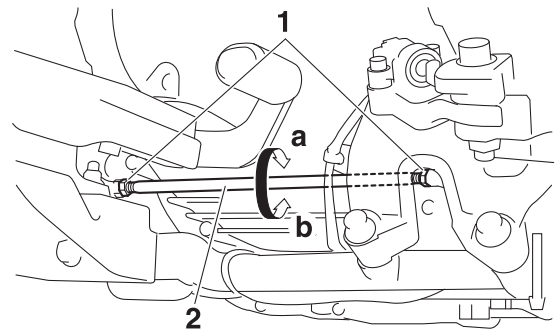
- Loosen both locknuts “1”.
- Turn the shift rod “2” in direction “a” or “b” to obtain the correct shift rod length.

Direction “a”

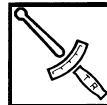
Installed shift rod length is increased.

Direction “b”

Installed shift rod length is decreased.



- Tighten the locknuts to specification.



Locknut

7 Nm (0.7 m·kgf, 5.1 ft·lbf)

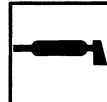
- Make sure the installed shift rod length is within specification.



EAS3D84002

LUBRICATING THE SHIFT PEDAL

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



Recommended lubricant
Lithium-soap-based grease

EAS5S71034

CHECKING THE SIDESTAND

1. Stand the vehicle on a level surface.

EWA13120



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 sidestand is elevated.

2. Check:
 - Sidestand vertical movement "A"
Free play is noticeable → Replace the defective part(s).
 - Sidestand axial movement "B"
Unsmooth operation → Replace the defective part(s).

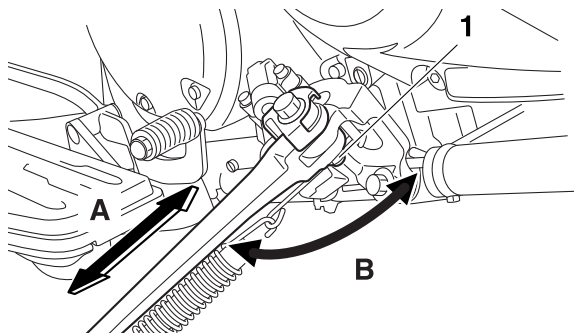


- a. Tighten the sidestand nut "1" to specification.



Sidestand nut
64 Nm (6.4 m·kgf, 46 ft·lbf)

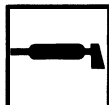
- b. Check the sidestand vertical movement "A" by moving the sidestand up and down.
- c. Check the sidestand axial movement "B" by moving the sidestand up and down.



EAS21720

LUBRICATING THE SIDESTAND

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



Recommended lubricant
Lithium-soap-based grease

EAS5S71035

CHECKING THE SIDESTAND SWITCH

Refer to "ELECTRICAL COMPONENTS" on page 7-73.

EAS21530

CHECKING THE FRONT FORK

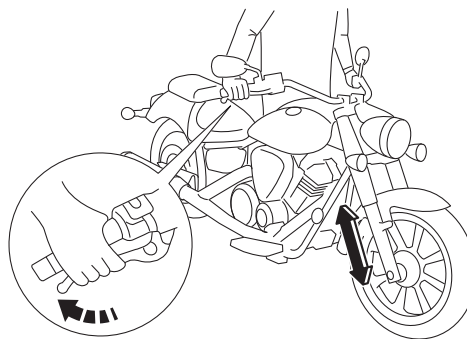
1. Stand the vehicle on a level surface.

EWA13120



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

2. Check:
 - Inner tube
Damage/scratches → Replace.
 - Oil seal
Oil leakage → Replace.
3. Hold the vehicle upright and apply the front brake.
4. Check:
 - Front fork operation
Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
Rough movement → Repair.
Refer to "FRONT FORK" on page 4-48.



EAS5S71025

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:
 - Damper rod
 - Oil leakage
 - Gas leakage
 - Spring
Refer to "CHECKING THE REAR SHOCK ABSORBER ASSEMBLY" on page 4-62.
2. Check:
 - Operation
Pump the rear shock absorber assembly up and down several times.
Unsmooth operation → Replace rear shock absorber assembly.
Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-60.

EAS21590

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

EWA13120



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

Spring preload

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Remove:
 - Left side cover
Refer to "GENERAL CHASSIS" on page 4-1.
 - Air duct
 - Drive pulley cover
Refer to "BELT DRIVE" on page 4-67.
 - Drive belt upper guard
Refer to "REAR WHEEL" on page 4-15.

2. Adjust:
 - Spring preload

- a. Adjust the spring preload with the special wrench "1" and wrench handle "2" included in the owner's tool kit.
- b. Turn the adjusting ring "3" in direction "a" or "b".
- c. Align the desired position on the adjusting ring with the stopper "4".

Direction "a"

Spring preload is decreased (suspension is softer).

Direction "b"

Spring preload is increased (suspension is harder).



Spring preload adjusting positions

Minimum

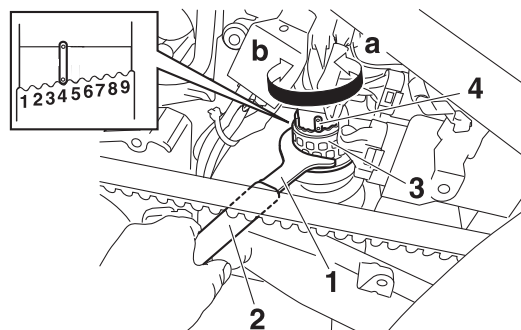
1

Standard

4

Maximum

9



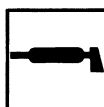
3. Install:

- Drive belt upper guard
Refer to "REAR WHEEL" on page 4-15.
- Air duct
- Drive pulley cover
Refer to "BELT DRIVE" on page 4-67.
- Left side cover
Refer to "GENERAL CHASSIS" on page 4-1.

EAS21740

LUBRICATING THE REAR SUSPENSION

Lubricate the pivoting points and metal-to-metal moving parts of the rear suspension.



Recommended lubricant
Lithium-soap-based grease

EAS20750

CHECKING THE ENGINE OIL LEVEL

1. Place the vehicle on a level surface and hold it in an upright position.

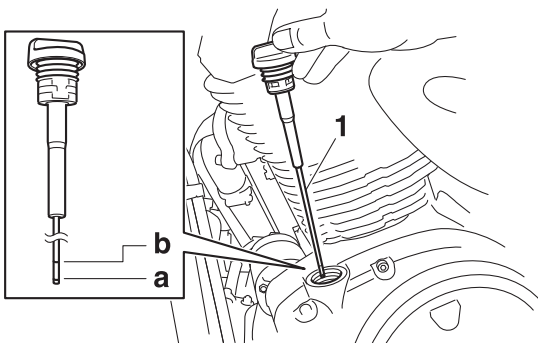
TIP

A slight tilt to the side can result in a false reading.

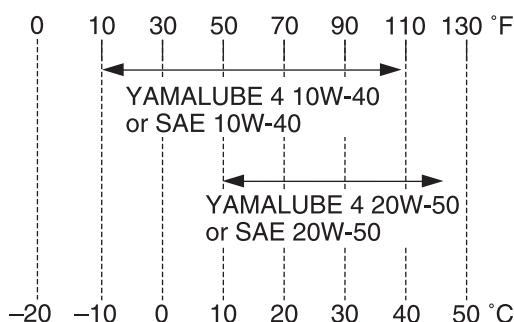
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Check:
 - Engine oil level
The engine oil level should be between the minimum level mark "a" and maximum level mark "b".
Below the minimum level mark → Add the recommended engine oil to the proper level.

TIP

- Before checking the engine oil level, wait a few minutes until the oil has settled.
- Do not screw the dipstick "1" in when checking the oil level.



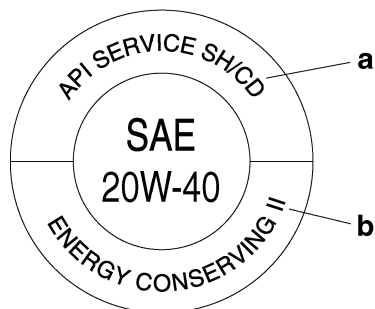
Type
YAMALUBE 4 10W-40 or 20W-50, SAE 10W-40 or SAE 20W-50
Recommended engine oil grade
API service SG type or higher, JASO standard MA



ECA5S71008

NOTICE

- In order to prevent clutch slippage (since the engine oil also lubricates the clutch), do not mix any chemical additives. Do not use oils with a diesel specification of “CD” “a” or oils of a higher quality than specified. In addition, do not use oils labeled “ENERGY CONSERVING II” “b” or higher.
- Make sure that no foreign material enters the crankcase.



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

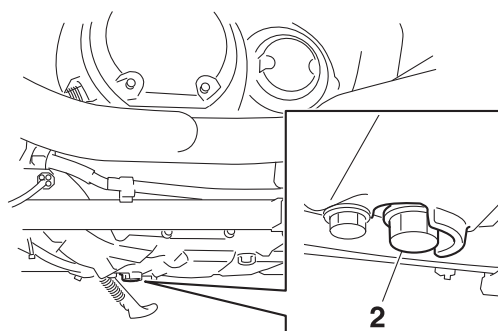
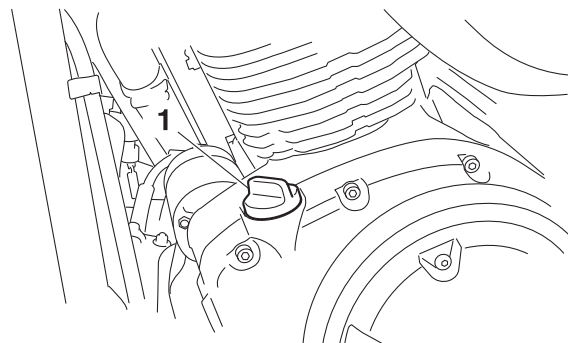
TIP

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

EAS20780

CHANGING THE ENGINE OIL

1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
 - Dipstick “1” (along with the O-ring)
 - Engine oil drain bolt “2” (along with the gasket)

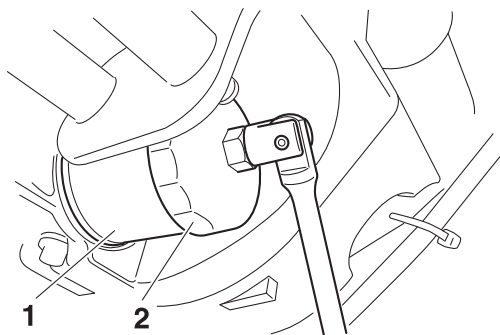


4. Drain:
 - Engine oil (completely from the crankcase)
5. If the oil filter cartridge is also to be replaced, perform the following procedure.

- a. Remove the oil filter cartridge “1” with an oil filter wrench “2”.



Oil filter wrench
90890-01426
YU-38411

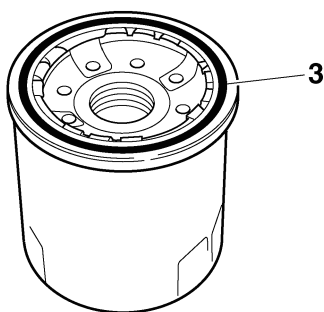


- b. Lubricate the O-ring “3” of the new oil filter cartridge with a thin coat of lithium-soap-based grease.

ECA13390

NOTICE

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



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



Oil filter cartridge
17 Nm (1.7 m·kgf, 12 ft·lbf)



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



Engine oil drain bolt
43 Nm (4.3 m·kgf, 31 ft·lbf)

7. Fill:
- Crankcase
(with the specified amount of the recommended engine oil)
8. Install:
- Dipstick
(along with the O-ring **New**)



Engine oil quantity

Total amount

4.30 L (4.55 US qt, 3.78 Imp.qt)

Without oil filter cartridge replacement

3.70 L (3.91 US qt, 3.26 Imp.qt)

With oil filter cartridge replacement

4.00 L (4.23 US qt, 3.52 Imp.qt)

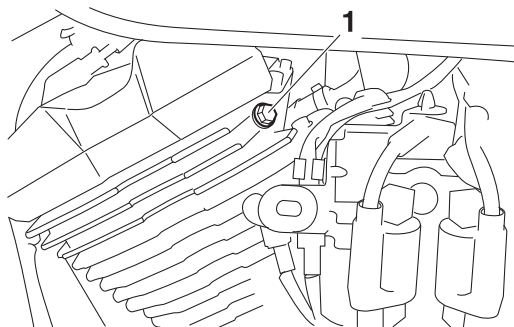
9. Start the engine, warm it up for several minutes, and then turn it off.
10. Check:
- Engine
(for engine oil leaks)
11. Check:
- Engine oil level
Refer to “CHECKING THE ENGINE OIL LEVEL” on page 3-23.
12. Remove:
- Side cover (cylinder head)
Refer to “GENERAL CHASSIS” on page 4-1.
 - Rear cylinder right plastic cover
 - Rear cylinder right plastic cover bracket
Refer to “ENGINE REMOVAL” on page 5-1.
 - Fuel tank bracket bolts
Refer to “FUEL TANK” on page 6-1.
13. Check:
- Engine oil pressure

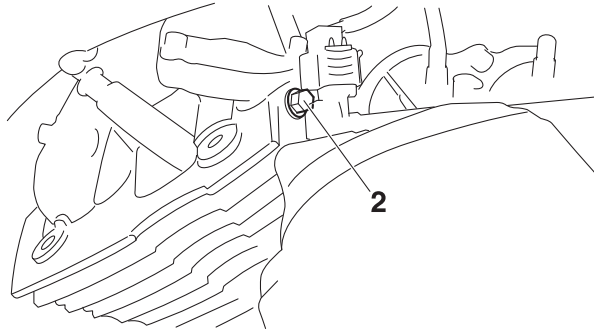


- a. Slightly loosen the front cylinder oil check bolt “1” and rear cylinder oil check bolt “2”.

TIP

To loosen the rear cylinder oil check bolt “2”, lift up the back of the fuel tank first.





- Start the engine and keep it idling until engine oil starts to seep from the oil check bolts. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
- Check the engine oil passages, the oil filter cartridge and the oil pump for damage or leakage. Refer to "OIL PUMP" on page 5-65.
- Start the engine after solving the problem(s) and check the engine oil pressure again.
- Tighten the oil check bolts to specification.



Oil check bolt
15 Nm (1.5 m·kgf, 11 ft·lbf)

14. Install:

- Fuel tank bracket bolts



Fuel tank bracket bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)

Refer to "FUEL TANK" on page 6-1.

- Rear cylinder right plastic cover bracket
- Rear cylinder right plastic cover



Rear cylinder right plastic cover bracket bolt
20 Nm (2.0 m·kgf, 14 ft·lbf)

Refer to "ENGINE REMOVAL" on page 5-1.

- Side cover (cylinder head)

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

EAS5S71036

CHECKING THE FRONT AND REAR BRAKE LIGHT SWITCH

Refer to "ELECTRICAL COMPONENTS" on page 7-73.

EAS21330

ADJUSTING THE REAR BRAKE LIGHT SWITCH

TIP

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

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

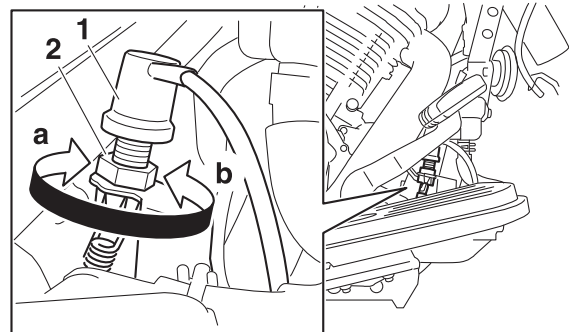
- Hold the main body "1" of the rear brake light switch so that it does not rotate and turn the adjusting nut "2" in direction "a" or "b" until the rear brake light comes on at the proper time.

Direction "a"

Brake light comes on sooner.

Direction "b"

Brake light comes on later.



EAS21690

CHECKING AND LUBRICATING THE CABLES

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

EWA13270



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

- Check:
 - Outer cable
Damage → Replace.

2. Check:

- Cable operation
Rough movement → Lubricate or replace.



Recommended lubricant
Engine oil or a suitable cable lubricant

TIP

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

EAS5S71037

CHECKING THE THROTTLE CABLE OPERATION

1. Check:

- Throttle cable operation
Dysfunctional → Check the throttle cable, throttle grip and throttle body.
Refer to “CHECKING AND LUBRICATING THE CABLES” on page 3-26, “HANDLEBAR” on page 4-44 and “THROTTLE BODIES” on page 6-6.

TIP

The throttle grip must turn smoothly when turning. When releasing the hands from the full throttle grip, it has to return to the base position smoothly.

EAS20630

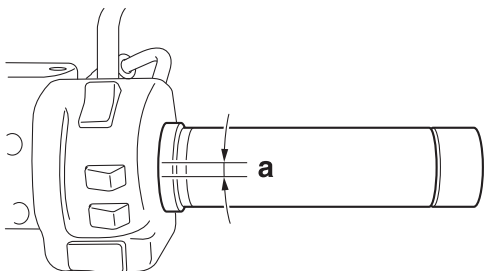
ADJUSTING THE THROTTLE CABLE FREE PLAY

TIP

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

1. Check:

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



Throttle cable free play
4.0–6.0 mm (0.16–0.24 in)

2. Remove:

- Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.
- Side cover (cylinder head)
Refer to “FUEL TANK” on page 6-1.
- Fuel tank
Refer to “FUEL TANK” on page 6-1.

3. Adjust:

- Throttle cable free play



Throttle body side

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

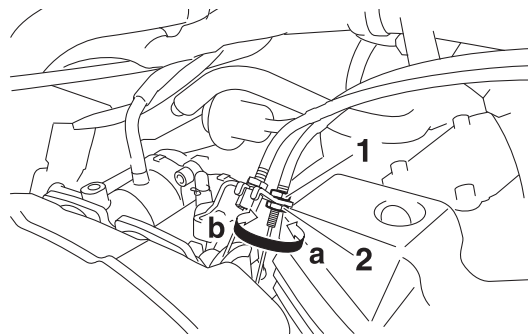
Direction “a”

Throttle cable free play is increased.

Direction “b”

Throttle cable free play is decreased.

- Tighten the locknut.



TIP

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



Handlebar side

- Loosen the locknut “1”.
- Turn the adjusting nut “2” in direction “a” or “b” until the specified throttle cable free play is obtained.

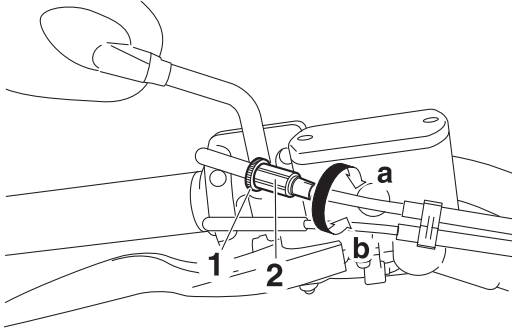
Direction “a”

Throttle cable free play is increased.

Direction “b”

Throttle cable free play is decreased.

- c. Tighten the locknut.



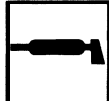
4. Install:

- Fuel tank
Refer to “FUEL TANK” on page 6-1.
- Side cover (cylinder head)
- Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS5S71031

LUBRICATING THE THROTTLE GRIP HOUSING AND CABLE

Lubricate the throttle grip housing and cable.



Recommended lubricant
Lithium-soap-based grease

EAS21760

CHECKING AND CHARGING THE BATTERY

Refer to “ELECTRICAL COMPONENTS” on page 7-73.

EAS21770

CHECKING THE FUSES

Refer to “ELECTRICAL COMPONENTS” on page 7-73.

EAS5S71026

CHECKING THE SWITCHES

Refer to “ELECTRICAL COMPONENTS” on page 7-73.

EAS21810

ADJUSTING THE HEADLIGHT BEAM

1. Adjust:

- Headlight beam (vertically)

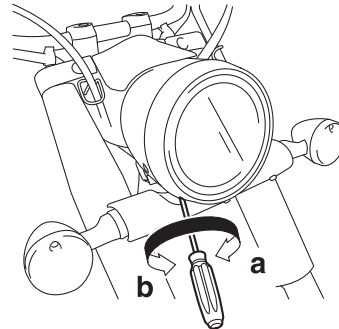
- a. Turn the adjusting screw with a screw driver in direction “a” or “b”.

Direction “a”

Headlight beam is raised.

Direction “b”

Headlight beam is lowered.



2. Adjust:

- Headlight beam (horizontally)

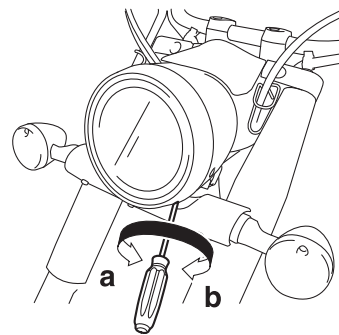
- a. Turn the adjusting screw with a screw driver in direction “a” or “b”.

Direction “a”

Headlight beam moves to the left.

Direction “b”

Headlight beam moves to the right.

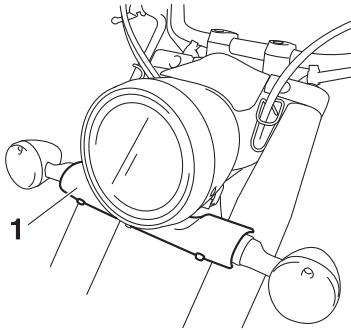


EAS21790

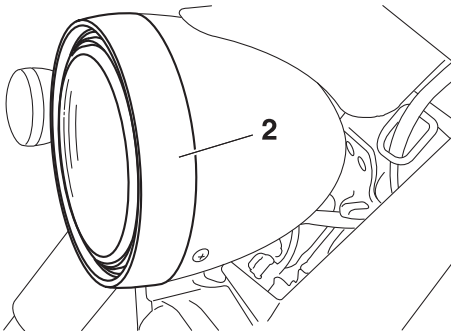
REPLACING THE HEADLIGHT BULB

1. Remove:

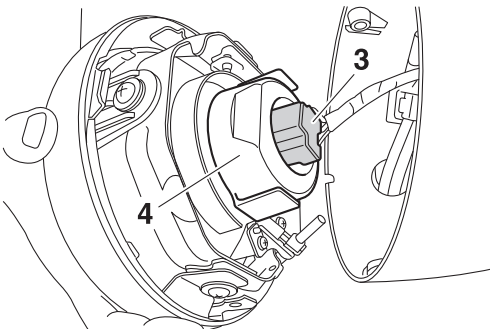
- Turn signal light bracket cover “1”



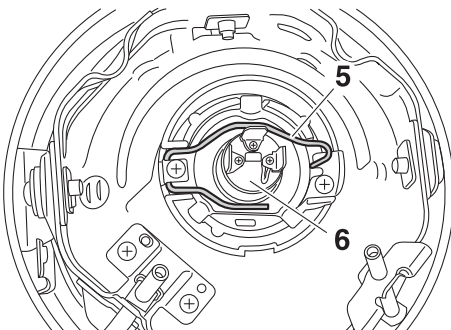
2. Remove:
 - Headlight lens unit "2"



3. Disconnect:
 - Headlight coupler "3"
4. Remove:
 - Bulb cover "4"



5. Detach:
 - Headlight bulb holder "5"
6. Remove:
 - Headlight bulb "6"



EWA13320

WARNING

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

7. Install:

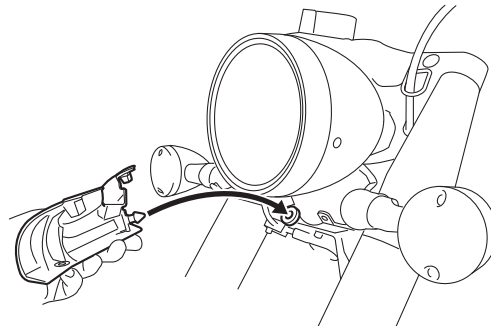
- Headlight bulb **New**
Secure the new headlight bulb with the headlight bulb holder.

ECA13690

NOTICE

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

8. Attach:
 - Headlight bulb holder
9. Install:
 - Bulb cover
10. Connect:
 - Headlight coupler
11. Install:
 - Headlight lens unit
 - Turn signal light bracket cover



CHASSIS

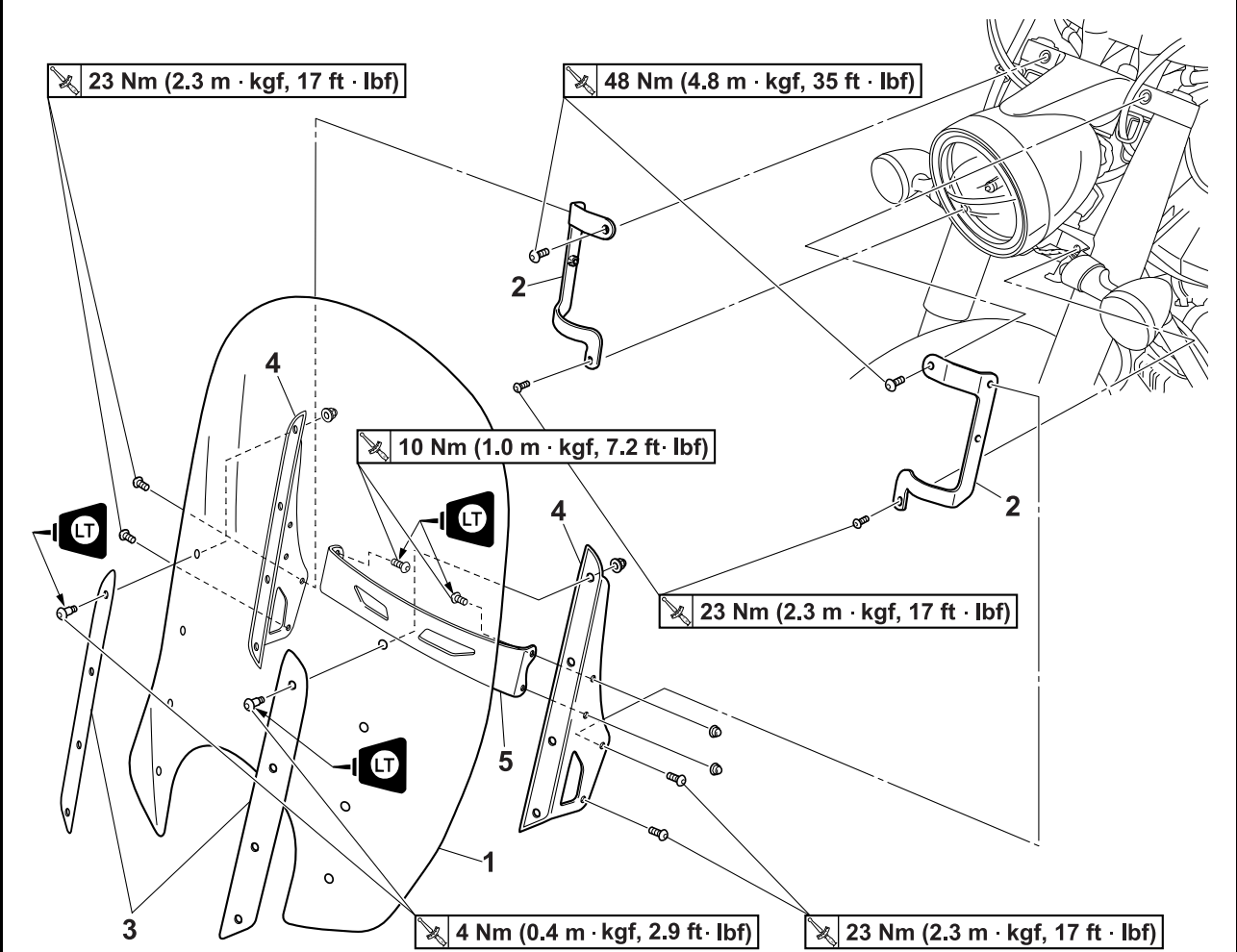
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EAS21830

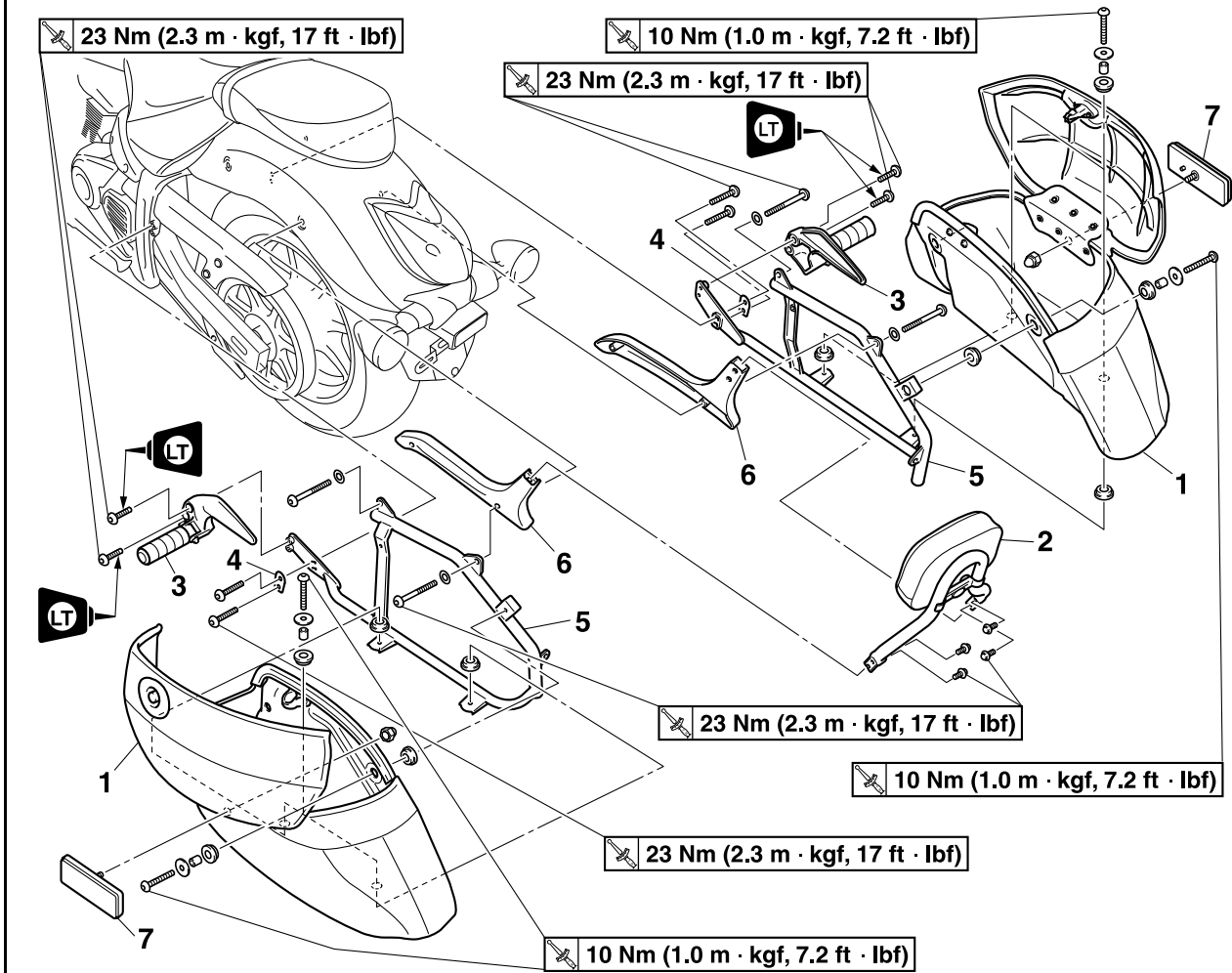
GENERAL CHASSIS

Removing the windshield (for XVS95CTY/XVS95CTYC)



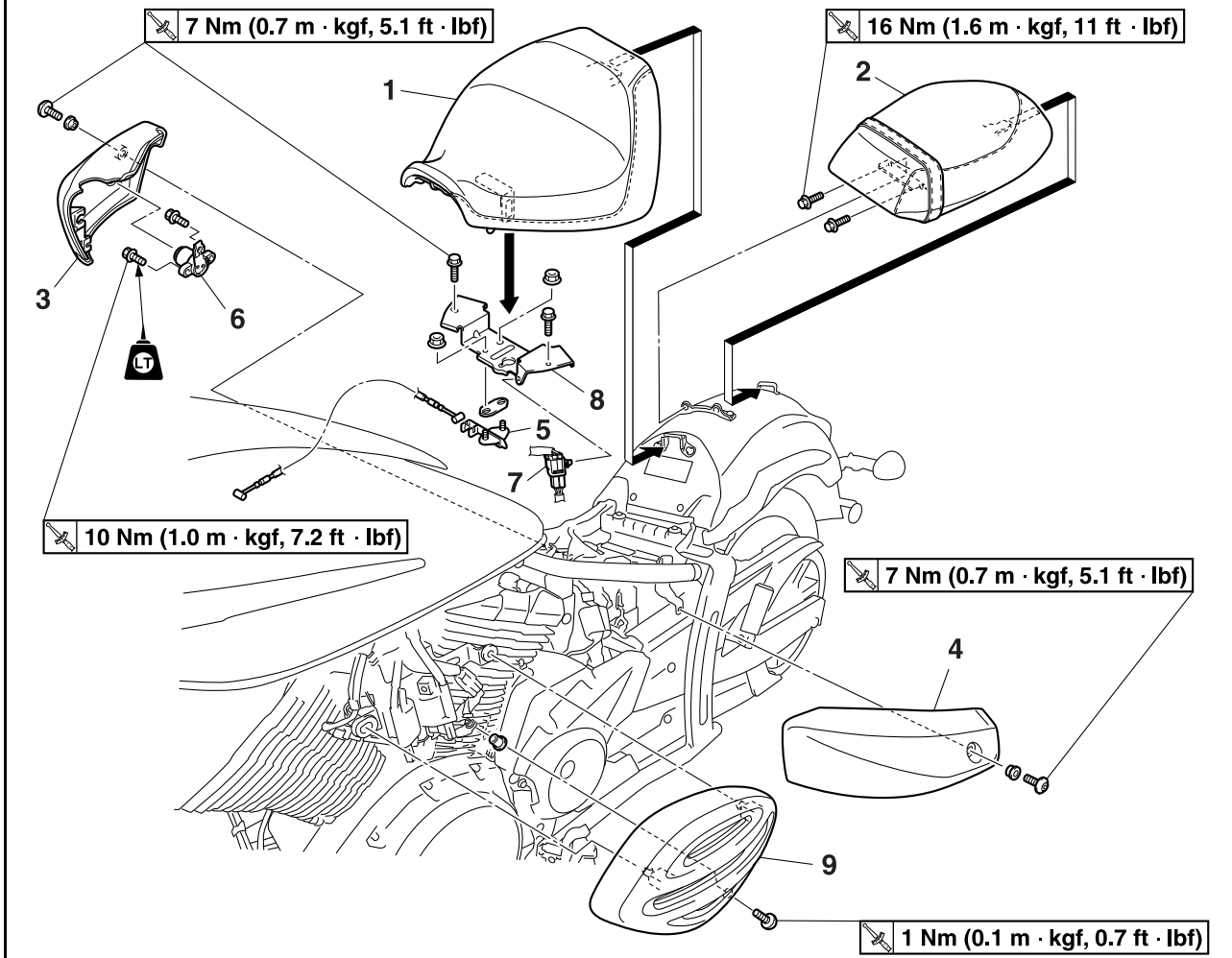
Order	Job/Parts to remove	Q'ty	Remarks
	Turn signal light bracket cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Windshield	1	
2	Stay (left and right)	2	
3	Plate (left and right)	2	
4	Bracket (left and right)	2	
5	Front plate	1	
			For installation, reverse the removal procedure.

Removing the sidebags and backrest (for XVS95CTY/XVS95CTYC)



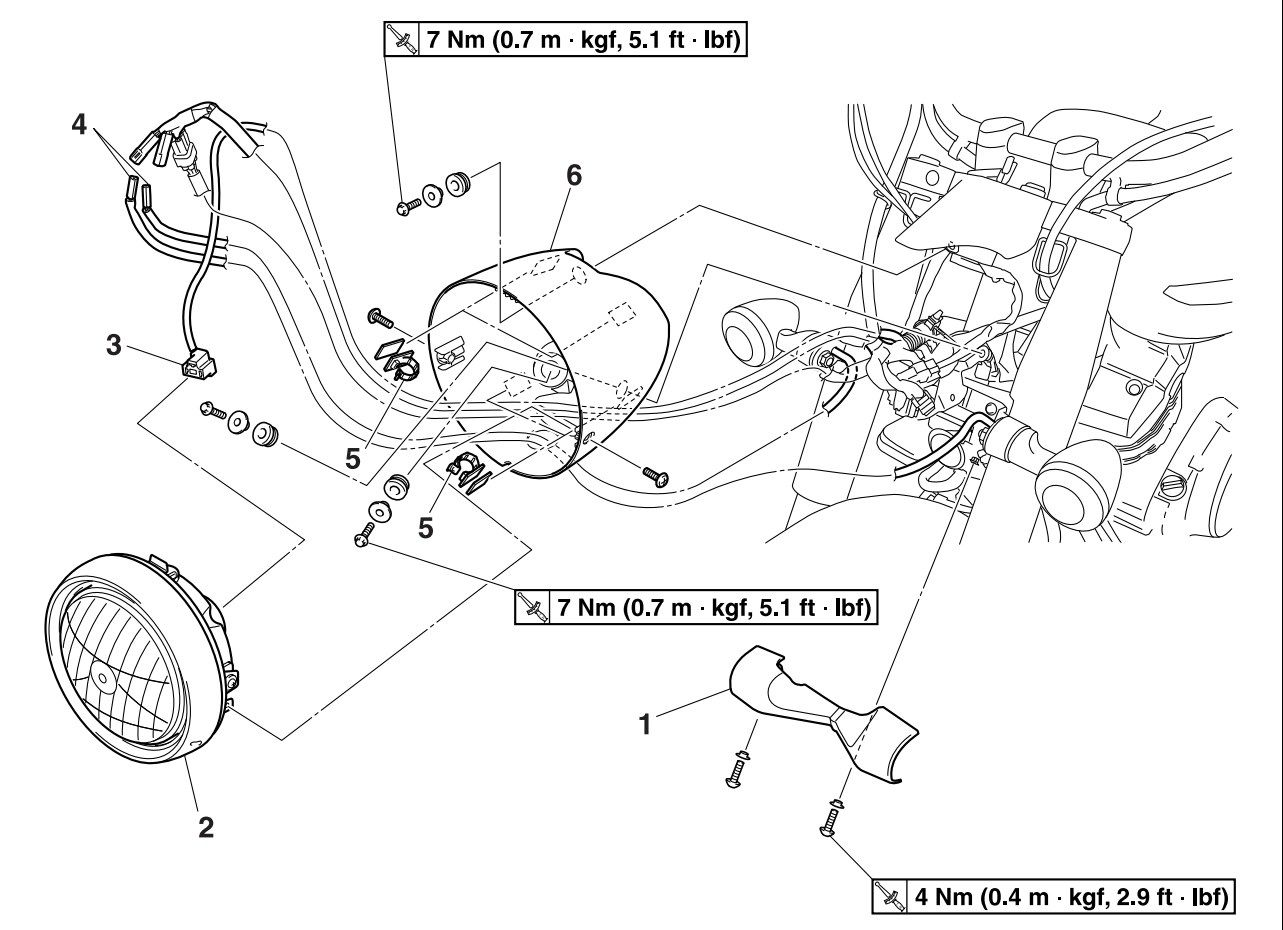
Order	Job/Parts to remove	Q'ty	Remarks
1	Sidebag (left and right)	2	TIP Water can be harmful to untreated leather. Use Yamaha Saddle Soap or another quality brand according to the manufacturer's directions to clean the leather on the sidebags. Polish the dry leather with a soft cloth, and then treat with Yamaha Mink Oil or another high-quality leather protectant for increased water resistance.
2	Backrest	1	
3	Passenger footrest (left and right)	2	
4	Sidebag bracket plate	2	
5	Sidebag bracket (left and right)	2	
6	Backrest bracket (left and right)	2	
7	Reflector (left and right)	2	
			For installation, reverse the removal procedure.

Removing the rider seat and side cover



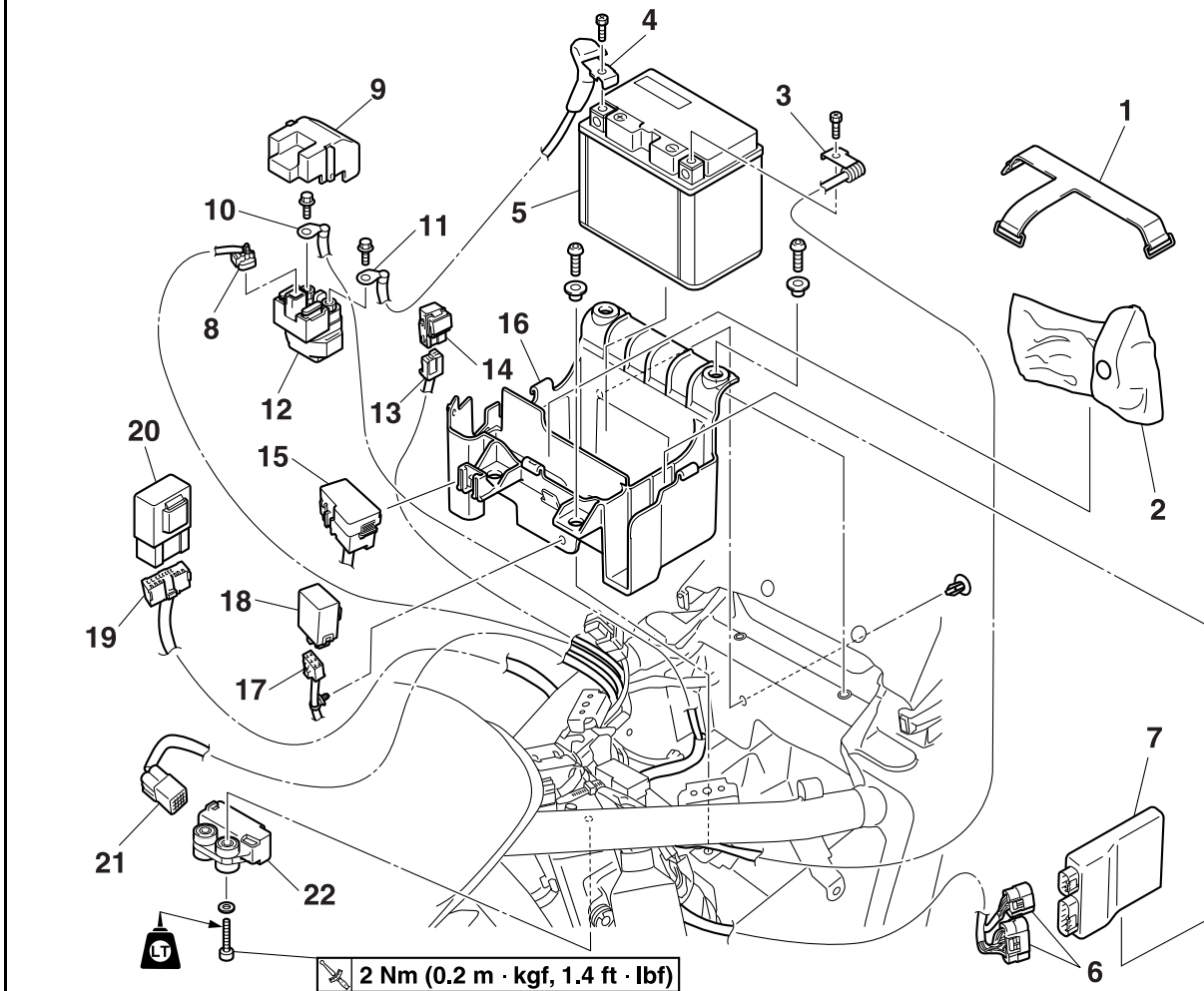
Order	Job/Parts to remove	Q'ty	Remarks
1	Rider seat	1	
2	Passenger seat	1	
3	Right side cover	1	
4	Left side cover	1	
5	Seat lock cable assembly	1	Disconnect.
6	Key cylinder (seat lock)	1	
7	Meter coupler	1	Disconnect.
8	Seat lock bracket	1	
9	Side cover (cylinder head)	1	
			For installation, reverse the removal procedure.

Removing the headlight



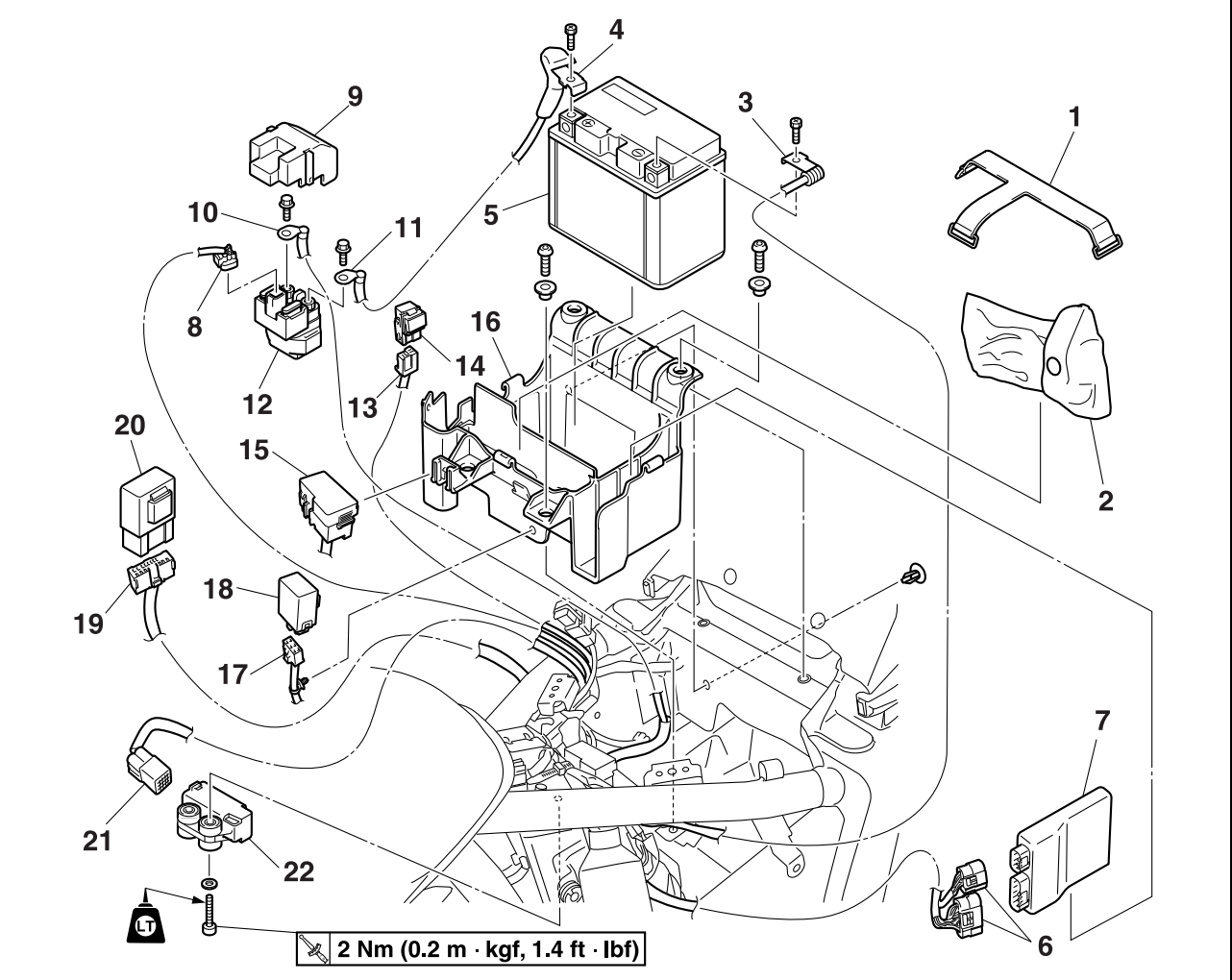
Order	Job/Parts to remove	Q'ty	Remarks
1	Turn signal light bracket cover	1	
2	Headlight lens unit	1	
3	Headlight coupler	1	Disconnect.
4	Turn signal light coupler	2	Disconnect.
5	Wire harness clamp	3	Disconnect.
6	Headlight body	1	
			For installation, reverse the removal procedure.

Removing the battery



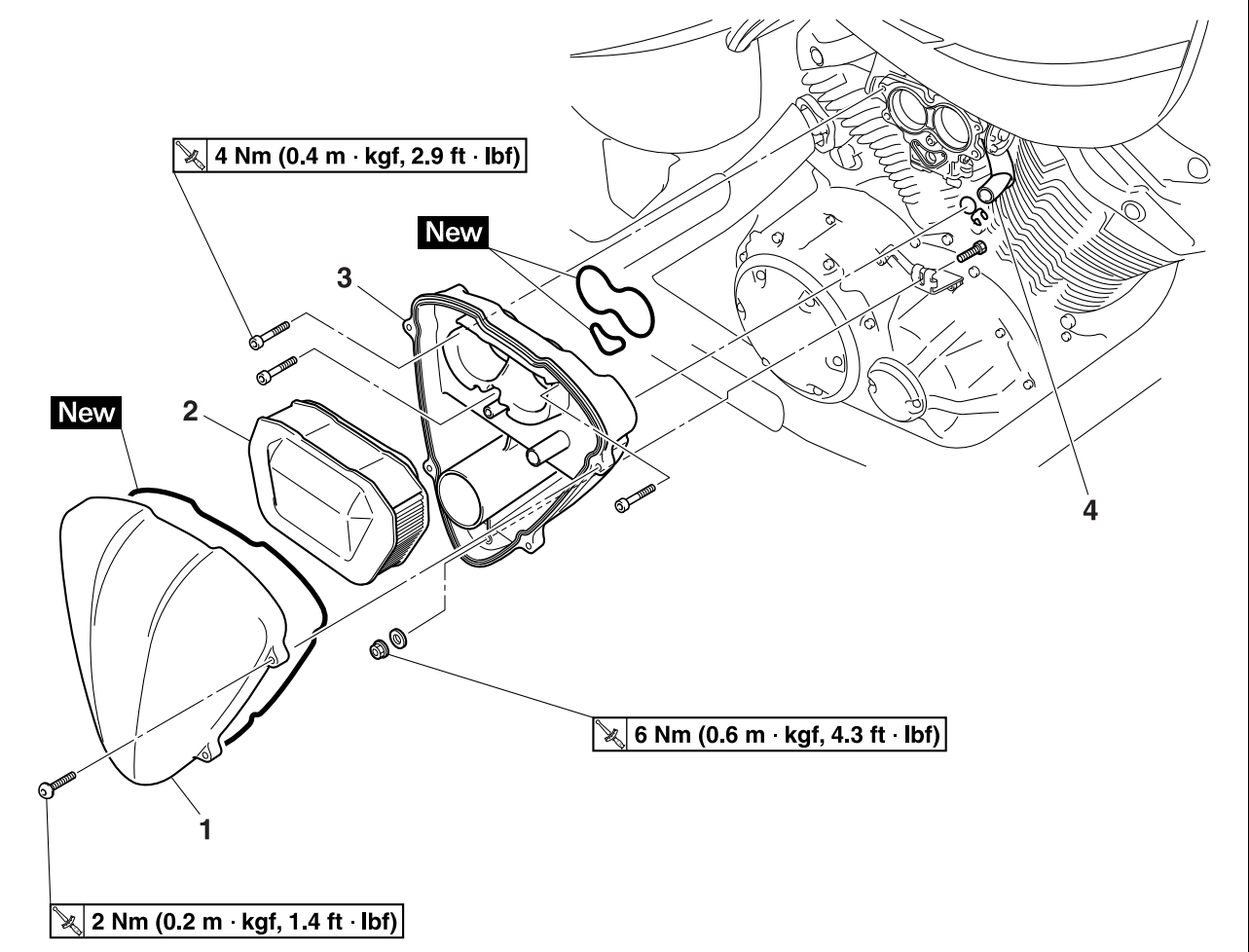
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Side cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Battery band	1	
2	Tool kit	1	
3	Negative battery lead	1	Disconnect.
4	Positive battery lead (battery)	1	Disconnect.
5	Battery	1	
6	ECU coupler	2	Disconnect.
7	ECU (engine control unit)	1	
8	Starter relay coupler	1	Disconnect.
9	Starter relay cover	1	
10	Starter motor lead	1	Disconnect.
11	Positive battery lead (starter relay)	1	Disconnect.
12	Starter relay	1	
13	Head light relay coupler	1	Disconnect.
14	Head light relay	1	Disconnect.
15	Fuse box	1	
16	Battery box	1	
17	Turn signal relay coupler	1	Disconnect.
18	Turn signal relay	1	
19	Relay unit coupler	1	Disconnect.
20	Relay unit	1	

Removing the battery



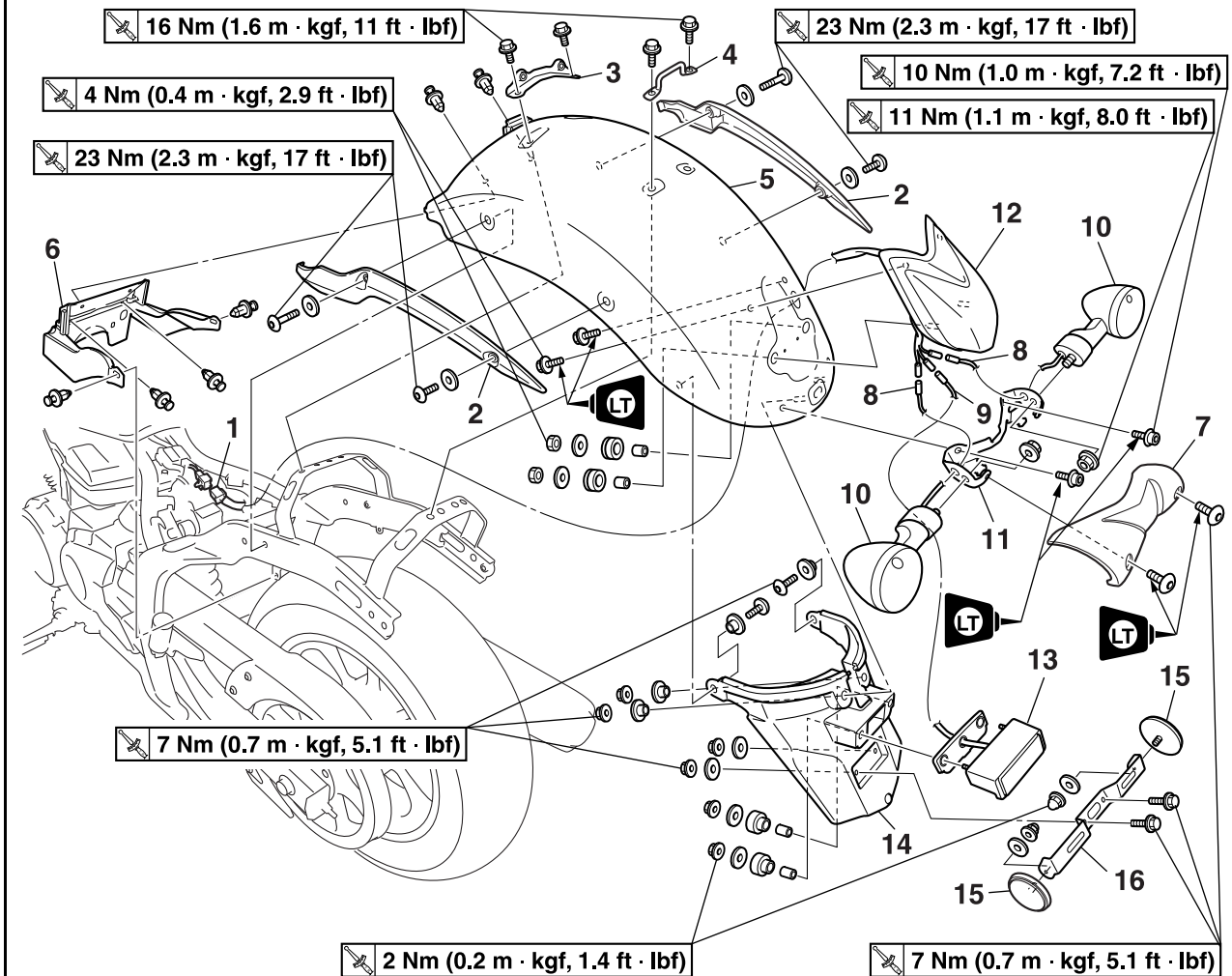
Order	Job/Parts to remove	Q'ty	Remarks
21	Lean angle sensor coupler	1	Disconnect.
22	Lean angle sensor	1	
			For installation, reverse the removal procedure.

Removing the air filter case



Order	Job/Parts to remove	Q'ty	Remarks
1	Air filter case cover	1	
2	Air filter element	1	
3	Air filter case	1	
4	Crankcase breather hose	1	Disconnect.
			For installation, reverse the removal procedure.

Removing the rear fender

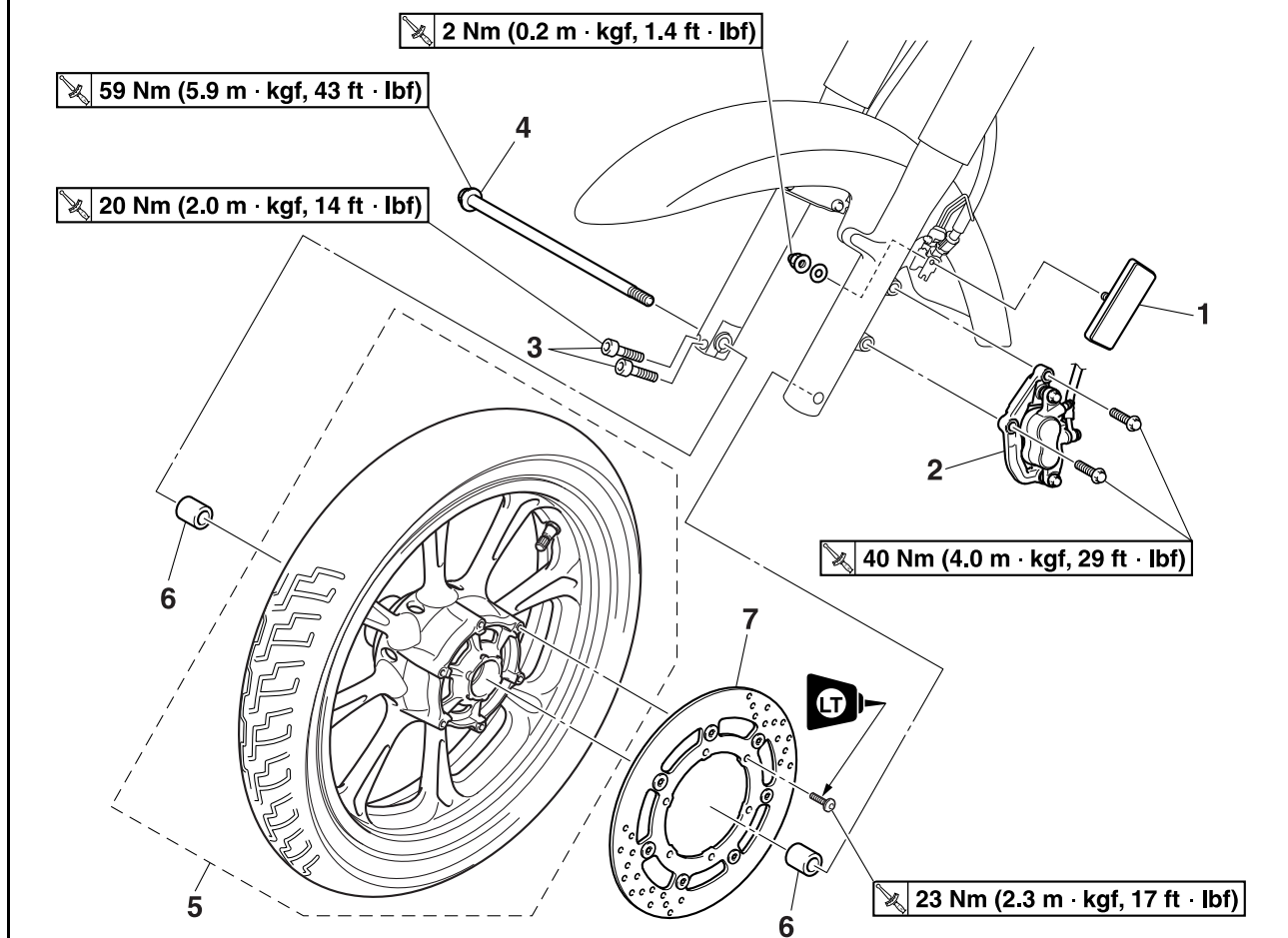


Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Passenger seat/Seat lock bracket		Refer to "GENERAL CHASSIS" on page 4-1.
1	Tail/brake light wire harness coupler	1	Disconnect.
2	Rear fender bracket	2	
3	Passenger seat bracket	1	
4	Passenger seat guide	1	
5	Rear fender	1	
6	Mudguard (front)	1	
7	Rear turn signal light bracket cover	1	
8	Rear turn signal light coupler	2	Disconnect.
9	License plate light coupler	1	Disconnect.
10	Rear turn signal light	2	
11	Rear turn signal light bracket	1	
12	Tail/brake light assembly	1	
13	License plate light assembly	1	
14	Mudguard (rear)	1	
15	Reflector	2	
16	Reflector bracket	1	
			For installation, reverse the removal procedure.

EAS21870

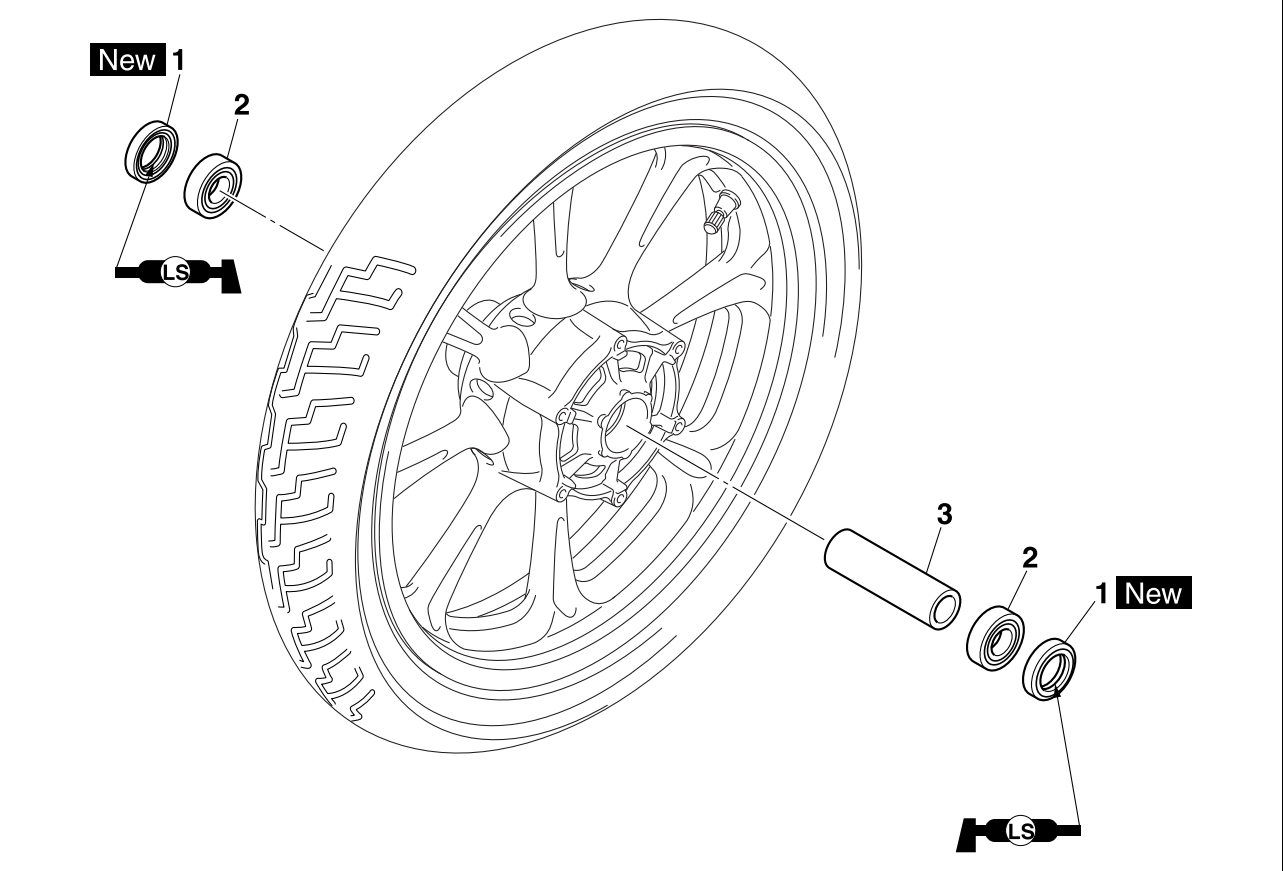
FRONT WHEEL

Removing the front wheel and brake disc



Order	Job/Parts to remove	Q'ty	Remarks
			TIP Place the vehicle on a suitable stand so that the front wheel is elevated.
1	Reflector (left)	1	
2	Front brake caliper	1	
3	Front wheel axle pinch bolt	2	Loosen.
4	Front wheel axle	1	
5	Front wheel	1	
6	Collar	2	
7	Front brake disc	1	
			For installation, reverse the removal procedure.

Disassembling the front wheel



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

EAS21900

REMOVING THE FRONT WHEEL

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Remove:
 - Reflector (left)
 - Front brake caliper

TIP

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

3. Elevate:
 - Front wheel

TIP

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

EAS21910

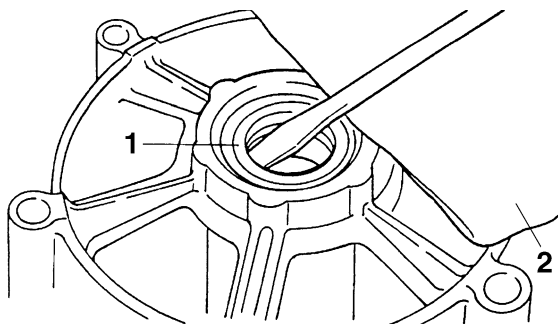
DISASSEMBLING THE FRONT WHEEL

1. Remove:
 - Oil seals
 - Wheel bearings

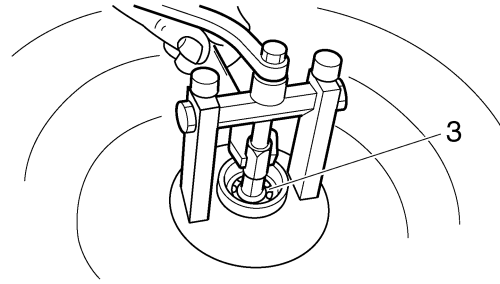
- a. Clean the outside of the front wheel hub.
- b. Remove the oil seals "1" with a flathead screwdriver.

TIP

To prevent damaging the wheel, place a rag "2" between the screwdriver and the wheel surface.



- c. Remove the wheel bearings "3" with a general bearing puller.



EAS21920

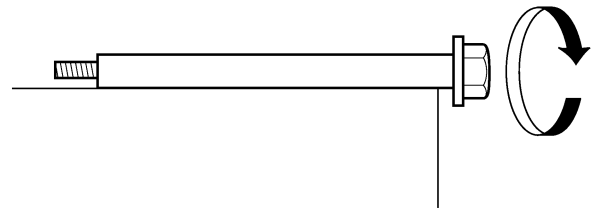
CHECKING THE FRONT WHEEL

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

EWA13460

WARNING

Do not attempt to straighten a bent wheel axle.



2. Check:
 - Tire
 - Front wheel
 - Damage/wear → Replace.
 - Refer to "CHECKING THE TIRES" on page 3-16 and "CHECKING THE WHEELS" on page 3-16.
3. Measure:
 - Radial wheel runout "1"
 - Lateral wheel runout "2"
 - Over the specified limits → Replace.

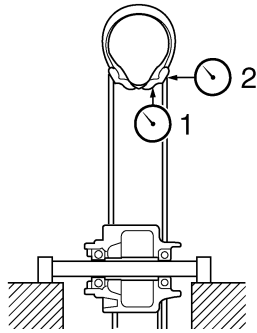


Radial wheel runout limit

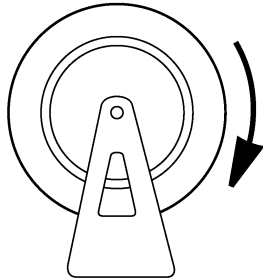
1.0 mm (0.04 in)

Lateral wheel runout limit

0.5 mm (0.02 in)



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



EAS21960

ASSEMBLING THE FRONT WHEEL

1. Install:

- Wheel bearings **New**
- Oil seals **New**

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

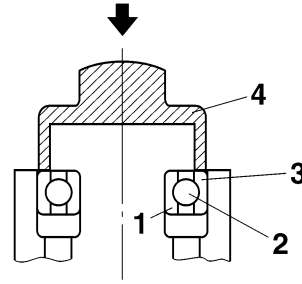
ECA3D81004

NOTICE

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

TIP

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



EAS21970

ADJUSTING THE FRONT WHEEL STATIC BALANCE

TIP

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

1. Remove:

- Balancing weight(s)

2. Find:

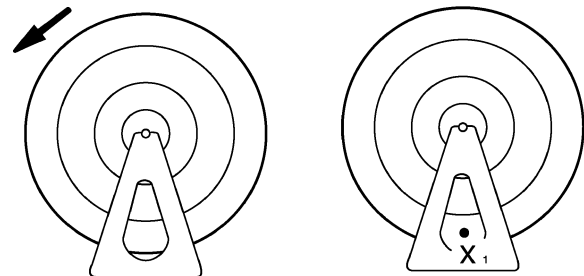
- Front wheel's heavy spot

TIP

Place the front wheel on a suitable balancing stand.

- a. Spin the front wheel.

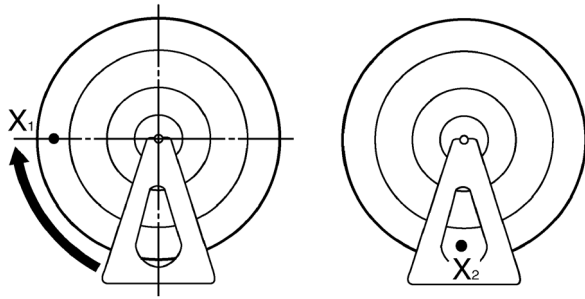
- b. When the front wheel stops, put an "X₁" mark at the bottom of the wheel.



- c. Turn the front wheel 90° so that the "X₁" mark is positioned as shown.

- d. Release the front wheel.

- e. When the wheel stops, put an "X₂" mark at the bottom of the wheel.

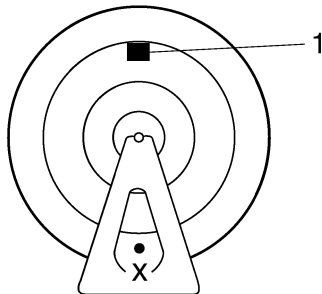


- f. Repeat steps (c) through (e) several times until all the marks come to rest at the same spot.
- g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

3. Adjust:

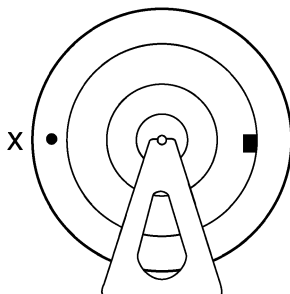
- Front wheel static balance

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



TIP Start with the lightest weight.

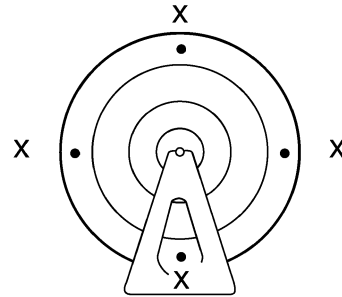
- b. Turn the front wheel 90° so that the heavy spot is positioned as shown.



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

4. Check:
 - Front wheel static balance

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

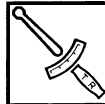


- b. If the front wheel does not remain stationary at all of the positions, rebalance it.

EAS22000

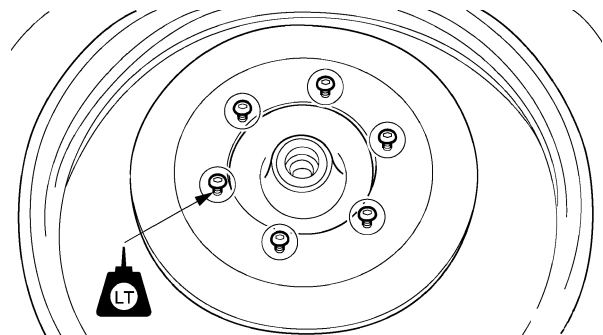
INSTALLING THE FRONT WHEEL (FRONT BRAKE DISC)

1. Install:
 - Front brake disc

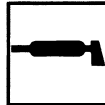


Front brake disc bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)
LOCTITE®

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



2. Check:
 - Front brake disc
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-26.
3. Lubricate:
 - Oil seal lips

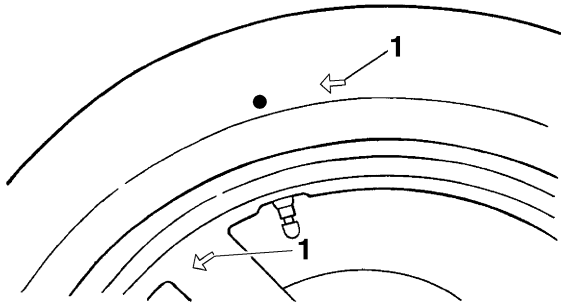


Recommended lubricant
Lithium-soap-based grease

4. Install:
 - Front wheel

TIP

Install the tire and wheel with the marks “1” pointing in the direction of wheel rotation.



5. Tighten:

- Front wheel axle
- Front wheel axle pinch bolts



Front wheel axle

59 Nm (5.9 m·kgf, 43 ft·lbf)

Front wheel axle pinch bolt

20 Nm (2.0 m·kgf, 14 ft·lbf)

ECA3D81011

NOTICE

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

TIP

Tighten the front wheel axle pinch bolts to specification twice. Tighten the inside and outside bolts alternately, starting with the inside bolt.

6. Install:

- Front brake caliper
- Reflector (left)



Front brake caliper bracket bolt

40 Nm (4.0 m·kgf, 29 ft·lbf)

EWA3D81008



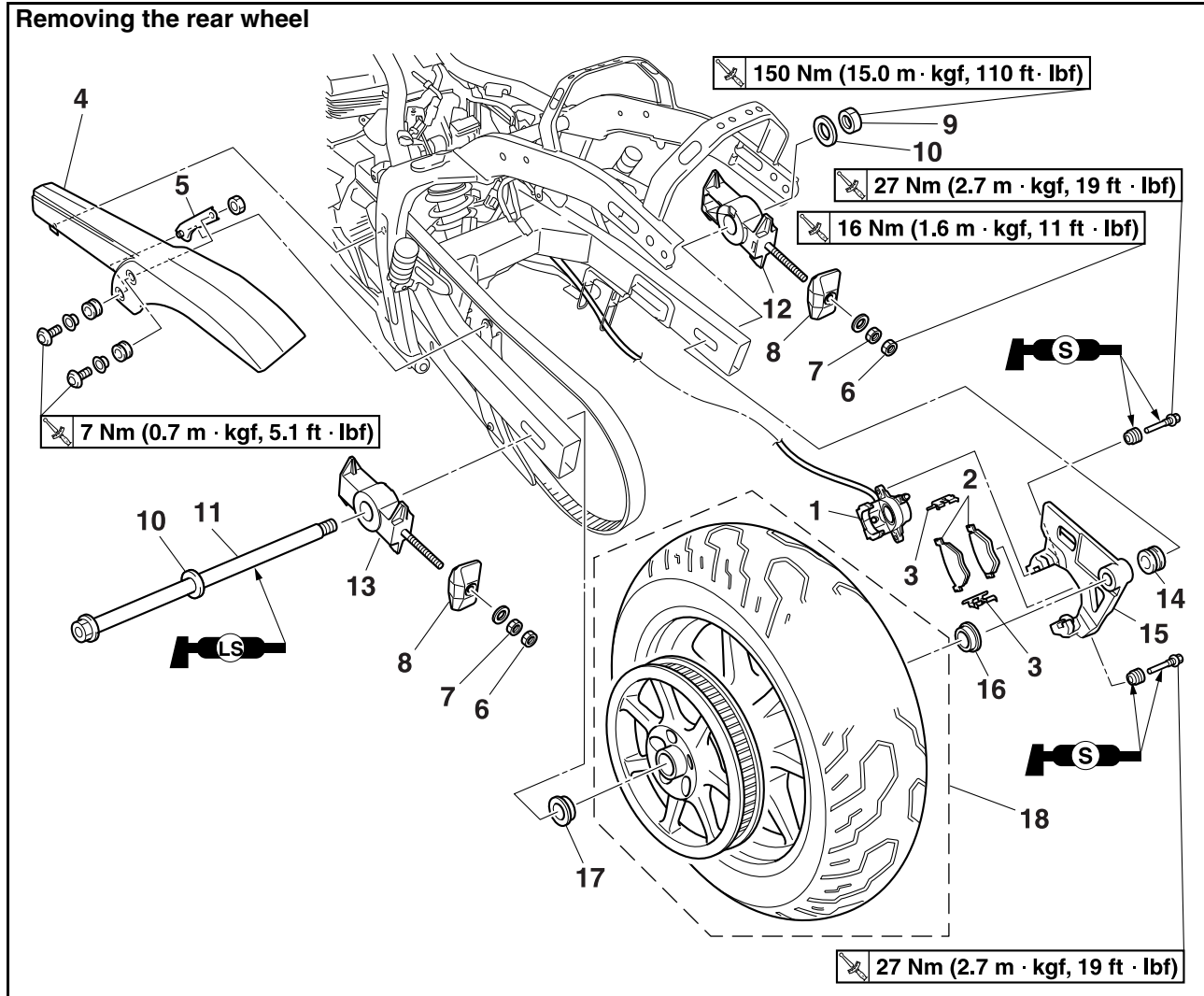
WARNING

Make sure the brake hose is routed properly.

EAS22020

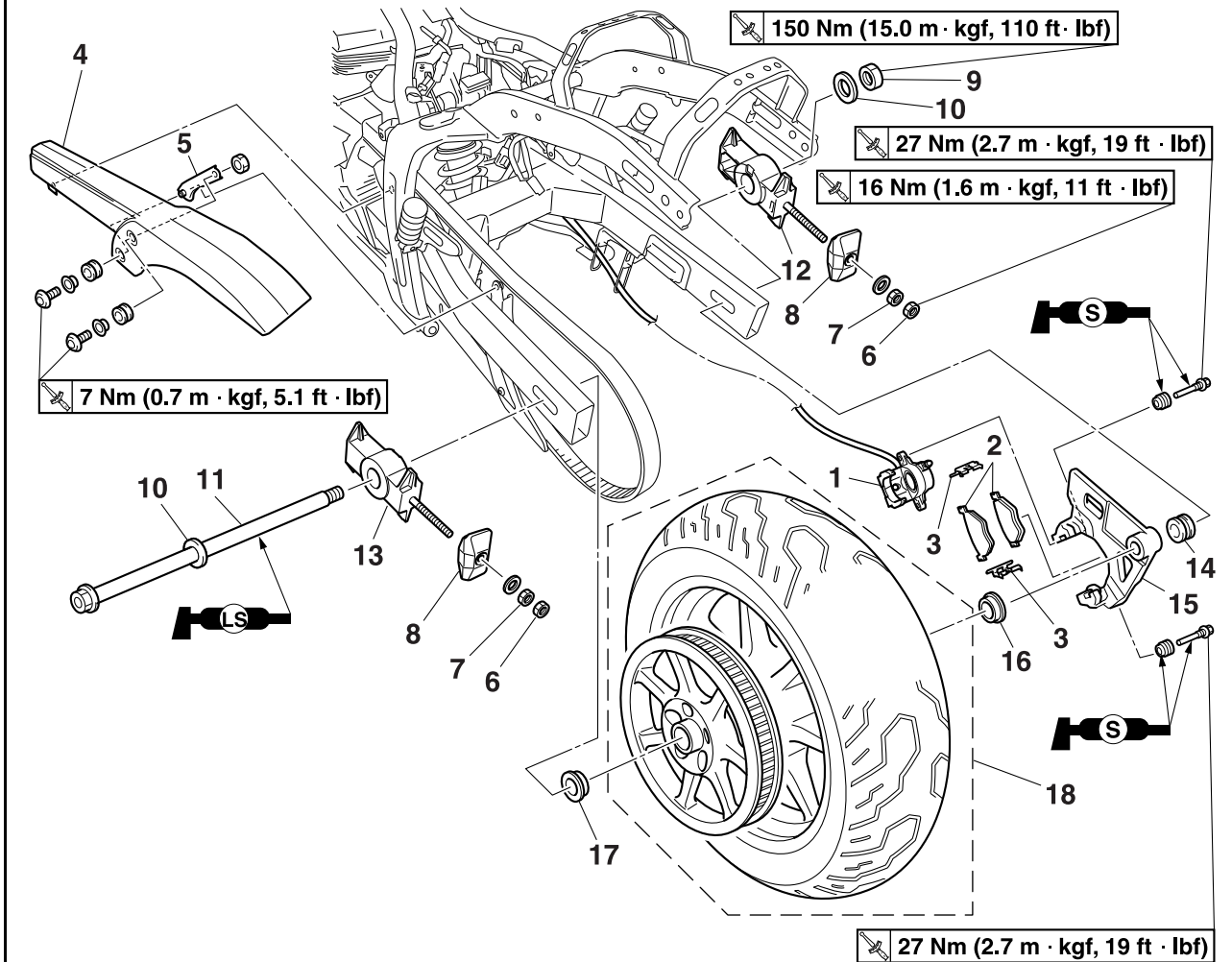
REAR WHEEL

Removing the rear wheel



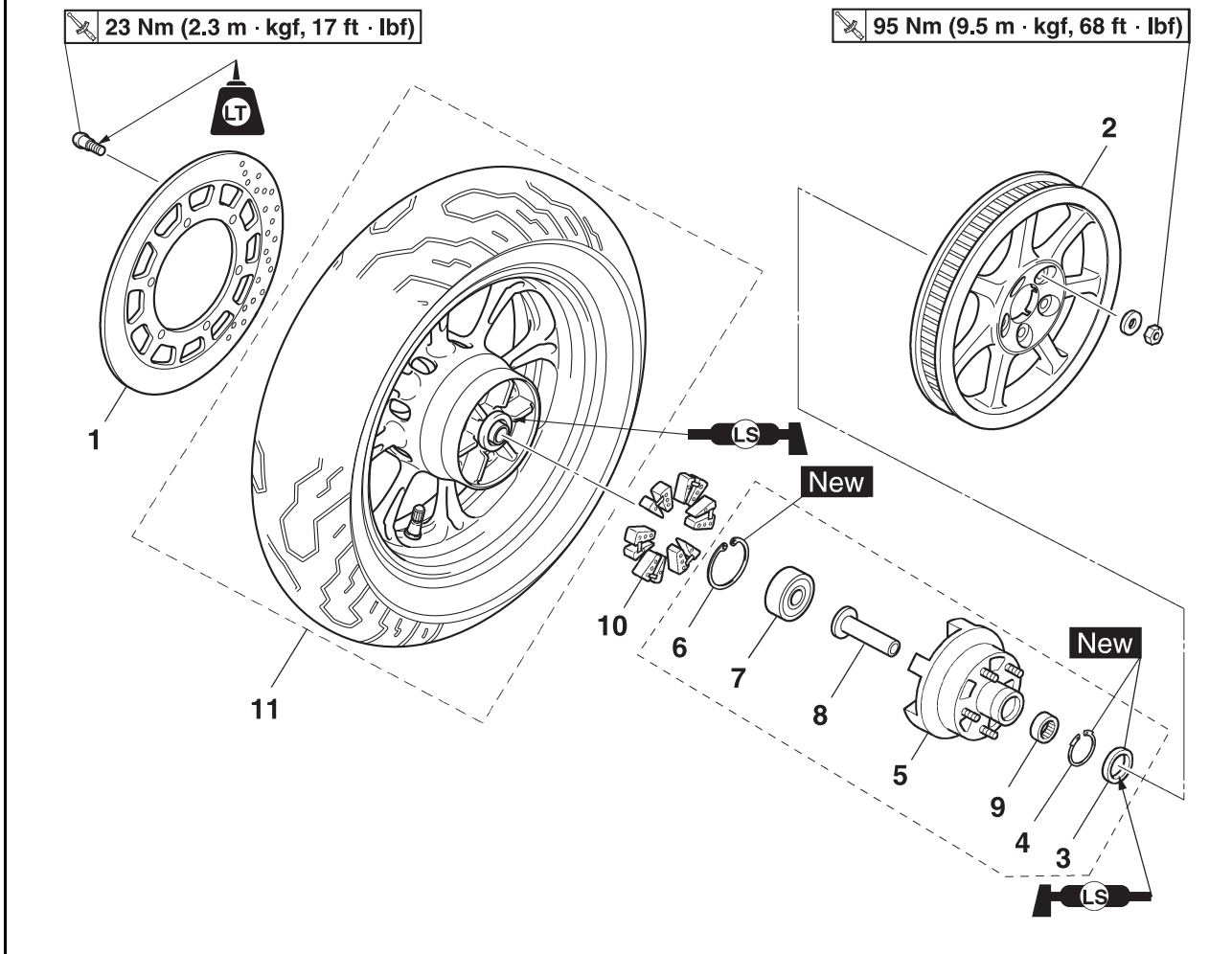
Order	Job/Parts to remove	Q'ty	Remarks
			TIP Place the vehicle on a suitable stand so that the rear wheel is elevated.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
1	Rear brake caliper	1	
2	Rear brake pad	2	
3	Brake pad spring	2	
4	Drive belt upper guard	1	
5	Belt case stay	1	
6	Drive belt adjusting locknut	2	Loosen.
7	Drive belt adjusting nut	2	Loosen.
8	Plate	2	
9	Rear wheel axle nut	1	
10	Washer	2	
11	Rear wheel axle	1	
12	Right drive belt puller	1	
13	Left drive belt puller	1	
14	Collar (caliper)	1	Black

Removing the rear wheel



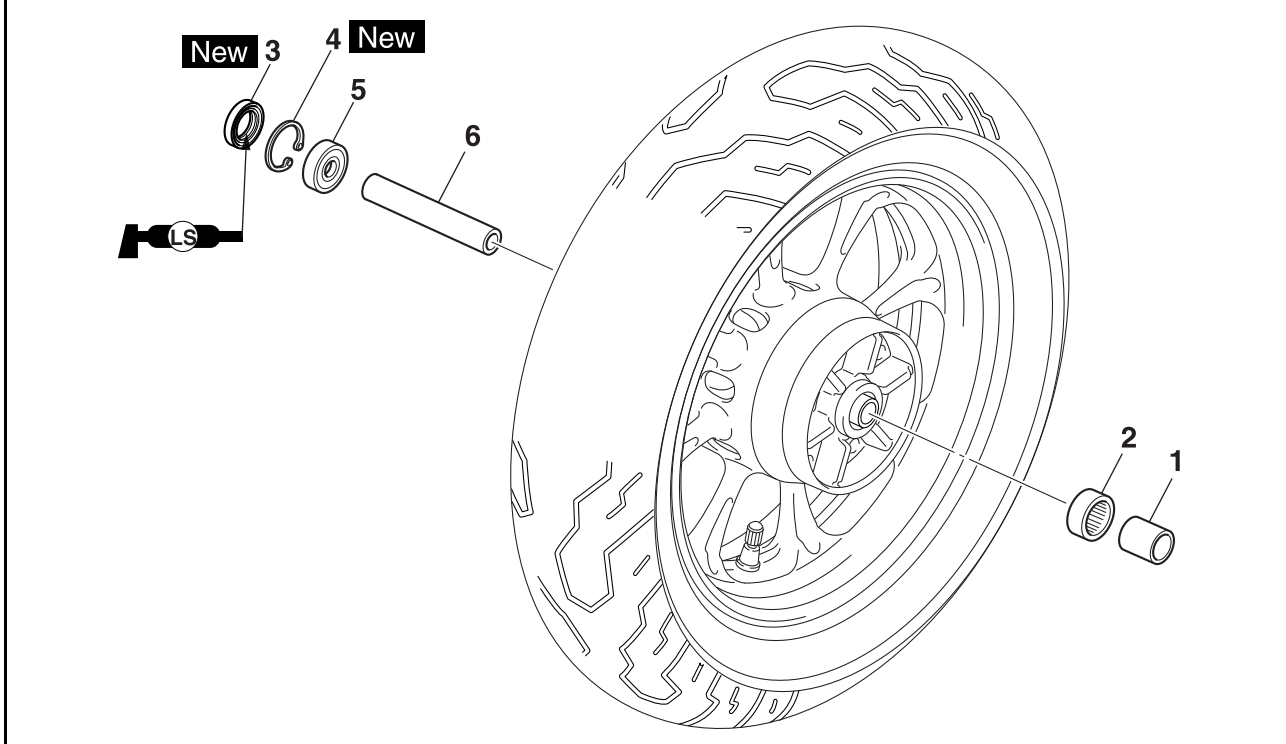
Order	Job/Parts to remove	Q'ty	Remarks
15	Rear brake caliper bracket	1	
16	Collar (right)	1	Black
17	Collar (left)	1	Silver
18	Rear wheel	1	
			For installation, reverse the removal procedure.

Removing the rear brake disc and rear wheel drive hub



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

Disassembling the rear wheel



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

EAS28760

REMOVING THE REAR WHEEL (DISC)

1. Stand the vehicle on a level surface.

EWA13120



WARNING

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

TIP

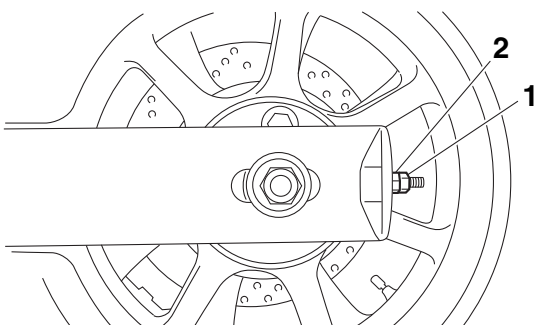
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
 - Rear brake caliper

TIP

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

3. Loosen:
 - Drive belt adjusting locknuts "1"
 - Drive belt adjusting nuts "2"



4. Remove:
 - Rear wheel axle nut
 - Rear wheel axle
 - Rear wheel

TIP

Push the rear wheel forward and remove the drive belt from the rear wheel pulley.

EAS22080

DISASSEMBLING THE REAR WHEEL

1. Remove:
 - Oil seals
 - Wheel bearings
 Refer to "DISASSEMBLING THE FRONT WHEEL" on page 4-11.

EAS22090

CHECKING THE REAR WHEEL

1. Check:
 - Rear wheel axle
 - Rear wheel
 - Wheel bearings

- Oil seals
Refer to "CHECKING THE FRONT WHEEL" on page 4-11.
2. Check:
 - Tire
 - Rear wheel
Damage/wear → Replace.
Refer to "CHECKING THE TIRES" on page 3-16 and "CHECKING THE WHEELS" on page 3-16.
 3. Measure:
 - Radial wheel runout
 - Lateral wheel runout
Refer to "CHECKING THE FRONT WHEEL" on page 4-11.



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

EAS3D81016

CHECKING THE REAR BRAKE CALIPER BRACKET

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

EAS22110

CHECKING THE REAR WHEEL DRIVE HUB

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

EAS22130

CHECKING AND REPLACING THE REAR WHEEL PULLEY

1. Check:
 - Rear wheel pulley
Surface plating has come off → Replace the rear wheel pulley.
Bent teeth → Replace the rear wheel pulley.
2. Replace:
 - Rear wheel pulley



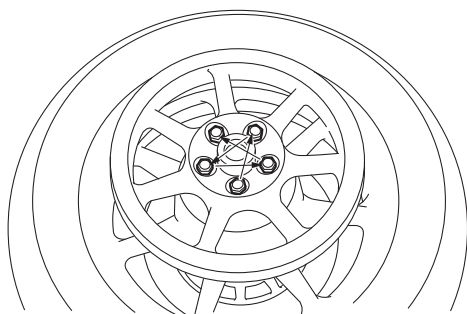
- a. Remove the self-locking nuts and the rear wheel pulley.
- b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the pulley.
- c. Install the new rear wheel pulley.



Rear wheel pulley self-locking nut
95 Nm (9.5 m·kgf, 68 ft·lbf)

TIP

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



EAS22140

ASSEMBLING THE REAR WHEEL

1. Install:

- Wheel bearings **New**
 - Oil seals **New**
- Refer to "ASSEMBLING THE FRONT WHEEL" on page 4-12.

EAS22150

ADJUSTING THE REAR WHEEL STATIC BALANCE

TIP

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

1. Adjust:

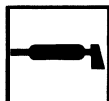
- Rear wheel static balance
- Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-12.

EAS28770

INSTALLING THE REAR WHEEL (REAR BRAKE DISC)

1. Lubricate:

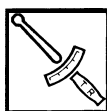
- Rear wheel axle
- Oil seal lips



Recommended lubricant
Lithium-soap-based grease

2. Install:

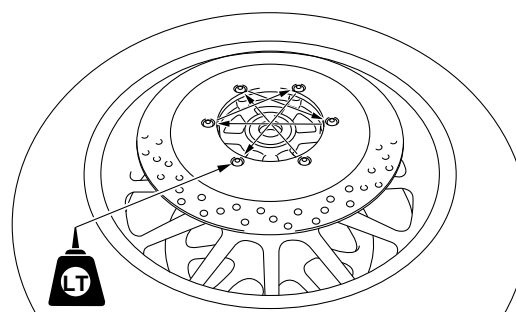
- Rear brake disc



Rear brake disc bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)
LOCTITE®

TIP

- Apply locking agent (LOCTITE®) to the threads of the brake disc bolts.
- Tighten the brake disc bolts in stages and in a crisscross pattern.



3. Check:

- Rear brake disc
- Refer to "CHECKING THE REAR BRAKE DISC" on page 4-38.

4. Install:

- Rear wheel axle
- Washer
- Rear wheel axle nut

TIP

Temporarily tighten the wheel axle nut.

5. Adjust:

- Drive belt slack
- Refer to "ADJUSTING THE DRIVE BELT SLACK" on page 3-18.

6. Tighten:

- Rear wheel axle nut



Rear wheel axle nut
150 Nm (15.0 m·kgf, 110 ft·lbf)

7. Install:

- Rear brake caliper



Rear brake caliper retaining bolt
27 Nm (2.7 m·kgf, 19 ft·lbf)

EWA13500

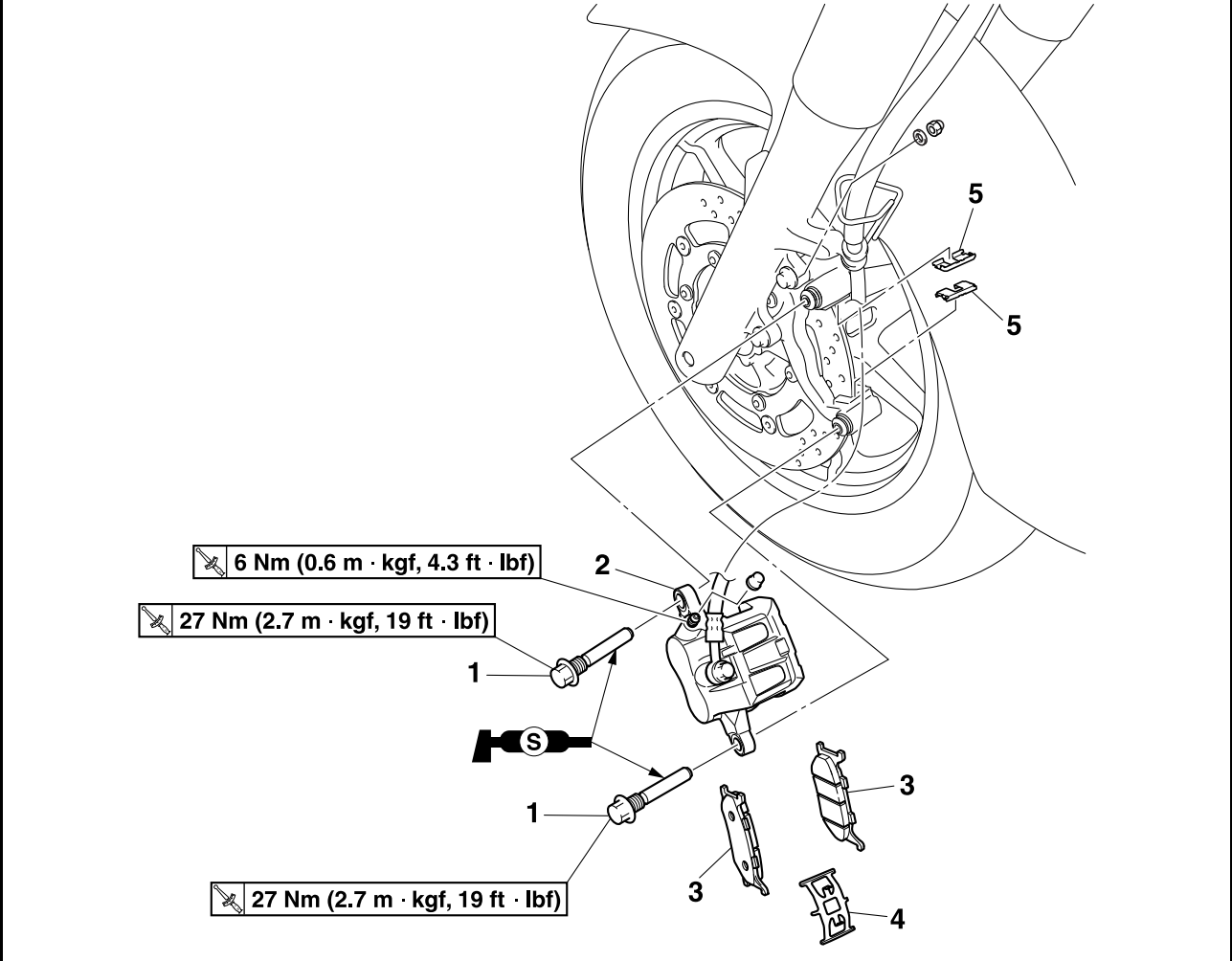


Make sure the brake hose is routed properly.

EAS22210

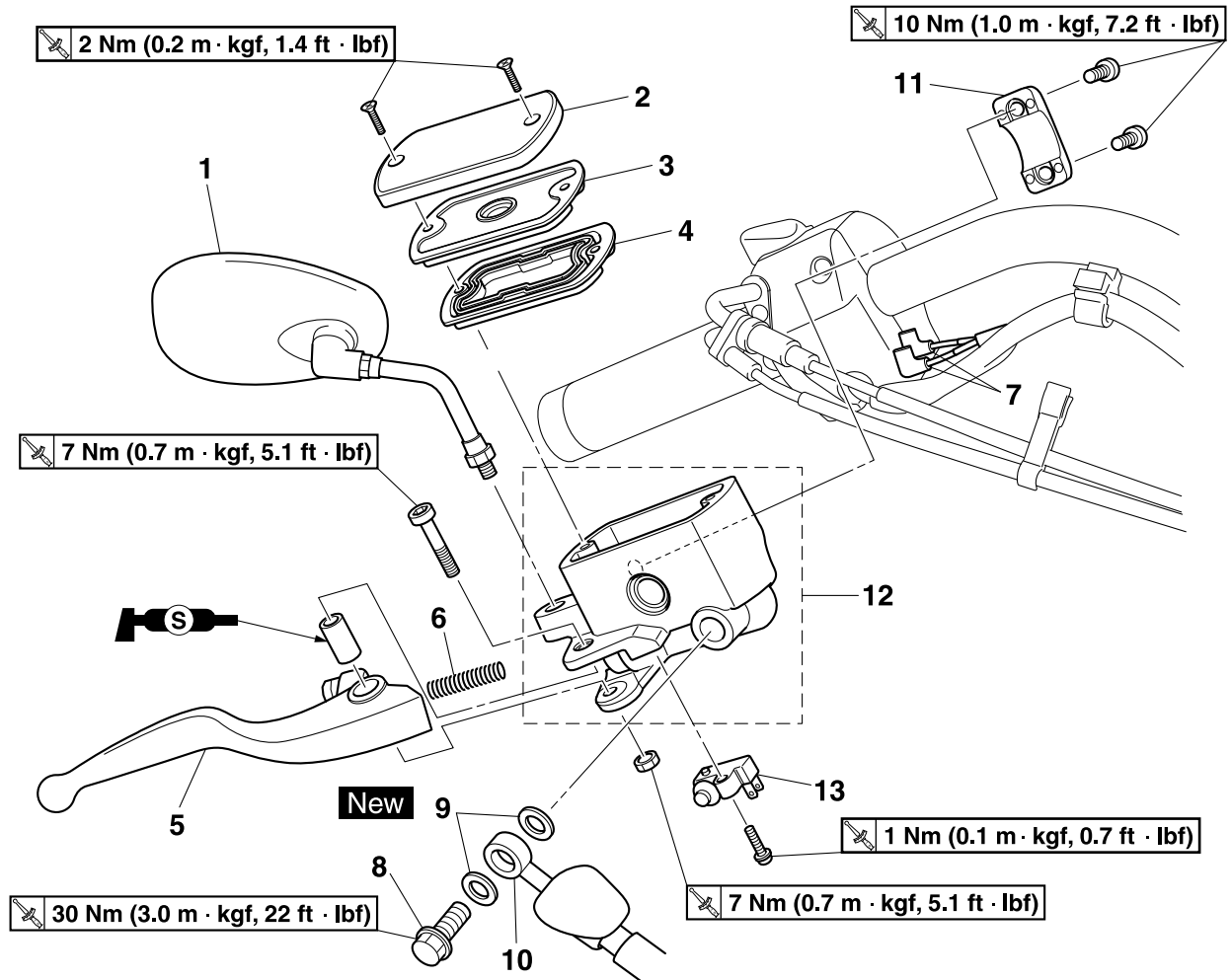
FRONT BRAKE

Removing the front brake pads



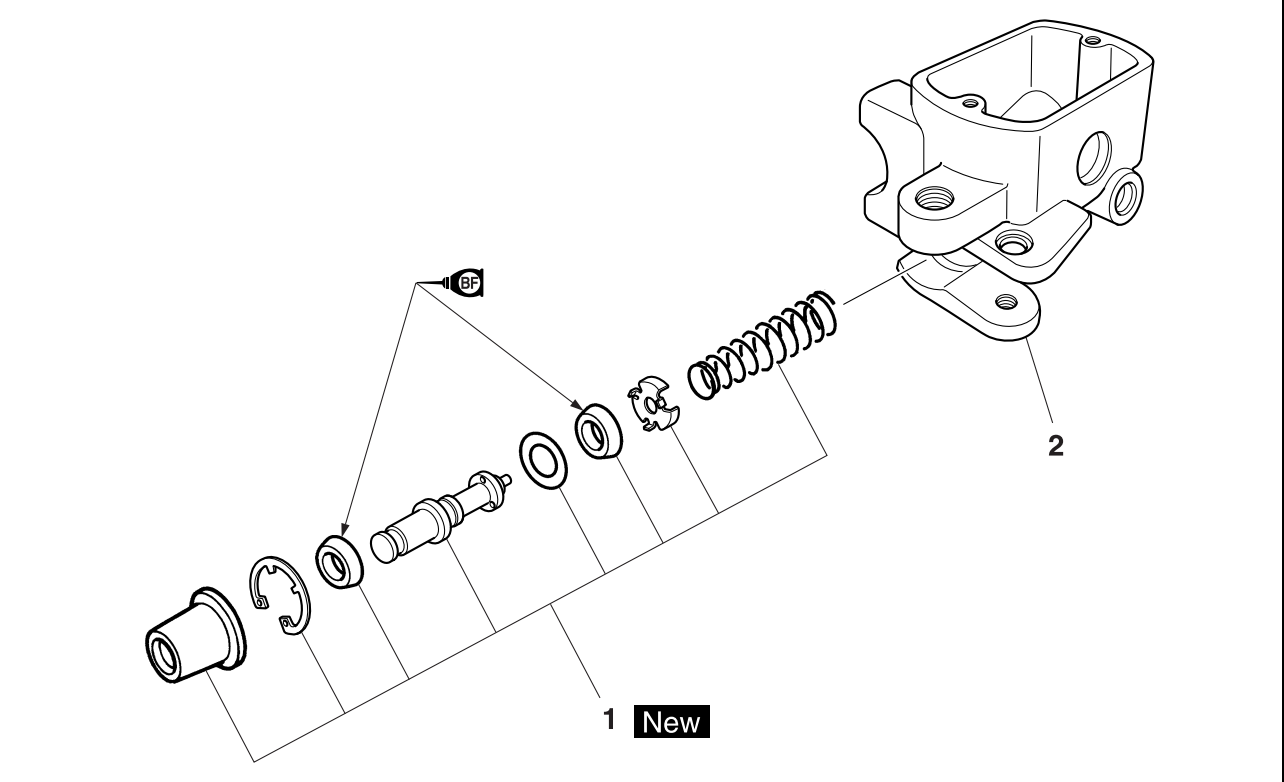
Order	Job/Parts to remove	Q'ty	Remarks
	Reflector (left)		The following procedure applies to both of the front brake calipers.
			Refer to "GENERAL CHASSIS" on page 4-1.
1	Front brake caliper retaining bolt	2	
2	Front brake caliper	1	
3	Front brake pad	2	
4	Front brake pad spring	1	
5	Front brake pad support	2	
			For installation, reverse the removal procedure.

Removing the front brake master cylinder



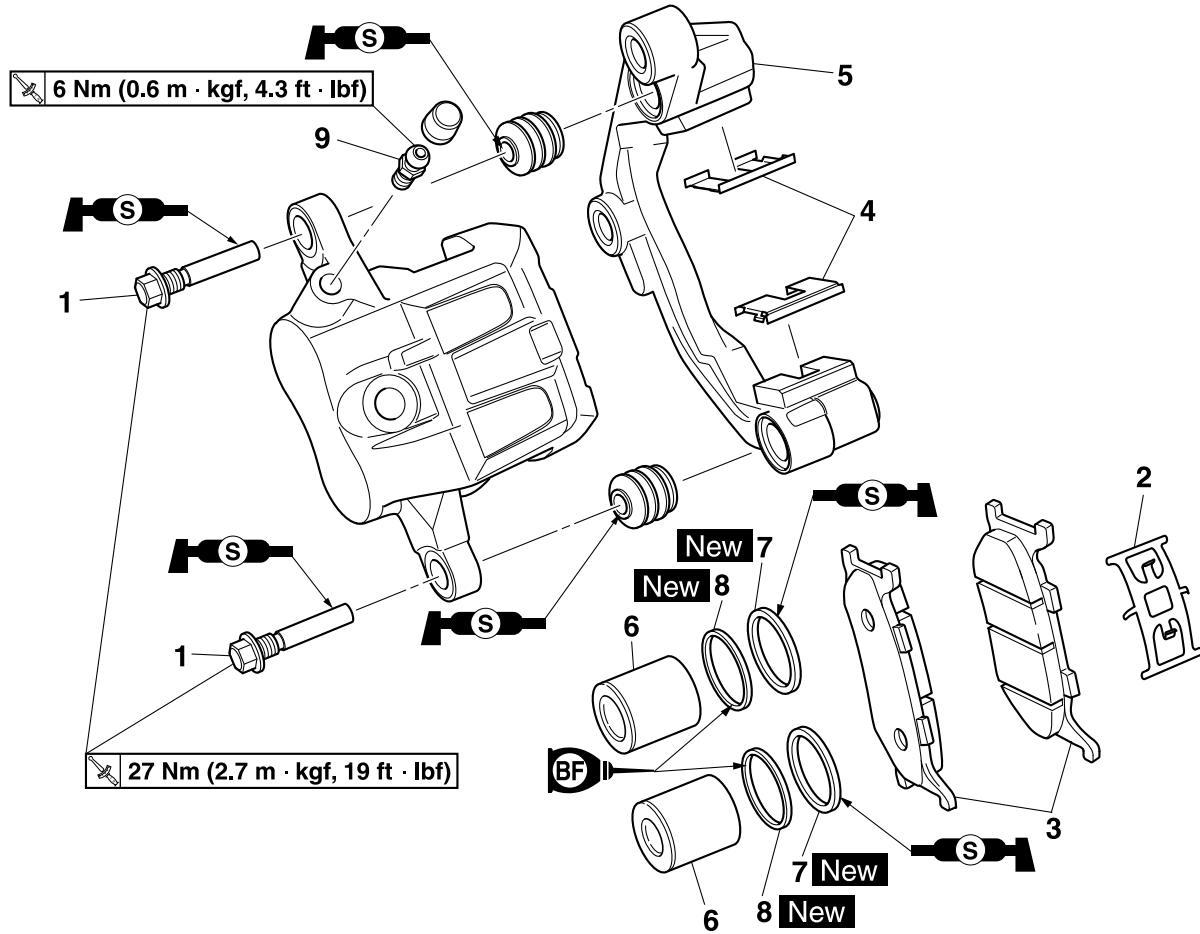
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.
1	Right rear view mirror	1	
2	Brake master cylinder reservoir cap	1	
3	Brake master cylinder reservoir diaphragm holder	1	
4	Brake master cylinder reservoir diaphragm	1	
5	Brake lever	1	
6	Spring	1	
7	Front brake light switch connector	2	Disconnect.
8	Front brake hose union bolt	1	
9	Washer	2	
10	Front brake hose	1	
11	Front brake master cylinder holder	1	
12	Front brake master cylinder	1	
13	Front brake light switch	1	
			For installation, reverse the removal procedure.

Disassembling the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.

Disassembling the front brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
1	Front brake caliper retaining bolt	2	
2	Brake pad spring	1	
3	Brake pad	2	
4	Brake pad support	2	
5	Brake caliper bracket	1	
6	Brake caliper piston	2	
7	Brake caliper piston dust seal	2	
8	Brake caliper piston seal	2	
9	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS22220

INTRODUCTION

EWA14100



WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.
- **FIRST AID FOR BRAKE FLUID ENTERING THE EYES:**
- Flush with water for 15 minutes and get immediate medical attention.

TIP

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

EAS22240

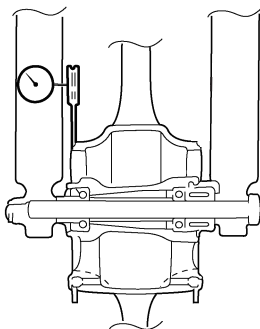
CHECKING THE FRONT BRAKE DISC

1. Remove:
 - Front wheel

Refer to "FRONT WHEEL" on page 4-9.
2. Check:
 - Brake disc

Damage/galling → Replace.
3. Measure:
 - Brake disc deflection

Out of specification → Correct the brake disc deflection or replace the brake disc.



Brake disc deflection limit
0.15 mm (0.0059 in)

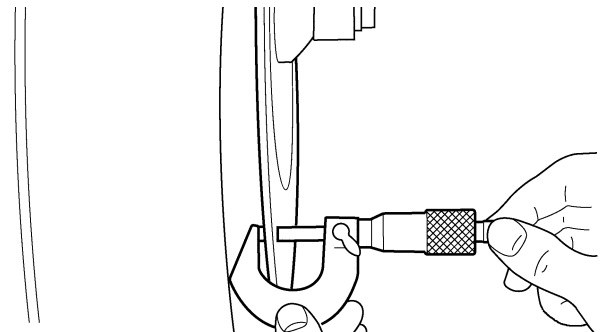
- a. Place the vehicle on a suitable stand so that the front wheel is elevated.
- b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- c. Remove the brake caliper.
- d. Hold the dial gauge at a right angle against the brake disc surface.
- e. Measure the deflection 1.5 mm (0.06 in) below the edge of the brake disc.

4. Measure:
 - Brake disc thickness

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

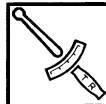


Brake disc thickness limit
4.0 mm (0.16 in)



5. Adjust:
 - Brake disc deflection

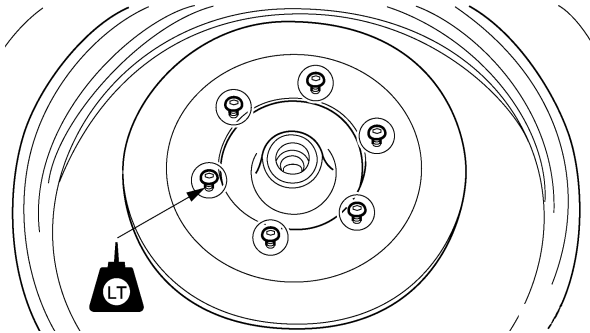
- a. Remove the brake disc.
- b. Rotate the brake disc by one bolt hole.
- c. Install the brake disc.



Front brake disc bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)
LOCTITE®

TIP

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



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



6. Install:
 - Front wheel
 Refer to "FRONT WHEEL" on page 4-9.

EAS22260

REPLACING THE FRONT BRAKE PADS

TIP

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

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



Brake pad lining thickness (inner)

6.0 mm (0.24 in)

Limit

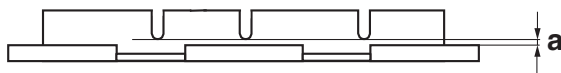
0.8 mm (0.03 in)

Brake pad lining thickness (outer)

6.0 mm (0.24 in)

Limit

0.8 mm (0.03 in)



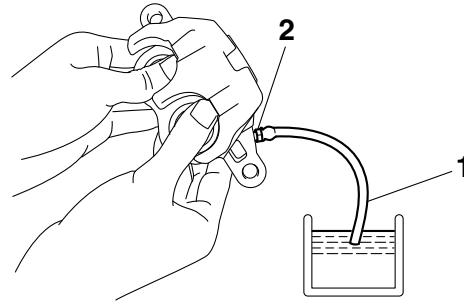
2. Install:
 - Brake pads
 - Brake pad spring

TIP

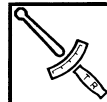
Always install new brake pads and a new brake pad spring as a set.



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



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



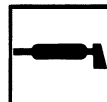
Bleed screw

6 Nm (0.6 m·kgf, 4.3 ft·lbf)

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



3. Lubricate:
 - Front brake caliper retaining bolts



Recommended lubricant
Silicone grease

ECA14150

NOTICE

- Do not allow grease to contact the brake pads.
- Remove any excess grease.

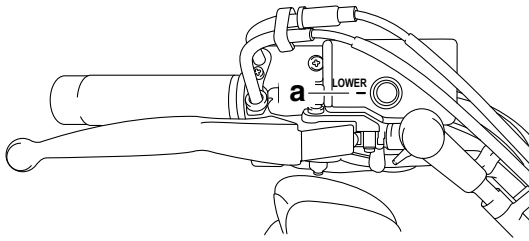
4. Install:
 - Brake caliper retaining bolts



Front brake caliper retaining bolt

27 Nm (2.7 m·kgf, 19 ft·lbf)

5. Check:
 - Brake fluid level
 Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-12.



6. Check:
- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.

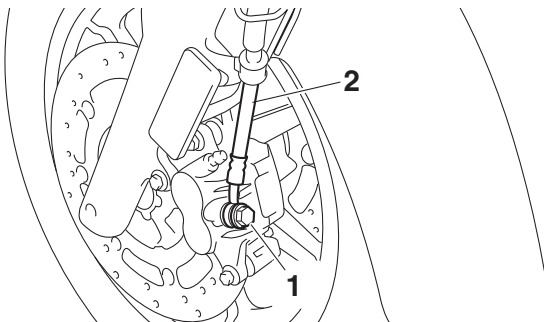
EAS22300

REMOVING THE FRONT BRAKE CALIPER

TIP

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

1. Remove:
- Front brake hose union bolt “1”
 - Washers
 - Front brake hose “2”



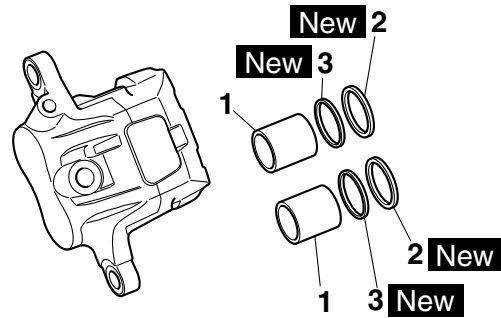
TIP

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

EAS22350

DISASSEMBLING THE FRONT BRAKE CALIPER

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

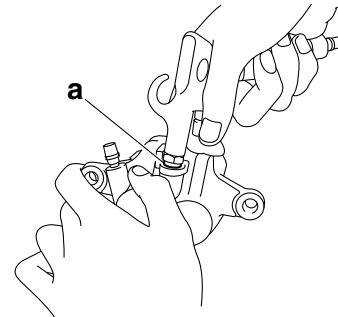


- a. Blow compressed air into the brake hose joint opening “a” to force out the piston from the brake caliper.

EWA3D81009

⚠ WARNING

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



- b. Remove the brake caliper piston dust seals and brake caliper piston seals.

EAS22390

CHECKING THE FRONT BRAKE CALIPERS

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

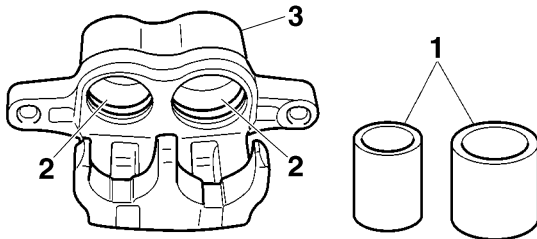
1. Check:
- Brake caliper pistons “1”
Rust/scratches/wear → Replace the brake caliper pistons.

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

EWA3D84001

WARNING

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



2. Check:
 - Brake caliper bracket
Cracks/damage → Replace.

EAS22410

ASSEMBLING THE FRONT BRAKE CALIPER

EWA3D84002

WARNING

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

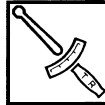


**Recommended fluid
DOT 4**

EAS22440

INSTALLING THE FRONT BRAKE CALIPER

1. Install:
 - Front brake caliper “1”
(temporarily)
 - Washers **New**
 - Front brake hose “2”
 - Front brake hose union bolt “3”



**Front brake hose union bolt
30 Nm (3.0 m·kgf, 22 ft·lbf)**

EWA13530

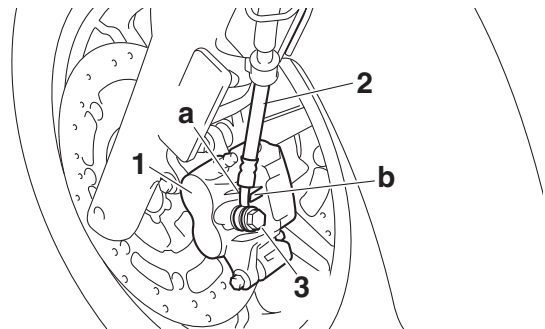
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-35.

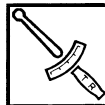
ECA14170

NOTICE

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



2. Remove:
 - Front brake caliper
3. Install:
 - Brake pad supports
 - Brake pads
 - Brake pad spring
 - Front brake caliper



**Front brake caliper retaining
bolt**

27 Nm (2.7 m·kgf, 19 ft·lbf)

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

Refer to “REPLACING THE FRONT BRAKE PADS” on page 4-27.

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



**Recommended fluid
DOT 4**

EWA3D81010

WARNING

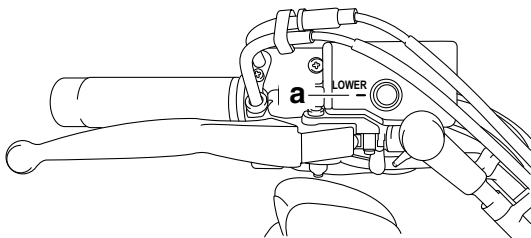
- **Use only the designated brake fluid.** Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- **Refill with the same type of brake fluid that is already in the system.** Mixing brake fluids may result in a harmful chemical reaction, leading to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

ECA13540

NOTICE

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

5. Bleed:
 - Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.
6. Check:
 - Brake fluid level
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-12.



7. Check:
 - Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.

EAS22490

REMOVING THE FRONT BRAKE MASTER CYLINDER

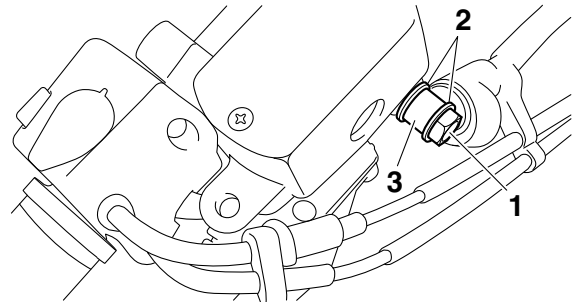
TIP

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

1. Remove:
 - Front brake hose union bolt "1"
 - Washers "2"
 - Front brake hose "3"

TIP

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



EAS22500

CHECKING THE FRONT BRAKE MASTER CYLINDER

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

EAS22520

ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

EWA13520

WARNING

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



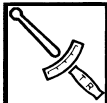
Recommended fluid
DOT 4

EAS22530

INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:

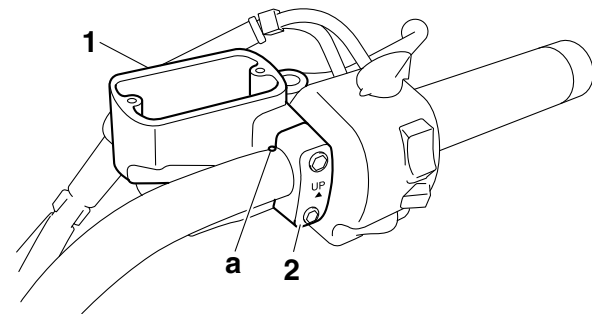
- Brake master cylinder “1”
- Front brake master cylinder holder “2”



Front brake master cylinder holder bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

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



2. Install:

- Washers **New**
- Front brake hose “1”
- Front brake hose union bolt “2”



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

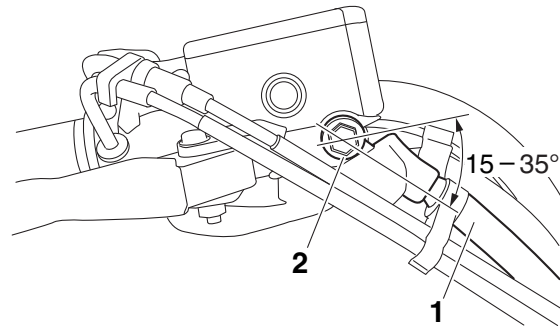
EWA13530

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-35.

TIP

- Install the brake hose to the front brake master cylinder within the angle shown in the illustration.
- While holding the brake hose, tighten the union bolt.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, and leads). Correct if necessary.



3. Fill:

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



Recommended fluid
DOT 4

EWA13540

WARNING

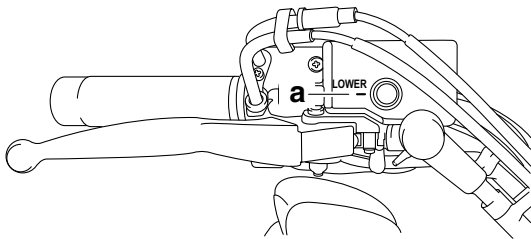
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

ECA13540

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” on page 3-14.
5. Check:
 - Brake fluid level
Below the minimum level mark “a” → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-12.

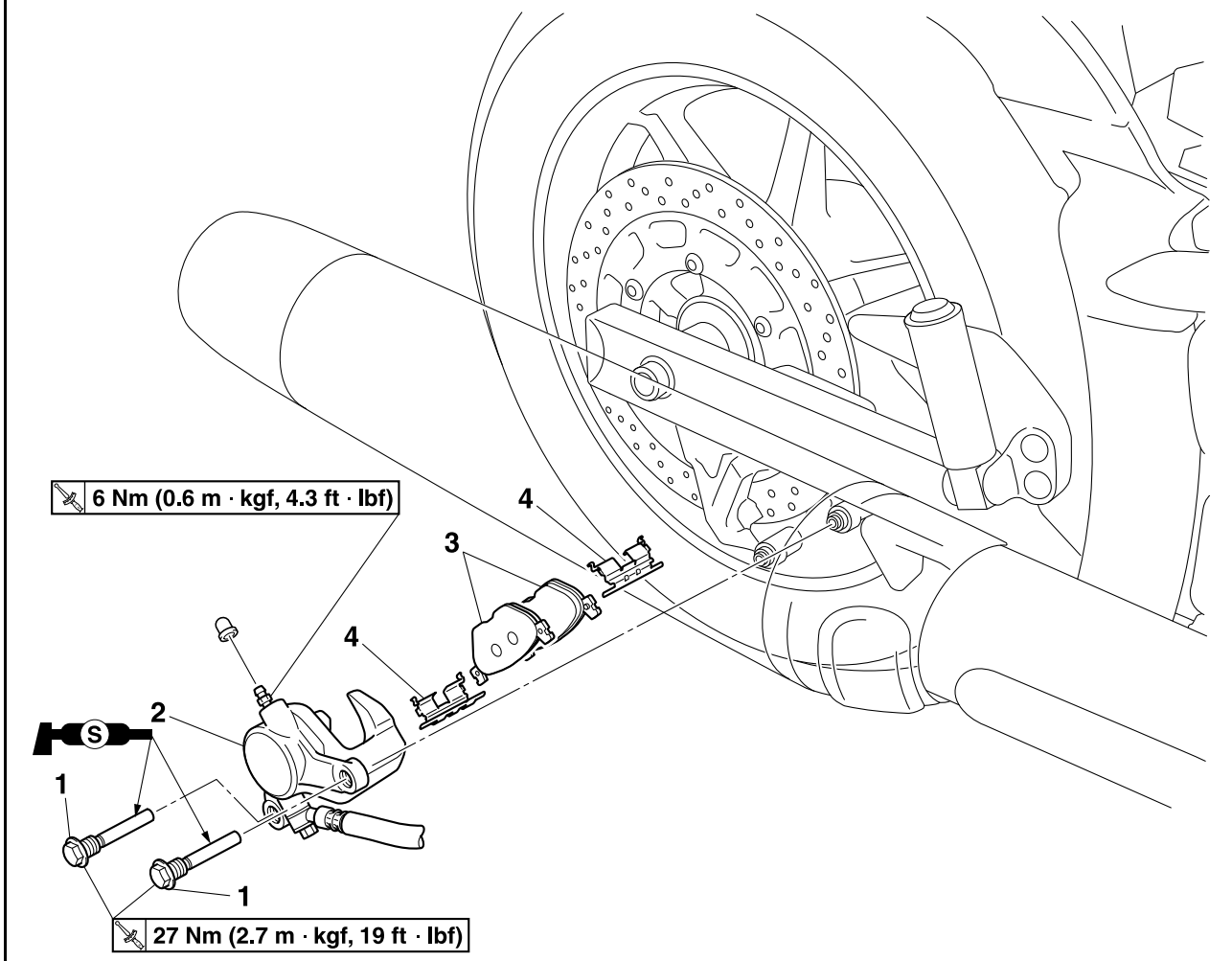


6. Check:
 - Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.

EAS22550

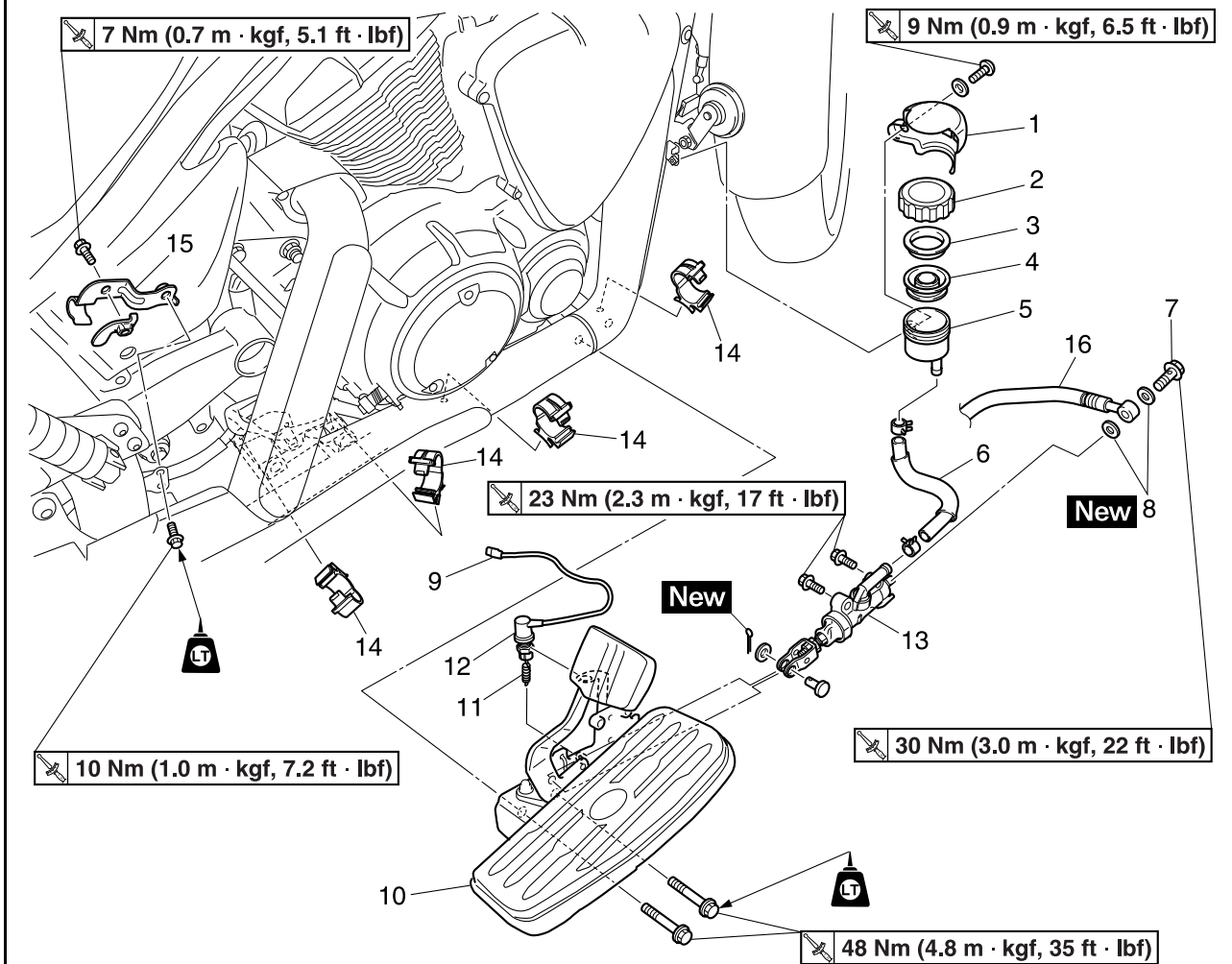
REAR BRAKE

Removing the rear brake pads



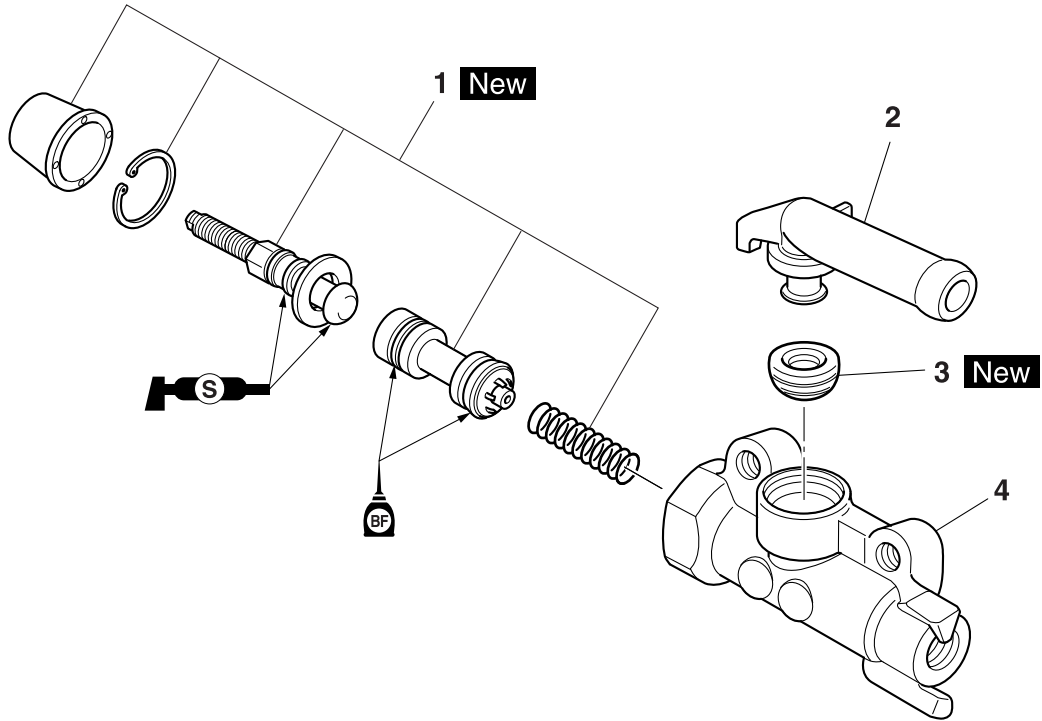
Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake caliper retaining bolt	2	
2	Rear brake caliper	1	
3	Rear brake pad	2	
4	Brake pad spring	2	
			For installation, reverse the removal procedure.

Removing the rear brake master cylinder



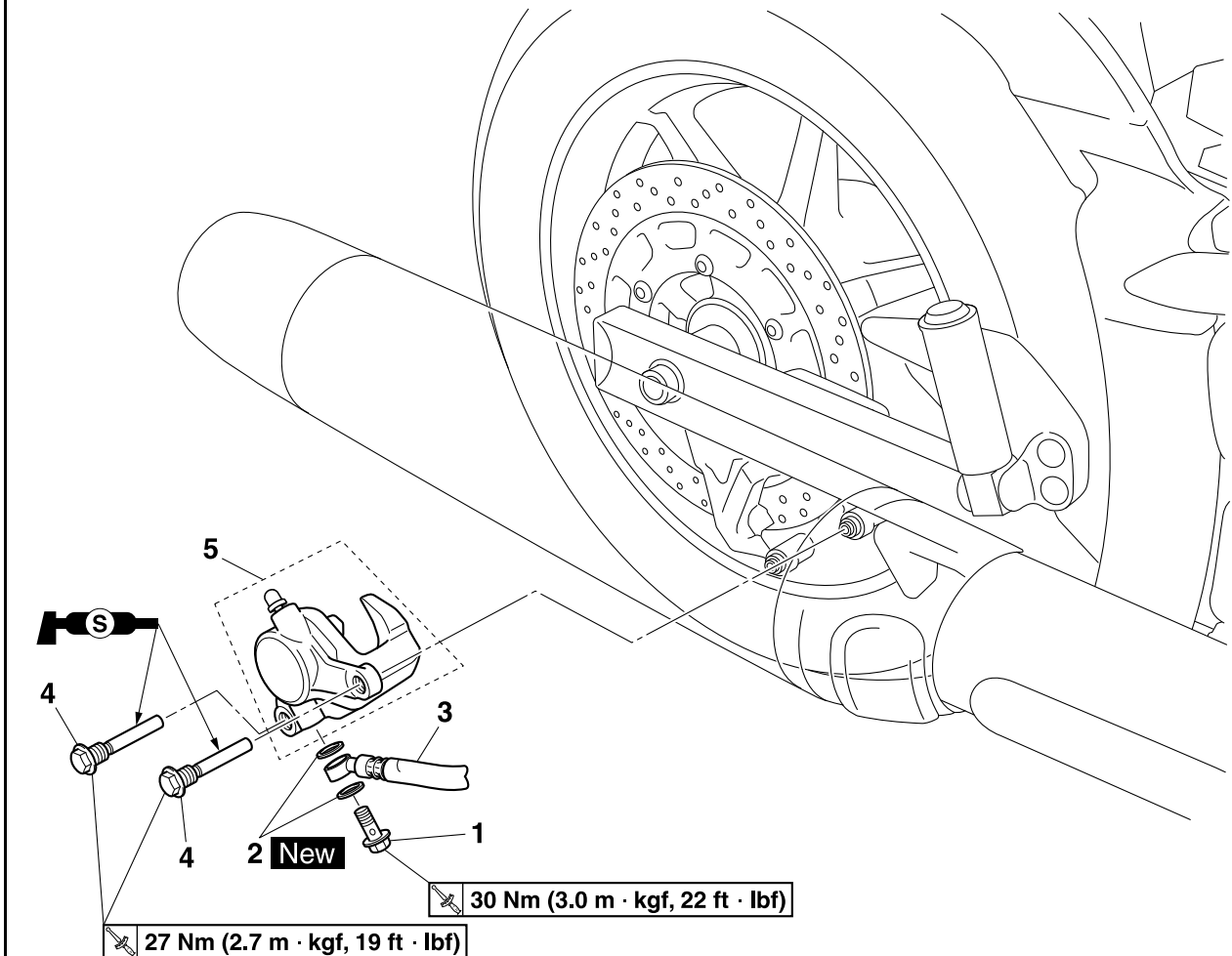
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.
1	Brake fluid reservoir cap cover	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Rear brake hose union bolt	1	
8	Washer	2	
9	Brake switch coupler	1	Disconnect.
10	Pedal step assembly (right)	1	
11	Brake switch return spring	1	
12	Brake switch	1	
13	Rear brake master cylinder	1	
14	Plastic clamp	4	
15	Rear brake hose bracket	1	
16	Rear brake hose	1	
			For installation, reverse the removal procedure.

Disassembling the rear brake master cylinder



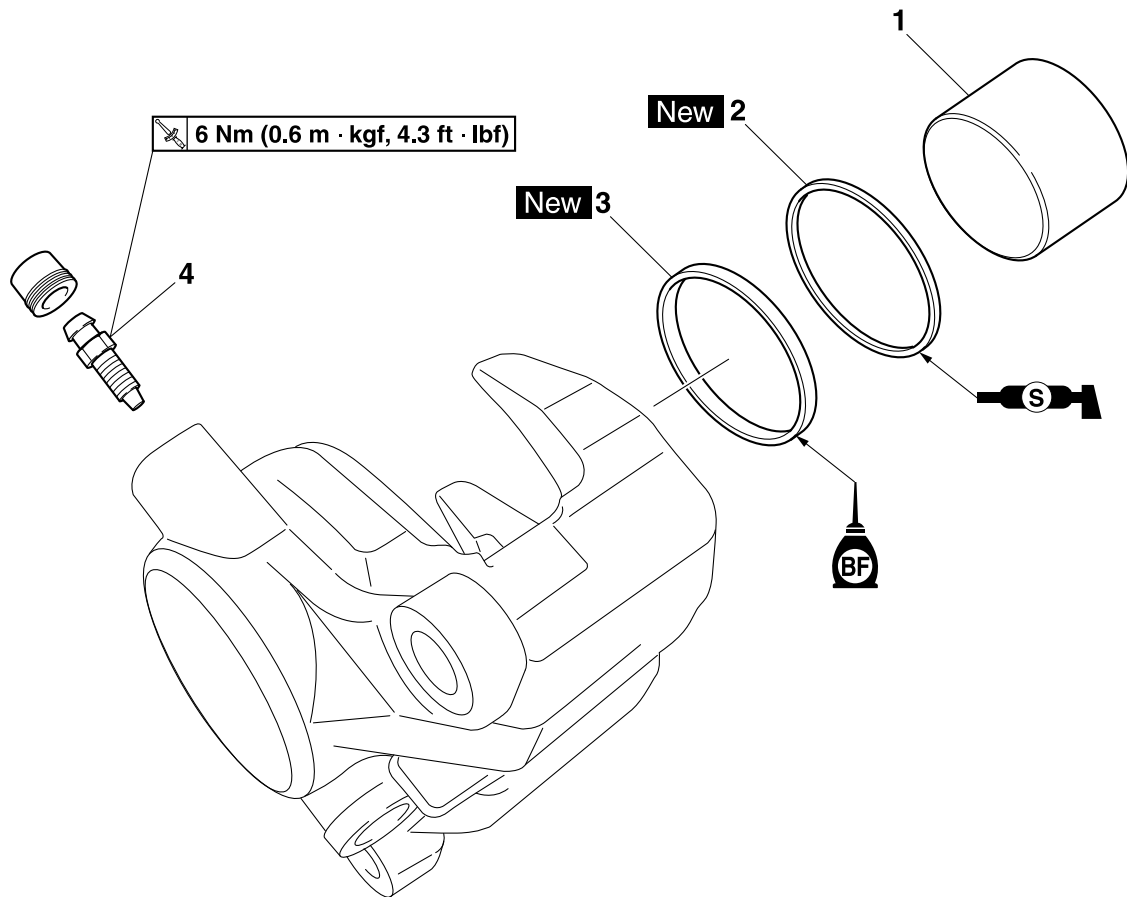
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Brake hose joint	1	
3	Bush	1	
4	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.

Removing the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.
1	Rear brake hose union bolt	1	
2	Copper washer	2	
3	Rear brake hose	1	
4	Rear brake caliper retaining bolt	2	
5	Rear brake caliper	1	
			For installation, reverse the removal procedure.

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.

EAS22560

INTRODUCTION

EWA14100



WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.
- **FIRST AID FOR BRAKE FLUID ENTERING THE EYES:**
- Flush with water for 15 minutes and get immediate medical attention.

TIP

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

EAS22570

CHECKING THE REAR BRAKE DISC

1. Remove:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-15.
2. Check:
 - Brake disc
Damage/galling → Replace.
3. Measure:
 - Brake disc deflection
Out of specification → Correct the brake disc deflection or replace the brake disc.
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-26.



Brake disc deflection limit
0.15 mm (0.0059 in)

TIP

Measure the deflection 1.5 mm (0.06 in) below the edge of the brake disc.

4. Measure:

- Brake disc thickness
Measure the brake disc thickness at a few different locations.
Out of specification → Replace.
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-26.



Brake disc thickness limit
5.5 mm (0.22 in)

5. Adjust:

- Brake disc deflection
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-26.



Front brake disc bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)
LOCTITE®

6. Install:

- Rear wheel
Refer to "REAR WHEEL" on page 4-15.

EAS22580

REPLACING THE REAR BRAKE PADS

TIP

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

1. Measure:

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



Brake pad lining thickness (inner)
5.8 mm (0.23 in)
Limit
0.8 mm (0.03 in)
Brake pad lining thickness (outer)
5.8 mm (0.23 in)
Limit
0.8 mm (0.03 in)

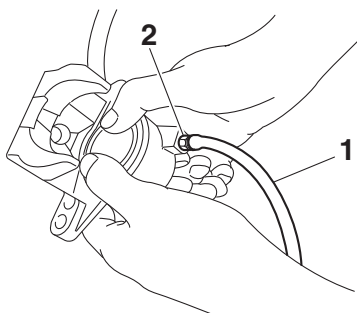


2. Install:
 - Brake pads
 - Brake pad springs

TIP

Always install new brake pads and brake pad springs as a set.

- a. Connect a clear plastic hose “1” tightly to the bleed screw “2”. Put the other end of the hose into an open container.
- b. Loosen the bleed screw and push the brake caliper piston into the brake caliper with your fingers.



- c. Tighten the bleed screw to specification.



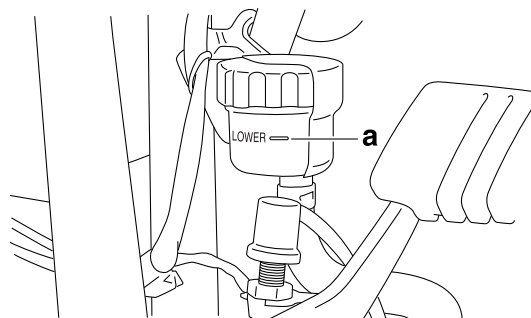
Bleed screw
6 Nm (0.6 m·kgf, 4.3 ft·lbf)

3. Install:
 - Rear brake caliper



Rear brake caliper retaining bolt
27 Nm (2.7 m·kgf, 19 ft·lbf)

4. Check:
 - Brake fluid level
Below the minimum level mark “a” → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-12.



5. Check:
 - Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.

EAS22590

REMOVING THE REAR BRAKE CALIPER

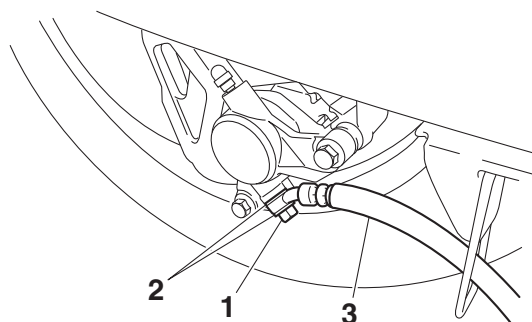
TIP

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

1. Remove:
 - Rear brake hose union bolt “1”
 - Washers “2”
 - Rear brake hose “3”

TIP

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



EAS22600

DISASSEMBLING THE REAR BRAKE CALIPER

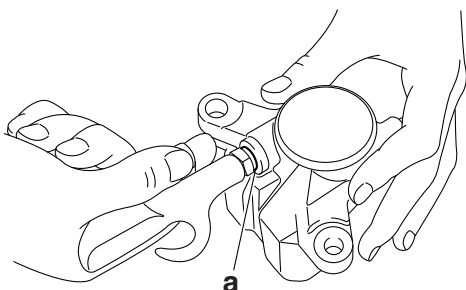
1. Remove:
 - Brake caliper piston
 - Brake caliper piston dust seal
 - Brake caliper piston seal

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

EWA13550

WARNING

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



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



EAS22640

CHECKING THE REAR BRAKE CALIPER

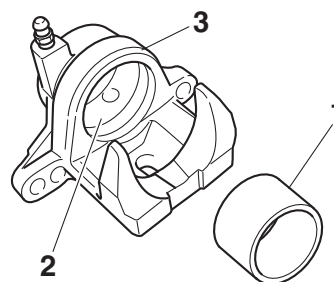
Recommended brake component replacement schedule	
Brake pads	If necessary
Piston dust seal	Every two years
Piston seal	Every two years
Brake hose	Every four years
Brake fluid	Every two years and whenever the brake is disassembled

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

EWA3D84003

WARNING

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



EAS22650

ASSEMBLING THE REAR BRAKE CALIPER

EWA3D84004

WARNING

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

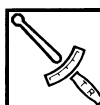


Recommended fluid
DOT 4

EAS22670

INSTALLING THE REAR BRAKE CALIPER

1. Install:
- Rear brake caliper “1”
(temporarily)
 - Washers **New**
 - Rear brake hose “2”
 - Rear brake hose union bolt “3”



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

EWA13530

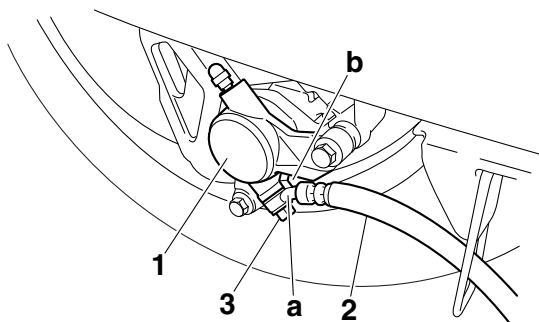
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-35.

ECA14170

NOTICE

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



2. Remove:
 - Rear brake caliper
3. Install:
 - Brake pads
 - Brake pad springs
 - Rear brake caliper
 Refer to "REPLACING THE REAR BRAKE PADS" on page 4-38.



Rear brake caliper retaining bolt
27 Nm (2.7 m·kgf, 19 ft·lbf)

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



Recommended fluid
DOT 4

EWA13090

WARNING

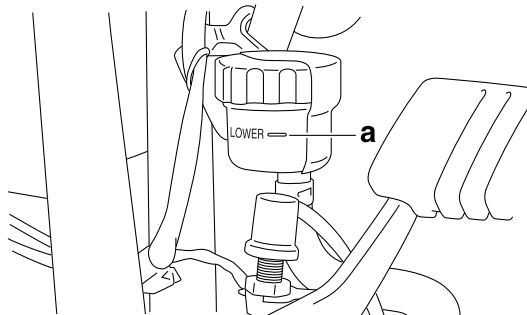
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

ECA13540

NOTICE

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

5. Bleed:
 - Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.
6. Check:
 - Brake fluid level
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-12.



7. Check:
 - Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.

EAS22700

REMOVING THE REAR BRAKE MASTER CYLINDER

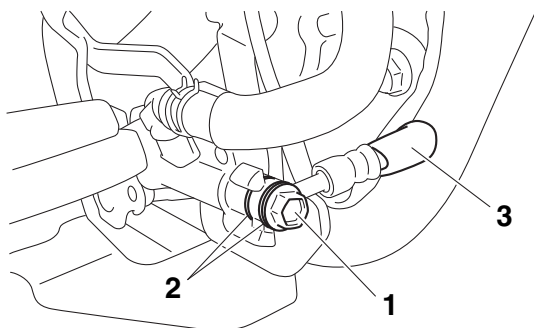
TIP

Before removing the rear brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:
 - Rear brake hose union bolt "1"
 - Washers "2"
 - Rear brake hose "3"

TIP

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



EAS22720

CHECKING THE REAR BRAKE MASTER CYLINDER

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

EAS22730

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

EWA13520

WARNING

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

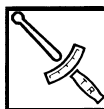


Recommended fluid
DOT 4

EAS22750

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:
 - Washers "1" **New**
 - Rear brake hose "2"
 - Rear brake hose union bolt "3"



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

EWA13530

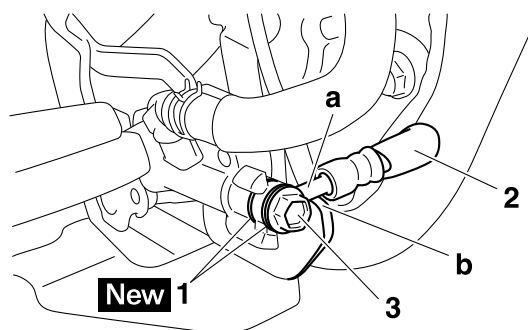
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-35.

ECA3D81005

NOTICE

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



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



Recommended fluid
DOT 4

EWA13090

WARNING

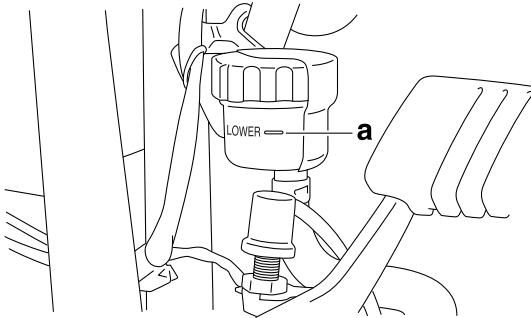
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

ECA13540

NOTICE

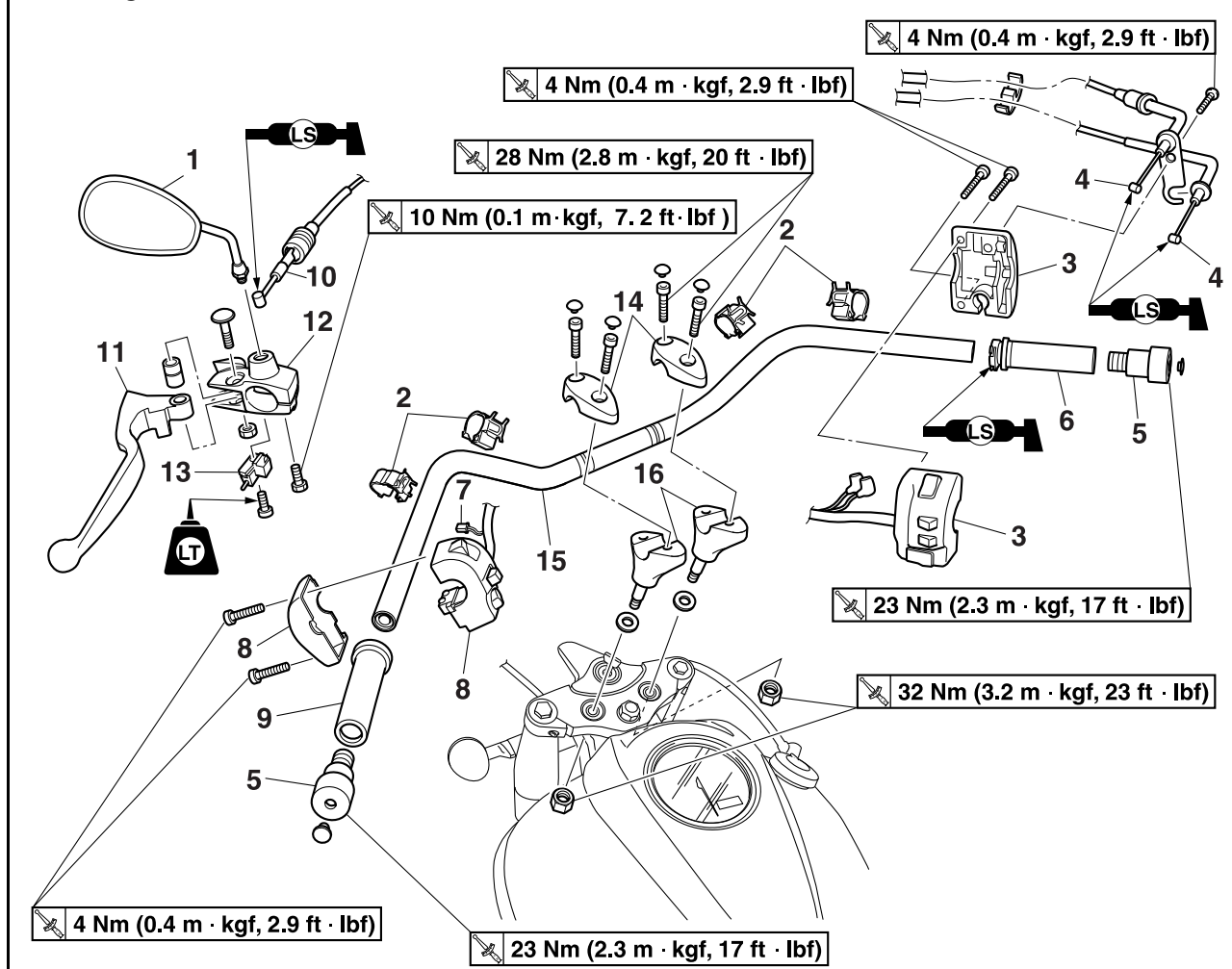
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

3. Bleed:
 - Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.
4. Check:
 - Brake fluid level
Below the minimum level mark “a” → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-12.



5. Check:
 - Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.
6. Adjust:
 - Brake pedal adjusting bolt position
Refer to “ADJUSTING THE REAR DISC BRAKE” on page 3-14.

EAS22840

HANDLEBAR**Removing the handlebar**

Order	Job/Parts to remove	Q'ty	Remarks
	Rear view mirror (right)/Front brake master cylinder		Refer to "FRONT BRAKE" on page 4-21.
1	Rear view mirror (left)	1	
2	Plastic clamp	4	
3	Right handlebar switch	1	
4	Throttle cable	2	Disconnect.
5	Grip end	2	
6	Throttle grip	1	
7	Clutch switch coupler	1	Disconnect.
8	Left handlebar switch	1	
9	Handlebar grip	1	
10	Clutch cable	1	Disconnect.
11	Clutch lever	1	
12	Clutch lever holder	1	
13	Clutch switch	1	
14	Upper handlebar holder	2	
15	Handlebar	1	
16	Lower handlebar holder	2	
			For installation, reverse the removal procedure.

EAS22860

REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

WARNING

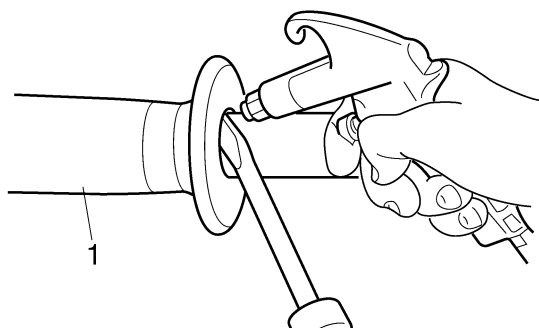
Securely support the vehicle so that there is no danger of it falling over.

2. Remove:

- Handlebar grip “1”

TIP

Blow compressed air between the handlebar and the handlebar grip, and gradually push the grip off the handlebar.



EAS22880

CHECKING THE HANDLEBAR

1. Check:

- Handlebar

Bends/cracks/damage → Replace.

EWA13690

WARNING

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

EAS22930

INSTALLING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Install:

- Handlebar “1”
- Upper handlebar holders “2”



**Upper handlebar holder bolt
28 Nm (2.8 m·kgf, 20 ft·lbf)**

ECA3D81006

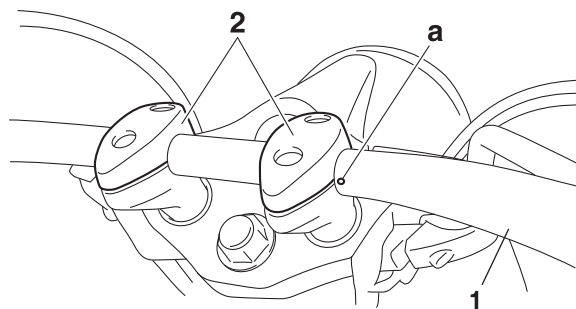
NOTICE

- First, tighten the bolts on the front side of the upper handlebar holder, and then on the rear side.

- Turn the handlebar all the way to the left and right. If there is any contact with the fuel tank, adjust the handlebar position.

TIP

Align the end of the upper handlebar holder with the punch mark “a” on the handlebar.



3. Install:

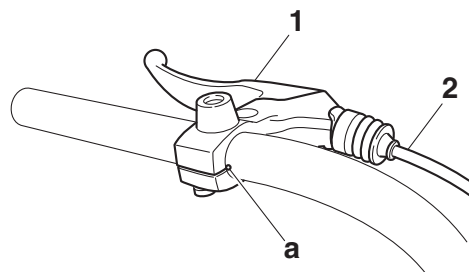
- Clutch lever “1”
- Clutch cable “2”



**Clutch lever holder bolt
10 Nm (0.1 m·kgf, 7.2 ft·lbf)**

TIP

Align the mating surfaces of the clutch lever with the punch mark “a” on the handlebar.

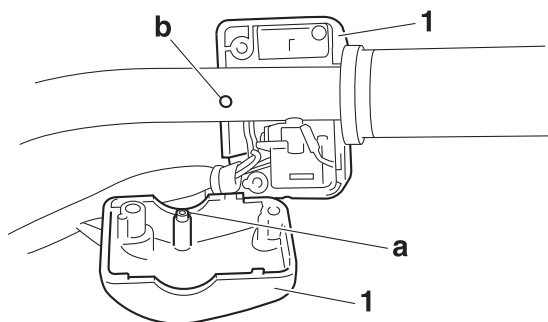


4. Install:

- Left handlebar switch “1”

TIP

Align the projection “a” on the left handlebar switch with the hole “b” in the handlebar.



5. Install:
- Handlebar grip “1”



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

EWA13700

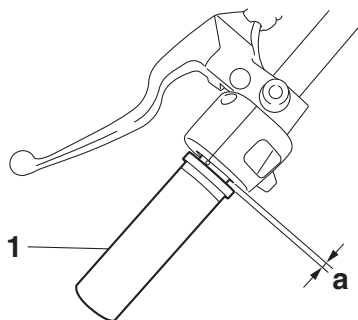


WARNING

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

TIP

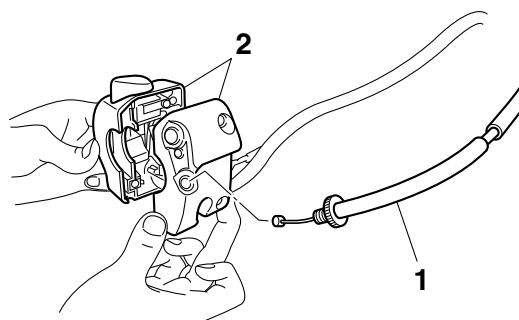
There should be less than 3 mm (0.12 in) of clearance “a” between the handlebar grip and left handlebar switch.



6. Connect:
- Throttle cable (decelerator cable) “1” (to the right handlebar switch “2”)

TIP

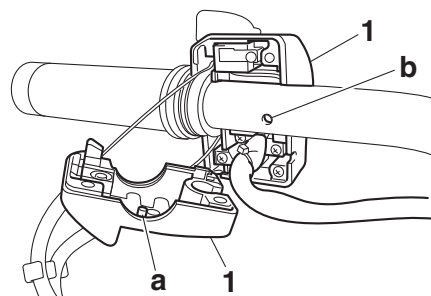
Rotate the right handlebar switch and screw it onto the end of the throttle cable.



7. Install:
- Right handlebar switch “1”

TIP

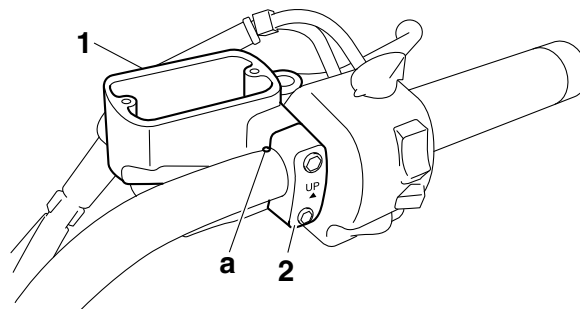
Align the projection “a” on the right handlebar switch with the hole “b” in the handlebar.



8. Install:
- Front brake master cylinder “1”
 - Front brake master cylinder holder “2”
- Refer to “INSTALLING THE FRONT BRAKE MASTER CYLINDER” on page 4-31.



Front brake master cylinder holder bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)



9. Adjust:
- Clutch lever free play
- Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-11.



Clutch lever free play
5.0–10.0 mm (0.20–0.39 in)

10. Adjust:

- Throttle cable free play

Refer to “ADJUSTING THE THROTTLE
CABLE FREE PLAY” on page 3-27.

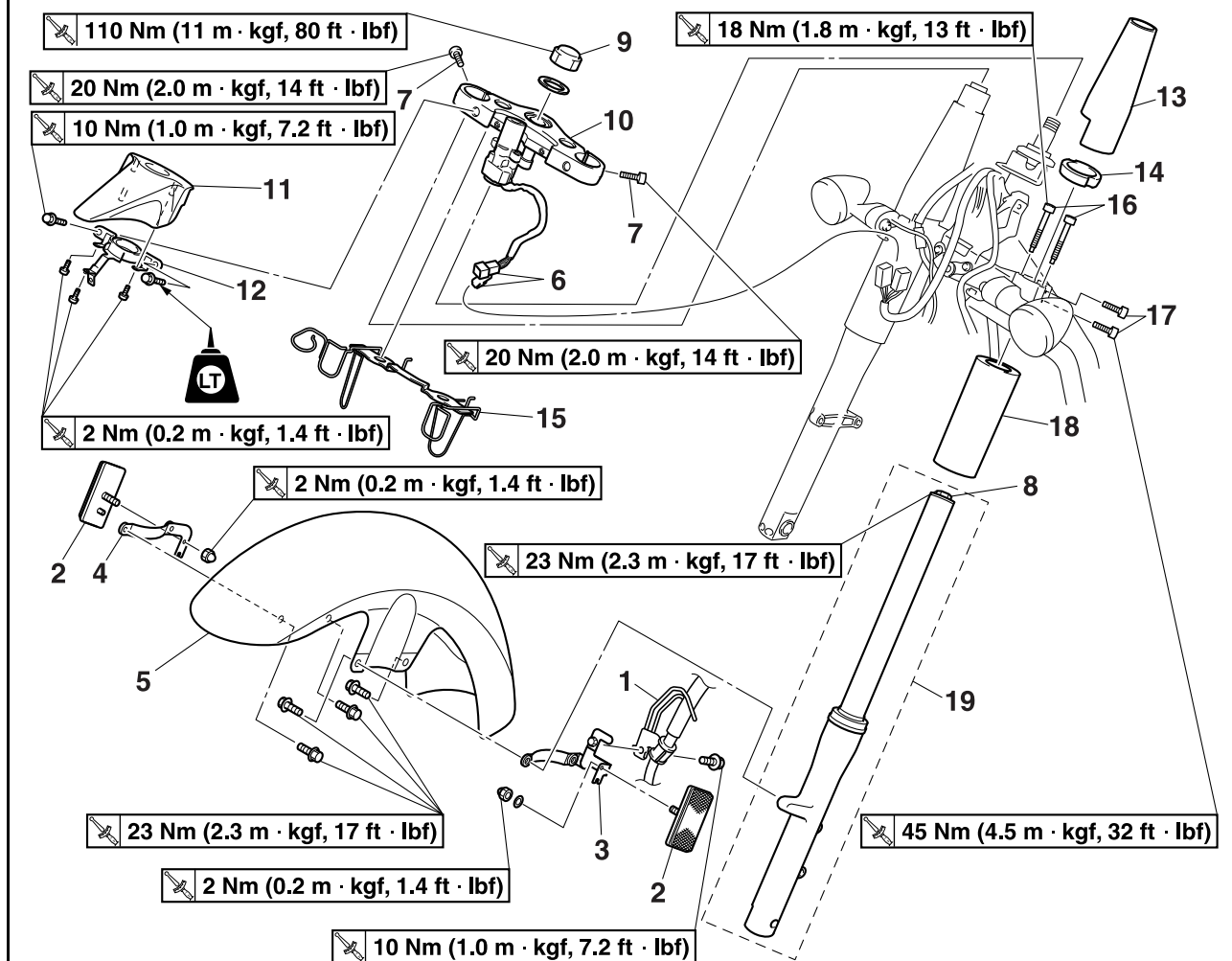


Throttle cable free play
4.0–6.0 mm (0.16–0.24 in)

EAS22950

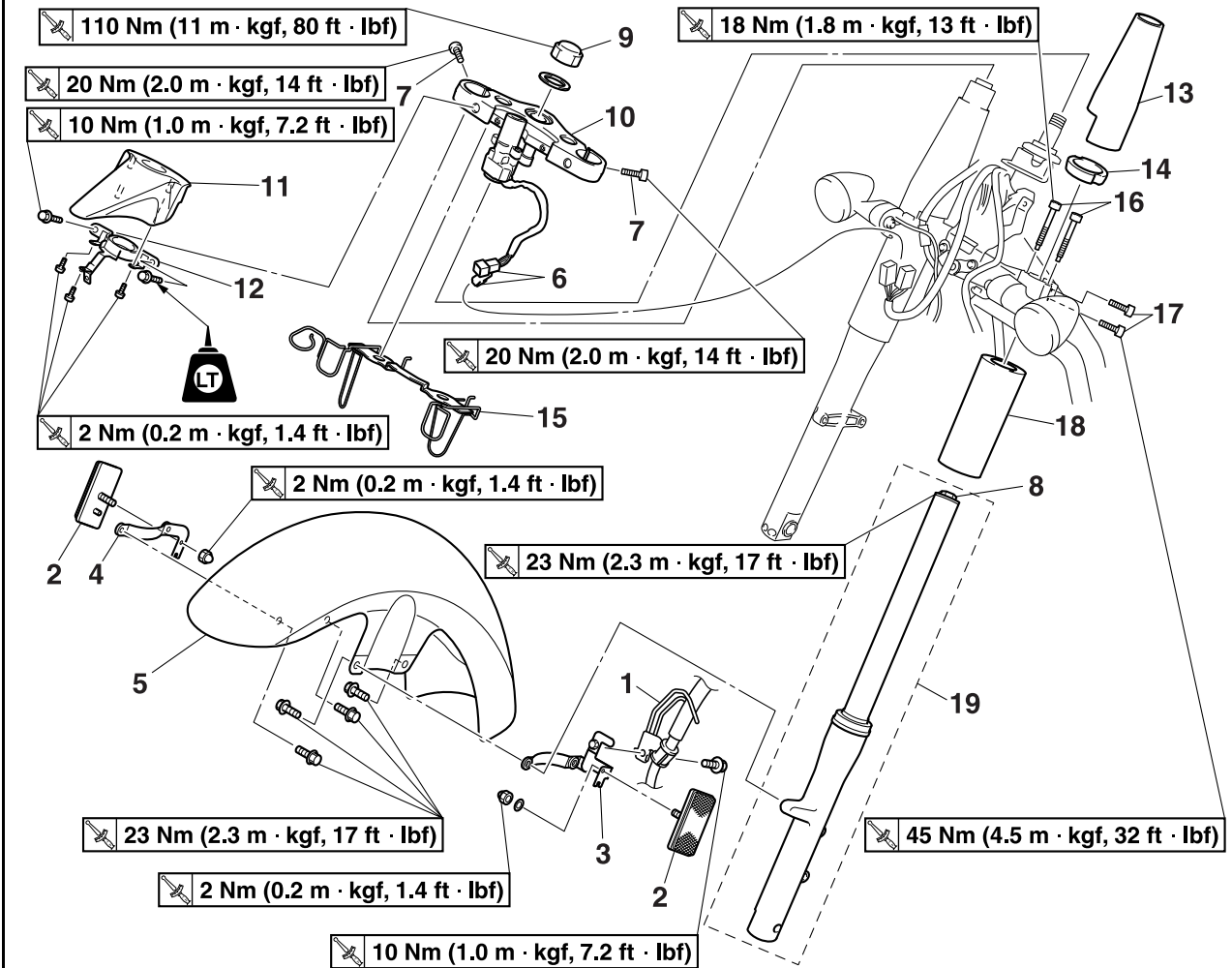
FRONT FORK

Removing the front fork legs



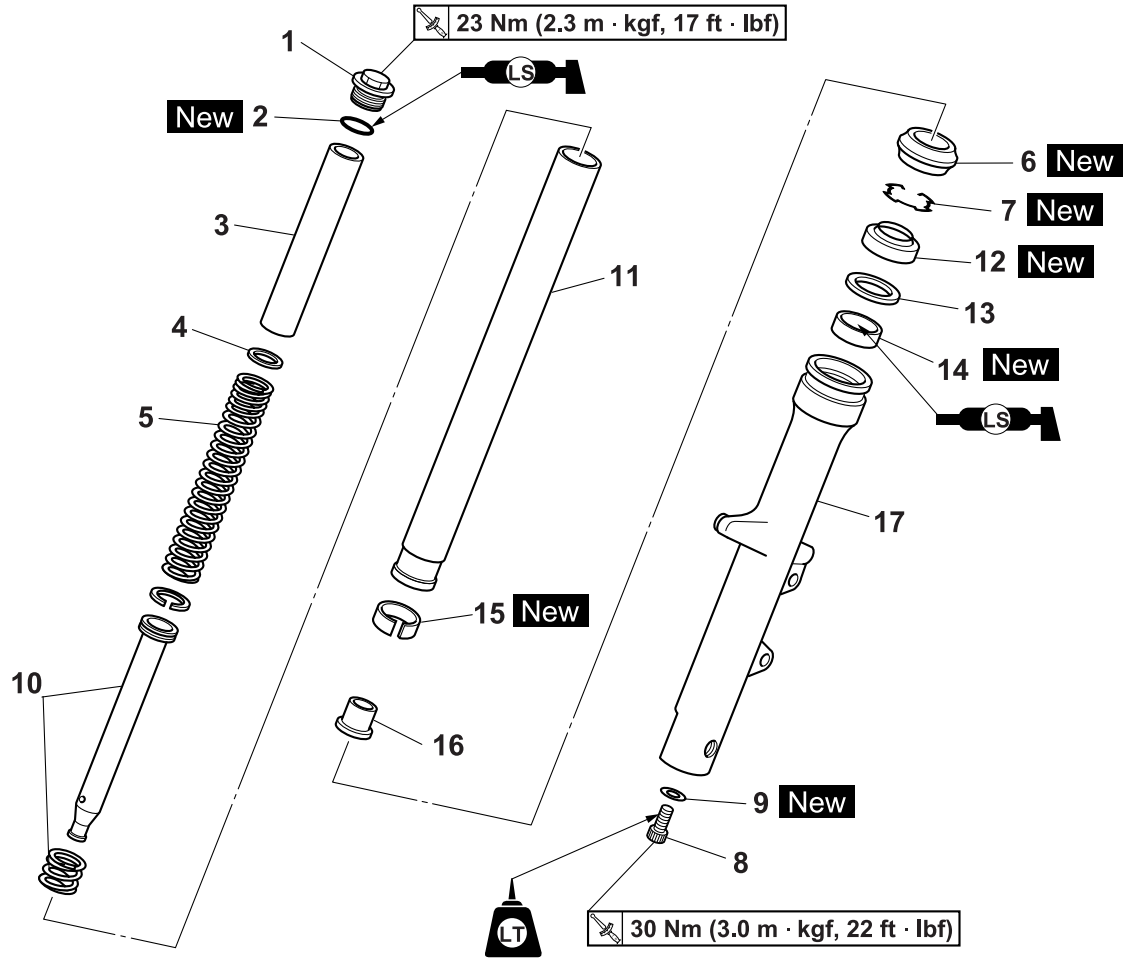
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Windshield bracket (left and right)		For XVS95CTY/XVS95CTYC only Refer to "GENERAL CHASSIS" on page 4-1.
	Headlight body		Refer to "GENERAL CHASSIS" on page 4-1.
	Front wheel		Refer to "FRONT WHEEL" on page 4-9.
	Rear handlebar holder		Refer to "HANDLEBAR" on page 4-44.
1	Brake hose guide	1	
2	Reflector	2	
3	Reflector bracket (left)	1	
4	Reflector bracket (right)	1	
5	Front fender	1	
6	Main switch coupler	2	Disconnect.
7	Upper bracket pinch bolt	2	Loosen.
8	Cap bolt	1	Loosen.
9	Steering stem nut	1	
10	Upper bracket	1	
11	Main switch cover	1	
12	Main switch cover holder	1	

Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
13	Upper front fork cover	1	
14	Upper front fork cover spacer	1	
15	Cable bracket	1	
16	Lower front fork cover bolt	2	
17	Lower bracket pinch bolt	2	Loosen.
18	Lower front fork cover	1	
19	Front fork leg	1	
			For installation, reverse the removal procedure.

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
1	Cap bolt	1	
2	O-ring	1	
3	Spacer	1	
4	Spring seat	1	
5	Fork spring	1	
6	Dust seal	1	
7	Oil seal clip	1	
8	Damper rod bolt	1	
9	Copper washer	1	
10	Damper rod	1	
11	Inner tube	1	
12	Oil seal	1	
13	Washer	1	
14	Outer tube bushing	1	
15	Inner tube bushing	1	
16	Oil flow stopper	1	
17	Outer tube	1	
			For assembly, reverse the disassembly procedure.

EAS22960

REMOVING THE FRONT FORK LEGS

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

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

2. Loosen:

- Lower bracket pinch bolts

EWA3D81004

WARNING

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

EAS22980

DISASSEMBLING THE FRONT FORK LEGS

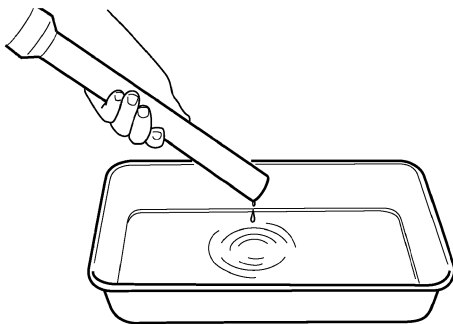
The following procedure applies to both of the front fork legs.

1. Drain:

- Fork oil

TIP

Stroke the outer tube several times while draining the fork oil.



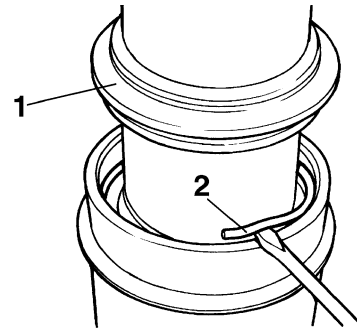
2. Remove:

- Dust seal "1"
- Oil seal clip "2"
(with a flathead screwdriver)

ECA14180

NOTICE

Do not scratch the inner tube.



3. Remove:

- Damper rod bolt "1"
- Copper washer

TIP

While holding the damper rod with the damper rod holder "2" and T-handle "3", loosen the damper rod bolt.



Damper rod holder

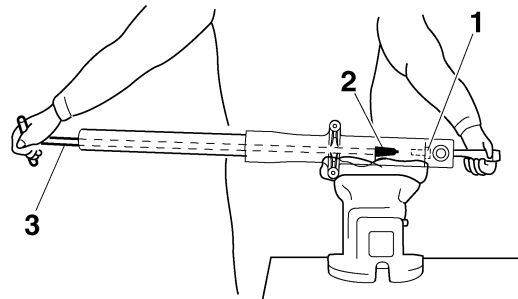
90890-01460

T-handle

90890-01326

T-handle 3/8" drive 60 cm long

YM-01326



4. Remove:

- Inner tube

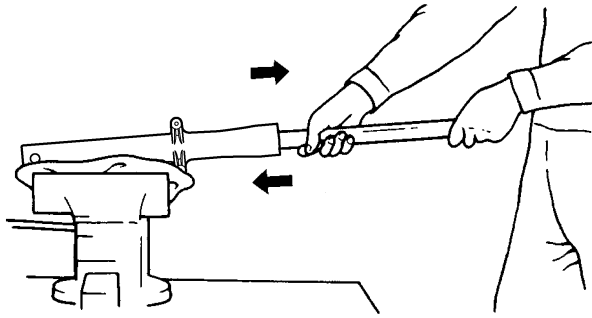


- a. Hold the front fork leg horizontally.
- b. Securely clamp the brake caliper bracket in a vise with soft jaws.
- c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

ECA14190

NOTICE

- Excessive force will damage the oil seal and bushing. A damaged oil seal or bushing must be replaced.
- Avoid bottoming the inner tube into the outer tube during the above procedure, as the oil flow stopper will be damaged.



EAS23010

CHECKING THE FRONT FORK LEGS

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

1. Check:

- Inner tube
- Outer tube
- Bends/damage/scratches → Replace.

EWA13650



WARNING

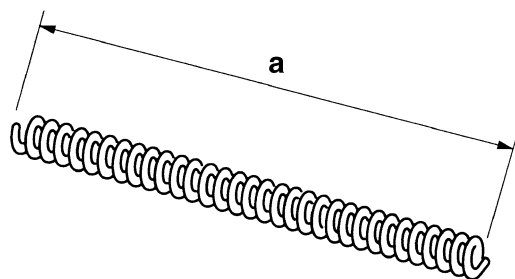
Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

2. Measure:

- Fork spring free length "a"
- Out of specification → Replace.



Fork spring free length
366 mm (14.41 in)
Limit
359 mm (14.13 in)



3. Check:

- Damper rod
- Damage/wear → Replace.
- Obstruction → Blow out all of the oil passages with compressed air.
- Oil flow stopper
- Damage → Replace.

ECA14200



- The front fork leg has a built-in damper adjusting rod and a very sophisticated

internal construction, which are particularly sensitive to foreign material.

- When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.

EAS23020

ASSEMBLING THE FRONT FORK LEGS

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

EWA13660



WARNING

- Make sure the oil levels in both front fork legs are equal.
- Uneven oil levels can result in poor handling and a loss of stability.

TIP

- When assembling the front fork leg, be sure to replace the following parts:
 - Inner tube bushing
 - Outer tube bushing
 - Oil seal
 - Dust seal
- Before assembling the front fork leg, make sure all of the components are clean.

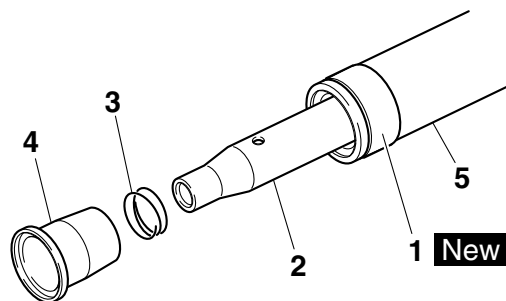
1. Install:

- Inner tube bushing "1" **New**
- Damper rod "2"
- Spring "3"
- Oil flow stopper "4"

ECA3D81007

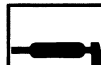


Allow the damper rod to slide slowly down the inner tube "5" until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.



2. Lubricate:

- Inner tube's outer surface



Recommended oil
Yamaha fork oil 10WT

3. Install:
 - Inner tube
(in the outer tube)
4. Install:
 - Copper washer **New**
 - Damper rod bolt
5. Tighten:
 - Damper rod bolt “1”



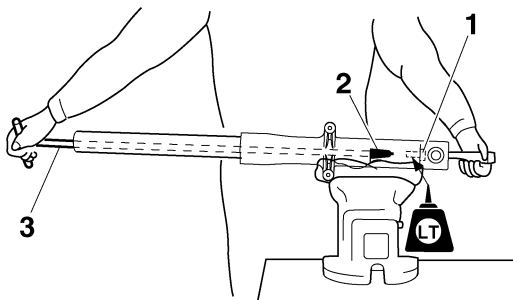
Damper rod bolt
30 Nm (3.0 m·kgf, 22 ft·lbf)
LOCTITE®

TIP

While holding the damper rod assembly with the damper rod holder “2” and T-handle “3”, tighten the damper rod bolt.



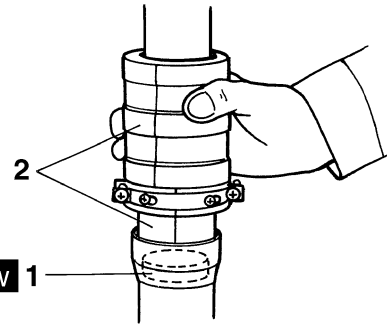
Damper rod holder
90890-01460
T-handle
90890-01326
T-handle 3/8" drive 60 cm long
YM-01326



6. Install:
 - Outer tube bushing “1” **New**
 - Washer
(with the fork seal driver “2”)



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



7. Install:
 - Oil seal “1” **New**
(with the fork seal driver “2”)

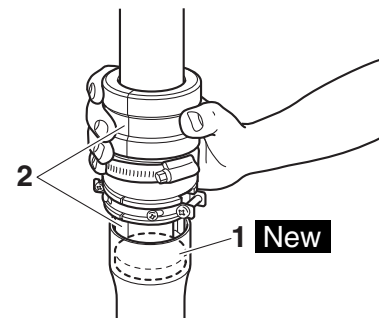
ECA14220

NOTICE

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

TIP

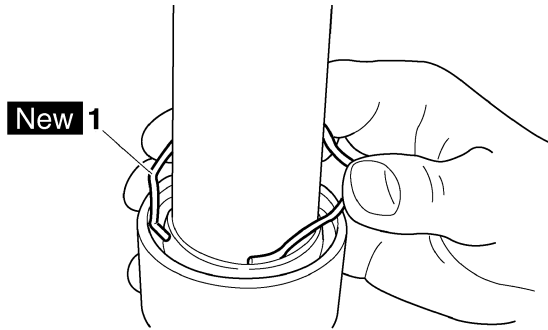
- Before installing the oil seal, lubricate its lips with lithium-soap-based grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag to protect the oil seal during installation.



8. Install:
 - Oil seal clip “1” **New**

TIP

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

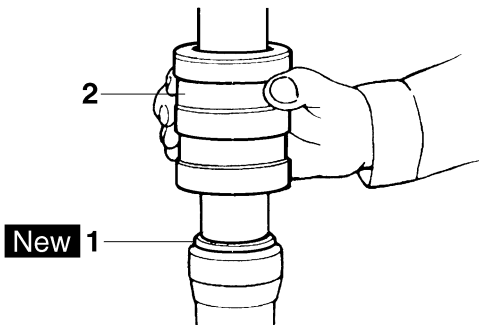


9. Install:

- Dust seal "1" **New**
(with the fork seal driver weight "2")



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



10. Fill:

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



Quantity
488.0 cm³ (16.50 US oz, 17.21 Imp oz)
Recommended oil
Yamaha fork oil 10WT

11. Measure:

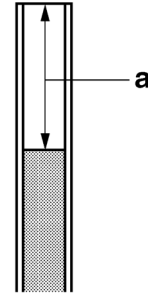
- Front fork leg oil level "a"
(from the top of the inner tube, with the outer tube fully compressed and without the fork spring)
Out of specification → Correct.



Level
107.0 mm (4.21 in)

TIP

- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.



12. Install:

- Spring
- Spring seat
- Spacer
- Cap bolt
(along with the O-ring **New**)

TIP

- Before installing the cap bolt, lubricate its O-ring with grease.
- Temporarily tighten the cap bolt.
- Tighten the cap bolt specified torque, when installing the front fork with upper bracket.

EAS23050

INSTALLING THE FRONT FORK LEGS

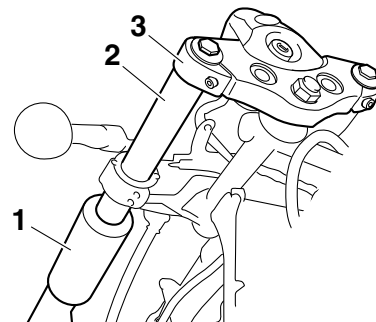
The following procedure applies to both of the front fork legs.

1. Install:

- Lower front fork cover "1"
- Front fork leg "2"
- Upper bracket "3"
Temporarily tighten the upper and lower bracket pinch bolts.

TIP

Make sure the inner tube end is flush with the top of the upper bracket.



2. Tighten:
 - Lower bracket pinch bolts



Lower bracket pinch bolt
45 Nm (4.5 m·kgf, 32 ft·lbf)

3. Remove:
 - Upper bracket
4. Tighten:
 - Lower front fork cover bolts

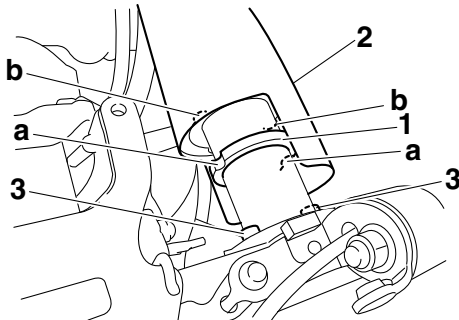


Lower front fork cover bolt
18 Nm (1.8 m·kgf, 13 ft·lbf)

5. Install:
 - Upper front fork cover spacer “1”
 - Upper front fork cover “2”
 - Upper bracket

TIP

Align the grooves “a” in the upper front fork cover spacer “1”, and groove “b” in the upper front fork cover “2” with the lower front fork cover bolts “3”.



6. Tighten:
 - Steering stem nut



Steering stem nut
110 Nm (11 m·kgf, 80 ft·lbf)

- Cap bolt



Cap bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)

- Upper bracket pinch bolt



Upper bracket pinch bolt
20 Nm (2.0 m·kgf, 14 ft·lbf)

EWA13680



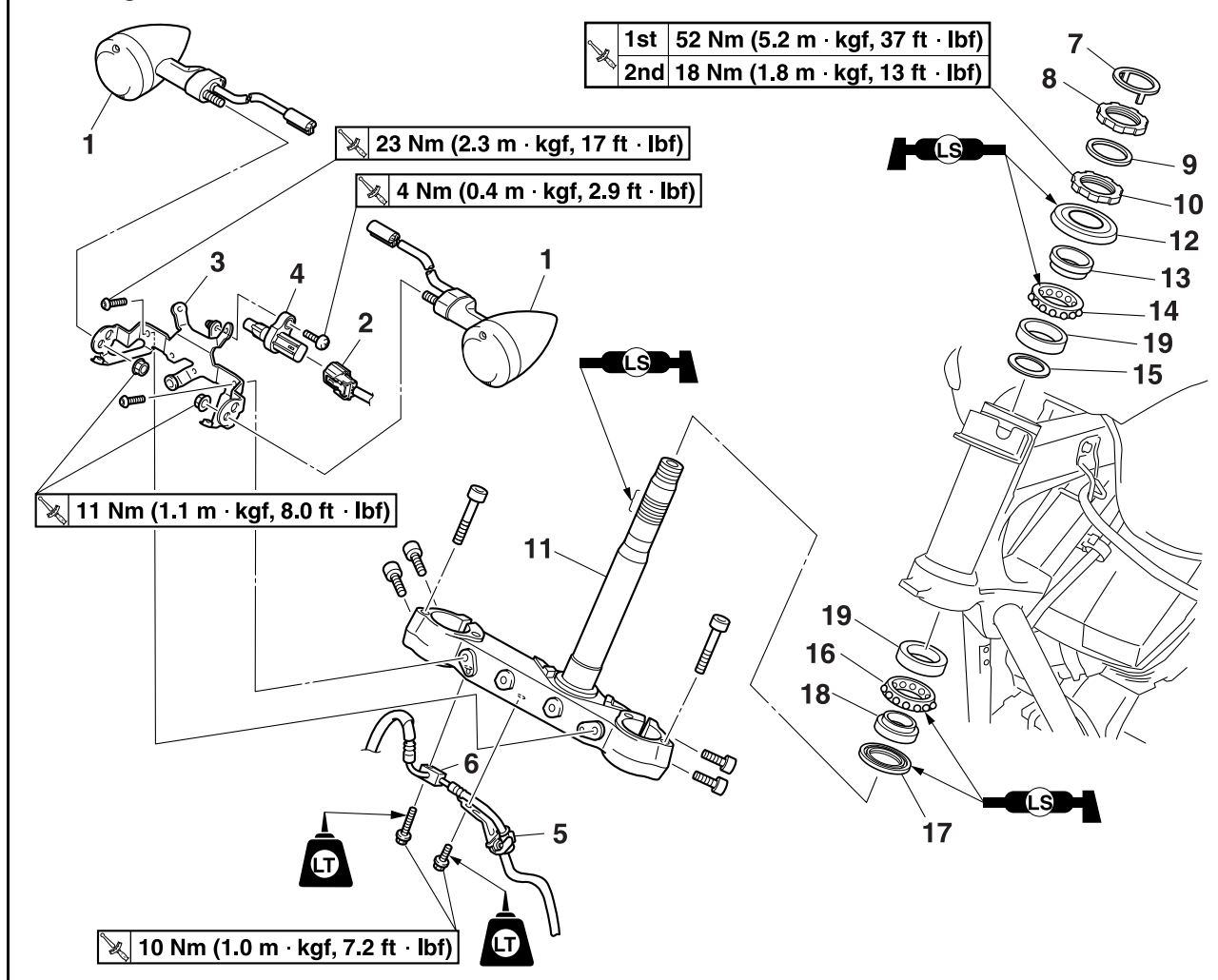
WARNING

Make sure the brake hose is routed properly.

EAS23090

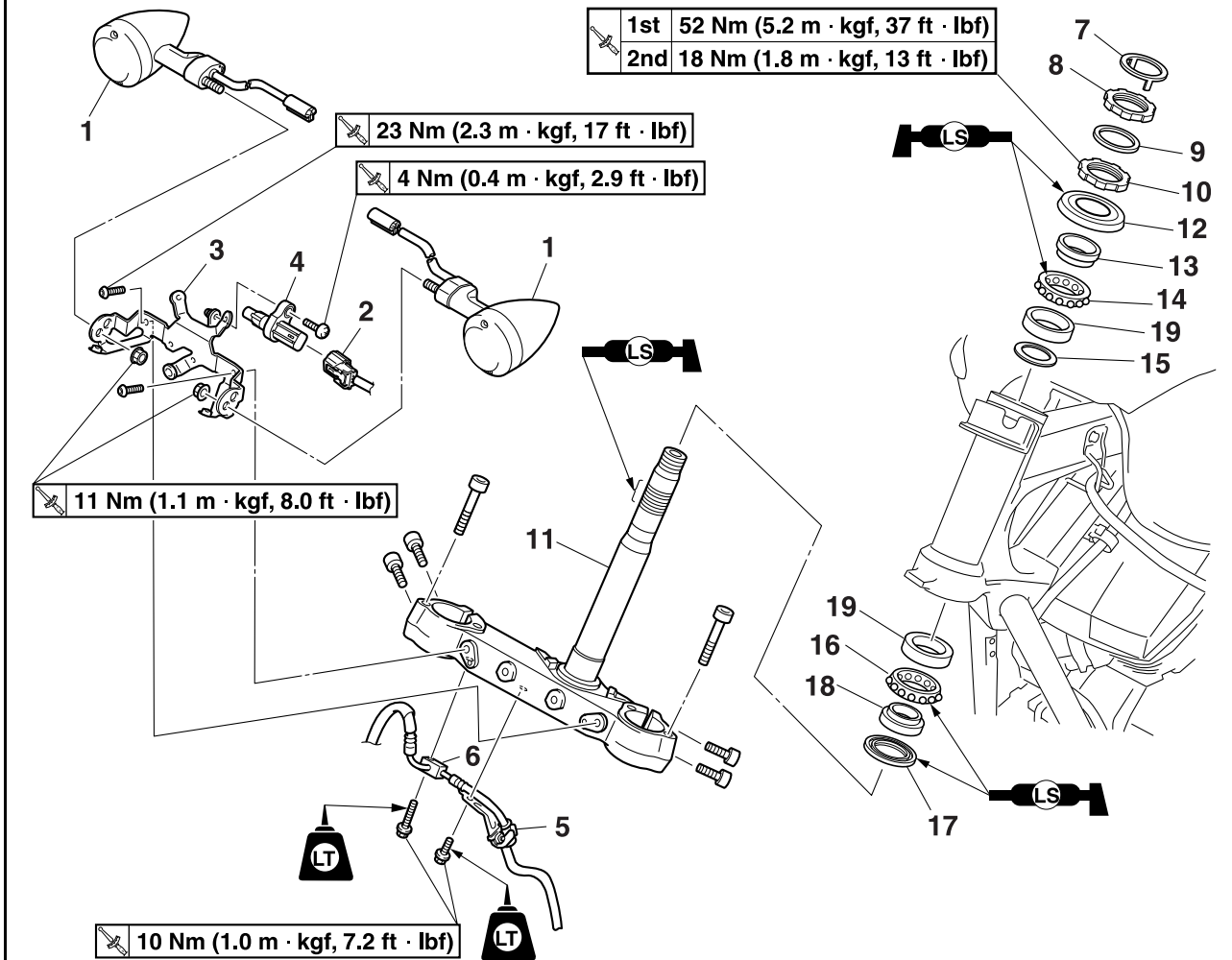
STEERING HEAD

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
	Upper bracket/Front fork legs		Refer to "FRONT FORK" on page 4-48.
1	Front turn signal light	2	
2	Air temperature sensor coupler	1	Disconnect.
3	Front turn signal light bracket	1	
4	Air temperature sensor	1	
5	Front brake hose holder	1	
6	Front brake hose joint	1	
7	Lock washer	1	
8	Upper ring nut	1	
9	Rubber washer	1	
10	Lower ring nut	1	
11	Lower bracket	1	
12	Upper bearing cover	1	
13	Upper bearing inner race	1	
14	Upper bearing	1	
15	Washer	1	
16	Lower bearing	1	
17	Dust seal	1	
18	Lower bearing inner race	1	

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
19	Bearing outer race	2	
			For installation, reverse the removal procedure.

EAS23110

REMOVING THE LOWER BRACKET

1. Stand the vehicle on a level surface.

EWA13120



WARNING

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

2. Remove:

- Upper ring nut
- Rubber washer
- Lower ring nut "1"
- Lower bracket

EWA13730



WARNING

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

TIP

Remove the lower ring nut with the steering nut wrench "2".

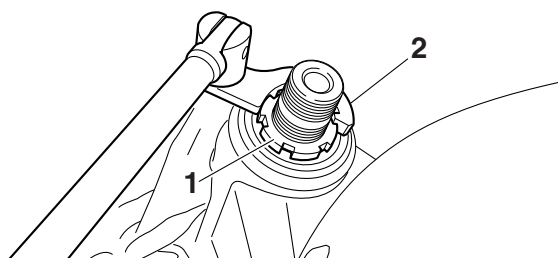


Steering nut wrench

90890-01403

Exhaust flange nut wrench

YU-A9472



EAS23120

CHECKING THE STEERING HEAD

1. Wash:

- Bearings
- Bearing races



Recommended cleaning solvent
Kerosene

2. Check:

- Bearings
- Bearing races
- Damage/pitting → Replace.

3. Replace:

- Bearings
- Bearing races



- a. Remove the bearing races from the steering head pipe with a long rod "1" and hammer.
- b. Remove the bearing race from the lower bracket with a floor chisel "2" and hammer.
- c. Install a new dust seal and new bearing races.

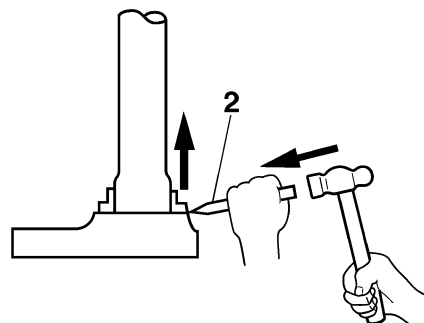
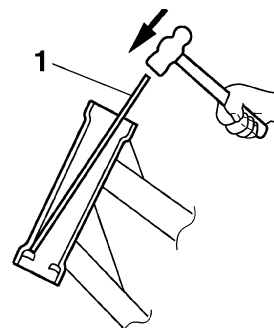
ECA14270

NOTICE

If the bearing race is not installed properly, the steering head pipe could be damaged.

TIP

- Always replace the bearings and bearing races as a set.
- Whenever the steering head is disassembled, replace the dust seal.



4. Check:

- Upper bracket
- Lower bracket
- (along with the steering stem)
- Bends/cracks/damage → Replace.

EAS23140

INSTALLING THE STEERING HEAD

1. Lubricate:

- Upper bearing
- Lower bearing
- Bearing races

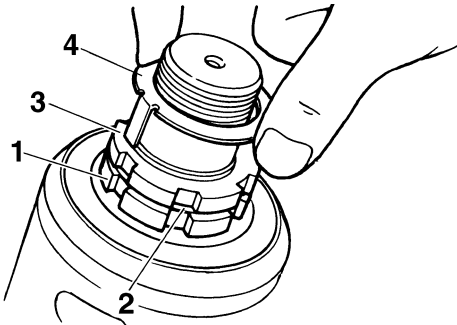


Recommended lubricant
Lithium-soap-based grease

2. Install:

- Lower ring nut “1”
- Rubber washer “2”
- Upper ring nut “3”
- Lock washer “4”

Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” on page 3-19.

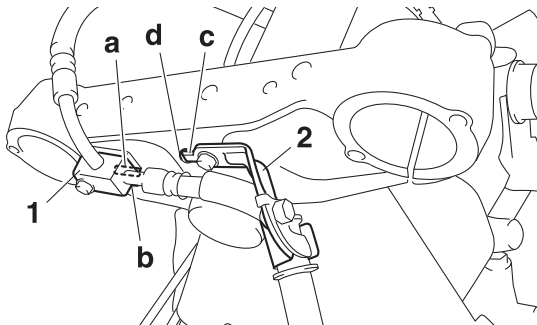


3. Install:

- Front brake hose joint “1”
- Front brake hose holder “2”

TIP

- Make sure that the projection “a” on the lower bracket contacts the side “b” of the front brake hose joint “1”.
- Align the projection “c” on the front brake hose holder with the hole “d” in the lower bracket.



4. Install:

- Front fork legs
- Upper bracket

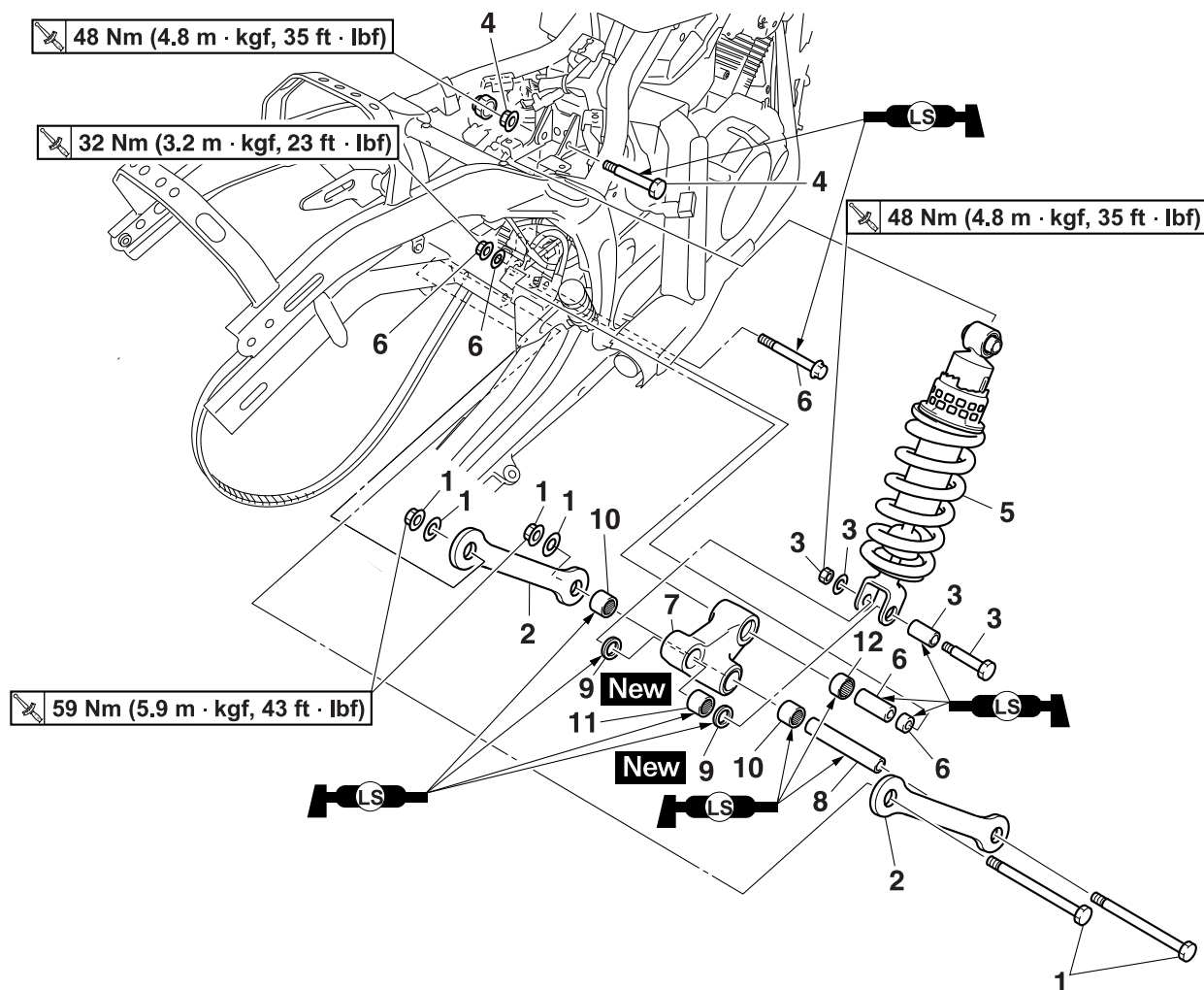
Refer to “FRONT FORK” on page 4-48.

REAR SHOCK ABSORBER ASSEMBLY

EAS23160

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Battery box		Refer to "GENERAL CHASSIS" on page 4-1.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
	Rear wheel		Refer to "REAR WHEEL" on page 4-15.
1	Connecting arm nut/Washer/Bolt	2/2/2	
2	Connecting arm	2	
3	Rear shock absorber assembly lower nut/Washer/Bolt/Collar	1/1/1/1	
4	Rear shock absorber assembly upper nut/Bolt	1/1	
5	Rear shock absorber assembly	1	
6	Relay arm nut/Bolt/Spacer/Collar/Washer	1/1/1/1/1	
7	Relay arm	1	
8	Spacer	1	
9	Oil seal	2	
10	Bearing	2	
11	Bearing	1	
12	Bearing	1	
			For installation, reverse the removal procedure.

REAR SHOCK ABSORBER ASSEMBLY

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

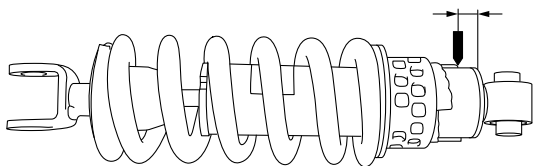
DISPOSING OF A REAR SHOCK ABSORBER

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 15–20 mm (0.60–0.79 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

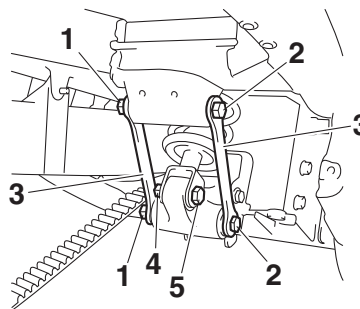
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Connecting arm nuts “1”
- Connecting arm bolts “2”
- Connecting arms “3”
- Rear shock absorber assembly lower nut “4”
- Rear shock absorber assembly lower bolt “5”

TIP

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

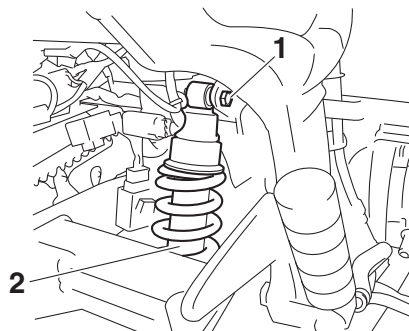


3. Remove:

- Rear shock absorber assembly upper nut
- Rear shock absorber assembly upper bolt “1”
- Rear shock absorber assembly “2”

TIP

Raise the swingarm and then remove the rear shock absorber assembly from between the swingarm and relay arm.

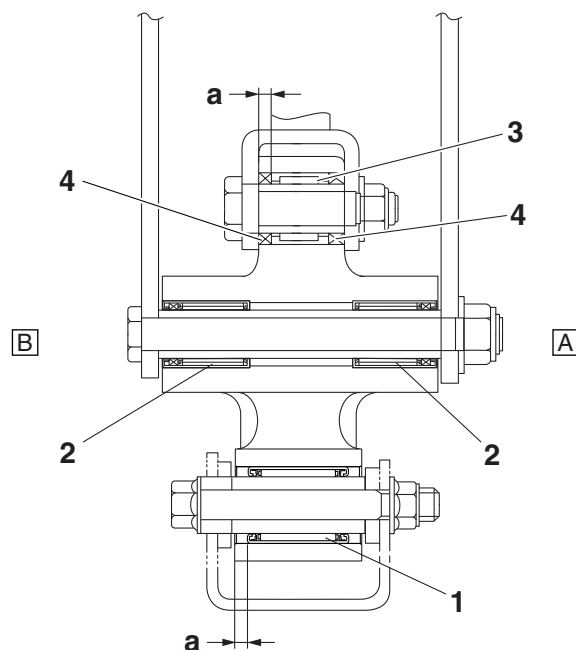


REAR SHOCK ABSORBER ASSEMBLY

EAS23240

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

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



EAS23260

CHECKING THE CONNECTING ARM AND RELAY ARM

1. Check:
 - Connecting arms
 - Relay arm
Damage/wear → Replace.
2. Check:
 - Bearings
 - Oil seals
Damage/pitting → Replace.
3. Check:
 - Spacers
Damage/scratches → Replace.

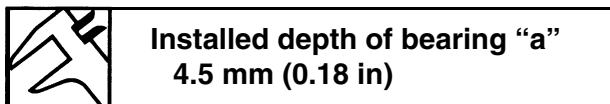
EAS23270

INSTALLING THE RELAY ARM

1. Lubricate:
 - Spacers
 - Bearings



2. Install:
 - Bearings "1", "2", and "3"
(to the relay arm)
 - Oil seals "4" **New**
(to the relay arm)



- A. Left side
B. Right side

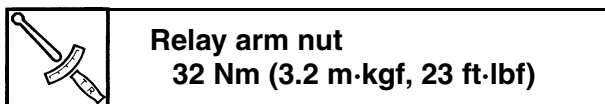
EAS23310

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
 - Spacer



2. Tighten:
 - Relay arm nut



3. Install:
 - Rear shock absorber assembly
 - Rear shock absorber assembly upper bolt
 - Rear shock absorber assembly lower bolt

TIP

Raise the swingarm and then install the rear shock absorber assembly from between the swingarm and relay arm.

REAR SHOCK ABSORBER ASSEMBLY

4. Tighten:

- Rear shock absorber assembly upper nut



**Rear shock absorber assembly
upper nut**
48 Nm (4.8 m·kgf, 35 ft·lbf)

- Rear shock absorber assembly lower nut



**Rear shock absorber assembly
lower nut**
48 Nm (4.8 m·kgf, 35 ft·lbf)

5. Install:

- Connecting arms
- Connecting arms bolts

TIP

When installing the connecting arms, lift up the swingarm.

6. Tighten:

- Connecting arm nuts

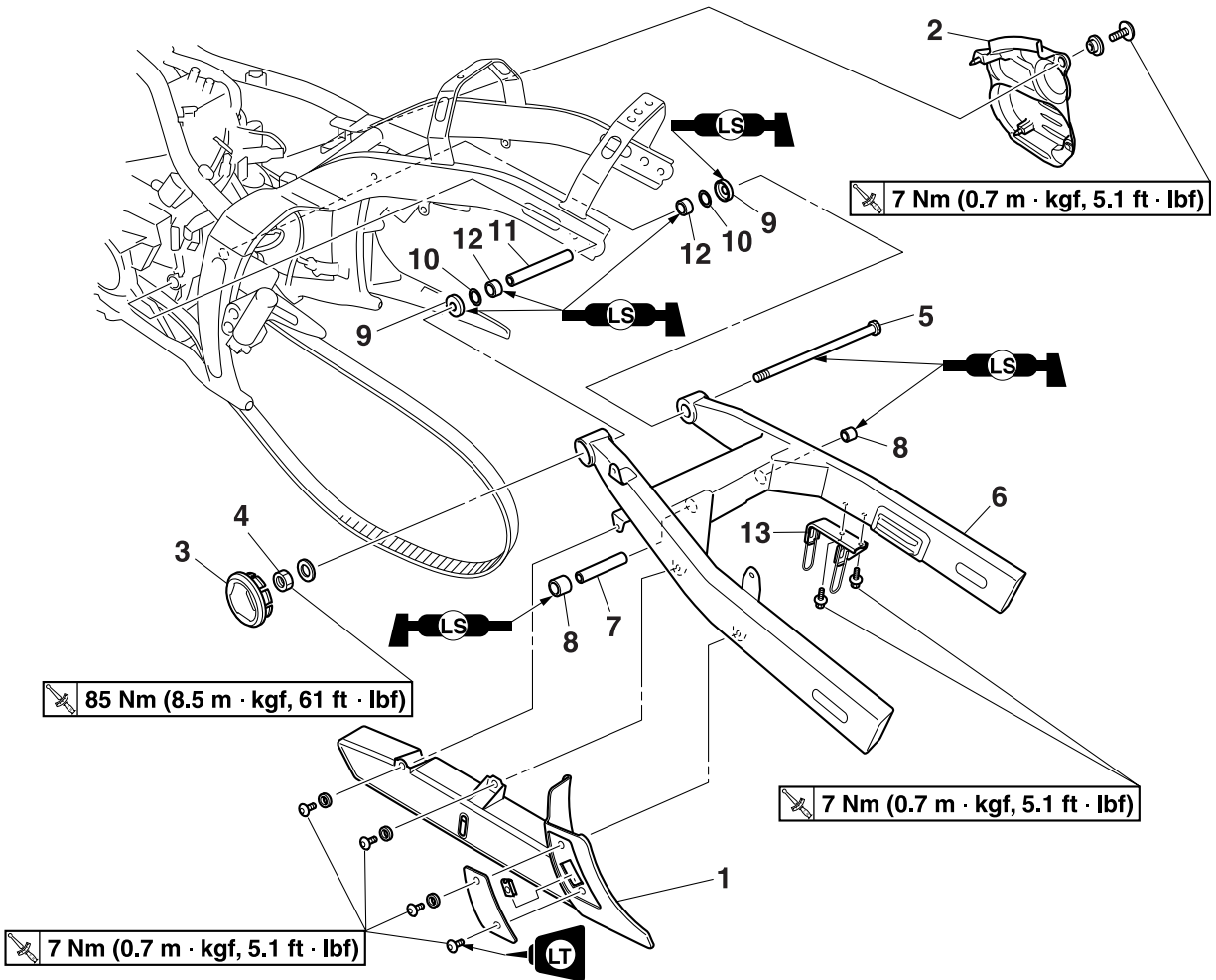


Connecting arm nut
59 Nm (5.9 m·kgf, 43 ft·lbf)

EAS23330

SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Drive belt puller/Drive belt upper guard		Refer to "REAR WHEEL" on page 4-15.
	Connecting arms		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-60.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-1.
1	Drive belt lower guard	1	
2	Right side cover (lower)	1	
3	Pivot shaft nut cover	1	
4	Pivot shaft nut	1	
5	Pivot shaft	1	
6	Swingarm	1	
7	Spacer	1	
8	Bearing	2	
9	Dust cover	2	
10	Washer	2	
11	Spacer	1	
12	Bearing	2	
13	Brake hose holder	1	
			For installation, reverse the removal procedure.

EAS23350

REMOVING THE SWINGARM

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

2. Measure:
 - Swingarm side play
 - Swingarm vertical movement



- a. Measure the tightening torque of the pivot shaft nut.



Pivot shaft nut
85 Nm (8.5 m·kgf, 61 ft·lbf)

- b. Measure the swingarm end free play "A" (axial) by moving the swingarm from side to side.
- c. If the swingarm end free play (axial) is out of specification, check the spacers, bearings, washers, and dust covers.



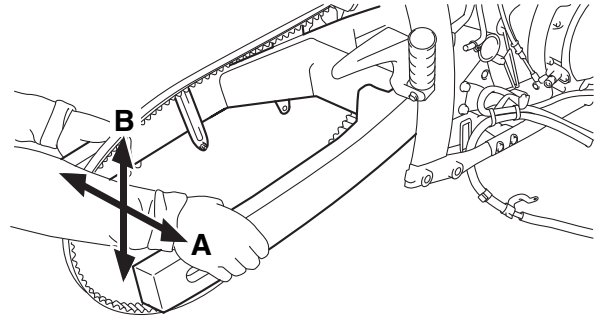
Swingarm end free play limit (axial)
1.0 mm (0.04 in)

- d. Measure the swingarm end free play "B" (radial) by moving the swingarm up or down.
- e. If the swingarm end free play (radial) is out of specification, check the spacers, bearings, washers, and dust covers.



Swingarm end free play limit (radial)
1.0 mm (0.04 in)

- f. Check the swingarm circumference movement by moving the swingarm up or down. If the swingarm circumference movement is not smooth or if it is stuck, check the spacers, bearings, washers, and dust covers.



EAS23360

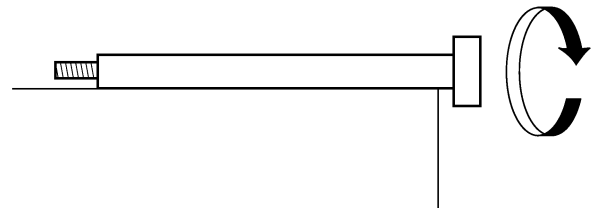
CHECKING THE SWINGARM

1. Check:
 - Swingarm
Bends/cracks/damage → Replace.
2. Check:
 - Pivot shaft
Roll the pivot shaft on a flat surface.
Bends → Replace.

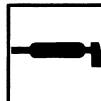
EWA13770

WARNING

Do not attempt to straighten a bent pivot shaft.



3. Wash:
 - Pivot shaft
 - Dust covers
 - Spacers
 - Washers
 - Bearings



Recommended cleaning solvent
Kerosene

4. Check:
 - Dust covers
 - Spacer
 - Washers
Damage/wear → Replace.
5. Check:
 - Bearings
Damage/pitting → Replace.

6. Check:
 - Spacer
 Damage/scratches → Replace.

EAS28780

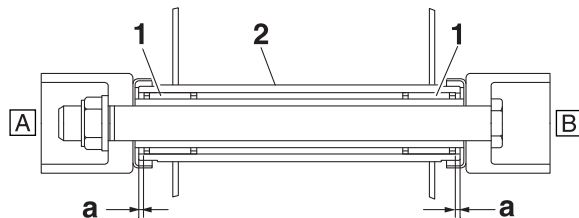
INSTALLING THE SWINGARM

1. Lubricate:
 - Bearings
 - Spacers
 - Dust covers
 - Pivot shaft



Recommended lubricant
Lithium-soap-based grease

2. Install:
 - Bearings “1”



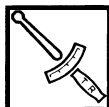
2. Swingarm

- A. Left side
B. Right side



Installed depth “a”
0–1.0 mm (0–0.04 in)

3. Install:
 - Pivot shaft nut



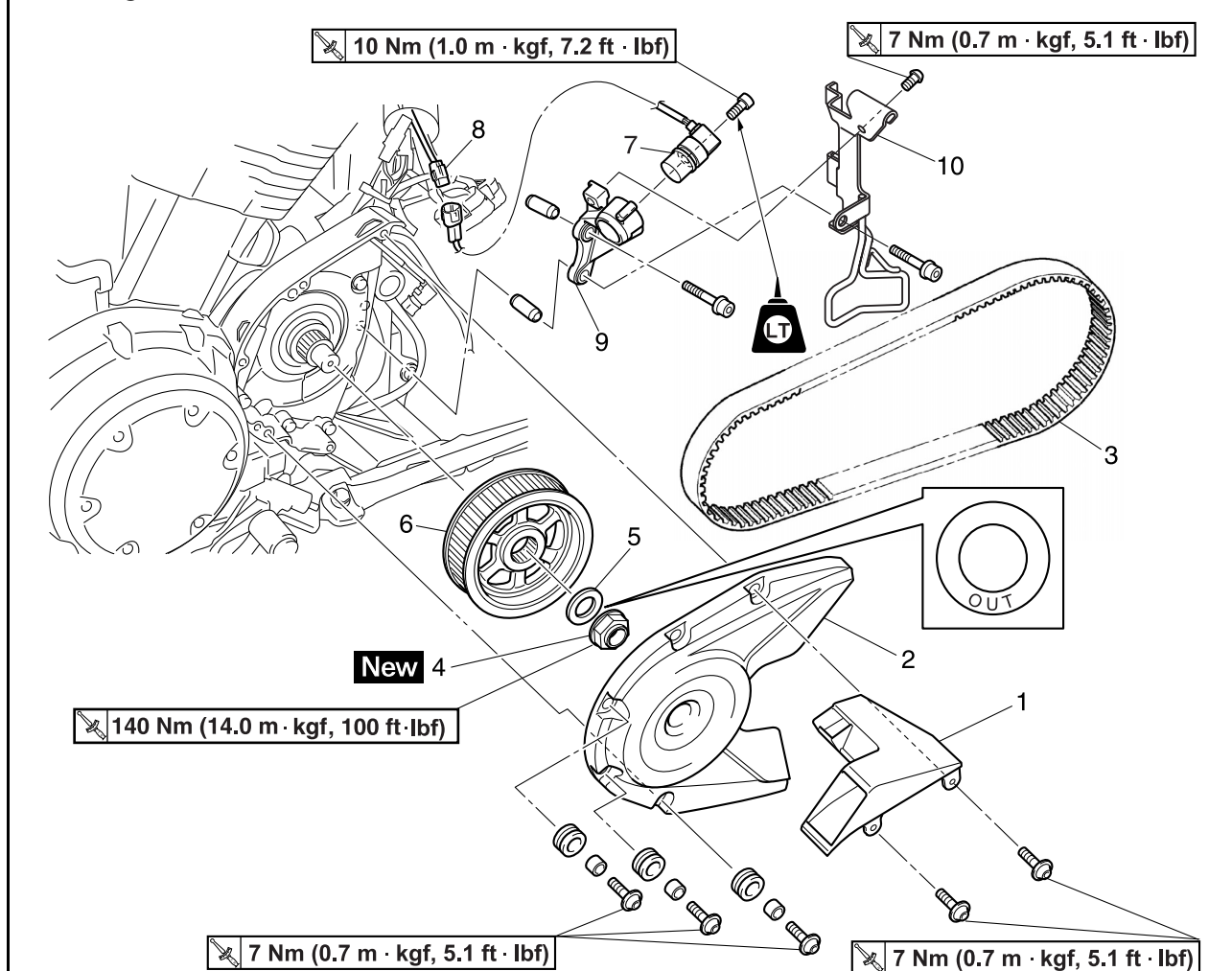
Pivot shaft nut
85 Nm (8.5 m·kgf, 61 ft·lbf)

4. Adjust:
 - Drive belt slack
 Refer to “ADJUSTING THE DRIVE BELT SLACK” on page 3-18.

EAS23510

BELT DRIVE

Removing the drive belt



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-15.
	Swingarm		Refer to "SWINGARM" on page 4-64.
	Rear shock absorber		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-60.
1	Air duct	1	
2	Drive pulley cover	1	
3	Drive belt	1	
4	Drive pulley nut	1	
5	Washer	1	
6	Drive pulley	1	
7	Speed sensor	1	
8	Speed sensor coupler	1	Disconnect.
9	Speed sensor bracket	1	
10	Lead bracket	1	
			For installation, reverse the removal procedure.

EAS23520

REMOVING THE DRIVE BELT AND DRIVE PULLEY

TIP

Loosen the drive pulley nut before removing the rear wheel.

1. Loosen:
 - Drive pulley nut

TIP

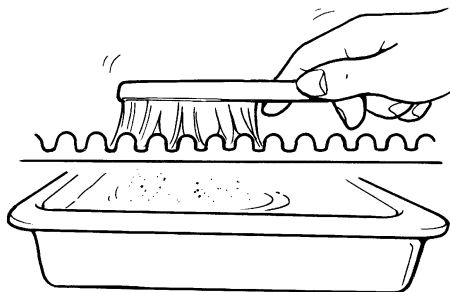
When loosening the drive pulley nut, press down on the brake pedal so the drive pulley does not move.

EAS23530

CHECKING THE DRIVE BELT

1. Clean:
 - Drive belt

- a. Wipe the drive belt with a clean cloth.
- b. Put the drive belt in a mixture of mild detergent and water. Then, remove any dirt from the drive belt.
- c. Remove the drive belt from the mixture and rinse it off with clean water. Then, let the drive belt thoroughly dry.

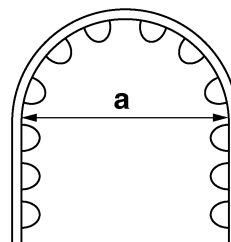


2. Check:
 - Drive belt

ECA14690

NOTICE

- To protect the drive belt from damage, handle it with care.
- The drive belt can not be bent smaller than 125 mm (4.92 in) “a”.
- The removed drive belt can not be twisted inside out.



3. Check:
 - Drive pulley
 - Rear wheel pulley
 Bent teeth → Replace the drive belt and pulleys as a set.

EAS23540

INSTALLING THE DRIVE BELT AND DRIVE PULLEY

1. Install:
 - Drive belt

ECA14710

NOTICE

Align the mark of the drive belt with the progress direction “A”.
Do not twist the drive belt when installing it.

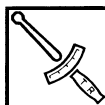


2. Install:
 - Swingarm
Refer to “SWINGARM” on page 4-64.
 - Rear wheel
Refer to “REAR WHEEL” on page 4-15.
3. Install:
 - Washer
 - Drive pulley nut

TIP

Install the washer with its “OUT” mark facing outward.

4. Tighten:
 - Drive pulley nut

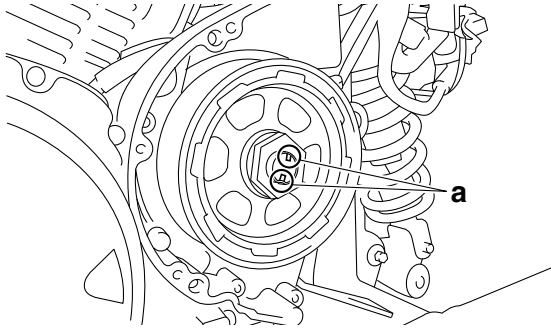


Drive pulley nut
140 Nm (14.0 m·kgf, 100 ft·lbf)

TIP

- Stake the drive pulley nut at the cutouts “a” in the drive axle.

- When tightening the drive pulley nut, press down on the brake pedal so the drive pulley does not move.
-



5. Adjust:
- Drive belt slack
Refer to “ADJUSTING THE DRIVE BELT SLACK” on page 3-18.

ENGINE

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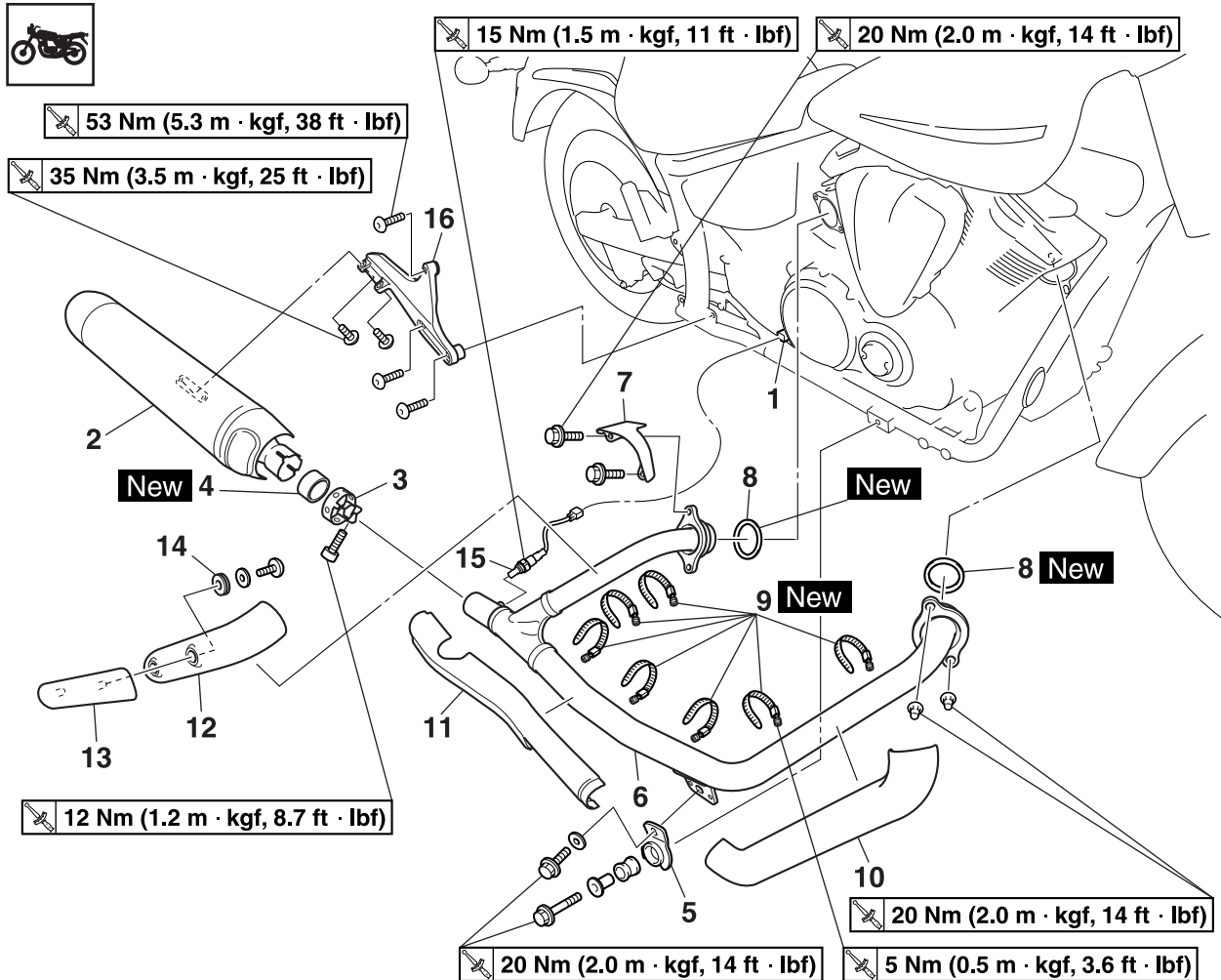
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EAS23710

ENGINE REMOVAL

Removing the muffler and exhaust pipe



Order	Job/Parts to remove	Q'ty	Remarks
	Right footrest		Refer to "REAR BRAKE" on page 4-33.
1	O ₂ sensor coupler	1	Disconnect.
2	Muffler	1	
3	Clamp	1	
4	Gasket	1	
5	Exhaust pipe stay	1	
6	Exhaust pipe	1	
7	Silencer plate	1	
8	Gasket	2	
9	Clamp	7	
10	Exhaust pipe protector 1	1	
11	Exhaust pipe protector 3	1	
12	Exhaust pipe protector 2	1	
13	Exhaust pipe protector 4	1	
14	Grommet	2	
15	O ₂ sensor	1	
16	Muffler bracket	1	
			For installation, reverse the removal procedure.

EAS5S71005

INSTALLING THE EXHAUST PIPE AND MUFFLER

1. Install:

- Exhaust pipe cover clamp screws **New**



Exhaust pipe cover clamp screw
5 Nm (0.5 m·kgf, 3.6 ft·lbf)

TIP

Do not retighten the exhaust pipe cover clamp screws; always replace them with new ones if they are loosened.

2. Install:

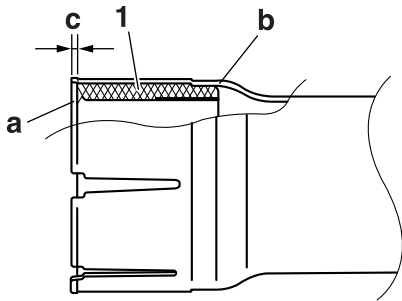
- Gasket “1” **New**
(to muffler)

TIP

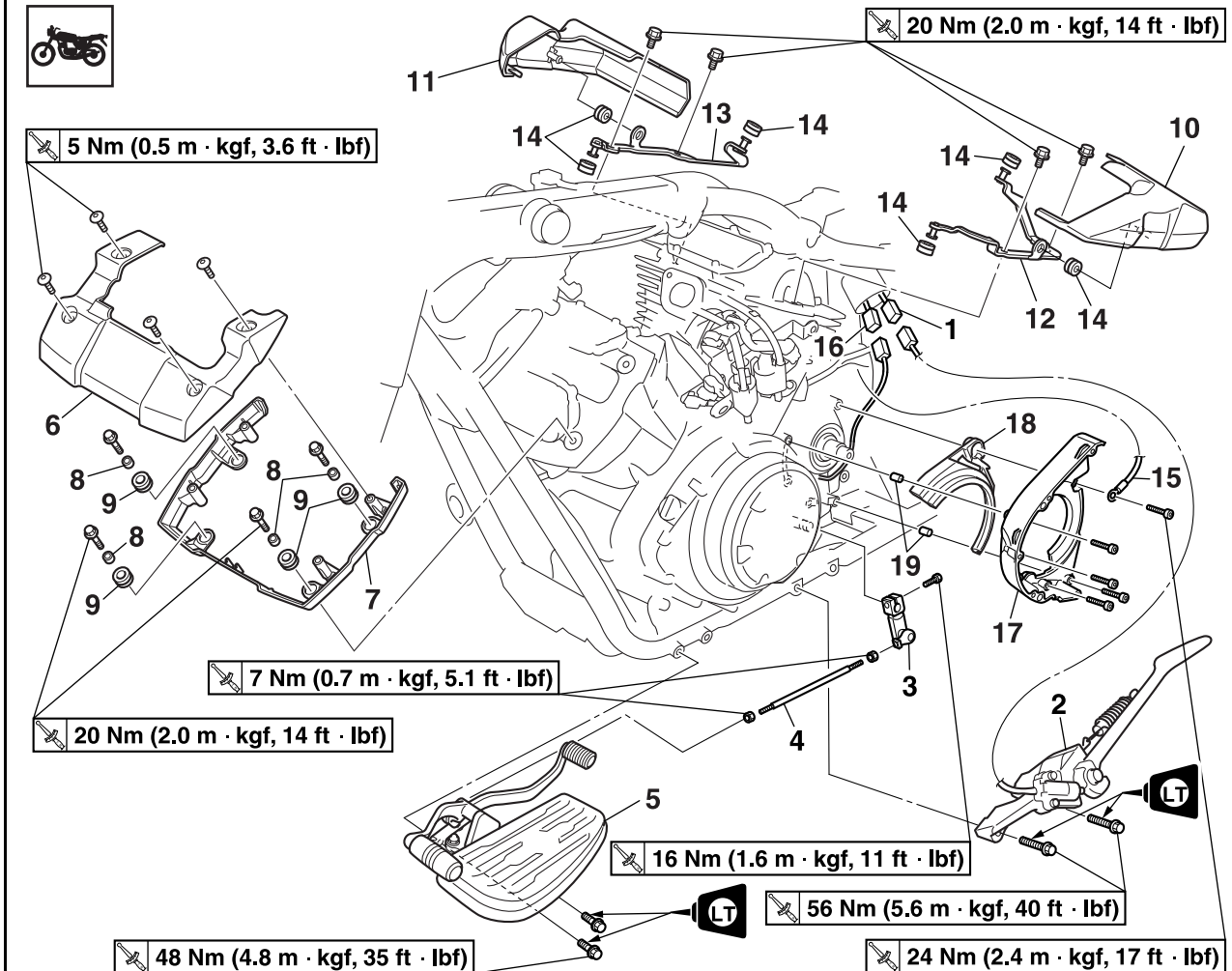
Install the gasket with the chamfer “a”, located on an inner rim of the gasket, and the chamfer “b”, located on an outer rim of the gasket, as shown.



Installed depth of gasket “c”
3.5 mm (0.14 in)

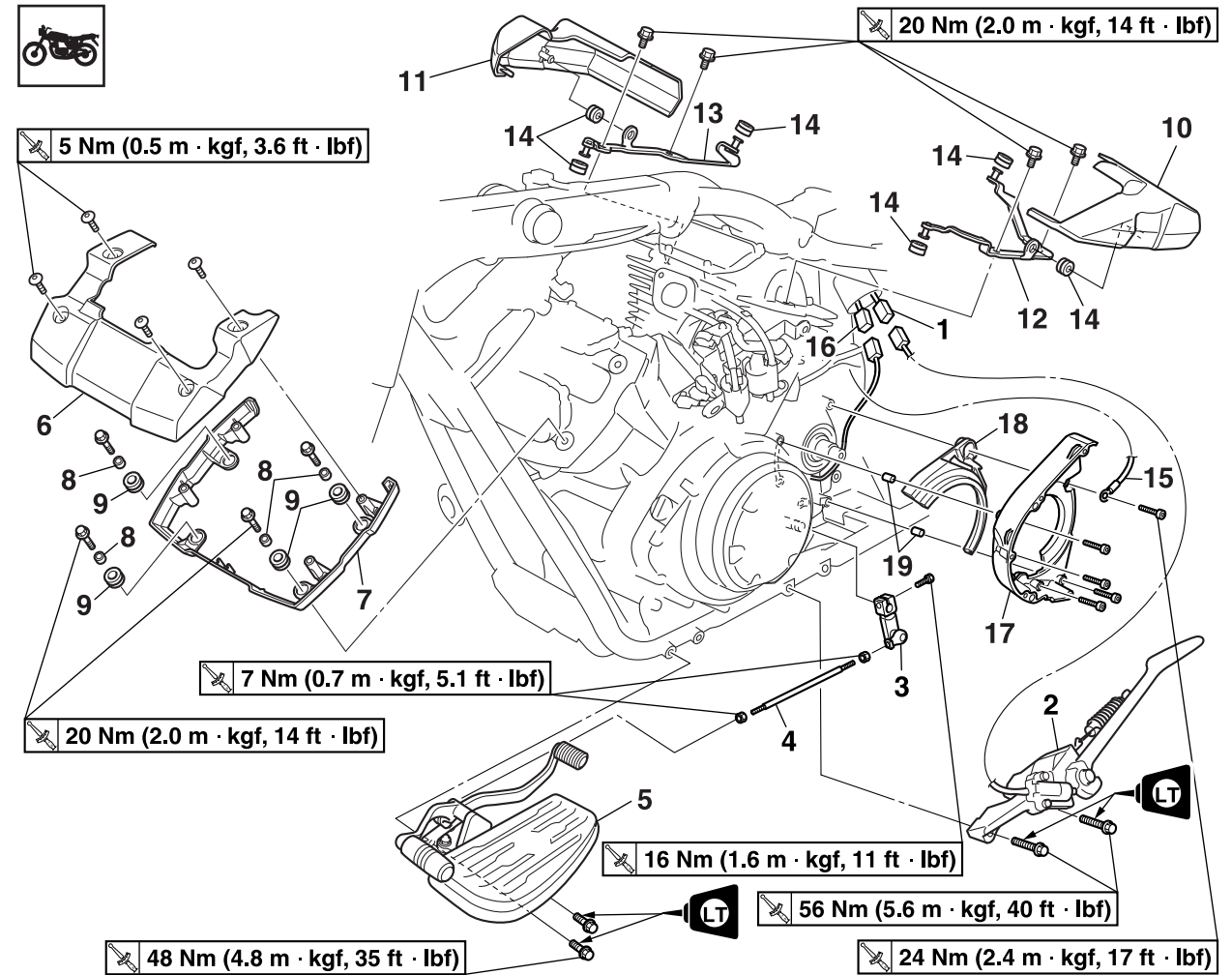


Removing the sidestand and drive pulley housing



Order	Job/Parts to remove	Q'ty	Remarks
	Drive belt		Refer to "BELT DRIVE" on page 4-67.
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Canister		Refer to "FUEL TANK" on page 6-1. California only
1	Sidestand switch coupler	1	Disconnect.
2	Sidestand	1	
3	Shift arm	1	
4	Shift rod	1	
5	Left footrest assembly	1	
6	Front cylinder upper plastic cover	1	
7	Front cylinder lower plastic cover	1	
8	Collar	4	
9	Grommet	4	
10	Rear cylinder left plastic cover	1	
11	Rear cylinder right plastic cover	1	
12	Rear cylinder left plastic cover bracket	1	
13	Rear cylinder right plastic cover bracket	1	
14	Grommet	6	
15	Ground lead	1	Disconnect.
16	Neutral switch coupler	1	Disconnect.

Removing the sidestand and drive pulley housing



Order	Job/Parts to remove	Q'ty	Remarks
17	Drive pulley housing	1	
18	Damper	1	
19	Dowel pin	2	
			For installation, reverse the removal procedure.

EAS5S71006

INSTALLING THE CYLINDER COVERS

1. Install:

- Front cylinder lower plastic cover “1”
- Front cylinder upper plastic cover “2”
- Rear cylinder left plastic cover bracket “3”
- Rear cylinder right plastic cover bracket “4”
- Rear cylinder left plastic cover “5”
- Rear cylinder right plastic cover “6”



Front cylinder lower plastic cover bolt

20 Nm (2.0 m·kgf, 14 ft·lbf)

Front cylinder upper plastic cover screw

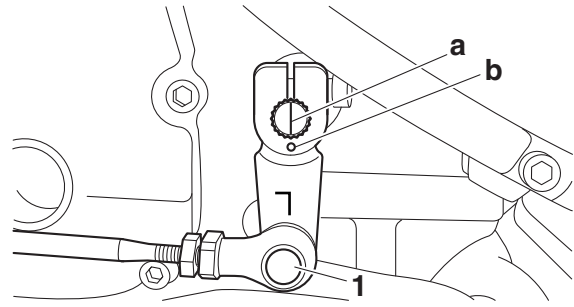
5 Nm (0.5 m·kgf, 3.6 ft·lbf)

Rear cylinder left plastic cover bracket bolt

20 Nm (2.0 m·kgf, 14 ft·lbf)

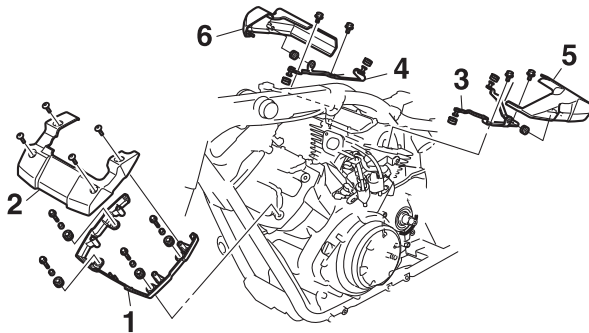
Rear cylinder right plastic cover bracket bolt

20 Nm (2.0 m·kgf, 14 ft·lbf)



2. Adjust:

- Shift rod length
Refer to “ADJUSTING THE SHIFT PEDAL” on page 3-21.



EAS5S71007

INSTALLING THE SHIFT ARM

1. Install:

- Shift arm “1”



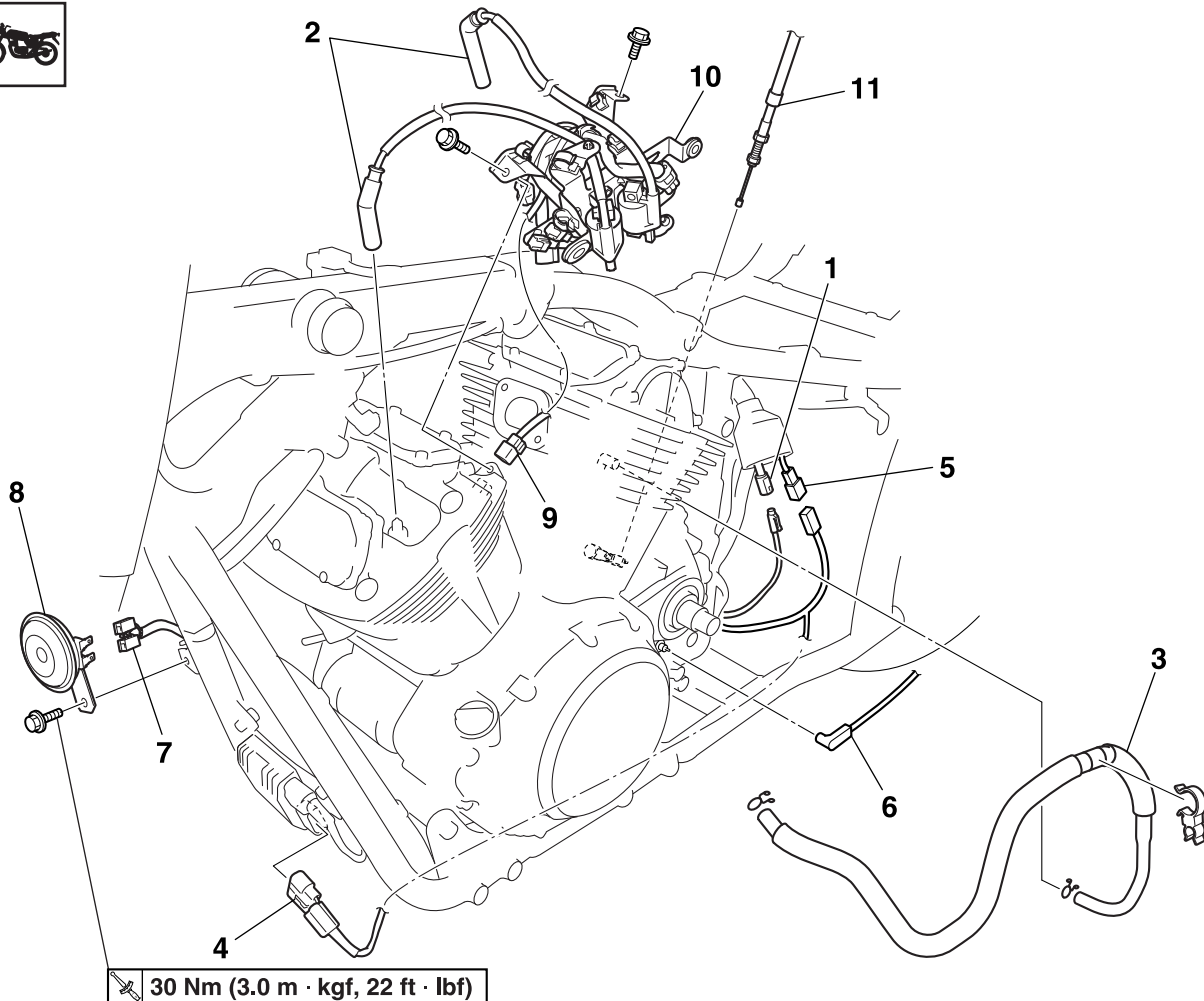
Shift arm bolt

16 Nm (1.6 m·kgf, 11 ft·lbf)

TIP

Align the “1” mark “a” in the shift shaft with the punch mark “b” in the shift arm.

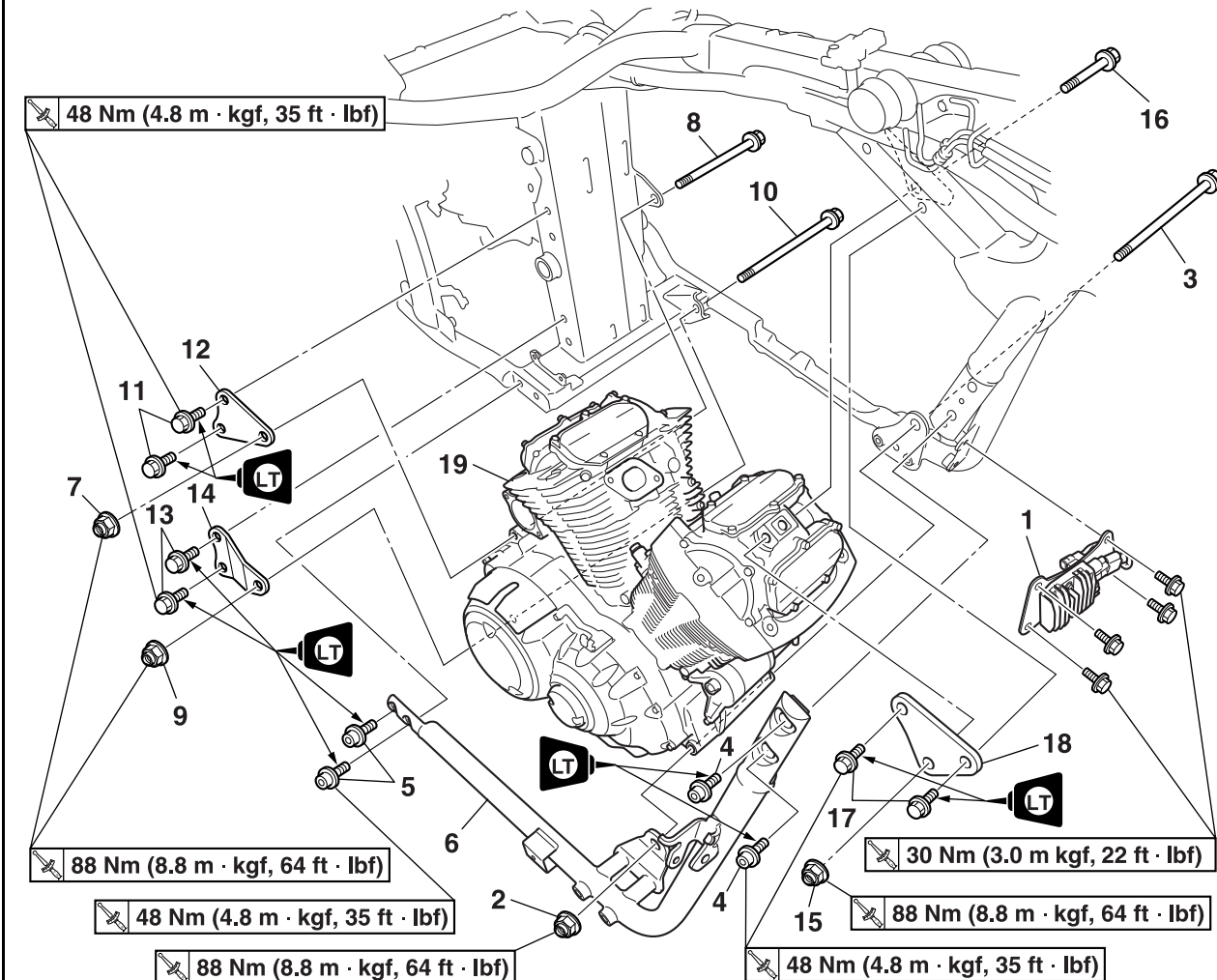
Disconnecting the leads and hoses



30 Nm (3.0 m · kgf, 22 ft · lbf)

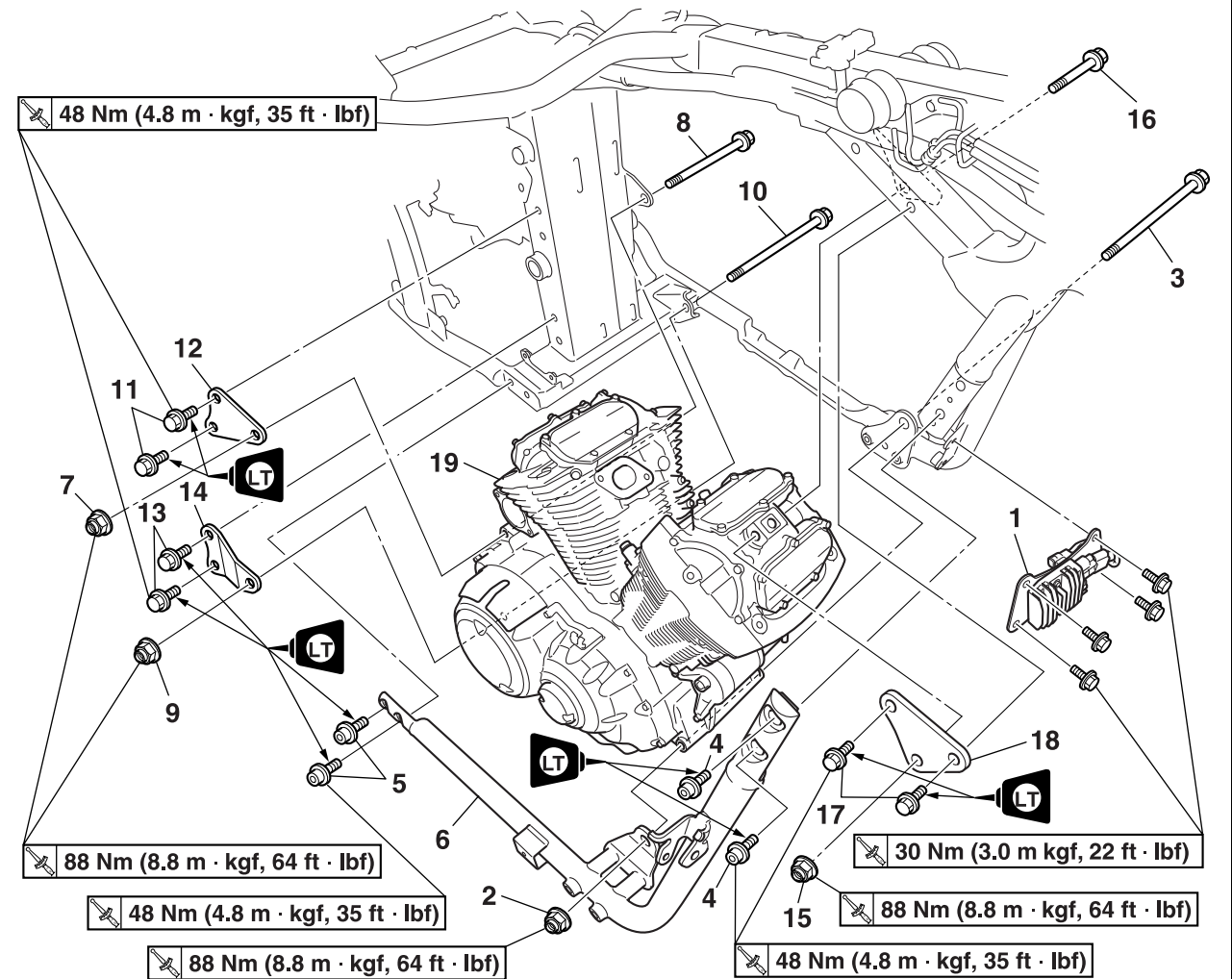
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover (cylinder head)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Intake manifold assembly		Refer to "THROTTLE BODIES" on page 6-6.
	Starter motor lead		Refer to "ELECTRIC STARTER" on page 5-55.
	Rear brake hose		Refer to "REAR BRAKE" on page 4-33.
1	Oil level switch coupler	1	Disconnect.
2	Spark plug cap	2	Disconnect.
3	Crankcase breather hose	1	
4	Rectifier/regulator coupler	1	Disconnect.
5	Crankshaft position sensor coupler	1	Disconnect.
6	Neutral switch connector	1	Disconnect.
7	Horn connector	2	Disconnect.
8	Horn	1	
9	Engine temperature sensor coupler	1	Disconnect.
10	Ignition coil bracket	1	
11	Clutch cable	1	
			For installation, reverse the removal procedure.

Removing the down tube and engine



Order	Job/Parts to remove	Q'ty	Remarks
	Rear brake hose bracket		Refer to "REAR BRAKE" on page 4-33.
	Engine oil		Drain.
1	Rectifier/regulator bracket	1	
2	Engine mounting nut (front lower side)	1	
3	Engine mounting bolt (front lower side)	1	
4	Down tube bolt (front side)	2	
5	Down tube bolt (rear side)	2	
6	Down tube	1	
7	Engine mounting nut (rear upper side)	1	
8	Engine mounting bolt (rear upper side)	1	
9	Engine mounting nut (rear lower side)	1	
10	Engine mounting bolt (rear lower side)	1	
11	Engine bracket bolt (rear upper side)	2	
12	Engine bracket (rear upper side)	1	
13	Engine bracket bolt (rear lower side)	2	
14	Engine bracket (rear lower side)	1	
15	Engine mounting nut (front upper side)	1	
16	Engine mounting bolt (front upper side)	1	
17	Engine bracket bolt (front upper side)	2	
18	Engine bracket (front upper side)	1	
19	Engine	1	

Removing the down tube and engine



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

EAS23720

INSTALLING THE ENGINE

1. Install:

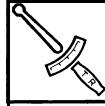
- Engine "1"
- Engine bracket (front upper side) "2"
- Engine bracket bolts (front upper side) "3"
- Engine mounting bolt (front upper side) "4"
- Engine mounting nut (front upper side) "5"
- Engine bracket (rear lower side) "6"
- Engine bracket bolts (rear lower side) "7"
- Engine bracket (rear upper side) "8"
- Engine bracket bolts (rear upper side) "9"
- Engine mounting bolt (rear lower side) "10"
- Engine mounting nut (rear lower side) "11"
- Engine mounting bolt (rear upper side) "12"
- Engine mounting nut (rear upper side) "13"
- Down tube "14"
- Down tube bolts (rear side) "15"
- Down tube bolts (front side) "16"
- Engine mounting bolt (front lower side) "17"
- Engine mounting nut (front lower side) "18"

TIP

- Apply locking agent (LOCTITE®) to the threads of the engine bracket bolts (front upper side), engine bracket bolts (rear lower side), engine bracket bolts (rear upper side), down tube bolts (front side), and down tube bolts (rear side).
- Do not tighten the bolts and nuts.

2. Tighten:

- Engine bracket bolts (front upper side) "3"
- Engine bracket bolts (rear lower side) "7"
- Engine bracket bolts (rear upper side) "9"
- Down tube bolts (front side) "15"
- Down tube bolts (rear side) "16"



Engine bracket bolt (front upper side)

48 Nm (4.8 m·kgf, 35 ft·lbf)

LOCTITE®

Engine bracket bolt (rear lower side)

48 Nm (4.8 m·kgf, 35 ft·lbf)

LOCTITE®

Engine bracket bolt (rear upper side)

48 Nm (4.8 m·kgf, 35 ft·lbf)

LOCTITE®

Down tube bolt (front side)

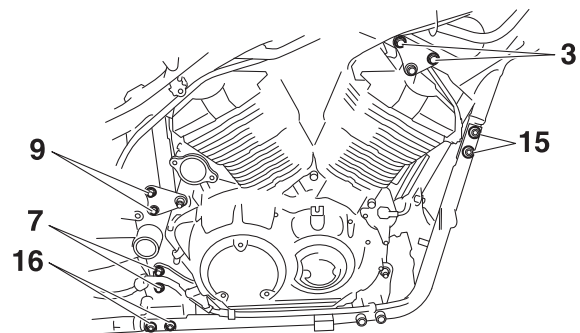
48 Nm (4.8 m·kgf, 35 ft·lbf)

LOCTITE®

Down tube bolt (rear side)

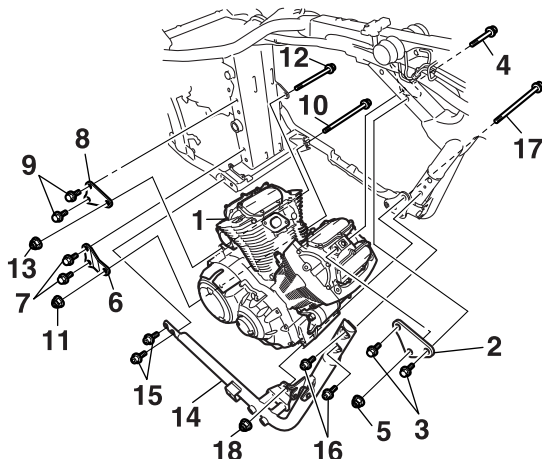
48 Nm (4.8 m·kgf, 35 ft·lbf)

LOCTITE®



3. Tighten:

- Engine mounting nut (front upper side) "5"
- Engine mounting nut (rear lower side) "11"
- Engine mounting nut (rear upper side) "13"
- Engine mounting nut (front lower side) "18"





Engine mounting nut (front upper side)

88 Nm (8.8 m·kgf, 64 ft·lbf)

Engine mounting nut (rear lower side)

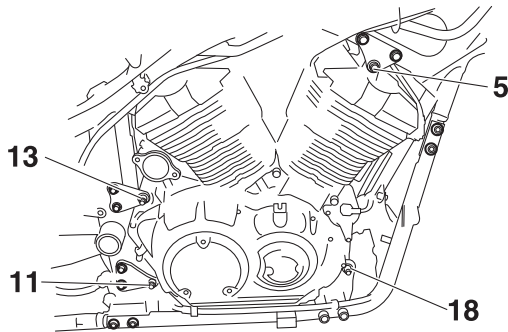
88 Nm (8.8 m·kgf, 64 ft·lbf)

Engine mounting nut (rear upper side)

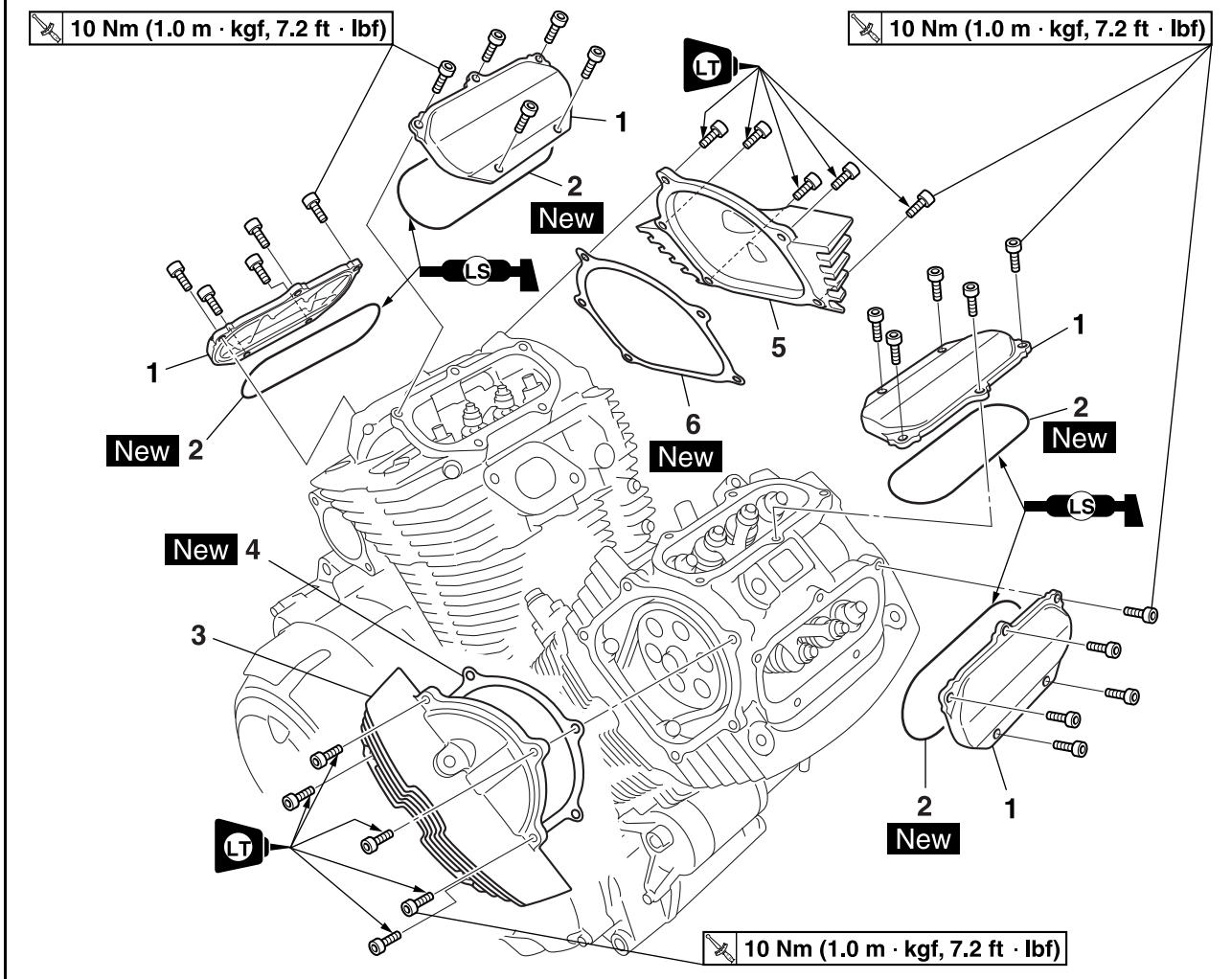
88 Nm (8.8 m·kgf, 64 ft·lbf)

Engine mounting nut (front lower side)

88 Nm (8.8 m·kgf, 64 ft·lbf)

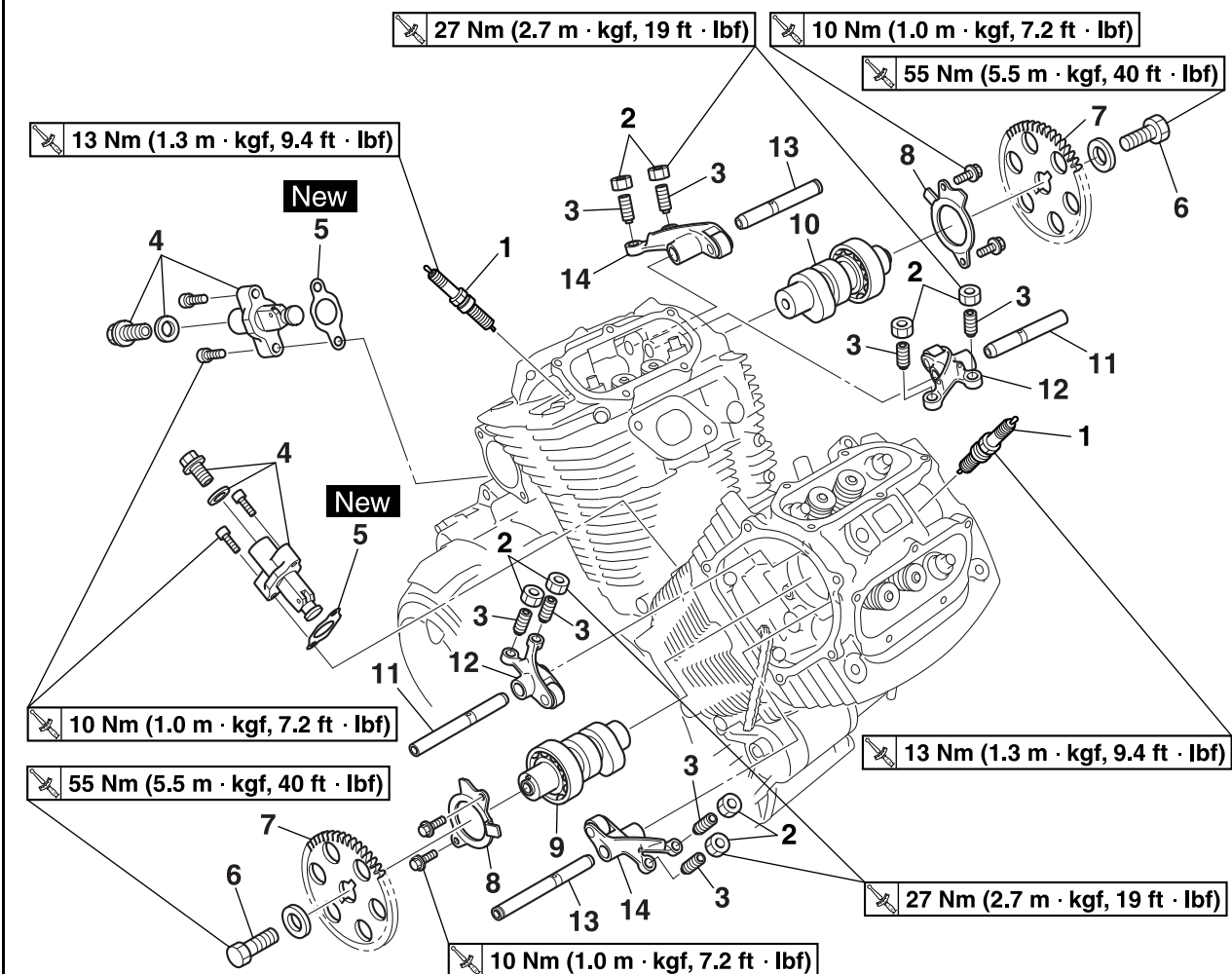


EAS23740

CAMSHAFTS**Removing the cylinder head covers**

Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
1	Tappet cover	4	
2	O-ring	4	
3	Front cylinder side cover	1	
4	Front cylinder side cover gasket	1	
5	Rear cylinder side cover	1	
6	Rear cylinder side cover gasket	1	
			For installation, reverse the removal procedure.

Removing the camshafts and rocker arms



Order	Job/Parts to remove	Q'ty	Remarks
1	Spark plug	2	
2	Locknut	8	
3	Valve clearance adjusting screw	8	
4	Timing chain tensioner	2	
5	Timing chain tensioner gasket	2	
6	Camshaft bolt	2	
7	Camshaft sprocket	2	
8	Camshaft retainer	2	
9	Front cylinder camshaft	1	
10	Rear cylinder camshaft	1	
11	Intake rocker arm shaft	2	
12	Intake rocker arm	2	
13	Exhaust rocker arm shaft	2	
14	Exhaust rocker arm	2	
			For installation, reverse the removal procedure.

EAS5S71008

REMOVING THE CAMSHAFTS AND ROCKER ARMS

1. Align:

- “I” mark on the front cylinder camshaft sprocket
(with the arrow mark on the front cylinder head)

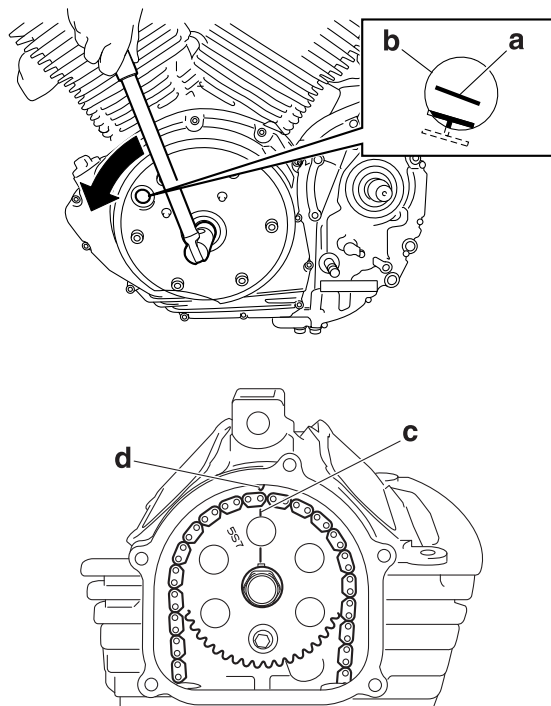


Front cylinder

- Turn the crankshaft counterclockwise.
- When the front cylinder piston is at TDC on the compression stroke, align the TDC mark “a” on the generator rotor with the slot “b” in the generator cover.

TIP

To position the front cylinder piston at TDC on the compression stroke, align the “I” mark “c” on the camshaft sprocket with the arrow mark “d” on the front cylinder head.

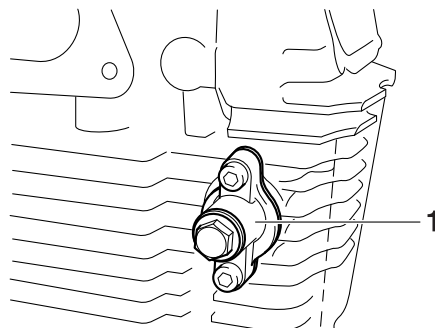


2. Remove:

- Front cylinder timing chain tensioner “1”

TIP

Never remove a timing chain tensioner when the engine is mounted.



3. Remove:

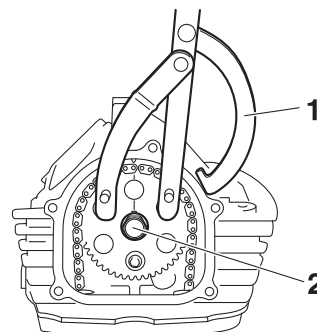
- Front cylinder camshaft sprocket

TIP

- While holding the camshaft sprocket with the rotor holding tool “1”, loosen the camshaft sprocket bolt “2”.
- To prevent the timing chain from falling into the crankcase, fasten it with a wire.



Rotor holding tool
90890-01235
Universal magneto & rotor
holder
YU-01235



4. Remove:

- Camshaft retainer
- Front cylinder camshaft

5. Remove:

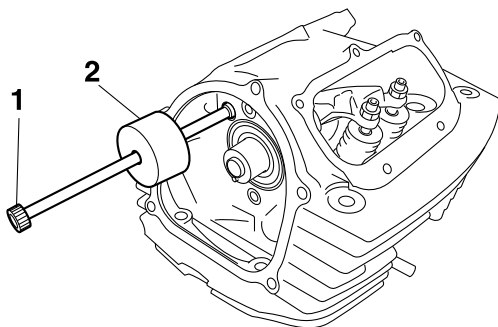
- Intake rocker arm shaft
- Exhaust rocker arm shaft
- Intake rocker arm
- Exhaust rocker arm

TIP

Remove the rocker arm shafts with the slide hammer bolt “1” and weight “2”.



Slide hammer bolt
90890-01083
Slide hammer bolt 6 mm
YU-01083-1
Weight
90890-01084
YU-01083-3



6. Align:
- "I" mark on the rear cylinder camshaft sprocket
(with the arrow mark on the rear cylinder head)

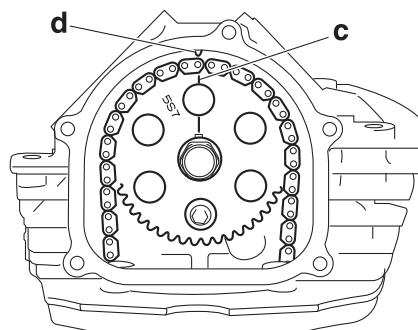


Rear cylinder

- Turn the crankshaft counterclockwise from the front cylinder piston TDC by 300 degrees.
- When the rear cylinder piston is at TDC on the compression stroke, align the TDC mark "a" on the generator rotor with the slot "b" in the generator cover.

TIP

To position the rear cylinder piston at TDC on the compression stroke, align the "I" mark "c" on the camshaft sprocket with the arrow mark "d" on the rear cylinder head.



7. Remove:
- Rear cylinder timing chain tensioner
 - Rear cylinder camshaft sprocket
 - Camshaft retainer
 - Rear cylinder camshaft
 - Intake rocker arm shaft
 - Exhaust rocker arm shaft
 - Intake rocker arm
 - Exhaust rocker arm

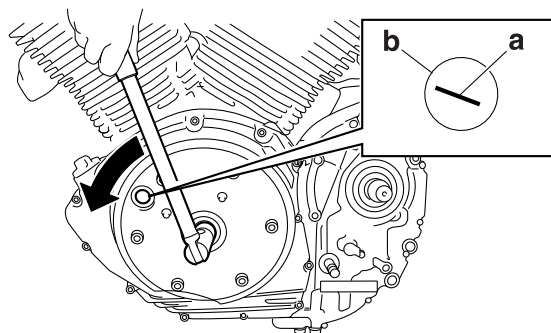
TIP

- Never remove a timing chain tensioner when the engine is mounted.
- Remove the parts using the same procedure as for the front cylinder camshaft and rocker arm.

EAS23840

CHECKING THE CAMSHAFTS

- Check:
 - Camshaft lobes
Blue discoloration/pitting/scratches → Replace the camshaft.
- Measure:
 - Camshaft lobe dimensions "a" and "b"
Out of specification → Replace the camshaft.





Camshaft lobe dimensions

Intake A

42.470–42.570 mm (1.6720–1.6760 in)

Limit

42.370 mm (1.6681 in)

Intake B

37.041–37.141 mm (1.4583–1.4622 in)

Limit

36.941 mm (1.4544 in)

Exhaust A

42.138–42.238 mm (1.6590–1.6629 in)

Limit

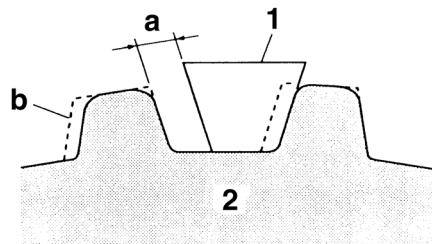
42.038 mm (1.6550 in)

Exhaust B

37.015–37.115 mm (1.4573–1.4612 in)

Limit

36.915 mm (1.4533 in)



a. 1/4 tooth

b. Correct

1. Timing chain roller

2. Camshaft sprocket

EAS23880

CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

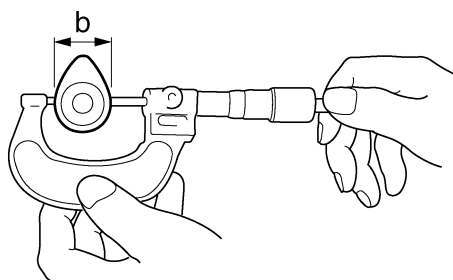
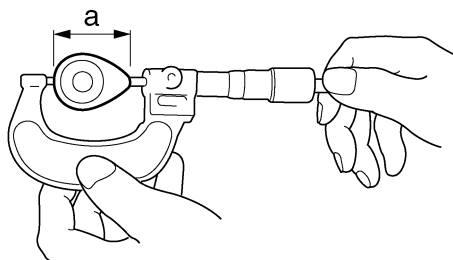
The following procedure applies to all of the rocker arms and rocker arm shafts.

1. Check:
 - Rocker arm
 - Rocker arm roller
 - Damage/wear → Replace.
2. Check:
 - Rocker arm shaft
 - Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.
3. Measure:
 - Rocker arm inside diameter
 - Out of specification → Replace.



Rocker arm inside diameter

12.000–12.018 mm (0.4724–0.4731 in)

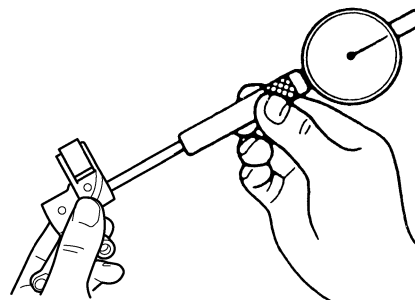


3. Check:
 - Camshaft oil passage
 - Obstruction → Blow out with compressed air.

EAS23870

CHECKING THE CAMSHAFT SPROCKETS

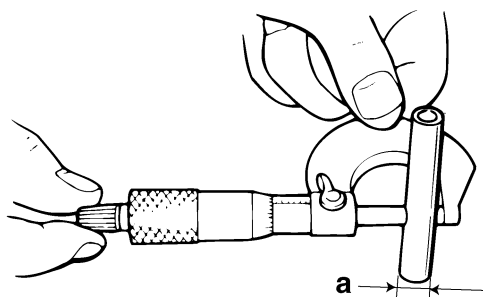
1. Check:
 - Camshaft sprockets
 - More than 1/4 tooth wear “a” → Replace the camshaft sprocket and the timing chain as a set.



4. Measure:
 - Rocker arm shaft outside diameter “a”
 - Out of specification → Replace.



Rocker arm shaft outside diameter
11.981–11.991 mm (0.4717–0.4721 in)



5. Calculate:
 - Rocker-arm-to-rocker-arm-shaft clearance

TIP

Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

Out of specification → Replace the defective part(s).



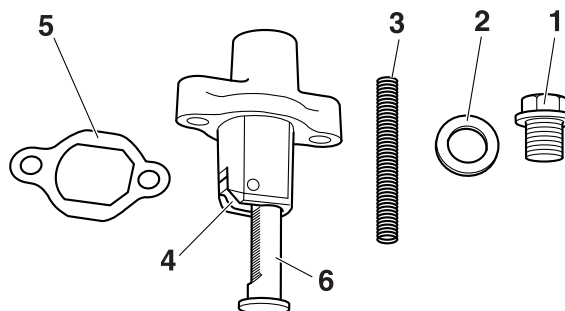
Rocker-arm-to-rocker-arm-shaft clearance
0.009–0.037 mm (0.0004–0.0015 in)
Limit
0.095 mm (0.0037 in)

EAS23970

CHECKING THE TIMING CHAIN TENSIONERS

The following procedure applies to all of the timing chain tensioners.

1. Check:
 - Timing chain tensioner
Cracks/damage → Replace.
2. Check:
 - One-way cam operation
Rough movement → Replace the timing chain tensioner assembly.
3. Check:
 - Timing chain tensioner cap bolt “1”
 - Copper washer “2”
 - Timing chain tensioner spring “3”
 - One-way cam “4”
 - Timing chain tensioner gasket “5”
 - Timing chain tensioner rod “6”
Damage/wear → Replace the defective part(s).

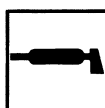


EAS24040

INSTALLING THE ROCKER ARMS AND CAMSHAFTS

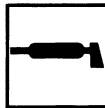
The following procedure applies to all of the rocker arms and camshafts.

1. Lubricate:
 - Rocker arm shafts



Recommended lubricant
Engine oil

2. Install:
 - Rocker arms
 - Rocker arm shafts
3. Lubricate:
 - Camshaft

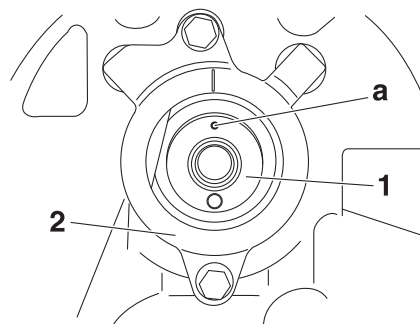


Recommended lubricant
Camshaft
Molybdenum disulfide oil
Camshaft bearing
Engine oil

4. Install:
 - Camshaft “1”
 - Camshaft retainer “2”

TIP

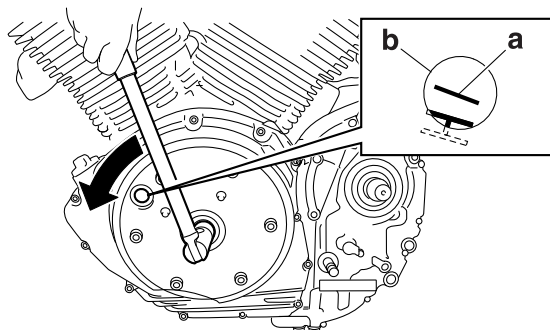
The front cylinder camshaft is identified by the punch mark “a”. The rear cylinder camshaft does not have a punch mark.



5. Install:
 - Front cylinder camshaft sprocket

Front cylinder

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



- Install the timing chain "1" onto the front cylinder camshaft sprocket "2", then install the camshaft sprocket onto the camshaft, and then finger tighten the camshaft sprocket bolt "3".

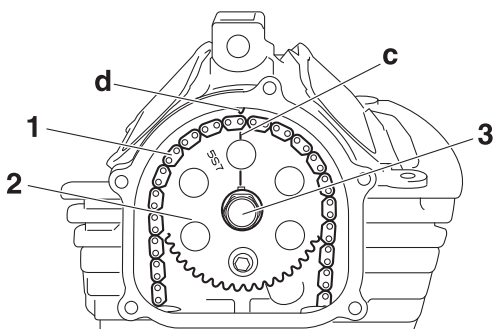
ECA13740

NOTICE

Do not turn the crankshaft when installing the camshaft(s) to avoid damage or improper valve timing.

TIP

- To position the front cylinder piston at TDC on the compression stroke, align the "I" mark "c" on the camshaft sprocket with the arrow mark "d" on the front cylinder head.
- When installing the front cylinder camshaft sprocket, be sure to keep the timing chain as tight as possible on the exhaust side.



- Remove the wire from the timing chain.

6. Tighten:

- Front cylinder camshaft sprocket bolt "1"

TIP

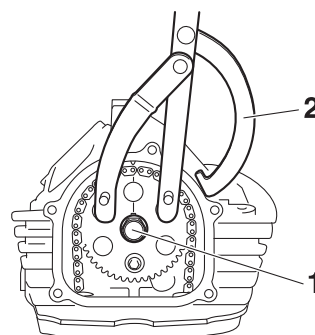
While holding the camshaft sprocket with the rotor holding tool "2", tighten the camshaft sprocket bolt.



Rotor holding tool
90890-01235
Universal magneto & rotor holder
YU-01235



Camshaft sprocket bolt
55 Nm (5.5 m·kgf, 40 ft·lbf)



7. Install:

- Front cylinder timing chain tensioner gasket "1" **New**
- Front cylinder timing chain tensioner "2"

TIP

To push in the timing chain tensioner rod, release the lock by pushing in the one-way cam "6".



Front cylinder timing chain tensioner bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

8. Install:

- Timing chain tensioner spring "5"
- Copper washer "4"
- Timing chain tensioner cap bolt "3"



Timing chain tensioner cap bolt
24 Nm (2.4 m·kgf, 17 ft·lbf)

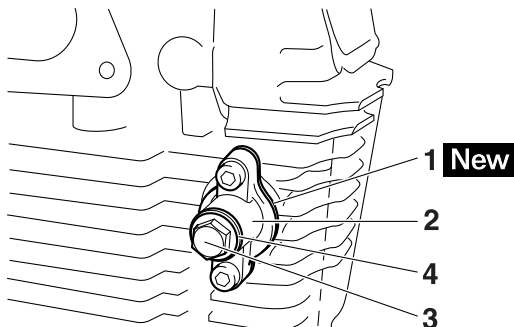
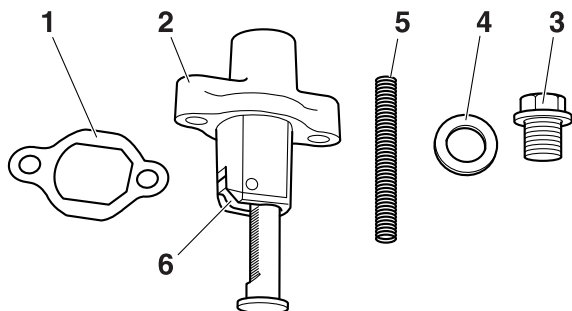
ECA13740

NOTICE

Do not turn the crankshaft when installing the camshaft(s) to avoid damage or improper valve timing.

TIP

- To position the rear cylinder piston at TDC on the compression stroke, align the "I" mark "c" on the camshaft sprocket with the arrow mark "d" on the rear cylinder head.
- When installing the rear cylinder camshaft sprocket, be sure to keep the timing chain as tight as possible on the intake side.



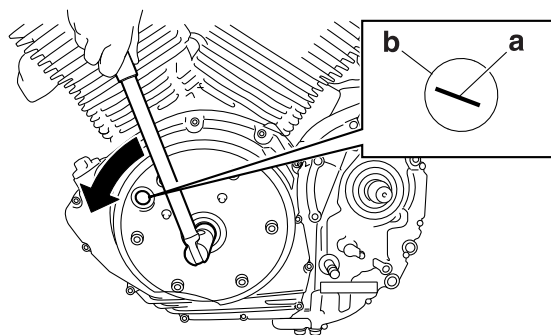
9. Install:

- Rear cylinder camshaft sprocket

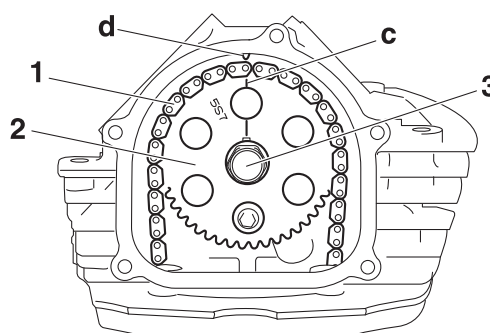


Rear cylinder

- Turn the crankshaft counterclockwise from the front cylinder piston TDC by 300 degrees.
- When the rear cylinder piston is at TDC on the compression stroke, align the TDC mark "a" on the generator rotor with the slot "b" in the generator cover.



- Install the timing chain "1" onto the rear cylinder camshaft sprocket "2", then install the camshaft sprocket onto the camshaft, and then finger tighten the camshaft sprocket bolt "3".



- Remove the wire from the timing chain.



10. Tighten:

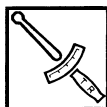
- Rear cylinder camshaft sprocket bolt "1"

TIP

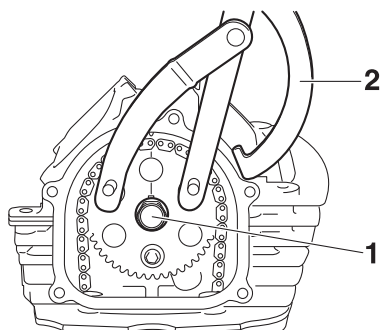
While holding the camshaft sprocket with the rotor holding tool "2", tighten the camshaft sprocket bolt.



Rotor holding tool
90890-01235
Universal magneto & rotor holder
YU-01235



Camshaft sprocket bolt
55 Nm (5.5 m·kgf, 40 ft·lbf)

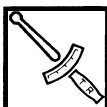


11. Install:

- Rear cylinder timing chain tensioner gasket "1" **New**
- Rear cylinder timing chain tensioner "2"

TIP

To push in the timing chain tensioner rod, release the lock by pushing in the one-way cam "6".



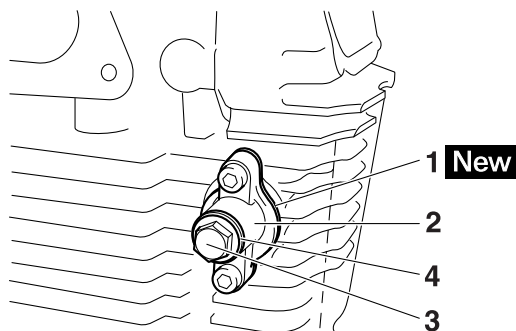
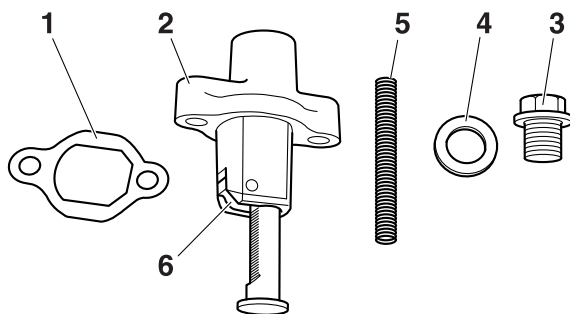
Rear cylinder timing chain tensioner bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

12. Install:

- Timing chain tensioner spring "5"
- Copper washer "4"
- Timing chain tensioner cap bolt "3"



Timing chain tensioner cap bolt
24 Nm (2.4 m·kgf, 17 ft·lbf)



13. Measure:

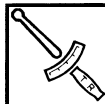
- Valve clearance
Out of specification → Adjust.
Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-5.

EAS5S71009

INSTALLING THE CYLINDER HEAD COVERS

1. Install:

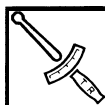
- Rear cylinder side cover
- Tappet covers



Rear cylinder side cover bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
Tappet cover
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

2. Install:

- Front cylinder side cover
- Tappet covers

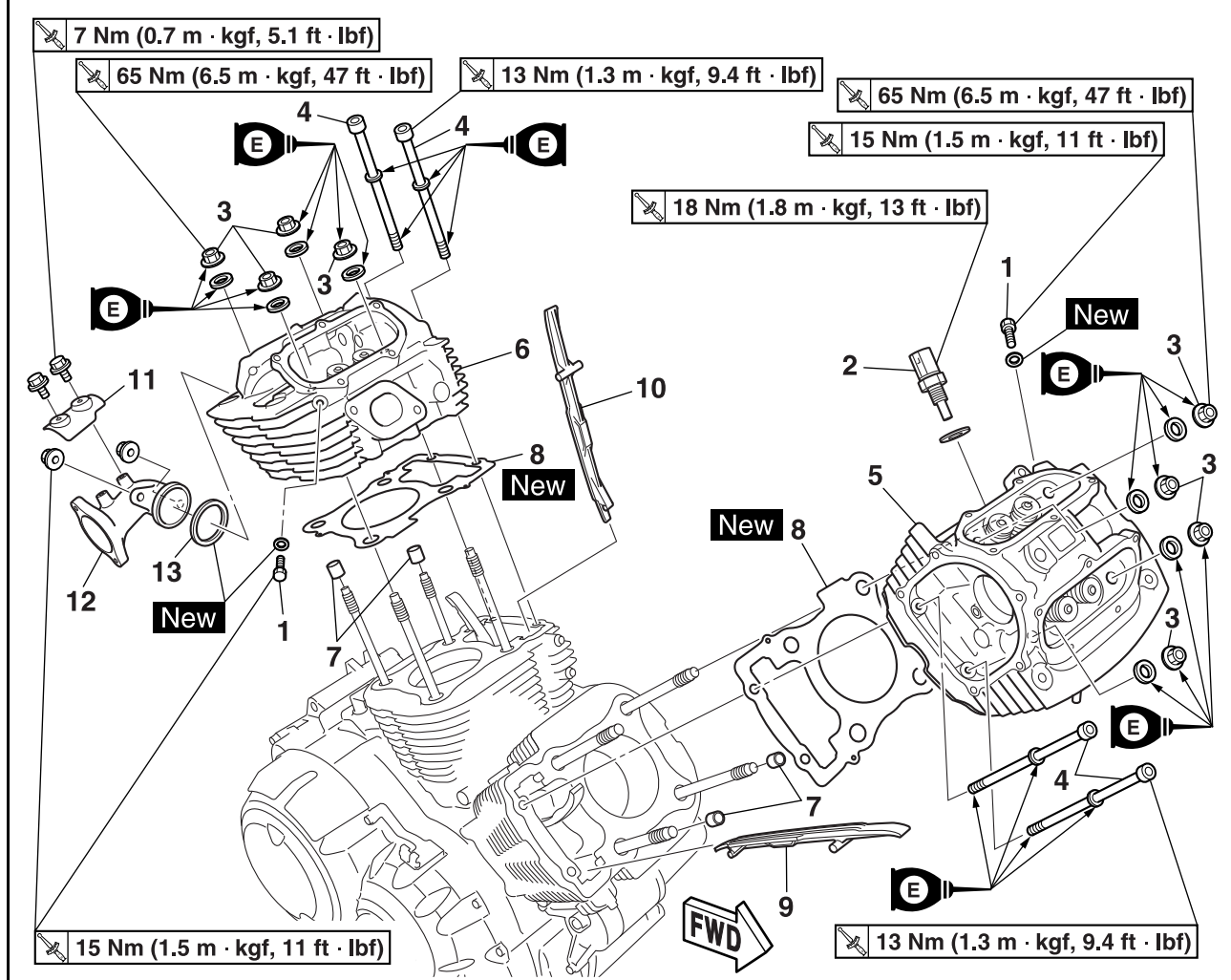


Front cylinder side cover bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
Tappet cover
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

EAS24110

CYLINDER HEADS

Removing the cylinder heads



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil check bolt	2	
2	Engine temperature sensor	1	
3	Cylinder head nut	8	
4	Cylinder head bolt	4	
5	Front cylinder head	1	
6	Rear cylinder head	1	
7	Dowel pin	4	
8	Cylinder head gasket	2	
9	Timing chain guide (exhaust side)	1	
10	Timing chain guide (intake side)	1	
11	Rear exhaust pipe joint cover	1	
12	Rear exhaust pipe joint	1	
13	Gasket	1	
			For installation, reverse the removal procedure.

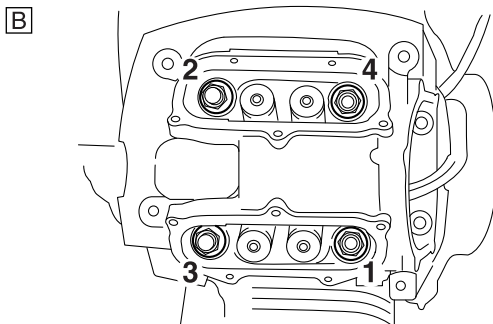
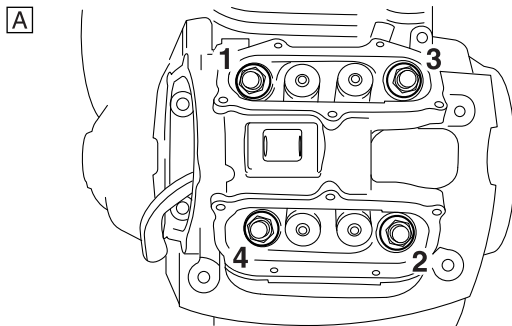
EAS24150

REMOVING THE CYLINDER HEADS

1. Remove:
 - Cylinder head bolts
 - Cylinder head nuts

TIP

- Loosen the cylinder head nuts in the proper sequence as shown.
- Loosen each cylinder head nut 1/2 of a turn at a time. After all of the cylinder head nut are fully loosened, remove them.



A. Front cylinder head

B. Rear cylinder head

EAS24170

CHECKING THE CYLINDER HEADS

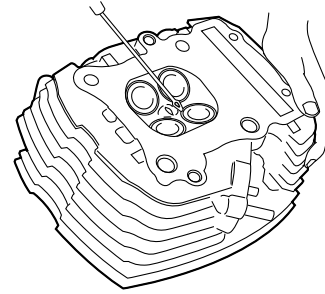
The following procedure applies to all of the cylinder heads.

1. Eliminate:
 - Combustion chamber carbon deposits (with a rounded scraper)

TIP

Do not use a sharp instrument to avoid damaging or scratching:

- Spark plug bore threads
- Valve seats

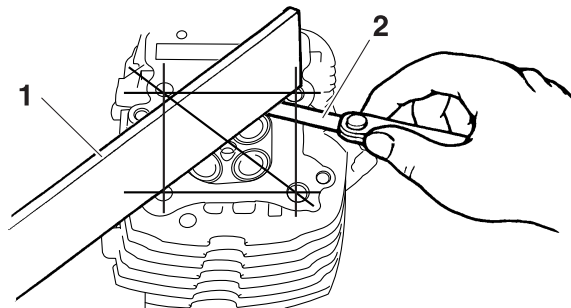


2. Check:
 - Cylinder heads
Damage/scratches → Replace.
3. Measure:
 - Cylinder head warpage
Out of specification → Resurface the cylinder head.



Warpage limit
0.05 mm (0.0020 in)

- a. Place a straightedge "1" and a thickness gauge "2" across the cylinder head.



- b. Measure the warpage.
- c. If the limit is exceeded, resurface the cylinder head as follows.
- d. Place 400–600 grit wet sandpaper on a surface plate and resurface the cylinder head using a figure-eight sanding pattern.

TIP

To ensure an even surface, rotate the cylinder head several times.

EAS24230

INSTALLING THE CYLINDER HEADS

1. Tighten:
 - Cylinder head nuts
 - Cylinder head bolts

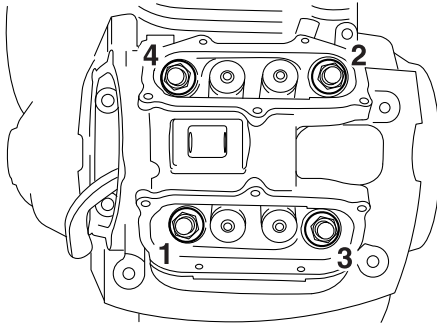


Cylinder head nut
1st: 15 Nm (1.5 m·kgf, 11 ft·lbf)
2st: 25 Nm (2.5 m·kgf, 18 ft·lbf)
Final: 65 Nm (6.5 m·kgf, 47 ft·lbf)
Cylinder head bolt
13 Nm (1.3 m·kgf, 9.4 ft·lbf)

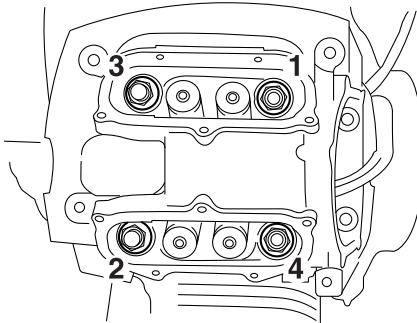
TIP

- Lubricate the cylinder head nuts and washers with engine oil.
- Tighten the cylinder head nuts in the proper tightening sequence as shown and torque them in three stages.

A



B



A. Front cylinder head

B. Rear cylinder head

2. Install:

- Rear exhaust pipe joint
- Rear exhaust pipe joint cover



Rear exhaust pipe joint nut
15 Nm (1.5 m·kgf, 11 ft·lbf)
Rear exhaust pipe joint cover
bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

TIP

Tighten the rear exhaust pipe joint nuts, and then install the rear exhaust pipe joint cover and bolts.

EAS20710

MEASURING THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

TIP

Insufficient compression pressure will result in a loss of performance.

1. Measure:

- Valve clearance
 Out of specification → Adjust.
 Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-5.

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

3. Remove:

- Rear cylinder right plastic cover
 Refer to “ENGINE REMOVAL” on page 5-1.

4. Disconnect:

- Spark plug caps

5. Remove:

- Spark plug

ECA13340

NOTICE

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

6. Install:

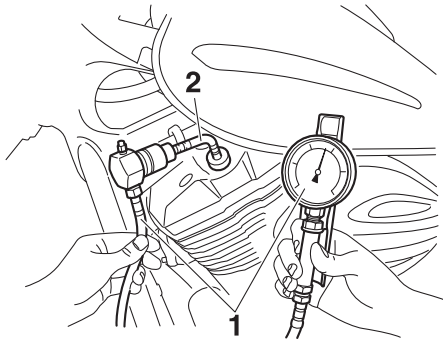
- Compression gauge “1”
- Extension “2”



Compression gauge
90890-03081
Engine compression tester
YU-33223
Extension
90890-04136
Extension
90890-04082

TIP

Use “extension : 90890-04136” for front cylinder and “extension : 90890-04082” for rear cylinder.



7. Measure:

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



Standard compression pressure (at sea level)
1400 kPa/400 r/min (14.0 kgf/cm²/400 r/min, 199.1 psi/400 r/min)
Minimum–maximum
1250–1500 kPa (12.5–15.0 kgf/cm², 177.8–213.3 psi)



- Set the main switch to “ON”.
- With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

TIP

The difference in compression pressure between cylinders should not exceed 100 kPa (1.0 kgf/cm², 14.5 psi).

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

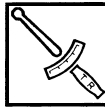
Compression pressure (with oil applied into the cylinder)

Reading	Diagnosis
Higher than without oil	Piston ring(s) wear or damage → Replace.
Same as without oil	Piston, valves or cylinder head gasket possibly defective → Replace.



8. Install:

- Spark plug



Spark plug
13 Nm (1.3 m·kgf, 9.4 ft·lbf)

9. Connect:

- Spark plug caps

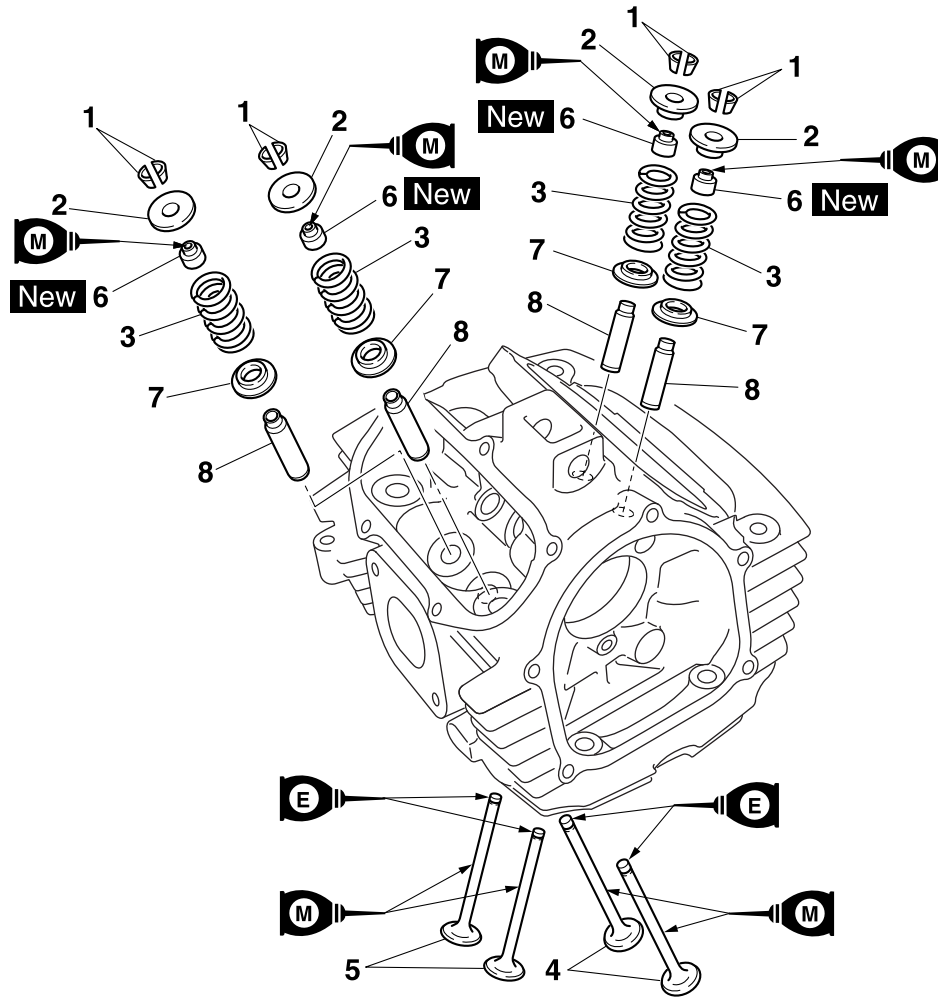
10. Install:

- Rear cylinder right plastic cover
- Refer to “ENGINE REMOVAL” on page 5-1.

EAS24270

VALVES AND VALVE SPRINGS

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both cylinders.
	Cylinder heads		Refer to "CYLINDER HEADS" on page 5-20.
1	Valve cotter	8	
2	Upper spring seat	4	
3	Valve spring	4	
4	Intake valve	2	
5	Exhaust valve	2	
6	Valve stem seal	4	
7	Lower spring seat	4	
8	Valve guide	4	
			For installation, reverse the removal procedure.

EAS24280

REMOVING THE VALVES

The following procedure applies to all of the valves and related components.

TIP

Before removing the internal parts of the cylinder head (e.g., valves, valve springs, and valve seats), make sure the valves properly seal.

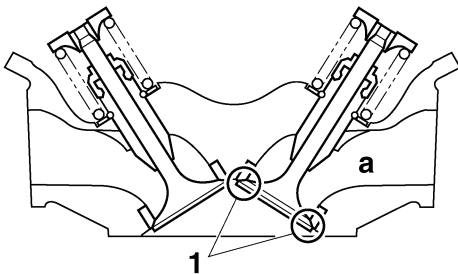
1. Check:

- Valve sealing
Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
Refer to "CHECKING THE VALVE SEATS" on page 5-27.

- Pour a clean solvent "a" into the intake and exhaust ports.
- Check that the valves properly seal.

TIP

There should be no leakage at the valve seat "1".



2. Remove:

- Valve cotters

TIP

Remove the valve cotters by compressing the valve spring with the valve spring compressor "1" and the valve spring compressor attachment "2".



Valve spring compressor

90890-04019

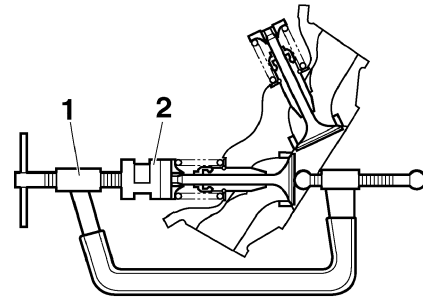
YM-04019

Valve spring compressor attachment

90890-01243

Valve spring compressor adapter (26 mm)

YM-01253-1

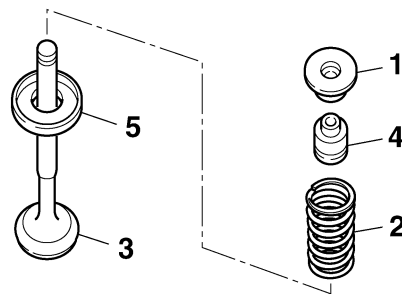


3. Remove:

- Upper spring seat "1"
- Valve spring "2"
- Valve "3"
- Valve stem seal "4"
- Lower spring seat "5"

TIP

Identify the position of each part very carefully so that it can be reinstalled in its original place.



EAS24290

CHECKING THE VALVES AND VALVE GUIDES

The following procedure applies to all of the valves and valve guides.

1. Measure:

- Valve-stem-to-valve-guide clearance
Out of specification → Replace the valve guide.

$$\text{Valve-stem-to-valve-guide clearance} = \text{Valve guide inside diameter "a"} - \text{Valve stem diameter "b"}$$



Valve-stem-to-valve-guide clearance (intake)

0.010–0.037 mm (0.0004–0.0015 in)

Limit

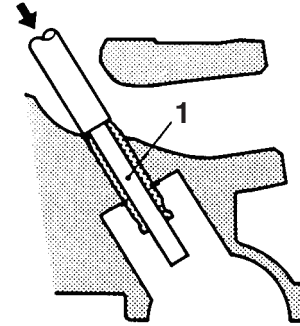
0.080 mm (0.0032 in)

Valve-stem-to-valve-guide clearance (exhaust)

0.025–0.052 mm (0.0010–0.0020 in)

Limit

0.100 mm (0.0039 in)

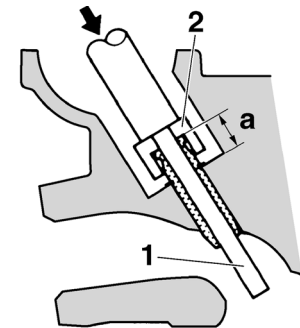


- b. Install the new valve guide with the valve guide installer "2" and valve guide remover "1".

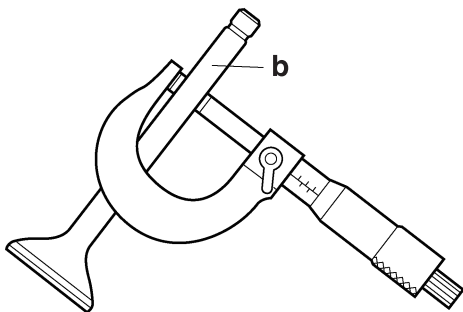
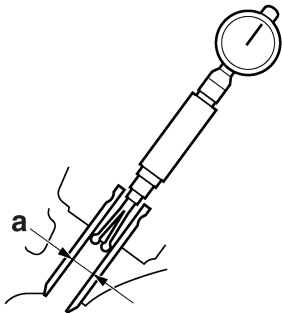


Valve guide position

12.7–13.1 mm (0.500–0.515 in)



- a. Valve guide position
- c. After installing the valve guide, bore the valve guide with the valve guide reamer "3" to obtain the proper valve-stem-to-valve-guide clearance.



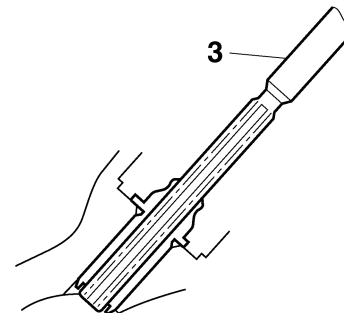
2. Replace:
- Valve guide

TIP

To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100 °C (212 °F) in an oven.



- a. Remove the valve guide with the valve guide remover "1".



TIP

After replacing the valve guide, reface the valve seat.



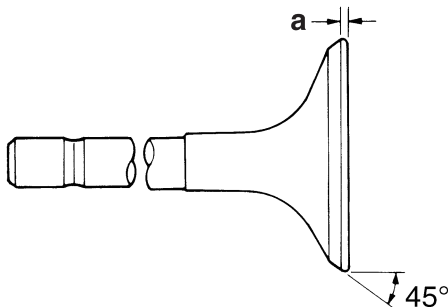
Valve guide remover (ø6)
90890-04064
Valve guide remover (6.0 mm)
YM-04064-A
Valve guide installer (ø6)
90890-04065
Valve guide installer (6.0 mm)
YM-04065-A
Valve guide reamer (ø6)
90890-04066
Valve guide reamer (6.0 mm)
YM-04066



3. Eliminate:
 - Carbon deposits
(from the valve face and valve seat)
4. Check:
 - Valve face
Pitting/wear → Grind the valve face.
 - Valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
 - Valve margin thickness “a”
Out of specification → Replace the valve.



Valve margin thickness D (intake)
1.00 mm (0.0394 in)
Valve margin thickness D (exhaust)
1.00 mm (0.0394 in)



6. Measure:
 - Valve stem runout
Out of specification → Replace the valve.

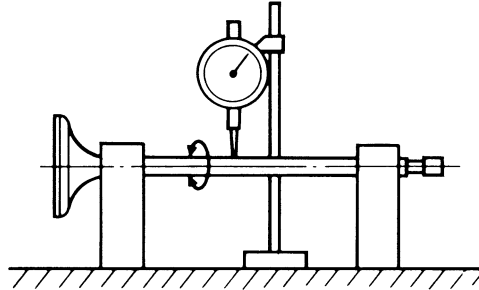
TIP

- When installing a new valve, always replace the valve guide.

- If the valve is removed or replaced, always replace the valve stem seal.



Valve stem runout
0.010 mm (0.0004 in)



EAS24300

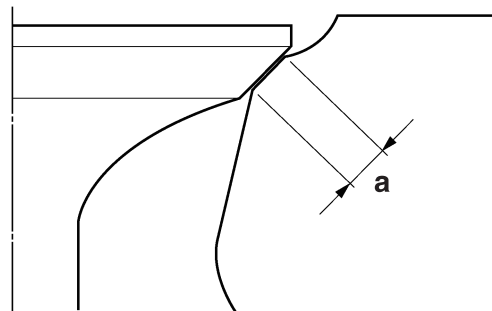
CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.

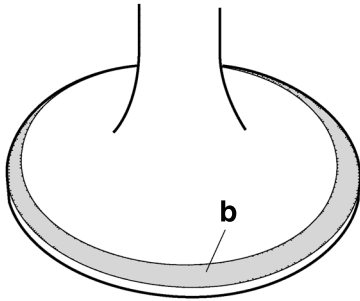
1. Eliminate:
 - Carbon deposits
(from the valve face and valve seat)
2. Check:
 - Valve seat
Pitting/wear → Replace the cylinder head.
3. Measure:
 - Valve seat width “a”
Out of specification → Replace the cylinder head.



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



- a. Apply Mechanic's blueing dye (Dykem) "b" onto the valve face.



- b. Install the valve into the cylinder head.
- c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- d. Measure the valve seat width.

TIP

Where the valve seat and valve face contacted one another, the blueing will have been removed.

4. Lap:
- Valve face
 - Valve seat

TIP

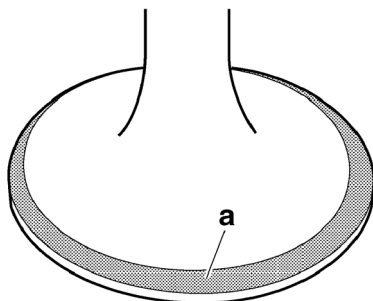
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

- a. Apply a coarse lapping compound “a” to the valve face.

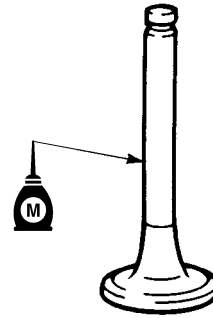
ECA13790

NOTICE

Do not let the lapping compound enter the gap between the valve stem and the valve guide.



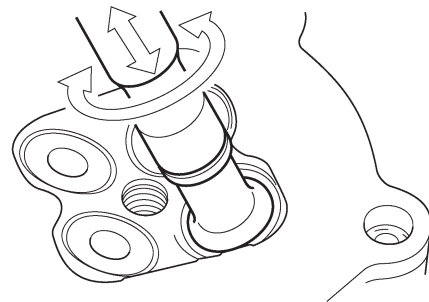
- b. Apply molybdenum disulfide oil onto the valve stem.



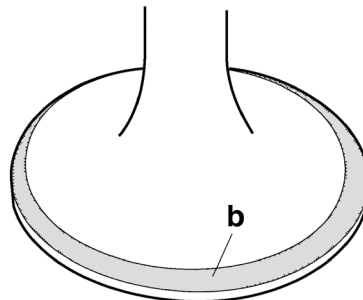
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

TIP

For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.

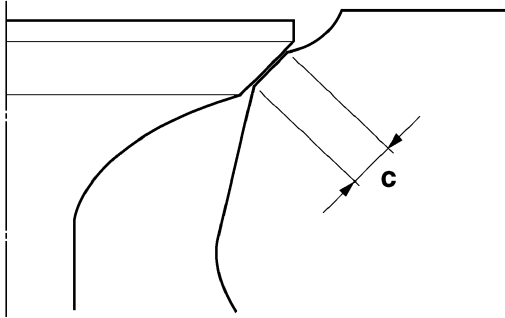


- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply Mechanic's blueing dye (Dykem) "b" onto the valve face.



- h. Install the valve into the cylinder head.
- i. Press the valve through the valve guide and onto the valve seat to make a clear impression.

- j. Measure the valve seat width “c” again. If the valve seat width is out of specification, reface and lap the valve seat.



EAS24310

CHECKING THE VALVE SPRINGS

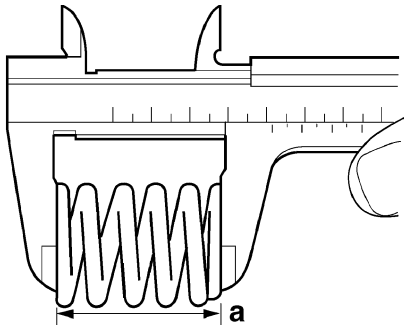
The following procedure applies to all of the valve springs.

1. Measure:
 - Valve spring free length “a”

Out of specification → Replace the valve spring.



Free length (intake)
42.43 mm (1.67 in)
Limit
40.31 mm (1.59 in)
Free length (exhaust)
42.43 mm (1.67 in)
Limit
40.31 mm (1.59 in)

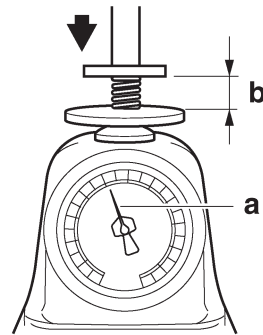


2. Measure:
 - Compressed valve spring force “a”

Out of specification → Replace the valve spring.



Installed compression spring force (intake)
171–197 N (17.44–20.09 kgf, 38.45–44.30 lbf)
Installed compression spring force (exhaust)
171–197 N (17.44–20.09 kgf, 38.45–44.30 lbf)
Installed length (intake)
35.00 mm (1.38 in)
Installed length (exhaust)
35.00 mm (1.38 in)



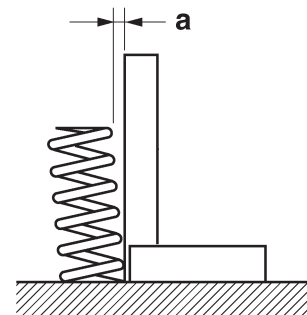
- b. Installed length

3. Measure:
 - Valve spring tilt “a”

Out of specification → Replace the valve spring.



Spring tilt (intake)
2.5°/1.9 mm (0.075 in)
Spring tilt (exhaust)
2.5°/1.9 mm (0.075 in)

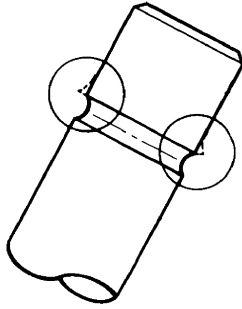


EAS24340

INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

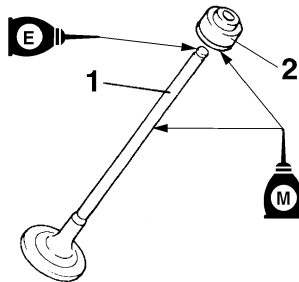
1. Deburr:
 - Valve stem end (with an oil stone)



2. Lubricate:
- Valve stem "1"
 - Valve stem seal "2"
- (with the recommended lubricant)



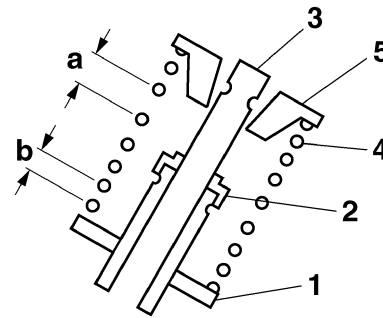
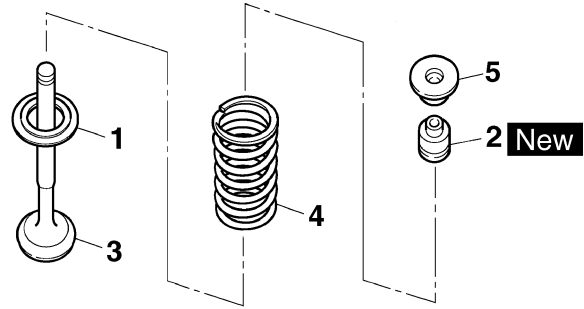
3. Lubricate:
- Valve stem end
- (with the recommended lubricant)



4. Install:
- Lower spring seat "1"
 - Valve stem seal "2" **New**
 - Valve "3"
 - Valve spring "4"
 - Upper spring seat "5"
- (into the cylinder head)

TIP

- Make sure each valve is installed in its original place.
- Install the valve springs with the larger pitch "a" facing up.



- a. Larger pitch
b. Smaller pitch

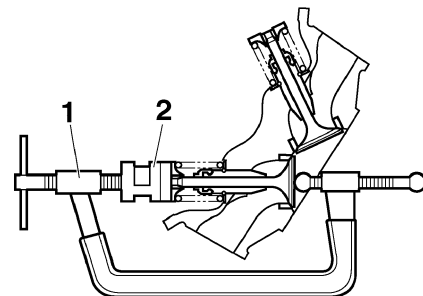
5. Install:
- Valve cotters

TIP

Install the valve cotters by compressing the valve spring with the valve spring compressor "1" and the valve spring compressor attachment "2".



Valve spring compressor
90890-04019
YM-04019
Valve spring compressor
attachment
90890-01243
Valve spring compressor
adapter (26 mm)
YM-01253-1

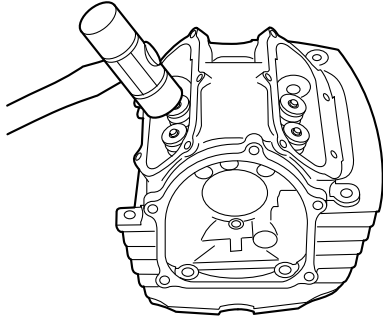


6. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

NOTICE

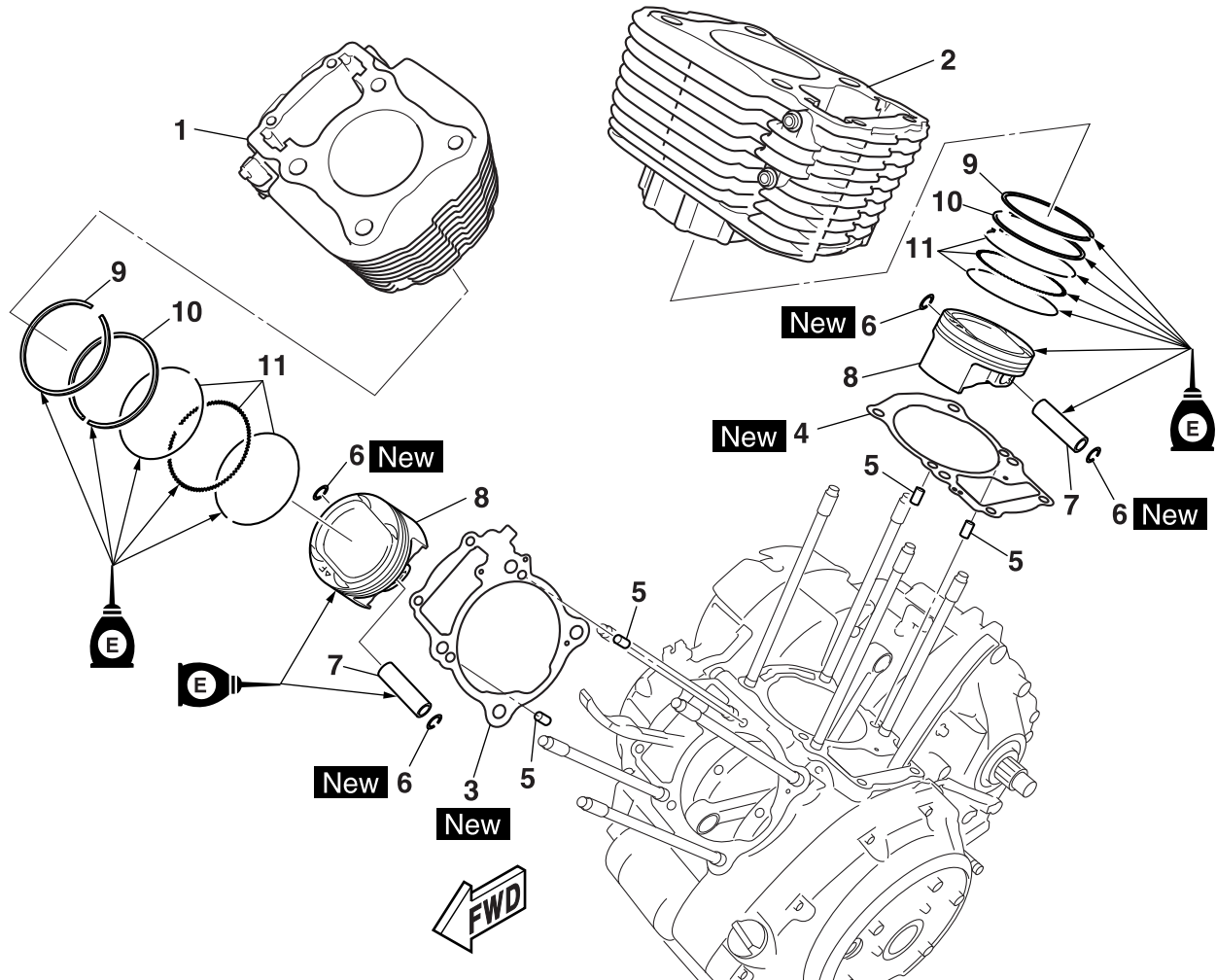
Hitting the valve tip with excessive force could damage the valve.



EAS24360

CYLINDERS AND PISTONS

Removing the cylinders and pistons



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder heads		Refer to "CYLINDER HEADS" on page 5-20.
1	Front cylinder	1	
2	Rear cylinder	1	
3	Front cylinder gasket	1	
4	Rear cylinder gasket	1	
5	Dowel pin	4	
6	Circlip	4	
7	Piston pin	2	
8	Piston	2	
9	Top ring	2	
10	2nd ring	2	
11	Oil ring	2	
			For installation, reverse the removal procedure.

EAS24380

REMOVING THE PISTONS

The following procedure applies to all of the pistons.

1. Remove:
 - Circlips “1”
 - Piston pin “2”
 - Piston “3”

ECA13810

NOTICE

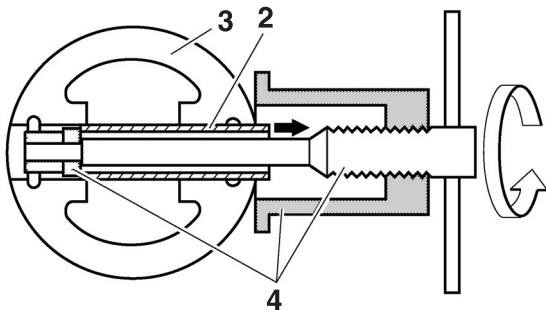
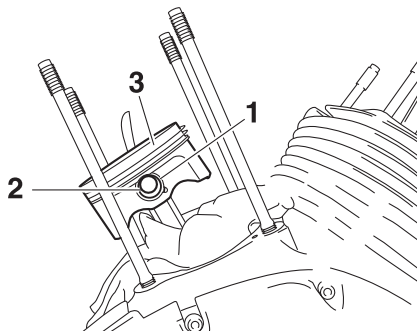
Do not use a hammer to drive the piston pin out.

TIP

- Before removing the circlips, cover the crankcase opening with a clean rag to prevent the circlips from falling into the crankcase.
- Before removing the piston pin, deburr the circlips' groove and the piston's pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set “4”.



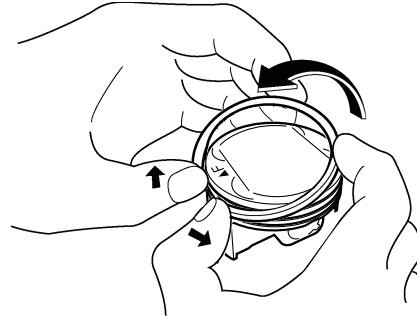
**Piston pin puller set
90890-01304
Piston pin puller
YU-01304**



2. Remove:
 - Top ring
 - 2nd ring
 - Oil ring

TIP

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.



EAS24410

CHECKING THE CYLINDERS AND PISTONS

The following procedure applies to all of the cylinders and pistons.

1. Check:
 - Piston wall
 - Cylinder wall

Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
 - Piston-to-cylinder clearance



- a. Measure the cylinder bore with the cylinder bore gauge.

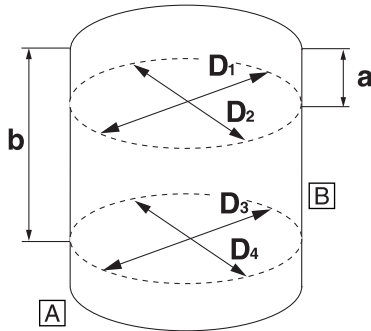
TIP

Measure the cylinder bore by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.



Bore
85.000–85.010 mm (3.3465–3.3468 in)
Wear limit
85.100 mm (3.3504 in)
Out of round limit
0.050 mm (0.0020 in)

Bore = maximum of D_1 – D_4
Wear limit = maximum of D_1 or D_3
Out of round limit = maximum of D_1 or D_3 - minimum of D_2 or D_4



a. 10.0 mm (0.39 in)

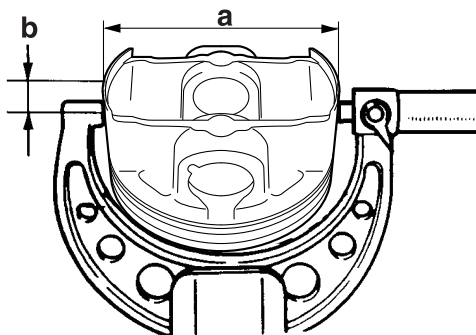
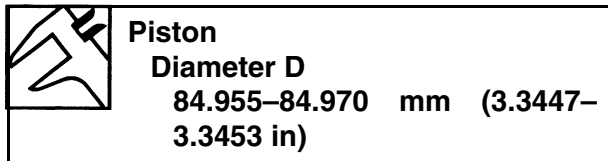
b. 85.6 mm (3.37 in)

A. Intake side

B. Exhaust side

b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.

c. Measure the piston skirt diameter “D” “a” with the micrometer.



b. 8 mm (0.31 in) from the bottom edge of the piston

d. If out of specification, replace the piston and piston rings as a set.

e. Calculate the piston-to-cylinder clearance with the following formula.

- Piston-to-cylinder clearance =
Cylinder bore “C” -
Piston skirt diameter “D”



Piston-to-cylinder clearance

0.030–0.055 mm (0.0012–0.0022 in)

Limit

0.15 mm (0.0059 in)

- f. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.



EAS24430

CHECKING THE PISTON RINGS

The following procedure applies to all of the piston rings.

1. Measure:

- Piston ring side clearance
Out of specification → Replace the piston and piston rings as a set.

TIP

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.



Piston ring

Top ring

Ring side clearance

0.040–0.080 mm (0.0016–0.0032 in)

Limit

0.130 mm (0.0051 in)

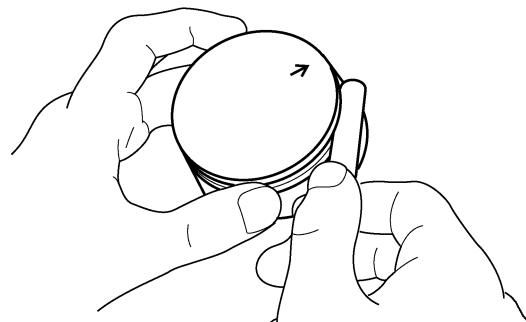
2nd ring

Ring side clearance

0.030–0.070 mm (0.0012–0.0028 in)

Limit

0.130 mm (0.0051 in)

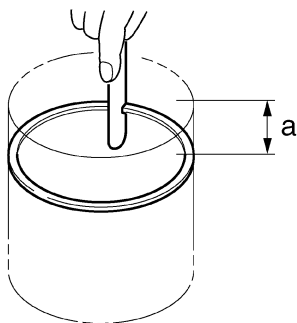


2. Install:

- Piston ring
(into the cylinder)

TIP

Level the piston ring in the cylinder with the piston crown.



a. 10 mm (0.39 in)

3. Measure:

- Piston ring end gap
Out of specification → Replace the piston ring.

TIP

The oil ring expander spacer end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.



Piston ring

Top ring

End gap (installed)
0.15–0.30 mm (0.0059–0.0118 in)

Limit
0.55 mm (0.0217 in)

2nd ring

End gap (installed)
0.30–0.45 mm (0.0118–0.0177 in)

Limit
0.80 mm (0.0315 in)

Oil ring

End gap (installed)
0.20–0.70 mm (0.0079–0.0276 in)

EAS24440

CHECKING THE PISTON PINS

The following procedure applies to all of the piston pins.

1. Check:

- Piston pin
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.

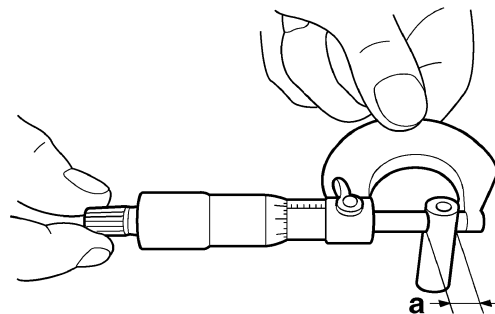
2. Measure:

- Piston pin outside diameter “a”
Out of specification → Replace the piston pin.



Piston pin outside diameter
20.991–21.000 mm (0.8264–0.8268 in)

Limit
20.971 mm (0.8256 in)



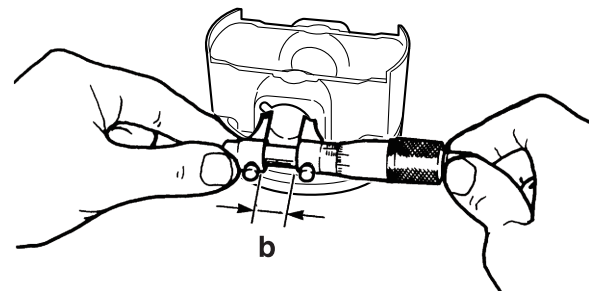
3. Measure:

- Piston pin bore diameter “b”
Out of specification → Replace the piston.



Piston pin bore inside diameter
21.004–21.015 mm (0.8269–0.8274 in)

Limit
21.045 mm (0.8285 in)



4. Calculate:

- Piston-pin-to-piston-pin-bore clearance
Out of specification → Replace the piston pin and piston as a set.

- Piston-pin-to-piston-pin-bore clearance =
Piston pin bore diameter “b” -
Piston pin outside diameter “a”



Piston-pin-to-piston-pin-bore clearance
0.004–0.024 mm (0.00016–
0.00094 in)

EAS24460

INSTALLING THE PISTONS AND CYLINDERS

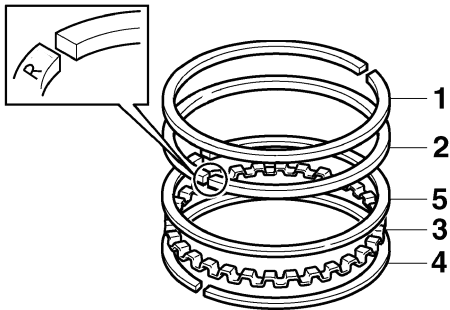
The following procedure applies to all of the pistons and cylinders.

1. Install:

- Top ring “1”
- 2nd ring “2”
- Oil ring expander “3”
- Lower oil ring rail “4”
- Upper oil ring rail “5”

TIP

Be sure to install the piston rings so that the manufacturer’s marks or numbers face up.

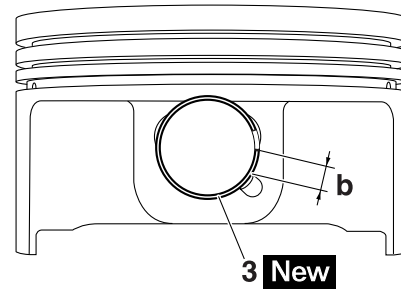
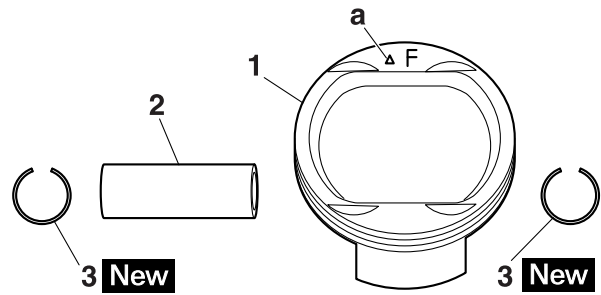


2. Install:

- Piston “1”
- Piston pin “2”
- Circlips “3” **New**

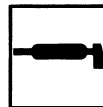
TIP

- Apply engine oil onto the piston pin.
- Make sure the arrow mark “a” on the piston faces towards the front side of the cylinder.
- Before installing the circlips, cover the crankcase opening with a clean rag to prevent the clips from falling into the crankcase.
- Install the circlips so that the clip ends are 3 mm (0.12 in) “b” or more from the cutout in the piston.
- Reinstall each piston into its original cylinder.



3. Lubricate:

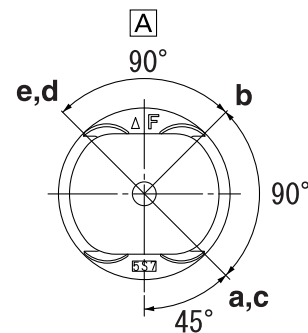
- Piston
- Piston rings
- Cylinder
(with the recommended lubricant)



Recommended lubricant
Engine oil

4. Offset:

- Piston ring end gaps

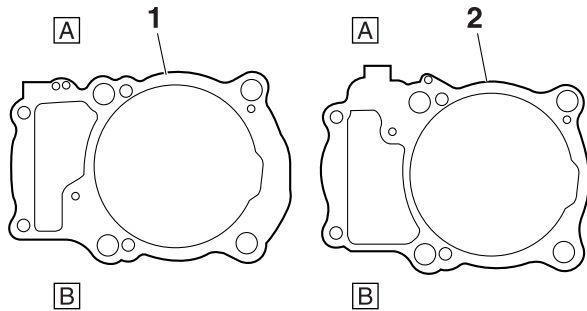


- a. Top ring
- b. Upper oil ring rail
- c. Oil ring expander
- d. Lower oil ring rail
- e. 2nd ring

A. forward

5. Install:

- Rear cylinder gasket "1"
- Front cylinder gasket "2"



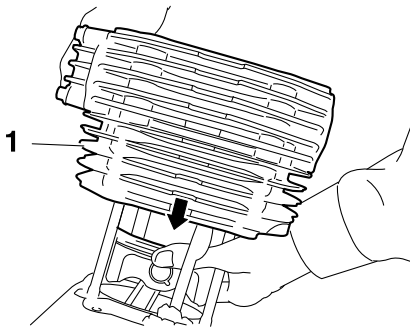
- A. Intake side
B. Exhaust side

6. Install:

- Cylinder "1"

TIP

- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide through the timing chain cavity.

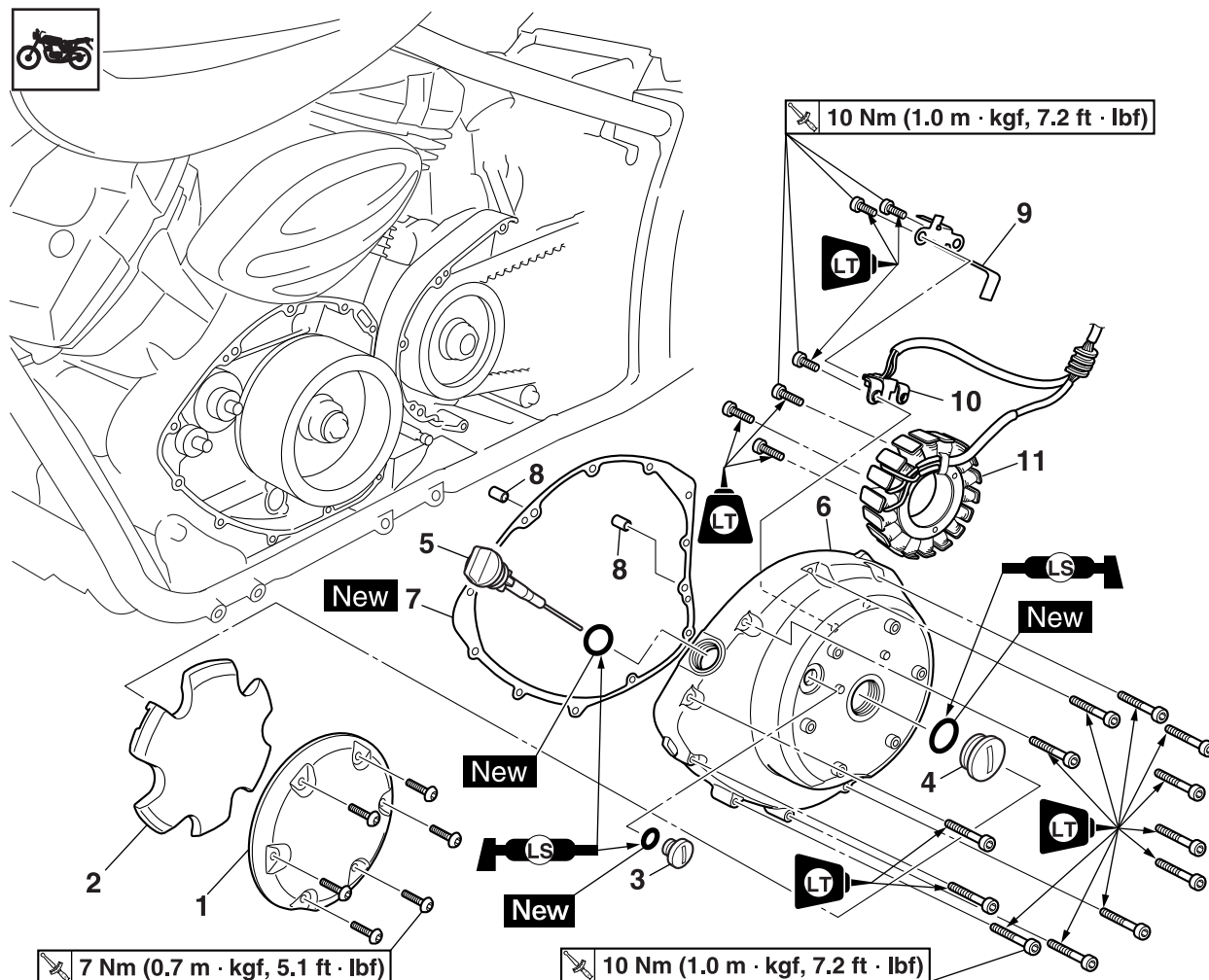


GENERATOR AND STARTER CLUTCH

EAS24480

GENERATOR AND STARTER CLUTCH

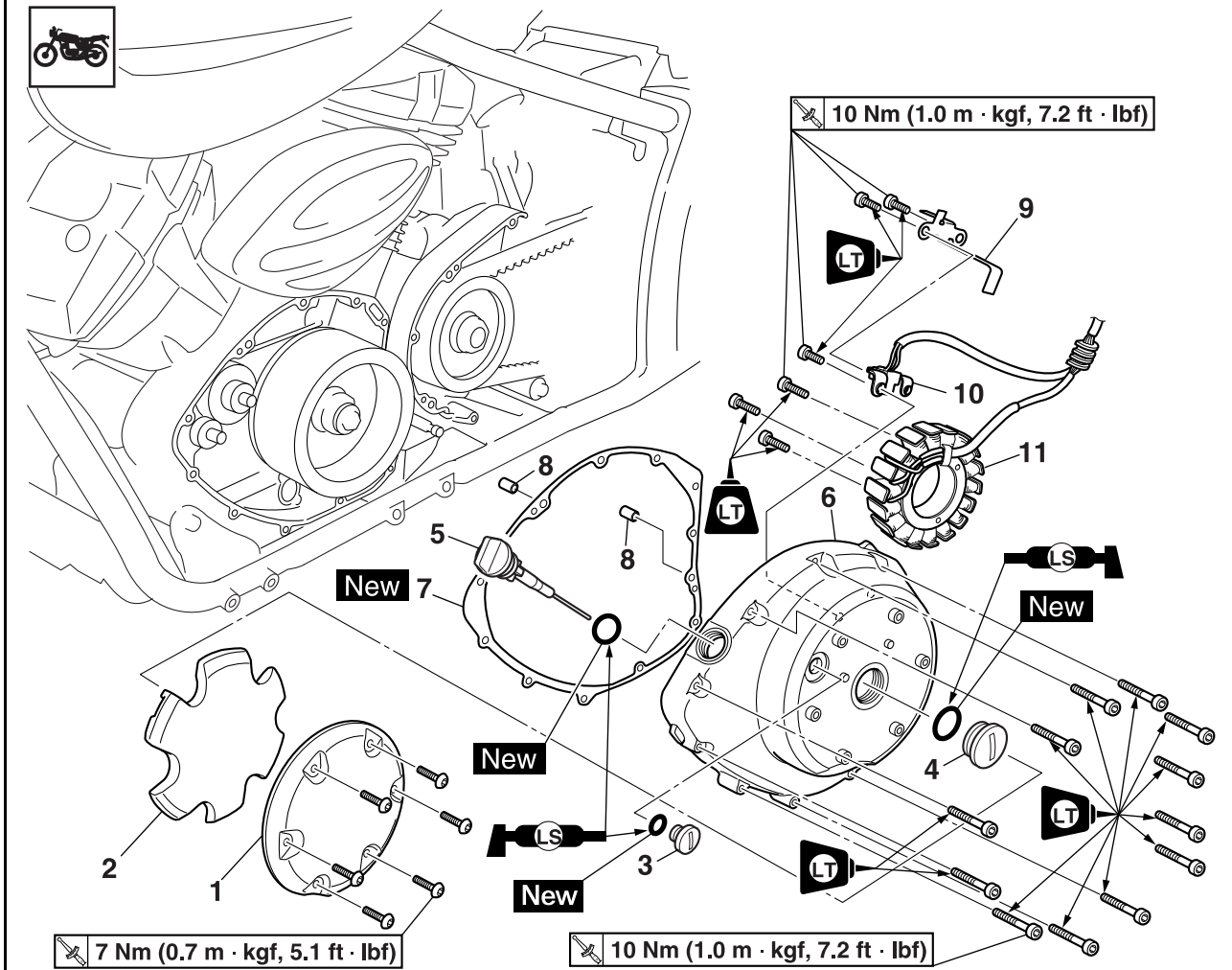
Removing the stator coil



Order	Job/Parts to remove	Q'ty	Remarks
	Side cover (cylinder head)		Refer to "GENERAL CHASSIS" on page 4-1.
	Side stand		Refer to "ENGINE REMOVAL" on page 5-1.
	Left footrest assembly		Refer to "ENGINE REMOVAL" on page 5-1.
	Canister		Refer to "FUEL TANK" on page 6-1. California only
	Drive pulley cover		Refer to "BELT DRIVE" on page 4-67.
	Speed sensor		Refer to "BELT DRIVE" on page 4-67.
	Crankshaft position sensor coupler		Refer to "ENGINE REMOVAL" on page 5-1.
	Rectifier/regulator coupler		Refer to "ENGINE REMOVAL" on page 5-1.
	Engine oil		Drain.
1	Damper cover	1	
2	Generator cover damper	1	
3	Crankshaft end accessing screw	1	
4	Timing mark accessing screw	1	
5	Oil level gauge	1	
6	Generator cover	1	
7	Generator cover gasket	1	
8	Dowel pin	2	
9	Crankshaft position sensor lead holder	1	

GENERATOR AND STARTER CLUTCH

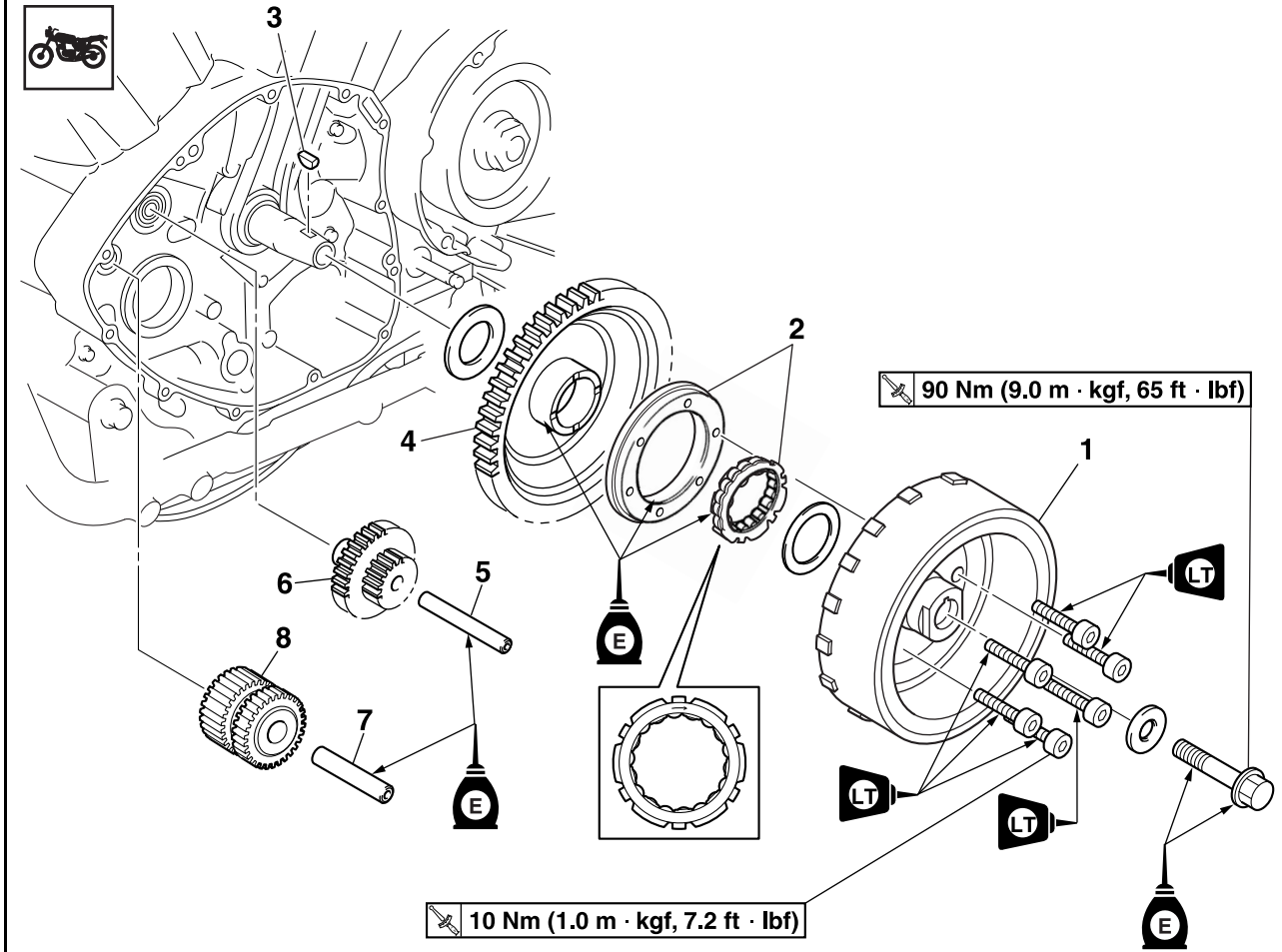
Removing the stator coil



Order	Job/Parts to remove	Q'ty	Remarks
10	Crankshaft position sensor	1	
11	Stator coil	1	
			For installation, reverse the removal procedure.

GENERATOR AND STARTER CLUTCH

Removing the generator rotor and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
1	Generator rotor	1	
2	Starter clutch	1	
3	Woodruff key	1	
4	Starter clutch gear	1	
5	Starter clutch idle gear 2 shaft	1	
6	Starter clutch idle gear 2	1	
7	Starter clutch idle gear 1 shaft	1	
8	Starter clutch idle gear 1	1	
			For installation, reverse the removal procedure.

GENERATOR AND STARTER CLUTCH

EAS24490

REMOVING THE GENERATOR

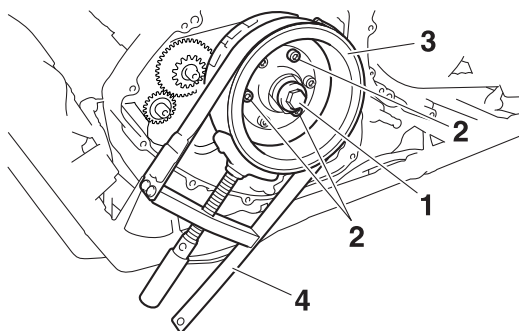
1. Remove:
 - Generator rotor bolt “1”
 - Washer
 - Starter clutch bolts “2”

TIP

- While holding the generator rotor “3” with the sheave holder “4”, loosen the generator rotor bolt.
- Do not allow the sheave holder to touch the projection on the generator rotor.



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



2. Remove:
 - Generator rotor “1”
(with the flywheel puller “2”)
 - Woodruff key

ECA13880

NOTICE

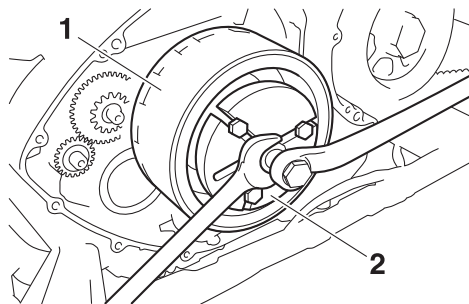
To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set's center bolt and the crankshaft.

TIP

- Install the flywheel puller bolts to the threaded holes of the starter clutch.
- Make sure the flywheel puller is centered over the generator rotor.



Flywheel puller set
90890-01468
Heavy duty puller
YU-33270-B



EAS24560

REMOVING THE STARTER CLUTCH

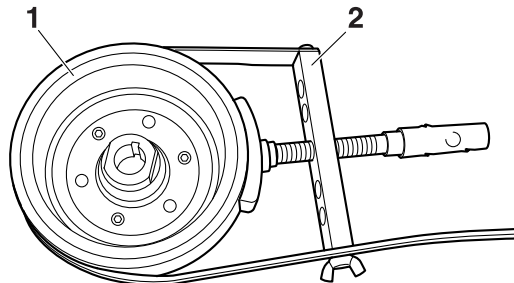
1. Remove:
 - Starter clutch bolts
 - Starter clutch

TIP

While holding the generator rotor “1” with the sheave holder “2”, loosen the starter clutch bolts.



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



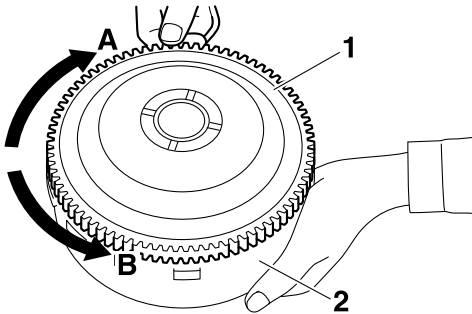
EAS24570

CHECKING THE STARTER CLUTCH

1. Check:
 - Starter clutch rollers
Damage/wear → Replace.
2. Check:
 - Starter clutch idle gears
 - Starter clutch gear
Burr/chips/roughness/wear → Replace the defective part(s).
3. Check:
 - Starter clutch gear's contacting surfaces
Damage/pitting/wear → Replace the starter clutch gear.
4. Check:
 - Starter clutch operation

GENERATOR AND STARTER CLUTCH

- 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.



EAS24600

INSTALLING THE STARTER CLUTCH

1. Install:
 - Starter clutch
 - Starter clutch bolts



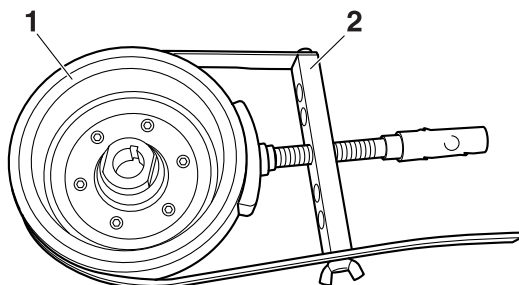
Starter clutch bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
LOCTITE®

TIP.

While holding the generator rotor “1” with the sheave holder “2”, tighten the starter clutch bolts.



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



EAS24500

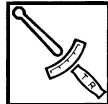
INSTALLING THE GENERATOR

1. Install:
 - 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”



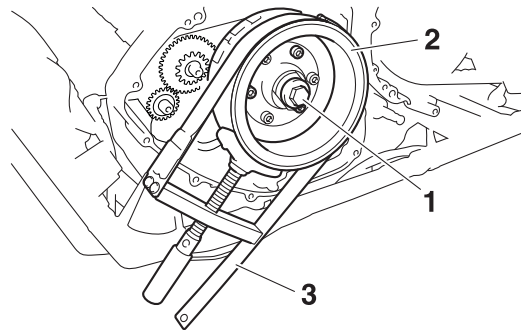
Generator rotor bolt
90 Nm (9.0 m·kgf, 65 ft·lbf)

TIP

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



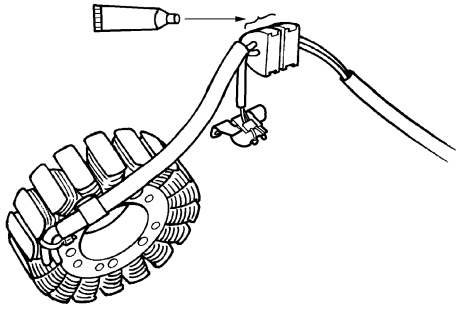
Sheave holder
90890-01701
Primary clutch holder
YS-01880-A



3. Apply:
 - Sealant
(onto the crankshaft position sensor lead grommet)



Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)



EAS5S71011

INSTALLING THE GENERATOR COVER

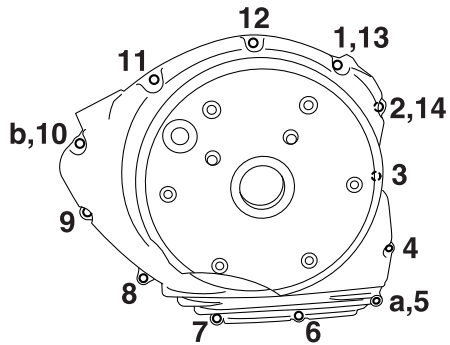
1. Install:



Generator cover bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

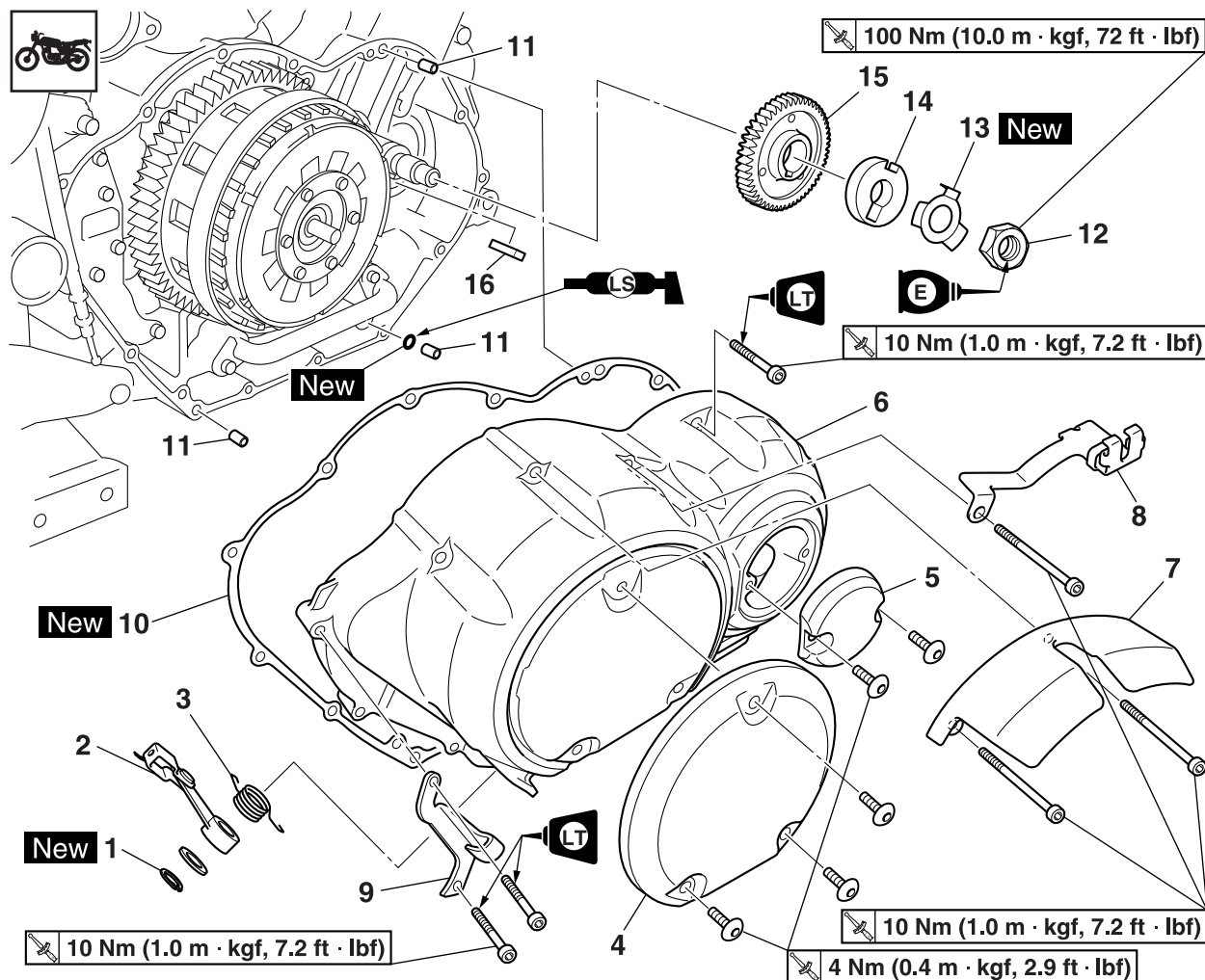
TIP

Temporally tighten “a” and “b” and then tighten the generator cover bolts in the order shown in the illustration.



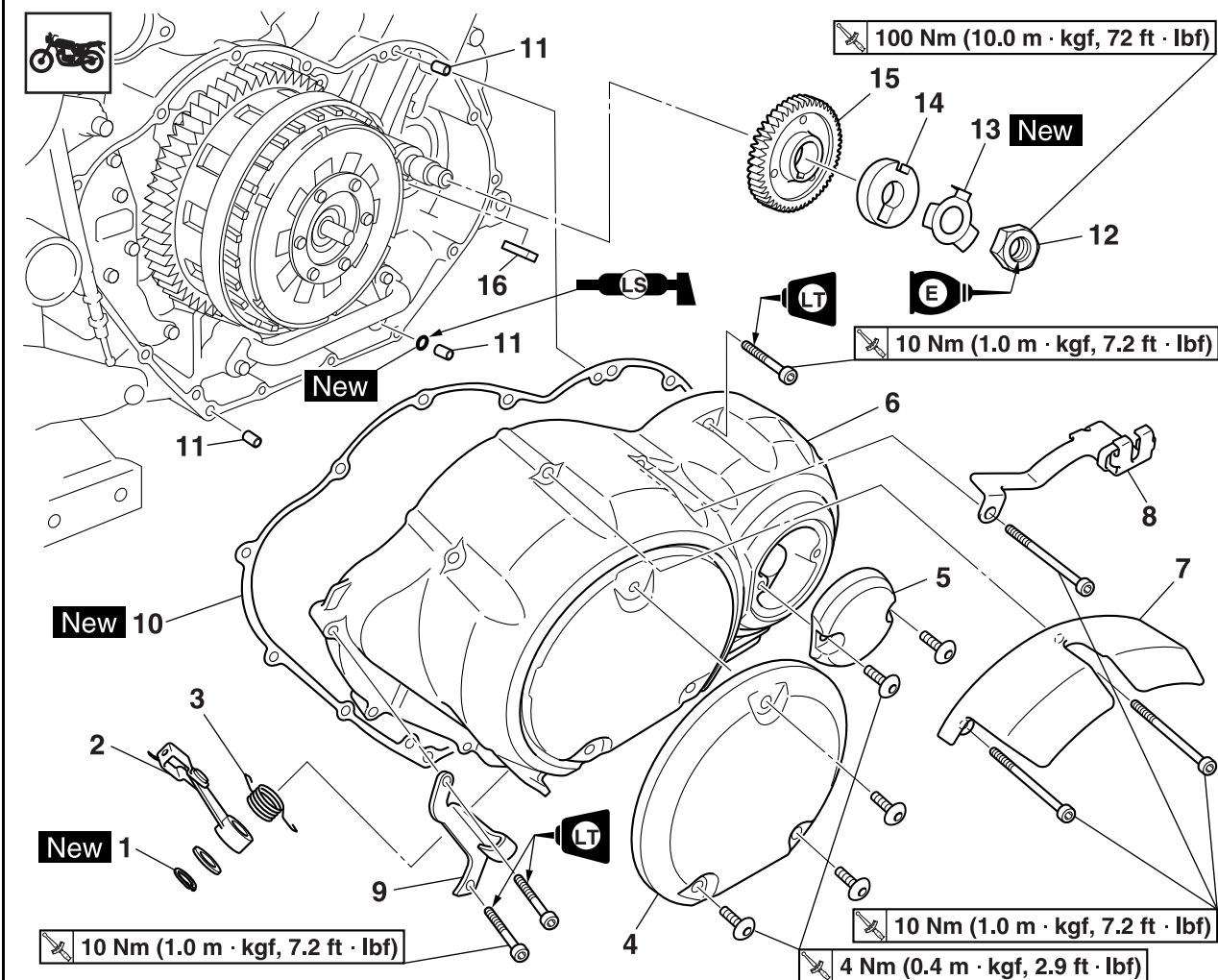
EAS25060 CLUTCH

Removing the primary drive gear



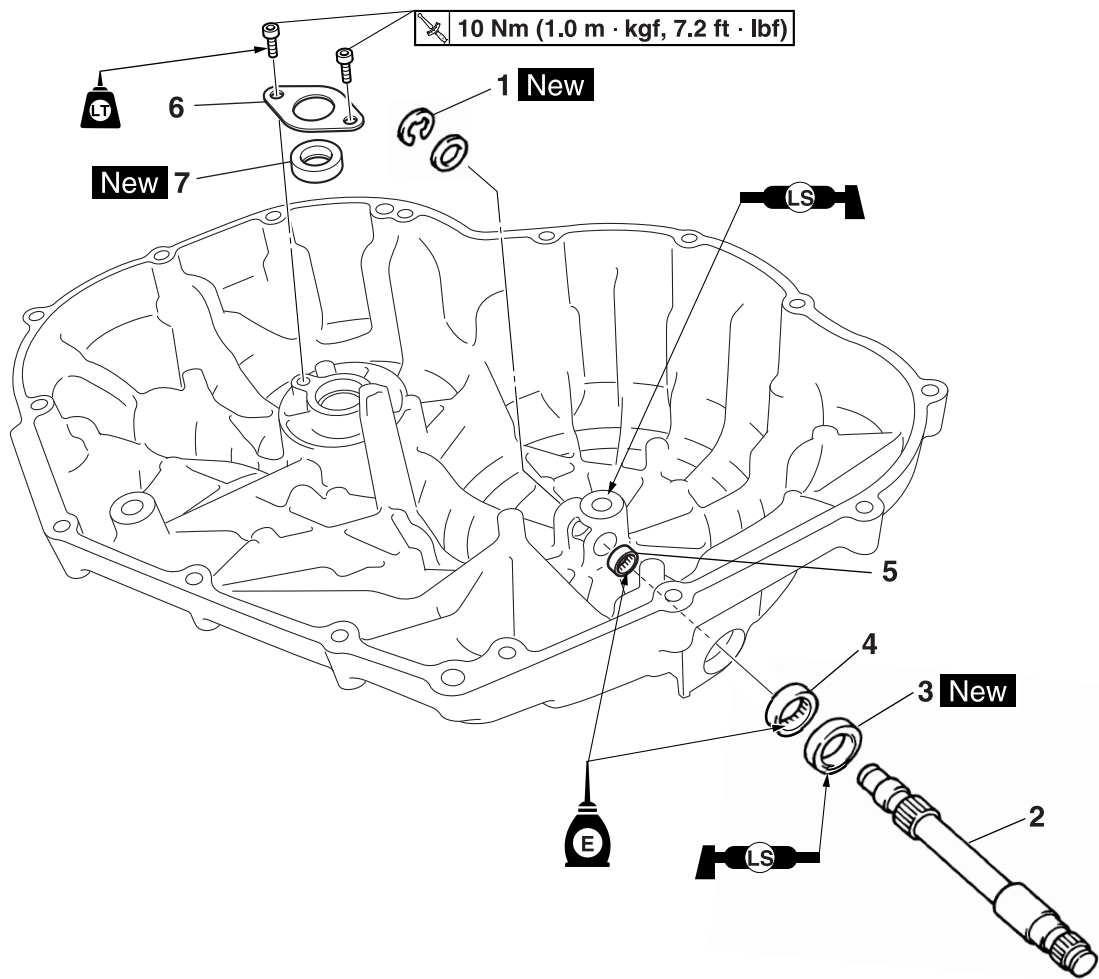
Order	Job/Parts to remove	Q'ty	Remarks
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Rear brake master cylinder		Refer to "REAR BRAKE" on page 4-33.
	Rear brake light switch		Refer to "REAR BRAKE" on page 4-33.
	Right footrest assembly		Refer to "REAR BRAKE" on page 4-33.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-1.
	Down tube		Refer to "ENGINE REMOVAL" on page 5-1.
	Clutch cable		Refer to "ENGINE REMOVAL" on page 5-1.
	Engine oil		Drain.
1	Circlip	1	
2	Pull lever	1	
3	Pull lever spring	1	
4	Primary drive gear plastic cover 1	1	
5	Primary drive gear plastic cover 2	1	
6	Primary drive gear cover	1	
7	Protector cover	1	
8	Air filter case bracket	1	
9	Clutch cable holder 2	1	
10	Primary drive gear cover gasket	1	
11	Dowel pin	3	

Removing the primary drive gear



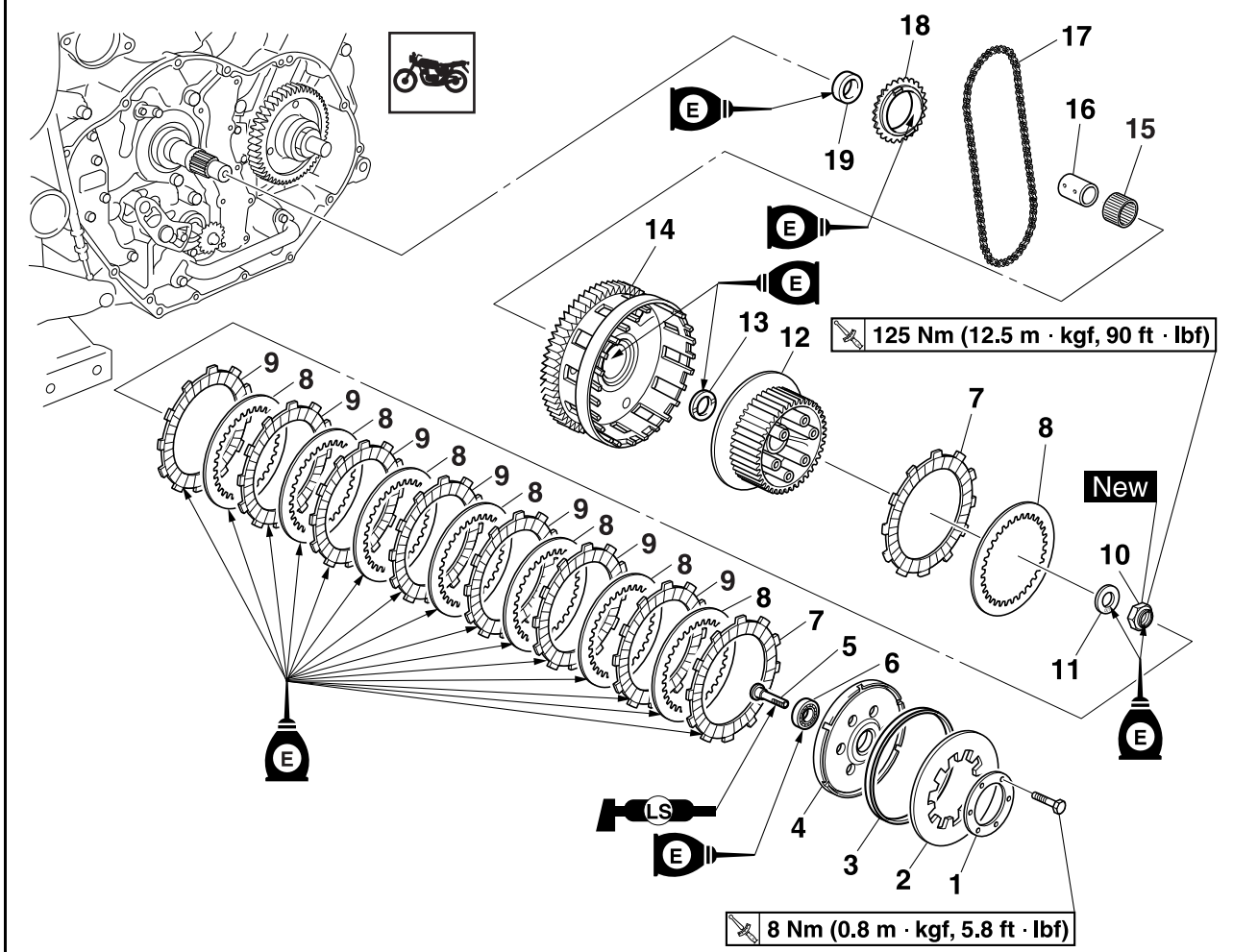
Order	Job/Parts to remove	Q'ty	Remarks
12	Primary drive gear nut	1	
13	Lock washer	1	
14	Spacer	1	
15	Primary drive gear	1	
16	Woodruff key	1	
			For installation, reverse the removal procedure.

Removing the pull lever shaft



Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Pull lever shaft	1	
3	Oil seal	1	
4	Bearing	1	
5	Bearing	1	
6	Oil seal retainer	1	
7	Oil seal	1	
			For installation, reverse the removal procedure.

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
1	Clutch spring plate retainer	1	
2	Clutch spring plate	1	
3	Clutch spring plate seat	1	
4	Pressure plate	1	
5	Pull rod	1	
6	Bearing	1	
7	Friction plate 1	2	Inside diameter: 124 mm (4.88 in)
8	Clutch plate	8	
9	Friction plate 2	7	Inside diameter: 124 mm (4.88 in)
10	Clutch boss nut	1	
11	Conical spring washer	1	
12	Clutch boss	1	
13	Thrust washer 1	1	
14	Clutch housing	1	
15	Bearing	1	
16	Collar	1	
17	Oil pump drive chain	1	
18	Oil pump drive sprocket	1	
19	Thrust washer 2	1	
			For installation, reverse the removal procedure.

EAS25080

REMOVING THE CLUTCH

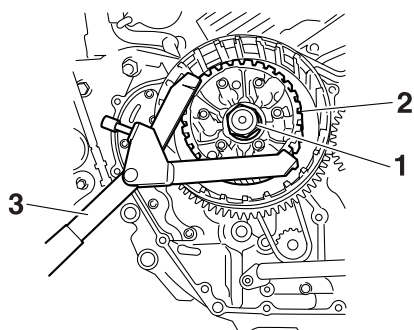
1. Loosen:
 - Clutch boss nut "1"

TIP

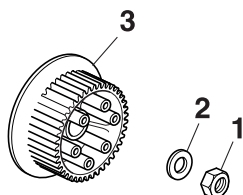
While holding the clutch boss "2" with the universal clutch holder "3", loosen the clutch boss nut.



Universal clutch holder
90890-04086
YM-91042



2. Remove:
 - Clutch boss nut "1"
 - Conical spring washer "2"
 - Clutch boss "3"



EAS25090

REMOVING THE PRIMARY DRIVE GEAR

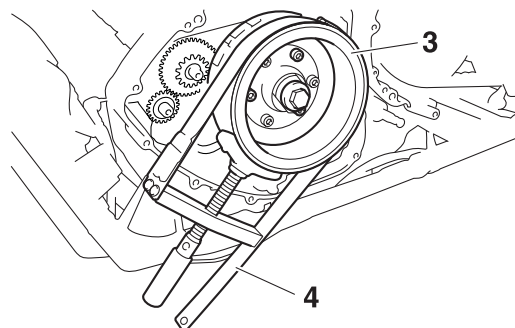
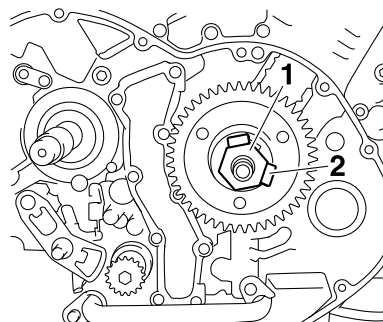
1. Straighten the lock washer tab.
2. Remove:
 - Primary drive gear nut "1"
 - Lock washer "2"

TIP

- While holding the generator rotor "3" with the sheave holder "4", loosen the primary drive gear nut.
- Do not allow the sheave holder to touch the projection on the generator rotor.



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



EAS25100

CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

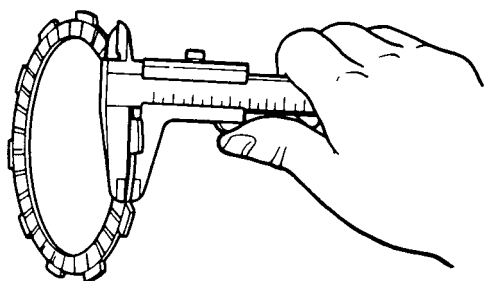
1. Check:
 - Friction plate
Damage/wear → Replace the friction plates as a set.
2. Measure:
 - Friction plate thickness
Out of specification → Replace the friction plates as a set.

TIP

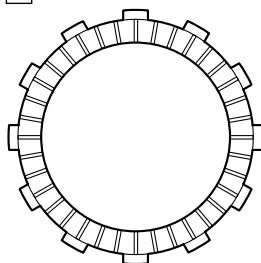
Measure each friction plate at four places.



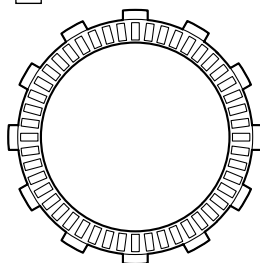
Friction plate 1 thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.1102 in)
Friction plate 2 thickness
2.92–3.08 mm (0.115–0.121 in)
Wear limit
2.80 mm (0.1102 in)



A



B



A. Friction plate 1

B. Friction plate 2

EAS25110

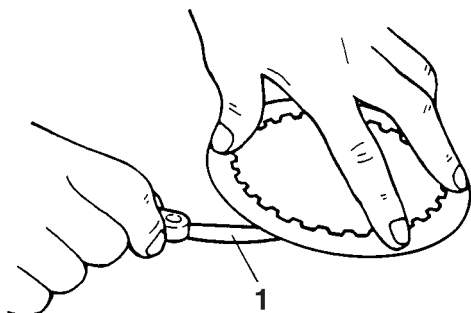
CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

1. Check:
 - Clutch plate
Damage → Replace the clutch plates as a set.
2. Measure:
 - Clutch plate warpage
(with a surface plate and thickness gauge "1")
Out of specification → Replace the clutch plates as a set.



Warpage limit
0.20 mm (0.0079 in)



EAS25130

CHECKING THE CLUTCH SPRING PLATE

1. Check:
 - Clutch spring plate
Damage → Replace.
2. Check:
 - Clutch spring plate seat
Damage → Replace.

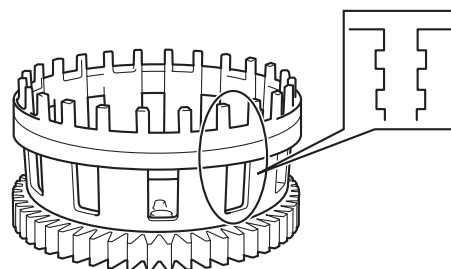
EAS25150

CHECKING THE CLUTCH HOUSING

1. Check:
 - Clutch housing dogs
Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

TIP

Pitting on the clutch housing dogs will cause erratic clutch operation.



2. Check:
 - Bearing
Damage/wear → Replace the bearing and clutch housing.

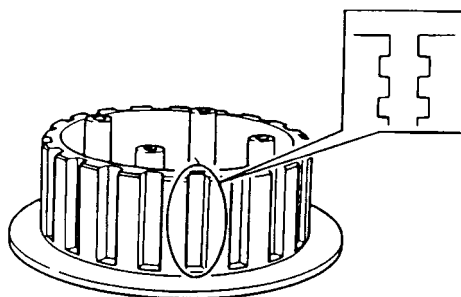
EAS25160

CHECKING THE CLUTCH BOSS

1. Check:
 - Clutch boss splines
Damage/pitting/wear → Replace the clutch boss.

TIP

Pitting on the clutch boss splines will cause erratic clutch operation.



EAS25170

CHECKING THE PRESSURE PLATE

1. Check:
 - Pressure plate
Cracks/damage → Replace.
 - Bearing
Damage/wear → Replace.

EAS25200

CHECKING THE PRIMARY DRIVE GEAR

1. Check:
 - Primary drive gear
Damage/wear → Replace the primary drive and primary driven gears as a set.
Excessive noise during operation → Replace the primary drive and primary driven gears as a set.

EAS25210

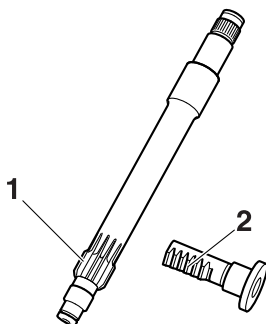
CHECKING THE PRIMARY DRIVEN GEAR

1. Check:
 - Primary driven gear
Damage/wear → Replace the primary drive and primary driven gears as a set.
Excessive noise during operation → Replace the primary drive and primary driven gears as a set.

EAS25220

CHECKING THE PULL LEVER SHAFT AND PULL ROD

1. Check:
 - Pull lever shaft pinion gear teeth “1”
 - Pull rod teeth “2”
Damage/wear → Replace the pull rod and pull lever shaft pinion gear as a set.



2. Check:
 - Pull rod bearing
Damage/wear → Replace.

EAS5S71001

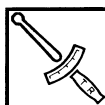
CHECKING THE OIL PUMP DRIVE SPROCKET AND OIL PUMP DRIVE CHAIN

1. Check:
 - Oil pump drive sprocket
Cracks/damage/wear → Replace the oil pump drive chain, and oil pump drive and driven sprockets as a set.
2. Check:
 - Oil pump drive chain
Damage/stiffness → Replace the oil pump drive chain, and oil pump drive and driven sprockets as a set.

EAS25230

INSTALLING THE PRIMARY DRIVE GEAR

1. Install:
 - Primary drive gear “1”
 - Spacer “2”
 - Lock washer “3”
 - Primary drive gear nut



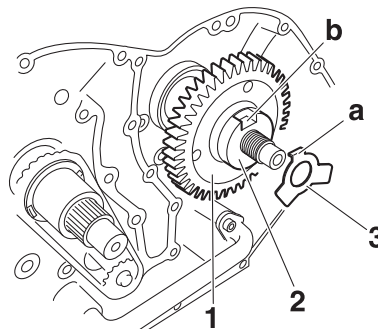
Primary drive gear nut
100 Nm (10.0 m·kgf, 72 ft·lbf)

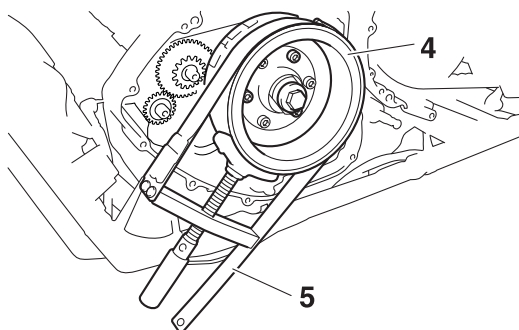
TIP

- Make sure that the shorter side of the primary drive gear is facing outward.
- Align the tab “a” on the lock washer with the groove “b” in the spacer.
- While holding the generator rotor “4” with the sheave holder “5”, tighten the primary drive gear nut.
- Do not allow the sheave holder to touch the projection on the generator rotor.
- Lubricate the primary drive gear nut threads with engine oil.



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





2. Bend lock washer tab along a flat side of the nut.

EAS25240

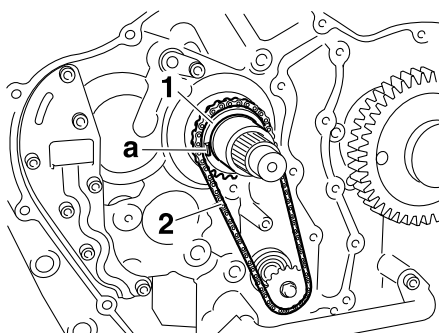
INSTALLING THE CLUTCH

1. Install:

- Oil pump drive sprocket "1"
- Oil pump drive chain "2"

TIP

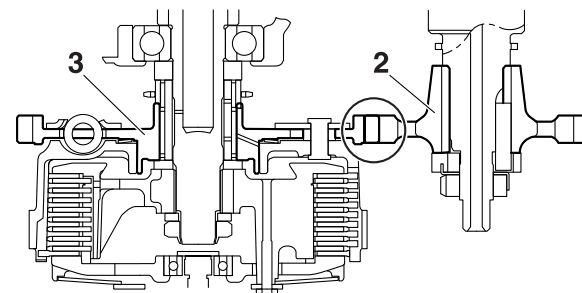
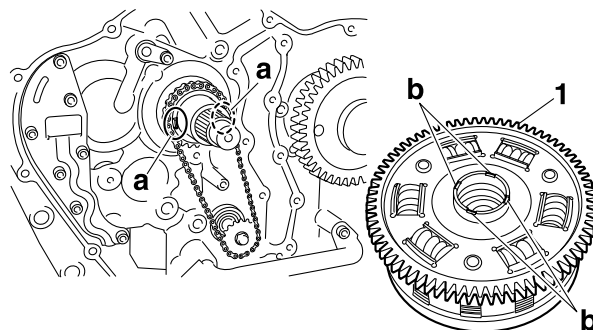
Install the oil pump drive sprocket with its projections "a" facing outward.



2. Install:
 - Clutch housing "1"

TIP

- Fit the projections "a" on the oil pump drive sprocket into the grooves "b" in the clutch housing.
- Lubricate the clutch housing bearing with engine oil.
- Make sure that the primary driven gear teeth and primary drive gear teeth mesh correctly.
- After installing the clutch housing, make sure that the primary drive gear "2" and clutch housing primary driven gear "3" are aligned as shown in the illustration.



3. Install:
 - Clutch boss "1"
 - Washer
 - Conical spring washer "2"
 - Clutch boss nut "3"



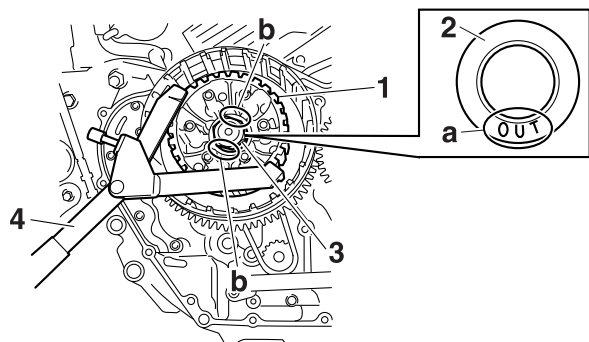
Clutch boss nut
125 Nm (12.5 m·kgf, 90 ft·lbf)

TIP

- Lubricate the clutch boss nut threads and conical spring washer mating surfaces with engine oil.
- Install the conical spring washer with the "OUT" mark "a" facing out.
- While holding the clutch boss with the universal clutch holder "4", tighten the clutch boss nut.
- Stake the clutch boss nut "3" at cutouts "b" in the main axle.



Universal clutch holder
90890-04086
YM-91042



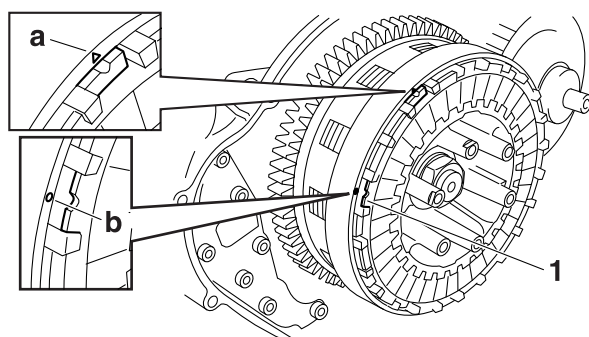
4. Lubricate:
- Friction plates
 - Clutch plates
- (with the recommended lubricant)



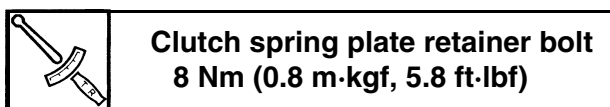
5. Install:
- Friction plates 2
 - Clutch plates
 - Friction plates 1

TIP

- First, install a friction plate and then alternate between a clutch plate and a friction plate.
- Align the cutout in the tab of each friction plate 1 and 2 with the “△” mark “a” on the clutch housing and align the cutout in the tab of the last friction plate 1 “1” with the punch mark “b” on the housing.



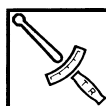
6. Install:
- Clutch spring plate
 - Clutch spring plate retainer



TIP

Tighten the clutch spring plate retainer bolts in stages and in a crisscross pattern.

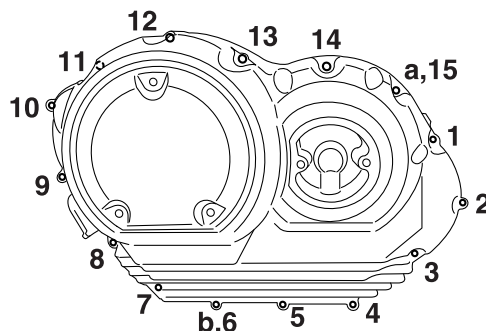
7. Install:
- Primary drive gear cover



Primary drive gear cover bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

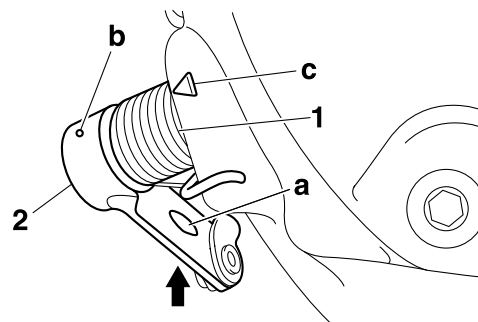
Temporarily tighten “a” and “b” and then tighten the primary drive gear cover bolts in the order shown in the illustration.



8. Install:
- Pull lever spring “1”
 - Pull lever “2”
 - Washer
 - Circlip **New**

TIP

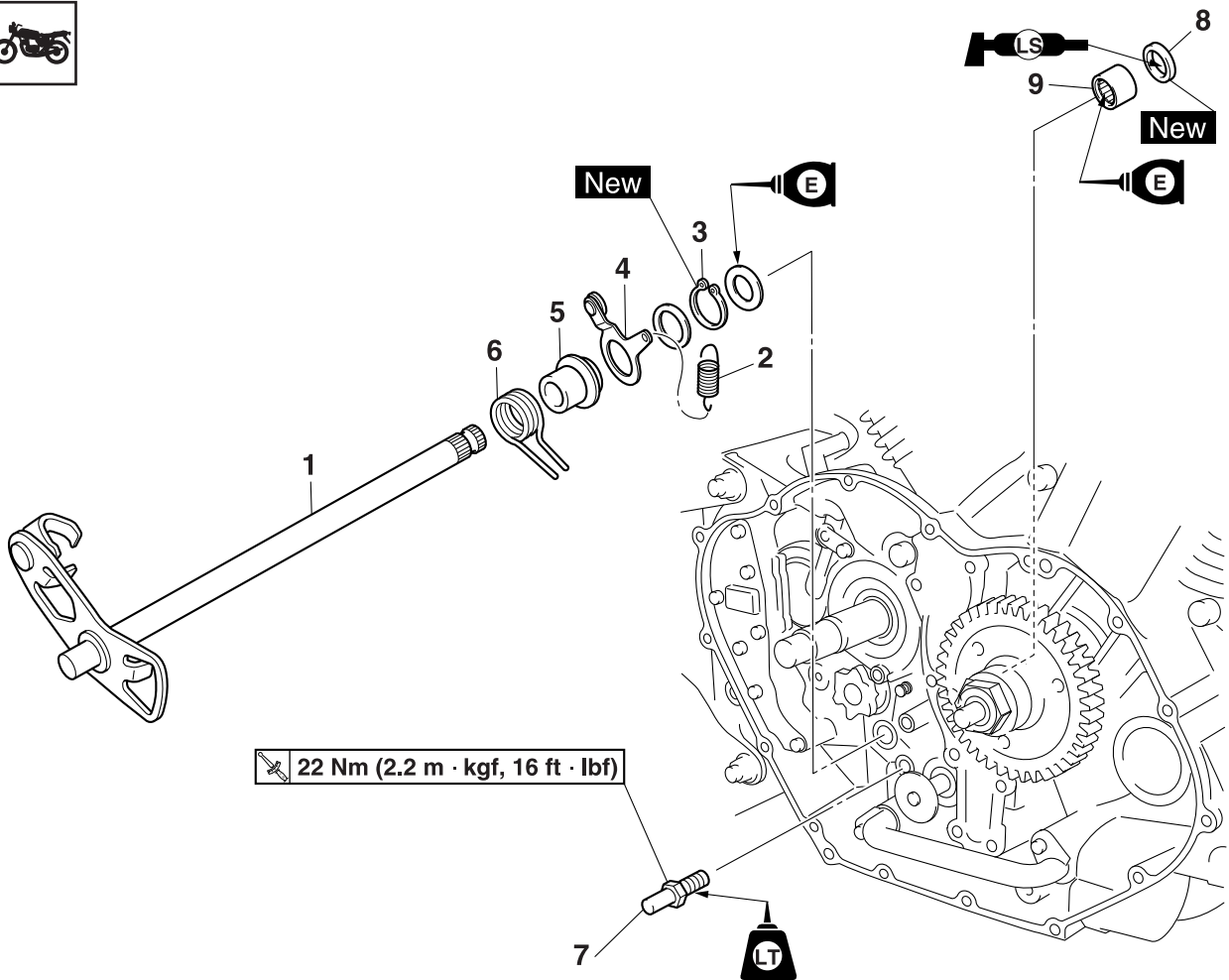
- Make sure that the mark “a” on the pull lever is facing forward.
- When installing the pull lever, push it and check that its punch mark “b” aligns with the mark “c” on the primary drive gear cover.
- Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.



9. Adjust:
- Clutch lever free play
- Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-11.

SHIFT SHAFT

Removing the shift shaft and stopper lever



Order	Job/Parts to remove	Q'ty	Remarks
	Drive pulley cover		Refer to "BELT DRIVE" on page 4-67.
	Shift arm		Refer to "ENGINE REMOVAL" on page 5-1.
	Primary drive gear cover		Refer to "CLUTCH" on page 5-44.
1	Shift shaft	1	
2	Stopper lever spring	1	
3	Circlip	1	
4	Stopper lever	1	
5	Collar	1	
6	Shift shaft spring	1	
7	Shift shaft spring stopper	1	
8	Oil seal	1	
9	Bearing	1	
			For installation, reverse the removal procedure.

EAS25420

CHECKING THE SHIFT SHAFT

1. Check:
 - Shift shaft
Bends/damage/wear → Replace.
 - Shift shaft spring
Damage/wear → Replace.

EAS25430

CHECKING THE STOPPER LEVER

1. Check:
 - Stopper lever
Bends/damage → Replace.
Roller turns roughly → Replace the stopper lever.

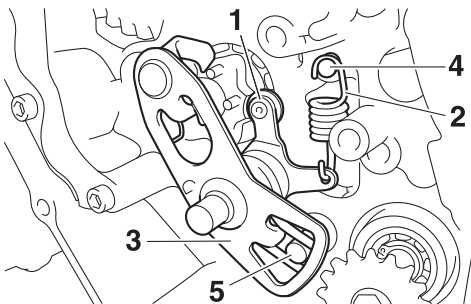
EAS25450

INSTALLING THE SHIFT SHAFT

1. Install:
 - Stopper lever “1”
 - Stopper lever spring “2”
 - Shift shaft “3”

TIP

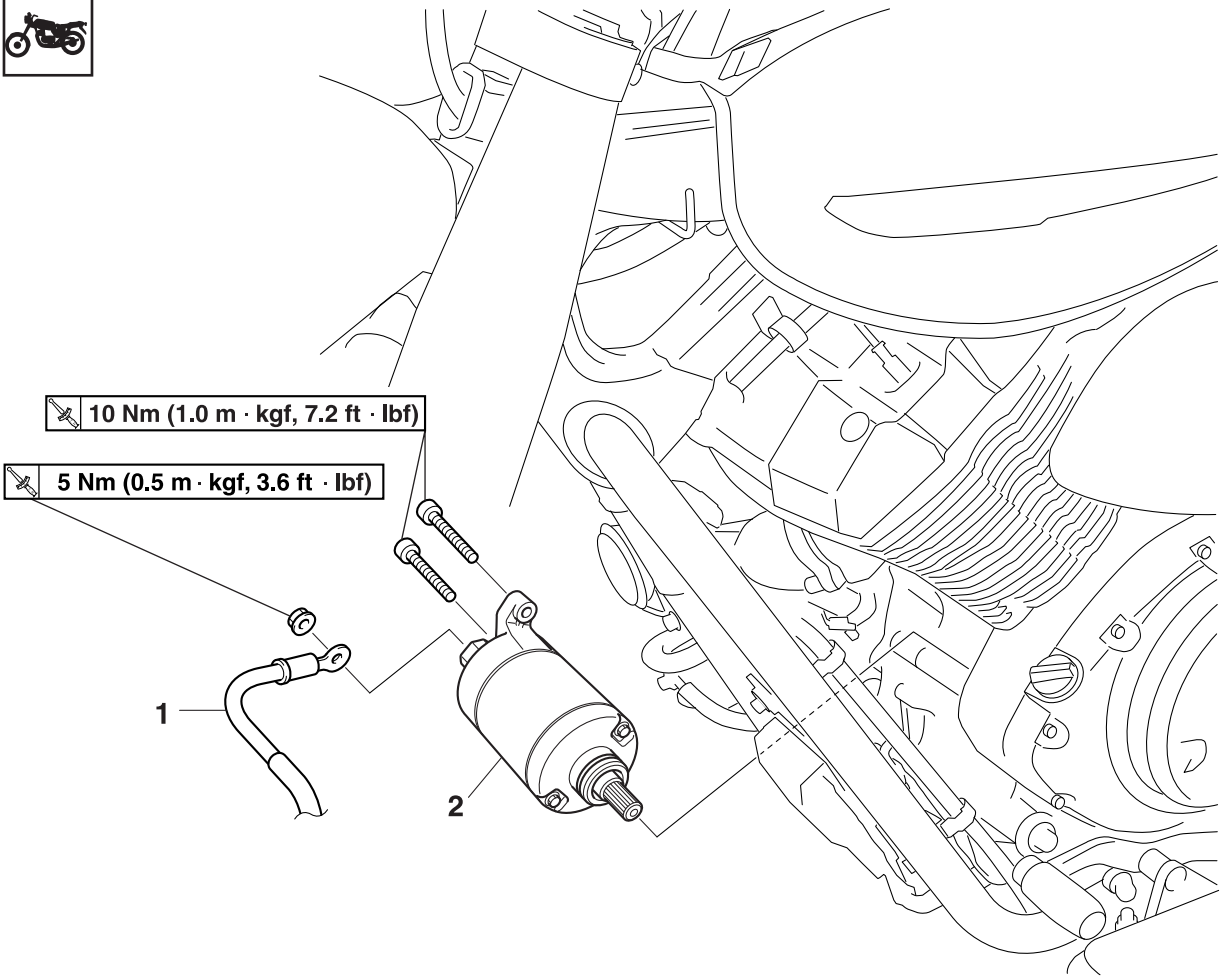
- Lubricate the oil seal lips with lithium-soap-based grease.
- Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss “4”.
- Mesh the stopper lever with the shift drum segment assembly.
- Hook the end of the shift shaft spring onto the shift shaft spring stopper “5”.



EAS24780

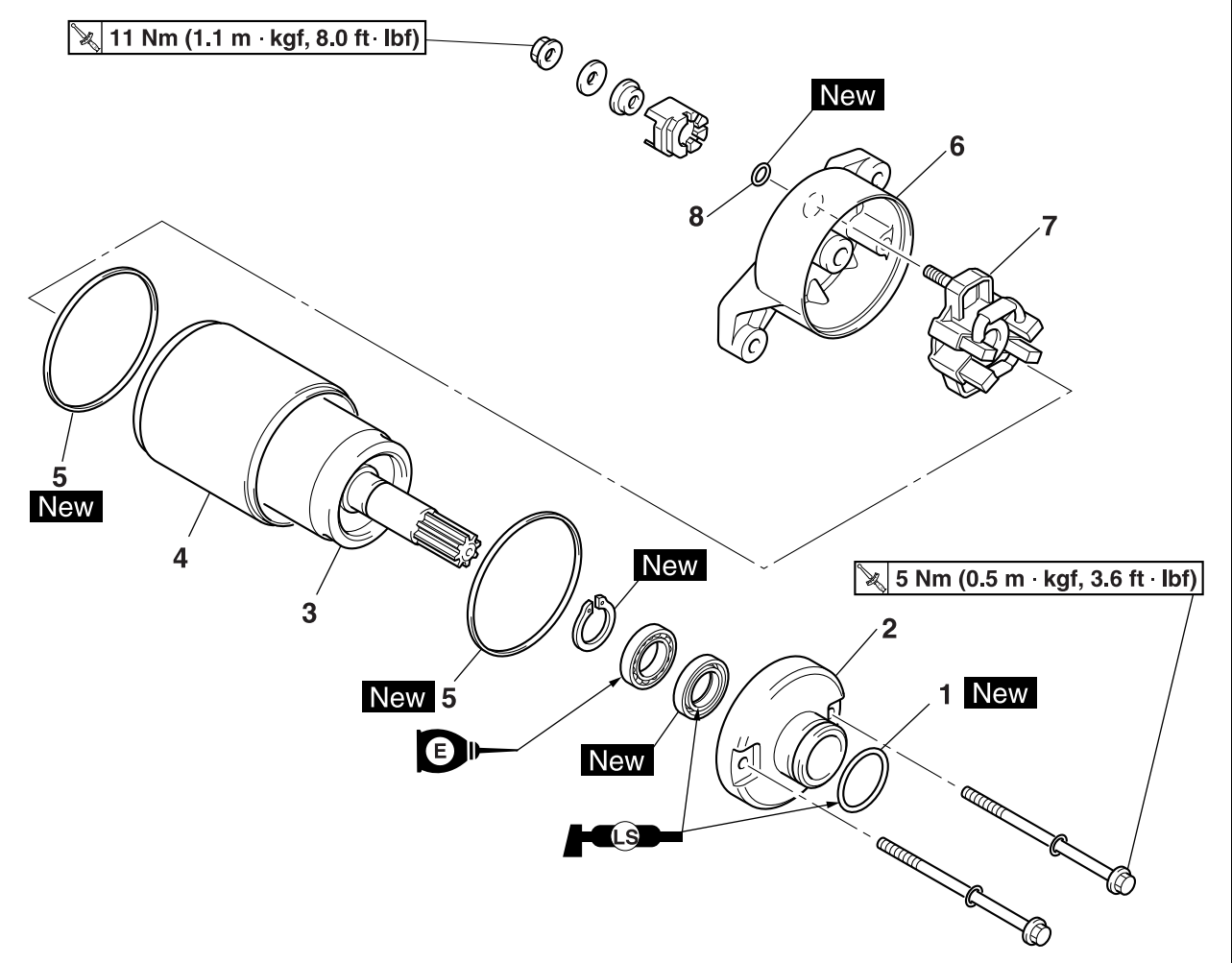
ELECTRIC STARTER

Removing the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
1	Starter motor lead	1	Disconnect.
2	Starter motor	1	
			For installation, reverse the removal procedure.

Disassembling the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
1	O-ring	1	
2	Starter motor front cover	1	
3	Armature assembly	1	
4	Starter motor yoke	1	
5	Gasket	2	
6	Starter motor rear cover	1	
7	Brush set assembly	1	
8	O-ring	1	
			For assembly, reverse the disassembly procedure.

EAS24790

CHECKING THE STARTER MOTOR

1. Check:

- Commutator
Dirt → Clean with 600 grit sandpaper.

2. Measure:

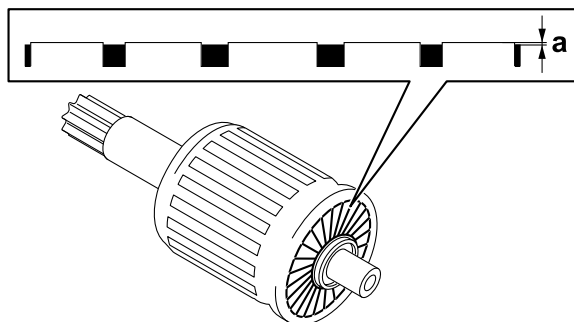
- Mica undercut "a"
Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.



Mica undercut (depth)
0.70 mm (0.03 in)

TIP

The mica of the commutator must be undercut to ensure proper operation of the commutator.



3. Measure:

- Armature assembly resistances (commutator and insulation)
Out of specification → Replace the starter motor.

- a. Measure the armature assembly resistances with the pocket tester.

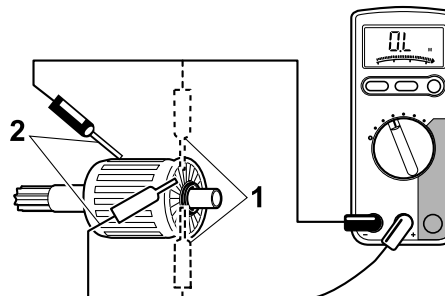


Digital circuit tester
90890-03174
Model 88 Multimeter with
tachometer
YU-A1927



Armature coil
Commutator resistance "1"
0.0050–0.0150 Ω at 20 °C (68 °F)
Insulation resistance "2"
Above 1 M Ω at 20 °C (68 °F)

- b. If any resistance is out of specification, replace the starter motor.

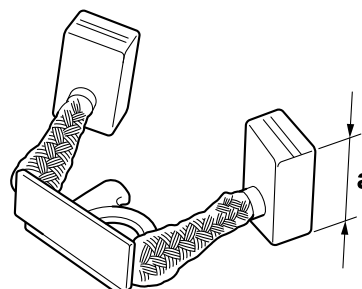


4. Measure:

- Brush length "a"
Out of specification → Replace the brush set assembly.



Brush overall length
12.0 mm (0.47 in)
Limit
6.50 mm (0.26 in)

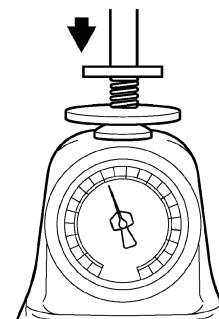


5. Measure:

- Brush spring force
Out of specification → Replace the brush set assembly.



Brush spring force
6.03–6.52 N (614–664 gf,
21.67–23.43 ozf)



6. Check:
 - Gear teeth
Damage/wear → Replace the starter motor.
7. Check:
 - Bearing
Damage/wear → Replace the starter motor.

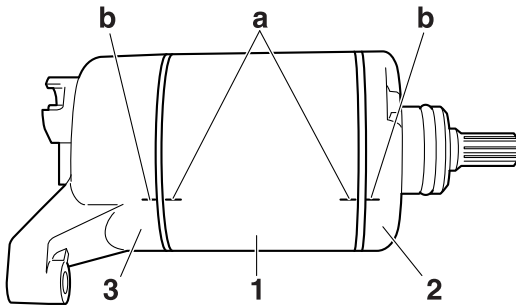
EAS24800

ASSEMBLING THE STARTER MOTOR

1. Install:
 - Brush set assembly
2. Install:
 - Starter motor yoke “1”
 - Starter motor front cover “2”
 - Starter motor rear cover “3”

TIP

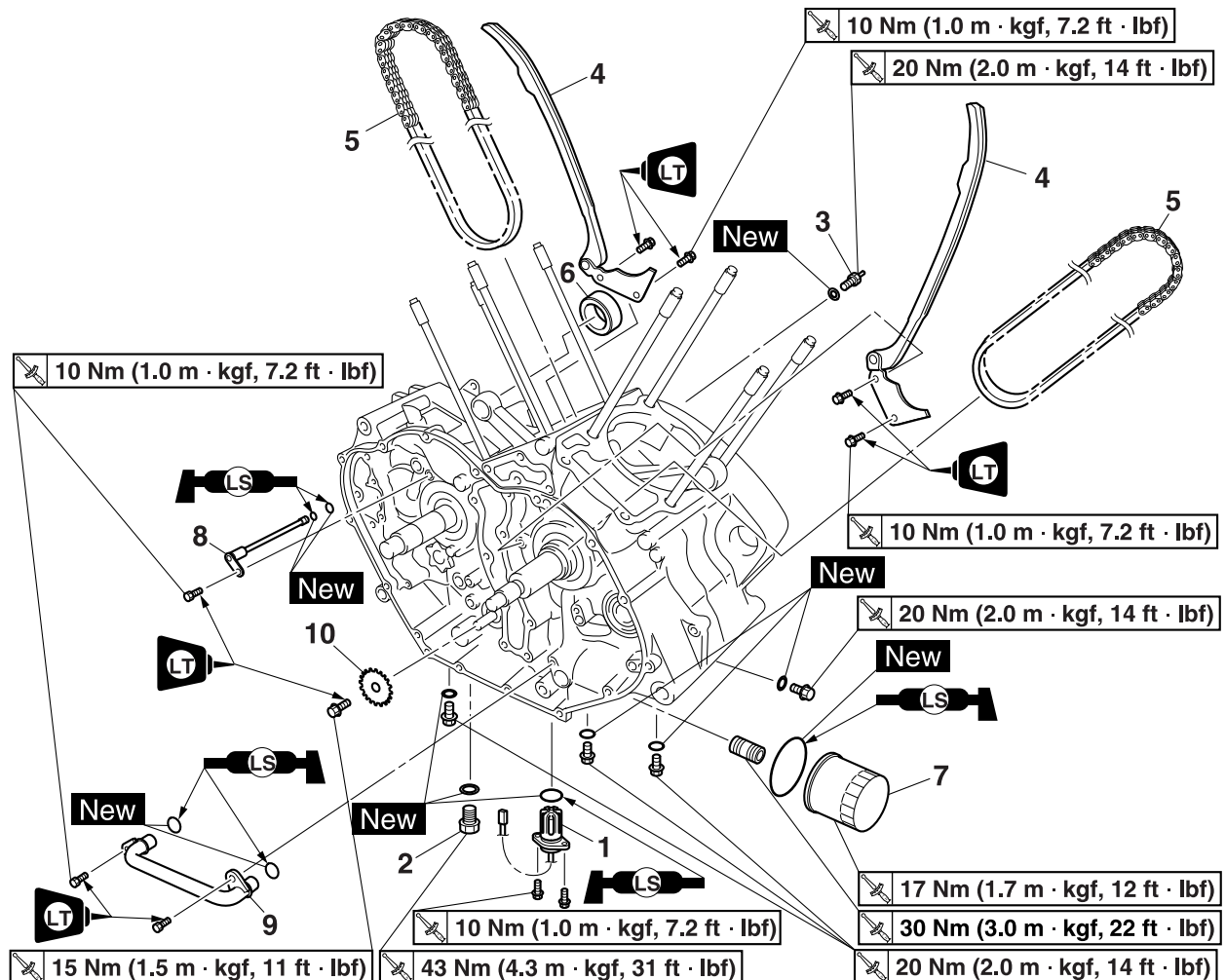
Align the match marks “a” on the starter motor yoke with the match marks “b” on the starter motor front and rear covers.



EAS25540

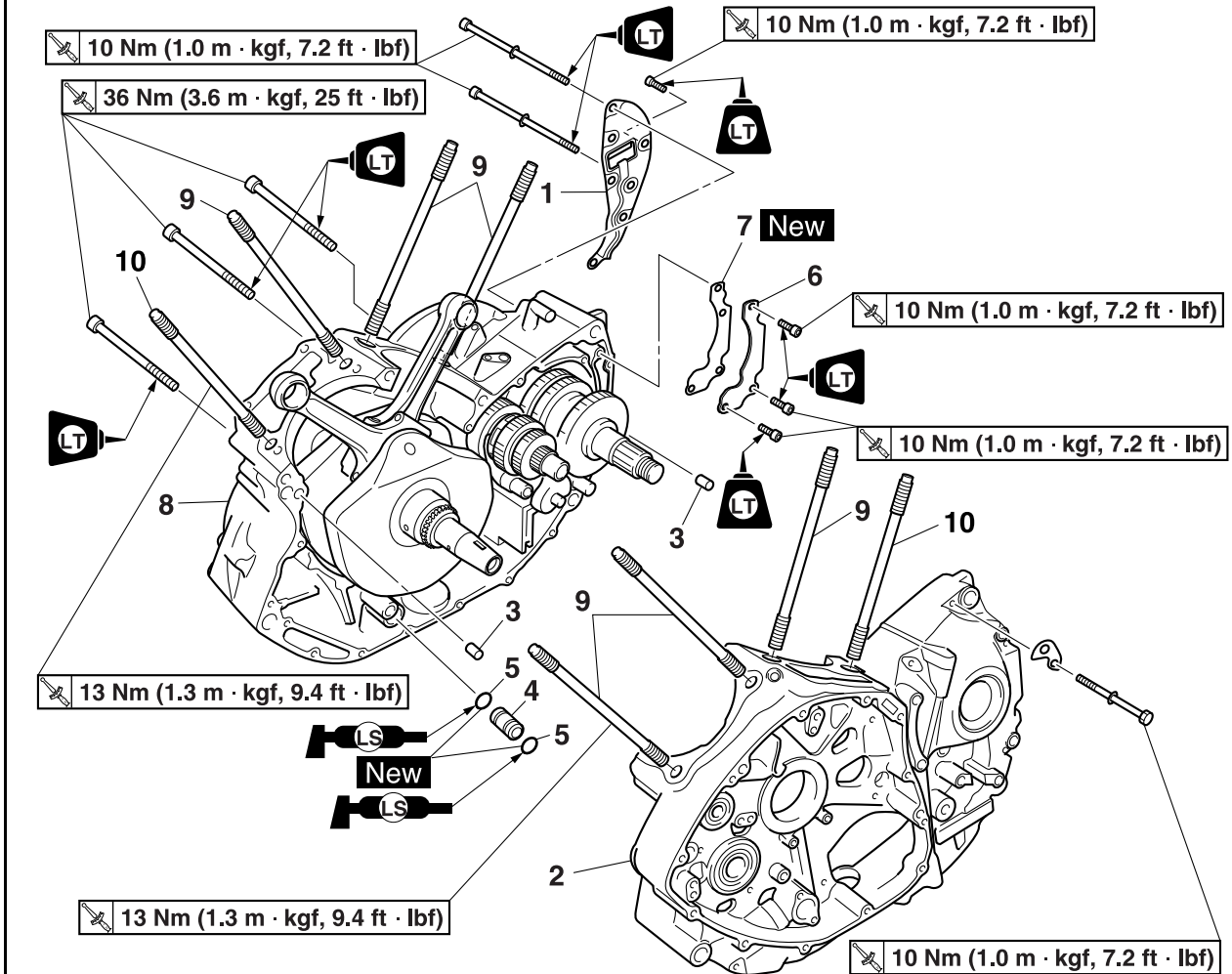
CRANKCASE

Removing the oil delivery pipes and timing chains



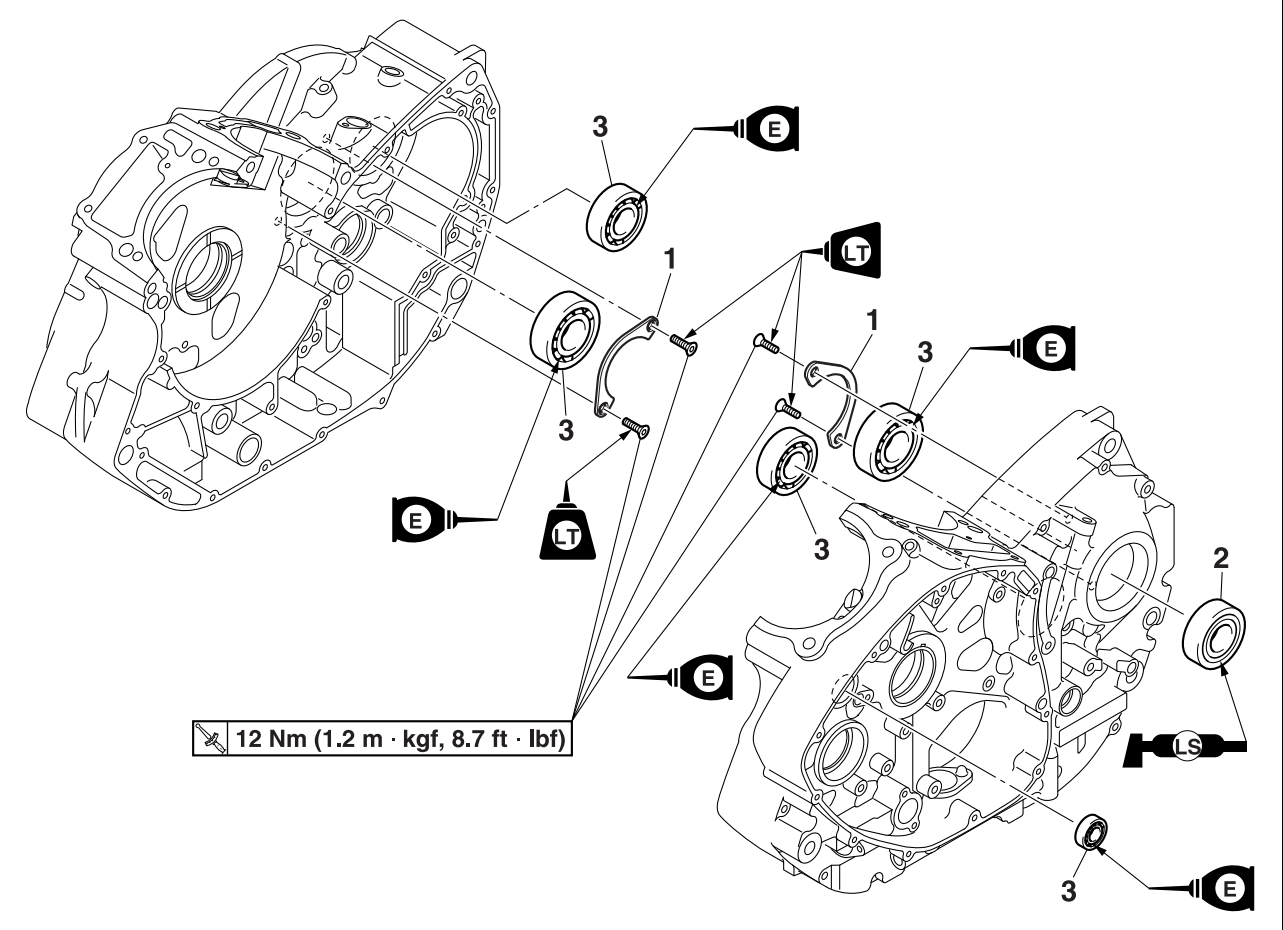
Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
	Piston		Refer to "CYLINDERS AND PISTONS" on page 5-32.
	Clutch		Refer to "CLUTCH" on page 5-44.
	Primary drive gear		Refer to "CLUTCH" on page 5-44.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-53.
1	Oil level switch	1	
2	Engine oil drain bolt	1	
3	Neutral switch	1	
4	Timing chain guide	2	
5	Timing chain	2	
6	Spacer	1	
7	Oil filter cartridge	1	
8	Oil delivery pipe 1	1	
9	Oil delivery pipe 2	1	
10	Oil pump driven sprocket	1	
			For installation, reverse the removal procedure.

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil baffle plate 1	1	
2	Left crankcase	1	
3	Dowel pin	2	
4	Joint pipe	1	
5	O-ring	2	
6	Oil baffle plate 2	1	
7	Gasket	1	
8	Right crankcase	1	
9	Stud bolt	6	l = 239 mm (9.41 in)
10	Stud bolt	2	l = 210 mm (8.27 in)
			For installation, reverse the removal procedure.

Removing the oil seal and bearings



Order	Job/Parts to remove	Q'ty	Remarks
	Oil pump assembly		Refer to "OIL PUMP" on page 5-65.
	Crankshaft		Refer to "CRANKSHAFT" on page 5-68.
	Transmission		Refer to "TRANSMISSION" on page 5-73.
1	Bearing retainer	2	
2	Oil seal	1	
3	Bearing	5	
			For installation, reverse the removal procedure.

EAS25560

DISASSEMBLING THE CRANKCASE

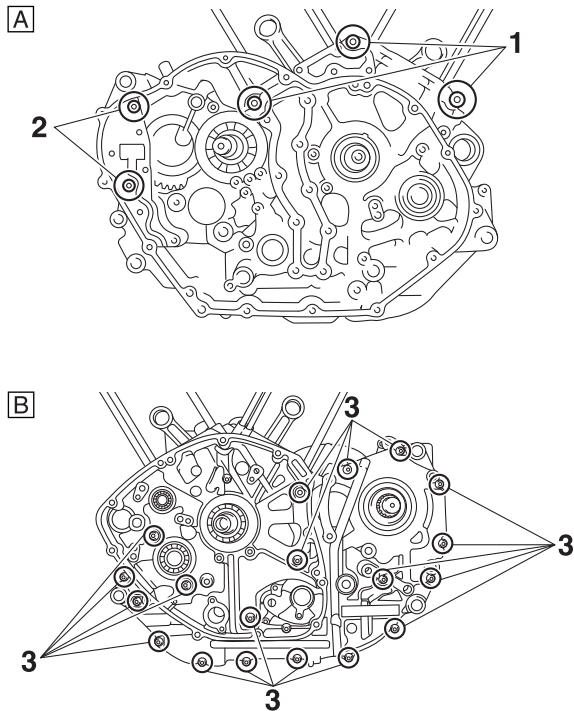
1. Remove:

- Crankcase bolts

TIP

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.

- M10 × 110 mm bolts "1"
- M6 × 120 mm bolts "2"
- M6 × 80 mm bolts "3"



- A. Right crankcase
B. Left crankcase

2. Remove:

- Left crankcase

ECA13900

NOTICE

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

EAS25580

CHECKING THE CRANKCASE

1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.

3. Check:

- Crankcase
Cracks/damage → Replace.
- Oil delivery passages
Obstruction → Blow out with compressed air.

EAS3D81029

CHECKING THE BEARINGS AND OIL SEAL

1. Check:

- Bearings
Clean and lubricate the bearings, then rotate the inner race with your finger.
Rough movement → Replace.
- Oil seals
Damage/wear → Replace.

EAS5S71002

CHECKING THE OIL DELIVERY PIPES

The following procedure applies to all of the oil delivery pipes and joint pipe.

1. Check:

- Oil delivery pipe
- Joint pipe
Damage → Replace.
Obstruction → Wash and blow out with compressed air.

EAS25620

CHECKING THE TIMING CHAINS

1. Check:

- Timing chains
Damage/stiffness → Replace the timing chain and camshaft sprocket as a set.

EAS5S71003

CHECKING THE OIL PUMP DRIVEN SPROCKET

1. Check:

- Oil pump driven sprocket
Cracks/damage/wear → Replace the oil pump driven sprocket and the oil pump drive chain as a set.

EAS5S71010

INSTALLING THE BEARING RETAINERS

1. Install:

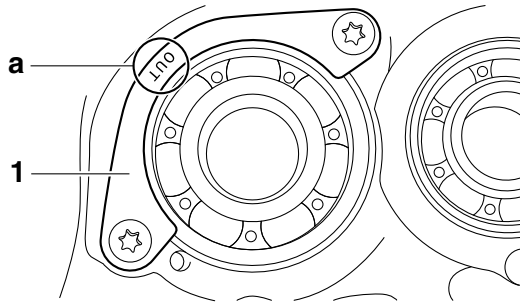
- Bearing retainers "1"

TIP

- Install each bearing retainer "1" with its "OUT" mark "a" facing outward.
- Apply locking agent (LOCTITE®) to the threads of the bearing retainer bolt.



Bearing retainer bolt
12 Nm (1.2 m·kgf, 8.7 ft·lbf)
LOCTITE®



EAS25700

ASSEMBLING THE CRANKCASE

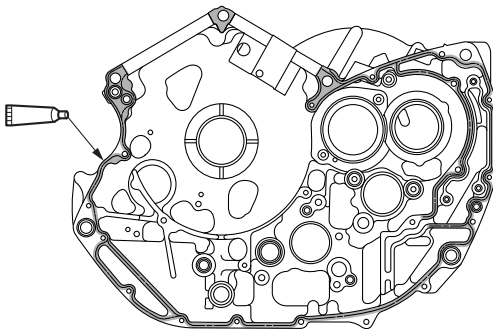
1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
2. Apply:
 - Sealant
(onto the crankcase mating surfaces)



Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)

TIP

Do not allow any sealant to come into contact with the oil gallery.

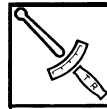


3. Install:
 - Left crankcase
(onto the right crankcase)

TIP

Tap lightly on the left crankcase with a soft-face hammer.

4. Install:
 - Crankcase bolts (M10)
 - Crankcase bolts (M6)
 - Oil baffle plate 1 bolts



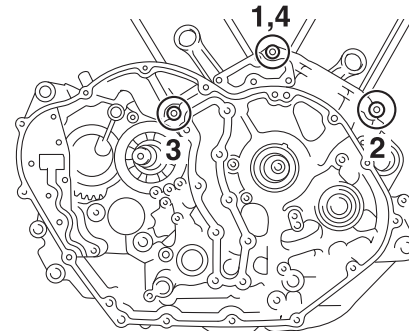
Crankcase bolt (M10)
36 Nm (3.6 m·kgf, 25 ft·lbf)
Crankcase bolt (M6)
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
Oil baffle plate 1 bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

- Apply locking agent (LOCTITE®) to the threads of the right crankcase bolts and oil baffle plate 1 bolts.
- Tighten the crankcase bolts in the proper tightening sequence as shown in the illustration.

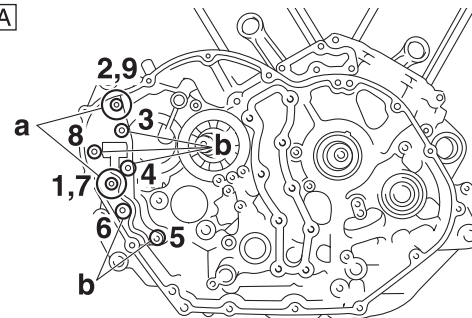
- M10 × 110 mm bolts

A



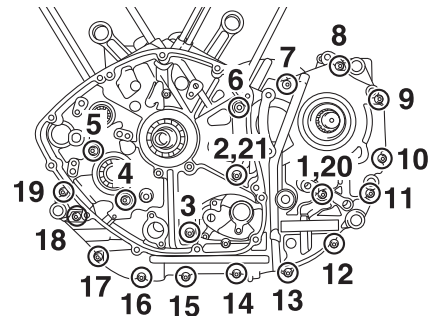
- M6 × 120 mm bolts: "a"
- Oil baffle plate 1 bolts: "b"

A



- M6 × 80 mm bolts

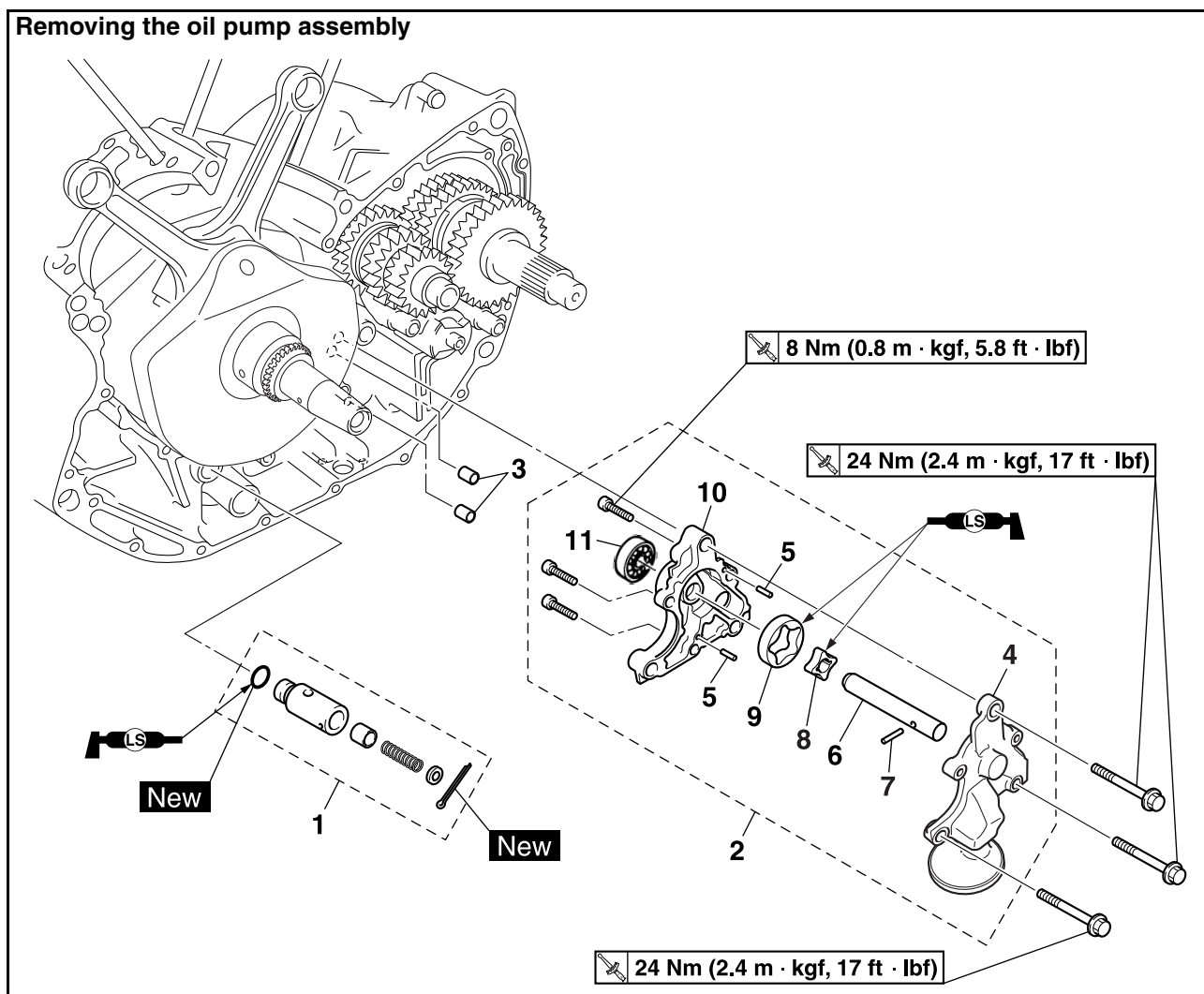
B



- A. Right crankcase
- B. Left crankcase

5. Apply:
 - Engine oil
(onto the crankshaft pin bearings and oil delivery holes)
6. Check:
 - Crankshaft and transmission operation
Rough movement → Repair.

EAS24910

OIL PUMP**Removing the oil pump assembly**

Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Refer to "CRANKCASE" on page 5-59.
1	Relief valve assembly	1	
2	Oil pump assembly	1	
3	Dowel pin	2	
4	Oil pump housing	1	
5	Dowel pin	2	
6	Impeller shaft	1	
7	Pin	1	
8	Oil pump inner rotor	1	
9	Oil pump outer rotor	1	
10	Oil pump housing cover	1	
11	Bearing	1	
			For installation, reverse the removal procedure.

EAS24960

CHECKING THE OIL PUMP

1. Check:
 - Oil pump housing
Cracks/damage/wear → Replace the oil pump assembly.
2. Measure:
 - Inner-rotor-to-outer-rotor-tip clearance “a”
 - Outer-rotor-to-oil-pump-housing clearance “b”
 - Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance “c”
Out of specification → Replace the oil pump assembly.



Inner-rotor-to-outer-rotor-tip clearance

Less than 0.12 mm (0.0047 in)

Limit

0.20 mm (0.0079 in)

Outer-rotor-to-oil-pump-housing clearance

0.09–0.19 mm (0.0035–0.0075 in)

Limit

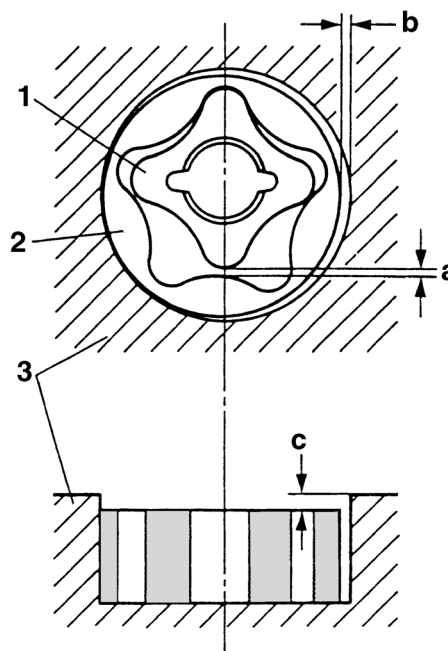
0.26 mm (0.0102 in)

Oil-pump-housing-to-inner-and-outer-rotor clearance

0.03–0.10 mm (0.0012–0.0039 in)

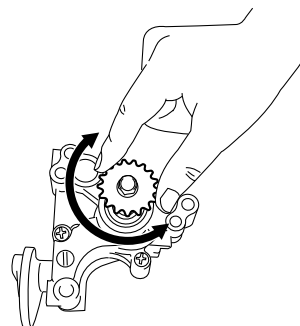
Limit

0.17 mm (0.0067 in)



1. Inner rotor
2. Outer rotor
3. Oil pump housing

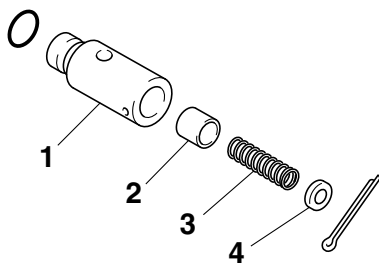
3. Check:
 - Oil pump operation
Rough movement → Repeat steps (1) and (2) or replace the oil pump assembly.



EAS24970

CHECKING THE RELIEF VALVE

1. Check:
 - Relief valve body “1”
 - Relief valve “2”
 - Spring “3”
 - Spring retainer “4”
Damage/wear → Replace the relief valve assembly.

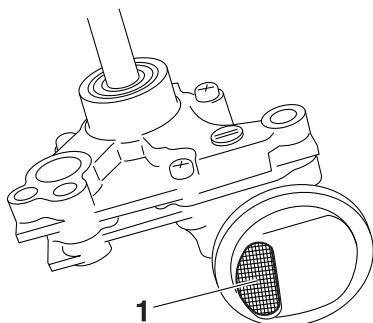


EAS24990

CHECKING THE OIL STRAINER

1. Check:

- Oil strainer “1”
Damage → Replace.
Contaminants → Clean with solvent.

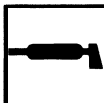


EAS25000

ASSEMBLING THE OIL PUMP

1. Lubricate:

- Inner rotor
- Outer rotor
(with the recommended lubricant)



Recommended lubricant
Engine oil

2. Install:

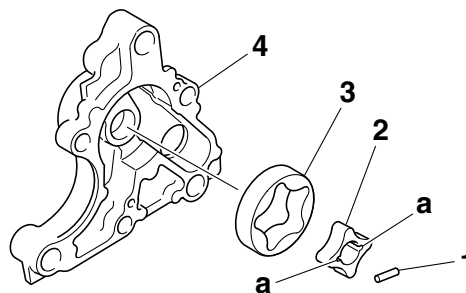
- Pin “1”
- Oil pump inner rotor “2”
- Oil pump outer rotor “3”
- Dowel pin
- Oil pump housing “4”

TIP

When installing the inner rotor, align the pin in the impeller shaft with the grooves “a” in the inner rotor.



Oil pump housing bolt
8 Nm (0.8 m·kgf, 5.8 ft·lbf)



3. Check:

- Oil pump operation
Refer to “CHECKING THE OIL PUMP” on page 5-66.

EAS5S71004

INSTALLING THE OIL PUMP ASSEMBLY

1. Install:

- Oil pump assembly

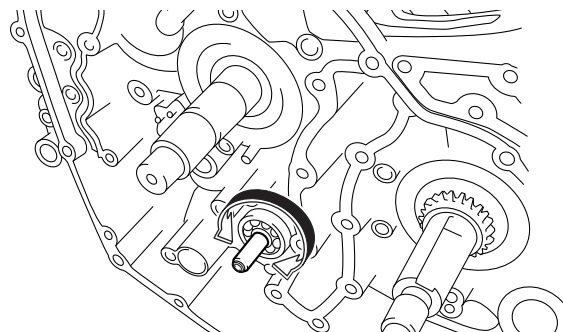


Oil pump assembly bolt
24 Nm (2.4 m·kgf, 17 ft·lbf)

ECA5S71002

NOTICE

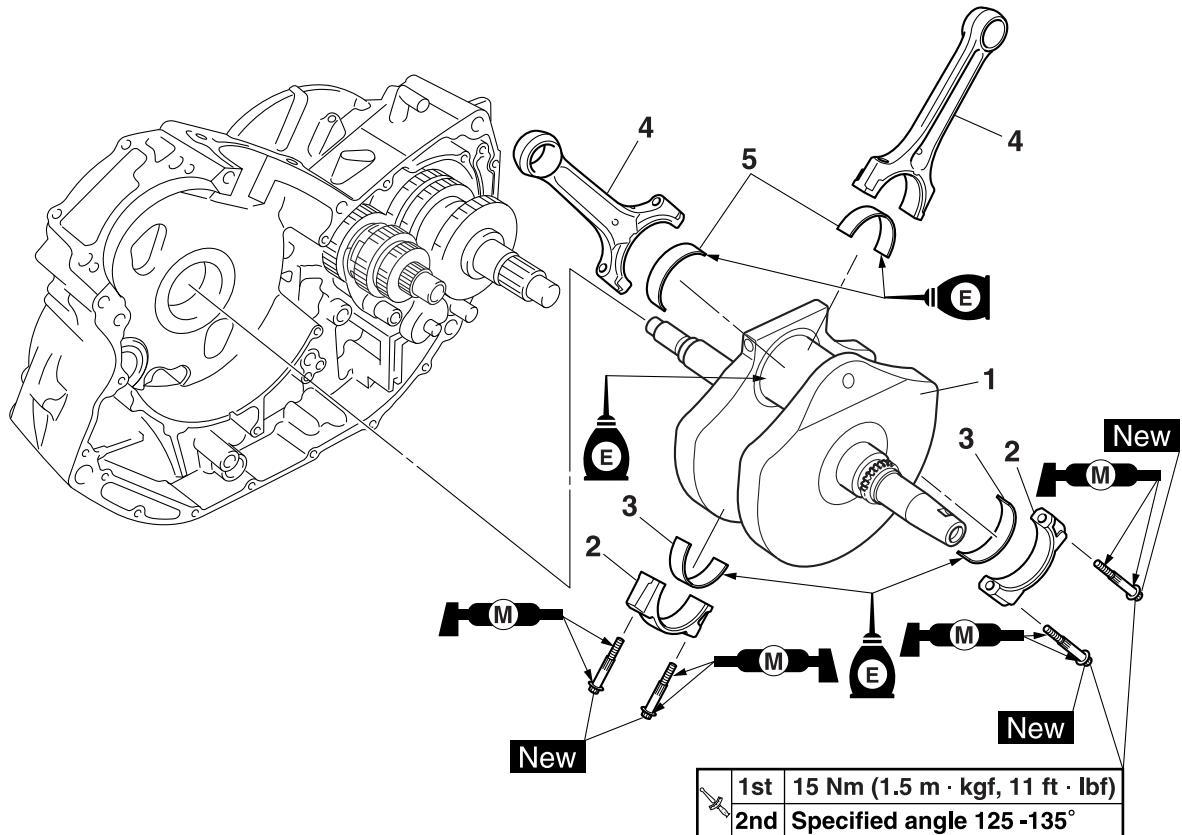
After tightening the bolts, make sure the oil pump assembly turns smoothly.



EAS25960

CRANKSHAFT

Removing the crankshaft



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-59.
1	Crankshaft	1	
2	Connecting rod cap	2	
3	Big end lower bearing	2	
4	Connecting rod	2	
5	Big end upper bearing	2	
			For installation, reverse the removal procedure.

EAS26010

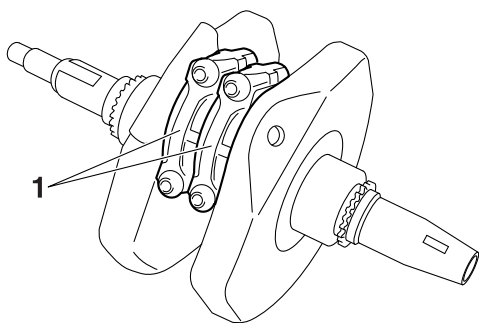
REMOVING THE CONNECTING RODS

1. Remove:

- Connecting rod caps “1”
- Connecting rods
- Big end bearings

TIP

Identify the position of each big end bearing so that it can be reinstalled in its original place.



EAS26090

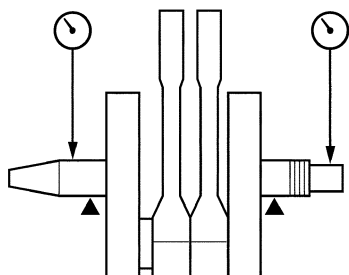
CHECKING THE CRANKSHAFT AND CONNECTING RODS

1. Measure:

- Crankshaft runout
Out of specification → Replace the crankshaft.



Runout limit C
0.020 mm (0.0008 in)



2. Check:

- Crankshaft journal surfaces
- Crankshaft pin surfaces
- Bearing surfaces
Scratches/wear → Replace the crankshaft.

3. Measure:

- Crankshaft-pin-to-big-end-bearing clearance
Out of specification → Replace the big end bearings.



Oil clearance (using plastigauge®)
0.022–0.046 mm (0.0009–0.0018 in)

The following procedure applies to all of the connecting rods.

ECA13930

NOTICE

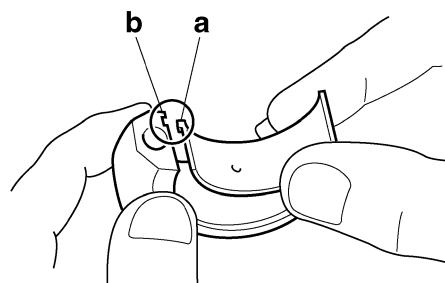
Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft-pin-to-big-end-bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.



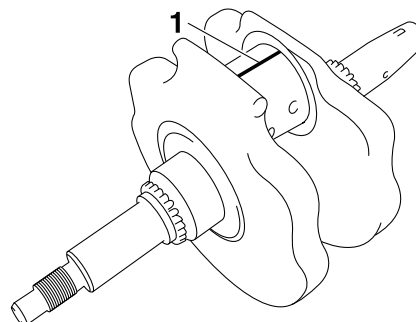
- Clean the big end bearings, crankshaft pin, and the inside of the connecting rod halves.
- Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

TIP

Align the projections “a” on the big end bearings with the notches “b” in the connecting rod and connecting rod cap.



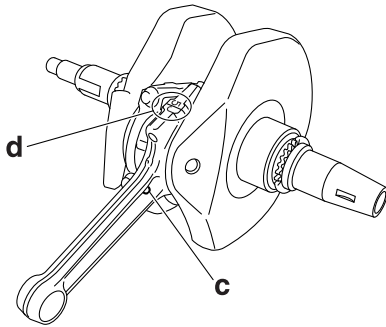
- Put a piece of Plastigauge® “1” on the crankshaft pin.



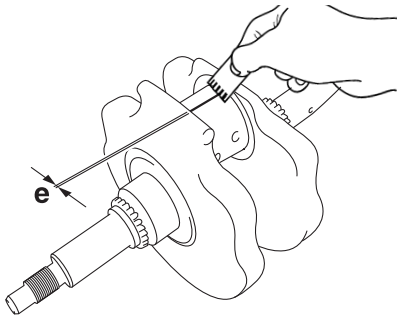
- Assemble the connecting rod halves.

TIP

- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Lubricate the bolts threads and nut seats with molybdenum disulfide grease.
- Make sure the projection “c” on the connecting rod faces towards the left side of the crankshaft.
- Make sure the characters “d” on both the connecting rod and connecting rod cap are aligned.



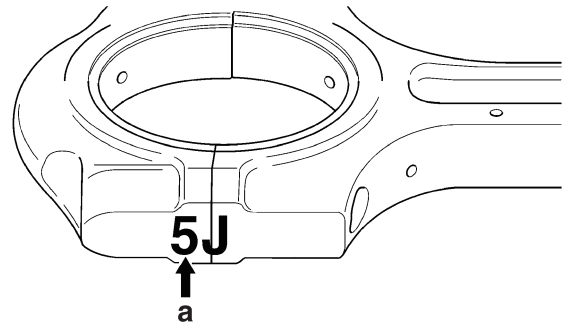
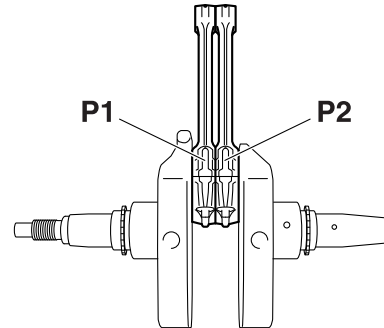
- Tighten the connecting rod bolts. Refer to “INSTALLING THE CONNECTING RODS” on page 5-71.
- Remove the connecting rod and big end bearings. Refer to “REMOVING THE CONNECTING RODS” on page 5-69.
- Measure the compressed Plastigauge® width “e” on the crankshaft pin. If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



- Select:
 - Big end bearings (P_1 – P_2)

TIP

- The numbers “a” on the connecting rods are used to determine the replacement big end bearing sizes.
- P_1 – P_2 refer to the bearings shown in the crankshaft illustration.



For example, if the connecting rod P_1 number is 5, then the bearing size for P_1 is 5 (brown).



Bearing color code
4.Black 5.Brown 6.Green

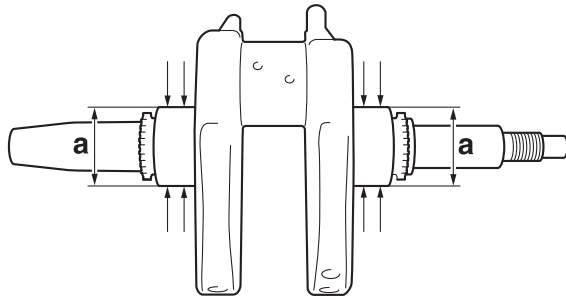
- Measure:
 - Crankshaft journal diameter “a”
Out of specification → Replace the crankshaft.

TIP

Measure the diameter of each crankshaft journal at two places.



Crankshaft journal diameter
49.968–49.980 mm (1.9672–1.9677 in)



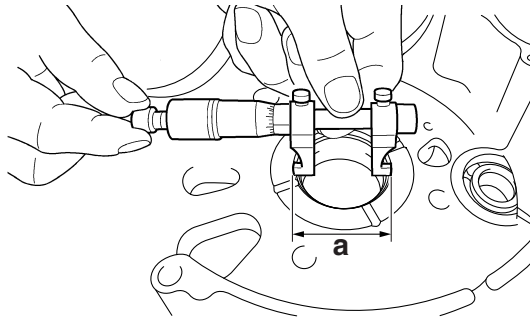
6. Measure:
- Crankshaft journal bearing inside diameter "a"
- Out of specification → Replace the crankcase assembly.

TIP

Measure the inside diameter of each crankshaft journal bearing at two places.



Crankshaft journal bearing inside diameter
50.010–50.030 mm (1.9689–1.9697 in)



7. Calculate:
- Crankshaft-journal-to-crankshaft-journal-bearing clearance
- Out of specification → Replace the crankshaft and crankcase as a set.

TIP

Calculate the clearance by subtracting the crankshaft journal diameter from the crankshaft journal bearing inside diameter.



Crankshaft-journal-to-crankshaft-journal-bearing clearance
0.030–0.062 mm (0.0012–0.0024 in)

EAS26150

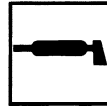
INSTALLING THE CONNECTING RODS

1. Lubricate:
- Bolt threads
- (with the recommended lubricant)



Recommended lubricant
Molybdenum disulfide grease

2. Lubricate:
- Crankshaft pin
 - Big end bearings
 - Connecting rod inner surface
- (with the recommended lubricant)

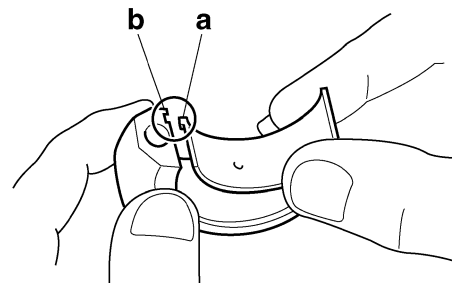


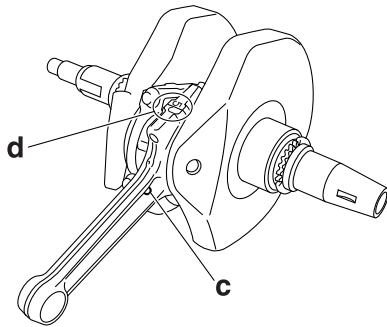
Recommended lubricant
Engine oil

3. Install:
- Big end bearings
 - Connecting rods
 - Connecting rod caps
- (onto the crankshaft pin)

TIP

- Align the projections "a" on the big end bearings with the notches "b" in the connecting rods and connecting rod caps.
- Be sure to reinstall each big end bearing in its original place.
- Make sure the projection "c" on each connecting rod faces towards the left side of the crankshaft.
- Make sure the characters "d" on both the connecting rod and connecting rod cap are aligned.





4. Tighten:
- Connecting rod bolts

EWA5S71002

WARNING

- Replace the connecting rod bolts with new ones.
- Clean the connecting rod bolts.

TIP

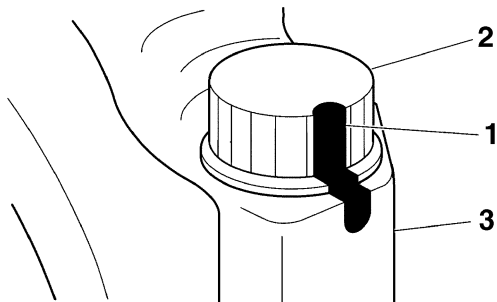
Tighten the connecting rod bolts using the following procedure.

- a. Tighten the connecting rod bolts to specification with a torque wrench.



Connecting rod bolt (1st)
15 Nm (1.5 m·kgf, 11 ft·lbf)

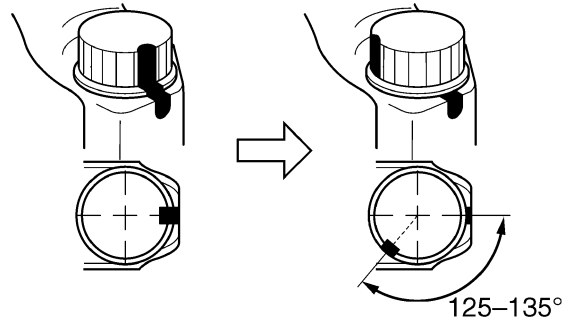
- b. Put a mark "1" on the corner of the connecting rod bolt "2" and the connecting rod cap "3".



- c. Tighten the connecting rod bolts further to reach the specified angle 125–135°.



Connecting rod bolt (final)
Specified angle 125–135°



EWA5S71003

WARNING

When a bolt is tightened more than the specified angle, do not loosen and then retighten it.

Replace the bolt with a new one and perform the procedure again.

ECA5S71003

NOTICE

- Do not use a torque wrench to tighten the bolt to the specified angle.
- Tighten the bolt until it is at the specified angle.

EAS26210

INSTALLING THE CRANKSHAFT ASSEMBLY

1. Install:
- Crankshaft assembly

ECA5S71004

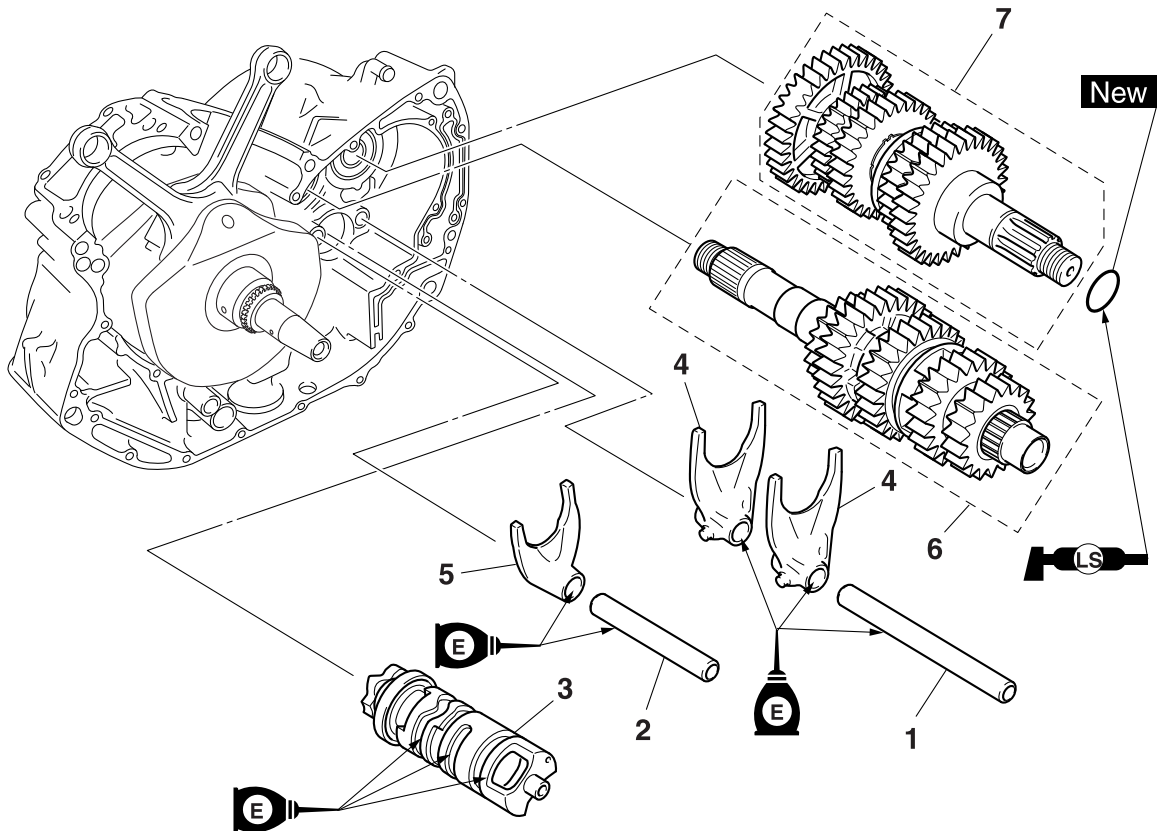
NOTICE

To avoid scratching the crankshaft and to ease the installation procedure, lubricate each bearing with engine oil.

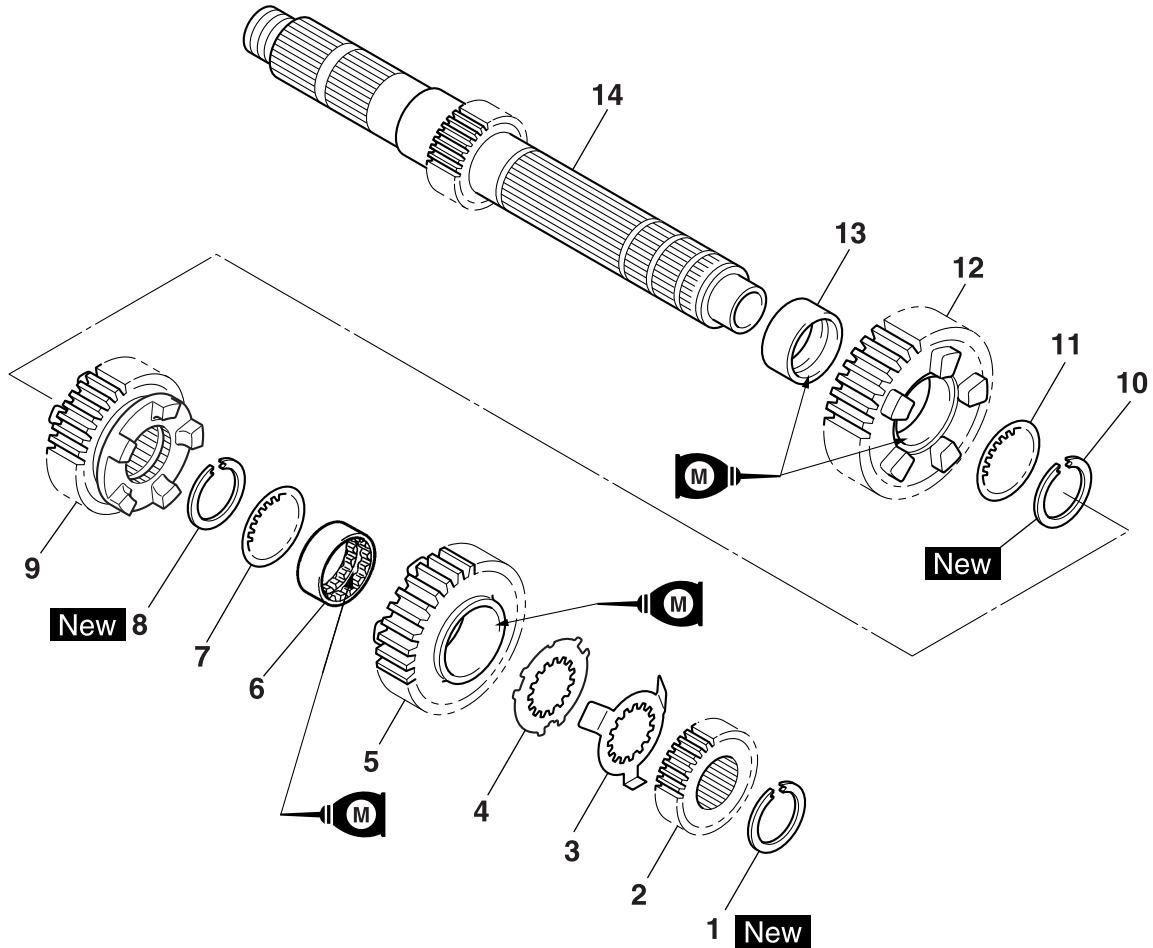
TIP

Align the right connecting rod with the rear cylinder sleeve hole.

EAS26240

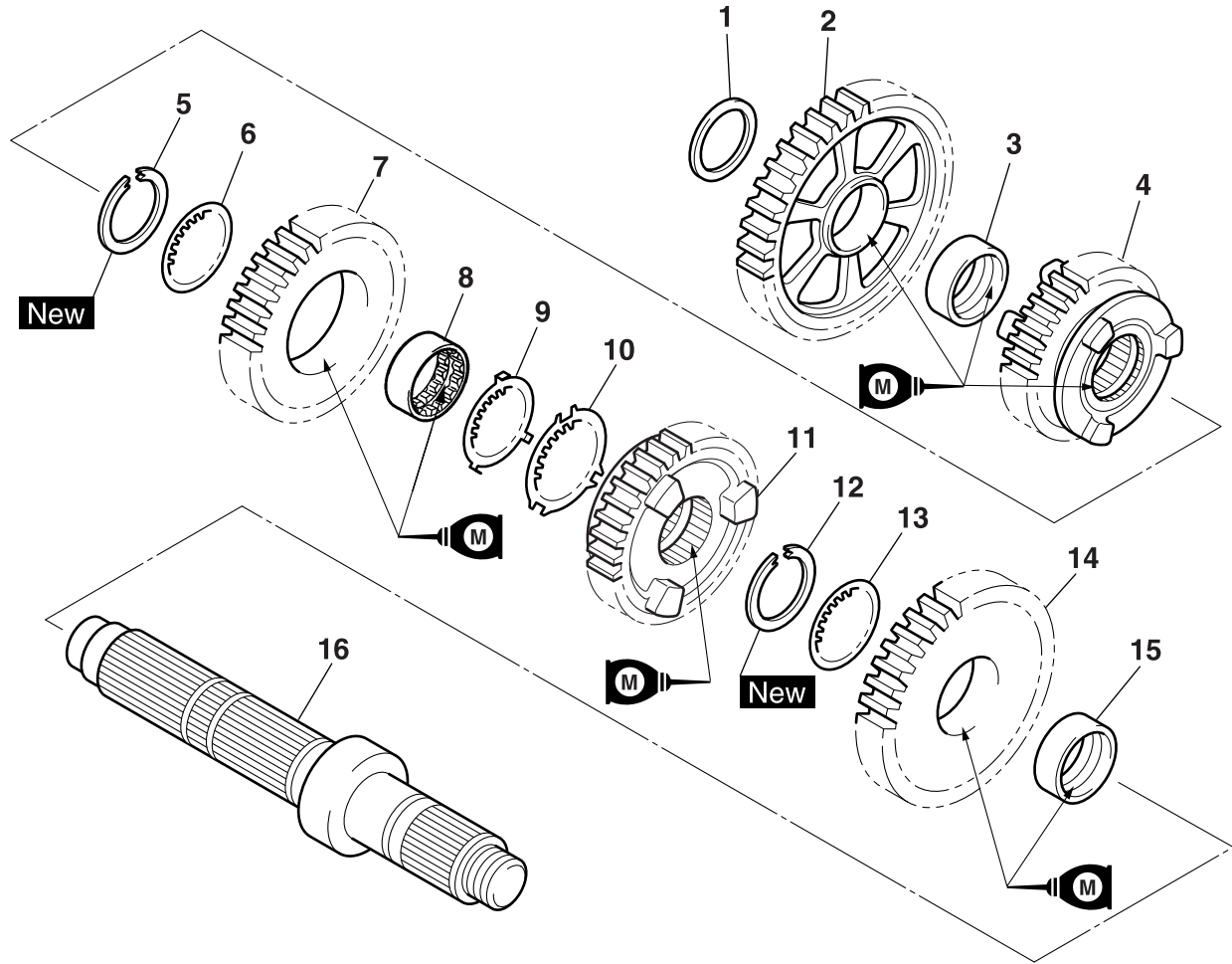
TRANSMISSION**Removing the transmission, shift drum assembly, and shift forks**

Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-59.
1	Long shift fork guide bar	1	
2	Short shift fork guide bar	1	
3	Shift drum assembly	1	
4	Shift fork 1	2	
5	Shift fork 2	1	
6	Main axle assembly	1	
7	Drive axle assembly	1	
			For installation, reverse the removal procedure.

Disassembling the main axle assembly

Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	2nd pinion gear	1	
3	Toothed lock washer	1	
4	Toothed lock washer retainer	1	
5	4th pinion gear	1	
6	Collar	1	
7	Toothed washer	1	
8	Circlip	1	
9	3rd pinion gear	1	
10	Circlip	1	
11	Toothed washer	1	
12	5th pinion gear	1	
13	Collar	1	
14	Main axle/1st pinion gear	1	
			For assembly, reverse the disassembly procedure.

Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Washer	1	
2	1st wheel gear	1	
3	Collar	1	
4	5th wheel gear	1	
5	Circlip	1	
6	Toothed washer	1	
7	3rd wheel gear	1	
8	Collar	1	
9	Toothed lock washer	1	
10	Toothed lock washer retainer	1	
11	4th wheel gear	1	
12	Circlip	1	
13	Toothed washer	1	
14	2nd wheel gear	1	
15	Collar	1	
16	Drive axle	1	
			For assembly, reverse the disassembly procedure.

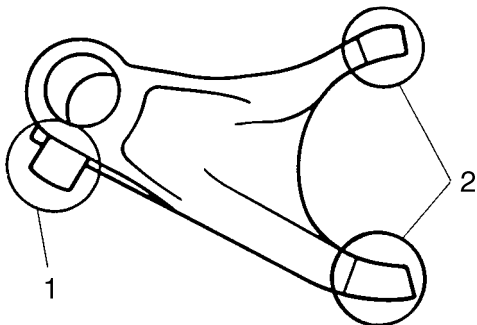
EAS26260

CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks and shift fork guide bars.

1. Check:

- Shift fork cam follower “1”
 - Shift fork pawls “2”
- Bends/damage/scoring/wear → Replace the shift fork.



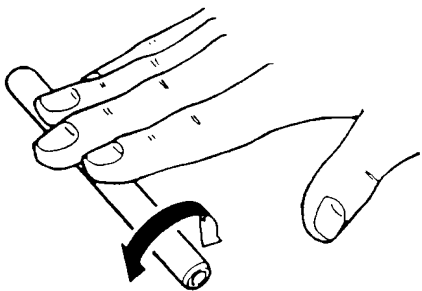
2. Check:

- Shift fork guide bar
- Roll the shift fork guide bar on a flat surface.
- Bends → Replace.

EWA12840

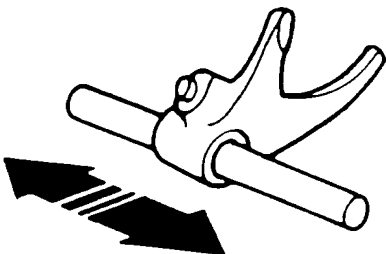
WARNING

Do not attempt to straighten a bent shift fork guide bar.



3. Check:

- Shift fork movement (along the shift fork guide bar)
- Rough movement → Replace the shift forks and shift fork guide bar as a set.

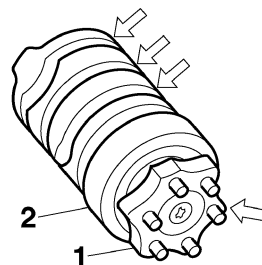


EAS26270

CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:

- Shift drum grooves
- Damage/scratches/wear → Replace the shift drum assembly.
- Shift drum segment “1”
- Damage/wear → Replace the shift drum assembly.
- Shift drum bearing “2”
- Damage/pitting → Replace the shift drum assembly.



EAS26300

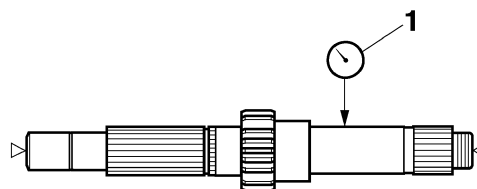
CHECKING THE TRANSMISSION

1. Measure:

- Main axle runout (with a centering device and dial gauge “1”)
- Out of specification → Replace the main axle.



Main axle runout limit
0.08 mm (0.0032 in)

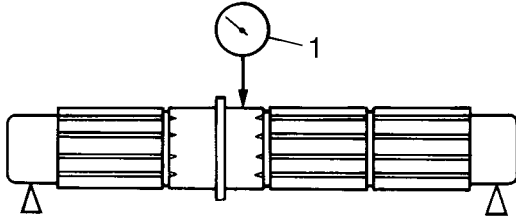


2. Measure:

- Drive axle runout (with a centering device and dial gauge “1”)
- Out of specification → Replace the drive axle.

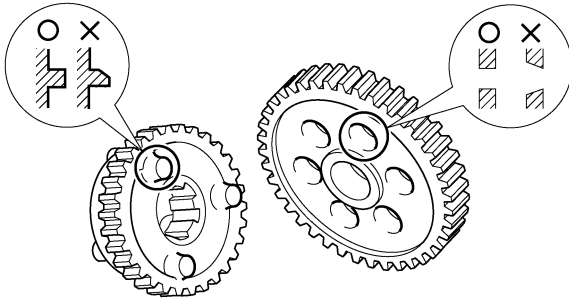


Drive axle runout limit
0.08 mm (0.0032 in)



3. Check:

- Transmission gears
Blue discoloration/pitting/wear → Replace the defective gear(s).
- Transmission gear dogs
Cracks/damage/rounded edges → Replace the defective gear(s).



4. Check:

- Transmission gear engagement
(each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.

5. Check:

- Transmission gear movement
Rough movement → Replace the defective part(s).

EAS5S71023

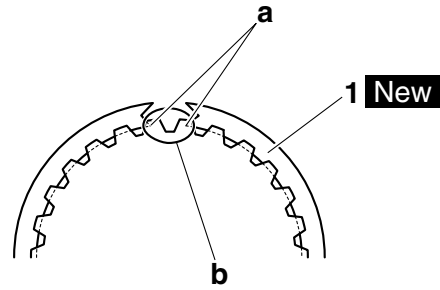
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

1. Install:

- Toothed washer
- Circlip "1" **New**

TIP

Install the circlip so that both ends "a" rest on the sides of a spline "b" with both axles aligned.

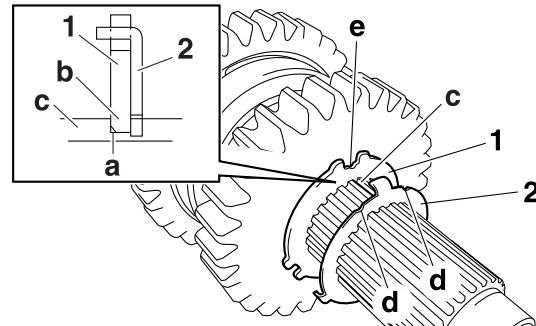


2. Install:

- Toothed lock washer retainer "1"
- Toothed lock washer "2"

TIP

- With the toothed lock washer retainer in the groove "a" in the drive axle, align the projection "b" on the retainer with an axle spline "c", and then install the toothed lock washer.
- Be sure to align the projection on the toothed lock washer that is between the alignment marks "d" with the alignment mark "e" on the retainer.



EAS26320

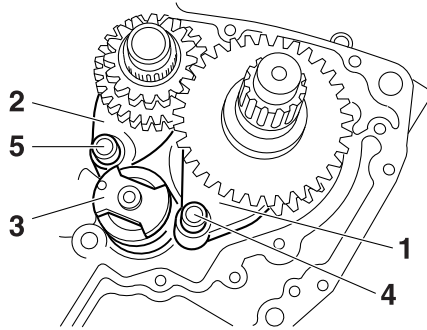
INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

1. Install:

- Shift forks 1 "1"
- Shift fork 2 "2"
- Shift drum assembly "3"
- Long shift fork guide bar "4"
- Short shift fork guide bar "5"

TIP

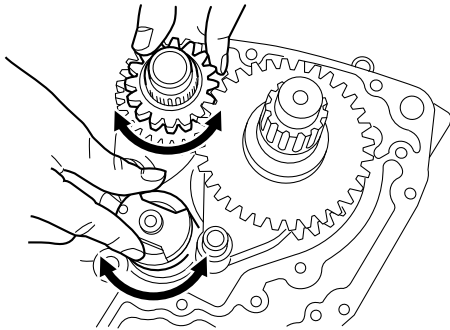
The embossed marks "3D8" on the shift forks should face towards the left side of the engine.



2. Check:
- Transmission
- Rough movement → Repair.

TIP

- Apply molybdenum disulfide grease to each gear and bearing thoroughly.
- Before assembling the crankcase, make sure that the transmission is in neutral and that the gears turn freely.



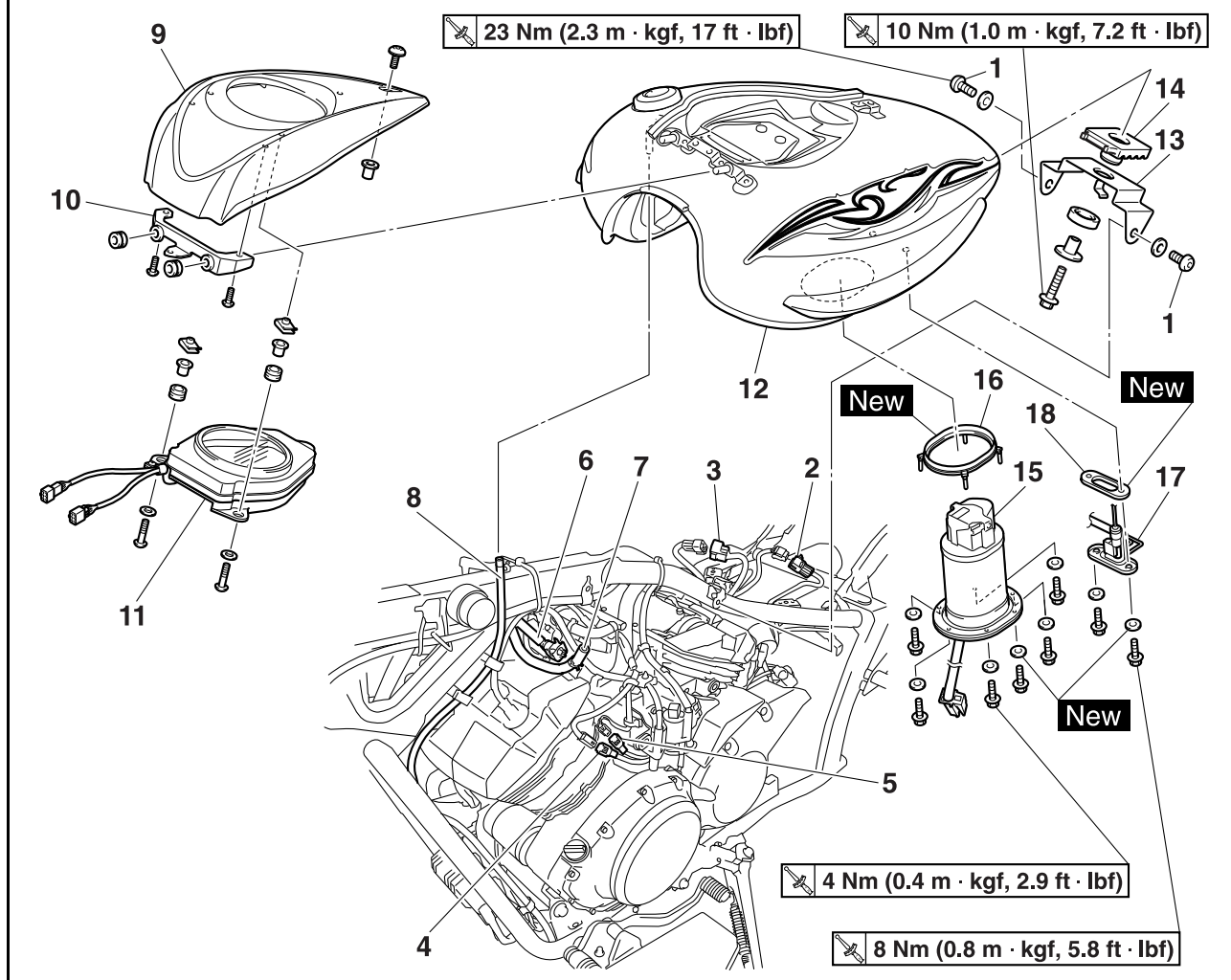
FUEL SYSTEM

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EAS26620

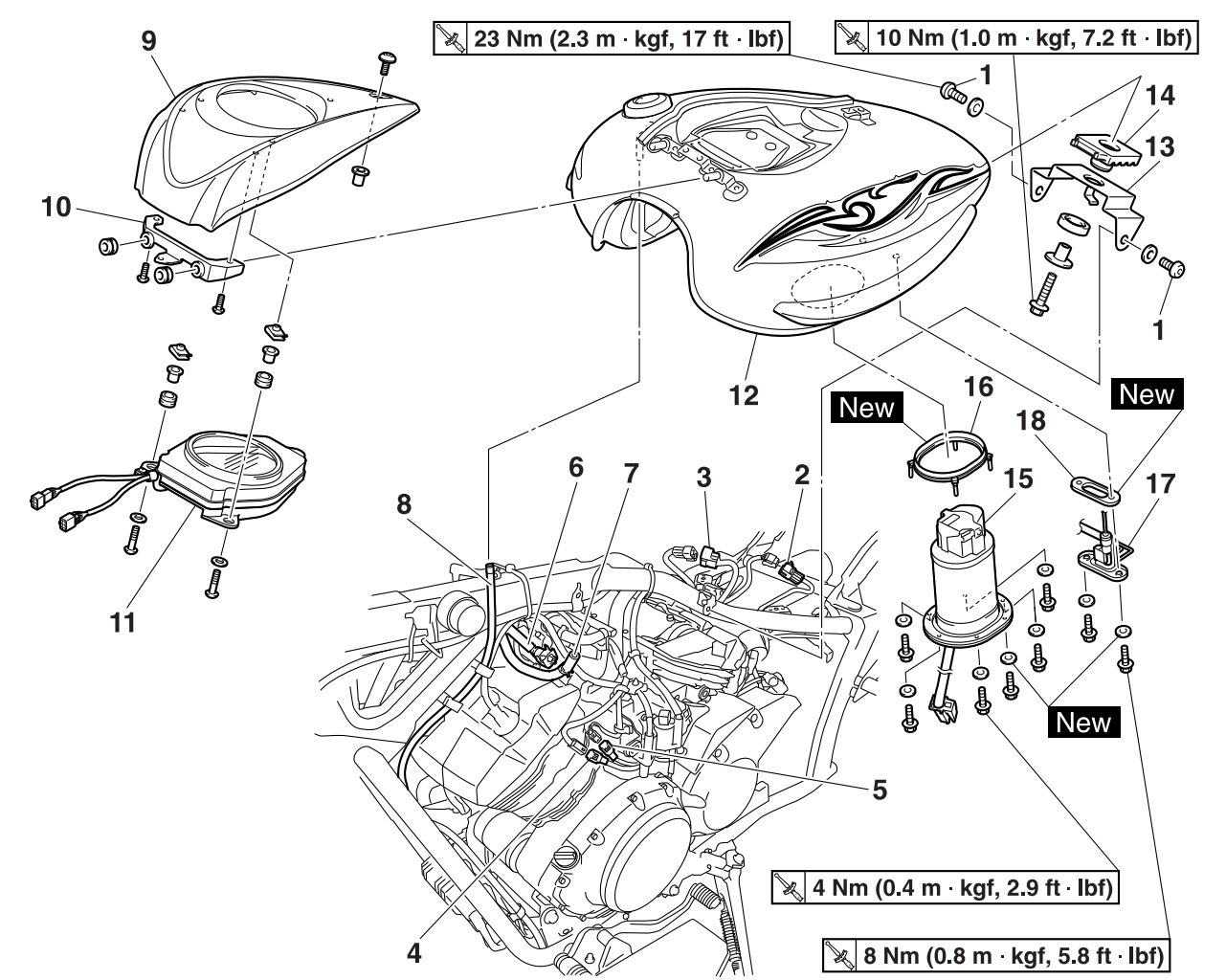
FUEL TANK

Removing the fuel tank



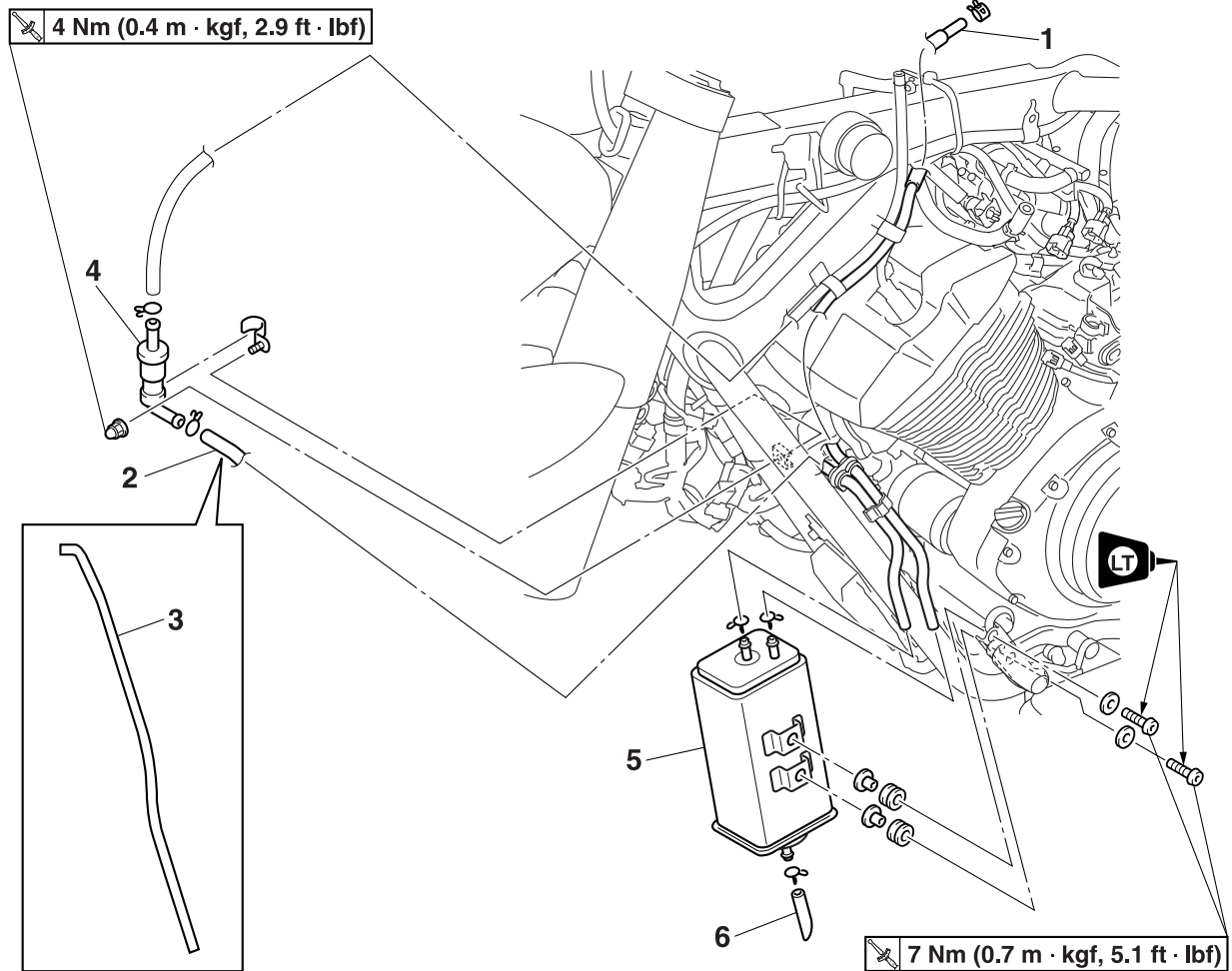
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover (cylinder head)		Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel tank bracket bolt	2	
2	Meter coupler 1	1	Disconnect.
3	Meter coupler 2	1	Disconnect.
4	Fuel pump coupler	1	Disconnect.
5	Fuel sender coupler	1	Disconnect.
6	Fuel hose	1	Disconnect.
7	Fuel return hose	1	Disconnect.
8	Fuel tank drain hose	1	
9	Meter cover	1	
10	Meter stay	1	
11	Meter assembly	1	
12	Fuel tank	1	
13	Fuel tank bracket	1	
14	Damper	1	
15	Fuel pump	1	
16	Fuel pump gasket	1	
17	Fuel sender	1	

Removing the fuel tank



Order	Job/Parts to remove	Q'ty	Remarks
18	Fuel sender gasket	1	
			For installation, reverse the removal procedure.

Removing the rollover valve and canister



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Fuel tank drain hose		Refer to "FUEL TANK" on page 6-1.
1	Canister purge hose	1	California only
2	Fuel tank breather hose	1	California only
3	Fuel tank breather hose	1	Except for California
4	Rollover valve	1	
5	Canister	1	California only
6	Canister breather hose	1	California only
			For installation, reverse the removal procedure.

EAS5S71013

REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.

EAS5S71014

REMOVING THE FUEL PUMP

1. Remove:
 - Fuel hose

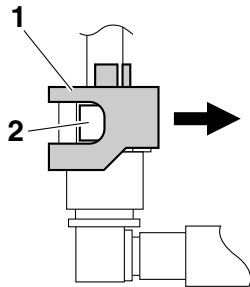
EWA5S71004

WARNING

Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

TIP

- To remove the fuel hose from the fuel pump, slide the fuel hose connector cover “1” on the end of the hose in the direction of the arrow shown, press the two buttons “2” on the sides of the connector, and then remove the hose.
- Remove the fuel hose manually without using any tools.
- Before removing the hose, place a few rags in the area under where it will be removed.



2. Remove:
 - Fuel pump

ECA5S71005

NOTICE

Do not drop the fuel pump or give it a strong shock.

EAS26670

CHECKING THE FUEL PUMP BODY

1. Check:
 - Fuel pump body
Obstruction → Clean.
Cracks/damage → Replace the fuel pump assembly.

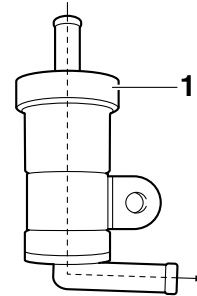
EAS5S71041

CHECKING THE ROLLOVER VALVE

1. Check:
 - Rollover valve “1”
Damage/faulty → Replace.

TIP

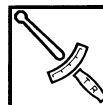
- Check that air flows smoothly only in the direction of the arrow shown in the illustration.
- The rollover valve must be in an upright position when checking the airflow.



EAS5S71015

INSTALLING THE FUEL PUMP

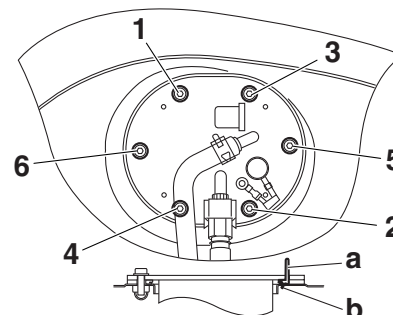
1. Install:
 - Fuel pump



Fuel pump bolt
4 Nm (0.4 m·kgf, 2.9 ft·lbf)

TIP

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Install the fuel pump as shown in the illustration.
- Pull O-ring's boss “a” (4 places) out to outside of pump plate.
- O-ring's lip “b” shall face up.
- Tighten the fuel pump bolts in the proper tightening sequence as shown.



2. Install:

- Fuel hose

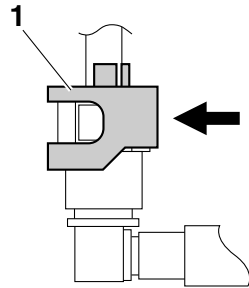
ECA5S71006

NOTICE

When installing the fuel hose, make sure that it is securely connected, and that the fuel hose connector cover on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.

TIP

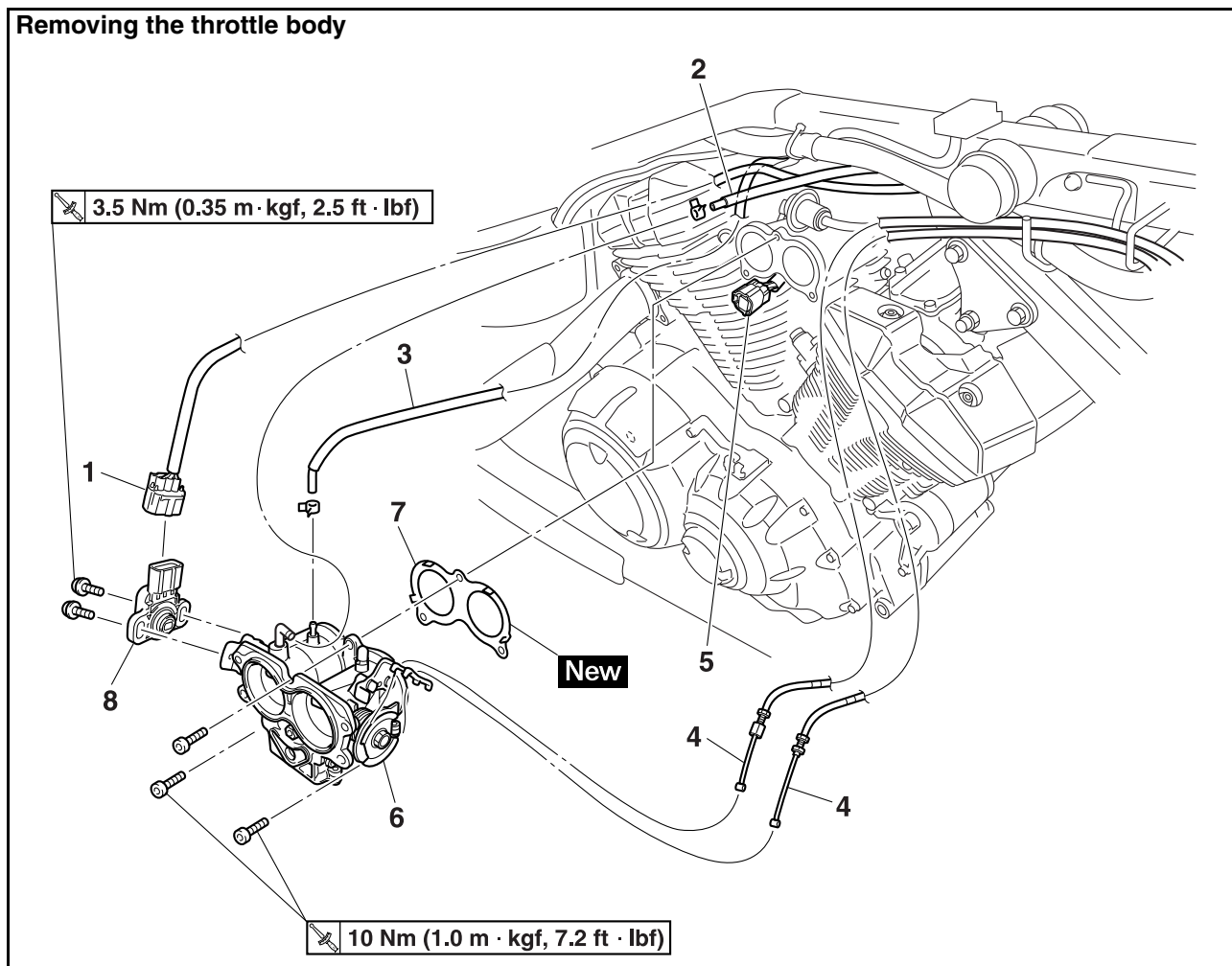
- Install the fuel hose securely onto the fuel pump until a distinct “click” is heard.
- To install the fuel hose onto the fuel pump, slide the fuel hose connector cover “1” on the end of the hose in the direction of the arrow shown.



EAS26970

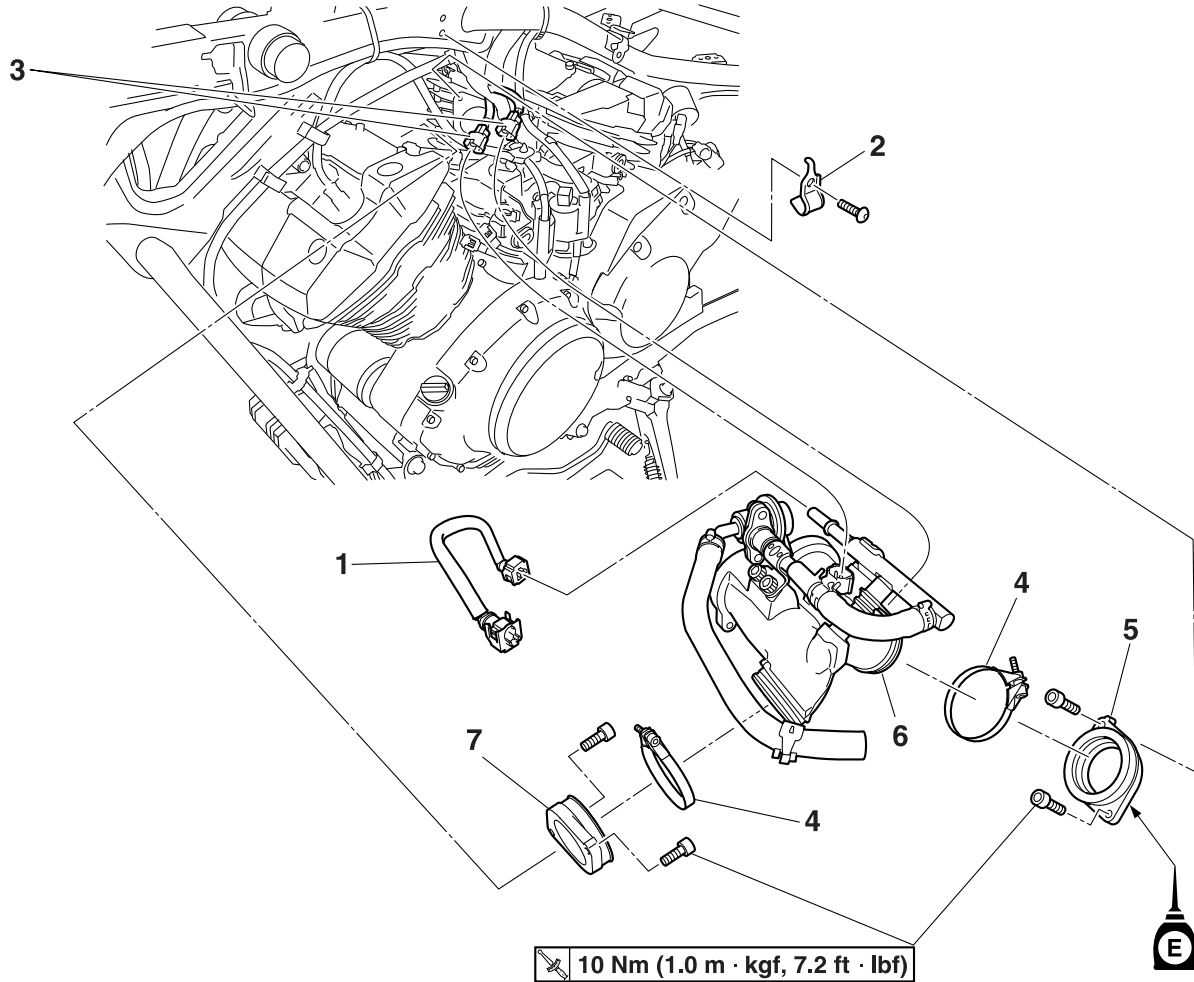
THROTTLE BODIES

Removing the throttle body



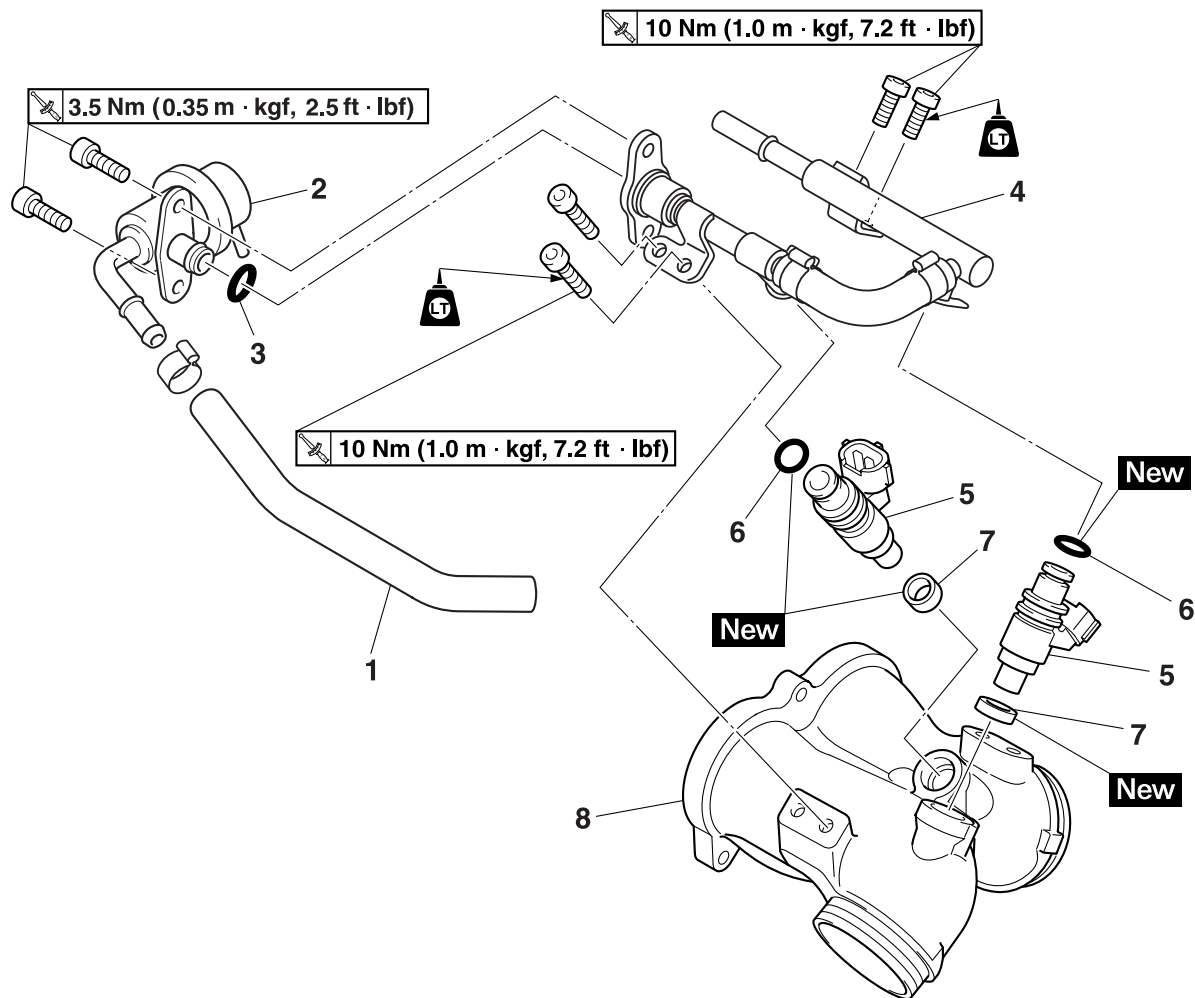
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
1	Throttle position sensor coupler	1	Disconnect.
2	Canister purge hose	1	California only. Disconnect.
3	Intake air pressure sensor hose	1	Disconnect.
4	Throttle cable	2	Disconnect.
5	ISC (idle speed control) unit coupler	1	Disconnect.
6	Throttle body	1	ECA5S71007 NOTICE The throttle body should not be disassembled.
7	Gasket	1	
8	Throttle position sensor	1	
			For installation, reverse the removal procedure.

Removing the intake manifold assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Throttle body		Refer to "THROTTLE BODIES" on page 6-6.
1	Fuel hose	1	
2	Clutch cable holder 2	1	
3	Fuel injector coupler	2	Disconnect.
4	Intake manifold joint clamp screw	2	Loosen.
5	Rear cylinder intake manifold joint	1	
6	Intake manifold assembly	1	
7	Front cylinder intake manifold joint	1	
			For installation, reverse the removal procedure.

Disassembling the intake manifold



Order	Job/Parts to remove	Q'ty	Remarks
1	Fuel return hose	1	
2	Pressure regulator	1	
3	O-ring	1	
4	Inlet pipe assembly	1	
5	Injector	2	
6	O-ring	2	
7	Gasket	2	
8	Intake manifold	1	
			For assembly, reverse the disassembly procedure.

EAS26980

CHECKING THE INJECTORS

EWA5S71011

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 hoses. Any remaining pressure in the fuel hoses may cause the fuel to spray out. Place a container or rag under the hoses 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 checking the injectors.

ECA5S71013

NOTICE

- Always use new O-rings.
- When checking the injectors, do not allow any foreign material to enter or adhere to the injectors, fuel rail, or O-rings.
- Be careful not to twist or pinch the O-rings when installing the injectors.
- If an injector is subject to strong shocks or excessive force, replace it.
- If installing the original fuel rail and bolts, remove the white paint marks using a cleaning solvent. Otherwise, paint chips on the bolt seats could prevent the bolts from being tightened to the specified torque.

1. Check:
 - Injectors
Damage/defective → Replace.
Refer to “FUEL INJECTION SYSTEM” on page 7-27.

EAS5S71042

INSTALLING THE INJECTORS

1. Install the injectors to the inlet pipe assembly.
2. Install a seal onto the end of each injector.
3. Install the injector assemblies to the intake manifold.



Inlet pipe assembly bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)
LOCTITE®

EAS26990

CHECKING THE THROTTLE BODIES

1. Check:
 - Throttle bodies
Cracks/damage → Replace the throttle bodies as a set.
2. Check:
 - Fuel passages
Obstructions → Clean.

EAS5S71044

CHECKING AND CLEANING THE THROTTLE BODIES

TIP

Clean the throttle bodies only if they cannot be synchronized using the bypass air screws. Before cleaning the throttle bodies, check the following items:

- Valve clearance
- Spark plugs
- Air filter element
- Throttle body joints
- Fuel hoses
- Exhaust system
- Canister purge hoses (for California only)
- Breather hoses

EWA5S71012

WARNING

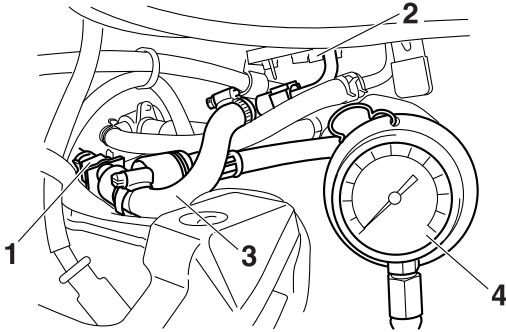
- If the throttle bodies are subjected to strong shocks or dropped during cleaning, replace them as a set.
- Before removing the throttle bodies to clean them, check the operation of the throttle bodies. Refer to “FUEL INJECTION SYSTEM” on page 7-27.

1. Check:
 - Throttle bodies
Cracks/damage → Replace the throttle bodies as a set.
2. Clean:
 - Throttle bodies

ECA5S71015

NOTICE

- Observe the following precautions; otherwise, the throttle bodies may not operate properly.
- To clean the throttle body, remove the throttle body from the vehicle.
- While cleaning, avoid injuring your fingers working around the throttle valve.
- Do not remove the bolts unspecified in the instructions (cause of malfunction).
- Do not open the throttle valves quickly.



- e. Start the engine.
- f. Measure the fuel pressure.



Fuel pressure

392.0 kPa (3.92 kgf/cm², 56.9 psi)

Faulty → Replace the fuel pump and pressure regulator.

EAS27030

ADJUSTING THE THROTTLE POSITION SENSOR

TIP

Before adjusting the throttle position sensor, the engine idling speed should be properly adjusted.

1. Check:
 - Throttle position sensor

Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 7-94.
2. Adjust:
 - Throttle position sensor angle

- a. Connect the throttle position sensor coupler to the throttle position sensor.
- b. Connect the digital circuit tester to the throttle position sensor.

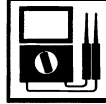
- Positive tester probe → yellow “1”
- Negative tester probe → black/blue “2”



Digital circuit tester

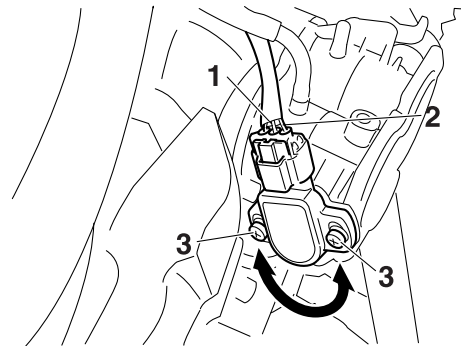
90890-03174
Model 88 Multimeter with tachometer
YU-A1927

- c. Turn the main switch to “ON”.
- d. Measure the throttle position sensor output voltage.
- e. Adjust the throttle position sensor angle so that the output voltage is within the specified range.



Output voltage (at idle)
0.63–0.73 V

- f. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws “3”.

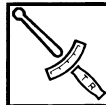


EAS5S71017

INSTALLING THE INTAKE MANIFOLD ASSEMBLY

1. Install:
 - Intake manifold assembly

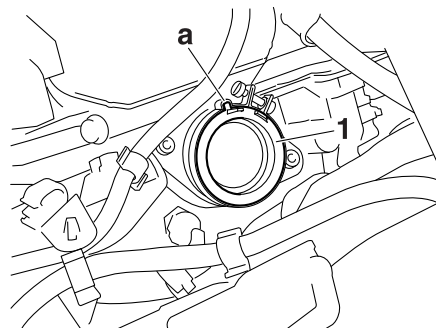
- a. Install the front cylinder intake manifold joint “1” to the front cylinder head.



Front cylinder intake manifold joint bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

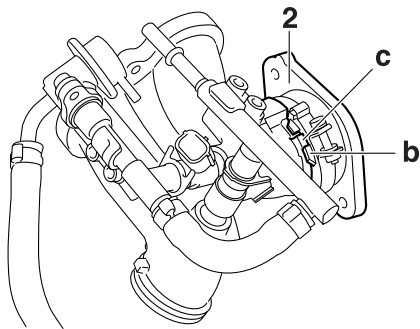
TIP

Install the front cylinder intake manifold joint with its projection “a” facing up as shown in the illustration.



- b. Install the rear cylinder intake manifold joint “2” to the intake manifold assembly.

TIP _____
Make sure that the projection “b” on the rear cylinder intake manifold joint contacts the projection “c” on the intake manifold assembly.



- c. Install the intake manifold assembly.



Rear cylinder intake manifold joint bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP _____
Lubricate the rear cylinder intake manifold joint and rear cylinder head mating surfaces with engine oil.



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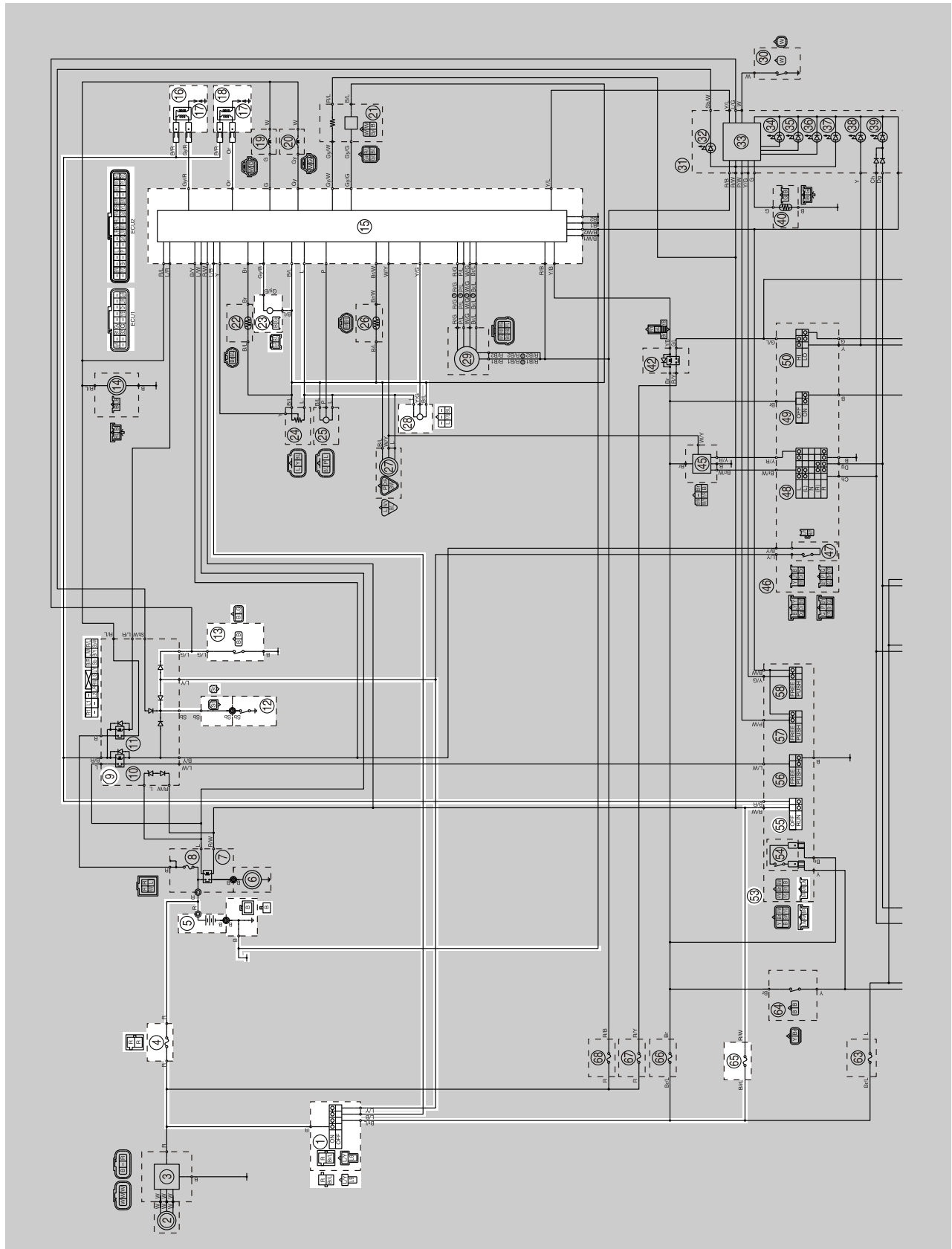
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EAS27090

IGNITION SYSTEM

EAS27110

CIRCUIT DIAGRAM



- 1. Main switch
- 4. Main fuse
- 5. Battery
- 9. Relay unit
- 12. Neutral switch
- 13. Sidestand switch
- 15. ECU (engine control unit)
- 16. Rear cylinder ignition coil
- 17. Spark plug
- 18. Front cylinder ignition coil
- 23. Crankshaft position sensor
- 28. Lean angle sensor
- 53. Right handlebar switch
- 55. Engine stop switch
- 65. Ignition fuse

When the engine is running and the transmission is in gear, the engine will stop if the sidestand is moved down. This is because the electric current from the ignition coils does not flow to the ECU when both the neutral switch and sidestand switch are set to “OFF”, thereby preventing the spark plugs from producing a spark. However, the engine continues to run under the following conditions:

-

1. Battery
2. Main fuse
3. Main switch
4. Ignition fuse
5. Engine stop switch
6. Ignition coil
7. Spark plug
8. ECU (engine control unit)
9. Sidestand switch
10. Relay unit (diode)
11. Neutral switch

EAS27140

TROUBLESHOOTING

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

TIP

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

1. Rider seat
2. Seat lock bracket
3. Battery
4. Battery box
5. Fuel tank
6. Side cover (cylinder head)

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 7-81.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-82.	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the spark plugs. Refer to "CHECKING THE SPARK PLUGS" on page 3-4.	NG→	Regap or replace the spark plug(s).
OK↓		
4. Check the ignition spark gap. Refer to "CHECKING THE IGNITION SPARK GAP" on page 7-88.	OK→	Ignition system is OK.
NG↓		
5. Check the spark plug caps. Refer to "CHECKING THE SPARK PLUG CAPS" on page 7-88.	NG→	Replace the spark plug cap(s).
OK↓		
6. Check the ignition coils. Refer to "CHECKING THE IGNITION COILS" on page 7-88.	NG→	Replace the ignition coil(s).
OK↓		
7. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 7-89.	NG→	Replace the crankshaft position sensor/stator assembly.
OK↓		

8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the main switch.
OK↓		
9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the right handlebar switch.
OK↓		
10. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the neutral switch.
OK↓		
11. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the sidestand switch.
OK↓		
12. Check the relay unit (diode). Refer to "CHECKING THE DIODES" on page 7-87.	NG→	Replace the relay unit.
OK↓		
13. Check the lean angle sensor. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 7-89.	NG→	Replace the lean angle sensor.
OK↓		
14. Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-1.	NG→	Properly connect or repair the ignition system's wiring.
OK↓		
Replace the ECU.		

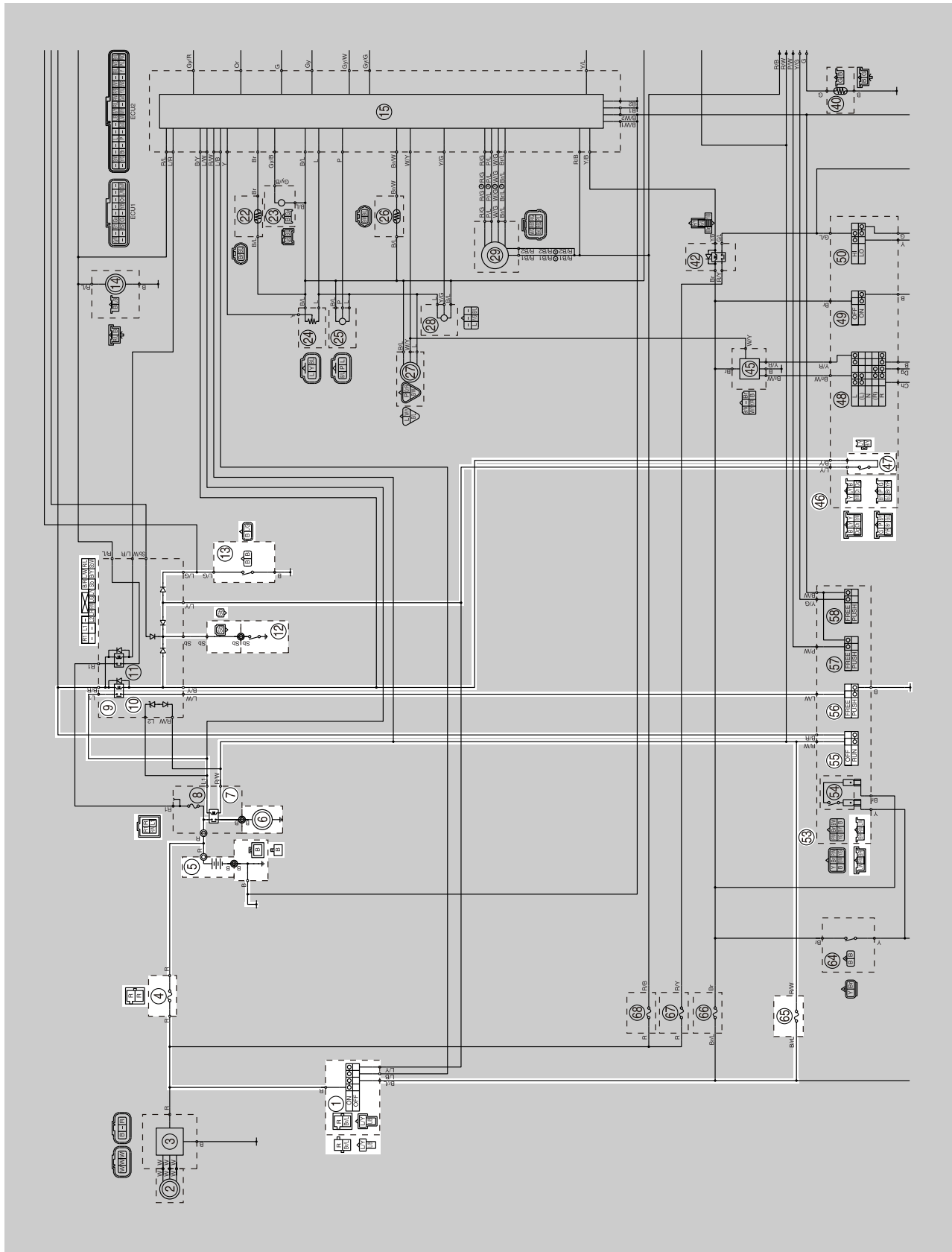
ELECTRIC STARTING SYSTEM

EAS27160

ELECTRIC STARTING SYSTEM

EAS27170

CIRCUIT DIAGRAM



- 1. Main switch
- 4. Main fuse
- 5. Battery
- 6. Starter motor
- 7. Starter relay
- 9. Relay unit
- 10. Starting circuit cut-off relay
- 12. Neutral switch
- 13. Sidestand switch
- 46. Left handlebar switch
- 47. Clutch switch
- 53. Right handlebar switch
- 55. Engine stop switch
- 56. Start switch
- 65. Ignition fuse

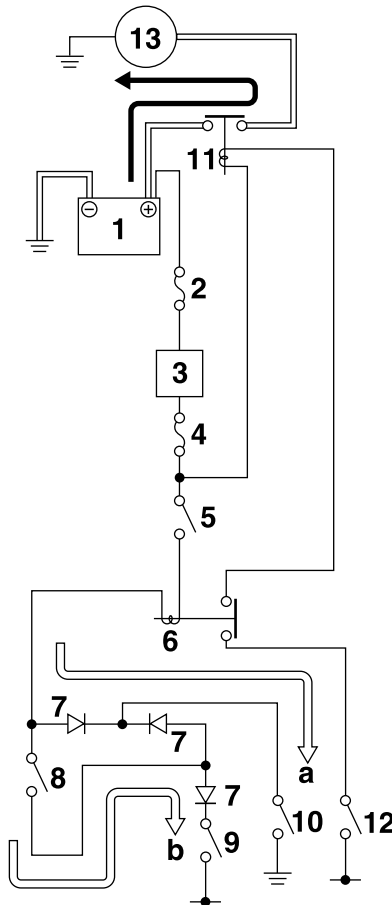
EAS27180

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

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

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

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



- a. WHEN THE TRANSMISSION IS IN NEUTRAL
- b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR

- 1. Battery
- 2. Main fuse
- 3. Main switch
- 4. Ignition fuse
- 5. Engine stop switch
- 6. Relay unit (starting circuit cut-off relay)
- 7. Relay unit (diode)
- 8. Clutch switch
- 9. Sidestand switch
- 10. Neutral switch
- 11. Starter relay
- 12. Start switch
- 13. Starter motor

EAS27190

TROUBLESHOOTING

The starter motor fails to turn.

TIP

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

1. Rider seat
2. Seat lock bracket

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 7-81.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-82.	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the starter motor operation. Refer to "CHECKING THE STARTER MOTOR OPERATION" on page 7-90.	OK→	The 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" on page 5-57.	NG→	Repair or replace the starter motor.
OK↓		
5. Check the relay unit (starting circuit cut-off relay). Refer to "CHECKING THE RELAYS" on page 7-85.	NG→	Replace the relay unit.
OK↓		
6. Check the relay unit (diode). Refer to "CHECKING THE DIODES" on page 7-87.	NG→	Replace the relay unit.
OK↓		
7. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 7-85.	NG→	Replace the starter relay.
OK↓		

ELECTRIC STARTING SYSTEM

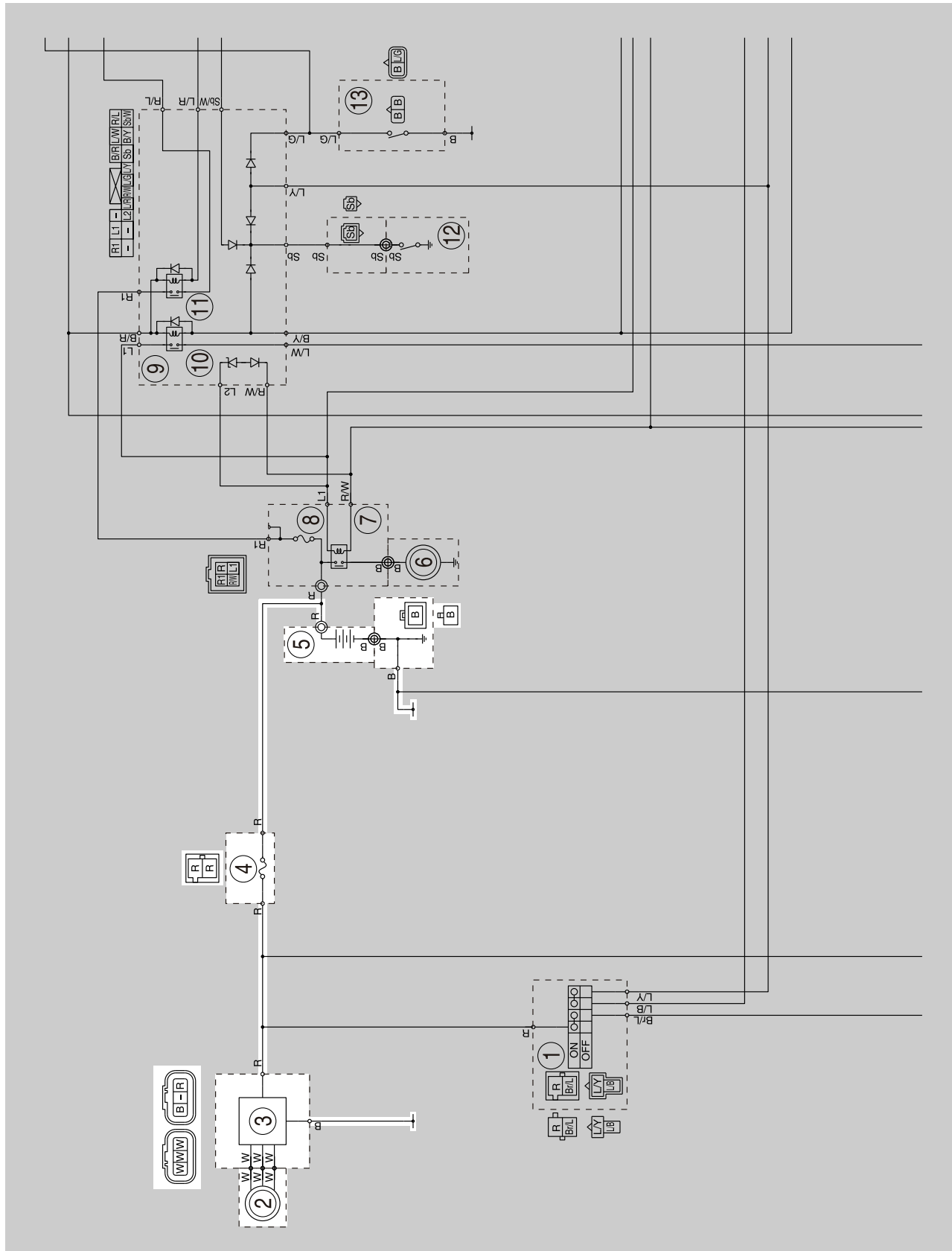
8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the main switch.
OK↓		
9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the right handlebar switch.
OK↓		
10. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the neutral switch.
OK↓		
11. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the sidestand switch.
OK↓		
12. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the clutch switch.
OK↓		
13. Check the start switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the right handlebar switch.
OK↓		
14. Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-7.	NG→	Properly connect or repair the starting system's wiring.
OK↓		
The starting system circuit is OK.		

EAS27200

CHARGING SYSTEM

EAS27210

CIRCUIT DIAGRAM



2. AC magneto
3. Rectifier/regulator
4. Main fuse
5. Battery

EAS27230

TROUBLESHOOTING

The battery is not being charged.

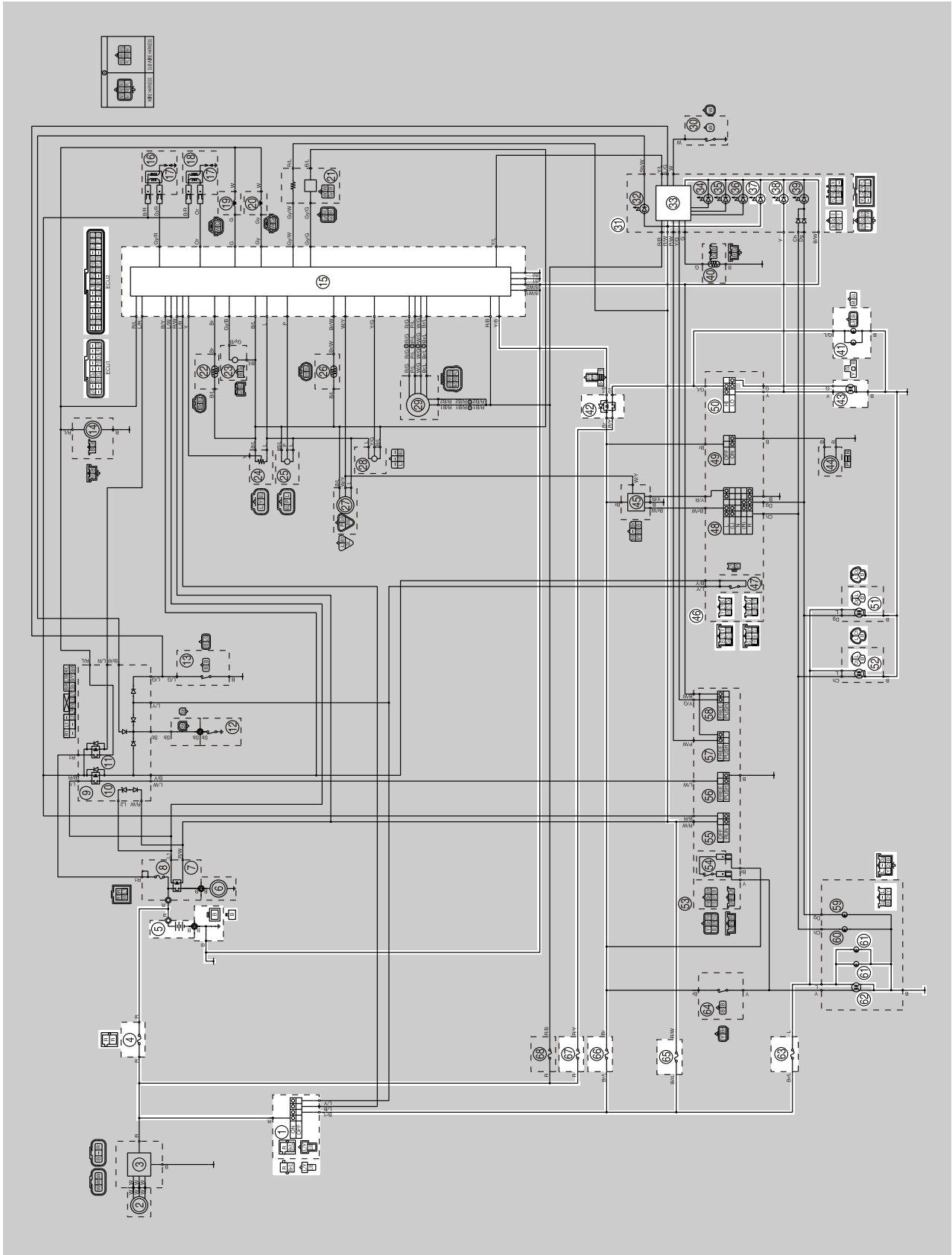
TIP

- Before troubleshooting, remove the following part(s):
 1. Rider seat
 2. Seat lock bracket

1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 7-81.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-82.	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 7-90.	NG→	Replace the crankshaft position sensor/stator assembly.
OK↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 7-91.	NG→	Replace the rectifier/regulator.
OK↓		
5. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-13.	NG→	Properly connect or repair the charging system's wiring.
OK↓		
The charging system circuit is OK.		

EAS27240
LIGHTING SYSTEM

EAS27250
CIRCUIT DIAGRAM



- 1. Main switch
- 4. Main fuse
- 5. Battery
- 15.ECU (engine control unit)
- 31.Meter assembly
- 33.Multi-function meter
- 37.Meter light
- 38.High beam indicator light
- 41.Accessory light (OPTION)
- 42.Headlight relay
- 43.Headlight
- 46.Left handlebar switch
- 50.Dimmer switch
- 51.Front right turn signal light
- 52.Front left turn signal light
- 61.License plate light
- 62.Tail/brake light
- 63.Taillight fuse
- 65.Ignition fuse
- 66.Signaling system fuse
- 67.Headlight fuse

EAS27260

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, license plate light, position light, meter light and accessory light (OPTION).

TIP

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

1. Rider seat
2. Seat lock bracket
3. Fuel tank

1. Check the condition of each bulb and bulb socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-80.	NG→	Replace the bulb(s) and bulb socket(s).
OK↓		
2. Check the fuses. (Main, headlight, signaling system, ignition and taillight) Refer to "CHECKING THE FUSES" on page 7-81.	NG→	Replace the fuse(s).
OK↓		
3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-82.	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the main switch.
OK↓		
5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	The dimmer switch is faulty. Replace the left handlebar switch.
OK↓		
6. Check the headlight relay. Refer to "CHECKING THE RELAYS" on page 7-85.	NG→	Replace the headlight relay.
OK↓		

7. Check the entire lighting system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 7-17.

NG→

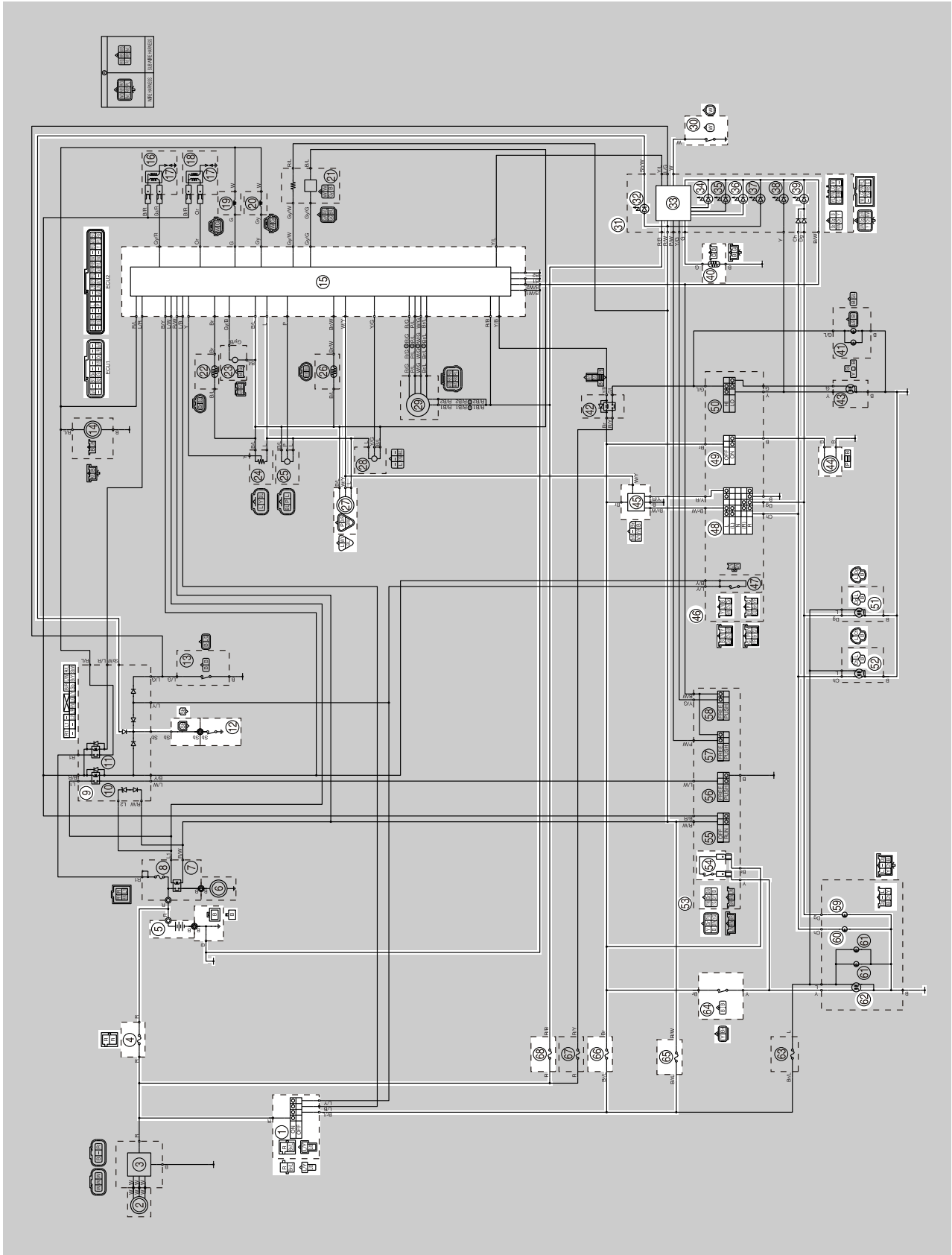
Properly connect or repair the lighting system's wiring.

OK↓

Replace the ECU or meter assembly.

EAS27270
SIGNALING SYSTEM

EAS27280
CIRCUIT DIAGRAM



- 1. Main switch
- 4. Main fuse
- 5. Battery
- 9. Relay unit
- 12. Neutral switch
- 15. ECU (engine control unit)
- 27. Speed sensor
- 30. Oil level switch
- 31. Meter assembly
- 32. Neutral indicator light
- 33. Multi-function meter
- 34. Oil level warning light
- 36. Fuel level warning light
- 39. Turn signal indicator light
- 40. Fuel sender
- 44. Horn
- 45. Turn signal relay
- 46. Left handlebar switch
- 48. Turn signal switch
- 49. Horn switch
- 51. Front right turn signal light
- 52. Front left turn signal light
- 53. Right handlebar switch
- 54. Front brake light switch
- 59. Rear right turn signal light
- 60. Rear left turn signal light
- 62. Tail/brake light
- 64. Rear brake light switch
- 65. Ignition fuse
- 66. Signaling system fuse
- 68. Backup fuse

EAS27290

TROUBLESHOOTING

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

TIP

- Before troubleshooting, remove the following part(s):
 1. Rider seat
 2. Seat lock bracket
 3. Fuel tank

1. Check the fuses. (Main, signaling system, ignition and backup) Refer to "CHECKING THE FUSES" on page 7-81.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-82.	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the main switch.
OK↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-21.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
Check the condition of each of the signaling system's circuits. Refer to "Checking the signaling system".		

Checking the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	The horn switch is faulty. Replace the left handlebar switch.
OK↓		
2. Check the horn. Refer to "CHECKING THE HORN" on page 7-91.	NG→	Replace the horn.
OK↓		

<div>3. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-21.</div>	NG→	<div>Properly connect or repair the signaling system's wiring.</div>
OK↓		
<div>This circuit is OK.</div>		
The brake light fails to come on.		
<div>1. Check the brake light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-80.</div>	NG→	<div>Replace the brake light bulb, socket or both.</div>
OK↓		
<div>2. Check the front brake light switch. Refer to "CHECKING THE SWITCHES" on page 7-77.</div>	NG→	<div>Replace the front brake light switch.</div>
OK↓		
<div>3. Check the rear brake light switch. Refer to "CHECKING THE SWITCHES" on page 7-77.</div>	NG→	<div>Replace the rear brake light switch.</div>
OK↓		
<div>4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-21.</div>	NG→	<div>Properly connect or repair the signaling system's wiring.</div>
OK↓		
<div>This circuit is OK.</div>		
The turn signal light, turn signal indicator light or both fail to blink.		
<div>1. Check the turn signal light bulbs and sockets. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-80.</div>	NG→	<div>Replace the turn signal light bulb(s), socket(s) or both.</div>
OK↓		
<div>2. Check the turn signal switch. Refer to "CHECKING THE SWITCHES" on page 7-77.</div>	NG→	<div>The turn signal switch is faulty. Replace the left handlebar switch.</div>
OK↓		

3. Check the turn signal relay. Refer to "CHECKING THE RELAYS" on page 7-85.	NG→	Replace the turn signal relay.
OK↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-21.	NG→	Properly connect or repair the signaling system's wiring.
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 7-77.	NG→	Replace the neutral switch.
OK↓		
2. Check the relay unit (diode). Refer to "CHECKING THE DIODES" on page 7-87.	NG→	Replace the relay unit.
OK↓		
3. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-21.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
Replace the meter assembly.		
The oil level warning light fails to come on.		
1. Check the oil level switch. Refer to "CHECKING THE OIL LEVEL SWITCH" on page 7-91.	NG→	Replace the oil level switch.
OK↓		
2. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-21.	NG→	Properly connect or repair the signaling system's wiring.
OK↓		
Replace the meter assembly.		

The fuel level warning light fails to come on.

1. Check the fuel sender.
Refer to "CHECKING THE FUEL
SENDER" on page 7-92.

NG→

Replace the fuel sender.

OK↓

2. Check the entire signaling system's
wiring.
Refer to "CIRCUIT DIAGRAM" on
page 7-21.

NG→

Properly connect or repair the signal-
ing system's wiring.

OK↓

Replace the meter assembly.

The speedometer fails to operate.

1. Check the speed sensor.
Refer to "CHECKING THE SPEED
SENSOR" on page 7-93.

NG→

Replace the speed sensor.

OK↓

2. Check the entire signaling system's
wiring.
Refer to "CIRCUIT DIAGRAM" on
page 7-21.

NG→

Properly connect or repair the signal-
ing system's wiring.

OK↓

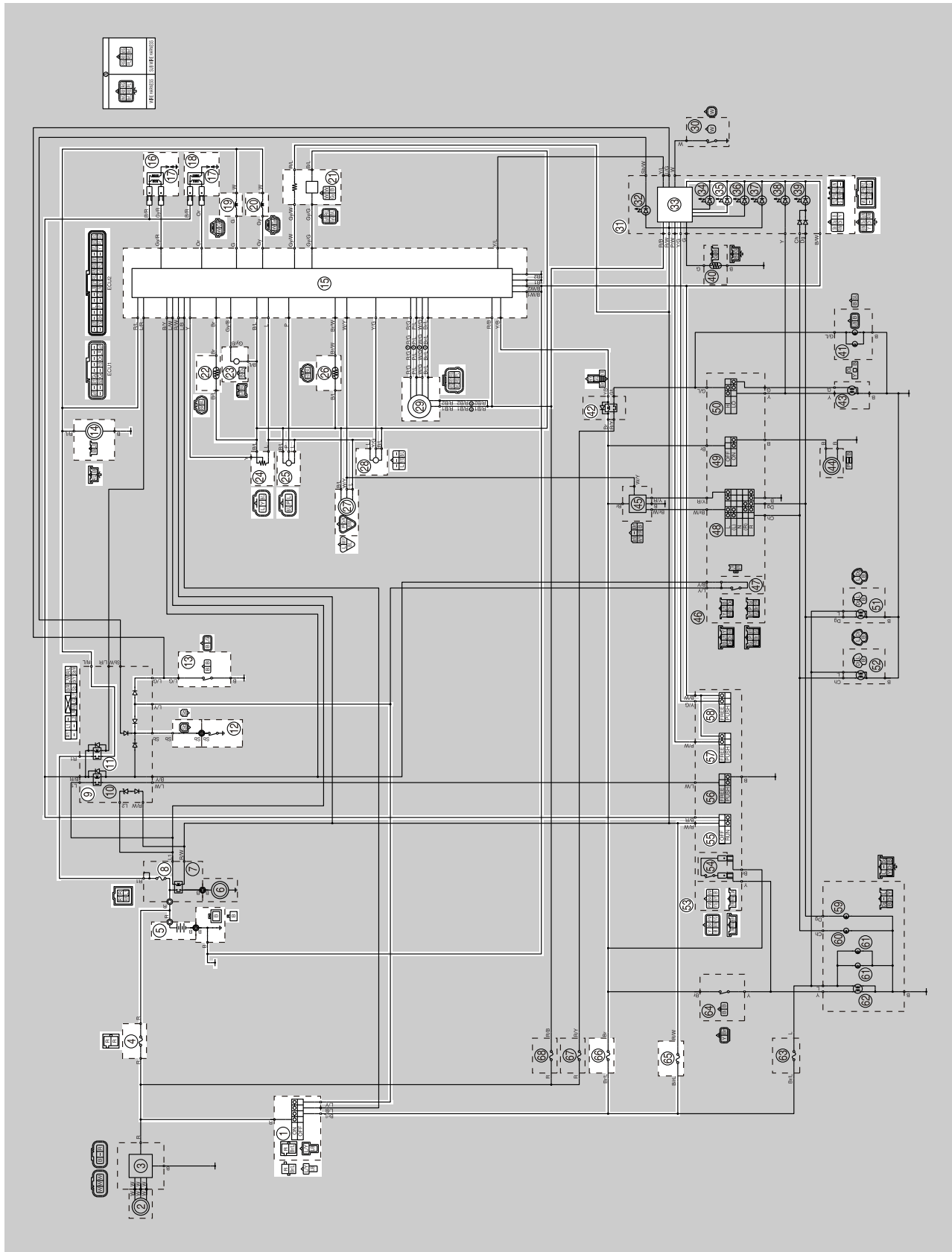
Replace the ECU or meter assembly.

EAS27330

FUEL INJECTION SYSTEM

EAS27340

CIRCUIT DIAGRAM



1. Main switch
4. Main fuse
5. Battery
8. Fuel injection system fuse
9. Relay unit
11. Fuel pump relay
12. Neutral switch
13. Sidestand switch
14. Fuel pump
15. ECU (engine control unit)
16. Rear cylinder ignition coil
17. Spark plug
18. Front cylinder ignition coil
19. Rear cylinder injector
20. Front cylinder injector
21. O₂ sensor
22. Engine temperature sensor
23. Crankshaft position sensor
24. Throttle position sensor
25. Intake air pressure sensor
26. Air temperature sensor
27. Speed sensor
28. Lean angle sensor
29. ISC (idle speed control) unit
31. Meter assembly
33. Multi-function meter
35. Engine trouble warning light
42. Headlight relay
53. Right handlebar switch
55. Engine stop switch
57. Select switch
58. Reset switch
65. Ignition fuse
66. Signaling system fuse

EAS27350

ECU SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning, the engine trouble warning light flashes when the start switch is being pushed to start the engine.
- If a malfunction is detected in the system by the self-diagnostic function, the ECU provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating the engine trouble warning light.
- After the engine has been stopped, the lowest fault code number appears on the odometer/tripmeter/fuel reserve tripmeter/clock LCD. Once a fault code has been displayed, it remains stored in the memory of the ECU until it is deleted.

Engine trouble warning light indication and fuel injection system operation

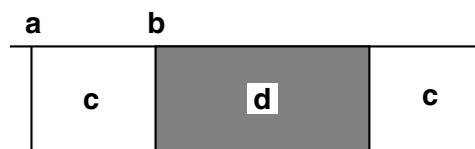
Warning light indication	ECU operation	Fuel injection operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Cannot be operated
Remains on	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	Can or cannot be operated depending on the fault code

* The warning light flashes when any one of the conditions listed below is present and the start switch is pushed:

12:	Crankshaft position sensor	41:	Lean angle sensor (open or short-circuit)
19:	Blue/yellow ECU lead (broken or disconnected)	50:	ECU internal malfunction (memory check error)
30:	Lean angle sensor (latch up detected)		

Checking the engine trouble warning light

The engine trouble warning light comes on for 1.4 seconds after the main switch has been turned to "ON" and it comes on while the start switch is being pushed. If the warning light does not come on under these conditions, the warning light (LED) may be defective.



- a. Main switch "OFF"
- b. Main switch "ON"

- c. Engine trouble warning light off
- d. Engine trouble warning light on for 1.4 seconds

EAS27363

FAIL-SAFE ACTIONS (SUBSTITUTE CHARACTERISTICS OPERATION CONTROL)

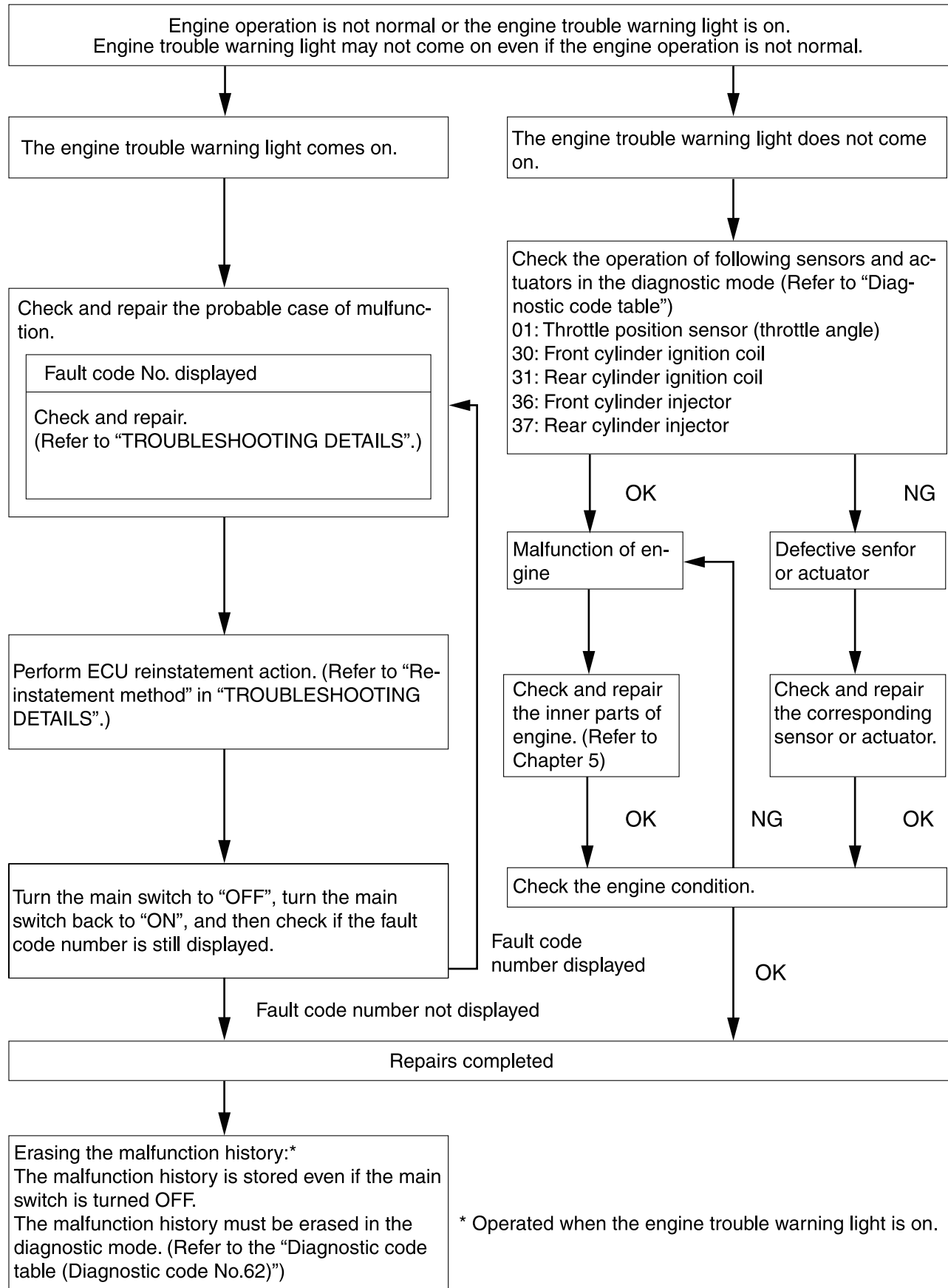
If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue to operate or stop operating, depending on the conditions.

The ECU takes fail-safe actions in two ways: one in which the sensor output is set to a prescribed value, and the other in which the ECU directly operates an actuator. Details on the fail-safe actions are given in the table below.

EAS5S71040

TROUBLE SHOOTING CHART

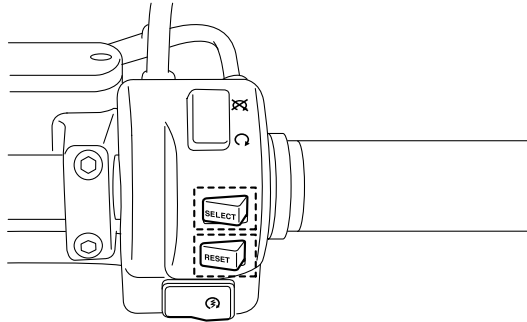


EAS27420

DIAGNOSTIC MODE

Setting the diagnostic mode

1. Turn the main switch to “OFF” and set the engine stop switch to “○”.
2. Disconnect the wire harness coupler from the fuel pump.
3. Simultaneously press and hold the “SELECT” and “RESET” buttons, turn the main switch to “ON”, and continue to press the buttons for 8 seconds or more.



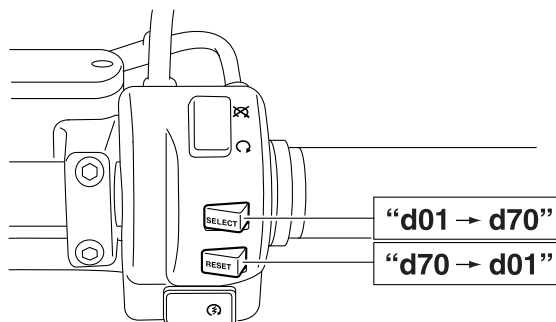
TIP

- All displays on the meter disappear except the clock and odometer/trip meter/fuel reserve trip meter/clock displays.
- “dIAG” appears on the odometer/trip meter/fuel reserve trip meter/clock LCD.

4. Simultaneously press the “SELECT” switch and the “RESET” switch for 2 seconds or more to activate the diagnostic mode. The diagnostic code number “d01” appears on the clock LCD.
5. Set the engine stop switch to “⊗”.
6. Select the diagnostic code number corresponding to the fault code number by pressing the “SELECT” and “RESET” switches.

TIP

- To decrease the selected diagnostic code number, press the “SELECT” switch. Press the “SELECT” switch for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the “SELECT” switch. Press the “SELECT” switch for 1 second or longer to automatically increase the diagnostic code numbers.



7. Verify the operation of the sensor or actuator.
 - Sensor operation
The data representing the operating conditions of the sensor appears on the odometer/trip meter/fuel reserve trip meter/clock LCD.
 - Actuator operation
Set the engine stop switch to “○” to operate the actuator.

TIP

If the engine stop switch is set to “○”, set it to “⊗”, and then set it to “○” again.

8. Turn the main switch to “OFF” to cancel the diagnostic mode.

EAS27460

TROUBLESHOOTING DETAILS

This section describes the measures per fault code number displayed on the meter. Check and service the items or components that are the probable cause of the malfunction following the order given.

After the check and service of the malfunctioning part has been completed, reset the meter display according to the reinstatement method.

Fault code No.:

Code number displayed on the meter when the engine failed to work normally. Refer to “Self-Diagnostic Function table”.

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to “DIAGNOSTIC MODE” on page 7-32.

Fault code No.	12		
Symptom	Normal signals are not received from the crankshaft position sensor.		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of crankshaft position sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Gray/Black–Gray/Black Black/Blue–Black/Blue	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	12		
Symptom	Normal signals are not received from the crankshaft position sensor.		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Sensor installation status - Check the mounting section for loose or pinched mounting.	Incorrect installation → Reinstall or repair the sensor.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Crankshaft position sensor malfunction	Sensor inspection procedure Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” on page 7-89.	Crank the engine, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

If fault codes 13 and 14 are indicated simultaneously, take the actions specified for fault code 13 first.

Fault code No.	13		
Symptom	Open or short circuit of intake air pressure sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	03		
Meter display	When engine is stopped: Make sure that the atmospheric pressure is indicated.		
Checking method	When engine is cranking: The indication value changes because the intake air pressure changes.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of intake air pressure sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Pink–Pink Blue–Blue	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	13		
Symptom	Open or short circuit of intake air pressure sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	03		
Meter display	When engine is stopped: Make sure that the atmospheric pressure is indicated.		
Checking method	When engine is cranking: The indication value changes because the intake air pressure changes.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Intake air pressure sensor malfunction	<p>Check in the diagnostic mode (Code No. 03).</p> <p>When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated.</p> <p>0 m above sea level: Approx. 101 kPa</p> <p>1000 m above sea level: Approx. 90 kPa</p> <p>2000 m above sea level: Approx. 80 kPa</p> <p>3000 m above sea level: Approx. 70 kPa</p> <p>When engine is cranking: Make sure that the indication value changes.</p> <p>Incorrect indication →</p> <p>Sensor malfunction →</p> <p>Replace the intake air pressure sensor.</p> <p>Sensor inspection procedure</p> <p>Refer to "CHECKING THE INTAKE AIR PRESSURE SENSOR" on page 7-94.</p>	<p>Place the main switch to the ON position, and check the fault code indication.</p> <p>No fault code indicated. → Recovered.</p> <p>Fault code indicated. → Check the next step.</p>
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

If fault codes 13 and 14 are indicated simultaneously, take the actions specified for fault code 13 first.

Fault code No.	14		
Symptom	The intake air pressure sensor has failed (due to clogging of hose or sensor disconnection).		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	03		
Meter display	When engine is stopped: Make sure that the atmospheric pressure is indicated.		
Checking method	When engine is cranking: The indication value changes because the intake air pressure changes.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	The intake air pressure sensor hose is damaged, disconnected, clogged, twisted or bent.	Repair or replace the sensor hose.	Starting the engine and operating it at idle. Fully close the throttle and check the fault recovery.
2	Intake air pressure sensor malfunction	<p>Check in the diagnostic mode (Code No. 03).</p> <p>When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated.</p> <p>0 m above sea level: Approx. 101 kPa</p> <p>1000 m above sea level: Approx. 90 kPa</p> <p>2000 m above sea level: Approx. 80 kPa</p> <p>3000 m above sea level: Approx. 70 kPa</p> <p>When engine is cranking: Make sure that the indication value changes.</p> <p>The value does not change when engine is cranking. → Replace the intake air pressure sensor.</p> <p>Sensor inspection procedure</p> <p>Refer to "CHECKING THE INTAKE AIR PRESSURE SENSOR" on page 7-94.</p>	

FUEL INJECTION SYSTEM

Fault code No.	15		
Symptom	Open or short circuit of throttle position sensor lead		
Fail-safe action	Engine startup: Possible under certain conditions		
	Riding: Possible under certain conditions		
Diagnostic monitoring code No.	01		
Meter display	Display the throttle opening (between 0 and 125 degrees)		
	When throttle is fully closed: 15 to 18 degrees When throttle is fully opened: 97 to 102 degrees		
Checking method	Check the values when the throttle is fully closed and opened.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of throttle position sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Yellow–Yellow Blue–Blue	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Sensor installation status	Check for loose mounting, pinched mounting, or hard mounting. Make sure that the mounting position is correct. Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 6-11.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	15			
Symptom	Open or short circuit of throttle position sensor lead			
Fail-safe action	Engine startup: Possible under certain conditions			
	Riding: Possible under certain conditions			
Diagnostic monitoring code No.	01			
Meter display	Display the throttle opening (between 0 and 125 degrees)			
	When throttle is fully closed: 15 to 18 degrees When throttle is fully opened: 97 to 102 degrees			
Checking method	Check the values when the throttle is fully closed and opened.			
Order	Item/components and probable cause	Check or maintenance job		Sensor inspection procedure
5	Supply voltage of throttle position sensor lead	Check the supply voltage. (Black/Blue–Yellow) Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 7-94.		Repair/replace the wire harness, or replace the ECU (common to separate and integration models.)
		Line disconnection points	Output voltage	
		Disconnection of ground lead	5 V	
		Disconnection of output line	0 V	
		Disconnection of power supply line	0 V	
6	Throttle position sensor malfunction	Check in the diagnostic mode (Code No. 01). When throttle is fully closed: A value of 15–16 is indicated. When throttle is fully opened: A value of 97–102 is indicated. If the indication is outside of range: Replace the throttle position sensor.		Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
		7		

Fault code No.	19		
Symptom	Open or short circuit of ECU input line (Blue/Yellow lead)		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	20		
Meter display	Sidestand retracted: ON indication Sidestand extended: OFF indication		
Checking method	Make sure that the ON and OFF indication is switched when the sidestand is retracted and extended.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of side-stand switch coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Connection of main switch coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	19		
Symptom	Open or short circuit of ECU input line (Blue/Yellow lead)		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	20		
Meter display	Sidestand retracted: ON indication Sidestand extended: OFF indication		
Checking method	Make sure that the ON and OFF indication is switched when the sidestand is retracted and extended.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Continuity of wire harness	Open or short circuit → Replace the wire harness. (Black–Black) (Blue/Green–Blue/Green)	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Sidestand switch malfunction	Diagnostic mode (Code No. 20). Sidestand retracted: ON indication Sidestand extended: OFF indication Indication is incorrect. → Replace the sidestand switch.	Place the main switch to the ON position, and check the fault code indication when the sidestand is retracted and extended. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

*Check the sensor only when the engine is cold.

Fault code No.	22		
Symptom	Open or short circuit of intake air temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	05		
Meter display	-30 to 120 °C During cold starting: A temperature close to the ambient temperature is indicated. During hot starting: Ambient temperature plus Approx. 20 °C (Offset of radiation heat)		
Checking method	Make sure that the meter indication is close to the ambient temperature during cold starting.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of intake air temperature sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Brown/White–Brown/White	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Installation status of intake air temperature sensor	Check the mounting section for a loose or pinched mounting. Make sure that the mounting position is correct.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	22		
Symptom	Open or short circuit of intake air temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	05		
Meter display	-30 to 120 °C During cold starting: A temperature close to the ambient temperature is indicated. During hot starting: Ambient temperature plus Approx. 20 °C (Offset of radiation heat)		
Checking method	Make sure that the meter indication is close to the ambient temperature during cold starting.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Intake air temperature sensor malfunction	Check in the diagnostic mode (Code No. 05). Sensor inspection procedure Refer to "CHECKING THE AIR TEMPERATURE SENSOR" on page 7-95. During cold starting: A temperature close to the ambient temperature is indicated. Indication is incorrect. → Replace the intake air temperature sensor.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Replace the ECU	

FUEL INJECTION SYSTEM

Fault code No.	24		
Symptom	The O₂ sensor does not operate.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	O ₂ sensor installation status	Check the sensor for a loose mounting or a pinch	Either start and warm up the engine, and then racing it, or reset it with diagnostic code D63.
2	Connection of O ₂ sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
3	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
4	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Black/Blue–Black/Blue Gray/White–Gray/White Red/Blue–Red/Blue Gray/Green–Gray/Green	
5	Check the fuel pressure.	Refer to “CHECKING THE FUEL PRESSURE” on page 6-10.	

FUEL INJECTION SYSTEM

Fault code No.	24		
Symptom	The O₂ sensor does not operate.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	O ₂ sensor malfunction	Check the O ₂ sensor for an abnormality. Refer to “ENGINE REMOVAL” on page 5-1. O ₂ sensor malfunction → Replace the O ₂ sensor	Either start and warm up the engine, and then racing it, or reset it with diagnostic code D63.
7	ECU malfunction	Replace the ECU.	

Fault code No.	28		
Symptom	Open or short circuit of engine temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	11		
Meter display	-30 to 120 °C During cold starting: A temperature close to the ambient temperature is indicated. During hot starting: The current engine temperature is indicated.		
Checking method	Make sure that the meter indication is close to the ambient temperature during cold starting.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of engine temperature sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	28		
Symptom	Open or short circuit of engine temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	11		
Meter display	-30 to 120 °C		
	During cold starting: A temperature close to the ambient temperature is indicated. During hot starting: The current engine temperature is indicated.		
Checking method	Make sure that the meter indication is close to the ambient temperature during cold starting.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Brown–Brown	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Installation status of engine temperature sensor	Check the mounting section for a loose or pinched mounting. Make sure that the mounting position is correct.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	28		
Symptom	Open or short circuit of engine temperature sensor lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	11		
Meter display	-30 to 120 °C		
	During cold starting: A temperature close to the ambient temperature is indicated. During hot starting: The current engine temperature is indicated.		
Checking method	Make sure that the meter indication is close to the ambient temperature during cold starting.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Engine temperature sensor malfunction	Check in the diagnostic mode (Code No. 06). During cold starting: A temperature close to the ambient temperature is indicated. Indication is incorrect. → Replace the engine temperature sensor. Sensor inspection procedure Refer to "CHECKING THE ENGINE TEMPERATURE SENSOR" on page 7-93.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	30		
Symptom	Turnover of vehicle		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	08		
Meter display	The lean angle sensor value is indicated. 0 to 0.5 V The vehicle is in a vertical position: 0.4–1.4 V The vehicle is turned over: 3.7–4.4 V		
Checking method	Remove the lean angle sensor, tilt the vehicle more than 65 degrees, and check the meter indication value.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Turnover of vehicle	Raise the vehicle to the upright position	Place the main switch to the ON position. (however, the engine cannot be restarted unless the main switch is first turned OFF)
2	Sensor installation status	Check for a loose mounting, pinched mounting, or hard mounting. Make sure that the mounting position is correct.	
3	Lean angle sensor malfunction	Diagnostic mode (Code No. 08). Sensor inspection procedure Refer to “CHECKING THE LEAN ANGLE SENSOR” on page 7-89. In vertical position: 0.4–1.4 V When turned over: 3.7–4.4 V Indication is incorrect. → Replace the lean angle sensor.	
4	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	33		
Symptom	Front cylinder ignition coil primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	30		
Meter display	Each ignition coil turns On or Off 5 times per second. The engine warning light flashes according to the On/Off switching.		
Checking method	Make sure that the engine warning light flashes according to the On/Off switching of ignition coil.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of ignition coil coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Orange—Orange	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Ignition coil installation status	Check the mounting section for a loose or pinched mounting. Make sure that the mounting position is correct.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	33		
Symptom	Front cylinder ignition coil primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	30		
Meter display	Each ignition coil turns On or Off 5 times per second. The engine warning light flashes according to the On/Off switching.		
Checking method	Make sure that the engine warning light flashes according to the On/Off switching of ignition coil.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Ignition coil malfunction (Check the resistance of front cylinder ignition coil.)	Refer to "CHECKING THE IGNITION COILS" on page 7-88. Ignition coil inspection method	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
6	ECU malfunction	Check in the diagnostic mode (Code No. 30). If not ignited, replace the defective ECU.	

Fault code No.	34		
Symptom	Rear cylinder ignition coil primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	31		
Meter display	Each ignition coil turns On or Off 5 times per second. The engine warning light flashes according to the On/Off switching.		
Checking method	Make sure that the engine warning light flashes according to the On/Off switching of ignition coil.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of ignition coil coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	34		
Symptom	Rear cylinder ignition coil primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	31		
Meter display	Each ignition coil turns On or Off 5 times per second. The engine warning light flashes according to the On/Off switching.		
Checking method	Make sure that the engine warning light flashes according to the On/Off switching of ignition coil.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Gray/Red–Gray/Red	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Ignition coil installation status	Check the connection of the coupler is secure. Make sure that the mounting position is correct.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	Ignition coil malfunction (Check the resistance of rear cylinder ignition coil.)	Refer to “CHECKING THE IGNITION COILS” on page 7-88. Ignition coil inspection method	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	34		
Symptom	Rear cylinder ignition coil primary lead malfunction		
Fail-safe action	Engine startup: Possible (depending on the number of failed cylinders)		
	Riding: Possible (depending on the number of failed cylinders)		
Diagnostic monitoring code No.	31		
Meter display	Each ignition coil turns On or Off 5 times per second. The engine warning light flashes according to the On/Off switching.		
Checking method	Make sure that the engine warning light flashes according to the On/Off switching of ignition coil.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
6	ECU malfunction	Check in the diagnostic mode (Code No. 31). If not ignited, replace the defective ECU.	

Fault code No.	37		
Symptom	Engine speed is high when the engine is idling		
Fail-safe action	Engine startup: Possible (stuck fully closed unable)		
	Riding: Possible		
Diagnostic monitoring code No.	54		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Throttle valve does not fully close.	Check the throttle bodies. Refer to “THROTTLE BODIES” on page 6-6. Check the throttle cables. Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-27.	ISC valve returns to its original position by turning the main switch to “ON” and back “OFF”. Reinstated if the engine idling speed is within specification after starting the engine
2	ISC valve installation status	Check that the ISC unit coupler is not disconnected. The ISC valve is stuck fully open if it does not operate when the main switch is turned to “OFF”. (Touch the ISC unit with your hand and check if it is vibrating to confirm if the ISC valve is operating.)	
3	ISC valve malfunction	Diagnostic mode (Code No. 54).	
4	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	39		
Symptom	Open or short circuit of injector lead		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	36 37		
Meter display	When engine is stopped: Make sure that the atmospheric pressure is indicated.		
Checking method	When engine is cranking: The indication value changes because the injector changes.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of injector coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. White–White Green–Green Gray–Gray	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Injector malfunction	Check in the diagnostic mode (Code No. 36, 37).	Place the main switch to the ON position, and check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	41		
Symptom	Open or short circuit of lean angle sensor lead		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	08		
Meter display	The lean angle sensor value is indicated. 0 to 5.0 V The vehicle is in a vertical position: 0.4–1.4 V The vehicle is turned over: 3.7–4.4 V		
Checking method	Remove the lean angle sensor, tilt the vehicle more than 65 degrees, and check the meter indication value.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of lean angle sensor coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Rotate the main switch to the OFF position first, and then rotate it to the ON position again. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the harness.	Rotate the main switch to the OFF position first, and then rotate it to the ON position again. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. Black/Blue–Black/Blue Yellow/Green–Yellow/Green Blue–Blue	Rotate the main switch to the OFF position first, and then rotate it to the ON position again. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	41		
Symptom	Open or short circuit of lean angle sensor lead		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	08		
Meter display	The lean angle sensor value is indicated.		
	0 to 5.0 V		
	The vehicle is in a vertical position: 0.4–1.4 V		
	The vehicle is turned over: 3.7–4.4 V		
Checking method	Remove the lean angle sensor, tilt the vehicle more than 65 degrees, and check the meter indication value.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
4	Lean angle sensor malfunction	Refer to “CHECKING THE LEAN ANGLE SENSOR” on page 7-89.	Rotate the main switch to the OFF position first, and then rotate it to the ON position again. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
5	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	42	
Symptom	A. Normal signals are not received from the speed sensor.	
	B. Open or short circuit of neutral switch lead	
Fail-safe action	Engine startup: Possible	
	Riding: Possible	
Diagnostic monitoring code No.	07 (Speed sensor) 21	
Meter display	Vehicle speed pulses: 0–999	
Checking method	Make sure that the indication value increases when the rotation speed of the rear wheel increases. This value is cumulative and is not reset each time the wheel is prevented from rotating.	
Order	Checkpoints	Inspection method
	Locate the malfunction.	<p>Check in the diagnostic mode (Code No. 07). Rotate the rear wheel and make sure that the indication value increases. Malfunction → Go to the “Speed sensor system malfunction” section below.</p> <p>Check in the diagnostic mode (Code No. 21).</p> <p>When the gear is in neutral position: ON indication</p> <p>When the gear is not in neutral position: OFF indication</p> <p>Malfunction → Go to the “Neutral switch system malfunction” section below.</p>

A. Speed sensor system malfunction

Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of speed sensor (meter) coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start the engine, and check the connection of the coupler is secure. Ride on the vehicle at a low speed (approx. 20–30 km/h).
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
3	Continuity of speed sensor leads Continuity of wire harness	Open or short circuit → Replace the sensor. Black/Blue–Black/Blue Blue–Blue White/Yellow–White/Yellow	
4	Speed sensor malfunction Refer to “CHECKING THE SPEED SENSOR” on page 7-93.	Replace the speed sensor.	
5	ECU malfunction	Replace the ECU.	

B. Neutral switch system malfunction

Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of neutral switch coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Reconnect or repair the coupler.	Start the engine, and check the secure connection of the coupler. Ride the vehicle at a low speed (approx. 20–30 km/h).
2	Connection of wire harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Reconnect or repair the coupler.	
3	Continuity of wire harness	Open or short circuit → Replace the wire harness. White/Red Black/Blue	
4	Continuity of leads between neutral switch and relay unit coupler	Open short circuit → Replace the neutral switch. Sky blue–Sky blue	
5	Neutral switch malfunction Refer to “CHECKING THE SWITCHES” on page 7-77.	Replace the neutral switch.	
6	Shift drum (that detects the neutral position) malfunction	Check the gear shift drum (that detects the neutral position). Refer to “CHECKING THE SHIFT DRUM ASSEMBLY” on page 5-76. Malfunction → Replace the shift drum.	
7	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	43		
Symptom	Incorrect voltage supplied to the fuel injector and fuel pump		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	50		
Meter display	The relay turns On or Off 5 times per second. The engine warning light flashes according to the On/Off switching.		
Checking method	Make sure that engine warning light flashes according to the On/Off switching of the relay.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of relay unit coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds.
2	Connection of fuel pump coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
3	Connection of fuel injector coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
4	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	

FUEL INJECTION SYSTEM

Fault code No.	43		
Symptom	Incorrect voltage supplied to the fuel injector and fuel pump		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	50		
Meter display	The relay turns On or Off 5 times per second. The engine warning light flashes according to the On/Off switching.		
Checking method	Make sure that engine warning light flashes according to the On/Off switching of the relay.		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	Continuity of wire harness between the battery and ECU coupler	Open or short circuit → Replace the wire harness. Red–Red Red/Blue–Red/Blue	Start and idle the engine for approximately 5 seconds.
6	Fuel injection system relay malfunction	Check in the diagnostic mode (Code No. 50). No operation sound of fuel injection system relay is heard. → Replace the relay unit.	
7	ECU malfunction	Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	44		
Symptom	An error is detected while reading or writing on EEP-ROM		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	60		
Meter display	<p>The in self diagnostic code 44 detected EEP-ROM errors are indicated.</p> <p>If there are multiple errors, they are indicated in 2 seconds intervals</p> <p>00 indication: Normal status</p> <p>01 indication: CO concentration adjusted for cylinders #1</p> <p>02 indication: CO concentration adjusted for cylinders #2</p>		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Locate the malfunction.	Diagnostic mode (Code No. 60) 00 indication Normal status 01 indication: CO concentration adjusted for cylinders #1 02 indication: CO concentration adjusted for cylinders #2	—
2	“01” is indicated in Diagnostic mode (Code No. 60) EEP-ROM data error for adjustment of CO concentration of cylinders #1	Change the CO concentration of cylinders #1, and rewrite in EEP-ROM. After this adjustment is made, the memory is not recovered when the main switch is turned OFF and ON again. → Replace the ECU.	Place the main switch to the ON position. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	“02” is indicated in Diagnostic mode (Code No. D60) EEP-ROM data error for adjustment of CO concentration of cylinders #2	Change the CO concentration of cylinders #2, and rewrite in EEP-ROM. After this adjustment is made, the memory is not recovered when the main switch is turned OFF and ON again. → Replace the ECU.	Place the main switch to the ON position. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	46		
Symptom	Incorrect voltage is supplied to the ECU.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
2	Continuity of wire harness	Open or short circuit → Replace the wire harness. Between the battery and main switch (Red–Red) Between the main switch and ignition fuse (Brown/Blue–Brown/Blue) Between the ignition fuse and ECU (Red/White–Red/White)	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
3	Battery malfunction	Check the battery voltage. Refer to “CHECKING AND CHARGING THE BATTERY” on page 7-82. Battery malfunction → Recharge or replace the battery.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.
4	Stator coil malfunction	Check the stator coil output. Replace to “CHARGING SYSTEM” on page 7-13. Stator coil malfunction → Replace the stator coil.	Start and idle the engine for approximately 5 seconds. Then, check the fault code indication. No fault code indicated. → Recovered. Fault code indicated. → Check the next step.

FUEL INJECTION SYSTEM

Fault code No.	46		
Symptom	Incorrect voltage is supplied to the ECU.		
Fail-safe action	Engine startup: Possible		
	Riding: Possible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
5	ECU malfunction	Replace the ECU.	

Fault code No.	50		
Symptom	ECU memory malfunction		
Fail-safe action	Engine startup: Possible under certain conditions		
	Riding: Possible under certain conditions		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	ECU malfunction	Replace the ECU.	Place the main switch to the ON position. Then, check that no fault code indicated.

Fault code No.	Er-1		
Symptom	No signal is received from the ECU.		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of meter coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
3	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Yellow/Blue—Yellow/Blue	
4	Abnormal meter unit operation	Replace the meter unit.	
5	ECU malfunction	Replace the ECU	

Fault code No.	Er-2		
Symptom	No signal is sent from ECU.		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of meter coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
3	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Yellow/Blue—Yellow/Blue	
4	Abnormal meter unit operation	Replace the meter unit.	
5	ECU malfunction	Replace the ECU.	

Fault code No.	Er-3		
Symptom	Correct data cannot be received from the ECU.		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of meter coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
3	Continuity or wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Yellow/Blue—Yellow/Blue	
4	Abnormal meter unit operation	Replace the meter unit.	
5	ECU malfunction	Replace the ECU.	

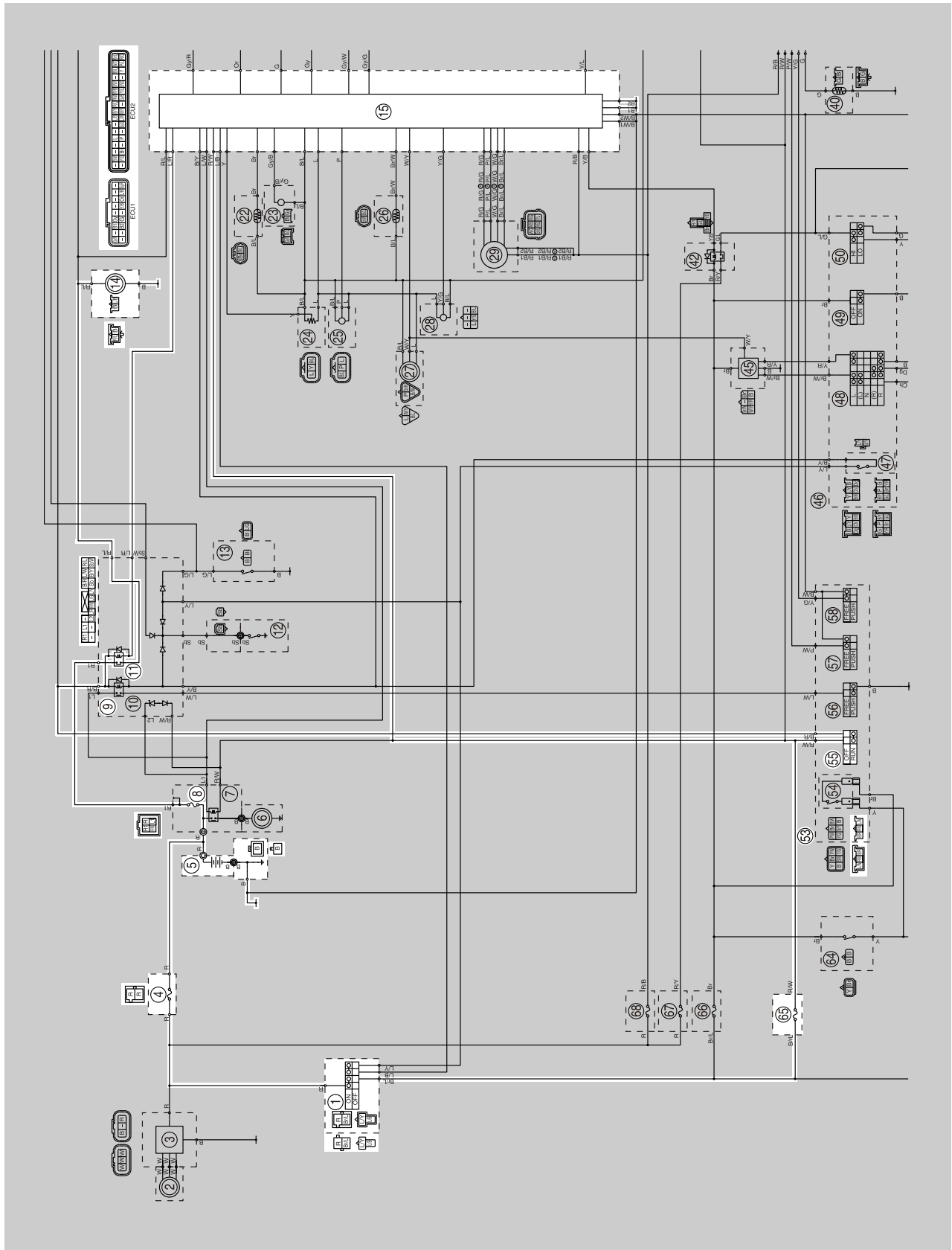
Fault code No.	Er-4		
Symptom	No registration data can be received from the meter unit.		
Fail-safe action	Engine startup: Impossible		
	Riding: Impossible		
Diagnostic monitoring code No.	—		
Meter display	—		
Checking method	—		
Order	Item/components and probable cause	Check or maintenance job	Sensor inspection procedure
1	Connection of meter coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wear, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	Place the main switch to the ON position.
2	Connection of main harness ECU coupler Check the connection of the coupler is secure. Remove the coupler, and check each pin (for bending, wire, or locking).	Poor connection → Connect it securely, or repair/replace the wire harness.	
3	Continuity of wire harness	Open or short circuit → Connect it securely, or repair/replace the wire harness. Yellow/Blue—Yellow/Blue	
4	Abnormal meter unit operation	Replace the meter unit.	
5	ECU malfunction	Replace the ECU.	

EAS27550

FUEL PUMP SYSTEM

EAS27560

CIRCUIT DIAGRAM



- 1. Main switch
- 4. Main fuse
- 5. Battery
- 8. Fuel injection system fuse
- 9. Relay unit
- 11. Fuel pump relay
- 14. Fuel pump
- 15. ECU (engine control unit)
- 53. Right handlebar switch
- 55. Engine stop switch
- 65. Ignition fuse

EAS27570

TROUBLESHOOTING

The fuel pump fails to operate.

TIP

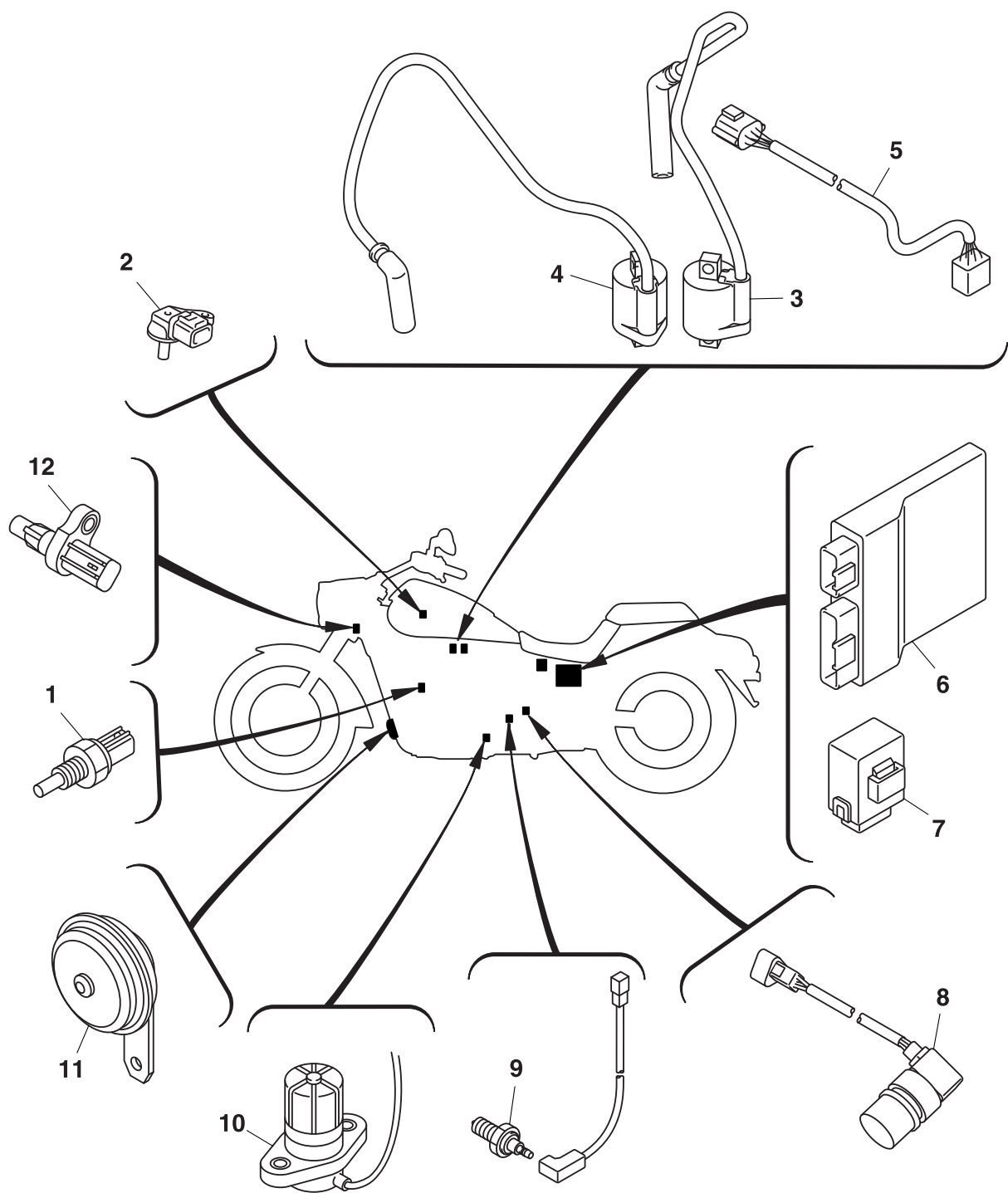
- Before troubleshooting, remove the following part(s):

1. Rider seat
2. Seat lock bracket
3. Fuel tank

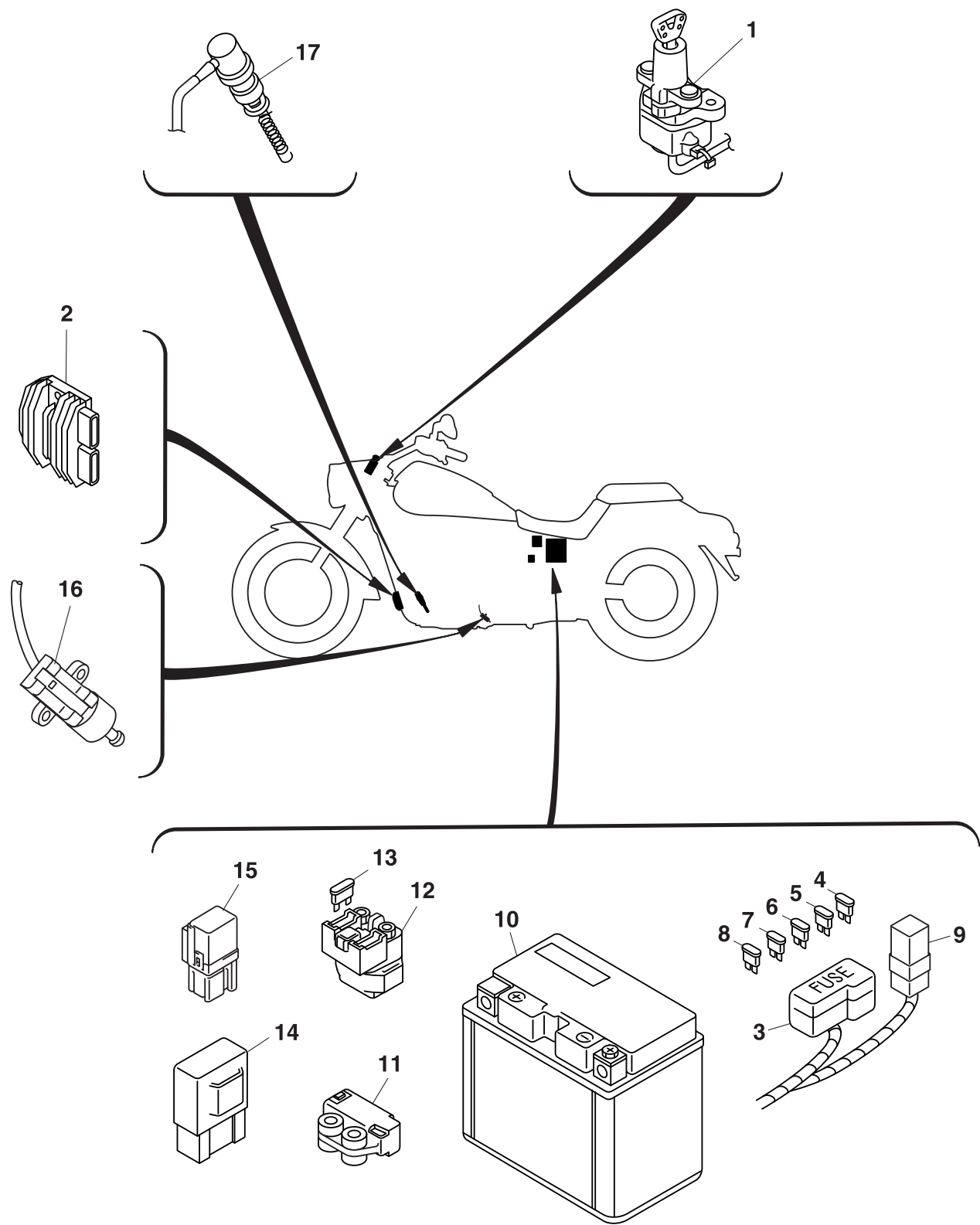
1. Check the fuses. (Main, ignition and fuel injection system) Refer to "CHECKING THE FUSES" on page 7-81.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-82.	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the main switch.
OK↓		
4. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-77.	NG→	Replace the right handlebar switch.
OK↓		
5. Check the relay unit (fuel pump relay). Refer to "CHECKING THE RELAYS" on page 7-85.	NG→	Replace the relay unit.
OK↓		
6. Check the fuel pump. Refer to "FUEL TANK" on page 6-1.	NG→	Replace the fuel pump.
OK↓		
7. Check the entire fuel pump system's wiring. Refer to "CIRCUIT DIAGRAM" on page 7-69.	NG→	Properly connect or repair the fuel pump system's wiring.
OK↓		
Replace the ECU.		

EAS27970

ELECTRICAL COMPONENTS

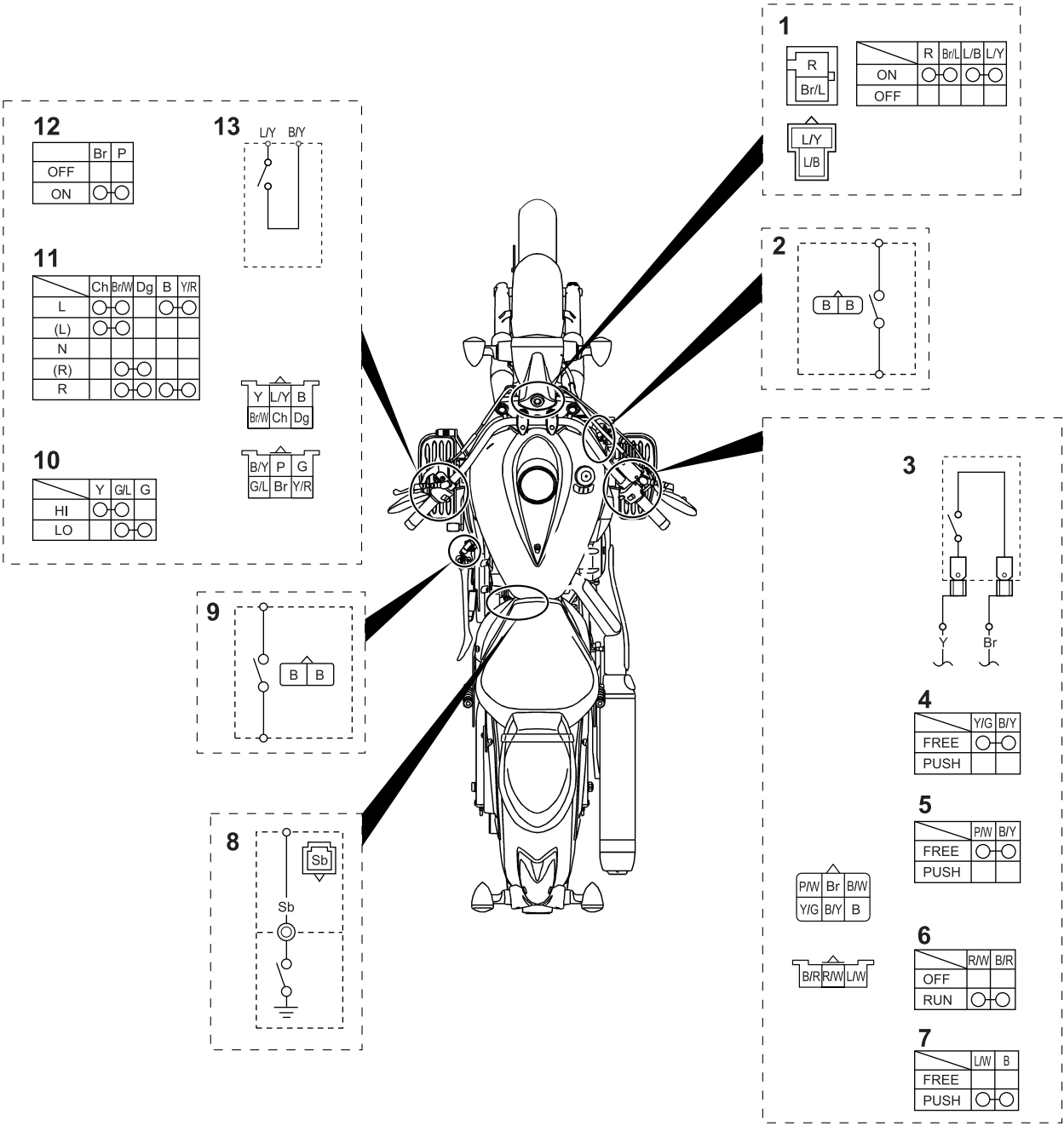


1. Engine temperature sensor
2. Intake air pressure sensor
3. Rear cylinder ignition coil
4. Front cylinder ignition coil
5. Sub-wire harness
6. ECU (engine control unit)
7. Turn signal relay
8. Speed sensor
9. Neutral switch
10. Oil level switch
11. Horn
12. Air temperature sensor



1. Main switch
2. Rectifier/regulator
3. Fuse box
4. Headlight fuse
5. Backup fuse
6. Taillight fuse
7. Ignition fuse
8. Signaling system fuse
9. Main fuse
10. Battery
11. Lean angle sensor
12. Starter relay
13. Fuel injection system fuse
14. Relay unit
15. Headlight relay
16. Sidestand switch
17. Rear brake light switch

EAS27980
CHECKING THE SWITCHES



1. Main switch
2. Rear brake light switch
3. Front brake light switch
4. Reset switch
5. Select switch
6. Engine stop switch
7. Start switch
8. Neutral switch
9. Sidestand switch
10. Dimmer switch
11. Turn signal switch
12. Horn switch
13. Clutch switch

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

ECA14370

NOTICE

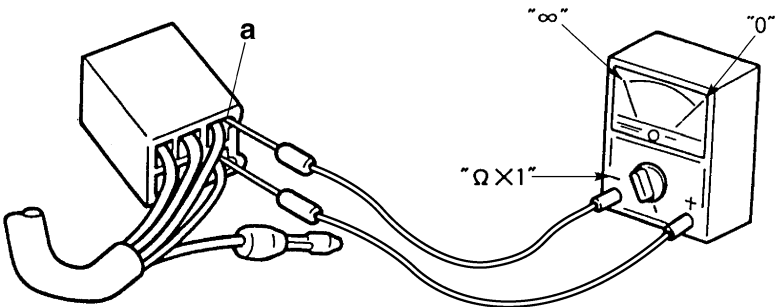
Never insert the tester probes into the coupler terminal slots “a”. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



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

TIP

- Before checking for continuity, set the pocket tester to “0” and to the “Ω × 1” range.
- When checking for continuity, switch back and forth between the switch positions a few times.

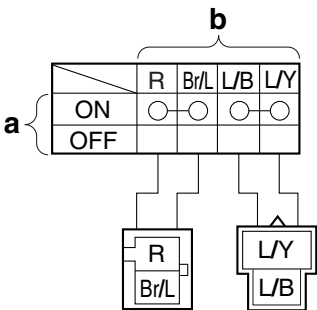


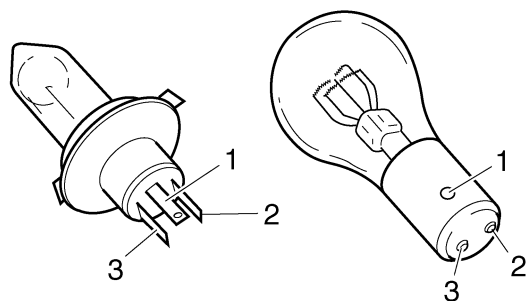
The switches and their terminal connections are illustrated as in the following example of the main switch.

The switch positions “a” are shown in the far left column and the switch lead colors “b” are shown in the top row.

The continuity (i. e., a closed circuit) between switch terminals at a given switch position is indicated by “○—○”.

There is continuity between the red and brown/blue leads, and between the blue/black and blue/yel-low leads when the switch is set to “ON”.





Checking the condition of the bulb sockets

The following procedure applies to all of the bulb sockets.

1. Check:
 - Bulb socket (for continuity) (with the pocket tester)No continuity → Replace.



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

TIP

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

- a. Install a good bulb into the bulb socket.
- b. Connect the pocket tester probes to the respective leads of the bulb socket.
- c. Check the bulb socket for continuity. If any of the readings indicates no continuity, replace the bulb socket.

EAS28000
CHECKING THE FUSES

The following procedure applies to all of the fuses.

ECA13680

NOTICE

To avoid a short circuit, always set the main switch to “OFF” when checking or replacing a fuse.

1. Remove:
 - Rider seatRefer to “GENERAL CHASSIS” on page 4-1.
2. Check:
 - Fuse

- a. Connect the pocket tester to the fuse and check the continuity.

TIP

Set the pocket tester selector to “Ω × 1”.



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

- b. If the pocket tester indicates “∞”, replace the fuse.

3. Replace:
 - Blown fuse

- a. Set the main switch to “OFF”.
- b. Install a new fuse of the correct amperage rating.
- c. Set on the switches to verify if the electrical circuit is operational.
- d. If the fuse immediately blows again, check the electrical circuit.

Fuses	Amperage rating	Q'ty
Main	40 A	1
Headlight	20 A	1
Ignition	15 A	1
Fuel injection system	10 A	1
Signaling system	10 A	1
Taillight	10 A	1
Backup	10 A	1
Spare	20 A	1
Spare	15 A	1
Spare	10 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” on page 4-1.

EAS28030

CHECKING AND CHARGING THE BATTERY

EWA13290

WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.
- KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.
- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

- Skin — Wash with water.
- Eyes — Flush with water for 15 minutes and get immediate medical attention.

INTERNAL

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

ECA3D81014

NOTICE

- This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.
- Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged 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 MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:

- Rider seat
- Tool kit tray
Refer to “GENERAL CHASSIS” on page 4-1.

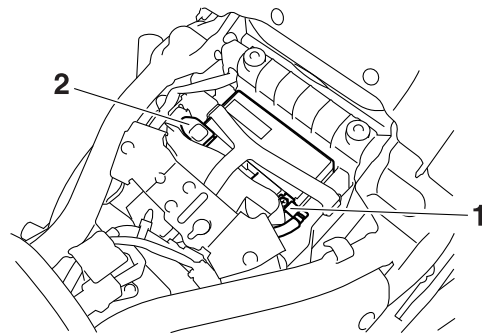
2. Disconnect:

- Battery leads
(from the battery terminals)

ECA3D81022

NOTICE

First, disconnect the negative battery lead “1”, then the positive battery lead “2”.



3. Remove:

- Battery

4. Check:

- Battery charge



- 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 an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

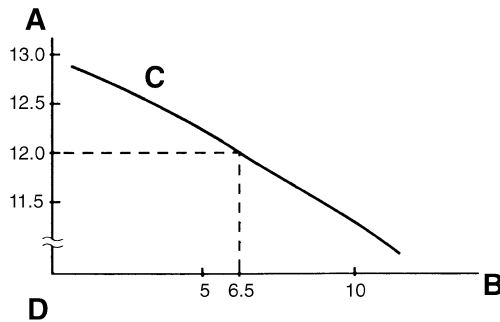
- Check the charge of the battery, as shown in the charts and the following example.

Example

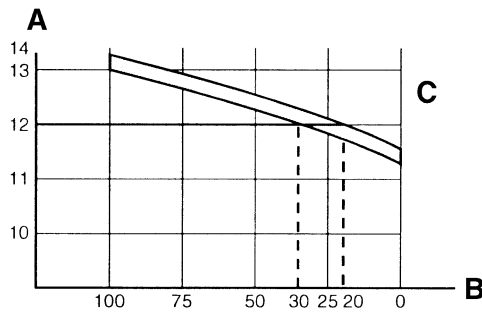
Open-circuit voltage = 12.0 V

Charging time = 6.5 hours

Charge of the battery = 20–30%



- A. Open-circuit voltage (V)
 B. Charging time (hours)
 C. Relationship between the open-circuit voltage and the charging time at 20 °C (68 °F)
 D. These values vary with the temperature, the condition of the battery plates, and the electrolyte level.



- A. Open-circuit voltage (V)
 B. Charging condition of the battery (%)
 C. Ambient temperature 20 °C (68 °F)



5. Charge:
- Battery (refer to the appropriate charging method)

EWA13300



WARNING

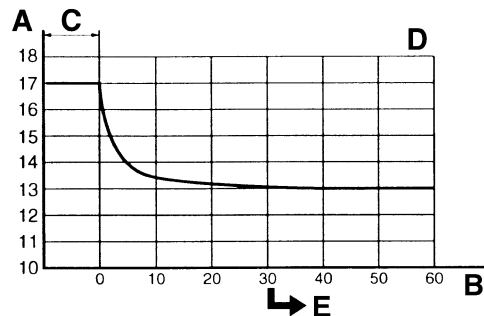
Do not quick charge a battery.

ECA13670

NOTICE

- Never remove the MF battery sealing caps.
- Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.

- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
- When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative battery lead from the battery terminal.)
- To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
- Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
- If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!
- As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.



- A. Open-circuit voltage (V)
 B. Time (minutes)
 C. Charging
 D. Ambient temperature 20 °C (68 °F)
 E. Check the open-circuit voltage.

Charging method using a variable-current (voltage) charger

- Measure the open-circuit voltage prior to charging.

TIP

Voltage should be measured 30 minutes after the engine is stopped.

- Connect a charger and ammeter to the battery and start charging.

TIP

Set the charging voltage to 16–17 V. If the setting is lower, charging will be insufficient. If too high, the battery will be overcharged.

- Make sure that the current is higher than the standard charging current written on the battery.

TIP

If the current is lower than the standard charging current written on the battery, set the charging voltage adjusting dial to 20–24 V and monitor the amperage for 3–5 minutes to check the battery.

- Standard charging current is reached
Battery is good.
- Standard charging current is not reached
Replace the battery.

- Adjust the voltage so that the current is at the standard charging level.
- Set the time according to the charging time suitable for the open-circuit voltage.
- If charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current.
- Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

Charging method using a constant voltage charger

- Measure the open-circuit voltage prior to charging.

TIP

Voltage should be measured 30 minutes after the engine is stopped.

- Connect a charger and ammeter to the battery and start charging.
- Make sure that the current is higher than the standard charging current written on the battery.

TIP

If the current is lower than the standard charging current written on the battery, this type of battery charger cannot charge the MF battery. A variable voltage charger is recommended.

- Charge the battery until the battery's charging voltage is 15 V.

TIP

Set the charging time to 20 hours (maximum).

- Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

6. Install:

- Battery

7. Connect:

- Battery leads
(to the battery terminals)

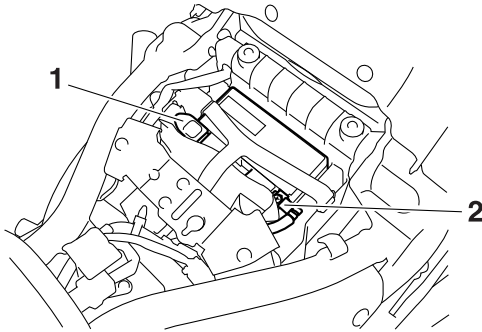
TIP

Route the positive battery lead under the negative battery lead, making sure not to route it on top of the relay unit.

ECA3D81023

NOTICE

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



8. Check:
 - Battery terminals
Dirt → Clean with a wire brush.
Loose connection → Connect properly.
9. Lubricate:
 - Battery terminals



10. Install:
 - Rider seat
 - Tool kit tray
 Refer to "GENERAL CHASSIS" on page 4-1.

EAS28040

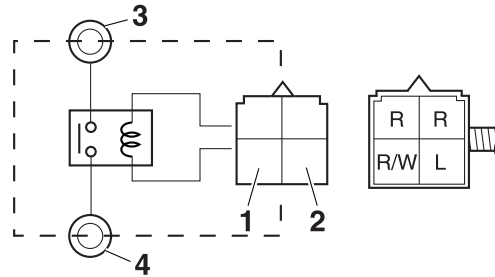
CHECKING THE RELAYS

Check each relay for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.

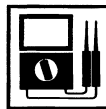


1. Disconnect the relay from the wire harness.
2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown. Check the relay operation.
Out of specification → Replace.

Starter relay



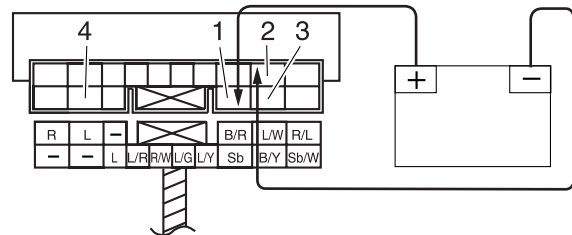
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



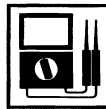
Result

Continuity
(between "3" and "4")

Relay unit (starting circuit cut-off relay)



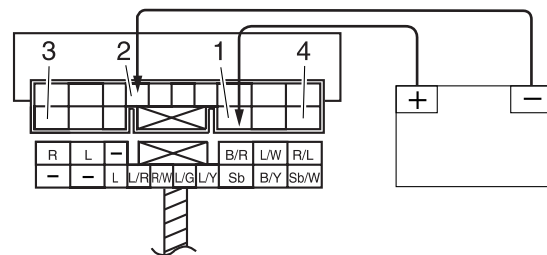
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result

Continuity
(between "3" and "4")

Relay unit (fuel pump relay)

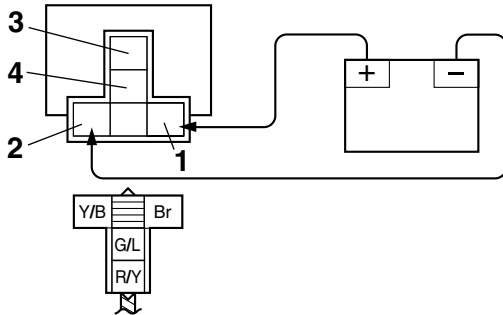


1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result
Continuity
(between “3” and “4”)

Headlight relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result
Continuity
(between “3” and “4”)

EAS3D81010

CHECKING THE TURN SIGNAL RELAY

1. Check:
 - Turn signal relay input voltage
Out of specification → The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.



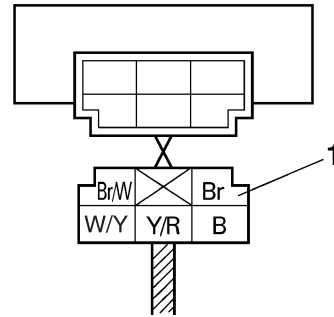
Turn signal relay input voltage
DC 12 V

- a. Connect the pocket tester (DC 20 V) to the turn signal relay terminal as shown.



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

- Positive tester probe → brown “1”
- Negative tester probe → ground



- b. Turn the main switch to “ON”.
- c. Measure the turn signal relay input voltage.

2. Check:

- Turn signal relay output voltage
Out of specification → Replace.



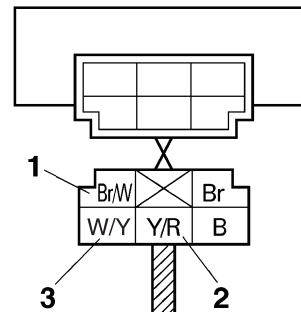
Turn signal relay output voltage
DC 12 V

- a. Connect the pocket tester (DC 20 V) to the turn signal relay terminal as shown.



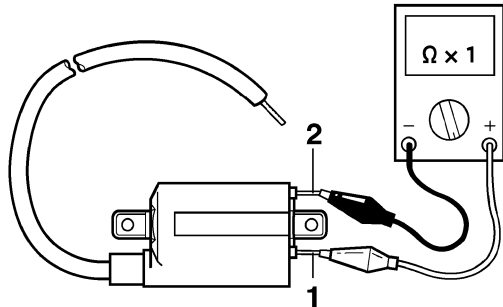
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → brown/white “1”, yellow/red “2” or white/yellow “3”
- Negative tester probe → ground



- b. Turn the main switch to “ON”.
- c. Measure the turn signal relay output voltage.

- Positive tester probe → black/red “1”
- Negative tester probe → orange or gray/red “2”

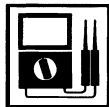


c. Measure the primary coil resistance.



2. Check:

- Secondary coil resistance
Out of specification → Replace.



Secondary coil resistance
8.64–12.96 kΩ

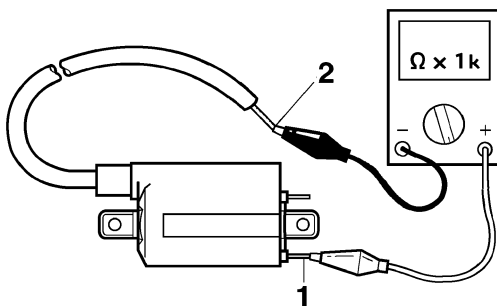


- Disconnect the spark plug cap from the ignition coil.
- Connect the pocket tester ($\Omega \times 1k$) to the ignition coil as shown.



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

- Positive tester probe → black/red “1”
- Negative tester probe → gray/red “2”



c. Measure the secondary coil resistance.



EAS28120

CHECKING THE CRANKSHAFT POSITION SENSOR

- Disconnect:
 - Crankshaft position sensor coupler (from the wire harness)
- Check:
 - Crankshaft position sensor resistance
Out of specification → Replace the crankshaft position sensor/stator assembly.



Crankshaft position sensor resistance
248–372 Ω

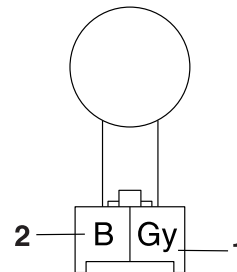


- Connect the pocket tester ($\Omega \times 100$) to the crankshaft position sensor coupler as shown.



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

- Positive tester probe → gray “1”
- Negative tester probe → black “2”



- Measure the crankshaft position sensor resistance.



EAS28130

CHECKING THE LEAN ANGLE SENSOR

- Remove:
 - Lean angle sensor
- Check:
 - Lean angle sensor output voltage
Out of specification → Replace.



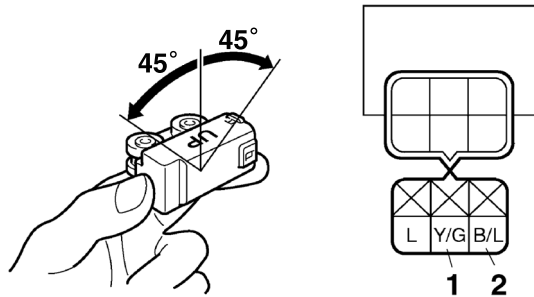
Lean angle sensor output voltage
Less than 45°
 0.4–1.4 V
More than 45°
 3.7–4.4 V

- Connect the lean angle sensor coupler to the wire harness.
- Connect the pocket tester (DC 20 V) to the lean angle sensor coupler as shown.



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

- Positive tester probe → yellow/green “1”
- Negative tester probe → black/blue “2”



- Turn the main switch to “ON”.
- Tilt the lean angle sensor 45°.
- Measure the lean angle sensor output voltage.

EAS3D81011

CHECKING THE STARTER MOTOR OPERATION

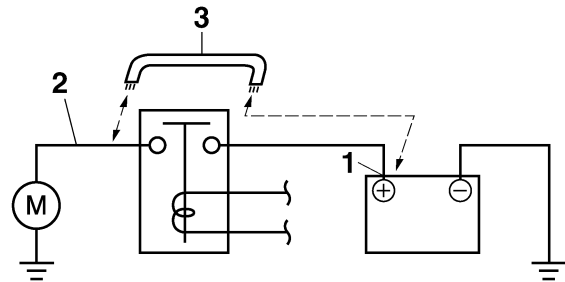
- Check:
 - Starter motor operation
 Does not operate → Perform the electric starting system troubleshooting, starting with step 4.
 Refer to “TROUBLESHOOTING” on page 7-11.

- Connect the positive battery terminal “1” and starter motor lead “2” with a jumper lead “3”.

EWA13810

WARNING

- A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.



- Check the starter motor operation.

EAS28150

CHECKING THE STATOR COIL

- Disconnect:
 - Stator coil coupler (from the wire harness)
- Check:
 - Stator coil resistance
 Out of specification → Replace the crankshaft position sensor/stator assembly.



Stator coil resistance
0.128–0.192 Ω

- Connect the pocket tester ($\Omega \times 1$) to the stator coil coupler as shown.

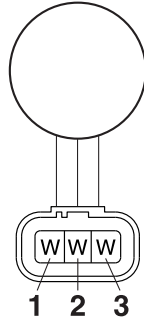


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → white “1”
- Negative tester probe → white “2”

- Positive tester probe → white “1”
- Negative tester probe → white “3”

- Positive tester probe → white “2”
- Negative tester probe → white “3”

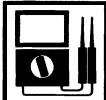


- Measure the stator coil resistance.

EAS28170

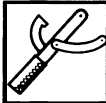
CHECKING THE RECTIFIER/REGULATOR

- Check:
 - Charging voltage
 Out of specification → Replace the rectifier/regulator.



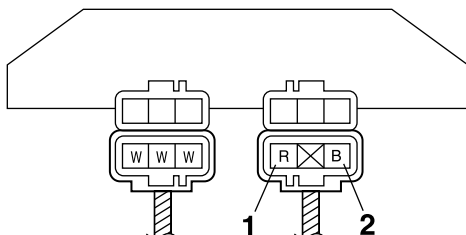
Charging voltage
14 V at 5000 r/min

- Attach the engine tachometer to the spark plug lead of the front cylinder.
- Connect the pocket tester (DC 20 V) to the rectifier/regulator coupler as shown.



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

- Positive tester probe → red “1”
- Negative tester probe → black “2”

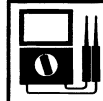


- Start the engine and operate it run at approximately 5000 r/min.
- Measure the charging voltage.

EAS28180

CHECKING THE HORN

- Check:
 - Horn resistance
 Out of specification → Replace.



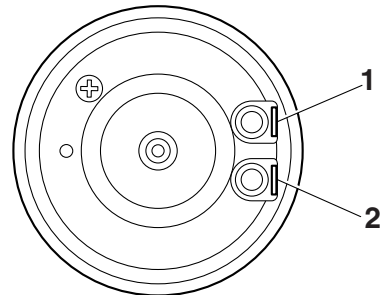
Coil resistance
1.07–1.11 Ω

- Disconnect the horn connectors from the horn terminals.
- Connect the pocket tester ($\Omega \times 1$) to the horn terminals.



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

- Positive tester probe → horn terminal “1”
- Negative tester probe → horn terminal “2”



- Measure the horn resistance.

- Check:
 - Horn sound
 Faulty sound → Replace.

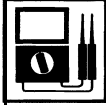
EAS3D81012

CHECKING THE OIL LEVEL SWITCH

- Drain:
 - Engine oil
- Remove:
 - Oil level switch (from the crankcase)

3. Check:

- Oil level switch resistance
Out of specification → Replace the oil level switch.



Oil level switch

Minimum level position resistance

114–126 Ω

Maximum level position resistance

484–536 Ω



- a. Connect the pocket tester ($\Omega \times 100$) to the oil level switch terminal as shown.



Pocket tester

90890-03112

Analog pocket tester

YU-03112-C

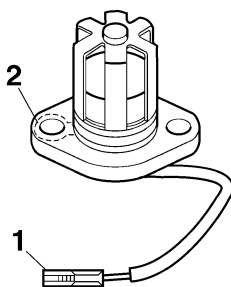
Minimum level position “A”

- Positive tester probe → connector (white) “1”
- Negative tester probe → body ground “2”

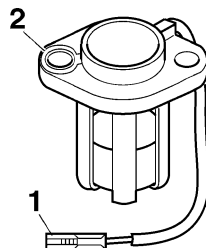
Maximum level position “B”

- Positive tester probe → connector (white) “1”
- Negative tester probe → body ground “2”

A



B



- b. Measure the oil level switch resistance.



EAS3D81013

CHECKING THE FUEL SENDER

1. Disconnect:

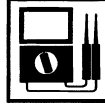
- Fuel sender coupler
(from the wire harness)

2. Remove:

- Fuel sender
(from the fuel tank)

3. Check:

- Fuel sender resistance
Out of specification → Replace the fuel sender.



Fuel sender resistance

830–1720 Ω at 25 °C (77 °F)



- a. Connect the pocket tester ($\Omega \times 1$) to the fuel sender terminals as shown.



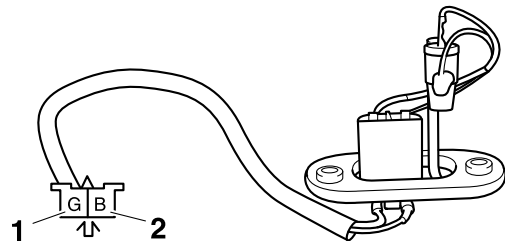
Pocket tester

90890-03112

Analog pocket tester

YU-03112-C

- Positive tester probe → green “1”
- Negative tester probe → black “2”



- b. Measure the fuel sender resistance.



EAS3D81014

CHECKING THE FUEL LEVEL WARNING LIGHT

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

1. Check:

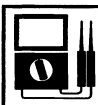
- Fuel level warning light “1”
(Turn the main switch to “ON”.)
Warning light comes on for a few seconds, then goes off → Warning light is OK.
Warning light does not come on → Replace the meter assembly.
Warning light flashes eight times, then goes off for three seconds in a repeated cycle (malfunction detected in fuel sender or thermistor) → Replace the fuel sender.

EAS28240



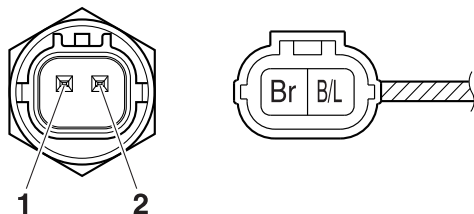
EAS28260

EWA14130



7-93

- Tester positive probe → black/blue “1”
- Negative tester probe → brown “2”



- b. Measure the engine temperature sensor resistance.

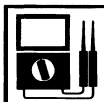


3. Install
- Engine temperature sensor

EAS28300

CHECKING THE THROTTLE POSITION SENSOR

1. Remove:
 - Throttle position sensor (from the throttle body)
2. Check:
 - Throttle position sensor maximum resistanceOut of specification → Replace the throttle position sensor.



Resistance
3.08–5.72 kΩ

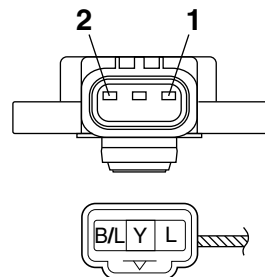


- a. Connect the pocket tester ($\Omega \times 1k$) to the throttle position sensor terminals as shown.



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

- Positive tester probe → blue “1”
- Negative tester probe → black/blue “2”



- b. Measure the throttle position sensor maximum resistance.



3. Install:
- Throttle position sensor

TIP

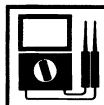
When installing the throttle position sensor, adjust its angle properly. Refer to “THROTTLE BODIES” on page 6-6.

EAS28410

CHECKING THE INTAKE AIR PRESSURE SENSOR

The following procedure applies to the intake air pressure.

1. Check:
 - Intake air pressure sensor output voltageOut of specification → Replace.



Intake air pressure sensor output voltage
3.594–3.684 V at 25 °C (77 °F)

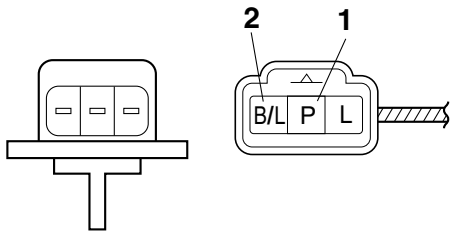


- a. Connect the pocket tester (DC 20 V) to the intake air pressure sensor coupler as shown.



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

- Positive tester probe → pink “1”
- Negative tester probe → black/blue “2”



- b. Set the main switch to “ON”.
- c. Measure the intake air pressure sensor output voltage.



EAS28420
CHECKING THE AIR TEMPERATURE SENSOR

- 1. Remove:
 - Air temperature sensor

EWA3D81003

⚠ WARNING

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

- 2. Check:
 - Air temperature sensor resistanceOut of specification → Replace.



Intake air temperature sensor resistance
290–390 Ω at 80 °C (176 °F)



- a. Connect the pocket tester ($\Omega \times 100$) to the air temperature sensor terminal as shown.



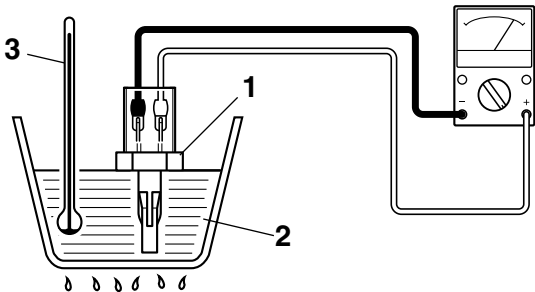
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- b. Immerse the air temperature sensor “1” in a container filled with water “2”.

TIP

Make sure that the air temperature sensor terminals do not get wet.

- c. Place a thermometer “3” in the water.



- d. Slowly heat the water, and then let it cool down to the specified temperature.
- e. Measure the air temperature sensor resistance.



TROUBLESHOOTING

TROUBLESHOOTING	8-1
GENERAL INFORMATION	8-1
STARTING FAILURES	8-1
INCORRECT ENGINE IDLING SPEED	8-1
POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE	8-2
FAULTY GEAR SHIFTING	8-2
SHIFT PEDAL DOES NOT MOVE	8-2
JUMPS OUT OF GEAR	8-2
FAULTY CLUTCH	8-2
OVERHEATING	8-2
POOR BRAKING PERFORMANCE	8-3
FAULTY FRONT FORK LEGS	8-3
UNSTABLE HANDLING	8-3
FAULTY LIGHTING OR SIGNALING SYSTEM	8-3

EAS28450

TROUBLESHOOTING

EAS28460

GENERAL INFORMATION

TIP

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

EAS28470

STARTING FAILURES

Engine

1. Cylinder(s) and cylinder head(s)
 - Loose spark plug
 - Loose cylinder head or cylinder
 - Damaged cylinder head gasket
 - Damaged cylinder gasket
 - Worn or damaged cylinder
 - Incorrect valve clearance
 - Improperly sealed valve
 - Incorrect valve-to-valve-seat contact
 - Incorrect valve timing
 - Faulty valve spring
 - Seized valve
2. Piston(s) and piston ring(s)
 - Improperly installed piston ring
 - Damaged, worn or fatigued piston ring
 - Seized piston ring
 - Seized or damaged piston
3. Air filter
 - Improperly installed air filter
 - Clogged air filter element
4. Crankcase and crankshaft
 - Improperly assembled crankcase
 - Seized crankshaft

Fuel system

1. Fuel tank
 - Empty fuel tank
 - Clogged fuel filter
 - Clogged fuel tank breather hose
 - Clogged rollover valve
 - Deteriorated or contaminated fuel
2. Fuel pump
 - Faulty fuel pump
 - Faulty relay unit (fuel pump relay)
3. Throttle body(-ies)
 - Deteriorated or contaminated fuel
 - Sucked-in air

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Fuse(s)
 - Blown, damaged or incorrect fuse
 - Improperly installed fuse
3. Spark plug(s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug
 - Worn or damaged electrode
 - Worn or damaged insulator
 - Faulty spark plug cap
4. Ignition coil(s)
 - Cracked or broken ignition coil body
 - Broken or shorted primary or secondary coils
 - Faulty spark plug lead
5. Ignition system
 - Faulty ECU
 - Faulty crankshaft position sensor
 - Broken generator rotor Woodruff key
6. Switches and wiring
 - Faulty main switch
 - Faulty engine stop switch
 - Broken or shorted wiring
 - Faulty neutral switch
 - Faulty start switch
 - Faulty sidestand switch
 - Faulty clutch switch
 - Improperly grounded circuit
 - Loose connections
7. Starting system
 - Faulty starter motor
 - Faulty starter relay
 - Faulty relay unit (starting circuit cut-off relay)
 - Faulty starter clutch

EAS28490

INCORRECT ENGINE IDLING SPEED

Engine

1. Cylinder(s) and cylinder head(s)
 - Incorrect valve clearance
 - Damaged valve train components
2. Air filter
 - Clogged air filter element

Fuel system

1. Throttle body(-ies)
 - Damaged or loose throttle body joint
 - Improperly synchronized throttle bodies

- Improper throttle cable free play
- Flooded throttle body

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Spark plug(s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug
 - Worn or damaged electrode
 - Worn or damaged insulator
 - Faulty spark plug cap
3. Ignition coil(s)
 - Broken or shorted primary or secondary coils
 - Faulty spark plug lead
 - Cracked or broken ignition coil
4. Ignition system
 - Faulty ECU
 - Faulty crankshaft position sensor
 - Broken generator rotor Woodruff key

EAS28510

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURES” on page 8-1.

Engine

1. Air filter
 - Clogged air filter element

Fuel system

1. Fuel pump
 - Faulty fuel pump

EAS28530

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to “Clutch drags”.

EAS28540

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear

- Foreign object between transmission gears
- Improperly assembled transmission

EAS28550

JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

EAS28560

FAULTY CLUTCH

Clutch slips

1. Clutch
 - Improperly assembled clutch
 - Improperly adjusted clutch cable
 - Loose or fatigued clutch spring
 - Worn friction plate
 - Worn clutch plate
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (low)
 - Deteriorated oil

Clutch drags

1. Clutch
 - Unevenly tensioned clutch springs
 - Warped pressure plate
 - Bent clutch plate
 - Swollen friction plate
 - Bent clutch pull rod
 - Broken clutch boss
 - Burnt primary driven gear bushing
 - Match marks not aligned
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (high)
 - Deteriorated oil

EAS28600

OVERHEATING

Engine

1. Cylinder head(s) and piston(s)
 - Heavy carbon buildup
2. Engine oil

- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

Fuel system

1. Throttle body(-ies)
 - Damaged or loose throttle body joint
2. Air filter
 - Clogged air filter element

Chassis

1. Brake(s)
 - Dragging brake

Electrical system

1. Spark plug(s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
2. Ignition system
 - Faulty ECU

EAS28620

POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EAS28650

FAULTY FRONT FORK LEGS

Leaking oil

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged cap bolt O-ring

Malfunction

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod

- Incorrect oil viscosity
- Incorrect oil level

EAS28670

UNSTABLE HANDLING

1. Handlebar
 - Bent or improperly installed handlebar
2. Steering head components
 - Improperly installed upper bracket
 - Improperly installed lower bracket (improperly tightened ring nut)
 - Bent steering stem
 - Damaged ball bearing or bearing race
3. Front fork leg(s)
 - Uneven oil levels (both front fork legs)
 - Unevenly tensioned fork spring (both front fork legs)
 - Broken fork spring
 - Bent or damaged inner tube
 - Bent or damaged outer tube
4. Swingarm
 - Worn bearing or bushing
 - Bent or damaged swingarm
5. Rear shock absorber assembly
 - Faulty rear shock absorber spring
 - Leaking oil or gas
6. Tire(s)
 - Uneven tire pressures (front and rear)
 - Incorrect tire pressure
 - Uneven tire wear
7. Wheel(s)
 - Incorrect wheel balance
 - Deformed cast wheel
 - Damaged wheel bearing
 - Bent or loose wheel axle
 - Excessive wheel runout
8. Frame
 - Bent frame
 - Damaged steering head pipe
 - Improperly installed bearing race

EAS28710

FAULTY LIGHTING OR SIGNALING SYSTEM

Headlight does not come on

- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main switch)
- Burnt-out headlight bulb

Headlight bulb burnt out

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Headlight bulb life expired

Tail/brake light does not come on

- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

Tail/brake light bulb burnt out

- Wrong tail/brake light bulb
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

Turn signal does not come on

- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

Turn signal flashes slowly

- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

Turn signal remains lit

- Faulty turn signal relay
- Burnt-out turn signal bulb

Turn signal flashes quickly

- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

Horn does not sound

- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

EAS28740

WIRING DIAGRAM**XVS95Y/XVS95YC/
XVS95CTY/XVS95CTYC
2009**

1. Main switch
2. AC magneto
3. Rectifier/regulator
4. Main fuse
5. Battery
6. Starter motor
7. Starter relay
8. Fuel injection system fuse
9. Relay unit
10. Starting circuit cut-off relay
11. Fuel pump relay
12. Neutral switch
13. Sidestand switch
14. Fuel pump
15. ECU (engine control unit)
16. Rear cylinder ignition coil
17. Spark plug
18. Front cylinder ignition coil
19. Rear cylinder injector
20. Front cylinder injector
21. O₂ sensor
22. Engine temperature sensor
23. Crankshaft position sensor
24. Throttle position sensor
25. Intake air pressure sensor
26. Air temperature sensor
27. Speed sensor
28. Lean angle sensor
29. ISC (idle speed control) unit
30. Oil level switch
31. Meter assembly
32. Neutral indicator light
33. Multi-function meter
34. Oil level warning light
35. Engine trouble warning light
36. Fuel level warning light
37. Meter light
38. High beam indicator light
39. Turn signal indicator light
40. Fuel sender
41. Accessory light (OPTION)
42. Headlight relay
43. Headlight
44. Horn
45. Turn signal relay
46. Left handlebar switch
47. Clutch switch
48. Turn signal switch
49. Horn switch
50. Dimmer switch
51. Front right turn signal light
52. Front left turn signal light
53. Right handlebar switch
54. Front brake light switch

55. Engine stop switch
56. Start switch
57. Select switch
58. Reset switch
59. Rear right turn signal light
60. Rear left turn signal light
61. License plate light
62. Tail/brake light
63. Taillight fuse
64. Rear brake light switch
65. Ignition fuse
66. Signaling system fuse
67. Headlight fuse
68. Backup fuse

Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

EAS28750

COLOR CODE

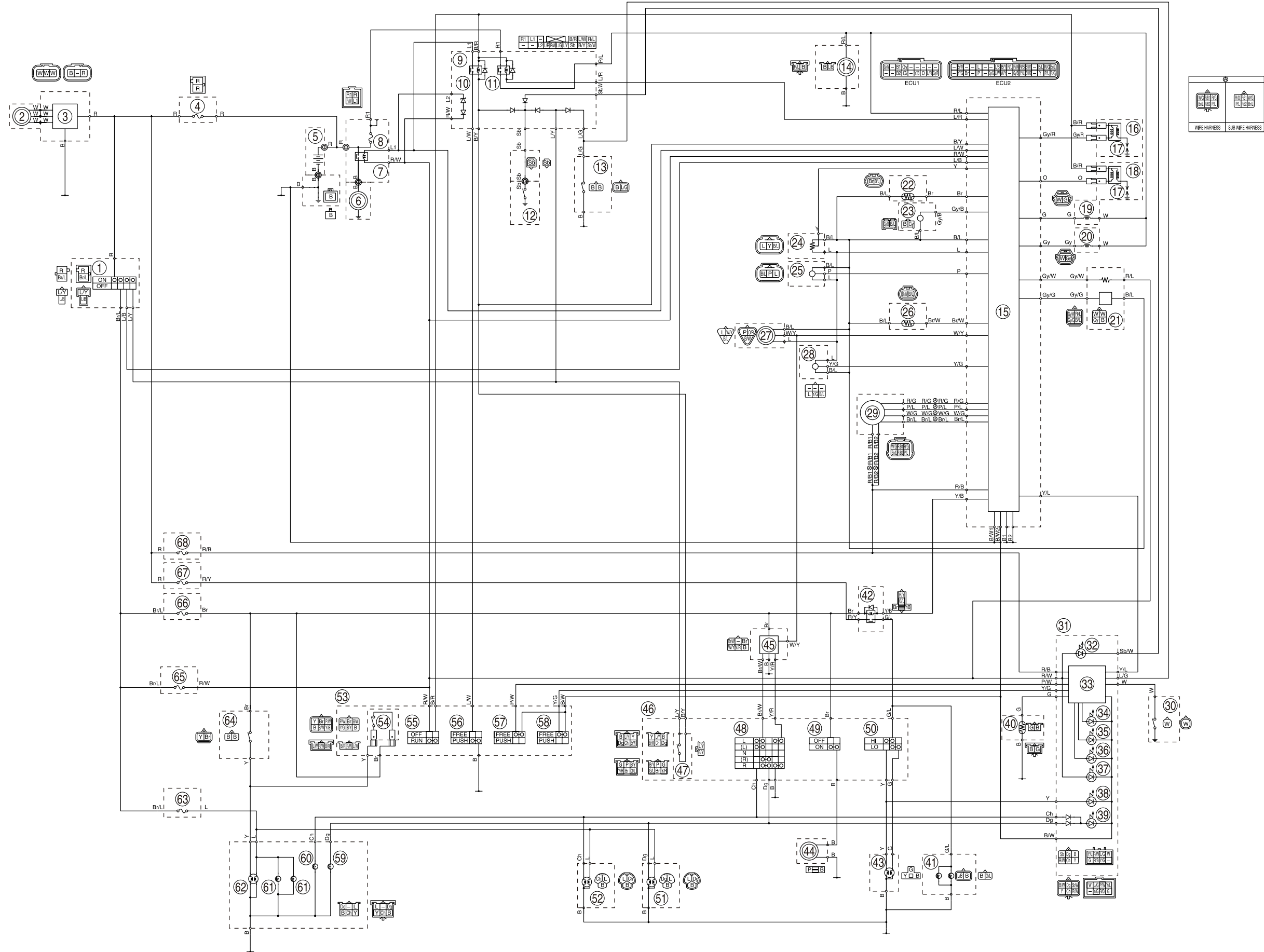
B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/L	Brown/Blue
Br/W	Brown/White
G/L	Green/Blue
Gy/B	Gray/Black
Gy/G	Gray/Green
Gy/R	Gray/Red
Gy/W	Gray/White
L/B	Blue/Black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



YAMAHA MOTOR CO., LTD.

2500 SHINGAI IWATA SHIZUOKA JAPAN

WIRING DIAGRAM
XVS95Y/XVS95YC/XVS95CTY/XVS95CTYC 2009



WIRING DIAGRAM
XVS95Y/XVS95YC/XVS95CTY/XVS95CTYC 2009

