

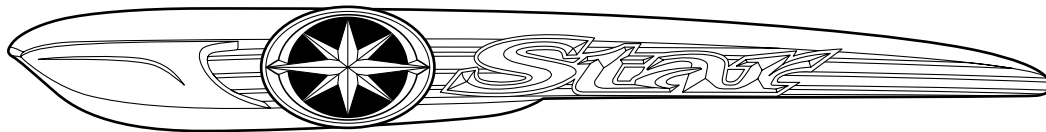


YAMAHA

2011

SERVICE MANUAL

XVS13AA(C)
XVS13CTA(C)
XVS13CA(C)



EAS20050

**XVS13AA(C)/XVS13CTA(C)/XVS13CA(C)
SERVICE MANUAL
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IMPORTANT

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

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.

- 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.

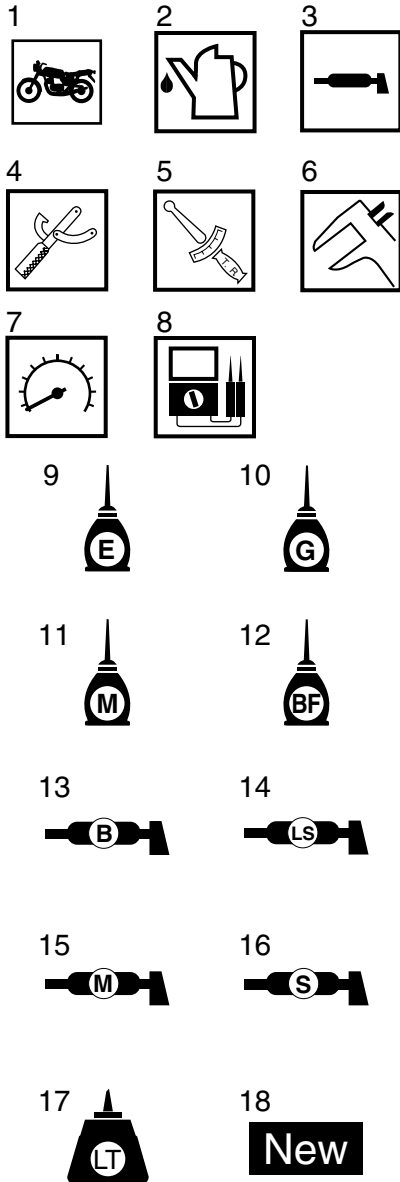


SYMBOLS

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

TIP

The following symbols are not relevant to every vehicle.



8. Electrical data
9. Engine oil
10. Gear oil
11. Molybdenum-disulfide oil
12. Brake fluid
13. Wheel-bearing grease
14. Lithium-soap-based grease
15. Molybdenum-disulfide grease
16. Silicone grease
17. Apply locking agent (LOCTITE®).
18. Replace the part with a new one.

1. Serviceable with engine mounted
2. Filling fluid
3. Lubricant
4. Special tool
5. Tightening torque
6. Wear limit, clearance
7. Engine speed

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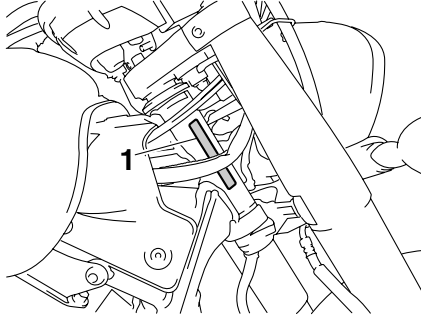
EAS20130

IDENTIFICATION

EAS20140

VEHICLE IDENTIFICATION NUMBER

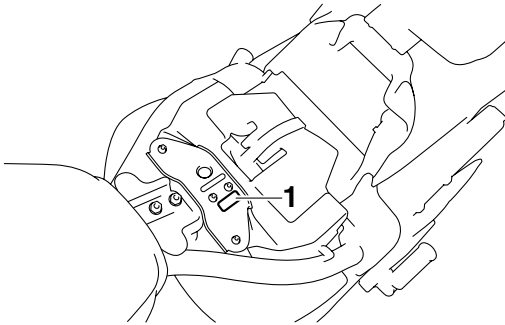
The vehicle identification number “1” is stamped into the right side of the steering head pipe.



EAS20150

MODEL LABEL

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



EAS20170

FEATURES

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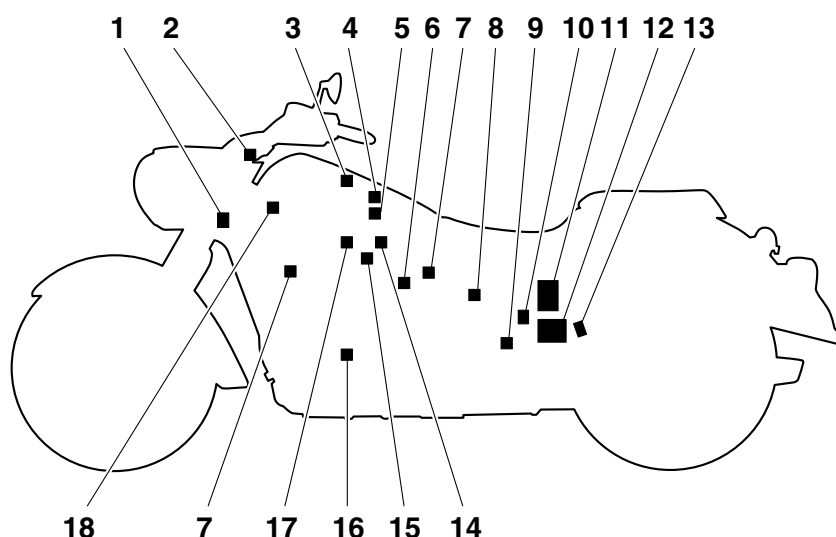
OUTLINE OF THE FI SYSTEM

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

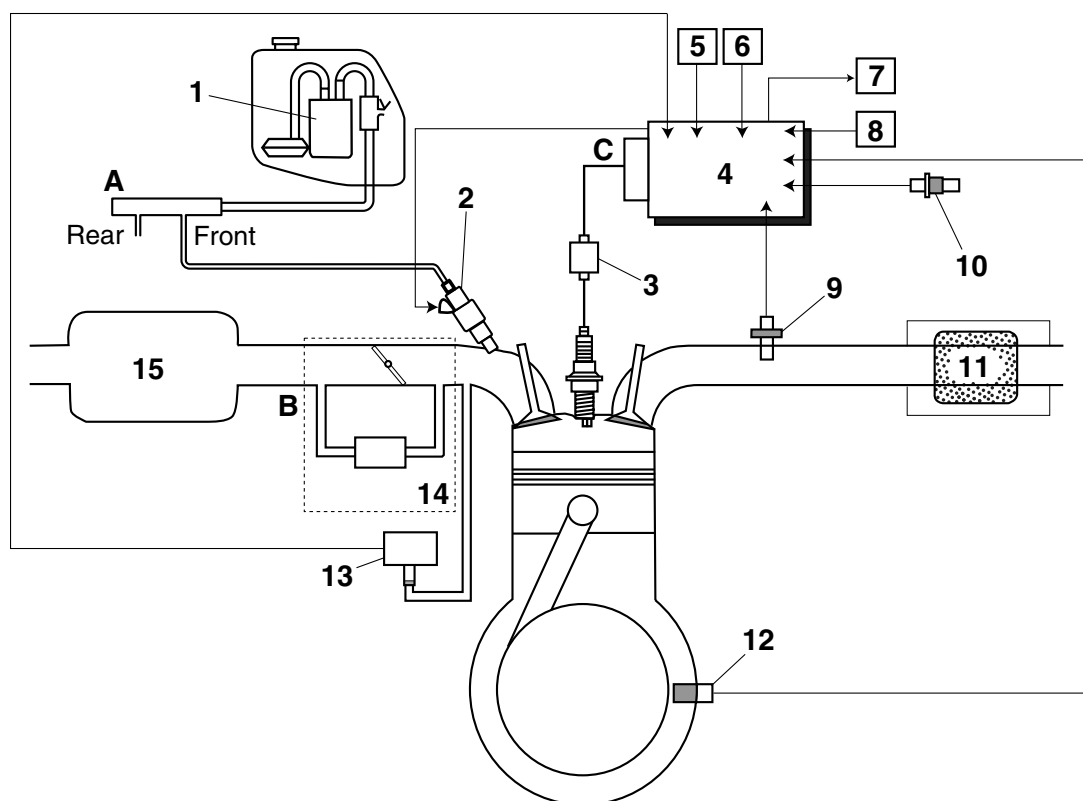
EAS3D81038

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 324 kPa (3.24 kg/cm², 46.1 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, coolant 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. Coolant temperature sensor
11. Catalytic converter
12. Crankshaft position sensor
13. Intake air pressure sensor

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

EAS3D81033

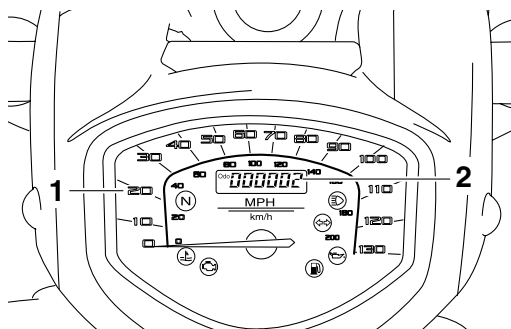
INSTRUMENT FUNCTIONS

Multi-function meter unit (for XVS13AA(C)/XVS13CTA(C))

EWA3D8A001

WARNING

Be sure to stop the vehicle before making any setting changes to the multi-function meter unit. Changing settings while riding can distract the operator and increase the risk of an accident.



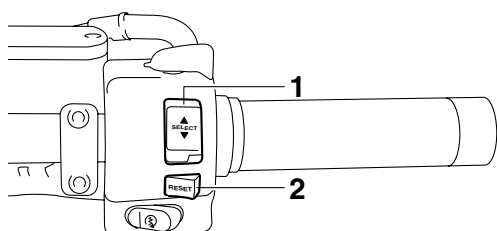
1. Speedometer
2. Odometer/tripmeter/fuel reserve tripmeter/clock

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

- a speedometer
- an odometer
- 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

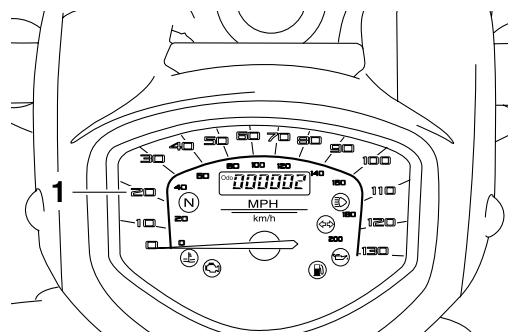
TIP

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

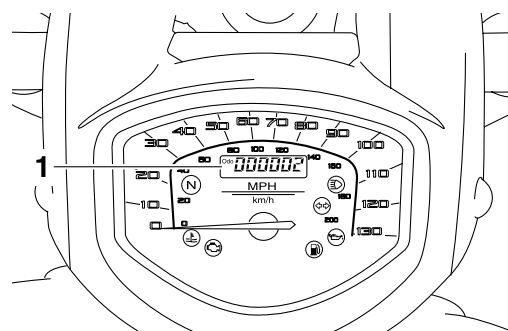
Speedometer



1. Speedometer

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.

Odometer, tripmeters, fuel reserve tripmeter and clock



1. Odometer/tripmeter/fuel reserve tripmeter/clock

Push the “▲” side of the “SELECT” switch to switch the display between the odometer mode “Odo”, the tripmeter modes “Trip 1” and “Trip 2” and the clock mode in the following order: Odo → Trip 1 → Trip 2 → Clock → Odo

TIP

- Push the “▼” side of the “SELECT” switch to switch the display in the reverse order.
- Push the “RESET” switch for less than one second to display the clock for five seconds, regardless of the currently selected display mode.

If the fuel level warning light comes on, the 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 “▲” side of the “SELECT” switch to switch the display between the various tripmeter, odometer, and clock modes in the following order:

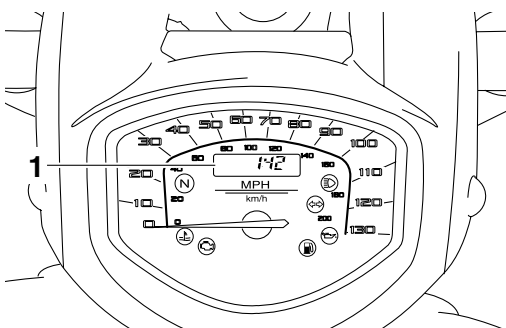
Trip F → Trip 1 → Trip 2 → Clock → Odo → Trip F

TIP

Push the “▼” side of the “SELECT” switch to switch the display in the reverse order.

To reset a tripmeter, select it by pushing the “▲” or “▼” side of 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).

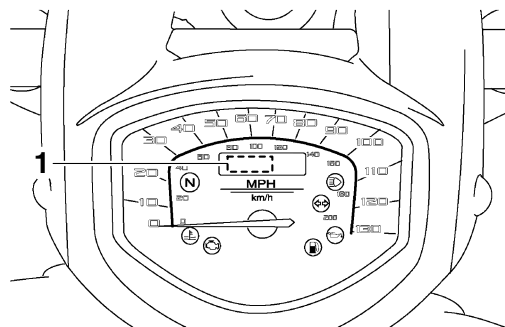
To set the clock:



1. Clock

1. Push the “▲” or “▼” side of the “SELECT” switch to change the display to the clock mode.
2. Push the “▲” side of the “SELECT” switch and the “RESET” switch together for at least two seconds.
3. When the hour digits start flashing, push the “▲” or “▼” side of the “SELECT” switch to set the hours.
4. Push the “RESET” switch, and the minute digits will start flashing.
5. Push the “▲” or “▼” side of the “SELECT” switch to set the minutes.
6. Push the “RESET” switch and then release it to start the clock.

Self-diagnosis device



1. Fault code display

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

If any of those circuits are not working correctly, the engine trouble warning light will come on, and then the odometer/tripmeter/clock display will indicate a two-digit fault code.

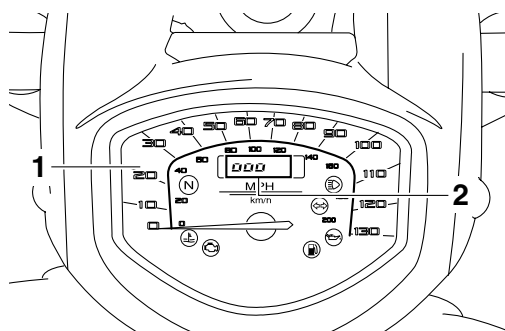
If the odometer/tripmeter/clock display indicates any fault codes, note the code number, and then check the vehicle. Refer to “FUEL INJECTION SYSTEM” on page 8-45.

ECA3D8A003

NOTICE

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

Brightness control mode

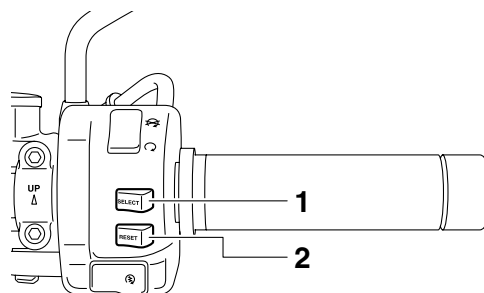


1. Speedometer panel
2. Brightness level

This function allows you to adjust the brightness of the speedometer panel to suit the outside lighting conditions.

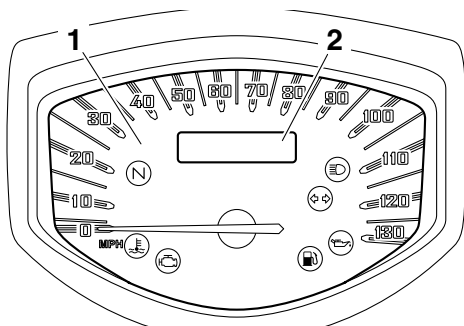
To set the brightness:

1. Turn the key to "OFF".
2. Push and hold the "▲" side of the "SELECT" switch.
3. Turn the key to "ON", and then release the "SELECT" switch after five seconds or more.
4. Push the "▲" or "▼" side of the "SELECT" switch to select the desired brightness level.
5. Push the "RESET" switch to confirm the selected brightness level. The display will return to the odometer, tripmeter or clock mode.



1. "SELECT" switch
2. "RESET" switch

Multi-function meter unit (for XVS13CA(C))



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

EWA12422



WARNING

Be sure to stop the vehicle before making any setting changes to the multi-function meter unit. Changing settings while riding can distract the operator and increase the risk of an accident.

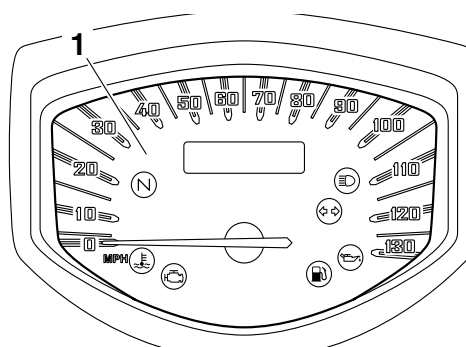
The multi-function meter unit is equipped with the following:

- a speedometer
- an odometer
- 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 fuel meter
- a clock
- a self-diagnosis device
- a brightness control mode

TIP

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

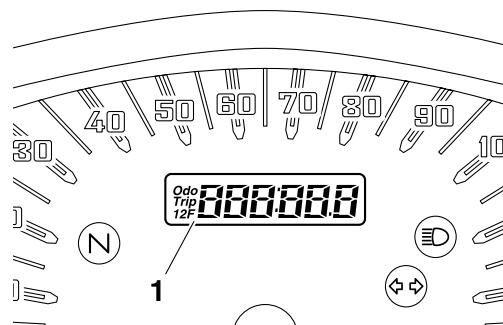
Speedometer



1. Speedometer

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.

Odometer, tripmeters, fuel reserve tripmeter, fuel meter and clock



1. Odometer/tripmeter/fuel reserve tripmeter/fuel meter/clock

Push the "SELECT" switch to change the display between the odometer mode "Odo", the tripmeter modes "Trip 1" and "Trip 2", the fuel meter mode, and the clock mode in the following order: Odo → Trip 1 → Trip 2 → Fuel meter → Clock → Odo

TIP

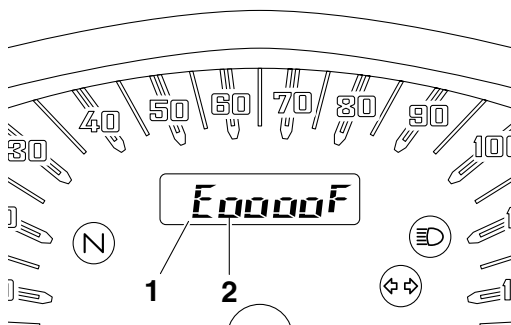
Push the “RESET” switch for less than one second to display the clock for five seconds, regardless of the currently selected display mode.

If the fuel level warning light comes on, the 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, odometer, fuel meter, and clock modes in the following order:

Trip F → Trip 1 → Trip 2 → Fuel meter → Clock → 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).

Fuel meter



1. Fuel meter
2. Segment

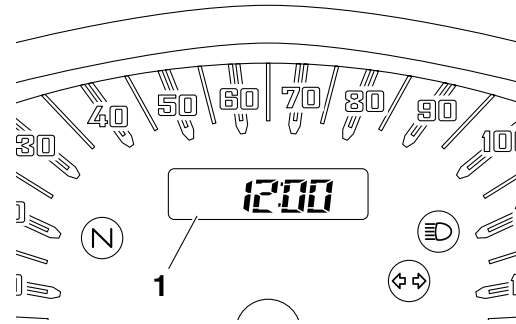
The fuel meter indicates the amount of fuel in the fuel tank. The display segments of the fuel meter disappear towards “E” (Empty) as the fuel level decreases. When the fuel meter changes from two segments to only one segment, approximately 5.0 L (1.32 US gal, 1.1 Imp.gal) of fuel remains in the fuel tank. Be sure to refuel as soon as possible.

TIP

If the display is showing another function when this occurs, the display will automatically change to the fuel meter mode.

The fuel level warning light comes on and the display switches to the fuel reserve tripmeter mode “Trip F” when the fuel level is very low. Refuel as soon as possible to avoid running out of fuel.

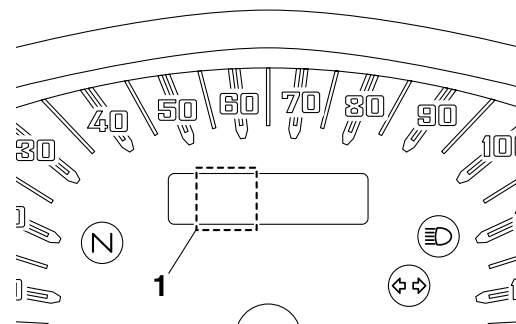
To set the clock



1. Clock

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

Self-diagnosis device



1. Fault code display

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

If a problem is detected in any of those circuits, the engine trouble warning light will come on and the display will indicate a fault code.

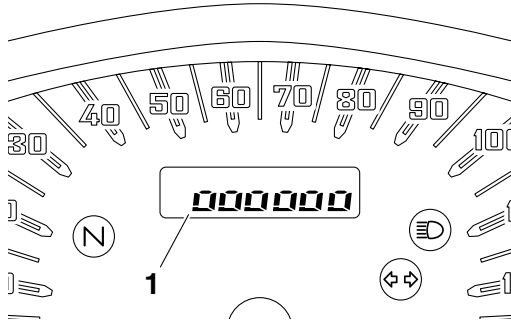
If the display indicates any fault codes, note the code number, and then check the vehicle. Refer to “FUEL INJECTION SYSTEM” on page 8-45.

ECA27D1003

NOTICE

If the display indicates a fault 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 display will change to the prior mode.

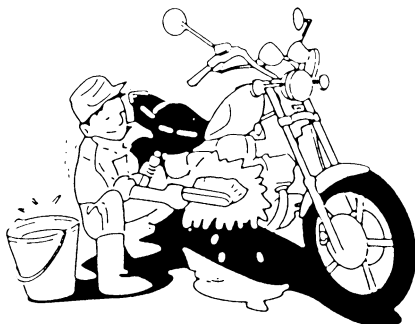
EAS20180

IMPORTANT INFORMATION

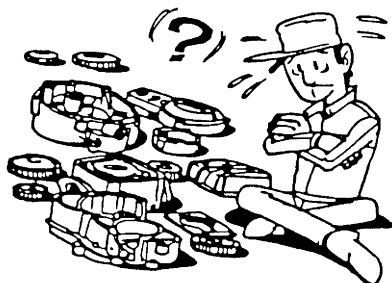
EAS20190

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 1-12.
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.

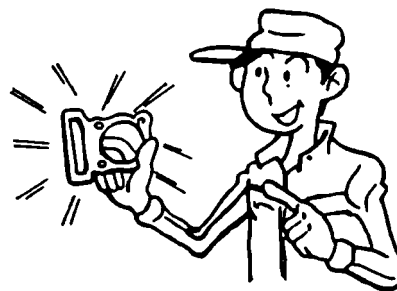


4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS20200

REPLACEMENT PARTS

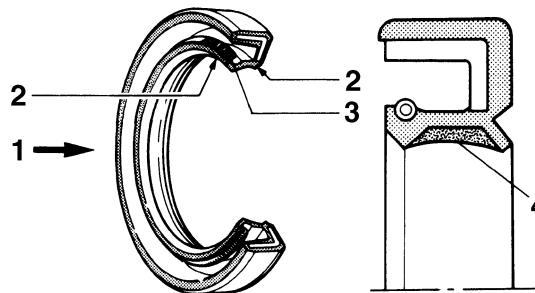
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



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.

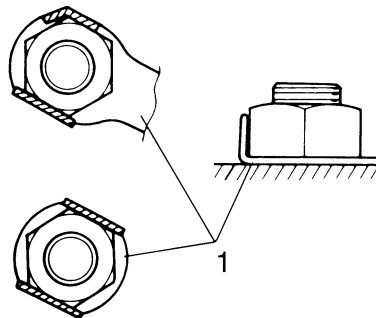


1. Oil
2. Lip
3. Spring
4. Grease

EAS20220

LOCK WASHERS/PLATES AND COTTER PINS

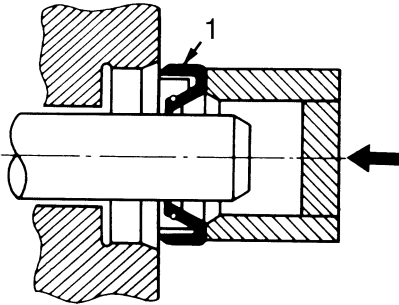
After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS20230

BEARINGS AND OIL SEALS

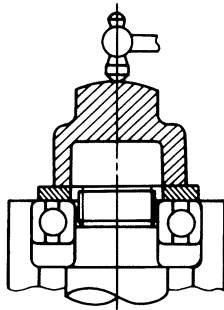
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals "1", lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.



ECA13300

NOTICE

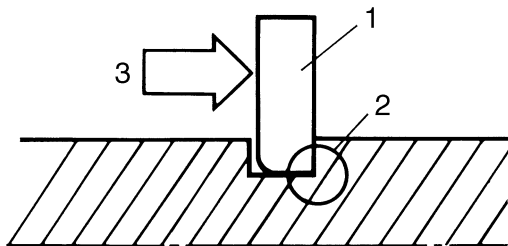
Do not spin the bearing with compressed air because this will damage the bearing surfaces.



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.



CHECKING THE CONNECTIONS

EAS20250

CHECKING THE CONNECTIONS

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

1. Disconnect:

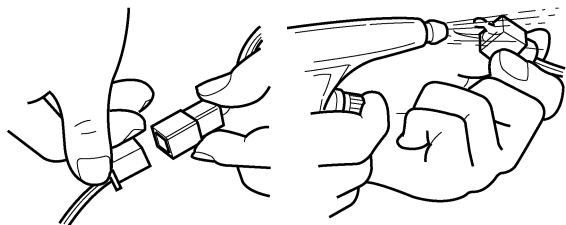
- Lead
- Coupler
- Connector

2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



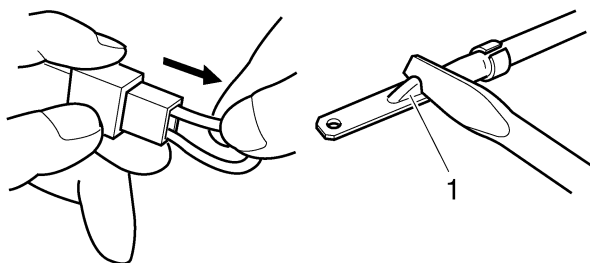
3. Check:

- 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:

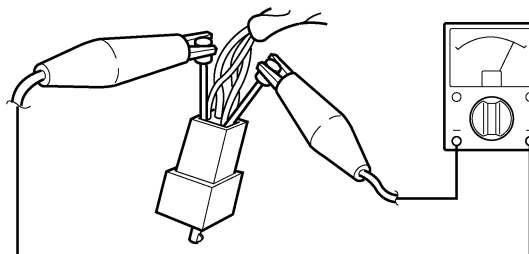
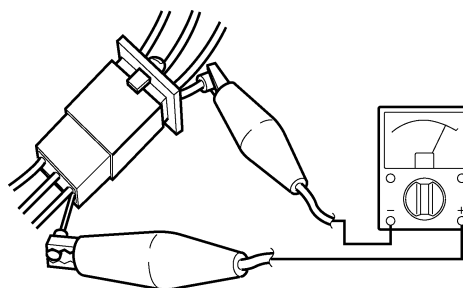
- Continuity
(with the pocket tester)



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.



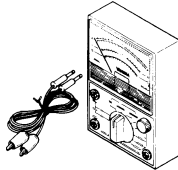
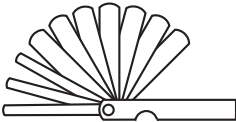
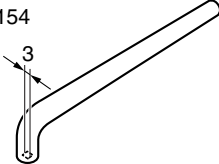
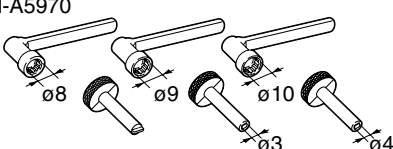
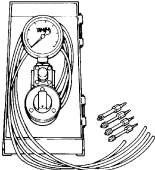

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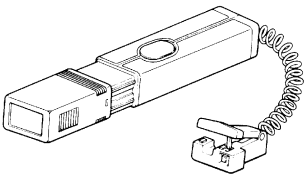
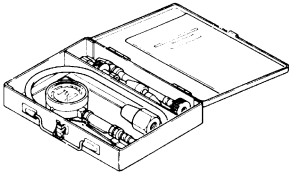
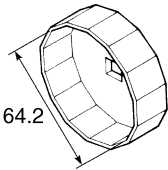

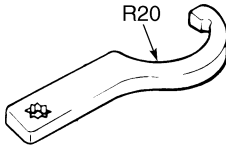
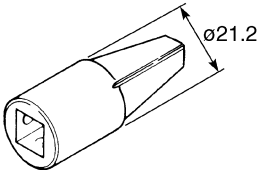
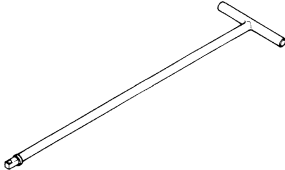
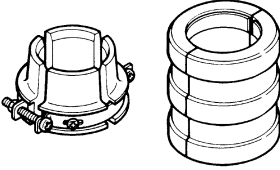
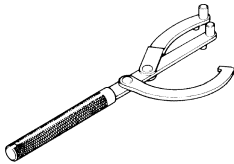
SPECIAL TOOLS

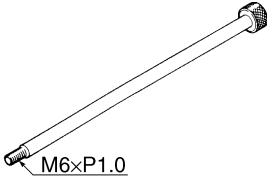
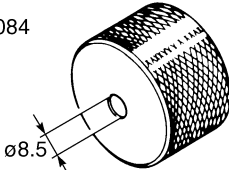
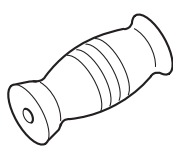
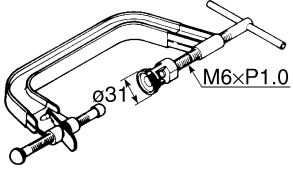
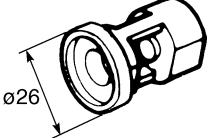
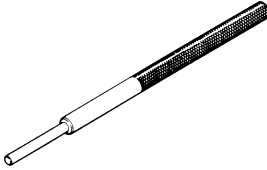
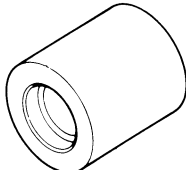
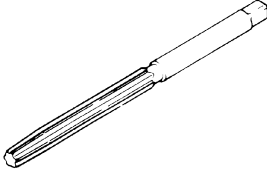
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

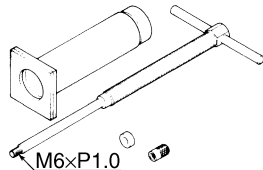
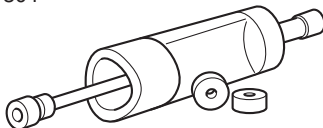
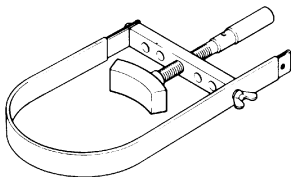
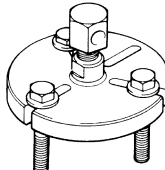
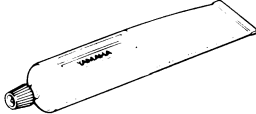
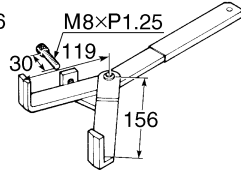
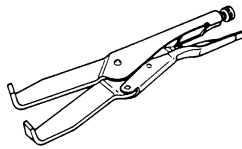
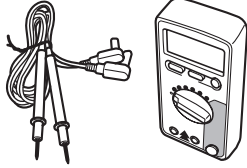
TIP

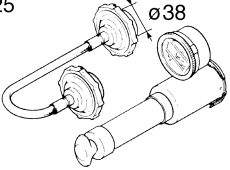
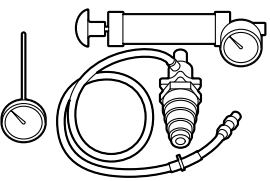
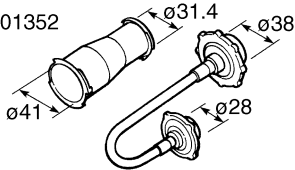
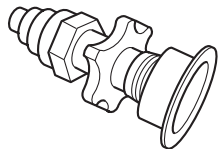
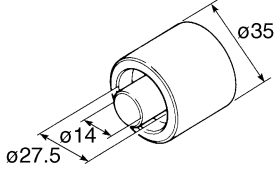
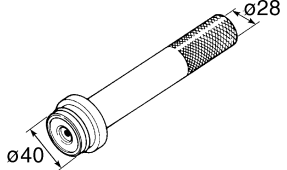
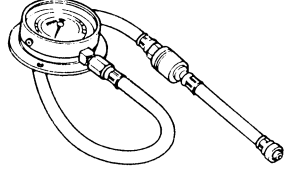
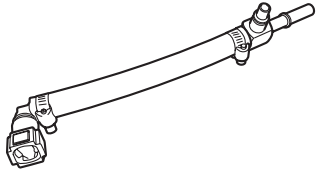
- For U.S.A. and Canada, use part numbers starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part numbers starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-11, 8-93, 8-94, 8-95, 8-99, 8-101, 8-102, 8-103, 8-104, 8-105, 8-106, 8-107, 8-109, 8-110, 8-111
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-5, 3-6
Tappet adjusting tool 90890-04154 Six piece tappet set YM-A5970	<p>90890-04154</p>  <p>YM-A5970</p> 	3-6
Vacuum gauge 90890-03094 Vacuummate YU-44456	<p>90890-03094</p>  <p>YU-44456</p> 	3-7

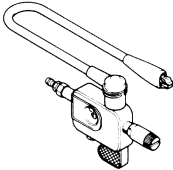
Tool name/Tool No.	Illustration	Reference pages
Timing light 90890-03141 YU-03141		3-10
Compression gauge 90890-03081 Engine compression tester YU-33223		3-10
Oil filter wrench 90890-01426 YU-38411		3-12
Belt tension gauge 90890-03170 Rear drive belt tension gauge YM-03170		3-25, 3-26
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472		3-27, 4-83
Damper rod holder 90890-01460		4-72, 4-74
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-72, 4-74
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-74, 4-75
Rotor holding tool 90890-01235 Universal magneto & rotor holder YU-01235		5-22, 5-28, 5-29

Tool name/Tool No.	Illustration	Reference pages
Slide hammer bolt 90890-01083 Slide hammer bolt 6 mm YU-01083-1		5-23
Weight 90890-01084 YU-01083-3	<p>90890-01084</p>  <p>YU-01083-3</p> 	5-23
Valve spring compressor 90890-04019 YM-04019		5-36, 5-41
Valve spring compressor attachment 90890-01243 Valve spring compressor adapter (26 mm) YM-01253-1		5-36, 5-41
Valve guide remover (ø6) 90890-04064 Valve guide remover (6.0 mm) YM-04064-A		5-37
Valve guide installer (ø6) 90890-04065 Valve guide installer (6.0 mm) YM-04065-A		5-37
Valve guide reamer (ø6) 90890-04066 Valve guide reamer (6.0 mm) YM-04066		5-37

Tool name/Tool No.	Illustration	Reference pages
Piston pin puller set 90890-01304 Piston pin puller YU-01304	<p>90890-01304</p>  <p>M6xP1.0</p> <p>YU-01304</p> 	5-43
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-51, 5-52, 5-59, 5-62
Flywheel puller 90890-01362 Heavy duty puller YU-33270-B		5-51
Yamaha bond No. 1215 90890-85505 (Three Bond No.1215®)		5-53, 5-79, 6-12
Universal clutch holder 90890-04086 YM-91042	<p>90890-04086</p>  <p>M8xP1.25</p> <p>30°</p> <p>119</p> <p>156</p> <p>YM-91042</p> 	5-59, 5-63
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		5-72, 7-14

Tool name/Tool No.	Illustration	Reference pages
Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A	<p>90890-01325</p>  <p>YU-24460-A</p> 	6-3
Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984	<p>90890-01352</p>  <p>YU-33984</p> 	6-3
Mechanical seal installer 90890-04078 Water pump seal installer YM-33221-A		6-12
Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 & 50 mm YM-04058		6-12
Pressure gauge 90890-03153 YU-03153		7-14
Fuel pressure adapter 90890-03176 YM-03176		7-14

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Ignition checker 90890-06754 Oppama pet-4000 spark checker YM-34487		8-103

SPECIFICATIONS

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GENERAL SPECIFICATIONS

EAS20280

GENERAL SPECIFICATIONS

Model

Model

XVS13AA 3D8D (USA)
XVS13AAC 3D8E (California)
XVS13CTA 5S6D (USA)
XVS13CTAC 5S6E (California)
XVS13CA 1GP1/27D1 (USA)
XVS13CAC 1GP2/27D2 (California)

Dimensions

Overall length

XVS13AA(C)/XVS13CTA(C):
2490 mm (98.0 in)

Overall width

XVS13CA(C):
2530 mm (99.6 in)
XVS13AA(C)/XVS13CTA(C):
1000 mm (39.4 in)

Overall height

XVS13CA(C):
860 mm (33.9 in)
XVS13AA(C):
1145 mm (45.1 in)
XVS13CTA(C):
1520 mm (59.8 in)

Seat height

XVS13CA(C):
1130 mm (44.5 in)
XVS13AA(C)/XVS13CTA(C):
690 mm (27.2 in)

Wheelbase

XVS13CA(C):
668 mm (26.3 in)
XVS13AA(C)/XVS13CTA(C):
1690 mm (66.5 in)

Ground clearance

XVS13CA(C):
1750 mm (68.9 in)
XVS13AA(C)/XVS13CTA(C):
145 mm (5.71 in)

Minimum turning radius

XVS13CA(C):
150 mm (5.91 in)
XVS13AA(C)/XVS13CTA(C):
3500 mm (137.8 in)
XVS13CA(C):
3400 mm (133.9 in)

Weight

With oil and fuel

XVS13AA(C):
303 kg (668 lb)
XVS13CTA(C):
323 kg (712 lb)
XVS13CA(C):
293 kg (646 lb)

GENERAL SPECIFICATIONS

Maximum load	XVS13AA(C): 210 kg (463 lb) XVS13CTA(C): 190 kg (419 lb) XVS13CA(C): 204 kg (450 lb)
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EAS20290

ENGINE SPECIFICATIONS

Engine

Engine type	Liquid cooled 4-stroke, SOHC
Displacement	1304 cm ³
Cylinder arrangement	V-type 2-cylinder
Bore × stroke	100.0 × 83.0 mm (3.94 × 3.27 in)
Compression ratio	9.50 :1
Standard compression pressure (at sea level)	1450 kPa/400 r/min (14.5 kgf/cm ² /400 r/min, 206.2 psi/400 r/min)
Minimum–maximum	1200–1500 kPa (12.0–15.0 kgf/cm ² , 170.7–213.3 psi)
Starting system	Electric starter

Fuel

Recommended fuel	Unleaded gasoline only
Fuel tank capacity	XVS13AA(C)/XVS13CTA(C): 18.5 L (4.89 US gal, 4.07 Imp.gal)
	XVS13CA(C): 15.0 L (3.96 US gal, 3.30 Imp.gal)
Fuel reserve amount	XVS13AA(C)/XVS13CTA(C): 3.7 L (0.98 US gal, 0.81 Imp.gal)
	XVS13CA(C): 5.0 L (1.32 US gal, 1.10 Imp.gal)

Engine oil

Lubrication system	Wet sump
Recommended brand	YAMALUBE
Type	SAE 10W-30, 10W-40, 10W-50, 15W-40, 20W-40 or 20W-50
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Engine oil quantity	
Total amount	3.70 L (3.91 US qt, 3.26 Imp.qt)
Without oil filter cartridge replacement	3.20 L (3.38 US qt, 2.82 Imp.qt)
With oil filter cartridge replacement	3.40 L (3.59 US qt, 2.99 Imp.qt)

Oil filter

Oil filter type	Cartridge
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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	80.0–120.0 kPa (0.80–1.20 kgf/cm ² , 11.6–17.4 psi)

ENGINE SPECIFICATIONS

Relief valve operating pressure	391.0–489.0 kPa (3.91–4.89 kgf/cm ² , 56.7–70.9 psi)
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Cooling system

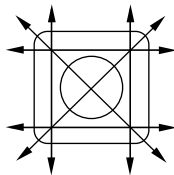
Radiator capacity (including all routes)	2.10 L (2.22 US qt, 1.85 Imp.qt)
Radiator capacity	0.55 L (0.58 US qt, 0.48 Imp.qt)
Coolant reservoir capacity (up to the maximum level mark)	0.45 L (0.48 US qt, 0.40 Imp.qt)
Radiator cap opening pressure	93.3–122.7 kPa (0.93–1.23 kgf/cm ² , 13.5–17.8 psi)
Valve relief pressure	4.9 kPa (0.05 kgf/cm ² , 0.7 psi)
Thermostat	
Valve opening temperature	80.5–83.5 °C (176.90–182.30 °F)
Valve full open temperature	95.0 °C (203.00 °F)
Valve lift (full open)	8.0 mm (0.31 in)
Radiator core	
Width	197.0 mm (7.76 in)
Height	320.0 mm (12.60 in)
Depth	22.0 mm (0.87 in)
Water pump	
Water pump type	Single suction centrifugal pump
Reduction ratio	70/45 × 17/26 (1.017)
Impeller shaft tilt limit	0.15 mm (0.006 in)

Spark plug(s)

Manufacturer/model	NGK/LMAR7A-9
Spark plug gap	0.8–0.9 mm (0.031–0.035 in)

Cylinder head

Volume	44.20–46.40 cm ³ (2.70–2.83 cu.in)
Warpage limit	0.03 mm (0.0012 in)

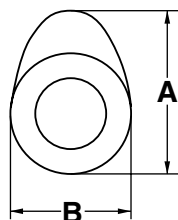


Camshaft

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	42.988–43.088 mm (1.6924–1.6964 in)
Limit	42.888 mm (1.6885 in)
Intake B	37.045–37.145 mm (1.4585–1.4624 in)
Limit	36.945 mm (1.4545 in)
Exhaust A	43.156–43.256 mm (1.6991–1.7030 in)
Limit	43.056 mm (1.6951 in)
Exhaust B	37.118–37.218 mm (1.4613–1.4653 in)

Limit

37.018 mm (1.4574 in)



Timing chain

Tensioning system

Automatic

Rocker arm/rocker arm shaft

Rocker arm inside diameter

12.000–12.018 mm (0.4724–0.4731 in)

Rocker arm shaft outside diameter

11.976–11.991 mm (0.4715–0.4721 in)

Rocker-arm-to-rocker-arm-shaft clearance

0.009–0.042 mm (0.0004–0.0017 in)

Limit

0.095 mm (0.0037 in)

Valve, valve seat, valve guide

Valve clearance (cold)

Intake

0.09–0.13 mm (0.0035–0.0051 in)

Exhaust

0.14–0.18 mm (0.0055–0.0071 in)

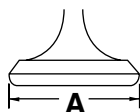
Valve dimensions

Valve head diameter A (intake)

35.90–36.10 mm (1.4134–1.4213 in)

Valve head diameter A (exhaust)

31.90–32.10 mm (1.2559–1.2638 in)

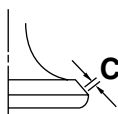


Valve seat width C (intake)

1.00–1.20 mm (0.0394–0.0472 in)

Valve seat width C (exhaust)

1.00–1.20 mm (0.0394–0.0472 in)

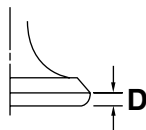


Valve margin thickness D (intake)

1.15–1.45 mm (0.0453–0.0571 in)

Valve margin thickness D (exhaust)

1.15–1.45 mm (0.0453–0.0571 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

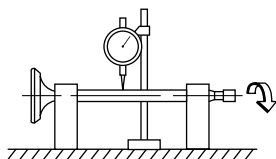
6.050 mm (0.2382 in)

Valve-stem-to-valve-guide clearance (intake)

0.010–0.037 mm (0.0004–0.0015 in)

ENGINE SPECIFICATIONS

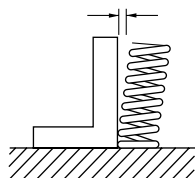
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)	0.025–0.052 mm (0.0010–0.0020 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.010 mm (0.0004 in)



Cylinder head valve seat width (intake)	1.00–1.20 mm (0.0394–0.0472 in)
Limit	1.6 mm (0.06 in)
Cylinder head valve seat width (exhaust)	1.00–1.20 mm (0.0394–0.0472 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, 141.32 lb/in)
Spring rate K2 (intake)	34.93 N/mm (3.56 kgf/mm, 199.45 lb/in)
Spring rate K1 (exhaust)	24.75 N/mm (2.52 kgf/mm, 141.32 lb/in)
Spring rate K2 (exhaust)	34.93 N/mm (3.56 kgf/mm, 199.45 lb/in)
Installed compression spring force (intake)	171.00–197.00 N (17.44–20.09 kgf, 38.44–44.29 lbf)
Installed compression spring force (exhaust)	171.00–197.00 N (17.44–20.09 kgf, 38.44–44.29 lbf)
Spring tilt (intake)	2.5°/1.9 mm (2.5°/0.07 in)
Spring tilt (exhaust)	2.5°/1.9 mm (2.5°/0.07 in)



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

Cylinder

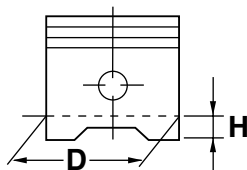
Bore	100.000–100.010 mm (3.9370–3.9374 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.050 mm (0.0020 in)

Piston

Piston-to-cylinder clearance	0.030–0.055 mm (0.0012–0.0022 in)
Limit	0.15 mm (0.0059 in)
Diameter D	99.955–99.970 mm (3.9352–3.9358 in)

ENGINE SPECIFICATIONS

Height H 8.0 mm (0.31 in)



Offset 0.50 mm (0.0197 in)
Piston pin bore inside diameter 23.004–23.015 mm (0.9057–0.9061 in)
Limit 23.045 mm (0.9073 in)
Piston pin outside diameter 22.991–23.000 mm (0.9052–0.9055 in)
Limit 22.971 mm (0.9044 in)
Piston-pin-to-piston-pin-bore clearance 0.004–0.024 mm (0.0002–0.0009 in)
Limit 0.074 mm (0.0029 in)

Piston ring

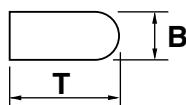
Top ring

Ring type

Barrel

Dimensions (B × T)

1.20 × 3.80 mm (0.05 × 0.15 in)



End gap (installed)

0.20–0.35 mm (0.0079–0.0138 in)

Limit

0.60 mm (0.0236 in)

Ring side clearance

0.030–0.080 mm (0.0012–0.0032 in)

Limit

0.130 mm (0.0051 in)

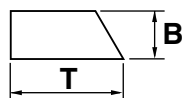
2nd ring

Ring type

Taper

Dimensions (B × T)

1.20 × 4.00 mm (0.05 × 0.16 in)



End gap (installed)

0.45–0.60 mm (0.0177–0.0236 in)

Limit

0.95 mm (0.0374 in)

Ring side clearance

0.030–0.070 mm (0.0012–0.0028 in)

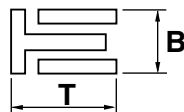
Limit

0.130 mm (0.0051 in)

Oil ring

Dimensions (B × T)

2.50 × 3.40 mm (0.10 × 0.13 in)



End gap (installed)

0.20–0.70 mm (0.0079–0.0276 in)

Connecting rod

Oil clearance

0.030–0.054 mm (0.0012–0.0021 in)

Bearing color code

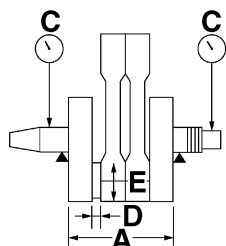
1:Blue 2:Black 3:Brown 4:Green 5:Yellow

Small end inside diameter

23.015–23.028 mm (0.9061–0.9066 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)
Big end radial clearance E	0.022–0.046 mm (0.0009–0.0018 in)
Limit	0.09 mm (0.0035 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)

Balancer

Balancer drive method	Gear
-----------------------	------

Clutch

Clutch type	Wet, multiple-disc
Clutch release method	Outer push, screw push
Operation	Left hand operation
Clutch lever free play	5.0–10.0 mm (0.20–0.39 in)
Friction plate 1, 3 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	2.82 mm (0.1110 in)
Plate quantity	7 pcs
Clutch plate thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	8 pcs
Warp page limit	0.20 mm (0.0079 in)
Clutch spring height	6.70 mm (0.26 in)
Minimum height	6.37 mm (0.25 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)

Transmission

Transmission type	Constant mesh 5-speed
Primary reduction system	Spur gear
Primary reduction ratio	70/45 (1.556)
Secondary reduction system	Belt drive
Secondary reduction ratio	XVS13AA(C)/XVS13CTA(C): 70/30 (2.333) XVS13CA(C): 70/31 (2.258)
Operation	Left foot operation

ENGINE SPECIFICATIONS

Gear ratio	
1st	36/13 (2.769)
2nd	32/18 (1.778)
3rd	29/21 (1.381)
4th	29/26 (1.115)
5th	24/25 (0.960)
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 guide bar bending limit	0.025 mm (0.0010 in)
Shift fork thickness	6.26–6.39 mm (0.2465–0.2516 in)
Air filter	
Air filter element	Oil-coated paper element
Fuel pump	
Pump type	Electrical
Maximum consumption amperage	4.6 A
Output pressure	392.0 kPa (3.92 kgf/cm ² , 56.8 psi)
Fuel injector	
Model/quantity	INP-284/2
Throttle body	
Type/quantity	ACW40/1
ID mark	XVS13AA/XVS13CA/XVS13CTA: 3D8D 40 XVS13AAC/XVS13CAC/XVS13CTAC: 3D8E 50
Throttle valve size	#40
Throttle position sensor	
Resistance	3.10–5.70 kΩ
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	3.57–3.71 V
Coolant temperature sensor resistance	290–354 Ω at 80 °C (176 °F)
Idling condition	
Engine idling speed	950–1050 r/min
Intake vacuum	32.0–37.3 kPa (240–280 mmHg, 9.4–11.0 inHg)
Water temperature	90.0–100.0 °C (194.00–212.00 °F)
Oil temperature	70.0–80.0 °C (158.00–176.00 °F)
Throttle cable free play	4.0–6.0 mm (0.16–0.24 in)

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CHASSIS SPECIFICATIONS

Chassis

Frame type	Double cradle
Caster angle	XVS13AA(C)/XVS13CTA(C): 32.70° XVS13CA(C): 34.00°
Trail	XVS13AA(C)/XVS13CTA(C): 145.0 mm (5.71 in) XVS13CA(C): 109.0 mm (4.29 in)

Front wheel

Wheel type	Cast wheel
Rim size	XVS13AA(C)/XVS13CTA(C): 16M/C × MT3.00 XVS13CA(C): 21M/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	XVS13AA(C)/XVS13CTA(C): 16M/C × MT4.50 XVS13CA(C): 18M/C × MT7.50
Rim material	Aluminum
Wheel travel	XVS13AA(C)/XVS13CTA(C): 110.0 mm (4.33 in) XVS13CA(C): 100.0 mm (3.94 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	XVS13AA(C)/XVS13CTA(C): 130/90 16M/C 67H XVS13CA(C): 120/70 21M/C 62H
Manufacturer/model	XVS13AA(C)/XVS13CTA(C): DUNLOP/D404F X BRIDGESTONE/EXEDRA G721 XVS13CA(C): BRIDGESTONE/EXEDRA G721 G
Wear limit (front)	1.0 mm (0.04 in)

CHASSIS SPECIFICATIONS

Rear tire

Type	Tubeless
Size	XVS13AA(C)/XVS13CTA(C): 170/70B 16M/C 75H XVS13CA(C): 210/40R 18M/C 73H
Manufacturer/model	XVS13AA(C)/XVS13CTA(C): DUNLOP/K555 BRIDGESTONE/EXEDRA G722 G XVS13CA(C): BRIDGESTONE/EXEDRA G852 RADIAL G
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	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	280 kPa (2.80 kgf/cm ² , 41 psi)
Loading condition	XVS13AA(C): 90–210 kg (198–463 lb) XVS13CTA(C): 90–190 kg (198–419 lb) XVS13CA(C): 90–204 kg (198–450 lb)
Front	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	280 kPa (2.80 kgf/cm ² , 41 psi)

Front brake

Type	XVS13AA(C)/XVS13CTA(C): Dual disc brake XVS13CA(C): Single disc brake
Operation	Right hand operation
Front disc brake	
Disc outside diameter × thickness	XVS13AA(C)/XVS13CTA(C): 298.0 × 5.0 mm (11.73 × 0.20 in) XVS13CA(C): 320.0 × 4.5 mm (12.60 × 0.18 in)
Brake disc thickness limit	XVS13AA(C)/XVS13CTA(C): 4.5 mm (0.18 in) XVS13CA(C): 4.0 mm (0.16 in)
Brake disc deflection limit	XVS13AA(C)/XVS13CTA(C): 0.12 mm (0.0047 in) XVS13CA(C): 0.15 mm (0.0059 in)
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)

CHASSIS SPECIFICATIONS

Master cylinder inside diameter	XVS13AA(C)/XVS13CTA(C): 15.00 mm (0.59 in) XVS13CA(C): 14.00 mm (0.55 in)
Caliper cylinder inside diameter	25.40 mm (1.00 in)
Caliper cylinder inside diameter	30.16 mm (1.19 in)
Recommended fluid	DOT 4
Rear brake	
Type	Single disc brake
Operation	Right foot operation
Rear disc brake	
Disc outside diameter × thickness	XVS13AA(C)/XVS13CTA(C): 298.0 × 6.0 mm (11.73 × 0.24 in) XVS13CA(C): 310.0 × 6.0 mm (12.20 × 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	XVS13AA(C)/XVS13CTA(C): 345.5 mm (13.60 in) XVS13CA(C): 401.7 mm (15.81 in)
Limit	XVS13AA(C)/XVS13CTA(C): 339.4 mm (13.36 in) XVS13CA(C): 393.7 mm (15.50 in)
Collar length	XVS13AA(C)/XVS13CTA(C): 183.0 mm (7.20 in) XVS13CA(C): 226.0 mm (8.90 in)
Installed length	XVS13AA(C)/XVS13CTA(C): 339.4 mm (13.36 in) XVS13CA(C): 359.4 mm (14.15 in)

CHASSIS SPECIFICATIONS

Spring rate K1	XVS13AA(C)/XVS13CTA(C): 7.35 N/mm (0.75 kgf/mm, 41.97 lb/in)
Spring rate K2	XVS13CA(C): 5.90 N/mm (0.60 kgf/mm, 33.69 lb/in)
Spring stroke K1	XVS13AA(C)/XVS13CTA(C): 0.0–135.0 mm (0.00–5.31 in)
Spring stroke K2	XVS13CA(C): 0.0–55.0 mm (0.00–2.17 in)
Inner tube outer diameter	41.0 mm (1.61 in)
Optional spring available	No
Recommended oil	Yamaha fork oil 10WT
Quantity	XVS13AA(C)/XVS13CTA(C): 490.0 cm ³ (16.57 US oz, 17.28 Imp.oz)
Level	XVS13CA(C): 514.0 cm ³ (17.38 US oz, 18.13 Imp.oz)
	XVS13AA(C)/XVS13CTA(C): 105.0 mm (4.13 in)
	XVS13CA(C): 124.0 mm (4.88 in)
Rear suspension	
Type	Swingarm (link suspension)
Spring/shock absorber type	Coil spring/gas-oil damper
Rear shock absorber assembly travel	XVS13AA(C)/XVS13CTA(C): 48.0 mm (1.89 in)
	XVS13CA(C): 44.0 mm (1.73 in)
Spring free length	XVS13AA(C)/XVS13CTA(C): 182.0 mm (7.17 in)
	XVS13CA(C): 174.5 mm (6.87 in)
Installed length	XVS13AA(C)/XVS13CTA(C): 166.0 mm (6.54 in)
	XVS13CA(C): 163.5 mm (6.44 in)
Spring rate K1	XVS13AA(C)/XVS13CTA(C): 160.00 N/mm (16.32 kgf/mm, 913.60 lb/in)
	XVS13CA(C): 186.00 N/mm (18.97 kgf/mm, 1062.06 lb/in)
Spring stroke K1	XVS13AA(C)/XVS13CTA(C): 0.0–48.0 mm (0.00–1.89 in)
	XVS13CA(C): 0.0–44.0 mm (0.00–1.73 in)
Optional spring available	No
Enclosed gas/air pressure (STD)	1200 kPa (12.0 kgf/cm ² , 170.7 psi)
Spring preload adjusting positions	
Minimum	1
Standard	4
Maximum	9

CHASSIS SPECIFICATIONS

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

Drive belt slack (on the sidestand)	5.0–7.0 mm (0.20–0.28 in)
Drive belt slack (on a suitable stand)	XVS13AA(C)/XVS13CTA(C): 4.0–6.0 mm (0.16–0.24 in) XVS13CA(C): 5.0–7.0 mm (0.20–0.28 in)

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ELECTRICAL SPECIFICATIONS

Voltage

System voltage	12 V
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Ignition system

Ignition system	TCI
Advancer type	Digital
Ignition timing (B.T.D.C.)	5.0°/1000 r/min

Engine control unit

Model/manufacturer	FUA0013/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	Resin
Resistance	10.0 k Ω

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	0.112–0.168 Ω

Rectifier/regulator

Regulator type	Semi conductor-short circuit
Regulated voltage (DC)	14.1–14.9 V
Rectifier capacity (DC)	50.0 A
Withstand voltage	200.0 V

Battery

Model	YTX20L-BS
Voltage, capacity	12 V, 18.0 Ah
Manufacturer	GS YUASA
Ten hour rate amperage	1.80 A

Headlight

Bulb type	Halogen bulb
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Bulb voltage, wattage × quantity

Headlight	12 V, 60 W/55 W × 1
Tail/brake light	XVS13AA(C)/XVS13CTA(C): 12 V, 5.0 W/21.0 W × 1 XVS13CA(C): LED
Front turn signal/position light	XVS13AA(C)/XVS13CTA(C): 12 V, 21 W/5.0 W × 2 XVS13CA(C): 12 V, 23 W/8.0 W × 2

ELECTRICAL SPECIFICATIONS

Rear turn signal light	12 V, 21.0 W × 2
License plate light	XVS13AA(C)/XVS13CTA(C): 12 V, 5.0 W × 1 XVS13CA(C): 12 V, 3.4 W × 2
Meter lighting	LED
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
Coolant temperature warning light	LED
Engine trouble warning light	LED
Electric starting system	
System type	Constant mesh
Starter motor	
Power output	0.80 kW
Armature coil resistance	0.0050–0.0150 Ω
Brush overall length	12.0 mm (0.47 in)
Limit	6.50 mm (0.26 in)
Brush spring force	6.025–6.515 N (614–664 gf, 21.69–23.45 oz)
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
Turn signal relay	
Relay type	Semi transistor
Built-in, self-canceling device	Yes
Turn signal blinking frequency	75–95 cycles/min
Wattage	21(23) W × 2 + LED
Oil level switch	
Oil level switch resistance (minimum level position)	114.0–126.0 Ω
Oil level switch resistance (maximum level position)	484.0–536.0 Ω
Starting circuit cut-off relay	
Coil resistance	162.0–198.0 Ω
Headlight relay	
Coil resistance	86.40–105.60 Ω

ELECTRICAL SPECIFICATIONS

Fuel pump relay

Coil resistance	162–198 Ω
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Fan motor relay

Coil resistance	86.40–105.60 Ω
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Fuses

Main fuse	50.0 A
Headlight fuse	20.0 A
Taillight fuse	10.0 A
Signaling system fuse	10.0 A
Ignition fuse	15.0 A
Radiator fan fuse	20.0 A
Fuel injection system fuse	10.0 A
Backup fuse	10.0 A
Spare fuse	20.0 A
Spare fuse	15.0 A
Spare fuse	10.0 A
Spare fuse	10.0 A

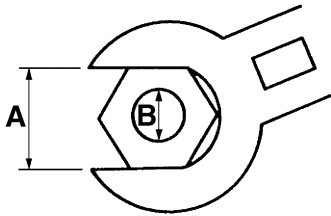
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TIGHTENING TORQUES

EAS20330

GENERAL TIGHTENING TORQUE SPECIFICATIONS

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










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

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







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·kg, 11 ft·lb)	
Oil check bolt	M8	2	15 Nm (1.5 m·kg, 11 ft·lb)	
Cylinder head nut	M12	8	65 Nm (6.5 m·kg, 47 ft·lb)	
Cylinder head bolt	M8	4	13 Nm (1.3 m·kg, 9.4 ft·lb)	
Front cylinder head cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	l = 30 mm (1.18 in)
Front cylinder head cover bolt*1	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	l = 45 mm (1.77 in)
Front cylinder head cover bolt*1	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	l = 45 mm (1.77 in)
Front cylinder head cover bolt*2	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	l = 50 mm (1.97 in)
Front cylinder head cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	l = 55 mm (2.17 in)
Rear cylinder head cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	l = 30 mm (1.18 in)
Rear cylinder head cover bolt*1	M6	6	10 Nm (1.0 m·kg, 7.2 ft·lb)	l = 45 mm (1.77 in)
Rear cylinder head cover bolt*1	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	l = 45 mm (1.77 in)
Rear cylinder head cover bolt*2	M6	7	10 Nm (1.0 m·kg, 7.2 ft·lb)	l = 45 mm (1.77 in)
Rear cylinder head cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	l = 55 mm (2.17 in)
Front cylinder left cover	M6	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Front cylinder right cover	M6	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Rear cylinder left cover	M6	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Rear cylinder right cover	M6	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Spark plug	M10	2	13 Nm (1.3 m·kg, 9.4 ft·lb)	
Tappet cover bolt	M6	8	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Timing chain tensioner housing bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Timing chain tensioner bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Connecting rod bolt (1st)	M8	4	15 Nm (1.5 m·kg, 11 ft·lb)	See TIP. 
Connecting rod bolt (final)	M8	4	Specified angle 125–135°	See TIP. 
Generator rotor bolt	M12	1	90 Nm (9.0 m·kg, 65 ft·lb)	
Right balancer assembly bolt	M6	3	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Left balancer assembly bolt	M6	3	12 Nm (1.2 m·kg, 8.7 ft·lb)	




TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Camshaft assembly bolt	M6	8	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Locknut (rocker arm adjusting screw)	M6	8	14 Nm (1.4 m·kg, 10 ft·lb)	
Timing chain guide bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Camshaft sprocket bolt	M7	4	20 Nm (2.0 m·kg, 14 ft·lb)	
Oil/water pump assembly bolt	M8	3	24 Nm (2.4 m·kg, 17 ft·lb)	
Oil/water pump assembly bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil pump housing cover bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Drain cock bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Coolant delivery pipe bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil/water pump driven sprocket bolt	M6	1	15 Nm (1.5 m·kg, 11 ft·lb)	
Oil filter cartridge	M20	1	17 Nm (1.7 m·kg, 12 ft·lb)	
Oil filter cartridge union bolt	M20	1	80 Nm (8.0 m·kg, 58 ft·lb)	
Oil level switch bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Engine oil drain bolt	M14	1	43 Nm (4.3 m·kg, 31 ft·lb)	
Oil delivery pipe 1 bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil delivery pipe 2 bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil delivery pipe 3 bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Intake air pressure sensor bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Intake manifold joint bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Intake manifold joint clamp screw	M5	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Throttle body bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Fuel pipe bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Air filter case bolt	M5	3	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Air filter case nut	M6	1	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Exhaust pipe nut	M8	4	20 Nm (2.0 m·kg, 14 ft·lb)	
Exhaust pipe protector screw clamp	M6	6	6 Nm (0.6 m·kg, 4.3 ft·lb)	See TIP.
Rear cylinder exhaust pipe protector bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Muffler protector bolt*2	M6	7	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Exhaust pipe clamp bolt	M8	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Muffler clamp bolt	M8	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	
O ₂ sensor*1	M18	1	44 Nm (4.4 m·kg, 32 ft·lb)	
O ₂ sensor*2	M18	1	45 Nm (4.5 m·kg, 32 ft·lb)	
Muffler bracket and frame bolt	M10	3	53 Nm (5.3 m·kg, 38 ft·lb)	
Muffler bracket and muffler bolt*1	M10	2	35 Nm (3.5 m·kg, 25 ft·lb)	
Muffler bracket and muffler bolt*2	M8	3	29 Nm (2.9 m·kg, 21 ft·lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Crankcase stud bolt	M12	6	15 Nm (1.5 m·kg, 11 ft·lb)	
Left crankcase bolt	M6	19	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Right crankcase bolt	M10	3	36 Nm (3.6 m·kg, 25 ft·lb)	
Generator cover bolt	M6	10	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Stator coil bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankshaft position sensor/stator assembly lead holder bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankshaft position sensor bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Coolant delivery cover 1 bolt	M6	9	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Coolant delivery cover 2 bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil baffle plate 1 bolt	M6	7	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil baffle plate 2 bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankcase bearing retainer bolt	M6	4	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Primary drive gear bearing plate bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Starter clutch bolt	M8	6	24 Nm (2.4 m·kg, 17 ft·lb)	
Primary drive gear cover bolt	M6	12	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Primary drive gear nut	M18	1	100 Nm (10.0 m·kg, 72 ft·lb)	 Use the lock washer.
Clutch cover bolt	M6	8	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Clutch cable holder bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Damper cover bolt (clutch)	M6	6	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Damper cover bolt (generator)	M6	6	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Clutch boss nut	M20	1	125 Nm (12.5 m·kg, 90 ft·lb)	 Stake.
Clutch spring plate retainer bolt	M6	6	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Shift shaft spring stopper	M8	1	22 Nm (2.2 m·kg, 16 ft·lb)	
Neutral switch	M10	1	17 Nm (1.7 m·kg, 12 ft·lb)	
Speed sensor bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Starter motor bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Starter motor lead nut	M6	1	5 Nm (0.5 m·kg, 3.6 ft·lb)	
Starter motor terminal nut	M6	1	11 Nm (1.1 m·kg, 8.0 ft·lb)	
Thermostat cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Radiator filler pipe bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Front cylinder thermostat inlet pipe bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Rear cylinder thermostat inlet pipe 1 bolt*1	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Rear cylinder thermostat inlet pipe 2 bolt*1	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Rear cylinder thermostat inlet pipe 2 bolt*1	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rear cylinder thermostat inlet pipe bolt*2	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Thermostat bracket bolt*2	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Thermostat bolt*2	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Coolant temperature sensor	M12	1	18 Nm (1.8 m·kg, 13 ft·lb)	
Coolant reservoir bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Radiator outlet pipe bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Coolant drain bolt	M12	1	2 Nm (0.2 m·kg, 1.4 ft·lb)	
Radiator bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	

*1 For XVS13AA(C)/XVS13CTA(C)

*2 For XVS13CA(C)

TIP

Connecting rod bolt

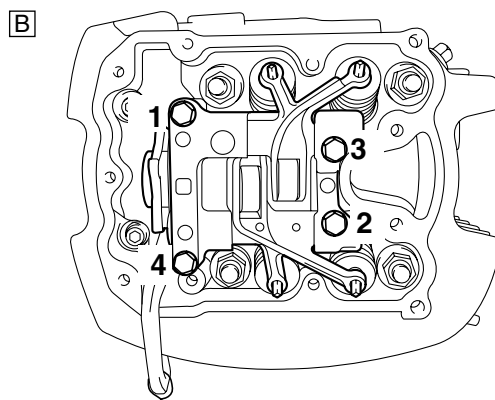
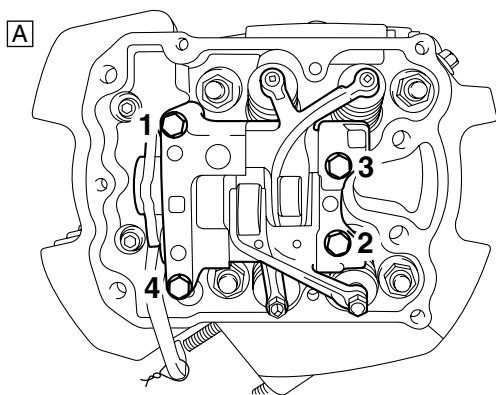
Tighten the connecting rod bolts to 15 Nm (1.5 m·kg, 11 ft·lb), and then tighten them further to reach the specified angle 125–135°.

TIP

Exhaust pipe protector screw clamp

Do not retighten the exhaust pipe protector screw clamps; always replace them with new ones if they are loosened.

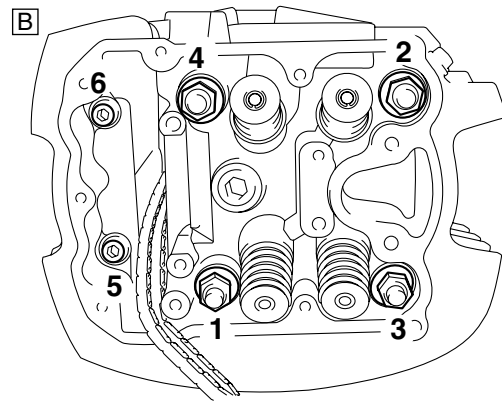
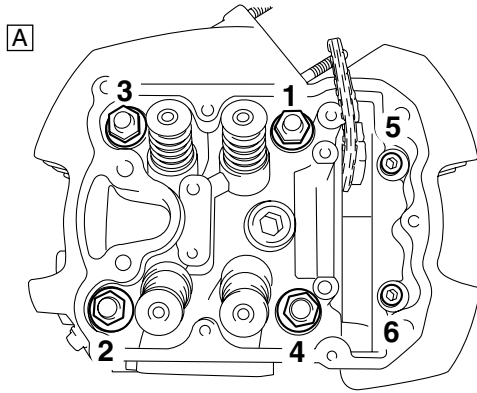
Camshaft assembly tightening sequence



A. Front cylinder camshaft assembly

B. Rear cylinder camshaft assembly

Cylinder head tightening sequence









- A. Front cylinder head
- B. Rear cylinder head







TIGHTENING TORQUES

EAS20350





CHASSIS TIGHTENING TORQUES (for XVS13AA(C)/XVS13CTA(C))

Item	Thread size	Q'ty	Tightening torque	Remarks
Engine bracket bolt (right front upper side)	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Engine bracket bolt (left front upper side)	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Engine mounting bolt (front upper side)	M12	4	30 Nm (3.0 m·kg, 22 ft·lb)	
Engine mounting nut (front lower side)	M12	1	88 Nm (8.8 m·kg, 64 ft·lb)	
Engine mounting nut (rear upper side)	M12	1	88 Nm (8.8 m·kg, 64 ft·lb)	
Engine bracket bolt (rear upper side)	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Engine mounting nut (rear lower side)	M12	1	88 Nm (8.8 m·kg, 64 ft·lb)	
Engine bracket bolt (rear lower side)	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Down tube and frame bolt	M10	4	48 Nm (4.8 m·kg, 35 ft·lb)	
Ignition coil bolt	M6	4	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Ignition coil bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rear shock absorber assembly lower nut	M10	1	48 Nm (4.8 m·kg, 35 ft·lb)	
Rear shock absorber assembly upper nut	M10	1	48 Nm (4.8 m·kg, 35 ft·lb)	
Pivot shaft nut	M16	1	85 Nm (8.5 m·kg, 61 ft·lb)	
Relay arm and frame nut	M10	1	32 Nm (3.2 m·kg, 23 ft·lb)	
Connecting arm and relay arm nut	M12	1	59 Nm (5.9 m·kg, 43 ft·lb)	
Connecting arm and swingarm nut	M12	1	59 Nm (5.9 m·kg, 43 ft·lb)	
Drive belt upper guard bolt	M6	3	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive belt lower guard and swingarm bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive belt lower guard plate bolt (upper side)	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive belt lower guard plate bolt (lower side)	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Upper bracket pinch bolt	M8	2	20 Nm (2.0 m·kg, 14 ft·lb)	
Steering stem nut	M22	1	110 Nm (11.0 m·kg, 80 ft·lb)	
Lower ring nut (initial tightening torque)	M25	1	52 Nm (5.2 m·kg, 37 ft·lb)	See TIP.
Lower ring nut (final tightening torque)	M25	1	18 Nm (1.8 m·kg, 13 ft·lb)	See TIP.






TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Lower bracket pinch bolt	M8	4	45 Nm (4.5 m·kg, 32 ft·lb)	
Front fork cap bolt	M38	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Damper rod bolt	M12	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Lower front fork cover bolt	M6	4	18 Nm (1.8 m·kg, 13 ft·lb)	
Main switch and upper bracket bolt	M8	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Rear handlebar holder nut	M12	2	32 Nm (3.2 m·kg, 23 ft·lb)	
Front handlebar holder bolt	M8	4	28 Nm (2.8 m·kg, 20 ft·lb)	
Front brake master cylinder holder bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Brake lever nut	M6	1	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Clutch lever holder bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Grip end	M16	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Front brake hose union bolt	M10	3	30 Nm (3.0 m·kg, 22 ft·lb)	
Front brake hose holder and lower bracket bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Front brake hose holder bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Front brake hose joint bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Front fender bolt	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Front brake hose guide bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Headlight bracket bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Headlight body bolt	M6	4	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Front turn signal/position light bracket bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Front turn signal/position light nut	M10	2	11 Nm (1.1 m·kg, 8.0 ft·lb)	
Air temperature sensor screw	M5	1	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Meter assembly bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Meter assembly cover bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Meter assembly cover bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Fuel cock screw	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Fuel pump bracket bolt	M5	6	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Fuel sender bolt	M6	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Fuel tank bracket bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Sub-fuel tank bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Canister bolt (California only)	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Seat lock bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Front wheel axle	M16	1	59 Nm (5.9 m·kg, 43 ft·lb)	
Front wheel axle pinch bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Front brake caliper bracket bolt	M10	4	40 Nm (4.0 m·kg, 29 ft·lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Front brake caliper retaining bolt	M10	4	27 Nm (2.7 m·kg, 19 ft·lb)	
Front brake disc bolt	M8	12	23 Nm (2.3 m·kg, 17 ft·lb)	
Bleed screw (front brake caliper)	M7	2	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Rear wheel axle nut	M18	1	150 Nm (15.0 m·kg, 110 ft·lb)	
Drive belt adjusting locknut	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
Rear brake caliper retaining bolt	M10	2	27 Nm (2.7 m·kg, 19 ft·lb)	
Rear brake disc bolt	M8	6	23 Nm (2.3 m·kg, 17 ft·lb)	
Bleed screw (rear brake caliper)	M7	1	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Rear brake hose union bolt	M10	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Rear brake hose guide bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rear brake hose holder bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rear wheel pulley nut	M12	5	95 Nm (9.5 m·kg, 68 ft·lb)	
Rear wheel drive hub stud bolt	M12	5	30 Nm (3.0 m·kg, 22 ft·lb)	
Rear fender bracket, rear fender, and frame bolt	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Passenger seat bracket, rear fender, and frame bolt	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
Passenger seat guide, rear fender, and frame bolt	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
Passenger seat bolt	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
License plate bracket and rear fender bolt	M6	2	11 Nm (1.1 m·kg, 8.0 ft·lb)	
Rear turn signal light nut	M10	2	11 Nm (1.1 m·kg, 8.0 ft·lb)	
Left side cover bolt	M6	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Relay cover bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Sub-fuel tank cover bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Coolant reservoir cover bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Side panel bolt (left and right)	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Positive battery lead bolt (starter relay side)	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Starter motor lead bolt (starter relay side)	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Battery terminal bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Relay bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Battery box bolt	M6	4	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Sidestand bracket bolt	M10	2	56 Nm (5.6 m·kg, 40 ft·lb)	
Sidestand switch bolt	M5	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Sidestand nut	M10	1	56 Nm (5.6 m·kg, 40 ft·lb)	
Shift rod locknut	M6	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Shift arm bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Brake pedal arm bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rear brake master cylinder bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Rear brake master cylinder bracket bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Rider footrest assembly bolt (left and right)	M10	4	64 Nm (6.4 m·kg, 46 ft·lb)	
Passenger footrest bolt (left and right)	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Horn bracket and down tube bolt	M8	1	30 Nm (3.0 m·kg, 22 ft·lb)	
Coolant reservoir cover bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Locknut (rear brake master cylinder)	M8	1	16 Nm (1.6 m·kg, 11 ft·lb)	
Brake fluid reservoir bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rectifier/regulator cover bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rectifier/regulator bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive pulley nut	M22	1	140 Nm (14.0 m·kg, 100 ft·lb)	 Stake.
Drive pulley cover bolt	M6	5	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Drive pulley housing bolt	M8	5	24 Nm (2.4 m·kg, 17 ft·lb)	
Windshield bolt*1	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Windshield bracket bolt (upper side)*1	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Windshield bracket bolt (lower side)*1	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Sidebag bolt (left and right)*1	M6	8	18 Nm (1.8 m·kg, 13 ft·lb)	
Backrest bolt*1	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Sidebag bracket bolt (left and right)*1	M8	8	23 Nm (2.3 m·kg, 17 ft·lb)	

*1 For XVS13CTA(C)

TIP

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




TIGHTENING TORQUES

EAS27D1024






CHASSIS TIGHTENING TORQUES (for XVS13CA(C))

Item	Thread size	Q'ty	Tightening torque	Remarks
Engine bracket nut (front upper side)	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Engine mounting bolt (front center side)	M10	4	30 Nm (3.0 m·kg, 22 ft·lb)	
Engine bracket nut (front upper side)	M12	1	88 Nm (8.8 m·kg, 64 ft·lb)	
Engine bracket bolt (front lower side)	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Engine mounting nut (front lower side)	M12	1	88 Nm (8.8 m·kg, 64 ft·lb)	
Engine bracket nut (rear upper side)	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Engine mounting nut (rear upper side)	M12	1	88 Nm (8.8 m·kg, 64 ft·lb)	
Engine bracket bolt (rear lower side)	M10	2	48 Nm (4.8 m·kg, 35 ft·lb)	
Engine mounting nut (rear lower side)	M12	1	88 Nm (8.8 m·kg, 64 ft·lb)	
Ignition coil bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Ignition coil bracket bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Clutch cable locknut (engine side)	M8	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Clutch cable locknut (handlebar side)	M8	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rear shock absorber assembly lower nut	M10	1	48 Nm (4.8 m·kg, 35 ft·lb)	
Rear shock absorber assembly upper nut	M10	1	50 Nm (5.0 m·kg, 36 ft·lb)	
Pivot shaft nut	M16	1	85 Nm (8.5 m·kg, 61 ft·lb)	
Relay arm and frame nut	M10	1	50 Nm (5.0 m·kg, 36 ft·lb)	
Connecting arm and relay arm nut	M12	1	59 Nm (5.9 m·kg, 43 ft·lb)	
Connecting arm and swingarm nut	M12	1	59 Nm (5.9 m·kg, 43 ft·lb)	
Drive belt upper guard bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive belt upper guard nut	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive belt lower guard and swingarm bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive belt lower guard plate bolt (upper side)	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive belt lower guard plate bolt (lower side)	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Upper bracket pinch bolt	M8	4	19 Nm (1.9 m·kg, 13 ft·lb)	







TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Steering stem nut	M22	1	110 Nm (11.0 m·kg, 80 ft·lb)	
Lower ring nut (initial tightening torque)	M25	1	52 Nm (5.2 m·kg, 37 ft·lb)	See TIP.
Lower ring nut (final tightening torque)	M25	1	18 Nm (1.8 m·kg, 13 ft·lb)	See TIP.
Bolt (upper bracket hole)	M8	2	32 Nm (3.2 m·kg, 23 ft·lb)	
Lower bracket pinch bolt	M10	4	45 Nm (4.5 m·kg, 32 ft·lb)	
Damper rod bolt	M10	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Front fork cap bolt	M38	2	24 Nm (2.4 m·kg, 17 ft·lb)	
Main switch and upper bracket bolt	M8	2	29 Nm (2.9 m·kg, 21 ft·lb)	
Cable guide bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Lower bracket cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Handlebar nut	M12	2	32 Nm (3.2 m·kg, 23 ft·lb)	
Front brake master cylinder holder bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Brake lever nut	M6	1	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Clutch lever holder bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Grip end	M16	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Front brake hose union bolt	M10	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Front brake hose holder and lower bracket bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Front brake hose holder bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Front fender bolt	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Headlight bracket bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Headlight body bolt	M6	3	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Front turn signal/position light and lower bracket bolt	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
Front turn signal/position light pinch bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Air temperature sensor screw	M5	1	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Meter assembly cover bolt	M5	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Fuel cock screw	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Fuel pump bracket bolt	M5	6	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Fuel sender bolt	M6	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Fuel tank bracket and fuel tank bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Fuel tank bracket and frame bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Sub-fuel tank bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Canister bolt (California only)	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Seat lock bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Front wheel axle	M16	1	72 Nm (7.2 m·kg, 52 ft·lb)	
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·kg, 29 ft·lb)	
Front brake caliper retaining bolt	M10	2	27 Nm (2.7 m·kg, 19 ft·lb)	
Front brake disc bolt	M8	5	23 Nm (2.3 m·kg, 17 ft·lb)	
Bleed screw (front brake caliper)	M7	1	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Rear wheel axle nut	M18	1	150 Nm (15.0 m·kg, 110 ft·lb)	
Drive belt adjusting locknut	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
Rear brake caliper retaining bolt	M10	2	27 Nm (2.7 m·kg, 19 ft·lb)	
Rear brake disc bolt	M6	6	18 Nm (1.8 m·kg, 13 ft·lb)	
Bleed screw (rear brake caliper)	M7	1	6 Nm (0.6 m·kg, 4.3 ft·lb)	
Rear brake hose union bolt	M10	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Rear brake hose holder bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rear brake hose guide bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive pulley cover bolt	M6	5	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Drive pulley nut	M22	1	140 Nm (14.0 m·kg, 100 ft·lb)	 Stake.
Drive pulley housing bolt	M8	5	24 Nm (2.4 m·kg, 17 ft·lb)	
Rear wheel pulley nut	M12	5	95 Nm (9.5 m·kg, 68 ft·lb)	
Rear wheel drive hub stud bolt	M12	5	32 Nm (3.2 m·kg, 23 ft·lb)	
Tail/brake light and rear fender nut	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Tail/brake light and rear fender bolt	M6	2	18 Nm (1.8 m·kg, 13 ft·lb)	
Seat bracket bolt	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
Seat guide bolt	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
Rear fender bracket bolt	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Relay cover bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Relay bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Sub-fuel tank cover bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Sub-fuel tank bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Coolant reservoir cover bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Coolant reservoir bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Side panel bolt (left and right)	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Side panel upper bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Side panel center bracket bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Side panel lower bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Positive battery lead bolt (starter relay side)	M6	1	4 Nm (0.4 m·kg, 2.9 ft·lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Starter motor lead bolt (starter relay side)	M6	1	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Battery terminal bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Battery box bolt	M6	4	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Battery box bracket bolt	M6	5	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Sidestand bracket bolt	M10	2	56 Nm (5.6 m·kg, 40 ft·lb)	
Sidestand switch bolt	M5	2	4.0 Nm (0.4 m·kg, 2.9 ft·lb)	
Sidestand nut	M10	1	64 Nm (6.4 m·kg, 46 ft·lb)	
Rear brake master cylinder cover bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Right rider footrest bracket nut	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	
Rider footrest assembly bolt (left and right)	M10	4	48 Nm (4.8 m·kg, 35 ft·lb)	
Passenger footrest bolt (left and right)	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Shift rod locknut	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Shift arm bolt	M6	1	16 Nm (1.6 m·kg, 11 ft·lb)	
Brake fluid reservoir bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Horn bracket bolt	M8	1	30 Nm (3.0 m·kg, 22 ft·lb)	
Coolant reservoir cover bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Locknut (rear brake master cylinder)	M8	1	16 Nm (1.6 m·kg, 11 ft·lb)	
Rectifier/regulator cover bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rectifier/regulator bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	

TIP

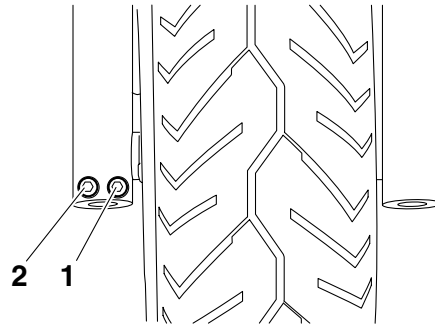
Lower ring nut

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

TIP

Front wheel axle pinch bolt

1. Insert the front wheel axle from the right side and tighten it to 72 Nm (7.2 m·kg, 52 ft·lb).
Check that the left end of the front wheel axle is flush with the front fork. If necessary, manually push the front wheel axle or lightly tap it with a soft hammer until its end is flush with the front fork. However, if the surface of the front wheel axle end is not parallel to the surface of the front fork, align a point on the outer edge of the axle with the fork, making sure that the axle does not protrude past the fork.
2. In the order pinch bolt "1" → pinch bolt "2" → pinch bolt "1", tighten each bolt to 20 Nm (2.0 m·kg, 14 ft·lb) without performing temporary tightening.

































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)	
Buffer boss	
Camshaft cam lobes and camshaft journals	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Rocker arm shafts	
Camshaft carrier bolts	
Oil pump rotors (inner and outer) and oil/water pump housing	
Cylinder head bolts	
Starter clutch idle gear shaft	
Starter clutch idle gear	
Starter clutch gear (inner and outer surfaces)	
Torque limiter	
Primary driven gear (inner surface)	
Clutch push rod	
Oil/water pump drive sprocket (inner surface)	
Clutch thrust washers	
Clutch boss nut and washer	
Transmission gears (wheel and pinion) and collar	
Drive pulley nut and washer	
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®)

LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Stator assembly lead grommet	Yamaha bond No.1215 (Three Bond No.1215®)

EAS20380

CHASSIS (for XVS13AA(C)/XVS13CTA(C))

Lubrication point	Lubricant
Steering bearings and upper bearing dust cover (lip)	
Lower bearing dust seal (lip)	
Front wheel oil seals (lip)	
Rear wheel oil seal (lip)	
Rear wheel drive hub 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)	

LUBRICATION POINTS AND LUBRICANT TYPES

EAS27D1025

CHASSIS (for XVS13CA(C))

Lubrication point	Lubricant
Steering bearings and upper bearing dust cover (lip)	
Lower bearing dust seal (lip)	
Front wheel oil seals (lip)	
Rear wheel oil seal (lip)	
Rear wheel drive hub 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	
Sidestand hook and link end	
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	
Clutch cable end	
Footrest pivoting point	
Swingarm pivot bearings (inner surface) and collars	
Swingarm pivot oil seals (lip)	
Rear shock absorber assembly upper bolt	
Swingarm bearings (connecting arm side) and collar (inner surface)	
Relay arm bearings (inner surface) and collars	
Relay arm oil seals (lip)	
Pivot shaft (outer surface)	
Rear wheel axle (outer surface)	

LUBRICATION POINTS AND LUBRICANT TYPES

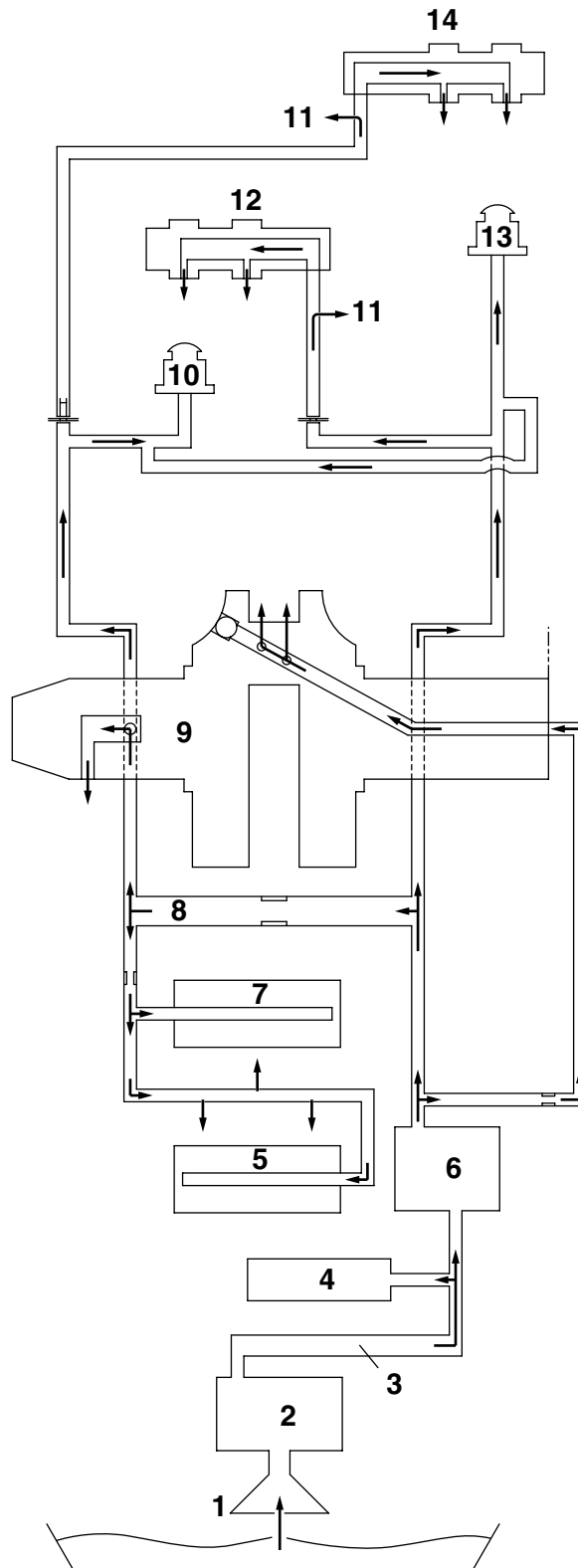
LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20390

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20400

ENGINE OIL LUBRICATION CHART



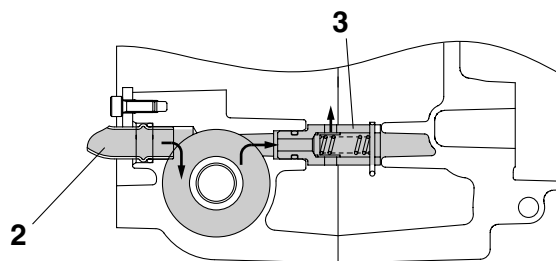
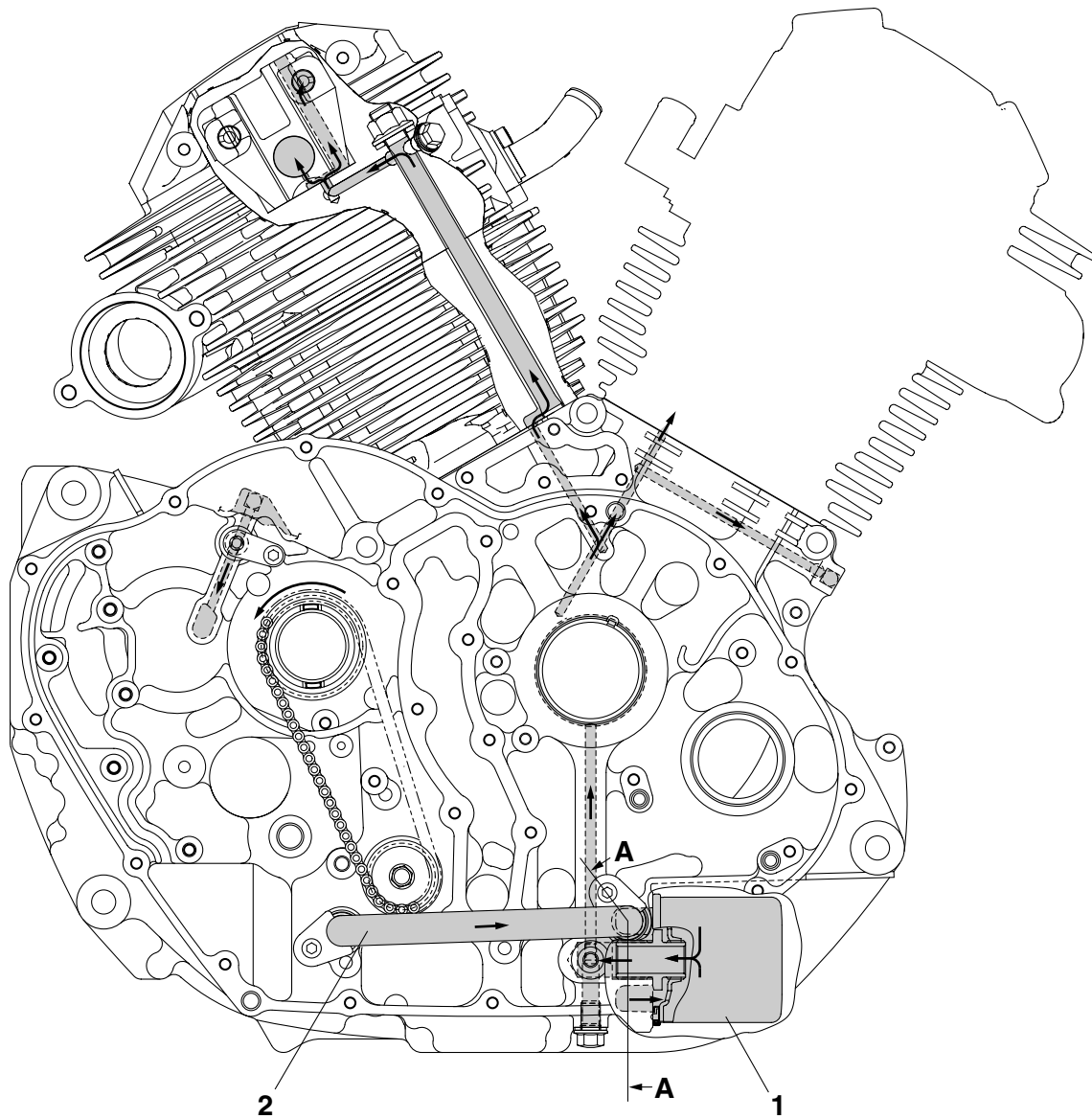
LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil strainer
2. Oil/water pump assembly
3. Oil delivery pipe 3
4. Relief valve assembly
5. Drive axle
6. Oil filter cartridge
7. Main axle
8. Main gallery
9. Crankcase
10. Rear cylinder timing chain tensioner
11. Valve stem end (intake side)
12. Rear cylinder camshaft
13. Front cylinder timing chain tensioner
14. Front cylinder camshaft

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20410

LUBRICATION DIAGRAMS

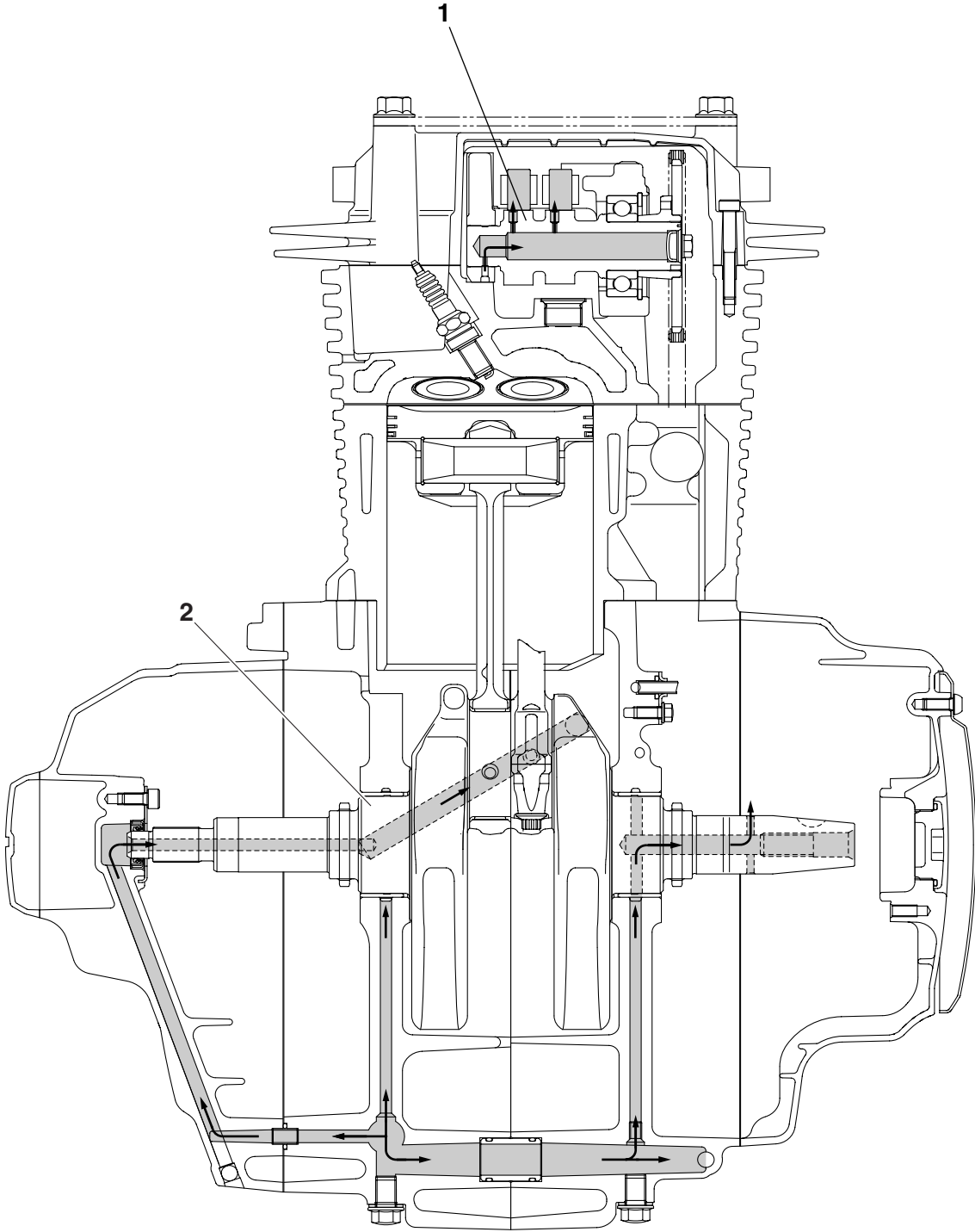


A-A

LUBRICATION SYSTEM CHART AND DIAGRAMS

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

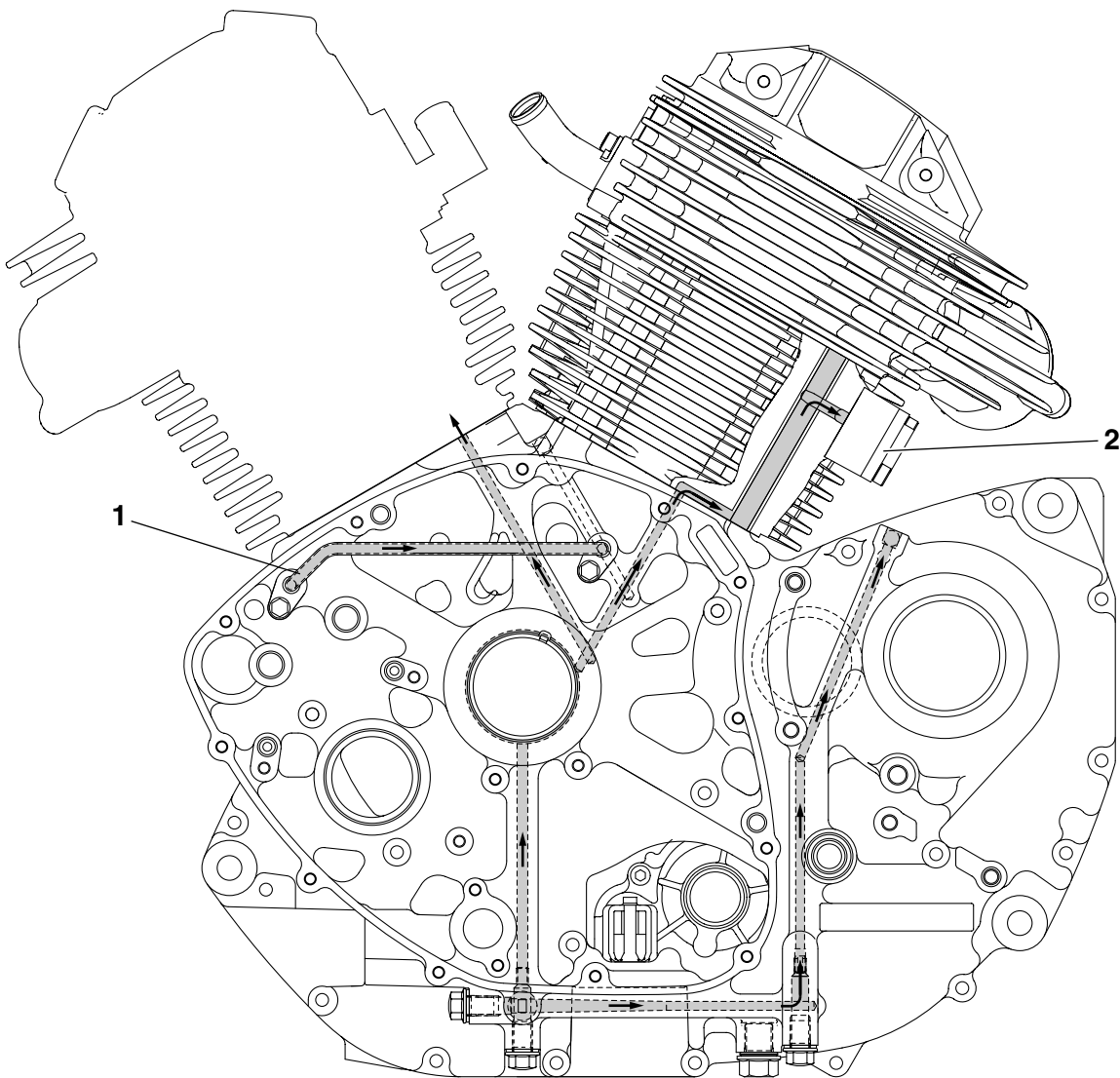
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Camshaft
2. Crankshaft

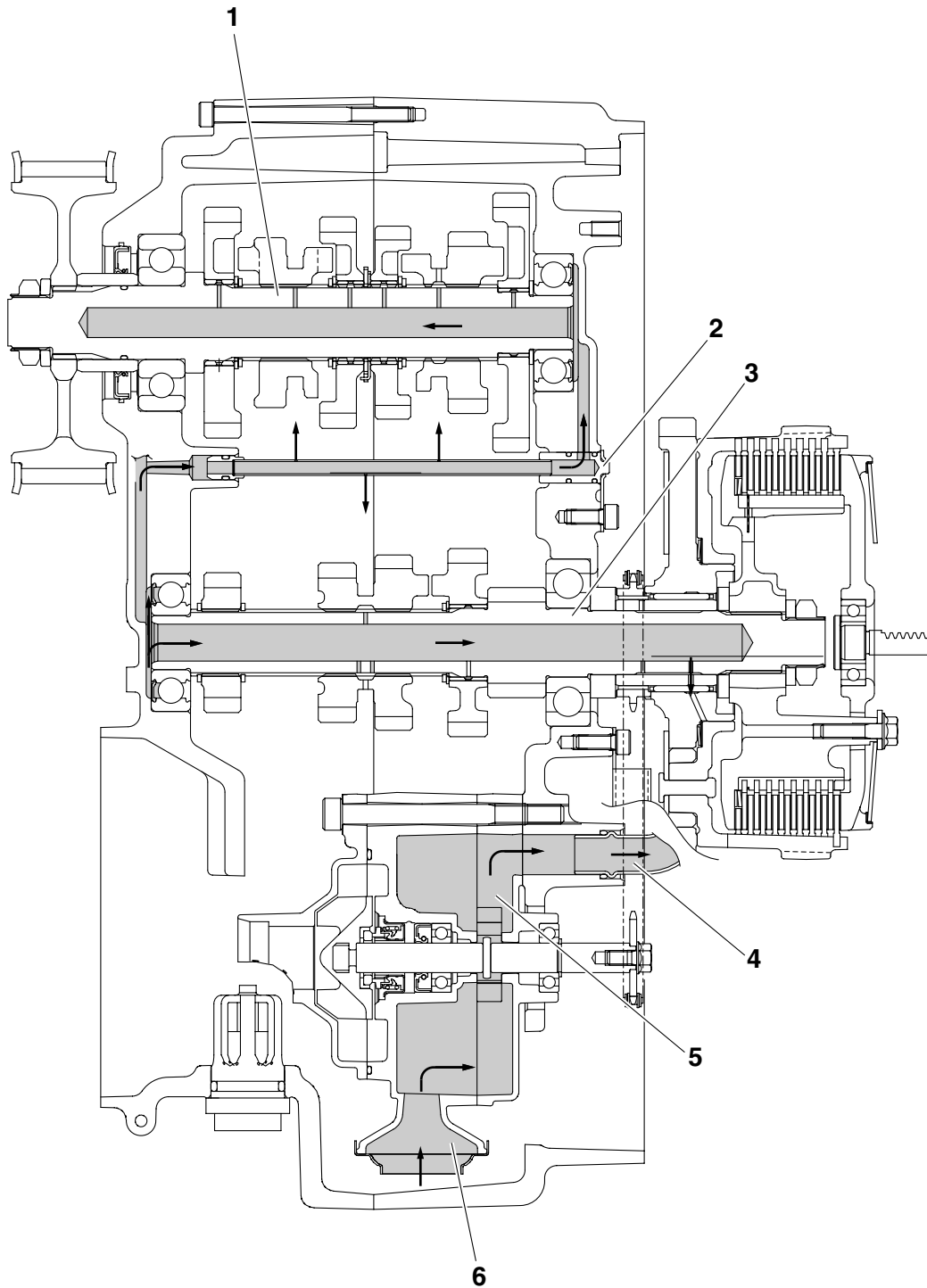
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil delivery pipe 1
2. Timing chain tensioner

LUBRICATION SYSTEM CHART AND DIAGRAMS

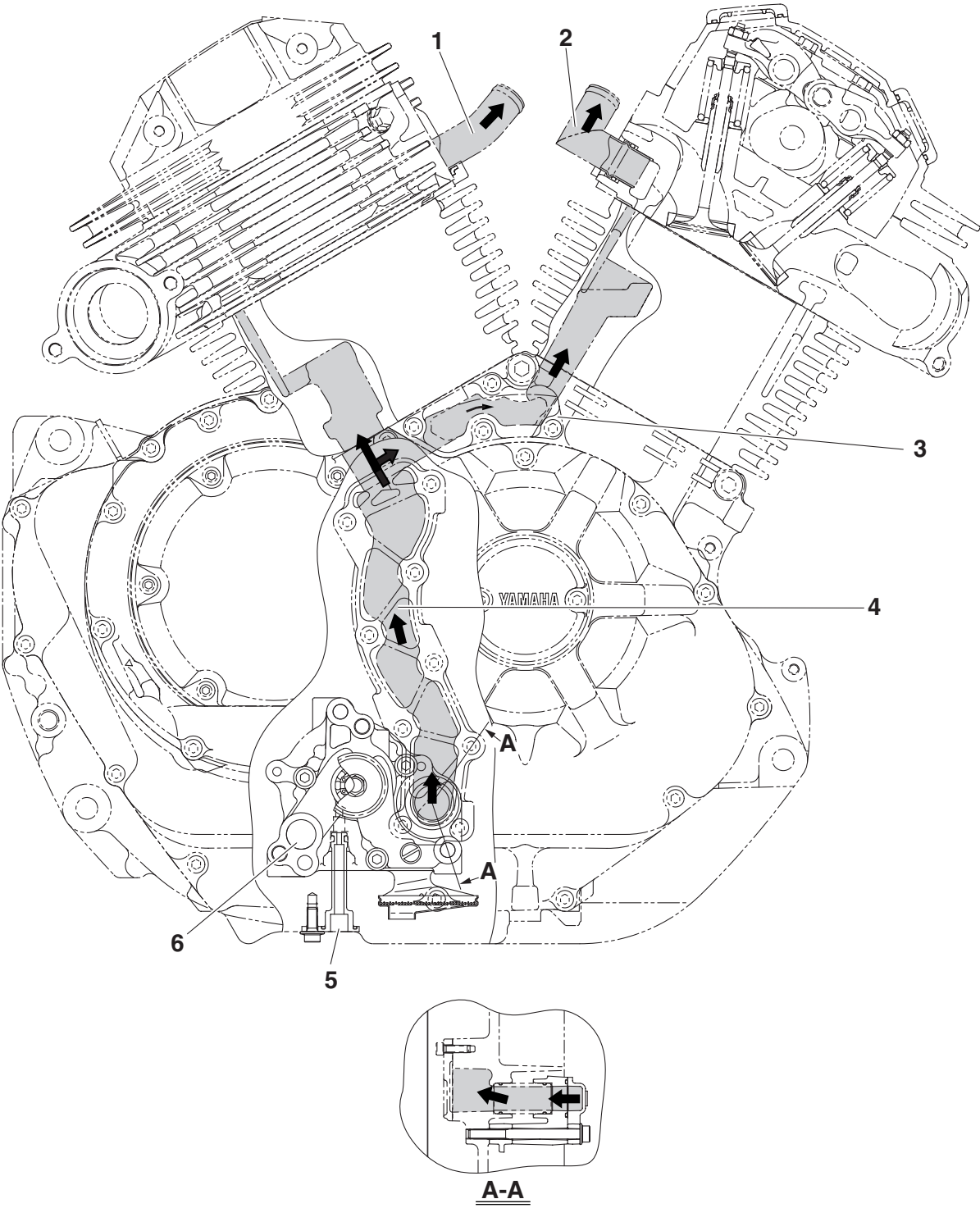


LUBRICATION SYSTEM CHART AND DIAGRAMS

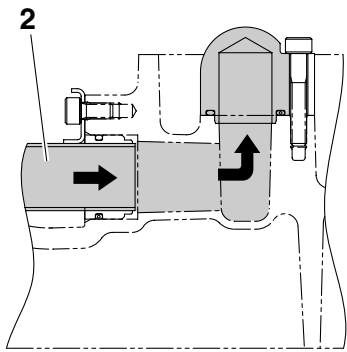
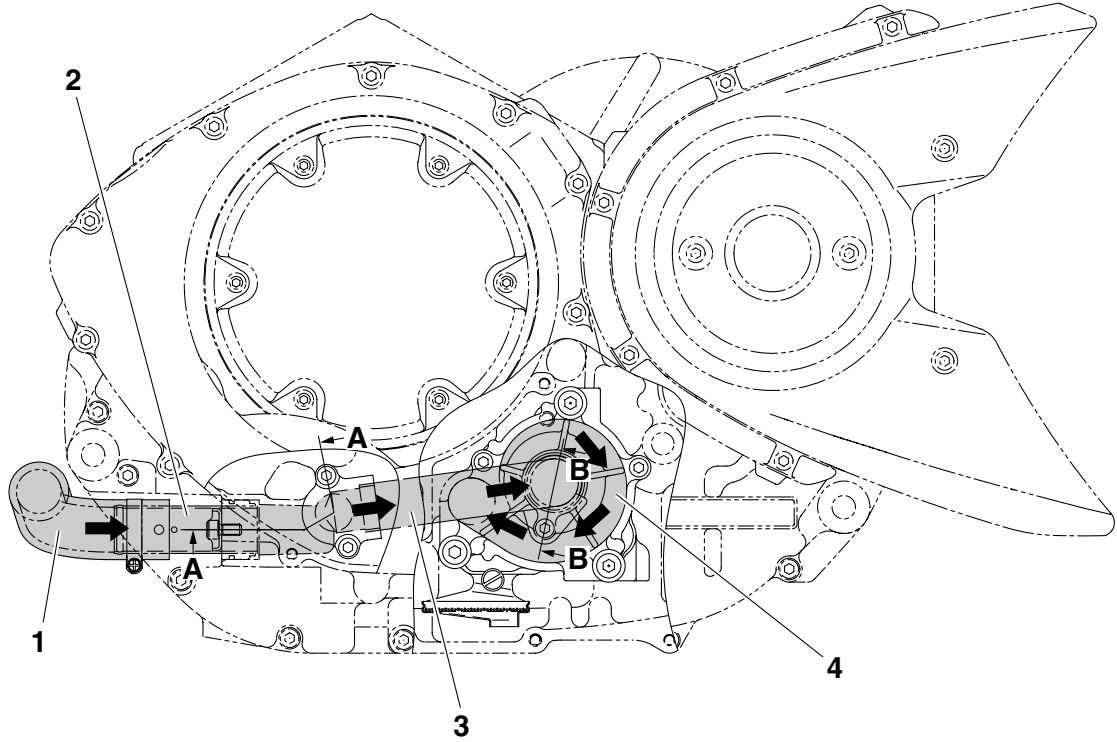
1. Drive axle
2. Oil delivery pipe 2
3. Main axle
4. Oil delivery pipe 3
5. Oil/water pump assembly
6. Oil strainer

EAS20420

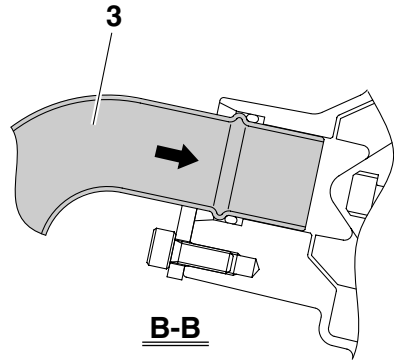
COOLING SYSTEM DIAGRAMS



1. Rear cylinder thermostat inlet pipe 1
2. Front cylinder thermostat inlet pipe
3. Coolant delivery cover 2
4. Coolant delivery cover 1
5. Drain cock
6. Oil/water pump assembly



A-A

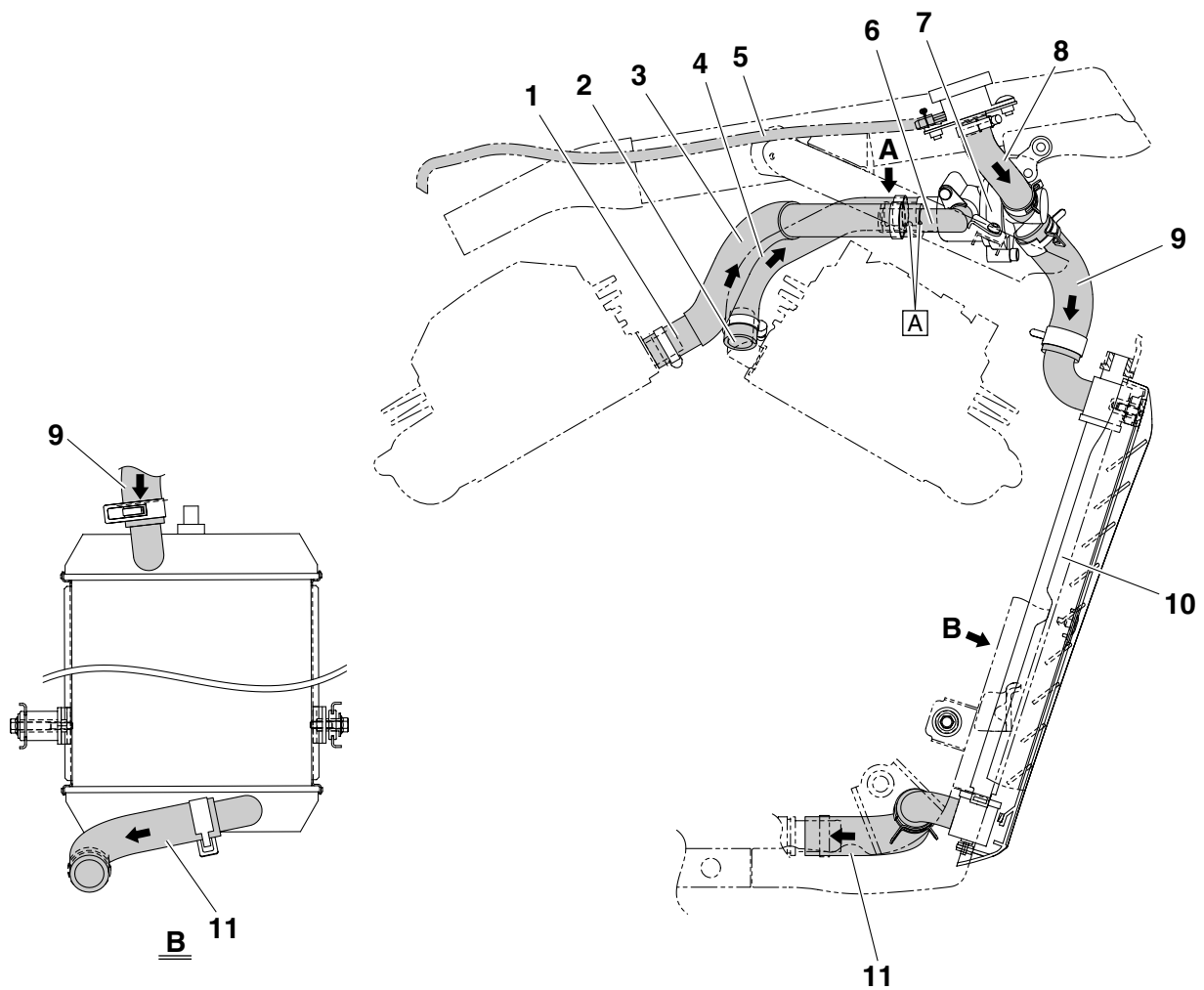
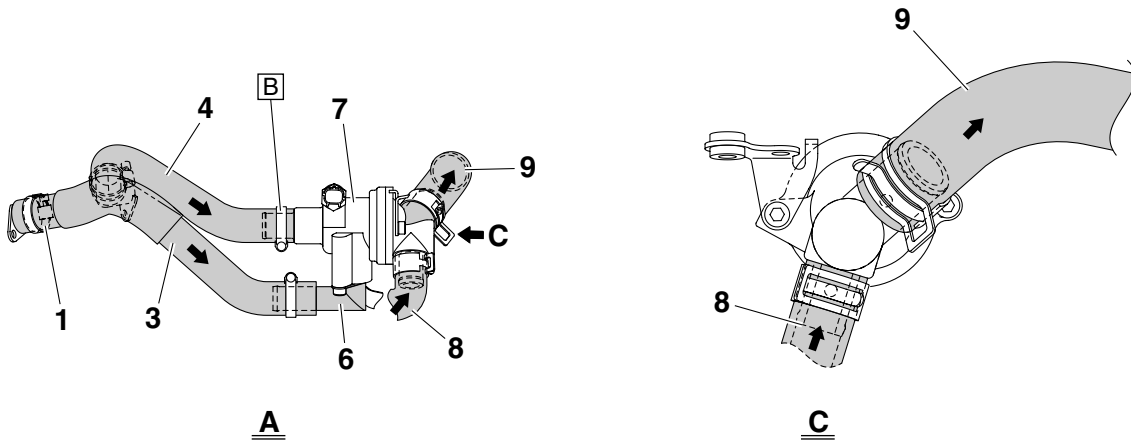


B-B

1. Radiator outlet hose
2. Radiator outlet pipe
3. Coolant delivery pipe
4. Oil/water pump assembly

COOLING SYSTEM DIAGRAMS

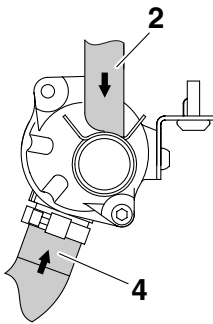
For XVS13AA(C)/XVS13CTA(C)



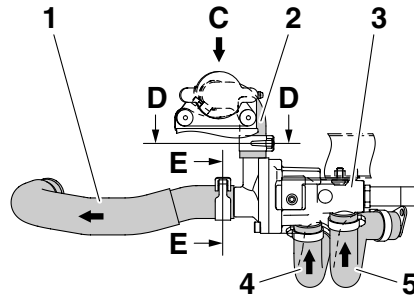
1. Rear cylinder thermostat inlet pipe 1
 2. Front cylinder thermostat inlet pipe
 3. Rear cylinder thermostat inlet hose
 4. Front cylinder thermostat inlet hose
 5. Coolant reservoir hose
 6. Rear cylinder thermostat inlet pipe 2
 7. Thermostat housing
 8. Thermostat cover inlet hose
 9. Radiator inlet hose
 10. Radiator
 11. Radiator outlet hose
- A. Align the paint mark on rear cylinder thermostat inlet pipe 2 with the paint mark on the rear cylinder thermostat inlet hose.
- B. Install the front cylinder thermostat inlet hose with its paint mark facing upward.

COOLING SYSTEM DIAGRAMS

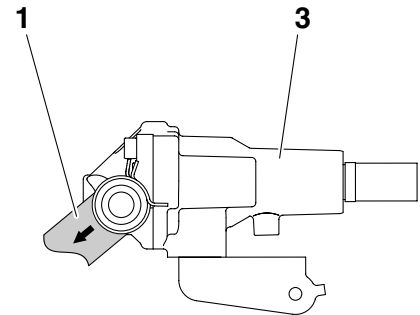
For XVS13CA(C)



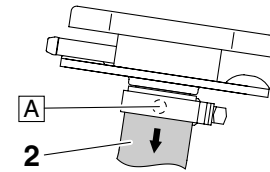
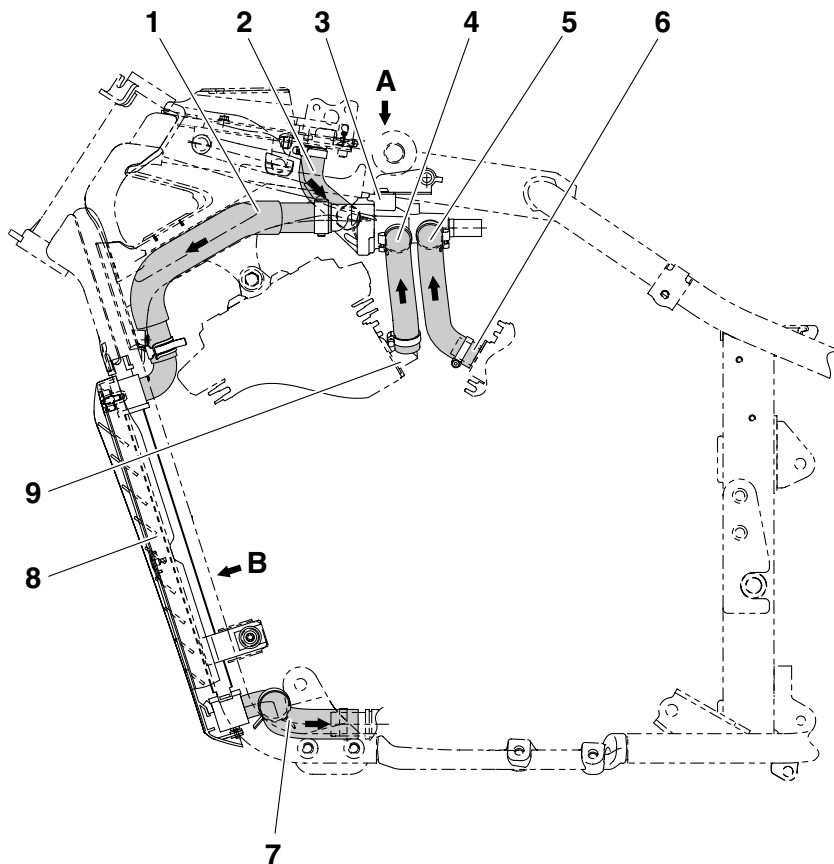
E-E



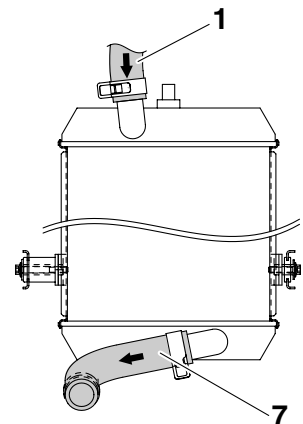
A



D-D



C



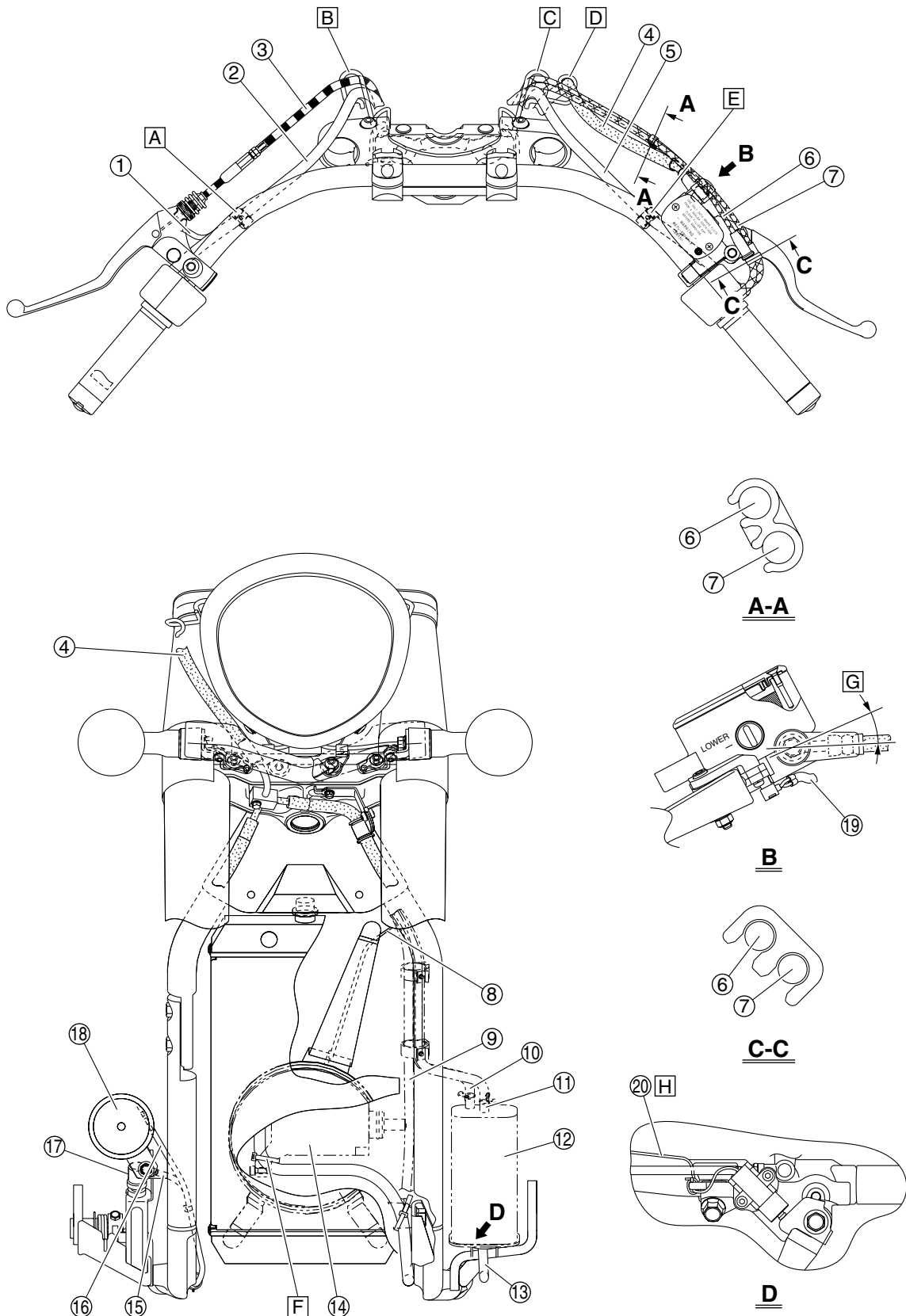
B

1. Radiator inlet hose
2. Thermostat cover inlet hose
3. Thermostat housing
4. Front cylinder thermostat inlet hose
5. Rear cylinder thermostat inlet hose
6. Rear cylinder thermostat inlet pipe
7. Radiator outlet hose
8. Radiator
9. Front cylinder thermostat inlet pipe
- A. Install the thermostat cover inlet hose with its paint mark facing outward.

CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

EAS20430

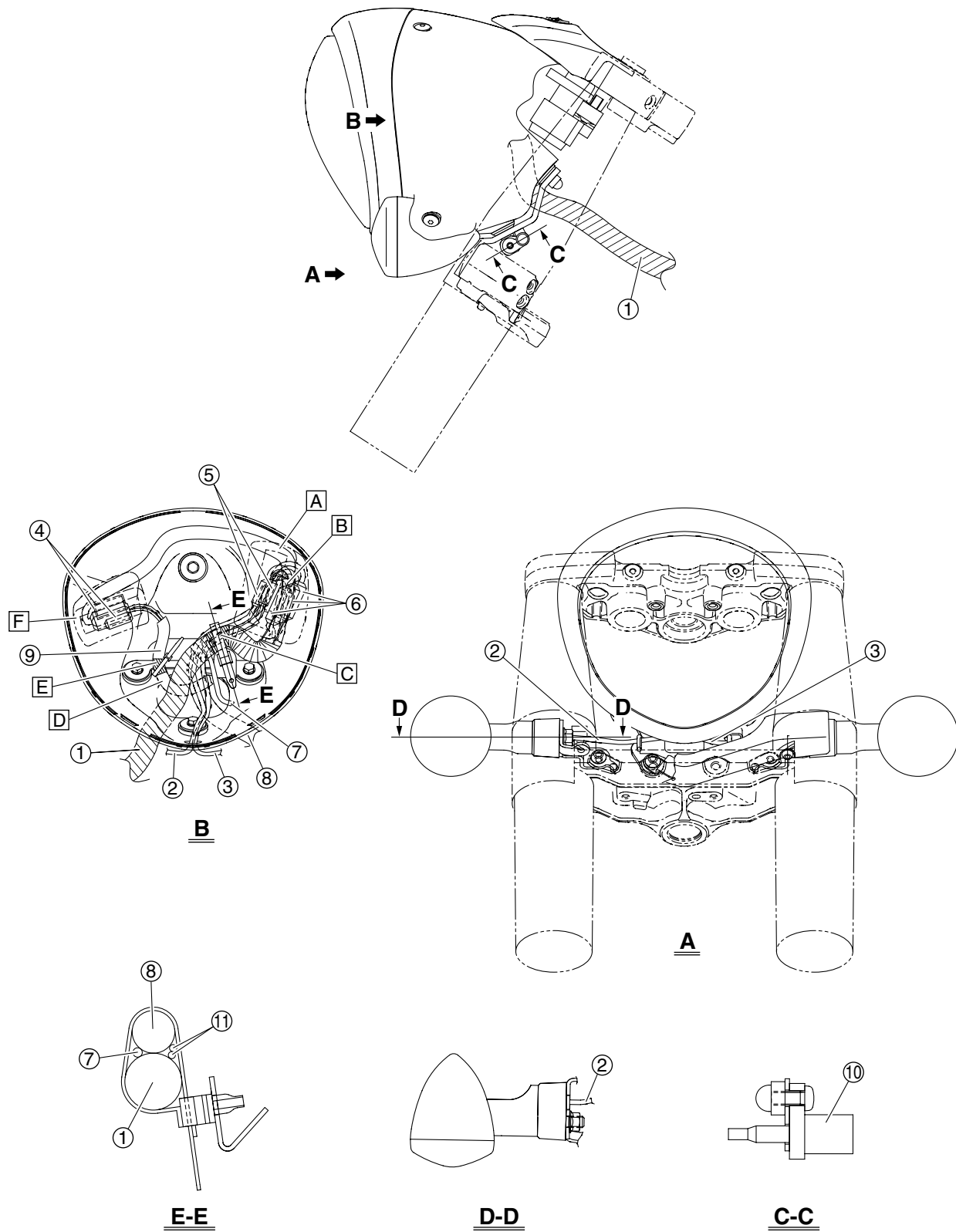
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Clutch switch lead
2. Left handlebar switch lead
3. Clutch cable
4. Front brake hose
5. Right handlebar switch lead
6. Throttle cable (accelerator cable)
7. Throttle cable (decelerator cable)
8. Radiator fan motor lead
9. Fuel tank overflow hose
10. Canister purge hose (California only)
11. Fuel tank breather hose (rollover valve to canister)
(California only)
12. Canister (California only)
13. Canister breather hose (California only)
14. Starter motor
15. Rear brake light switch lead
16. Horn lead
17. Rear brake light switch
18. Horn
19. Front brake light switch lead
20. Sidestand switch lead
- A. Fasten the left handlebar switch lead with the holder.
- B. Route the clutch cable and left handlebar switch lead through the guide, making sure to route the cable to the outside of the lead.
- C. Route the throttle cables and right handlebar switch lead through the guide, making sure to route the cables to the outside of the lead.
- D. Route the front brake hose through the guide.
- E. Fasten the right handlebar switch lead with the holder.
- F. Fasten the starter motor lead at the gray tape with a plastic locking tie, making sure that the lead contacts the mounting boss on the starter motor. Point the end of the plastic locking tie forward, and then cut off the excess end of the tie.
- G. 30–50°
- H. Route the sidestand switch lead to the outside of the shift rod.

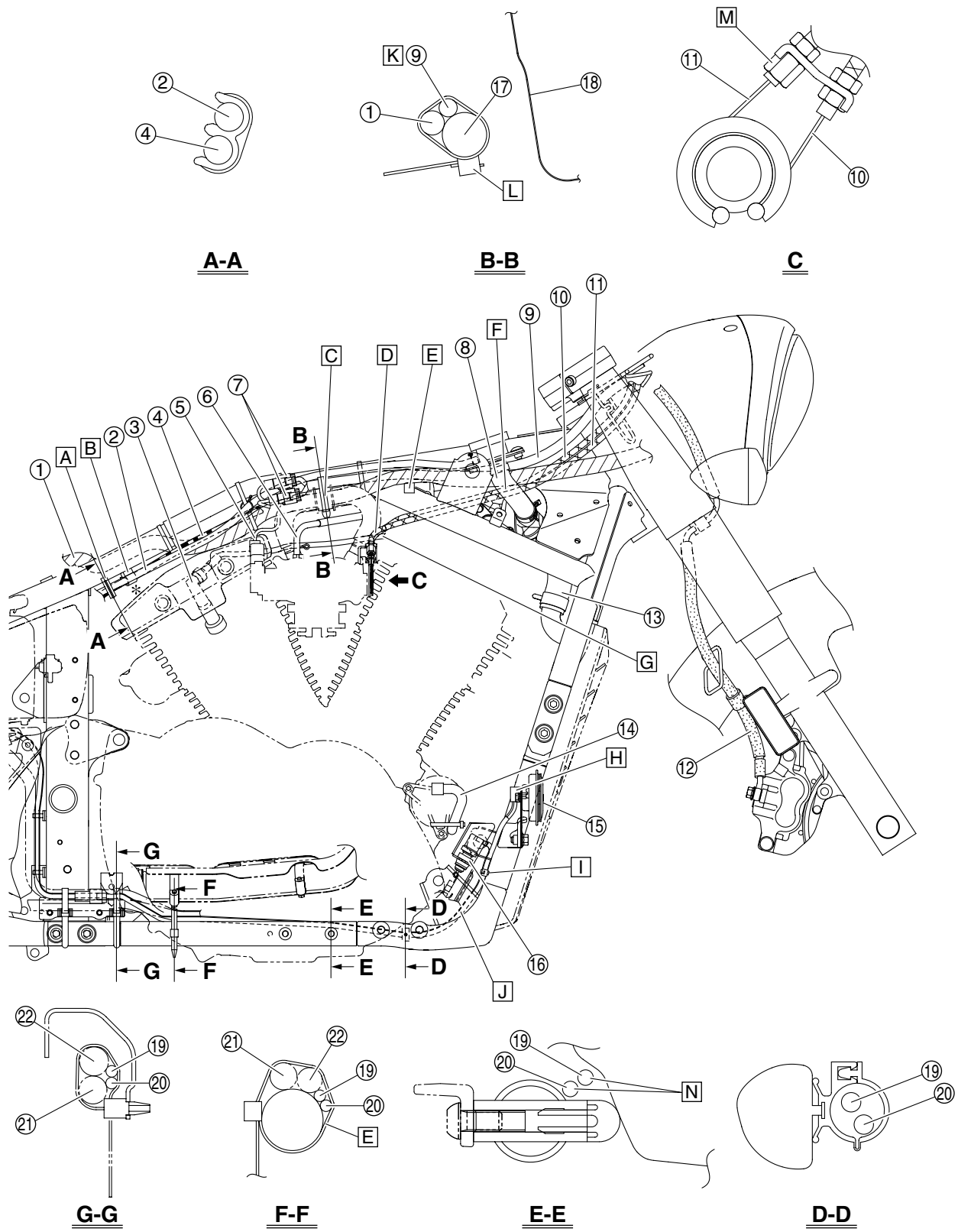
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Wire harness
2. Front right turn signal/position light lead
3. Front left turn signal/position light lead
4. Main switch couplers
5. Front turn signal/position light couplers
6. Meter assembly couplers
7. Air temperature sensor lead
8. Meter assembly lead
9. Main switch lead
10. Air temperature sensor
11. Front turn signal/position light leads
- A. Route the main switch lead that branches off from the wire harness behind the other leads.
- B. Route the meter assembly lead that branches off from the wire harness in front of the meter assembly couplers and front turn signal/position light couplers, and then wrap the protective covering around the lead and couplers.
- C. Fasten the wire harness, front turn signal/position light leads, meter assembly lead, and air temperature sensor lead with the plastic band. Align the red tape on the wire harness, the gray tape on the front turn signal/position light leads, and the white tape on the meter assembly lead with the plastic band.
- D. Route the main switch lead behind the wire harness and meter assembly lead.
- E. Fasten the main switch lead at the white tape to the plastic band bracket with a plastic locking tie.
- F. Wrap the protective covering around the main switch couplers.

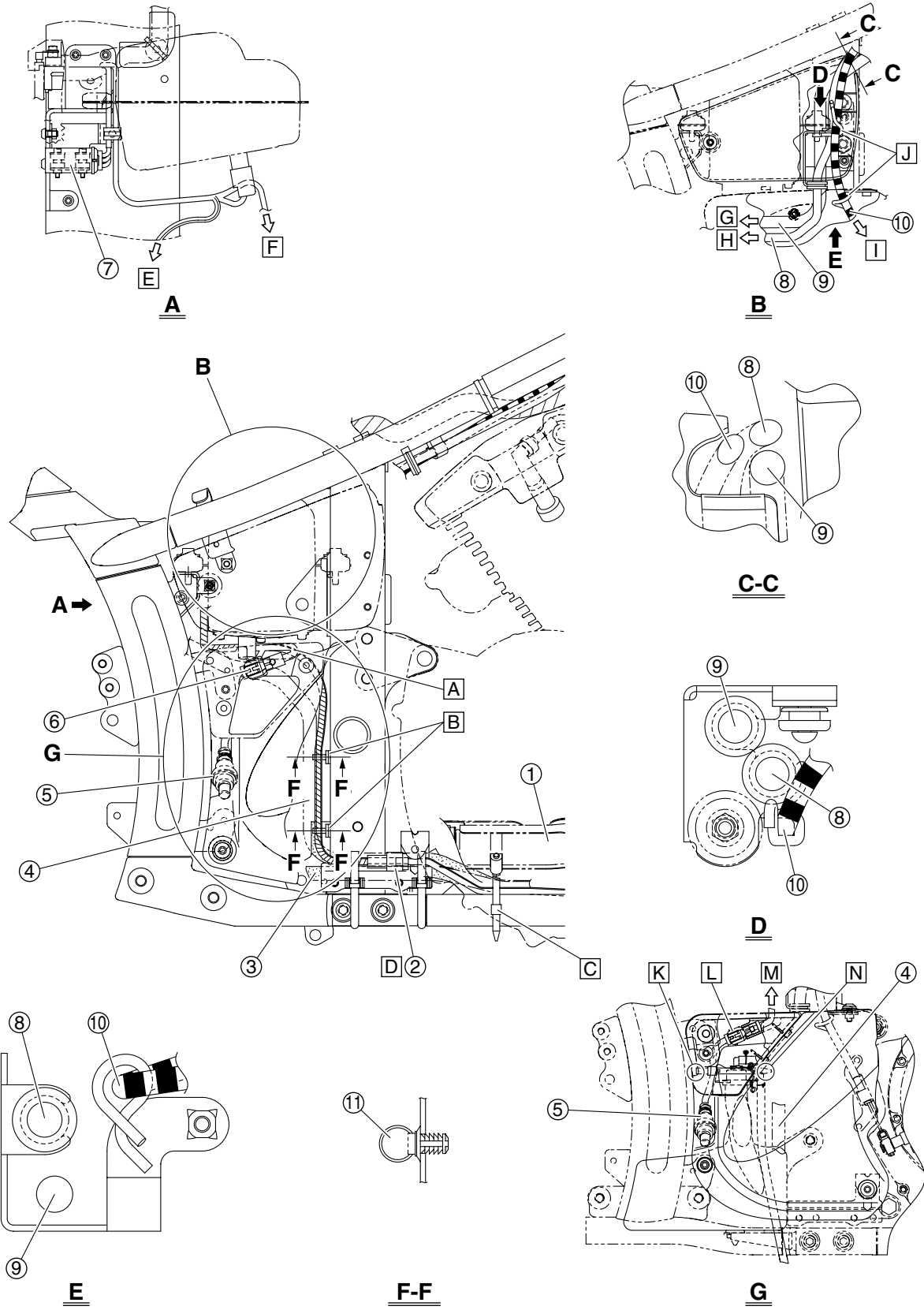
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Wire harness
2. Coolant reservoir hose
3. Rear cylinder spark plug cap
4. Clutch cable
5. Throttle position sensor lead
6. Intake air pressure sensor hose
7. Right handlebar switch couplers
8. Thermostat cover inlet hose
9. Right handlebar switch lead
10. Throttle cable (accelerator cable)
11. Throttle cable (decelerator cable)
12. Front brake hose
13. Radiator inlet hose
14. Starter motor lead
15. Horn
16. Rear brake light switch
17. Resonator hose joint
18. Fuel tank
19. Horn lead
20. Rear brake light switch lead
21. Rear brake hose
22. Brake fluid reservoir hose
- A. Fasten the clutch cable and coolant reservoir hose with the holder, making sure to position the holder 15–20 mm (0.59–0.79 in) to the rear of the holder (indicated with an asterisk in the illustration) that is attached to the frame.
- B. Fasten the clutch cable with the plastic band. Point the end of the plastic band inward.
- C. Fasten the resonator hose joint, wire harness, and right handlebar switch lead with the plastic band.
- D. Make sure that the throttle cable (decelerator cable) does not contact the frame, the throttle cable (accelerator cable) does not contact the rear cylinder thermostat inlet hose, and the throttle cables do not contact each other.
- E. Fasten the wire harness by sliding the plastic holder on the wire harness onto the stud on the frame.
- F. Route the throttle cables to the inside of the thermostat cover inlet hose and under the wire harness, making sure that the cables are not pinched by the harness.
- G. Route the rear cylinder spark plug lead to the inside of the intake air pressure sensor hose and front cylinder resonator hose.
- H. Connect the longer horn lead to the upper horn terminal and connect the shorter horn lead to the lower horn terminal.
- I. Fasten the horn lead and rear brake light switch lead with a plastic locking tie, and then cut off the excess end of the tie.
- J. Route the horn lead and rear brake light switch lead to the inside of the engine bracket on the down tube.
- K. Fasten the right handlebar switch lead at the tape with the plastic band, making sure to install the band on the lead's protective sleeve, not the lead itself.
- L. Position the buckle of the plastic band under the resonator hose joint, making sure to point the end of the band inward. The end of the plastic band may be positioned above or below the intake air pressure sensor hose.
- M. Be sure to install the throttle cable (decelerator cable), identified by the longer nut, on the outer side of the throttle cable pulley.
- N. Route the horn lead and rear brake light switch lead over the blind plug.

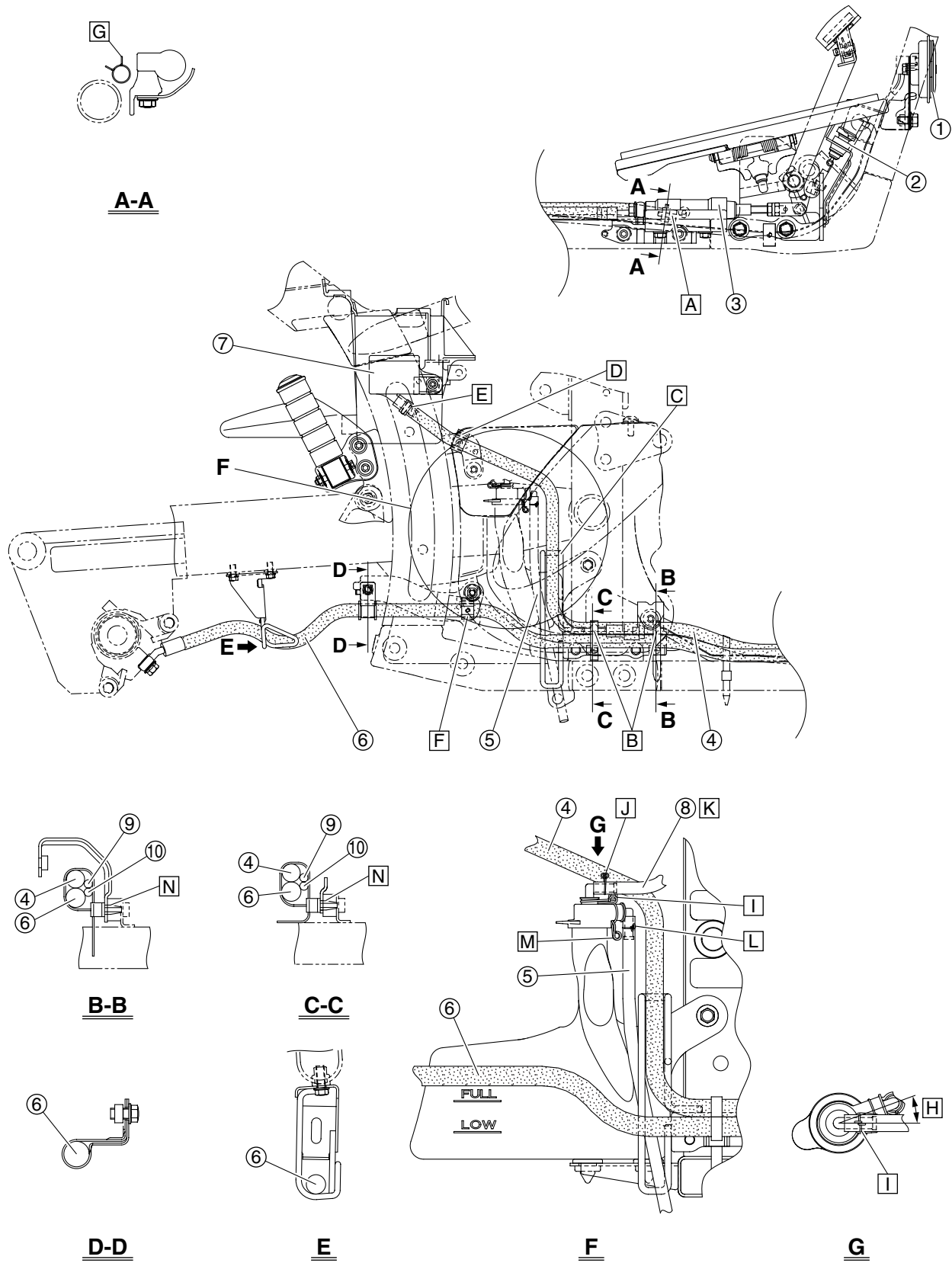
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Front cylinder exhaust pipe
2. Rear brake light switch coupler
3. Rear brake hose
4. Brake fluid reservoir hose
5. O₂ sensor
6. O₂ sensor coupler
7. Lean angle sensor
8. Coolant reservoir hose
9. Fuel hose
10. Clutch cable
11. Wire harness
- A. Be sure not to pinch the O₂ sensor lead when installing the coolant reservoir cap cover.
- B. Fasten the wire harness with the holders.
- C. Fasten the horn lead, rear brake light switch lead, rear brake hose, and brake fluid reservoir hose with the plastic band. Align the plastic band with the exhaust pipe protector screw clamp and point the end of the band downward.
- D. Position the rear brake light switch coupler to the inside of the rear brake hose and brake fluid reservoir hose.
- E. To horn and rear brake light switch
- F. To O₂ sensor
- G. To fuel pump
- H. To coolant reservoir
- I. To clutch cover
- J. Route the clutch cable through the guides.
- K. Fasten the O₂ sensor lead to the coolant reservoir cover with the plastic band.
- L. Insert the projection on the O₂ sensor coupler into the hole in the coolant reservoir cover.
- M. To wire harness
- N. Position the end of the plastic band to the inside of the coolant reservoir cover.

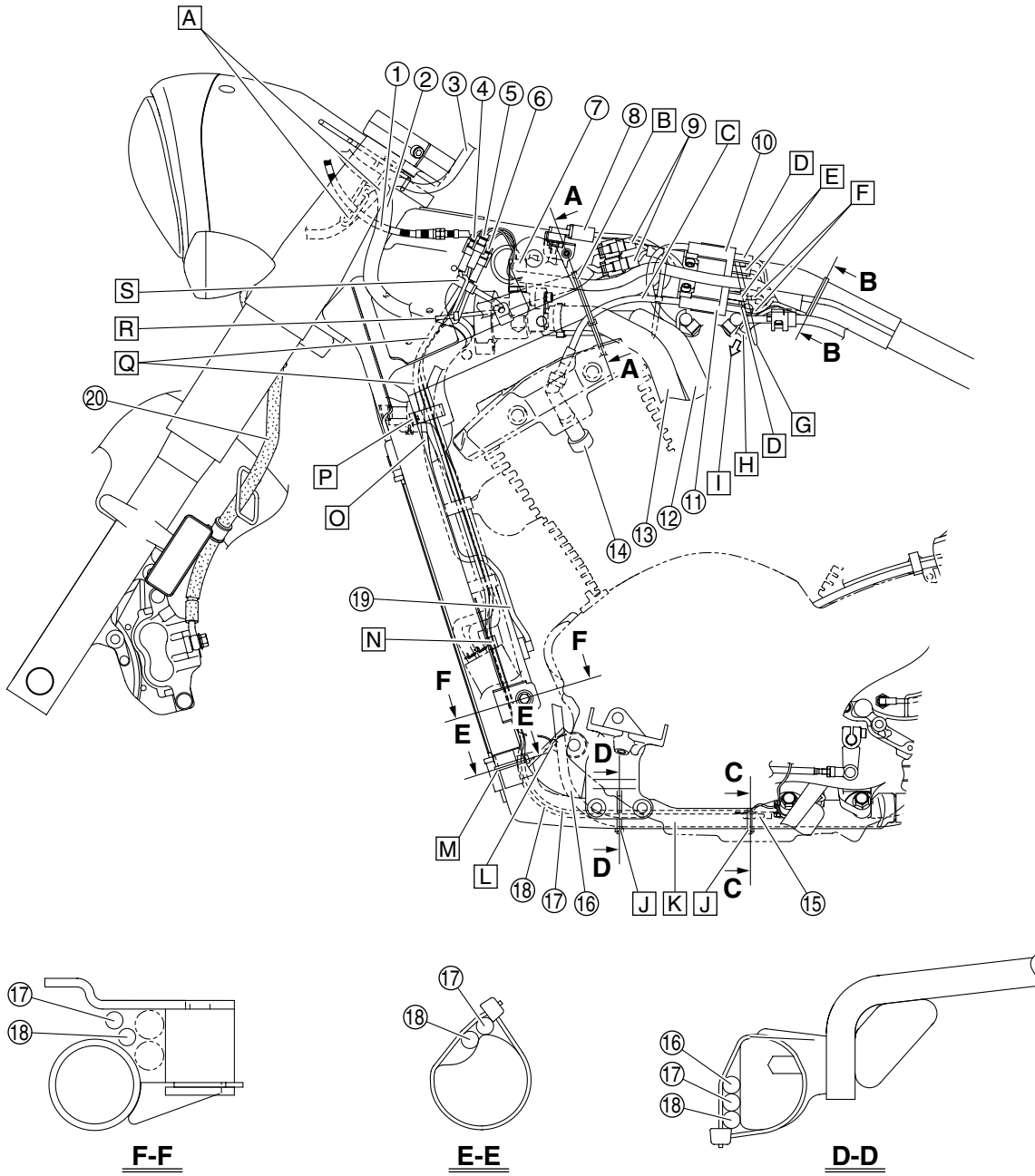
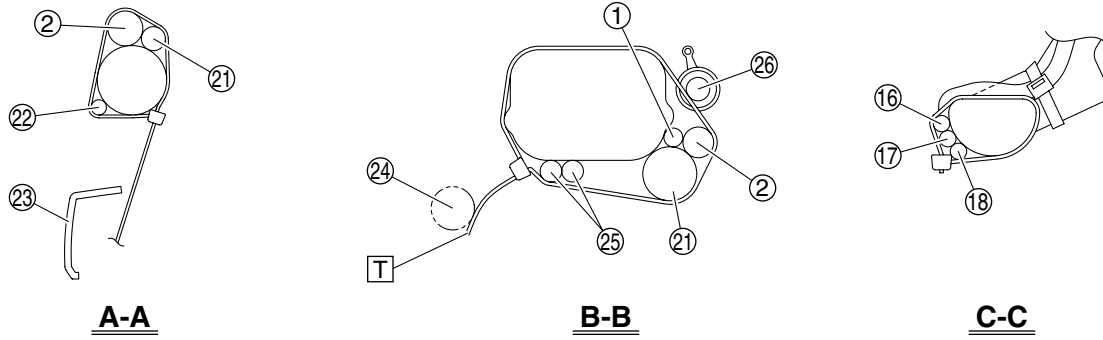
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Horn
2. Rear brake light switch
3. Rear brake master cylinder
4. Brake fluid reservoir hose
5. Coolant reservoir breather hose
6. Rear brake hose
7. Brake fluid reservoir
8. Coolant reservoir hose
9. Horn lead
10. Rear brake light switch lead
- A. Install the brake fluid reservoir hose with its paint mark facing upward.
- B. Fasten the rear brake hose, brake fluid reservoir hose, horn lead, and rear brake light switch lead with the plastic bands. Make sure to align the white paint marks on the brake fluid reservoir hose with the plastic bands.
- C. Route the brake fluid reservoir hose through the guide.
- D. Fasten the brake fluid reservoir hose with the holder.
- E. Point the ends of the hose clamp inward.
- F. Fasten the rear brake hose with the holder.
- G. Point the end of the hose clamp upward.
- H. 20°
- I. Align the ends of the hose clamp on the coolant reservoir cap with the coolant reservoir hose.
- J. Point the ends of the hose clamp upward.
- K. Connect the curved end of the coolant reservoir hose to the coolant reservoir.
- L. Point the ends of the hose clamp outward.
- M. Point the ends of the hose clamp downward.
- N. Insert the projection on the plastic band completely into the hole in the coolant reservoir cover bracket.

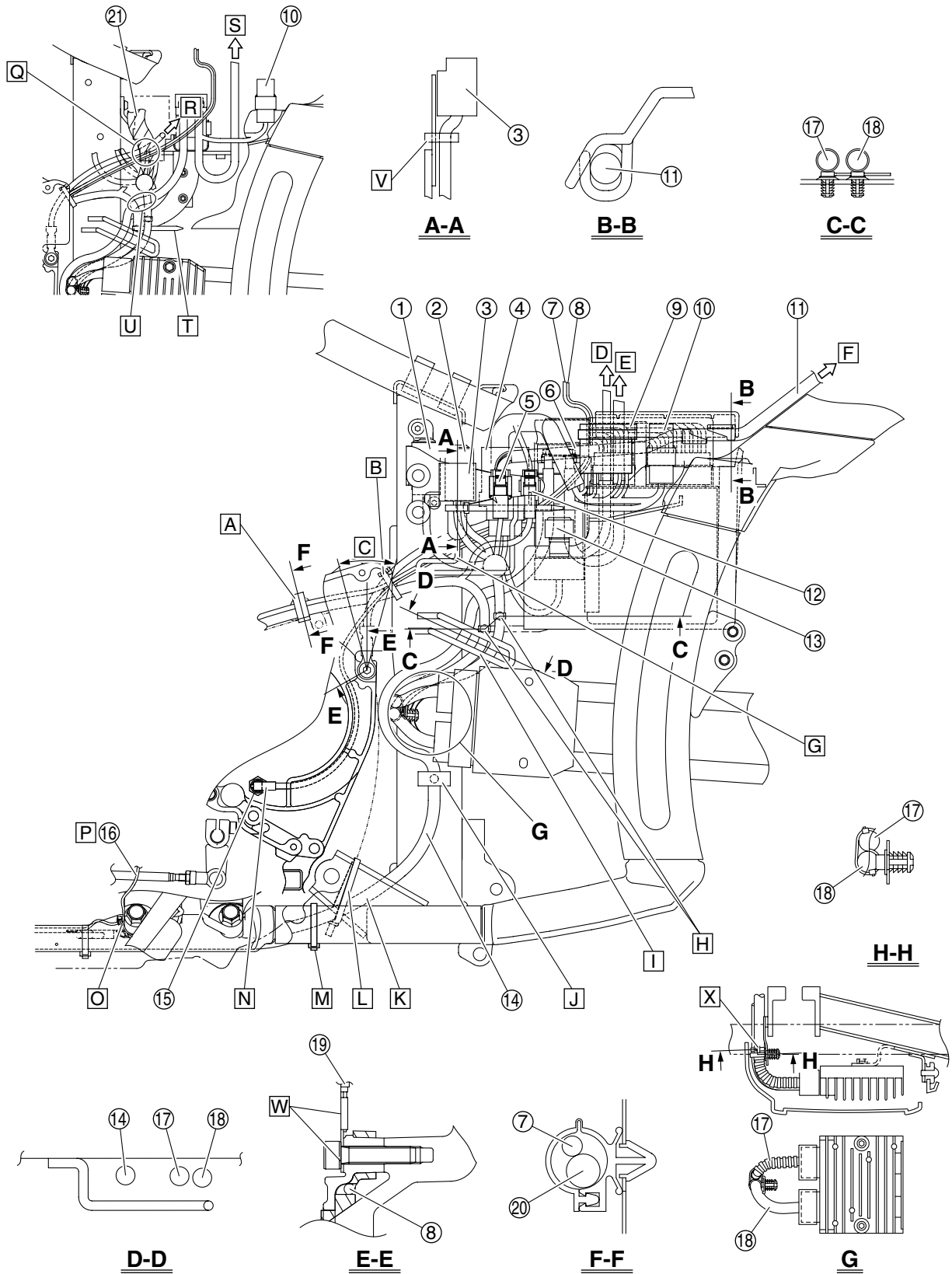
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Clutch cable
2. Left handlebar switch lead
3. Meter assembly lead
4. Sidestand switch coupler
5. Oil level switch coupler
6. Radiator fan motor coupler
7. Coolant temperature sensor coupler
8. Intake air pressure sensor
9. Left handlebar switch couplers
10. Rear cylinder ignition coil
11. Front cylinder ignition coil
12. Rear cylinder thermostat inlet hose
13. Front cylinder thermostat inlet hose
14. Front cylinder spark plug cap
15. Oil level switch
16. Starter motor lead
17. Sidestand switch lead
18. Oil level switch lead
19. Radiator fan motor lead
20. Front brake hose
21. Wire harness
22. Front cylinder spark plug lead
23. Front cylinder left cover
24. Fuel hose
25. Sub-wire harness
26. Coolant reservoir hose
- A. Route the meter assembly lead under the left handlebar switch lead and clutch cable.
- B. Fasten the left handlebar switch lead, front cylinder spark plug lead, and wire harness with a plastic locking tie, making sure to align the tape on the harness with the tie. Be sure to install the plastic locking tie on the left handlebar switch lead's protective sleeve and position it 10–15 mm (0.39–0.59 in) from the end of the sleeve. Point the end of the plastic locking tie downward, to the inside of the front cylinder left cover.
- C. Route the front cylinder spark plug lead to the outside of the rear cylinder spark plug lead.
- D. Black connectors
- E. White connectors
- F. Connect the ignition coil leads with the “I” marks to the front cylinder ignition coil.
- G. Fasten the wire harness to the ignition coil bracket with a plastic locking tie. Position the end of the plastic locking tie to the inside of the other leads.
- H. Route the sub-wire harness to the inside of the fuel pipe.
- I. To engine
- J. Fasten the sidestand switch lead, starter motor lead, and oil level switch lead with a plastic locking tie. Point the end of the plastic locking tie downward, and then cut off the excess end of the tie.
- K. Route the starter motor lead so that it does not protrude below the frame.
- L. Fasten the starter motor lead at the gray tape to the engine mounting boss with a plastic locking tie. Make sure that the starter motor lead does not contact the engine bracket on the frame. Position the end of the plastic locking tie between the radiator bracket mounting boss and the frame.
- M. Fasten the oil level switch lead and sidestand switch lead with a plastic locking tie. Point the end of the plastic locking tie rearward, and then cut off the excess end of the tie.
- N. Fasten the sidestand switch lead and oil level switch lead with the holder. Face the catch of the holder outward.
- O. Route the radiator fan motor lead to the front of the fuel tank breather hose and fuel tank overflow hose.
- P. Fasten the sidestand switch lead, oil level switch lead, and radiator fan motor lead with the holder. Face the catch of the holder outward.
- Q. Route the sidestand switch lead, radiator fan motor lead, and oil level switch lead to the front of the radiator inlet hose.
- R. Fasten the sidestand switch lead to the frame with a plastic locking tie. The oil level switch lead and radiator fan motor lead may also be fastened with the plastic locking tie. Point the end of the plastic locking tie rearward, making sure that it does not contact the left side panel.
- S. Fasten the sidestand switch lead, oil level switch lead, and radiator fan motor lead with the plastic band. Point the end of the plastic band rearward. Do not install the plastic band on the couplers or the sections of the leads that are not covered by the protective sleeves.
- T. Point the end of the plastic locking tie downward, to the inside of the fuel hose.

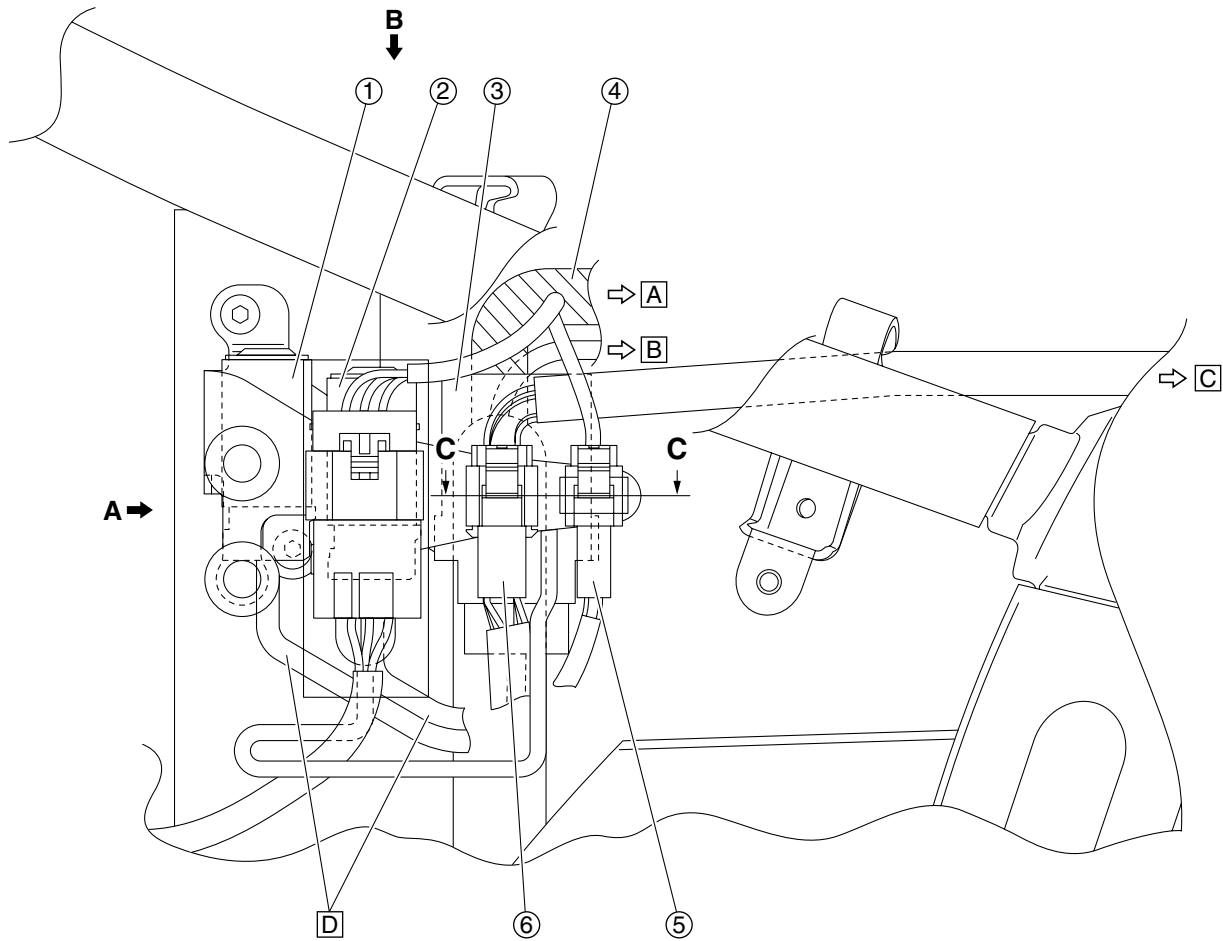
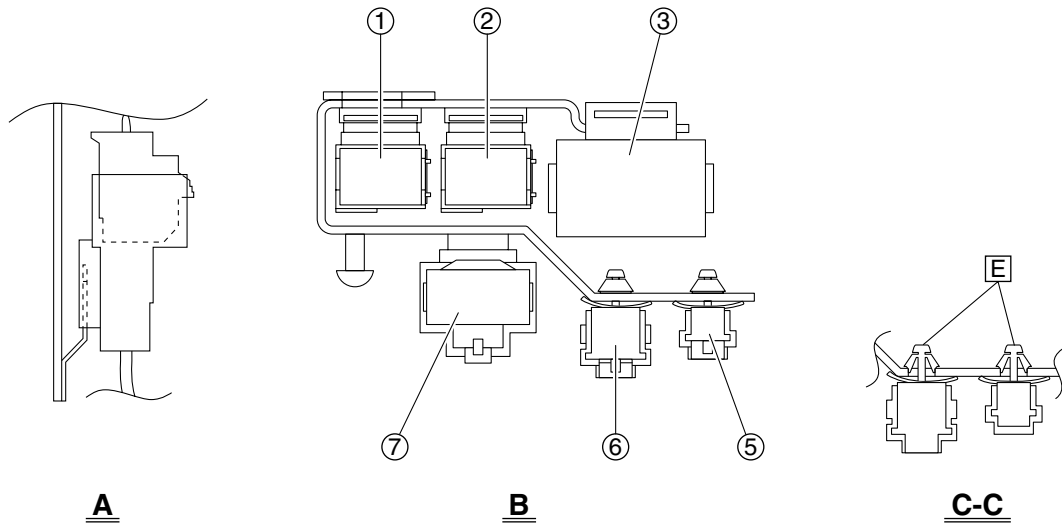
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Headlight relay
 2. Radiator fan motor relay
 3. Joint coupler
 4. Turn signal relay
 5. Tail/brake light wire harness coupler
 6. Starter relay
 7. Speed sensor lead
 8. Neutral switch lead
 9. Fuse box
 10. Main fuse
 11. Tail/brake light wire harness
 12. Crankshaft position sensor coupler
 13. Relay unit
 14. Starter motor lead
 15. Neutral switch
 16. Sidestand switch lead
 17. Stator coil lead
 18. Rectifier/regulator lead
 19. Ground lead
 20. Crankshaft position sensor/stator assembly lead
 21. Wire harness
- A. Fasten the crankshaft position sensor/stator assembly lead and speed sensor lead with the holder.
 - B. Fasten the speed sensor lead, crankshaft position sensor/stator assembly lead, ground lead, and neutral switch lead with a plastic locking tie, making sure to position the tie 10 mm (0.39 in) or less to the front or rear of the front edge of the frame. Point the end of the plastic locking tie upward, and then cut off the excess end of the tie down to the buckle, making sure that there are no sharp edges.
 - C. Position the ground lead in the range shown in the illustration, 15° or less to the front or rear of the vertical line shown in the illustration.
 - D. To negative battery terminal
 - E. To positive battery terminal
 - F. To tail/brake light assembly
 - G. Route the joint coupler lead, tail/brake light wire harness, and crankshaft position sensor/stator assembly lead through the guide, making sure that the leads pass to the inside of the lower portion of the guide.
 - H. Insert the projection on the lead holders completely into the holes in the sub-fuel tank bracket.
 - I. Route the starter motor lead, rectifier/regulator lead, and crankshaft position sensor/stator assembly lead through the guide on the frame.
 - J. Fasten the starter motor lead with the holder.
 - K. Route the starter motor lead to the inside of the engine bracket on the frame.
 - L. Fasten the starter motor lead to the engine bracket on the frame with a plastic locking tie. Point the end of the plastic locking tie downward, and then cut off the excess end of the tie to 10 mm (0.39 in) or less.
 - M. Fasten the starter motor lead with a plastic locking tie. Position the plastic locking tie to the rear of the frame weld. Point the end of the plastic locking tie downward, and then cut off the excess end of the tie.
 - N. Install the neutral switch lead terminal so that the lead is routed rearward. Make sure that there is no slack in the neutral switch lead.
 - O. Fasten the sidestand switch lead with a plastic locking tie, making sure to fit the tie in the gap between the sidestand bracket and the frame boss. Point the end of the plastic locking tie forward, and then cut off the excess end of the tie.
 - P. Route the sidestand switch lead to the outside of the shift rod.
 - Q. Route the speed sensor lead and neutral switch lead over the wire harness. Route the negative battery lead between the wire harness and the bracket.
 - R. To negative battery lead
 - S. To positive battery lead
 - T. Position the end of the plastic locking tie to the inside of the rectifier/regulator lead.
 - U. Route the starter motor lead to the inside of the crankshaft position sensor/stator assembly lead and rectifier/regulator lead.
 - V. Fasten the joint coupler lead with a plastic locking tie, making sure that the tie does not contact the guide on the relay bracket.
 - W. Install the ground lead terminal with the drive pulley housing bolt, making sure that the crimped section of the terminal that secures the ground lead is facing inward as shown in the illustration.
 - X. Fasten the stator coil lead and rectifier/regulator lead with a plastic locking tie. Align the white tape on the stator coil lead with the plastic locking tie. Position the plastic locking tie next to the holder. Face the buckle of the plastic locking tie upward, and then cut off the excess end of the tie.

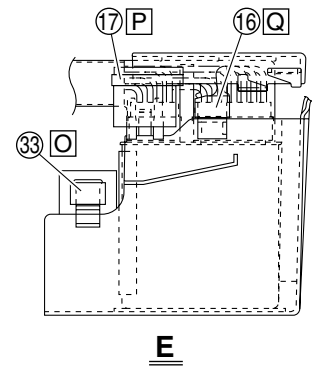
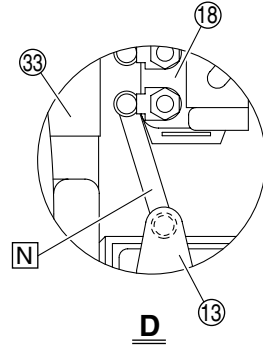
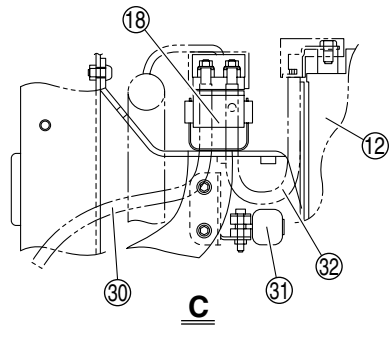
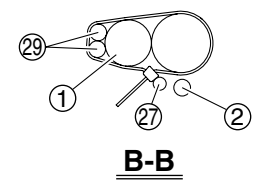
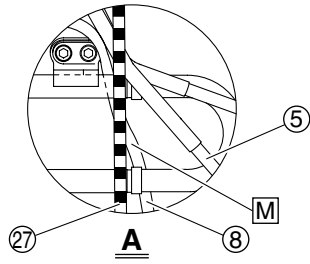
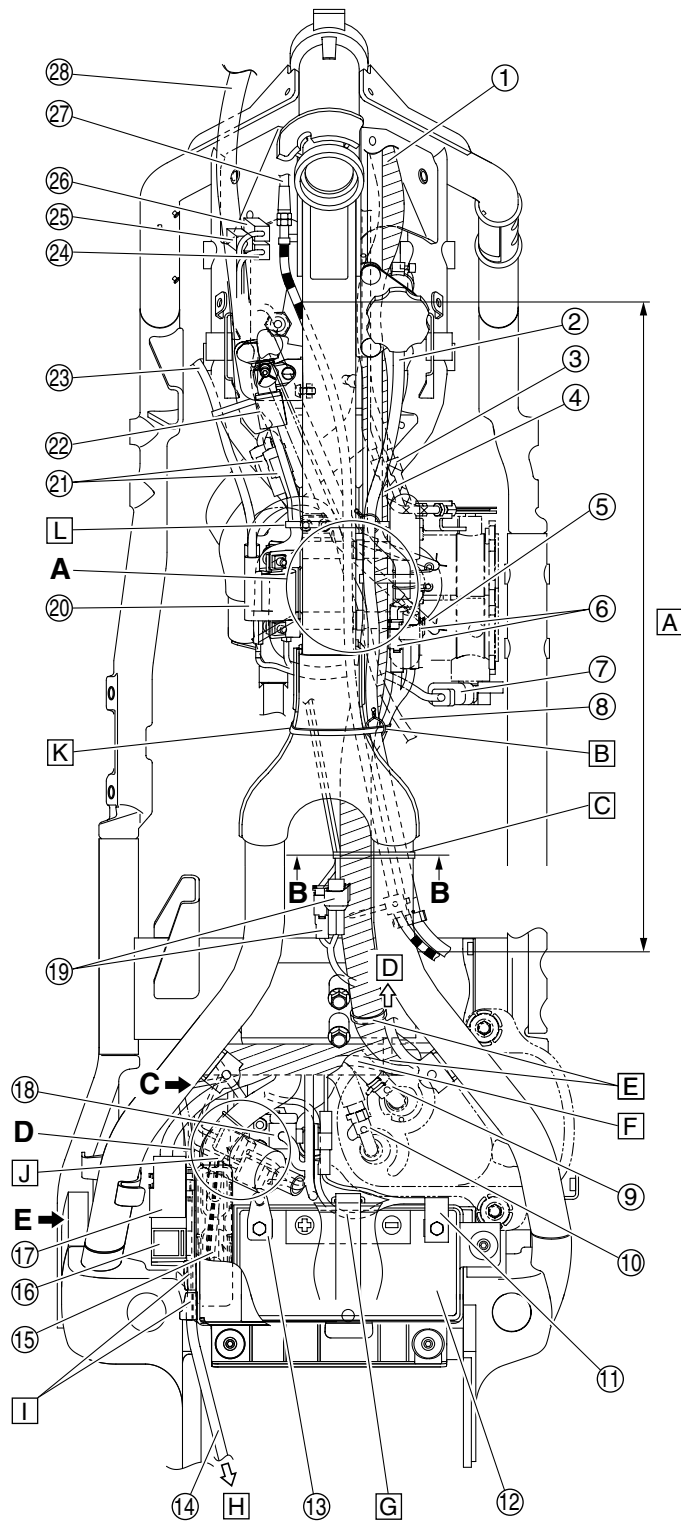
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Headlight relay
2. Radiator fan motor relay
3. Turn signal relay
4. Wire harness
5. Crankshaft position sensor coupler
6. Tail/brake light coupler
7. Joint coupler
 - A. To fuse box and main fuse
 - B. To starter relay
 - C. To tail/brake light assembly
 - D. Connect the lead with white tape to the headlight relay and connect the lead without white tape to the radiator fan motor relay.
 - E. Insert the projections on the crankshaft position sensor coupler and tail/brake light coupler into the holes in the bracket.

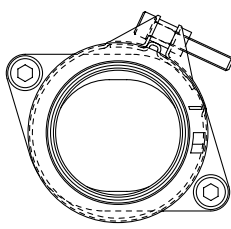
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



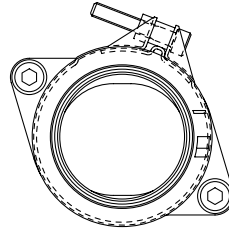
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Wire harness
2. Coolant reservoir hose
3. Throttle cable (accelerator cable)
4. Throttle cable (decelerator cable)
5. Intake air pressure sensor hose
6. Right handlebar switch couplers
7. Throttle position sensor
8. Rear cylinder spark plug lead
9. Air vent hose
10. Fuel cock hose
11. Negative battery lead terminal
12. Battery
13. Positive battery lead terminal
14. Tail/brake light wire harness
15. ECU (engine control unit)
16. Main fuse
17. Fuse box
18. Starter relay
19. Sub-wire harness couplers
20. Rear cylinder ignition coil
21. Left handlebar switch couplers
22. Intake air pressure sensor coupler
23. Front cylinder spark plug lead
24. Sidestand switch coupler
25. Oil level switch coupler
26. Radiator fan motor coupler
27. Clutch cable
28. Left handlebar switch lead
29. Sub-wire harness
30. Starter motor lead
31. Lean angle sensor
32. Positive battery lead
33. Relay unit
- A. Be sure to route the clutch cable over any cable, lead, pipe, or hose that it crosses in the area shown in the illustration.
- B. Fasten the coolant reservoir hose to the plastic locking tie with the clamp.
- C. Fasten the wire harness and sub-wire harness with a plastic locking tie. Point the end of the plastic locking tie downward, to the inside of the rear cylinder right cover.
- D. To fuel sender
- E. Insert the projections on the wire harness holders completely into the holes in the frame.
- F. Route the fuel sender lead under the air vent hose.
- G. Route the negative battery lead between the battery and the tool kit tray, and then fasten the tray and lead with the battery cover band.
- H. To tail/brake light assembly
- I. Route the tail/brake light wire harness through the guides on the tool kit tray.
- J. Slide the rubber cover over the neutral switch coupler and speed sensor coupler, making sure that the couplers are covered completely.
- K. Fasten the wire harness, sub-wire harness, left handlebar switch lead, and clutch cable with a plastic locking tie, making sure that the tie does not contact the protective tape on the frame.
- L. Fasten the wire harness and right handlebar switch lead to the frame with a plastic locking tie. Position the end of the plastic locking tie to the inside of the front cylinder thermostat inlet hose.
- M. Route the rear cylinder spark plug lead under the U-shaped fuel pipe.
- N. Make sure not to route the positive battery lead on top of the relay unit.
- O. Install the relay unit completely onto the tab on the battery box.
- P. Install the fuse box completely onto the tab on the battery box.
- Q. Install the main fuse completely onto the tab on the battery box.

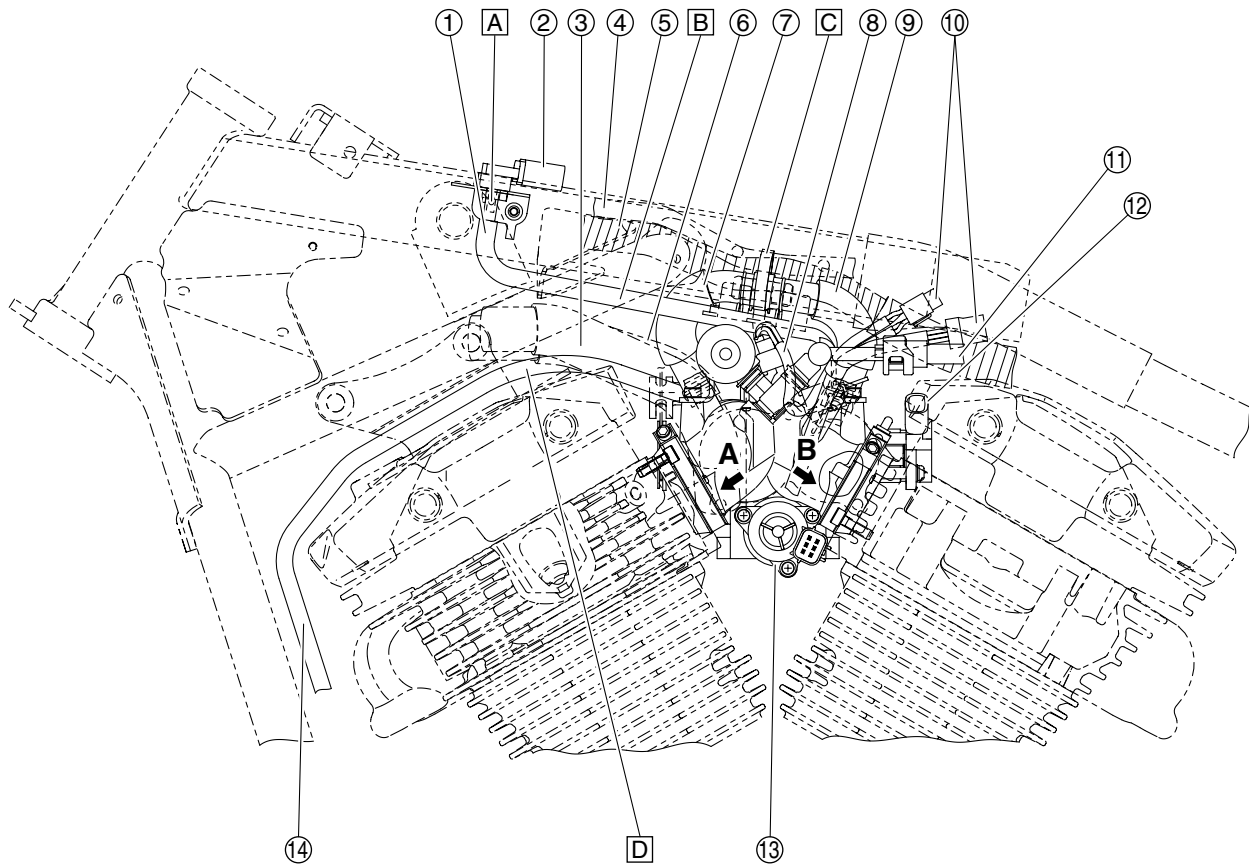
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



A



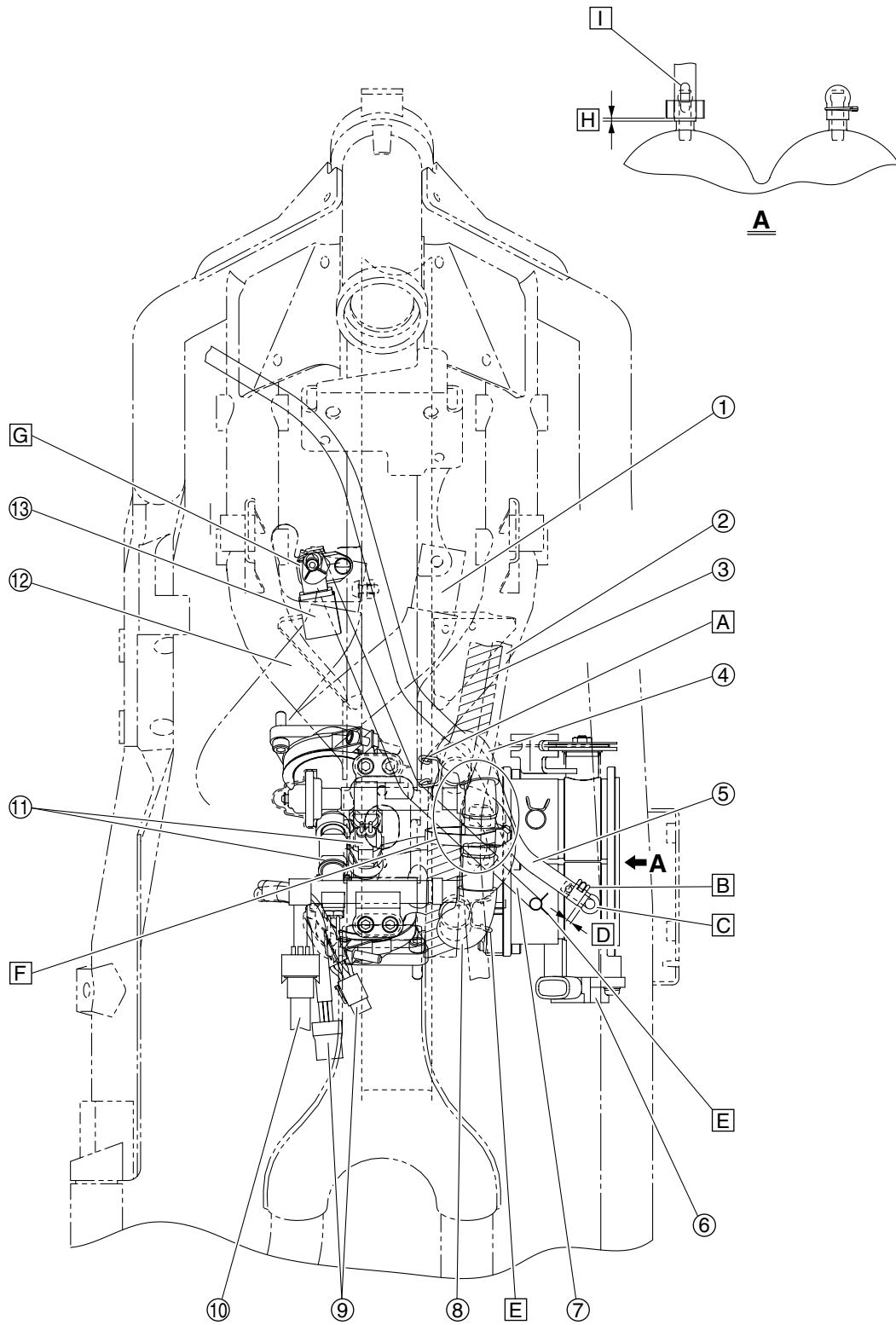
B



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Intake air pressure sensor hose
 2. Intake air pressure sensor
 3. Front cylinder thermostat inlet hose
 4. Right handlebar switch lead
 5. Wire harness
 6. Rear cylinder thermostat inlet hose
 7. Front cylinder resonator hose
 8. Sub-wire harness
 9. Rear cylinder resonator hose
 10. Sub-wire harness couplers
 11. Fuel hose
 12. Throttle position sensor
 13. ISC (idle speed control) unit
 14. Canister purge hose (California only)
- A. Install the intake air pressure sensor hose with its white paint mark facing outward.
 - B. Route the intake air pressure sensor hose over the rear cylinder thermostat inlet hose and front cylinder thermostat inlet hose.
 - C. Fasten the resonator hose joint, wire harness, and right handlebar switch lead with a plastic locking tie.
 - D. Route the canister purge hose (California only) under the rear cylinder thermostat inlet hose and front cylinder thermostat inlet hose.

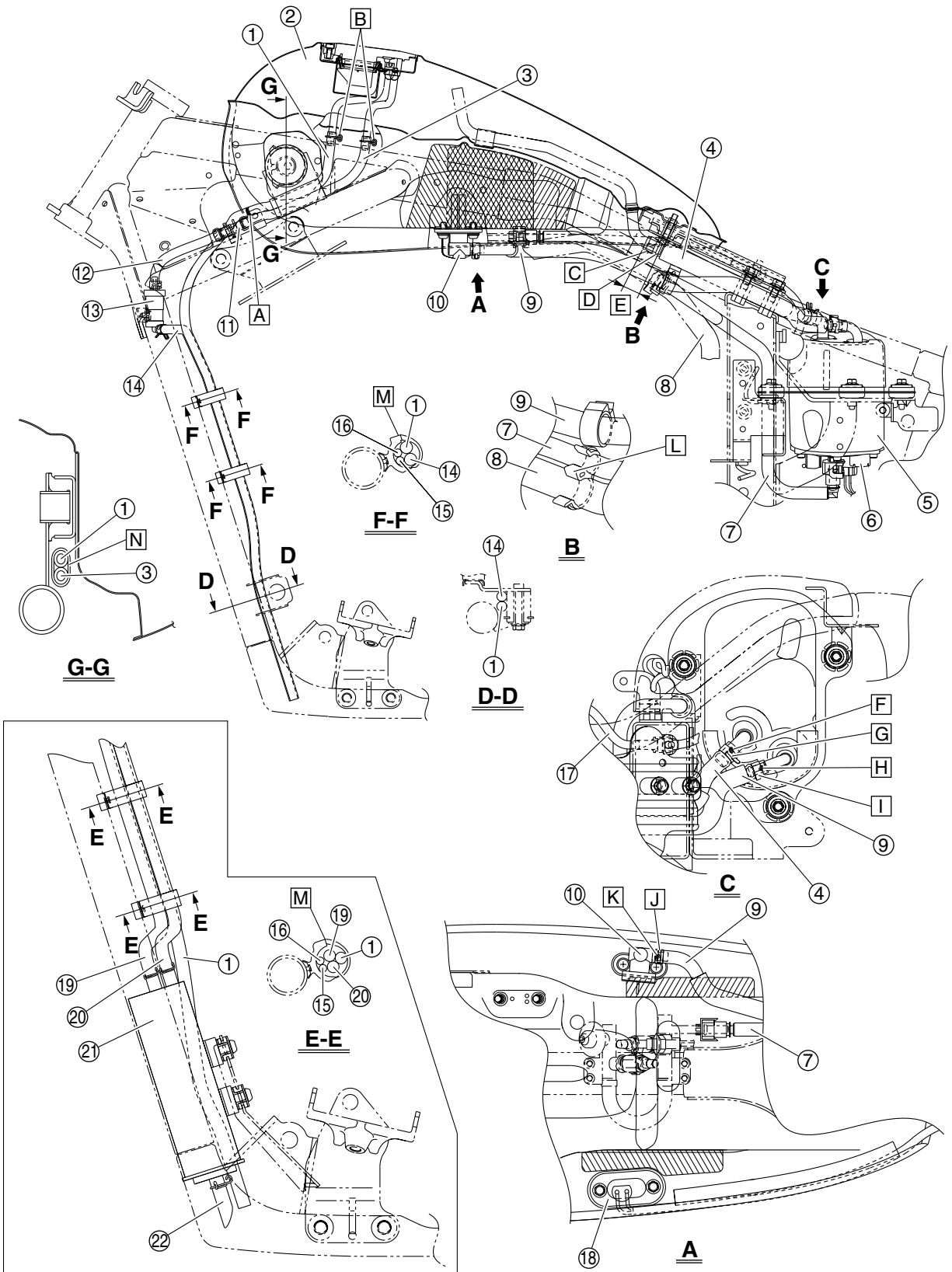
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Rear cylinder thermostat inlet hose
2. Right handlebar switch lead
3. Wire harness
4. Front cylinder resonator hose
5. Canister purge hose (California only)
6. Throttle position sensor
7. Intake air pressure sensor hose
8. Rear cylinder resonator hose
9. Sub-wire harness couplers
10. Fuel hose
11. Injectors
12. Front cylinder thermostat inlet hose
13. Intake air pressure sensor
- A. Point the ends of the hose clamp inward.
- B. Align the hose clamp with the white paint mark on the canister purge hose (California only) and point the ends of the clamp forward.
- C. Route the canister purge hose (California only) to the outside of the front cylinder resonator hose, and then install it onto the throttle body pipe up to the bend in the pipe, making sure to face the white paint mark on the hose upward.
- D. 2–4 mm (0.08–0.16 in)
- E. Point the ends of the hose clamp outward.
- F. Route the canister purge hose (California only) under the intake air pressure sensor hose.
- G. Point the ends of the hose clamp rearward.
- H. 0–1 mm (0–0.04 in)
- I. Install the intake air pressure sensor hose with its white paint mark facing outward.

CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))



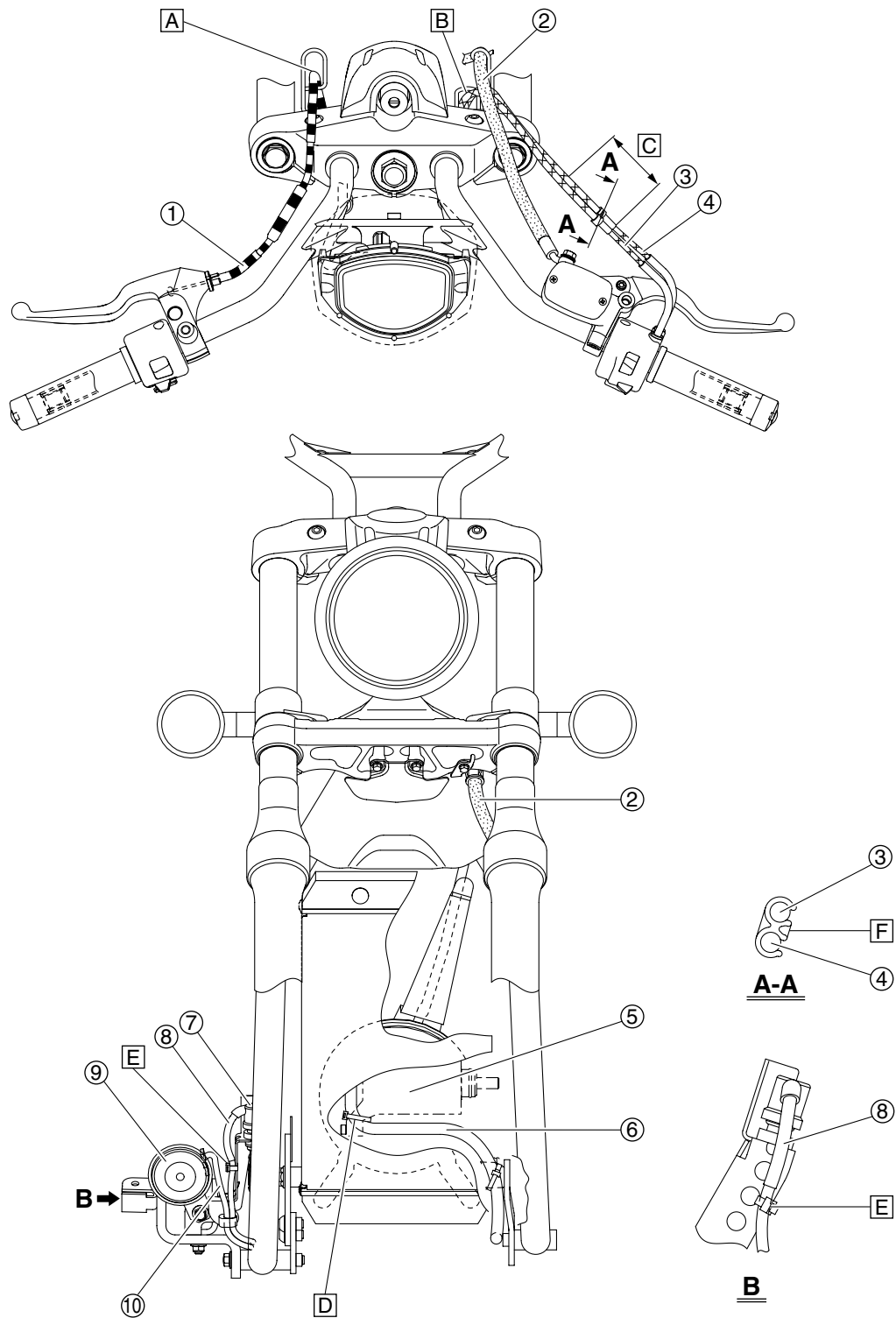
CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))

1. Fuel tank overflow hose
2. Fuel tank
3. Fuel tank breather hose (fuel tank to hose joint)
4. Air vent hose
5. Sub-fuel tank
6. Fuel pump
7. Fuel hose
8. Crankcase breather hose
9. Fuel cock hose
10. Fuel cock
11. Hose joint
12. Fuel tank breather hose (hose joint to rollover valve)
13. Rollover valve
14. Fuel tank breather hose (except for California)
15. Sidestand switch lead
16. Oil level switch lead
17. Fuel sender lead
18. Fuel sender
19. Fuel tank breather hose (rollover valve to canister) (California only)
20. Canister purge hose (California only)
21. Canister (California only)
22. Canister breather hose (California only)
- A. Route the fuel tank overflow hose, identified by the paint mark, over the fuel tank breather hose (fuel tank to hose joint).
- B. Do not point the ends of the hose clamps inward.
- C. Face the crimped section of the hose clamp downward. Position the hose clamp over the marking on the air vent hose, making sure not to install it on the raised portion of the hose fitting.
- D. Install the air vent hose to the fuel tank with its white paint mark facing downward.
- E. 15 mm (0.59 in) or more
- F. Install the air vent hose with its paint mark facing upward.
- G. Point the ends of the hose clamp upward. Position the hose clamp over the paint mark on the air vent hose.
- H. Install the fuel cock hose with its yellow paint mark facing upward.
- I. Face the crimped section of the hose clamp upward. Position the hose clamp over the marking on the fuel cock hose.
- J. Point the ends of the hose clamp downward, making sure that they do not contact the fuel tank. Position the hose clamp over the marking on the fuel cock hose, making sure not to install it on the raised portion of the hose fitting.
- K. Install the fuel cock hose completely onto the fuel cock hose fitting, making sure that the blue paint mark on the hose is facing downward.
- L. Point the open ends of the holder downward.
- M. Face the catch of the holder outward.
- N. Be sure not to pinch the fuel tank overflow hose and fuel tank breather hose (fuel tank to hose joint) when installing the fuel tank.

CABLE ROUTING (for XVS13CA(C))

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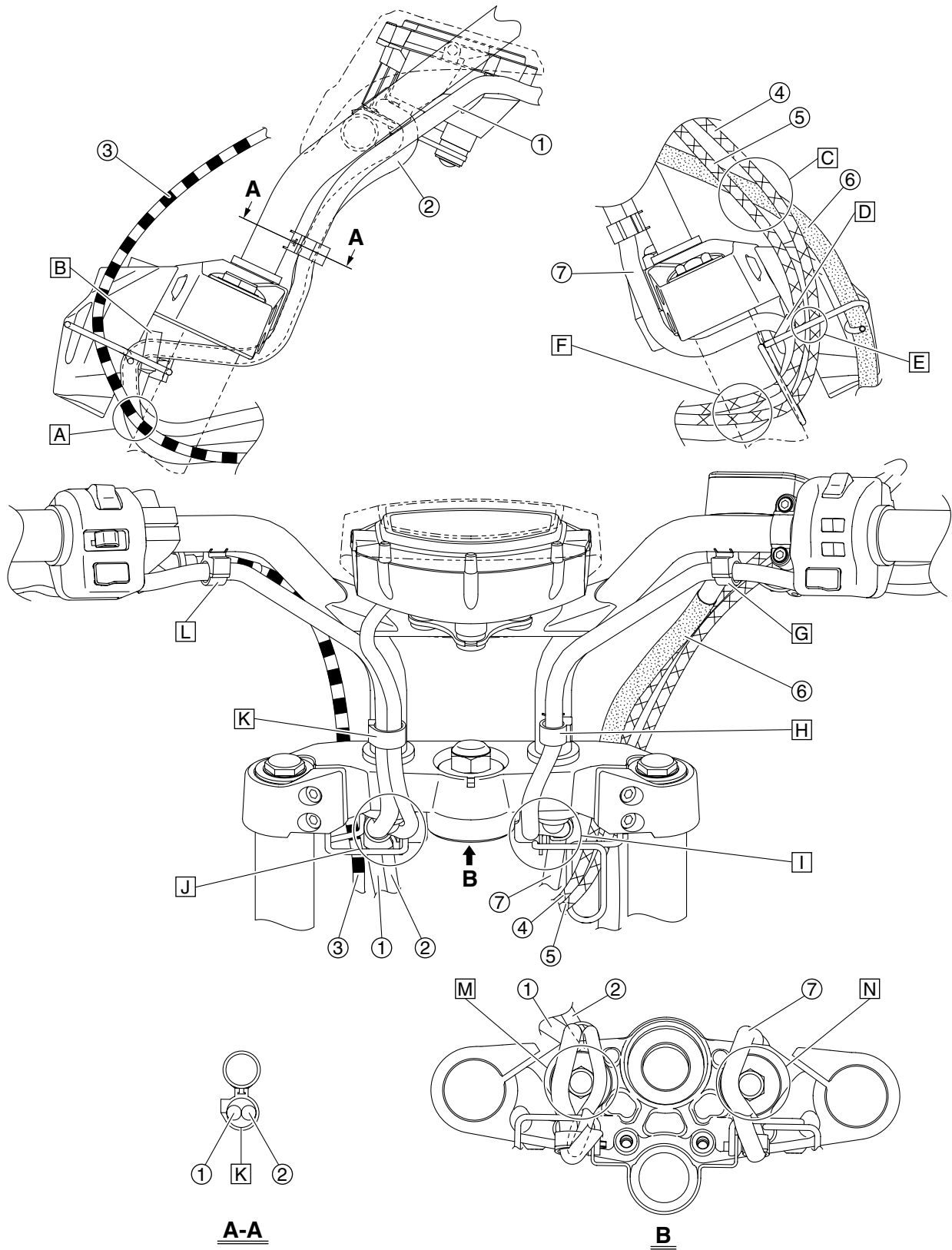
CABLE ROUTING (for XVS13CA(C))



CABLE ROUTING (for XVS13CA(C))

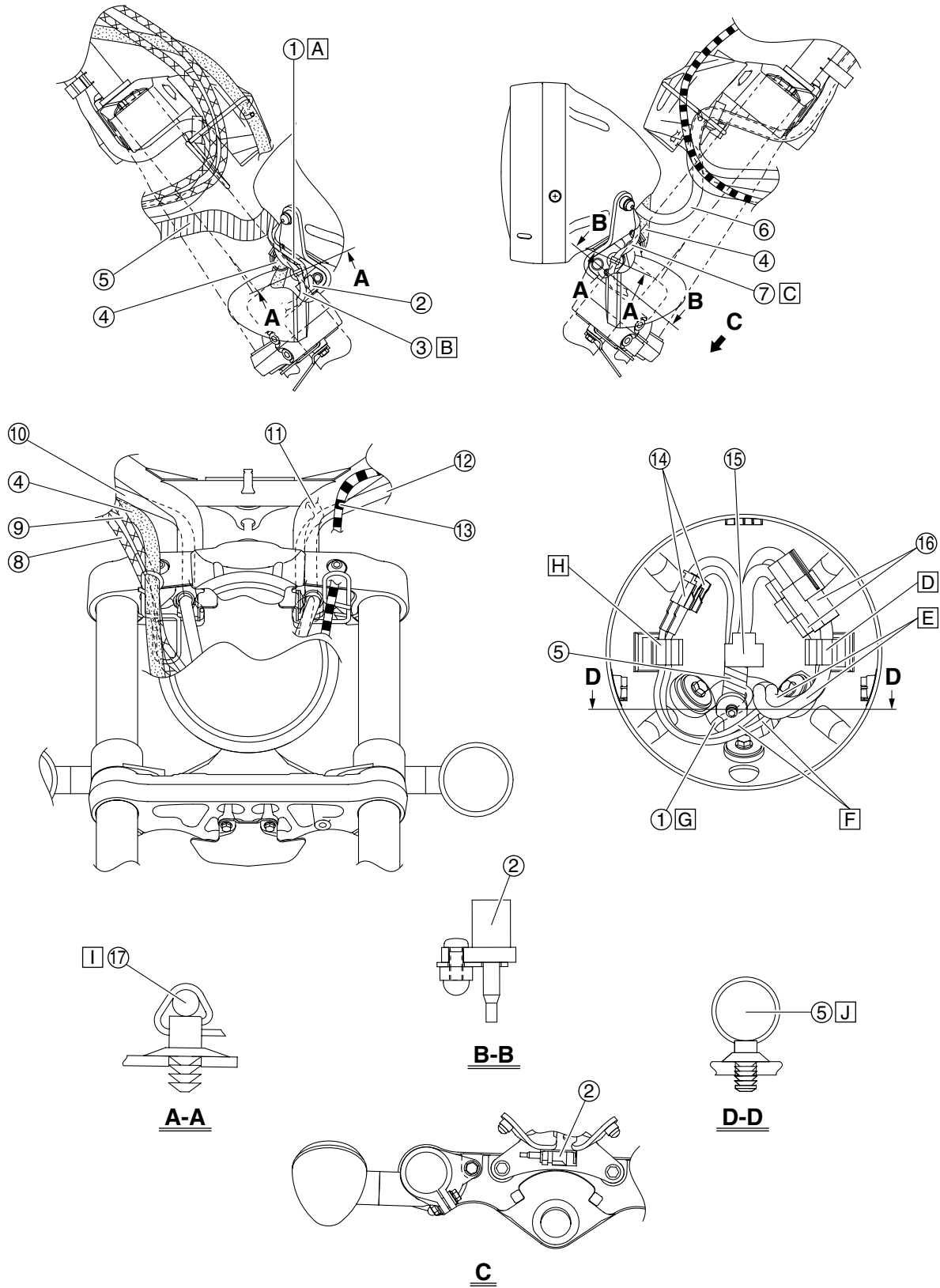
1. Clutch cable
 2. Front brake hose
 3. Throttle cable (accelerator cable)
 4. Throttle cable (decelerator cable)
 5. Starter motor
 6. Starter motor lead
 7. Rear brake light switch
 8. Rear brake light switch lead
 9. Horn
 10. Horn lead
- A. Route the clutch cable through the guide.
 - B. Route the throttle cables through the guide.
 - C. Position the holder less than 50 mm (1.96 in) from the ends of the protectors on the throttle cables as shown in the illustration.
 - D. Fasten the starter motor lead at the gray tape with a plastic locking tie, making sure that the lead contacts the mounting boss on the starter motor. Point the end of the plastic locking tie forward, and then cut off the excess end of the tie.
 - E. Pass a plastic locking tie through the center hole in the rear brake light switch bracket, and then fasten the rear brake light switch lead to the bracket with the tie. The rear brake light switch lead should not be too taut or slack. Cut off the excess end of the plastic locking tie to 3 mm (0.12 in) or less.
 - F. Point the open ends of the holder inward.

CABLE ROUTING (for XVS13CA(C))



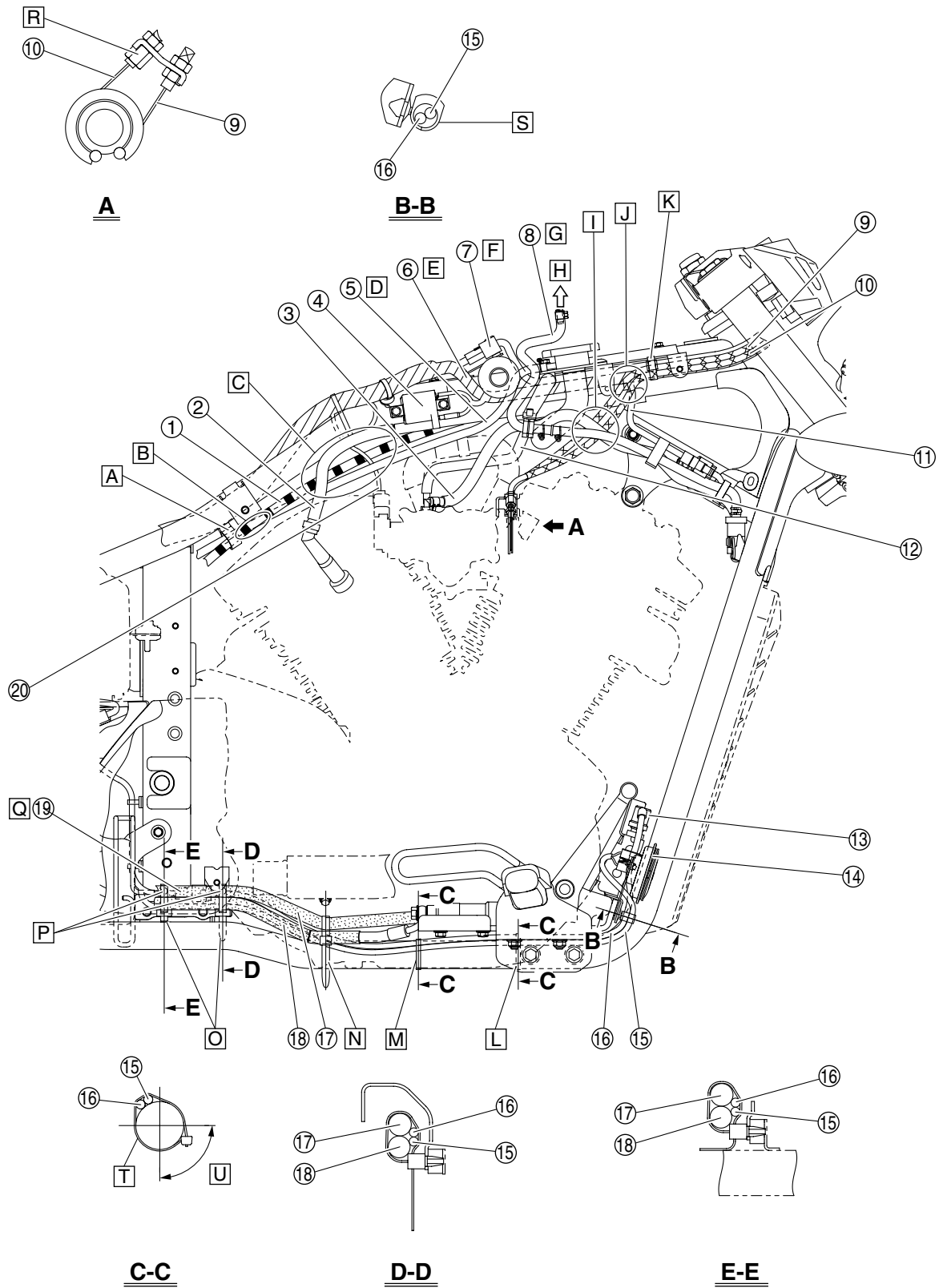
1. Left handlebar switch lead
2. Meter assembly lead
3. Clutch cable
4. Throttle cable (accelerator cable)
5. Throttle cable (decelerator cable)
6. Front brake hose
7. Right handlebar switch lead
- A. Route the clutch cable to the outside of the left handlebar switch lead and meter assembly lead.
- B. Secure the holder by inserting the projection on the holder into the hole in the cable guide, and then fasten the left handlebar switch lead and meter assembly lead with the holder. Align the purple tape on the left handlebar switch lead and the black tape on the meter assembly lead with the holder. Face the catch of the holder downward.
- C. Route the throttle cables to the outside of the front brake hose.
- D. Secure the holder by inserting the projection on the holder into the hole in the cable guide.
- E. Route the throttle cables through the guide.
- F. Route the right handlebar switch lead to the inside of the throttle cables.
- G. Fasten the right handlebar switch lead with the holder. Face the catch of the holder rearward.
- H. Fasten the right handlebar switch lead with the holder. Face the catch of the holder outward.
- I. Route the right handlebar switch lead to the rear of the upper bracket, and through the guide.
- J. Route the left handlebar switch lead and meter assembly lead to the rear of the upper bracket, and through the guide.
- K. Fasten the left handlebar switch lead and meter assembly lead with the holder. Face the catch of the holder outward.
- L. Fasten the left handlebar switch lead with the holder. Face the catch of the holder rearward.
- M. Route the left handlebar switch lead to the outside of the handlebar nut. Route the meter assembly lead to the inside of the handlebar nut.
- N. Route the right handlebar switch lead to the inside of the handlebar nut.

CABLE ROUTING (for XVS13CA(C))



1. Air temperature sensor lead
2. Air temperature sensor
3. Front right turn signal/position light lead
4. Front brake hose
5. Wire harness
6. Main switch lead
7. Front left turn signal/position light lead
8. Throttle cable (decelerator cable)
9. Throttle cable (accelerator cable)
10. Right handlebar switch lead
11. Meter assembly lead
12. Left handlebar switch lead
13. Clutch cable
14. Front turn signal couplers
15. Headlight coupler
16. Main switch couplers
17. Front turn signal/position light lead
- A. Route the air temperature sensor lead between the front brake hose and the headlight bracket.
- B. Route the front right turn signal/position light lead to the front of the front brake hose.
- C. Route the front left turn signal/position light lead to the front of the front brake hose.
- D. Fasten the main switch leads with the holder.
- E. Route the main switch leads through the left side of the hole in the headlight body.
- F. Route the front turn signal/position light leads through the lower left portion of the hole in the headlight body.
- G. Route the air temperature sensor lead to the rear of the headlight bracket.
- H. Fasten the front turn signal/position light leads with the holder.
- I. Secure the plastic locking tie by inserting the projection on the tie into the hole in the headlight bracket.
- J. Secure the holder by inserting the projection on the holder into the hole in the headlight bracket.

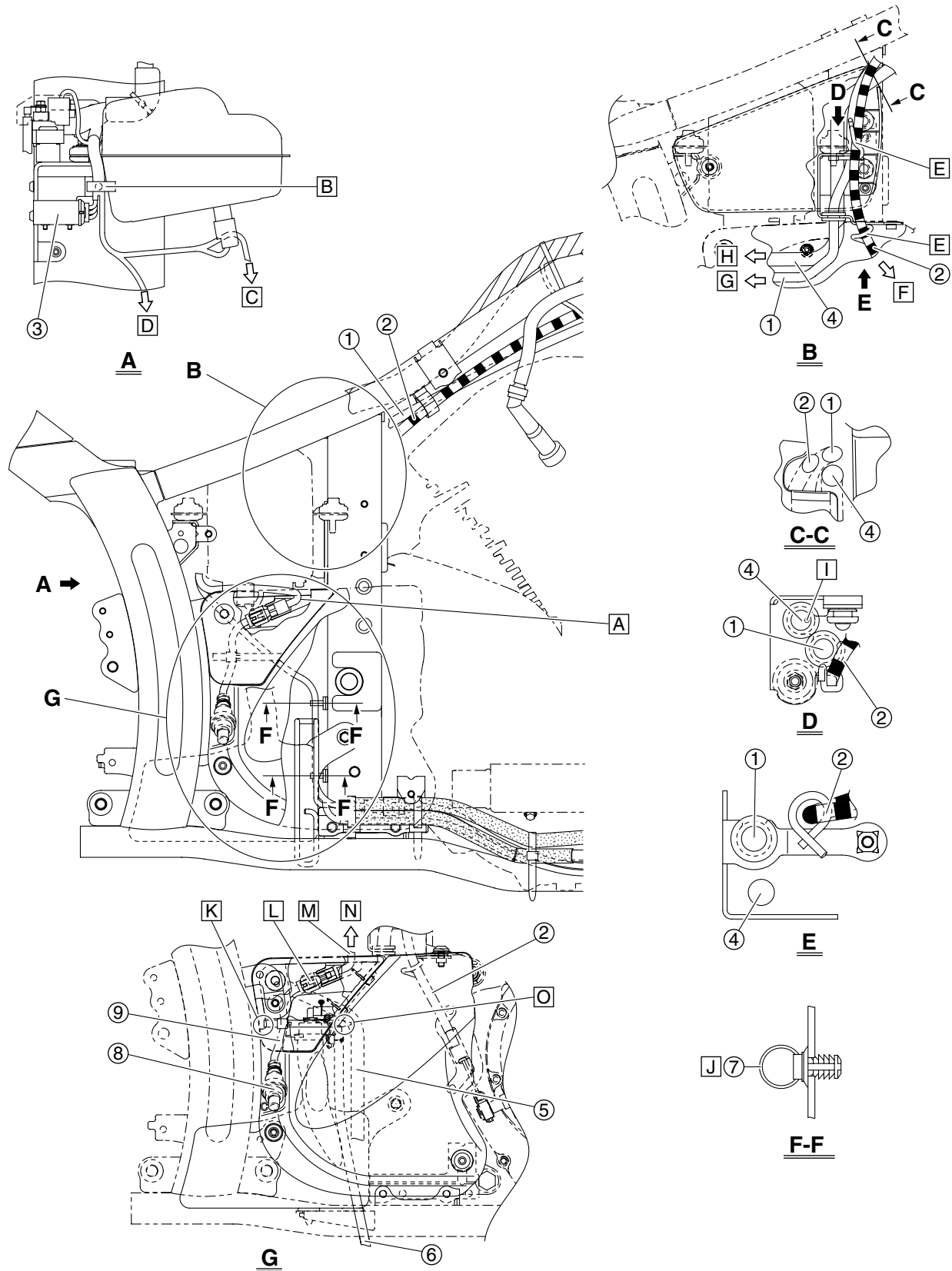
CABLE ROUTING (for XVS13CA(C))



CABLE ROUTING (for XVS13CA(C))

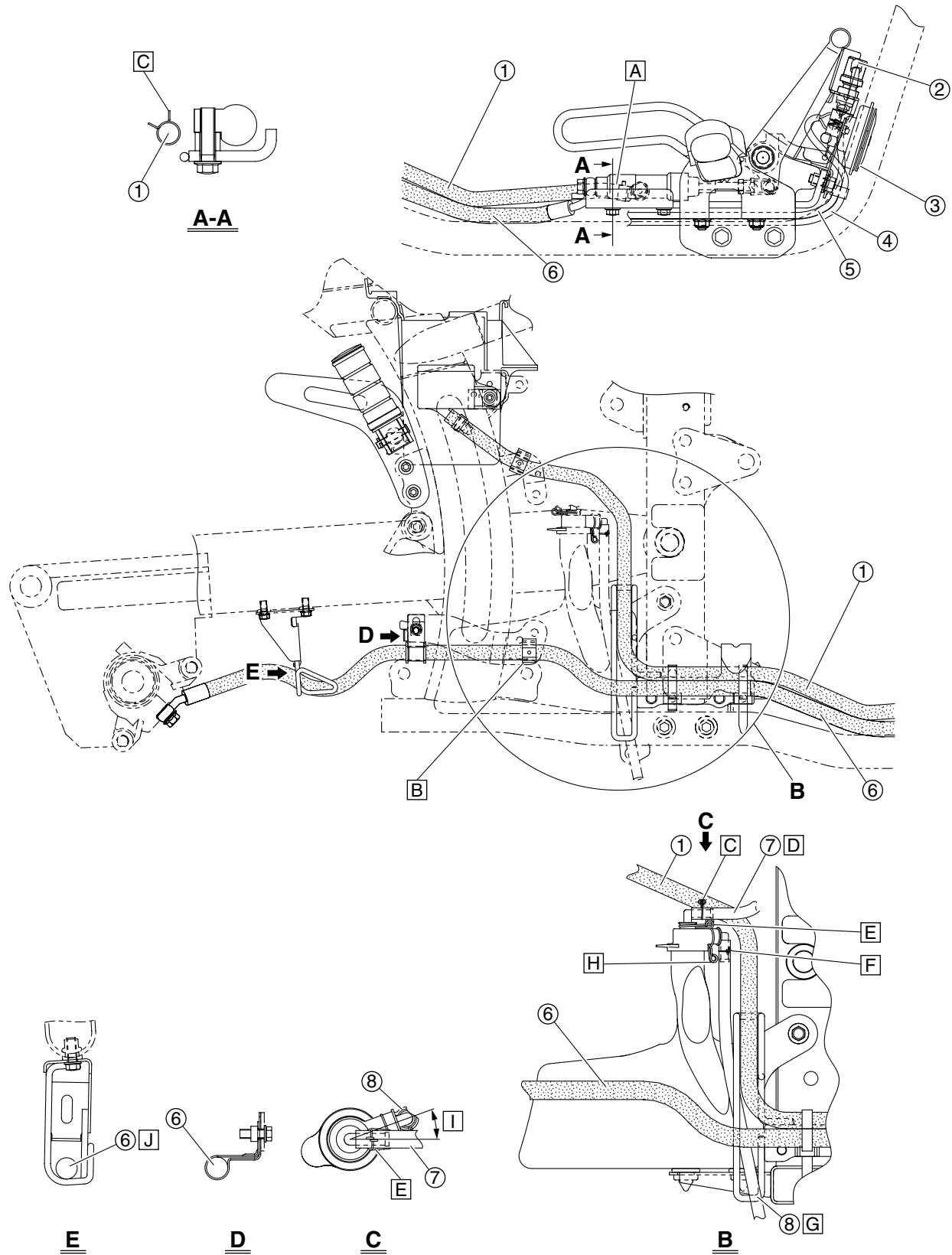
1. Clutch cable
 2. Rear cylinder spark plug lead
 3. Canister purge hose (California only)
 4. Rear cylinder ignition coil
 5. Coolant reservoir hose
 6. Wire harness
 7. Right handlebar switch coupler
 8. Fuel tank overflow hose
 9. Throttle cable (accelerator cable)
 10. Throttle cable (decelerator cable)
 11. Radiator fan motor lead
 12. Intake air pressure sensor hose
 13. Rear brake light switch
 14. Horn
 15. Horn lead
 16. Rear brake light switch lead
 17. Brake fluid reservoir hose
 18. Rear brake hose
 19. Rear brake light switch coupler
 20. Throttle position sensor lead
- A. Fasten the clutch cable and coolant reservoir hose with the holder. Face the catch of the holder outward.
 - B. Route the clutch cable to the outside of the coolant reservoir hose.
 - C. Route the clutch cable, throttle position sensor lead, coolant reservoir hose, and rear cylinder spark plug lead in the order listed from left to right. Route the throttle position sensor lead under the frame.
 - D. Route the coolant reservoir hose to the outside of the wire harness and right handlebar switch lead, and under the fuel tank bracket.
 - E. Route the wire harness under the fuel tank bracket.
 - F. Route the right handlebar switch lead over the fuel tank bracket.
 - G. Route the fuel tank overflow hose to the outside of the wire harness, right handlebar switch lead, and coolant reservoir hose.
 - H. To fuel tank
 - I. Route the fuel tank overflow hose to the outside of the throttle cables. (Except for California) Route the throttle cables, canister purge hose, and fuel tank overflow hose in the order listed from left to right. (California only)
 - J. Route the throttle cables to the outside of the wire harness and radiator fan motor lead.
 - K. Secure the plastic band by inserting the projection on the band into the hole in the frame, and then fasten the wire harness, right handlebar switch lead, and throttle cables with the band. Align the tape on the wire harness and right handlebar switch lead with the plastic band. Cut off the excess end of the plastic band. Route the throttle cable (accelerator cable) over the throttle cable (decelerator cable).
 - L. Fasten the horn lead and rear brake light switch lead to the frame with a plastic locking tie. Point the end of the plastic locking tie downward, and then cut off the excess end of the tie.
 - M. Fasten the horn lead and rear brake light switch lead to the frame with a plastic locking tie. Point the end of the plastic locking tie downward, and then cut off the excess end of the tie. Align the plastic locking tie with the rear end of the right footrest bracket.
 - N. Fasten the horn lead, rear brake light switch lead, rear brake hose, and brake fluid reservoir hose to the frame with the plastic band. Position the plastic band under the exhaust pipe protector screw clamp. Point the end of the plastic band downward. Make sure that the horn lead and rear brake light switch lead do not protrude below the frame.
 - O. Secure the plastic band by inserting the projection on the band into the hole in the coolant reservoir cover bracket, and then fasten the horn lead, rear brake light switch lead, rear brake hose, and brake fluid reservoir hose with the band.
 - P. Align the white paint mark on the brake fluid reservoir hose with the plastic band.
 - Q. Position the rear brake light switch coupler to the inside of the rear brake hose and brake fluid reservoir hose.
 - R. Be sure to install the throttle cable (decelerator cable), identified by the longer nut, on the outer side of the throttle cable pulley.
 - S. Secure the holder by inserting the projection on the holder into the hole in the rider footrest assembly, and then fasten the horn lead and rear brake light switch lead with the holder.
 - T. Fasten the horn lead and rear brake light switch lead with a plastic locking tie. Make sure that the horn lead and rear brake light switch lead do not protrude below the frame.
 - U. Position the buckle of the plastic locking tie within the range shown in the illustration.

CABLE ROUTING (for XVS13CA(C))



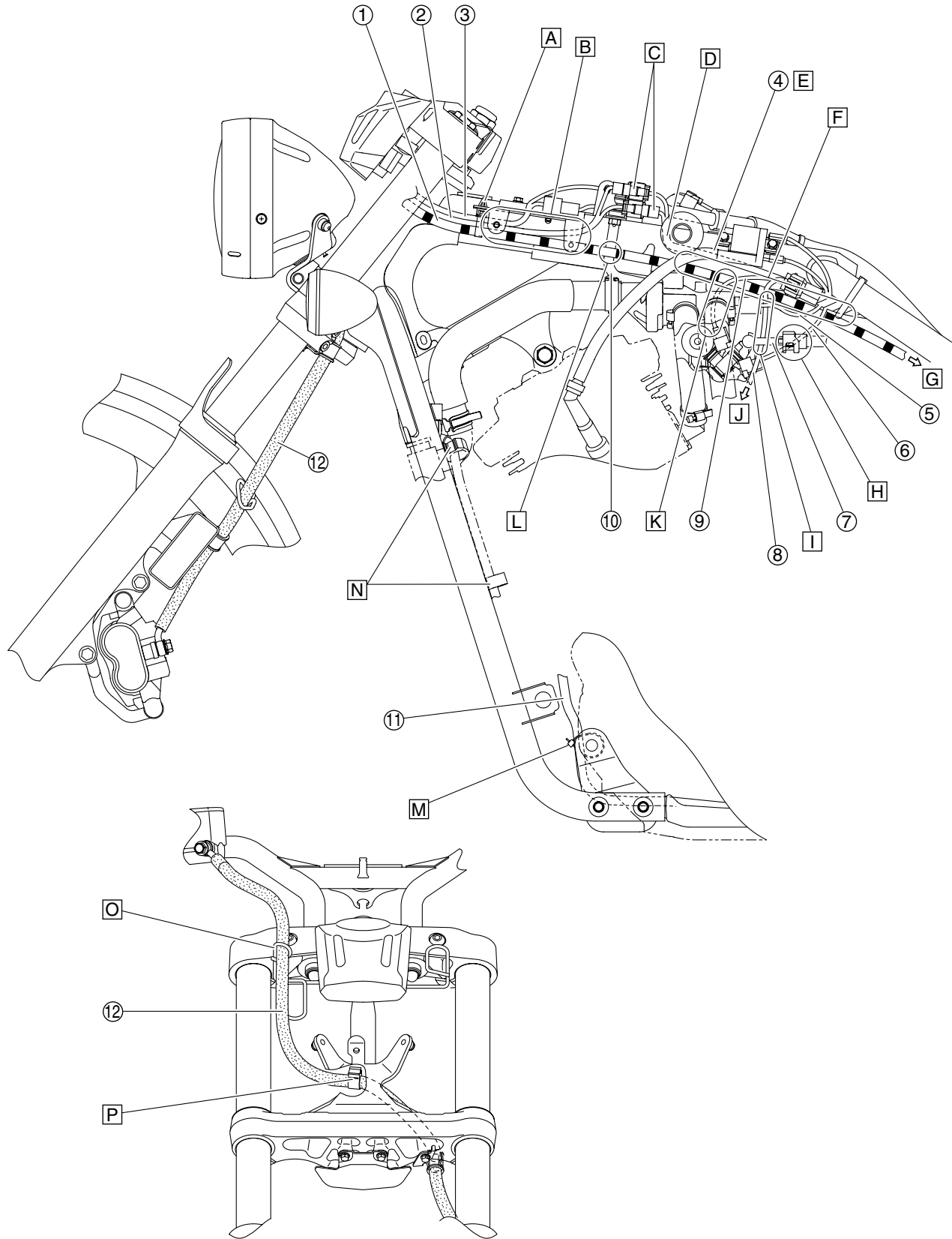
1. Coolant reservoir hose
2. Clutch cable
3. Lean angle sensor
4. Fuel hose
5. Brake fluid reservoir hose
6. Coolant reservoir breather hose
7. Wire harness
8. O₂ sensor
9. O₂ sensor lead
- A. Be sure not to pinch the O₂ sensor lead when installing the coolant reservoir cap cover.
- B. Secure the holder by inserting the projection on the holder into the hole in the bracket, and then fasten the lean angle sensor lead and wire harness with the holder.
- C. To O₂ sensor
- D. To horn and rear brake light switch
- E. Route the clutch cable through the guide.
- F. To clutch cover
- G. To coolant reservoir
- H. To fuel pump
- I. Install the fuel hose with its white paint mark facing forward.
- J. Secure the holder by inserting the projection on the holder into the hole in the frame, and then fasten the wire harness with the holder.
- K. Fasten the O₂ sensor lead to the coolant reservoir cover with the plastic band.
- L. Insert the projection on the O₂ sensor coupler into the hole in the coolant reservoir cover.
- M. Route the O₂ sensor lead over the brake fluid reservoir hose.
- N. To wire harness
- O. Position the end of the plastic band to the inside of the coolant reservoir cover.

CABLE ROUTING (for XVS13CA(C))



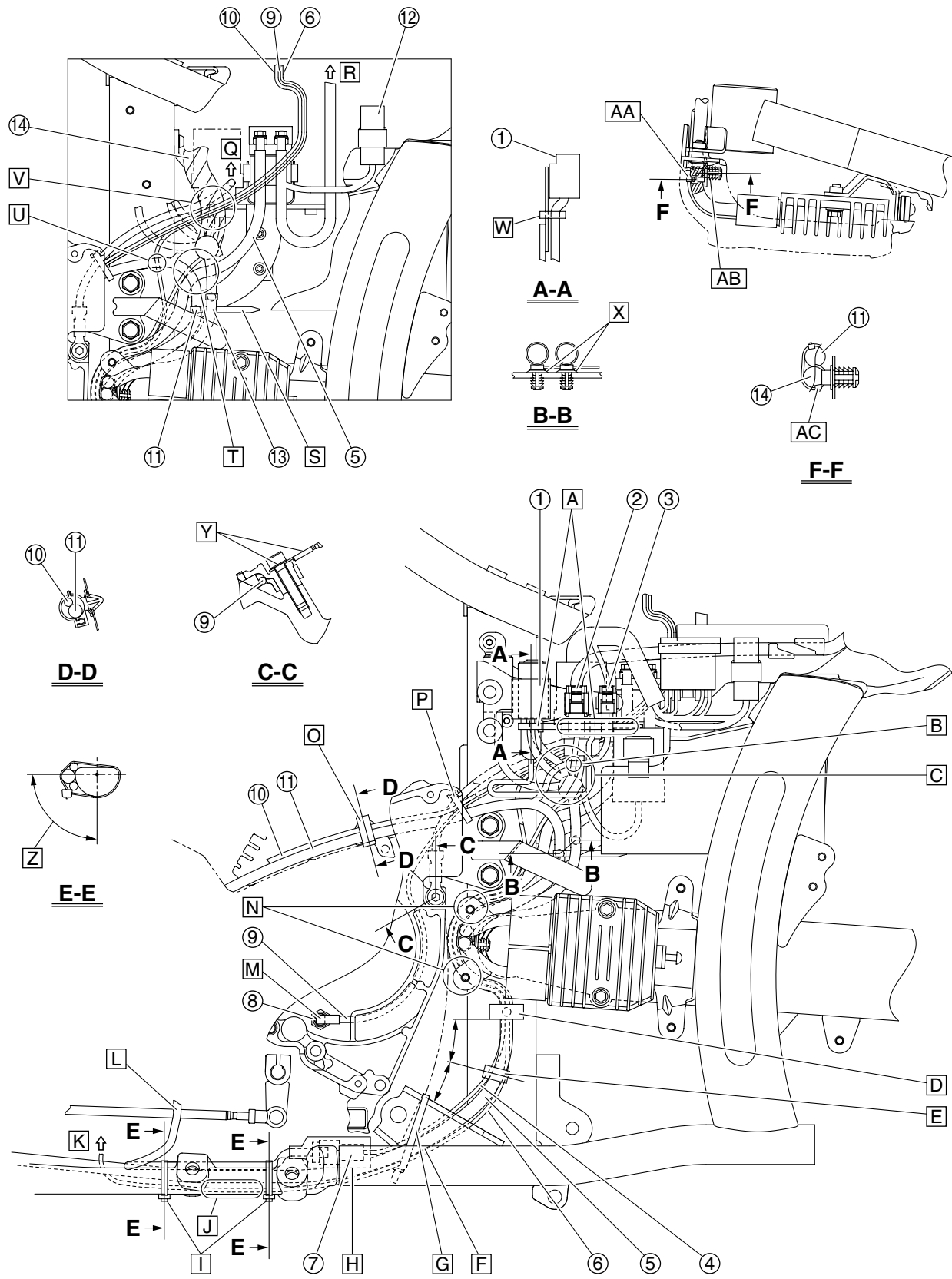
1. Brake fluid reservoir hose
2. Rear brake light switch
3. Horn
4. Horn lead
5. Rear brake light switch lead
6. Rear brake hose
7. Coolant reservoir hose
8. Coolant reservoir breather hose
- A. Install the brake fluid reservoir hose with its paint mark facing upward.
- B. Fasten the rear brake hose with the holder.
- C. Point the ends of the hose clamp upward.
- D. Connect the curved end of the coolant reservoir hose to the coolant reservoir.
- E. Align the ends of the hose clamp on the coolant reservoir cap with the coolant reservoir hose.
- F. Point the ends of the hose clamp outward.
- G. Route the coolant reservoir breather hose through the guide.
- H. Point the ends of the hose clamp downward.
- I. 20°
- J. Route the rear brake hose through the guide.

CABLE ROUTING (for XVS13CA(C))



1. Clutch cable
2. Left handlebar switch lead
3. Meter assembly lead
4. Front cylinder spark plug lead
5. Coolant temperature sensor lead
6. Front cylinder injector lead
7. Fuel pipe
8. ISC (idle speed control) unit lead
9. Rear cylinder injector lead
10. Intake air pressure sensor hose
11. Starter motor lead
12. Front brake hose
- A. Secure the plastic locking tie by inserting the projection on the tie into the hole in the bracket, and then fasten the meter assembly lead, clutch cable, and left handlebar switch lead with the tie. Align the tape on the meter assembly lead and left handlebar switch lead with the plastic locking tie. Cut off the excess end of the plastic locking tie so that the cut end does not protrude past with the edge of the bracket.
- B. Route the left handlebar switch lead and meter assembly lead under the bracket as shown in the illustration.
- C. Insert the projection on each left handlebar switch coupler into the hole in the bracket.
- D. Route the left handlebar switch lead under the fuel tank bracket.
- E. Route the front cylinder spark plug lead to the outside of the left handlebar switch lead.
- F. Route the clutch cable to the inside of the leads.
- G. To right side of vehicle
- H. Route the front cylinder injector lead to the inside of the fuel pipe.
- I. Route the ISC (idle speed control) unit lead to the inside of the coolant temperature sensor lead and fuel pipe, and to the outside of the front cylinder injector lead.
- J. To ISC (idle speed control) unit
- K. Route the rear cylinder injector lead to the outside of the clutch cable, and to the inside of the thermostat cover.
- L. Route the intake air pressure sensor hose to the inside of the clutch cable.
- M. Fasten the starter motor lead at the gray tape to the engine mounting boss with a plastic locking tie. Make sure that the starter motor lead does not contact the engine bracket on the frame. Cut off the excess end of the plastic locking tie.
- N. Face the catch of each holder outward.
- O. Route the front brake hose through the guide.
- P. Fasten the front brake hose with the holder.

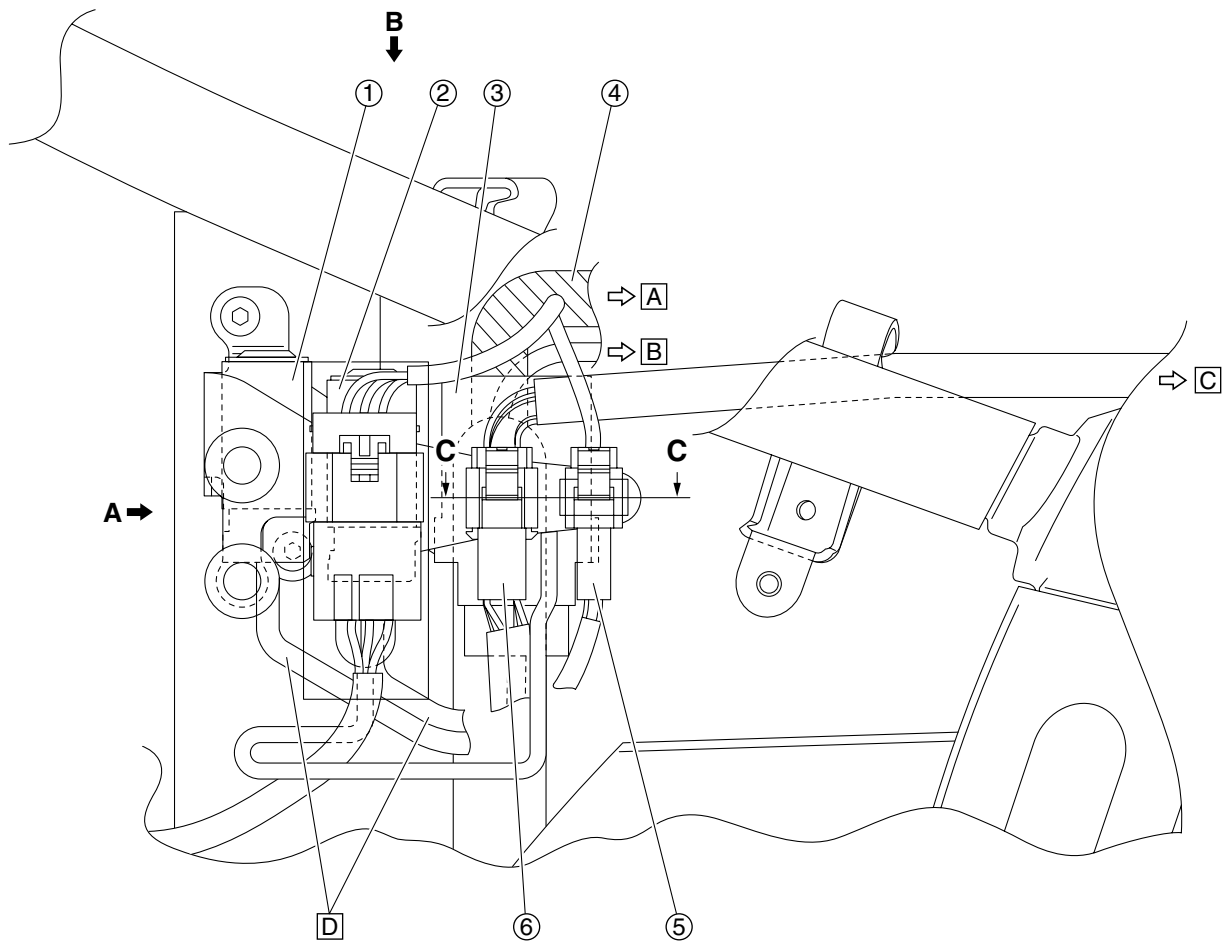
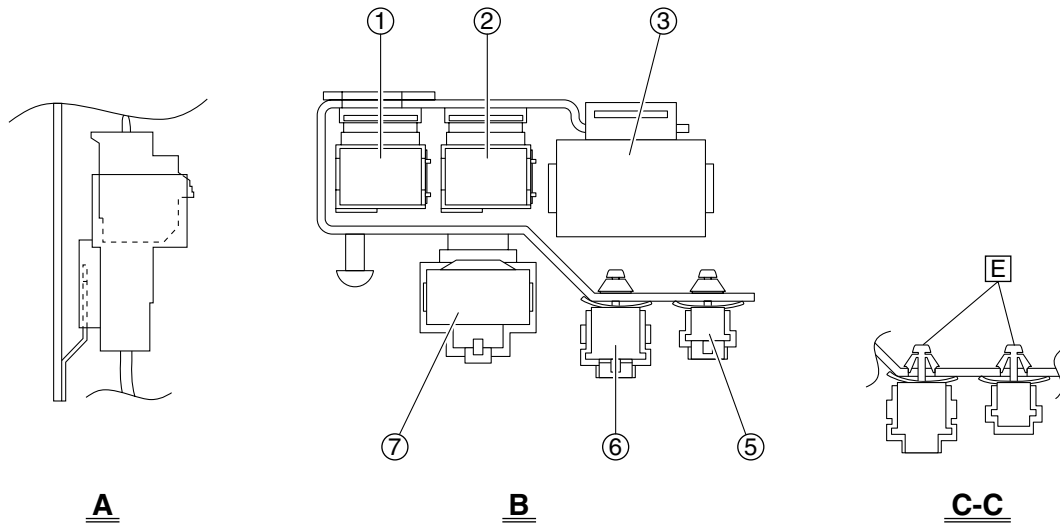
CABLE ROUTING (for XVS13CA(C))



CABLE ROUTING (for XVS13CA(C))

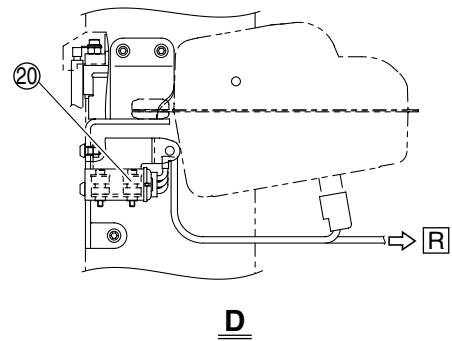
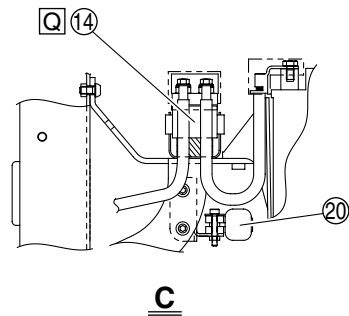
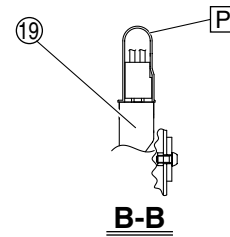
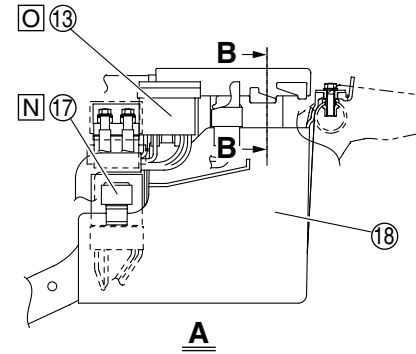
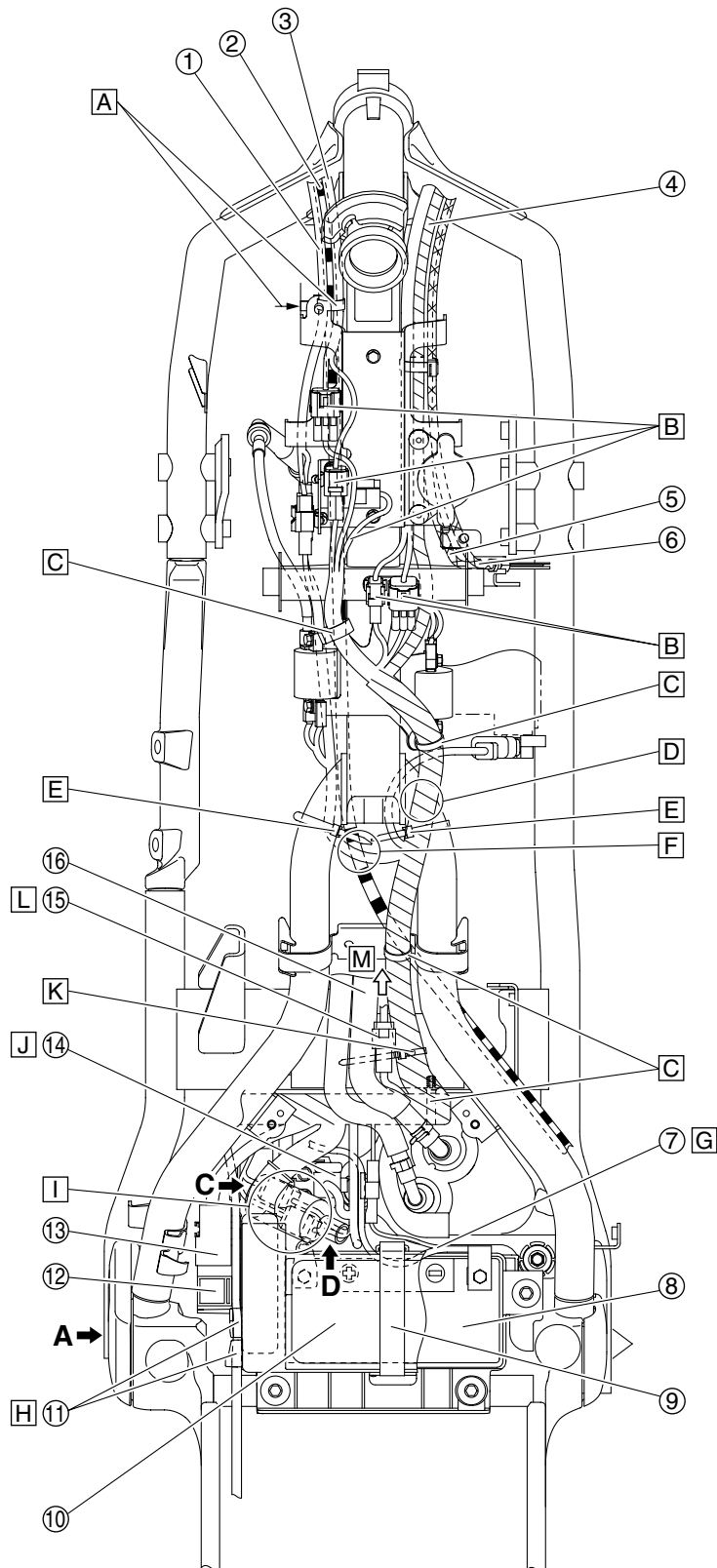
1. Joint coupler
 2. Tail/brake light wire harness coupler
 3. Crankshaft position sensor coupler
 4. Sidestand switch lead
 5. Starter motor lead
 6. Oil level switch lead
 7. Sidestand switch coupler
 8. Neutral switch
 9. Neutral switch lead
 10. Speed sensor lead
 11. Crankshaft position sensor/stator assembly lead
 12. Main fuse
 13. Rectifier/regulator lead
 14. Wire harness
- A. Fasten the joint coupler lead at the white tape to the relay bracket with a plastic locking tie. Position the end of the plastic locking tie to the inside of the tail/brake light wire harness coupler and crankshaft position sensor coupler.
 - B. Route the crankshaft position sensor lead to the inside of the tail/brake light wire harness.
 - C. Route the joint coupler lead, crankshaft position sensor lead, and tail/brake light wire harness through the guide. Be sure to route the leads to the inside of the horizontal portion of the guide and to the outside of the vertical portion of the guide. Route the other leads to the inside of the guide.
 - D. Secure the holder by inserting the projection on the holder into the hole in the frame, and then fasten the sidestand switch lead, starter motor lead, and oil level switch lead with the holder.
 - E. Fasten the sidestand switch lead, starter motor lead, and oil level switch lead with the holder. Position the holder halfway between the engine bracket on the frame and the holder that is secured to the frame.
 - F. Route the sidestand switch lead, starter motor lead, and oil level switch lead to the inside of the engine bracket on the frame.
 - G. Fasten the sidestand switch lead, starter motor lead, and oil level switch lead to the engine bracket on the frame with a plastic locking tie. Point the end of the plastic locking tie downward, and then cut off the excess end of the tie to 10 mm (0.39 in) or less.
 - H. Slide the rubber cover over the sidestand switch coupler, making sure that the coupler is covered completely.
 - I. Fasten the sidestand switch lead, starter motor lead, and oil level switch lead to the frame with plastic locking ties. Point the end of each plastic locking tie downward, and then cut off the excess end of the tie.
 - J. Make sure that the leads do not protrude below the frame.
 - K. To oil level switch
 - L. Route the sidestand switch lead to the outside of the shift rod.
 - M. Install the neutral switch lead terminal so that the lead is routed rearward. Make sure that there is no slack in the neutral switch lead.
 - N. Route the sidestand switch lead, starter motor lead, and oil level switch lead to the front of the swingarm pivot.
 - O. Secure the holder by inserting the projection on the holder into the hole in the bracket, and then fasten the crankshaft position sensor/stator assembly lead and speed sensor lead with the holder.
 - P. Fasten the speed sensor lead, crankshaft position sensor/stator assembly lead, ground lead, and neutral switch lead with a plastic locking tie, making sure to position the tie 10 mm (0.39 in) or less to the front or rear of the front edge of the frame. Point the end of the plastic locking tie upward, and then cut off the excess end of the tie down to the buckle, making sure that there are no sharp edges.
 - Q. To negative battery terminal
 - R. To positive battery terminal
 - S. Position the end of the plastic locking tie to the inside of the rectifier/regulator lead.
 - T. Route the starter motor lead to the inside of the crankshaft position sensor/stator assembly lead and rectifier/regulator lead.
 - U. Route the oil level switch lead to the inside of the crankshaft position sensor/stator assembly lead.
 - V. Route the speed sensor lead, neutral switch lead, and oil level switch lead over the wire harness. Route the negative battery lead between the wire harness and the bracket.
 - W. Fasten the joint coupler lead with a plastic locking tie, making sure that the tie does not contact the guide on the relay bracket.
 - X. Secure each holder by inserting the projection on the holder into the hole in the sub-fuel tank stay.
 - Y. Install the ground lead terminal with the drive pulley housing bolt, making sure that the crimped section of the terminal that secures the ground lead is facing inward as shown in the illustration.
 - Z. Position the buckle of the plastic locking tie within the range shown in the illustration.
 - AA. Fasten the crankshaft position sensor/stator assembly lead and rectifier/regulator lead with a plastic locking tie. Align the white tape on the crankshaft position sensor/stator assembly lead with the plastic locking tie. Position the plastic locking tie next to the holder. Face the buckle of the plastic locking tie upward, and then cut off the excess end of the tie.
 - AB. Secure the holder by inserting the projection on the holder into the hole in the swingarm.
 - AC. Wire harness holder

CABLE ROUTING (for XVS13CA(C))



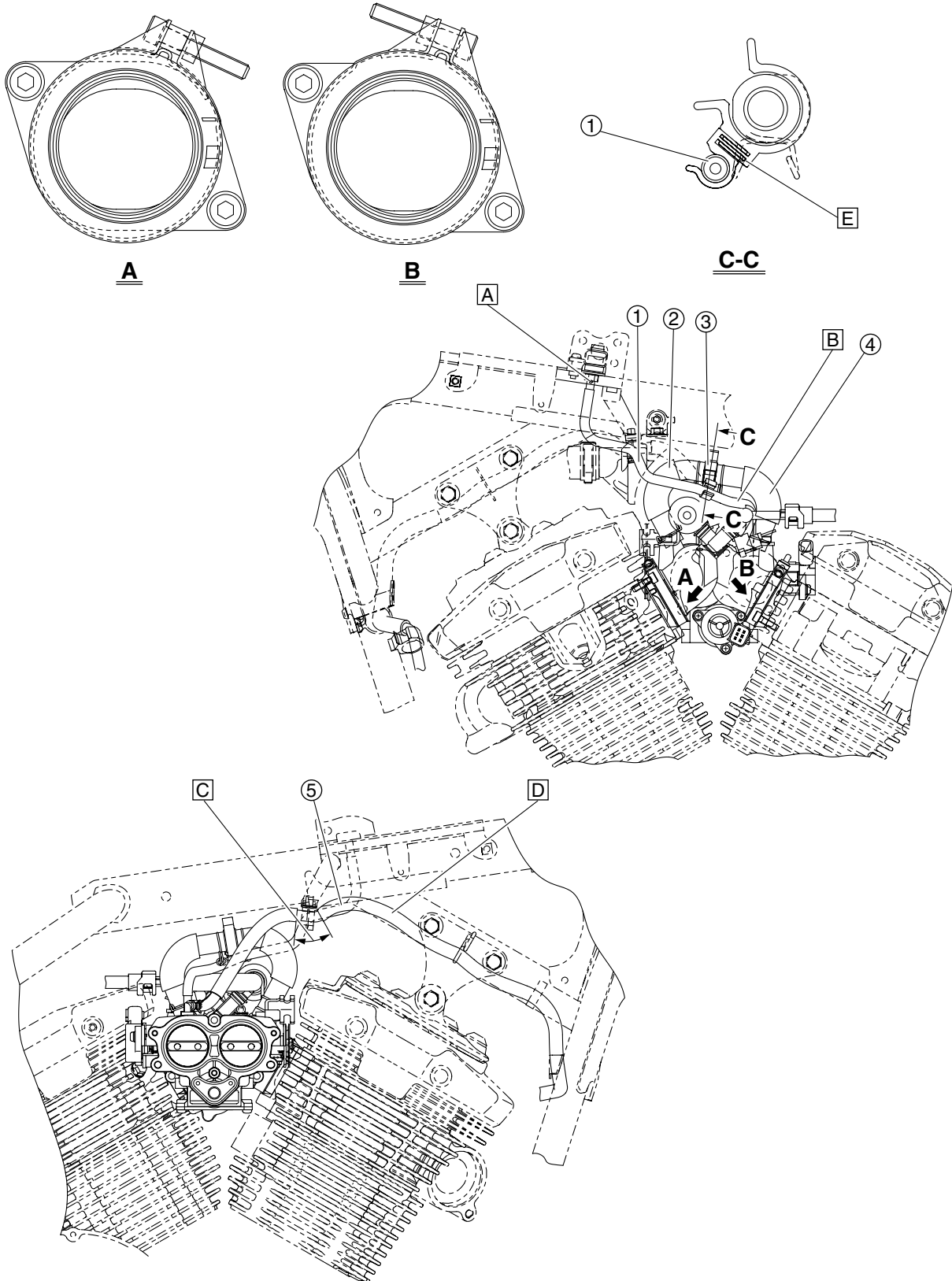
1. Headlight relay
2. Radiator fan motor relay
3. Turn signal relay
4. Wire harness
5. Crankshaft position sensor coupler
6. Tail/brake light coupler
7. Joint coupler
- A. To fuse box and main fuse
- B. To starter relay
- C. To tail/brake light assembly
- D. Connect the lead with white tape to the headlight relay and connect the lead without white tape to the radiator fan motor relay.
- E. Insert the projections on the crankshaft position sensor coupler and tail/brake light coupler into the holes in the bracket.

CABLE ROUTING (for XVS13CA(C))

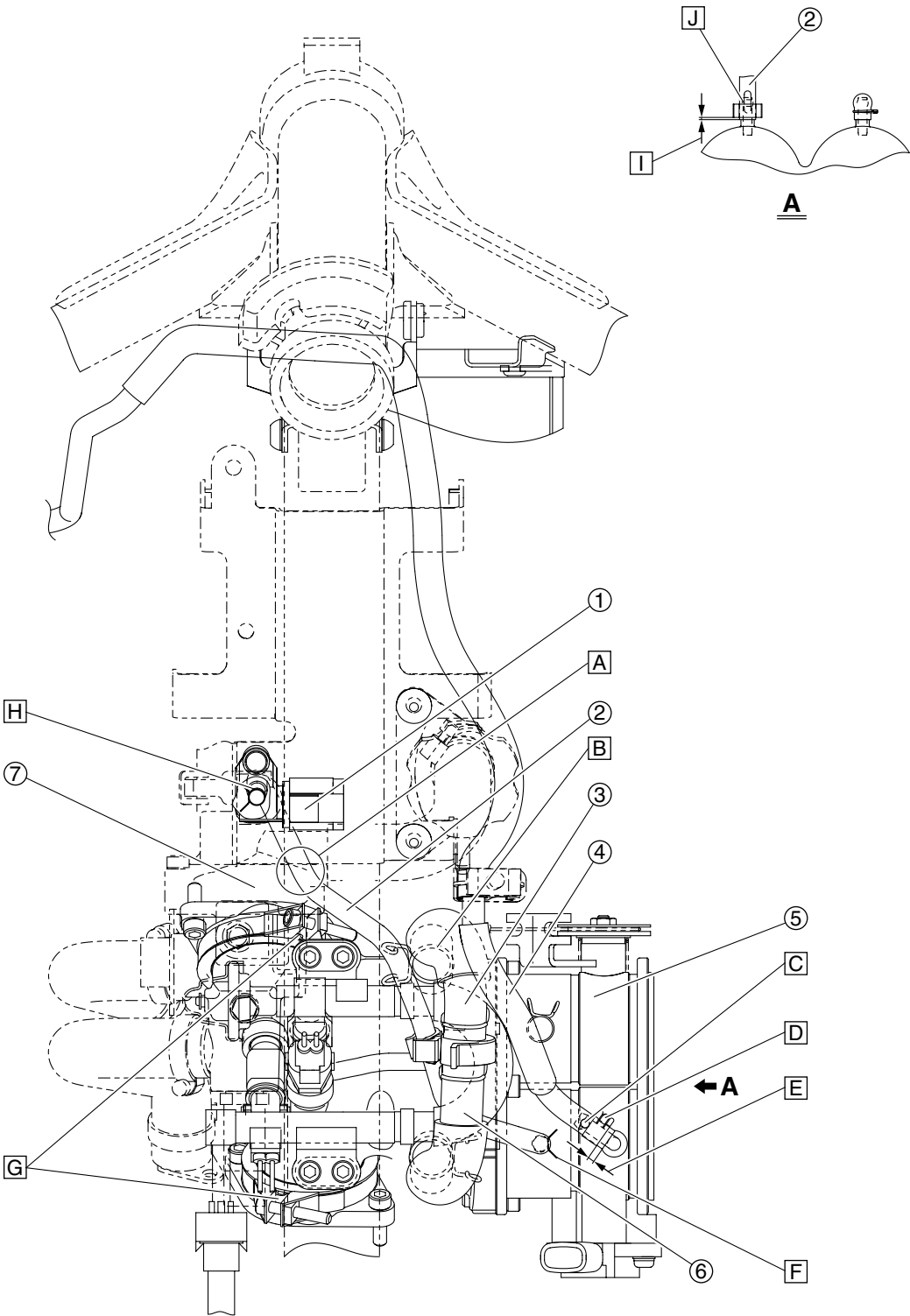


-
- | | |
|-------------------------------|-----------------------------|
| 1. Left handlebar switch lead | R. To O ₂ sensor |
|-------------------------------|-----------------------------|
2. Clutch cable
 3. Meter assembly lead
 4. Wire harness
 5. Throttle cable (accelerator cable)
 6. Throttle cable (decelerator cable)
 7. Negative battery lead
 8. Battery
 9. Battery cover band
 10. Tool kit tray
 11. Tail/brake light wire harness
 12. Main fuse
 13. Fuse box
 14. Starter relay
 15. Fuel sender coupler
 16. Air vent hose
 17. Relay unit
 18. Battery box
 19. ECU (engine control unit)
 20. Lean angle sensor
- A. Secure the plastic locking tie by inserting the projection on the tie into the hole in the bracket, and then fasten the meter assembly lead, clutch cable, and left handlebar switch lead with the tie. Align the tape on the meter assembly lead and left handlebar switch lead with the plastic locking tie. Cut off the excess end of the plastic locking tie so that the cut end does not protrude past the edge of the bracket.
 - B. Insert the projection on each coupler into the hole in the bracket.
 - C. Insert the projection on the wire harness holder into the hole in the bracket.
 - D. Route the wire harness over the frame.
 - E. Fasten the wire harness to the frame with a plastic locking tie at the location shown in the illustration. Face the buckle of the plastic locking tie upward with the end pointing inward.
 - F. Route the clutch cable under the wire harness.
 - G. Route the negative battery lead between the battery and the tool kit tray, and then fasten the tray and lead with the battery cover band.
 - H. Route the tail/brake light wire harness through the guides on the tool kit tray.
 - I. Slide the rubber cover over the neutral switch coupler, speed sensor coupler, and oil level switch coupler, making sure that the couplers are covered completely.
 - J. Securely install the starter relay cover.
 - K. Secure the plastic locking tie by inserting the projection on the tie into the hole in the frame. Face the buckle of the plastic locking tie upward with the end pointing inward.
 - L. Position the fuel sender coupler between the wire harness and the air vent hose.
 - M. To fuel sender
 - N. Install the relay unit completely onto the tab on the battery box.
 - O. Install the fuse box completely onto the tab on the battery box.
 - P. Install the cover completely onto the ECU (engine control unit) coupler.
 - Q. Install the starter relay completely onto the tab on the tool kit tray.

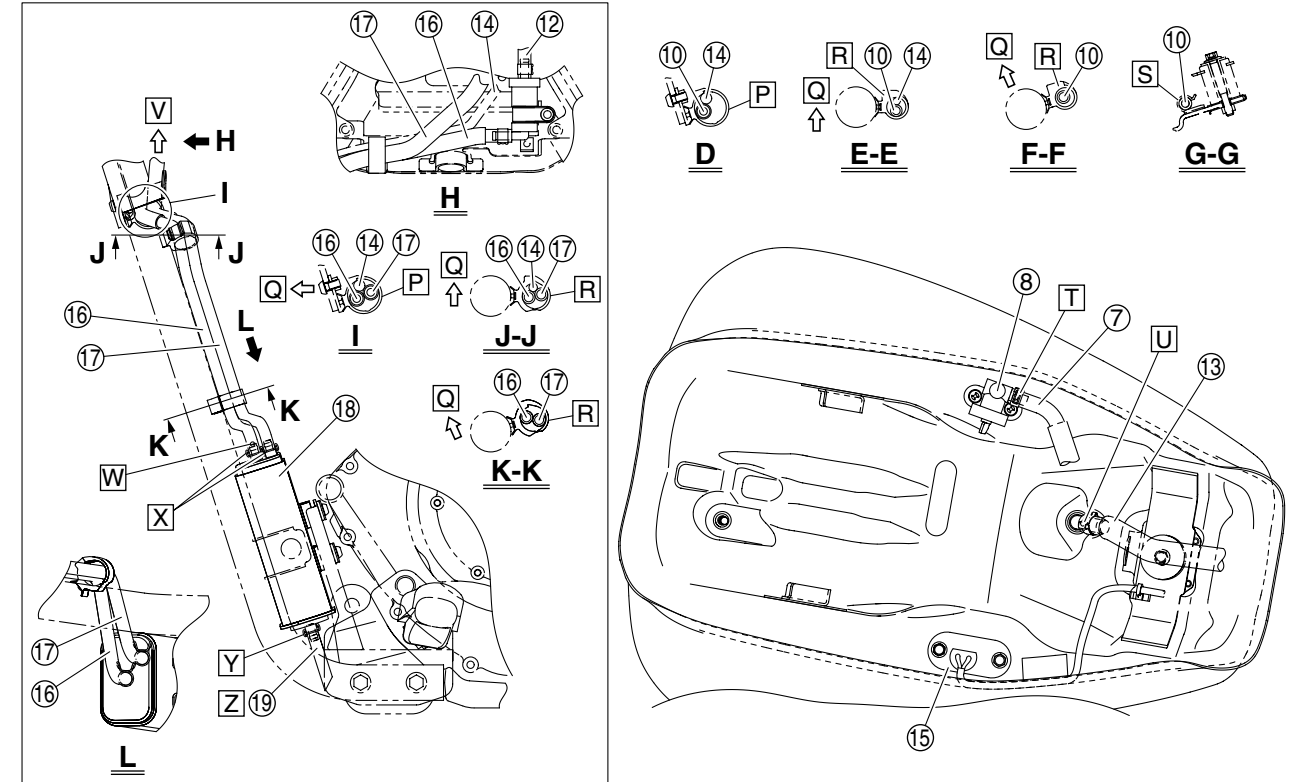
CABLE ROUTING (for XVS13CA(C))



1. Intake air pressure sensor hose
 2. Front cylinder resonator hose
 3. Resonator hose joint
 4. Rear cylinder resonator hose
 5. Canister purge hose (California only)
- A. Install the intake air pressure sensor hose with its green paint mark facing to the left.
 - B. Fasten the intake air pressure sensor hose to the resonator hose joint with the holder. Be sure to route the intake air pressure sensor hose to the left of the front cylinder resonator hose and to the right of the rear cylinder resonator hose.
 - C. Fasten the canister purge hose with the holder at the location shown in the illustration. Fasten the hose only, not the hose protector. (California only)
 - D. Route the canister purge hose to the right of the frame. (California only)
 - E. Position the intake air pressure sensor hose below and to the left of the resonator hose joint.



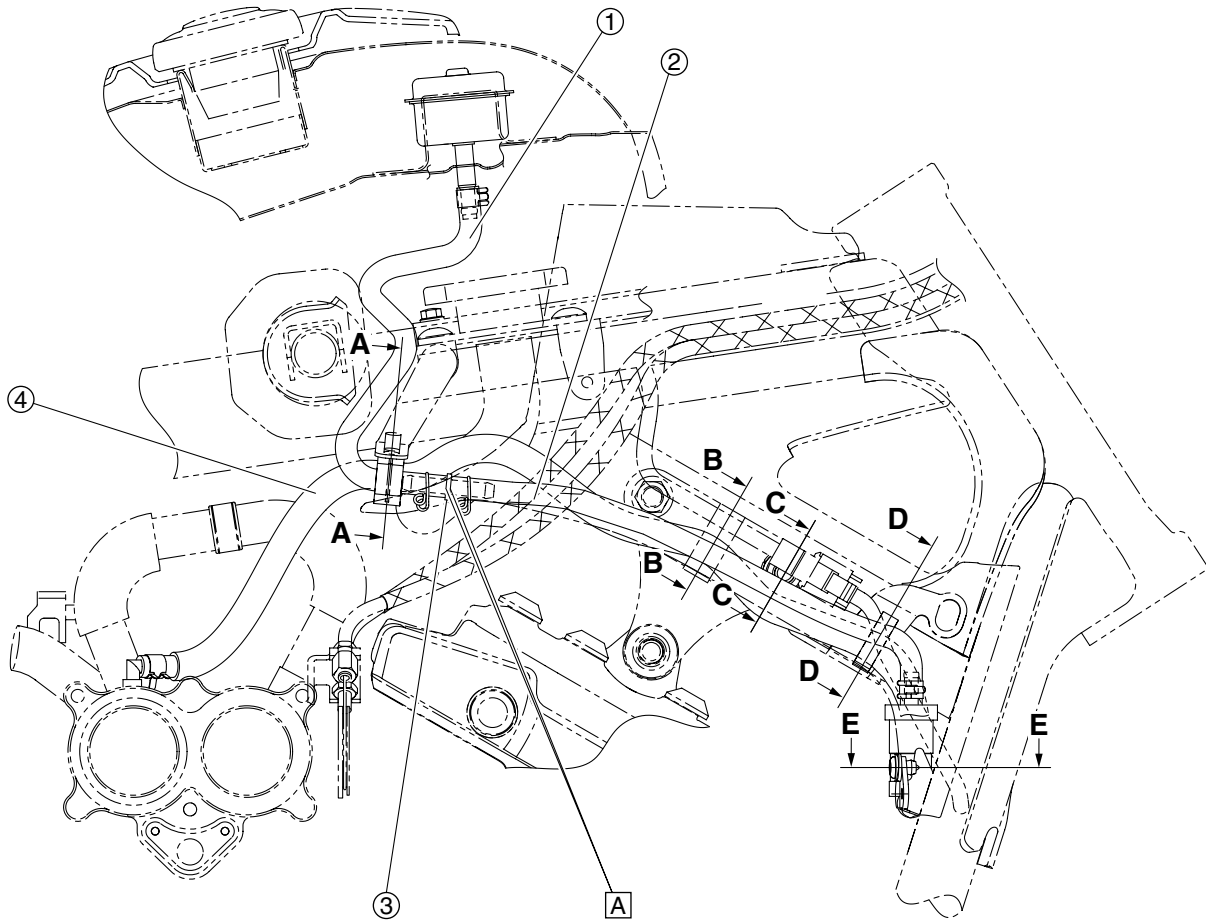
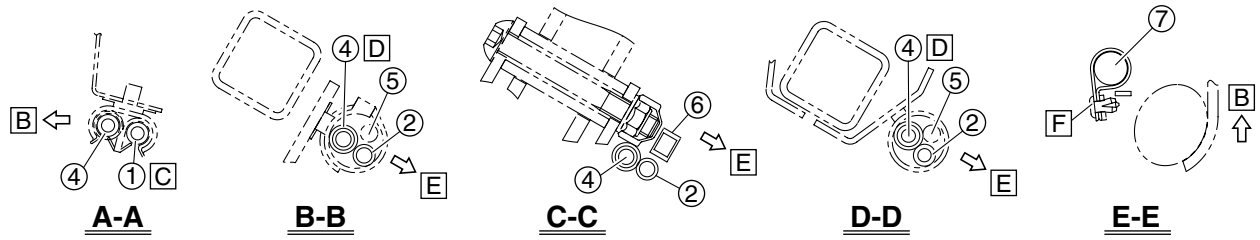
1. Intake air pressure sensor
2. Intake air pressure sensor hose
3. Front cylinder resonator hose
4. Canister purge hose (California only)
5. Throttle body
6. Rear cylinder resonator hose
7. Thermostat cover
- A. Route the intake air pressure sensor hose between the frame and the thermostat cover.
- B. Point the ends of the hose clamp inward.
- C. Install the canister purge hose with its green paint mark facing upward. (California only)
- D. Point the ends of the hose clamp forward. Position the hose clamp over the green paint mark on the canister purge hose. (California only)
- E. 2–4 mm (0.08–0.16 in) (California only)
- F. Point the ends of the hose clamp outward.
- G. Align the projections on the intake manifold joints with the slots in the intake manifold joint clamps.
- H. Point the ends of the hose clamp outward.
- I. 0–1 mm (0–0.04 in)
- J. Install the intake air pressure sensor hose onto the hose fitting of the throttle body with its green paint mark facing to the right. Make sure that the hose contacts the throttle body.



CABLE ROUTING (for XVS13CA(C))

1. Fuel tank breather hose (fuel tank to hose joint)
2. Fuel tank cap
3. Fuel tank
4. Fuel hose
5. Sub-fuel tank
6. Fuel pump
7. Fuel cock hose
8. Fuel cock
9. Hose joint
10. Fuel tank breather hose (except for California)
11. Rollover valve
12. Fuel tank breather hose (hose joint to rollover valve)
13. Air vent hose
14. Radiator fan motor lead
15. Fuel sender
16. Fuel tank breather hose (rollover valve to canister) (California only)
17. Canister purge hose (California only)
18. Canister (California only)
19. Canister breather hose (California only)
- A. Install the fuel tank breather hose (fuel tank to hose joint) onto the hose fitting of the fuel tank with its white paint mark facing forward. Make sure that the hose contacts the fuel tank.
- B. 9 mm (0.35 in)
- C. Point the ends of the hose clamp downward.
- D. Install the air vent hose with its paint mark facing upward.
- E. Point the ends of the hose clamp upward. Position the hose clamp over the paint mark on the air vent hose.
- F. 15 mm (0.59 in) or more
- G. Install the fuel cock hose with its yellow paint mark facing upward.
- H. Face the crimped section of the hose clamp upward. Position the hose clamp over the marking on the fuel cock hose.
- I. Make sure not to install the hose clamps on the raised portions of the hose fittings.
- J. Point the open ends of the holder downward.
- K. 15 mm (0.59 in)
- L. Point the ends of the hose clamp outward.
- M. 3 mm (0.12 in)
- N. Install the fuel tank breather hose onto the hose fitting of the rollover valve, making sure that the hose contacts the valve.
- O. Point the ends of the hose clamp downward.
- P. Face the catch of the holder upward.
- Q. Forward
- R. Face the catch of the holder outward.
- S. Fasten the fuel tank breather hose at the white paint mark with the holder. (Except for California)
- T. Position the hose clamp over the paint mark on the fuel cock hose.
- U. Position the hose clamp over the paint mark on the air vent hose.
- V. To throttle body
- W. Install the fuel tank breather hose (rollover valve to canister) with its white paint mark facing outward. (California only)
- X. Point the ends of each hose clamp inward. (California only)
- Y. Point the ends of the hose clamp inward. (California only)
- Z. Install the canister breather hose so that the end of the hose is positioned as shown in the illustration. (California only)

CABLE ROUTING (for XVS13CA(C))



1. Fuel tank breather hose (fuel tank to hose joint)
2. Fuel tank breather hose (hose joint to rollover valve)
3. Hose joint
4. Canister purge hose (California only)
5. Radiator fan motor lead
6. Radiator fan motor coupler
7. Rollover valve
- A. Install the fuel tank breather hose (fuel tank to hose joint) and fuel tank breather hose (hose joint to rollover valve) onto the hose joint. Make sure that the breather hoses contact the flange on the hose joint.
- B. Inward
- C. Install the fuel tank breather hose (fuel tank to hose joint) onto the hose joint, and then fasten the hose with the holder.
- D. Route the canister purge hose to the inside of the fuel tank breather hose (hose joint to rollover valve). (California only)
- E. Outward
- F. Securely install the rollover valve holder to the stay on the frame with the quick fastener.

PERIODIC CHECKS AND ADJUSTMENTS

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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.

EAU17600

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

TIP

- From 24000 mi (37000 km) or 36 months, repeat the maintenance intervals starting from 8000 mi (13000 km) or 12 months.
- Items marked with an asterisk require special tools, data and technical skills, have a Yamaha dealer perform the service.

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.				√		√	

EAU32185

GENERAL MAINTENANCE AND LUBRICATION CHART

TIP

- From 24000 mi (37000 km) or 36 months, repeat the maintenance intervals starting from 8000 mi (13000 km) or 12 months.
- Items marked with an asterisk require special tools, data and technical skills, have a Yamaha dealer perform the service.

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
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. • 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.	Every 4 years					
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. • Moderately repack with lithium-soap-based grease.			√		Repack.	
10	* Drive belt	• Check belt condition. • Replace if damaged. • 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 every 16000 mi (25000 km) or 24 months.	√	√	√	√	Repack.	√
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.		√	√	√	√	√

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	
21	*	Rear suspension link pivots	• Apply lithium-soap-based grease lightly.						✓	
22		Engine oil	• Change (warm engine before draining).	✓	✓	✓	✓	✓	✓	✓
23	*	Engine oil filter cartridge	• Replace.	✓		✓			✓	
24	*	Cooling system	• Check hoses for cracks or damage. • Replace if necessary.		✓	✓	✓		✓	✓
			• Change with ethylene glycol anti-freeze coolant every 24 months.					Change.		
25	*	Front and rear brake switches	• Check operation.	✓	✓	✓	✓	✓	✓	✓
26	*	Control cables	• Apply Yamaha chain and cable lube or engine oil thoroughly.	✓	✓	✓	✓	✓	✓	✓
27	*	Throttle grip	• Check operation. • Check throttle cable free play, and adjust if necessary. • Lubricate cable and grip housing.		✓	✓	✓		✓	✓
28	*	Lights, signals and switches	• Check operation. • Adjust headlight beam.	✓	✓	✓	✓		✓	✓

EAU17650

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.

EAS20470

ENGINE

EAS20530

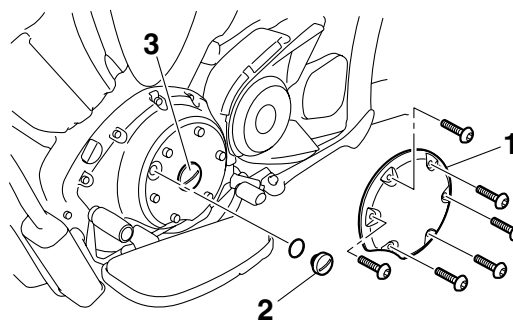
ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

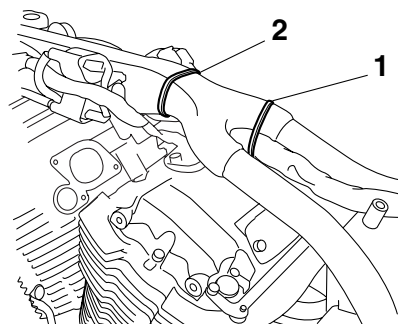
TIP

- 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.

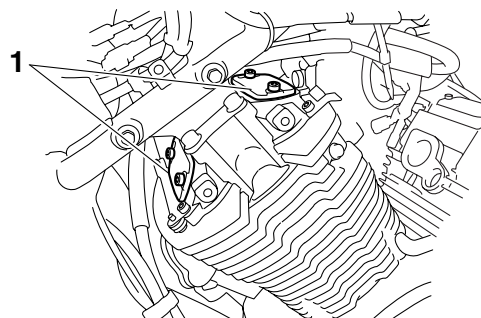
1. Remove:
 - Rider seat (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
 - Left side cover (for XVS13AA(C)/XVS13CTA(C))
Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Front cylinder left cover
 - Front cylinder right cover
 - Rear cylinder left cover
 - Rear cylinder right cover
Refer to "ENGINE REMOVAL" on page 5-1.
2. Remove:
 - Throttle body
 - Intake manifold assembly
Refer to "THROTTLE BODIES" on page 7-9.
3. Drain:
 - Coolant
Refer to "CHANGING THE COOLANT" on page 3-18.
4. Remove:
 - Front cylinder thermostat inlet hose
 - Rear cylinder thermostat inlet hose
Refer to "THERMOSTAT" on page 6-4.
5. Disconnect:
 - Spark plug caps
Refer to "ENGINE REMOVAL" on page 5-1.
6. Remove:
 - Spark plugs
Refer to "CAMSHAFTS" on page 5-17.
7. Remove:
 - Damper cover "1"
 - Timing mark accessing screw "2"
 - Crankshaft end screw "3"



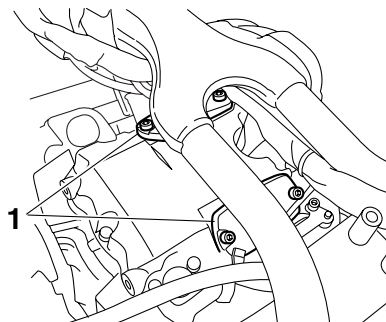
8. Remove: (for XVS13AA(C)/XVS13CTA(C))
 - Plastic locking tie "1"
 - Plastic locking tie "2"



9. Remove:
 - Front cylinder tappet covers "1"



10. Remove:
 - Rear cylinder tappet covers "1"



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



Valve clearance (cold)

Intake

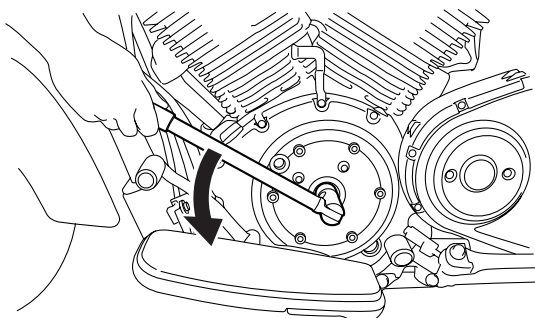
0.09–0.13 mm (0.0035–0.0051 in)

Exhaust

0.14–0.18 mm (0.0055–0.0071 in)

Front cylinder

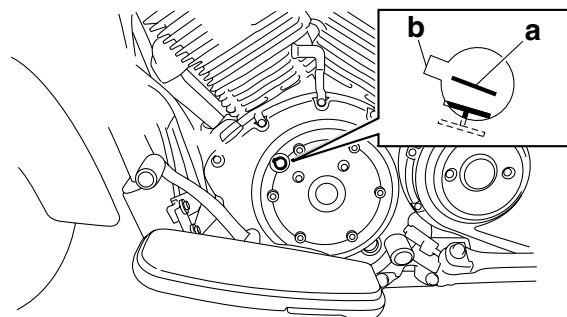
- Turn the crankshaft counterclockwise.



- 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

- 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

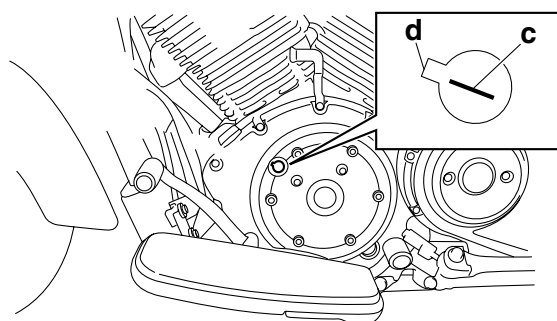
YU-26900-9

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

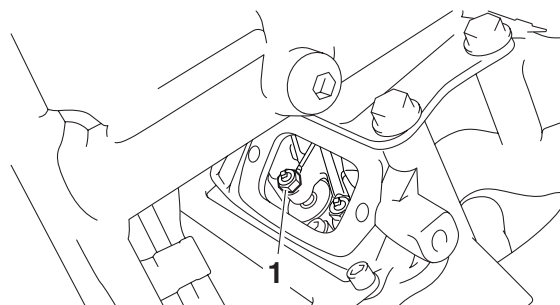
Feeler gauge set

YU-26900-9

12.Adjust:

- Valve clearance

- Loosen the locknut “1”.



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



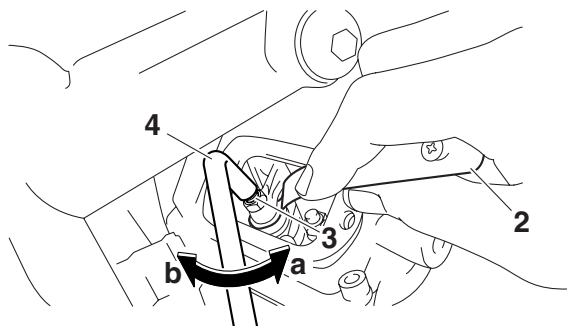
Thickness gauge
90890-03180
Feeler gauge set
YU-26900-9

- c. Turn the adjusting screw “3” in direction “a” or “b” with the tappet adjusting tool “4” until the specified valve clearance is obtained.



Tappet adjusting tool
90890-04154
Six piece tappet set
YM-A5970

Direction “a”
Valve clearance is increased.
Direction “b”
Valve clearance is decreased.



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



Locknut (rocker arm adjusting screw)
14 Nm (1.4 m·kg, 10 ft·lb)

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

13. Install:

- Rear cylinder tappet covers
- Front cylinder tappet covers



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

14. Install: (for XVS13AA(C)/XVS13CTA(C))
- Plastic locking ties

15. Install:

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



Damper cover bolt
4 Nm (0.4 m·kg, 2.9 ft·lb)

16. Install:

- All removed parts

TIP

For installation, reverse the removal procedure.

EAS20570

SYNCHRONIZING THE THROTTLE BODIES

TIP

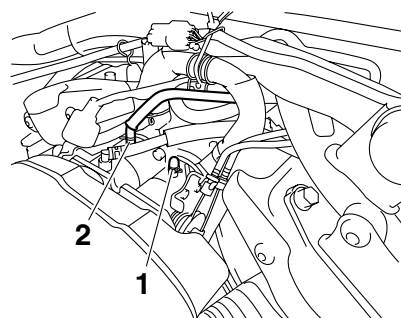
Prior to synchronizing the throttle bodies, the valve clearance and the engine idling speed should be properly adjusted and the ignition timing should be checked.

1. Stand the vehicle on a level surface.

TIP

Place the vehicle on a suitable stand.

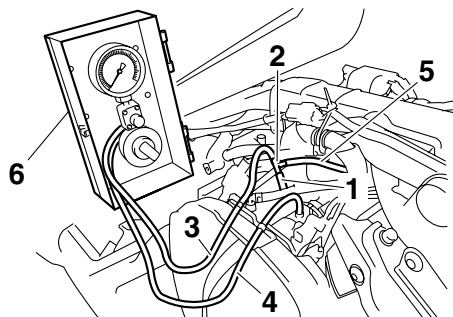
2. Remove: (for XVS13AA(C)/XVS13CTA(C))
- Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
3. Remove:
- Cap “1”
4. Disconnect:
- Intake air pressure sensor hose “2”



5. Install:

- Hose “1” (Parts No.: 5JW-24311-00)
- 3-way joint “2” (Parts No.: 90413-05014)
- Vacuum gauge hose #1 “3”
- Vacuum gauge hose #2 “4”
- Intake air pressure sensor hose “5”
- Vacuum gauge “6”

- Digital tachometer



6. Install: (for XVS13AA(C)/XVS13CTA(C))

- Fuel tank

Refer to "FUEL TANK" on page 7-1.

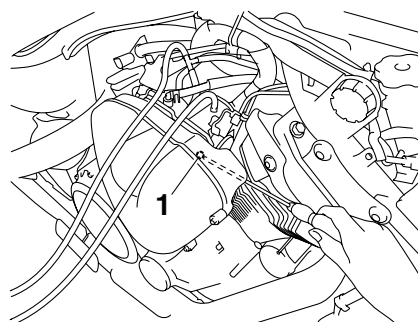
7. Adjust:

- Throttle body synchronization

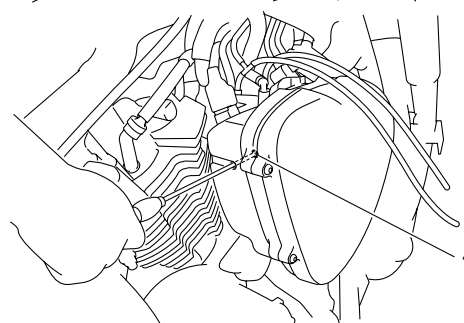


- Measure the vacuum pressure of the front cylinder throttle body and rear cylinder throttle body.
- Using the throttle body with the lowest vacuum pressure as the standard, turn the air screw "1" of the other throttle body to adjust its vacuum pressure.
- If the vacuum pressure of the throttle body with the lower pressure is out of specification, adjust it to specification first, and then synchronize the throttle bodies.

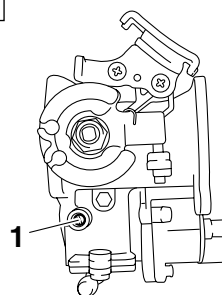
A



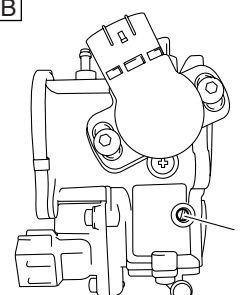
B



A



B



A. Front cylinder throttle body

B. Rear cylinder throttle body

TIP

- After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.
- If the air screw was removed, turn the screw in fully, and then turn it out 1 1/4 turns. Then, synchronize the throttle bodies.

ECA14900

NOTICE

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



Vacuum gauge
90890-03094
Vacuummate
YU-44456



Intake vacuum
32.0–37.3 kPa (240–280 mmHg,
9.4–11.0 inHg)

TIP

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



8. Measure:

- Engine idling speed
Out of specification → Adjust.
Make sure that the vacuum pressure is within specification.

9. Stop the engine and remove the measuring equipment.

10. Connect:

- Intake air pressure sensor hose

11. Install:

- Cap

12. Adjust:

- Throttle cable free play
Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-8.



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

13. Install: (for XVS13AA(C)/XVS13CTA(C))

- Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS20630

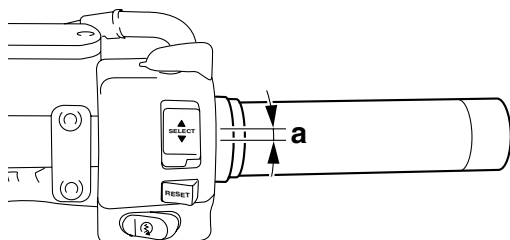
ADJUSTING THE THROTTLE CABLE FREE PLAY

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)

- Remove: (for XVS13AA(C)/XVS13CTA(C))
 - Rider seat
Refer to “GENERAL CHASSIS” on page 4-1.
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
- 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.

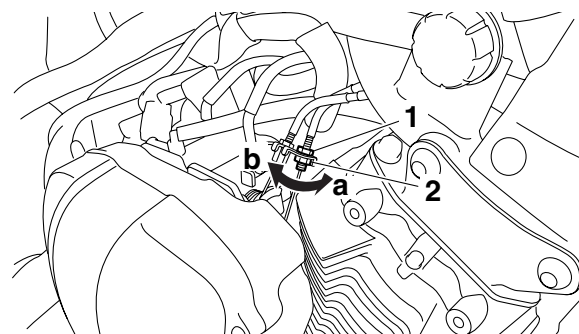
Direction “a”

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

- Slide back the throttle cable holder “1”.
- Loosen the locknut “2”.
- Turn the adjusting nut “3” in direction “a” or “b” until the specified throttle cable free play is obtained.

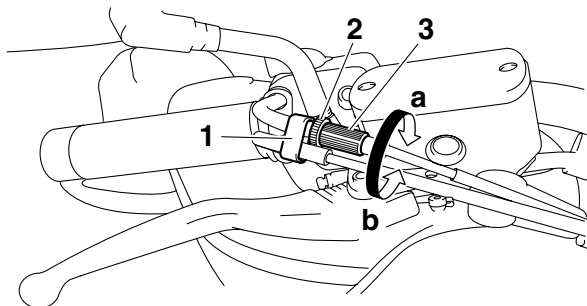
Direction “a”

Throttle cable free play is increased.

Direction “b”

Throttle cable free play is decreased.

- d. Tighten the locknut.
- e. Slide the throttle cable holder to its original position.



4. Install: (for XVS13AA(C)/XVS13CTA(C))
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
 - 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:
 - Front cylinder left cover
 - Rear cylinder right 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.



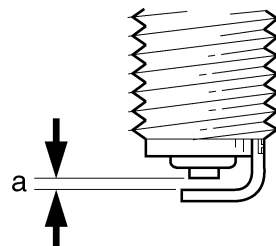
Manufacturer/model
NGK/LMAR7A-9

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·kg, 9.4 ft·lb)

TIP

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

9. Connect:
 - Spark plug cap
10. Install:
 - Rear cylinder right cover
 - Front cylinder left cover
Refer to “ENGINE REMOVAL” on page 5-1.

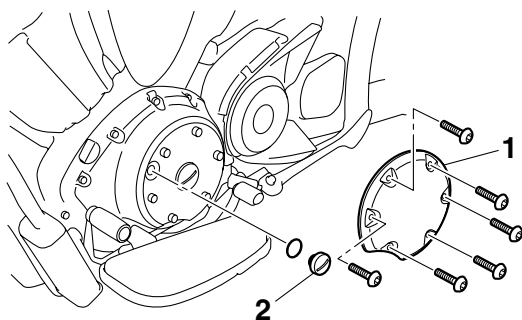
EAS20700

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.

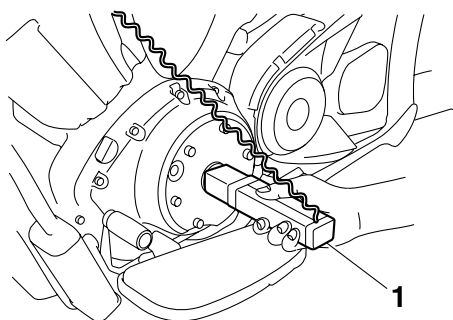
1. Remove:
 - Front cylinder covers
Refer to “ENGINE REMOVAL” on page 5-1.
2. Remove:
 - Damper cover “1”
 - Timing mark accessing screw “2”
(along with the O-ring)



3. Connect:
- Timing light "1"
 - Digital tachometer



Timing light
90890-03141
YU-03141



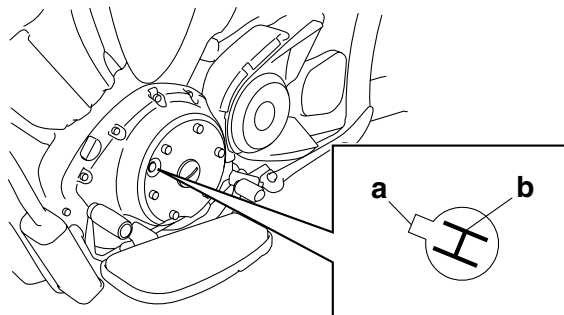
4. Check:
- Ignition timing

- 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

- b. 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.



5. Install:
- Timing mark accessing screw
(along with the O-ring **New**)
 - Damper cover



Damper cover bolt
4 Nm (0.4 m·kg, 2.9 ft·lb)

6. Install:
- Front cylinder covers
Refer to "ENGINE REMOVAL" on page 5-1.

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.

- Measure:
 - Valve clearance
Out of specification → Adjust.
Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-4.
- Start the engine, warm it up for several minutes, and then turn it off.
- Remove:
 - Front cylinder covers
 - Rear cylinder covers
Refer to "ENGINE REMOVAL" on page 5-1.
- Disconnect:
 - Spark plug caps
- Remove:
 - Spark plug

ECA13340

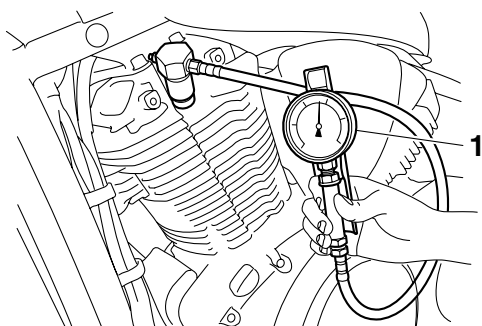
NOTICE

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"



Compression gauge
90890-03081
Engine compression tester
YU-33223



7. Measure:

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

	Standard compression pressure (at sea level) 1450 kPa/400 r/min (14.5 kgf/cm²/400 r/min, 206.2 psi/400 r/min) Minimum–maximum 1200–1500 kPa (12.0–15.0 kgf/cm², 170.7–213.3 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 kg/cm², 14 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 → Repair.
Same as without oil	Piston, valves, cylinder head gasket or piston possibly defective → Repair.



8. Install:

- Spark plug

	Spark plug 13 Nm (1.3 m·kg, 9.4 ft·lb)
--	---

9. Connect:

- Spark plug caps

10. Install:

- Rear cylinder covers
- Front cylinder covers

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

EAS20750

CHECKING THE ENGINE OIL LEVEL

- Stand the vehicle on a level surface.

TIP

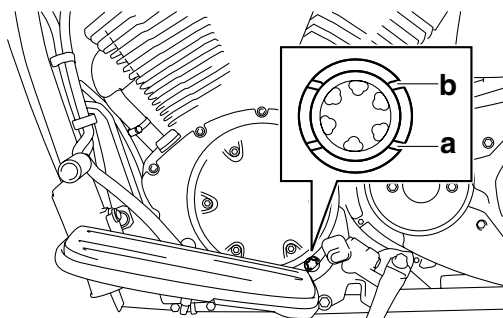
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.

2. 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.



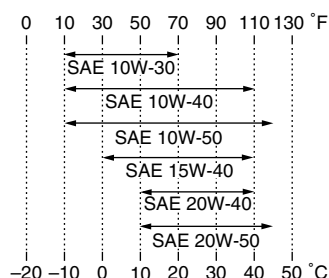


**Recommended brand
YAMALUBE**

Type

**SAE 10W-30, 10W-40, 10W-50,
15W-40, 20W-40 or 20W-50**

**Recommended engine oil grade
API service SG type or higher,
JASO standard MA**



ECA13380

NOTICE

- Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives.
- Do not allow foreign materials to enter the crankcase.

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

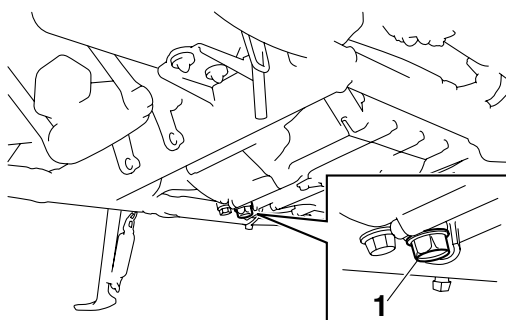
TIP

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:
 - Engine oil drain bolt "1" (along with the gasket)

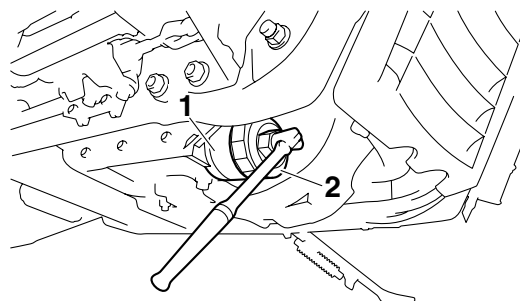


4. Drain:
 - Engine oil (completely from the crankcase)
5. If the oil filter cartridge is also to be replaced, perform the following procedure.

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



**Oil filter wrench
90890-01426
YU-38411**

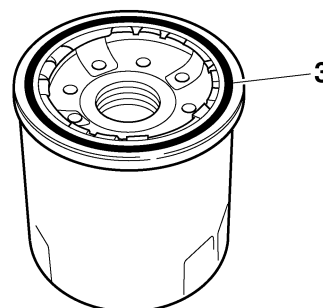


- b. Lubricate the O-ring "3" of the new oil filter cartridge with a thin coat of engine oil.

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·kg, 12 ft·lb)**

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



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

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



Engine oil quantity

Total amount

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

Without oil filter cartridge replacement

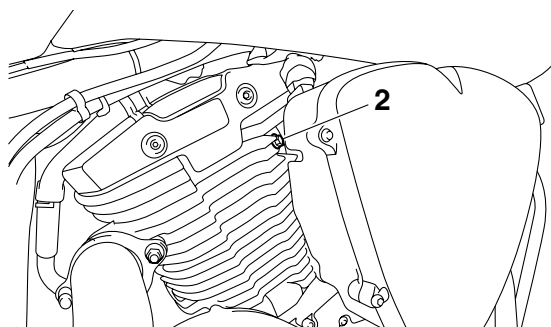
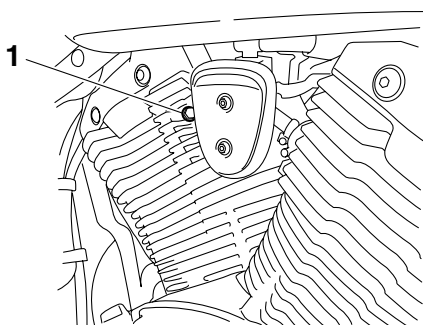
3.20 L (3.38 US qt, 2.82 Imp.qt)

With oil filter cartridge replacement

3.40 L (3.59 US qt, 2.99 Imp.qt)

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

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



- b. 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.

- c. Check the engine oil passages, the oil filter cartridge and the oil pump for damage or leakage. Refer to "OIL PUMP" on page 5-80.
- d. Start the engine after solving the problem(s) and check the engine oil pressure again.
- e. Remove the throttle body. Refer to "THROTTLE BODIES" on page 7-9.
- f. Tighten the oil check bolts to specification.



Oil check bolt

15 Nm (1.5 m·kg, 11 ft·lb)

- g. Install the throttle body. Refer to "THROTTLE BODIES" on page 7-9.

EAS20870

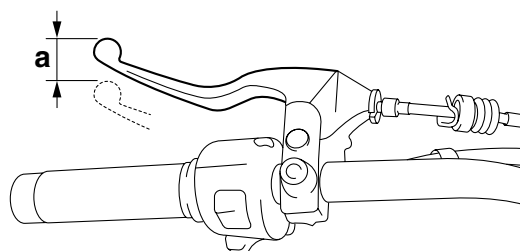
ADJUSTING THE CLUTCH LEVER FREE PLAY

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

Clutch lever free play adjusting bolt

- a. Slide back the rubber cover. (For XVS13AA(C)/XVS13CTA(C))
- b. Loosen the locknut "1".
- c. Turn the adjusting bolt "2" in direction "a" or "b" until the specified clutch lever free play is obtained.

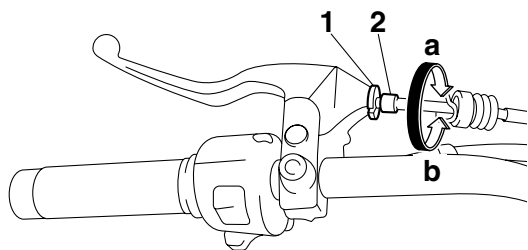
Direction "a"

Clutch lever free play is increased.

Direction "b"

Clutch lever free play is decreased.

- d. Tighten the locknut "1".



TIP

If the specified clutch lever free play cannot be obtained using the clutch lever free play adjusting bolt, use the clutch lever free play adjusting nut.

e. Slide the rubber cover to its original position.



Clutch lever free play adjusting nut

- Slide back the rubber covers. (For XVS13CA(C))
- Loosen the locknut "1".
- Turn the adjusting nut "2" in direction "a" or "b" until the specified clutch lever free play is obtained.

Direction "a"

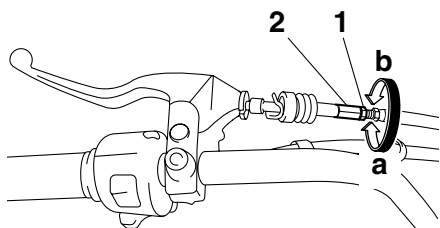
Clutch lever free play is increased.

Direction "b"

Clutch lever free play is decreased.

d. Tighten the locknut.

e. Slide the rubber covers to their original positions. (For XVS13CA(C))

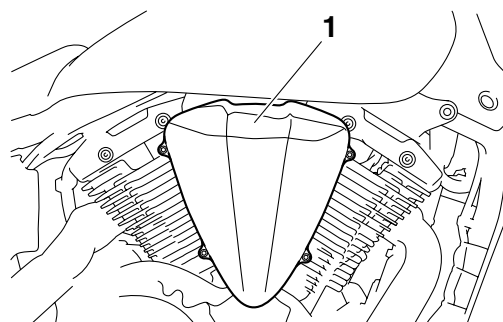


EAS20960

REPLACING THE AIR FILTER ELEMENT

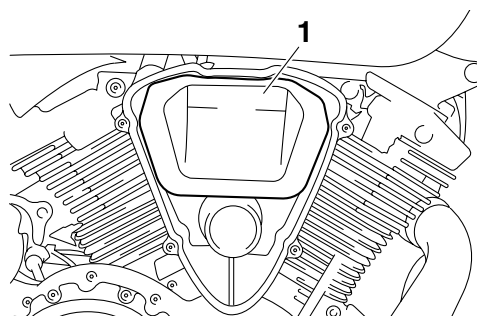
1. Remove:

- 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

ECA3D81015

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.

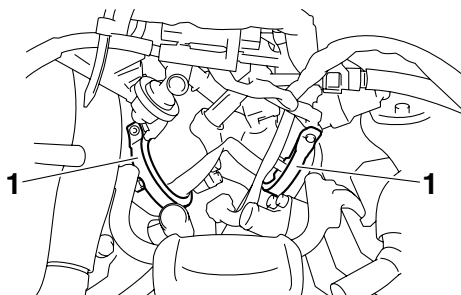
EAS3D81008

CHECKING THE INTAKE MANIFOLD JOINTS

1. Remove:

- Fuel tank
- Refer to "FUEL TANK" on page 7-1.
- Front cylinder thermostat inlet hose

- Rear cylinder thermostat inlet hose
Refer to “THERMOSTAT” on page 6-4.
2. Check:
- Intake manifold joints “1”
Cracks/damage → Replace.



3. Install:
- Rear cylinder thermostat inlet hose
 - Front cylinder thermostat inlet hose
Refer to “THERMOSTAT” on page 6-4.
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.

EAS21030

CHECKING THE FUEL LINE

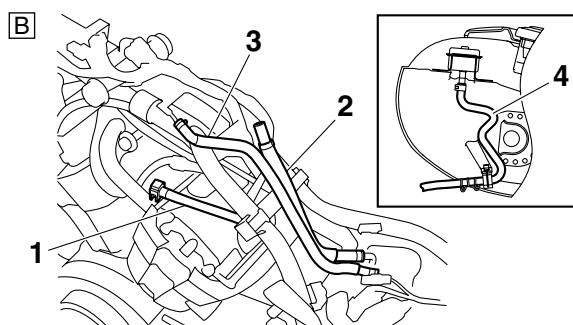
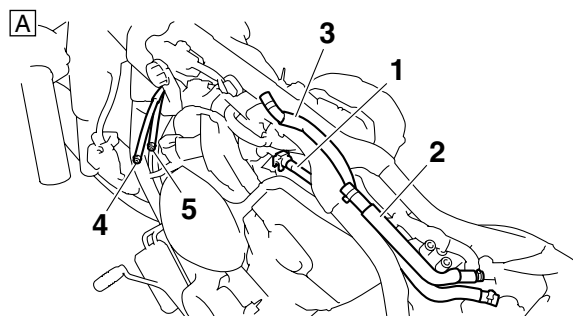
The following procedure applies to all of the fuel, air vent and breather hoses.

1. Remove:
- Rider seat (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
Refer to “GENERAL CHASSIS” on page 4-1.
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
2. Check:
- Fuel hose “1”
 - Air vent hose “2”
 - Fuel cock hose “3”
 - Fuel tank breather hose “4”
 - Fuel tank overflow hose “5” (for XVS13AA(C)/XVS13CTA(C))
Cracks/damage → Replace.
Loose connection → Connect properly.

ECA3D81009

NOTICE

Make sure the fuel tank breather hose and fuel tank overflow hose are routed correctly.



A. For XVS13AA(C)/XVS13CTA(C)

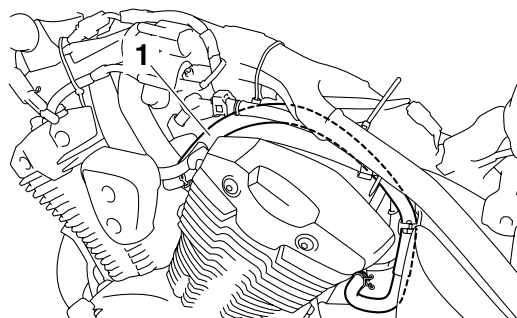
B. For XVS13CA(C)

3. Install:
- Fuel tank
Refer to “FUEL TANK” on page 7-1.
 - Rider seat (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
Refer to “GENERAL CHASSIS” on page 4-1.

EAS21070

CHECKING THE CRANKCASE BREATHER HOSE

1. Remove:
- Rider seat (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
 - Air filter case
Refer to “GENERAL CHASSIS” on page 4-1.
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
2. Check:
- Crankcase breather hose “1”
Cracks/damage → Replace.
Loose connection → Connect properly.



ECA13450

NOTICE

Make sure the crankcase breather hose is routed correctly.

3. Install:

- Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Air filter case
- Rider seat (for XVS13AA(C)/XVS13CTA(C))
- Seat (for XVS13CA(C))
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:

- Front cylinder exhaust pipe "1"
- Rear cylinder exhaust pipe "2"
- Muffler "3"
- Cracks/damage → Replace.
- Gaskets "4"
- Gaskets "5"

Exhaust gas leaks → Replace.

2. Check:

Tightening torques

- Exhaust pipe nuts "6"
- Front cylinder exhaust pipe and rear cylinder exhaust pipe bolt "7"
- Muffler and rear cylinder exhaust pipe bolt "8"
- Muffler bracket and frame bolts "9"
- Muffler bracket and muffler bolts "10"



Exhaust pipe nut

20 Nm (2.0 m·kg, 14 ft·lb)

Front cylinder exhaust pipe and rear cylinder exhaust pipe bolt

12 Nm (1.2 m·kg, 8.7 ft·lb)

Muffler and rear cylinder exhaust pipe bolt

12 Nm (1.2 m·kg, 8.7 ft·lb)

Muffler bracket and frame bolt

53 Nm (5.3 m·kg, 38 ft·lb)

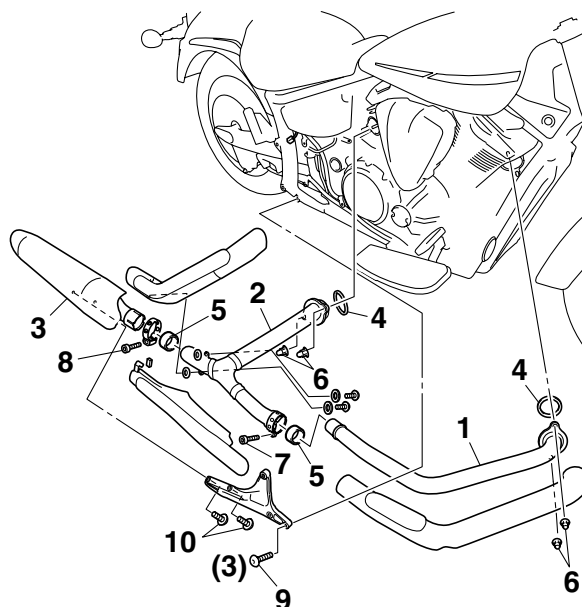
Muffler bracket and muffler bolt (for XVS13AA(C)/XVS13CTA(C))

35 Nm (3.5 m·kg, 25 ft·lb)

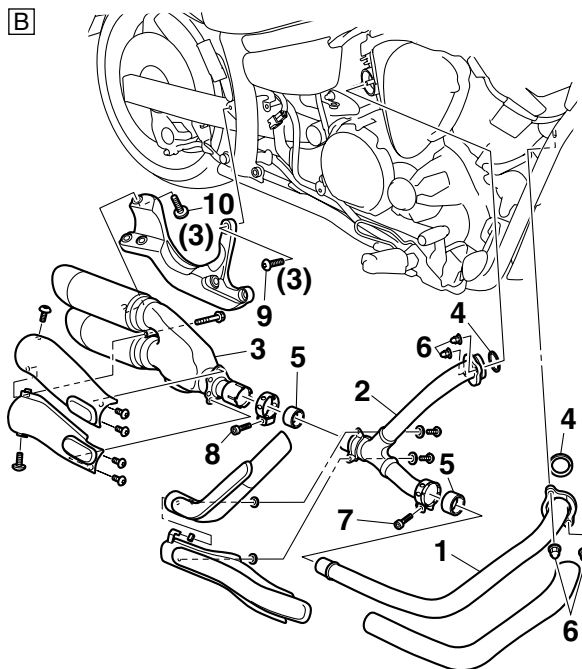
Muffler bracket and muffler bolt (for XVS13CA(C))

29 Nm (2.9 m·kg, 21 ft·lb)

A



B



A. For XVS13AA(C)/XVS13CTA(C)

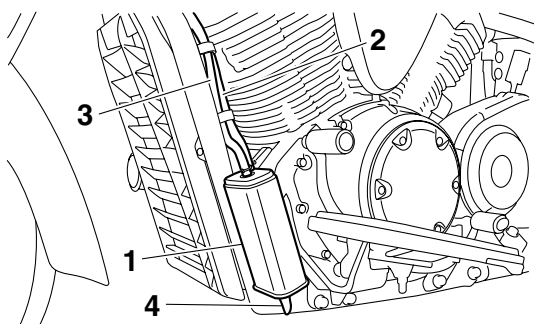
B. For XVS13CA(C)

EAS21090

CHECKING THE CANISTER (California only)

1. Check:

- Canister "1"
- Canister purge hose "2"
- Fuel tank breather hose (rollover valve to canister) "3"
- Canister breather hose "4"
- Cracks/damage → Replace.



EAS21110

CHECKING THE COOLANT LEVEL

1. Stand the vehicle on a level surface.

TIP

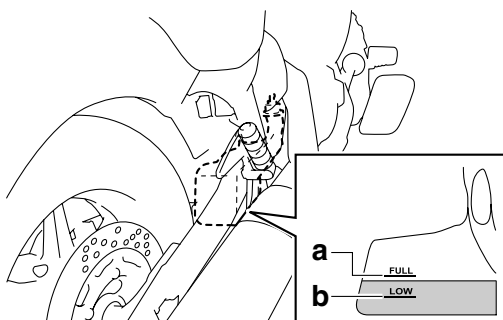
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.

2. Check:

- Coolant level

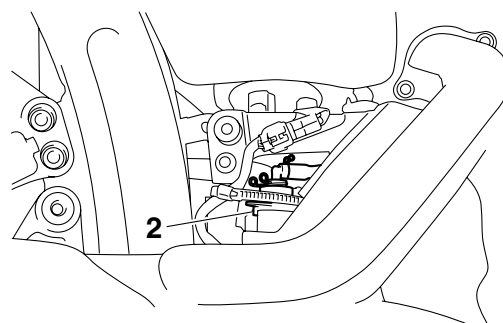
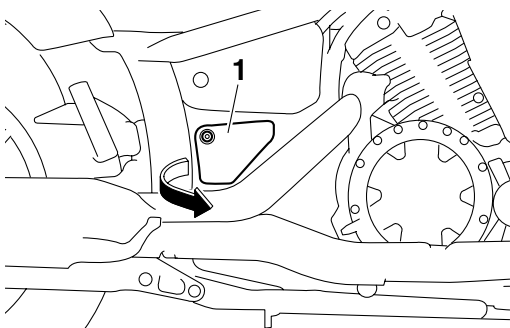
The coolant level should be between the maximum level mark "a" and minimum level mark "b".

Below the minimum level mark → Add the recommended coolant to the proper level.



TIP

To add coolant, remove the coolant reservoir cap cover "1" and coolant reservoir cap "2".



ECA13470

NOTICE

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

3. Install:

- Coolant reservoir cap
- Coolant reservoir cap cover

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

5. Check:

- Coolant level

TIP

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

EAS21120

CHECKING THE COOLING SYSTEM

1. Remove:

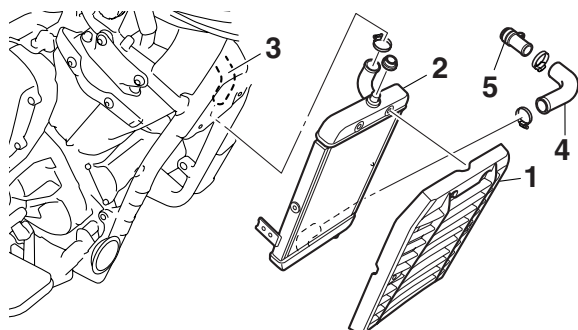
- Front cylinder exhaust pipe
Refer to "ENGINE REMOVAL" on page 5-1.

2. Check:

- Radiator cover "1"
- Radiator "2"
- Radiator inlet hose "3"
- Radiator outlet hose "4"
- Radiator outlet pipe "5"

Cracks/damage → Replace.

Refer to "RADIATOR" on page 6-1.

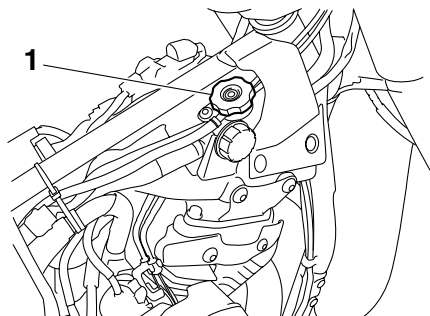


3. Install:
- Front cylinder exhaust pipe
Refer to “ENGINE REMOVAL” on page 5-1.

EAS21130

CHANGING THE COOLANT

1. Remove:
- Fuel tank
Refer to “FUEL TANK” on page 7-1.
 - Muffler
 - Coolant reservoir cover
Refer to “ENGINE REMOVAL” on page 5-1.
2. Remove:
- Radiator cap “1”



EWA13030

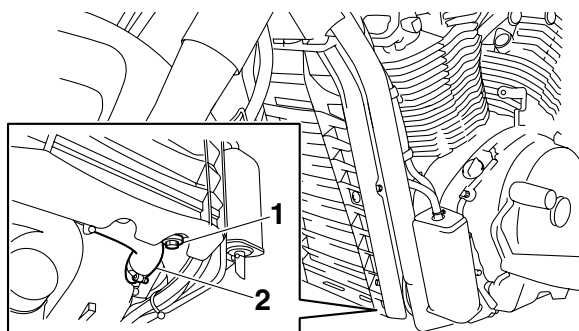
WARNING

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

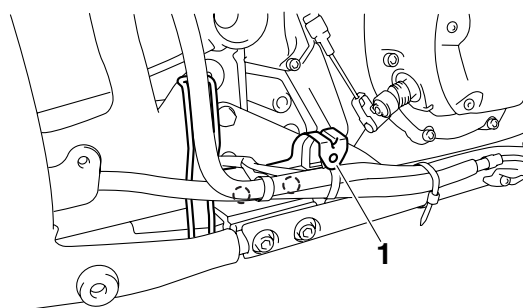
Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, press down on the radiator cap and turn it counterclockwise to remove.

3. Remove:
- Coolant drain bolt (radiator) “1”
(along with the copper washer)

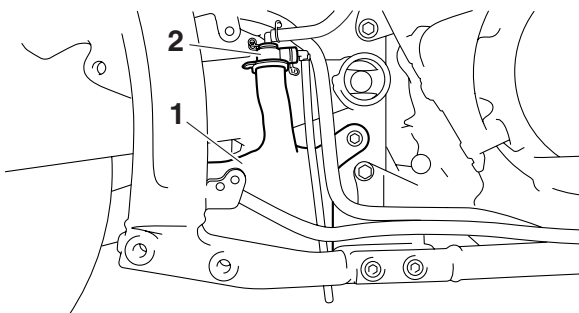
4. Disconnect:
- Radiator outlet hose “2”



5. Drain:
- Coolant
(from the engine and radiator)
6. Remove:
- Coolant reservoir cover bracket “1”



7. Remove:
- Coolant reservoir “1”
 - Coolant reservoir cap “2”



8. Drain:
- Coolant
(from the coolant reservoir)
9. Install:
- Coolant reservoir



Coolant reservoir bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)

10. Install:
- Coolant reservoir cover bracket



Coolant reservoir cover bracket bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)

11. Connect:

- Radiator outlet hose

12. Install:

- Coolant drain bolt (radiator)
(along with the copper washer **New**)



Coolant drain bolt (radiator)
2 Nm (0.2 m·kg, 1.4 ft·lb)

13. Fill:

- Cooling system
(with the specified amount of the recommended coolant)



Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze:water)
Radiator capacity (including all routes)
2.10 L (2.22 US qt, 1.85 Imp. qt)
Coolant reservoir capacity (up to the maximum level mark)
0.45 L (0.48 US qt, 0.40 Imp. qt)

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

EWA13040

WARNING

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

ECA13480

NOTICE

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

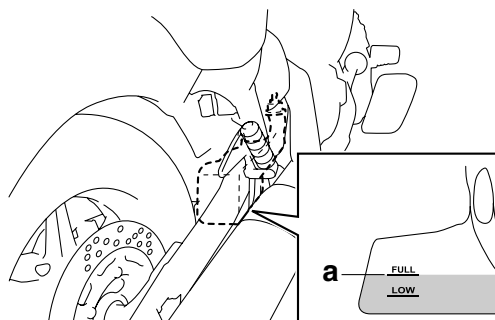
- If coolant comes into contact with painted surfaces, immediately wash them with water.
- Do not mix different types of antifreeze.

14. Install:

- Radiator cap

15. Fill:

- Coolant reservoir
(with the recommended coolant to the maximum level mark "a")



16. Install:

- Coolant reservoir cap

17. Start the engine, warm it up for several minutes, and then stop it.

18. Check:

- Coolant level
Refer to "CHECKING THE COOLANT LEVEL" on page 3-17.

TIP

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

19. Install:

- Coolant reservoir cover
- Muffler
Refer to "ENGINE REMOVAL" on page 5-1.
- Fuel tank
Refer to "FUEL TANK" on page 7-1.

EWA3D81007

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 front 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

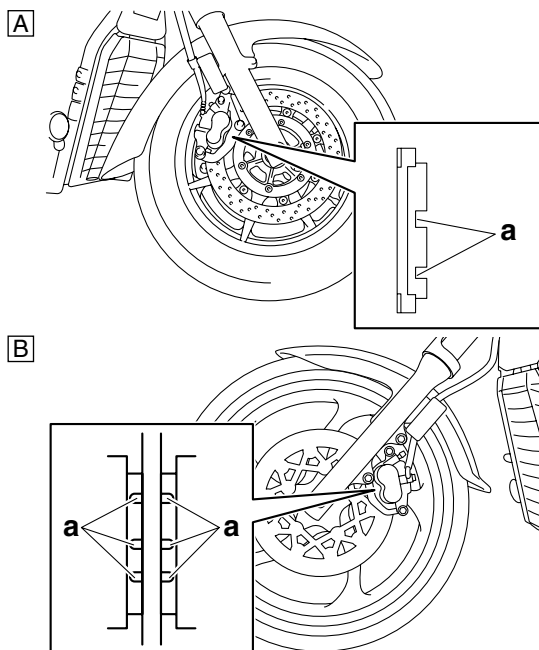
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

EAS21250

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
 - Front brake pad
Wear indicator grooves “a” almost disappeared → Replace the brake pads as a set.
Refer to “FRONT BRAKE” on page 4-30.



A. For XVS13AA(C)/XVS13CTA(C)

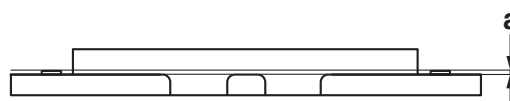
B. For XVS13CA(C)

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 4-42.



EAS27D1027

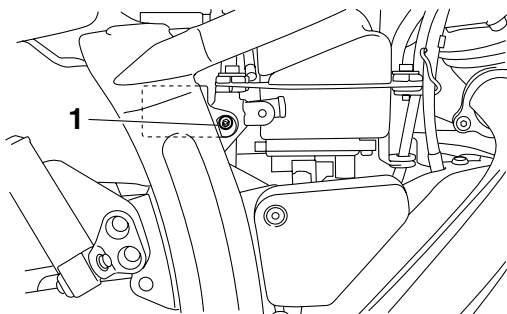
CHECKING THE FRONT BRAKE HOSE(S)

The following procedure applies to all of the brake hose(s) and brake hose clamps.

1. Check:
 - Brake hose(s) “1”
Cracks/damage/wear → Replace.

• brake operation is faulty.

1. Remove:
 - Rider seat (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
 - Sub-fuel tank cover
 Refer to “GENERAL CHASSIS” on page 4-1.
2. Remove:
 - Brake fluid reservoir bolt “1”



TIP

- Remove the brake fluid reservoir bolt, and then remove the brake fluid reservoir cap screws.
- 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.

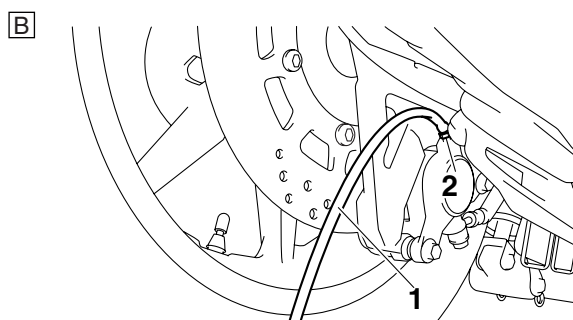
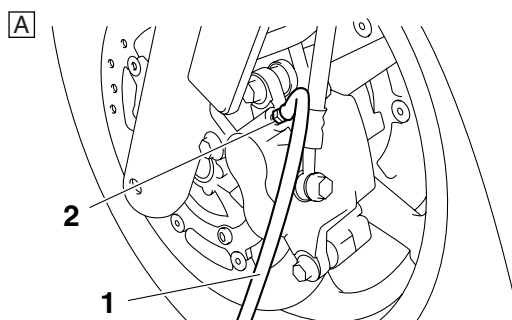
3. Install:
 - Brake fluid reservoir

TIP

Install the brake fluid reservoir temporarily.

4. Bleed:
 - Hydraulic brake system

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



- A. Front
- B. Rear

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

TIP

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

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



Bleed screw (front brake caliper)
6 Nm (0.6 m·kg, 4.3 ft·lb)
Bleed screw (rear brake caliper)
6 Nm (0.6 m·kg, 4.3 ft·lb)

- k. 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 3-20.



5. Tighten:
- Brake fluid reservoir bolt



Brake fluid reservoir bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)
LOCTITE®

6. Install:
- Sub-fuel tank cover
 - Rider seat (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
- Refer to “GENERAL CHASSIS” on page 4-1.

EAS21380

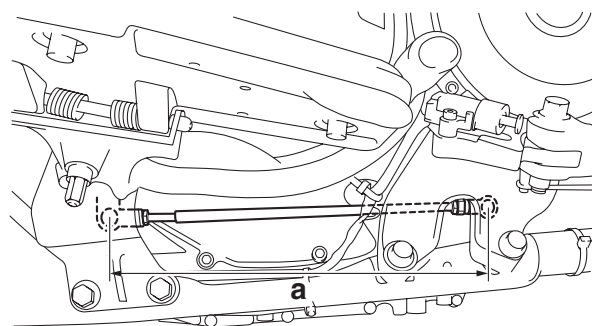
TIP

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
XVS13AA(C)/XVS13CTA(C):
 257–259 mm (10.12–10.20 in)
XVS13CA(C):
 252–256 mm (9.92–10.08 in)



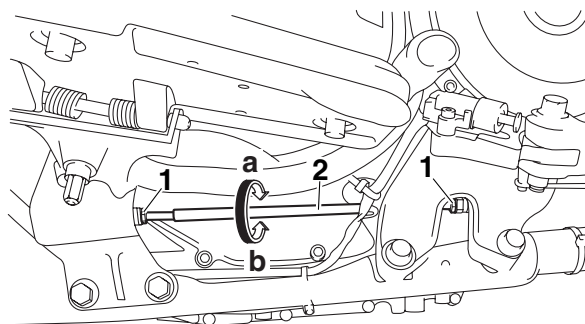
- Installed shift rod length



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

Direction “a”
Installed shift rod length is increased.

Direction “b”
Installed shift rod length is decreased.



- c. Tighten the locknuts to specification.



Locknut (for XVS13AA(C)/XVS13CTA(C))
8 Nm (0.8 m·kg, 5.8 ft·lb)
Locknut (for XVS13CA(C))
7 Nm (0.7 m·kg, 5.1 ft·lb)

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



EAS21430

ADJUSTING THE DRIVE BELT SLACK (for XVS13AA(C)/XVS13CTA(C))

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 swing-arm 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

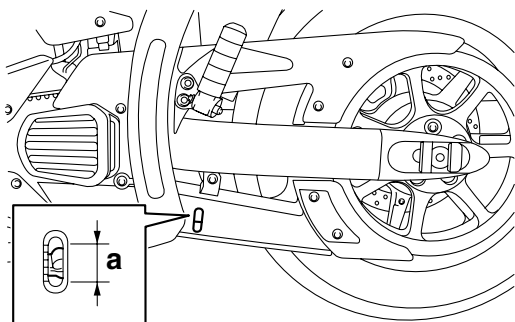


Securely support the vehicle so that there is no danger of it falling over.

TIP

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

- Drive belt slack “a”
Out of specification → Adjust.



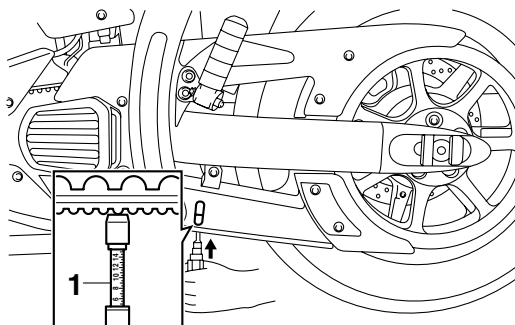
Drive belt slack (on the side-stand)
 5.0–7.0 mm (0.20–0.28 in)
Drive belt slack (on a suitable stand)
 4.0–6.0 mm (0.16–0.24 in)



Belt tension gauge
 90890-03170
Rear drive belt tension gauge
 YM-03170

TIP

- The level marks of the level window on the drive belt lower guard 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 "1".



3. Remove:

- Muffler

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

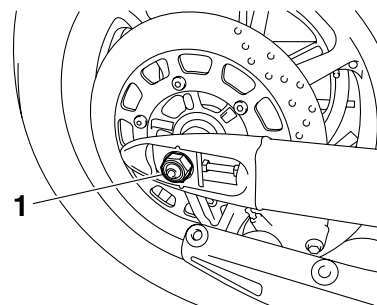
4. Adjust:

- Drive belt slack

TIP

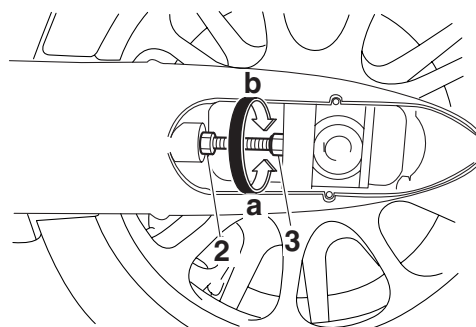
Place the vehicle on a suitable stand so that the rear wheel is elevated.

- a. Loosen the rear wheel axle nut "1".



- b. Loosen both locknuts "2".
 c. Turn both adjusting bolts "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 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·kg, 11 ft·lb)

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



Rear wheel axle nut
 150 Nm (15.0 m·kg, 110 ft·lb)

5. Install:
 • Muffler
 Refer to "ENGINE REMOVAL" on page 5-1.

EAS27D1002

ADJUSTING THE DRIVE BELT SLACK (for XVS13CA(C))**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 swing-arm 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

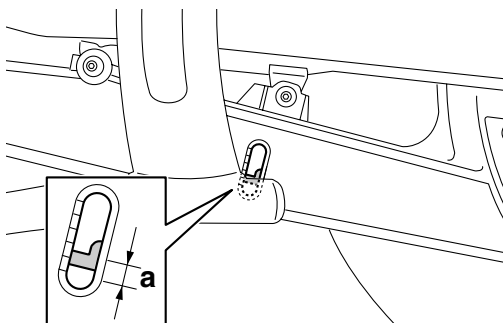
Securely support the vehicle so that there is no danger of it falling over.

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)

5.0–7.0 mm (0.20–0.28 in)

Drive belt slack (on a suitable stand)

5.0–7.0 mm (0.20–0.28 in)

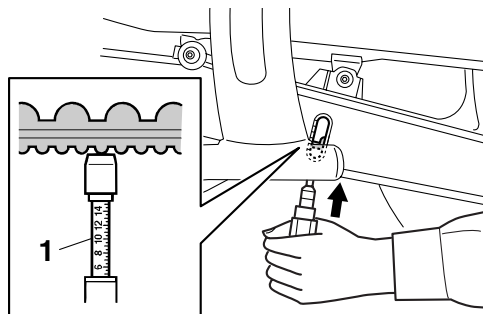


Belt tension gauge
90890-03170

Rear drive belt tension gauge
YM-03170

TIP

- The level marks of the level window on the drive belt lower guard 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 "1".



3. Remove:

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

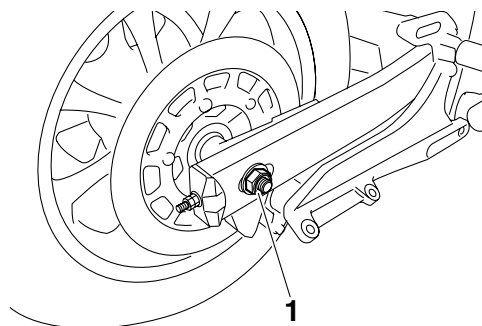
4. Adjust:

- 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.

EWA13140



EAS21530

FWA13120



EAS21590

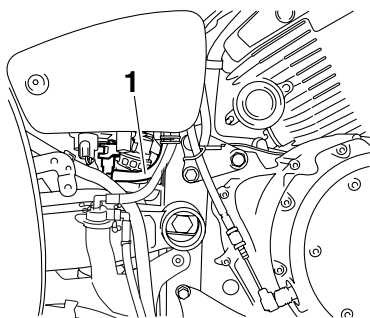
FWA13120



FCA13590

NOTICE

3-28



3. 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

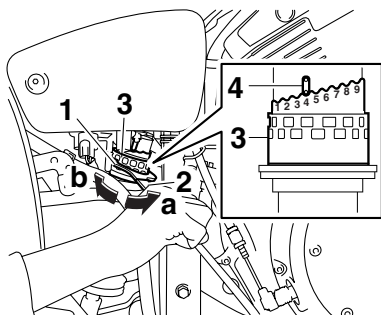
1

Standard

4

Maximum

9



4. Connect:
 - Fuel hose
Refer to "FUEL TANK" on page 7-1.
5. Install:
 - Rear cylinder exhaust pipe

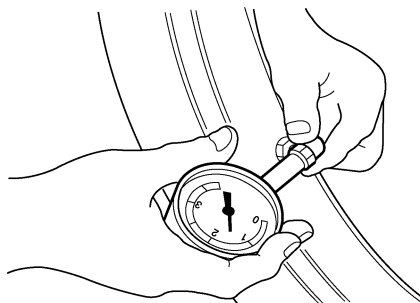
- Coolant reservoir cover
Refer to "ENGINE REMOVAL" on page 5-1.

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

250 kPa (2.50 kgf/cm², 36 psi)

Rear

280 kPa (2.80 kgf/cm², 41 psi)

Loading condition

XVS13AA(C):

90–210 kg (198–463 lb)

XVS13CTA(C):

90–190 kg (198–419 lb)

XVS13CA(C):

90–204 kg (198–450 lb)

Front

250 kPa (2.50 kgf/cm², 36 psi)

Rear

280 kPa (2.80 kgf/cm², 41 psi)

Maximum load

XVS13AA(C):

210 kg (463 lb)

XVS13CTA(C):

190 kg (419 lb)

XVS13CA(C):

204 kg (450 lb)

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

EWA13190



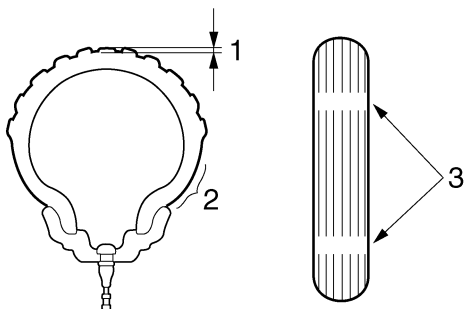
WARNING

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)

EWA14080

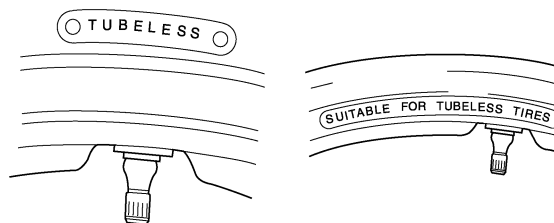


WARNING

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

A

B



A. Tire

B. Wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

EWA14090



WARNING

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

**Front tire****Size**

XVS13AA(C)/XVS13CTA(C):

130/90 16M/C 67H

XVS13CA(C):

120/70 21M/C 62H

Manufacturer/model

XVS13AA(C)/XVS13CTA(C):

DUNLOP/D404F X

BRIDGESTONE/EXEDRA G721

XVS13CA(C):

BRIDGESTONE/EXEDRA G721

G

**Rear tire****Size**

XVS13AA(C)/XVS13CTA(C):

170/70B 16M/C 75H

XVS13CA(C):

210/40R 18M/C 73H

Manufacturer/model

XVS13AA(C)/XVS13CTA(C):

DUNLOP/K555

BRIDGESTONE/EXEDRA G722

G

XVS13CA(C):

BRIDGESTONE/EXEDRA G852

RADIAL G

EWA13210

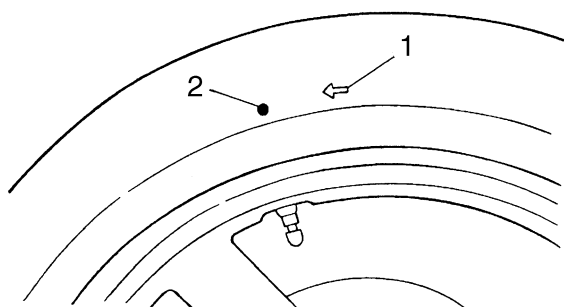
**WARNING**

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

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.



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.

EAS21690

CHECKING AND LUBRICATING THE CABLES

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

EWA13270

**WARNING**

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

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



Recommended lubricant
Engine oil or a suitable cable lubricant

TIP

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

EAS21700

LUBRICATING THE BRAKE LEVER

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



Recommended lubricant
Silicone grease

EAS3D84001

LUBRICATING THE CLUTCH LEVER

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



EAS21710

LUBRICATING THE BRAKE PEDAL

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



EAS3D84002

LUBRICATING THE SHIFT PEDAL

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



EAS21720

LUBRICATING THE SIDESTAND

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



EAS21740

LUBRICATING THE REAR SUSPENSION

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



EAS21750

ELECTRICAL SYSTEM

EAS21760

CHECKING AND CHARGING THE BATTERY

Refer to "ELECTRICAL COMPONENTS" on page 8-89.

EAS21770

CHECKING THE FUSES

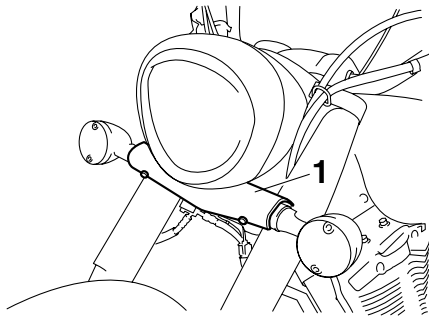
Refer to "ELECTRICAL COMPONENTS" on page 8-89.

EAS21790

REPLACING THE HEADLIGHT BULB (for XVS13AA(C)/XVS13CTA(C))

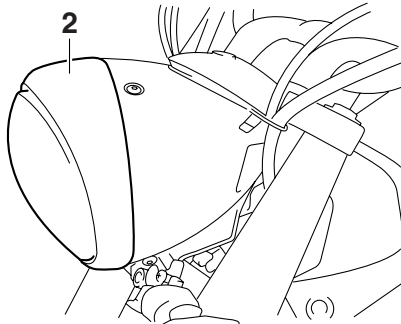
1. Remove:

- Front turn signal/position light bracket cover "1"



2. Remove:

- Headlight lens unit "2"

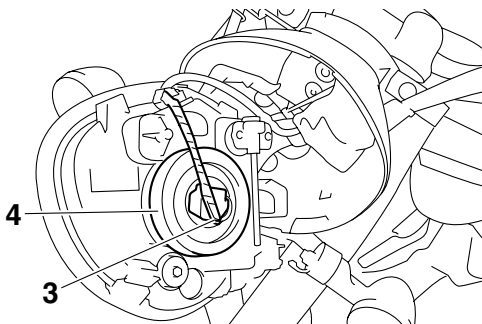


3. Disconnect:

- Headlight coupler "3"

4. Remove:

- Bulb cover "4"

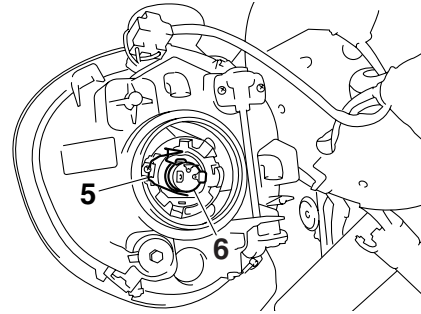


5. Detach:

- 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:

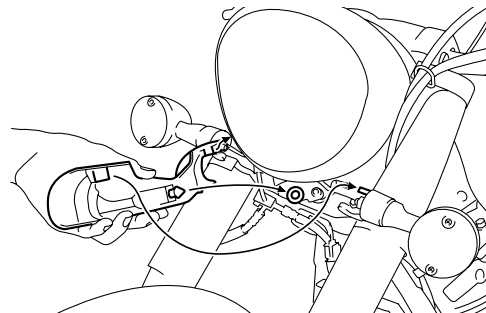
- Bulb cover

10. Connect:

- Headlight coupler

11. Install:

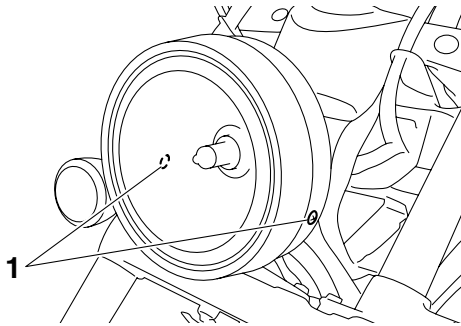
- Headlight lens unit
- Front turn signal/position light bracket cover



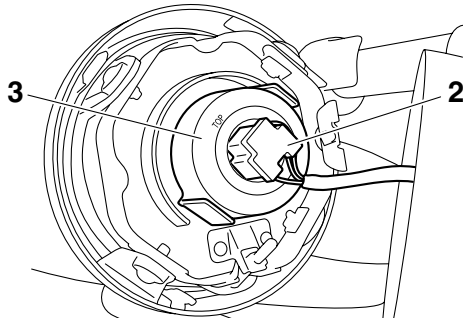
EAS27D1004

REPLACING THE HEADLIGHT BULB (for XVS13CA(C))

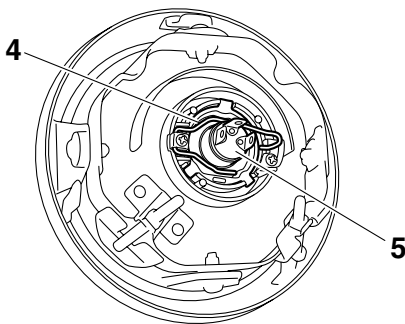
1. Remove:
 - Headlight lens unit "1"



2. Disconnect:
 - Headlight coupler "2"
3. Remove:
 - Bulb cover "3"



4. Detach:
 - Headlight bulb holder "4"
5. Remove:
 - Headlight bulb "5"



EWA13320



WARNING

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

6. 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.

7. Attach:
 - Headlight bulb holder
8. Install:
 - Bulb cover
9. Connect:
 - Headlight coupler
10. Install:
 - Headlight lens unit

EAS21810

ADJUSTING THE HEADLIGHT BEAM

1. Adjust:
 - Headlight beam (vertically)

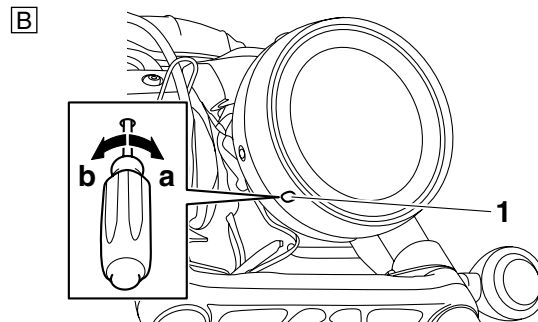
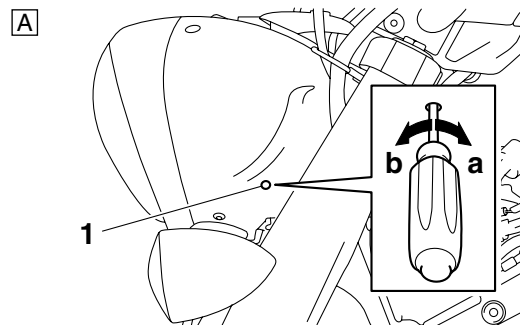
- a. Turn the adjusting screw "1" with a screwdriver in direction "a" or "b".

Direction "a"

Headlight beam is raised.

Direction "b"

Headlight beam is lowered.



- A. For XVS13AA(C)/XVS13CTA(C)
- B. For XVS13CA(C)

CHASSIS

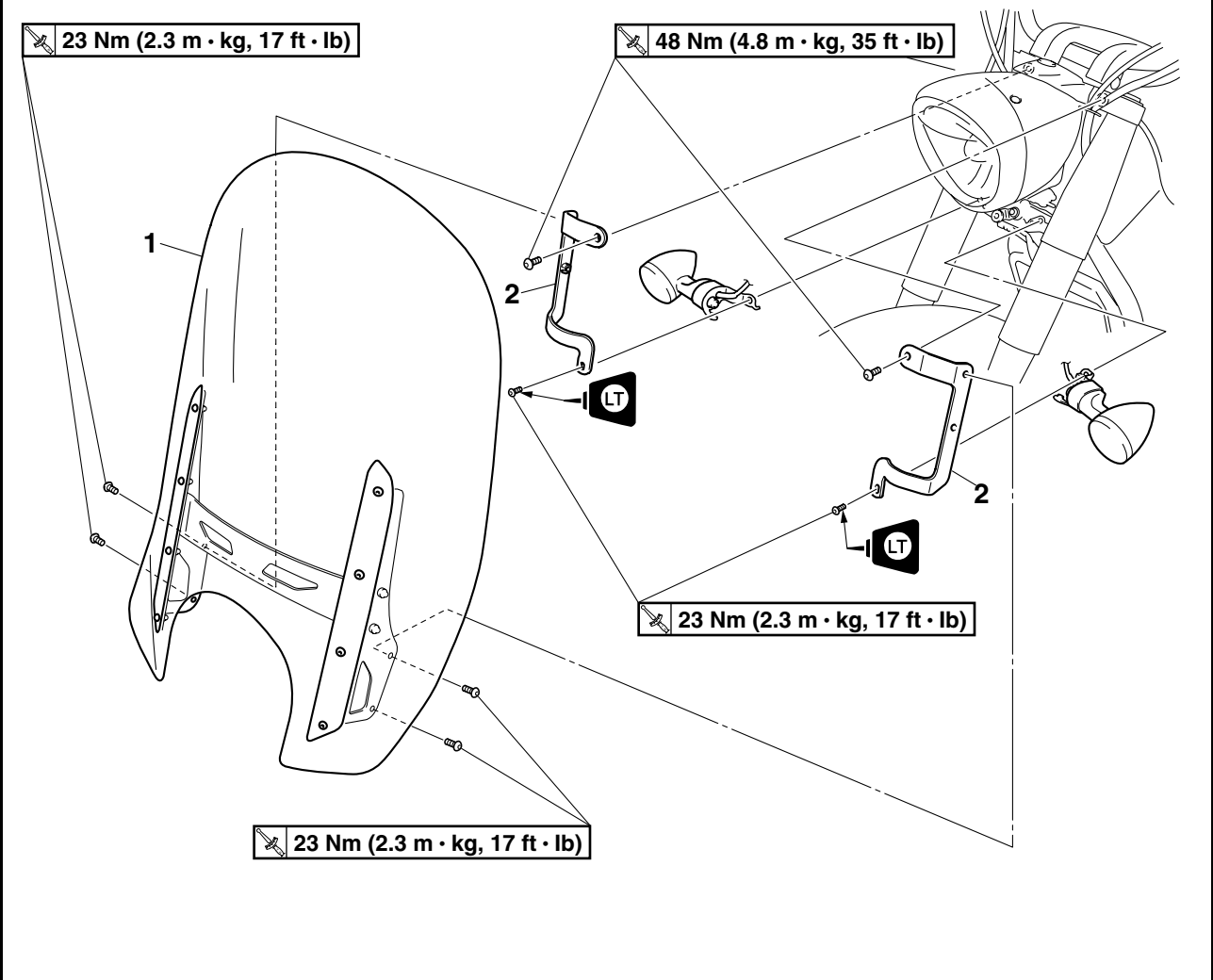
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EAS21830

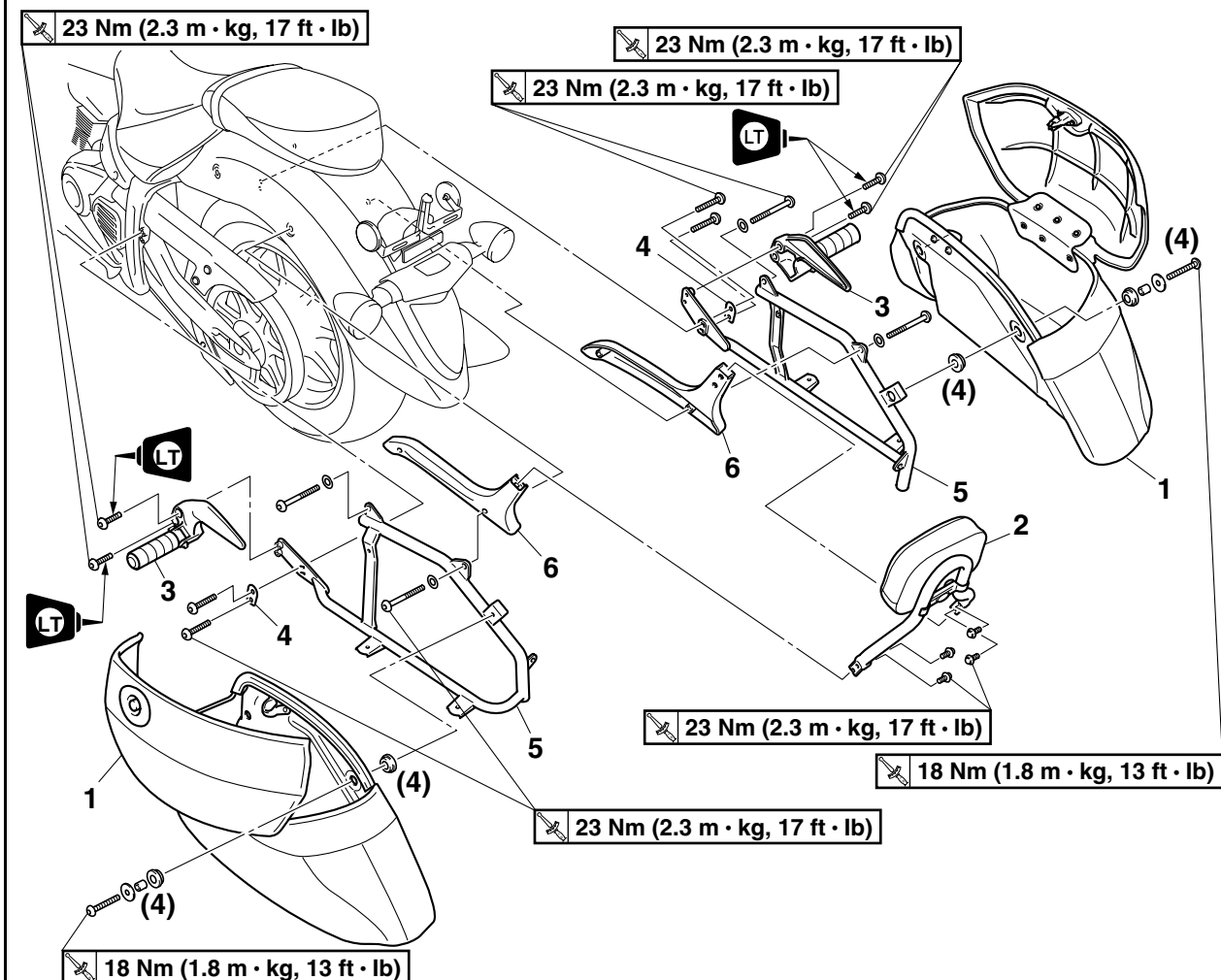
GENERAL CHASSIS

Removing the windshield (for XVS13CTA(C))



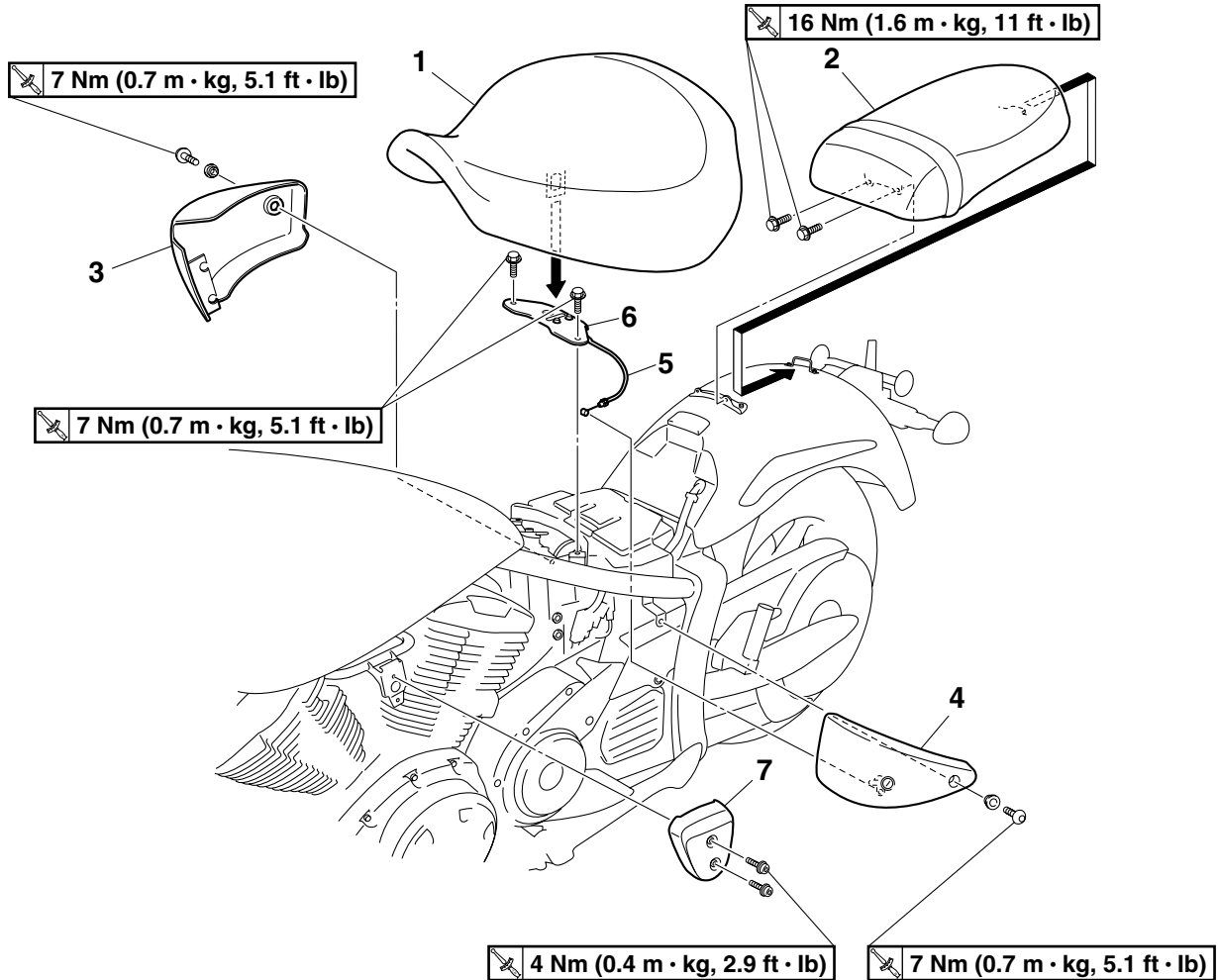
Order	Job/Parts to remove	Q'ty	Remarks
	Front turn signal/position light bracket cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Windshield	1	
2	Windshield bracket (left and right)	2	
			For installation, reverse the removal procedure.

Removing the sidebags and backrest (for XVS13CTA(C))



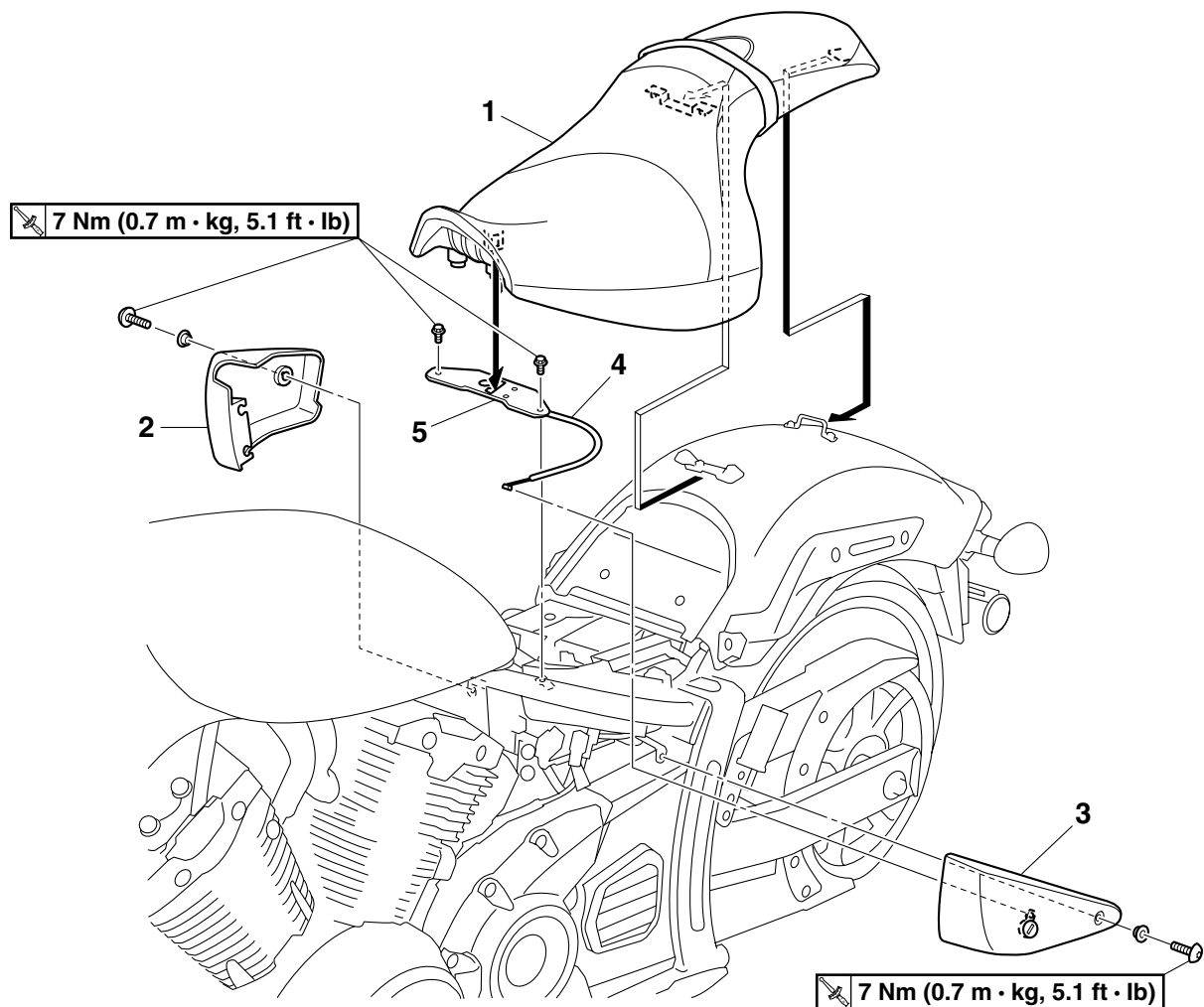
Order	Job/Parts to remove	Q'ty	Remarks
1	Sidebag (left and right)	2	TIP Water can be harmful to untreated leather. Use Yamaha Saddle Soap or another quality brand according to the manufacturer's directions to clean the leather on the sidebags. Polish the dry leather with a soft cloth, and then treat 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	
			For installation, reverse the removal procedure.

Removing the seats and left side cover (for XVS13AA(C)/XVS13CTA(C))



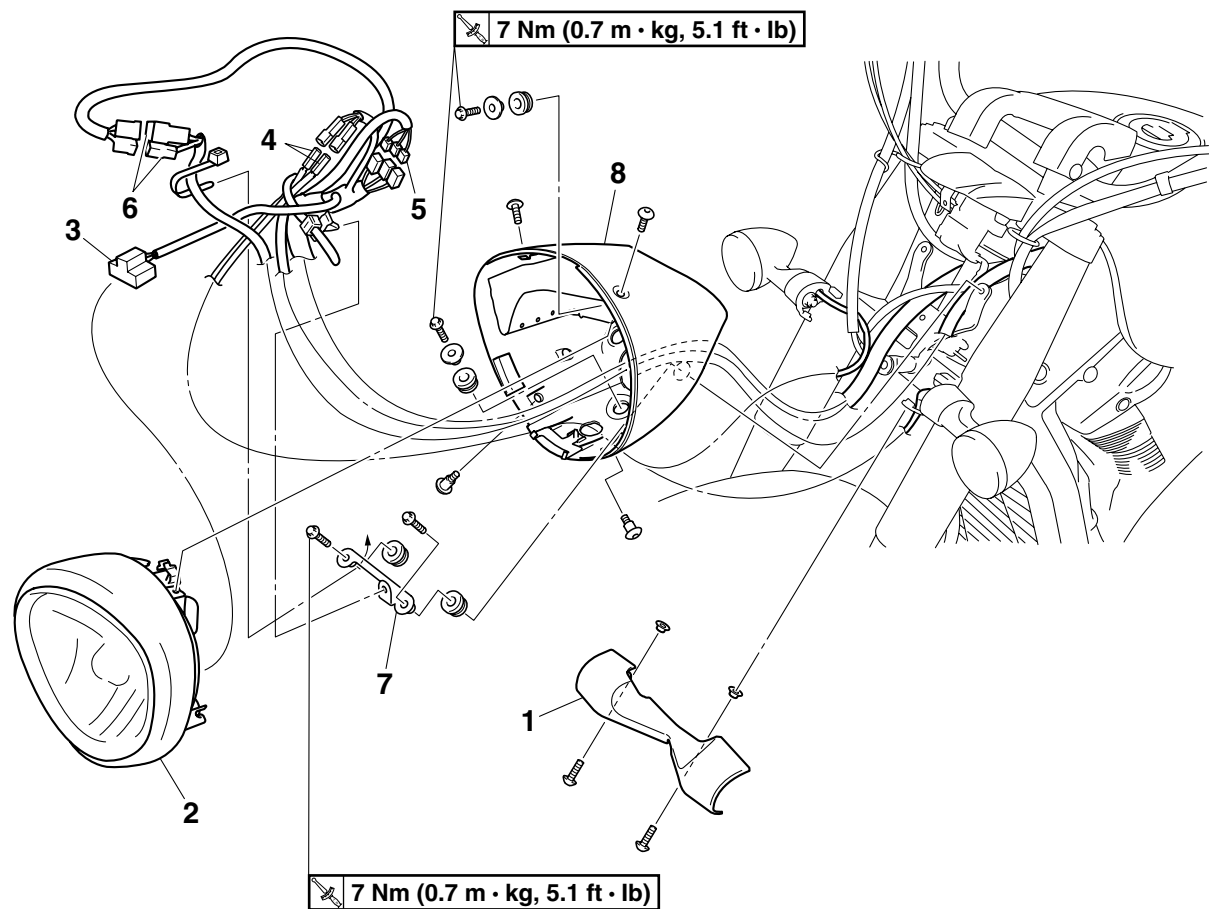
Order	Job/Parts to remove	Q'ty	Remarks
1	Rider seat	1	
2	Passenger seat	1	
3	Sub-fuel tank cover	1	
4	Relay cover	1	
5	Seat lock cable	1	Disconnect.
6	Seat lock bracket	1	
7	Left side cover	1	
			For installation, reverse the removal procedure.

Removing the seat (for XVS13CA(C))



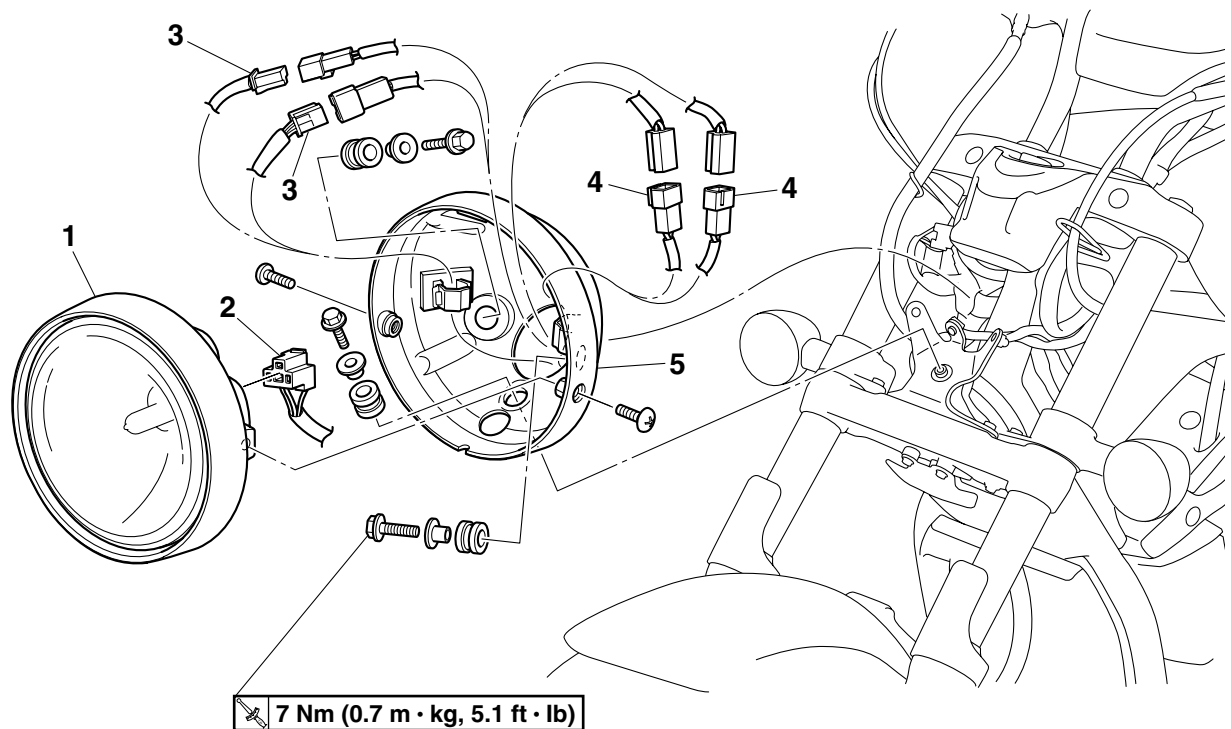
Order	Job/Parts to remove	Q'ty	Remarks
1	Seat	1	
2	Sub-fuel tank cover	1	
3	Relay cover	1	
4	Seat lock cable	1	Disconnect.
5	Seat lock bracket	1	
			For installation, reverse the removal procedure.

Removing the headlight (for XVS13AA(C)/XVS13CTA(C))



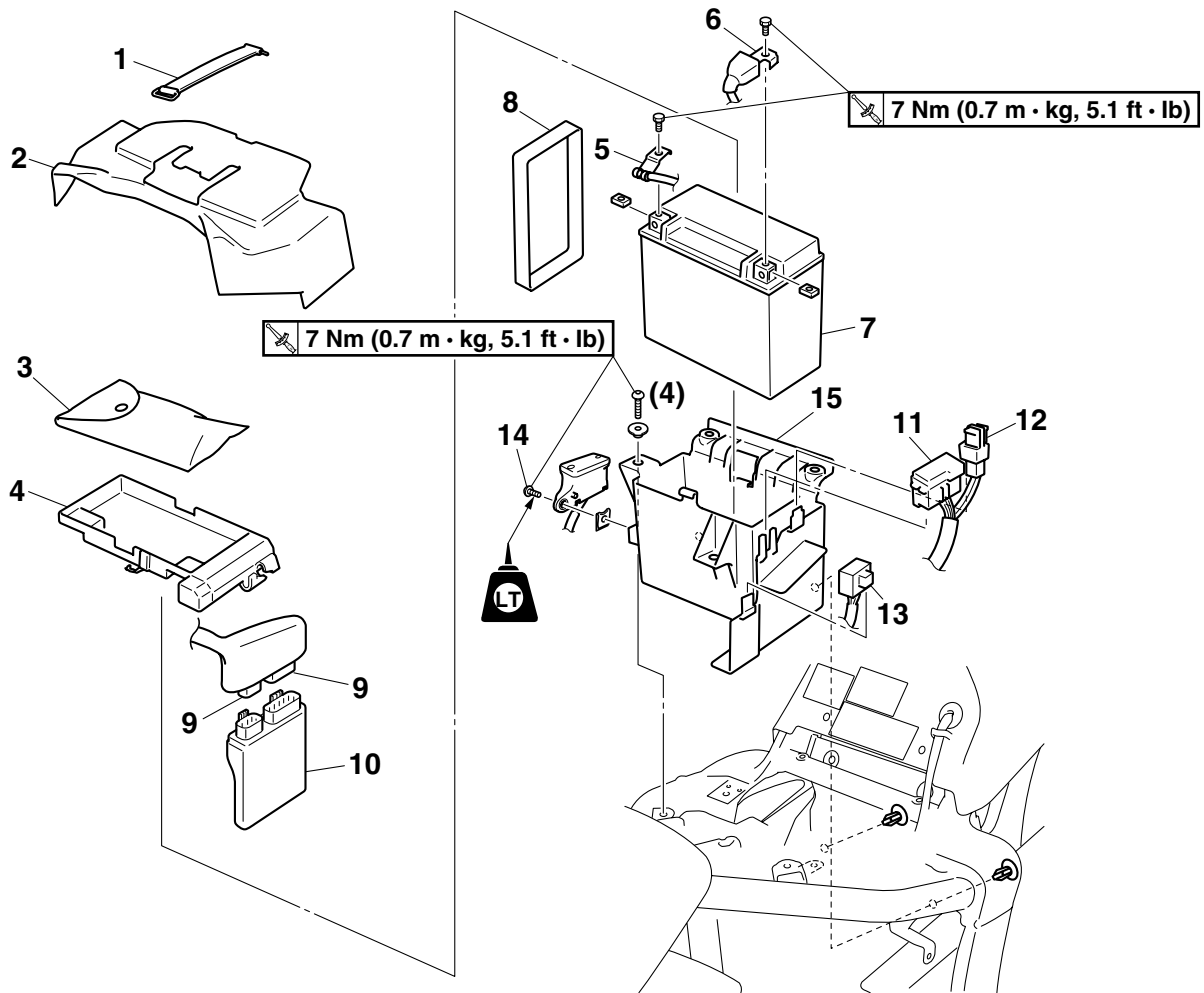
Order	Job/Parts to remove	Q'ty	Remarks
1	Front turn signal/position light bracket cover	1	
2	Headlight lens unit	1	
3	Headlight coupler	1	Disconnect.
4	Front turn signal/position light coupler	2	Disconnect.
5	Meter assembly coupler	3	Disconnect.
6	Main switch coupler	2	Disconnect.
7	Plastic band bracket	1	
8	Headlight body	1	
			For installation, reverse the removal procedure.

Removing the headlight (for XVS13CA(C))



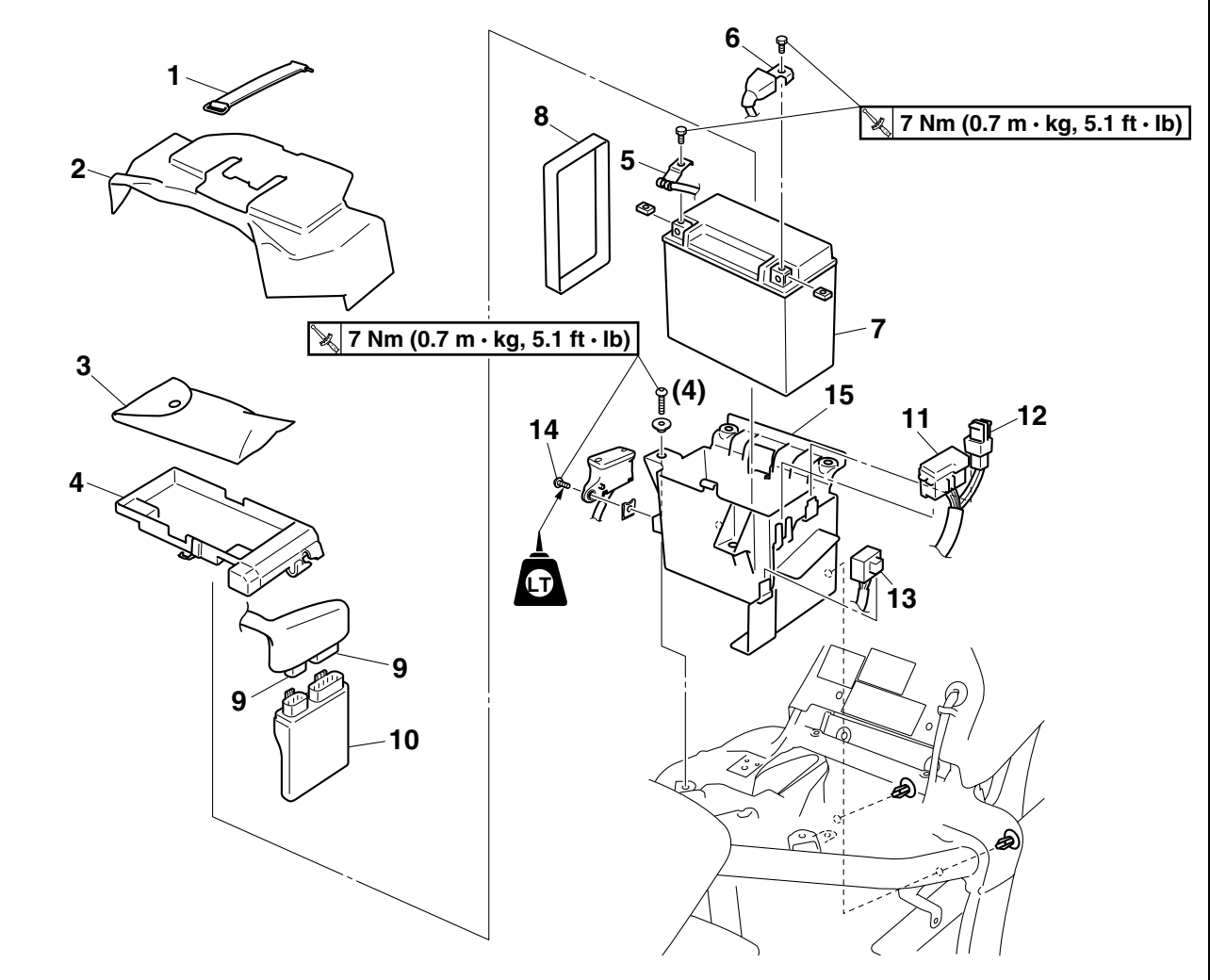
Order	Job/Parts to remove	Q'ty	Remarks
1	Headlight lens unit	1	
2	Headlight coupler	1	Disconnect.
3	Front turn signal/position light coupler	2	Disconnect.
4	Main switch coupler	2	Disconnect.
5	Headlight body	1	
			For installation, reverse the removal procedure.

Removing the battery



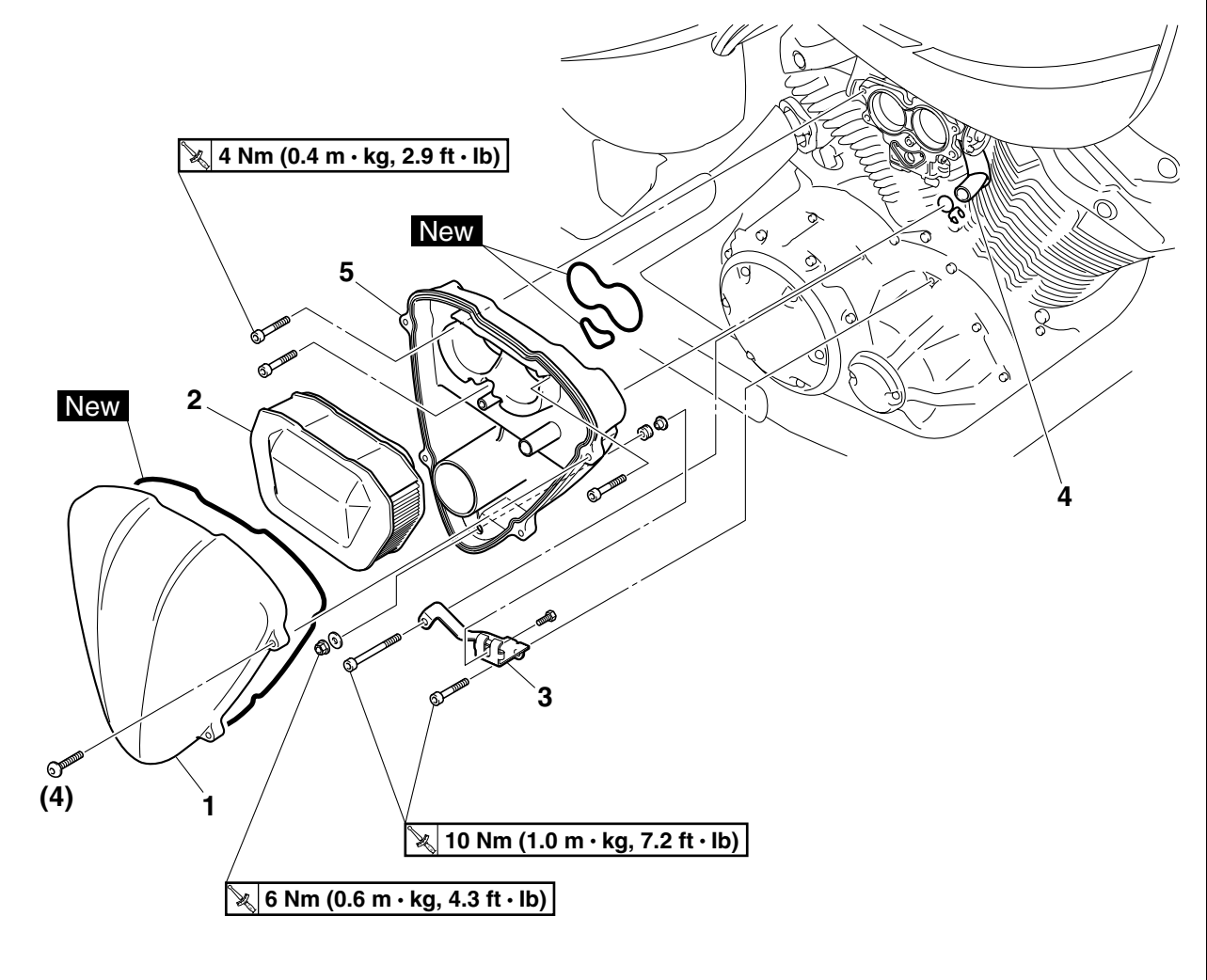
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Sub-fuel tank cover		For XVS13AA(C)/XVS13CTA(C) Refer to "GENERAL CHASSIS" on page 4-1.
	Seat/Sub-fuel tank cover		For XVS13CA(C) Refer to "GENERAL CHASSIS" on page 4-1.
1	Battery cover band	1	
2	Battery cover	1	For XVS13AA(C)/XVS13CTA(C)
3	Tool kit	1	
4	Tool kit tray	1	
5	Negative battery lead	1	Disconnect.
6	Positive battery lead	1	Disconnect.
7	Battery	1	
8	Battery band	1	
9	ECU coupler	2	Disconnect.
10	ECU (engine control unit)	1	
11	Fuse box	1	
12	Main fuse	1	
13	Relay unit	1	

Removing the battery



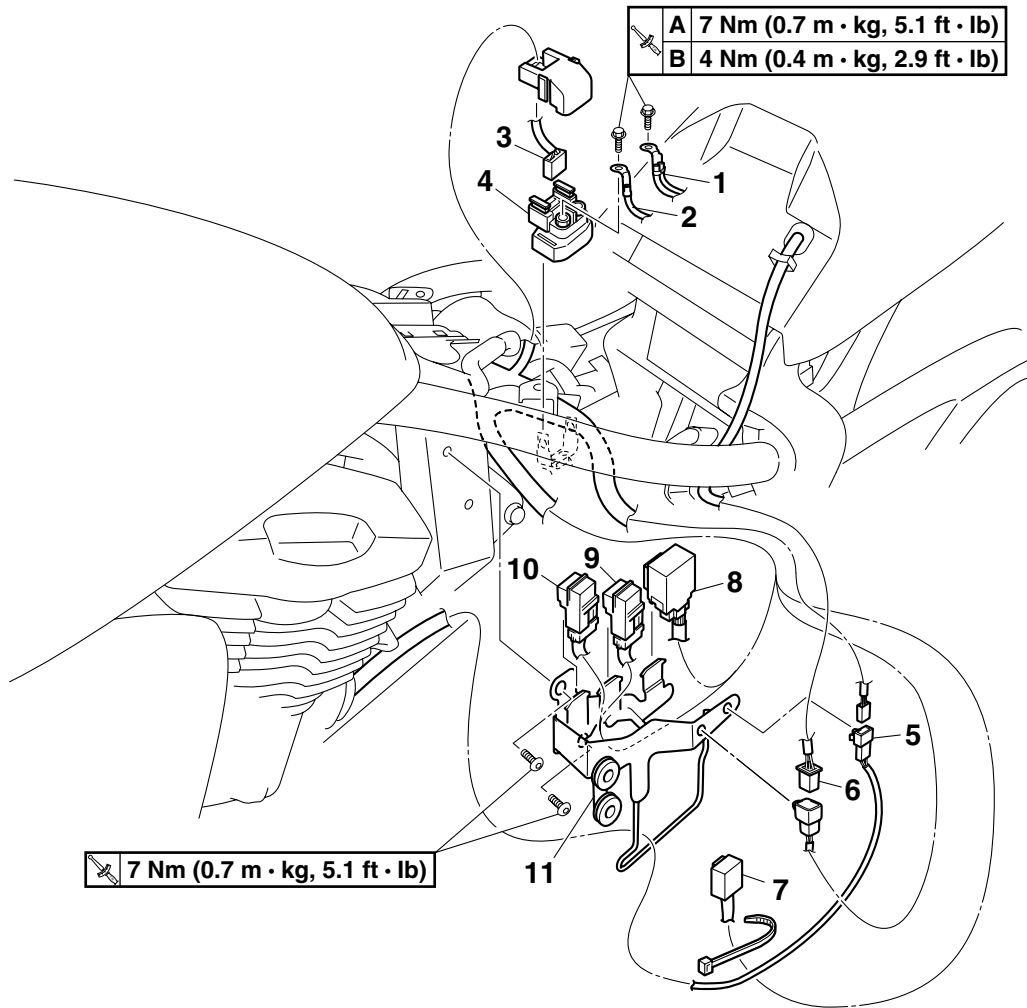
Order	Job/Parts to remove	Q'ty	Remarks
14	Brake fluid reservoir bolt	1	
15	Battery box	1	
			For installation, reverse the removal procedure.

Removing the air filter case



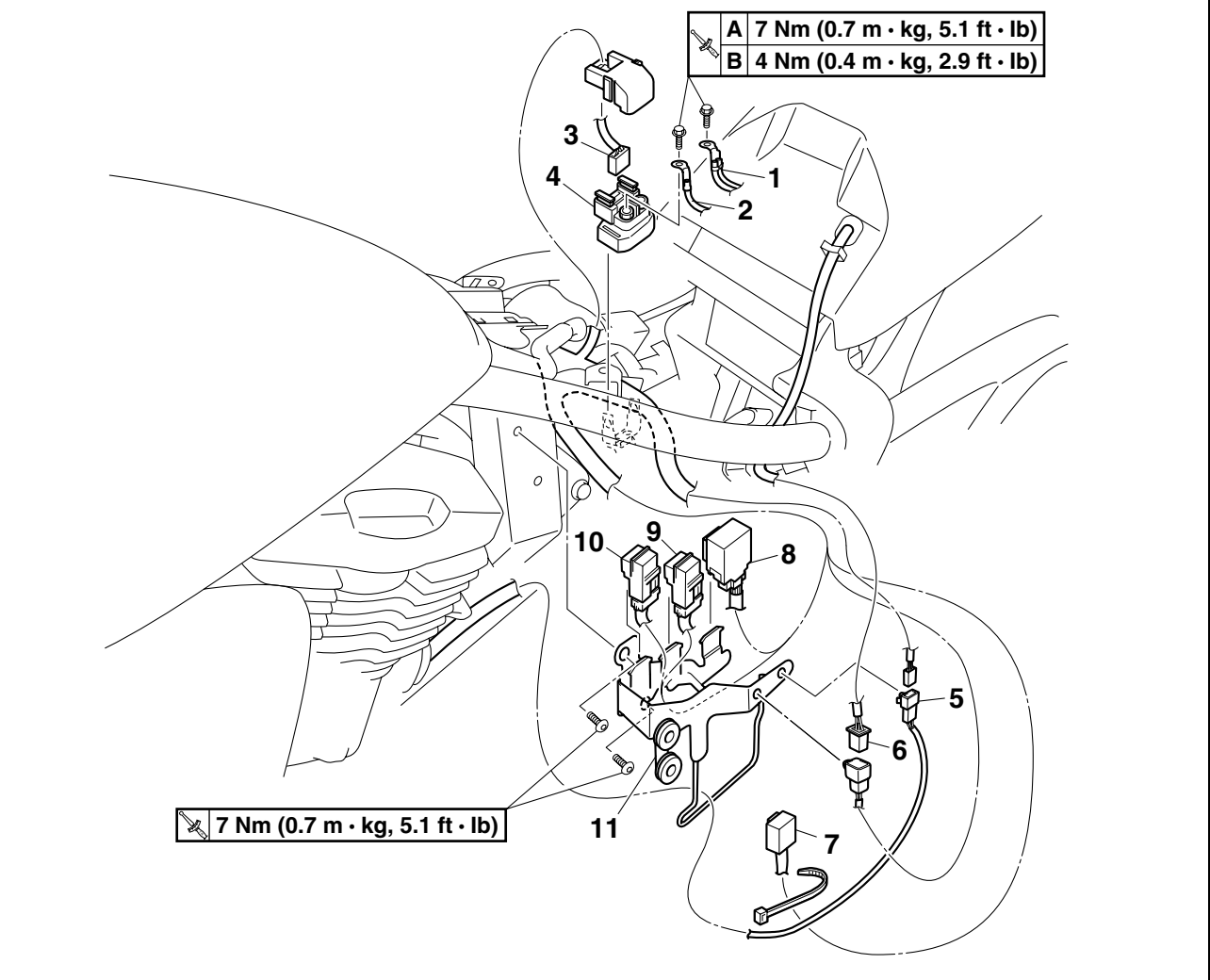
Order	Job/Parts to remove	Q'ty	Remarks
1	Air filter case cover	1	
2	Air filter element	1	
3	Air filter case bracket	1	
4	Crankcase breather hose	1	Disconnect.
5	Air filter case	1	
			For installation, reverse the removal procedure.

Removing the relays



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Sub-fuel tank cover/Battery box		For XVS13AA(C)/XVS13CTA(C) Refer to "GENERAL CHASSIS" on page 4-1.
	Seat/Sub-fuel tank cover/Battery box		For XVS13CA(C) Refer to "GENERAL CHASSIS" on page 4-1.
1	Positive battery lead	1	Disconnect.
2	Starter motor lead	1	Disconnect.
3	Starter relay coupler	1	Disconnect.
4	Starter relay	1	
5	Crankshaft position sensor coupler	1	Disconnect.
6	Tail/brake light wire harness coupler	1	Disconnect.
7	Joint coupler	1	
8	Turn signal relay	1	
9	Radiator fan motor relay	1	
10	Headlight relay	1	

Removing the relays



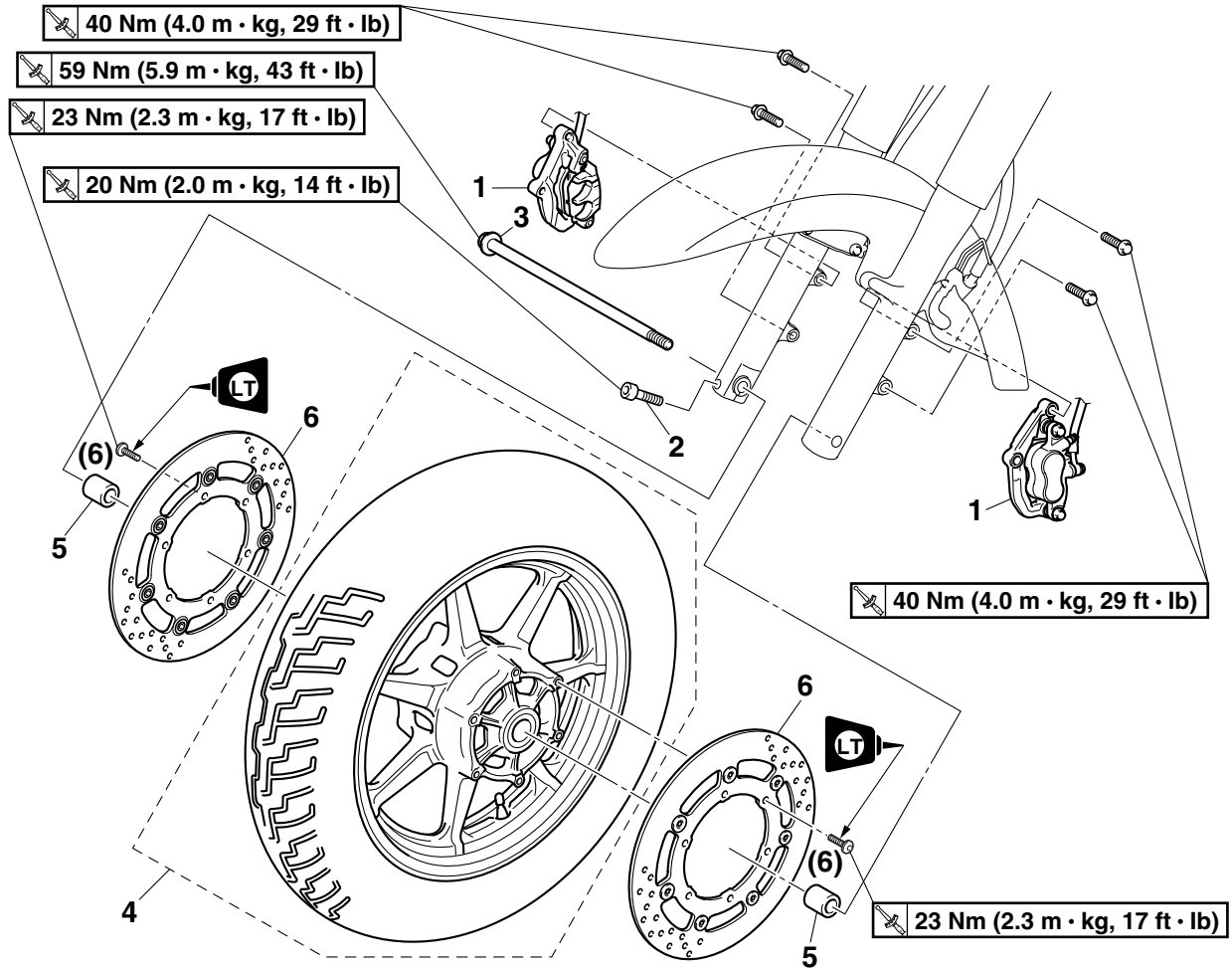
Order	Job/Parts to remove	Q'ty	Remarks
11	Relay bracket	1	
			For installation, reverse the removal procedure.

A: For XVS13AA(C)/XVS13CTA(C)
B: For XVS13CA(C)

EAS21870

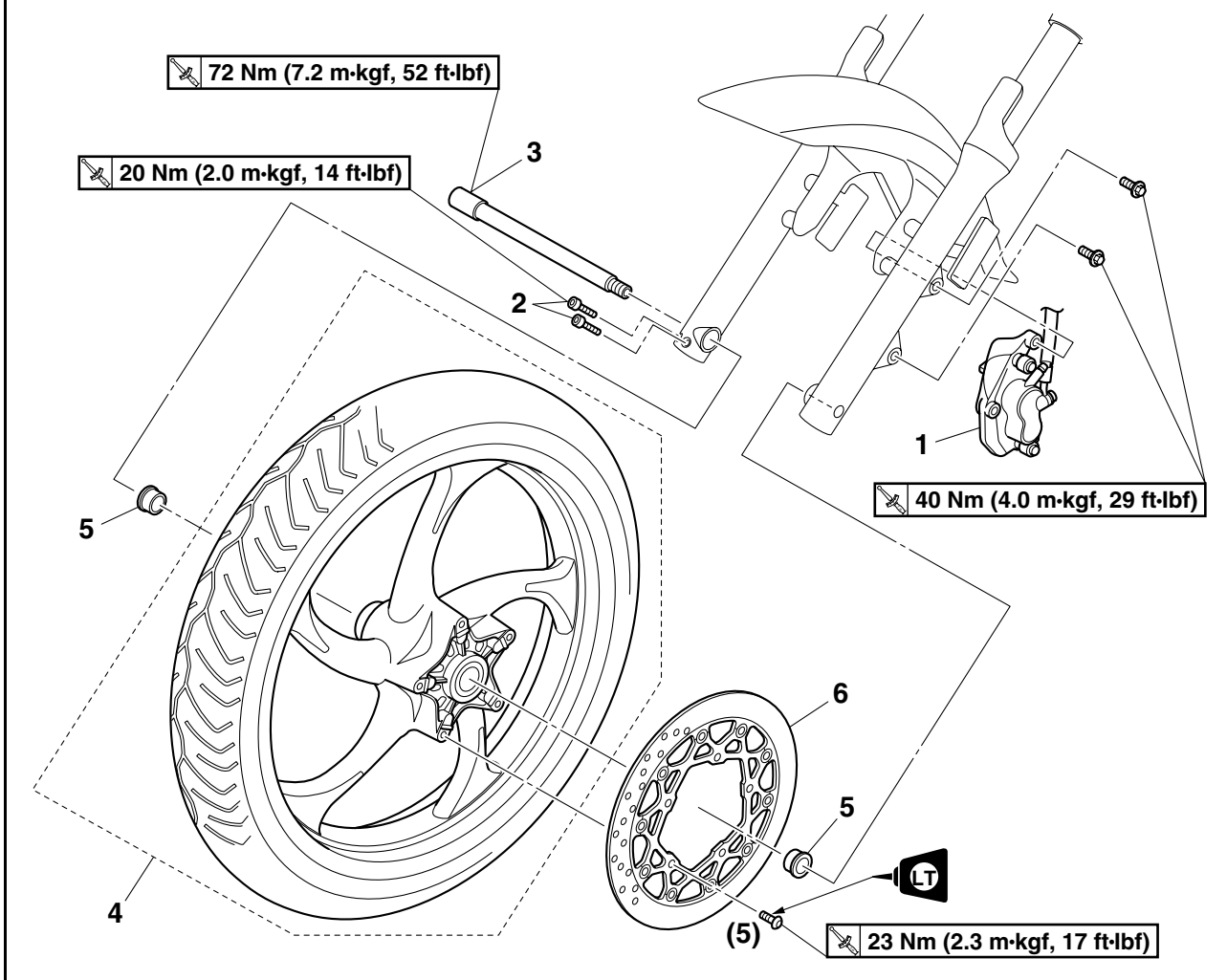
FRONT WHEEL

Removing the front wheel and brake discs (for XVS13AA(C)/XVS13CTA(C))



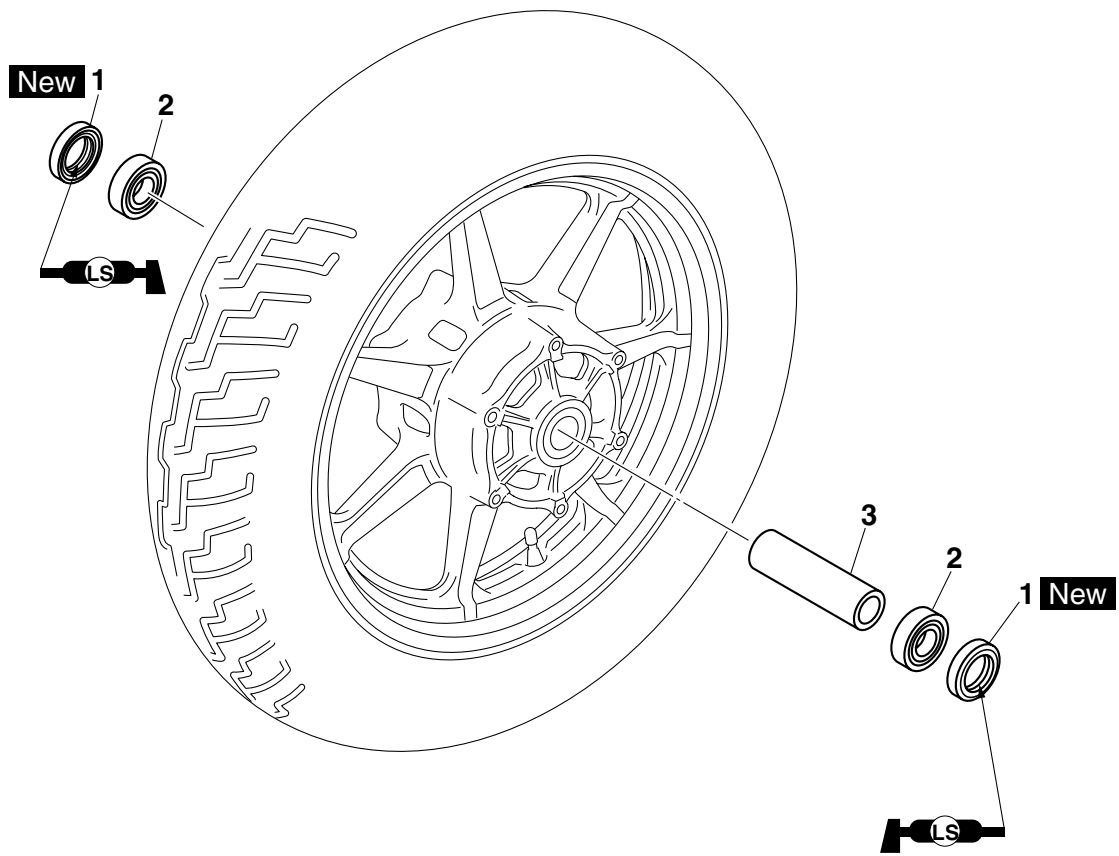
Order	Job/Parts to remove	Q'ty	Remarks
			TIP Place the vehicle on a suitable stand so that the front wheel is elevated.
	Reflectors		Refer to "FRONT BRAKE" on page 4-30.
1	Front brake caliper	2	
2	Front wheel axle pinch bolt	1	Loosen.
3	Front wheel axle	1	
4	Front wheel	1	
5	Collar	2	
6	Front brake disc	2	
			For installation, reverse the removal procedure.

Removing the front wheel and brake disc (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
			TIP _____ Place the vehicle on a suitable stand so that the front wheel is elevated.
1	Front brake caliper	1	
2	Front wheel axle pinch bolt	2	Loosen.
3	Front wheel axle	1	
4	Front wheel	1	
5	Collar	2	
6	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:
 - Front brake caliper(s)

TIP

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

3. Elevate:
 - Front wheel

TIP

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

EAS21910

DISASSEMBLING THE FRONT WHEEL

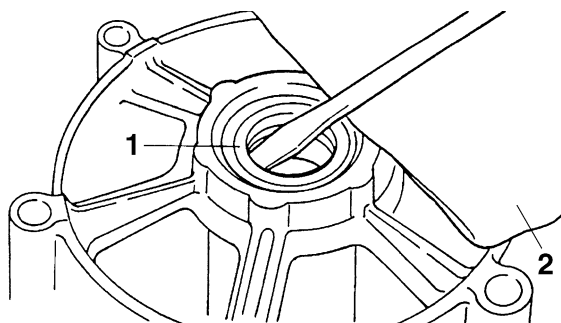
1. Remove:
 - Oil seals
 - Wheel bearings



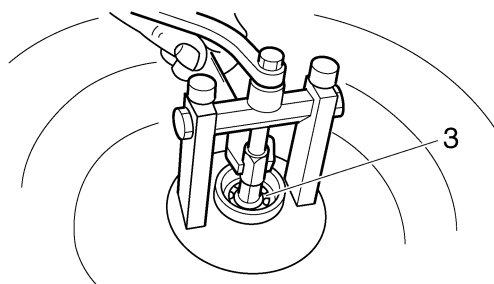
- a. Clean the outside of the front wheel hub.
- b. Remove the oil seals "1" with a flathead screwdriver.

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

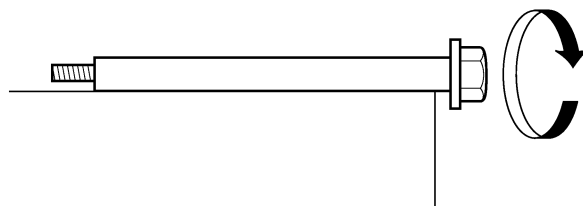
1. Check:
 - Wheel axle
 - Roll the wheel axle on a flat surface.
 - Bends → Replace.

EWA13460

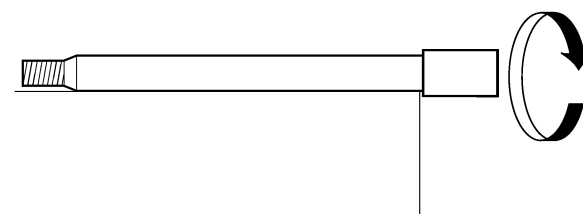
WARNING

Do not attempt to straighten a bent wheel axle.

A




B



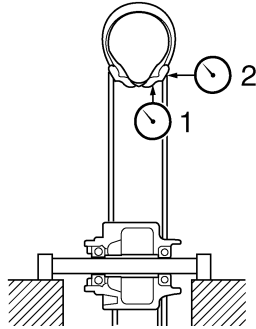
- A. For XVS13AA(C)/XVS13CTA(C)
- B. For XVS13CA(C)

2. Check:
 - Tire
 - Front wheel
 - Damage/wear → Replace.
 - Refer to "CHECKING THE TIRES" on page 3-29 and "CHECKING THE WHEELS" on page 3-31.
3. Measure:
 - Radial wheel runout "1"

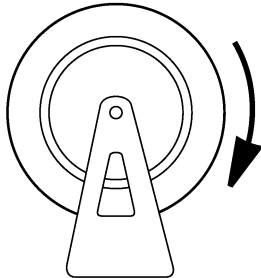
- Lateral wheel runout “2”
Over the specified limits → Replace.



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.

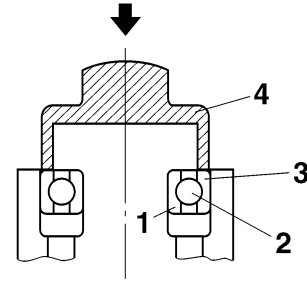
ECA3D81004

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

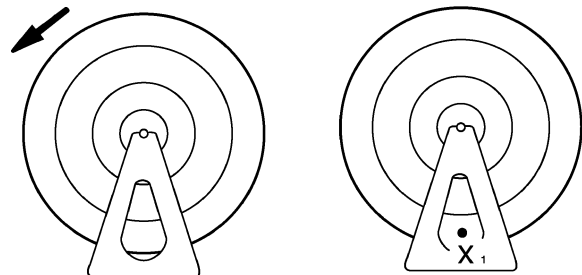
- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake discs installed.

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

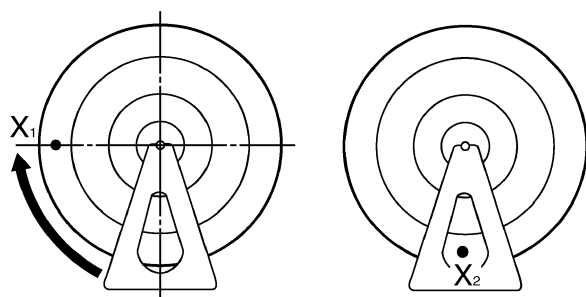
TIP

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.

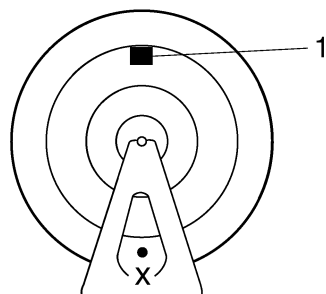


- f. Repeat steps (c) through (e) several times until all the marks come to rest at the same spot.
- g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

3. Adjust:

- Front wheel static balance

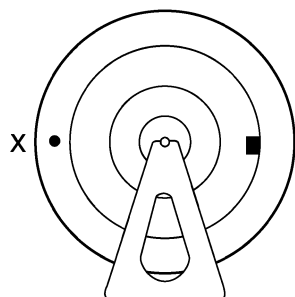
- a. Install a balancing weight "1" onto the rim exactly opposite the heavy spot "X".



TIP

Start with the lightest weight.

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

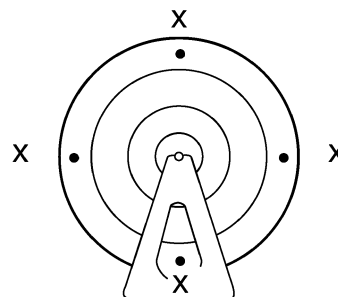


- c. If the heavy spot does not stay in that position, install a heavier weight.
- d. Repeat steps (b) and (c) until the front wheel is balanced.

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)

The following procedure applies to both of the brake discs.

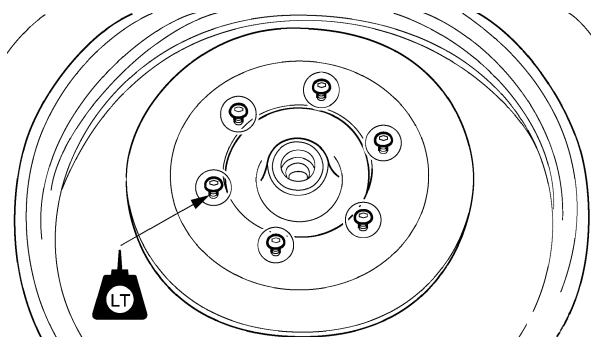
1. Install:
 - Front brake disc



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

TIP

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



2. Check:
 - Front brake discs
 Refer to "CHECKING THE FRONT BRAKE DISC(S)" on page 4-35.
3. Lubricate:
 - Oil seal lips

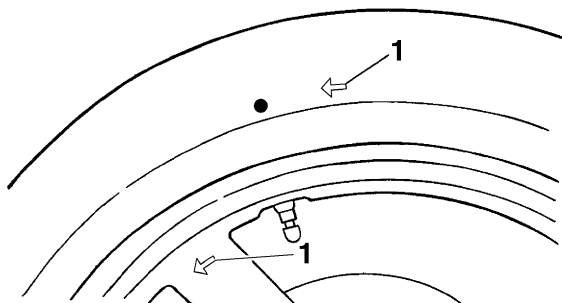


Recommended lubricant
Lithium-soap-based grease

4. Install:
 - Front wheel

TIP

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



5. Tighten: (for XVS13AA(C)/XVS13CTA(C))

- Front wheel axle
- Front wheel axle pinch bolt



Front wheel axle
59 Nm (5.9 m·kg, 43 ft·lb)
Front wheel axle pinch bolt
20 Nm (2.0 m·kg, 14 ft·lb)

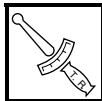
ECA3D81011

NOTICE

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

6. Tighten: (for XVS13CA(C))

- Front wheel axle
- Front wheel axle pinch bolts



Front wheel axle
72 Nm (7.2 m·kg, 52 ft·lb)
Front wheel axle pinch bolt
20 Nm (2.0 m·kg, 14 ft·lb)

ECA3D81011

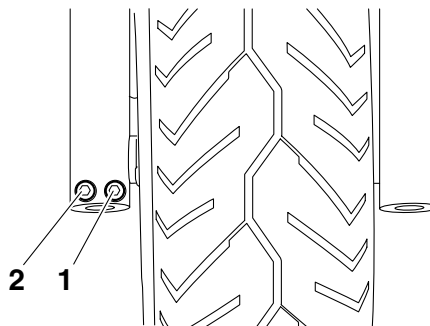
NOTICE

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

- Insert the front wheel axle from the right side and tighten it to 72 Nm (7.2 m·kg, 52 ft·lb).
- Check that the right end of the front wheel axle is flush with the front fork. If necessary, manually push the front wheel axle or lightly tap it with a soft hammer until its end is flush with the front fork. However, if the surface of the front wheel axle end is not parallel to the surface of the front fork, align a point on the

outer edge of the axle with the fork, making sure that the axle does not protrude past the fork.

- In the order pinch bolt "1" → pinch bolt "2" → pinch bolt "1", tighten each bolt to 20 Nm (2.0 m·kg, 14 ft·lb) without performing temporary tightening.



7. Install:

- Front brake caliper(s)



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

EWA3D81008

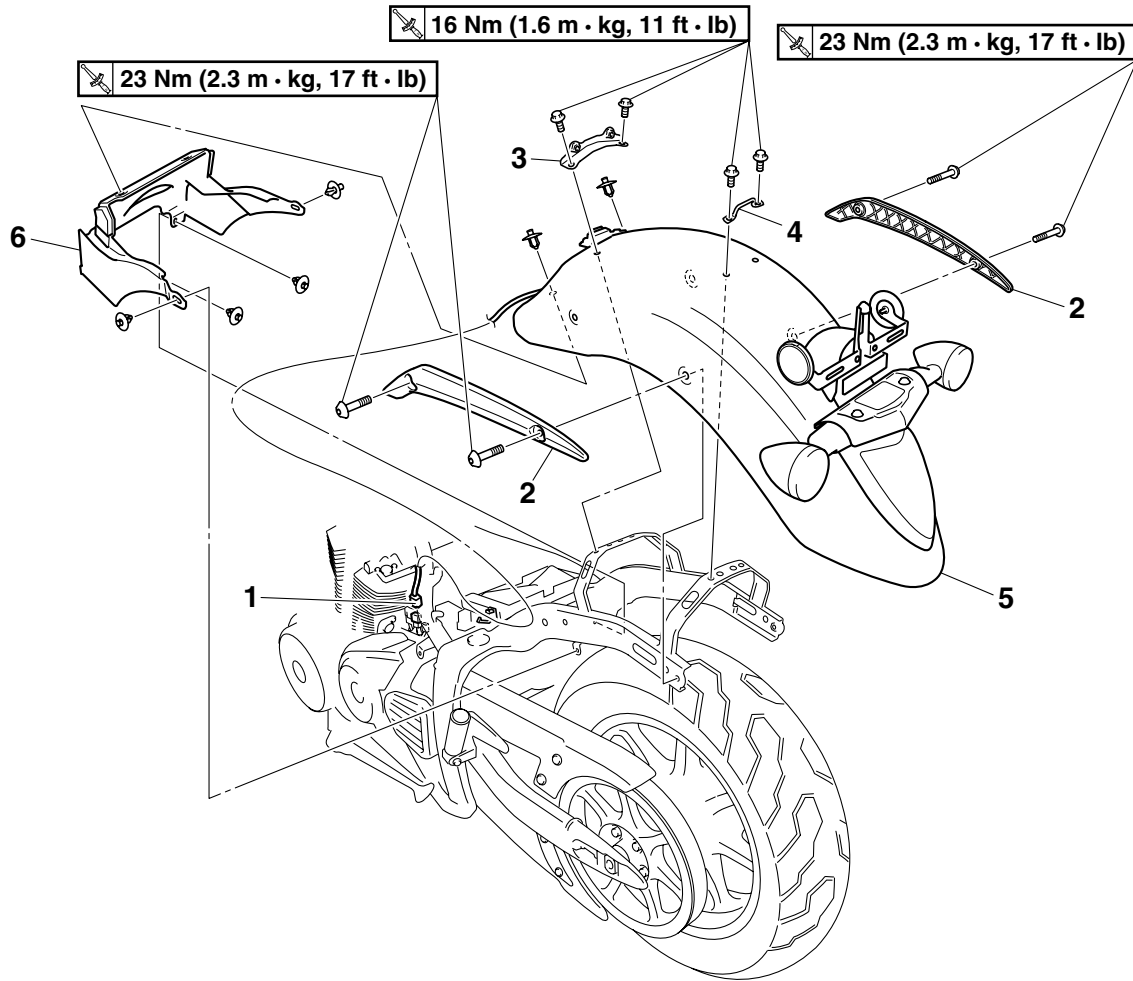
WARNING

Make sure the brake hoses are routed properly.

EAS22020

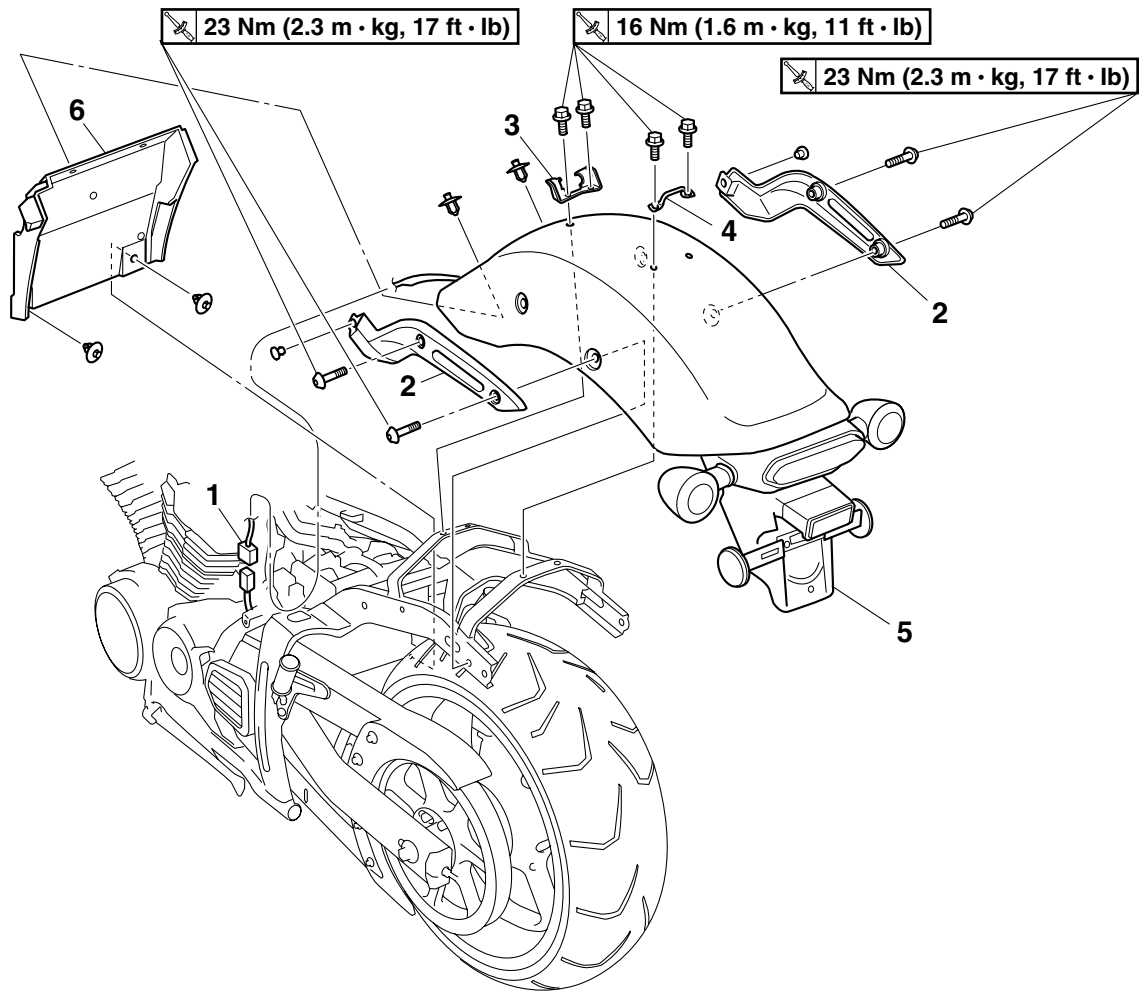
REAR WHEEL

Removing the rear fender (for XVS13AA(C)/XVS13CTA(C))



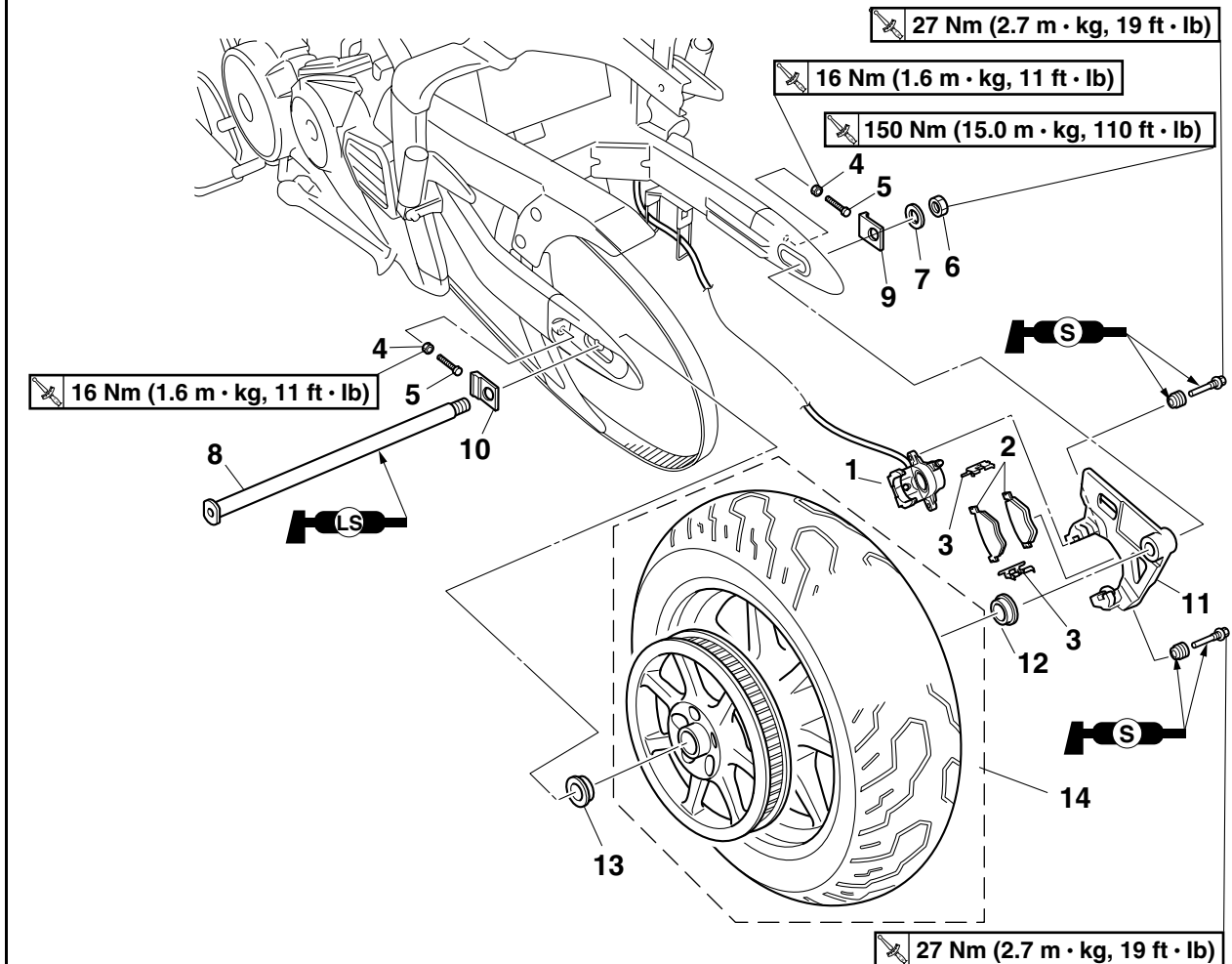
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Passenger seat/Seat lock bracket/Tool kit tray		Refer to "GENERAL CHASSIS" on page 4-1.
1	Tail/brake light wire harness coupler	1	Disconnect.
2	Rear fender bracket	2	
3	Passenger seat bracket	1	
4	Passenger seat guide	1	
5	Rear fender assembly	1	
6	Mudguard	1	
			For installation, reverse the removal procedure.

Removing the rear fender (for XVS13CA(C))



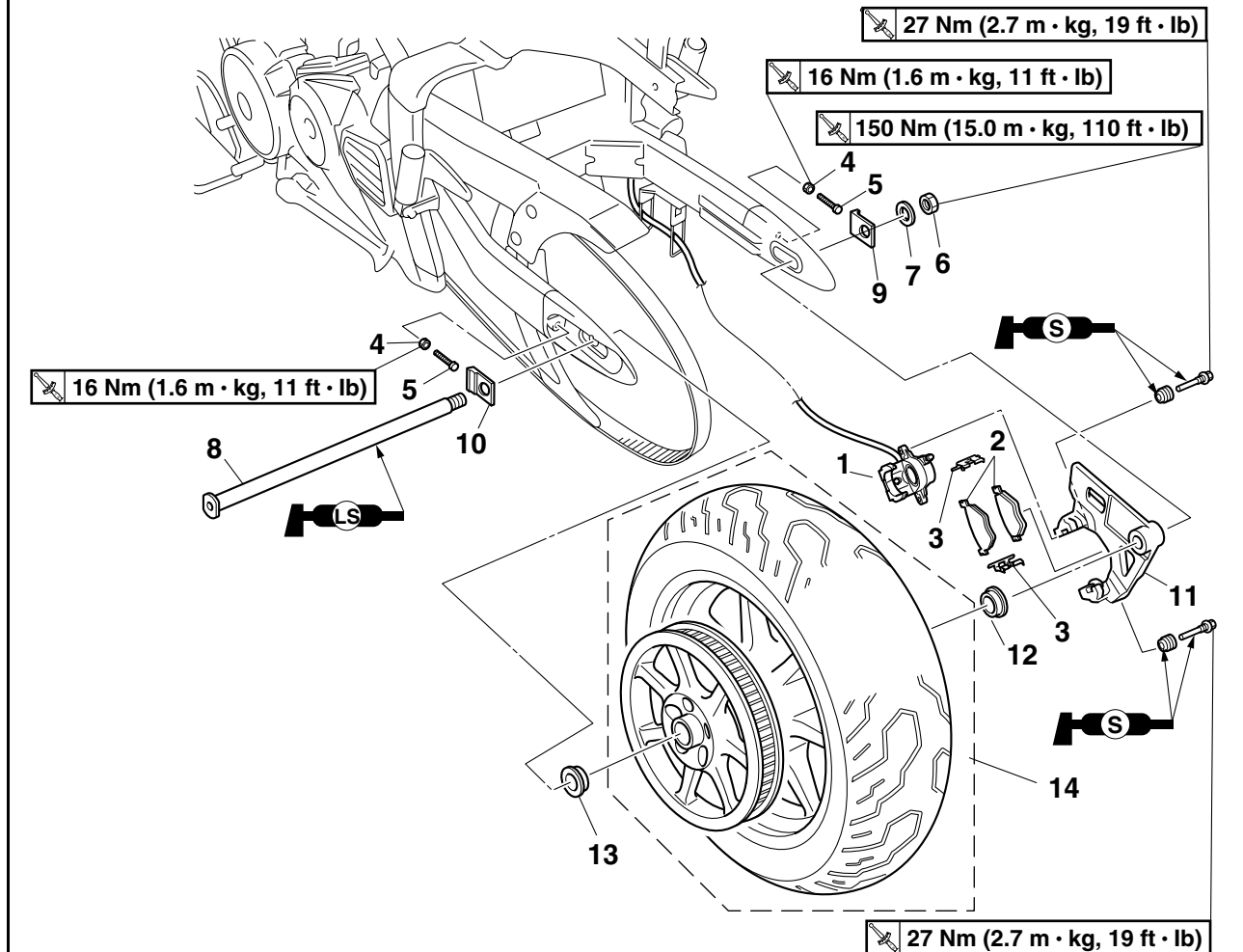
Order	Job/Parts to remove	Q'ty	Remarks
	Seat/Seat lock bracket/Tool kit tray		Refer to "GENERAL CHASSIS" on page 4-1.
1	Tail/brake light wire harness coupler	1	Disconnect.
2	Rear fender bracket	2	
3	Seat bracket	1	
4	Seat guide	1	
5	Rear fender assembly	1	
6	Mudguard	1	
			For installation, reverse the removal procedure.

Removing the rear wheel (for XVS13AA(C)/XVS13CTA(C))



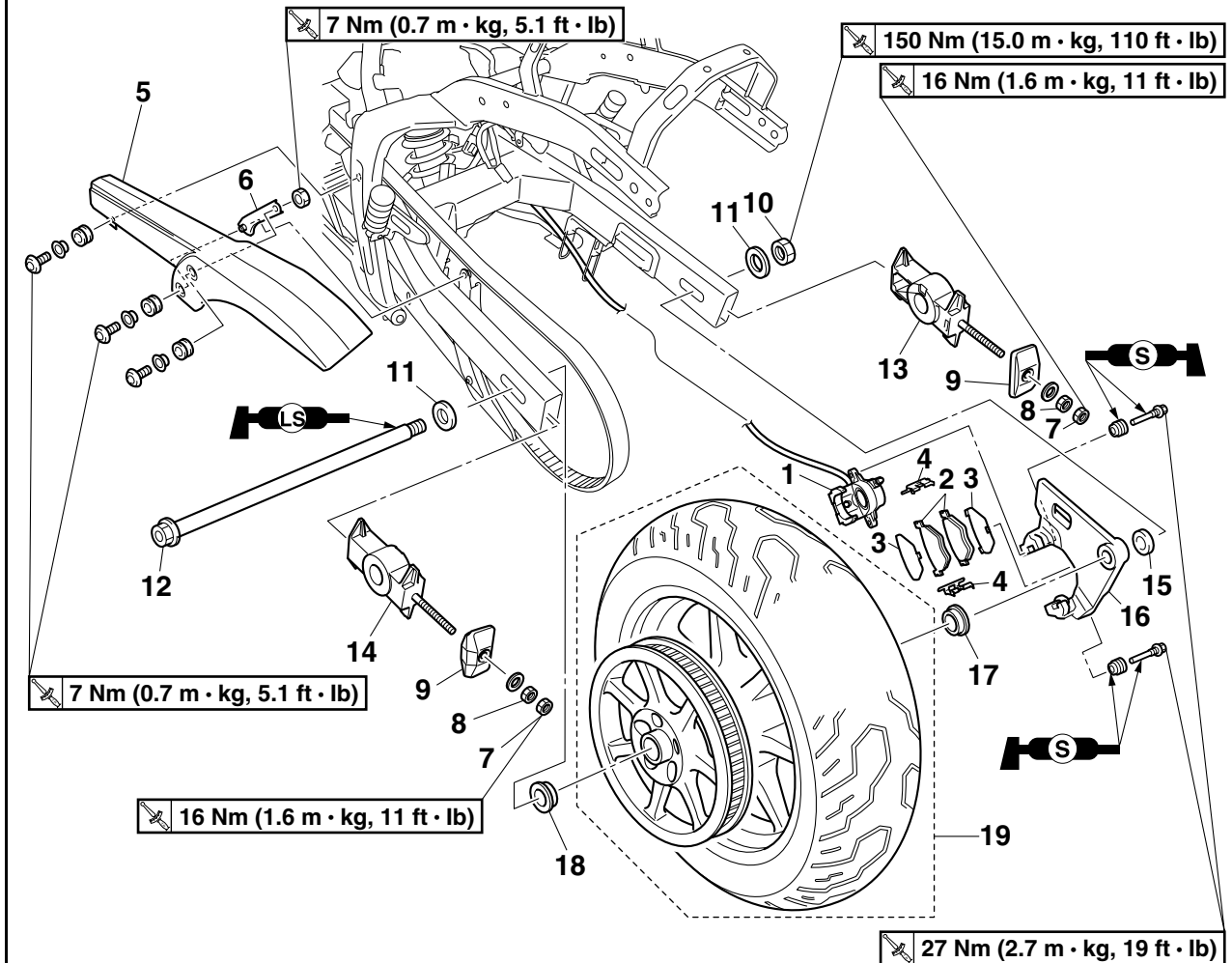
Order	Job/Parts to remove	Q'ty	Remarks
			TIP Place the vehicle on a suitable stand so that the rear wheel is elevated.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
1	Rear brake caliper	1	
2	Rear brake pad	2	
3	Brake pad spring	2	
4	Drive belt adjusting locknut	2	Loosen.
5	Drive belt adjusting bolt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

Removing the rear wheel (for XVS13AA(C)/XVS13CTA(C))



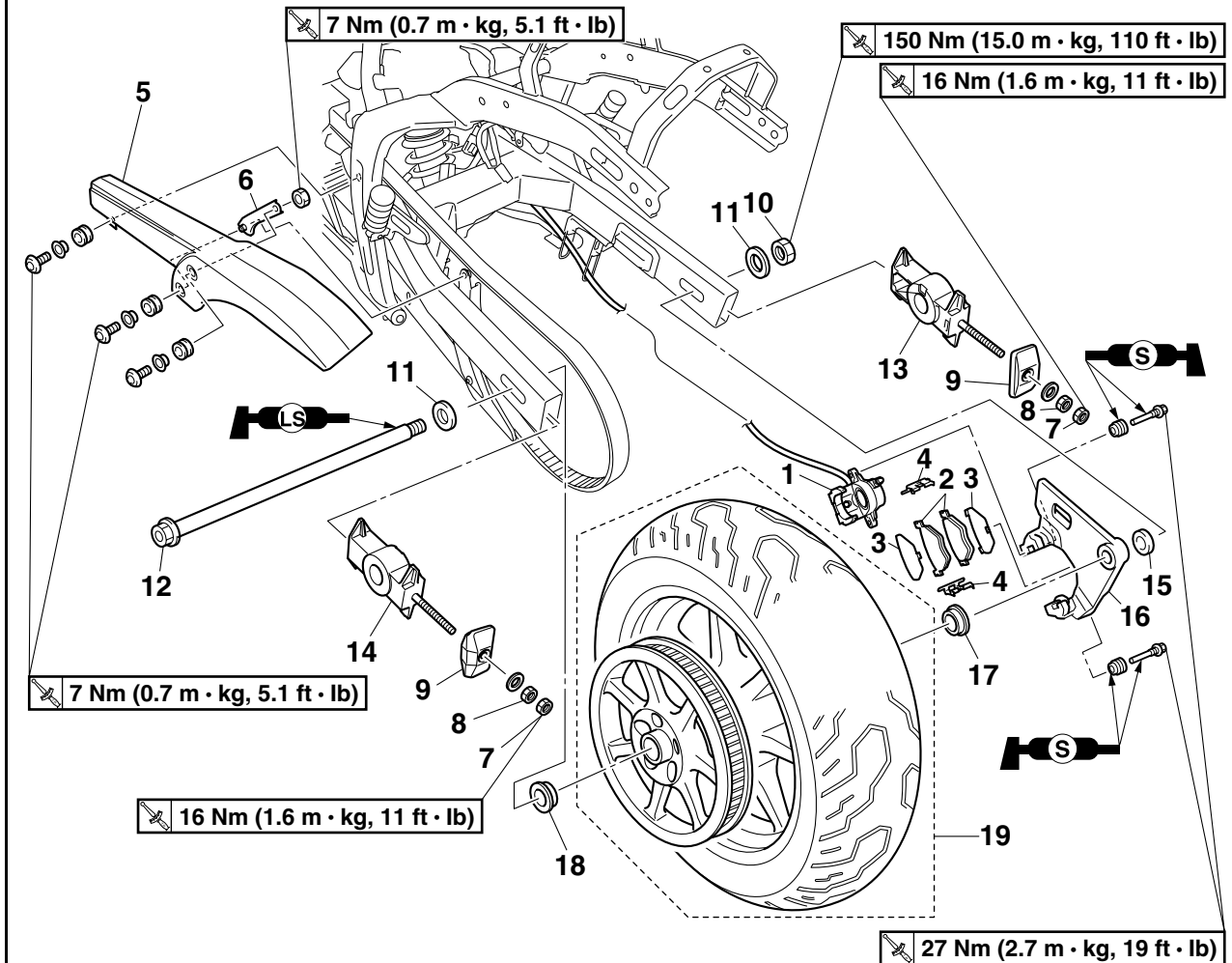
Order	Job/Parts to remove	Q'ty	Remarks
14	Rear wheel	1	
			For installation, reverse the removal procedure.

Removing the rear wheel (for XVS13CA(C))



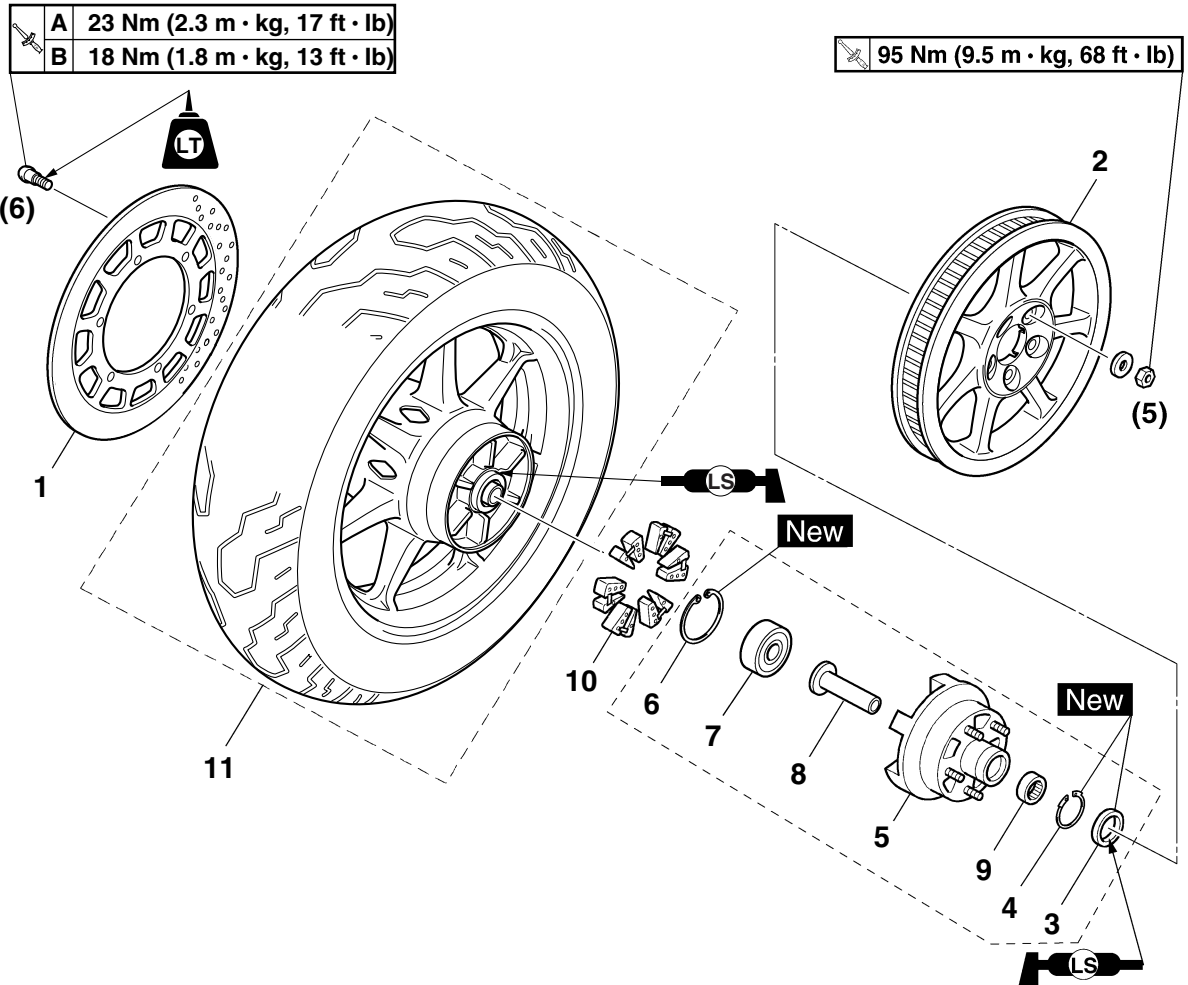
Order	Job/Parts to remove	Q'ty	Remarks
			TIP Place the vehicle on a suitable stand so that the rear wheel is elevated.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
1	Rear brake caliper	1	
2	Rear brake pad	2	
3	Brake pad shim	2	
4	Brake pad spring	2	
5	Drive belt upper guard	1	
6	Drive belt case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

Removing the rear wheel (for XVS13CA(C))



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

Removing the rear brake disc and rear wheel drive hub

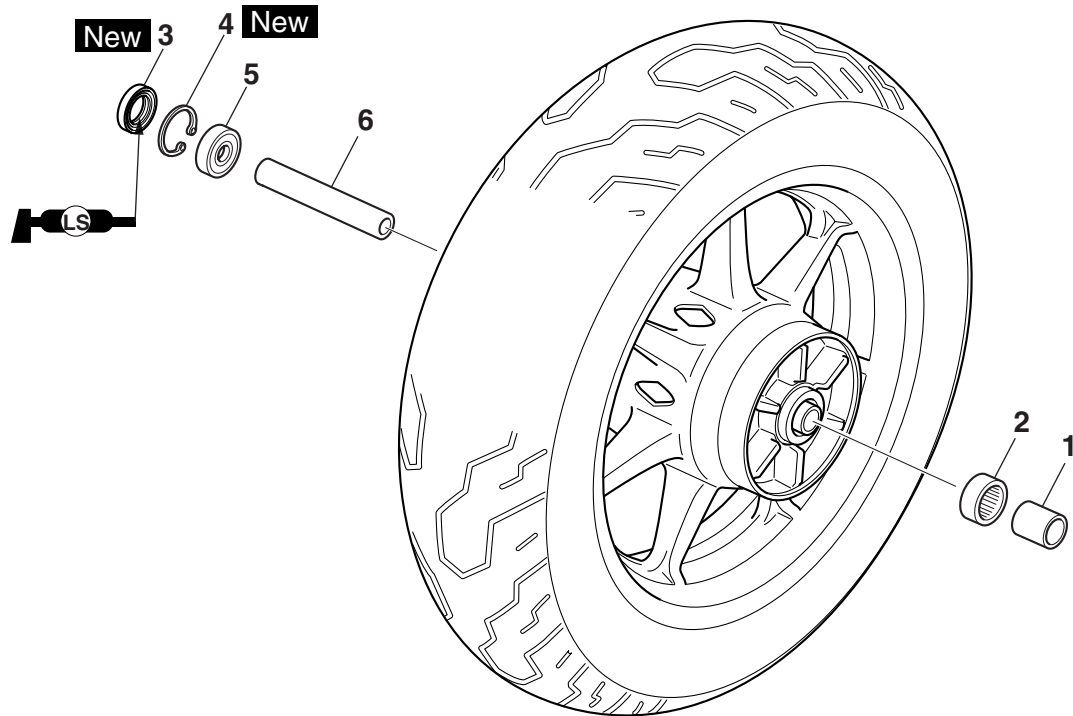


Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake disc	1	
2	Rear wheel pulley	1	
3	Oil seal	1	
4	Circlip	1	
5	Rear wheel drive hub	1	
6	Circlip	1	
7	Bearing	1	
8	Collar	1	
9	Bearing	1	
10	Rear wheel drive hub damper	6	
11	Rear wheel	1	
			For installation, reverse the removal procedure.

A: For XVS13AA(C)/XVS13CTA(C)

B: For XVS13CA(C)

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

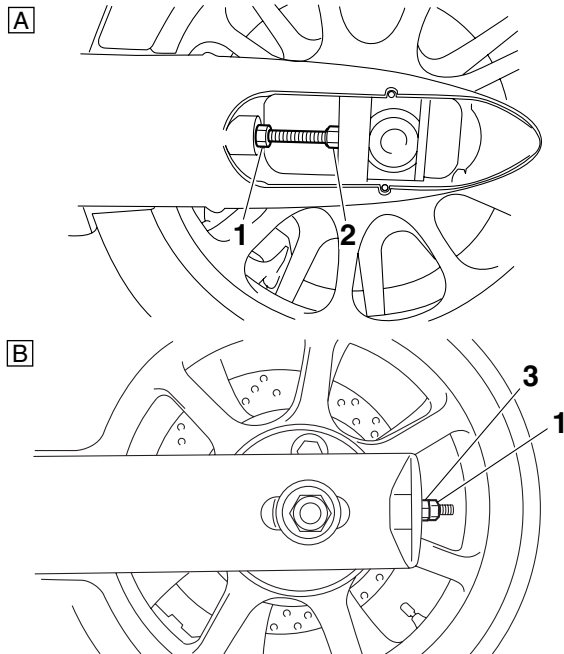
Place the vehicle on a suitable stand so that the rear wheel is elevated.

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 bolts "2" (for XVS13AA(C)/XVS13CTA(C))
 - Drive belt adjusting nuts "3" (for XVS13CA(C))



- A. For XVS13AA(C)/XVS13CTA(C)
- B. For XVS13CA(C)

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 4-15.

EAS22090

CHECKING THE REAR WHEEL

1. Check:
 - Rear wheel axle
 - Rear wheel
 - Wheel bearings
 - Oil seals
 Refer to "CHECKING THE FRONT WHEEL" on page 4-15.
2. Check:
 - Tire
 - Rear wheel
 Damage/wear → Replace.
 Refer to "CHECKING THE TIRES" on page 3-29 and "CHECKING THE WHEELS" on page 3-31.
3. Measure:
 - Radial wheel runout
 - Lateral wheel runout
 Refer to "CHECKING THE FRONT WHEEL" on page 4-15.



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
 - 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



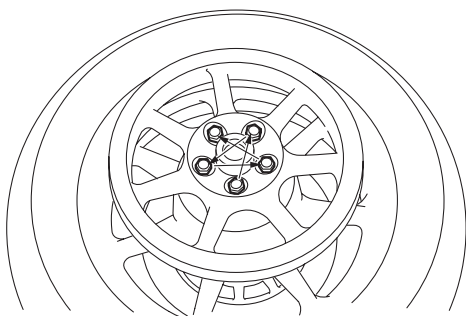
- Remove the self-locking nuts and the rear wheel pulley.
- Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the pulley.
- Install the new rear wheel pulley.



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

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 4-16.

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 4-16.

EAS28770

INSTALLING THE REAR WHEEL (REAR BRAKE DISC)

1. Lubricate:

- Rear wheel axle
- Oil seal lips



Recommended lubricant
Lithium-soap-based grease

2. Install:

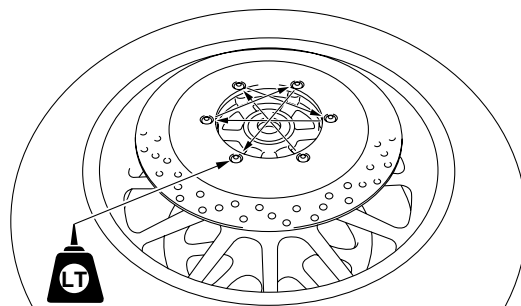
- Rear brake disc



Rear brake disc bolt (for XVS13AA(C)/XVS13CTA(C))
23 Nm (2.3 m·kg, 17 ft·lb)
LOCTITE®
Rear brake disc bolt (for XVS13CA(C))
18 Nm (1.8 m·kg, 13 ft·lb)
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 4-51.

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 (for XVS13AA(C)/XVS13CTA(C))” on page 3-24 and “ADJUSTING THE DRIVE BELT SLACK (for XVS13CA(C))” on page 3-26.

6. Tighten:

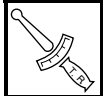
- Rear wheel axle nut



Rear wheel axle nut
150 Nm (15.0 m·kg, 110 ft·lb)

7. Install:

- Rear brake caliper



Rear brake caliper retaining bolt
27 Nm (2.7 m·kg, 19 ft·lb)

EWA13500



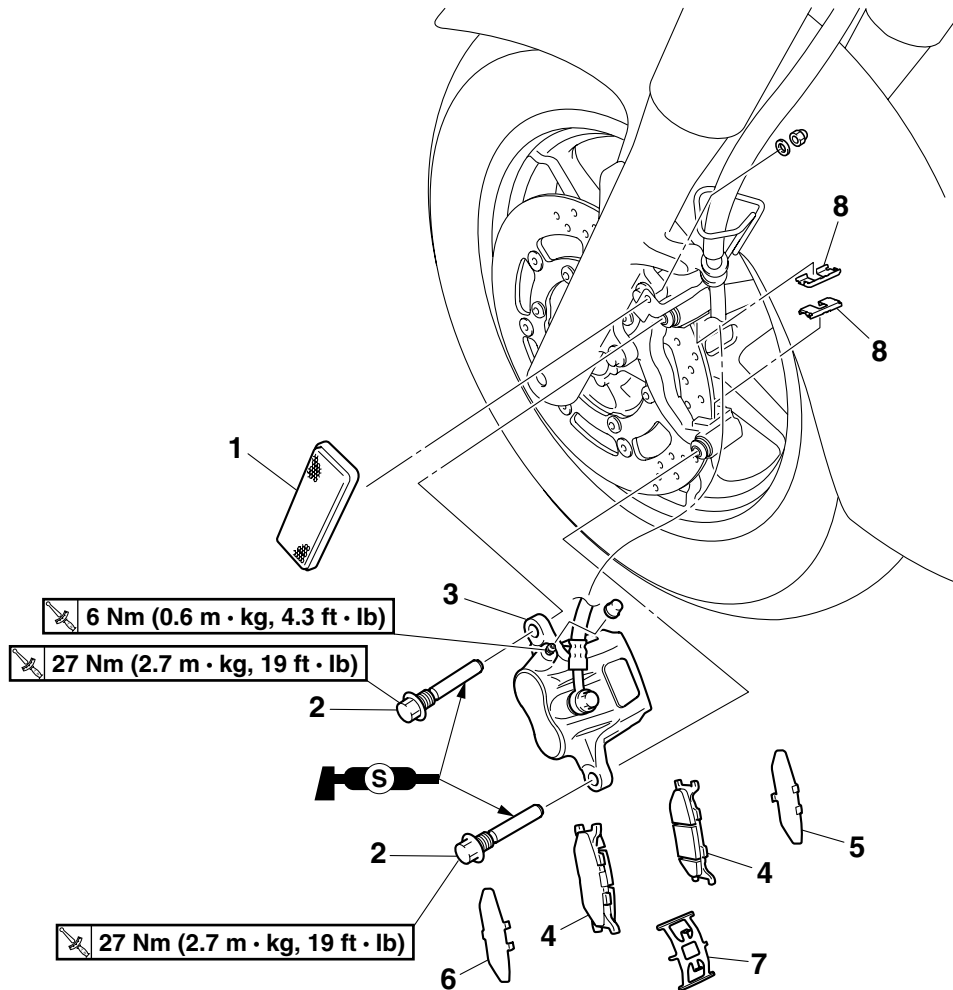
WARNING

Make sure the brake hose is routed properly.

EAS22210

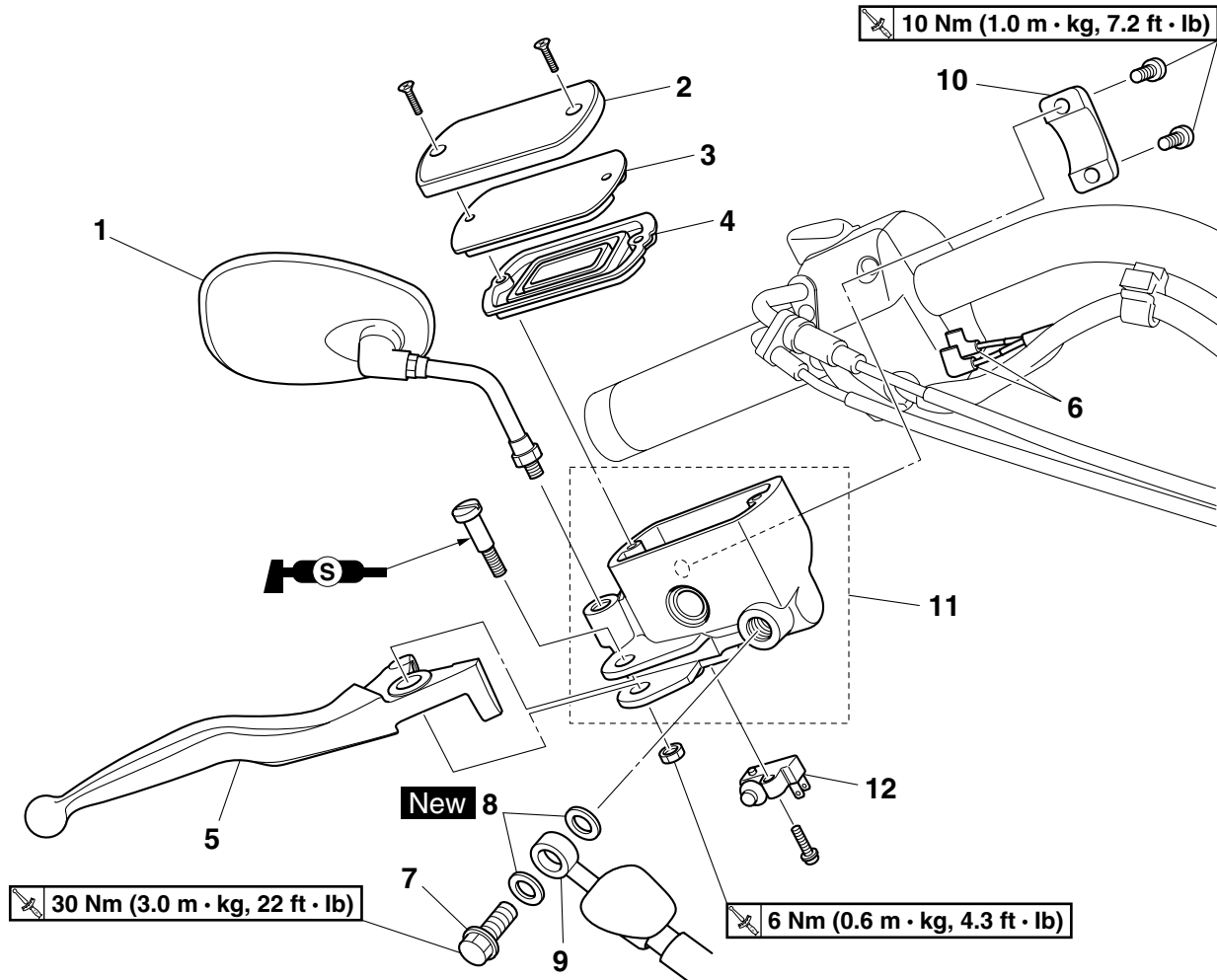
FRONT BRAKE

Removing the front brake pads



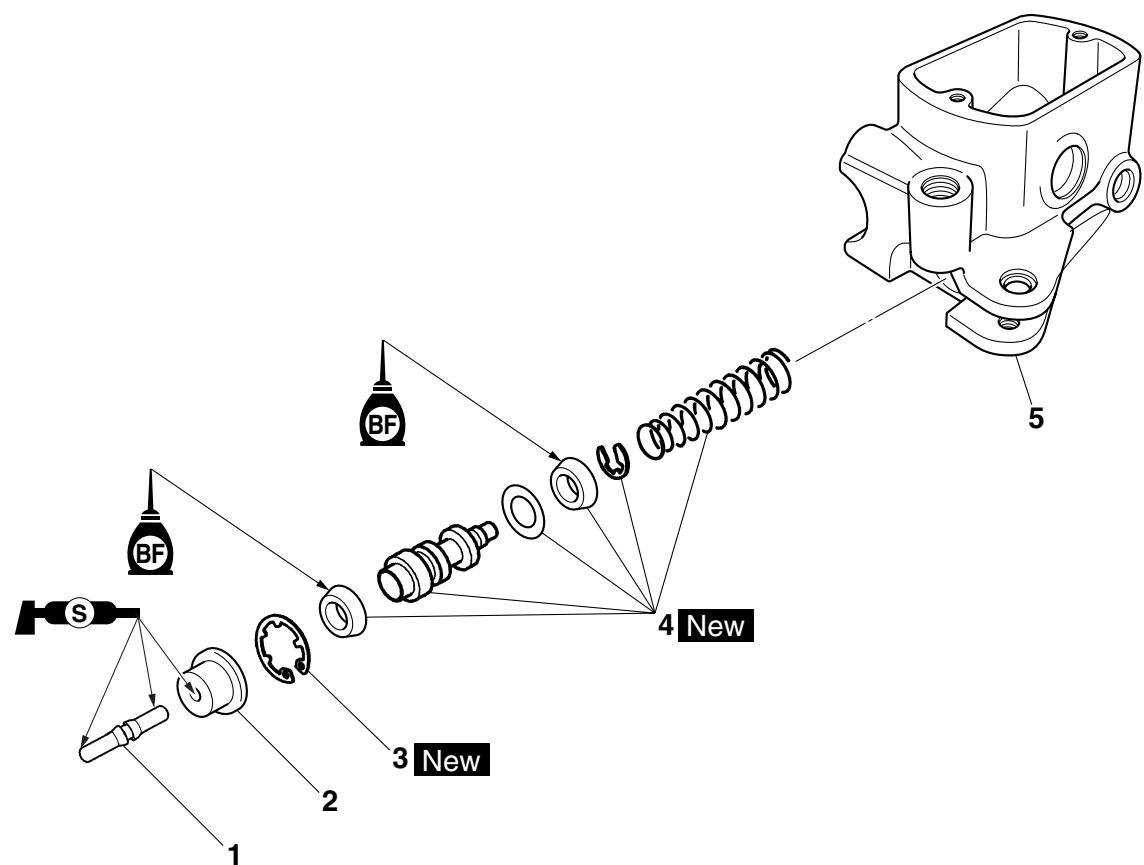
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers. (for XVS13AA(C)/XVS13CTA(C))
1	Reflector	1	For XVS13AA(C)/XVS13CTA(C)
2	Front brake caliper retaining bolt	2	
3	Front brake caliper	1	
4	Front brake pad	2	
5	Brake pad shim (inner)	1	
6	Brake pad shim (outer)	1	For XVS13CA(C)
7	Front brake pad spring	1	
8	Front brake pad support	2	
			For installation, reverse the removal procedure.

Removing the front brake master cylinder



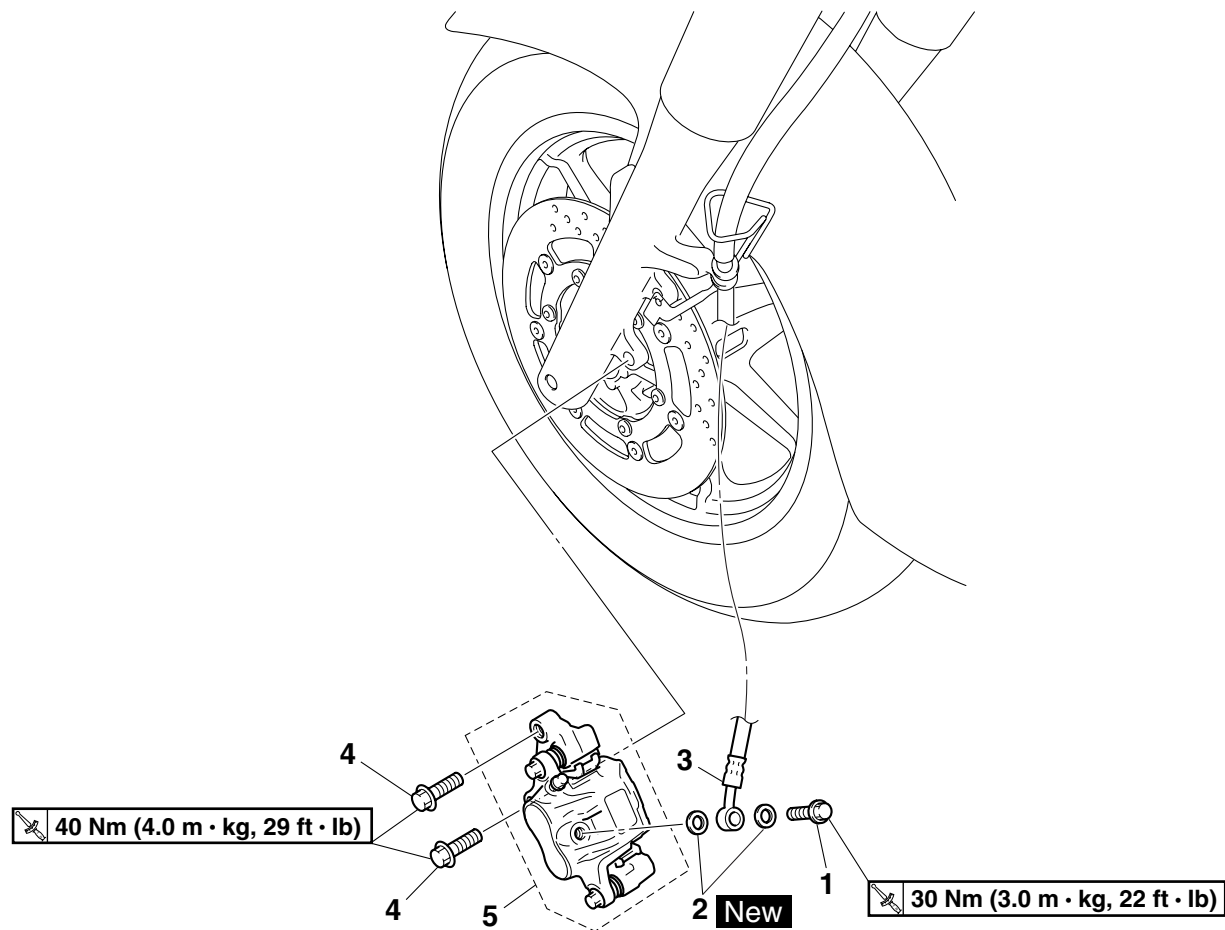
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-22.
1	Right rear view mirror	1	
2	Brake master cylinder reservoir cap	1	
3	Brake master cylinder reservoir diaphragm holder	1	
4	Brake master cylinder reservoir diaphragm	1	
5	Brake lever	1	
6	Front brake light switch connector	2	Disconnect.
7	Front brake hose union bolt	1	
8	Copper washer	2	
9	Front brake hose	1	
10	Front brake master cylinder holder	1	
11	Front brake master cylinder	1	
12	Front brake light switch	1	
			For installation, reverse the removal procedure.

Disassembling the front brake master cylinder



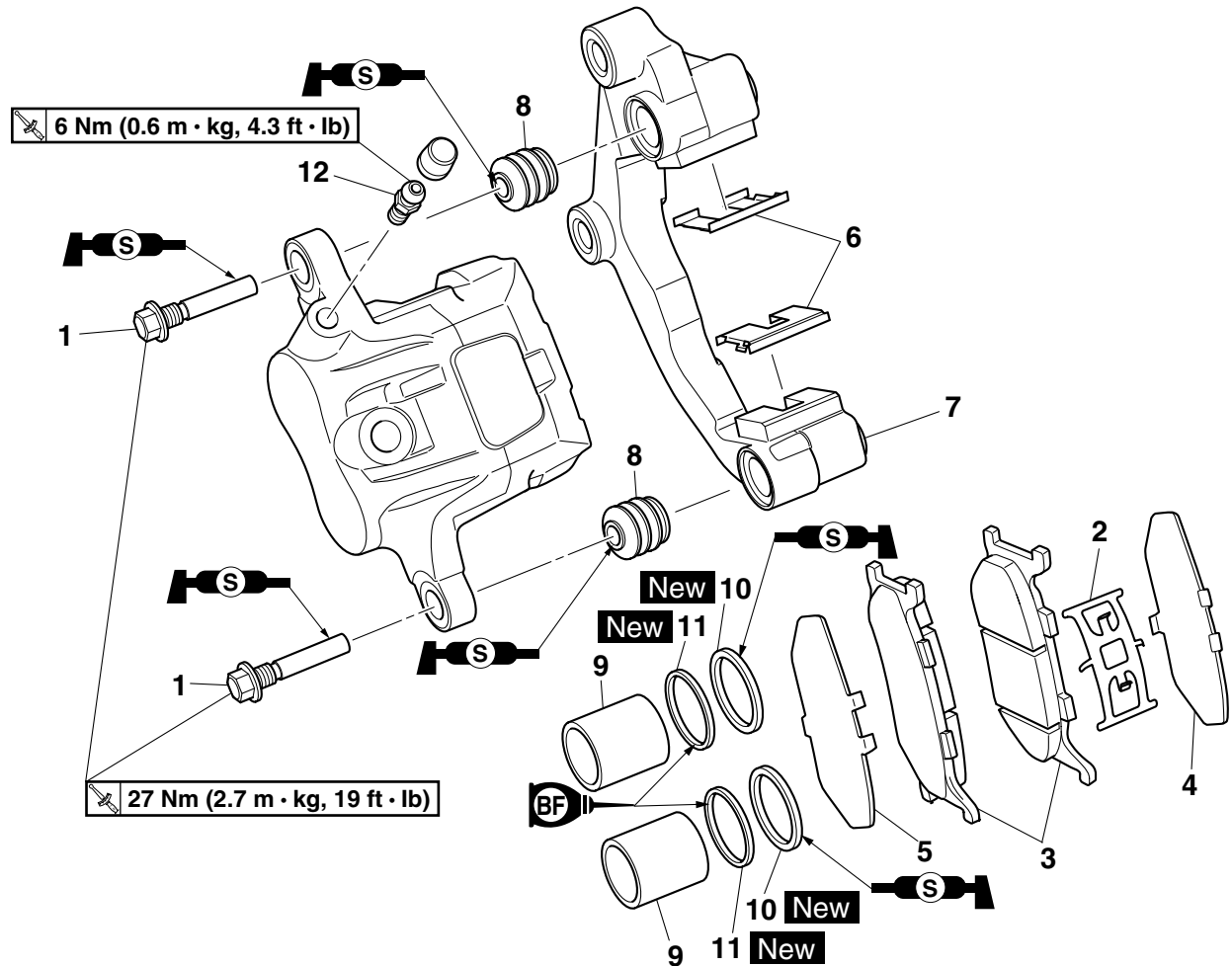
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder push rod	1	
2	Dust boot	1	
3	Circlip	1	
4	Brake master cylinder kit	1	
5	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.

Removing the front brake caliper(s)



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers. (for XVS13AA(C)/XVS13CTA(C))
	Reflector		For XVS13AA(C)/XVS13CTA(C) Refer to "FRONT BRAKE" on page 4-30.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-22.
1	Front brake hose union bolt	1	
2	Copper washer	2	
3	Front brake hose	1	
4	Front brake caliper bracket bolt	2	
5	Front brake caliper	1	
			For installation, reverse the removal procedure.

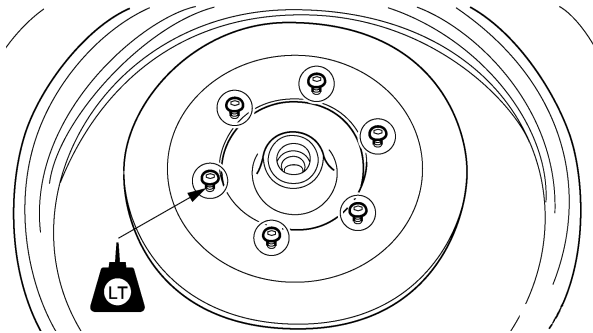
Disassembling the front brake caliper(s)



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers. (for XVS13AA(C)/XVS13CTA(C))
1	Front brake caliper retaining bolt	2	
2	Brake pad spring	1	
3	Brake pad	2	
4	Brake pad shim (inner)	1	
5	Brake pad shim (outer)	1	For XVS13CA(C)
6	Brake pad support	2	
7	Brake caliper bracket	1	
8	Rubber boot	2	
9	Brake caliper piston	2	
10	Brake caliper piston dust seal	2	
11	Brake caliper piston seal	2	
12	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

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 4-12.

EAS22260

REPLACING THE FRONT BRAKE PADS

TIP

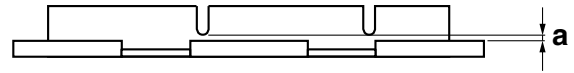
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Measure:

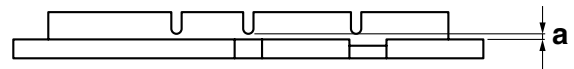
- Brake pad wear limit “a”
- Out of specification → Replace the brake pads as a set.

	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)

A



B



A. For XVS13AA(C)/XVS13CTA(C)

B. For XVS13CA(C)

2. Install:

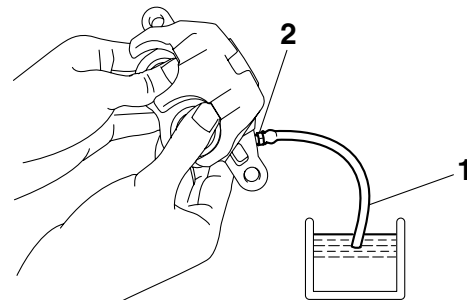
- Brake pad supports
- Brake pad shim (inner)
- Brake pad shim (outer) (for XVS13CA(C))
- Brake pads
- Brake pad spring

TIP

Always install new brake pads, brake pad shims, brake pad supports, and a 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·kg, 4.3 ft·lb)

- d. Install a new brake pad shim (inner), a new brake pad spring (outer) (for XVS13CA(C)) new brake pads, and a new brake pad spring.



3. Lubricate:
 - Front brake caliper retaining bolts



Recommended lubricant
Silicone grease

ECA14150

NOTICE

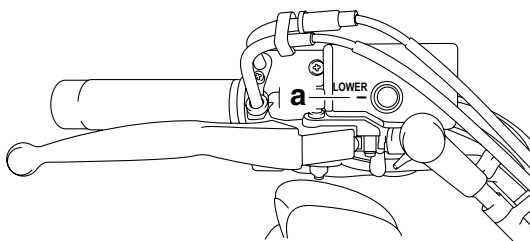
- Do not allow grease to contact the brake pads.
- Remove any excess grease.

4. Install:
 - Front brake caliper retaining bolts



Front brake caliper retaining bolt
27 Nm (2.7 m·kg, 19 ft·lb)

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 3-20.



6. Check:
 - Brake lever operation
Soft or spongy feeling → Bleed the brake system. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-22.

EAS27D1035

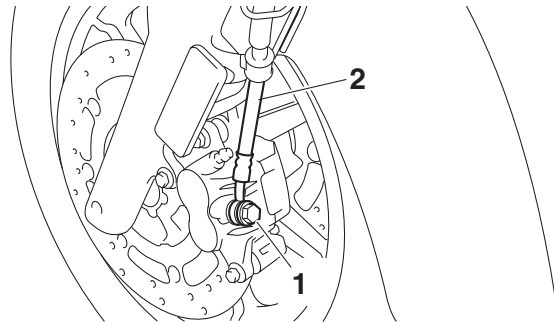
REMOVING THE FRONT BRAKE CALIPER(S)

The following procedure applies to both of the brake calipers. (For XVS13AA(C)/XVS13CTA(C))

TIP

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

1. Remove:
 - Front brake hose union bolt "1"
 - Copper washers
 - Front brake hose "2"



TIP

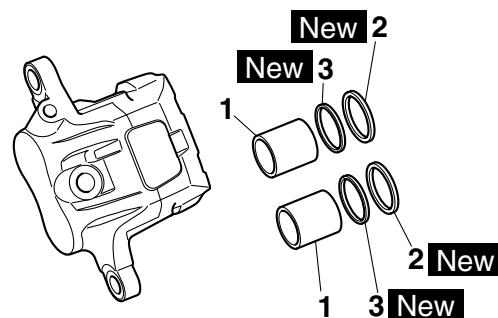
Put the end of the brake hose into a container and pump out the brake fluid carefully.

EAS27D1029

DISASSEMBLING THE FRONT BRAKE CALIPER(S)

The following procedure applies to both of the brake calipers. (For XVS13AA(C)/XVS13CTA(C))

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



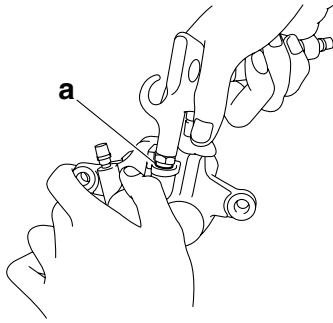
- a. Blow compressed air into the brake hose joint opening "a" to force out the pistons from the brake caliper.

EWA27D1002

WARNING

- Cover the brake caliper pistons with a rag. Be careful not to get injured when the pistons are expelled from the brake caliper.

- Never try to pry out the brake caliper pistons.



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



EAS27D1030

CHECKING THE FRONT BRAKE CALIPER(S)

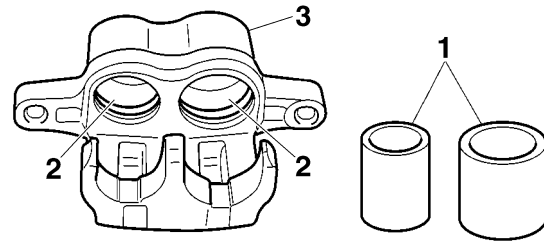
Recommended brake component replacement schedule	
Brake pads	If necessary
Piston dust seals	Every two years
Piston seals	Every two years
Brake hoses	Every four years
Brake fluid	Every two years and whenever the brake is disassembled

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

EWA3D84001



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.

EAS27D1031

ASSEMBLING THE FRONT BRAKE CALIPER(S)

EWA3D84002



- 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.



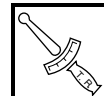
**Recommended fluid
DOT 4**

EAS27D1032

INSTALLING THE FRONT BRAKE CALIPER(S)

The following procedure applies to both of the brake calipers. (For XVS13AA(C)/XVS13CTA(C))

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



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

EWA27D1001

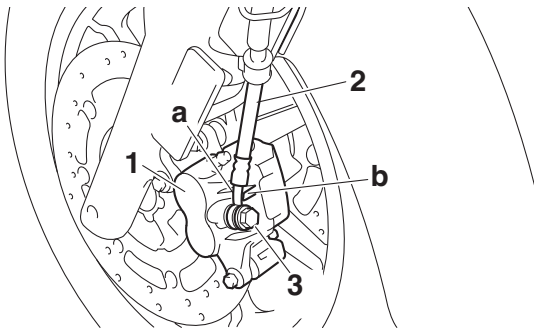
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))” on page 2-55 and “CABLE ROUTING (for XVS13CA(C))” on page 2-79.

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 pad shim (inner)
- Brake pad shim (outer) (for XVS13CA(C))
- Brake pads
- Brake pad spring
- Front brake caliper



Front brake caliper retaining bolt
27 Nm (2.7 m·kg, 19 ft·lb)
Front brake caliper bracket bolt
40 Nm (4.0 m·kg, 29 ft·lb)

Refer to “REPLACING THE FRONT BRAKE PADS” on page 4-36.

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

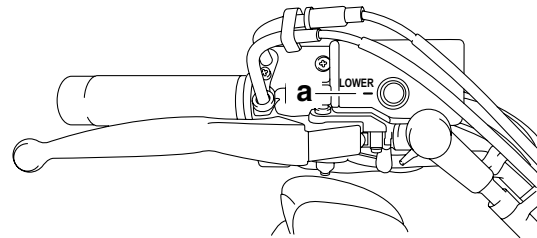
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-22.

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 3-20.



7. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-22.

EAS22490

REMOVING THE FRONT BRAKE MASTER CYLINDER

TIP

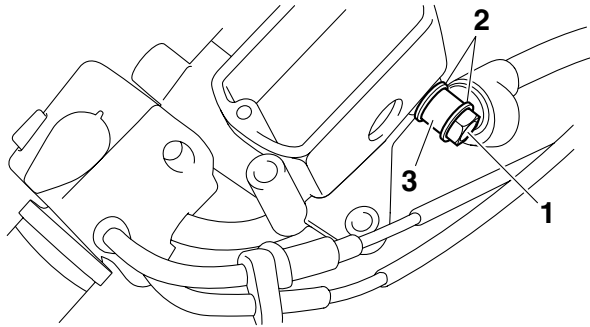
Before removing the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:

- Front brake hose union bolt “1”
- Copper 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 hoses
Cracks/damage/wear → Replace.

EAS22520

ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

EWA13520

WARNING

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

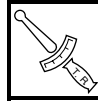


Recommended fluid
DOT 4

EAS22530

INSTALLING THE FRONT BRAKE MASTER CYLINDER

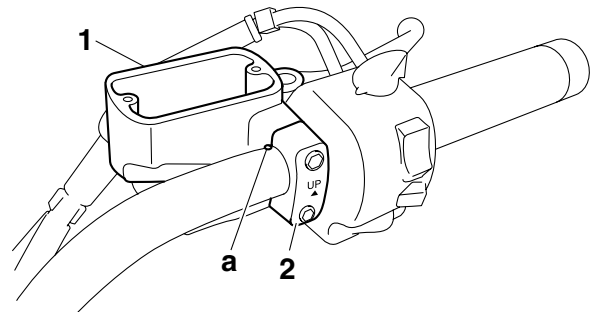
1. Install:
 - Front brake master cylinder “1”
 - Front brake master cylinder holder “2”



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

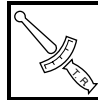
TIP

- 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:

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



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

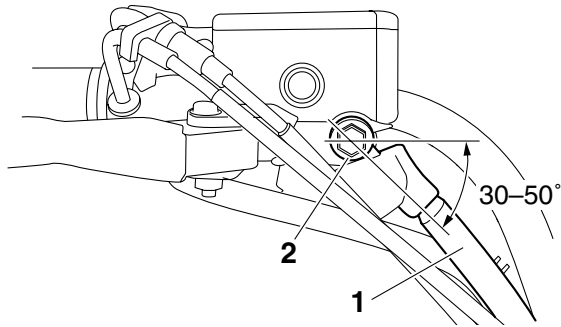
EWA27D1001

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))” on page 2-55 and “CABLE ROUTING (for XVS13CA(C))” on page 2-79.

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

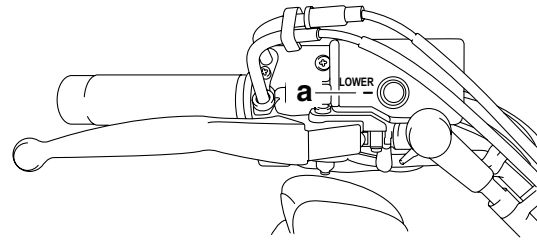
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-22.

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 3-20.



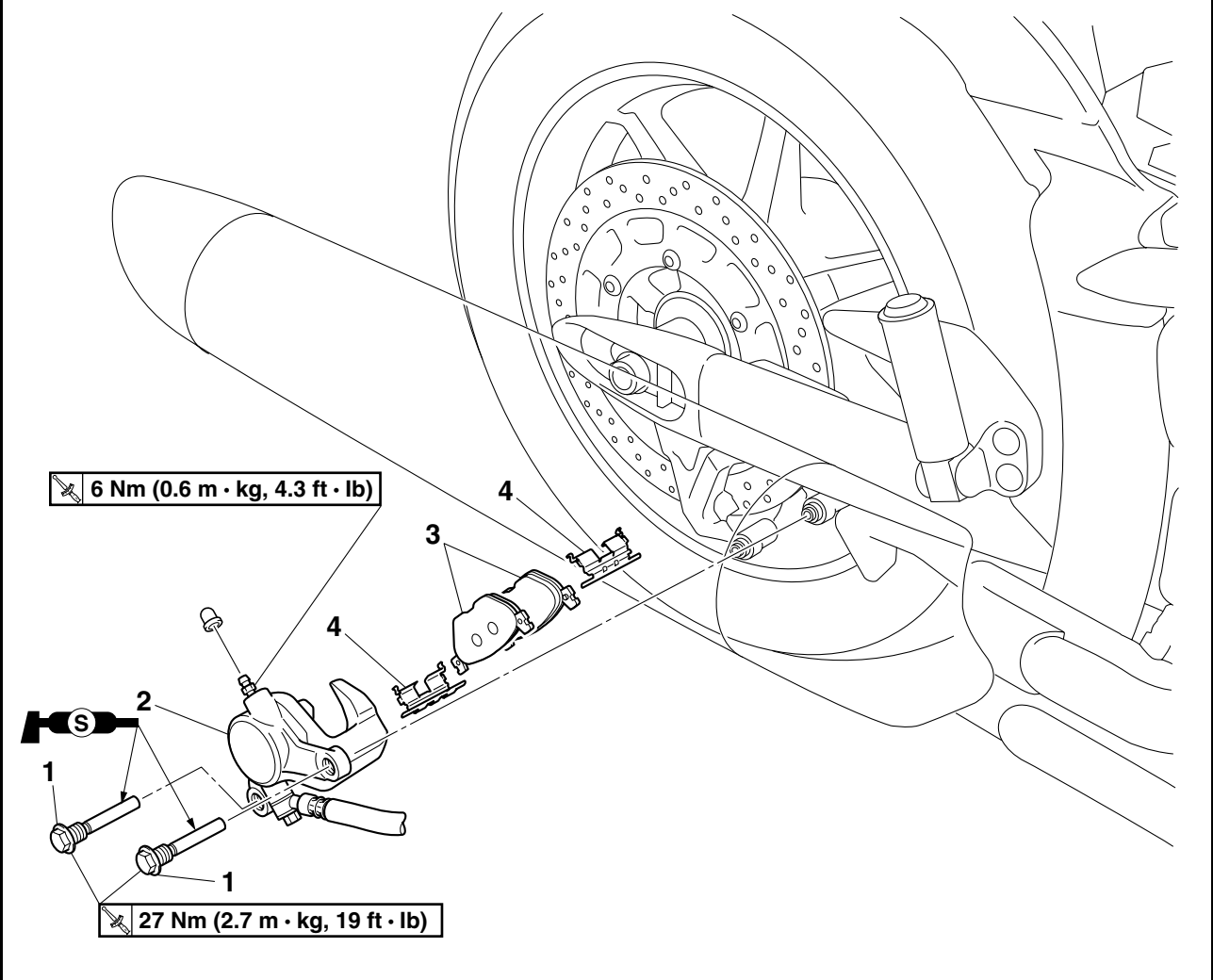
6. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-22.

EAS22550

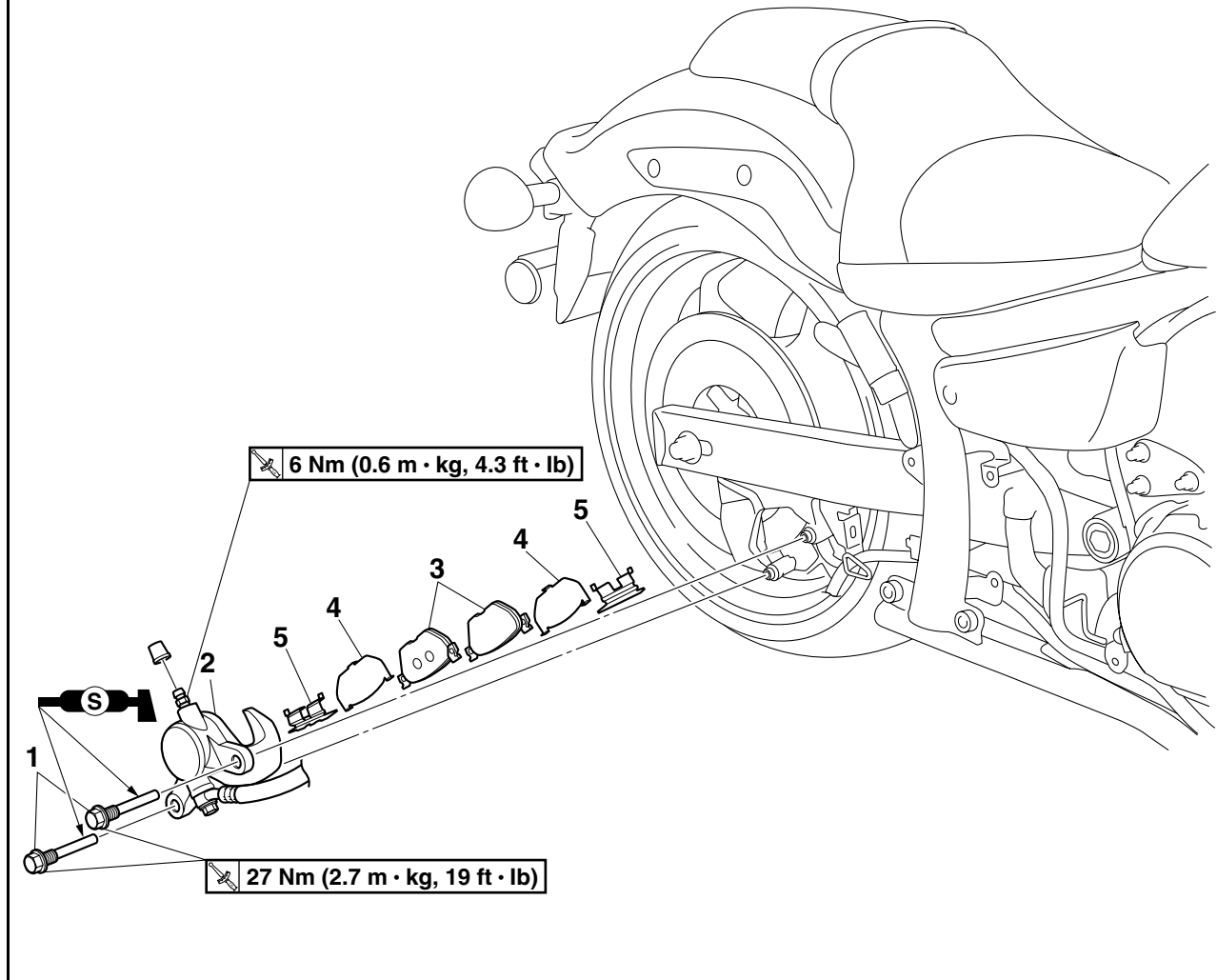
REAR BRAKE

Removing the rear brake pads (for XVS13AA(C)/XVS13CTA(C))



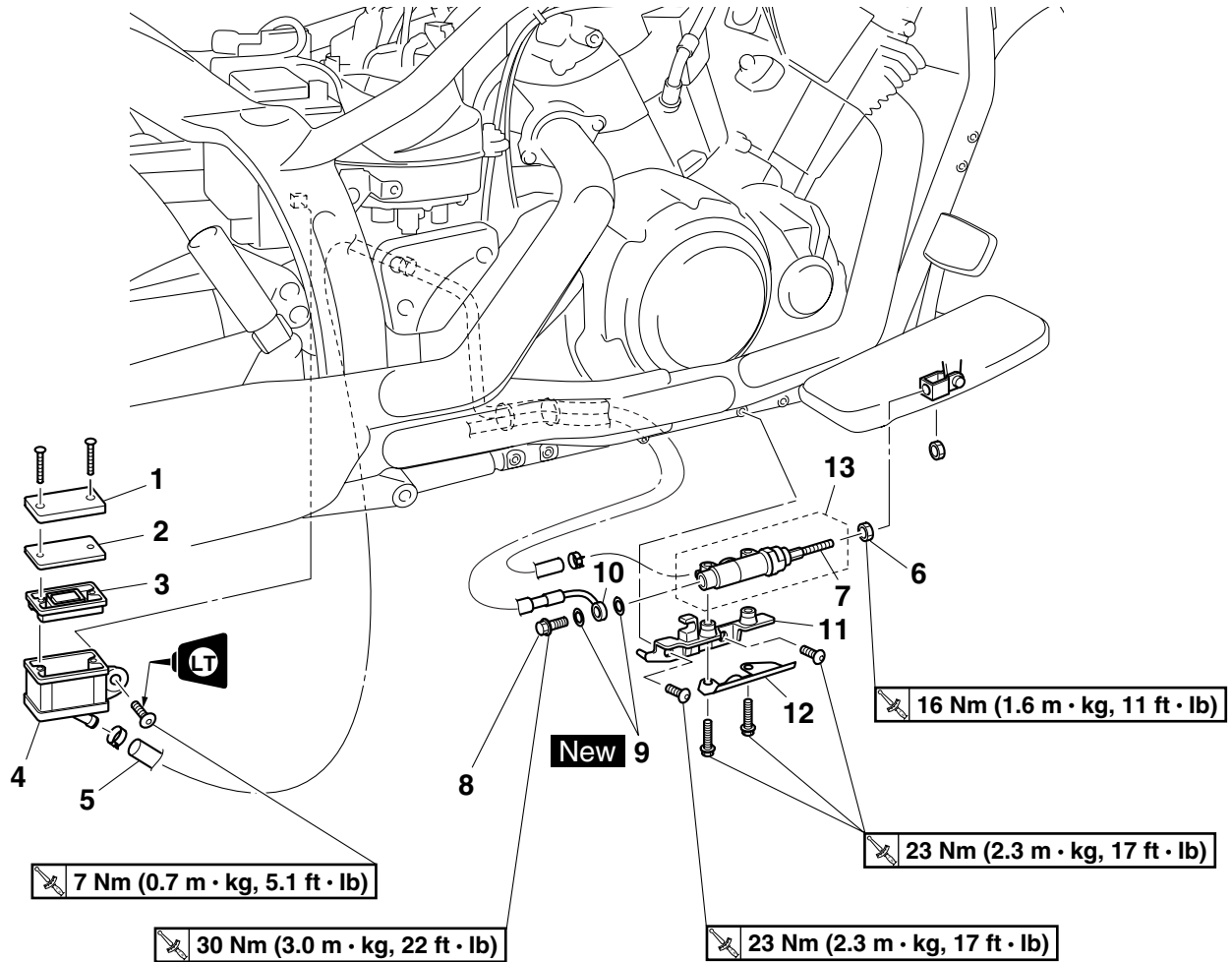
Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake caliper retaining bolt	2	
2	Rear brake caliper	1	
3	Rear brake pad	2	
4	Brake pad spring	2	
			For installation, reverse the removal procedure.

Removing the rear brake pads (for XVS13CA(C))



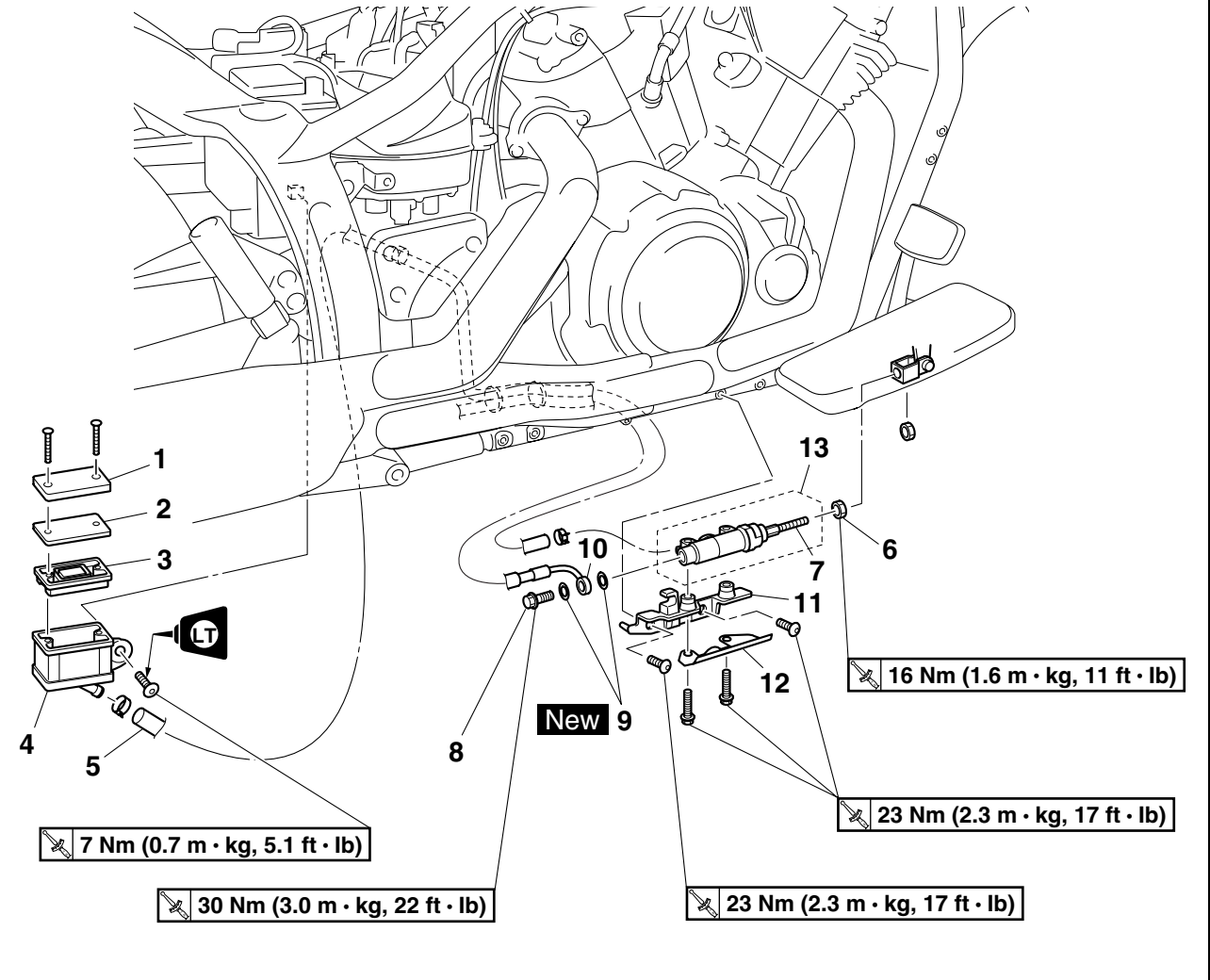
Order	Job/Parts to remove	Q'ty	Remarks
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
1	Rear brake caliper retaining bolt	2	
2	Rear brake caliper	1	
3	Rear brake pad	2	
4	Brake pad shim	2	
5	Brake pad spring	2	
			For installation, reverse the removal procedure.

Removing the rear brake master cylinder (for XVS13AA(C)/XVS13CTA(C))



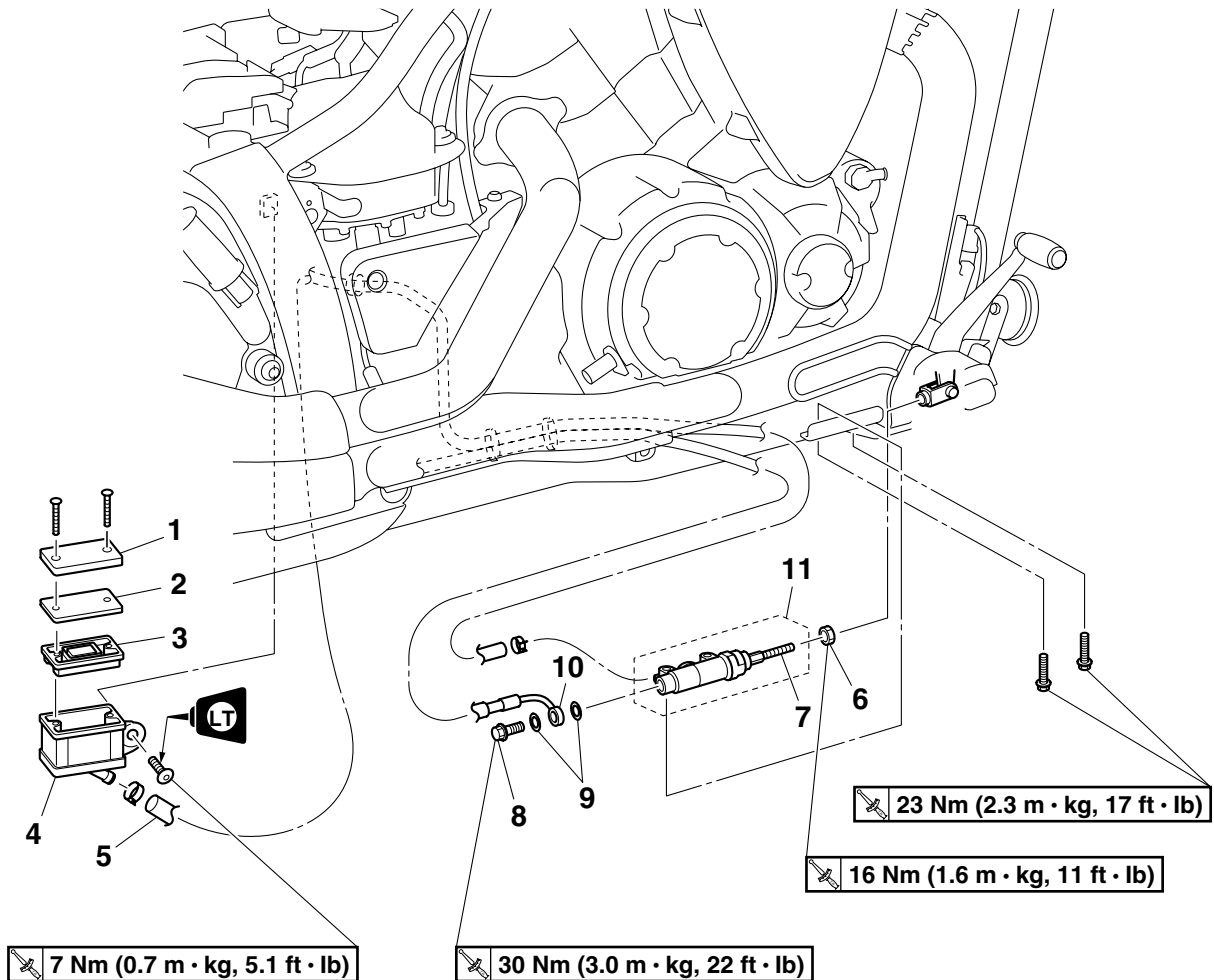
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-22.
	Sub-fuel tank cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Brake fluid reservoir cap	1	
2	Brake fluid reservoir diaphragm holder	1	
3	Brake fluid reservoir diaphragm	1	
4	Brake fluid reservoir	1	
5	Brake fluid reservoir hose	1	
6	Locknut (rear brake master cylinder)	1	Loosen.
7	Brake pedal adjusting bolt	1	Loosen.
8	Rear brake hose union bolt	1	
9	Copper washer	2	
10	Rear brake hose	1	
11	Rear brake master cylinder bracket	1	
12	Rear brake master cylinder cover	1	

Removing the rear brake master cylinder (for XVS13AA(C)/XVS13CTA(C))



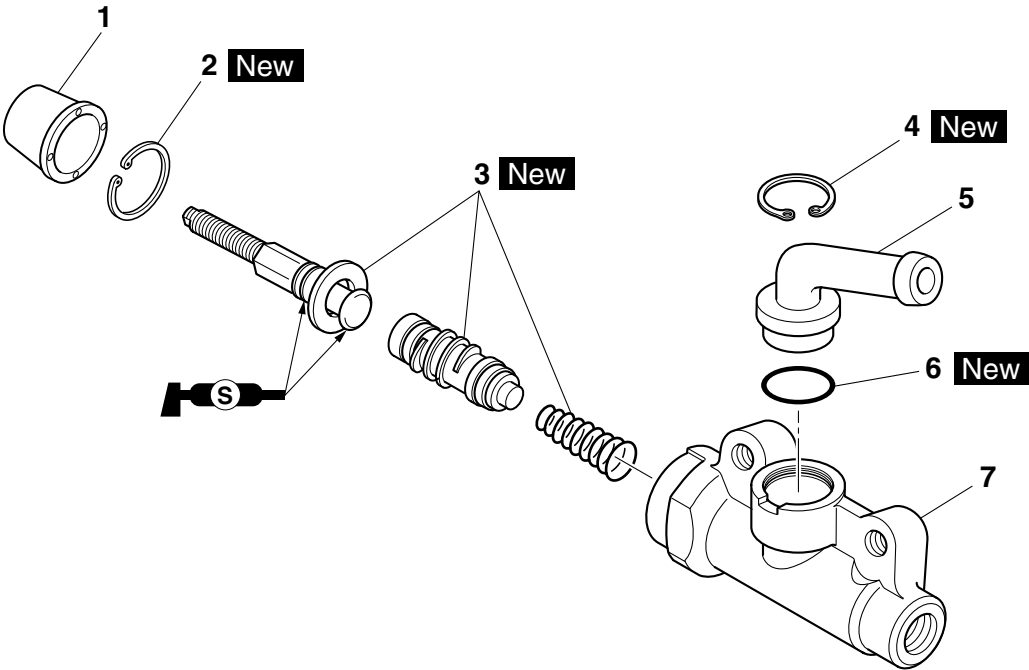
Order	Job/Parts to remove	Q'ty	Remarks
13	Rear brake master cylinder	1	
			For installation, reverse the removal procedure.

Removing the rear brake master cylinder (for XVS13CA(C))



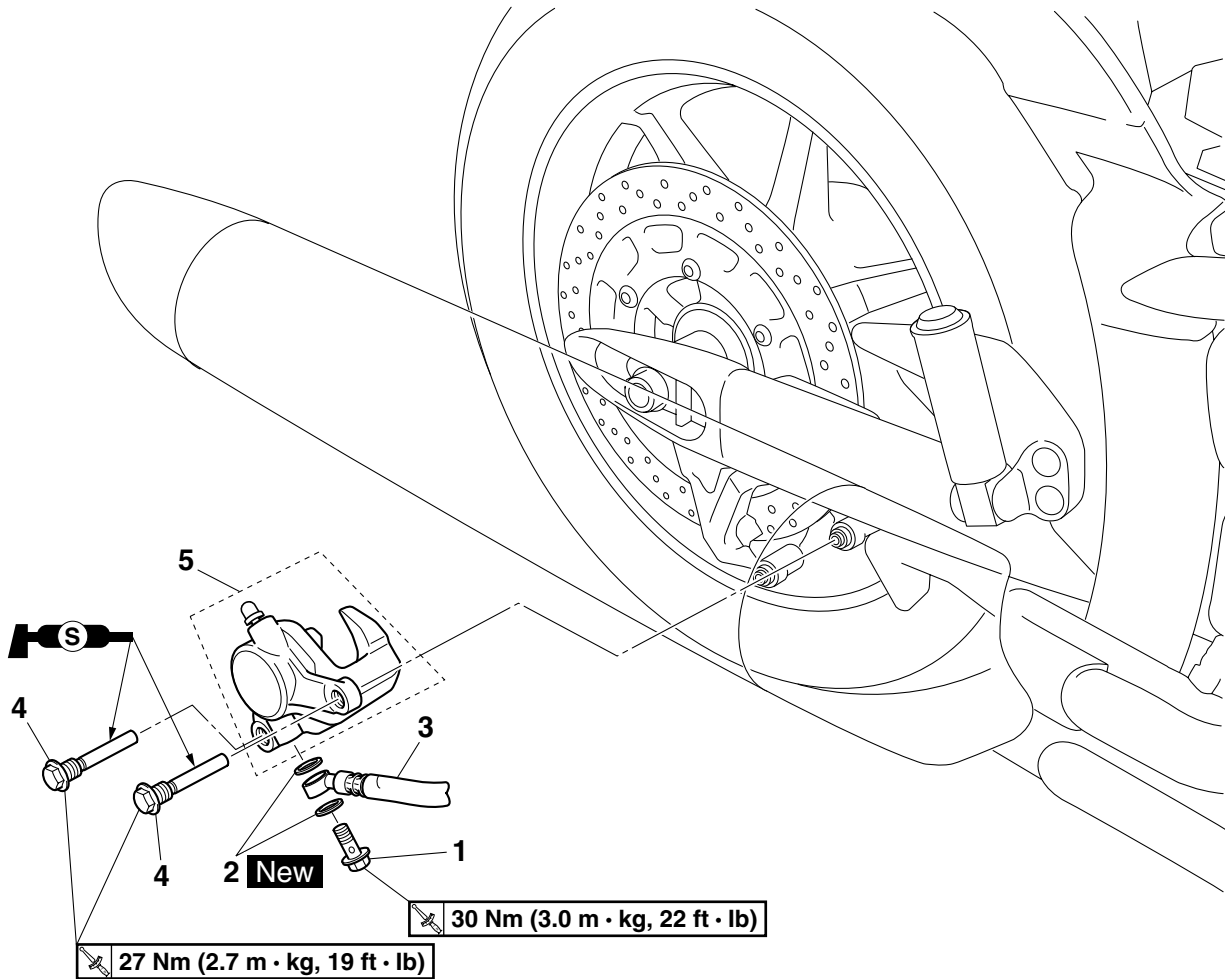
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-22.
	Sub-fuel tank cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Brake fluid reservoir cap	1	
2	Brake fluid reservoir diaphragm holder	1	
3	Brake fluid reservoir diaphragm	1	
4	Brake fluid reservoir	1	
5	Brake fluid reservoir hose	1	
6	Locknut (rear brake master cylinder)	1	Loosen.
7	Brake pedal adjusting bolt	1	Loosen.
8	Rear brake hose union bolt	1	
9	Copper washer	2	
10	Rear brake hose	1	
11	Rear brake master cylinder	1	
			For installation, reverse the removal procedure.

Disassembling the rear brake master cylinder



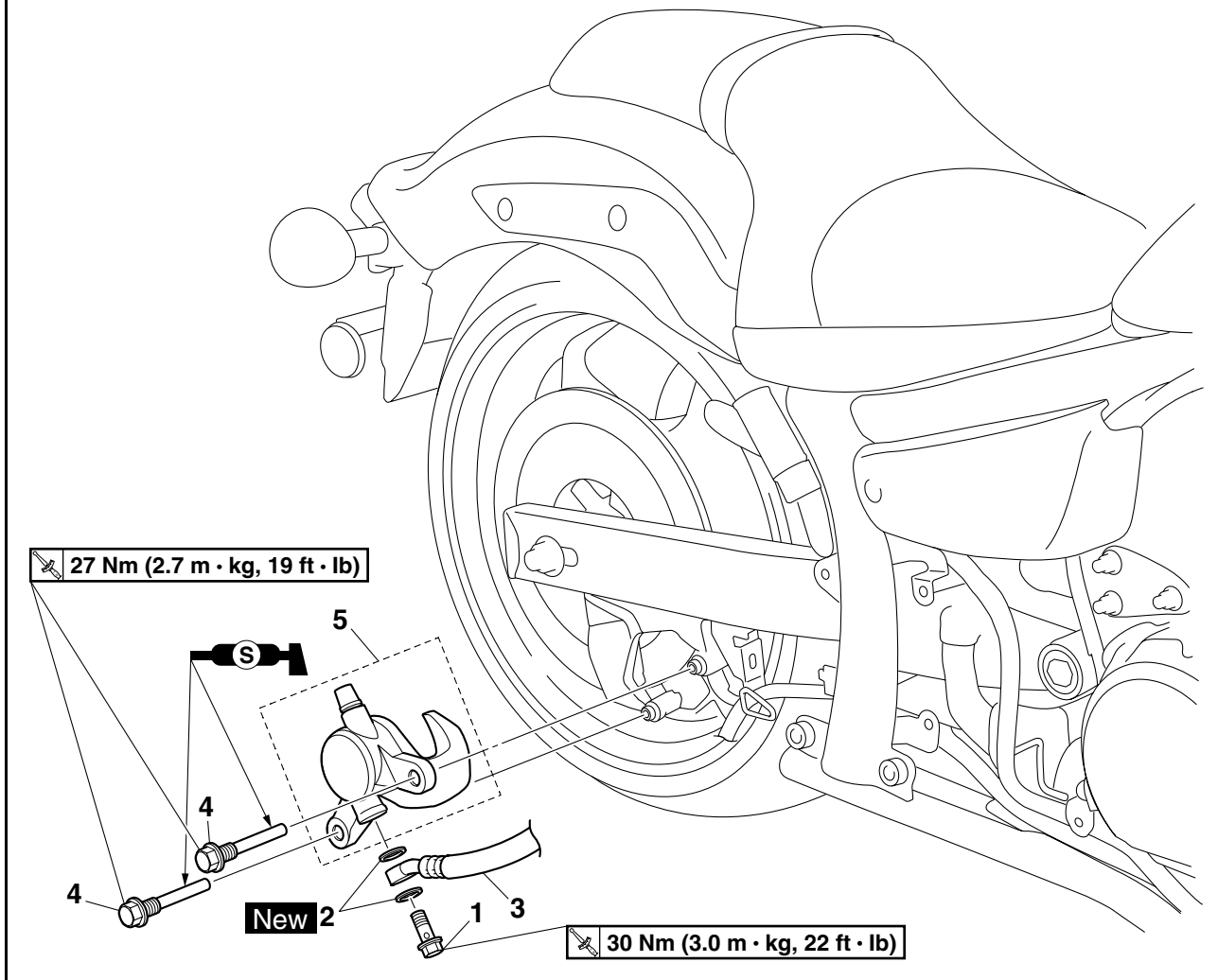
Order	Job/Parts to remove	Q'ty	Remarks
1	Dust boot	1	
2	Circlip	1	
3	Brake master cylinder kit	1	
4	Circlip	1	
5	Brake hose joint	1	
6	O-ring	1	
7	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.

Removing the rear brake caliper (for XVS13AA(C)/XVS13CTA(C))



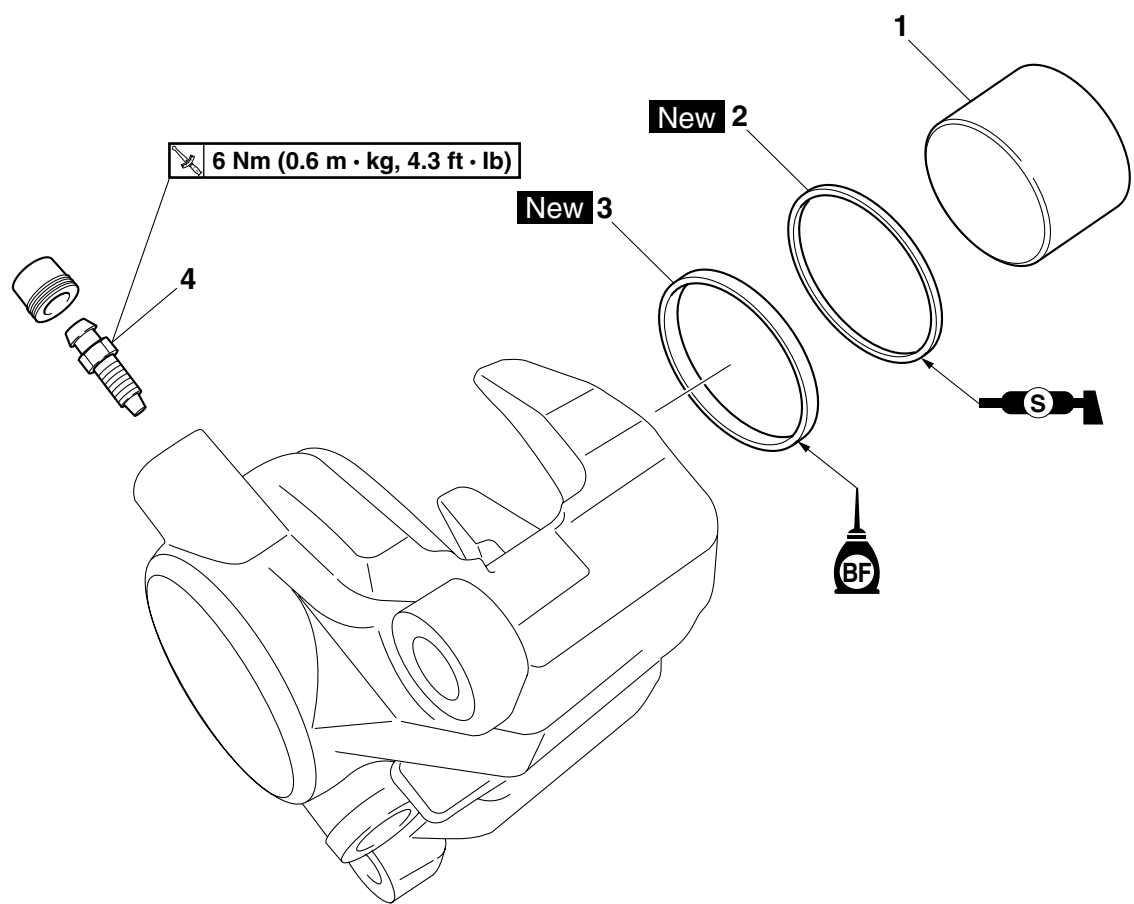
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-22.
1	Rear brake hose union bolt	1	
2	Copper washer	2	
3	Rear brake hose	1	
4	Rear brake caliper retaining bolt	2	
5	Rear brake caliper	1	
			For installation, reverse the removal procedure.

Removing the rear brake caliper (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-22.
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.**
- **Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.**
- **Avoid brake fluid coming into contact with the eyes as it can cause serious injury.**
- **FIRST AID FOR BRAKE FLUID ENTERING THE EYES:**
- **Flush with water for 15 minutes and get immediate medical attention.**

EAS22570

CHECKING THE REAR BRAKE DISC

1. Remove:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-19.
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(S)" on page 4-35.



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(S)" on page 4-35.



Brake disc thickness limit
5.5 mm (0.22 in)

5. Adjust:
 - Brake disc deflection
Refer to "CHECKING THE FRONT BRAKE DISC(S)" on page 4-35.



Brake disc bolt
23 Nm (2.3 m·kg, 17 ft·lb)
LOCTITE®

6. Install:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-19.

EAS22580

REPLACING THE REAR BRAKE PADS

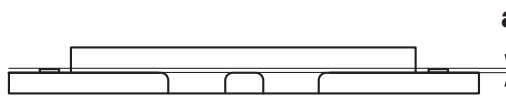
TIP

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)



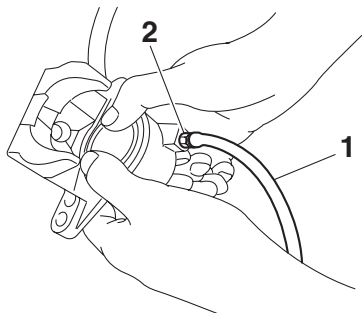
2. Install:
 - Brake pad springs
 - Brake pad shims
(onto the brake pads) (for XVS13CA(C))

- Brake pads

TIP

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

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



- Tighten the bleed screw to specification.



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

- Install:

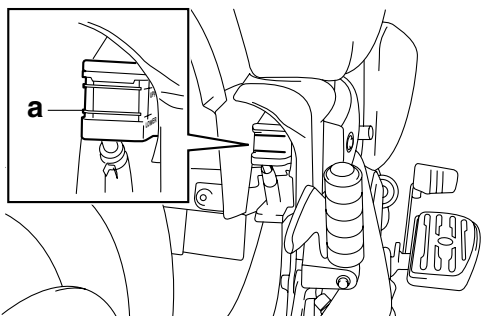
- Rear brake caliper



Rear brake caliper retaining bolt
27 Nm (2.7 m·kg, 19 ft·lb)

- 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 3-20.



- Check:

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

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-22.

EAS22590

REMOVING THE REAR BRAKE CALIPER

TIP

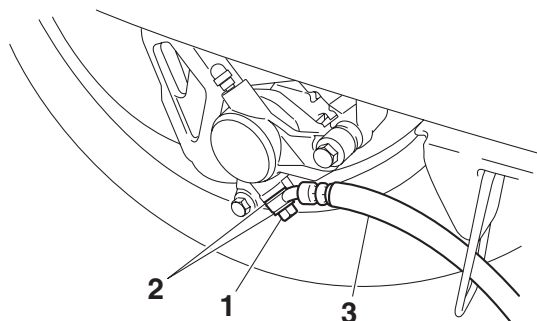
Before removing the brake caliper, drain the brake fluid from the entire brake system.

- Remove:

- Rear brake hose union bolt "1"
- Copper 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

- Remove:

- Brake caliper piston
- Brake caliper piston dust seal
- Brake caliper piston seal

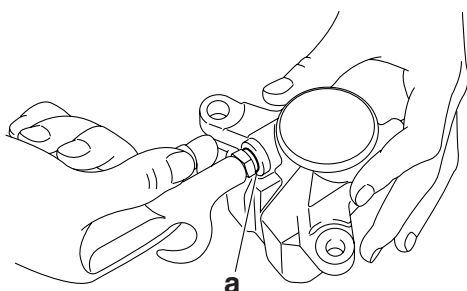
- Blow compressed air into the brake hose joint opening "a" to force out the piston from the brake caliper.

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

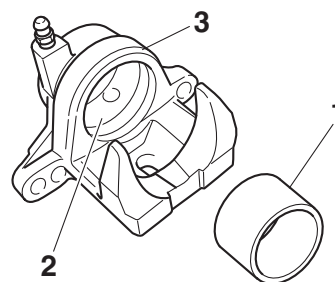
1. Check:

- 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



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



- 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)
- Copper washers **New**
- Rear brake hose “2”
- Rear brake hose union bolt “3”



**Rear brake hose union bolt
30 Nm (3.0 m·kg, 22 ft·lb)**

EWA27D1001

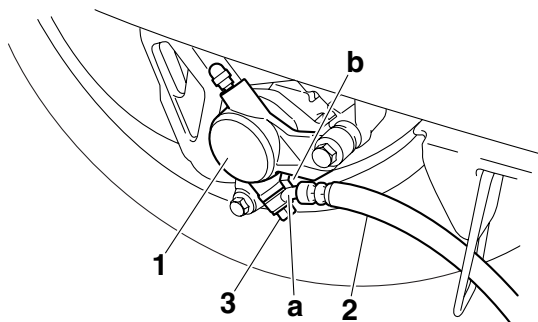


Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))” on page 2-55 and “CABLE ROUTING (for XVS13CA(C))” on page 2-79.

ECA14170



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

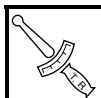


2. Remove:

- Rear brake caliper

3. Install:

- Brake pad springs
 - Brake pad shims
(onto the brake pads) (for XVS13CA(C))
 - Brake pads
 - Rear brake caliper
- Refer to “REPLACING THE REAR BRAKE PADS” on page 4-51.



Rear brake caliper retaining bolt
27 Nm (2.7 m·kg, 19 ft·lb)

4. Fill:

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



Recommended fluid
DOT 4

EWA13090



WARNING

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

ECA13540

NOTICE

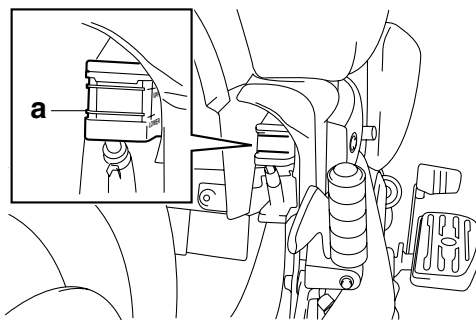
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-22.

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 3-20.



7. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-22.

EAS22700

REMOVING THE REAR BRAKE MASTER CYLINDER

TIP

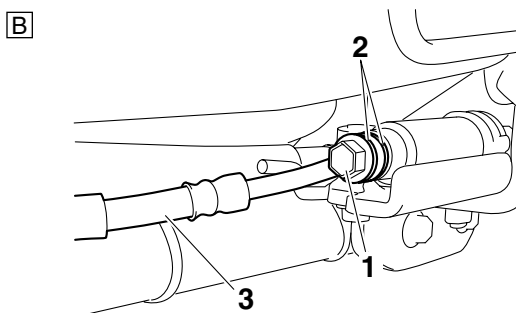
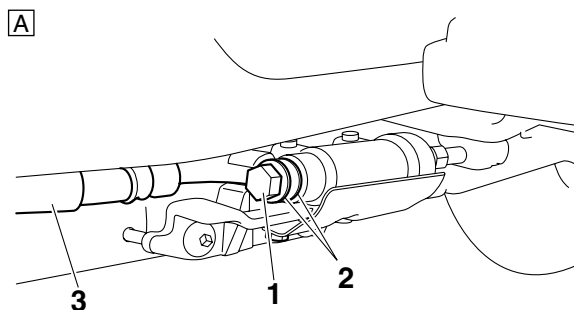
Before removing the rear brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:

- Rear brake hose union bolt “1”
- Copper 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.



- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)

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:
 - Copper washers “1” **New**
 - Rear brake hose “2”
 - Rear brake hose union bolt “3”



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

EWA13530

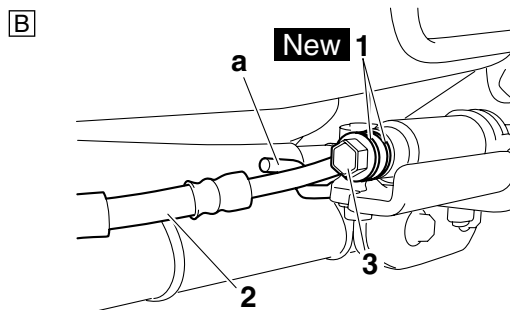
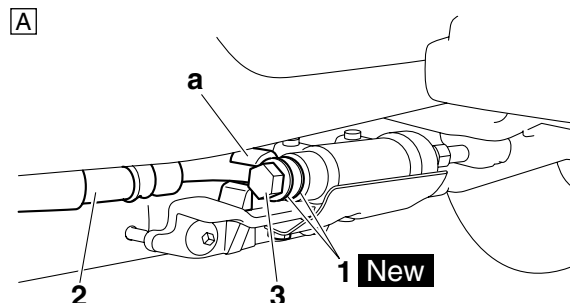
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))” on page 2-55 and “CABLE ROUTING (for XVS13CA(C))” on page 2-79.

ECA14160

NOTICE

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



- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)

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

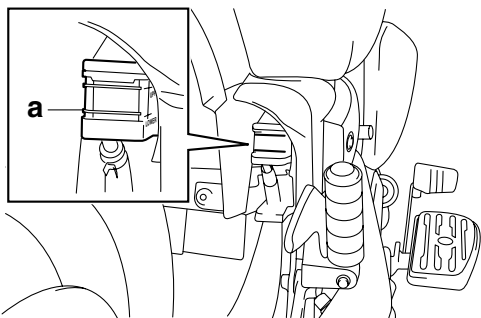
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

3. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-22.

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 3-20.



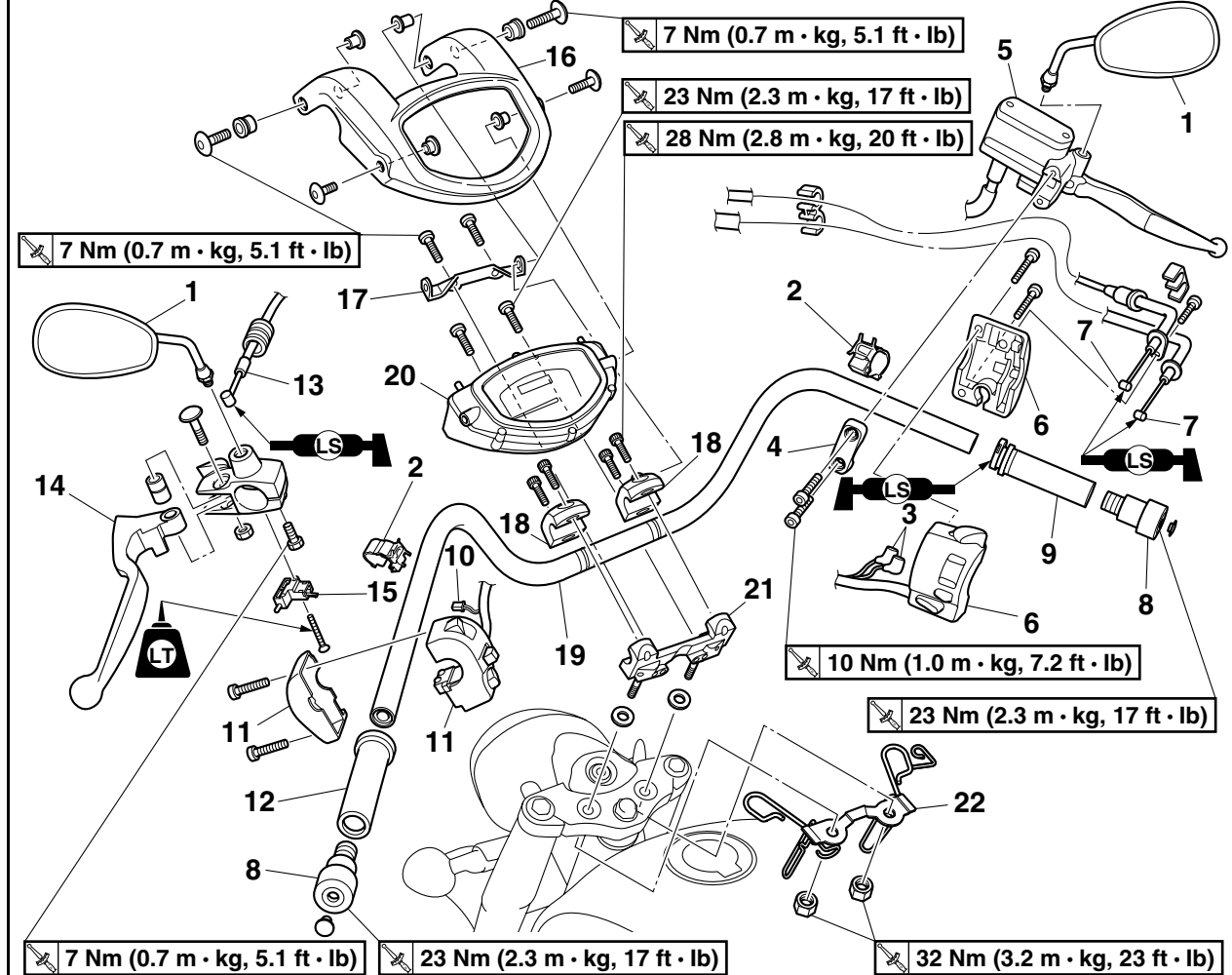
5. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-22.

6. Adjust:

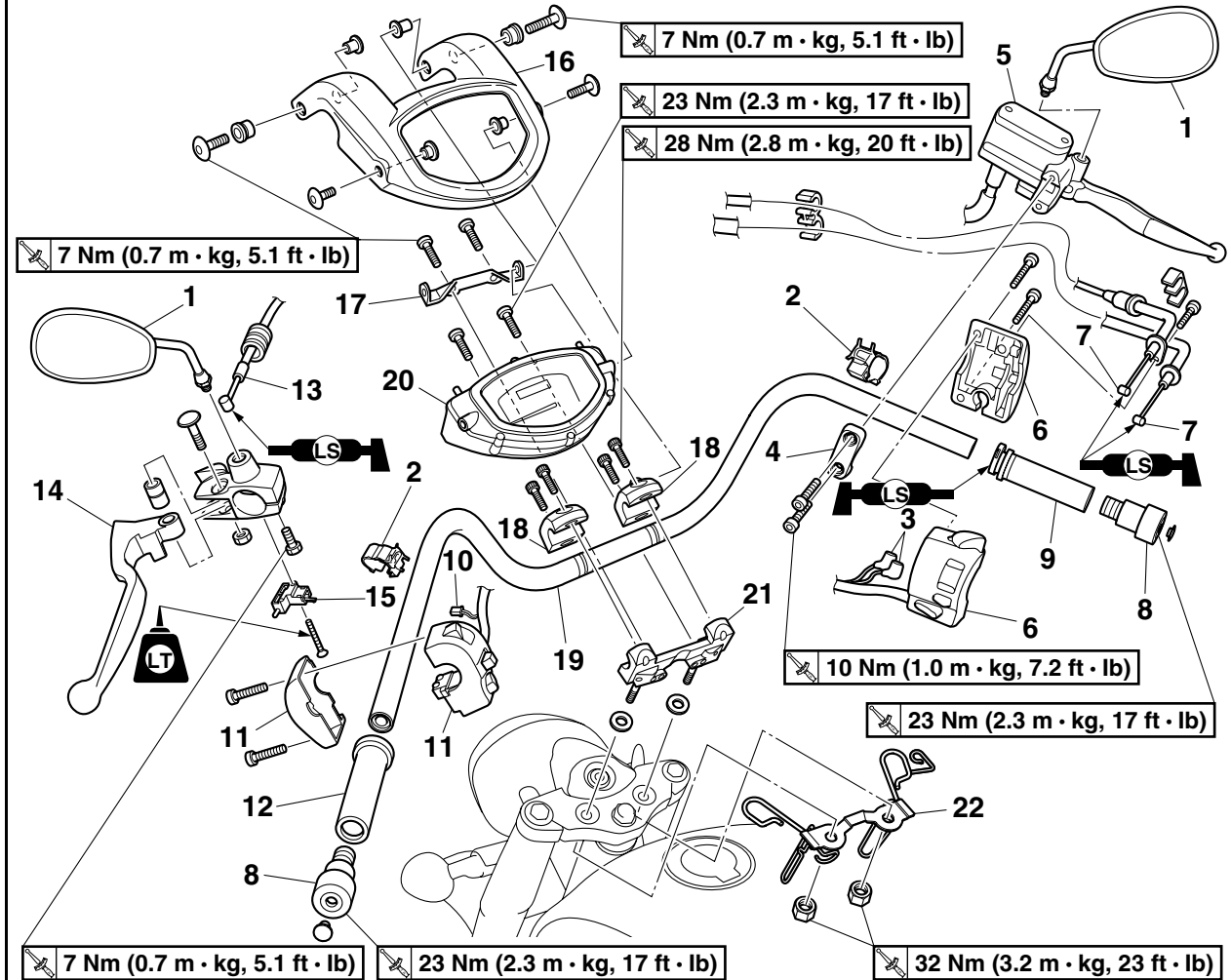
- Brake pedal adjusting bolt position
Refer to “ADJUSTING THE REAR DISC BRAKE” on page 3-20.

EAS22840

HANDLEBAR**Removing the handlebar (for XVS13AA(C)/XVS13CTA(C))**

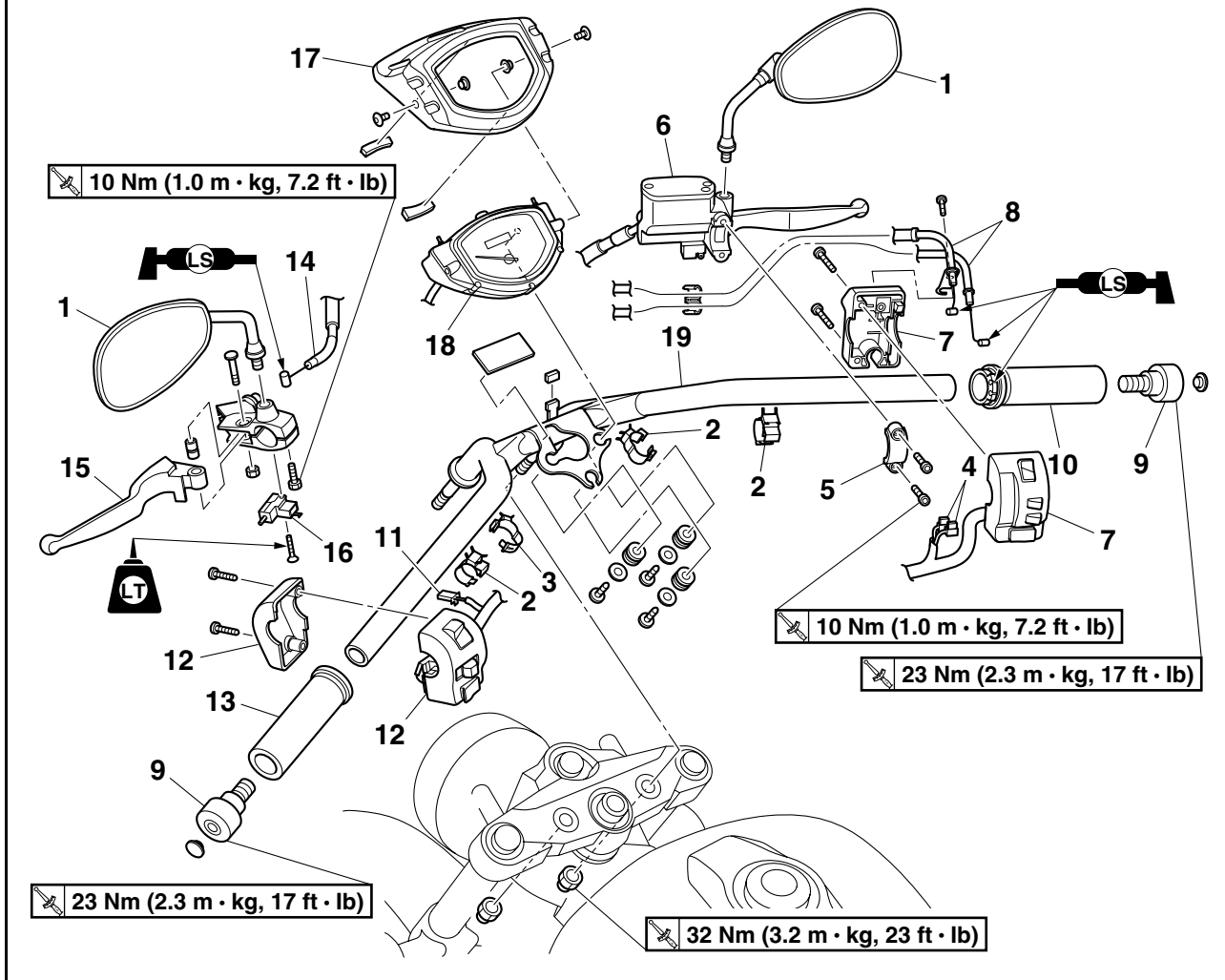
Order	Job/Parts to remove	Q'ty	Remarks
1	Rear view mirror	2	
2	Plastic holder	2	
3	Front brake light switch connector	2	Disconnect.
4	Front brake master cylinder holder	1	
5	Front brake master cylinder assembly	1	
6	Right handlebar switch	1	
7	Throttle cable	2	Disconnect.
8	Grip end	2	
9	Throttle grip	1	
10	Clutch switch coupler	1	Disconnect.
11	Left handlebar switch	1	
12	Handlebar grip	1	
13	Clutch cable	1	Disconnect.
14	Clutch lever	1	
15	Clutch switch	1	
16	Meter assembly cover	1	

Removing the handlebar (for XVS13AA(C)/XVS13CTA(C))



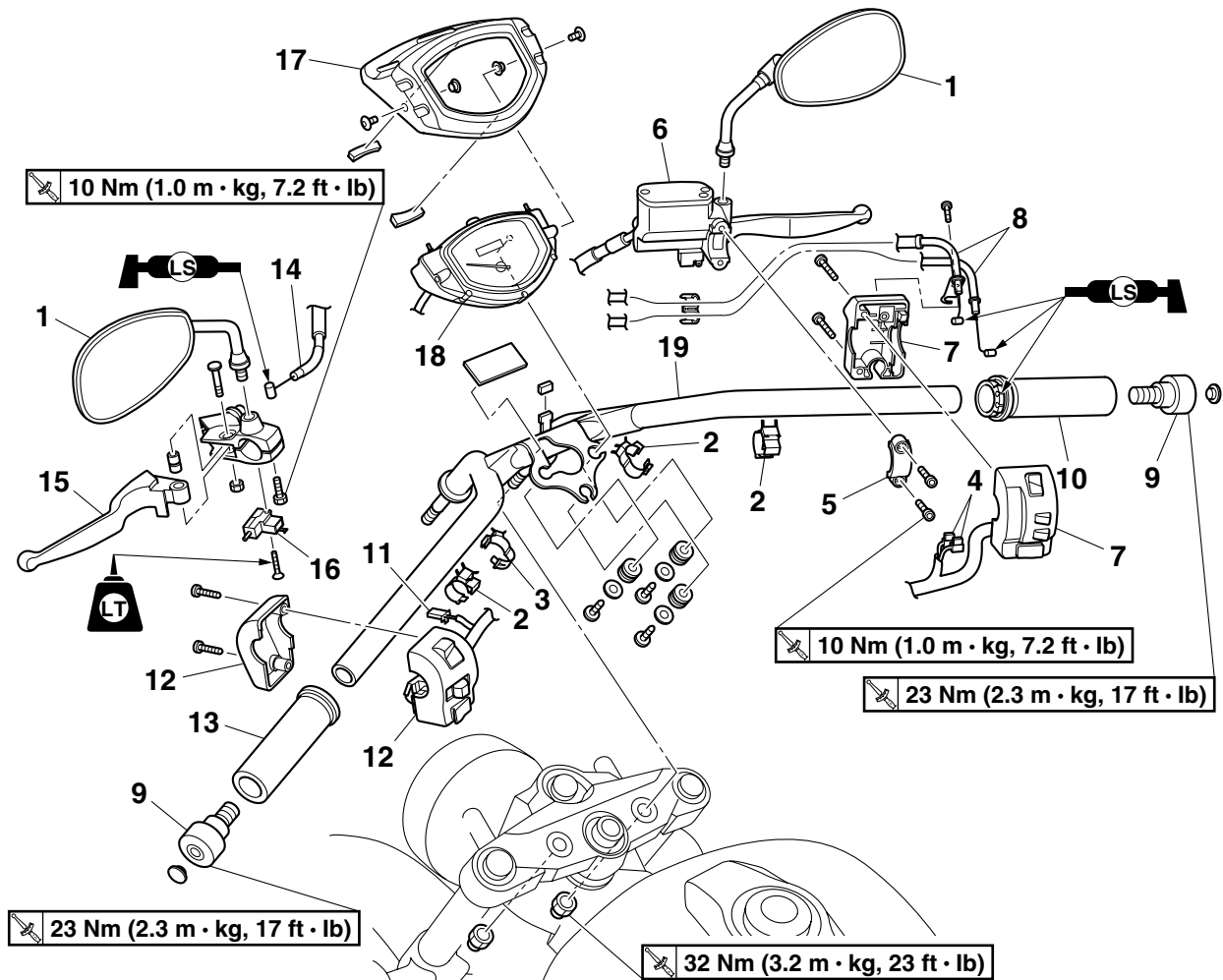
Order	Job/Parts to remove	Q'ty	Remarks
17	Meter assembly cover bracket	1	
18	Front handlebar holder	2	
19	Handlebar	1	
20	Meter assembly	1	
21	Rear handlebar holder	1	
22	Guide	1	
			For installation, reverse the removal procedure.

Removing the handlebar (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear view mirror	2	
2	Plastic holder (small)	3	
3	Plastic holder (large)	1	
4	Front brake light switch connector	2	Disconnect.
5	Front brake master cylinder holder	1	
6	Front brake master cylinder assembly	1	
7	Right handlebar switch	1	
8	Throttle cable	2	Disconnect.
9	Grip end	2	
10	Throttle grip	1	
11	Clutch switch coupler	1	Disconnect.
12	Left handlebar switch	1	
13	Handlebar grip	1	
14	Clutch cable	1	Disconnect.
15	Clutch lever	1	
16	Clutch switch	1	
17	Meter assembly cover	1	

Removing the handlebar (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
18	Meter assembly	1	
19	Handlebar	1	
			For installation, reverse the removal procedure.

EAS22860

REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

WARNING

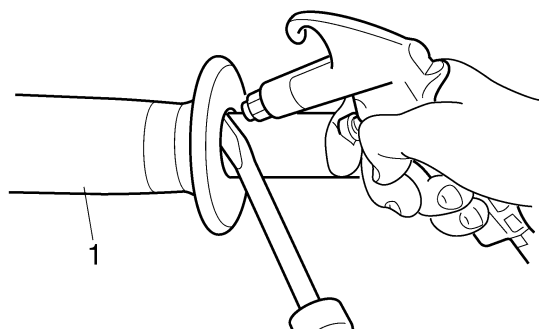
Securely support the vehicle so that there is no danger of it falling over.

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 (for XVS13AA(C)/XVS13CTA(C))

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"
- Front handlebar holders "2"



**Front handlebar holder bolt
28 Nm (2.8 m·kg, 20 ft·lb)**

ECA27D1004

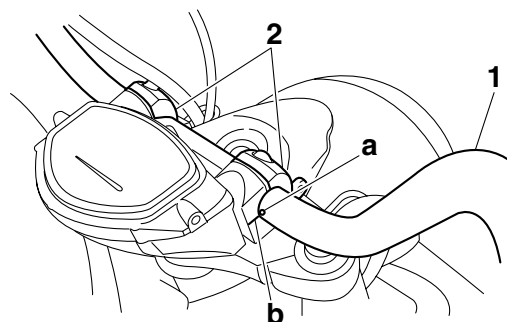
NOTICE

- First, tighten the bolts on the lower side of the handlebar holders, and then tighten the bolts on the upper 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 punch mark "a" on the handlebar with the match mark "b" on the rear handlebar holder.



3. Install:

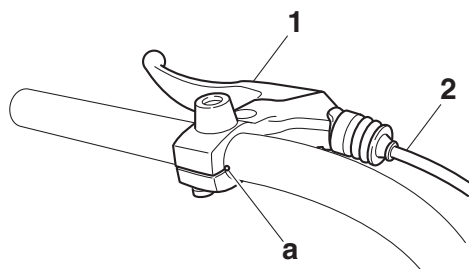
- Clutch lever "1"
- Clutch cable "2"



**Clutch lever bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)**

TIP

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

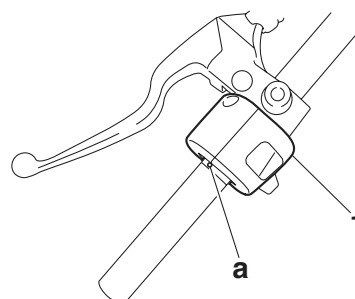


4. Install:

- Left handlebar switch "1"

TIP

Align the mating surfaces of the left handlebar switch with the punch mark "a" on 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.

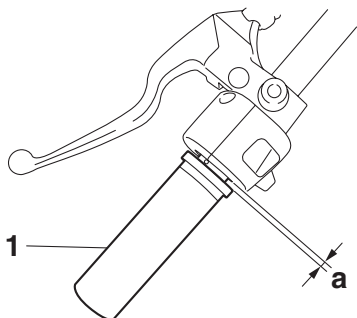
EWA13700

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.

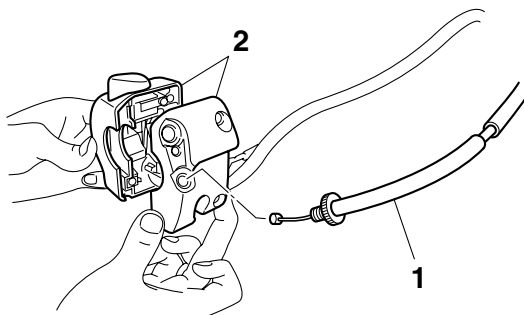


6. Connect:

- 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.

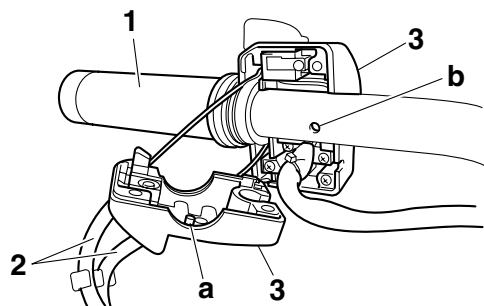


7. Install:

- Right handlebar switch “1”

TIP

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



8. Install:

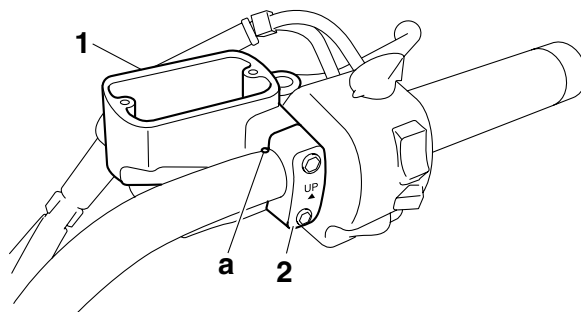
- Front brake master cylinder “1”
- Front brake master cylinder holder “2”



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

TIP

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



9. Adjust:

- Clutch lever free play
Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-13.



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 3-8.



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

- b. Slide the handlebar grip over the left end of the handlebar.
- c. Wipe off any excess rubber adhesive with a clean rag.

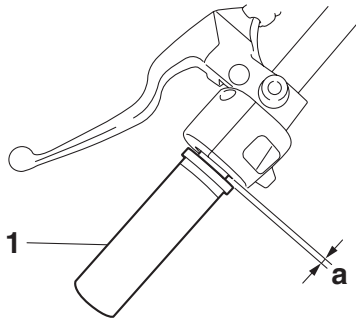
EWA13700

WARNING

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

TIP

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

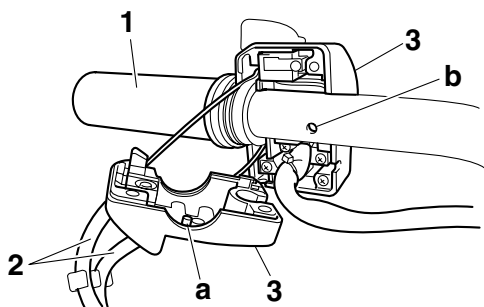


7. Install:

- Throttle grip “1”
- Throttle cables “2”
- Right handlebar switch “3”

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”

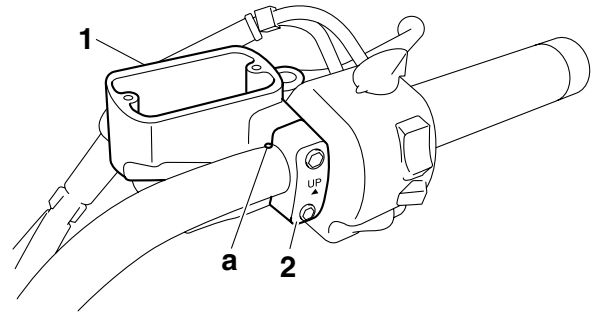


Front brake master cylinder holder bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)

TIP

- Install the front brake master cylinder holder with the “UP” mark facing up.

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



9. Adjust:

- Clutch lever free play
Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-13.



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 3-8.

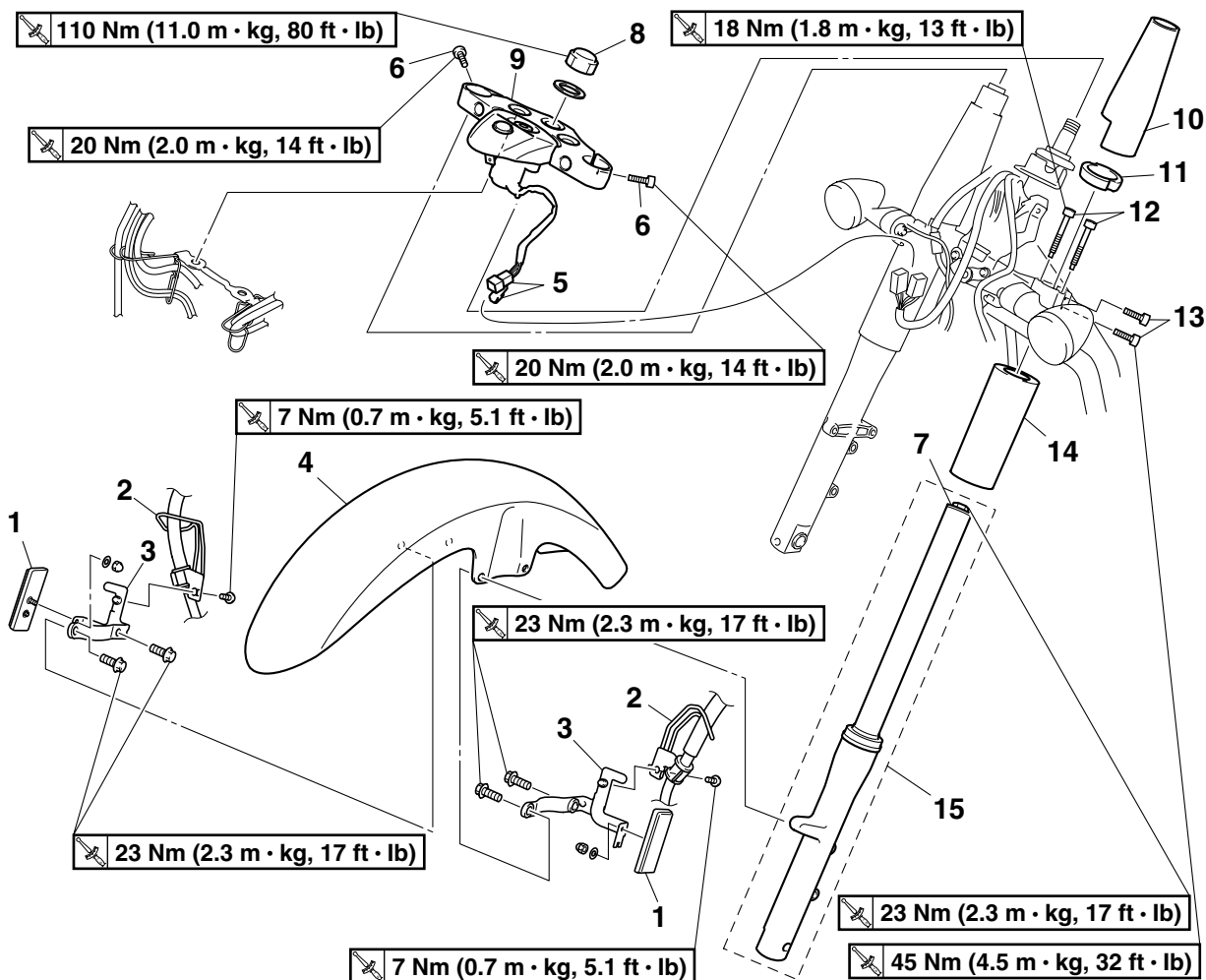


Throttle cable free play
4.0–6.0 mm (0.16–0.24 in)

EAS22950

FRONT FORK

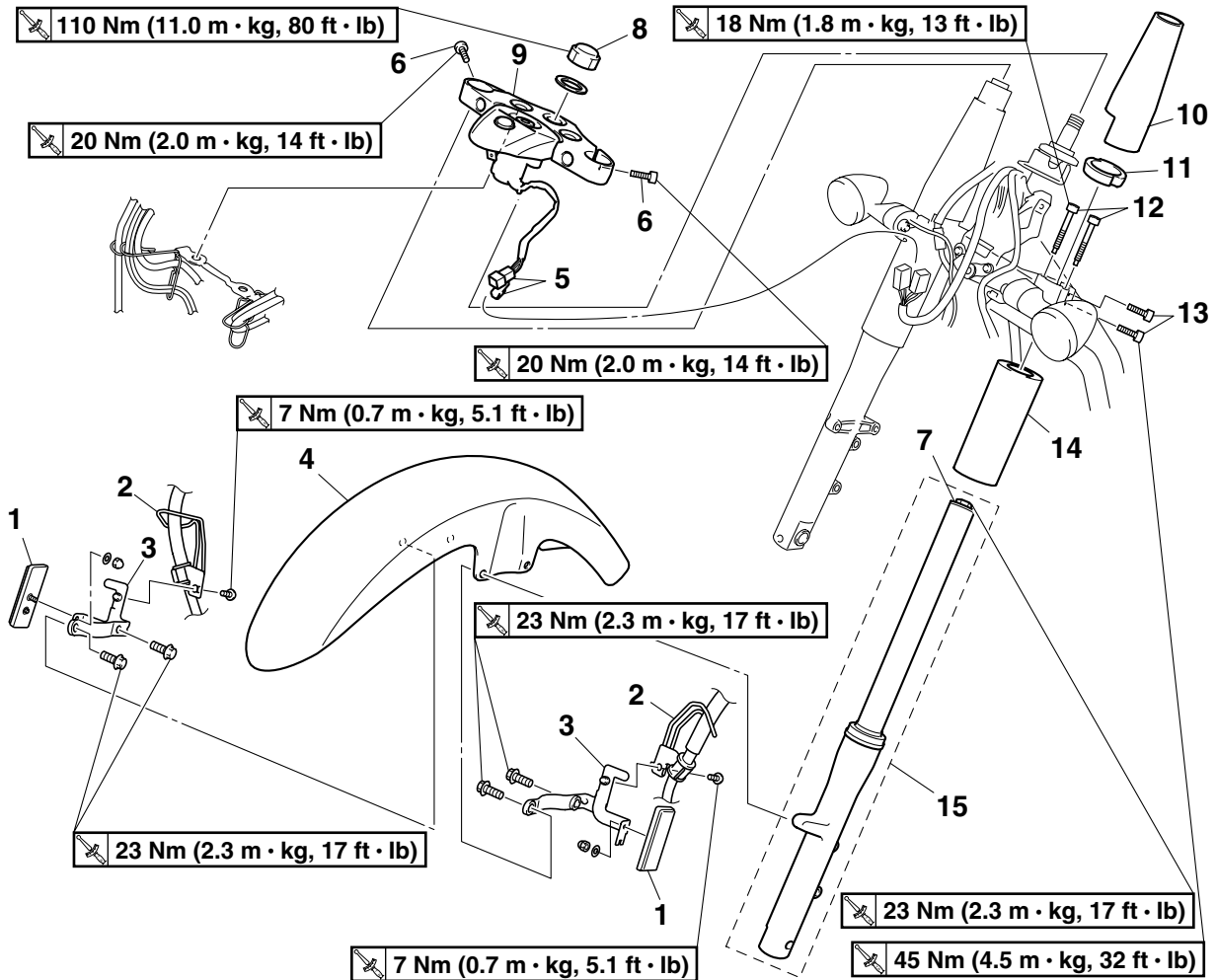
Removing the front fork legs (for XVS13AA(C)/XVS13CTA(C))



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 XVS13CTA(C) 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 4-12.
	Rear handlebar holder		Refer to "HANDLEBAR" on page 4-57.
1	Front reflector	2	
2	Brake hose guide	2	
3	Reflector bracket	2	
4	Front fender	1	
5	Main switch coupler	2	Disconnect.
6	Upper bracket pinch bolt	2	Loosen.
7	Cap bolt	1	Loosen.
8	Steering stem nut	1	

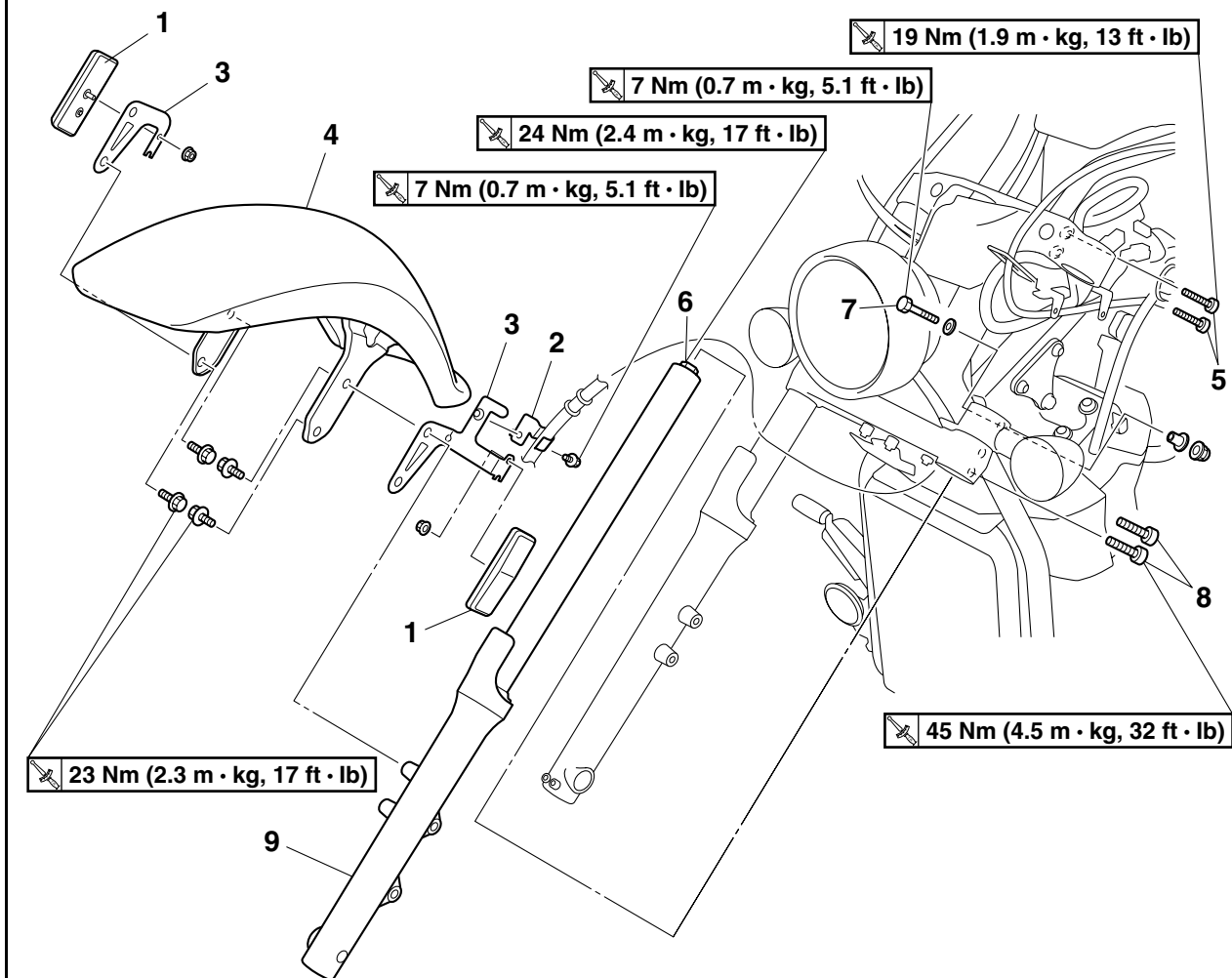
FRONT FORK

Removing the front fork legs (for XVS13AA(C)/XVS13CTA(C))



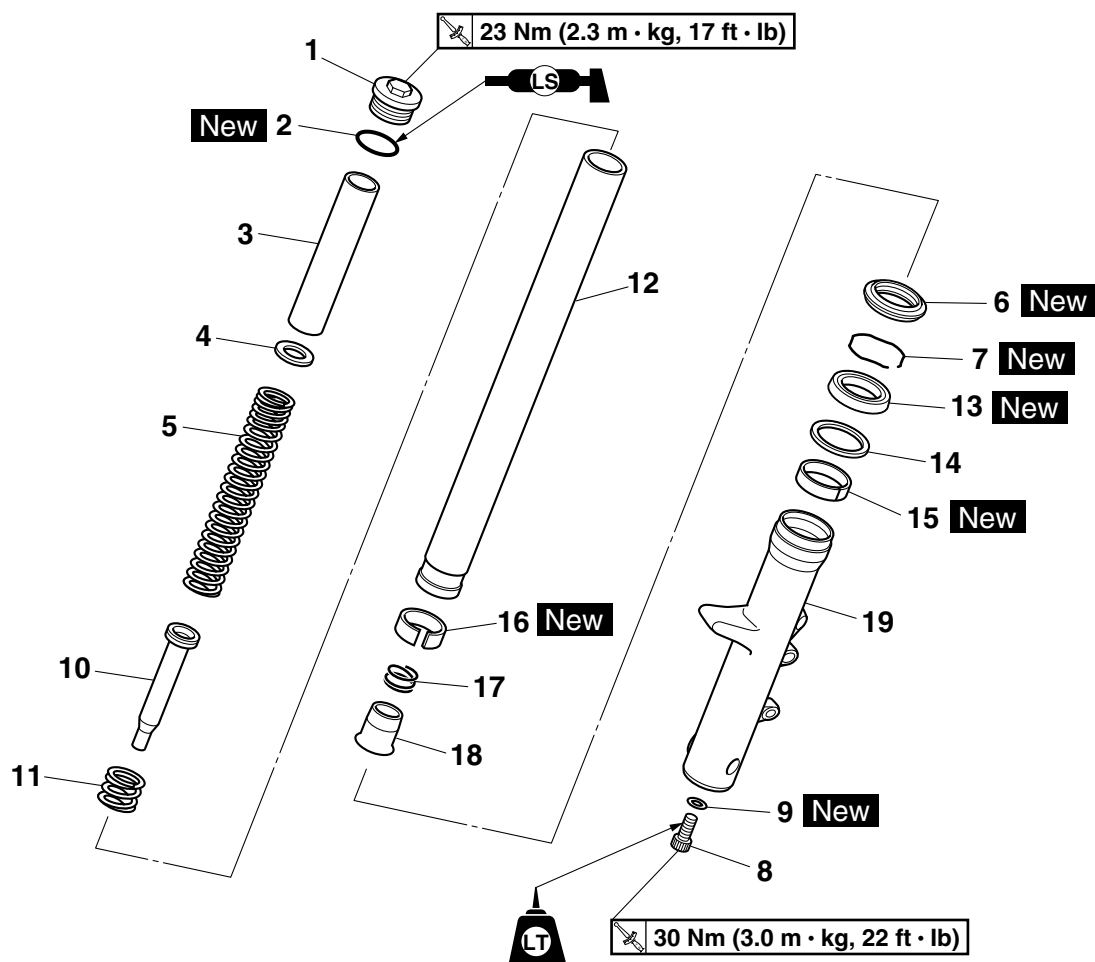
Order	Job/Parts to remove	Q'ty	Remarks
9	Upper bracket	1	
10	Upper front fork cover	1	
11	Upper front fork cover spacer	1	
12	Lower front fork cover bolt	2	
13	Lower bracket pinch bolt	2	Loosen.
14	Lower front fork cover	1	
15	Front fork leg	1	
			For installation, reverse the removal procedure.

Removing the front fork legs (for XVS13CA(C))



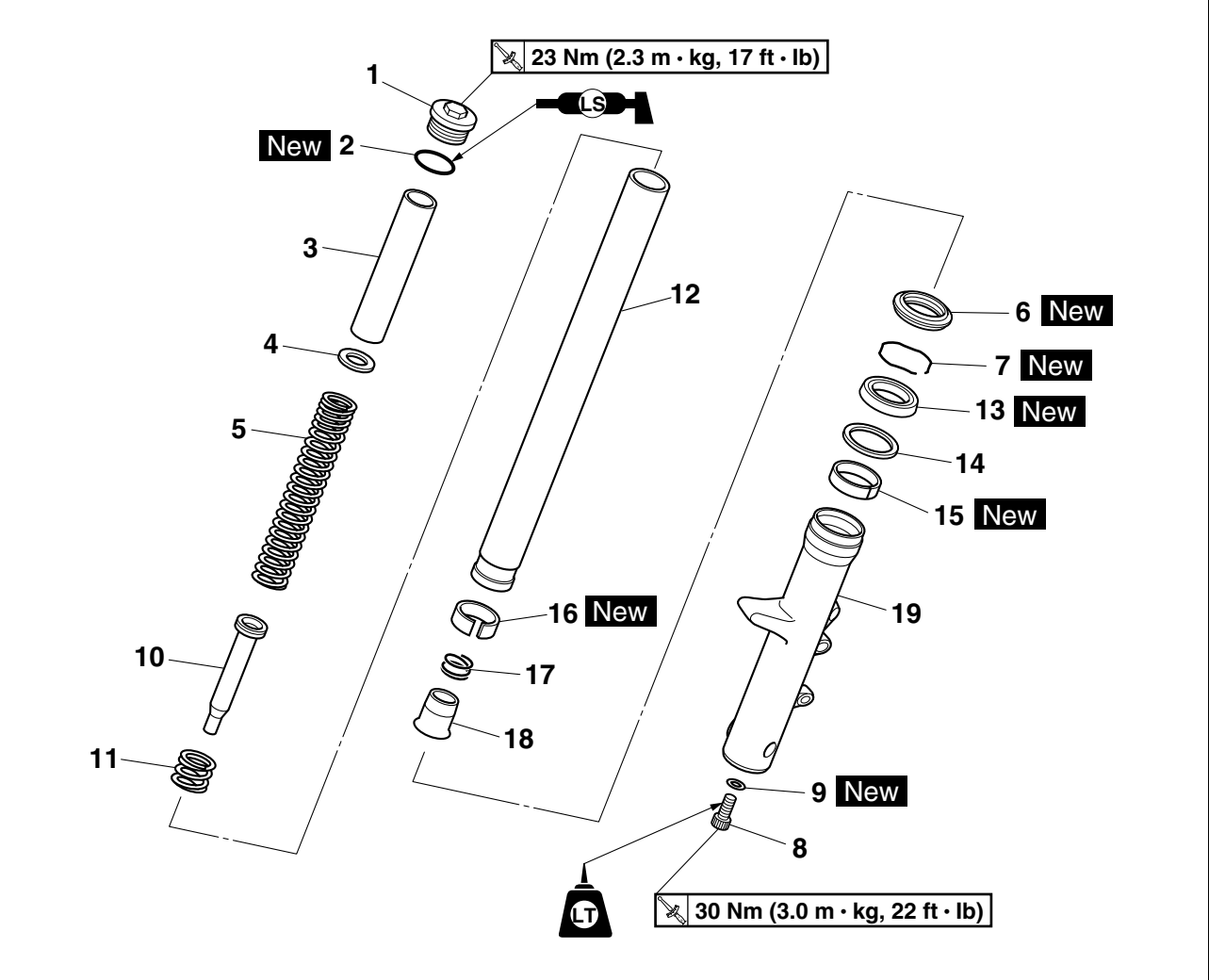
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Front wheel		Refer to "FRONT WHEEL" on page 4-12.
1	Front reflector	2	
2	Front brake hose holder	1	
3	Reflector bracket	2	
4	Front fender	1	
5	Upper bracket pinch bolt	2	Loosen.
6	Cap bolt	1	Loosen.
7	Front turn signal/position light pinch bolt	1	Loosen.
8	Lower bracket pinch bolt	2	Loosen.
9	Front fork leg	1	
			For installation, reverse the removal procedure.

Disassembling the front fork legs (for XVS13AA(C)/XVS13CTA(C))



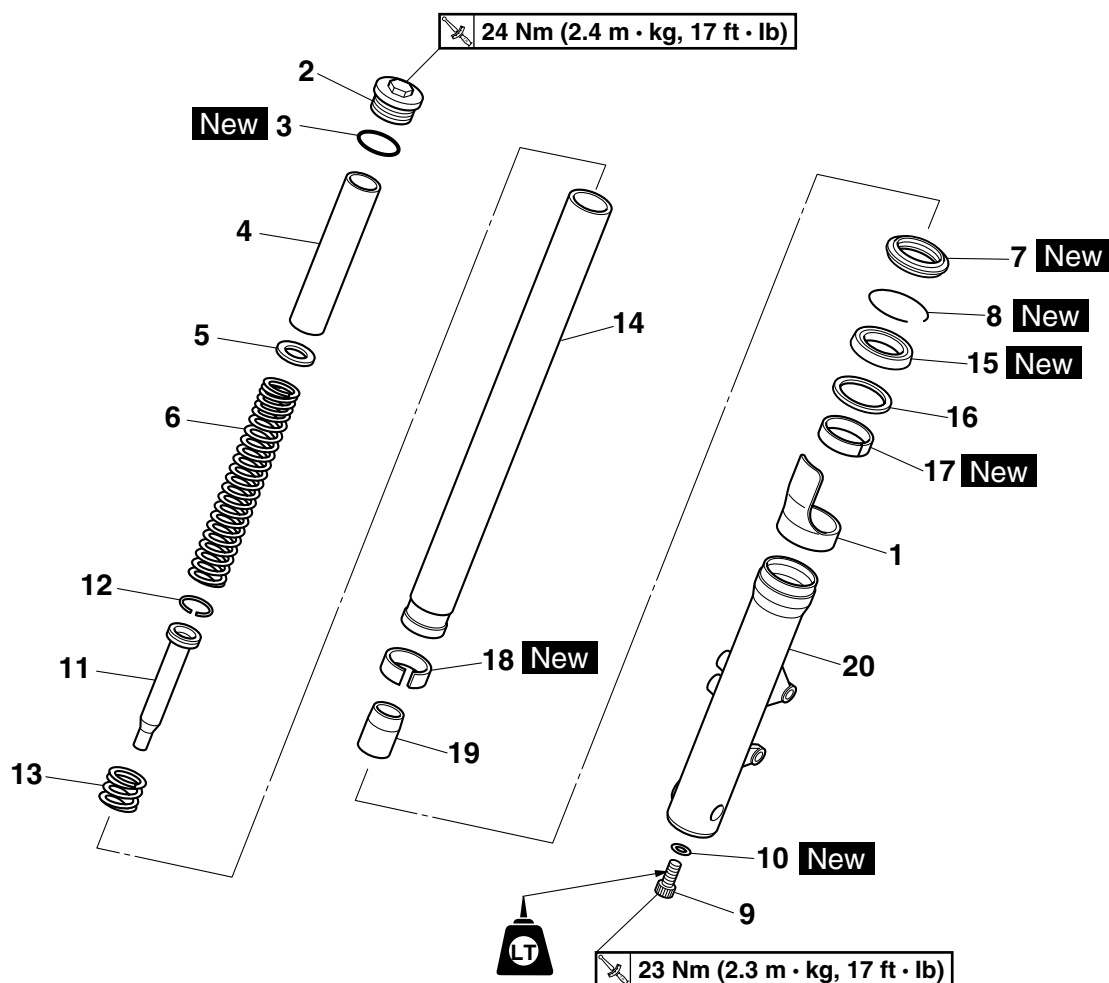
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
1	Cap bolt	1	
2	O-ring	1	
3	Spacer	1	
4	Spring seat	1	
5	Fork spring	1	
6	Dust seal	1	
7	Oil seal clip	1	
8	Damper rod bolt	1	
9	Copper washer	1	
10	Damper rod	1	
11	Rebound spring	1	
12	Inner tube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

Disassembling the front fork legs (for XVS13AA(C)/XVS13CTA(C))



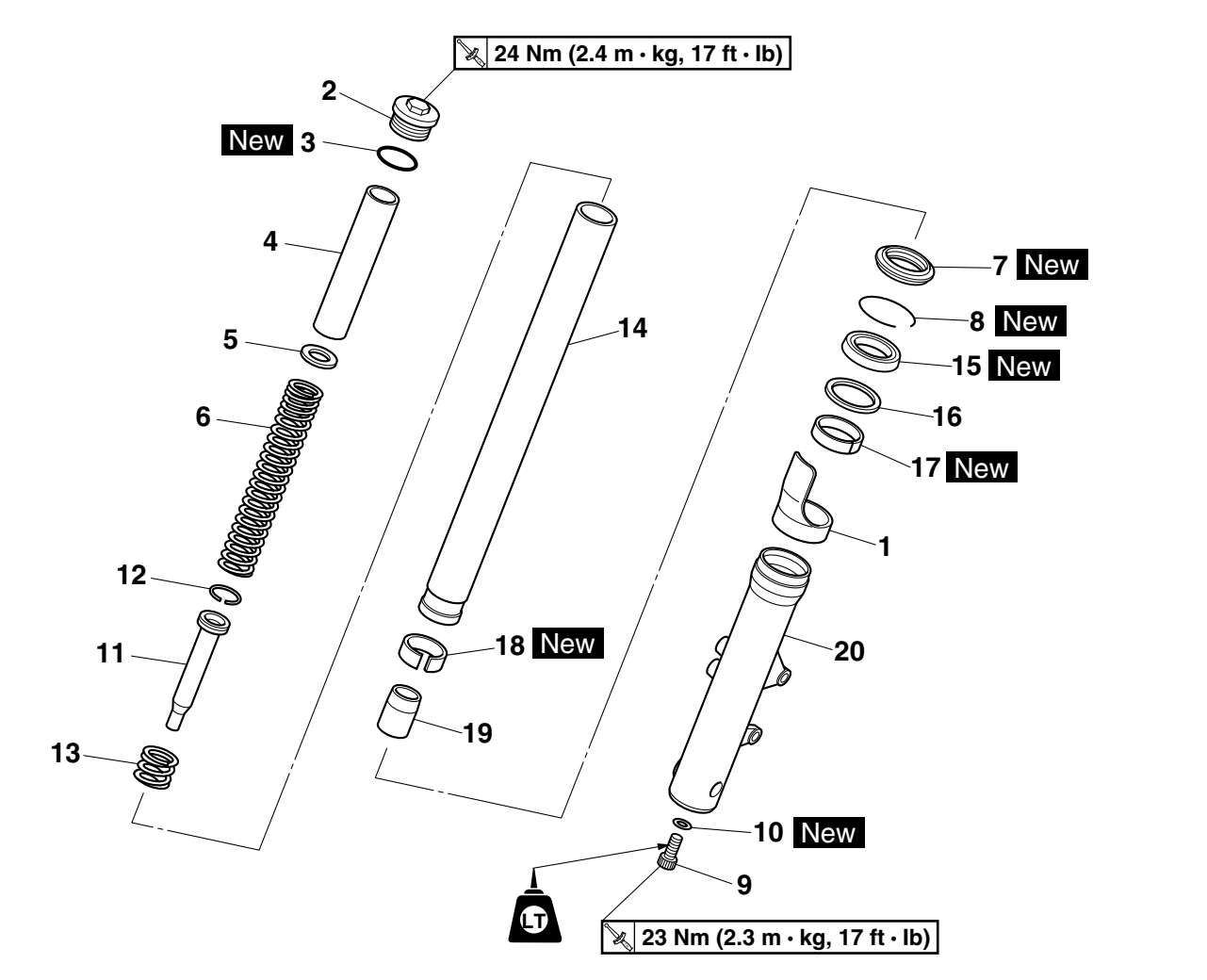
Order	Job/Parts to remove	Q'ty	Remarks
17	Spring	1	
18	Oil flow stopper	1	
19	Outer tube	1	
			For assembly, reverse the disassembly procedure.

Disassembling the front fork legs (for XVS13CA(C))



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

Disassembling the front fork legs (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
17	Outer tube bushing	1	
18	Inner tube bushing	1	
19	Oil flow stopper	1	
20	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

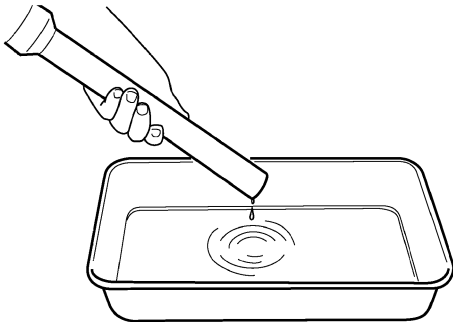
The following procedure applies to both of the front fork legs.

1. Drain:

- Fork oil

TIP

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



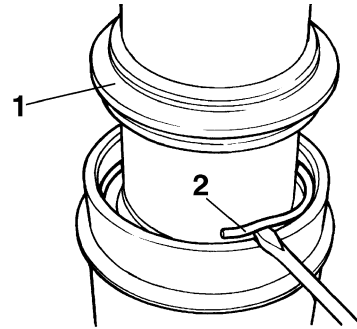
2. Remove:

- 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

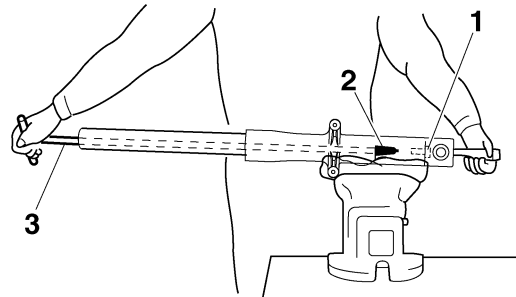
90890-01460

T-handle

90890-01326

T-handle 3/8" drive 60 cm long

YM-01326



4. Remove:

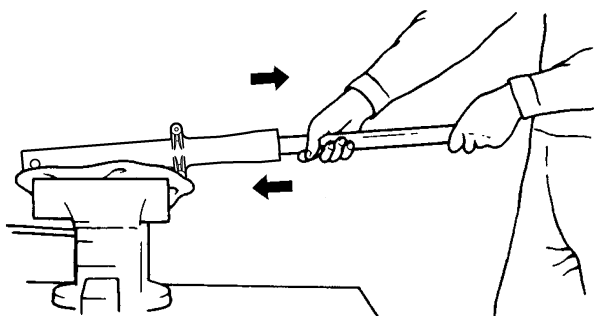
- Inner tube

- 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

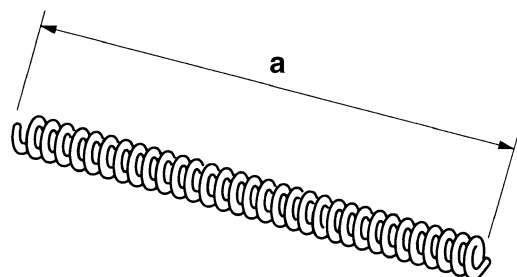
Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

2. Measure:

- Spring free length “a”
- Out of specification → Replace.



Fork spring free length
XVS13AA(C)/XVS13CTA(C):
 345.5 mm (13.60 in)
XVS13CA(C):
 401.7 mm (15.81 in)
Limit
XVS13AA(C)/XVS13CTA(C):
 339.4 mm (13.36 in)
XVS13CA(C):
 393.7 mm (15.50 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

NOTICE

- 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.

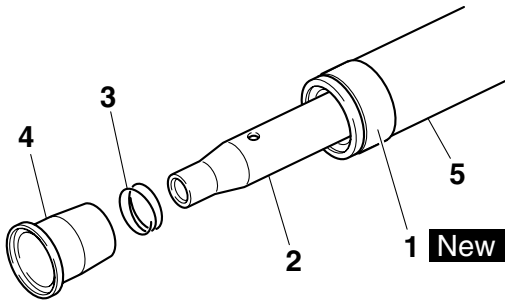
1. Install:

- Inner tube bushing “1” **New**
- Damper rod “2”
- Rebound spring
- Spring “3”
- Oil flow stopper “4”

ECA3D81007

NOTICE

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



3. Install:

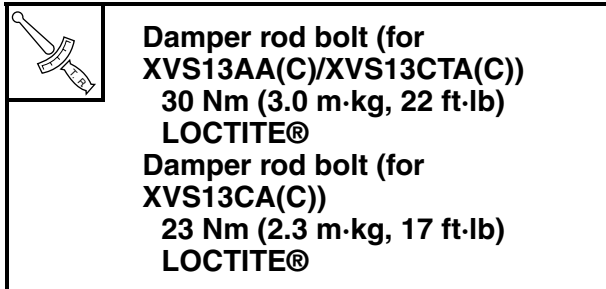
- Inner tube
(in the outer tube)

4. Install:

- Copper washer **New**
- Damper rod bolt

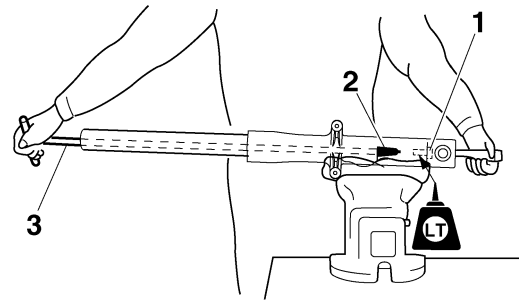
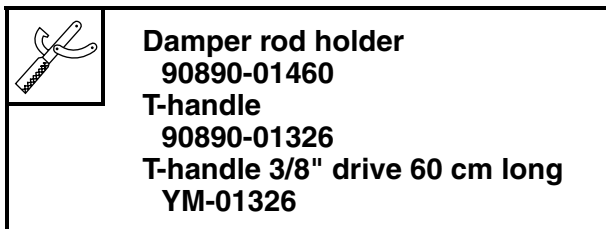
5. Tighten:

- Damper rod bolt "1"



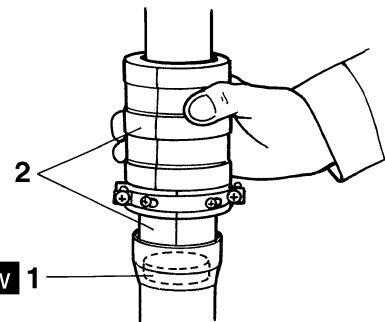
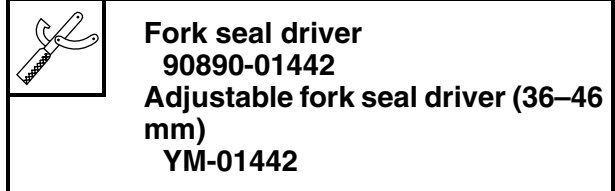
TIP

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



6. Install:

- Outer tube bushing "1" **New**
- Washer
(with the fork seal driver "2")



7. Install:

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

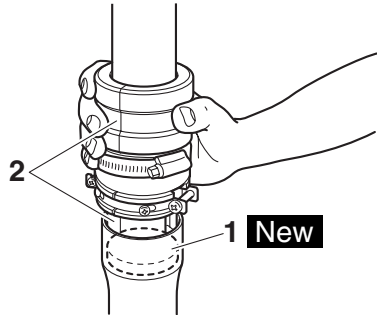
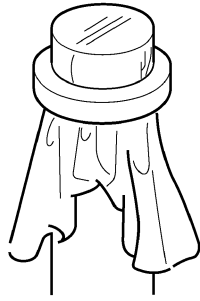
ECA14220

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.

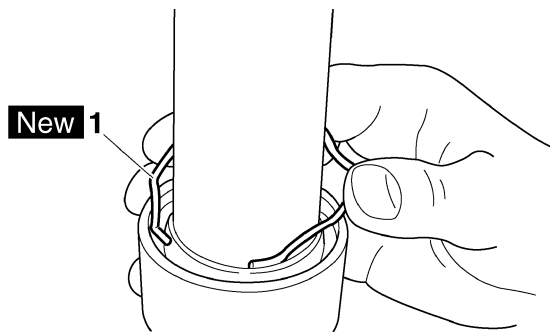


8. Install:

- Oil seal clip “1” **New**

TIP

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

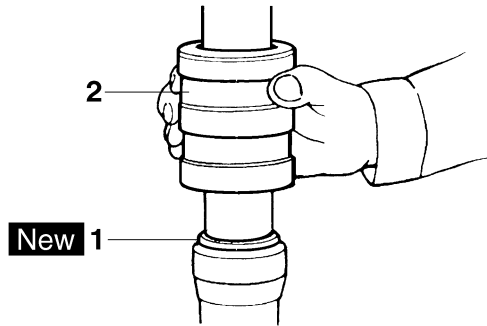


9. Install:

- 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

XVS13AA(C)/XVS13CTA(C):
490.0 cm³ (16.57 US oz, 17.28 Imp.oz)

XVS13CA(C):
514.0 cm³ (17.38 US oz, 18.13 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.



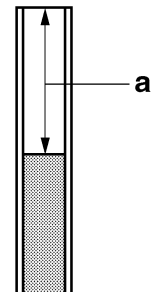
Level

XVS13AA(C)/XVS13CTA(C):
105.0 mm (4.13 in)

XVS13CA(C):
124.0 mm (4.88 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:

- Fork spring

- Spring seat
- Spacer
- Cap bolt

(along with the O-ring **New**)

TIP

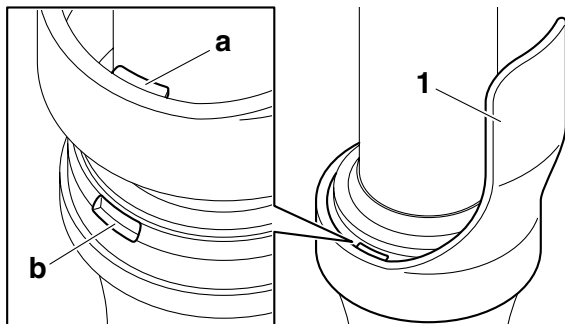
- Install the fork spring with the smaller pitch facing up. (For XVS13CA(C))
- Before installing the cap bolt, lubricate its O-ring with grease.
- Temporarily tighten the cap bolt.

13. Install: (for XVS13CA(C))

- Protector "1"

TIP

Align the projection "a" on the protector "1" with the slot "b" in the outer tube.



EAS27D1036

INSTALLING THE FRONT FORK LEGS (for XVS13AA(C)/XVS13CTA(C))

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

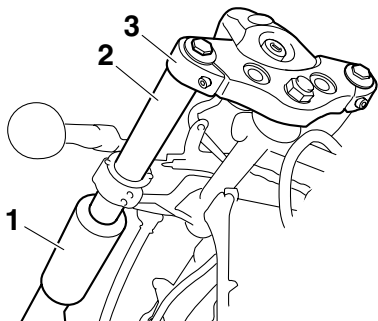
1. Install:

- 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·kg, 32 ft·lb)

TIP

Tighten the lower bracket pinch bolts to specification twice. Tighten the upper and lower bolts alternately, starting with the upper bolts.

3. Remove:

- Upper bracket

4. Tighten:

- Lower front fork cover bolts



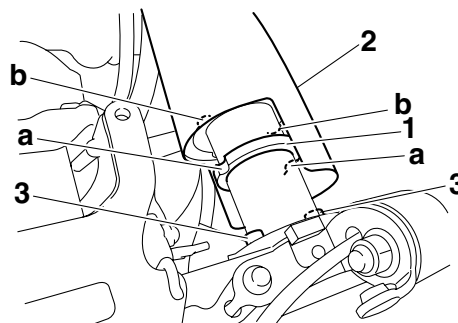
Lower front fork cover bolt
18 Nm (1.8 m·kg, 13 ft·lb)

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
- Cap bolt
- Upper bracket pinch bolt



Steering stem nut
110 Nm (11.0 m·kg, 80 ft·lb)
Cap bolt
23 Nm (2.3 m·kg, 17 ft·lb)
Upper bracket pinch bolt
23 Nm (2.3 m·kg, 17 ft·lb)

EWA13680

WARNING

Make sure the brake hoses are routed properly.

EAS27D1020

INSTALLING THE FRONT FORK LEGS (for XVS13CA(C))

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

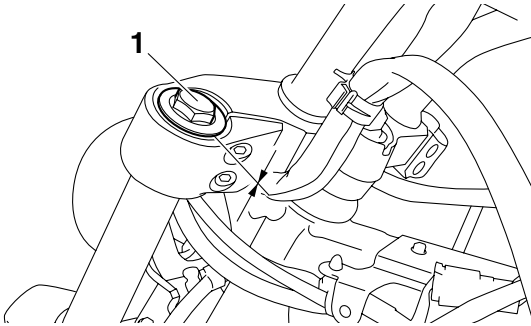
1. Install:

- Front fork leg “1”

Temporarily tighten the 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
- Front turn signal/position light pinch bolts



Lower bracket pinch bolt
45 Nm (4.5 m·kg, 32 ft·lb)
Front turn signal/position light
pinch bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)

3. Tighten:

- Cap bolt
- Upper bracket pinch bolts



Cap bolt
24 Nm (2.4 m·kg, 17 ft·lb)
Upper bracket pinch bolt
19 Nm (1.9 m·kg, 13 ft·lb)

TIP

Tighten the upper bracket pinch bolts to specification twice. Tighten the upper and lower bolts alternately, starting with the upper bolts.

EWA13680



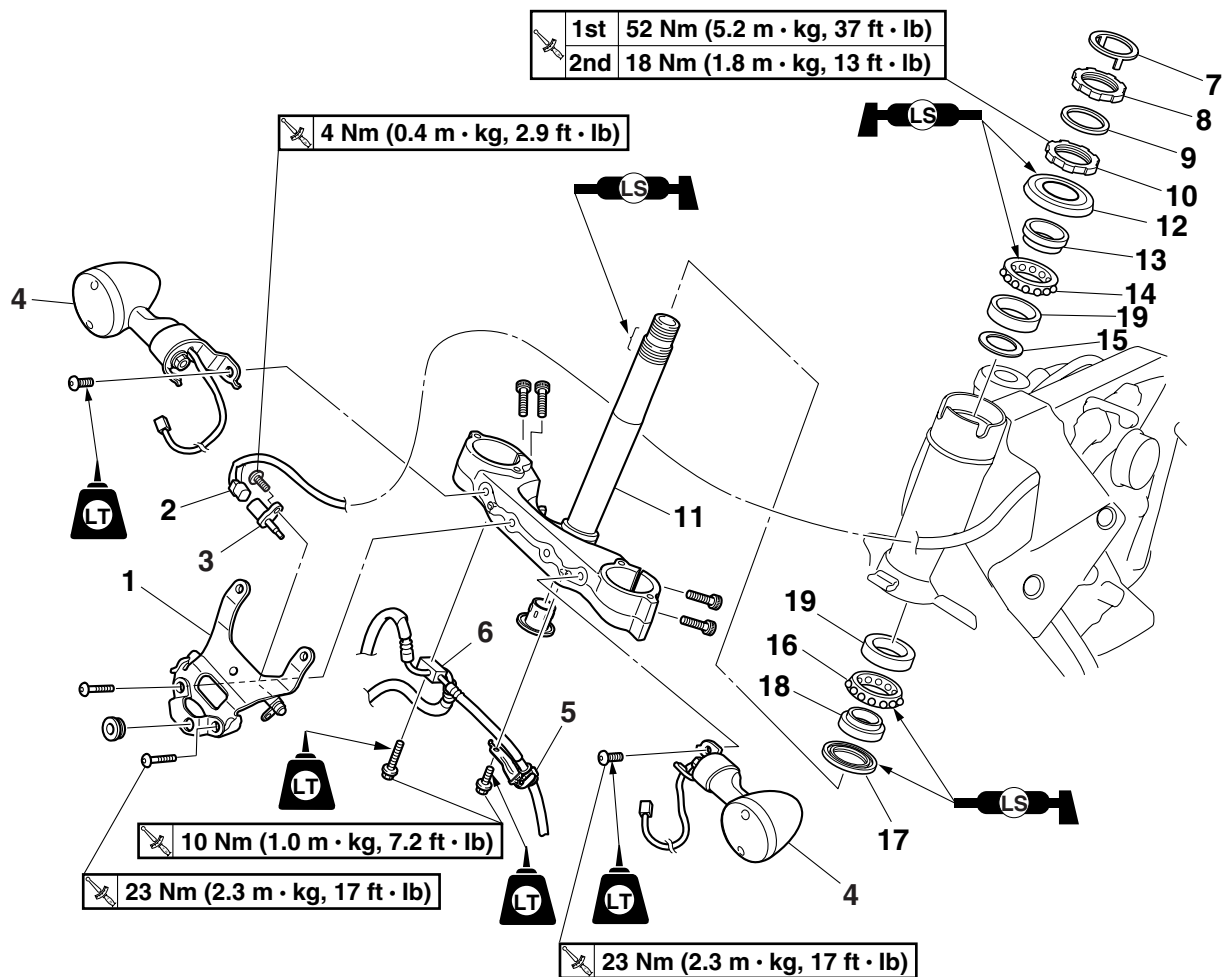
WARNING

Make sure the brake hoses are routed properly.

EAS23090

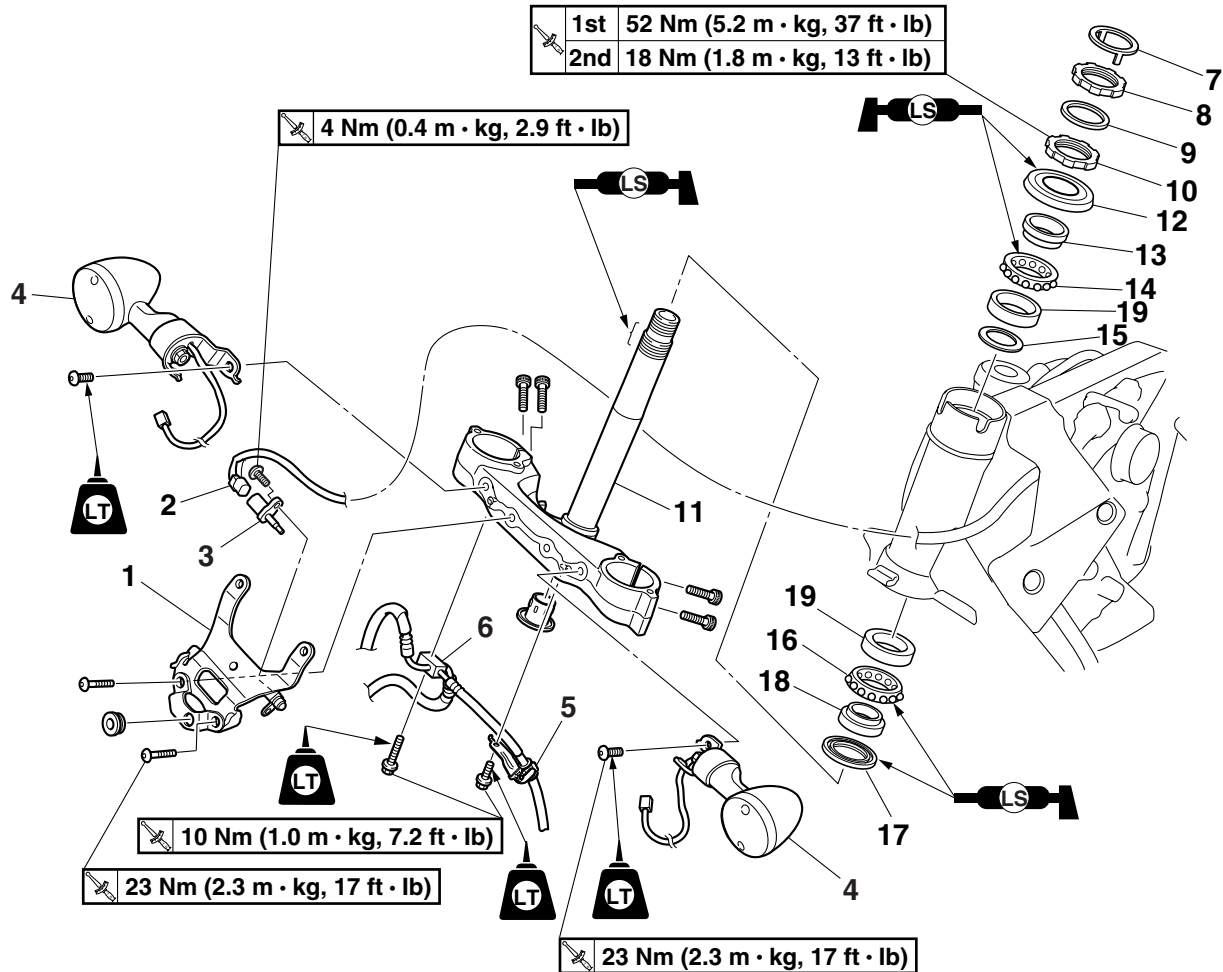
STEERING HEAD

Removing the lower bracket (for XVS13AA(C)/XVS13CTA(C))



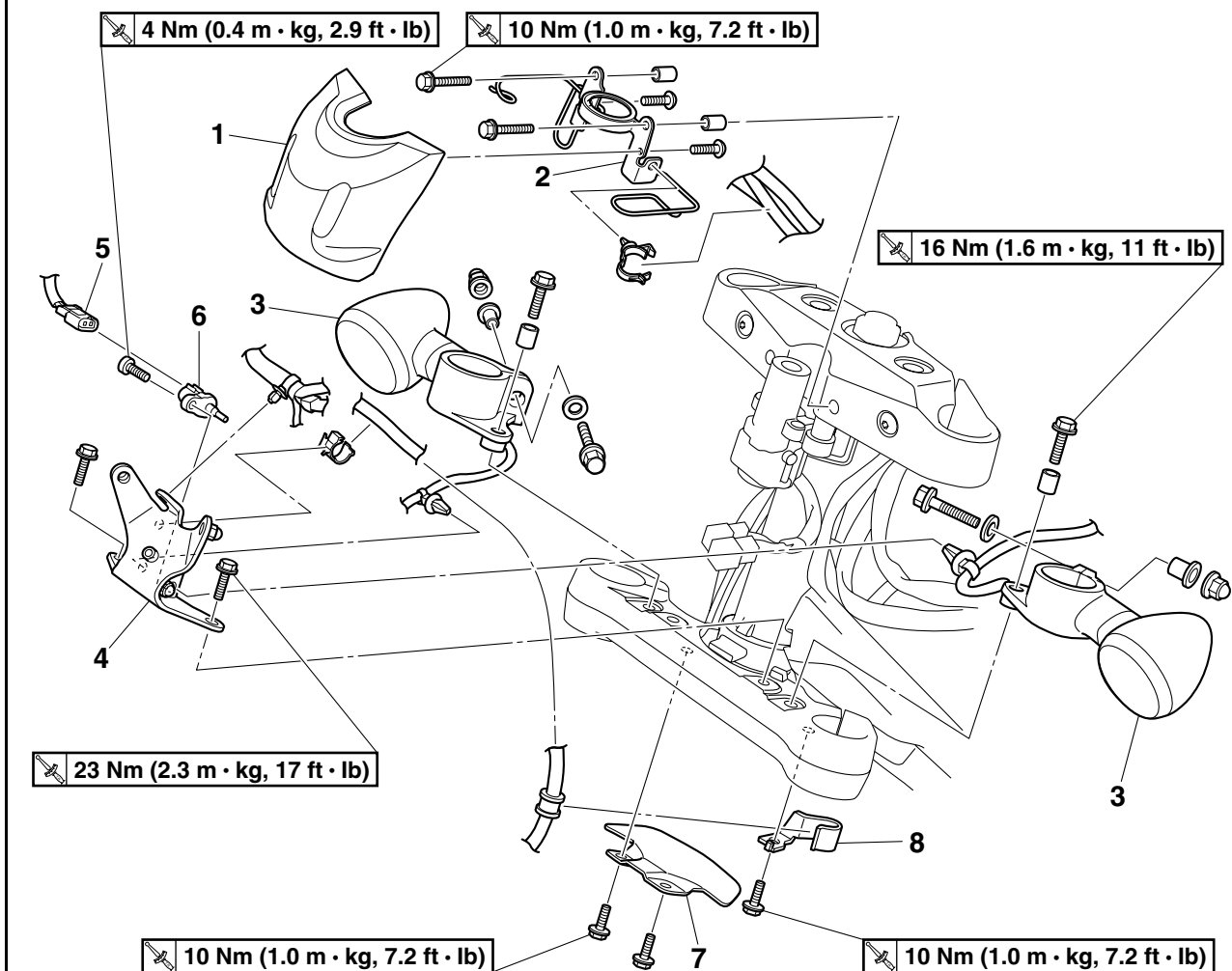
Order	Job/Parts to remove	Q'ty	Remarks
	Upper bracket/Front fork legs		Refer to "FRONT FORK" on page 4-65.
1	Headlight bracket	1	
2	Air temperature sensor coupler	1	Disconnect.
3	Air temperature sensor	1	
4	Front turn signal/position light	2	
5	Front brake hose holder	1	
6	Front brake hose joint	1	
7	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	

Removing the lower bracket (for XVS13AA(C)/XVS13CTA(C))



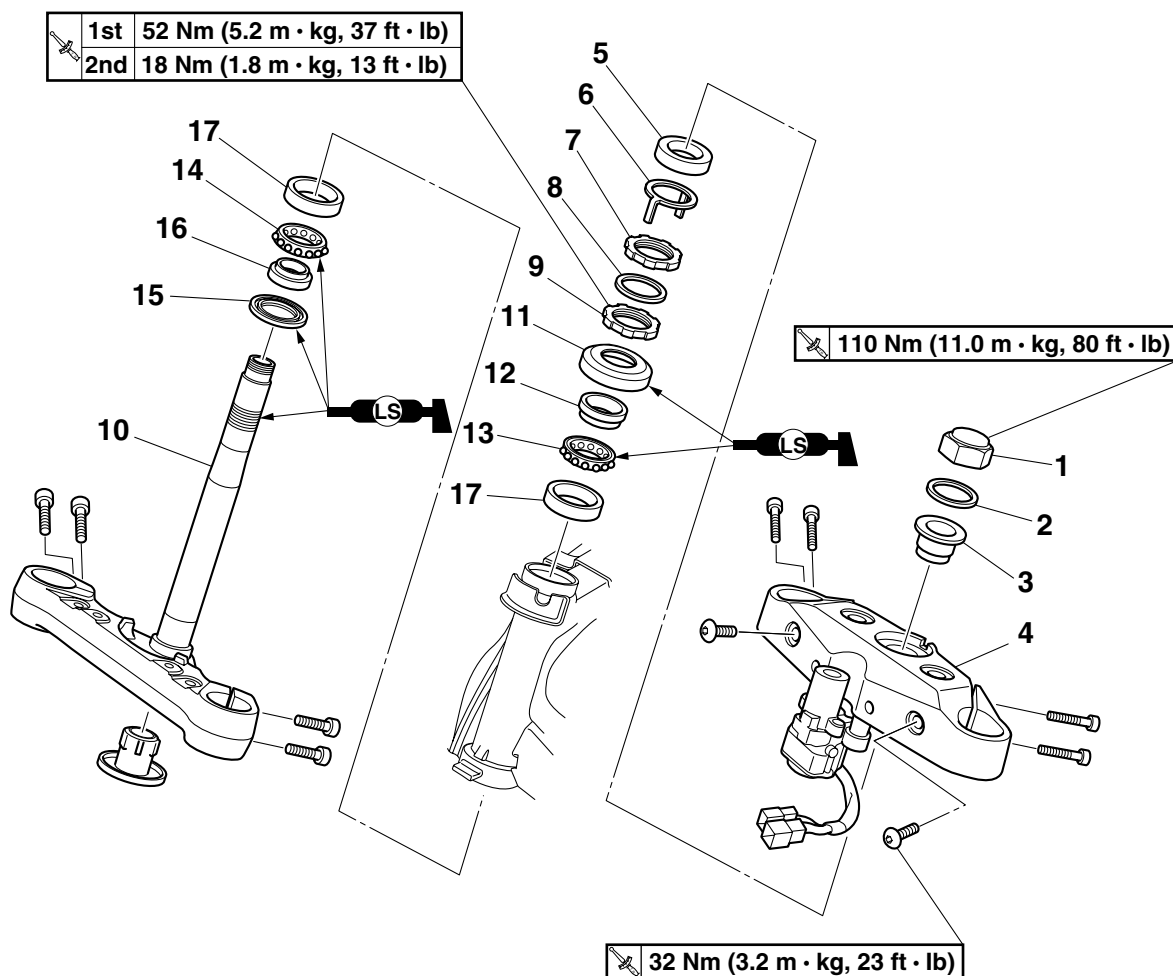
Order	Job/Parts to remove	Q'ty	Remarks
16	Lower bearing	1	
17	Dust seal	1	
18	Lower bearing inner race	1	
19	Bearing outer race	2	
			For installation, reverse the removal procedure.

Removing the headlight bracket and front brake hose holder (for XVS13CA(C))



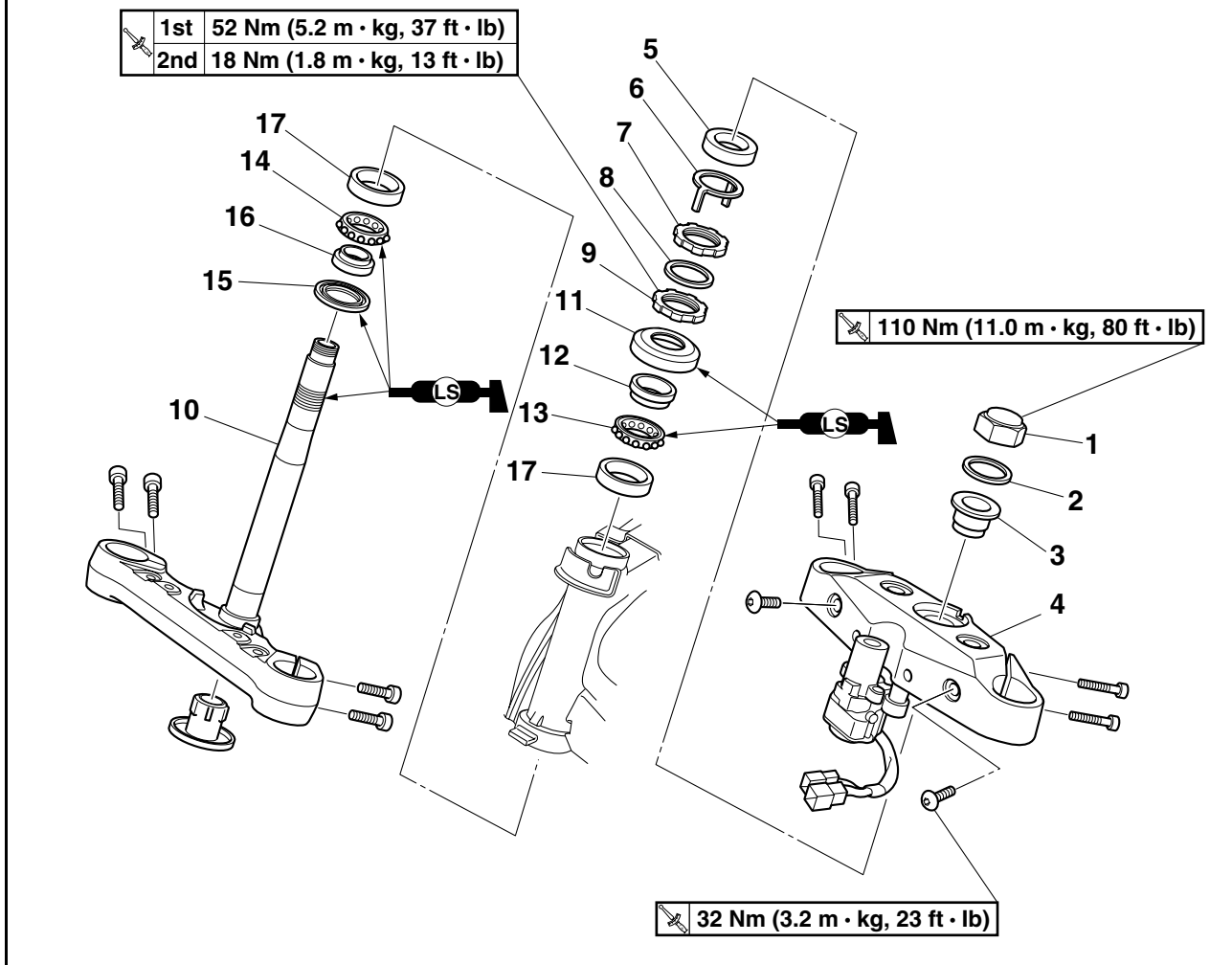
Order	Job/Parts to remove	Q'ty	Remarks
	Headlight body		Refer to "GENERAL CHASSIS" on page 4-1.
	Handlebar		Refer to "HANDLEBAR" on page 4-57.
	Front fork legs		Refer to "FRONT FORK" on page 4-65.
1	Main switch cover	1	
2	Cable guide	1	
3	Front turn signal/position light	2	
4	Headlight bracket	1	
5	Air temperature sensor coupler	1	Disconnect.
6	Air temperature sensor	1	
7	Lower bracket cover	1	
8	Front brake hose holder	1	
			For installation, reverse the removal procedure.

Removing the lower bracket (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
1	Steering stem nut	1	
2	Washer	1	
3	Collar	1	
4	Upper bracket	1	
5	Washer	1	
6	Lock washer	1	
7	Upper ring nut	1	
8	Rubber washer	1	
9	Lower ring nut	1	
10	Lower bracket	1	
11	Upper bearing cover	1	
12	Upper bearing inner race	1	
13	Upper bearing	1	
14	Lower bearing	1	
15	Dust seal	1	
16	Lower bearing inner race	1	

Removing the lower bracket (for XVS13CA(C))



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

EAS23110

REMOVING THE LOWER BRACKET

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Remove:

- 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".

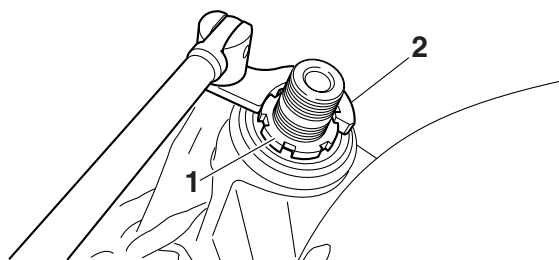


Steering nut wrench

90890-01403

Exhaust flange nut wrench

YU-A9472

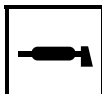


EAS23120

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.

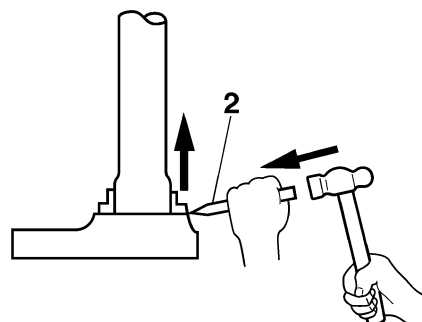
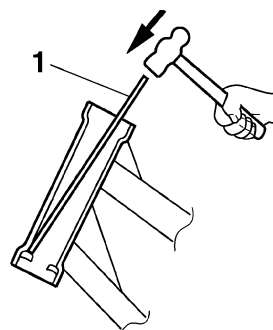
ECA14270

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.

EAS27D1037

INSTALLING THE STEERING HEAD (for XVS13AA(C)/XVS13CTA(C))

1. Lubricate:

- Upper bearing
- Lower bearing
- Bearing races



Recommended lubricant
Lithium-soap-based grease

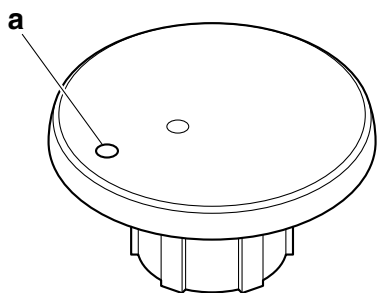
2. Install:

- Lower bracket

- Lower bracket cap

TIP

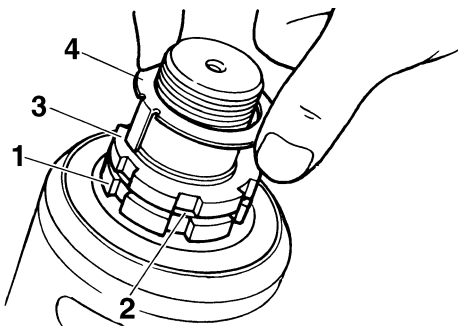
Face the hole “a” in the lower bracket cap rearward.



3. 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 3-27.

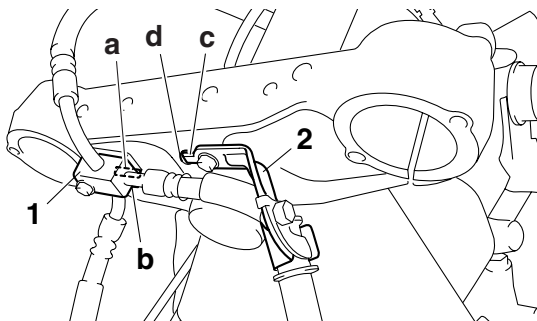


4. Install:

- 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.



5. Install:

- Front fork legs

- Upper bracket

Refer to “FRONT FORK” on page 4-65.

EAS27D1033

INSTALLING THE STEERING HEAD (for XVS13CA(C))

1. Lubricate:

- Upper bearing
- Lower bearing
- Bearing races



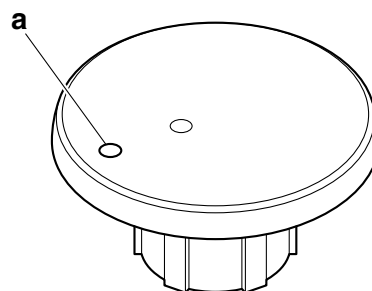
Recommended lubricant
Lithium-soap-based grease

2. Install:

- Lower bracket
- Lower bracket cap

TIP

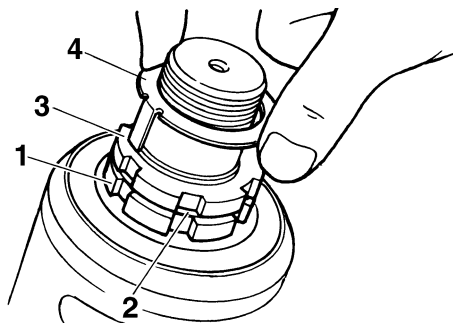
Face the hole “a” in the lower bracket cap rearward.



3. 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 3-27.



4. Install:

- Washer
- Upper bracket
- Collar
- Washer
- Steering stem nut

TIP

Temporarily tighten the steering stem nut.

5. Install:

- Front fork legs

Refer to “FRONT FORK” on page 4-65.

TIP

Temporarily tighten the upper and lower bracket pinch bolts.

6. Tighten:

- Steering stem nut



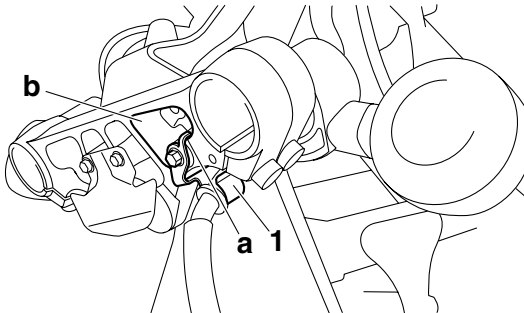
Steering stem nut
110 Nm (11.0 m·kg, 80 ft·lb)

7. Install:

- Front brake hose holder “1”

TIP

Align the projection “a” on the front brake hose holder with the hole “b” in the lower bracket.

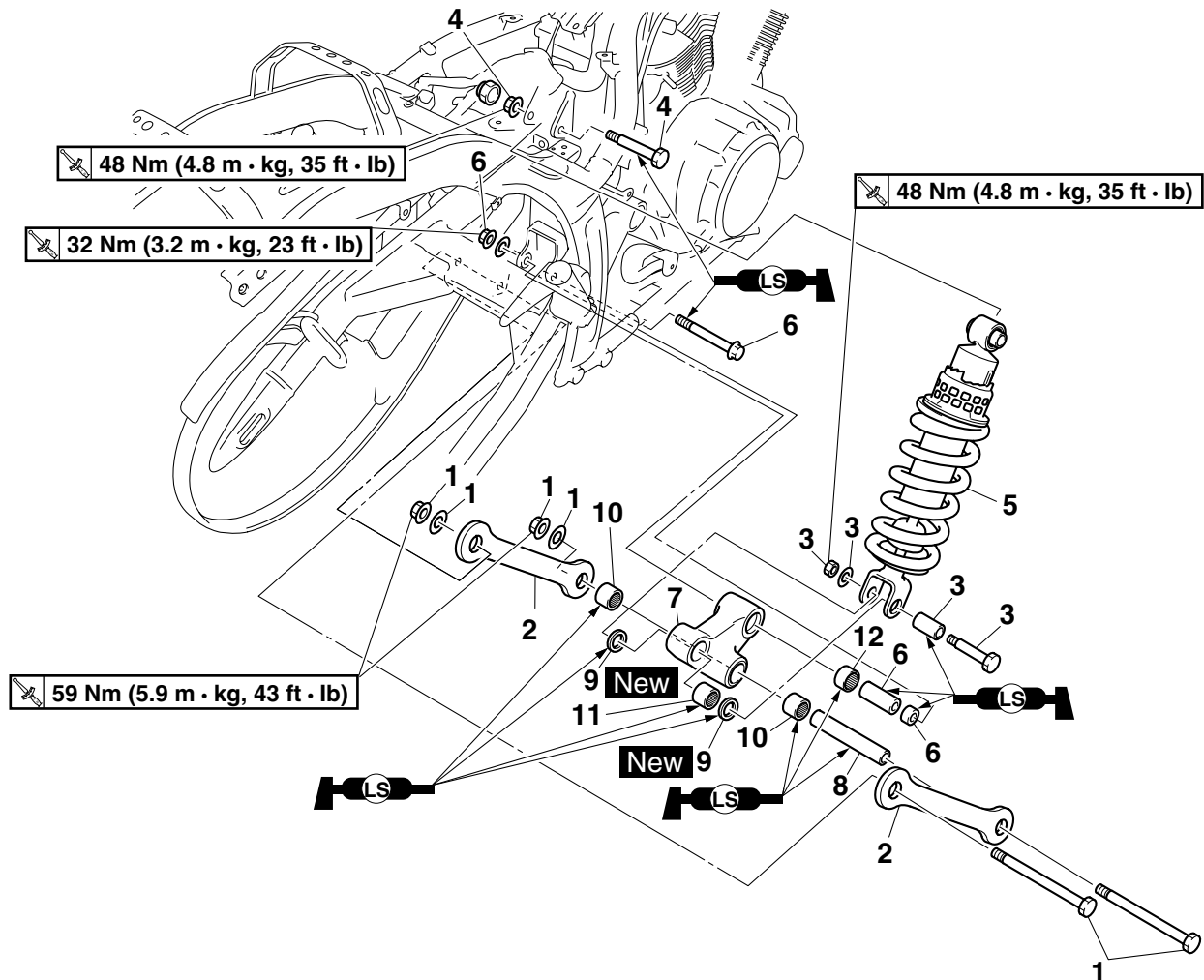


REAR SHOCK ABSORBER ASSEMBLY

EAS23160

REAR SHOCK ABSORBER ASSEMBLY

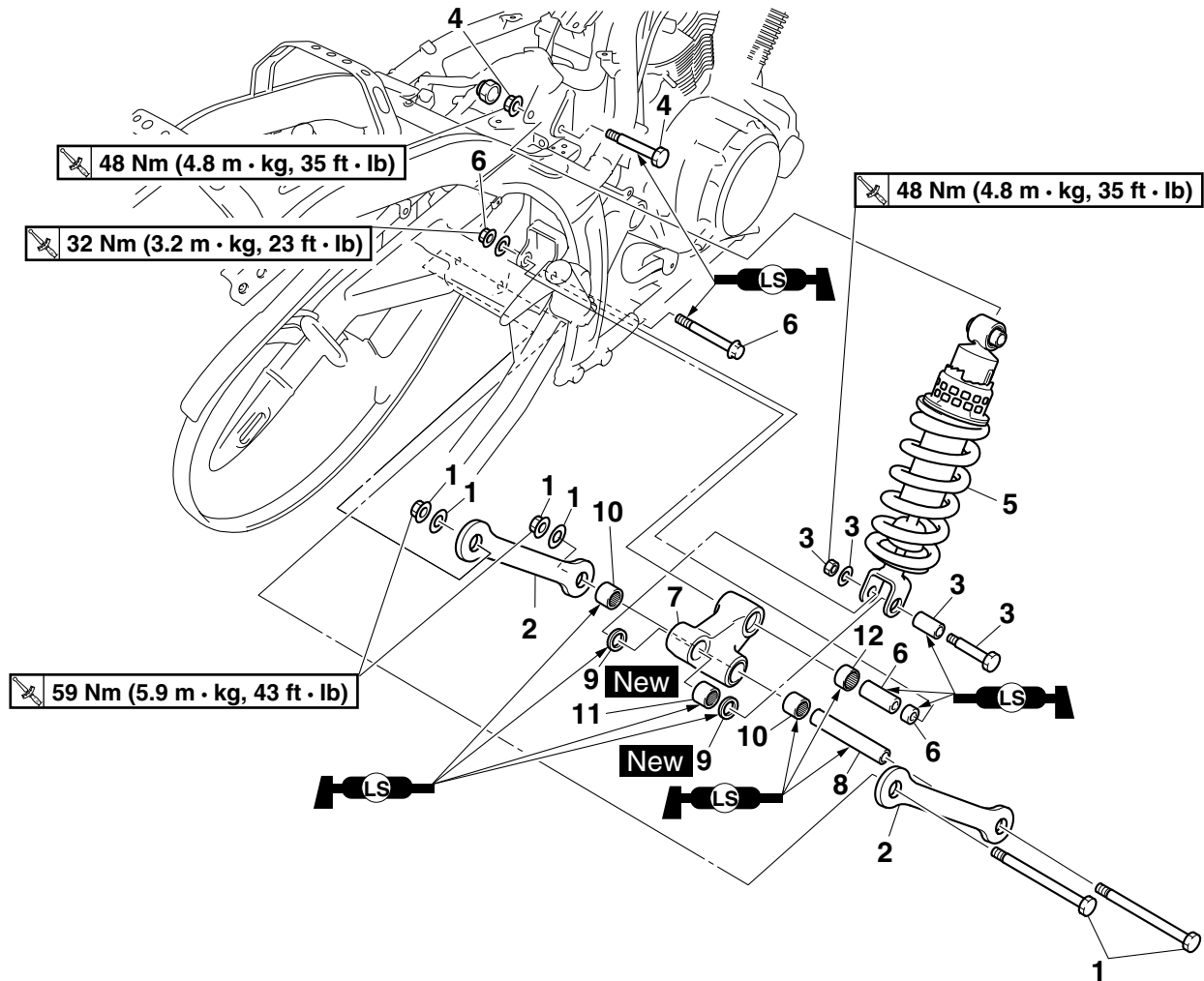
Removing the rear shock absorber assembly (for XVS13AA(C)/XVS13CTA(C))



Order	Job/Parts to remove	Q'ty	Remarks
	Battery box/Relay bracket		Refer to "GENERAL CHASSIS" on page 4-1.
	Muffler/Coolant reservoir cover		Refer to "ENGINE REMOVAL" on page 5-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
	Coolant reservoir		Refer to "RADIATOR" on page 6-1.
	Sub-fuel tank		Refer to "FUEL TANK" on page 7-1.
	Rear wheel		Refer to "REAR WHEEL" on page 4-19.
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	1/1/1/1	
7	Relay arm	1	

REAR SHOCK ABSORBER ASSEMBLY

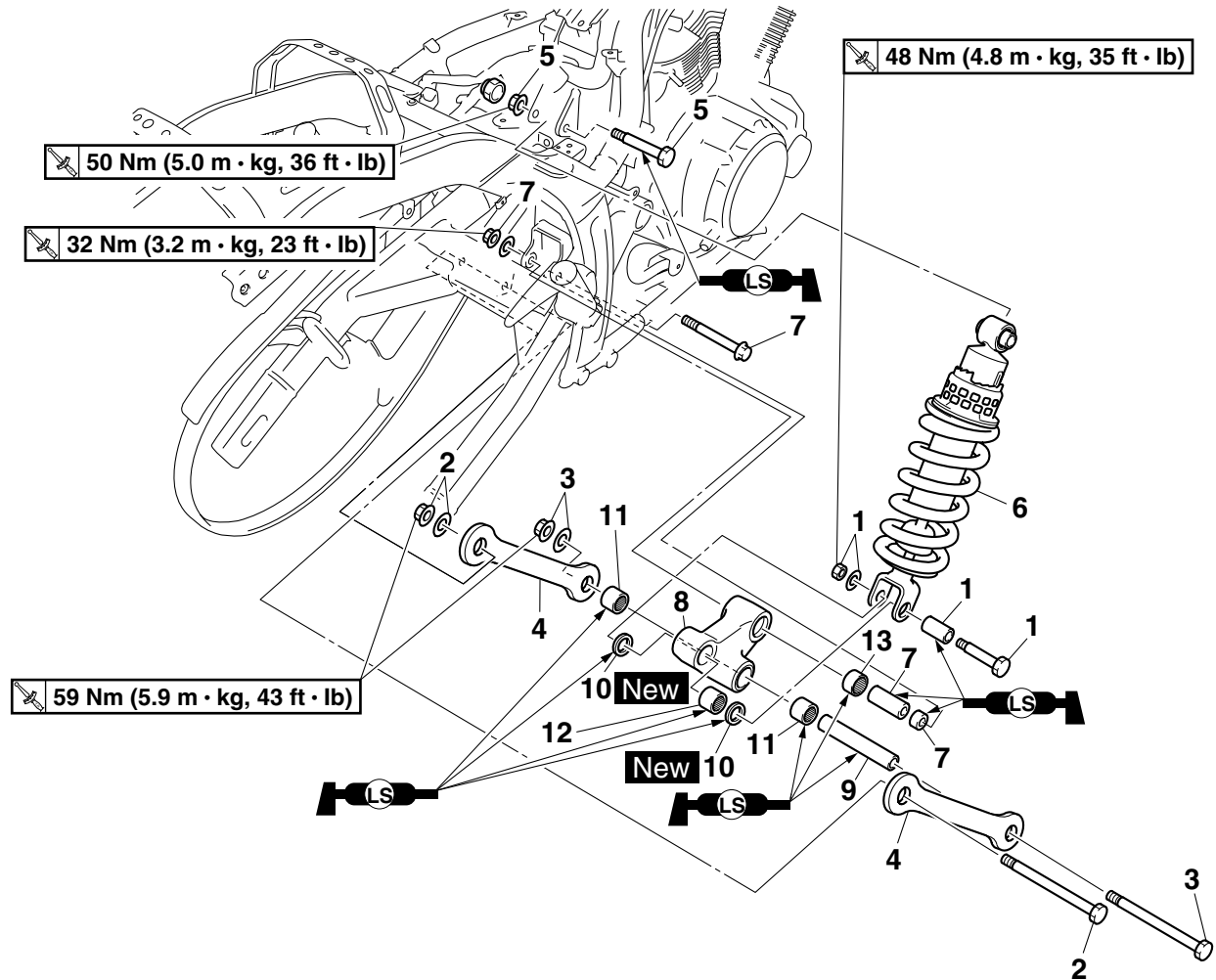
Removing the rear shock absorber assembly (for XVS13AA(C)/XVS13CTA(C))



Order	Job/Parts to remove	Q'ty	Remarks
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

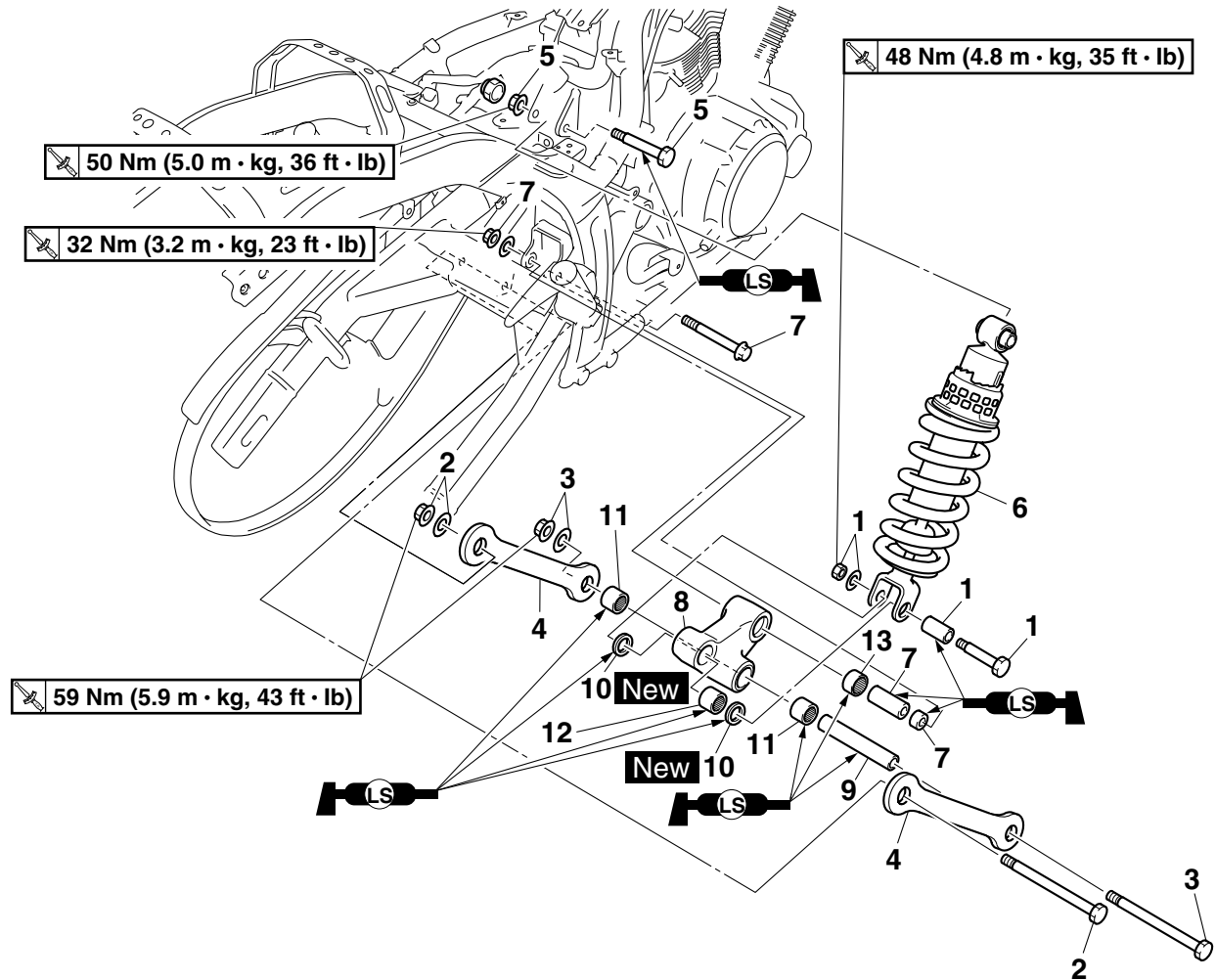
Removing the rear shock absorber assembly (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
	Battery box/Relay bracket		Refer to "GENERAL CHASSIS" on page 4-1.
	Muffler/Coolant reservoir cover		Refer to "ENGINE REMOVAL" on page 5-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
	Coolant reservoir		Refer to "RADIATOR" on page 6-1.
	Sub-fuel tank		Refer to "FUEL TANK" on page 7-1.
	Rear wheel		Refer to "REAR WHEEL" on page 4-19.
1	Rear shock absorber assembly lower nut/Washer/Bolt/Collar	1/1/1/1	
2	Connecting arm nut (upper)/Washer/Bolt (upper)	1/1/1	
3	Connecting arm nut (lower)/Washer/Bolt (lower)	1/1/1	
4	Connecting arm	2	
5	Rear shock absorber assembly upper nut/Bolt	1/1	
6	Rear shock absorber assembly	1	
7	Relay arm nut/Bolt/Spacer/Collar	1/1/1/1	
8	Relay arm	1	

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
9	Spacer	1	
10	Oil seal	2	
11	Bearing	2	
12	Bearing	1	
13	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

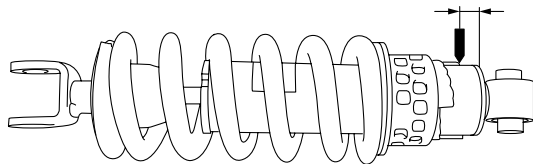
1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3 mm (0.08–0.12 in) hole through the rear shock absorber at a point 15–20 mm (0.60–0.79 in) from its end as shown.

EWA13760



WARNING

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



EAS23230

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY (for XVS13AA(C)/XVS13CTA(C))

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

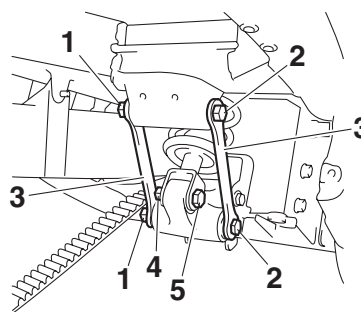
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Connecting arm nuts “1”
- Connecting arm bolts “2”
- Washers
- 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.

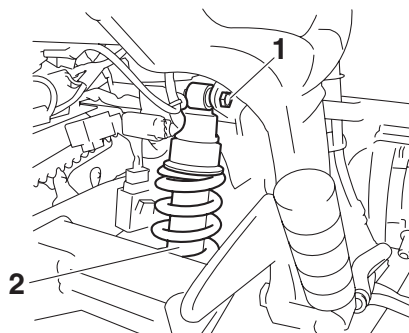


3. Remove:

- 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.



EAS27D1021

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY (for XVS13CA(C))

1. Stand the vehicle on a level surface.

EWA13120



WARNING

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

REAR SHOCK ABSORBER ASSEMBLY

TIP

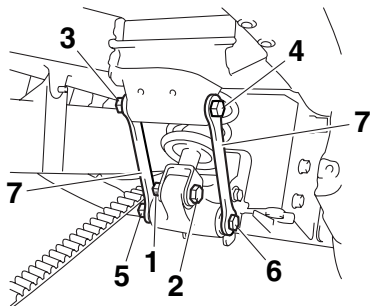
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Rear shock absorber assembly lower nut “1”
- Rear shock absorber assembly lower bolt “2”
- Connecting arm nut (upper) “3”
- Connecting arm bolt (upper) “4”
- Connecting arm nut (lower) “5”
- Connecting arm bolt (lower) “6”
- Washers
- Connecting arms “7”

TIP

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

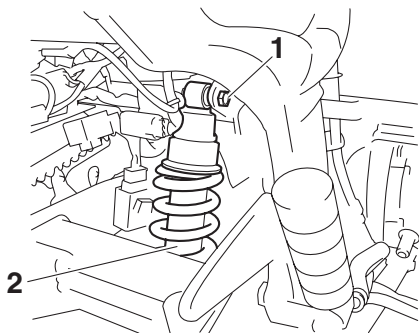


3. Remove:

- 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.



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:

- Oil seals
- Spacers
- Bearings
- Rear shock absorber assembly upper bolt
- Relay arm bolt thread



Recommended lubricant
Lithium-soap-based grease

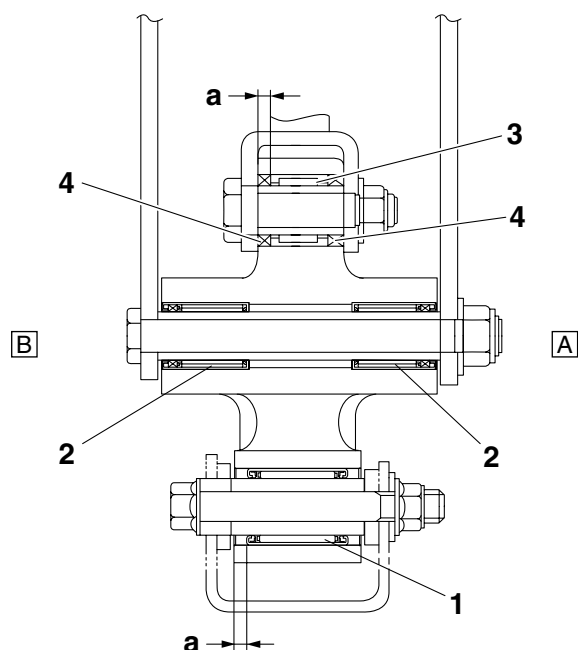
2. Install:

- Bearings “1”, “2”, and “3”
(to the relay arm)
- Oil seals “4” **New**
(to the relay arm)



Installed depth of bearing “a”
4.5 mm (0.18 in)

REAR SHOCK ABSORBER ASSEMBLY



- A. Left side
B. Right side

EAS23310

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
- Spacer



Recommended lubricant
Lithium-soap-based grease

2. Tighten:
- Relay arm nut



Relay arm nut (for XVS13AA(C)/XVS13CTA(C))
32 Nm (3.2 m·kg, 23 ft·lb)
Relay arm nut (for XVS13CA(C))
50 Nm (5.0 m·kg, 36 ft·lb)

3. Install:
- Rear shock absorber assembly

TIP

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

4. Tighten:
- Rear shock absorber assembly upper nut
 - Rear shock absorber assembly lower nut



Rear shock absorber assembly upper nut (for XVS13AA(C)/XVS13CTA(C))
48 Nm (4.8 m·kg, 35 ft·lb)
Rear shock absorber assembly upper nut (for XVS13CA(C))
50 Nm (5.0 m·kg, 36 ft·lb)
Rear shock absorber assembly lower nut
48 Nm (4.8 m·kg, 35 ft·lb)

5. Install:
- Connecting arms

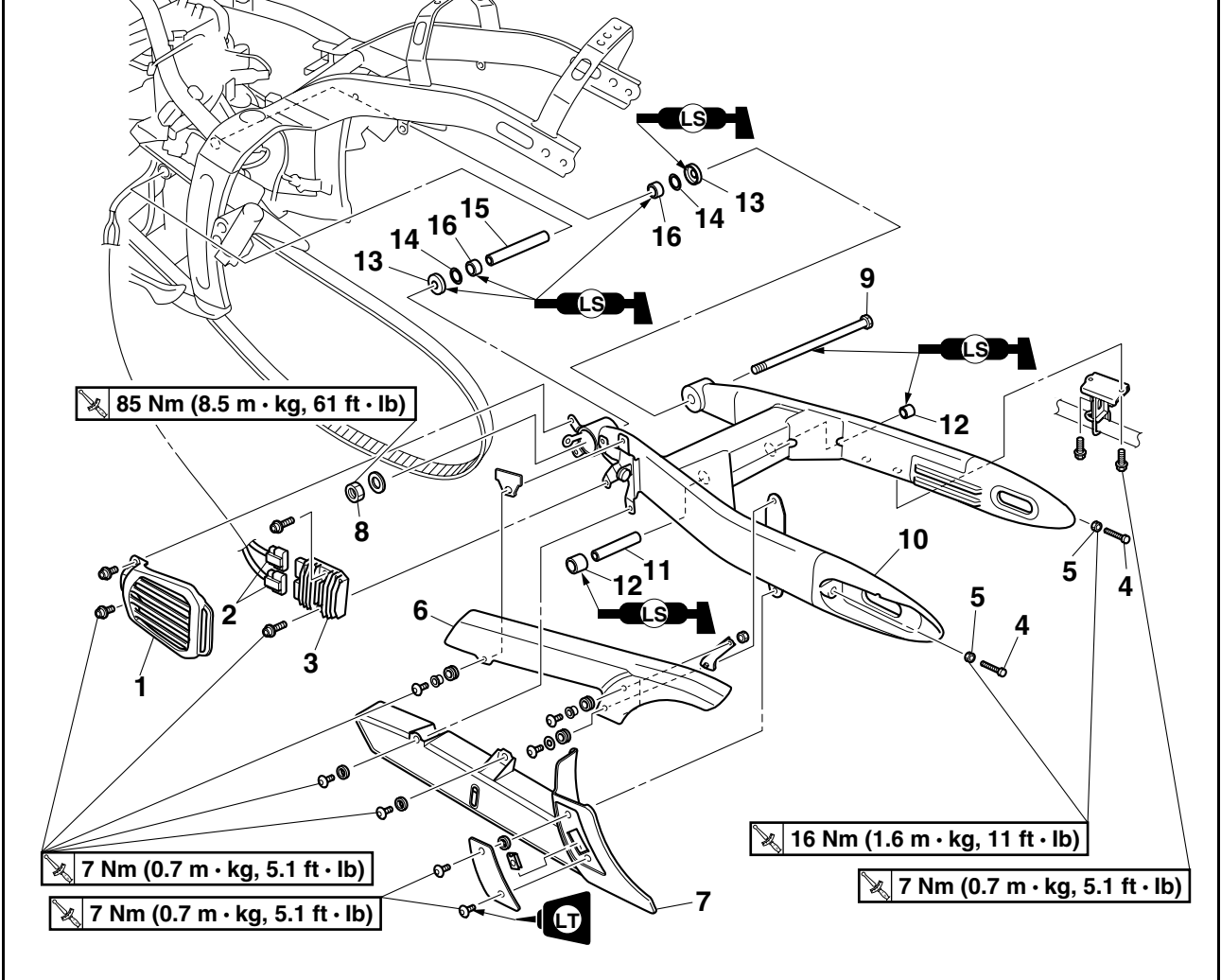
TIP

When installing the connecting arms, lift up the swingarm.

EAS23330

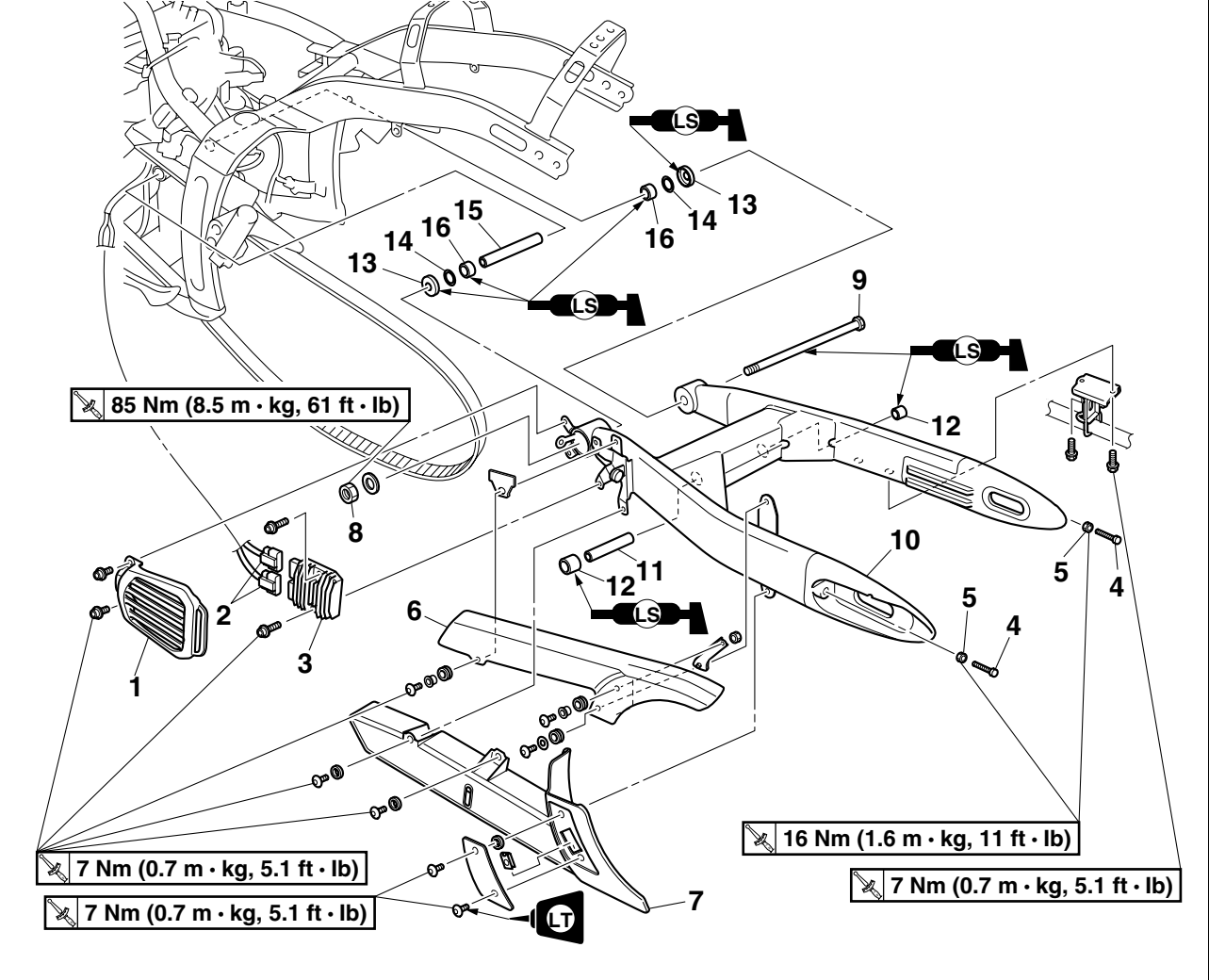
SWINGARM

Removing the swingarm (for XVS13AA(C)/XVS13CTA(C))



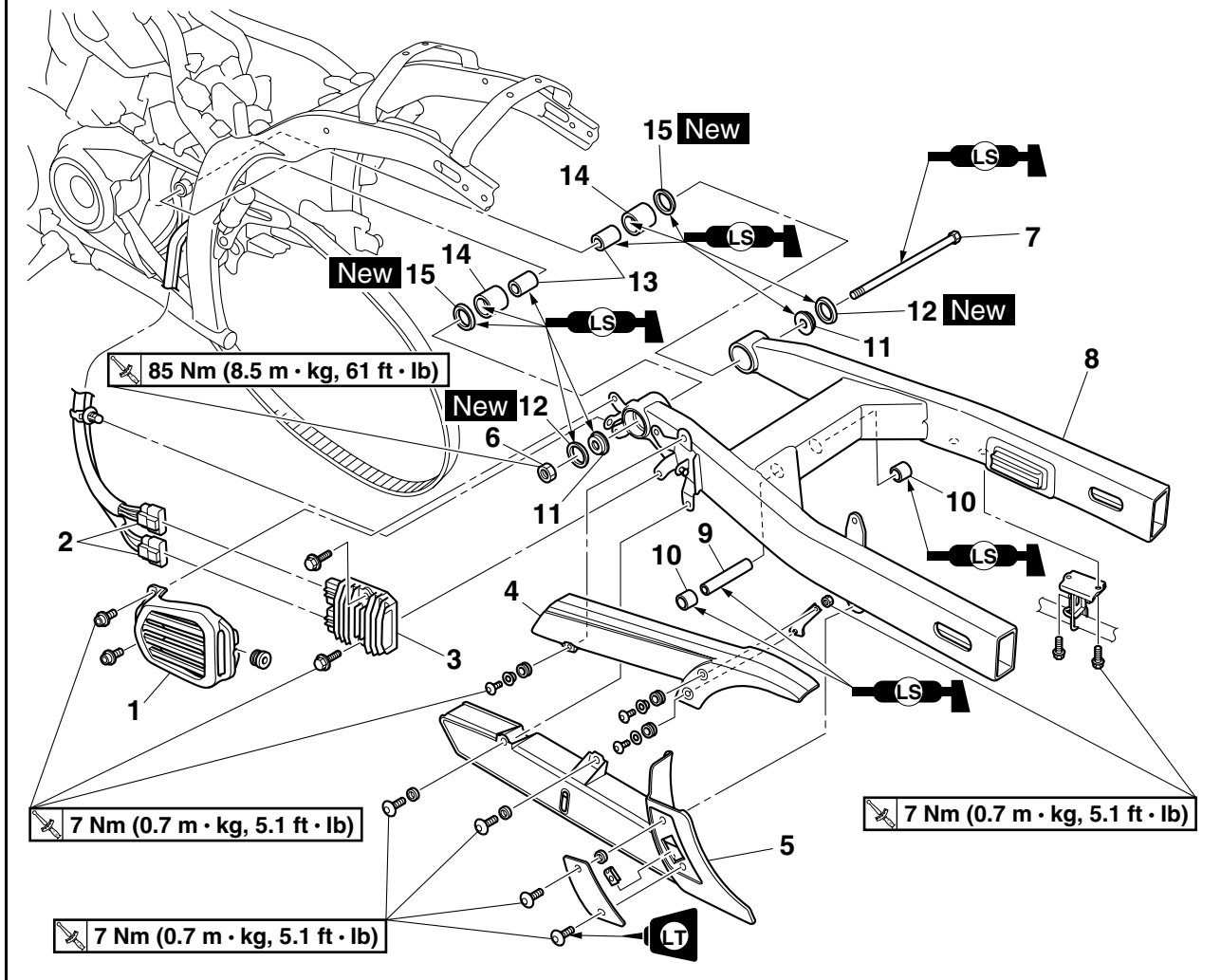
Order	Job/Parts to remove	Q'ty	Remarks
	Connecting arms		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-86.
1	Rectifier/regulator cover	1	
2	Rectifier/regulator coupler	2	Disconnect.
3	Rectifier/regulator	1	
4	Drive belt adjusting bolt	2	
5	Drive belt adjusting locknut	2	
6	Drive belt upper guard	1	
7	Drive belt lower guard	1	
8	Pivot shaft nut	1	
9	Pivot shaft	1	
10	Swingarm	1	
11	Spacer	1	
12	Bearing	2	
13	Dust cover	2	
14	Washer	2	

Removing the swingarm (for XVS13AA(C)/XVS13CTA(C))



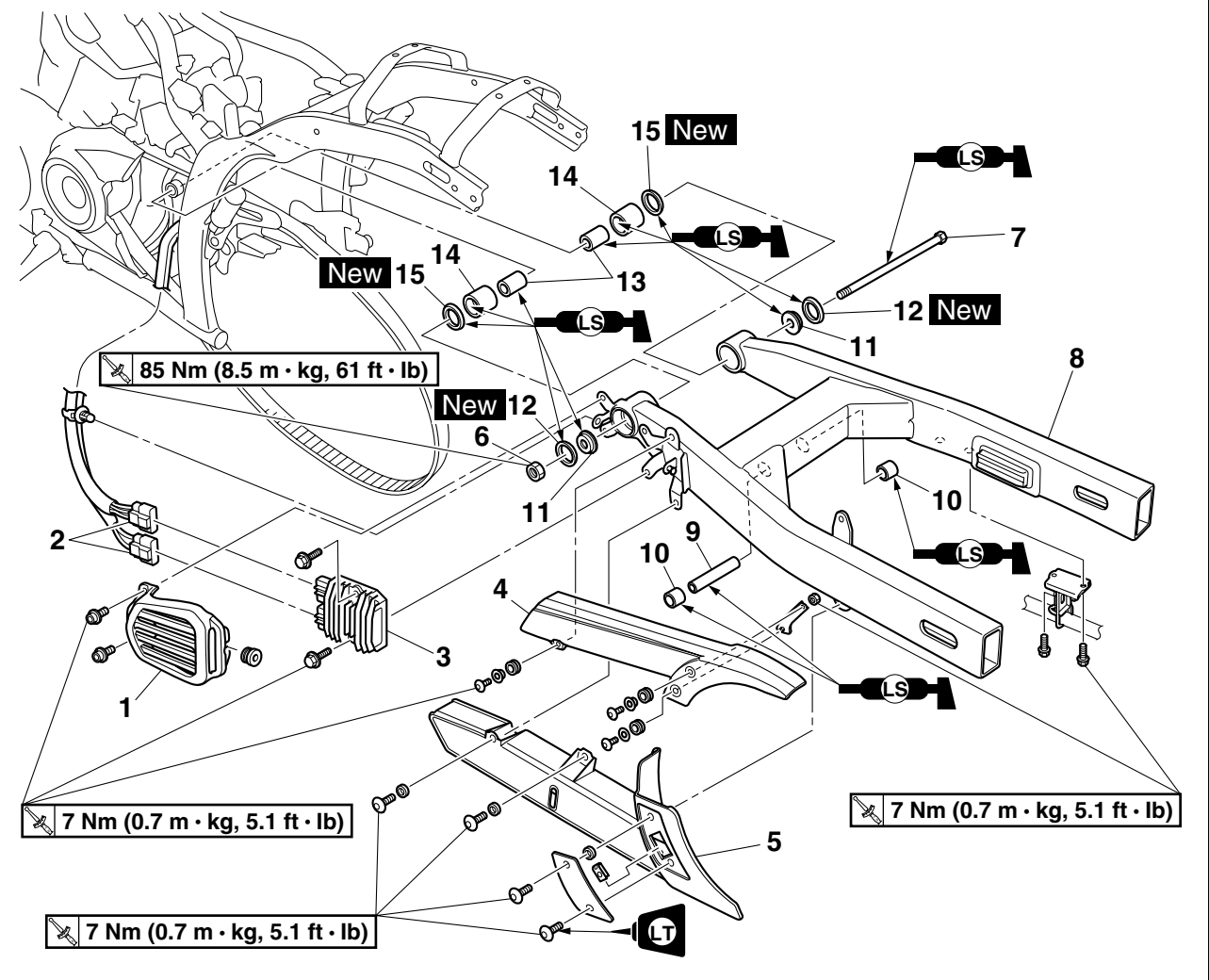
Order	Job/Parts to remove	Q'ty	Remarks
15	Spacer	1	
16	Bearing	2	
			For installation, reverse the removal procedure.

Removing the swingarm (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
	Connecting arms		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-86.
1	Rectifier/regulator cover	1	
2	Rectifier/regulator coupler	2	Disconnect.
3	Rectifier/regulator	1	
4	Drive belt upper guard	1	
5	Drive belt lower guard	1	
6	Pivot shaft nut	1	
7	Pivot shaft	1	
8	Swingarm	1	
9	Spacer	1	
10	Bearing	2	
11	Collar	2	
12	Oil seal	2	
13	Spacer	2	
14	Bearing	2	

Removing the swingarm (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
15	Oil seal	2	
			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.



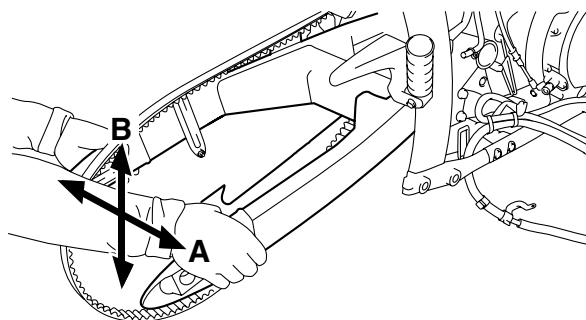
Pivot shaft nut
85 Nm (8.5 m·kg, 61 ft·lb)

- b. Measure the swingarm side play "A" by moving the swingarm from side to side.
- c. If the swingarm side play is out of specification, check the spacer, bearings, washers, and dust covers. (For XVS13AA(C)/XVS13CTA(C))
- d. If the swingarm side play is out of specification, check the spacers, bearings, oil seals, and collars. (For XVS13CA(C))



Swingarm side play (at the end of the swingarm)
1.0 mm (0.04 in)

- e. Check the swingarm vertical movement "B" by moving the swingarm up and down. If the swingarm vertical movement is not smooth or if there is binding, check the spacer, bearings, washers, and dust covers. (For XVS13AA(C)/XVS13CTA(C))
- f. Check the swingarm vertical movement "B" by moving the swingarm up and down. If the swingarm vertical movement is not smooth or if there is binding, check the spacers, bearings, oil seals, and collars. (For XVS13CA(C))



EAS23360

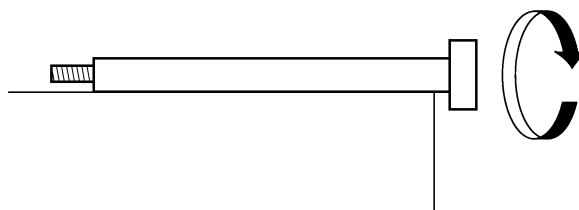
CHECKING THE SWINGARM

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 (for XVS13AA(C)/XVS13CTA(C))
 - Collars (for XVS13CA(C))
 - Bearings



Recommended cleaning solvent
Kerosene

4. Check:
 - Dust covers (for XVS13AA(C)/XVS13CTA(C))
 - Spacers
 - Washers (for XVS13AA(C)/XVS13CTA(C))
 - Collars (for XVS13CA(C))
 - Damage/wear → Replace.

5. Check:

- Bearings
Damage/pitting → Replace.

EAS28780

INSTALLING THE SWINGARM

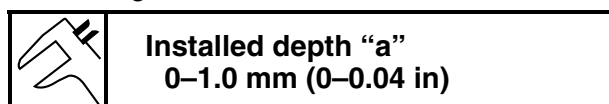
1. Lubricate:

- Bearings
- Spacers
- Dust covers
- Pivot shaft

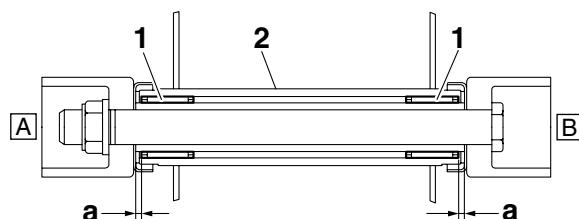


2. Install:

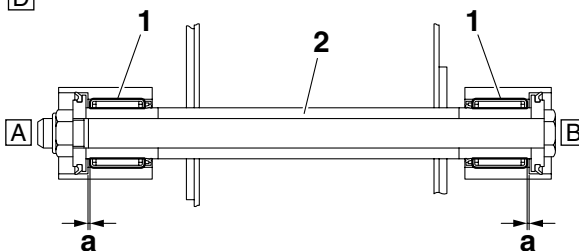
- Bearings “1”



C



D

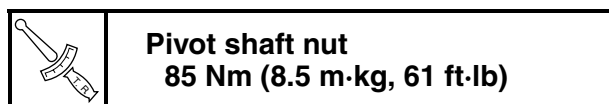


2. Swingarm

- A. Left side
- B. Right side
- C. For XVS13AA(C)/XVS13CTA(C)
- D. For XVS13CA(C)

3. Install:

- Pivot shaft nut

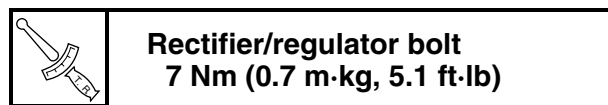


4. Install:

- Rectifier/regulator

TIP

When installing the rectifier/regulator, first tighten the upper bolt, then the lower bolt.



5. Adjust:

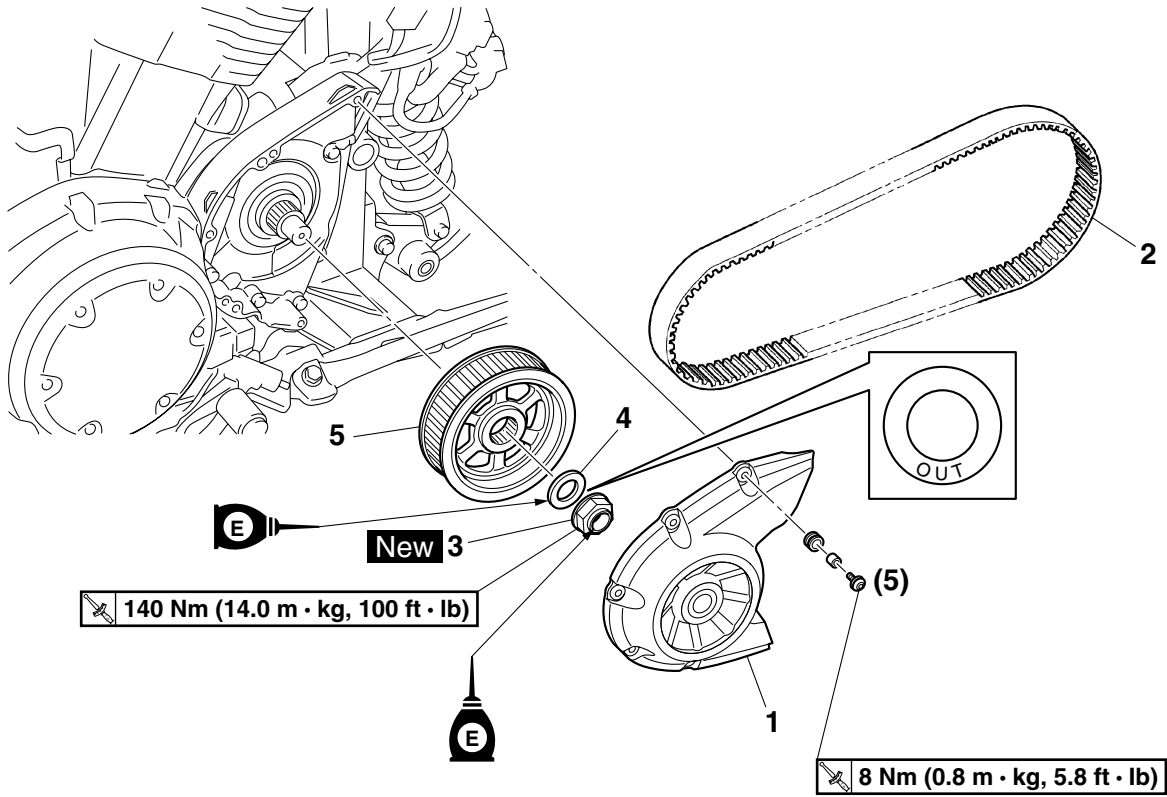
- Drive belt slack

Refer to “ADJUSTING THE DRIVE BELT SLACK (for XVS13AA(C)/XVS13CTA(C))” on page 3-24 and “ADJUSTING THE DRIVE BELT SLACK (for XVS13CA(C))” on page 3-26.

EAS23510

BELT DRIVE

Removing the drive belt



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-19.
	Swingarm		Refer to "SWINGARM" on page 4-93.
1	Drive pulley cover	1	
2	Drive belt	1	
3	Drive pulley nut	1	
4	Conical spring washer	1	
5	Drive pulley	1	
			For installation, reverse the removal procedure.

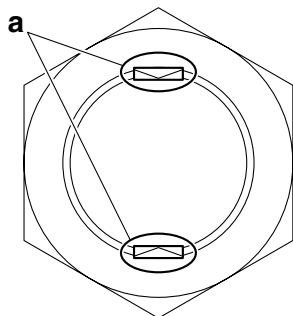
EAS23520

REMOVING THE DRIVE BELT AND DRIVE PULLEY

TIP

Loosen the drive pulley nut before removing the rear wheel.

1. Straighten the drive pulley nut ribs "a".



2. Loosen:
 - Drive pulley nut

TIP

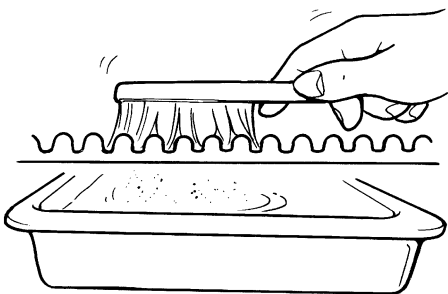
When loosening the drive pulley nut, press down on the brake pedal so the drive pulley does not move.

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.



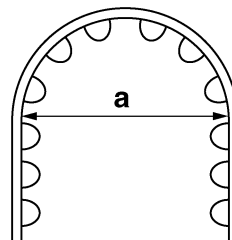
2. Check:
 - Drive belt

ECA14690

NOTICE

- To protect the drive belt from damage, handle it with care.

- The drive belt can not be bent smaller than 127 mm (5 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

Install the drive belt facing the same way it was removed.

Do not twist the drive belt when installing it.

2. Install:
 - Swingarm
 - Refer to "SWINGARM" on page 4-93.
 - Rear wheel
 - Refer to "REAR WHEEL" on page 4-19.
3. Install:
 - Conical spring washer
 - Drive pulley nut

TIP

- Install the conical spring washer with its "OUT" mark facing outward.
- Lubricate the conical spring washer and drive pulley nut with engine oil.

4. Tighten:
 - Drive pulley nut

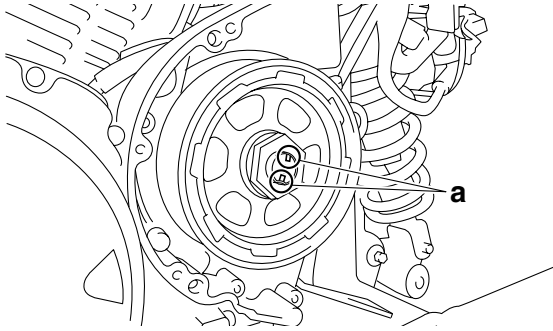


Drive pulley nut
140 Nm (14.0 m·kg, 100 ft·lb)

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 (for XVS13AA(C)/XVS13CTA(C))” on page 3-24 and “ADJUSTING THE DRIVE BELT SLACK (for XVS13CA(C))” on page 3-26.

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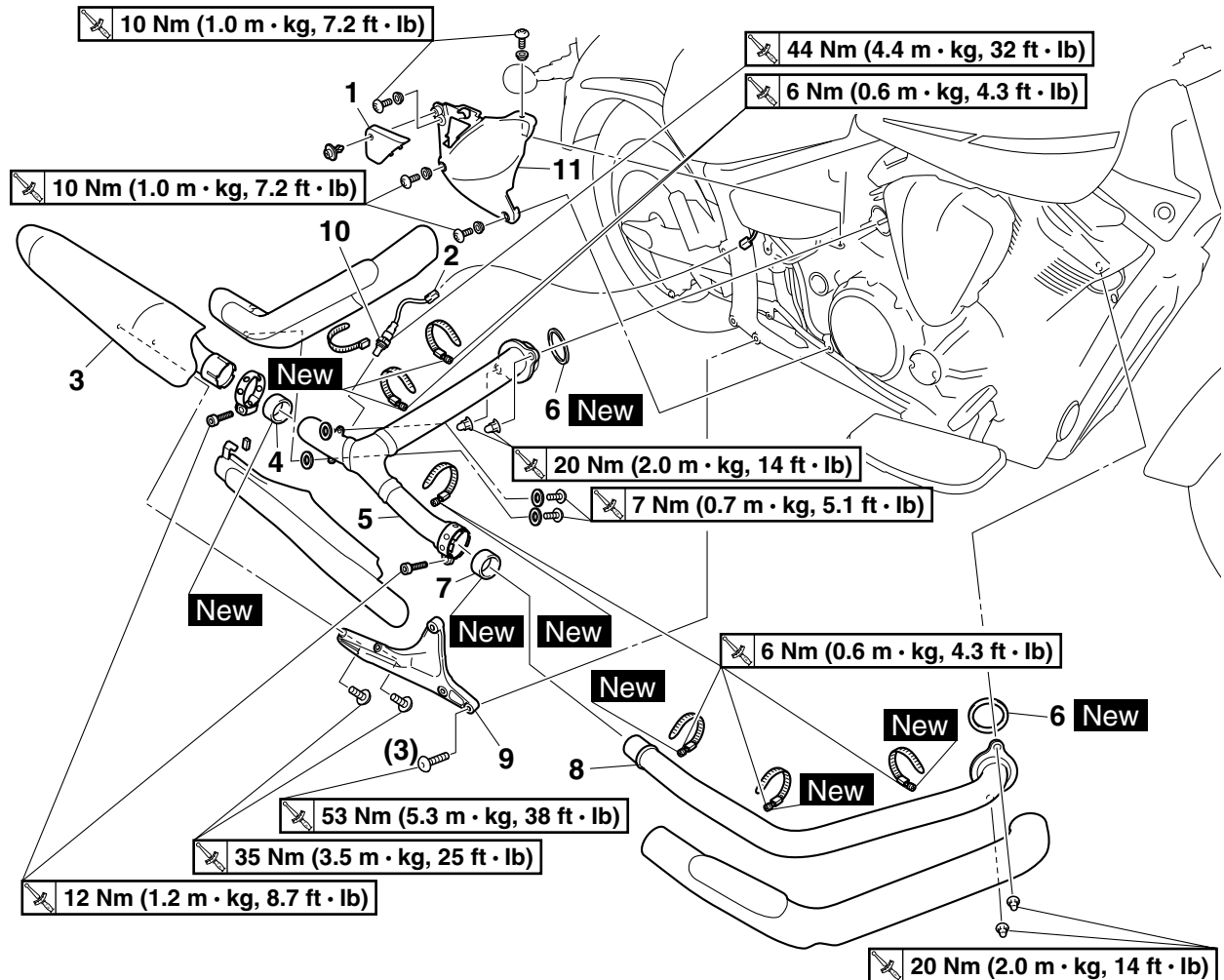
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EAS23710

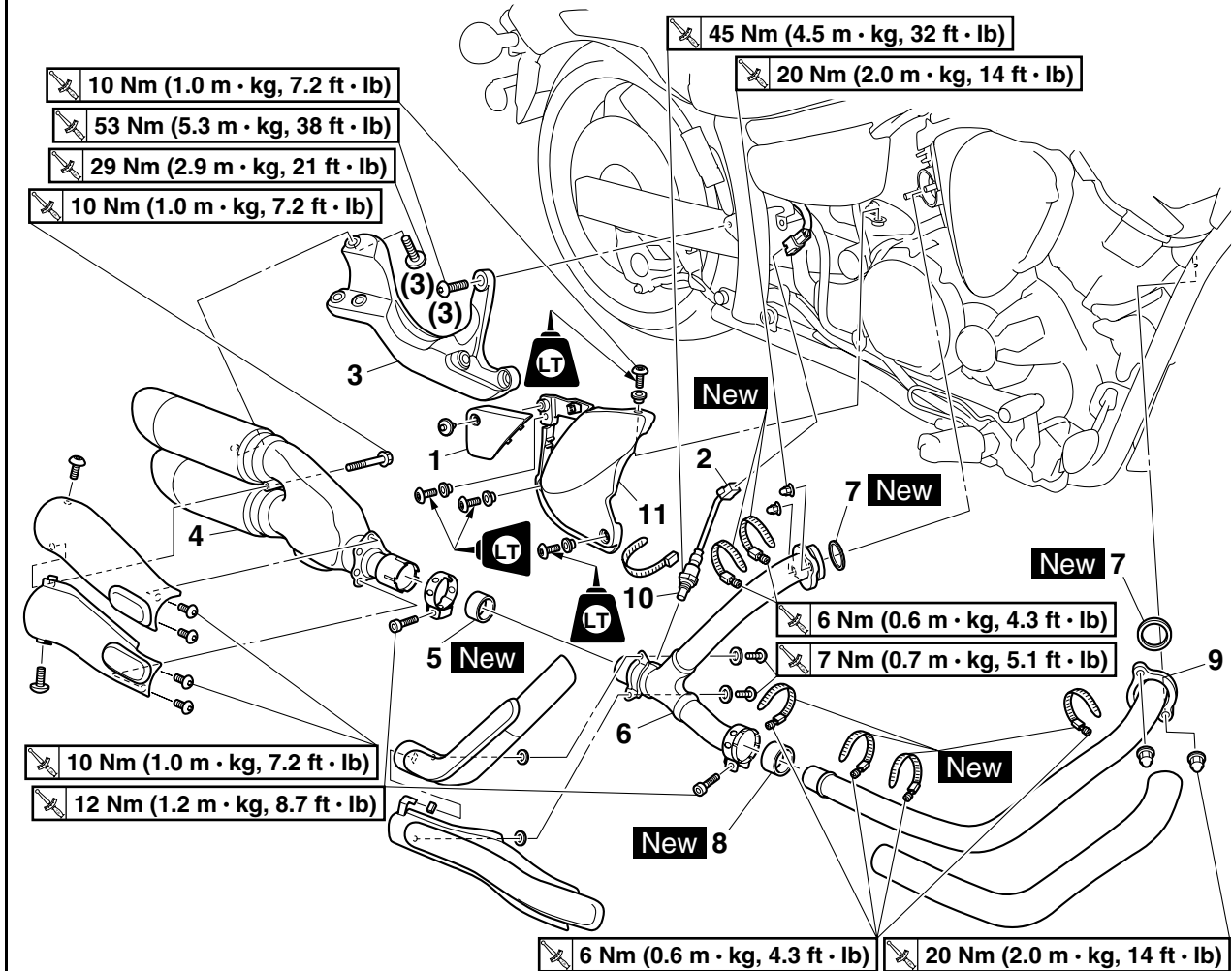
ENGINE REMOVAL

Removing the muffler and exhaust pipes (for XVS13AA(C)/XVS13CTA(C))



Order	Job/Parts to remove	Q'ty	Remarks
1	Coolant reservoir cap cover	1	
2	O ₂ sensor coupler	1	Disconnect.
3	Muffler	1	
4	Gasket	1	
5	Rear cylinder exhaust pipe	1	
6	Gasket	2	
7	Gasket	1	
8	Front cylinder exhaust pipe	1	
9	Muffler bracket	1	
10	O ₂ sensor	1	
11	Coolant reservoir cover	1	
			For installation, reverse the removal procedure.

Removing the muffler and exhaust pipes (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
1	Coolant reservoir cap cover	1	
2	O ₂ sensor coupler	1	Disconnect.
3	Muffler bracket	1	
4	Muffler	1	
5	Gasket	1	
6	Rear cylinder exhaust pipe	1	
7	Gasket	2	
8	Gasket	1	
9	Front cylinder exhaust pipe	1	
10	O ₂ sensor	1	
11	Coolant reservoir cover	1	
			For installation, reverse the removal procedure.

EAS3D8A001

INSTALLING THE COOLANT RESERVOIR COVER

1. Install:

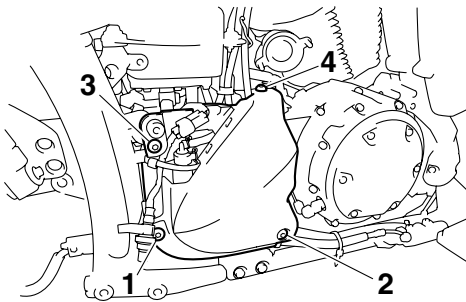
- Coolant reservoir cover



Coolant reservoir cover bolt (for XVS13AA(C)/XVS13CTA(C))
10 Nm (1.0 m·kg, 7.2 ft·lb)
Coolant reservoir cover bolt (for XVS13CA(C))
10 Nm (1.0 m·kg, 7.2 ft·lb)
LOCTITE®

TIP

First, tighten the bolt “1”, then the bolt “2”. The bolts “3” and “4” may be tightened in any tightening sequence.



EAS3D81019

INSTALLING THE EXHAUST PIPE COVER SCREW CLAMPS

1. Install:

- Exhaust pipe cover screw clamps **New**

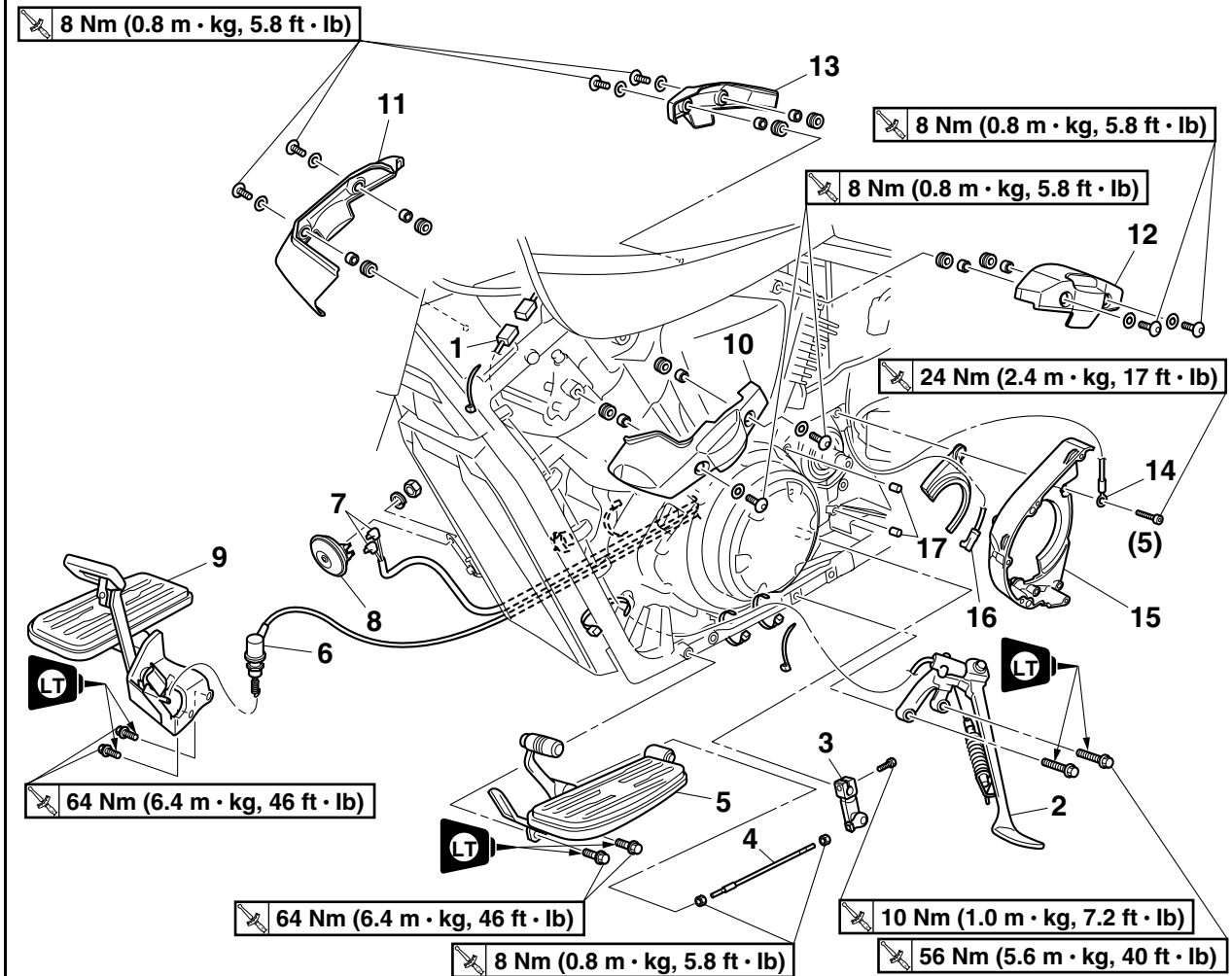


Exhaust pipe cover screw clamp
6 Nm (0.6 m·kg, 4.3 ft·lb)

TIP

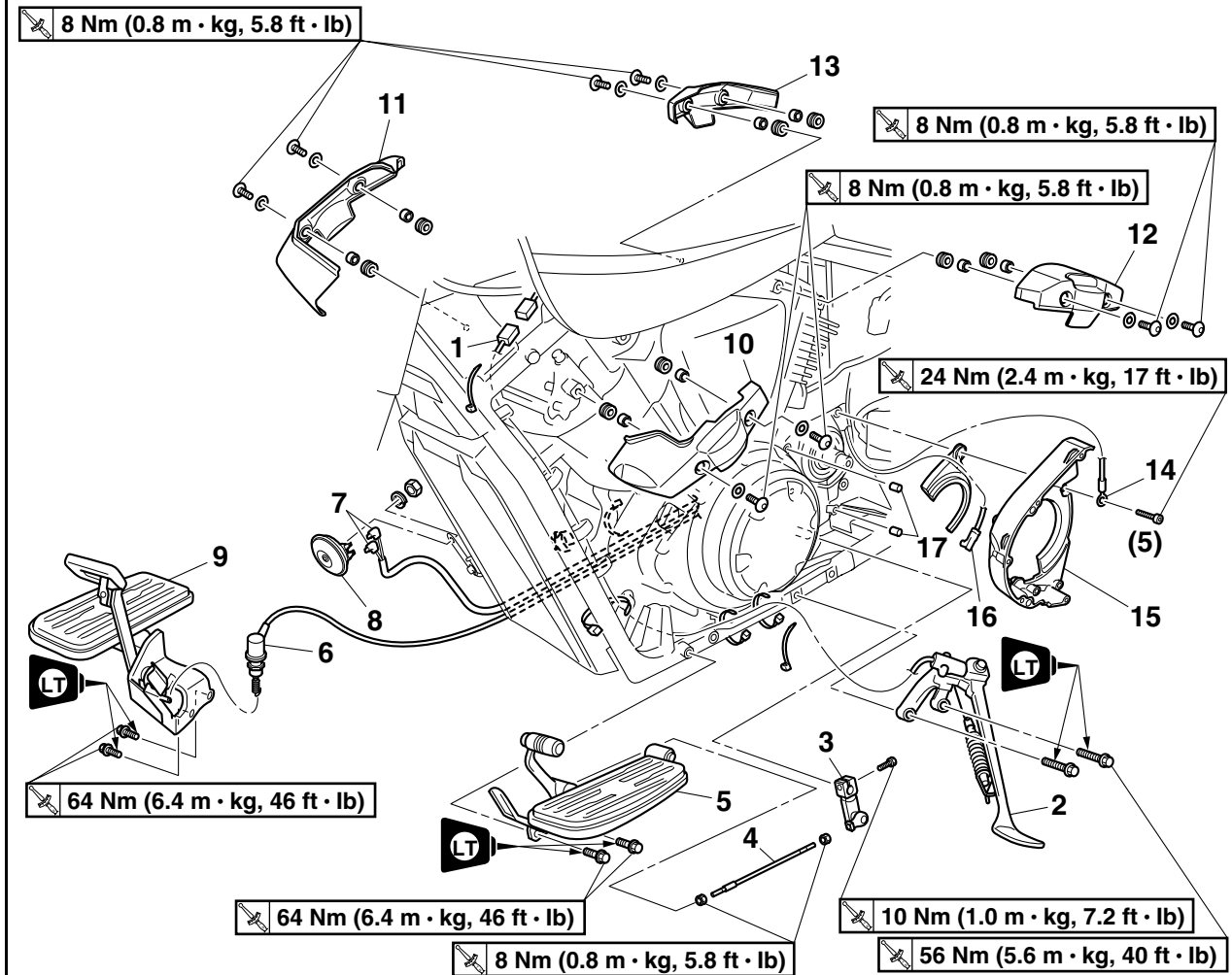
Do not retighten the exhaust pipe cover screw clamps; always replace them with new ones if they are loosened.

Removing the sidestand and drive pulley housing (for XVS13AA(C)/XVS13CTA(C))



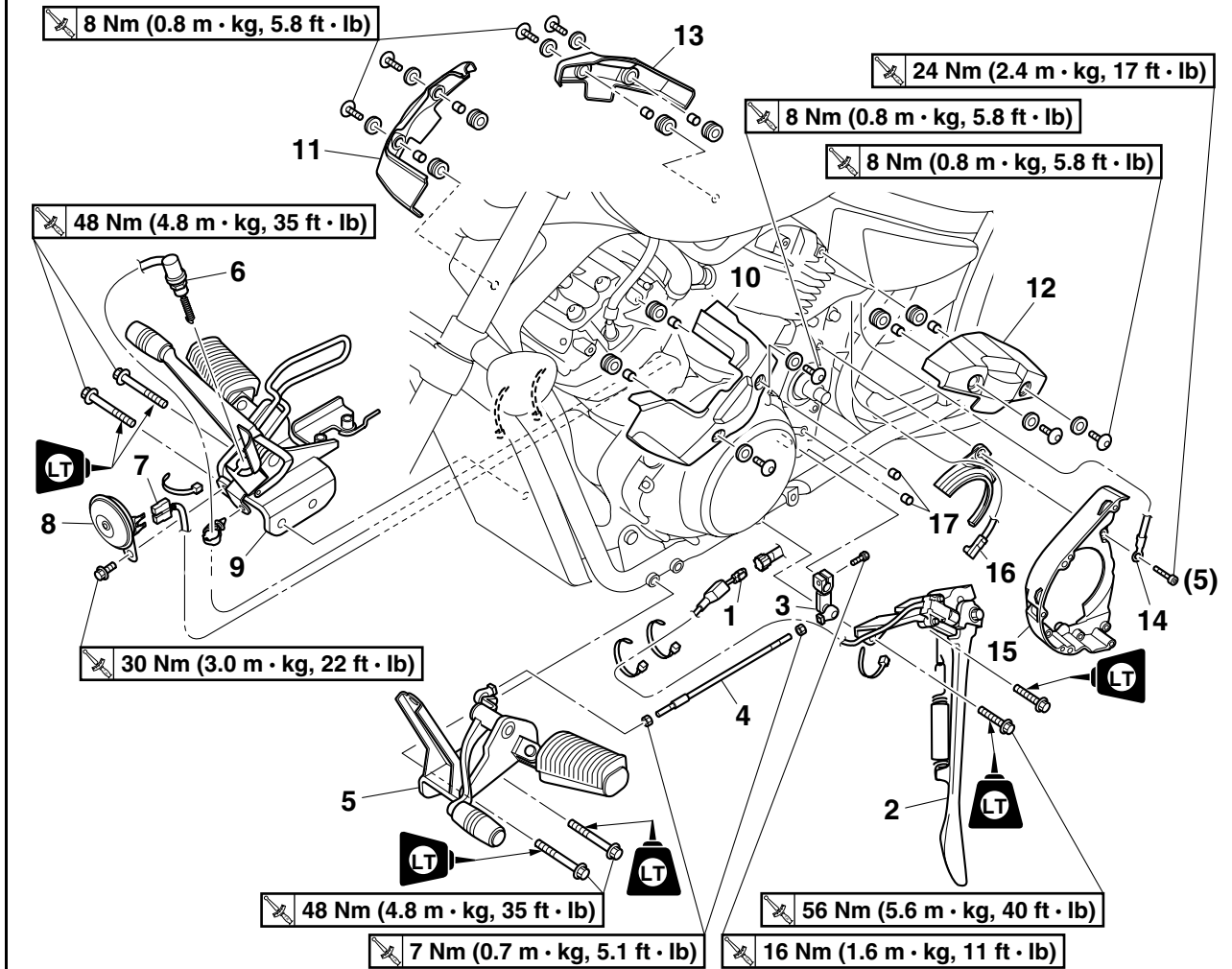
Order	Job/Parts to remove	Q'ty	Remarks
	Drive belt		Refer to "BELT DRIVE" on page 4-99.
	Rear brake master cylinder		Refer to "REAR BRAKE" on page 4-42.
	Canister		California only. Refer to "THROTTLE BODIES" on page 7-9.
	Coolant reservoir cover bracket		Refer to "RADIATOR" on page 6-1.
1	Sidestand switch coupler	1	Disconnect.
2	Sidestand	1	
3	Shift arm	1	
4	Shift rod	1	
5	Left rider footrest assembly	1	
6	Rear brake light switch	1	
7	Horn connector	2	Disconnect.
8	Horn	1	
9	Right rider footrest assembly	1	
10	Front cylinder left cover	1	
11	Front cylinder right cover	1	
12	Rear cylinder left cover	1	
13	Rear cylinder right cover	1	

Removing the sidestand and drive pulley housing (for XVS13AA(C)/XVS13CTA(C))



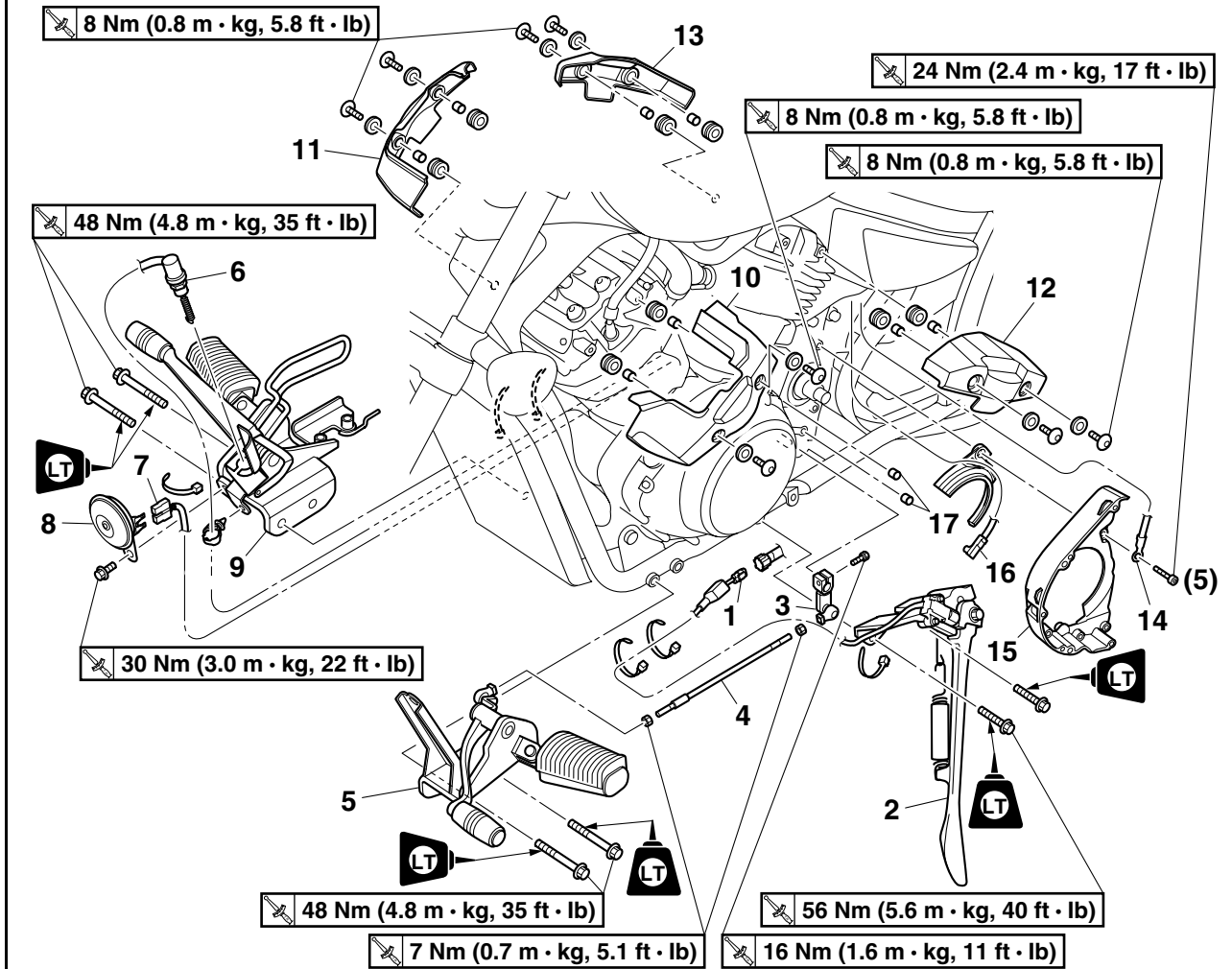
Order	Job/Parts to remove	Q'ty	Remarks
14	Ground lead	1	Disconnect.
15	Drive pulley housing	1	
16	Neutral switch connector	1	Disconnect.
17	Dowel pin	2	
			For installation, reverse the removal procedure.

Removing the sidestand and drive pulley housing (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
	Drive belt		Refer to "BELT DRIVE" on page 4-99.
	Rear brake master cylinder		Refer to "REAR BRAKE" on page 4-42.
	Canister		California only. Refer to "THROTTLE BODIES" on page 7-9.
	Coolant reservoir cover bracket		Refer to "RADIATOR" on page 6-1.
1	Sidestand switch coupler	1	Disconnect.
2	Sidestand	1	
3	Shift arm	1	
4	Shift rod	1	
5	Left rider footrest assembly	1	
6	Rear brake light switch	1	
7	Horn connector	1	Disconnect.
8	Horn	1	
9	Right rider footrest assembly	1	
10	Front cylinder left cover	1	
11	Front cylinder right cover	1	
12	Rear cylinder left cover	1	
13	Rear cylinder right cover	1	

Removing the sidestand and drive pulley housing (for XVS13CA(C))



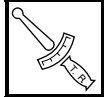
Order	Job/Parts to remove	Q'ty	Remarks
14	Ground lead	1	Disconnect.
15	Drive pulley housing	1	
16	Neutral switch connector	1	Disconnect.
17	Dowel pin	2	
			For installation, reverse the removal procedure.

EAS3D81039

INSTALLING THE CYLINDER COVERS

1. Install:

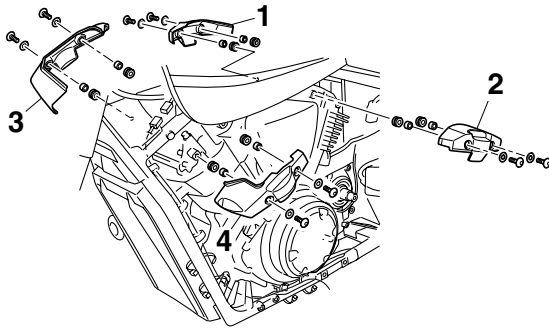
- Rear cylinder right cover “1”
- Rear cylinder left cover “2”
- Front cylinder right cover “3”
- Front cylinder left cover “4”



Cylinder cover bolt
8 Nm (0.8 m·kg, 5.8 ft·lb)

TIP

Tighten the cover bolts temporarily, and then tighten the intake-side bolts, then the exhaust-side bolts, to specification.



EAS3D81018

INSTALLING THE SHIFT ARM

1. Install:

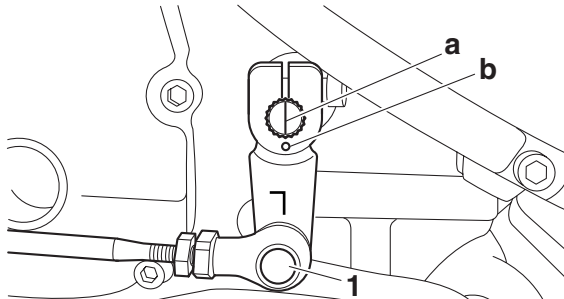
- Shift arm “1”



Shift arm bolt (for XVS13AA(C)/XVS13CTA(C))
10 Nm (1.0 m·kg, 7.2 ft·lb)
Shift arm bolt (for XVS13CA(C))
16 Nm (1.6 m·kg, 11 ft·lb)

TIP

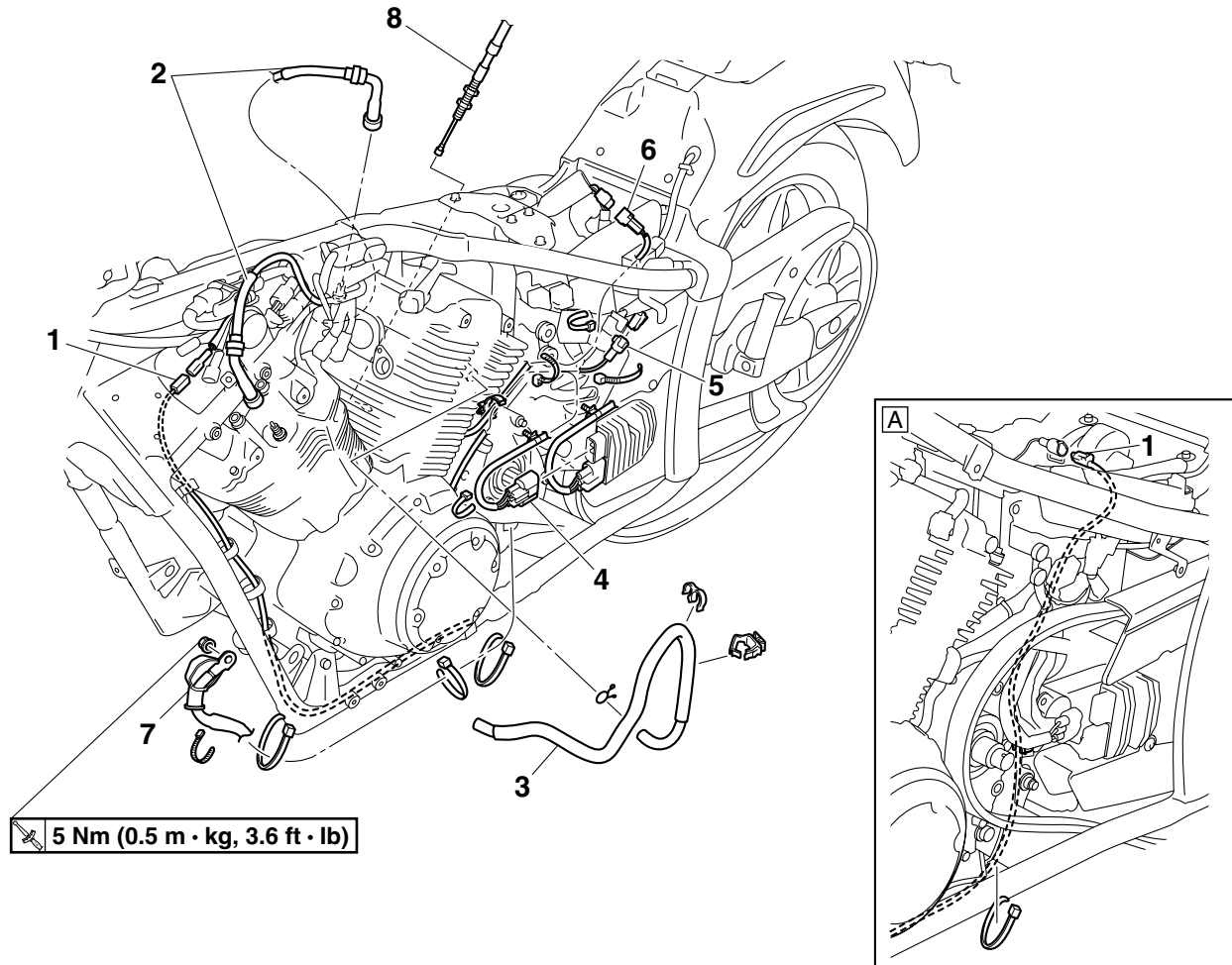
Align the “I” mark “a” in the shift shaft with the punch mark “b” in the shift arm.



2. Adjust:

- Shift rod length
Refer to “ADJUSTING THE SHIFT PEDAL” on page 3-24.

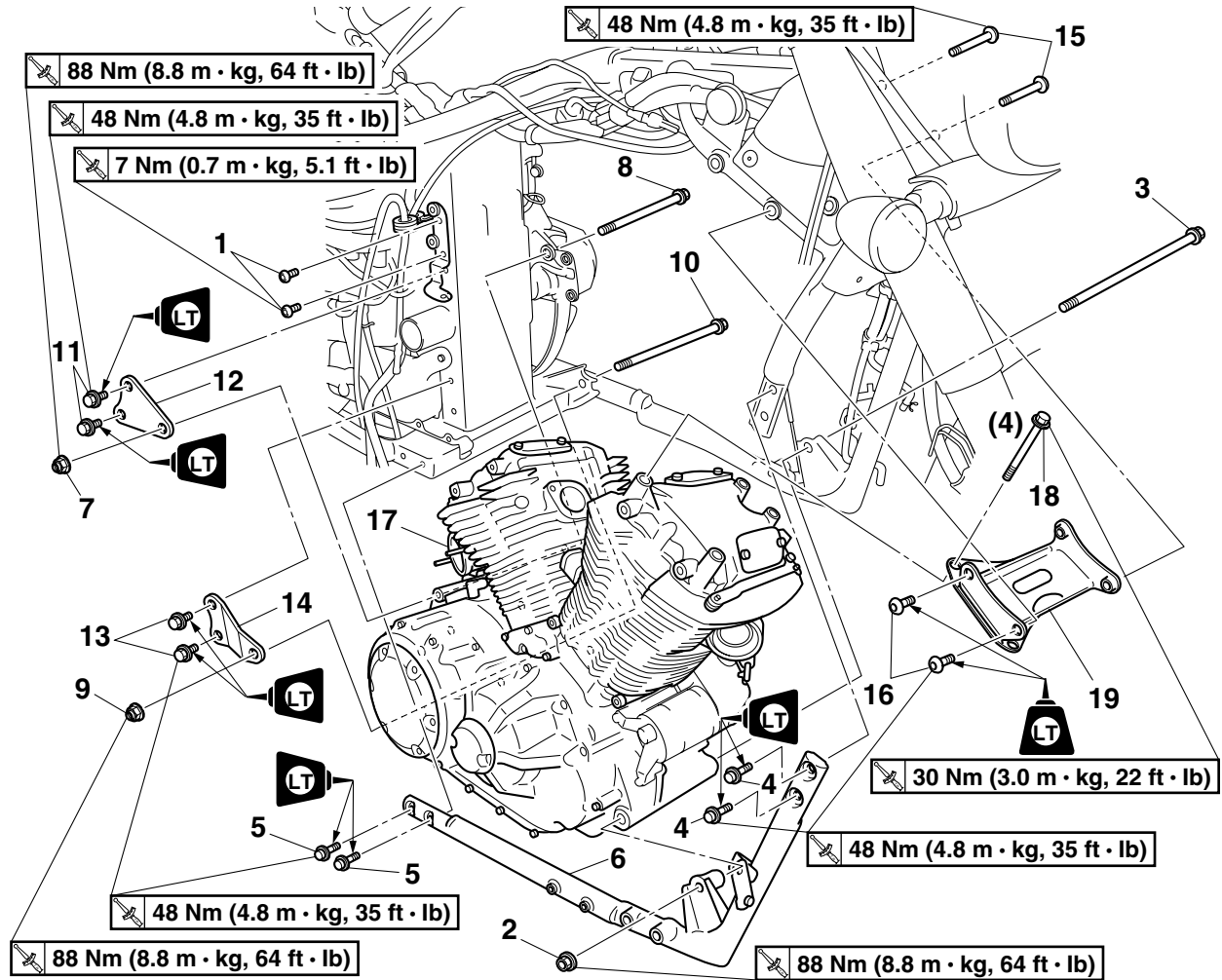
Disconnecting the leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
	Sub-fuel tank cover/Relay cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Thermostat		Refer to "THERMOSTAT" on page 6-4.
	Intake manifold assembly		Refer to "THROTTLE BODIES" on page 7-9.
	Rectifier/regulator cover		Refer to "SWINGARM" on page 4-93.
1	Oil level switch coupler	1	Disconnect.
2	Spark plug cap	2	Disconnect.
3	Crankcase breather hose	1	
4	Stator coil coupler	1	Disconnect.
5	Crankshaft position sensor coupler	1	Disconnect.
6	Speed sensor coupler	1	Disconnect.
7	Starter motor lead	1	Disconnect.
8	Clutch cable	1	Disconnect.
			For installation, reverse the removal procedure.

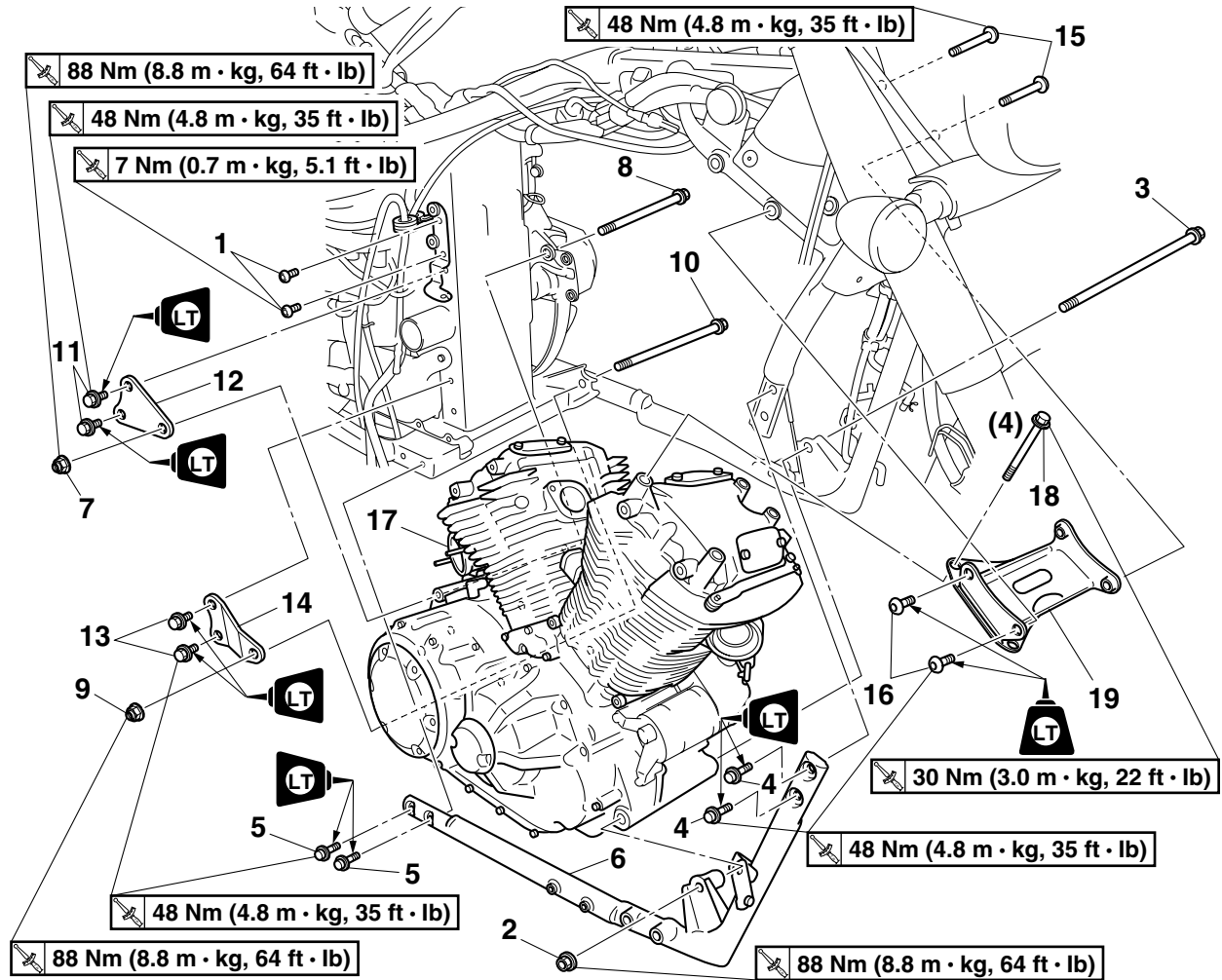
A: For XVS13CA(C)

Removing the down tube and engine (for XVS13AA(C)/XVS13CTA(C))



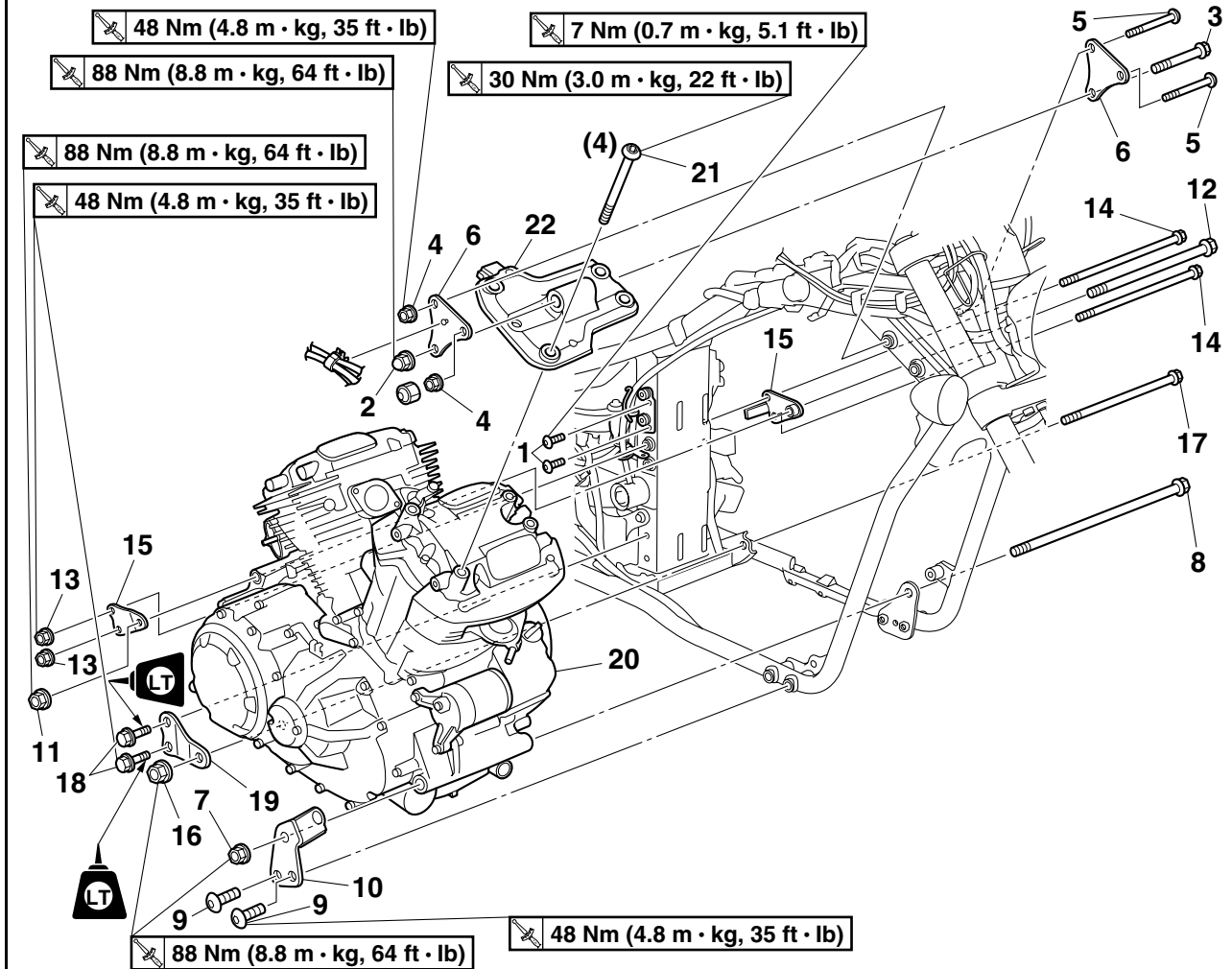
Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-12.
1	Sub-fuel tank bracket bolt	2	
2	Engine mounting nut (front lower side)	1	
3	Engine mounting bolt (front lower side)	1	
4	Down tube bolt (front side)	2	
5	Down tube bolt (rear side)	2	
6	Down 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 bolt (front left upper side)	2	

Removing the down tube and engine (for XVS13AA(C)/XVS13CTA(C))



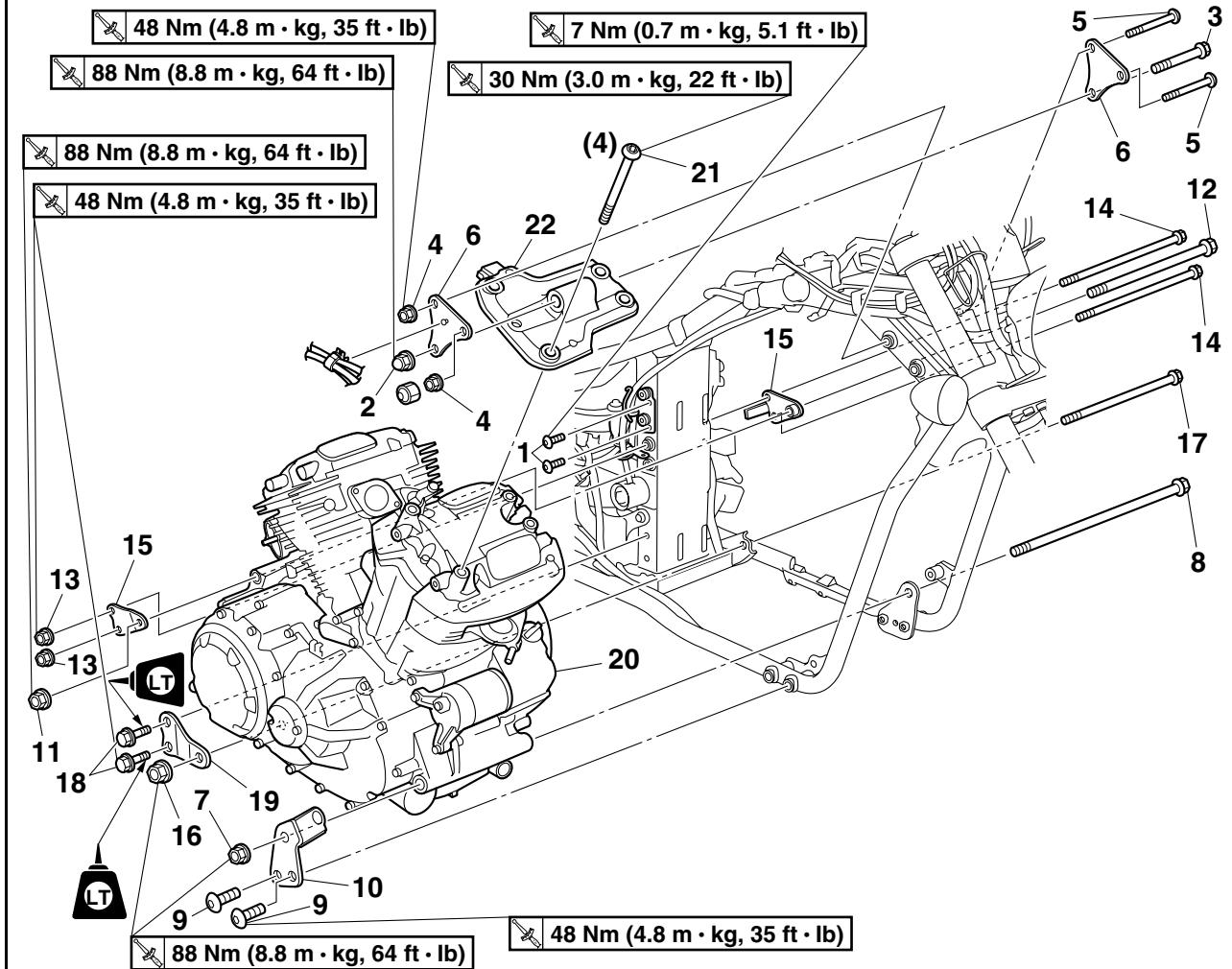
Order	Job/Parts to remove	Q'ty	Remarks
16	Engine mounting bolt (front right upper side)	2	
17	Engine	1	
18	Engine bracket bolt (front upper side)	4	
19	Engine bracket (front upper side)	1	
			For installation, reverse the removal procedure.

Removing the down tube and engine (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-12.
1	Sub-fuel tank bracket bolt	2	
2	Engine bracket nut (front upper side) (M12)	1	
3	Engine bracket bolt (front upper side) (M12)	1	
4	Engine bracket nut (front upper side) (M10)	2	
5	Engine bracket bolt (front upper side) (M10)	2	
6	Engine bracket (front upper side)	2	
7	Engine mounting nut (front lower side)	1	
8	Engine mounting bolt (front lower side)	1	
9	Engine bracket bolt (front lower side)	2	
10	Engine bracket (front lower side)	1	
11	Engine mounting nut (rear upper side)	1	
12	Engine mounting bolt (rear upper side)	1	
13	Engine bracket nut (rear upper side)	2	
14	Engine bracket bolt (rear upper side)	2	
15	Engine bracket (rear upper side)	2	

Removing the down tube and engine (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
16	Engine mounting nut (rear lower side)	1	
17	Engine mounting bolt (rear lower side)	1	
18	Engine bracket bolt (rear lower side)	2	
19	Engine bracket (rear lower side)	1	
20	Engine	1	
21	Engine mounting bolt (front center side)	4	
22	Engine bracket (front center side)	1	
			For installation, reverse the removal procedure.

EAS23720

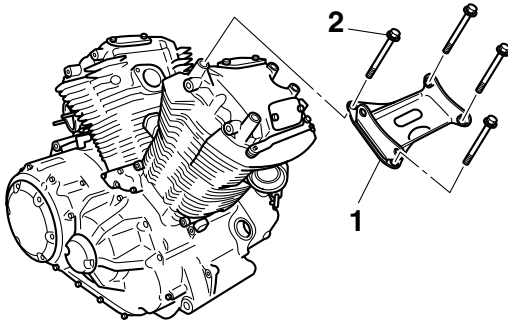
INSTALLING THE ENGINE (for XVS13AA(C)/XVS13CTA(C))

1. Install:

- Engine bracket (front upper side) “1”
- Engine bracket bolts (front upper side) “2”



Engine bracket bolt (front upper side)
30 Nm (3.0 m·kg, 22 ft·lb)

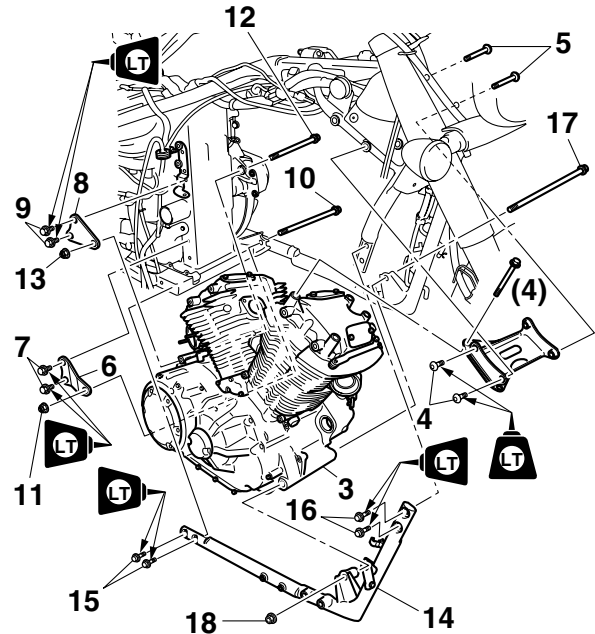


2. Install:

- Engine “3”
- Engine mounting bolts (front right upper side) “4”
- Engine mounting bolts (front left 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 mounting bolts (front right 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.



3. Tighten:

- 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 (rear lower side)

48 Nm (4.8 m·kg, 35 ft·lb)

LOCTITE®

Engine bracket bolt (rear upper side)

48 Nm (4.8 m·kg, 35 ft·lb)

LOCTITE®

Down tube bolt (front side)

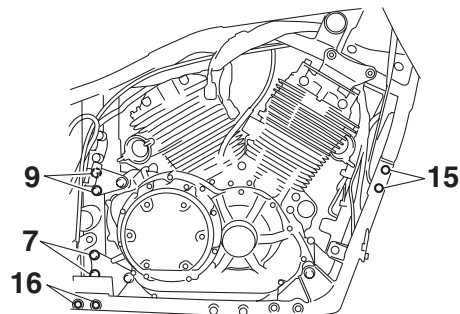
48 Nm (4.8 m·kg, 35 ft·lb)

LOCTITE®

Down tube bolt (rear side)

48 Nm (4.8 m·kg, 35 ft·lb)

LOCTITE®



4. Tighten:

- Engine mounting bolts (front right upper side) "4"
- Engine mounting bolts (front left upper side) "5"
- Engine mounting nut (rear lower side) "11"
- Engine mounting nut (rear upper side) "13"
- Engine mounting nut (front lower side) "16"



Engine mounting bolt (front right upper side)

48 Nm (4.8 m·kg, 35 ft·lb)

LOCTITE®

Engine mounting bolt (front left upper side)

48 Nm (4.8 m·kg, 35 ft·lb)

LOCTITE®

Engine mounting nut (rear lower side)

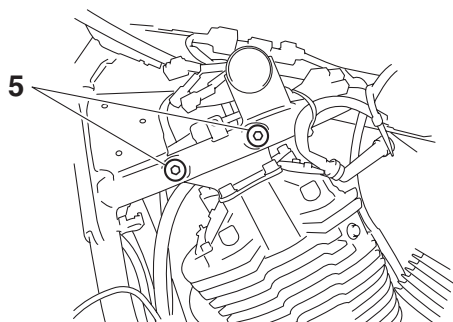
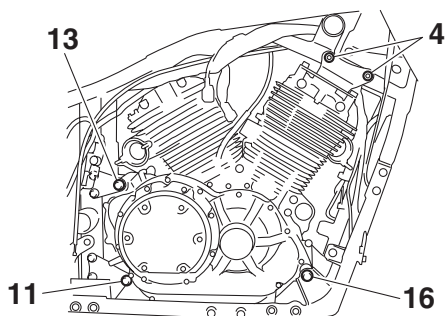
88 Nm (8.8 m·kg, 64 ft·lb)

Engine mounting nut (rear upper side)

88 Nm (8.8 m·kg, 64 ft·lb)

Engine mounting nut (front lower side)

88 Nm (8.8 m·kg, 64 ft·lb)



EAS27D1022

INSTALLING THE ENGINE (for XVS13CA(C))

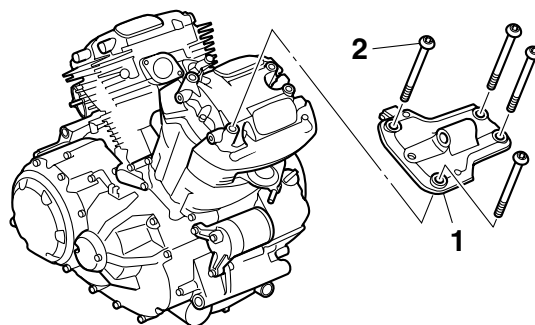
1. Install:

- Engine bracket (front center side) "1"
- Engine mounting bolts (front center side) "2"



Engine mounting bolt (front center side)

30 Nm (3.0 m·kg, 22 ft·lb)



2. Install:

- Engine "3"
- Engine bracket (rear lower side) "4"
- Engine bracket bolts (rear lower side) "5"
- Engine mounting bolt (rear lower side) "6"
- Engine mounting nut (rear lower side) "7"
- Engine brackets (rear upper side) "8"
- Engine bracket bolts (rear upper side) "9"
- Engine bracket nuts (rear upper side) "10"
- Engine mounting bolt (rear upper side) "11"
- Engine mounting nut (rear upper side) "12"
- Engine bracket (front lower side) "13"
- Engine bracket bolts (front lower side) "14"
- Engine mounting bolt (front lower side) "15"
- Engine mounting nut (front lower side) "16"
- Engine brackets (front upper side) "17"
- Engine bracket bolts (front upper side) (M10) "18"
- Engine bracket nuts (front upper side) (M10) "19"
- Engine bracket bolt (front upper side) (M12) "20"
- Engine bracket nut (front upper side) (M12) "21"

TIP

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

3. Tighten:

- Engine bracket bolts (rear lower side) "5"
- Engine bracket nuts (rear upper side) "10"
- Engine bracket bolts (front lower side) "14"
- Engine bracket nuts (front upper side) (M10) "19"



Engine bracket bolt (rear lower side)

48 Nm (4.8 m·kg, 35 ft·lb)

LOCTITE®

Engine bracket nut (rear upper side)

48 Nm (4.8 m·kg, 35 ft·lb)

Engine bracket bolt (front lower side)

48 Nm (4.8 m·kg, 35 ft·lb)

Engine bracket nut (front upper side) (M10)

48 Nm (4.8 m·kg, 35 ft·lb)

4. Tighten:

- Engine mounting nut (rear lower side) “7”
- Engine mounting nut (rear upper side) “12”
- Engine mounting nut (front lower side) “16”
- Engine bracket nut (front upper side) (M12) “21”



Engine mounting nut (rear lower side)

88 Nm (8.8 m·kg, 64 ft·lb)

Engine mounting nut (rear upper side)

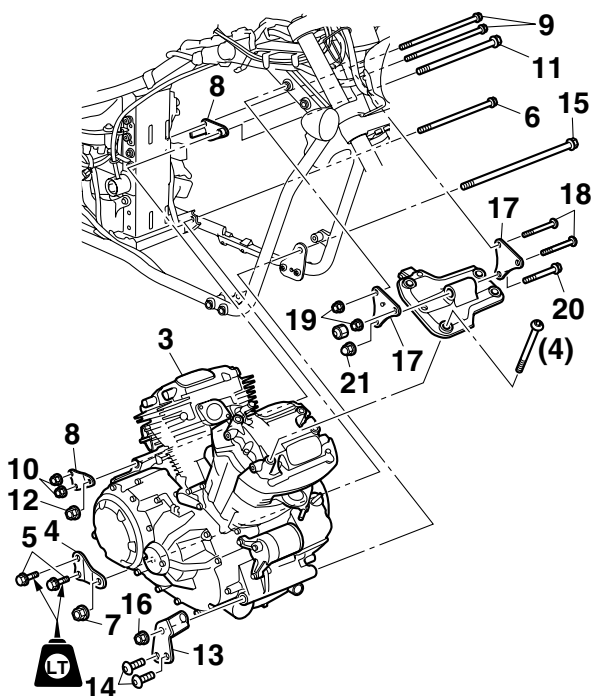
88 Nm (8.8 m·kg, 64 ft·lb)

Engine mounting nut (front lower side)

88 Nm (8.8 m·kg, 64 ft·lb)

Engine bracket nut (front upper side) (M12)

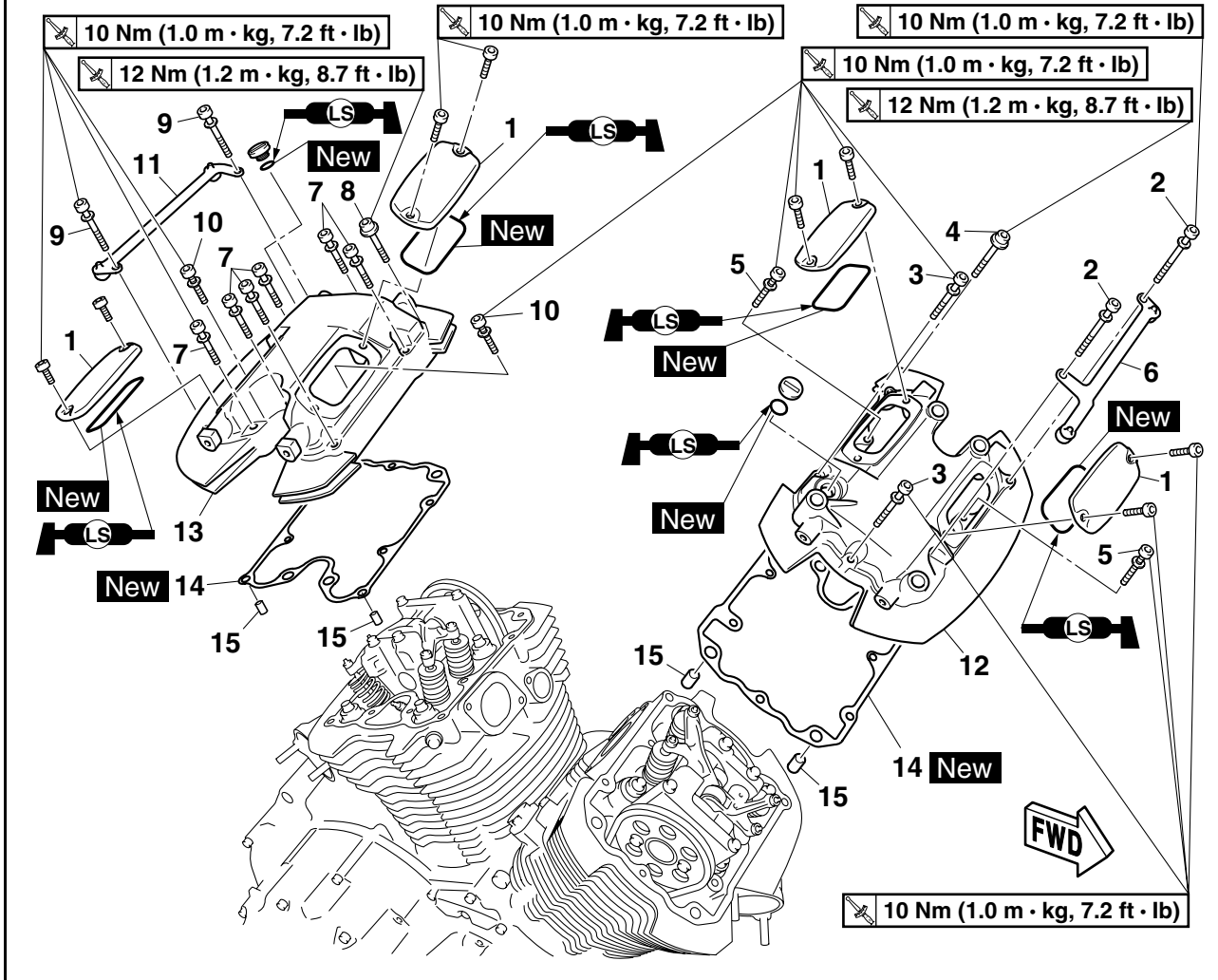
88 Nm (8.8 m·kg, 64 ft·lb)



EAS23740

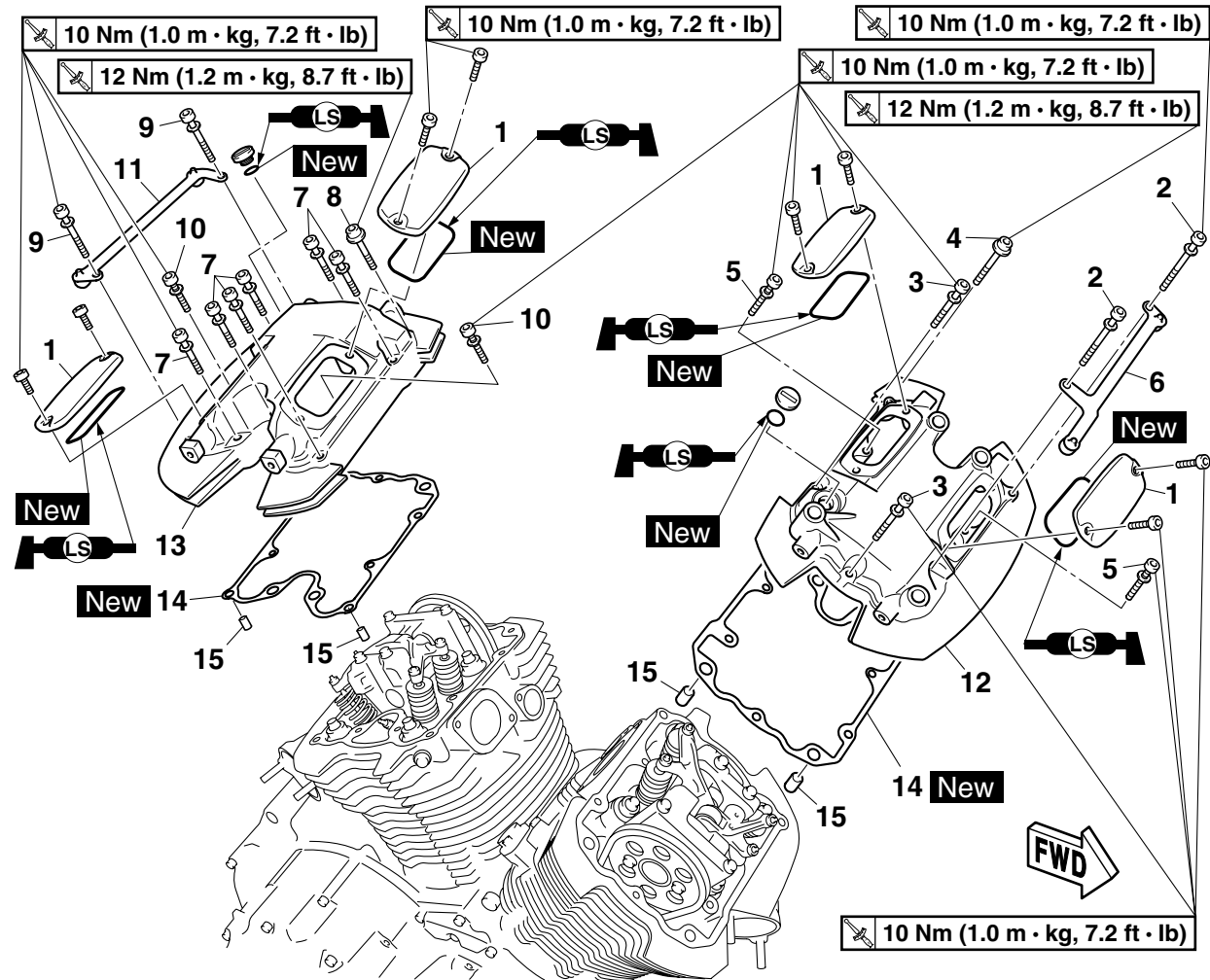
CAMSHAFTS

Removing the cylinder head covers (for XVS13AA(C)/XVS13CTA(C))



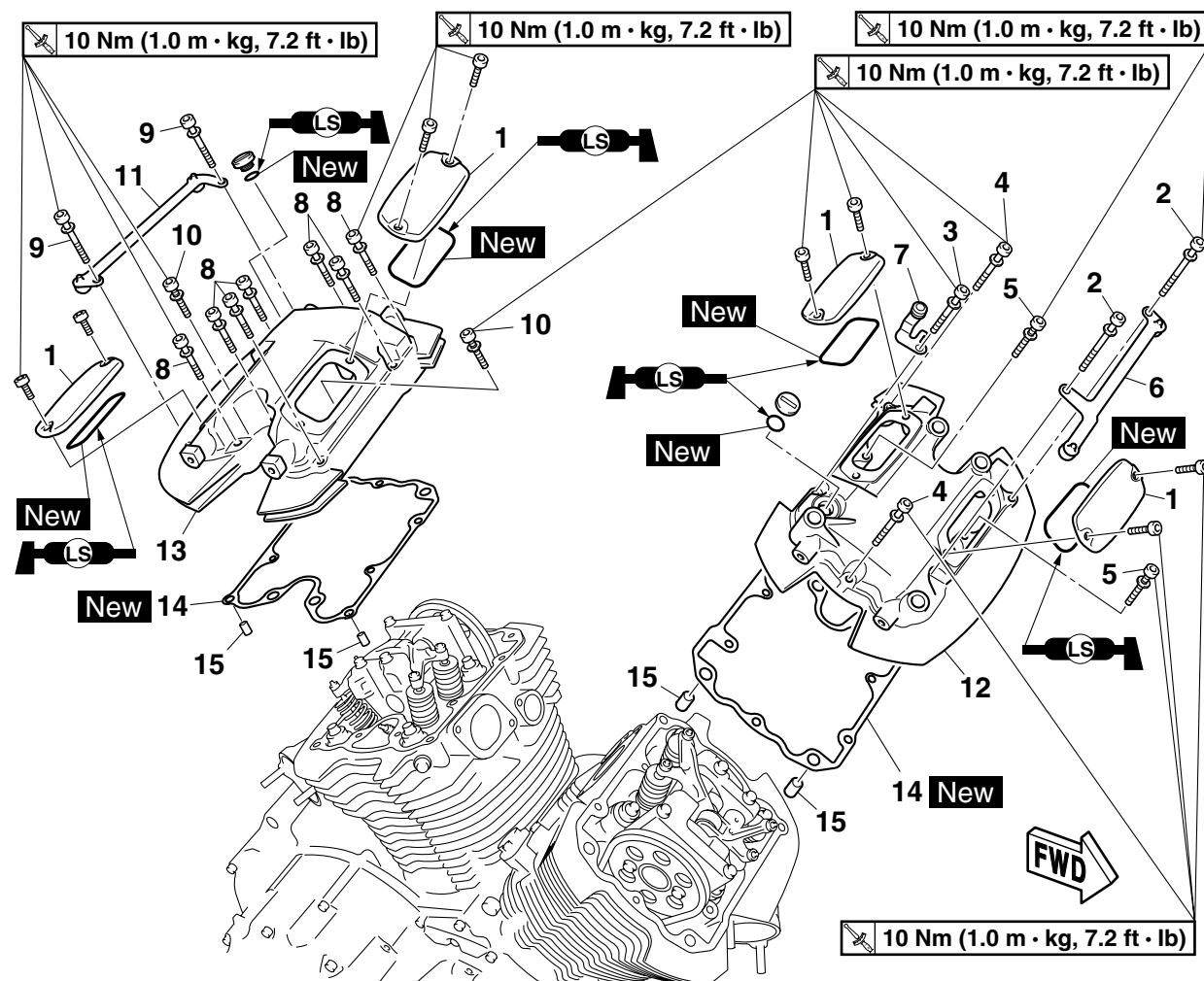
Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
1	Tapet cover	4	
2	Front cylinder head cover bolt	2	l = 55 mm (2.17 in)
3	Front cylinder head cover bolt	2	l = 45 mm (1.77 in)
4	Front cylinder head cover bolt	1	l = 45 mm (1.77 in)
5	Front cylinder head cover bolt	2	l = 30 mm (1.18 in)
6	Front cylinder head cover bracket	1	
7	Rear cylinder head cover bolt	6	l = 45 mm (1.77 in)
8	Rear cylinder head cover bolt	1	l = 45 mm (1.77 in)
9	Rear cylinder head cover bolt	2	l = 55 mm (2.17 in)
10	Rear cylinder head cover bolt	2	l = 30 mm (1.18 in)
11	Rear cylinder head cover bracket	1	
12	Front cylinder head cover	1	
13	Rear cylinder head cover	1	
14	Cylinder head cover gasket	2	

Removing the cylinder head covers (for XVS13AA(C)/XVS13CTA(C))



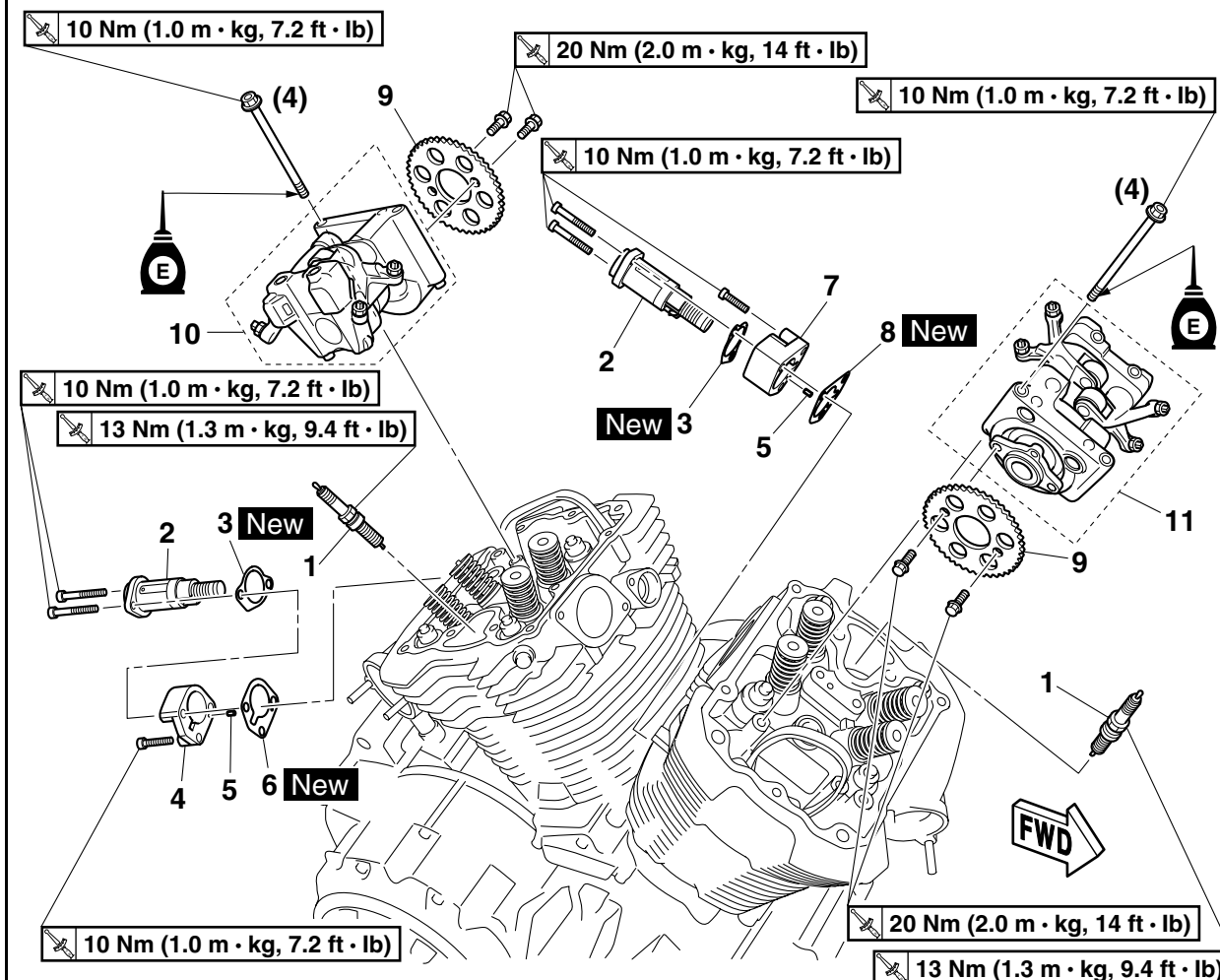
Order	Job/Parts to remove	Q'ty	Remarks
15	Dowel pin	4	
			For installation, reverse the removal procedure.

Removing the cylinder head covers (for XVS13CA(C))



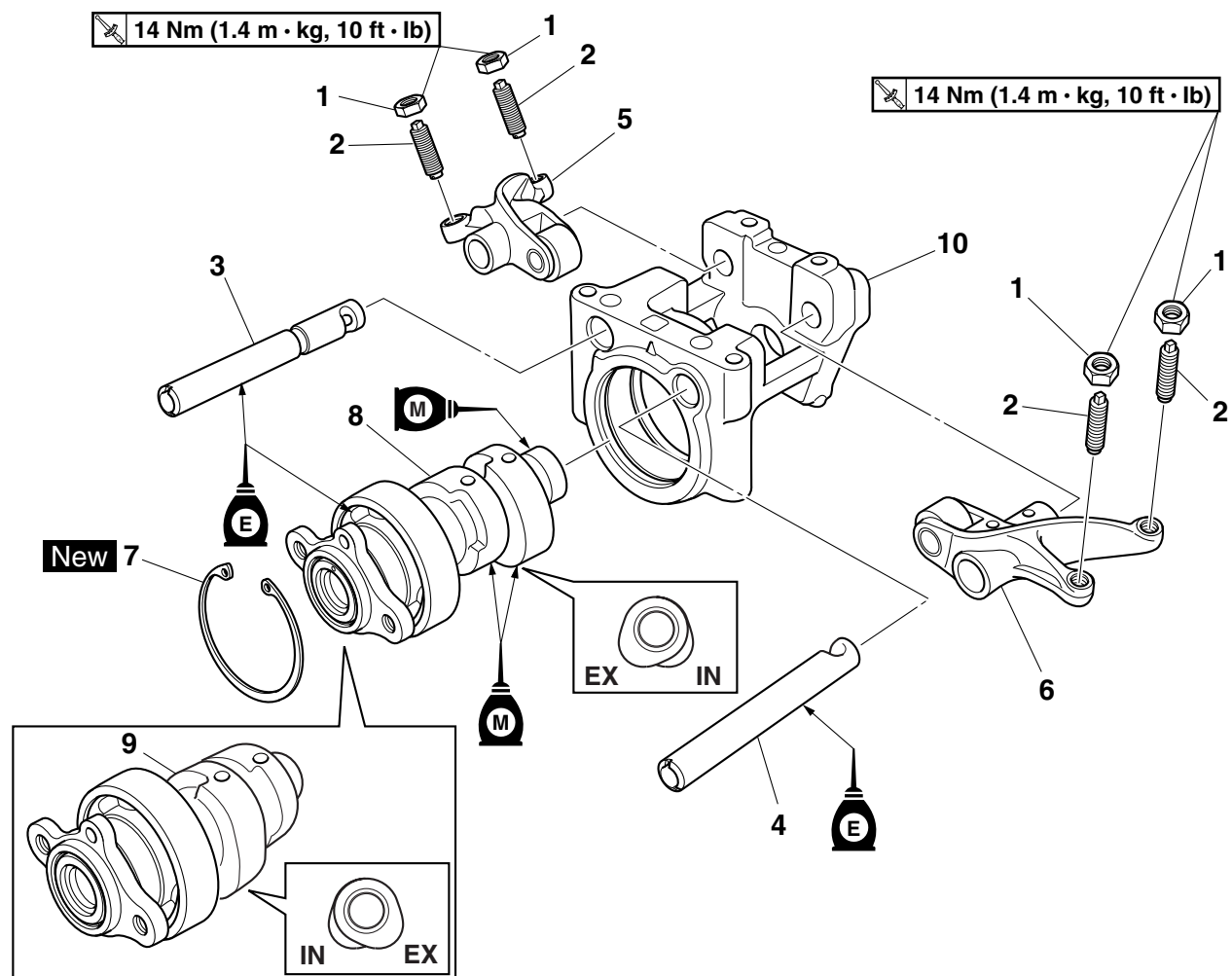
Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
1	Tappet cover	4	
2	Front cylinder head cover bolt	2	l = 55 mm (2.17 in)
3	Front cylinder head cover bolt	1	l = 50 mm (1.97 in)
4	Front cylinder head cover bolt	2	l = 45 mm (1.77 in)
5	Front cylinder head cover bolt	2	l = 30 mm (1.18 in)
6	Front cylinder head cover bracket	1	
7	Front cylinder head cover holder	1	
8	Rear cylinder head cover bolt	7	l = 45 mm (1.77 in)
9	Rear cylinder head cover bolt	2	l = 55 mm (2.17 in)
10	Rear cylinder head cover bolt	2	l = 30 mm (1.18 in)
11	Rear cylinder head cover bracket	1	
12	Front cylinder head cover	1	
13	Rear cylinder head cover	1	
14	Cylinder head cover gasket	2	
15	Dowel pin	4	
			For installation, reverse the removal procedure.

Removing the camshaft assemblies



Order	Job/Parts to remove	Q'ty	Remarks
1	Spark plug	2	
2	Timing chain tensioner	2	
3	Timing chain tensioner gasket	2	
4	Rear cylinder timing chain tensioner housing	1	
5	Pin	2	
6	Rear cylinder timing chain tensioner housing gasket	1	
7	Front cylinder timing chain tensioner housing	1	
8	Front cylinder timing chain tensioner housing gasket	1	
9	Camshaft sprocket	2	
10	Rear cylinder camshaft assembly	1	
11	Front cylinder camshaft assembly	1	
			For installation, reverse the removal procedure.

Removing the rocker arms and camshafts



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the camshaft assemblies.
1	Locknut	4	Loosen.
2	Valve clearance adjusting screw	4	
3	Intake rocker arm shaft	1	
4	Exhaust rocker arm shaft	1	
5	Intake rocker arm	1	
6	Exhaust rocker arm	1	
7	Circlip	1	
8	Front cylinder camshaft	1	
9	Rear cylinder camshaft	1	
10	Camshaft carrier	1	
			For installation, reverse the removal procedure.

EAS3D81020

REMOVING THE CAMSHAFT ASSEMBLIES

1. Align:

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

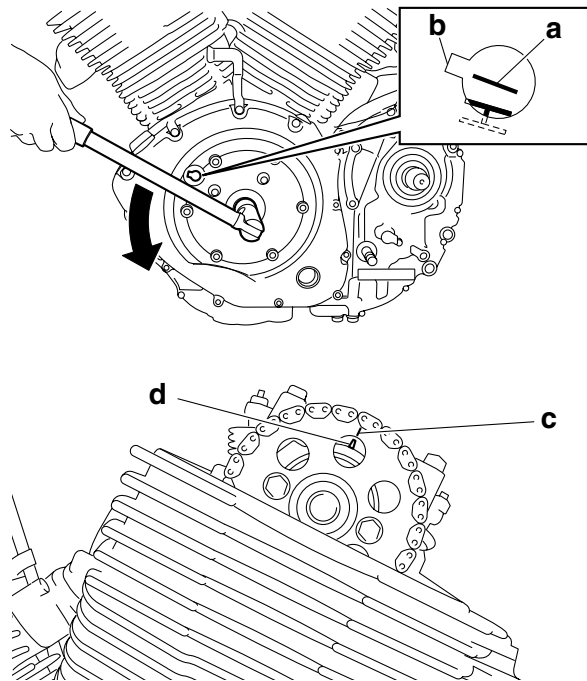


Front cylinder

- 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 camshaft carrier.

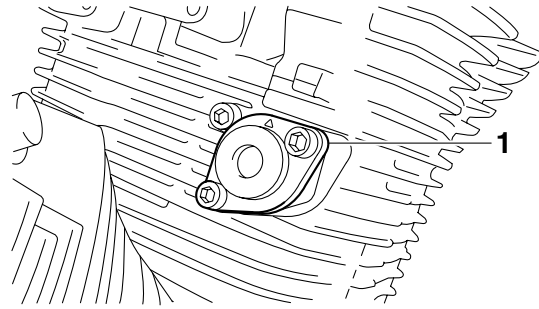


2. Remove:

- 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 bolts “2”.
- To prevent the timing chain from falling into the crankcase, fasten it with a wire.

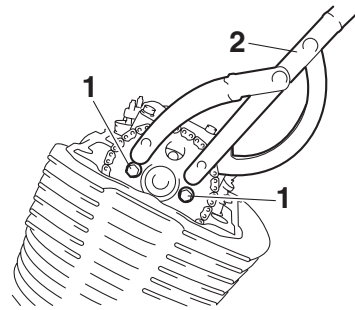


Rotor holding tool

90890-01235

Universal magneto & rotor holder

YU-01235

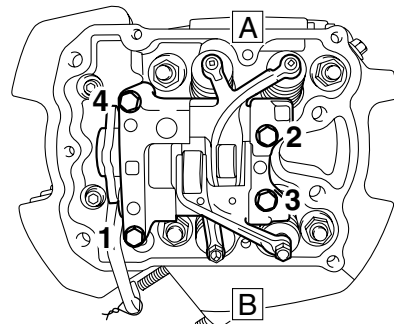


4. Remove:

- Front cylinder camshaft assembly

TIP

Loosen the bolts in the proper sequence as shown.



A. Intake side

B. Exhaust side

5. Align:

- “1” mark on the rear cylinder camshaft sprocket
(with the arrow mark on the rear cylinder camshaft carrier)

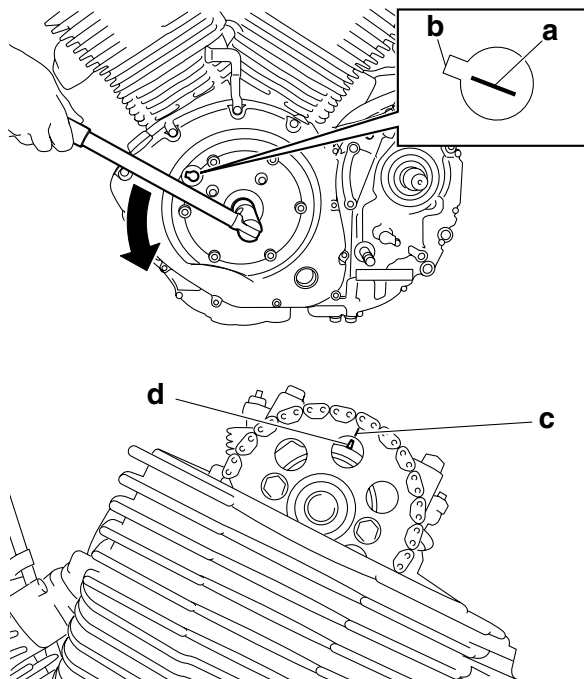


Rear cylinder

- 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 “1” mark “c” on the camshaft sprocket with the arrow mark “d” on the rear cylinder camshaft carrier.



6. Remove:

- Rear cylinder timing chain tensioner
- Rear cylinder camshaft sprocket
- Rear cylinder camshaft assembly

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 assembly.

EAS3D81034

REMOVING THE ROCKER ARMS AND CAMSHAFTS

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

1. 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

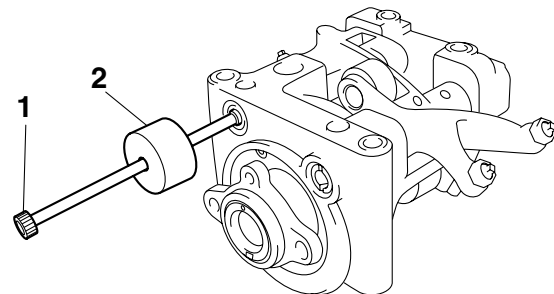
Slide hammer bolt 6 mm

YU-01083-1

Weight

90890-01084

YU-01083-3

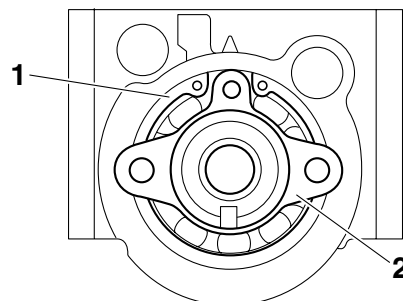


2. Remove:

- Circlip “1”
- Camshaft “2”

TIP

Position the camshaft as shown in the illustration so that the camshaft lobes will not catch on the camshaft carrier during removal.



EAS23840

CHECKING THE CAMSHAFTS

1. Check:

- Camshaft lobes
Blue discoloration/pitting/scratches → Replace the camshaft.

2. Measure:

- Camshaft lobe dimensions “a” and “b”
Out of specification → Replace the camshaft.



Camshaft lobe dimensions

Intake A

42.988–43.088 mm (1.6924–1.6964 in)

Limit

42.888 mm (1.6885 in)

Intake B

37.045–37.145 mm (1.4585–1.4624 in)

Limit

36.945 mm (1.4545 in)

Exhaust A

43.156–43.256 mm (1.6991–1.7030 in)

Limit

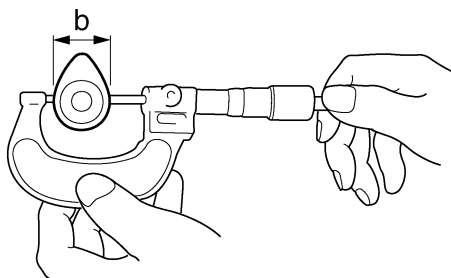
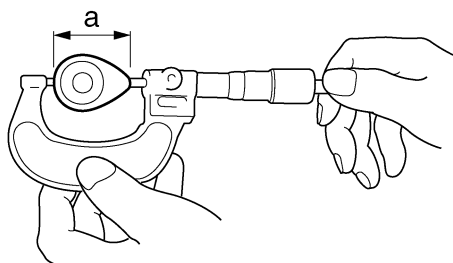
43.056 mm (1.6951 in)

Exhaust B

37.118–37.218 mm (1.4613–1.4653 in)

Limit

37.018 mm (1.4574 in)



3. Check:

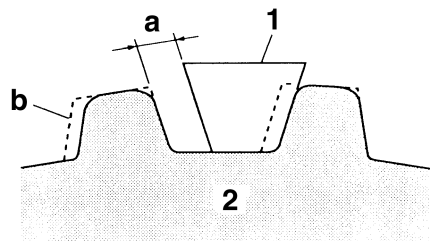
- Camshaft oil passage
Obstruction → Blow out with compressed air.

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.



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:

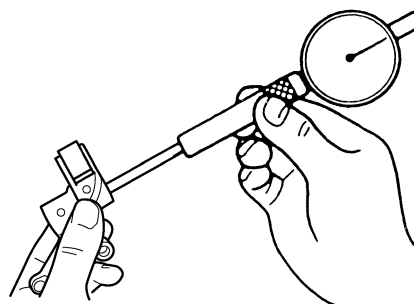
- Rocker arm shaft
Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.

3. Measure:

- Rocker arm inside diameter
Out of specification → Replace.



Rocker arm inside diameter
12.000–12.018 mm (0.4724–0.4731 in)



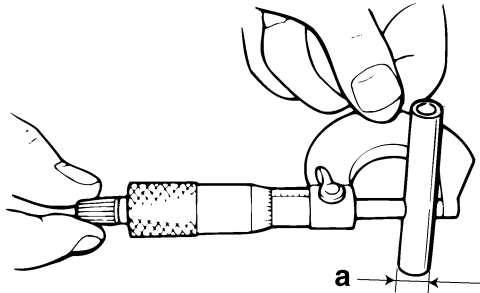
4. Measure:

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



Rocker arm shaft outside diameter

11.976–11.991 mm (0.4715–0.4721 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

0.009–0.042 mm (0.0004–0.0017 in)

Limit

0.095 mm (0.0037 in)

EAS23970

CHECKING THE TIMING CHAIN TENSIONERS

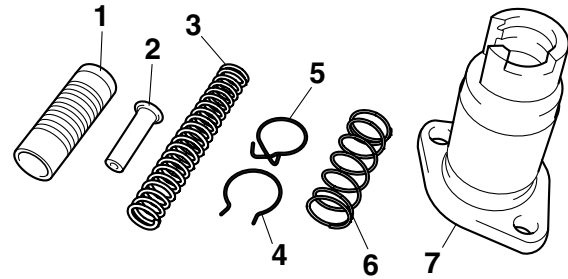
The following procedure applies to all of the timing chain tensioners.

1. Disassemble:

- Timing chain tensioner

TIP

Squeeze timing chain tensioner clip 2 “5”, and then remove the timing chain tensioner springs and timing chain tensioner rod.



1. Timing chain tensioner rod
2. Timing chain tensioner spring seat
3. Timing chain tensioner inner spring
4. Timing chain tensioner clip 1
5. Timing chain tensioner clip 2
6. Timing chain tensioner outer spring
7. Timing chain tensioner housing

2. Check:

- Timing chain tensioner housing
 - Timing chain tensioner rod
 - Timing chain tensioner spring seat
 - Timing chain tensioner springs
 - Timing chain tensioner clips
- Damage/wear → Replace the as a set.

3. Assemble:

- Timing chain tensioner

TIP

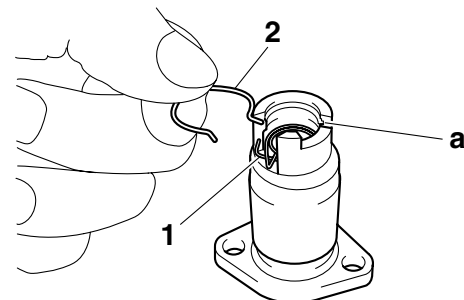
Prior to installing the timing chain tensioner rod, drain the engine oil from the timing chain tensioner housing.



- a. Install the timing chain tensioner outer spring, timing chain tensioner clip 2 “1”, and clip 1 “2”.

TIP

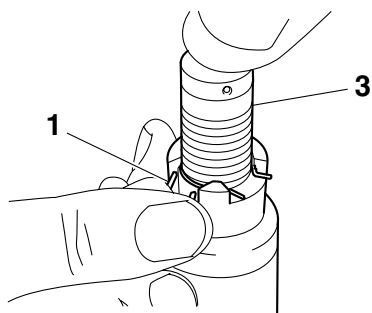
Be sure to face the ends of timing chain tensioner clip 2 “1” in the direction shown in the illustration and to fit timing chain tensioner clip 1 “2” in the groove “a” in the timing chain tensioner housing.



- b. Install the timing chain tensioner inner spring, timing chain tensioner spring seat, and timing chain tensioner rod.
- c. Squeeze timing chain tensioner clip 2 "1", and then push the timing chain tensioner rod "3" into the timing chain tensioner housing.

TIP

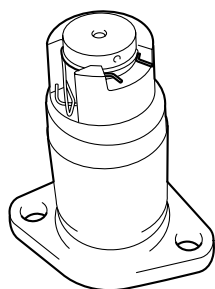
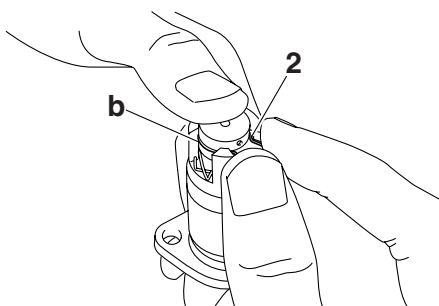
Do not release timing chain tensioner clip 2 while pushing the rod into the housing, otherwise the rod may be ejected.



- d. Align the groove "b" in the timing chain tensioner rod with timing chain tensioner clip 1 "2", and then squeeze the clip to fit it into the groove.

TIP

Make sure that the timing chain tensioner rod is secured by the clip, otherwise the rod may be ejected.



EAS24040

INSTALLING THE CAMSHAFTS AND ROCKER ARMS

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

1. Lubricate:
 - Camshaft

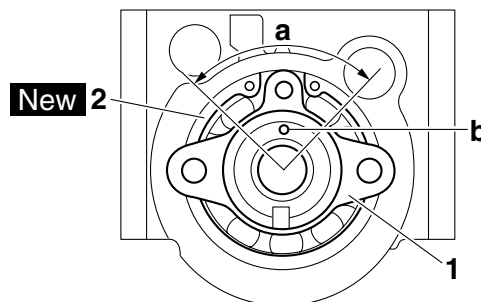


Recommended lubricant
Camshaft
 Molybdenum disulfide oil
Camshaft bearing
 Engine oil

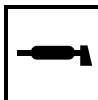
2. Install:
 - Camshaft "1"
 - Circlip "2" **New**

TIP

- Position the camshaft as shown in the illustration so that the camshaft lobes will not catch on the camshaft carrier during installation.
- Position the opening between the ends of the circlip in the 90° range "a" shown in the illustration.
- The front cylinder camshaft is identified by the punch mark "b". The rear cylinder camshaft does not have a punch mark.



3. Lubricate:
 - Rocker arm shafts



Recommended lubricant
Engine oil

4. Install:
 - Rocker arms
 - Rocker arm shafts

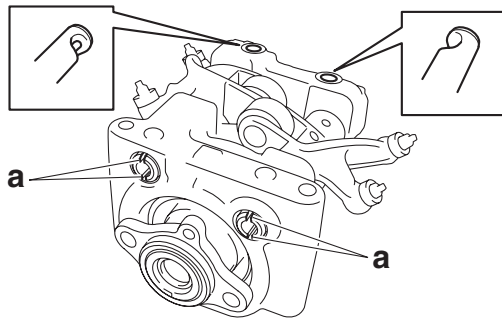
TIP

Make sure that the notches "a" in the rocker arm shafts are aligned vertically as shown in the illustration.

ECA3D81017

NOTICE

Make sure the cutouts in the rocker arm shafts faces inward.



EAS3D81021

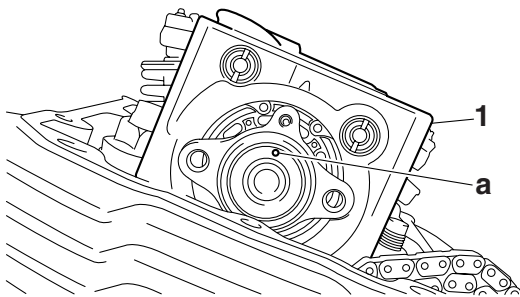
INSTALLING THE CAMSHAFT ASSEMBLIES

1. Install:

- Front cylinder camshaft assembly "1"

TIP

- Be sure to install the camshaft assembly with the punch mark "a" onto the front cylinder.
- The rear cylinder camshaft assembly does not have a punch mark.



2. Tighten:

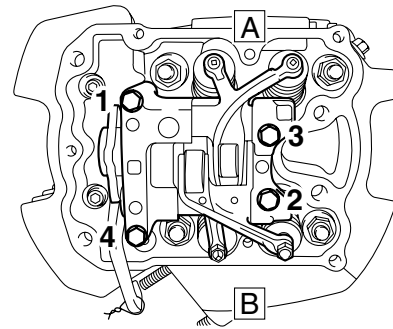
- Front cylinder camshaft assembly bolts

TIP

Tighten the bolts in the proper sequence as shown.



Front cylinder camshaft assembly bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)



- A. Intake side
- B. Exhaust side

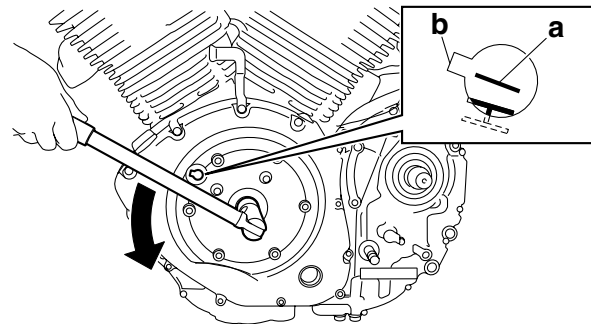
3. Install:

- 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 bolts "3".

ECA13740

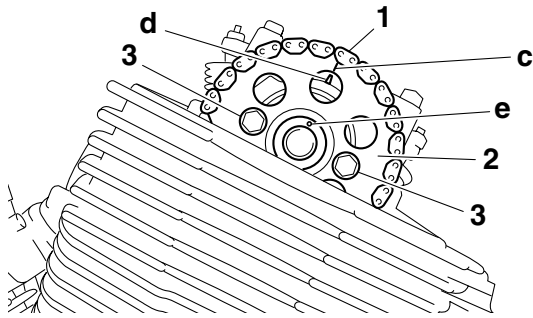
NOTICE

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 "1" mark "c" on the camshaft sprocket with the arrow mark "d" on the front cylinder camshaft carrier.
- The front cylinder camshaft is identified by the punch mark "e". The rear cylinder camshaft does not have a punch mark.

- When installing the front cylinder camshaft sprocket, be sure to keep the timing chain as tight as possible on the exhaust side.



d. Remove the wire from the timing chain.



4. Tighten:

- Front cylinder camshaft sprocket bolts "1"

TIP

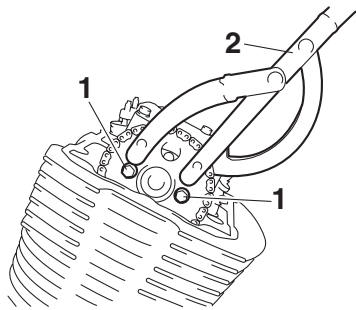
While holding the camshaft sprocket with the rotor holding tool "2", tighten the camshaft sprocket bolts.



Rotor holding tool

90890-01235

Universal magneto & rotor holder
YU-01235



5. Install:

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

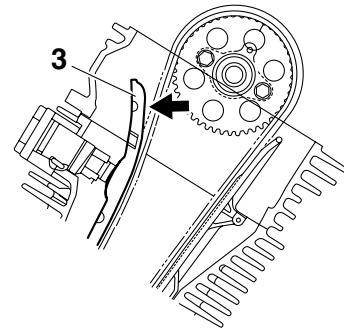
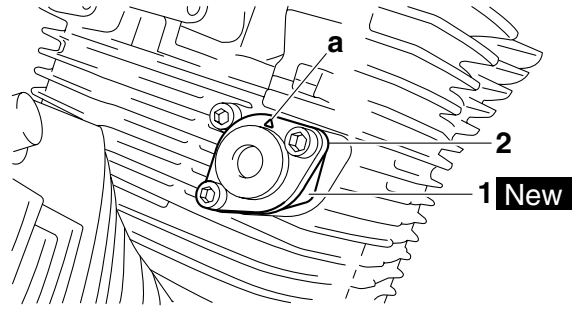


Front cylinder timing chain tensioner bolt

10 Nm (1.0 m·kg, 7.2 ft·lb)

TIP

- The arrow mark "a" on the front cylinder timing chain tensioner should face up.
- Push the end of the front cylinder timing chain guide (intake side) "3" to release the timing chain tensioner rod.

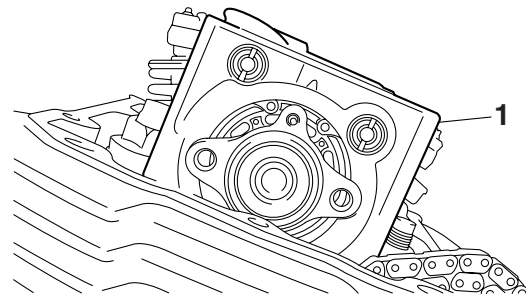


6. Install:

- Rear cylinder camshaft assembly "1"

TIP

Be sure to install the camshaft assembly without a punch mark onto the rear cylinder.



7. Tighten:

- Rear cylinder camshaft assembly bolts

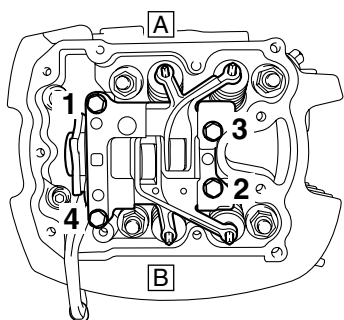
TIP

Tighten the bolts in the proper sequence as shown.



Rear cylinder camshaft assembly bolt

10 Nm (1.0 m·kg, 7.2 ft·lb)



- A. Intake side
- B. Exhaust side

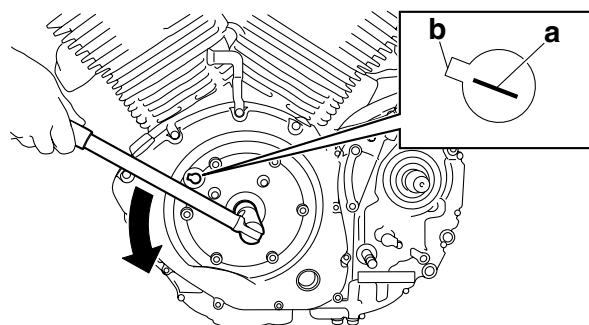
8. Install:

- Rear cylinder camshaft sprocket



Rear cylinder

- a. Turn the crankshaft counterclockwise from the front cylinder piston TDC by 300 degrees.
- b. 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.



- c. 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 bolts "3".

ECA13740

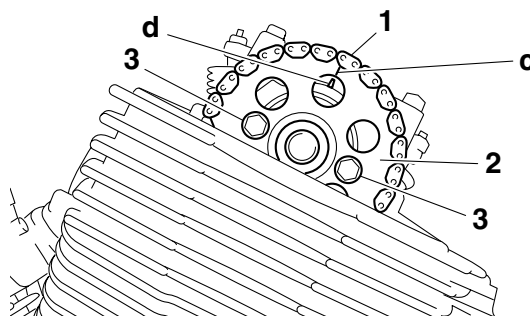
NOTICE

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 camshaft carrier.
- The rear cylinder camshaft assembly does not have a punch mark. Be sure to install the camshaft assembly without a punch mark onto the rear cylinder.

- When installing the rear cylinder camshaft sprocket, be sure to keep the timing chain as tight as possible on the intake side.



- d. Remove the wire from the timing chain.



9. Tighten:

- Rear cylinder camshaft sprocket bolts "1"

TIP

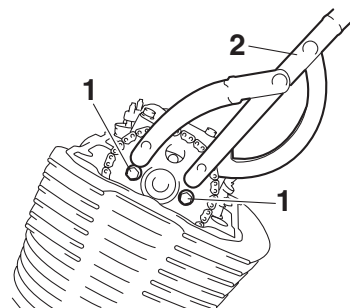
While holding the camshaft sprocket with the rotor holding tool "2", tighten the camshaft sprocket bolts.



Rotor holding tool

90890-01235

Universal magneto & rotor holder
YU-01235



10. Install:

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

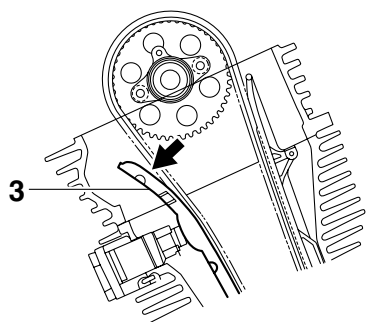
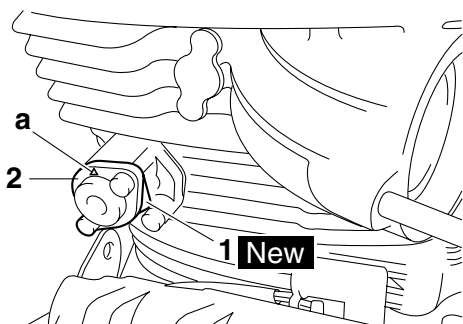


Rear cylinder timing chain tensioner bolt

10 Nm (1.0 m·kg, 7.2 ft·lb)

TIP

- The arrow mark "a" on the rear timing chain tensioner should face up.
- Push the end of the rear cylinder timing chain guide (exhaust side) "3" to release the timing chain tensioner rod.



11. Measure:

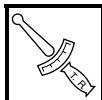
- Valve clearance
Out of specification → Adjust.
Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-4.

EAS3D81035

INSTALLING THE CYLINDER HEAD COVERS (for XVS13AA(C)/XVS13CTA(C))

1. Install:

- Rear cylinder head cover
- Rear cylinder head cover bracket "1"



Rear cylinder head cover bolt "2", "3", "5"

10 Nm (1.0 m·kg, 7.2 ft·lb)

Rear cylinder head cover bolt "4"

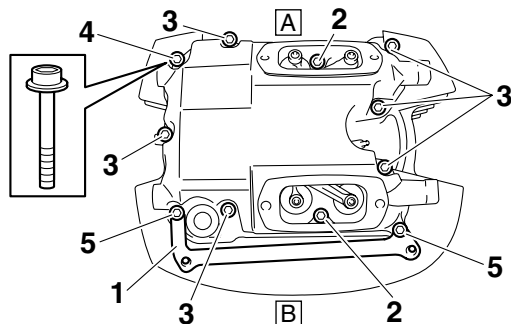
12 Nm (1.2 m·kg, 8.7 ft·lb)

Bolts "2": l = 30 mm (1.18 in)

Bolts "3": l = 45 mm (1.77 in)

Bolt "4": l = 45 mm (1.77 in)

Bolts "5": l = 55 mm (2.17 in)



A. Intake side

B. Exhaust side

2. Install:

- Front cylinder head cover
- Front cylinder head cover bracket "1"



Front cylinder head cover bolt "2", "3", "5"

10 Nm (1.0 m·kg, 7.2 ft·lb)

Front cylinder head cover bolt "4"

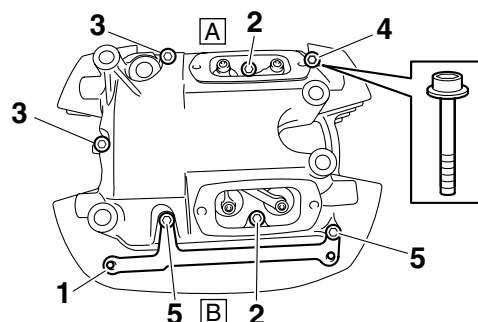
12 Nm (1.2 m·kg, 8.7 ft·lb)

Bolts "2": l = 30 mm (1.18 in)

Bolts "3": l = 45 mm (1.77 in)

Bolt "4": l = 45 mm (1.77 in)

Bolts "5": l = 55 mm (2.17 in)



A. Intake side

B. Exhaust side

EAS27D1023

INSTALLING THE CYLINDER HEAD COVERS (for XVS13CA(C))

1. Install:

- Rear cylinder head cover
- Rear cylinder head cover bracket "1"



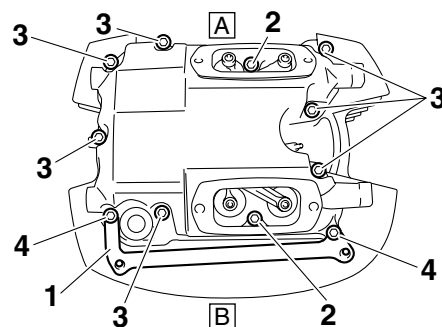
Rear cylinder head cover bolt "2", "3", "5"

10 Nm (1.0 m·kg, 7.2 ft·lb)

Bolts "2": l = 30 mm (1.18 in)

Bolts "3": l = 45 mm (1.77 in)

Bolts "4": l = 55 mm (2.17 in)



A. Intake side

B. Exhaust side

2. Install:

- Front cylinder head cover
- Front cylinder head cover bracket "1"
- Front cylinder head cover holder "2"



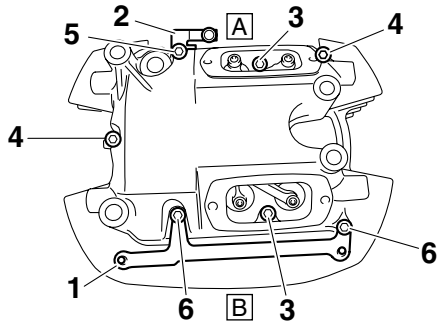
Front cylinder head cover bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)

Bolts "3": l = 30 mm (1.18 in)

Bolts "4": l = 45 mm (1.77 in)

Bolt "5": l = 50 mm (1.97 in)

Bolts "6": l = 55 mm (2.17 in)



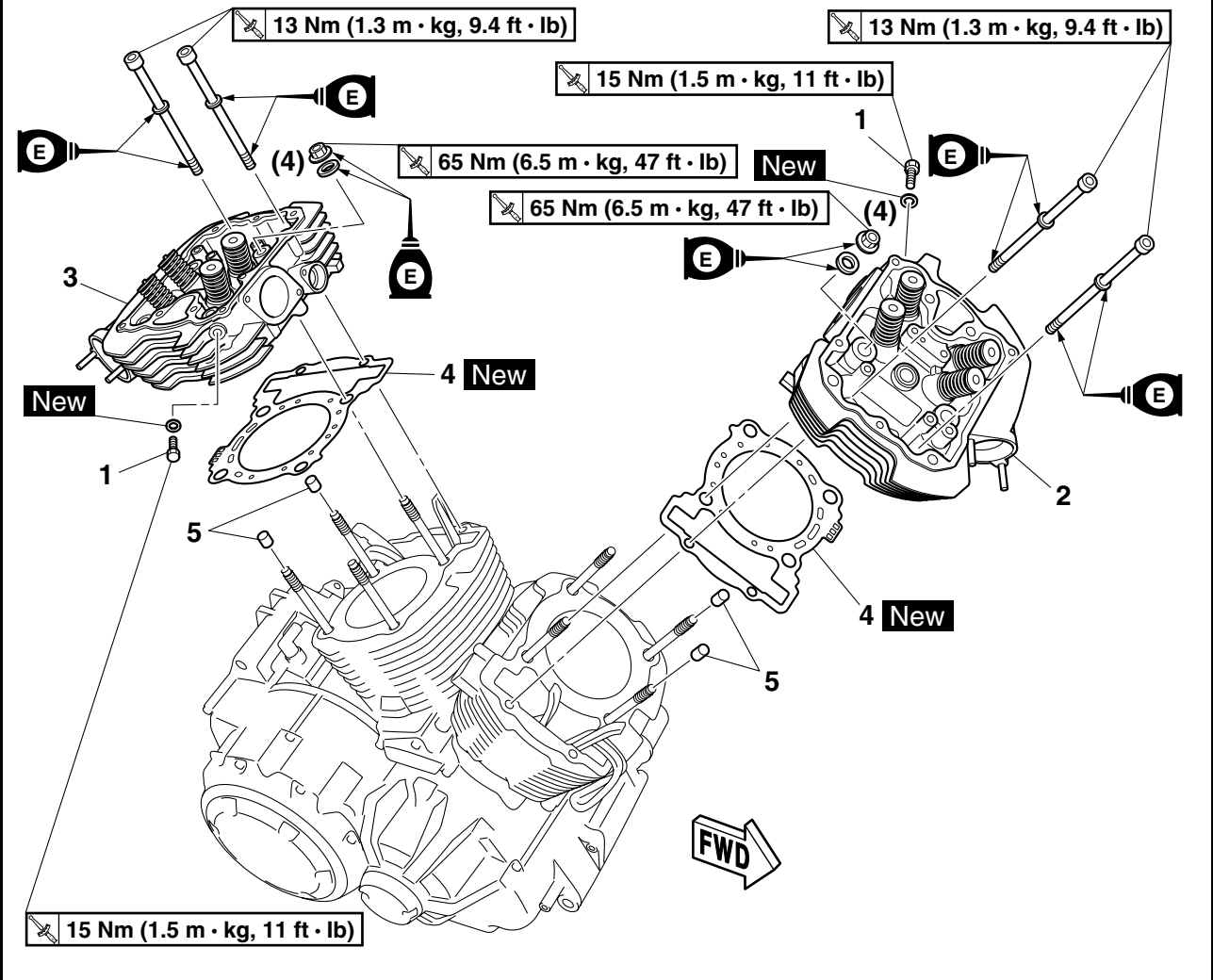
A. Intake side

B. Exhaust side

EAS24110

CYLINDER HEADS

Removing the cylinder heads

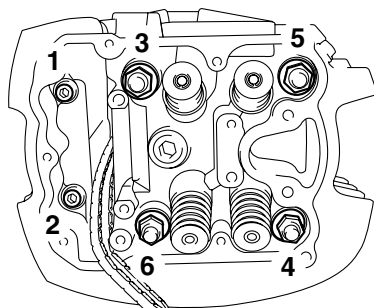
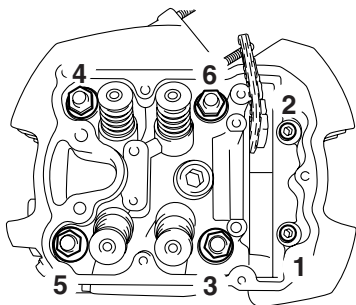


Order	Job/Parts to remove	Q'ty	Remarks
	Camshaft assemblies		Refer to "CAMSHAFTS" on page 5-17.
1	Oil check bolt	2	
2	Front cylinder head	1	
3	Rear cylinder head	1	
4	Cylinder head gasket	2	
5	Dowel pin	4	
			For installation, reverse the removal procedure.

1. Remove:

- TIP**

- A**



- EAS24170

The following procedure applies to all of the cylinder heads.

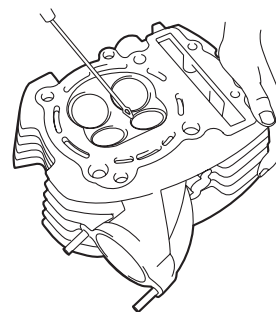
1. Eliminate:

- 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.

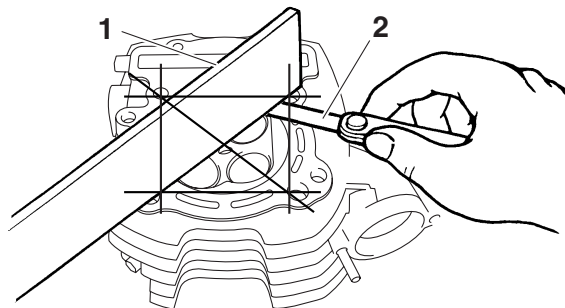
- ### 3. Measure:

- Cylinder head warpage
Out of specification → Resurface the cylinder head.



Warpage limit
0.03 mm (0.0012 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

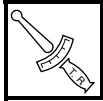
To ensure an even surface, rotate the cylinder head several times.



EAS24230

1. Tighten:

- Cylinder head nuts
- Cylinder head bolts

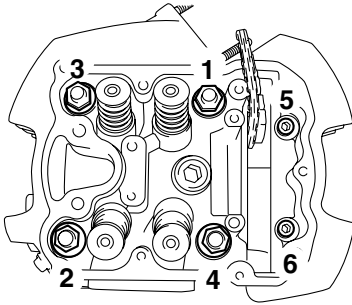


Cylinder head nut
65 Nm (6.5 m·kg, 47 ft·lb)
Cylinder head bolt
13 Nm (1.3 m·kg, 9.4 ft·lb)

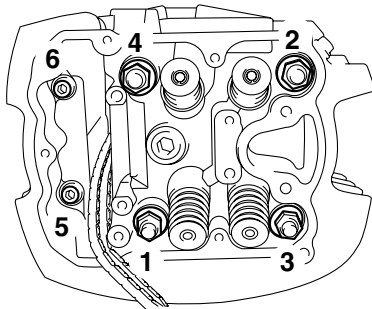
TIP

- Lubricate the cylinder head nuts and washers with engine oil.
- Tighten the cylinder head nuts and bolts in the proper tightening sequence as shown and torque them in two stages.

A



B

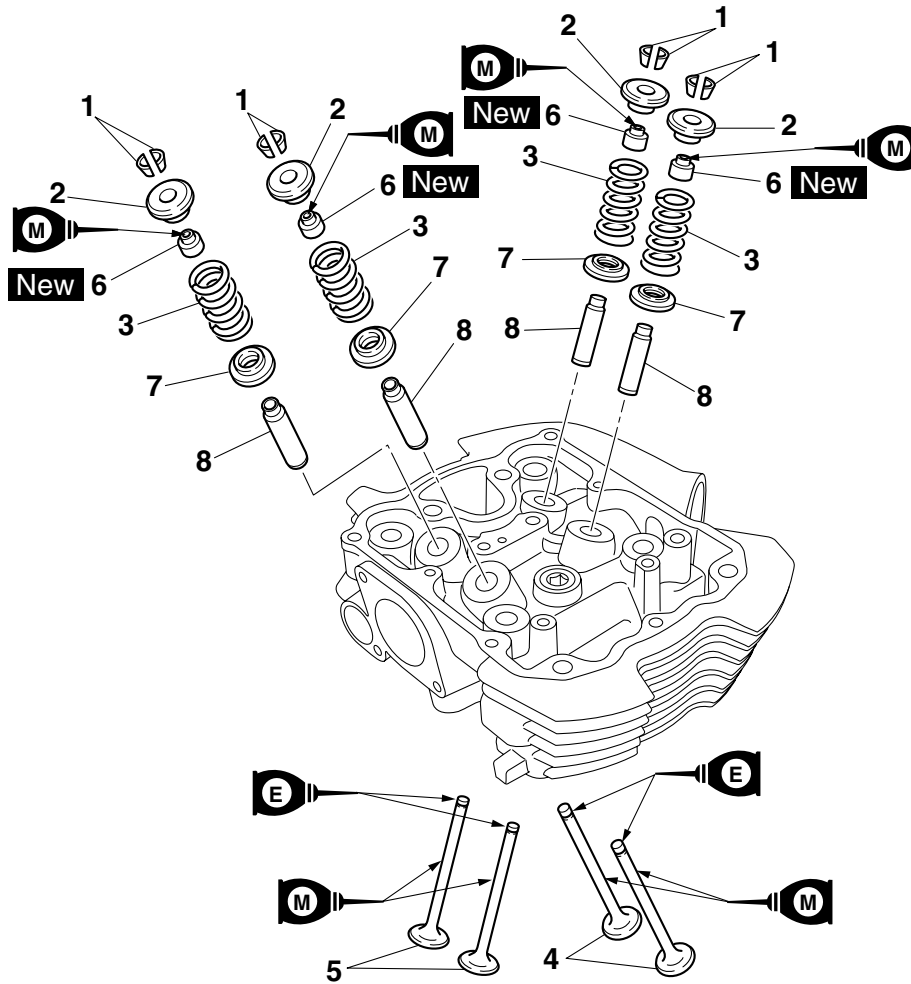


- A. Front cylinder head
B. Rear cylinder head

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 5-32.
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.

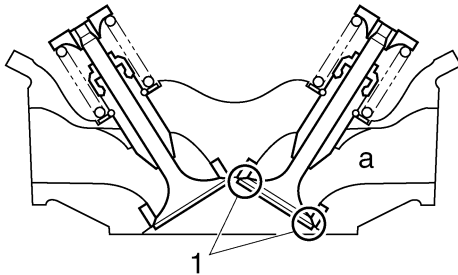
1. Check:

- 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 5-38.

- 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

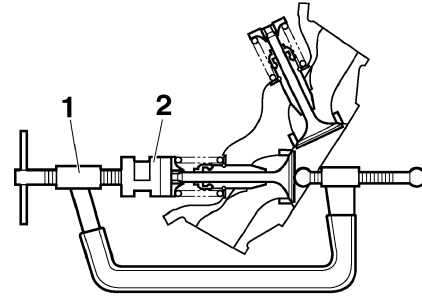
YM-04019

Valve spring compressor attachment

90890-01243

Valve spring compressor adapter (26 mm)

YM-01253-1

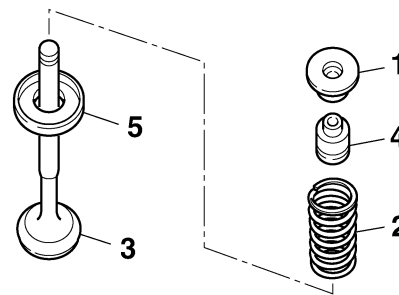


3. Remove:

- 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.

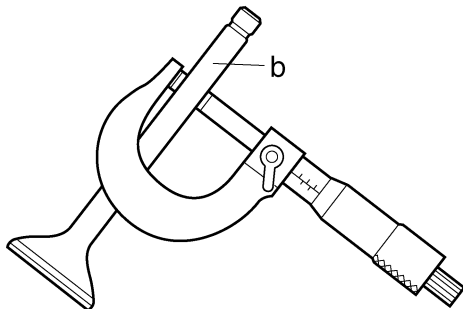
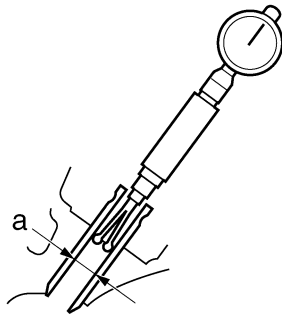
1. Measure:

- 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)

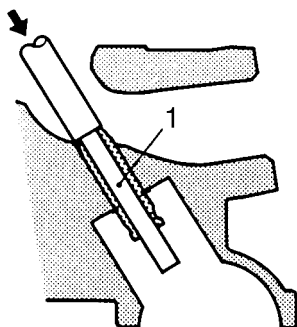


2. Replace:
- Valve guide

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.

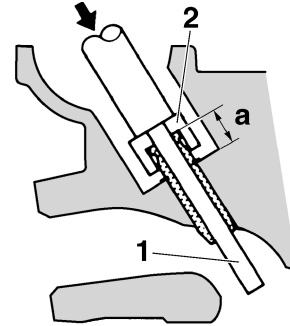
- a. Remove the valve guide with the valve guide remover “1”.



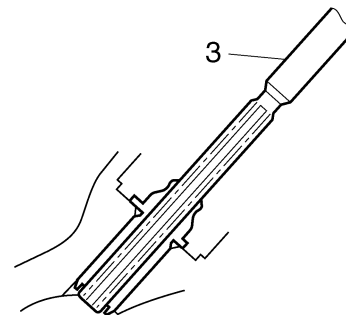
- b. Install the new valve guide with the valve guide installer “2” and valve guide remover “1”.



Valve guide position
 14.5–14.9 mm (0.571–0.587 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.



TIP

After replacing the valve guide, reface the valve seat.

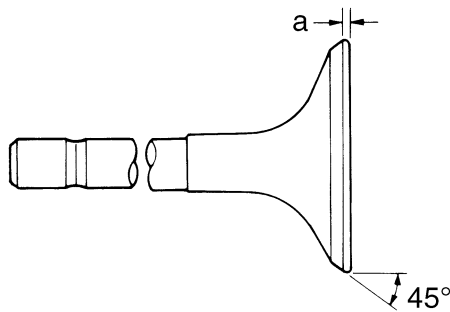
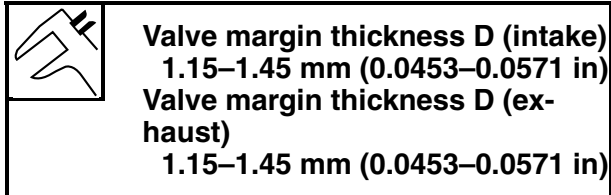


Valve guide remover (ø6)
 90890-04064
Valve guide remover (6.0 mm)
 YM-04064-A
Valve guide installer (ø6)
 90890-04065
Valve guide installer (6.0 mm)
 YM-04065-A
Valve guide reamer (ø6)
 90890-04066
Valve guide reamer (6.0 mm)
 YM-04066

3. Eliminate:

- Carbon deposits
 (from the valve face and valve seat)

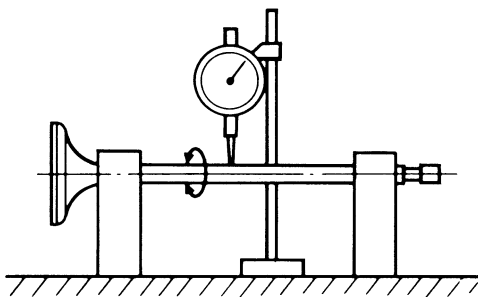
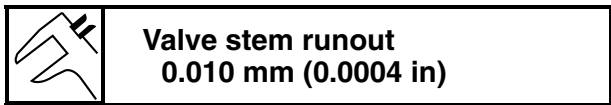
4. Check:
 - Valve face
Pitting/wear → Grind the valve face.
 - Valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
 - Valve margin thickness “a”
Out of specification → Replace the valve.



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.

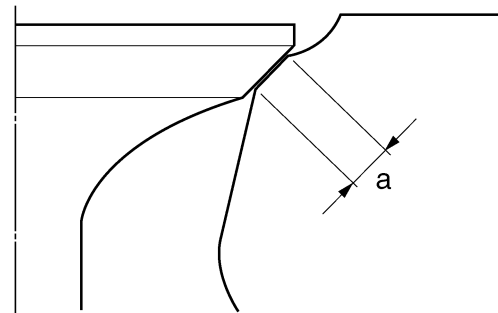
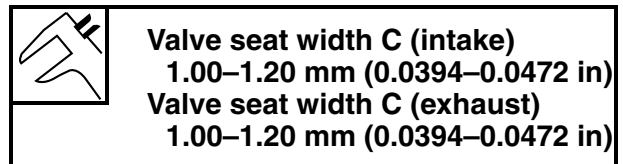


EAS24300

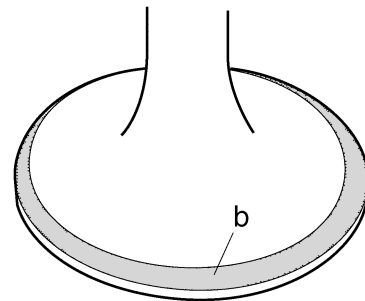
CHECKING THE VALVE SEATS

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.



- a. Apply Mechanic's blueing dye (Dykem) “b” onto the valve face.

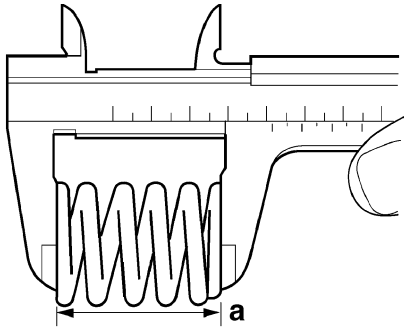


- b. Install the valve into the cylinder head.
- c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- d. Measure the valve seat width.

TIP

Where the valve seat and valve face contacted one another, the blueing will have been removed.

4. Lap:
 - Valve face
 - Valve seat



2. Measure:

- Compressed valve spring force "a"
Out of specification → Replace the valve spring.



Installed compression spring force (intake)

171.00–197.00 N (17.44–20.09 kgf, 38.44–44.29 lbf)

Installed compression spring force (exhaust)

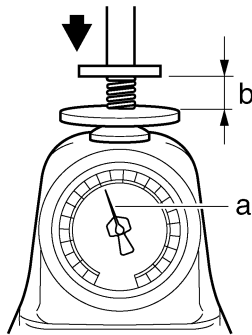
171.00–197.00 N (17.44–20.09 kgf, 38.44–44.29 lbf)

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.

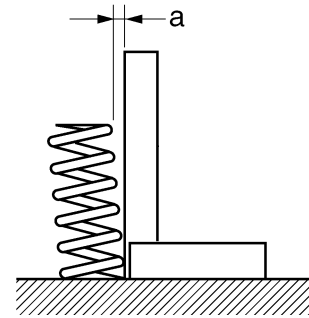


Spring tilt (intake)

2.5°/1.9 mm (2.5°/0.07 in)

Spring tilt (exhaust)

2.5°/1.9 mm (2.5°/0.07 in)



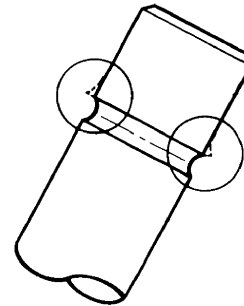
EAS24340

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)



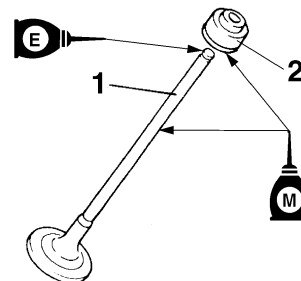
Recommended lubricant
Molybdenum disulfide oil

3. Lubricate:

- Valve stem end
(with the recommended lubricant)



Recommended lubricant
Engine oil



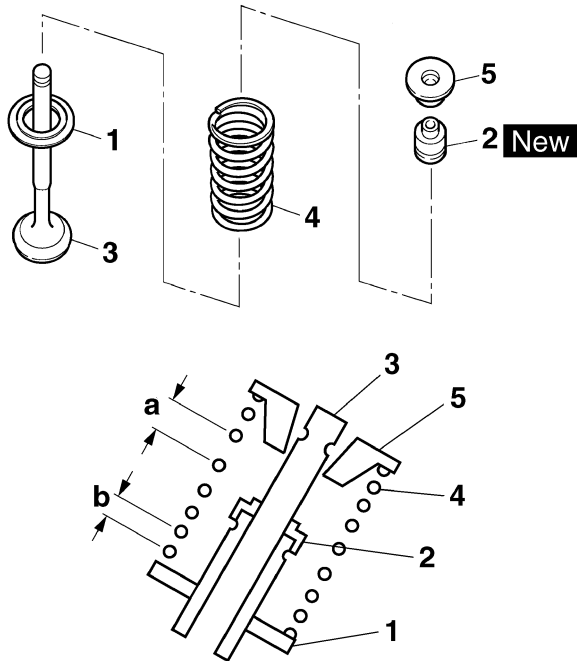
4. Install:

- 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.



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

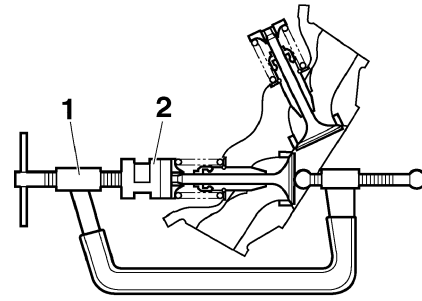
YM-04019

Valve spring compressor attachment

90890-01243

Valve spring compressor adapter (26 mm)

YM-01253-1

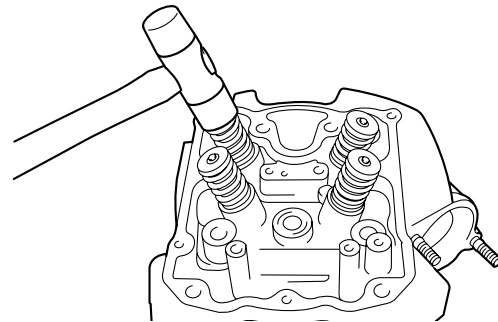


6. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

NOTICE

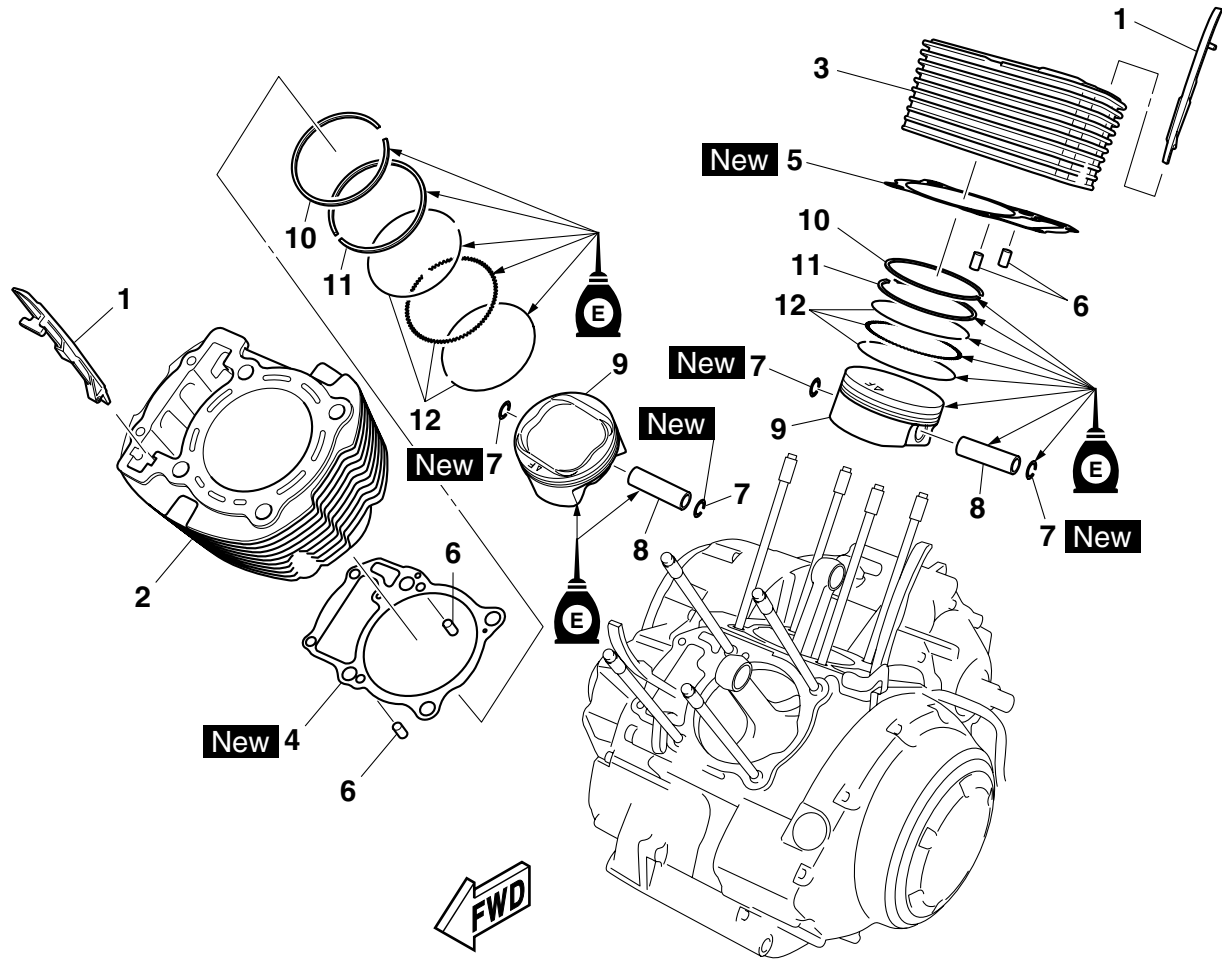
Hitting the valve tip with excessive force could damage the valve.



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 5-32.
1	Timing chain guide	2	
2	Front cylinder	1	
3	Rear cylinder	1	
4	Front cylinder gasket	1	
5	Rear cylinder gasket	1	
6	Dowel pin	4	
7	Circlip	4	
8	Piston pin	2	
9	Piston	2	
10	Top ring	2	
11	2nd ring	2	
12	Oil ring	2	
			For installation, reverse the removal procedure.

EAS24380

REMOVING THE PISTONS

The following procedure applies to all of the pistons.

1. Remove:
 - Piston pin clips “1”
 - Piston pin “2”
 - Piston “3”

ECA13810

NOTICE

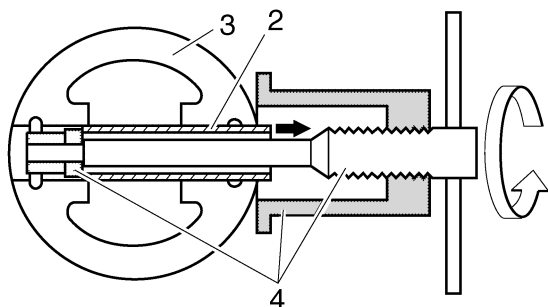
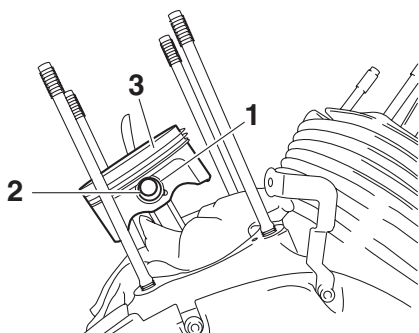
Do not use a hammer to drive the piston pin out.

TIP

- Before removing the piston pin clips, cover the crankcase opening with a clean rag to prevent the piston pin clips from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip's 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”.



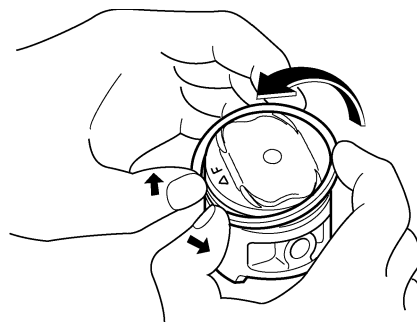
**Piston pin puller set
90890-01304
Piston pin puller
YU-01304**



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 “C” with the cylinder bore gauge.

TIP

Measure the cylinder bore “C” by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

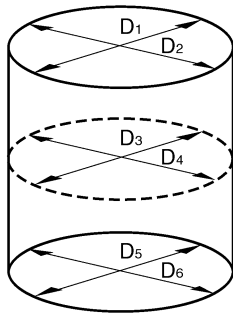


Bore
100.000–100.010 mm (3.9370–3.9374 in)
Taper limit
0.050 mm (0.0020 in)
Out of round limit
0.050 mm (0.0020 in)

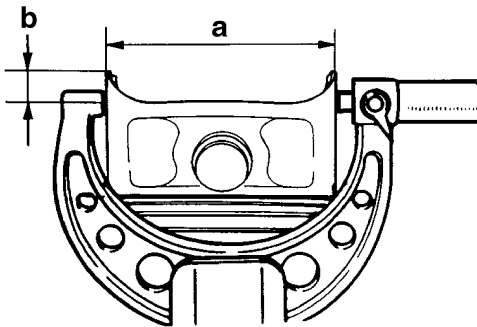
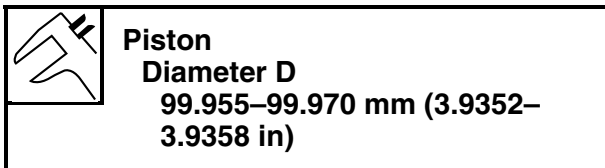
“C” = maximum of D₁–D₆

“T” = maximum of D₁ or D₂ - maximum of D₅ or D₆

“R” = maximum of D₁, D₃ or D₅ - minimum of D₂, D₄ or D₆

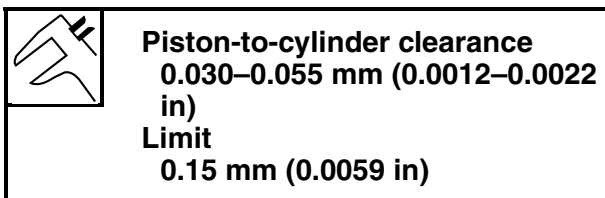


- b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.
- c. Measure the piston skirt diameter "D" "a" with the micrometer.



- 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 "P"



- 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

0.030–0.080 mm (0.0012–0.0032 in)

Limit

0.130 mm (0.0051 in)

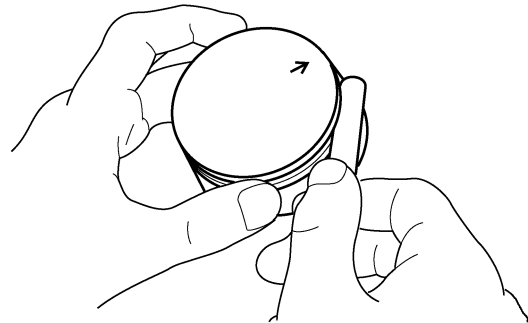
2nd ring

Ring side clearance

0.030–0.070 mm (0.0012–0.0028 in)

Limit

0.130 mm (0.0051 in)

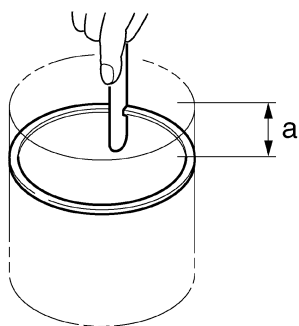


2. Install:

- 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)
0.20–0.35 mm (0.0079–0.0138 in)

Limit
0.60 mm (0.0236 in)

2nd ring

End gap (installed)
0.45–0.60 mm (0.0177–0.0236 in)

Limit
0.95 mm (0.0374 in)

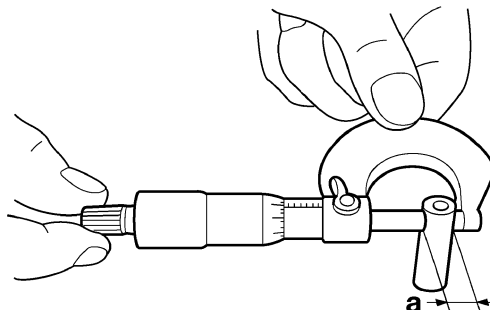
Oil ring

End gap (installed)
0.20–0.70 mm (0.0079–0.0276 in)



Piston pin outside diameter
22.991–23.000 mm (0.9052–0.9055 in)

Limit
22.971 mm (0.9044 in)



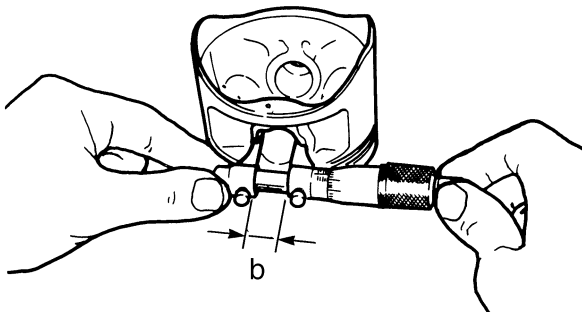
3. Measure:

- Piston pin bore diameter “b”
Out of specification → Replace the piston.



Piston pin bore inside diameter
23.004–23.015 mm (0.9057–0.9061 in)

Limit
23.045 mm (0.9073 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 (0.0002–0.0009 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.

EAS24460

INSTALLING THE PISTONS AND CYLINDERS

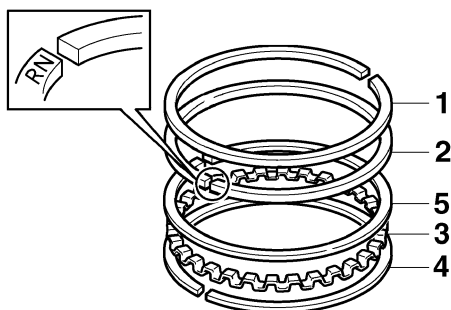
The following procedure applies to all of the pistons and cylinders.

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.

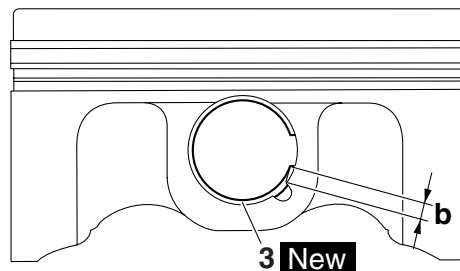
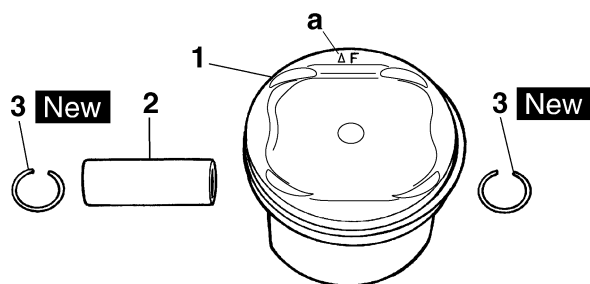


2. Install:

- Piston "1"
- Piston pin "2"
- Piston pin clips "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 piston pin clips, cover the crankcase opening with a clean rag to prevent the clips from falling into the crankcase.
- Install the piston pin clips 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.



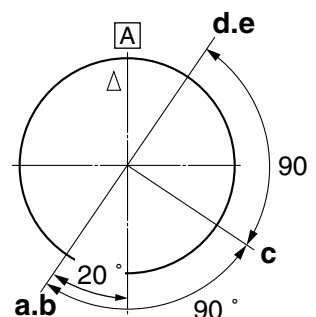
3. Lubricate:

- Piston
- Piston rings
- Cylinder (with the recommended lubricant)

	Recommended lubricant Engine oil
--	---

4. Offset:

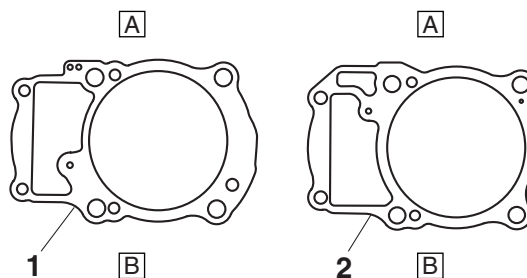
- Piston ring end gaps



- 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"



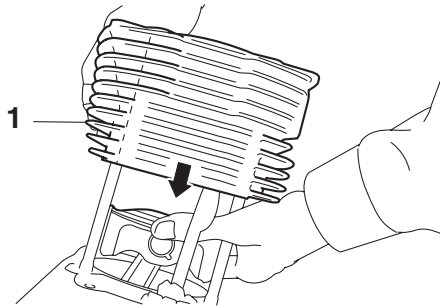
- A. Intake side
- B. Exhaust side

6. Install:

- Cylinder “1”

TIP

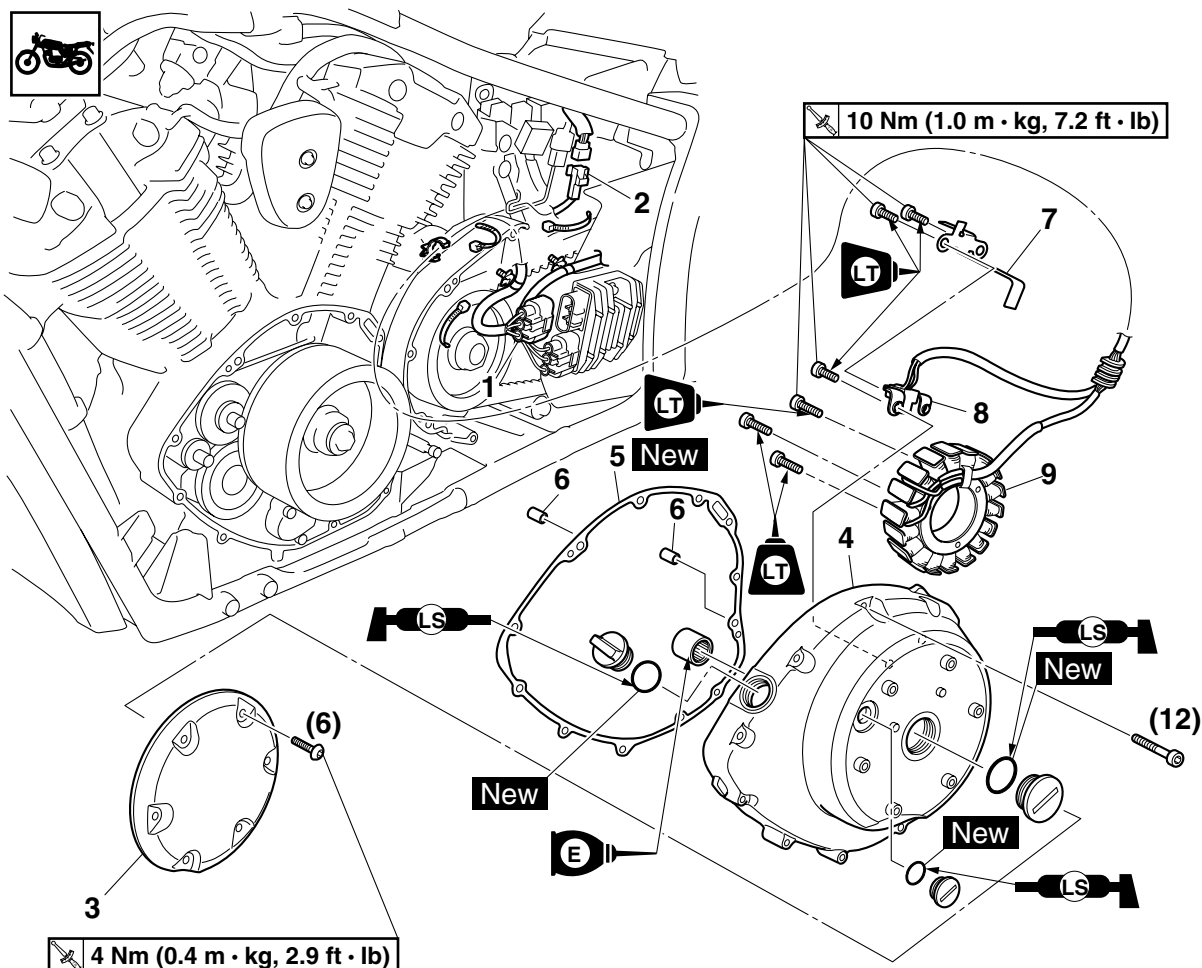
- While compressing the piston rings with one hand, install the cylinder with the other hand.
 - Pass the timing chain and timing chain guide through the timing chain cavity.
-



EAS24480

GENERATOR AND STARTER CLUTCH

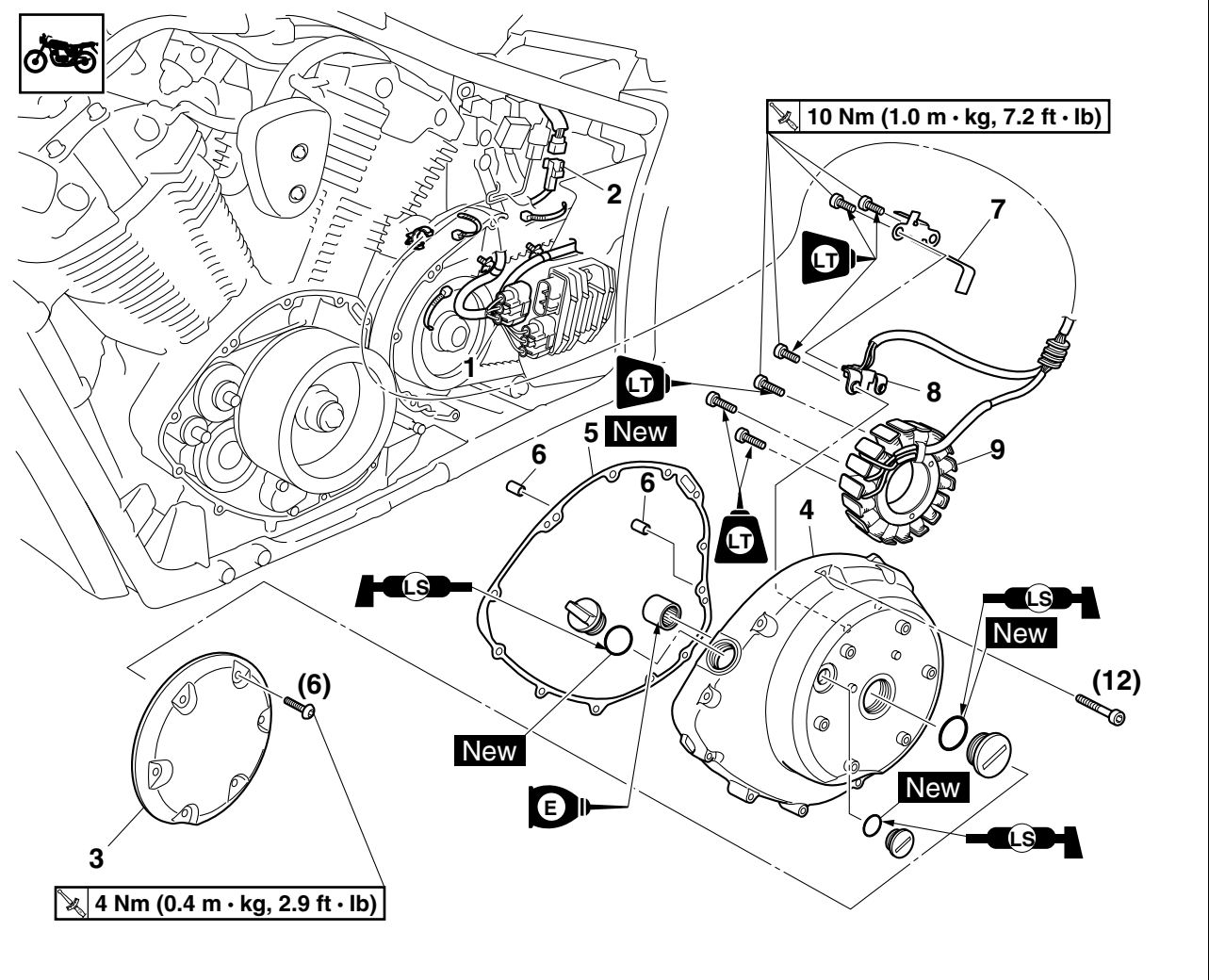
Removing the stator coil



Order	Job/Parts to remove	Q'ty	Remarks
	Rectifier/regulator cover		Refer to "SWINGARM" on page 4-93.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-12.
	Canister		For California only. Refer to "FUEL TANK" on page 7-1.
	Drive pulley cover		Refer to "BELT DRIVE" on page 4-99.
	Left rider footrest assembly/Sidestand		Refer to "ENGINE REMOVAL" on page 5-1.
1	Stator coil coupler	1	Disconnect.
2	Crankshaft position sensor coupler	1	Disconnect.
3	Damper cover	1	
4	Generator cover	1	
5	Generator cover gasket	1	
6	Dowel pin	2	
7	Crankshaft position sensor/stator assembly lead holder	1	
8	Crankshaft position sensor	1	

GENERATOR AND STARTER CLUTCH

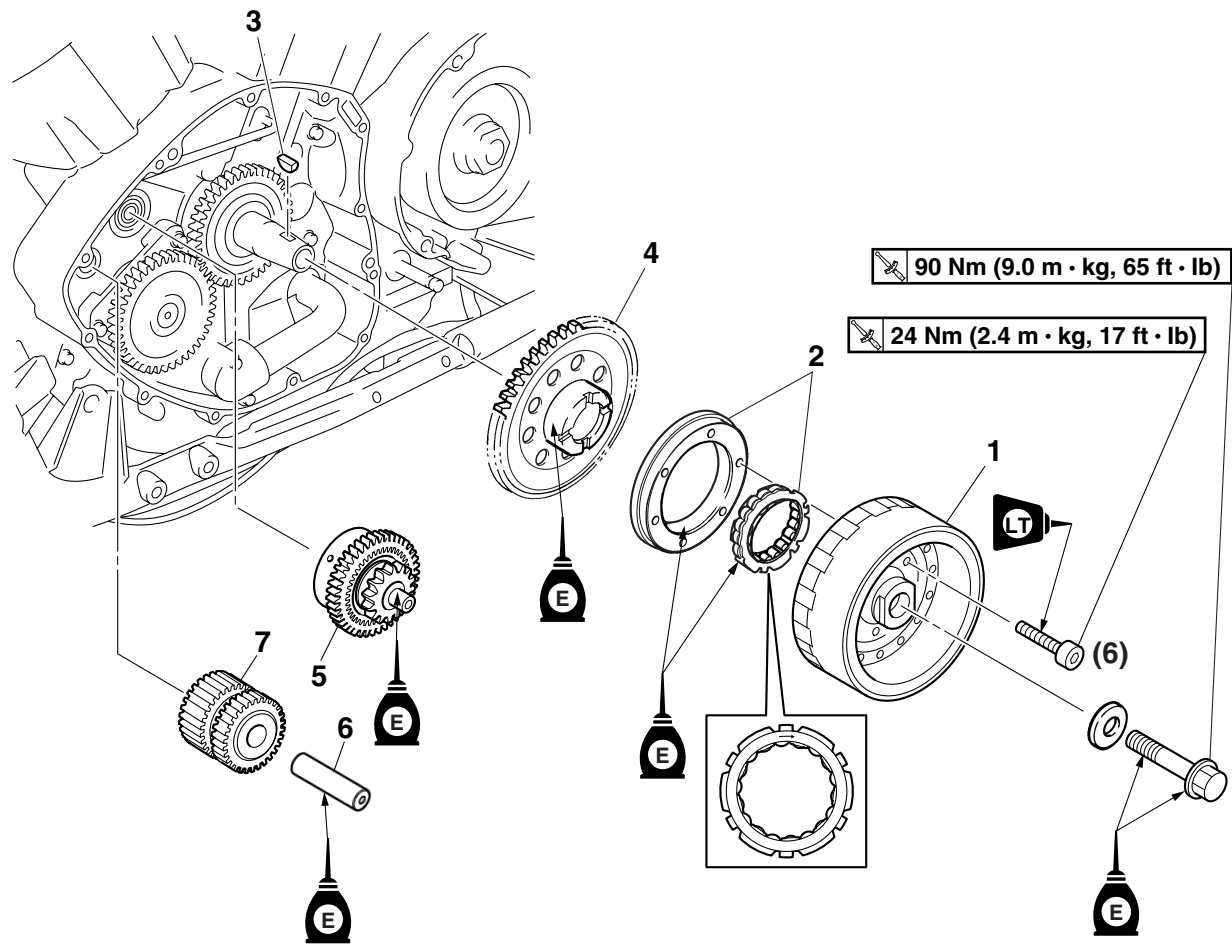
Removing the stator coil



Order	Job/Parts to remove	Q'ty	Remarks
9	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	Torque limiter	1	
6	Starter clutch idle gear shaft	1	
7	Starter clutch idle gear	1	
			For installation, reverse the removal procedure.

GENERATOR AND STARTER CLUTCH

EAS24490

REMOVING THE GENERATOR

1. Remove:

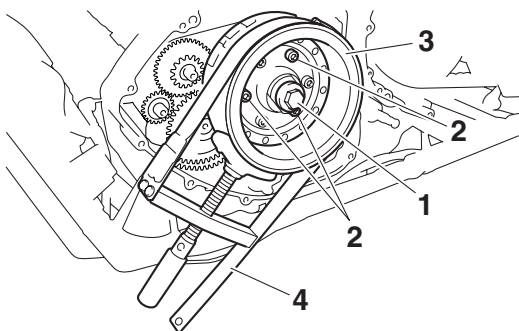
- Generator rotor bolt “1”
- Washer
- Starter clutch bolts “2”

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

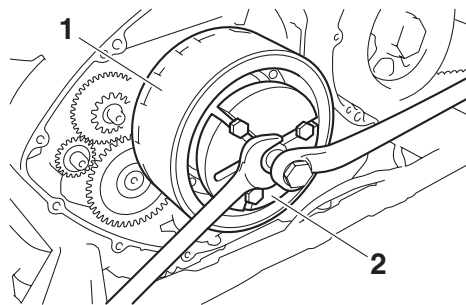
To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set's center bolt and the crankshaft.

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
90890-01362
Heavy duty puller
YU-33270-B



EAS24560

REMOVING THE STARTER CLUTCH

1. Remove:

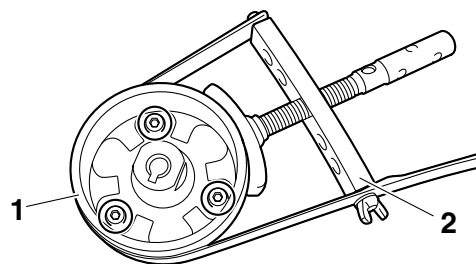
- Starter clutch bolts
- Starter clutch

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 gear
- 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:

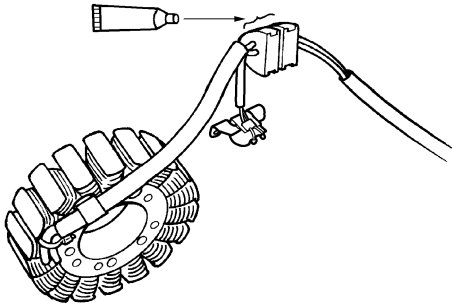
- Starter clutch operation

3. Apply:

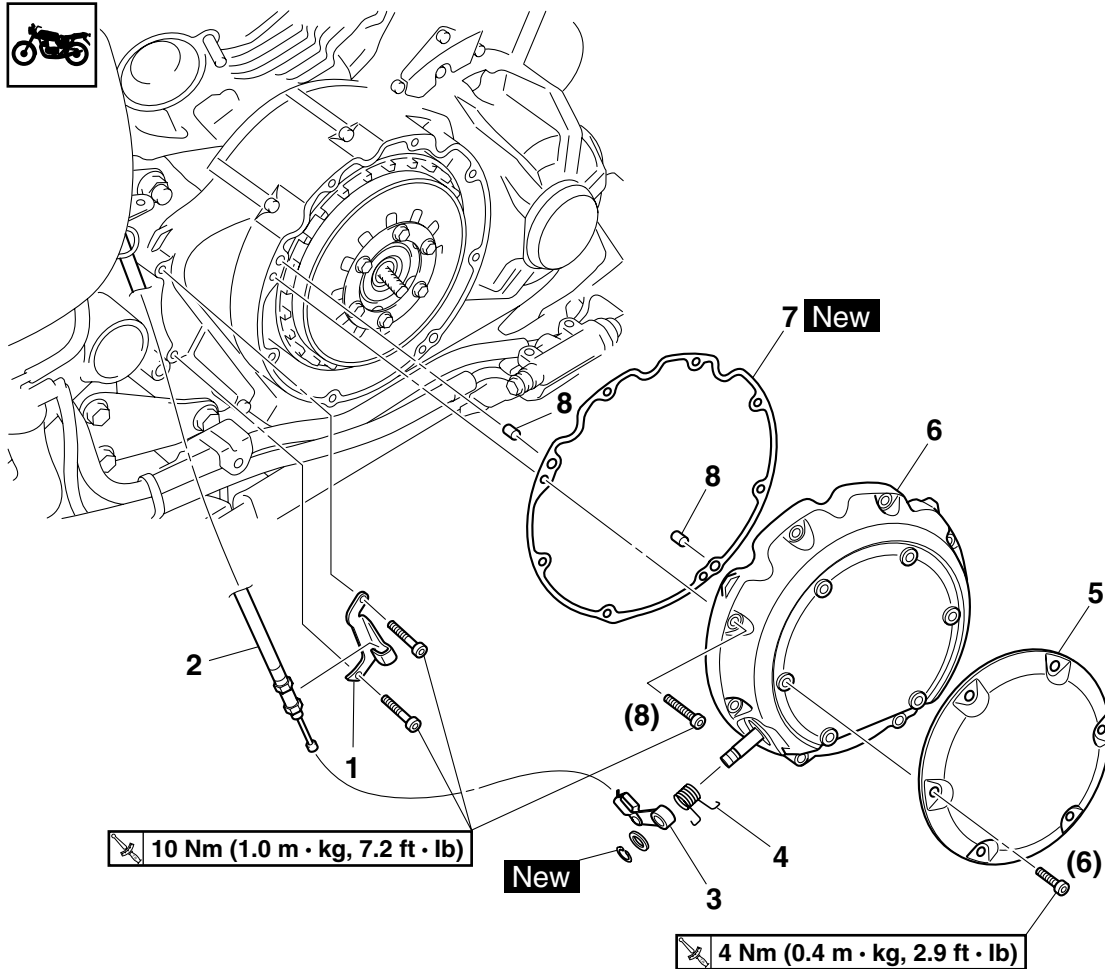
- Sealant
(onto the crankshaft position sensor/stator
assembly lead grommet)



Yamaha bond No. 1215
90890-85505
(Three Bond No.1215®)

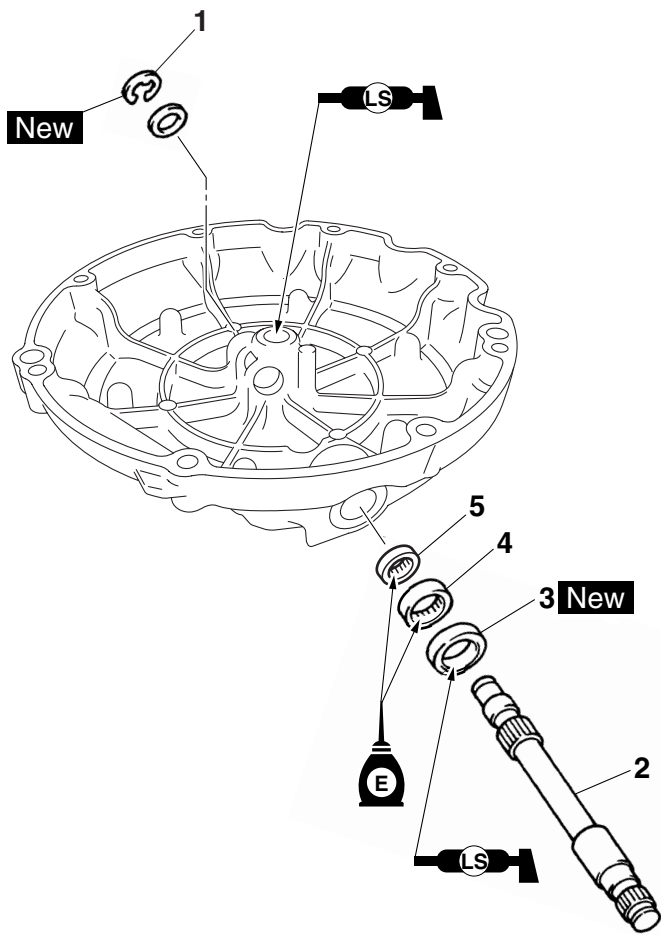


EAS25060

CLUTCH**Removing the clutch cover**

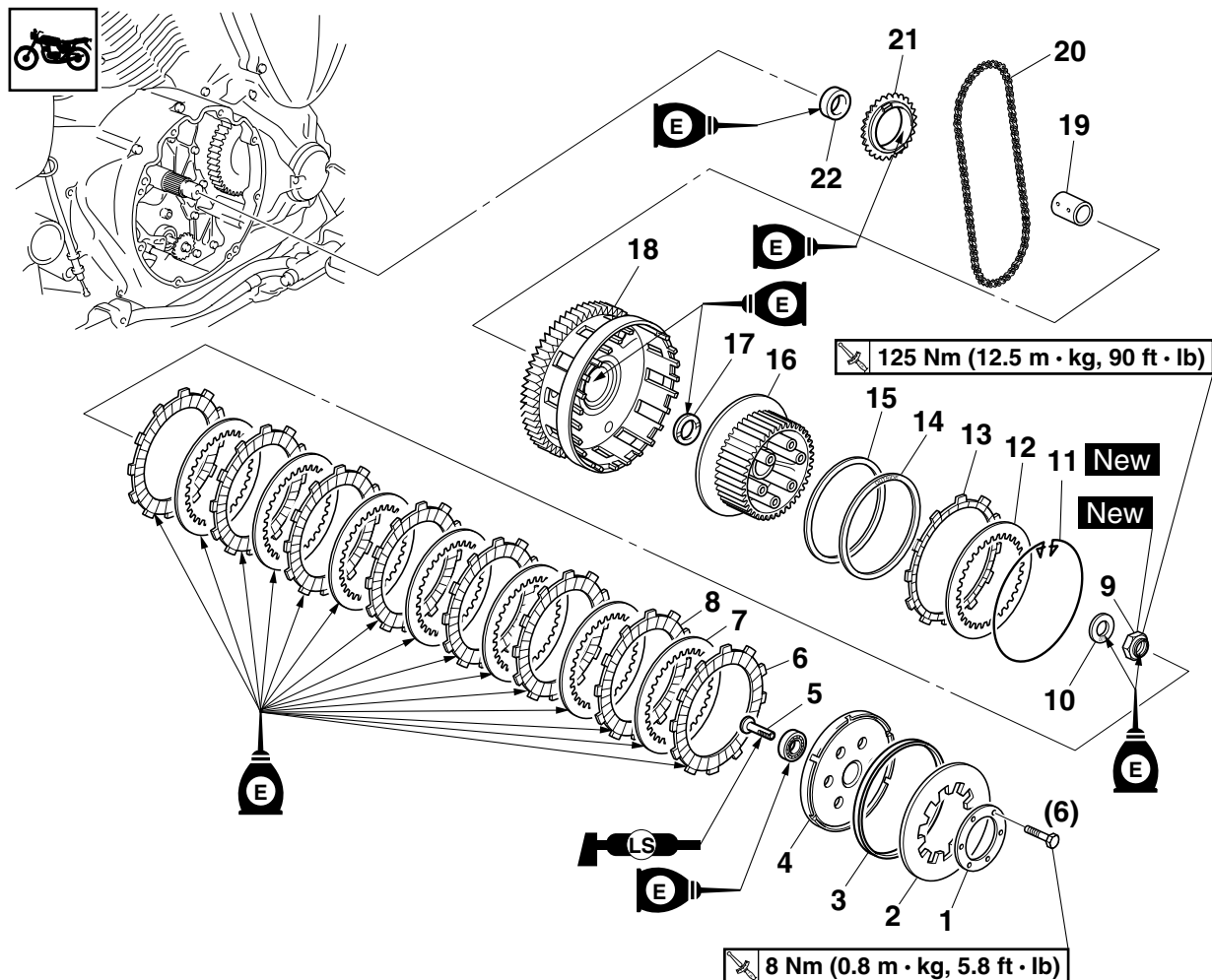
Order	Job/Parts to remove	Q'ty	Remarks
	Muffler/Coolant reservoir cover		Refer to "ENGINE REMOVAL" on page 5-1.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-12.
1	Clutch cable holder	1	
2	Clutch cable	1	Disconnect.
3	Pull lever	1	
4	Pull lever spring	1	
5	Damper cover	1	
6	Clutch cover	1	
7	Clutch cover gasket	1	
8	Dowel pin	2	
			For installation, reverse the removal procedure.

Removing the pull lever shaft



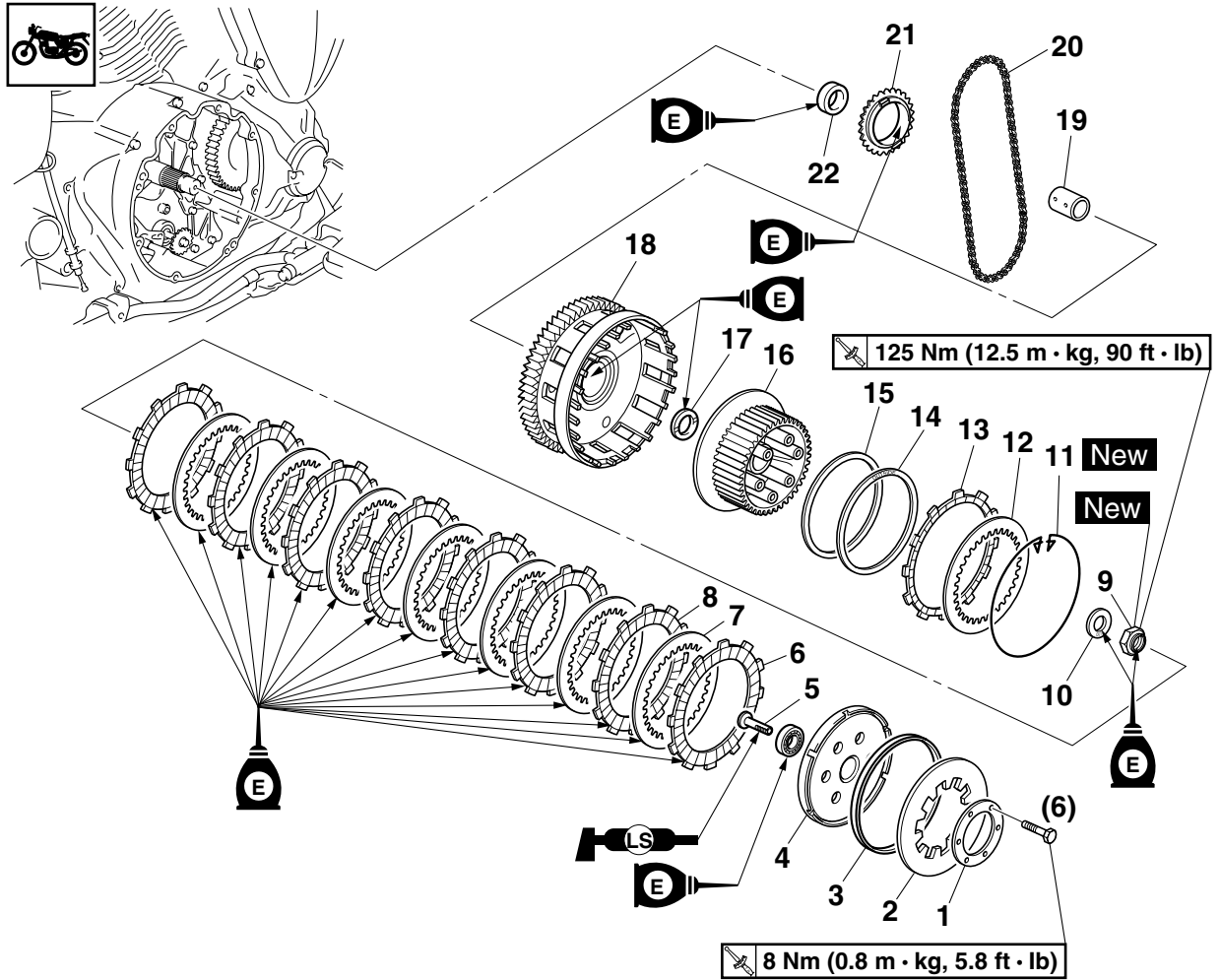
Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Pull lever shaft	1	
3	Oil seal	1	
4	Bearing	1	
5	Bearing	1	
			For installation, reverse the removal procedure.

Removing the clutch



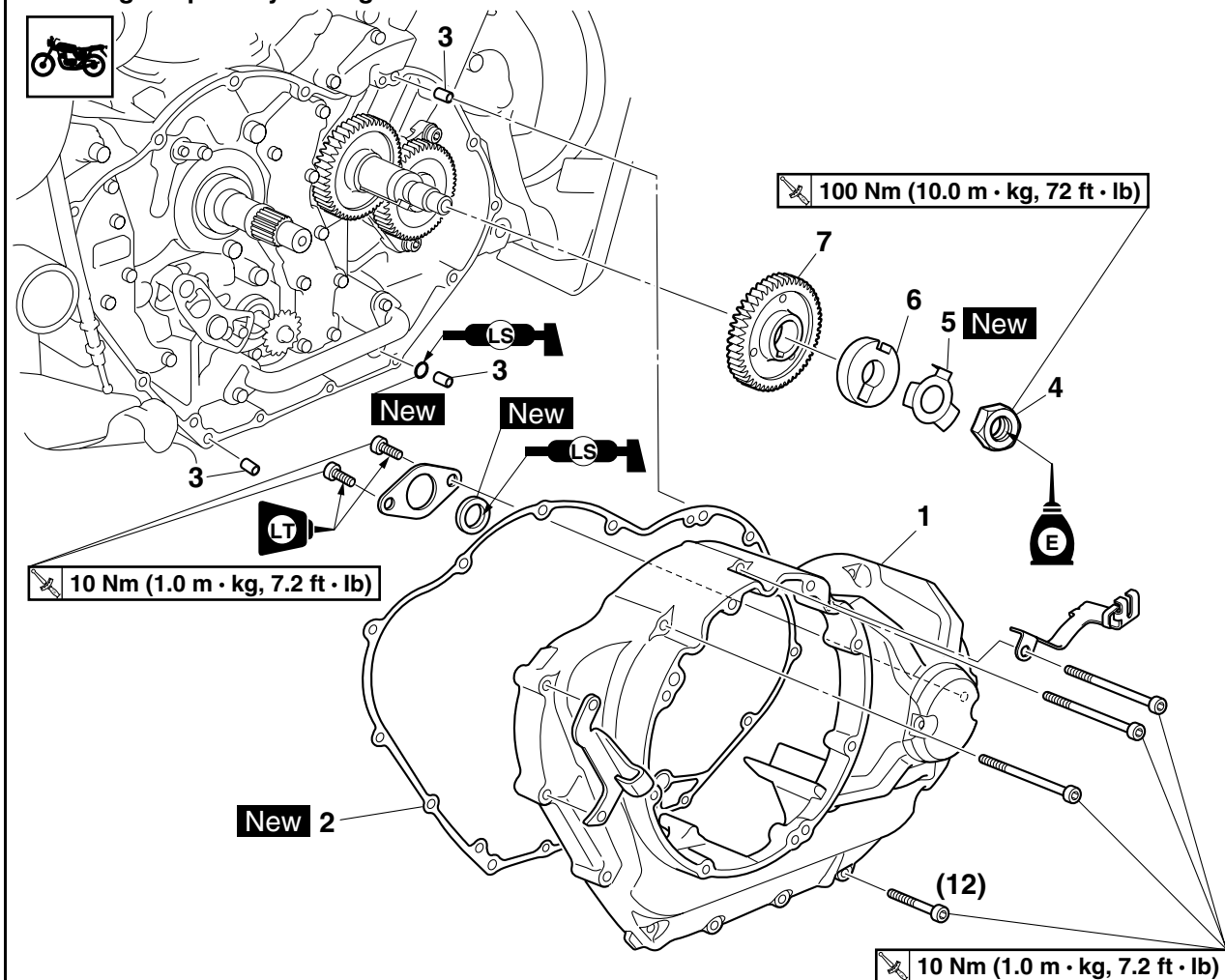
Order	Job/Parts to remove	Q'ty	Remarks
1	Clutch spring plate retainer	1	
2	Clutch spring plate	1	
3	Clutch spring plate seat	1	
4	Pressure plate	1	
5	Pull rod	1	
6	Friction plate 1	1	Inside diameter: 124 mm (4.88 in)
7	Clutch plate	7	
8	Friction plate 2	7	Inside diameter: 124 mm (4.88 in)
9	Clutch boss nut	1	
10	Conical spring washer	1	
11	Wire circlip	1	
12	Clutch plate	1	
13	Friction plate 3	1	Inside diameter: 135 mm (5.31 in)
14	Clutch damper spring	1	
15	Clutch damper spring seat	1	
16	Clutch boss	1	
17	Thrust washer 1	1	

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
18	Clutch housing	1	
19	Collar	1	
20	Oil/water pump drive chain	1	
21	Oil/water pump drive sprocket	1	
22	Thrust washer 2	1	
			For installation, reverse the removal procedure.

Removing the primary drive gear

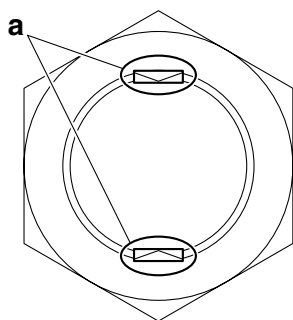


Order	Job/Parts to remove	Q'ty	Remarks
	Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Rear brake master cylinder		Refer to "REAR BRAKE" on page 4-42.
	Right rider footrest assembly/Rear brake light switch/Horn/Down tube		Refer to "ENGINE REMOVAL" on page 5-1.
	Generator cover		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-48.
1	Primary drive gear cover	1	
2	Primary drive gear cover gasket	1	
3	Dowel pin	3	
4	Primary drive gear nut	1	
5	Lock washer	1	
6	Spacer	1	
7	Primary drive gear	1	
			For installation, reverse the removal procedure.

EAS25080

REMOVING THE CLUTCH

1. Straighten the clutch boss nut rib "a".



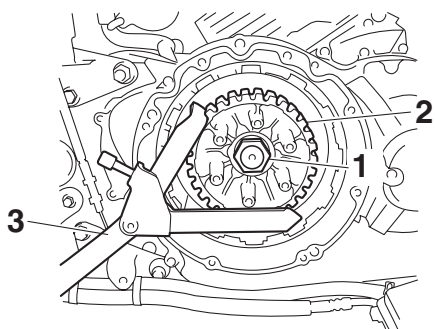
2. Loosen:
 - Clutch boss nut "1"

TIP

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



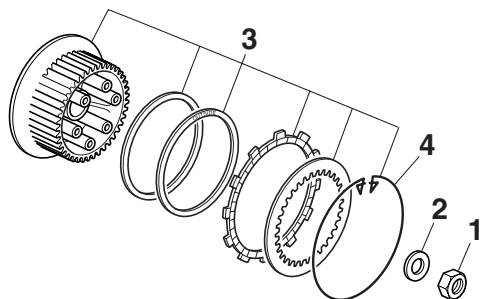
Universal clutch holder
90890-04086
YM-91042



3. Remove:
 - Clutch boss nut "1"
 - Conical spring washer "2"
 - Clutch boss assembly "3"

TIP

There is a built-in damper between the clutch boss and the clutch plate. It is not necessary to remove the wire circlip "4" and disassemble the built-in damper unless there is serious clutch chattering.



EAS25090

REMOVING THE PRIMARY DRIVE GEAR

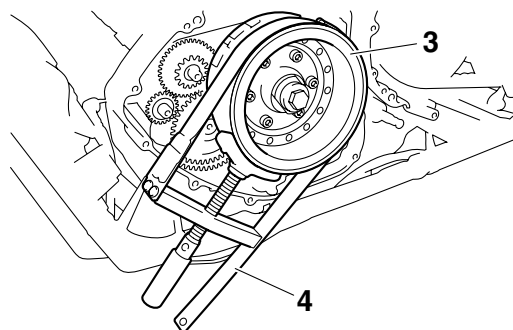
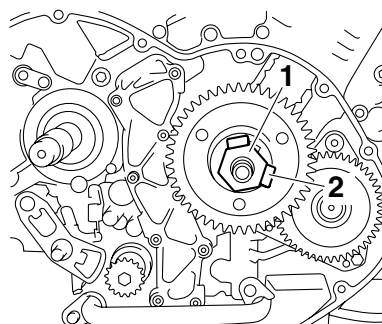
1. Straighten the lock washer tab.
2. Remove:
 - Primary drive gear nut "1"
 - Lock washer "2"

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.

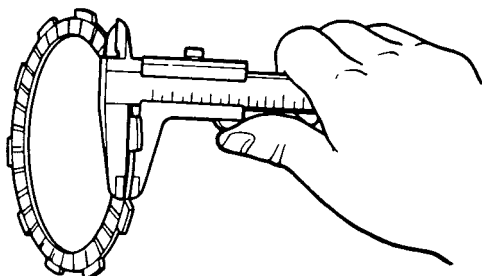
1. Check:
 - Friction plate
Damage/wear → Replace the friction plates as a set.
2. Measure:
 - Friction plate thickness
Out of specification → Replace the friction plates as a set.

TIP

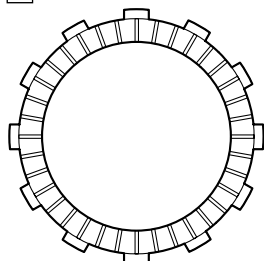
Measure each friction plate at four places.



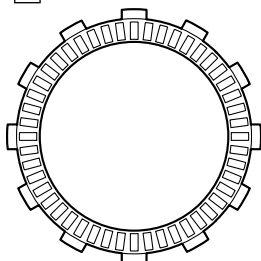
Friction plate 1, 3 thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.1102 in)
Friction plate 2 thickness
2.92–3.08 mm (0.115–0.121 in)
Wear limit
2.82 mm (0.1110 in)



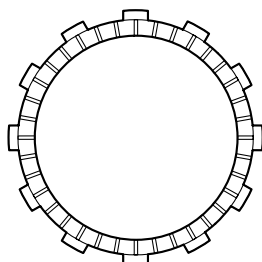
A



B



C



- A. Friction plate 1
- B. Friction plate 2
- C. Friction plate 3

EAS25110

CHECKING THE CLUTCH PLATES

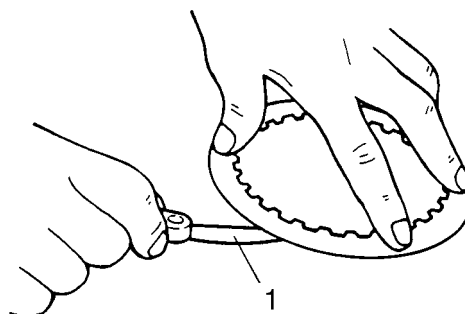
The following procedure applies to all of the clutch plates.

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)



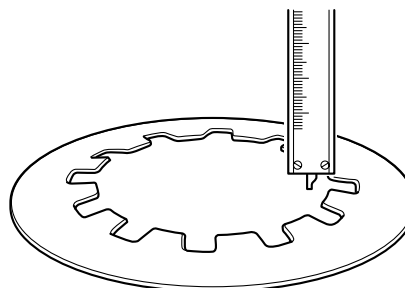
EAS25130

CHECKING THE CLUTCH SPRING PLATE

1. Check:
 - Clutch spring plate
Damage → Replace.
2. Check:
 - Clutch spring plate seat
Damage → Replace.
3. Measure:
 - Clutch spring free height
Out of specification → Replace the clutch spring plate.



Clutch spring height
6.70 mm (0.26 in)
Minimum height
6.37 mm (0.25 in)



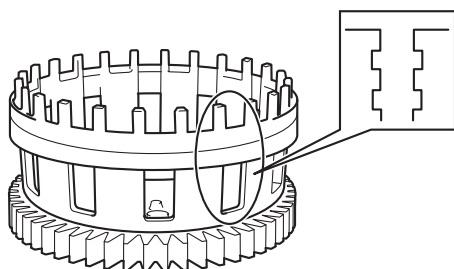
EAS25150

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.

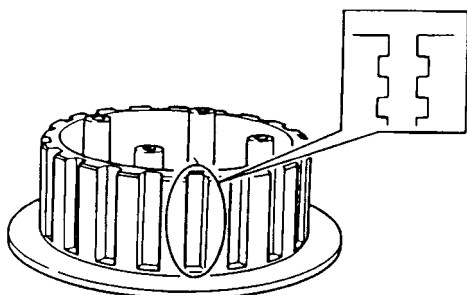
EAS25160

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

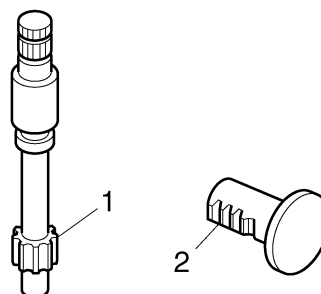
CHECKING THE PRIMARY DRIVEN GEAR

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.

EAS3D81028

CHECKING THE OIL/WATER PUMP DRIVE SPROCKET AND OIL/WATER PUMP DRIVE CHAIN

1. Check:
 - Oil/water pump drive sprocket
Cracks/damage/wear → Replace the oil/water pump drive chain, and oil/water pump drive and driven sprockets as a set.
2. Check:
 - Oil/water pump drive chain
Damage/stiffness → Replace the oil/water pump drive chain, and oil/water 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



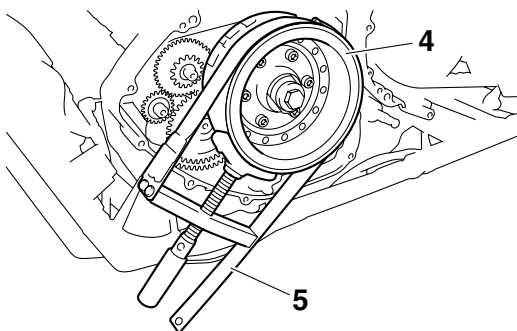
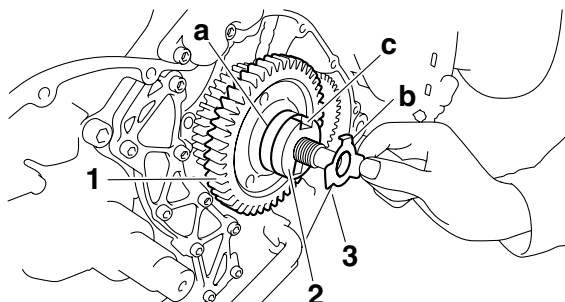
Primary drive gear nut
100 Nm (10.0 m·kg, 72 ft·lb)

TIP

- Make sure that the side of the primary drive gear “1” with the groove “a” is facing outward.
- Align the tab “b” on the lock washer “3” with the groove “c” in the spacer “2”.
- 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

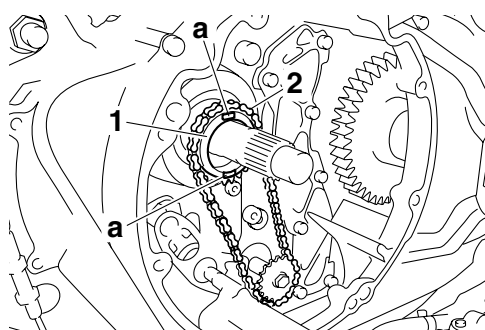
INSTALLING THE CLUTCH

1. Install:

- Oil/water pump drive sprocket “1”
- Oil/water pump drive chain “2”

TIP

Install the oil/water pump drive sprocket with its projections “a” facing outward.

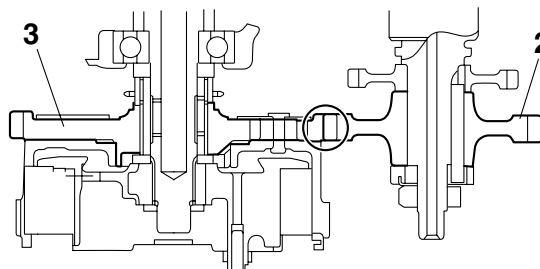
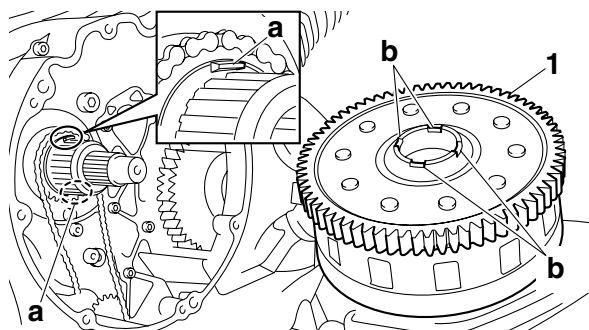


2. Install:

- Clutch housing “1”

TIP

- Fit the projections “a” on the oil/water 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.

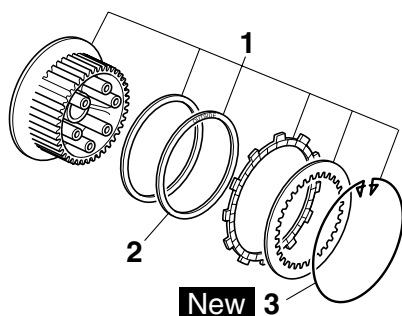


3. Install:

- Clutch boss assembly “1”

TIP

- Install the clutch damper spring “2” with the “OUTSIDE” mark facing out.
- If the wire circlip “3” has been removed, carefully install a new one.



4. Install:

- Clutch boss “1”
- Washer
- Conical spring washer “2”
- Clutch boss nut “3”



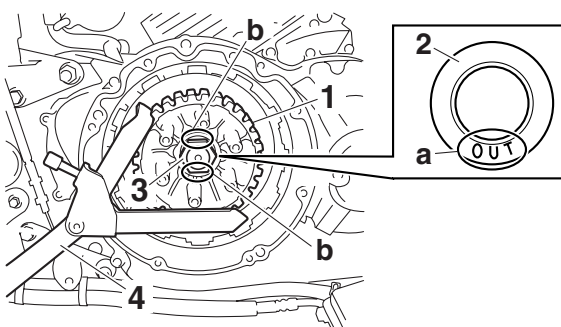
Clutch boss nut
125 Nm (12.5 m·kg, 90 ft·lb)

TIP

- Lubricate the clutch boss nut threads and conical spring washer mating surfaces with engine oil.
- Install the conical spring washer “2” 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



5. Lubricate:

- Friction plates
 - Clutch plates
- (with the recommended lubricant)



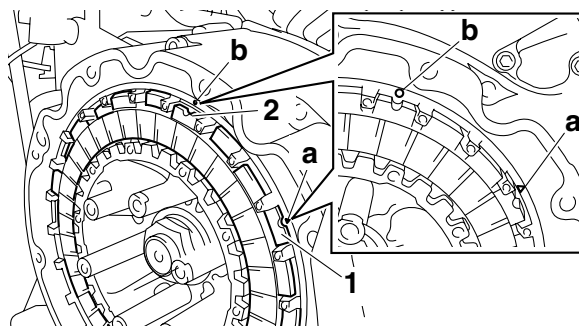
Recommended lubricant
Engine oil

6. Install:

- Friction plates 2 “1”
- Clutch plates
- Friction plate 1 “2”

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 2 “1” with the “△” mark “a” on the clutch housing and align the cutout in the tab of friction plate 1 “2” with the punch mark “b” on the housing.



7. Install:

- Clutch spring plate
- Clutch spring plate retainer



Clutch spring plate retainer bolt
8 Nm (0.8 m·kg, 5.8 ft·lb)

TIP

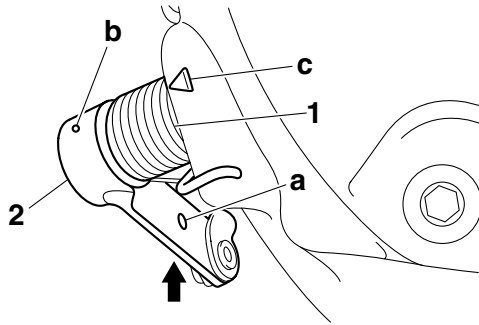
Tighten the clutch spring plate retainer bolts in stages and in a crisscross pattern.

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 clutch cover. Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.



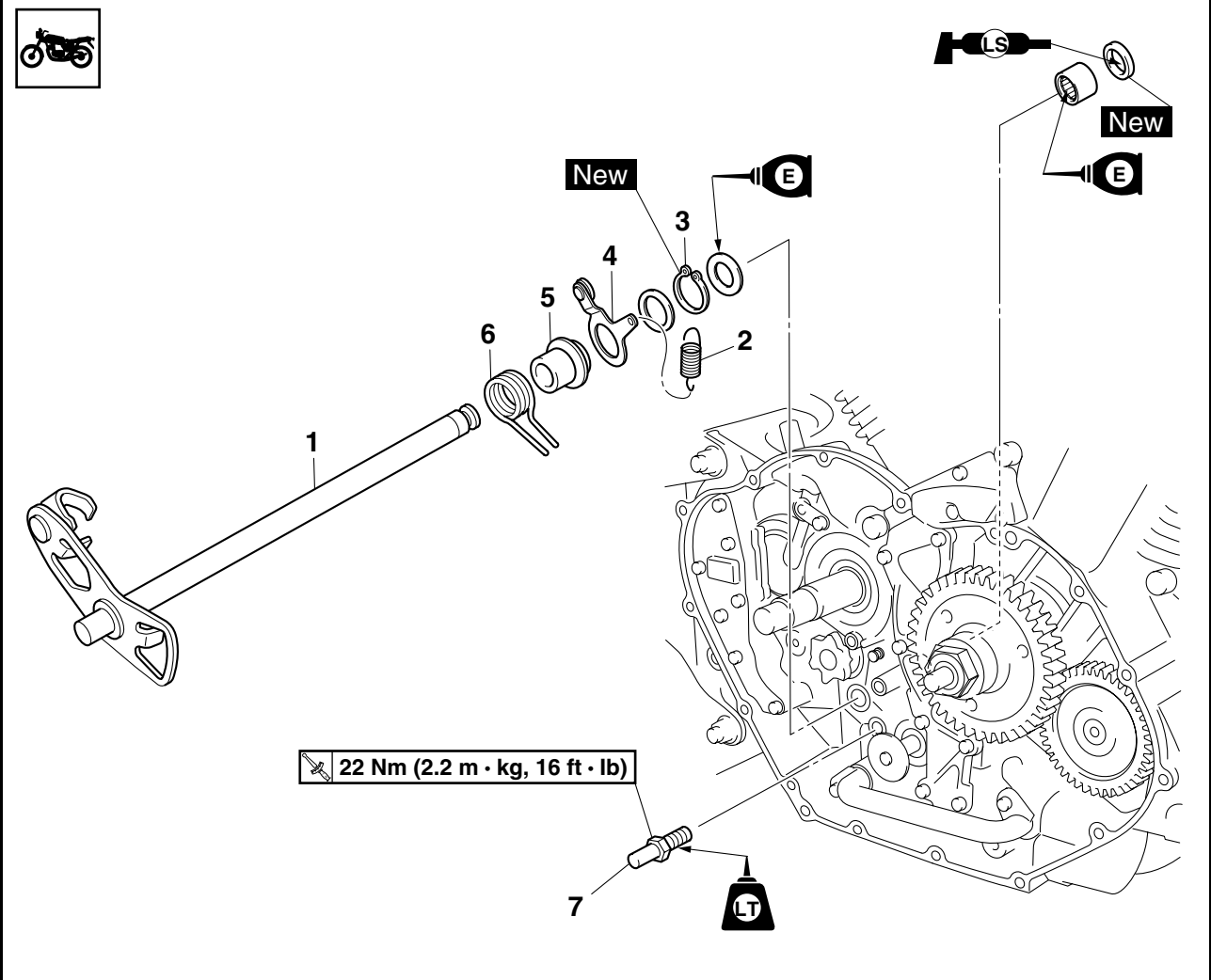
9. Adjust:

- Clutch lever free play
Refer to “ADJUSTING THE CLUTCH LEVER
FREE PLAY” on page 3-13.

EAS25410

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 4-99.
	Shift arm		Refer to "ENGINE REMOVAL" on page 5-1.
	Primary drive gear cover		Refer to "CLUTCH" on page 5-54.
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	
			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

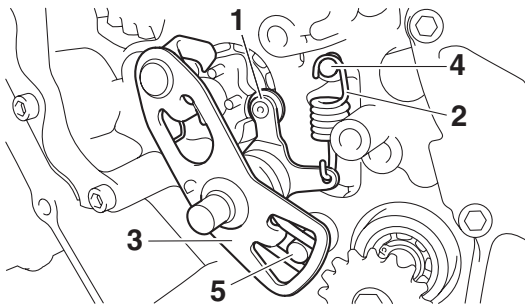
INSTALLING THE SHIFT SHAFT

1. Install:

- Stopper lever “1”
- Stopper lever spring “2”
- Shift shaft “3”

TIP

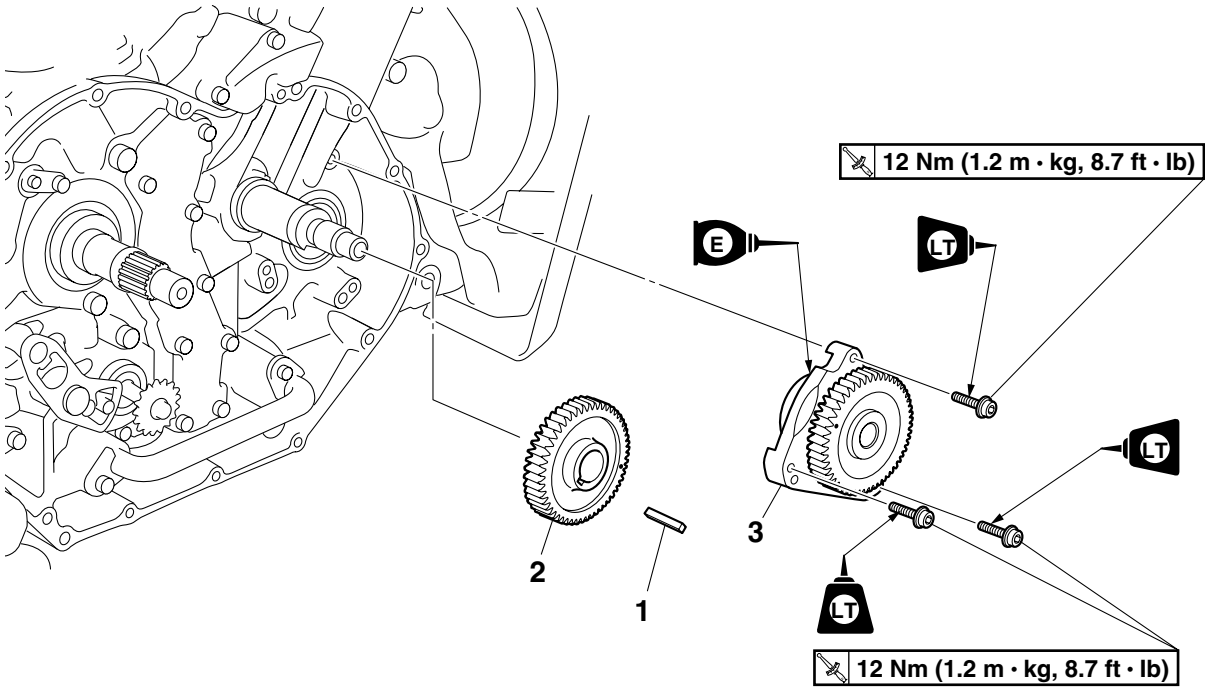
- Lubricate the oil seal lips with lithium-soap-based grease.
- Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss “4”.
- Mesh the stopper lever with the shift drum segment assembly.
- Hook the end of the shift shaft spring onto the shift shaft spring stopper “5”.



EAS3D81023

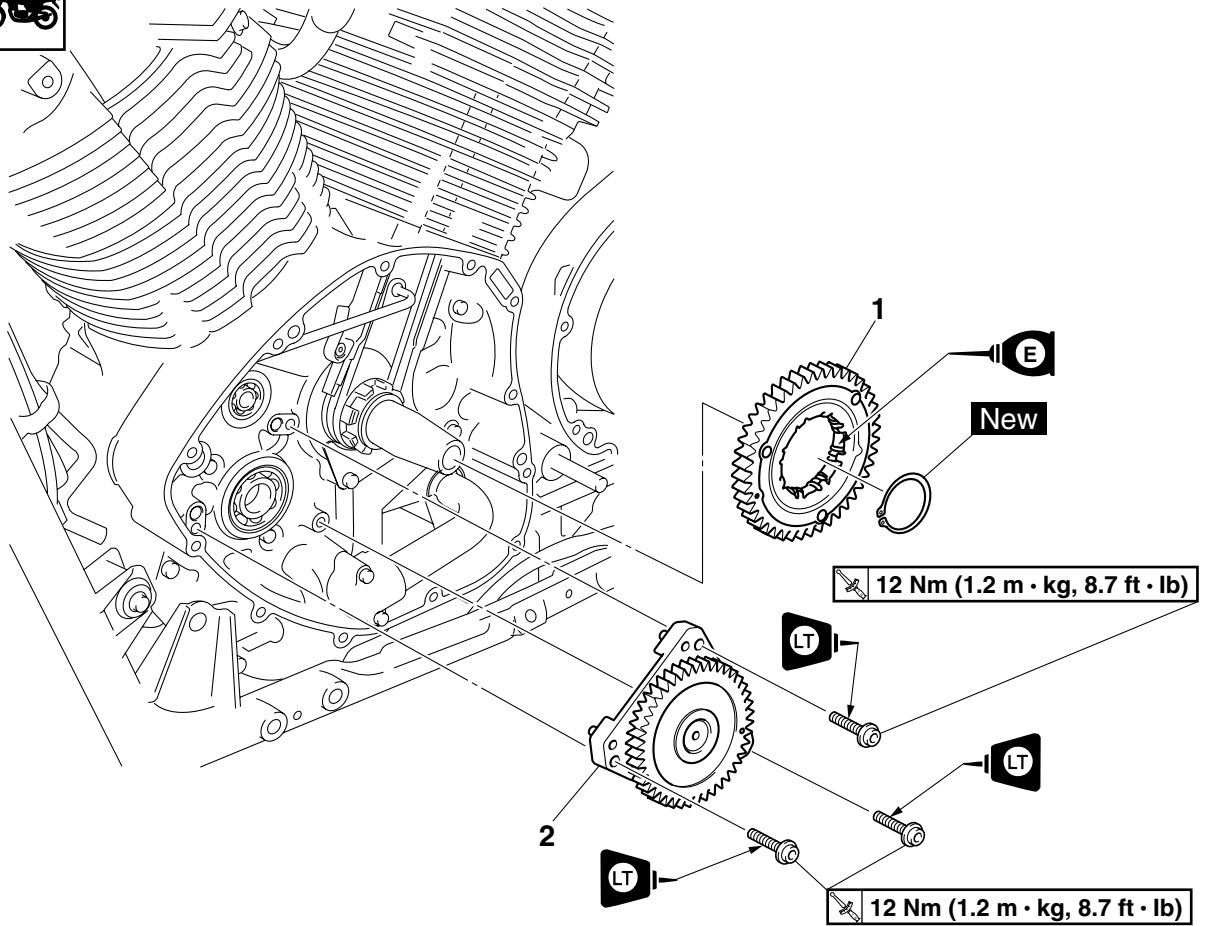
BALANCER GEARS

Removing the right balancer assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Primary drive gear		Refer to "CLUTCH" on page 5-54.
1	Straight key	1	
2	Right balancer drive gear	1	
3	Right balancer assembly	1	
			For installation, reverse the removal procedure.

Removing the left balancer assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Generator rotor/Starter clutch idle gear		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-48.
1	Left balancer drive gear	1	
2	Left balancer assembly	1	
			For installation, reverse the removal procedure.

EAS3D81024

CHECKING THE RIGHT BALANCER GEARS

1. Check:

- Right balancer drive gear
 - Right balancer driven gear
 - Right balancer driven gear bearing
- Damage/wear → Replace the right balancer assembly.

EAS3D81025

CHECKING THE LEFT BALANCER GEARS

1. Check:

- Left balancer drive gear
 - Left balancer driven gear
 - Left balancer driven gear bearing
- Damage/wear → Replace the left balancer assembly.

EAS3D81026

INSTALLING THE RIGHT BALANCER GEARS

1. Install:

- Right balancer assembly



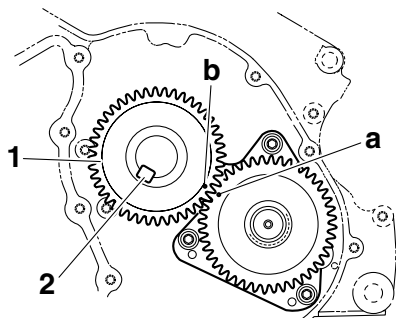
Right balancer assembly bolt
12 Nm (1.2 m·kg, 8.7 ft·lb)
LOCTITE®

2. Install:

- Right balancer drive gear “1”
- Straight key “2”

TIP

Align the punch mark “a” in the right balancer driven gear with the punch mark “b” in the right balancer drive gear.



EAS3D81027

INSTALLING THE LEFT BALANCER GEARS

1. Install:

- Left balancer assembly



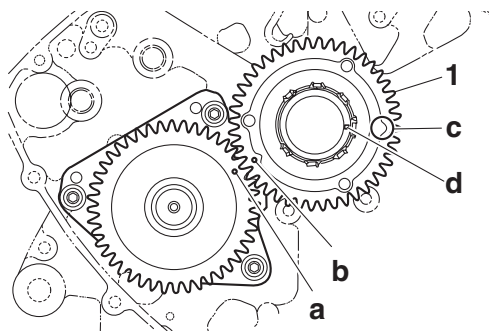
Left balancer assembly bolt
12 Nm (1.2 m·kg, 8.7 ft·lb)
LOCTITE®

2. Install:

- Left balancer drive gear “1”

TIP


- Align the punch mark “a” in the left balancer driven gear with the punch mark “b” in the left balancer drive gear.
- Align the projection “c” on the left balancer drive gear with the punch mark “d” on the crankshaft when installing the gear.

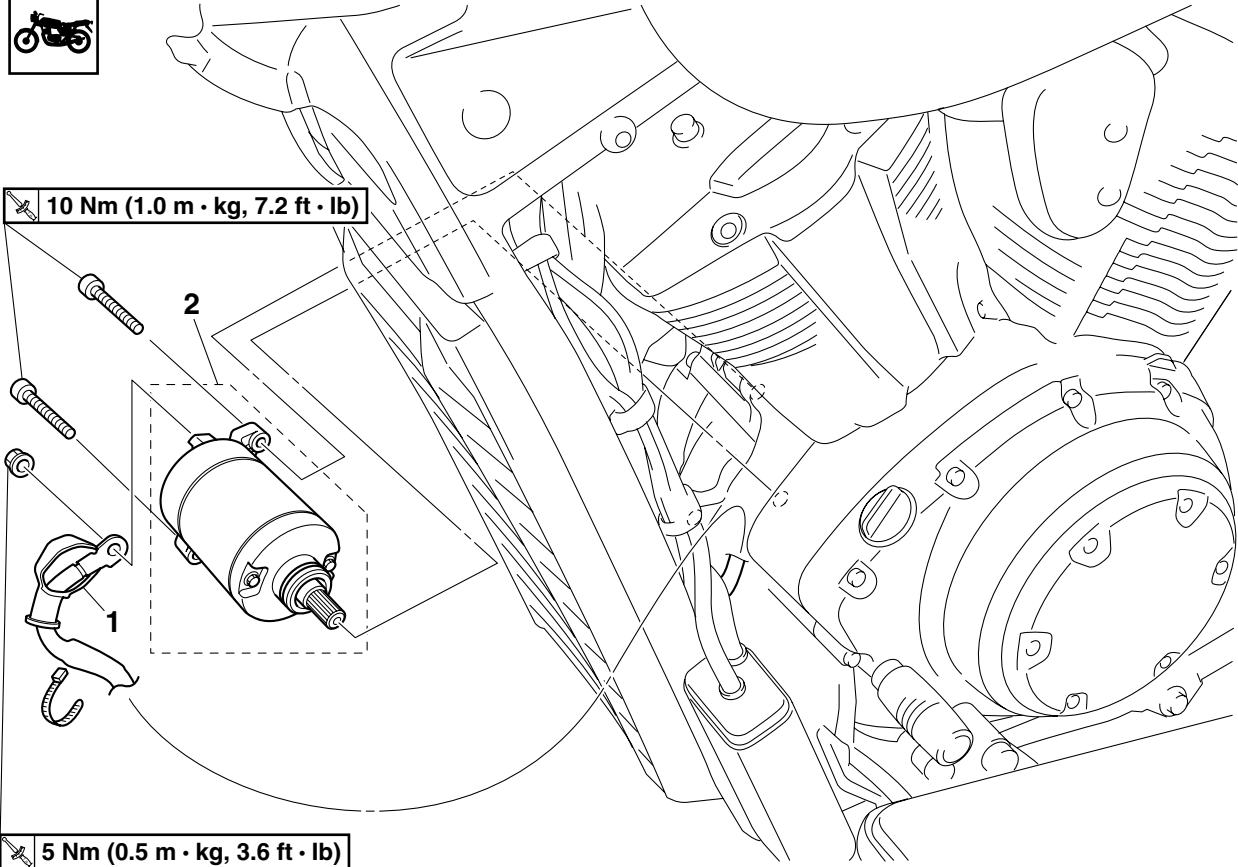


EAS24780

ELECTRIC STARTER

Removing the starter motor





10 Nm (1.0 m · kg, 7.2 ft · lb)

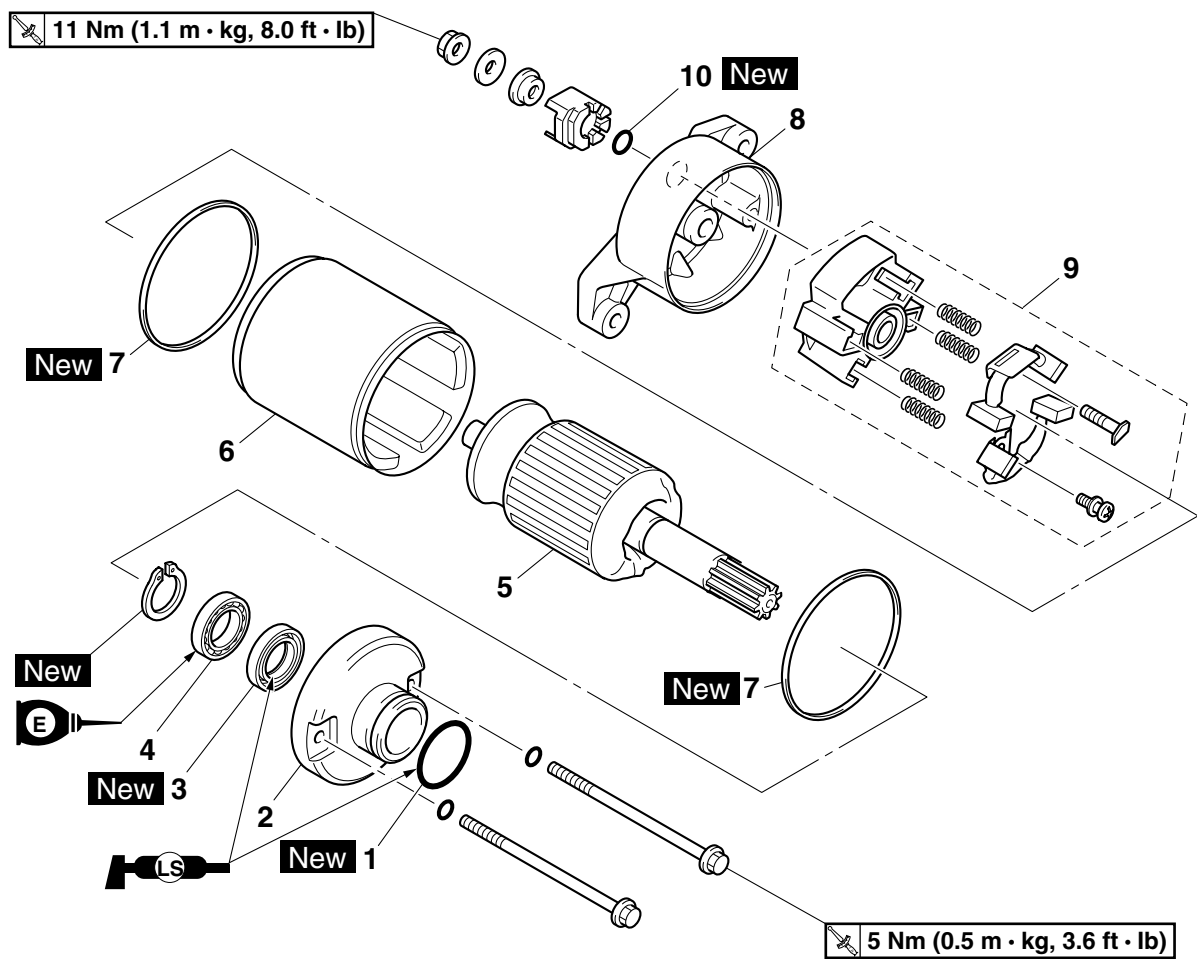
2

1

5 Nm (0.5 m · kg, 3.6 ft · lb)

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	Oil seal	1	
4	Bearing	1	
5	Armature assembly	1	
6	Starter motor yoke	1	
7	Gasket	2	
8	Starter motor rear cover	1	
9	Brush assembly	1	
10	O-ring	1	
			For assembly, reverse the disassembly procedure.

CHECKING THE STARTER MOTOR

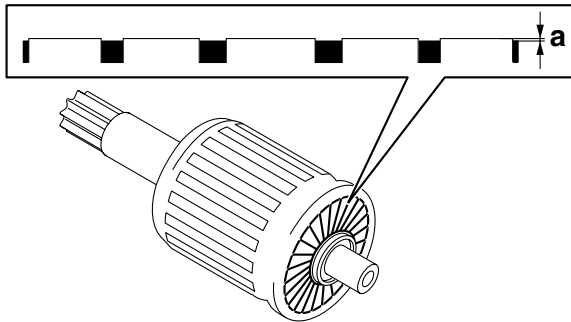
1. Check:
 - Commutator
Dirt → Clean with 600 grit sandpaper.
2. Measure:
 - Mica undercut “a”
Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been ground to fit the commutator.



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 digital circuit tester.

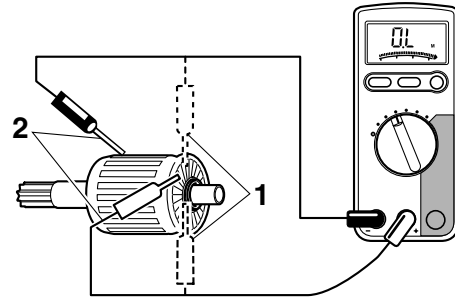


Digital circuit tester
90890-03174
Model 88 Multimeter with ta-
chometer
YU-A1927



Armature coil
Commutator resistance “1”
 Continuity (0.0050–0.0150 Ω at 20 °C (68 °F))
Insulation resistance “2”
 No continuity (Above 1 M Ω at 20 °C (68 °F))

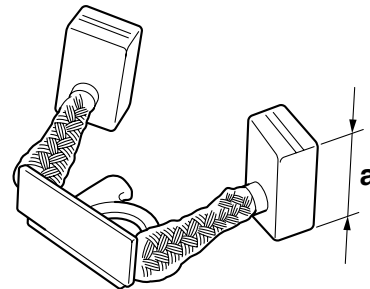
- b. If any resistance is out of specification, replace the starter motor.



4. Measure:
- Brush length “a”
Out of specification → Replace the brush assembly.



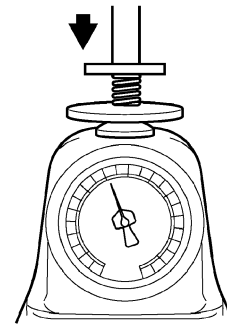
Limit
6.50 mm (0.26 in)



5. Measure:
- Brush spring force
Out of specification → Replace the brush assembly.



Brush spring force
6.025–6.515 N (614–664 gf,
21.69–23.45 oz)



6. Check:
 - Gear teeth
Damage/wear → Replace the starter motor.
7. Check:
 - Bearing
Damage/wear → Replace the starter motor.

EAS24800

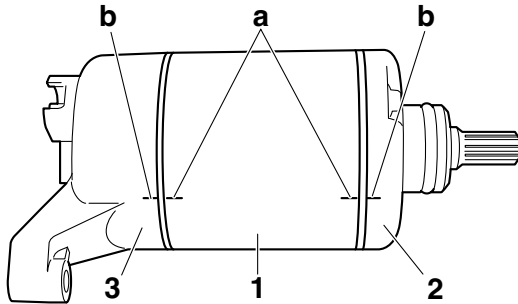
ASSEMBLING THE STARTER MOTOR

1. Install:

- Starter motor yoke "1"
- Starter motor front cover "2"
- Starter motor rear cover "3"

TIP

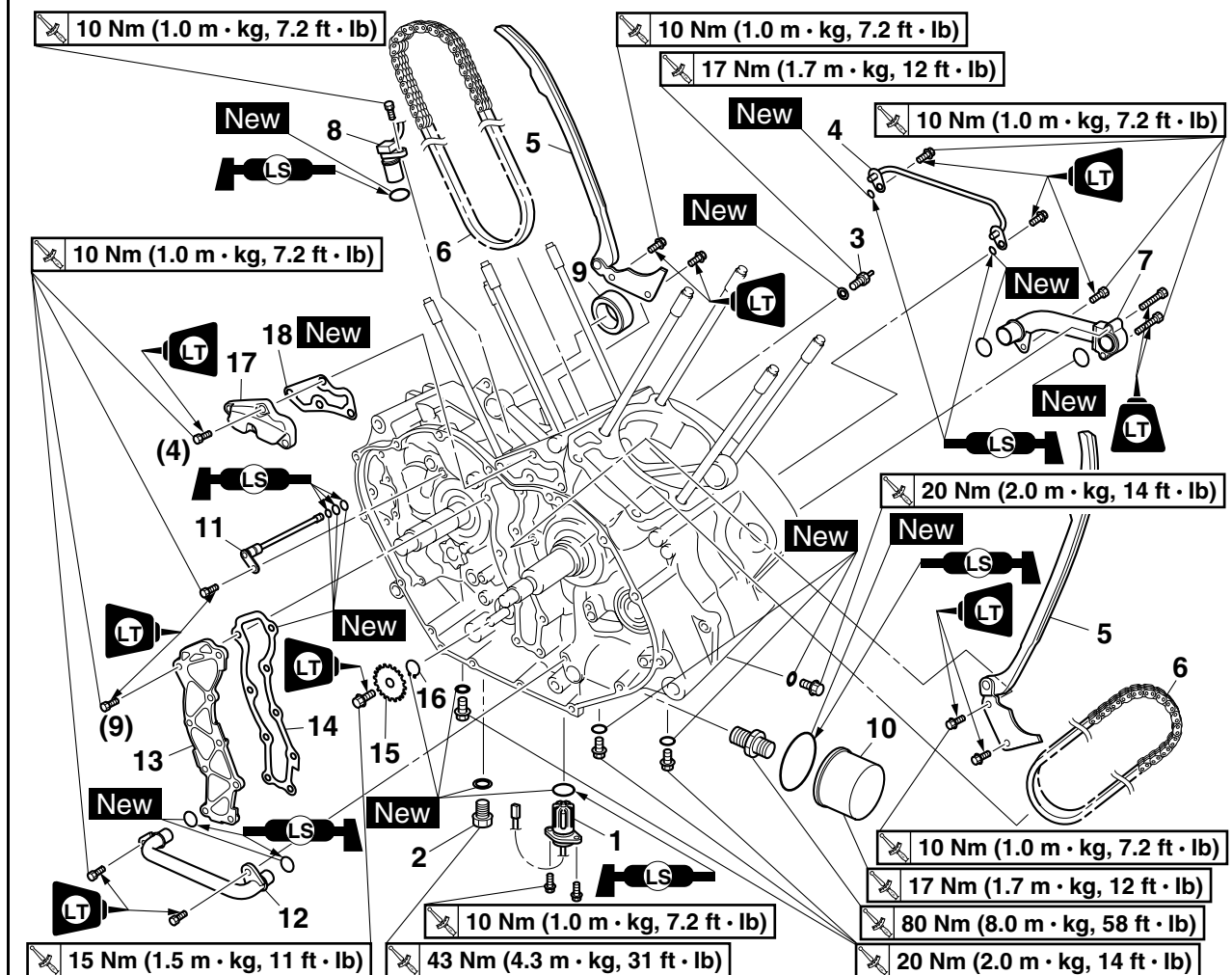
Align the match marks "a" on the starter motor yoke with the match marks "b" on the starter motor front and rear covers.



EAS25540

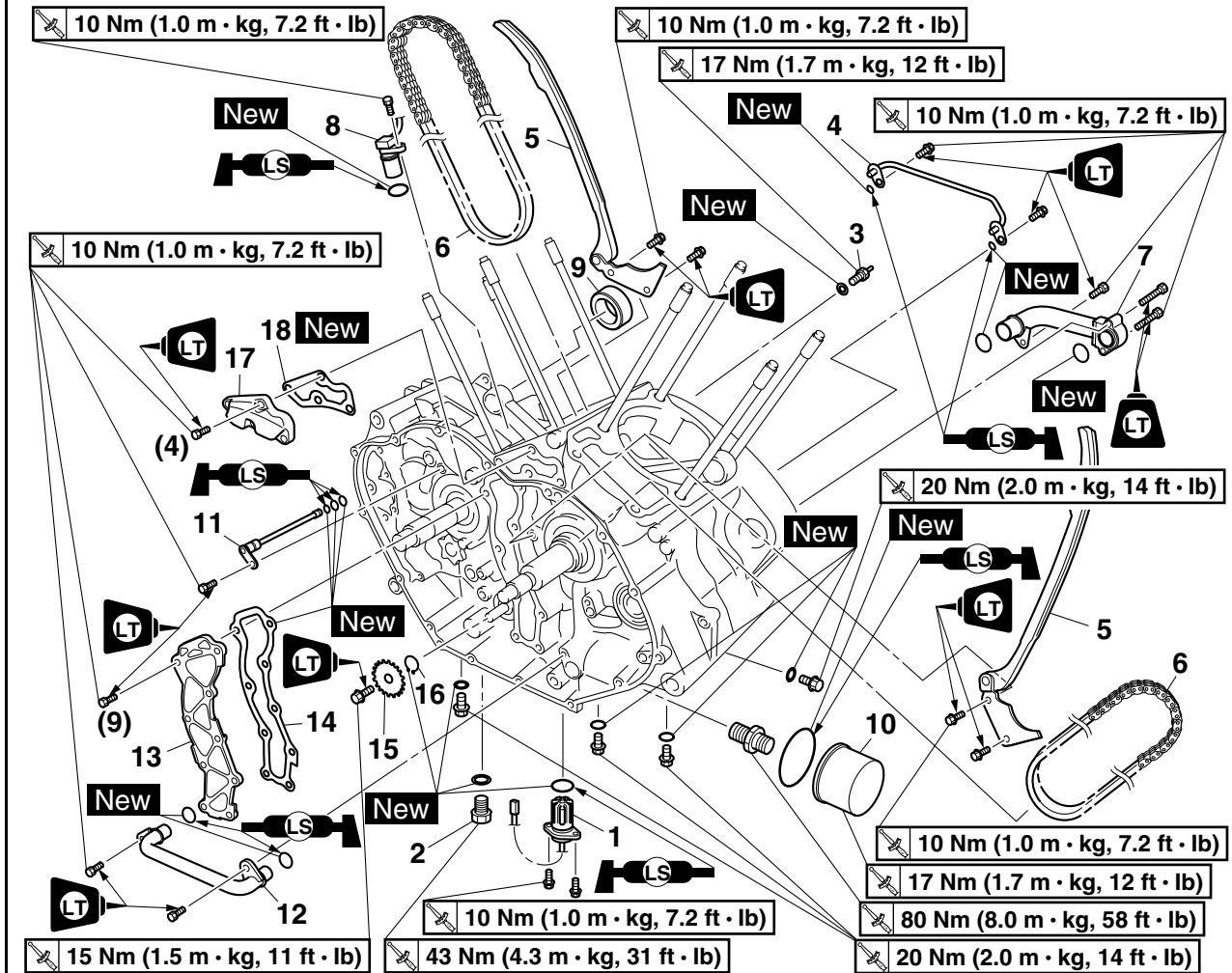
CRANKCASE

Removing the oil delivery pipes and timing chains



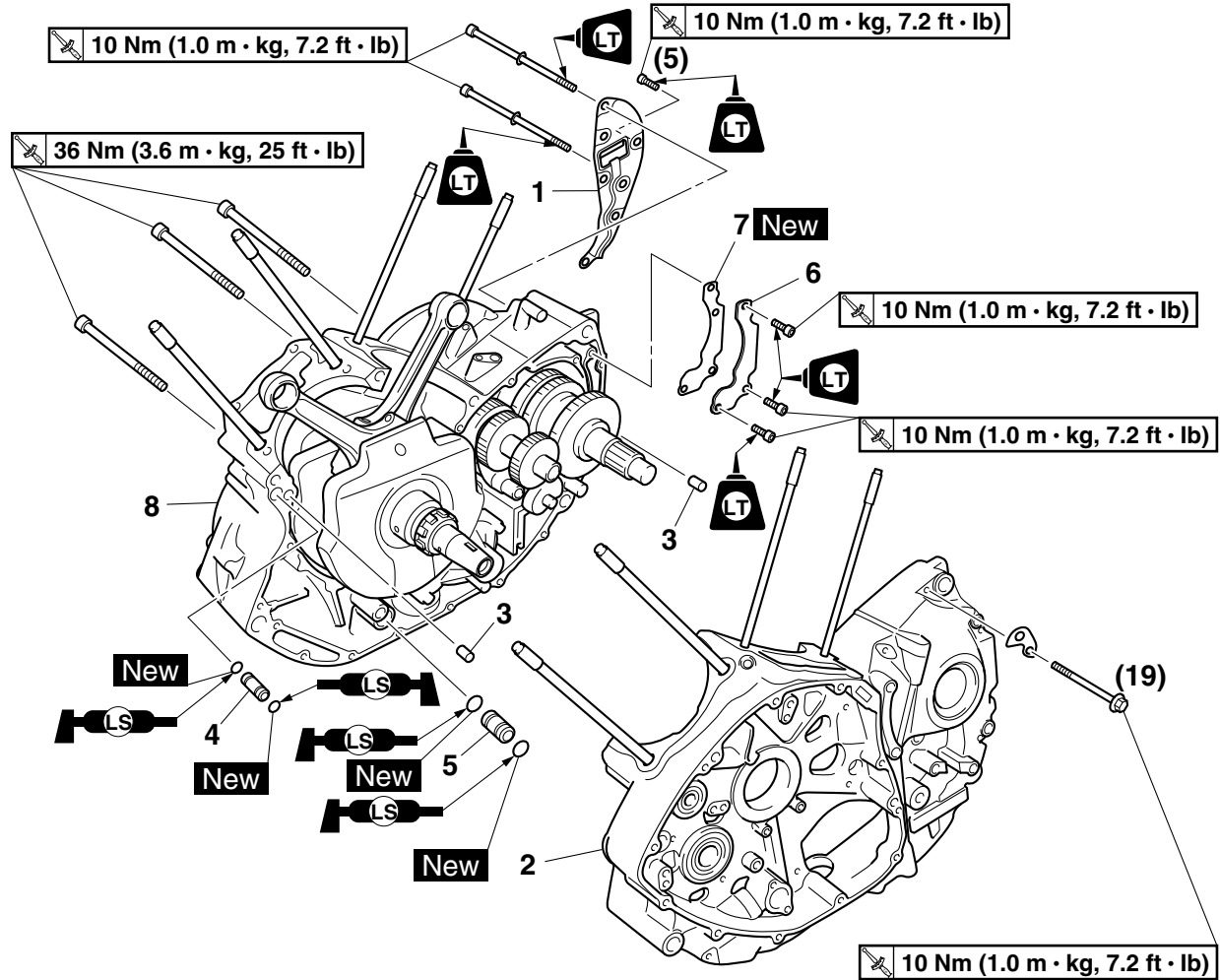
Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
	Pistons		Refer to "CYLINDERS AND PISTONS" on page 5-42.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-65.
	Balancer assemblies		Refer to "BALANCER GEARS" on page 5-67.
1	Oil level switch	1	
2	Engine oil drain bolt	1	
3	Neutral switch	1	
4	Oil delivery pipe 1	1	
5	Timing chain guide	2	
6	Timing chain	2	
7	Coolant delivery pipe	1	
8	Speed sensor	1	
9	Spacer	1	
10	Oil filter cartridge	1	
11	Oil delivery pipe 2	1	

Removing the oil delivery pipes and timing chains



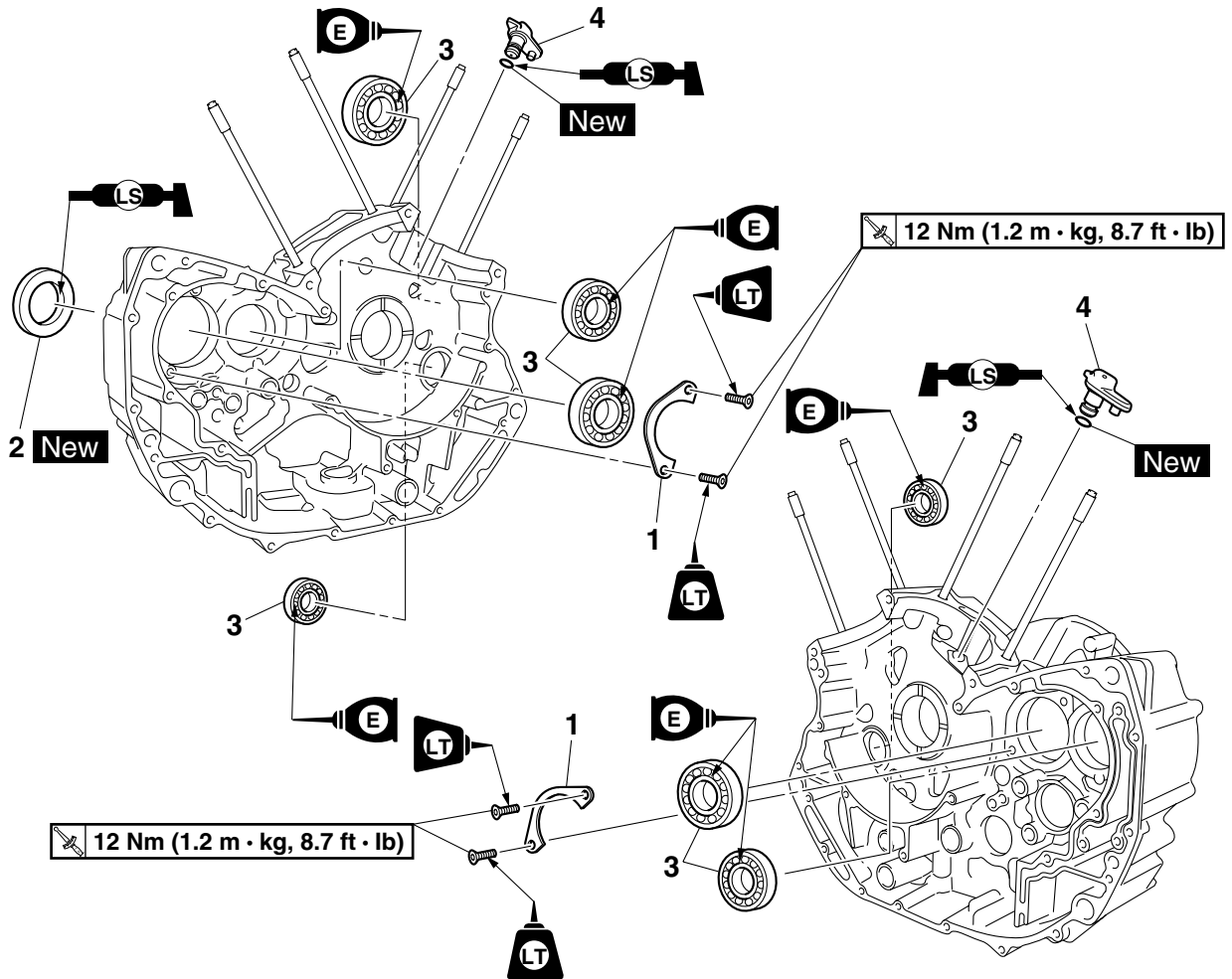
Order	Job/Parts to remove	Q'ty	Remarks
12	Oil delivery pipe 3	1	
13	Coolant delivery cover 1	1	
14	Coolant delivery cover 1 gasket	1	
15	Oil/water pump driven sprocket	1	
16	Circlip	1	
17	Coolant delivery cover 2	1	
18	Coolant delivery cover 2 gasket	1	
			For installation, reverse the removal procedure.

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	1	
5	Joint pipe 2	1	
6	Oil baffle plate 2	1	
7	Gasket	1	
8	Right crankcase	1	
			For installation, reverse the separating procedure.

Removing the oil seal and bearings



Order	Job/Parts to remove	Q'ty	Remarks
	Oil/water pump assembly		Refer to "OIL PUMP" on page 5-80.
	Crankshaft		Refer to "CRANKSHAFT" on page 5-83.
	Transmission		Refer to "TRANSMISSION" on page 5-88.
1	Bearing retainer	2	
2	Oil seal	1	
3	Bearing	7	
4	Oil nozzle	2	
			For installation, reverse the removal procedure.

EAS25560

DISASSEMBLING THE CRANKCASE

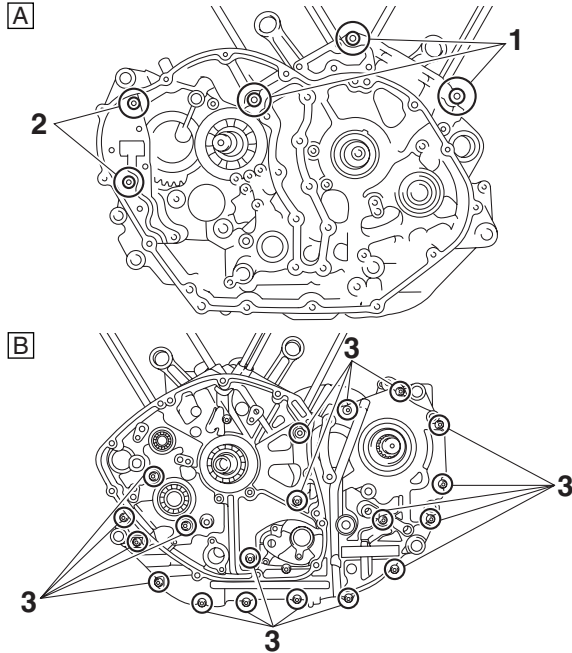
1. Remove:

- 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.

EAS25600

CHECKING THE OIL DELIVERY PIPES AND COOLANT DELIVERY PIPE

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.
2. Check:
 - Coolant delivery pipe
Cracks/damage/wear → Replace.

EAS25620

CHECKING THE TIMING CHAINS

1. Check:
 - Timing chains
Damage/stiffness → Replace the timing chain and camshaft sprocket as a set.

EAS3D81030

CHECKING THE OIL/WATER PUMP DRIVEN SPROCKET

1. Check:
 - Oil/water pump driven sprocket
Cracks/damage/wear → Replace the oil/water pump driven sprocket and the oil/water pump drive chain as a set.

EAS3D81036

CHECKING THE OIL NOZZLES

The following procedure applies to all of the oil nozzles.

1. Check:
 - Oil nozzle
Damage/wear → Replace the oil nozzle.
 - Oil passage
Obstruction → Blow out with compressed air.

EAS3D81031

INSTALLING THE BEARING RETAINERS

1. Install:

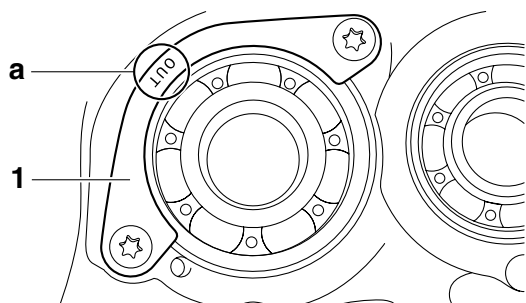
- Bearing retainers “1”

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.



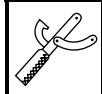
Bearing retainer bolt
12 Nm (1.2 m·kg, 8.7 ft·lb)
LOCTITE®



EAS25700

ASSEMBLING THE CRANKCASE

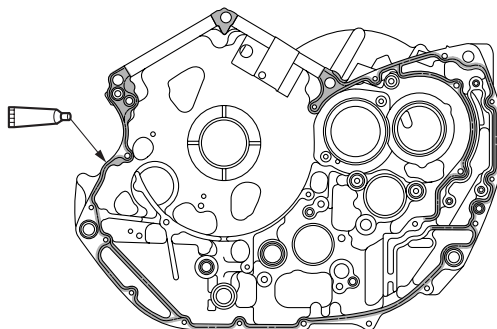
1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
2. Apply:
 - Sealant (onto the crankcase mating surfaces)



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)

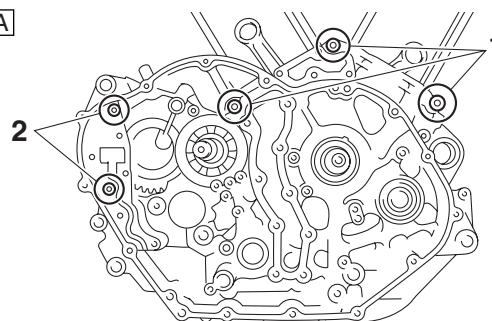


Crankcase bolt (M10)
36 Nm (3.6 m·kg, 25 ft·lb)
Crankcase bolt (M6)
10 Nm (1.0 m·kg, 7.2 ft·lb)

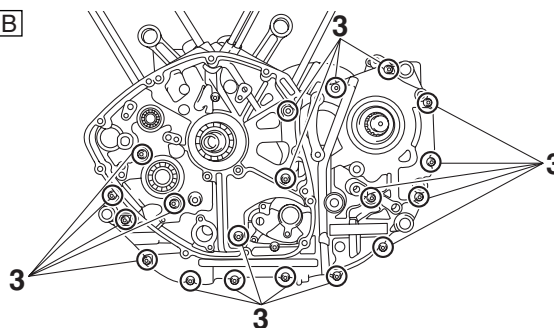
TIP

- Apply locking agent (LOCTITE®) to the threads of the bolts “2”.
 - Tighten each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.
- M10 × 110 mm bolts: “1”
 - M6 × 120 mm bolts: “2”
 - M6 × 80 mm bolts: “3”

A



B



- A. Right crankcase
- B. Left crankcase

5. Apply:

- Engine oil (onto the crankshaft pin bearings and oil delivery holes)

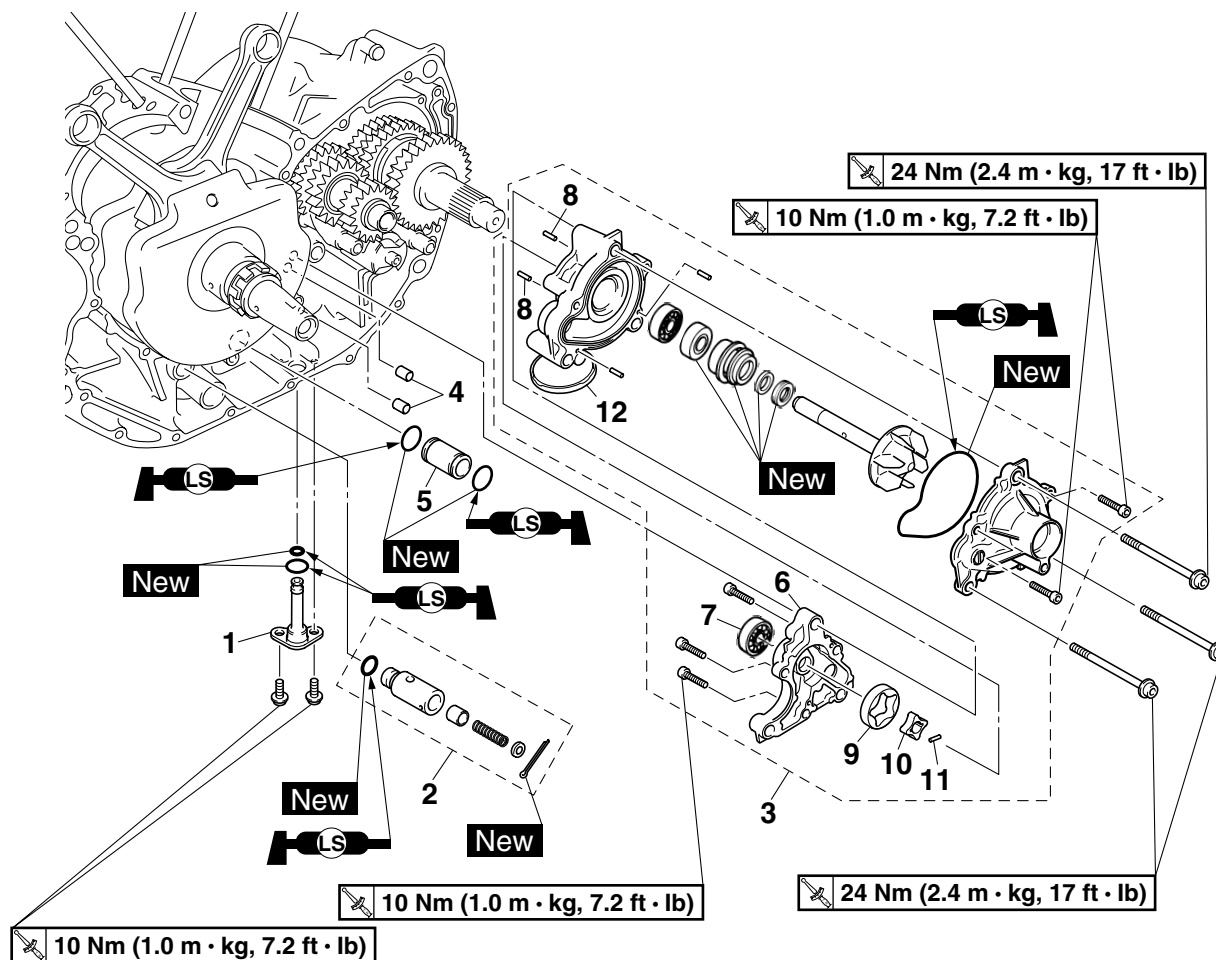
6. Check:

- Crankshaft and transmission operation
Rough movement → Repair.

EAS24910

OIL PUMP

Removing the oil/water pump assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-74.
1	Drain cock	1	
2	Relief valve assembly	1	
3	Oil/water pump assembly	1	
4	Dowel pin	2	
5	Joint pipe	1	
6	Oil pump housing	1	
7	Bearing	1	
8	Pin	2	
9	Oil pump outer rotor	1	
10	Oil pump inner rotor	1	
11	Pin	1	
12	Water pump housing	1	
			For installation, reverse the removal procedure.

EAS24960

CHECKING THE OIL PUMP

1. Check:

- Oil pump housing
- Water pump housing
- Cracks/damage/wear → Replace the defective part(s).

2. Measure:

- Inner-rotor-to-outer-rotor-tip clearance "a"
- Outer-rotor-to-oil-pump-housing clearance "b"
- Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance "c"
- Out of specification → Replace the oil/water 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

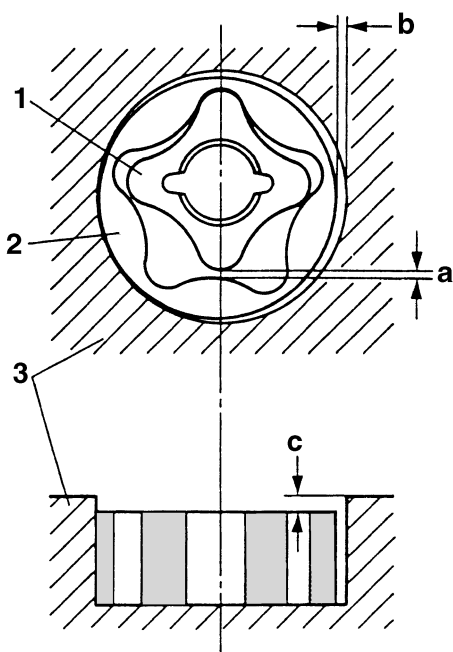
0.26 mm (0.0102 in)

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)

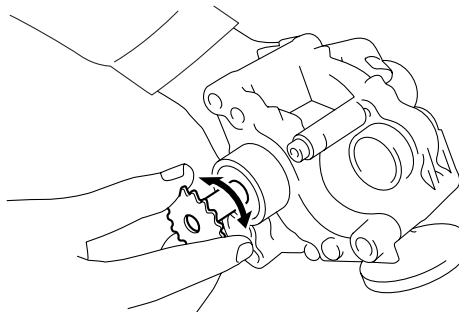


1. Inner rotor
2. Outer rotor

3. Oil/water pump housing

3. Check:

- Oil pump operation
- Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

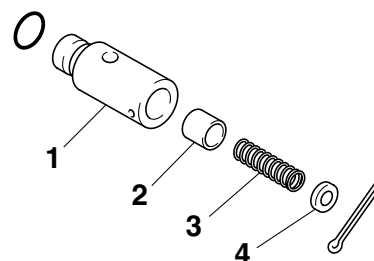


EAS24970

CHECKING THE RELIEF VALVE

1. Check:

- Relief valve body "1"
- Relief valve "2"
- Spring "3"
- Spring retainer "4"
- Damage/wear → Replace the defective part(s).

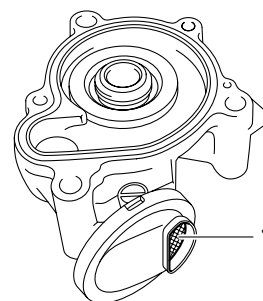


EAS24990

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)

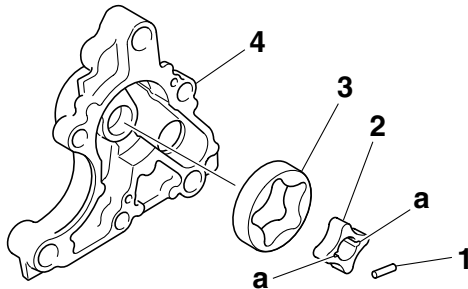
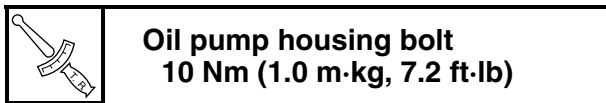


2. Install:

- Pin “1”
- Oil pump inner rotor “2”
- Oil pump outer rotor “3”
- Pins
- 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.



3. Check:

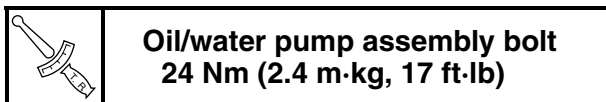
- Oil pump operation
Refer to “CHECKING THE OIL PUMP” on page 5-81.

EAS25020

INSTALLING THE OIL/WATER PUMP ASSEMBLY

1. Install:

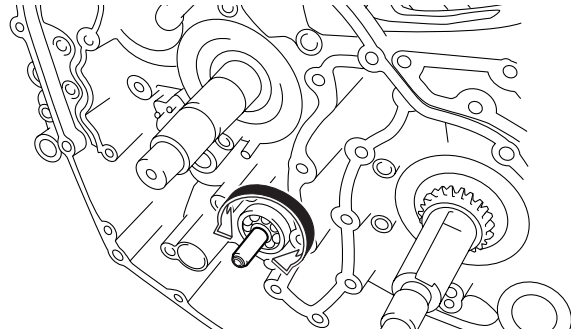
- Oil/water pump assembly



ECA3D81020

NOTICE

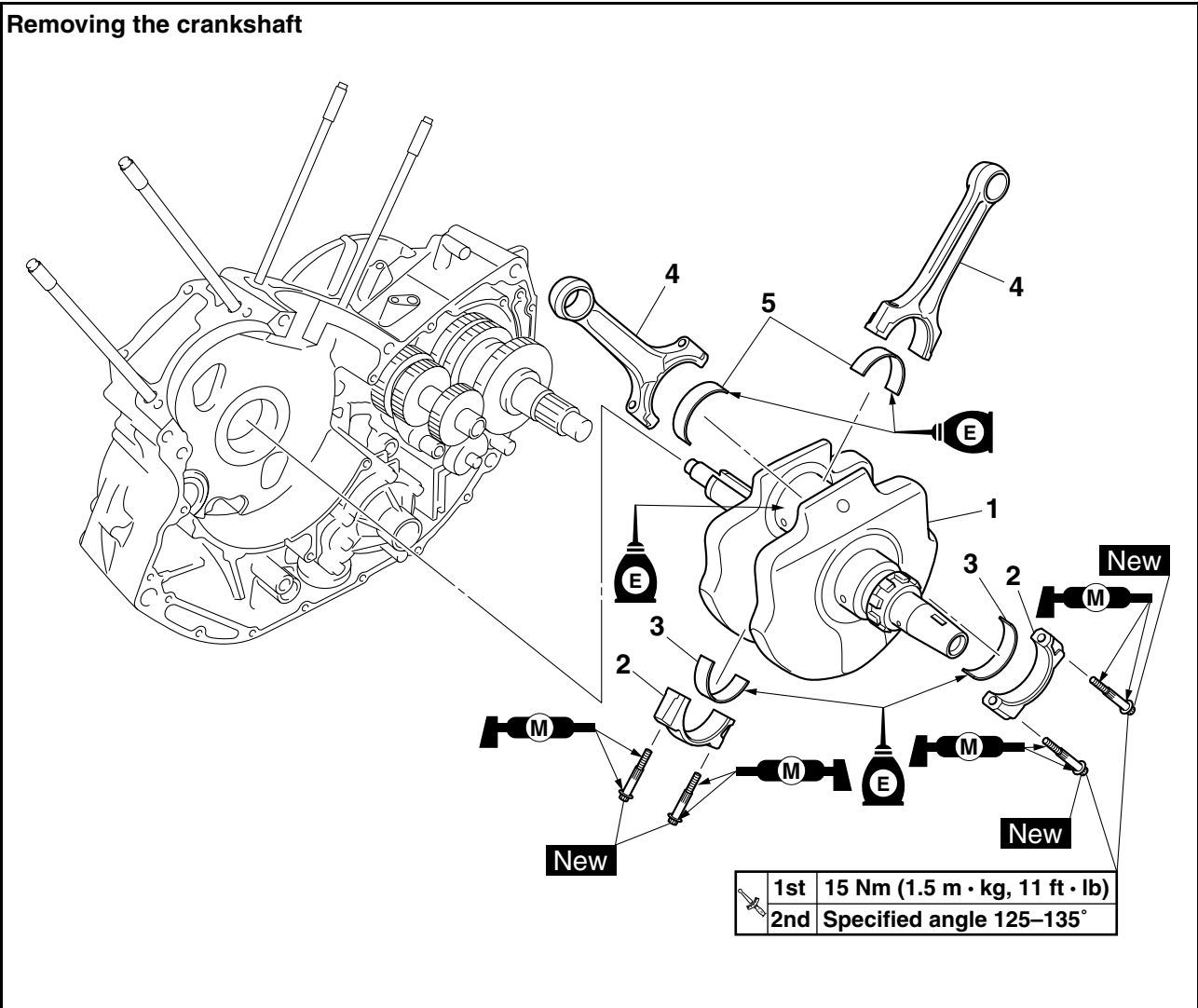
After tightening the bolts, make sure the oil/water pump assembly turns smoothly.



EAS25960

CRANKSHAFT

Removing the crankshaft



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-74.
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

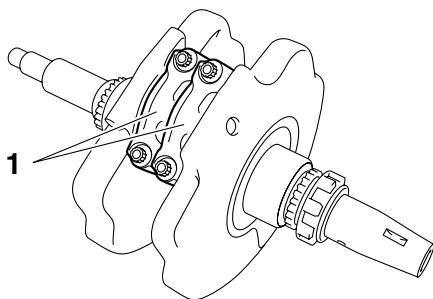
REMOVING THE CONNECTING RODS

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

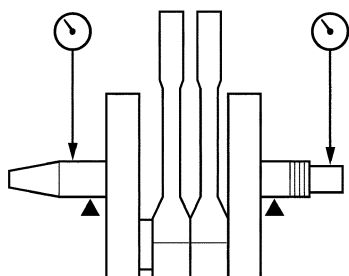
CHECKING THE CRANKSHAFT AND CONNECTING RODS

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
0.030–0.054 mm (0.0012–0.0021 in)

The following procedure applies to all of the connecting rods.

ECA13930

NOTICE

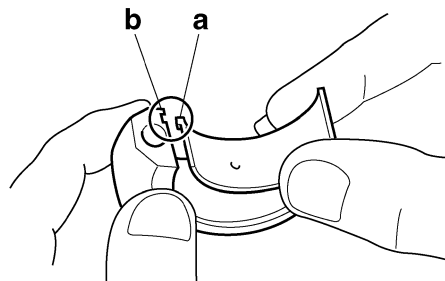
Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft-pin-to-big-end-bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.



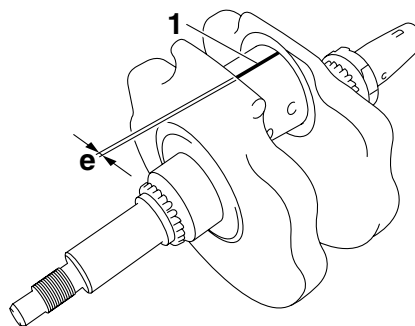
- a. Clean the big end bearings, crankshaft pin, and the inside of the connecting rod halves.
- b. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

TIP

Align the projections “a” on the big end bearings with the notches “b” in the connecting rod and connecting rod cap.



- c. Put a piece of Plastigauge® “1” on the crankshaft pin.

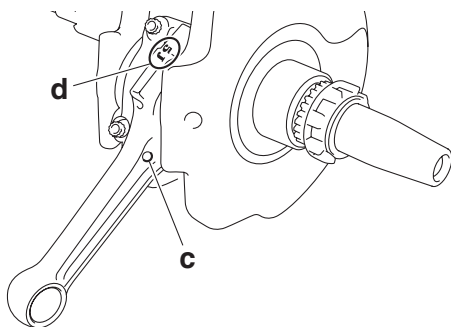


- d. Assemble the connecting rod halves.

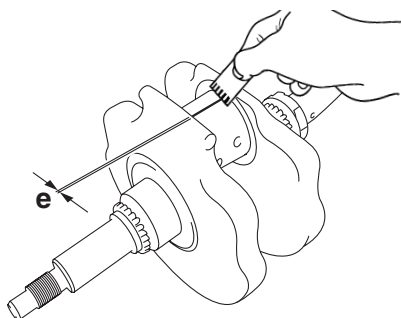
TIP

- 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 5-86.
- Remove the connecting rod and big end bearings.
Refer to “REMOVING THE CONNECTING RODS” on page 5-84.
- 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.

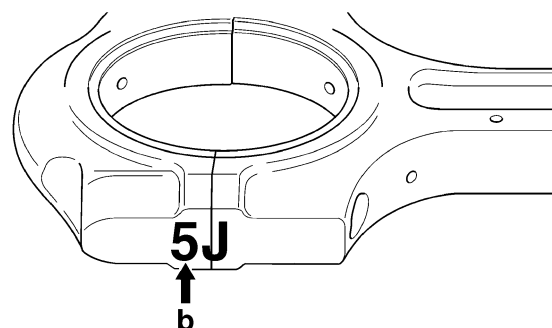
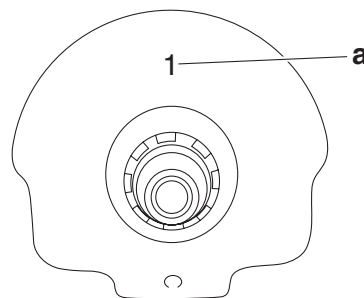
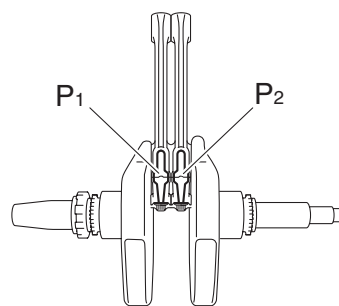


4. Select:

- Big end bearings (P_1 – P_2)

TIP

- The numbers “a” stamped into the crankshaft web and the numbers “b” 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 and the crankshaft web P numbers are 5 and 1 respectively, then the bearing size for P_1 is:

$$\begin{aligned} &P_1 \text{ (connecting rod)} - P \text{ (crankshaft)} \\ &= \\ &5 - 1 = 4 \text{ (green)} \end{aligned}$$



Bearing color code

**1:Blue 2:Black 3:Brown 4:Green
5:Yellow**

5. Measure:

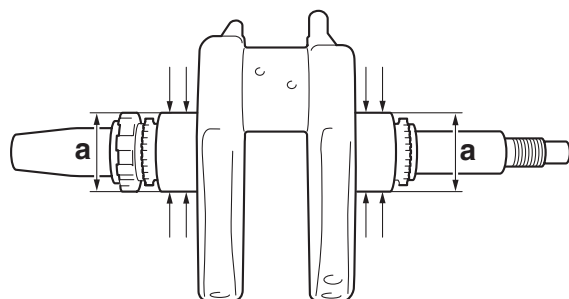
- Crankshaft journal diameter “a”
Out of specification → Replace the crankshaft.

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”

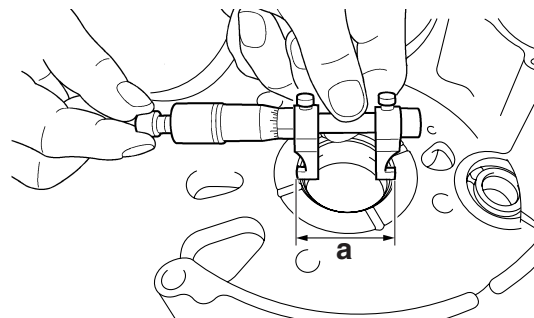
Out of specification → Replace the crankcase assembly.

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
0.030–0.060 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
- Connecting rod bearing inner surface
(with the recommended lubricant)



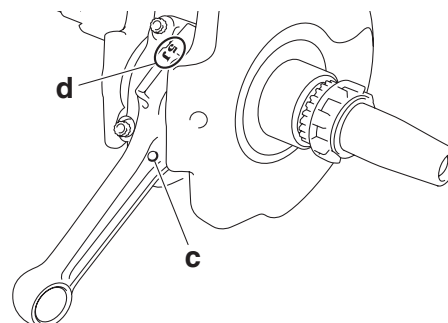
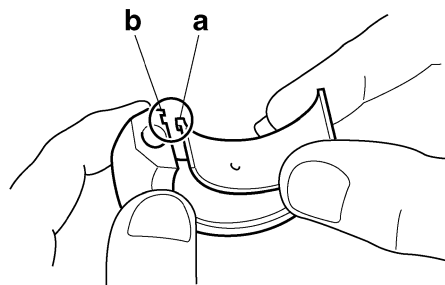
Recommended lubricant
Engine oil

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 nuts

EWA3D81005

WARNING

- Replace the connecting rod bolts and nuts with new ones.
- Clean the connecting rod bolts.

TIP

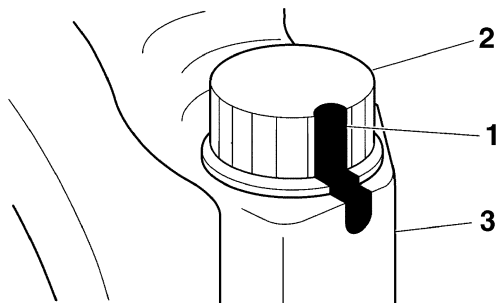
Tighten the connecting rod bolts using the following procedure.

- a. Tighten the connecting rod bolts to specification with a torque wrench.



Connecting rod bolt (1st)
15 Nm (1.5 m·kg, 11 ft·lb)

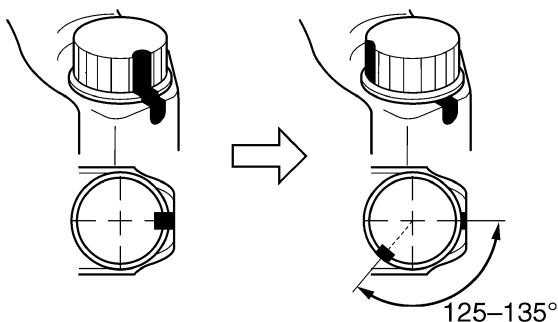
- b. Put a mark "1" on the corner of the connecting rod bolt "2" and the connecting rod cap "3".



- c. Tighten the connecting rod bolts further to reach the specified angle 125–135°.



Connecting rod bolt (final)
Specified angle 125–135°



EWA3D81006

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.

ECA3D81012

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

ECA3D81013

NOTICE

To avoid scratching the crankshaft and to ease the installation procedure, lubricate each bearing with engine oil.

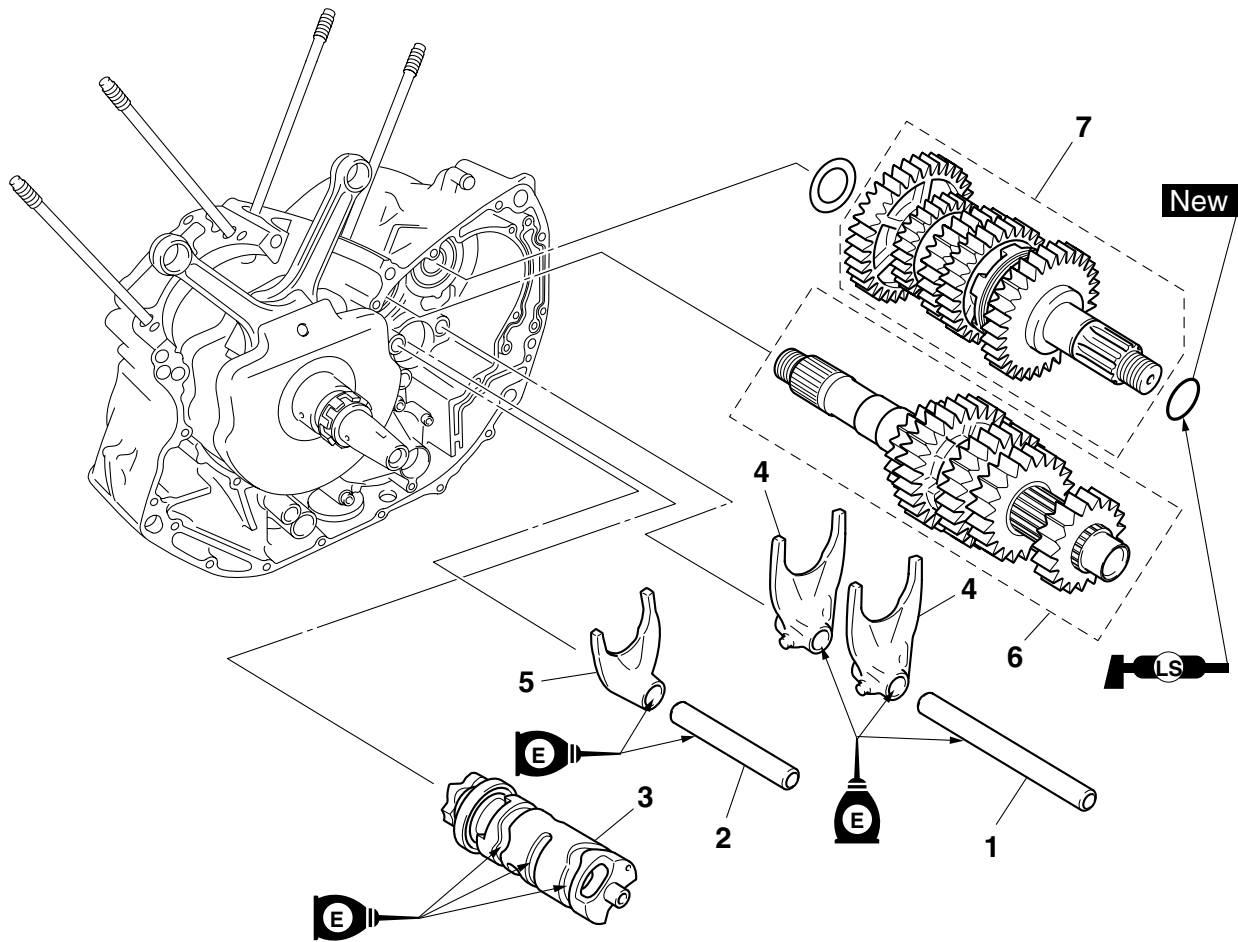
TIP

Align the right connecting rod with the rear cylinder sleeve hole.

EAS26240

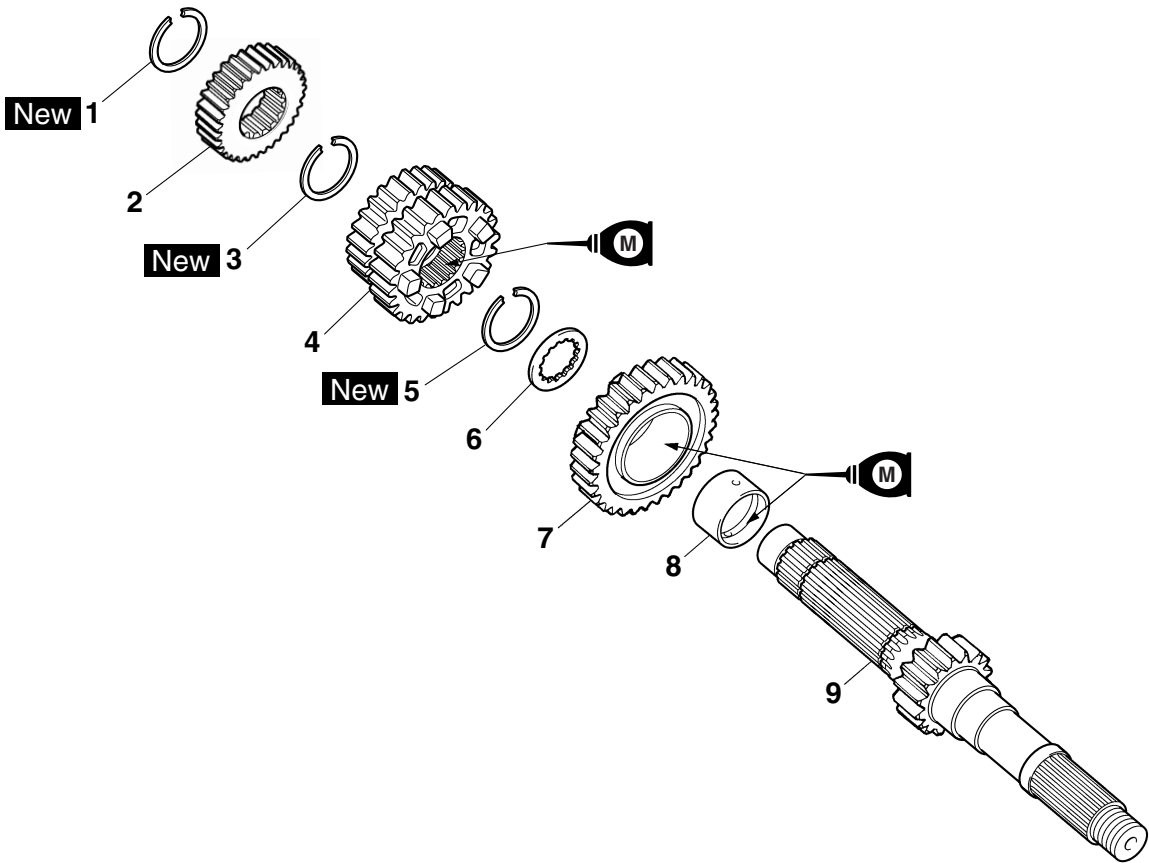
TRANSMISSION

Removing the transmission, shift drum assembly, and shift forks



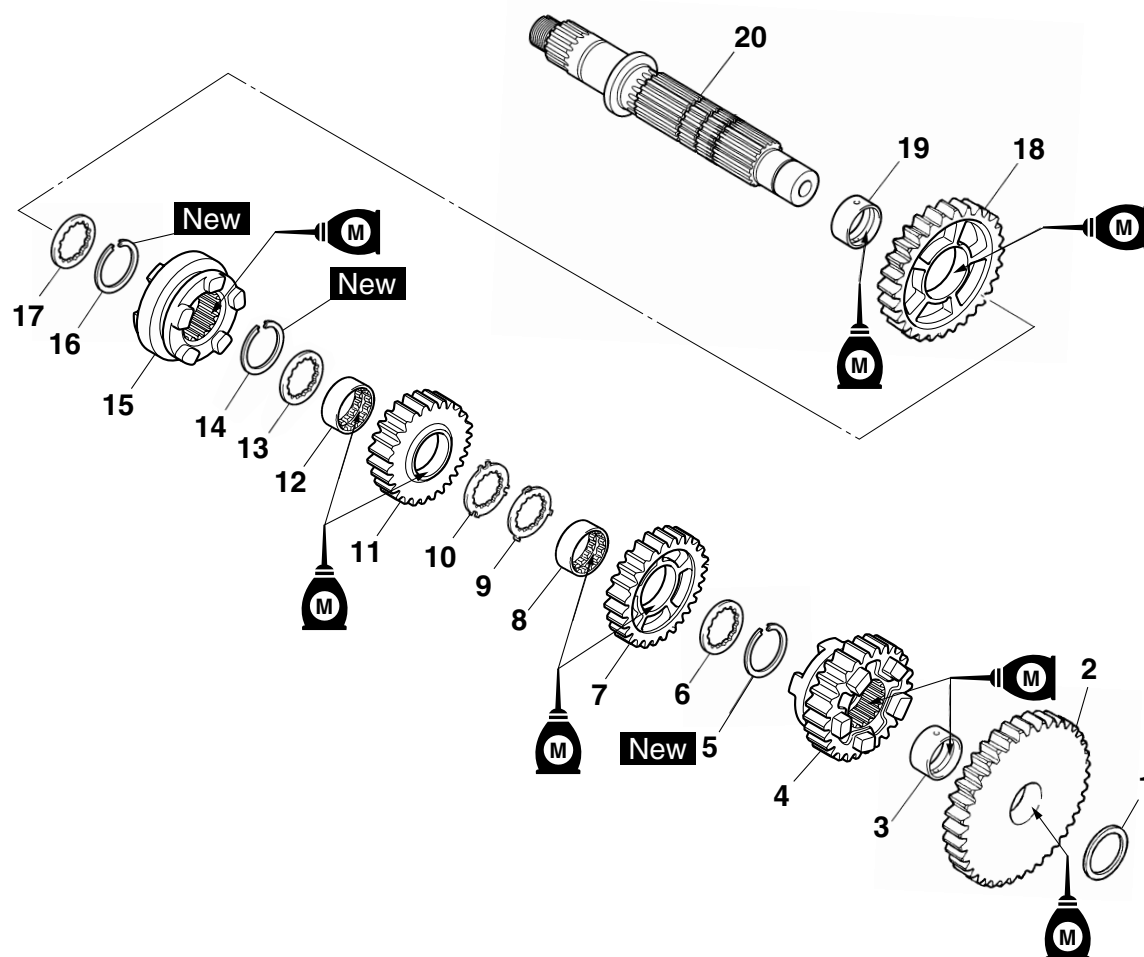
Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-74.
1	Long shift fork guide bar	1	
2	Short shift fork guide bar	1	
3	Shift drum assembly	1	
4	Shift fork 1	2	
5	Shift fork 2	1	
6	Main axle assembly	1	
7	Drive axle assembly	1	
			For installation, reverse the removal procedure.

Disassembling the main axle assembly



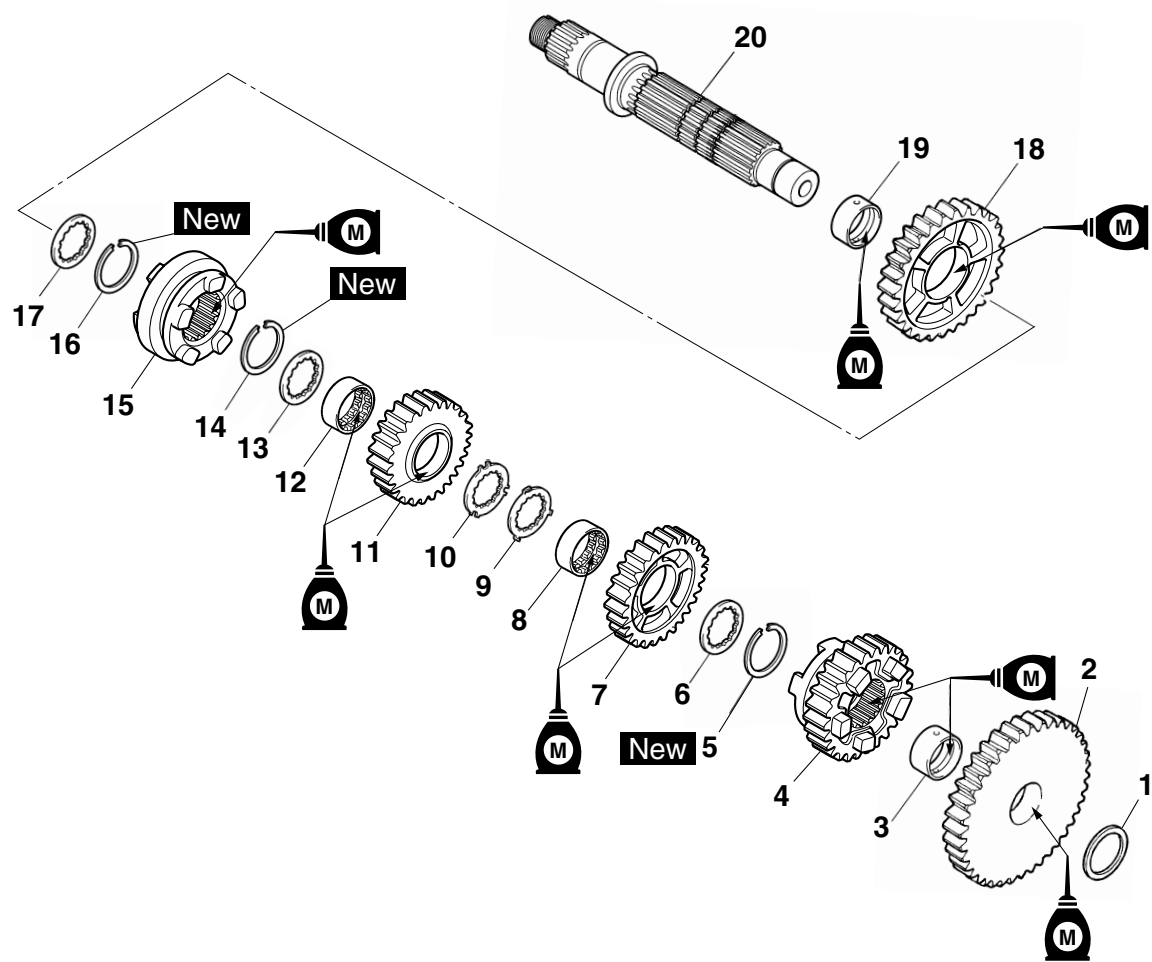
Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	2nd pinion gear	1	
3	Circlip	1	
4	3rd/4th pinion gear	1	
5	Circlip	1	
6	Toothed washer	1	
7	5th pinion gear	1	
8	Collar	1	
9	Main axle/1st pinion gear	1	
			For assembly, reverse the disassembly procedure.

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	4th wheel gear	1	
8	Toothed spacer	1	
9	Toothed lock washer	1	
10	Toothed lock washer retainer	1	
11	3rd wheel gear	1	
12	Toothed spacer	1	
13	Toothed washer	1	
14	Circlip	1	
15	Dog clutch	1	
16	Circlip	1	
17	Toothed washer	1	

Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
18	2nd wheel gear	1	
19	Collar	1	
20	Drive axle	1	
			For assembly, reverse the disassembly procedure.

EAS26260

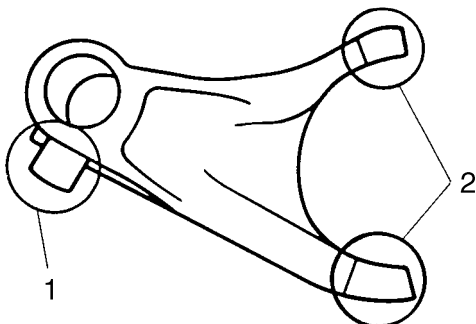
CHECKING THE SHIFT FORKS

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

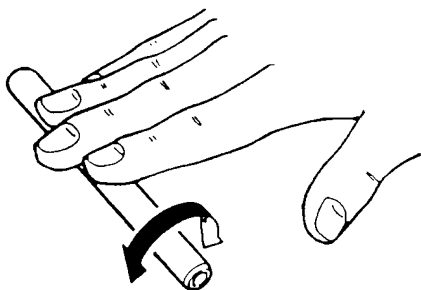
Roll the shift fork guide bar on a flat surface.

Bends → Replace.

EWA12840

WARNING

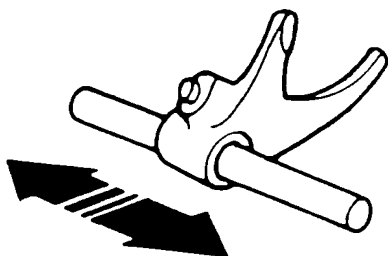
Do not attempt to straighten a bent shift fork guide bar.



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.

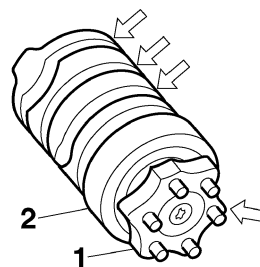


EAS26270

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

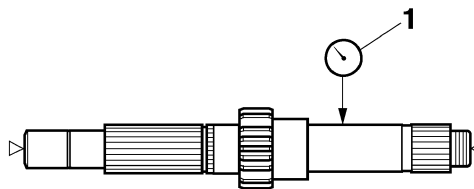
CHECKING THE TRANSMISSION

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)**

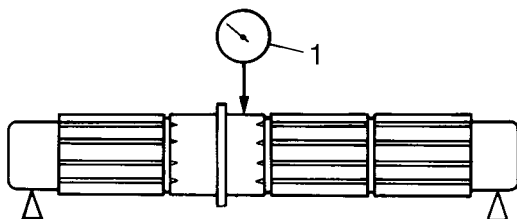


2. Measure:

- Drive axle runout (with a centering device and dial gauge "1")
Out of specification → Replace the drive axle.

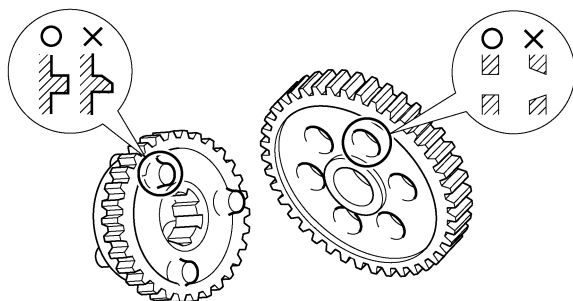


**Drive axle runout limit
0.08 mm (0.0032 in)**



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).

EAS3D81032

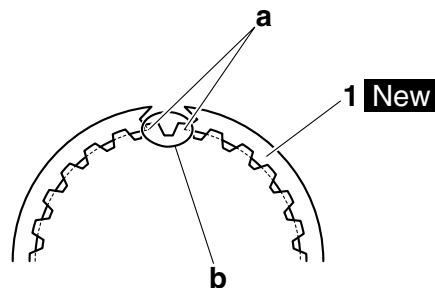
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

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.

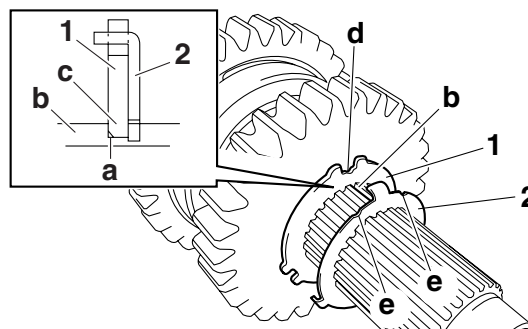


2. Install:

- Toothed lock washer retainer "1"
- Toothed lock washer "2"

TIP

- With the toothed lock washer retainer "1" in the groove "a" in the drive axle, align the projection "c" on the retainer with an axle spline "b", and then install the toothed lock washer "2".
- Be sure to align the projection on the toothed lock washer that is between the alignment marks "e" with the alignment mark "d" on the retainer.



EAS26320

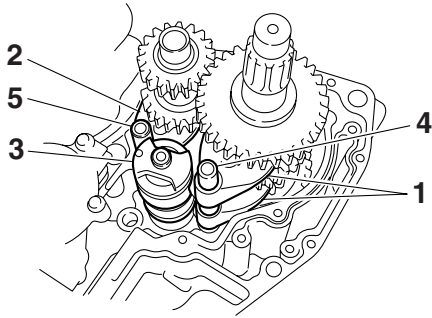
INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

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.

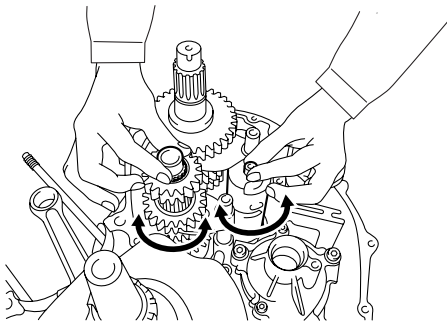


2. Check:

- Transmission
Rough movement → Repair.

TIP

- Apply engine oil to each gear and bearing thoroughly.
- Before assembling the crankcase, make sure that the transmission is in neutral and that the gears turn freely.



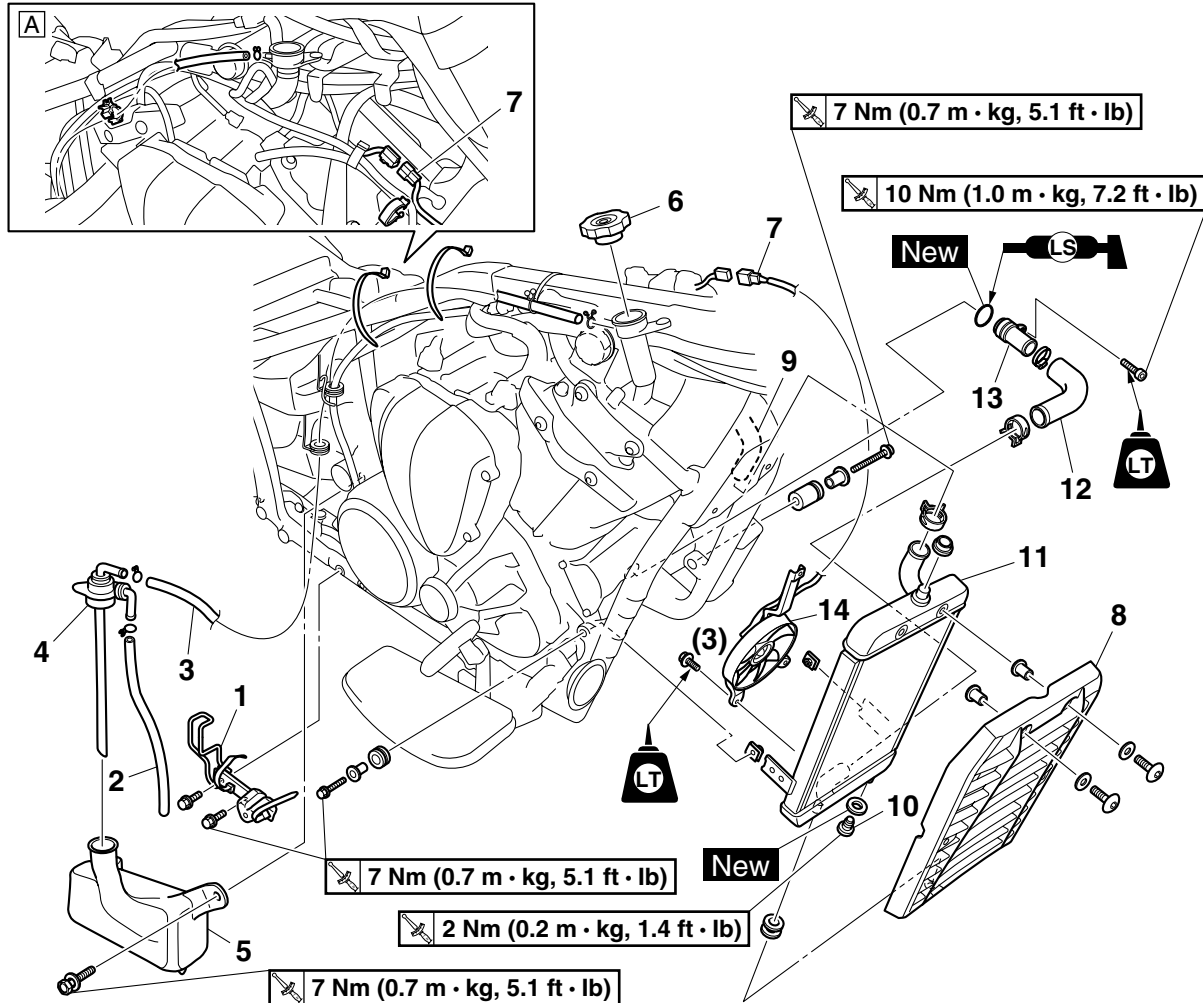
COOLING SYSTEM

RADIATOR	6-1
CHECKING THE RADIATOR.....	6-3
INSTALLING THE RADIATOR.....	6-3
 THERMOSTAT	6-4
CHECKING THE THERMOSTAT.....	6-8
INSTALLING THE THERMOSTAT ASSEMBLY	6-8
 WATER PUMP	6-9
DISASSEMBLING THE WATER PUMP.....	6-11
CHECKING THE WATER PUMP	6-11
ASSEMBLING THE WATER PUMP.....	6-11

EAS26380

RADIATOR

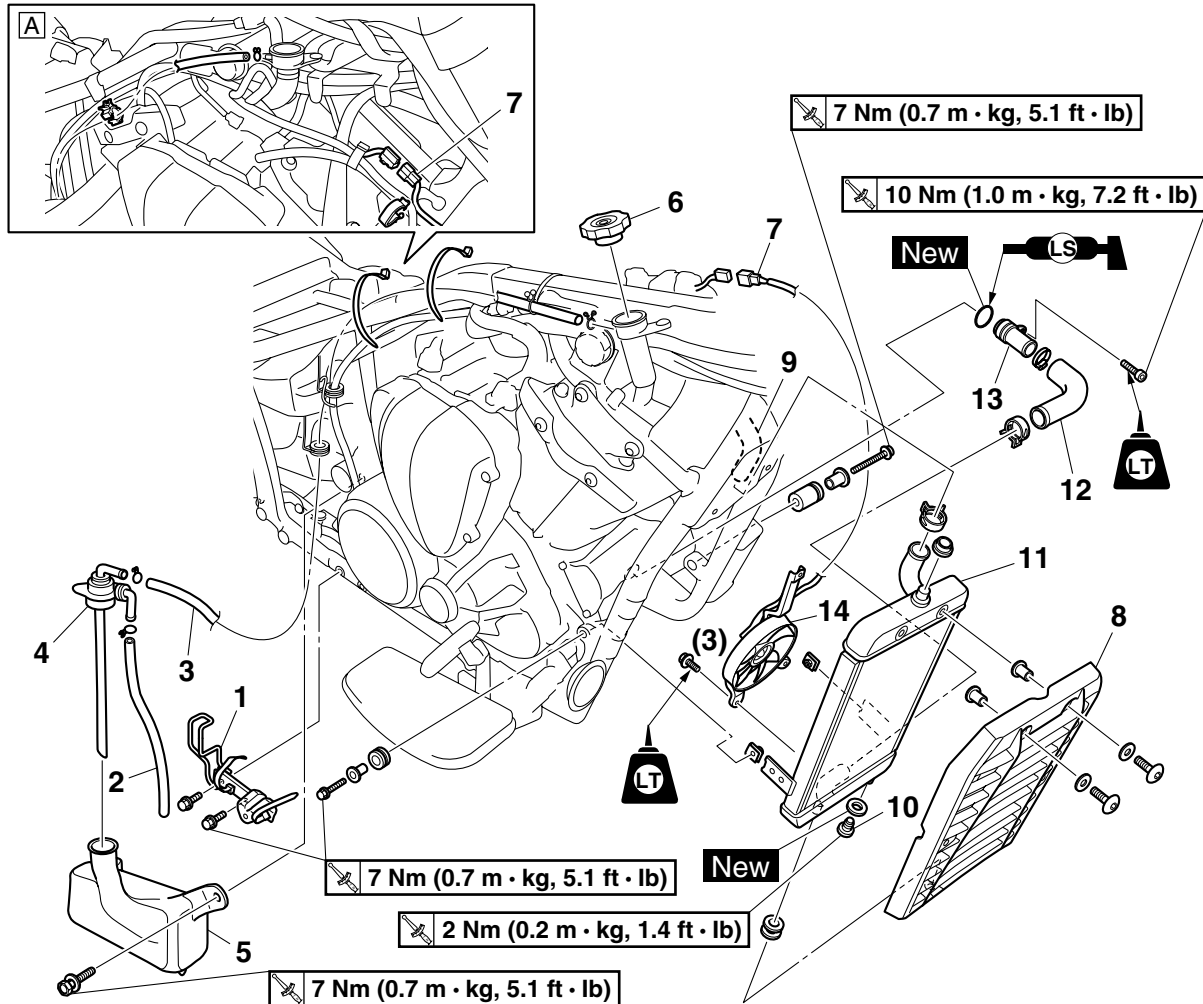
Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Sub-fuel tank cover		For XVS13AA(C)/XVS13CTA(C) Refer to "GENERAL CHASSIS" on page 4-1.
	Seat/Sub-fuel tank cover		For XVS13CA(C) Refer to "GENERAL CHASSIS" on page 4-1.
	Muffler/Coolant reservoir cover		Refer to "ENGINE REMOVAL" on page 5-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Side panels		For XVS13CA(C) Refer to "FUEL TANK" on page 7-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
1	Coolant reservoir cover bracket	1	
2	Coolant reservoir breather hose	1	
3	Coolant reservoir hose	1	
4	Coolant reservoir cap	1	
5	Coolant reservoir	1	
6	Radiator cap	1	

RADIATOR

Removing the radiator



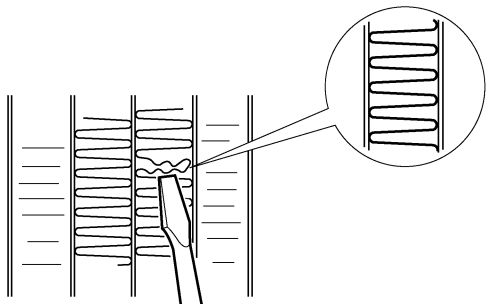
Order	Job/Parts to remove	Q'ty	Remarks
7	Radiator fan motor coupler	1	Disconnect.
8	Radiator cover	1	
9	Radiator inlet hose	1	Disconnect.
10	Coolant drain bolt	1	
11	Radiator	1	
12	Radiator outlet hose	1	
13	Radiator outlet pipe	1	
14	Radiator fan	1	
			For installation, reverse the removal procedure.

A: For XVS13CA(C)

1. Check:

- Radiator fins
Obstruction → Clean.
Apply compressed air to the rear of the radiator.
Damage → Repair or replace.

Straighten any flattened fins with a thin, flathead screwdriver.



2. Check:
 - Radiator hoses
 - Radiator pipeCracks/damage → Replace.
3. Measure:
 - Radiator cap opening pressureBelow the specified pressure → Replace the radiator cap.



Radiator cap opening pressure
93.3–122.7 kPa (0.93–1.23
kgf/cm², 13.5–17.8 psi)

- a. Install the radiator cap tester “1” and radiator cap tester adapter “2” to the radiator cap “3”.

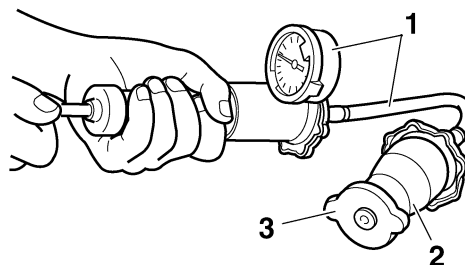


Radiator cap tester
90890-01325

Mityvac cooling system tester kit
YU-24460-A

Radiator cap tester adapter
90890-01352

Pressure tester adapter
YU-33984



- b. Apply the specified pressure for ten seconds and make sure there is no drop in pressure.



4. Check:
- Radiator fan
Damage → Replace.
Malfunction → Check and repair.
Refer to “COOLING SYSTEM” on page 8-39.

EAS26400

1. Install:

- Coolant reservoir cover bracket



Coolant reservoir cover bracket bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)

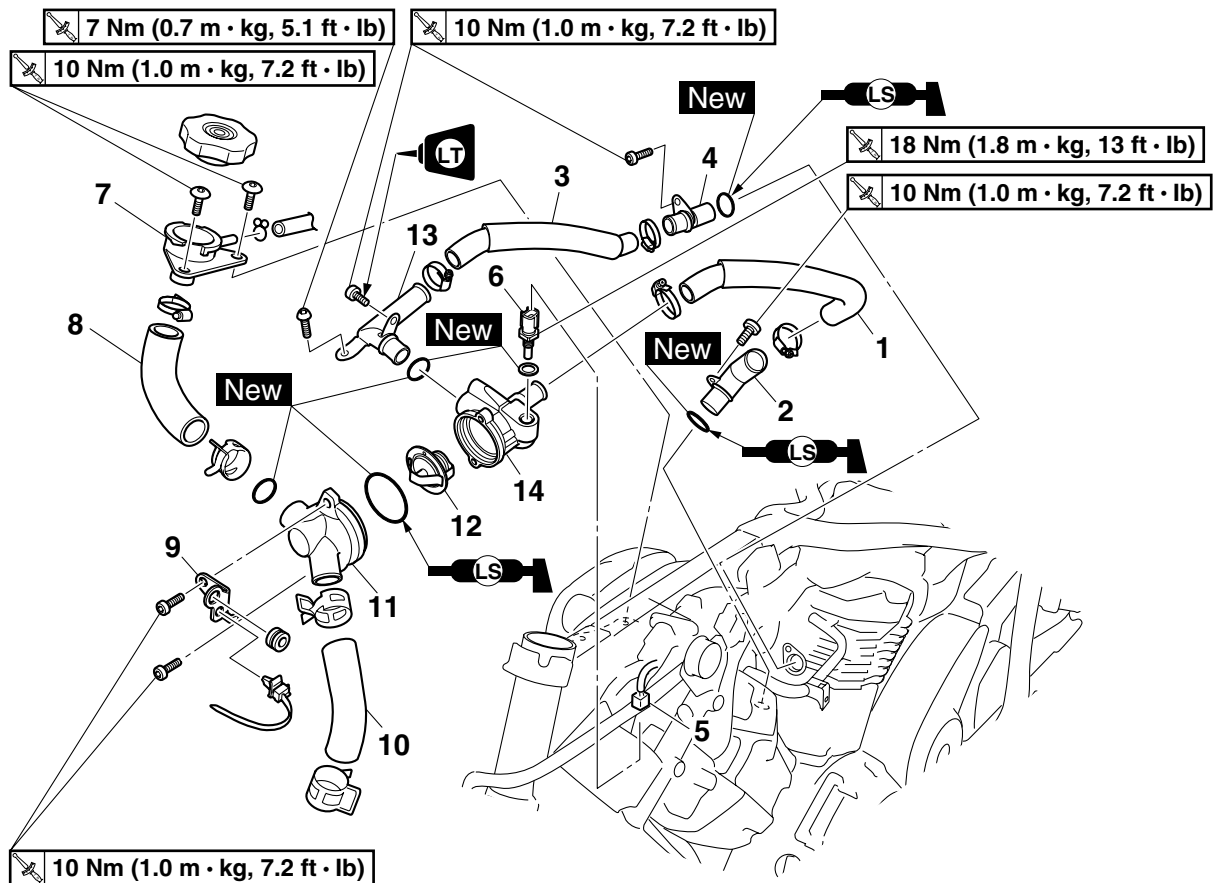
Make sure that the rear brake hose, brake fluid reservoir hose, coolant reservoir breather hose, horn lead, and rear brake light switch lead are routed properly. Refer to “CABLE ROUTING (for XVS13AA(C)/XVS13CTA(C))” on page 2-55 and “CABLE ROUTING (for XVS13CA(C))” on page 2-79.

2. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-18.
3. Check:
 - Cooling system
Leaks → Repair or replace any faulty part.
4. Measure:
 - Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to “CHECKING THE RADIATOR” on page 6-3.

EAS26440

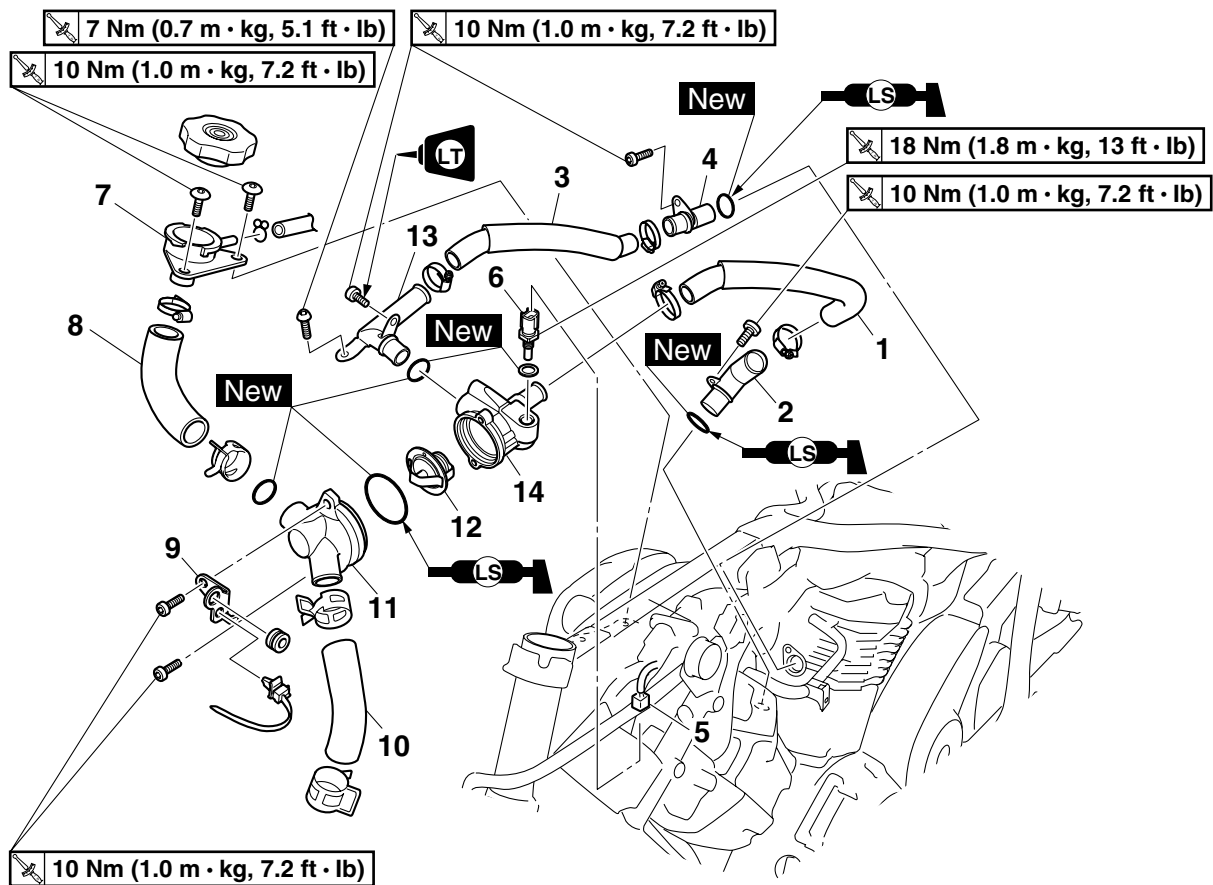
THERMOSTAT

Removing the thermostat (for XVS13AA(C)/XVS13CTA(C))



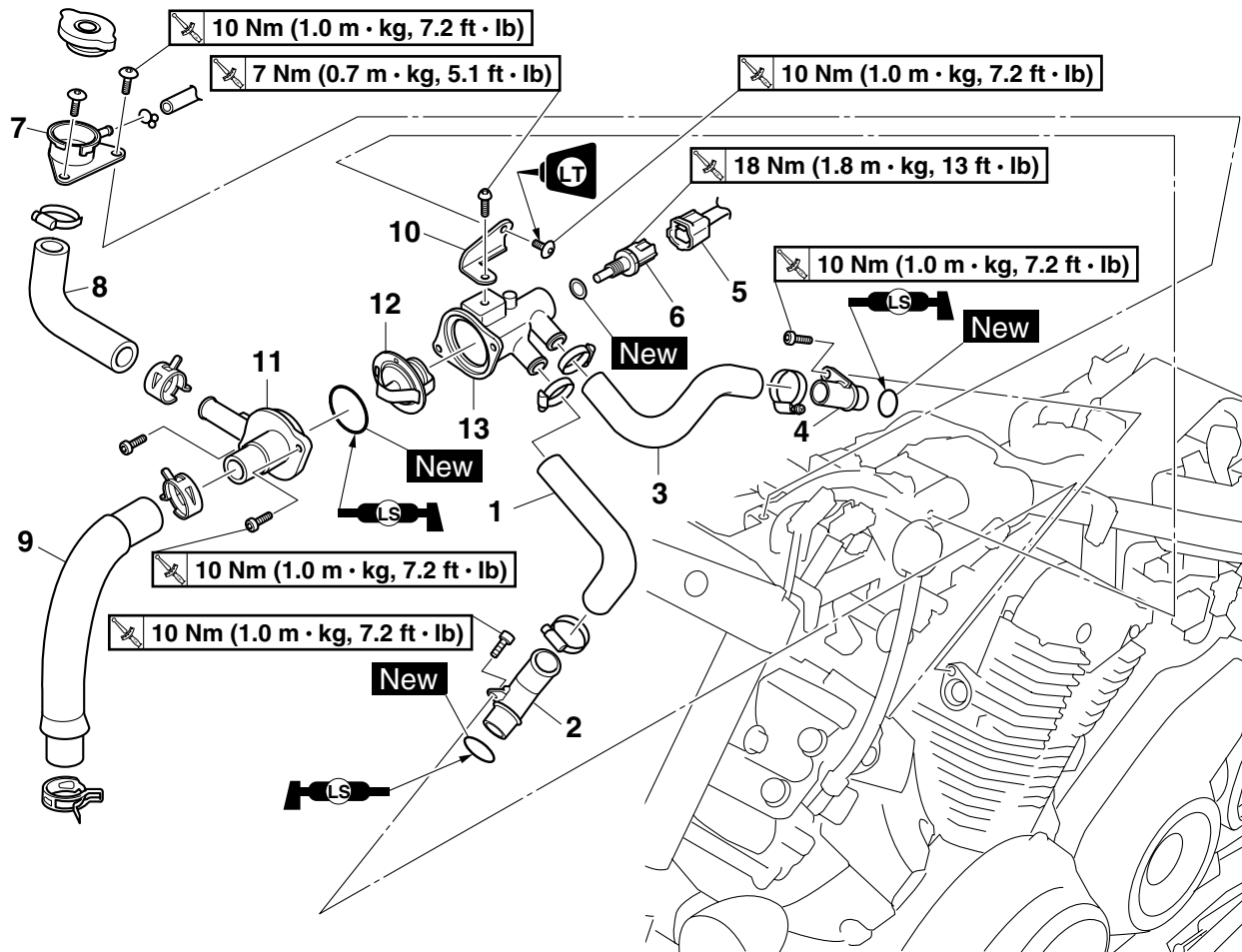
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Left side cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Muffler/Front cylinder covers		Refer to "ENGINE REMOVAL" on page 5-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
1	Front cylinder thermostat inlet hose	1	
2	Front cylinder thermostat inlet pipe	1	
3	Rear cylinder thermostat inlet hose	1	
4	Rear cylinder thermostat inlet pipe 1	1	
5	Coolant temperature sensor coupler	1	Disconnect.
6	Coolant temperature sensor	1	
7	Radiator filler pipe	1	
8	Thermostat cover inlet hose	1	
9	Thermostat bracket	1	
10	Radiator inlet hose	1	

Removing the thermostat (for XVS13AA(C)/XVS13CTA(C))



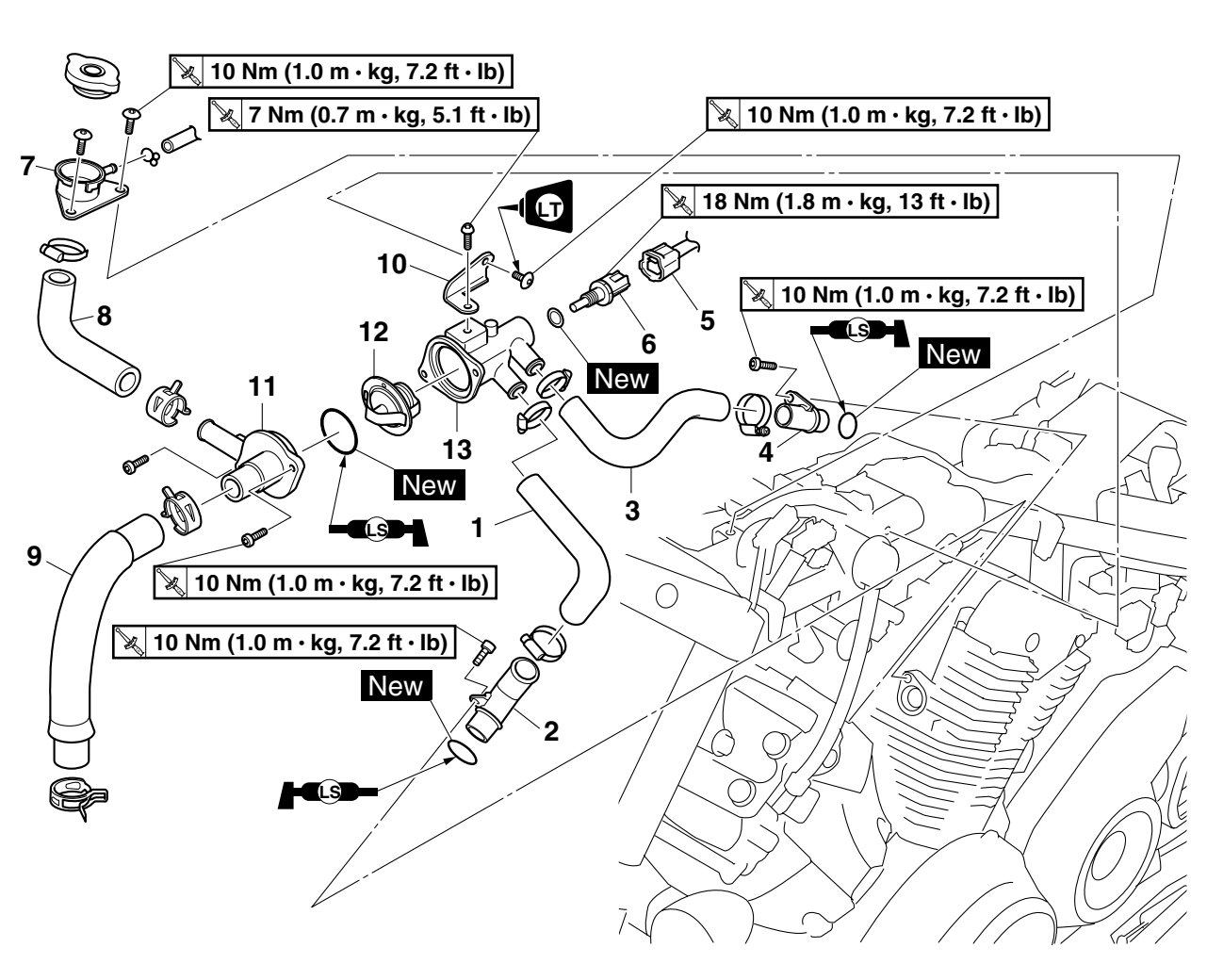
Order	Job/Parts to remove	Q'ty	Remarks
11	Thermostat cover	1	
12	Thermostat	1	
13	Rear cylinder thermostat inlet pipe 2	1	
14	Thermostat housing	1	
			For installation, reverse the removal procedure.

Removing the thermostat (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
1	Front cylinder thermostat inlet hose	1	
2	Front cylinder thermostat inlet pipe	1	
3	Rear cylinder thermostat inlet hose	1	
4	Rear cylinder thermostat inlet pipe	1	
5	Coolant temperature sensor coupler	1	Disconnect.
6	Coolant temperature sensor	1	
7	Radiator filler pipe	1	
8	Thermostat cover inlet hose	1	
9	Radiator inlet hose	1	
10	Thermostat bracket	1	
11	Thermostat cover	1	
12	Thermostat	1	

Removing the thermostat (for XVS13CA(C))



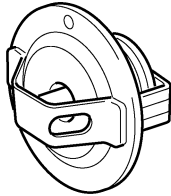
Order	Job/Parts to remove	Q'ty	Remarks
13	Thermostat housing	1	
			For installation, reverse the removal procedure.

EAS26450

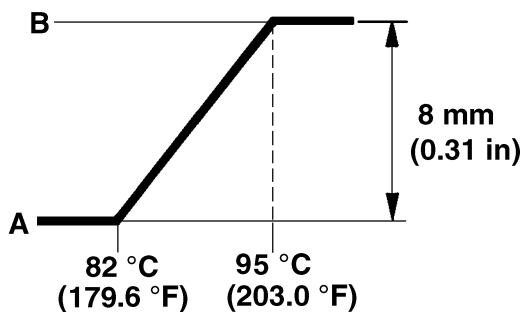
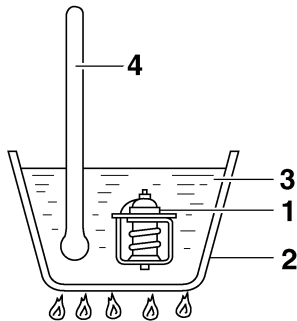
CHECKING THE THERMOSTAT

1. Check:

- Thermostat
Does not open at 82–95 °C (179.6–203.0 °F)
→ Replace.



- Suspend the thermostat "1" in a container "2" filled with water.
- Slowly heat the water "3".
- Place a thermometer "4" in the water.
- While stirring the water, observe the thermostat and thermometer's indicated temperature.



- A. Fully closed
B. Fully open

TIP

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

2. Check:

- Thermostat housing cover
 - Thermostat housing
 - Thermostat pipes
 - Thermostat hoses
 - Radiator inlet hose
 - Radiator filler pipe
- Cracks/damage/wear → Replace.

EAS26480

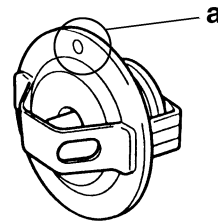
INSTALLING THE THERMOSTAT ASSEMBLY

1. Install:

- Thermostat

TIP

Install the thermostat with its breather hole “a” facing up.

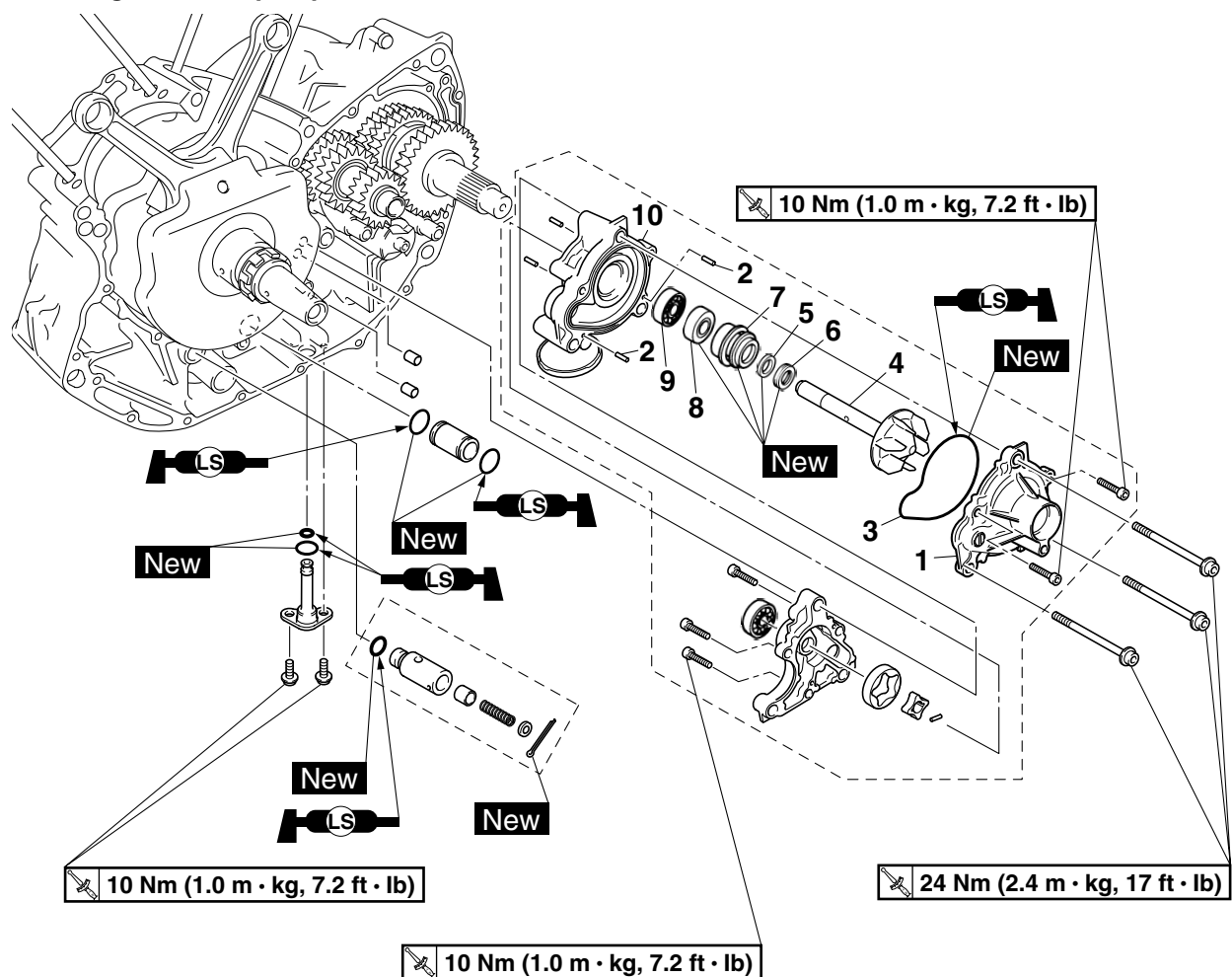


2. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-18.
3. Check:
 - Cooling system
Leaks → Repair or replace any faulty part.
4. Measure:
 - Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to “CHECKING THE RADIATOR” on page 6-3.

EAS26500

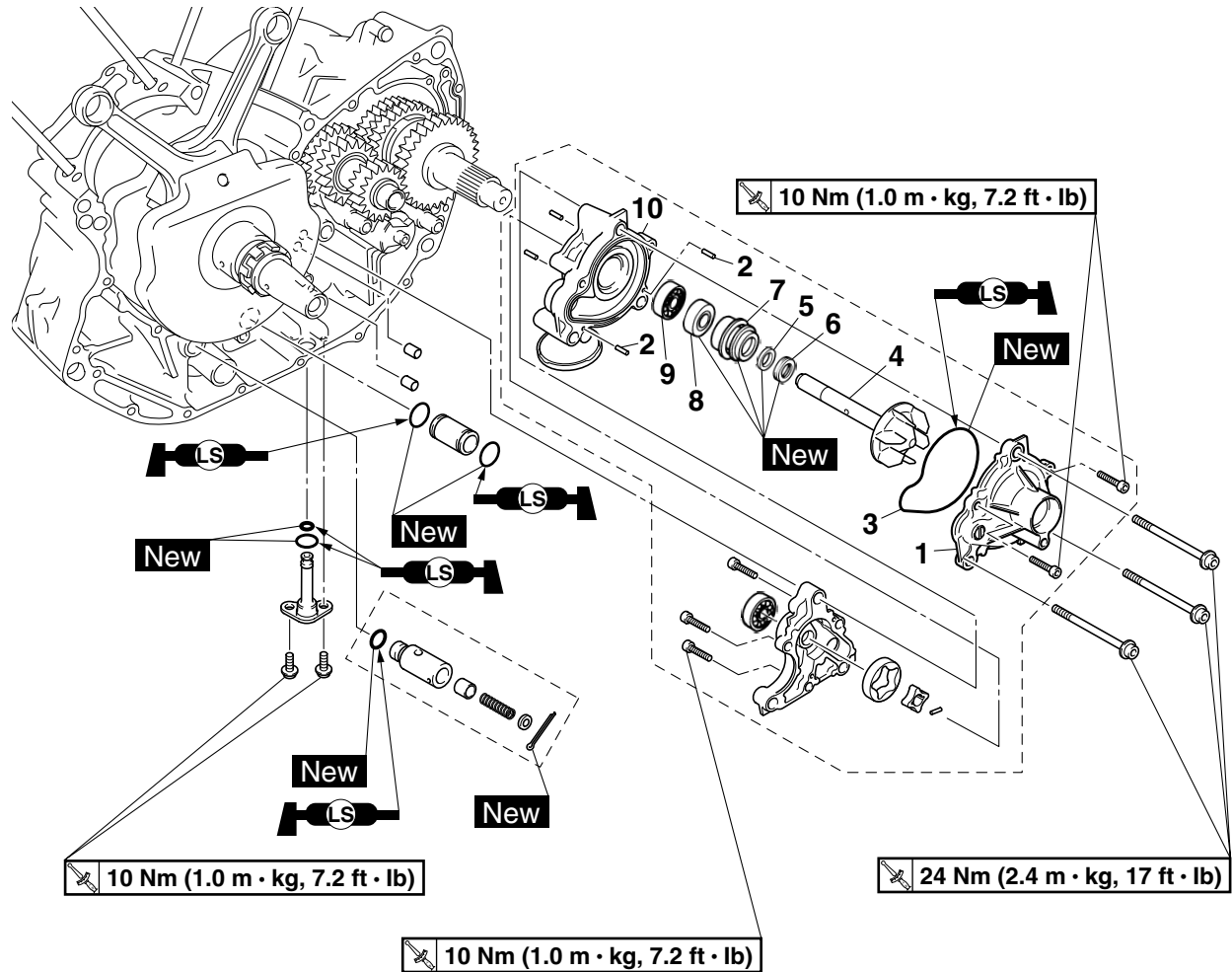
WATER PUMP

Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
			It is not necessary to remove the water pump unless the coolant level is extremely low or the coolant contains engine oil.
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-74.
	Oil pump rotors		Refer to "OIL PUMP" on page 5-80.
1	Water pump housing cover	1	
2	Pin	2	
3	O-ring	1	
4	Impeller shaft	1	
5	Rubber damper holder	1	
6	Rubber damper	1	
7	Water pump seal	1	
8	Oil seal	1	
9	Bearing	1	

Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
10	Water pump housing	1	
			For installation, reverse the removal procedure.

EAS26510

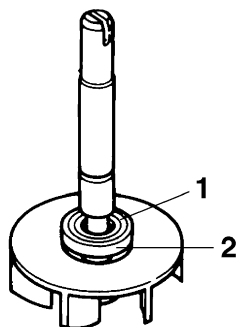
DISASSEMBLING THE WATER PUMP

1. Remove:

- Rubber damper holder "1"
- Rubber damper "2"
(from the impeller, with a thin, flathead screw-driver)

TIP

Do not scratch the impeller shaft.

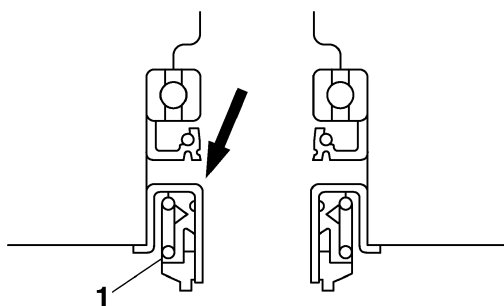


2. Remove:

- Water pump seal "1"

TIP

Remove the water pump seal from the inside of the water pump housing.

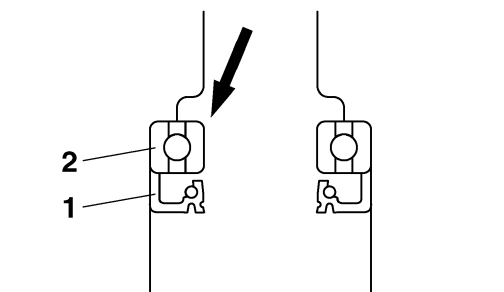


3. Remove:

- Oil seal "1"
- Bearing "2"

TIP

Remove the bearing and oil seal from the inside of the water pump housing.



EAS26540

CHECKING THE WATER PUMP

1. Check:

- Water pump housing cover
- Water pump housing
- Impeller shaft
Cracks/damage/wear → Replace.

2. Check:

- Bearing
Rough movement → Replace.

EAS26560

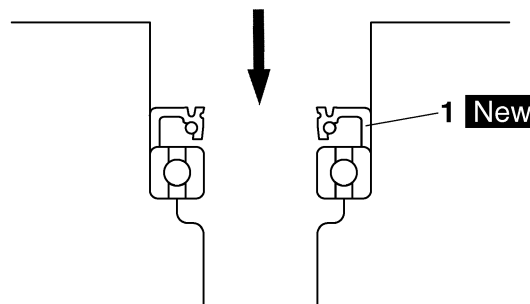
ASSEMBLING THE WATER PUMP

1. Install:

- Oil seal "1" **New**
(into the oil/water pump housing)

TIP

- Before installing the oil seal, apply tap water or coolant onto its outer surface.
- Install the oil seal with a socket that matches its outside diameter.



2. Install:

- Water pump seal "1" **New**

ECA14080

NOTICE

Never lubricate the water pump seal surface with oil or grease.

TIP

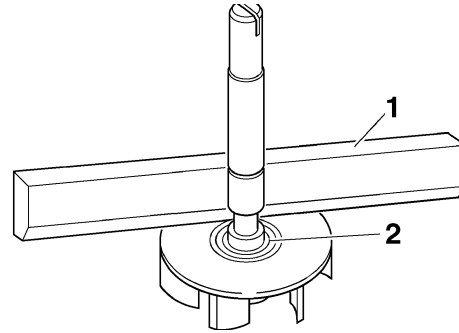
- Install the water pump seal with the special tools.
- Before installing the water pump seal, apply Yamaha bond No.1215 (Three Bond No.1215®) "2" to the water pump housing "3".



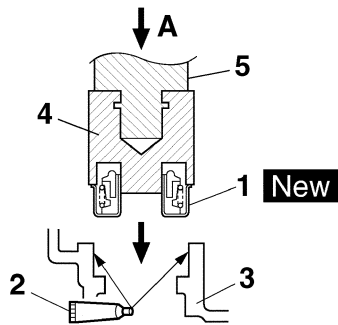
Mechanical seal installer
90890-04078
Water pump seal installer
YM-33221-A
Middle driven shaft bearing driver
90890-04058
Middle drive bearing installer 40 & 50 mm
YM-04058
Yamaha bond No. 1215
90890-85505
(Three Bond No.1215®)



Impeller shaft tilt limit
0.15 mm (0.006 in)



- 1. Straightedge
- 2. Impeller



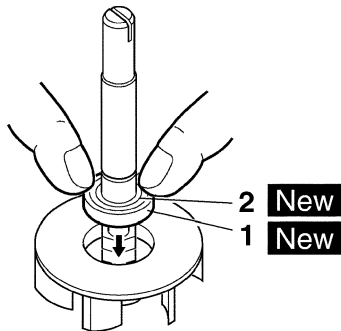
- A. Push down
- 4. Mechanical seal installer
- 5. Middle driven shaft bearing driver

3. Install:

- Rubber damper "1" **New**
- Rubber damper holder "2" **New**

TIP

Before installing the rubber damper, apply tap water or coolant onto its outer surface.



4. Measure:

- Impeller shaft tilt
- Out of specification → Repeat steps (3) and (4).

ECA14090

NOTICE

Make sure the rubber damper and rubber damper holder are flush with the impeller.

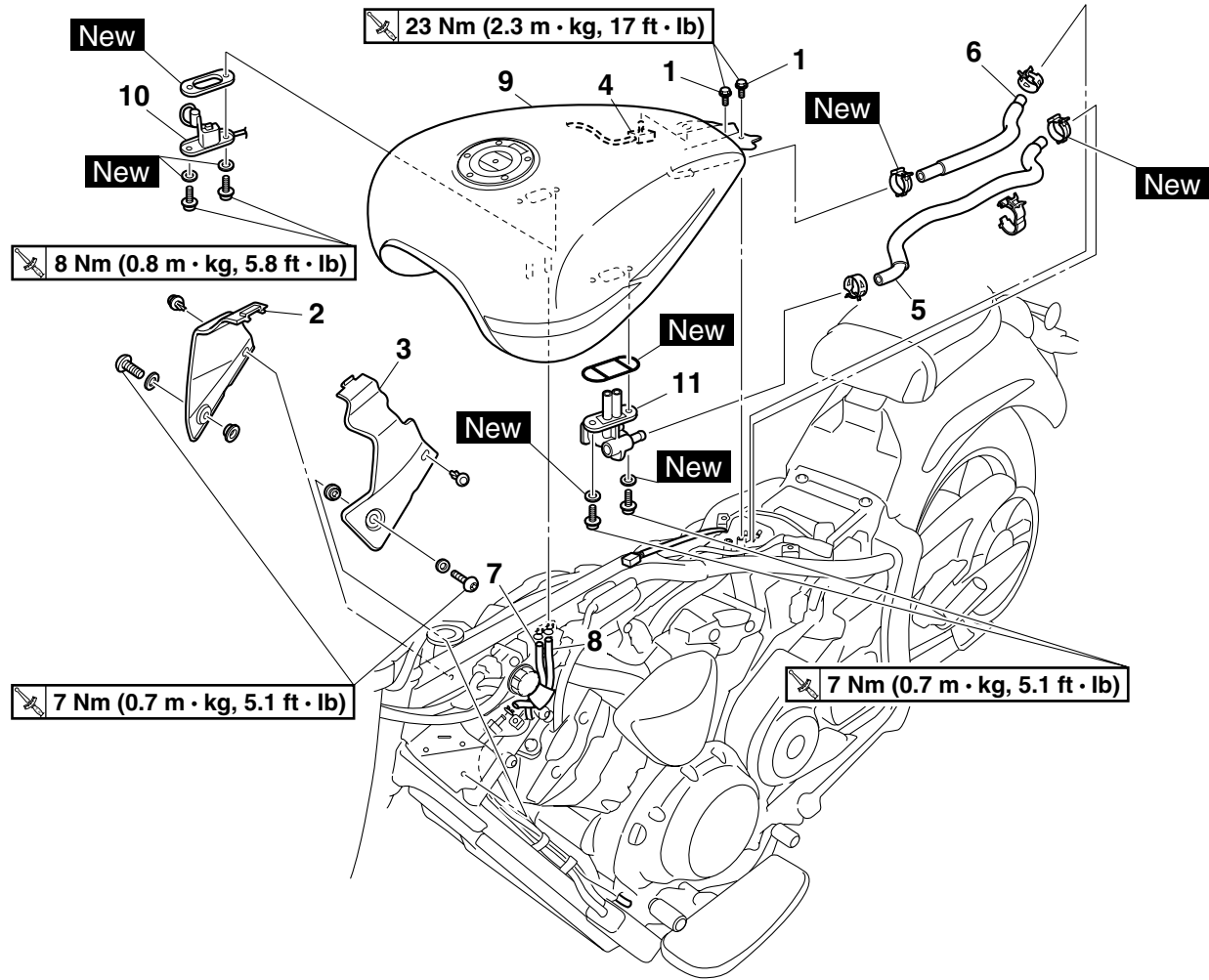
FUEL SYSTEM

FUEL TANK	7-1
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EAS26620

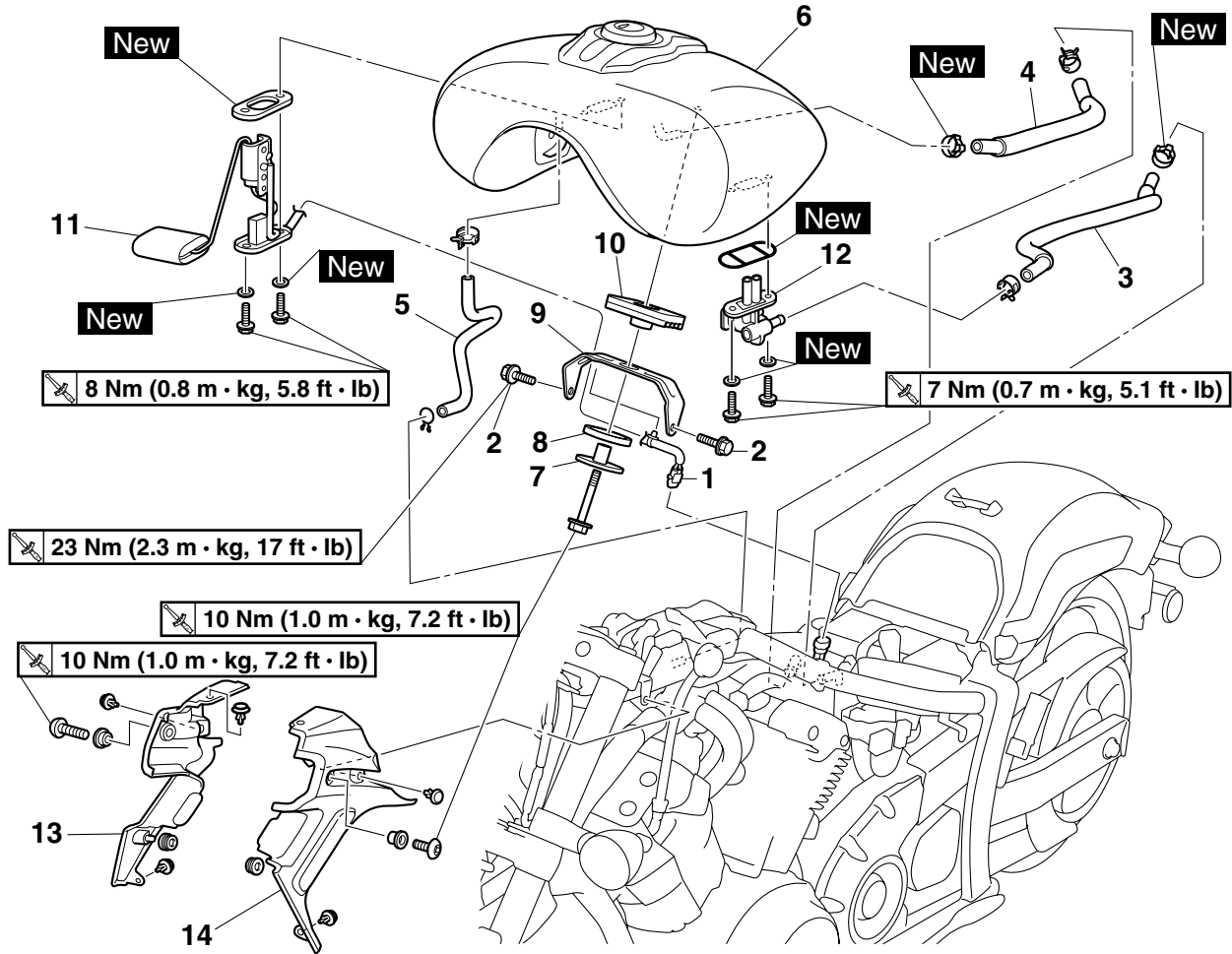
FUEL TANK

Removing the fuel tank (for XVS13AA(C)/XVS13CTA(C))



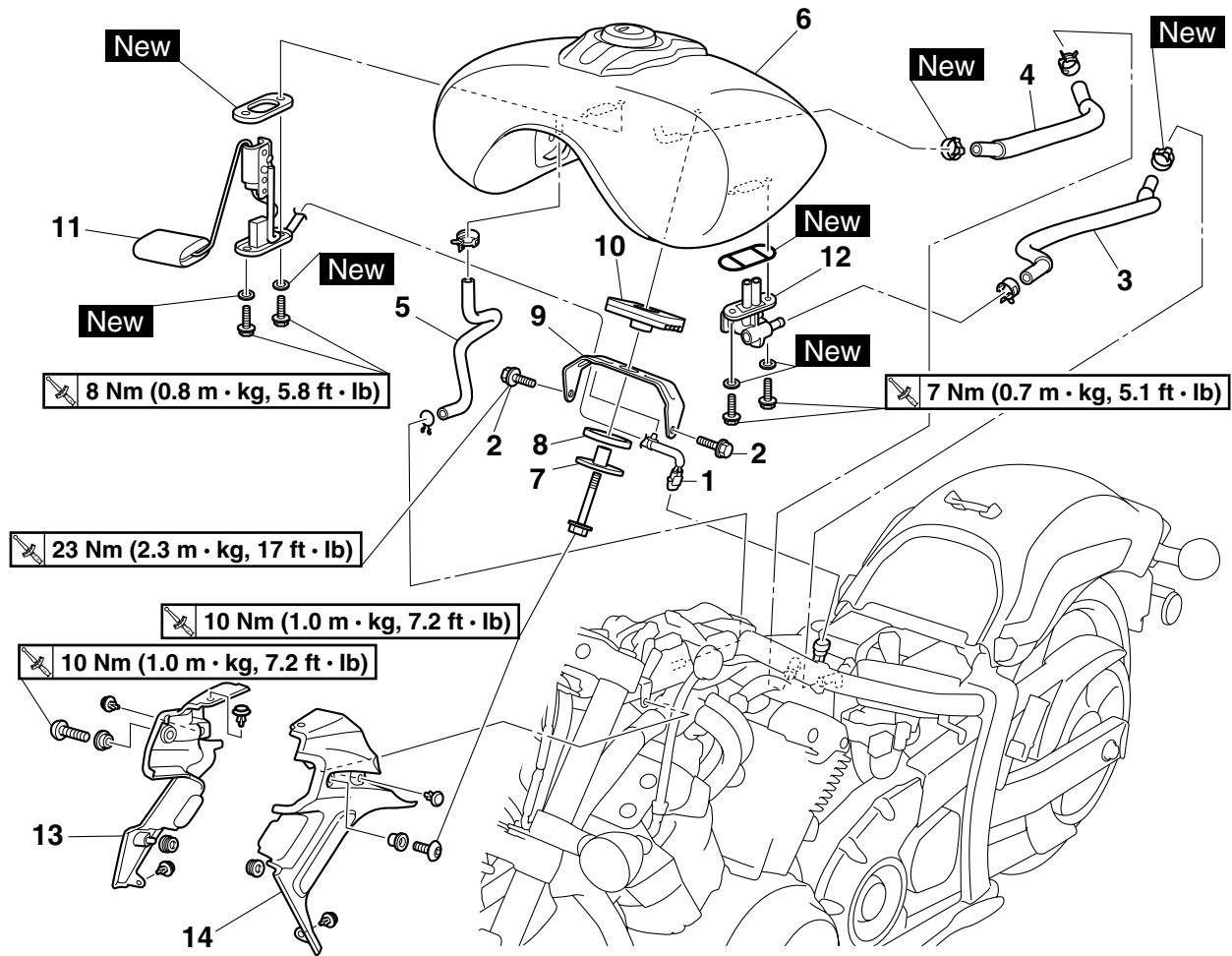
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Relay cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel tank bracket bolt	2	
2	Right side panel	1	
3	Left side panel	1	
4	Fuel sender coupler	1	Disconnect.
5	Fuel cock hose	1	TIP Before removing the fuel cock hose, turn the fuel cock to "OFF".
6	Air vent hose	1	
7	Fuel tank overflow hose	1	
8	Fuel tank breather hose (fuel tank to hose joint)	1	
9	Fuel tank	1	
10	Fuel sender	1	
11	Fuel cock	1	
			For installation, reverse the removal procedure.

Removing the fuel tank (for XVS13CA(C))



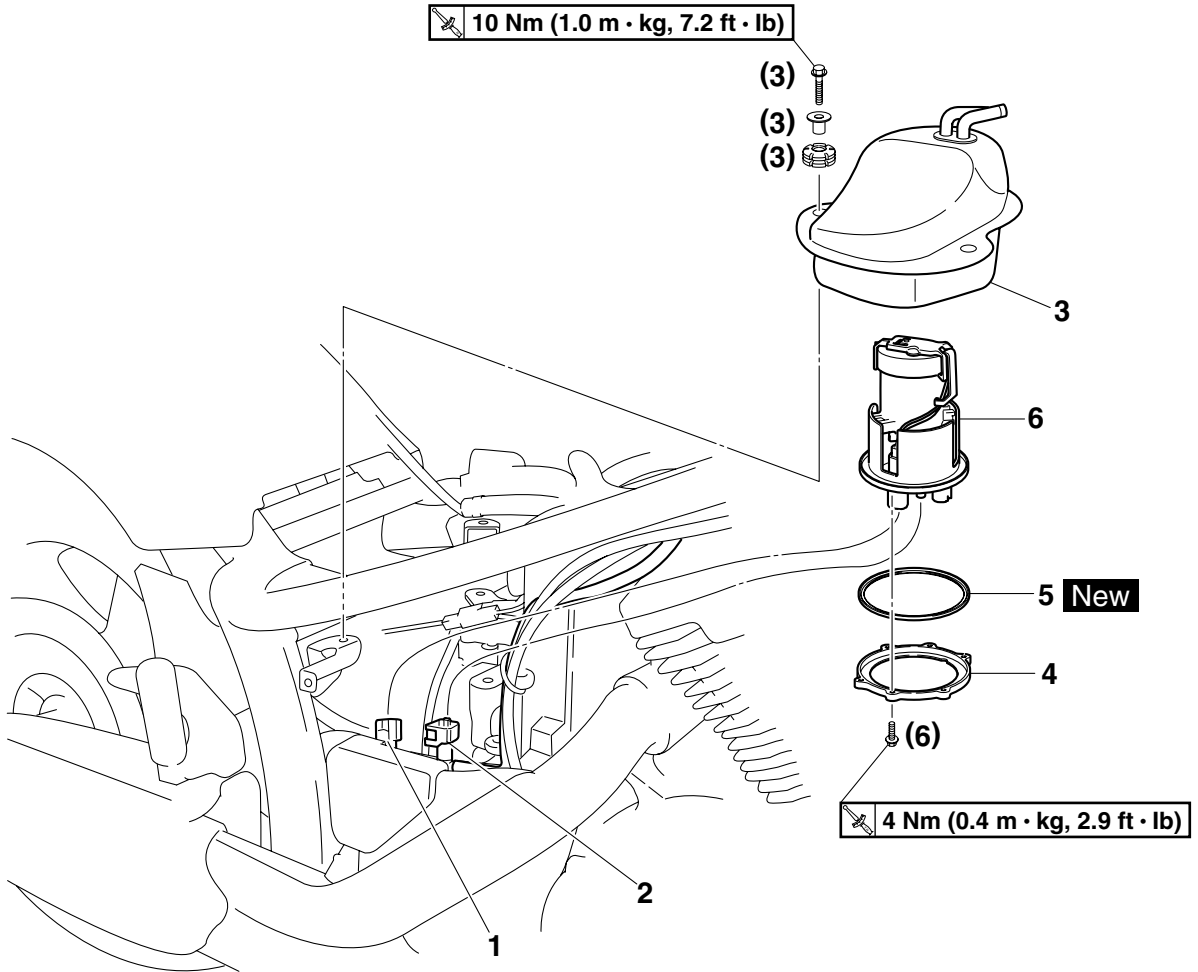
Order	Job/Parts to remove	Q'ty	Remarks
	Seat/Relay cover/Seat lock bracket		Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel sender coupler	1	Disconnect.
2	Fuel tank bracket bolt	2	
3	Fuel cock hose	1	TIP Before removing the fuel cock hose, turn the fuel cock to "OFF".
4	Air vent hose	1	
5	Fuel tank breather hose (fuel tank to hose joint)	1	
6	Fuel tank	1	
7	Collar	1	
8	Grommet	1	
9	Fuel tank bracket	1	
10	Rubber damper	1	
11	Fuel sender	1	
12	Fuel cock	1	
13	Right side panel	1	

Removing the fuel tank (for XVS13CA(C))



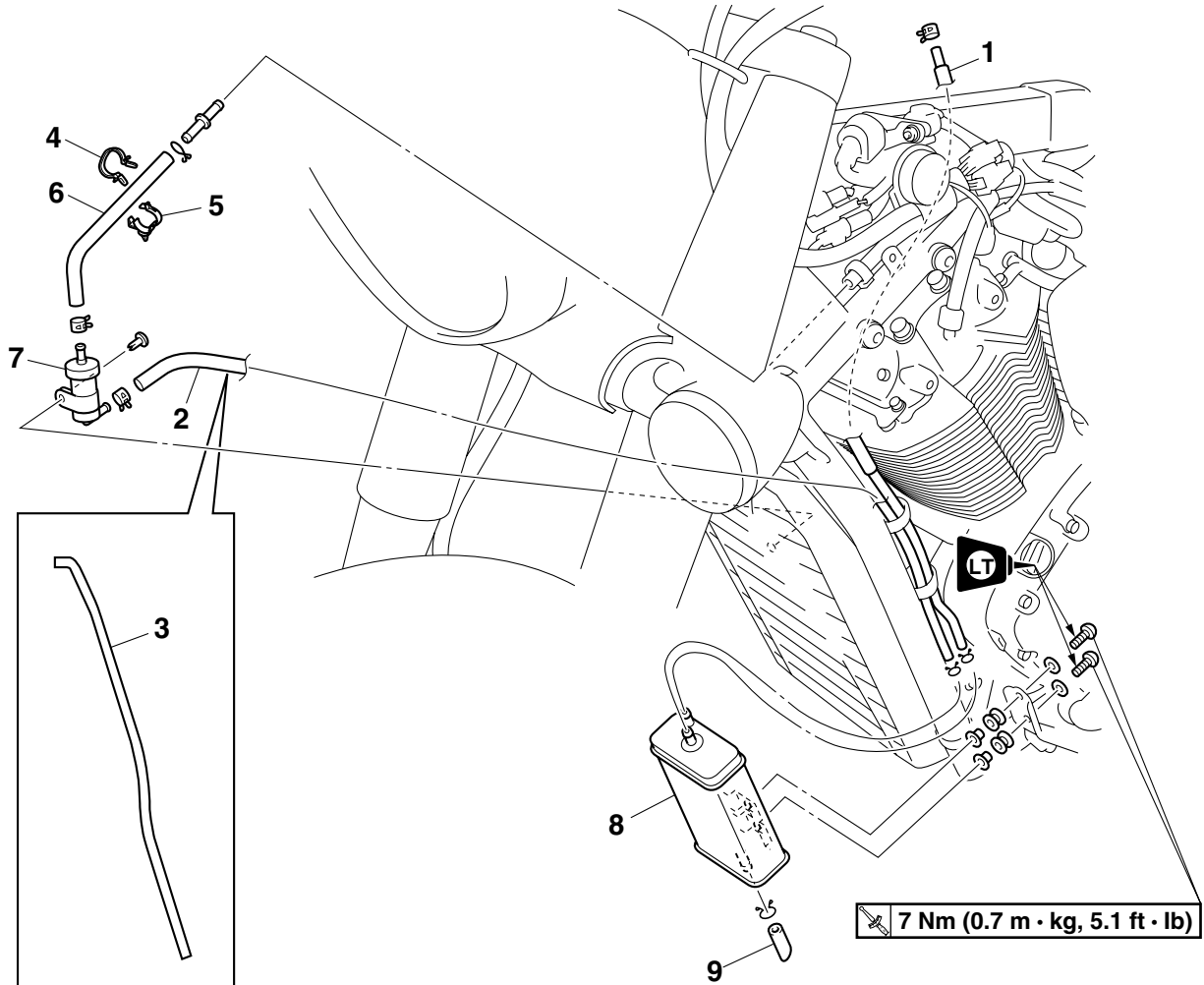
Order	Job/Parts to remove	Q'ty	Remarks
14	Left side panel	1	
			For installation, reverse the removal procedure.

Removing the sub-fuel tank



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Sub-fuel tank cover/Battery box		For XVS13AA(C)/XVS13CTA(C) Refer to "GENERAL CHASSIS" on page 4-1.
	Seat/Sub-fuel tank cover/Battery box		For XVS13CA(C) Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel pump coupler	1	Disconnect.
2	Fuel hose	1	Disconnect.
3	Sub-fuel tank	1	
4	Fuel pump bracket	1	
5	Fuel pump gasket	1	
6	Fuel pump	1	
			For installation, reverse the removal procedure.

Removing the rollover valve and canister



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank/Side panels		Refer to "FUEL TANK" on page 7-1.
	Front cylinder covers		Refer to "ENGINE REMOVAL" on page 5-1.
1	Canister purge hose	1	California only
2	Fuel tank breather hose (rollover valve to canister)	1	California only
3	Fuel tank breather hose	1	Except for California
4	Holder	1	For XVS13CA(C)
5	Holder	1	For XVS13CA(C)
6	Fuel tank breather hose (hose joint to rollover valve)	1	
7	Rollover valve	1	
8	Canister	1	California only
9	Canister breather hose	1	California only
			For installation, reverse the removal procedure.

EAS3D81001

REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
 - Fuel cock hose

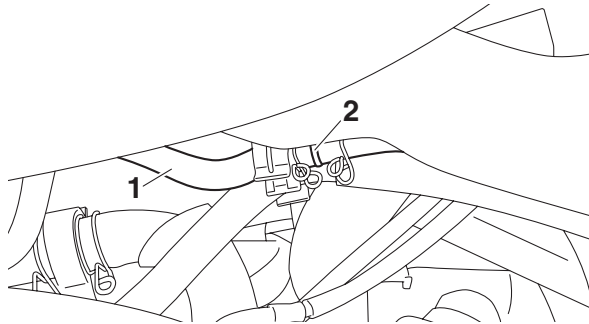
TIP

Before removing the fuel cock hose, turn the fuel cock to “OFF”.

3. Remove: (for XVS13CA(C))
 - Fuel tank breather hose (fuel tank to hose joint) “1”
 - Fuel tank

TIP

Disconnect the fuel tank breather hose (fuel tank to hose joint) from the hose joint "2", and then remove the fuel tank from the frame.



EAS3D81002

REMOVING THE FUEL PUMP

1. Remove:
 - Fuel hose

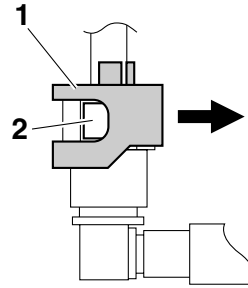
EWA3D81001



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

ECA3D81001

NOTICE

Do not drop the fuel pump or give it a strong shock.

EAS26650

CHECKING THE FUEL COCK

1. Check:
 - Fuel cock
Cracks/damage/wear → Replace.
2. Check:
 - Fuel cock strainer
Obstruction → clean.
Blow out the jets with compressed air.
Damage → Replace.

EAS26660

CHECKING THE FUEL COCK OPERATION

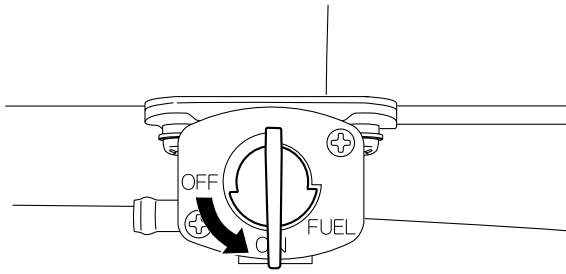
TIP

After installing the fuel cock, check its operation.

1. Check:
 - Fuel cock operation
Out of specification → Replace the fuel cock.

Fuel flows.
Fuel cock is OK.
Fuel does not flow.
Replace the fuel cock.

- Check that the fuel cock lever is turned to "ON".
- Place a container under the end of the fuel cock.



EAS26670

CHECKING THE FUEL PUMP BODY

1. Check:

- Fuel pump body
Obstruction → Clean.
Cracks/damage → Replace the fuel pump assembly.

EAS3D81004

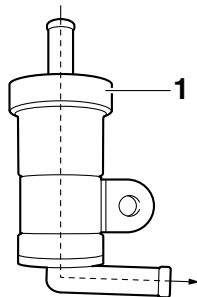
CHECKING THE ROLLOVER VALVE

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.



EAS3D81007

INSTALLING THE FUEL PUMP

1. Install:

- Fuel pump

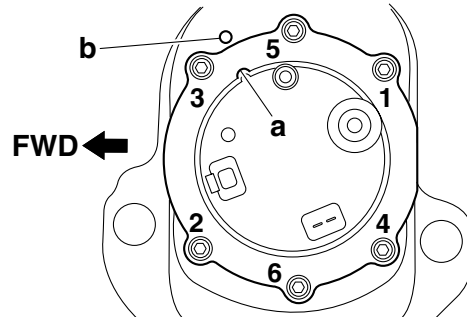


Fuel pump bracket bolt
4 Nm (0.4 m·kg, 2.9 ft·lb)

TIP

- Do not damage the installation surfaces of the sub-fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Install the fuel pump as shown in the illustration.

- Align the projection “a” on the fuel pump with the slot in the fuel pump bracket and the indentation “b” in the sub-fuel tank.
- Tighten the fuel pump bolts in the proper tightening sequence as shown.



2. Install:

- Fuel hose

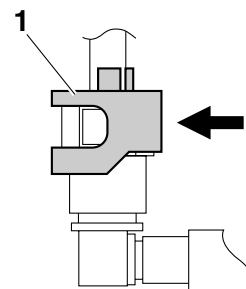
ECA3D81002

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.



EAS3D81040

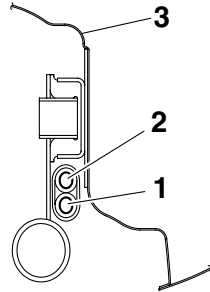
INSTALLING THE FUEL TANK HOSES (for XVS13AA(C)/XVS13CTA(C))

1. Install:

- Fuel tank breather hose (fuel tank to hose joint) “1”
- Fuel tank overflow hose “2”

TIP

Install the fuel tank overflow hose and fuel tank breather hose (fuel tank to hose joint) as shown in the illustration, making sure that they are not pinched by the fuel tank “3”.



EAS27D1005

INSTALLING THE FUEL TANK BREATHER HOSE (for XVS13CA(C))

1. Install:

- Fuel tank breather hose (fuel tank to hose joint) “1”

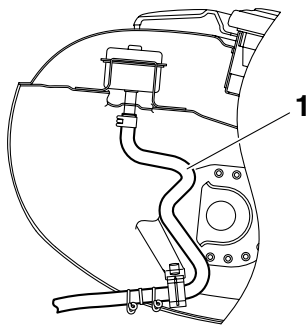
ECA27D1001

NOTICE

Be sure to install the fuel tank breather hose (fuel tank to hose joint) correctly. Otherwise, the engine may not operate properly or other problem could occur.

TIP

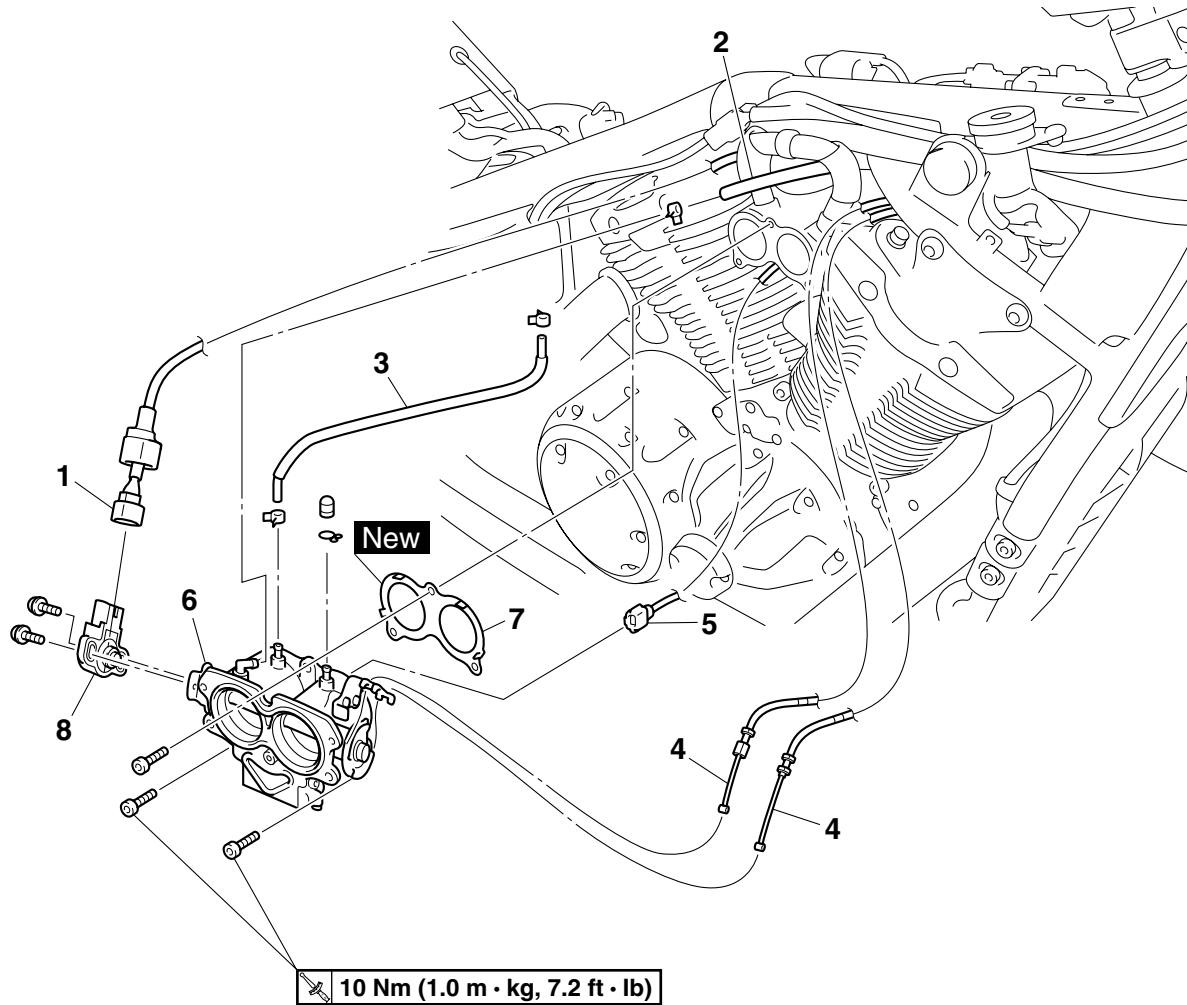
- Connect the fuel tank breather hose (fuel tank to hose joint) to the fuel tank, place the fuel tank in its original position, and then connect the hose to the hose joint.
- Make sure that the fuel tank breather hose (fuel tank to hose joint) is routed properly. Refer to “CABLE ROUTING (for XVS13CA(C))” on page 2-79.



EAS26970

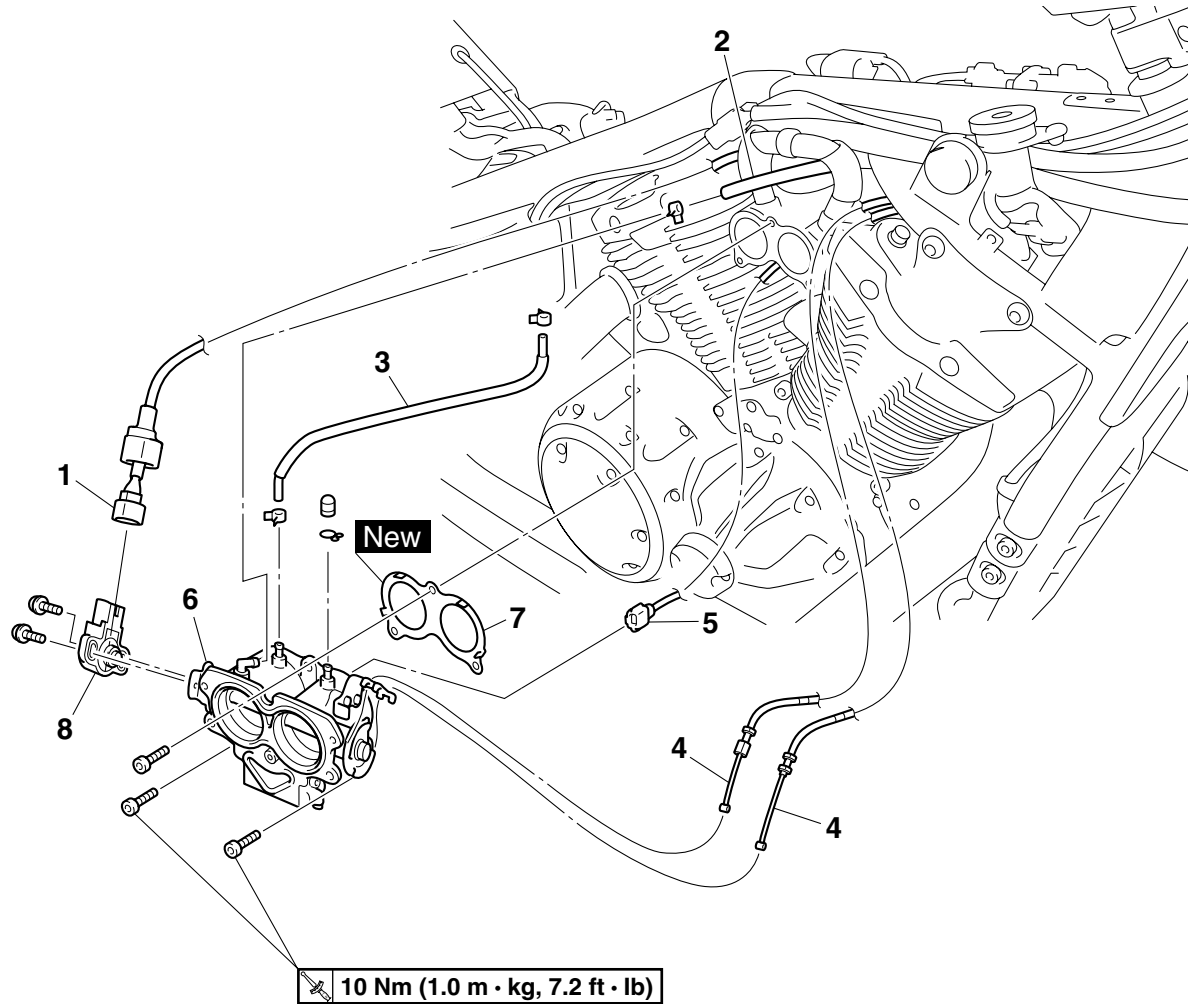
THROTTLE BODIES

Removing the throttle body and ISC (idle speed control) unit



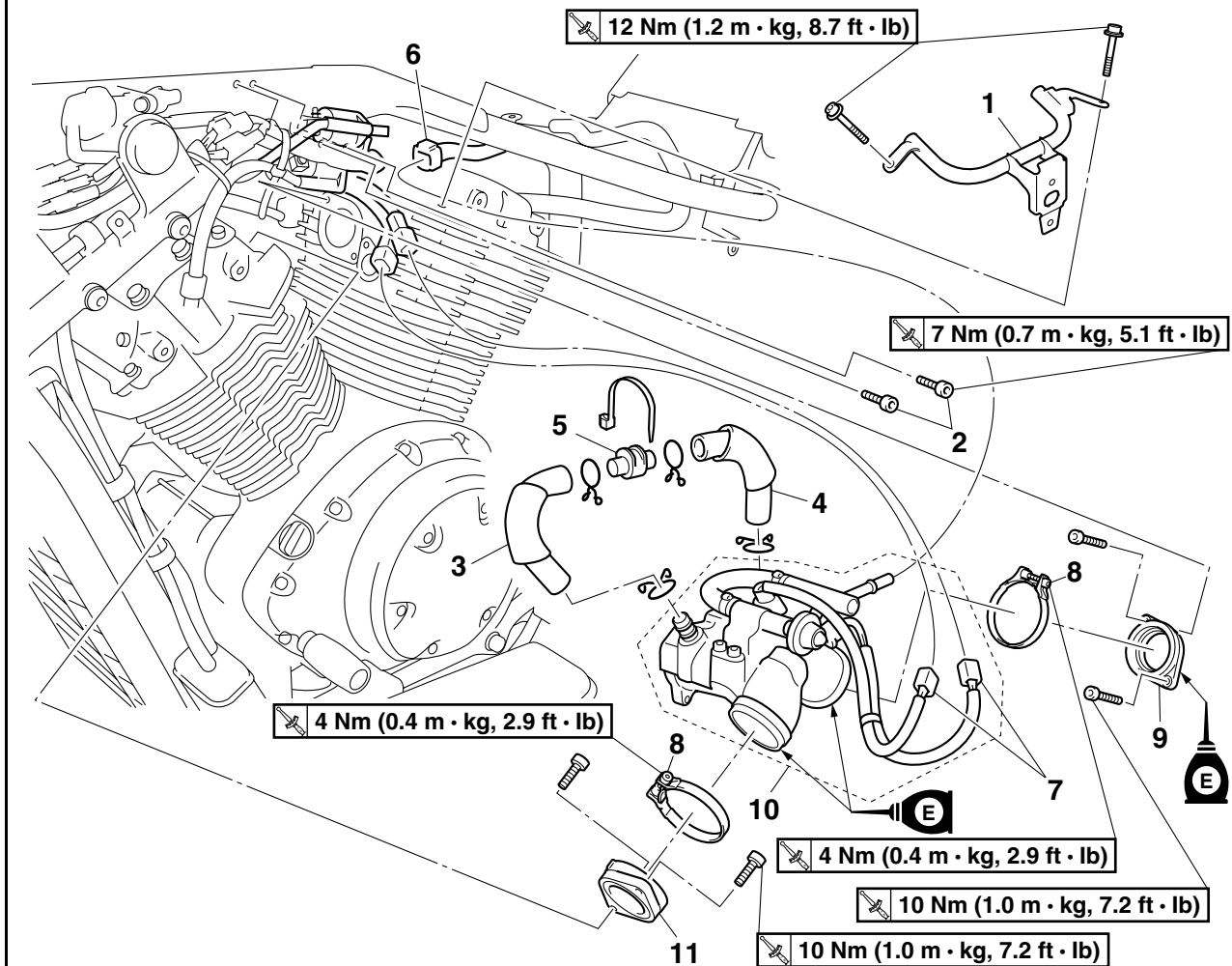
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Air filter case		For XVS13AA(C)/XVS13CTA(C) Refer to "GENERAL CHASSIS" on page 4-1.
	Seat/Air filter case		For XVS13CA(C) Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Throttle position sensor coupler	1	Disconnect.
2	Canister purge hose	1	California only Disconnect.
3	Intake air pressure sensor hose	1	
4	Throttle cable	2	Disconnect.
5	ISC (idle speed control) unit coupler	1	Disconnect.
6	Throttle body	1	ECA3D81003 NOTICE The throttle body should not be disassembled.
7	Gasket	1	

Removing the throttle body and ISC (idle speed control) unit



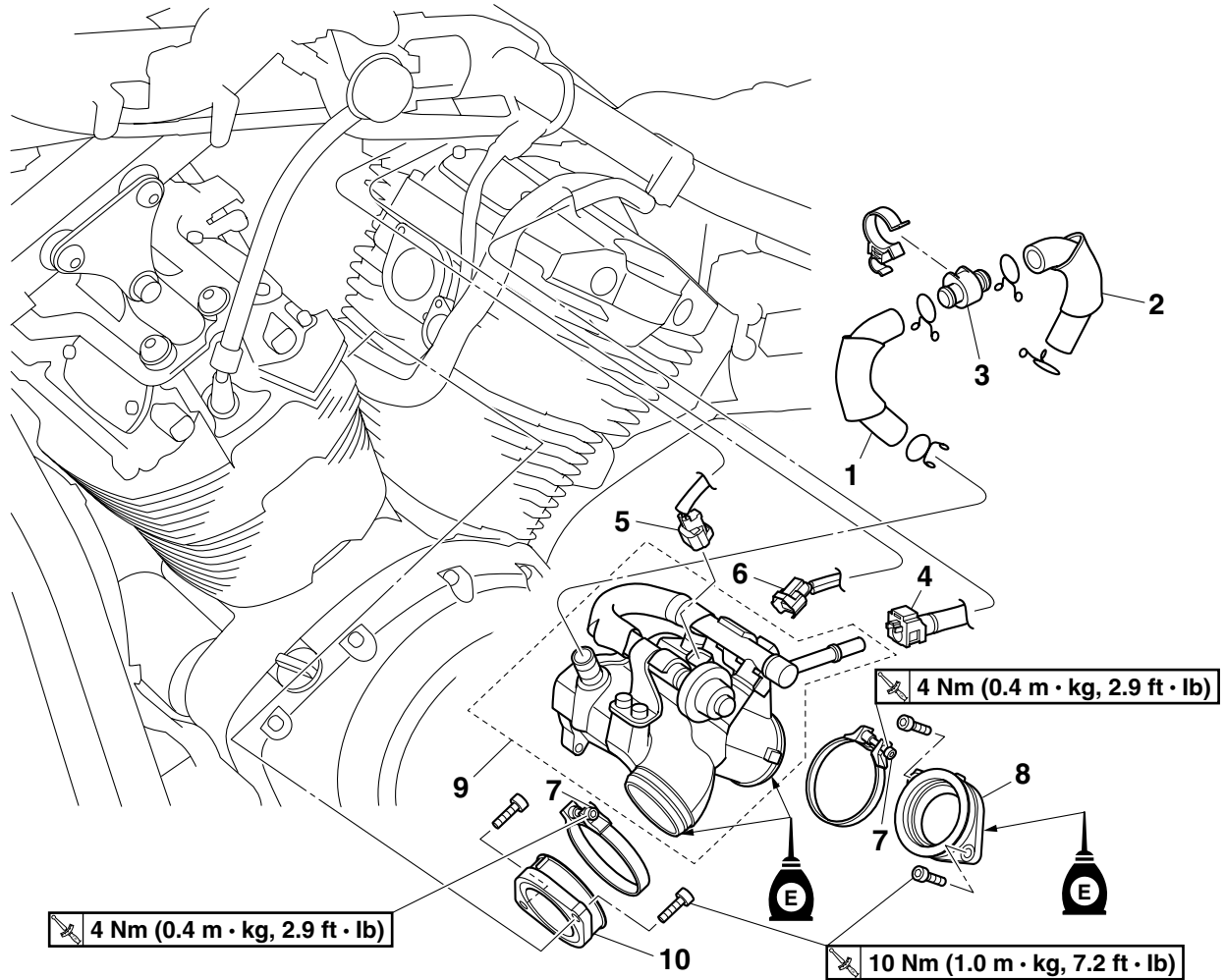
Order	Job/Parts to remove	Q'ty	Remarks
8	Throttle position sensor	1	
			For installation, reverse the removal procedure.

Removing the intake manifold assembly (for XVS13AA(C)/XVS13CTA(C))



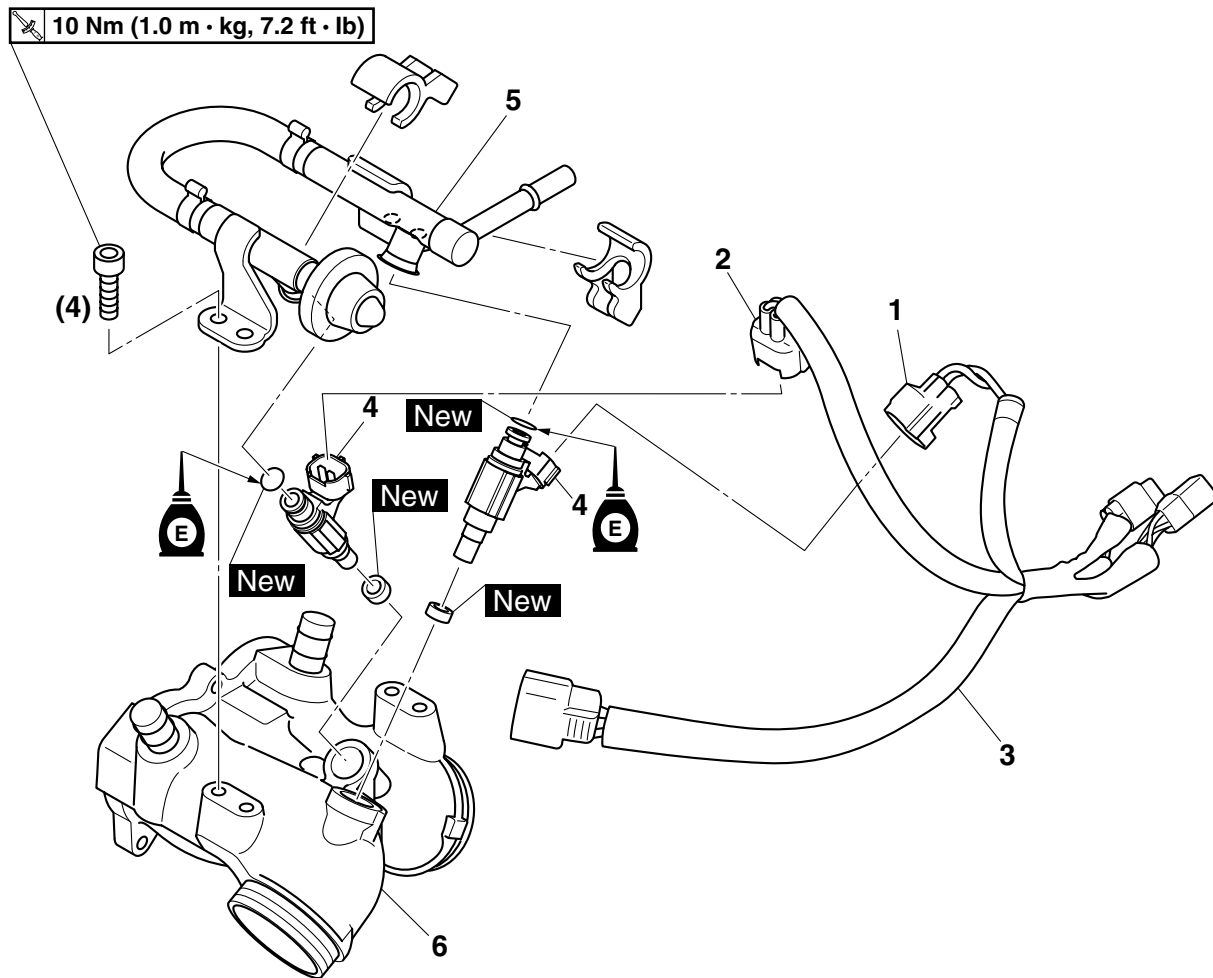
Order	Job/Parts to remove	Q'ty	Remarks
	Left side cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Front cylinder covers		Refer to "ENGINE REMOVAL" on page 5-1.
	Front cylinder thermostat inlet hose/Rear cylinder thermostat inlet hose		Refer to "THERMOSTAT" on page 6-4.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-9.
1	Left side cover bracket	1	
2	Ignition coil bracket bolt	2	
3	Front cylinder resonator hose	1	
4	Rear cylinder resonator hose	1	
5	Resonator hose joint	1	
6	Fuel hose	1	Disconnect.
7	Sub-wire harness coupler	2	Disconnect.
8	Intake manifold joint clamp screw	2	Loosen.
9	Rear cylinder intake manifold joint	1	
10	Intake manifold assembly	1	
11	Front cylinder intake manifold joint	1	
			For installation, reverse the removal procedure.

Removing the intake manifold assembly (for XVS13CA(C))



Order	Job/Parts to remove	Q'ty	Remarks
	Front cylinder covers		Refer to "GENERAL CHASSIS" on page 4-1.
	Front cylinder thermostat inlet hose/Rear cylinder thermostat inlet hose		Refer to "THERMOSTAT" on page 6-4.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-9.
1	Front cylinder resonator hose	1	
2	Rear cylinder resonator hose	1	
3	Resonator hose joint	1	
4	Fuel hose	1	Disconnect.
5	Front cylinder injector coupler	1	Disconnect.
6	Rear cylinder injector coupler	1	Disconnect.
7	Intake manifold joint clamp screw	2	Loosen.
8	Rear cylinder intake manifold joint	1	
9	Intake manifold assembly	1	
10	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	Front cylinder injector coupler	1	For XVS13AA(C)/XVS13CTA(C) Disconnect.
2	Rear cylinder injector coupler	1	For XVS13AA(C)/XVS13CTA(C) Disconnect.
3	Sub-wire harness	1	For XVS13AA(C)/XVS13CTA(C)
4	Injector	2	
5	Fuel pipe	1	
6	Intake manifold	1	
			For assembly, reverse the disassembly procedure.

EAS26980

CHECKING THE INJECTORS

1. Check:
 - Injectors
Damage → Replace.

EAS26990

CHECKING THE THROTTLE BODIES

1. Check:
 - Throttle bodies
Cracks/damage → Replace the throttle bodies as a set.
2. Check:
 - Fuel passages
Obstructions → Clean.

- a. Wash the throttle bodies in a petroleum-based solvent.
Do not use any caustic carburetor cleaning solution.
- b. Blow out all of the passages with compressed air.

EAS3D81005

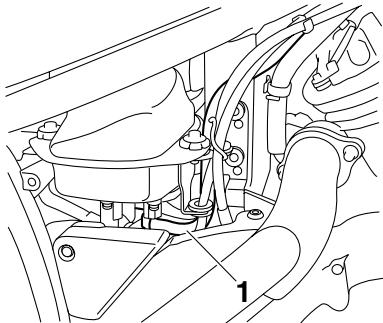
CHECKING THE FUEL PRESSURE

1. Check:
 - Fuel pressure
-
- a. Remove the sub-fuel tank cover.
Refer to “GENERAL CHASSIS” on page 4-1.
 - b. Disconnect the fuel hose “1” from the fuel pump.

EWA3D81001



Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

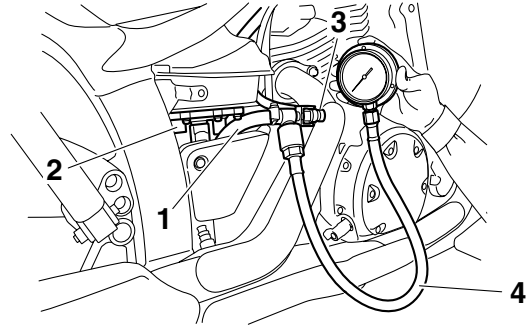


- c. Connect the fuel pressure adapter “3” between the fuel hose “1” and fuel pump “2”.
- d. Connect the pressure gauge “4” to the fuel pressure adapter “3”.



Pressure gauge
90890-03153
YU-03153

Fuel pressure adapter
90890-03176
YM-03176



- e. Start the engine.
- f. Measure the fuel pressure.



Fuel pressure
324 kPa (3.24 kg/cm², 46.1 psi)

Faulty → Replace the fuel pump.

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 sensorRefer to “CHECKING THE THROTTLE POSITION SENSOR” on page 8-114.
 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"



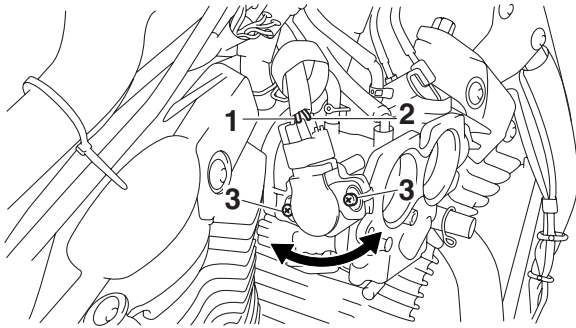
Digital circuit tester
90890-03174
Model 88 Multimeter with ta-
chometer
YU-A1927

- 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".



EAS3D81006

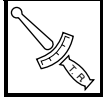
INSTALLING THE INTAKE MANIFOLD ASSEMBLY

1. Install:

- Intake manifold assembly



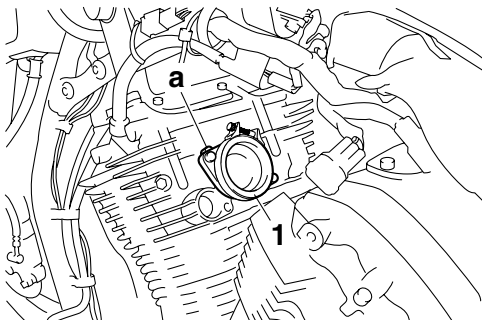
- a. Install the front cylinder intake manifold joint "1" to the front cylinder head.



Front cylinder intake manifold joint bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)

TIP

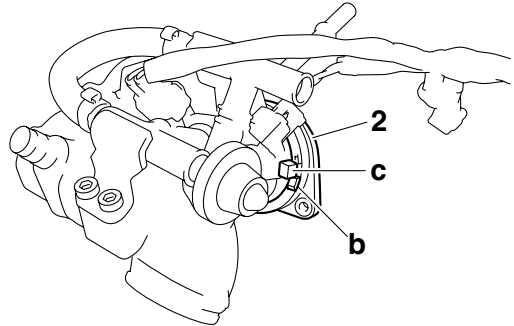
Install the front cylinder intake manifold joint with its projection "a" facing up as shown in the illustration.



- b. Install the rear cylinder intake manifold joint "2" to the intake manifold assembly.

TIP

- Lubricate the rear cylinder intake manifold joint and intake manifold assembly mating surfaces with engine oil.
- 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·kg, 7.2 ft·lb)

TIP

- Lubricate the front cylinder intake manifold joint and intake manifold assembly mating surfaces with engine oil.
- Lubricate the rear cylinder intake manifold joint and rear cylinder head mating surfaces with engine oil.



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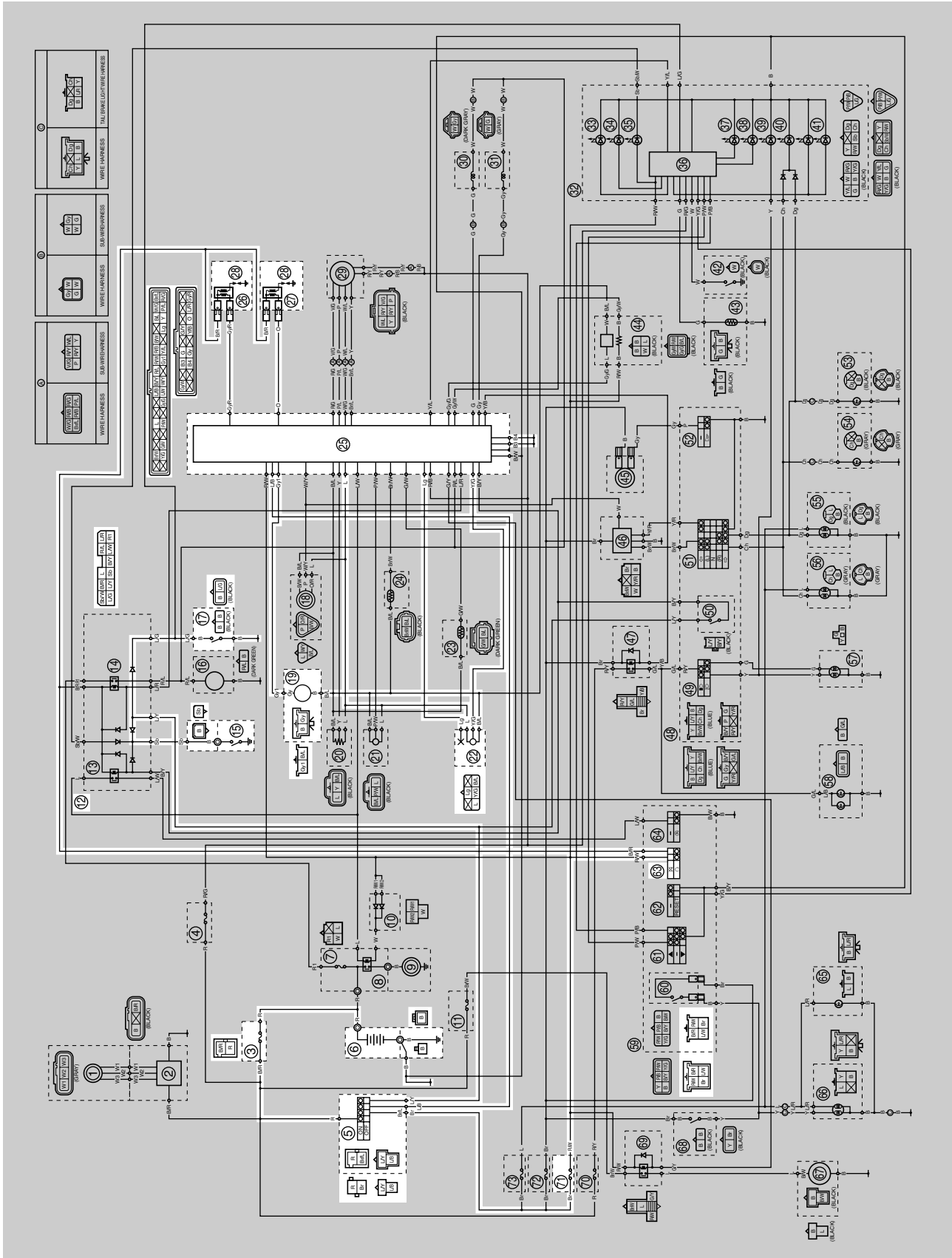
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EAS27090

IGNITION SYSTEM

EAS27110

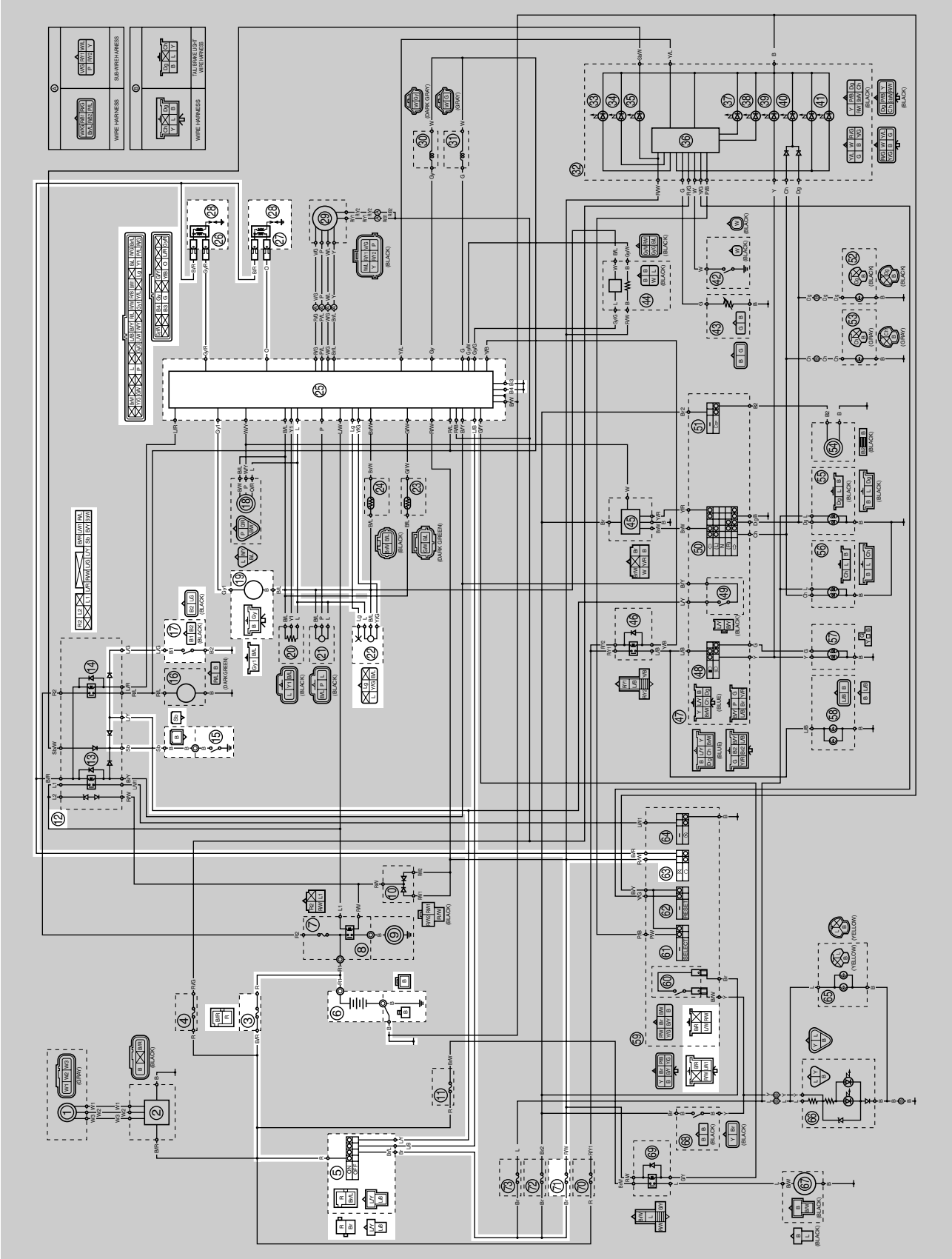
CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 12. Relay unit
- 15. Neutral switch
- 17. Sidestand switch
- 19. Crankshaft position sensor
- 22. Lean angle sensor
- 25. ECU (engine control unit)
- 26. Rear cylinder ignition coil
- 27. Front cylinder ignition coil
- 28. Spark plug
- 63. Engine stop switch
- 71. Ignition fuse

EAS27D1007

CIRCUIT DIAGRAM (for XVS13CA(C))



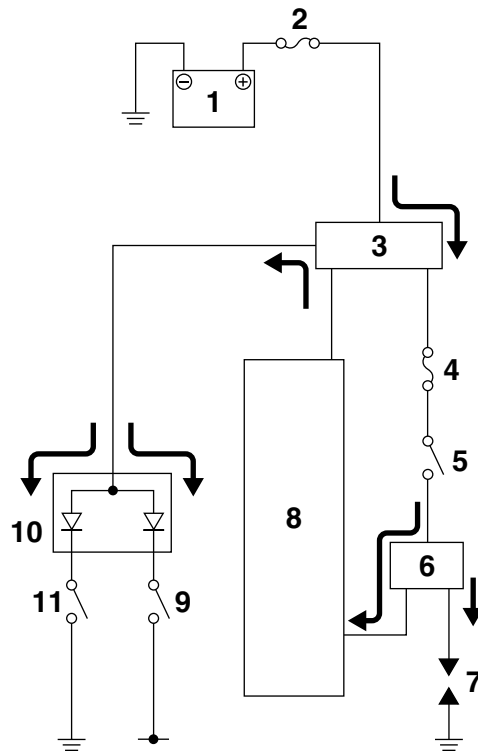
- 3. Main fuse
- 5. Main switch
- 6. Battery
- 12. Relay unit
- 15. Neutral switch
- 17. Sidestand switch
- 19. Crankshaft position sensor
- 22. Lean angle sensor
- 25. ECU (engine control unit)
- 26. Rear cylinder ignition coil
- 27. Front cylinder ignition coil
- 28. Spark plug
- 63. Engine stop switch
- 71. Ignition fuse

EAS3D81009

ENGINE STOPPING DUE TO SIDESTAND OPERATION

When the engine is running and the transmission is in gear, the engine will stop if the sidestand is moved down. This is because the electric current from the 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:

- The transmission is in gear (the neutral switch is open) and the sidestand is up (the sidestand switch is closed).
- The transmission is in neutral (the neutral switch is closed) and the sidestand is down (the sidestand switch is open).



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 (for XVS13AA(C)/XVS13CTA(C))
2. Seat (for XVS13CA(C))
3. Tool kit tray
4. Fuel tank
5. Battery box
6. Headlight lens unit

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-99.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-100.	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 3-9.	NG →	Regap or replace the spark plug(s).
OK ↓		
4. Check the ignition spark gap. Refer to "CHECKING THE IGNITION SPARK GAP" on page 8-107.	OK →	Ignition system is OK.
NG ↓		
5. Check the spark plug caps. Refer to "CHECKING THE SPARK PLUG CAPS" on page 8-107.	NG →	Replace the spark plug cap(s).
OK ↓		
6. Check the ignition coils. Refer to "CHECKING THE IGNITION COILS" on page 8-108.	NG →	Replace the ignition coil(s).
OK ↓		
7. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-108.	NG →	Replace the crankshaft position sensor/stator assembly.
OK ↓		

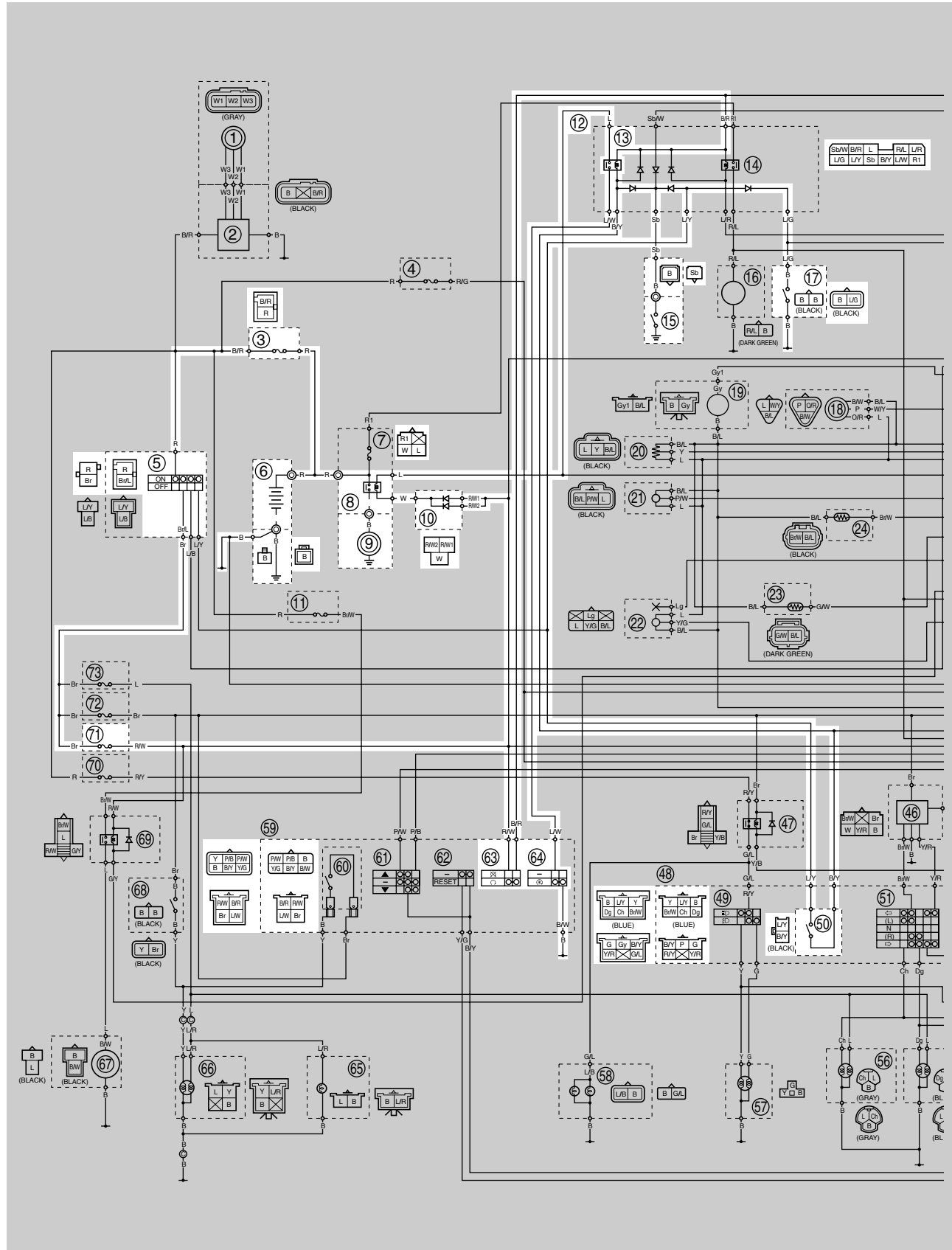
8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the main switch.
OK ↓		
9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the right handlebar switch.
OK ↓		
10. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the neutral switch.
OK ↓		
11. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the sidestand switch.
OK ↓		
12. Check the relay unit (diode). Refer to "CHECKING THE DIODES" on page 8-105.	NG →	Replace the relay unit.
OK ↓		
13. Check the lean angle sensor. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-109.	NG →	Replace the lean angle sensor.
OK ↓		
14. Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-1 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-3.	NG →	Properly connect or repair the ignition system's wiring.
OK ↓		
Replace the ECU.		

EAS27160

ELECTRIC STARTING SYSTEM

EAS27170

CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))

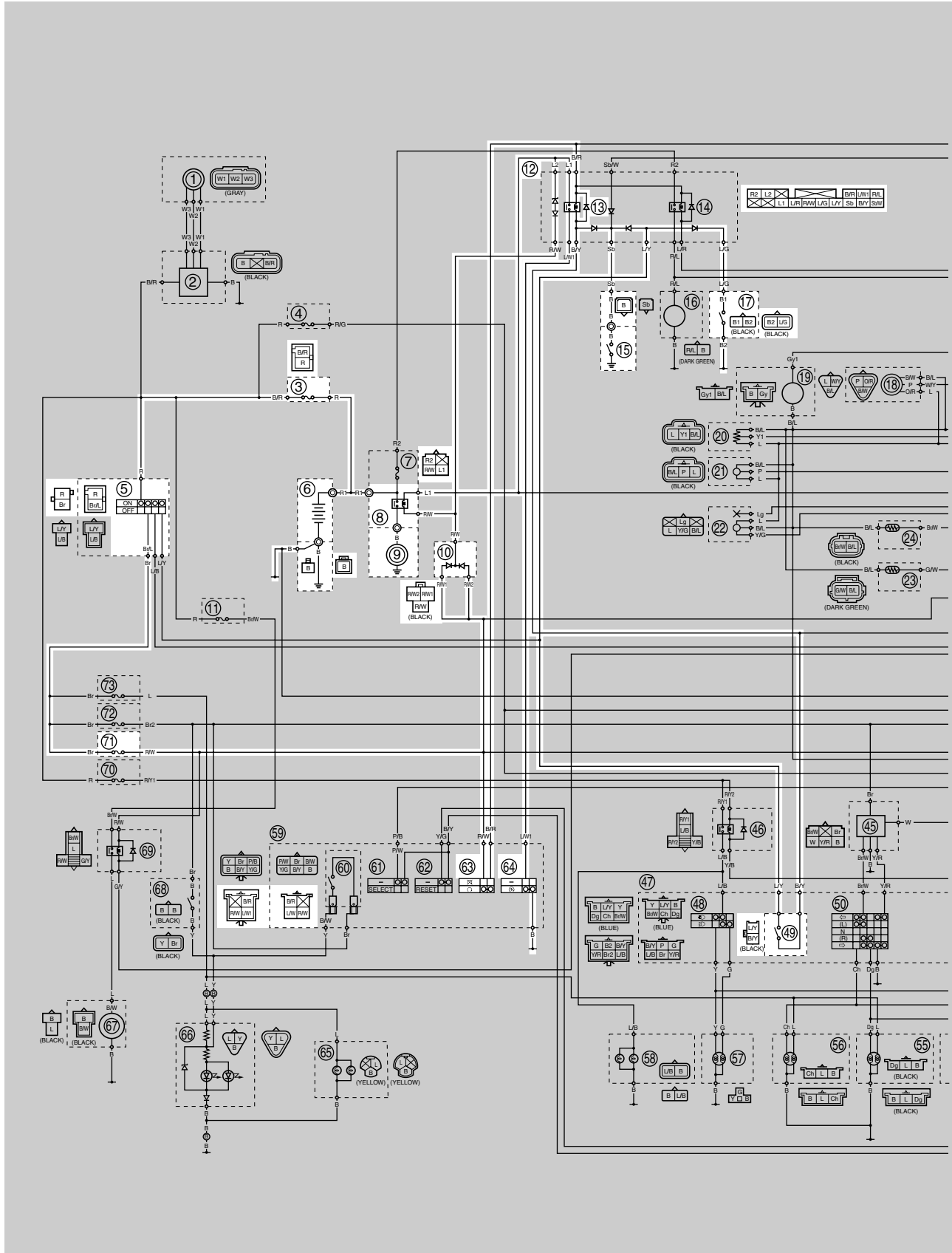


- 3. Main fuse
- 5. Main switch
- 6. Battery
- 8. Starter relay
- 9. Starter motor
- 10. Diode
- 12. Relay unit
- 13. Starting circuit cut-off relay
- 15. Neutral switch
- 17. Sidestand switch
- 50. Clutch switch
- 63. Engine stop switch
- 64. Start switch
- 71. Ignition fuse

ELECTRIC STARTING SYSTEM

EAS27D1010

CIRCUIT DIAGRAM (for XVS13CA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 8. Starter relay
- 9. Starter motor
- 10. Diode
- 12. Relay unit
- 13. Starting circuit cut-off relay
- 15. Neutral switch
- 17. Sidestand switch
- 49. Clutch switch
- 63. Engine stop switch
- 64. Start switch
- 71. Ignition fuse

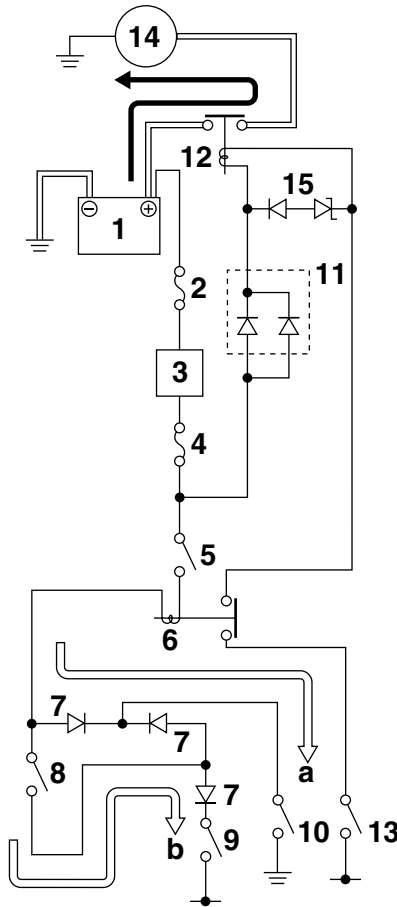
EAS27180

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. Diode
 - 12. Starter relay
 - 13. Start switch
 - 14. Starter motor
 - 15. Relay unit (diode) (for XVS13CA(C))

EAS27190

TROUBLESHOOTING

The starter motor fails to turn.

TIP

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

1. Rider seat (for XVS13AA(C)/XVS13CTA(C))
2. Seat (for XVS13CA(C))
3. Tool kit tray
4. Fuel tank
5. Headlight lens unit

1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-99.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-100.	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 8-109.	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 5-72.	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 8-103.	NG →	Replace the relay unit.
OK ↓		
6. Check the relay unit (diode). Refer to "CHECKING THE DIODES" on page 8-105.	NG →	Replace the relay unit.
OK ↓		
7. Check the diode. Refer to "CHECKING THE DIODES" on page 8-105.	NG →	Replace the diode.
OK ↓		

ELECTRIC STARTING SYSTEM

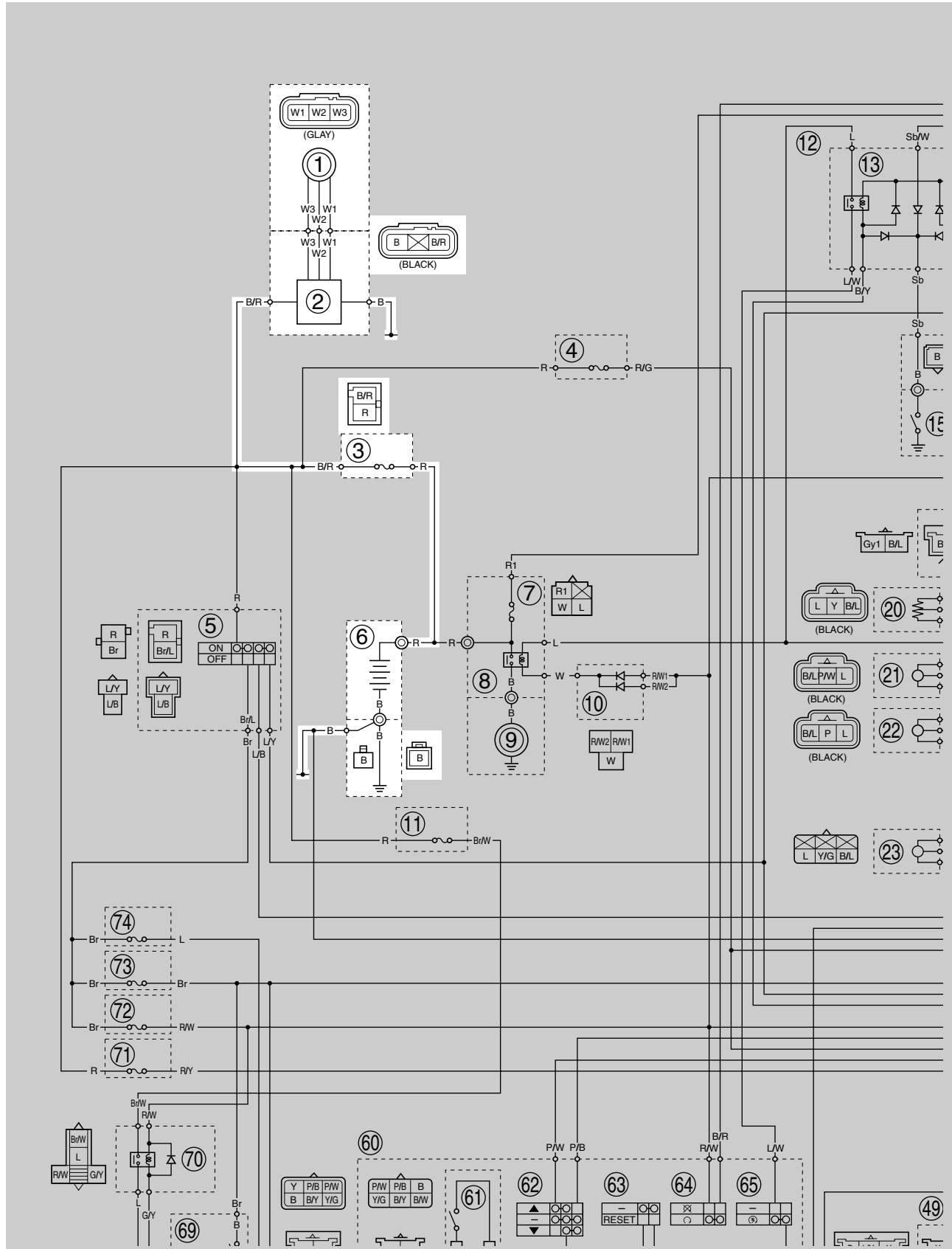
8. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-103.	NG →	Replace the starter relay.
OK ↓		
9. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the main switch.
OK ↓		
10. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the right handlebar switch.
OK ↓		
11. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the neutral switch.
OK ↓		
12. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the sidestand switch.
OK ↓		
13. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the clutch switch.
OK ↓		
14. Check the start switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the right handlebar switch.
OK ↓		
15. Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-9 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-11.	NG →	Properly connect or repair the starting system's wiring.
OK ↓		
The starting system circuit is OK.		

EAS27200

CHARGING SYSTEM

EAS27210

CIRCUIT DIAGRAM



1. AC magneto
2. Rectifier/regulator
3. Main fuse
6. Battery

EAS27230

TROUBLESHOOTING

The battery is not being charged.

TIP

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

1. Rider seat (for XVS13AA(C)/XVS13CTA(C))
2. Seat (for XVS13CA(C))
3. Tool kit tray
4. Rectifier/regulator cover

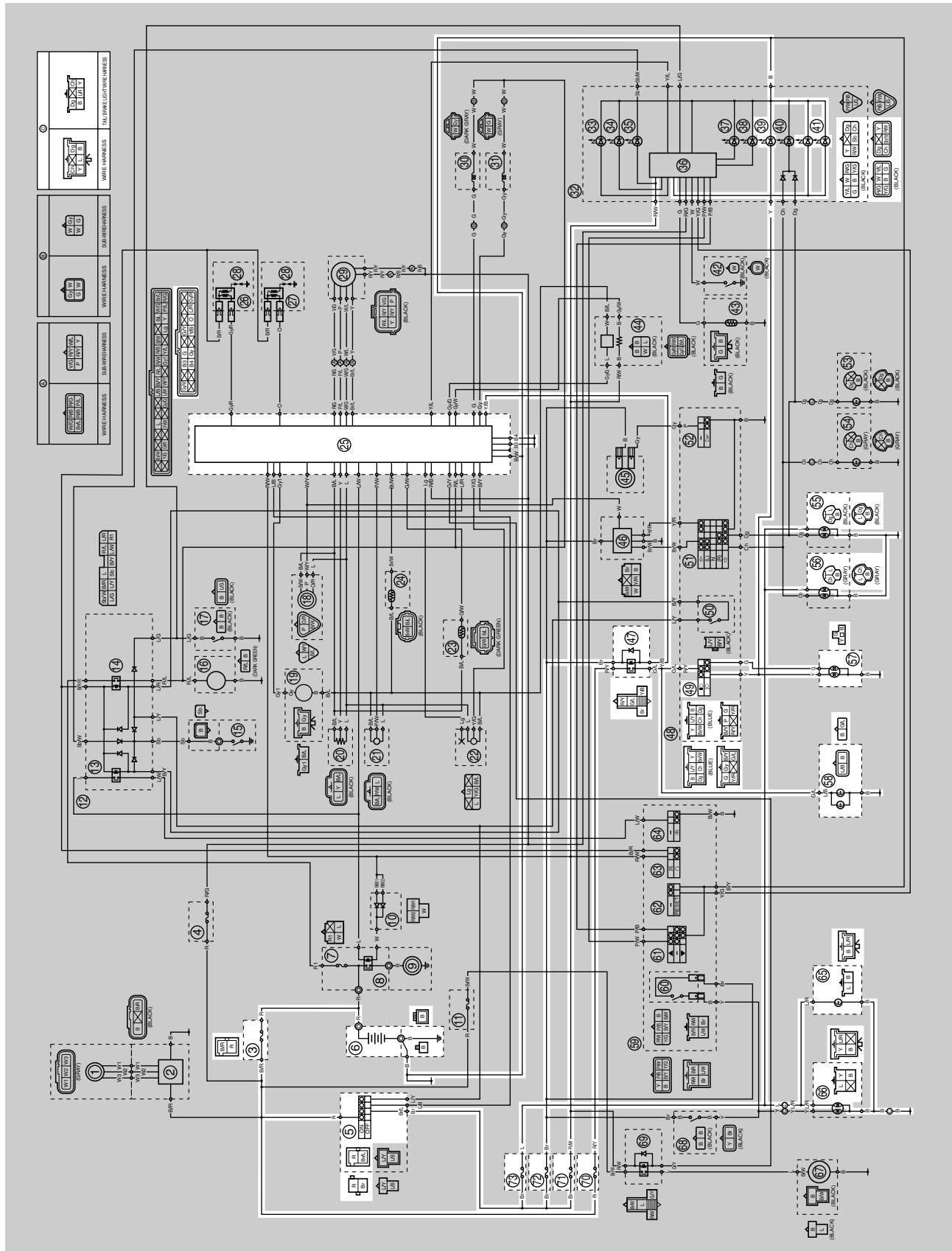
1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 8-99.	NG →	Replace the fuse.
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-100.	NG →	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 8-110.	NG →	Replace the crankshaft position sensor/stator assembly.
OK ↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 8-110.	NG →	Replace the rectifier/regulator.
OK ↓		
5. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-17.	NG →	Properly connect or repair the charging system's wiring.
OK ↓		
The charging system circuit is OK.		

EAS27240

LIGHTING SYSTEM

EAS27250

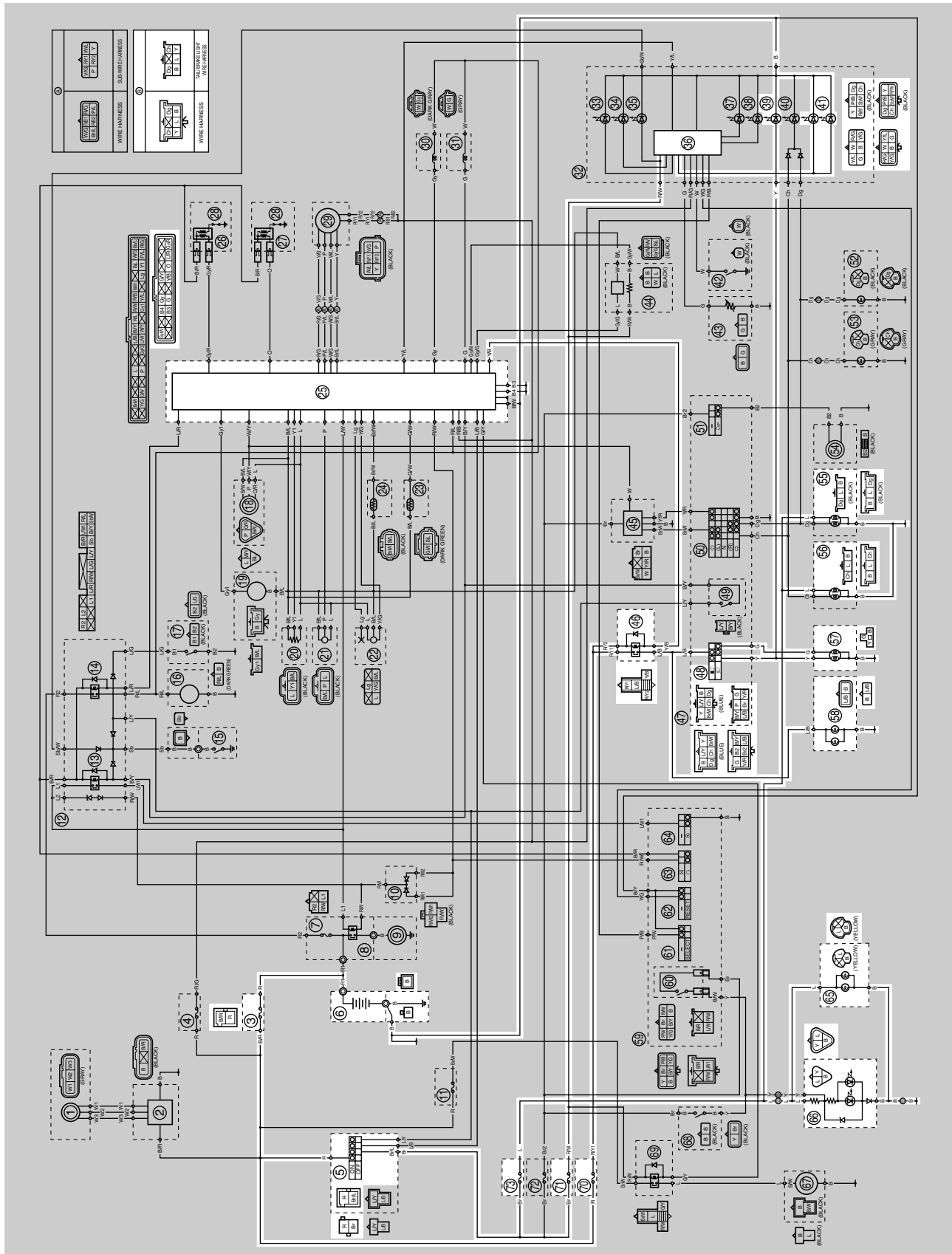
CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 25. ECU (engine control unit)
- 36. Multi-function meter
- 39. High beam indicator light
- 41. Meter light
- 47. Headlight relay
- 49. Dimmer switch
- 55. Front right turn signal/position light
- 56. Front left turn signal/position light
- 57. Headlight
- 58. Accessory light (OPTION)
- 65. License plate light
- 66. Tail/brake light
- 70. Headlight fuse
- 71. Ignition fuse
- 72. Signaling system fuse
- 73. Taillight fuse

EAS27D1011

CIRCUIT DIAGRAM (for XVS13CA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 25.ECU (engine control unit)
- 36.Multi-function meter
- 39.High beam indicator light
- 41.Meter light
- 46.Headlight relay
- 48.Dimmer switch
- 55.Front right turn signal/position light
- 56.Front left turn signal/position light
- 57.Headlight
- 58.Accessory light (OPTION)
- 65.License plate light
- 66.Tail/brake light
- 70.Headlight fuse
- 71.Ignition fuse
- 73.Taillight fuse

EAS27260

TROUBLESHOOTING (XVS13AA(C)/XVS13CTA(C))

Any of the following fail to light: headlight, high beam indicator light, taillight, license plate light, position light, meter light or accessory light (OPTION).

TIP

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

1. Rider seat
2. Tool kit tray
3. Fuel tank
4. Headlight lens unit

1. Check the condition of each bulb and bulb socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-98.	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 8-99.	NG →	Replace the fuse(s).
OK ↓		
3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-100.	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 8-93.	NG →	Replace the main switch.
OK ↓		
5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	The dimmer switch is faulty. Replace the left handlebar switch.
OK ↓		
6. Check the headlight relay. Refer to "CHECKING THE RELAYS" on page 8-103.	NG →	Replace the headlight relay.
OK ↓		

7. Check the entire lighting system's wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-21.

OK ↓

Replace the ECU or meter assembly.

NG →

Properly connect or repair the lighting system's wiring.

EAS27D1012

TROUBLESHOOTING (XVS13CA(C))

Any of the following fail to light: headlight, high beam indicator light, taillight, license plate light, position light, meter light or accessory light (OPTION).

TIP

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

1. Seat
2. Tool kit tray
3. Fuel tank
4. Headlight lens unit

1. Check the condition of each bulb and bulb socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-98.	NG →	Replace the bulb(s) and bulb socket(s).
OK ↓		
2. Check the fuses. (Main, headlight, ignition and tail-light) Refer to "CHECKING THE FUSES" on page 8-99.	NG →	Replace the fuse(s).
OK ↓		
3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-100.	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 8-93.	NG →	Replace the main switch.
OK ↓		
5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	The dimmer switch is faulty. Replace the left handlebar switch.
OK ↓		
6. Check the headlight relay. Refer to "CHECKING THE RELAYS" on page 8-103.	NG →	Replace the headlight relay.
OK ↓		

7. Check the entire lighting system wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-23.

OK ↓

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

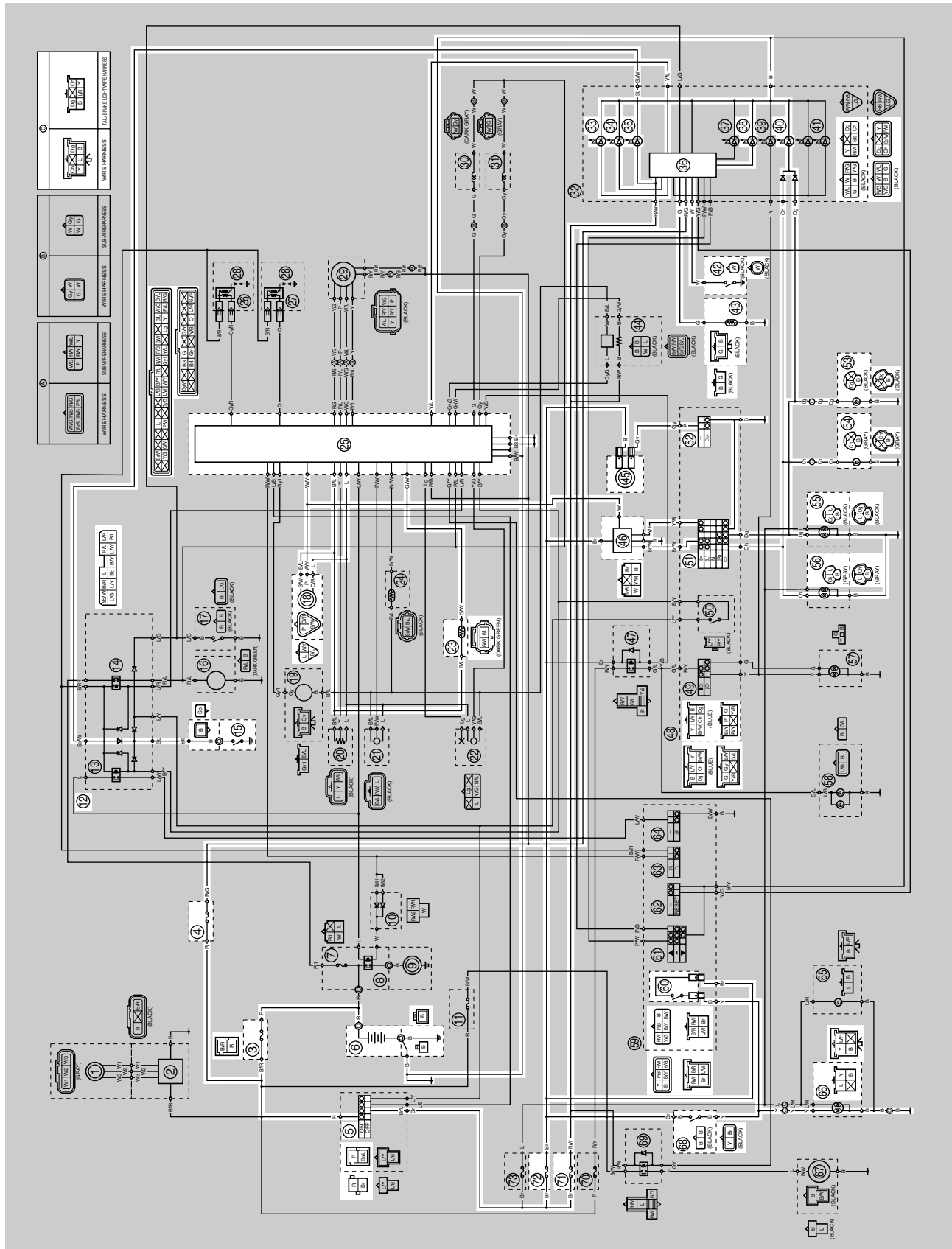
NG →

Properly connect or repair the lighting system wiring.

SIGNALING SYSTEM

EAS27280

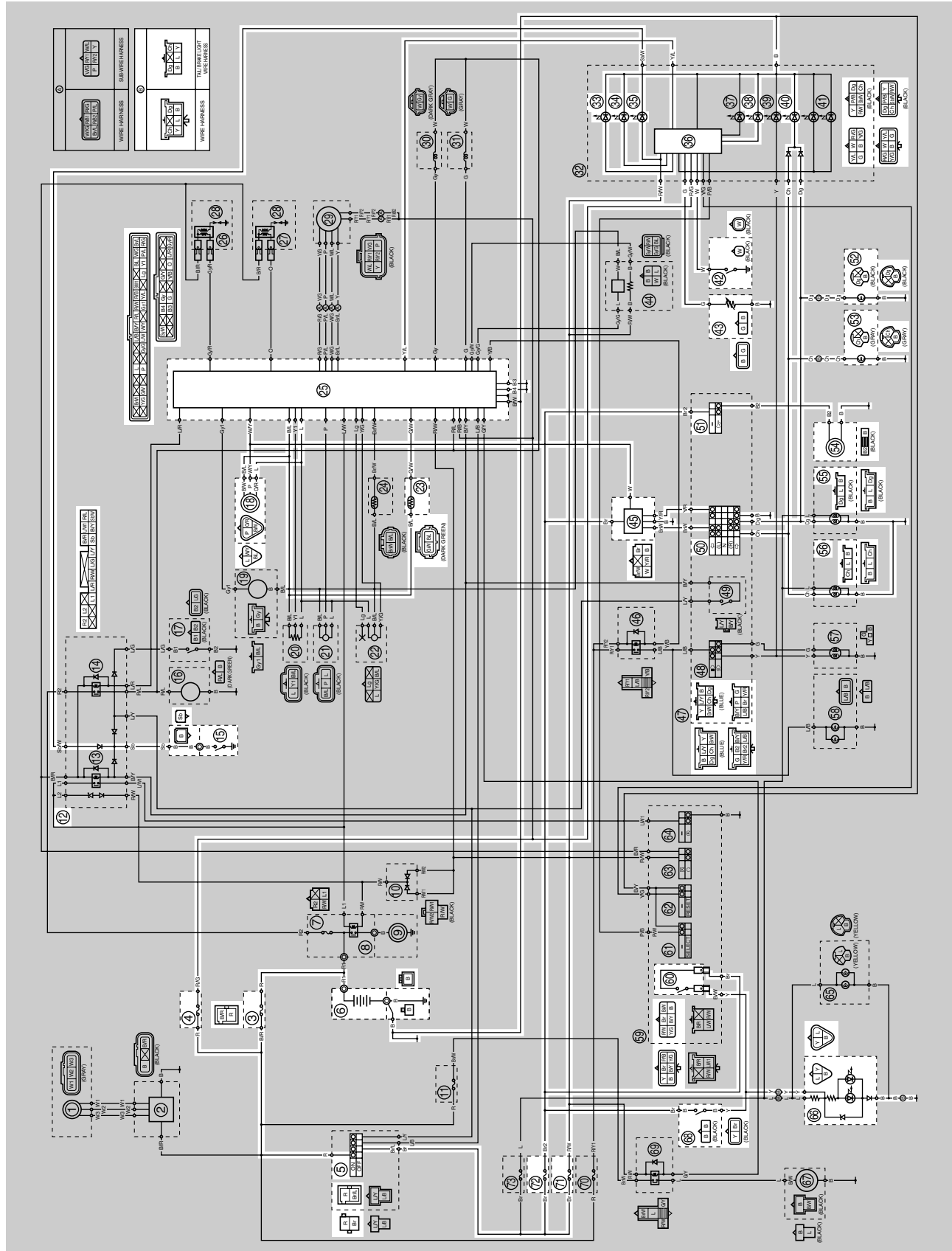
CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))



- 3. Main fuse
- 4. Backup fuse (odometer and clock)
- 5. Main switch
- 6. Battery
- 12. Relay unit
- 15. Neutral switch
- 18. Speed sensor
- 23. Coolant temperature sensor
- 25. ECU (engine control unit)
- 33. Fuel level warning light
- 34. Oil level warning light
- 35. Neutral indicator light
- 36. Multi-function meter
- 38. Coolant temperature warning light
- 40. Turn signal indicator light
- 42. Oil level switch
- 43. Fuel sender
- 45. Horn
- 46. Turn signal relay
- 51. Turn signal switch
- 52. Horn switch
- 53. Rear right turn signal light
- 54. Rear left turn signal light
- 55. Front right turn signal/position light
- 56. Front left turn signal/position light
- 60. Front brake light switch
- 66. Tail/brake light
- 68. Rear brake light switch
- 71. Ignition fuse
- 72. Signaling system fuse

EAS27D1013

CIRCUIT DIAGRAM (for XVS13CA(C))



- 3. Main fuse
- 4. Backup fuse (odometer and clock)
- 5. Main switch
- 6. Battery
- 12. Relay unit
- 15. Neutral switch
- 18. Speed sensor
- 23. Coolant temperature sensor
- 25. ECU (engine control unit)
- 33. Fuel level warning light
- 34. Oil level warning light
- 35. Neutral indicator light
- 36. Multi-function meter
- 38. Coolant temperature warning light
- 40. Turn signal indicator light
- 42. Oil level switch
- 43. Fuel sender
- 45. Turn signal relay
- 50. Turn signal switch
- 51. Horn switch
- 52. Rear right turn signal light
- 53. Rear left turn signal light
- 54. Horn
- 55. Front right turn signal/position light
- 56. Front left turn signal/position light
- 60. Front brake light switch
- 66. Tail/brake light
- 68. Rear brake light switch
- 71. Ignition fuse
- 72. Signaling system 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 (for XVS13AA(C)/XVS13CTA(C))
 2. Seat (for XVS13CA(C))
 3. Tool kit tray
 4. Fuel tank
 5. Headlight lens unit

<p>1. Check the fuses. (Main, signaling, ignition and back-up) Refer to "CHECKING THE FUSES" on page 8-99.</p>	<p>NG →</p>	<p>Replace the fuse(s).</p>
<p>OK ↓</p>		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-100.</p>	<p>NG →</p>	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
<p>OK ↓</p>		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-93.</p>	<p>NG →</p>	<p>Replace the main switch.</p>
<p>OK ↓</p>		
<p>4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.</p>	<p>NG →</p>	<p>Properly connect or repair the signaling system's wiring.</p>
<p>OK ↓</p>		
<p>Check the condition of each of the signaling system's circuits. Refer to "Checking the signaling system".</p>		

Checking the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	The horn switch is faulty. Replace the left handlebar switch.
OK ↓		
2. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.	NG →	Properly connect or repair the signaling system's wiring.
OK ↓		
Replace the horn.		

The brake light fails to come on. (For XVS13AA(C)/XVS13CTA(C))

1. Check the brake light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-98.	NG →	Replace the brake light bulb, socket or both.
OK ↓		
2. Check the front brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the front brake light switch.
OK ↓		
3. Check the rear brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the rear brake light switch.
OK ↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29.	NG →	Properly connect or repair the signaling system's wiring.
OK ↓		
This circuit is OK.		

The tail/brake light fails to come on. (For XVS13CA(C))

1. Check the front brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the front brake light switch.
OK ↓		
2. Check the rear brake light switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	Replace the rear brake light switch.
OK ↓		
3. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.	NG →	Properly connect or repair the signaling system wiring.
OK ↓		
Replace the tail/brake light.		

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

1. Check the turn signal light bulbs and sockets. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-98.	NG →	Replace the turn signal light bulb(s), socket(s) or both.
OK ↓		
2. Check the turn signal switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	The turn signal switch is faulty. Replace the left handlebar switch.
OK ↓		
3. Check the turn signal relay. Refer to "CHECKING THE RELAYS" on page 8-103.	NG →	Replace the turn signal relay.
OK ↓		
4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.	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 8-93.

NG →

Replace the neutral switch.

OK ↓

2. Check the relay unit (diode).
Refer to "CHECKING THE DIODES" on page 8-105.

NG →

Replace the relay unit.

OK ↓

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.

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 8-110.

NG →

Replace the oil level switch.

OK ↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.

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 (for XVS13AA(C)/XVS13CTA(C))" on page 8-111 and "CHECKING THE FUEL SENDER (for XVS13CA(C))" on page 8-111.

NG →

Replace the fuel sender.

OK ↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.

NG →

Properly connect or repair the signaling system's wiring.

OK ↓

Replace the meter assembly.

The coolant temperature warning light fails to come on.

1. Check the coolant temperature sensor.
Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-113.

NG →

Replace the coolant temperature sensor.

OK ↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.

NG →

Properly connect or repair the signaling system's wiring.

OK ↓

Replace the ECU or meter assembly.

The speedometer fails to operate.

1. Check the speed sensor.
Refer to "CHECKING THE SPEED SENSOR" on page 8-112.

NG →

Replace the speed sensor.

OK ↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-29 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-31.

NG →

Properly connect or repair the signaling system's wiring.

OK ↓

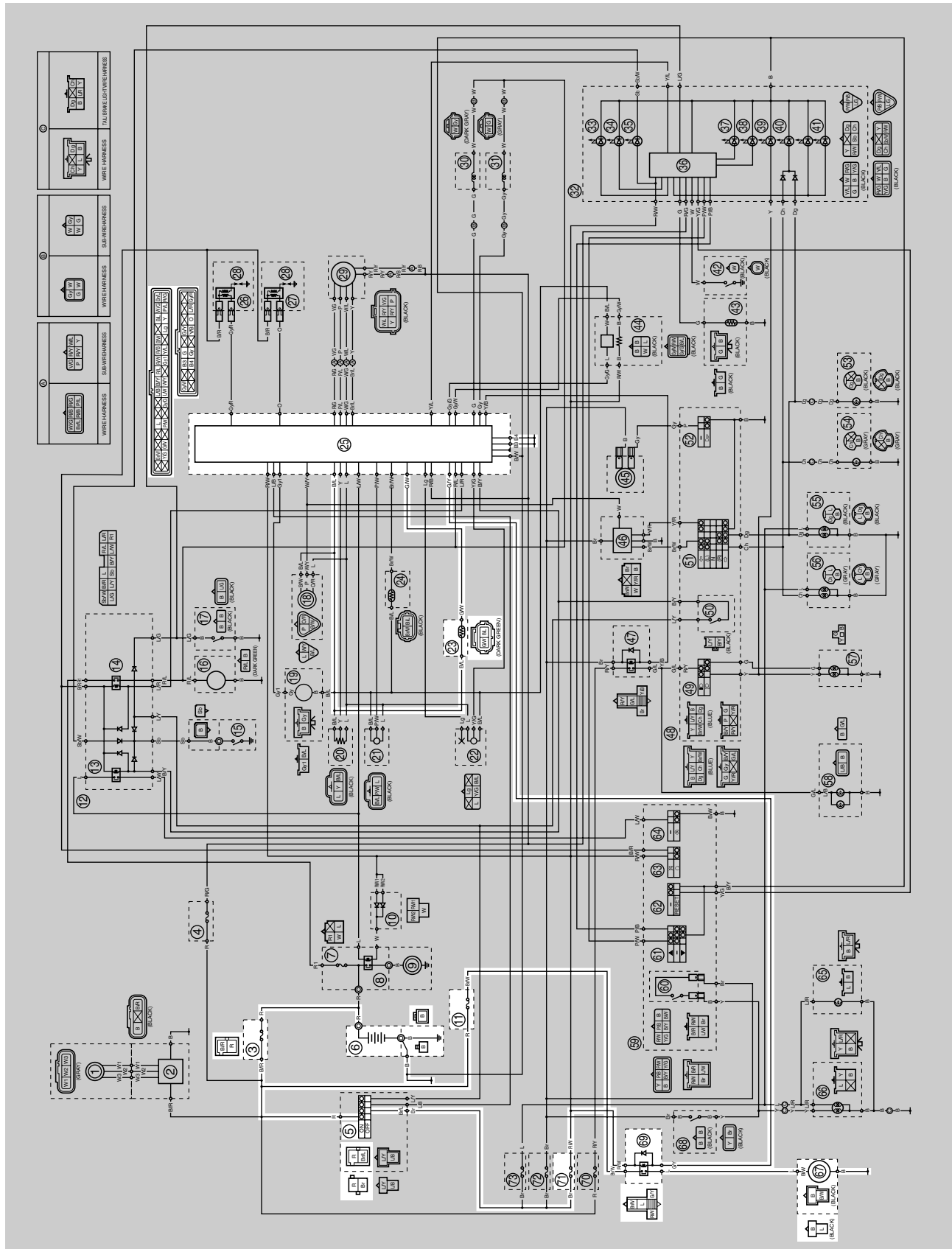
Replace the ECU or meter assembly.

EAS27300

COOLING SYSTEM

EAS27310

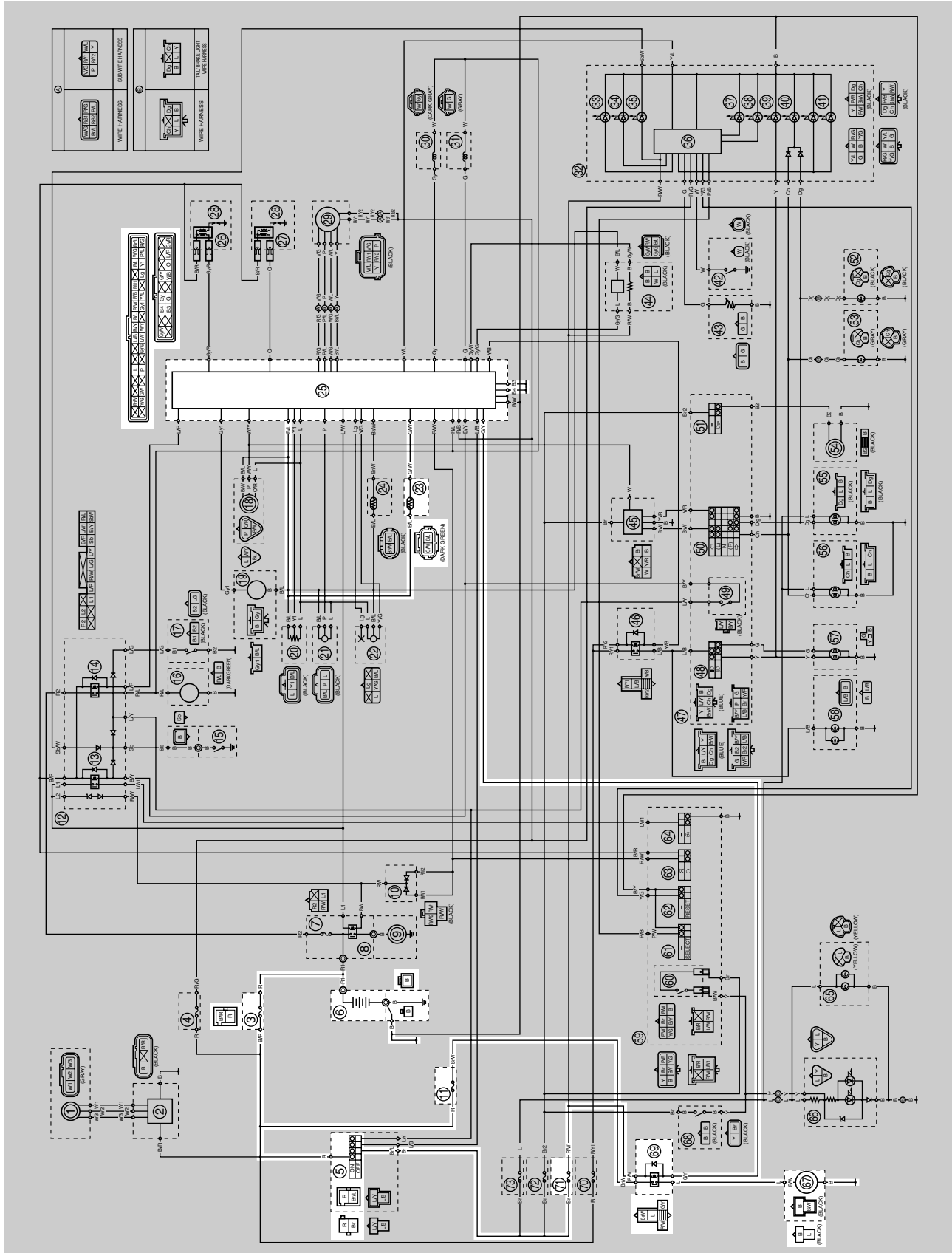
CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 11. Radiator fan motor fuse
- 23. Coolant temperature sensor
- 25. ECU (engine control unit)
- 67. Radiator fan motor
- 69. Radiator fan motor relay
- 71. Ignition fuse

EAS27D1014

CIRCUIT DIAGRAM (for XVS13CA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 11. Radiator fan motor fuse
- 23. Coolant temperature sensor
- 25. ECU (engine control unit)
- 67. Radiator fan motor
- 69. Radiator fan motor relay
- 71. Ignition fuse

EAS27320

TROUBLESHOOTING

The radiator fan motor fails to turn.

TIP

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

1. Rider seat (for XVS13AA(C)/XVS13CTA(C))
2. Seat (for XVS13CA(C))
3. Tool kit tray
4. Fuel tank
5. Headlight lens unit

1. Check the fuses. (Main, ignition and radiator fan motor) Refer to "CHECKING THE FUSES" on page 8-99.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-100.	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 8-93.	NG →	Replace the main switch.
OK ↓		
4. Check the radiator fan motor. Refer to "CHECKING THE RADIATOR FAN MOTOR" on page 8-113.	NG →	Replace the radiator fan motor.
OK ↓		
5. Check the radiator fan motor relay. Refer to "CHECKING THE RELAYS" on page 8-103.	NG →	Replace the radiator fan motor relay.
OK ↓		
6. Check the coolant temperature sensor. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-113.	NG →	Replace the coolant temperature sensor.
OK ↓		

7. Check the entire cooling system's wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-39 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-41.

OK ↓

Replace the ECU.

NG →

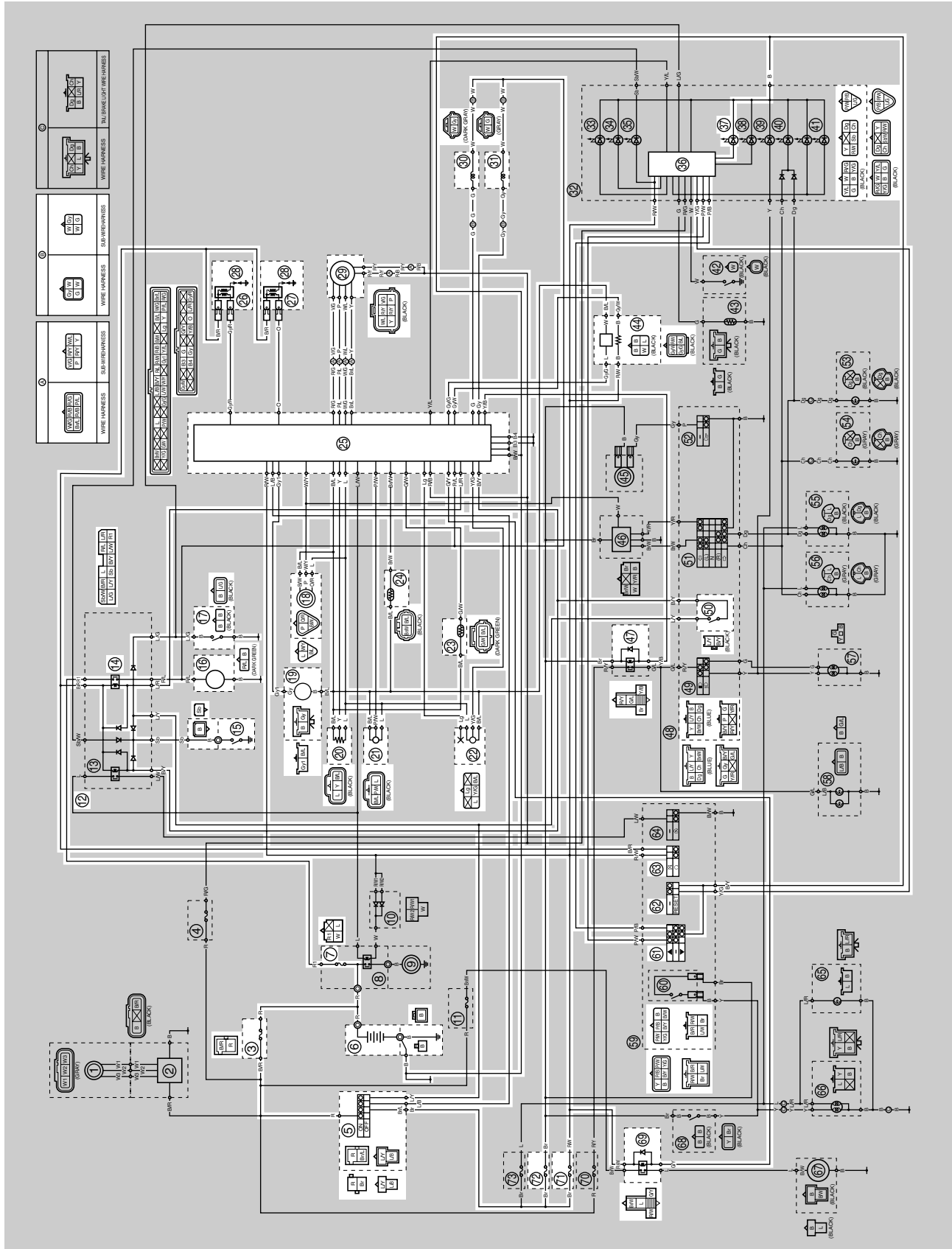
Properly connect or repair the cooling system's wiring.

EAS27330

FUEL INJECTION SYSTEM

EAS27340

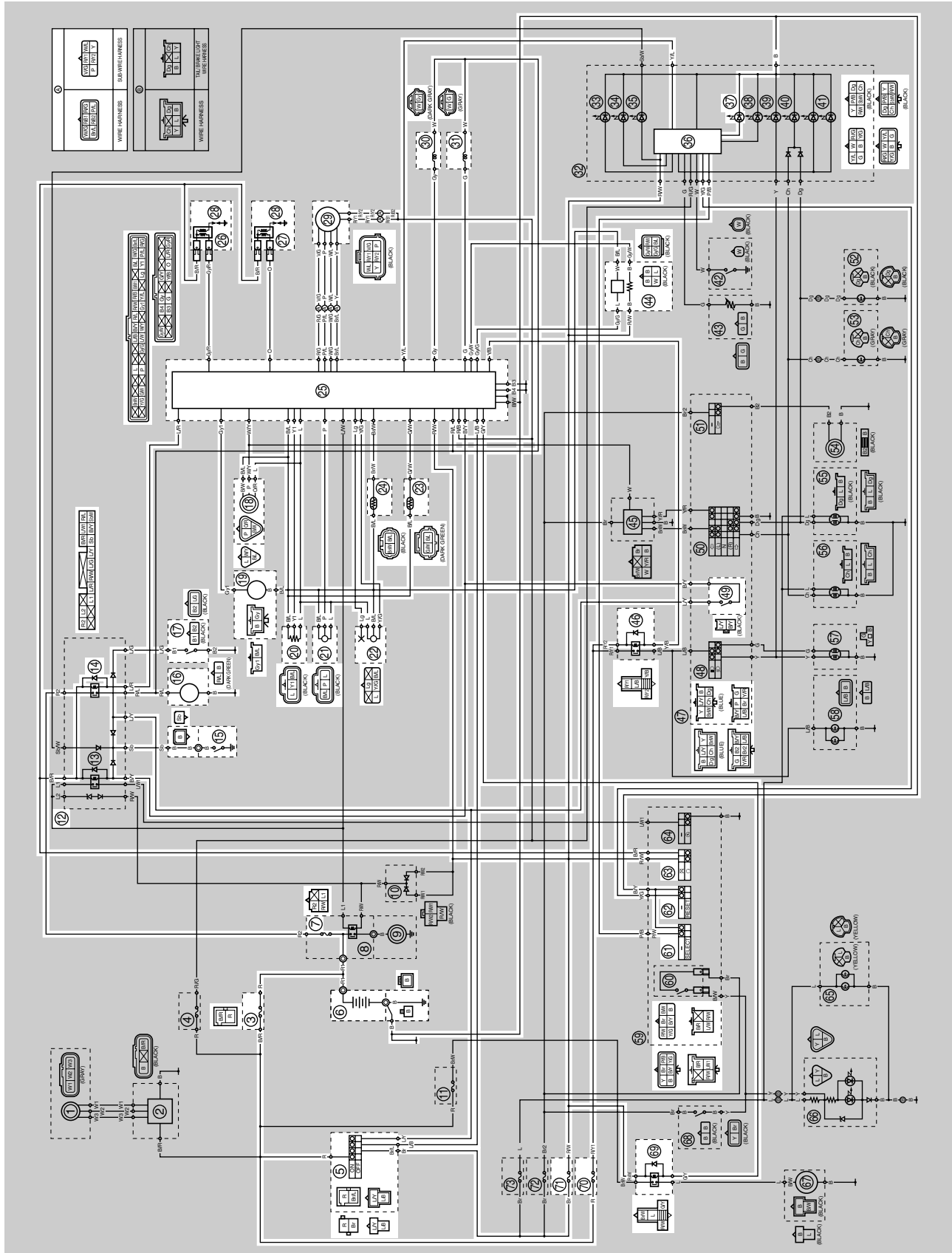
CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 7. Fuel injection system fuse
- 12. Relay unit
- 14. Fuel pump relay
- 15. Neutral switch
- 16. Fuel pump
- 17. Sidestand switch
- 18. Speed sensor
- 19. Crankshaft position sensor
- 20. Throttle position sensor
- 21. Intake air pressure sensor
- 22. Lean angle sensor
- 23. Coolant temperature sensor
- 24. Air temperature sensor
- 25. ECU (engine control unit)
- 26. Rear cylinder ignition coil
- 27. Front cylinder ignition coil
- 28. Spark plug
- 29. ISC (idle speed control) unit
- 30. Front cylinder injector
- 31. Rear cylinder injector
- 36. Multi-function meter
- 37. Engine trouble warning light
- 44. O₂ sensor
- 47. Headlight relay
- 50. Clutch switch
- 61. Select switch
- 62. Reset switch
- 63. Engine stop switch
- 69. Radiator fan motor relay
- 71. Ignition fuse
- 72. Signaling system fuse

EAS27D1015

CIRCUIT DIAGRAM (for XVS13CA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 7. Fuel injection system fuse
- 12. Relay unit
- 14. Fuel pump relay
- 15. Neutral switch
- 16. Fuel pump
- 17. Sidestand switch
- 18. Speed sensor
- 19. Crankshaft position sensor
- 20. Throttle position sensor
- 21. Intake air pressure sensor
- 22. Lean angle sensor
- 23. Coolant temperature sensor
- 24. Air temperature sensor
- 25. ECU (engine control unit)
- 26. Rear cylinder ignition coil
- 27. Front cylinder ignition coil
- 28. Spark plug
- 29. ISC (idle speed control) unit
- 30. Front cylinder injector
- 31. Rear cylinder injector
- 36. Multi-function meter
- 37. Engine trouble warning light
- 44. O₂ sensor
- 46. Headlight relay
- 49. Clutch switch
- 61. Select switch
- 62. Reset switch
- 63. Engine stop switch
- 69. Radiator fan motor relay
- 70. Headlight fuse
- 71. Ignition fuse

EAS27350

ECU SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning, the engine trouble warning light flashes when the start switch is being pushed to start the engine.
- If a malfunction is detected in the system by the self-diagnostic function, the ECU provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating the engine trouble warning light.
- After the engine has been stopped, the lowest fault code number appears on the 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

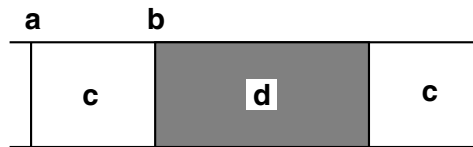
Warning light indication	ECU operation	Fuel injection operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Cannot be operated
Remains on	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	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/black 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

EAS27380

SELF-DIAGNOSTIC FUNCTION TABLE

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.

Self-Diagnostic Function table

Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
12	Crankshaft position sensor	No normal signals are received from the crankshaft position sensor.	Unable	Unable
13	Intake air pressure sensor (open or short circuit)	Intake air pressure sensor: open or short circuit detected.	Able	Able
14	Intake air pressure sensor (hose system)	Intake air pressure sensor: hose system malfunction (clogged or detached hose).	Able	Able
15	Throttle position sensor (open or short circuit)	Throttle position sensor: open or short circuit detected.	Able	Able
19	Blue/black ECU lead (broken or disconnected)	A break or disconnection of the blue/black lead of the ECU is detected.	Unable	Unable
21	Coolant temperature sensor	Coolant temperature sensor: open or short circuit detected.	Able	Able
22	Air temperature sensor (open or short circuit)	Air temperature sensor: open or short circuit detected.	Able	Able
24	O ₂ sensor	No normal signal is received from the O ₂ sensor.	Able	Able

FUEL INJECTION SYSTEM

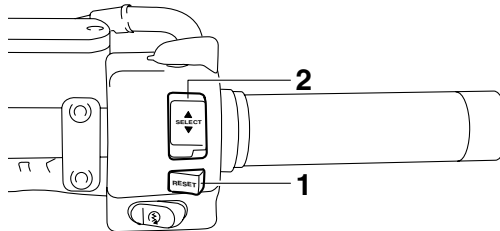
Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
30	Lean angle sensor (latch up detected)	The vehicle has overturned.	Unable	Unable
33	Front cylinder ignition coil (faulty ignition)	Malfunction detected in the primary wire of the front cylinder ignition coil.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)
34	Rear cylinder ignition coil (faulty ignition)	Malfunction detected in the primary wire of the rear cylinder ignition coil.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)
37	ISC valve (stuck fully open)	Engine speed is high when the engine is idling.	Able	Able
39	Injector	Injector: open or short circuit detected.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)
41	Lean angle sensor (open or short circuit)	Lean angle sensor: open or short circuit detected.	Unable	Unable
42	Speed sensor	No normal signals are received from the speed sensor.	Able	Able
	Neutral switch	Open or short circuit is detected in the neutral switch.		
	Clutch switch	Open or short circuit is detected in the clutch switch.		
43	Fuel system voltage (monitoring voltage)	The ECU is unable to monitor the battery voltage (an open or short circuit in the line to the ECU).	Able	Able
44	Error in writing the amount of CO adjustment on EEPROM	Error is detected while reading or writing on EEPROM (CO adjustment value).	Able	Able
46	Vehicle system power supply (monitoring voltage)	Charging voltage is abnormal.	Able	Able
50	ECU internal malfunction (memory check error)	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	Unable	Unable

EAS27420

DIAGNOSTIC MODE

Setting the diagnostic mode (for XVS13AA(C)/XVS13CTA(C))

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. Press and hold the “RESET” switch “1” and the “▲” side of the “SELECT” switch “2”, turn the main switch to “ON”, and continue to press the switches for 8 seconds or more.



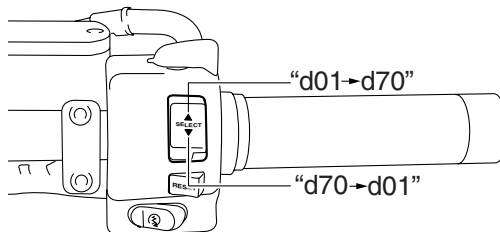
TIP

“diag” appears on the odometer/trip meter/fuel reserve trip meter/clock LCD.

4. Simultaneously press the “▲” side of 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 odometer/trip meter/fuel reserve trip meter/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 “▼” side of the “SELECT” switch. Press the “▼” side of the “SELECT” switch for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the “▲” side of the switch. Press the “▲” side of the 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.

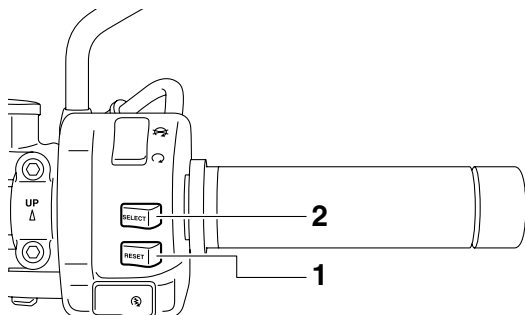
TIP

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.

Setting the diagnostic mode (for XVS13CA(C))

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. Press and hold the “RESET” switch “1” and “SELECT” switch “2”, turn the main switch to “ON”, and continue to press the switches for 8 seconds or more.



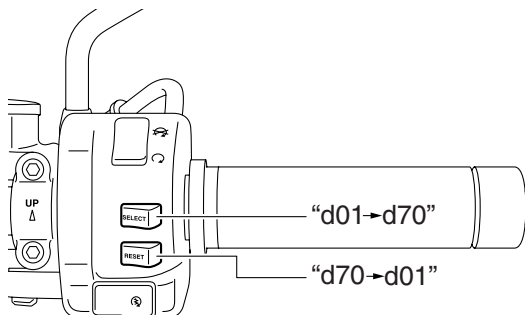
TIP

“dIAG” appears on the odometer/trip meter/fuel reserve trip meter/clock LCD.

4. Simultaneously press the “SELECT” switch and “RESET” switch for 2 seconds or more to activate the diagnostic mode. The diagnostic code number “d01” appears on the odometer/trip meter/fuel reserve trip meter/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 “RESET” switch. Press the “RESET” 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.

Diagnostic code table

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
12	No normal signals are received from the crankshaft position sensor.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective crankshaft position sensor. • Malfunction in crankshaft position sensor rotor. • Malfunction in ECU. • Improperly installed crankshaft position sensor. 	—
13	Intake air pressure sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective intake air pressure sensor. • Malfunction in ECU. 	04
14	Intake air pressure sensor: hose system malfunction (clogged or detached hose).	<ul style="list-style-type: none"> • Intake air pressure sensor hose is detached, clogged, kinked, or pinched. • Malfunction in ECU. • Improperly installed intake air pressure sensor. 	04
15	Throttle position sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective throttle position sensor. • Malfunction in ECU. • Improperly installed throttle position sensor. 	01
19	A break or disconnection of the blue/black lead of the ECU is detected.	<ul style="list-style-type: none"> • Malfunction in wire harness ECU coupler. • Open or short circuit in wire harness. • Defective sidestand switch. • Malfunction in ECU. 	20
21	Coolant temperature sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective coolant temperature sensor. • Malfunction in ECU. • Improperly installed coolant temperature sensor. 	06
22	Air temperature sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective air temperature sensor. • Malfunction in ECU. • Improperly installed air temperature sensor. 	05
24	No normal signal is received from the O ₂ sensor.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective O₂ sensor. • Malfunction in ECU. • Improperly installed O₂ sensor. • Deteriorated or contaminated fuel. 	—
30	The vehicle has overturned.	<ul style="list-style-type: none"> • The vehicle has overturned. • Defective lean angle sensor. • Malfunction in ECU. • Improperly installed lean angle sensor. 	08
33	Malfunction detected in the primary wire of the front cylinder ignition coil.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Malfunction in front cylinder ignition coil. • Malfunction in ECU. • Improperly installed front cylinder ignition coil. 	30

FUEL INJECTION SYSTEM

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
34	Malfunction detected in the primary wire of the rear cylinder ignition coil.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Malfunction in rear cylinder ignition coil. • Malfunction in ECU. • Improperly installed rear cylinder ignition coil. 	31
37	Engine speed is high when the engine is idling.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Open or short circuit in sub-wire harness. • Malfunction in throttle body. • Malfunction in throttle cables. • Incorrect speed sensor signal. • Improperly installed ISC. • ISC valve is stuck fully open due to disconnected ISC unit hose or coupler. (High engine idling speed is detected with the ISC valve stuck fully open even though signals for the valve to close are continuously being transmitted by the ECU.) • Malfunction in ECU. 	54
39	Injector: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective injector. • Malfunction in ECU. • Improperly installed injector. 	36 37
41	Lean angle sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective lean angle sensor. • Malfunction in ECU. 	08
42	No normal signals are received from the speed sensor. Open or short circuit is detected in the neutral switch. Open or short circuit is detected in the clutch switch.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective speed sensor. • Malfunction in speed sensor. • Defective neutral switch. • Malfunction in the engine side of the neutral switch. • Defective clutch switch. • Improperly adjusted clutch lever. • Malfunction in ECU. 	07 21
43	The ECU is unable to monitor the battery voltage (an open or short circuit in the line to the ECU).	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Malfunction in ECU. • Defection in fuel pump relay. 	09 50
44	Error is detected while reading or writing on EEPROM (CO adjustment value).	<ul style="list-style-type: none"> • Malfunction in ECU. (The CO adjustment value is not properly written on or read from the internal memory.) 	60
46	Charging voltage is abnormal.	Malfunction in the charging system. Refer to "CHARGING SYSTEM" on page 8-17.	—
50	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	<ul style="list-style-type: none"> • Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.) 	—

FUEL INJECTION SYSTEM

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
70	Engine has been left idling. (The ECU automatically stops the engine after 20 minutes if it is left idling.)	<ul style="list-style-type: none"> • This fault code number does not indicate a malfunction. • If the engine was stopped by the ECU after idling for 20 minutes, the fault code number is stored in the malfunction history. The fault code number is displayed only when diagnostic code No. 61 is executed. 	—
Er-1	No signals are received from the ECU.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Malfunction in meter. • Malfunction in ECU. 	—
Er-2	No signals are received from the ECU within the specified duration.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Malfunction in meter. • Malfunction in ECU. 	—
Er-3	Data from the ECU cannot be received correctly.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Malfunction in meter. • Malfunction in ECU. 	—
Er-4	Non-registered data has been received from the meter.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Malfunction in meter. • Malfunction in ECU. 	—

Sensor operation table

Diagnostic code No.	Item	Meter display	Checking method
01	Throttle angle <ul style="list-style-type: none"> • Fully closed position • Fully opened position 	14–20 87–107	Check with throttle fully closed. Check with throttle fully open.
04	Intake air pressure	Displays the intake air pressure.	Set the engine stop switch to “○”, and then operate the throttle while pushing the start switch “⊗”. (If the display value changes, the performance is OK.)
05	Air temperature	Displays the air temperature.	Compare the actually measured intake air temperature with the meter display value.
06	Coolant temperature	Displays the coolant temperature.	Compare the actually measured coolant temperature with the meter display value.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	Meter display	Checking method
07	Vehicle speed pulse	0–999	Check that the number increases when the rear wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.
08	Lean angle sensor <ul style="list-style-type: none"> • Upright • Overturned 	0.4–1.4 3.7–4.4	Remove the lean angle sensor and incline it more than 65 degrees.
09	Fuel system voltage (battery voltage)	Approximately 12.0	Set the engine stop switch to “○”, and then compare with the actually measured battery voltage. (If the battery voltage is lower, perform recharging.)
20	Sidestand switch <ul style="list-style-type: none"> • Sidestand retracted • Sidestand extended 	ON OFF	Set on/off the sidestand switch (with the transmission in gear).
21	Neutral switch and clutch switch <ul style="list-style-type: none"> • Neutral • In gear and clutch lever released • In gear, clutch lever squeezed, and sidestand retracted • In gear, clutch lever squeezed, and sidestand extended 	ON OFF ON OFF	Shift the transmission, squeeze the clutch lever, and extend the sidestand.
60	EEPROM fault code display <ul style="list-style-type: none"> • No history • History exists 	00 01 or 02 (Cylinder fault code) <ul style="list-style-type: none"> • (If both cylinders are defective, the display alternates every two seconds.) 	—

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	Meter display	Checking method
61	Malfunction history code display <ul style="list-style-type: none"> • No history • History exists 	00 Fault codes 12-70 <ul style="list-style-type: none"> • (If more than one code number is detected, the display alternates every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.) 	—
62	Malfunction history code erasure <ul style="list-style-type: none"> • No history • History exists 	0 <ul style="list-style-type: none"> • Displays the total number of malfunctions, including the current malfunction, that have occurred since the history was last erased. (For example, if there have been three malfunctions, "03" is displayed.) 	— To erase the history, set the engine stop switch to "○".
63	Malfunction code reinstatement (for fault code No. 24 only) <ul style="list-style-type: none"> • No malfunction code • Malfunction code exists 	00 Fault code 24 <ul style="list-style-type: none"> • (If more than one code number is detected, the display alternates every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.) 	— To reinstate, set the engine stop switch from "⊗" to "○".
70	Control number	0-254	—

FUEL INJECTION SYSTEM

Actuator operation table

Diagnostic code No.	Item	Actuation	Checking method
30	Front cylinder ignition coil	Actuates the front cylinder ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	Check the spark five times. • Connect an ignition checker.
31	Rear cylinder ignition coil	Actuates the rear cylinder ignition coil five times at one-second intervals. Illuminates the engine trouble warning light.	Check the spark five times. • Connect an ignition checker.
36	Front cylinder injector	Actuates the front cylinder injector five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the front cylinder injector five times.
37	Rear cylinder injector	Actuates the rear cylinder injector five times at one-second intervals. Illuminates the engine trouble warning light.	Check the operating sound of the rear cylinder injector five times.
50	Fuel pump relay	Actuates the fuel pump relay five times at one-second intervals. Illuminates the engine trouble warning light. (The engine trouble warning light is OFF when the relay is ON, and the engine trouble warning light is ON when the relay is OFF).	Check the operating sound of the fuel pump relay five times.
51	Radiator fan motor relay	Actuates the radiator fan motor relay for five cycles of five seconds. (ON 2 seconds, OFF 3 seconds) Illuminates the engine trouble warning light and rotates the radiator fan motor.	Check the operating sound of the radiator fan motor relay five times.
52	Headlight relay	Actuates the headlight relay for five cycles of five seconds. (ON 2 seconds, OFF 3 seconds) Illuminates the engine trouble warning light and headlight.	Check the operating sound of the headlight relay five times.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	Actuation	Checking method
54	ISC valve	Actuates and fully closes the ISC valve, then opens it to the standby opening position when the engine is started. This operation takes approximately 12 seconds until it is completed. Illuminates the engine trouble warning light.	The ISC unit vibrates when the ISC valve operates.

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 8-53.

Fault code No.		12	Symptom	No normal signals are received from the crankshaft position sensor.	
Diagnostic code No.		—	—	—	
Order	Item/components and probable cause			Check or maintenance job	Reinstatement method
1	Installed condition of crankshaft position sensor.			Check for looseness or pinching.	Cranking the engine.
2	Connections <ul style="list-style-type: none"> • Crankshaft position sensor coupler • Main wire harness ECU coupler 			<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	
3	Open or short circuit in wire harness.			<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between the crankshaft position sensor coupler and ECU coupler. (gray-gray) (black/blue-black/blue) 	
4	Defective crankshaft position sensor.			<ul style="list-style-type: none"> • Replace if defective. Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” on page 8-108. 	

FUEL INJECTION SYSTEM

Fault code No.		13	Symptom	Intake air pressure sensor: open or short circuit detected.	
Diagnostic code No.		04		Intake air pressure sensor	
Order	Item/components and probable cause			Check or maintenance job	Reinstatement method
1	Installed condition of intake air pressure sensor.			<ul style="list-style-type: none">• Check for looseness or pinching.	Turning the main switch to “ON”.
2	<p>Connections</p> <ul style="list-style-type: none">• Intake air pressure sensor coupler• Wire harness ECU coupler			<ul style="list-style-type: none">• Check the coupler for any pins that may be pulled out.• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.			<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit between intake air pressure sensor coupler and ECU coupler. XVS13AA(C)/XVS13CTA(C): (black/blue–black/blue) (pink/white–pink/white) (blue–blue) XVS13CA(C): (black/blue–black/blue) (pink–pink) (blue–blue)	
4	Defective intake air pressure sensor.			<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 04)• Replace if defective. Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 8-114.	

Fault code No.	14	Symptom	Intake air pressure sensor: hose system malfunction (clogged or detached hose).	
Diagnostic code No.	04	Intake air pressure sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Intake air pressure sensor hose		<ul style="list-style-type: none">• Check the intake air pressure sensor hose condition.• Repair or replace the sensor hose.	Start the engine and let it idle for approximately 5 seconds.
2	Intake air pressure sensor malfunction at intermediate electrical potential.		<ul style="list-style-type: none">• Check and repair the connection.• Replace it if there is a malfunction.	
3	Connections <ul style="list-style-type: none">• Intake air pressure sensor coupler• Wire harness ECU coupler		<ul style="list-style-type: none">• Check the coupler for any pins that may be pulled out.• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely.	
4	Defective intake air pressure sensor.		<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 04)• Replace if defective. Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 8-114.	

FUEL INJECTION SYSTEM

Fault code No.	15	Symptom	Throttle position sensor: open or short circuit detected.			
Diagnostic code No.		01	Throttle position sensor			
Order	Item/components and probable cause		Check or maintenance job		Reinstatement method	
1	Installed condition of throttle position sensor.		<ul style="list-style-type: none">• Check for looseness or pinching.• Check that the sensor is installed in the specified position.		Turning the main switch to “ON”.	
2	Connections <ul style="list-style-type: none">• Throttle position sensor coupler• Wire harness ECU coupler		<ul style="list-style-type: none">• Check the coupler for any pins that may be pulled out.• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely.			
3	Open or short circuit in wire harness.		<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit between throttle position sensor coupler and ECU coupler. (blue–blue) (yellow–yellow) (black/blue–black/blue)			
4	Throttle position sensor lead open circuit output voltage check.		<ul style="list-style-type: none">• Check for open circuit and replace the throttle position sensor. (black/blue–yellow)			
			Open circuit item	Output voltage		
			Ground wire open circuit	5 V		
			Output wire open circuit	0 V		
			Power supply wire open circuit	0 V		
5	Defective throttle position sensor.		<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 01)• Replace if defective. Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 8-114.			

Fault code No.	19	Symptom	A break or disconnection of the blue/black lead of the ECU is detected.	
Diagnostic code No.		20	Sidestand switch	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connection <ul style="list-style-type: none">• Sidestand switch coupler• Main switch coupler• Wire harness ECU coupler		<ul style="list-style-type: none">• Check the coupler for any pins that may be pulled out.• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely.	If the transmission is in gear, retracting the sidestand. If the transmission is in neutral, reconnecting the wiring.
2	Open or short circuit in wire harness.		<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit.• Between ECU and blue/black lead.	
3	Defective sidestand switch.		<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 20)• Replace if defective. Refer to “CHECKING THE SWITCHES” on page 8-93.	

Fault code No.	21	Symptom	Coolant temperature sensor: open or short circuit detected.	
Diagnostic code No.	06	Coolant temperature sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Installed condition of coolant temperature sensor.		Check for looseness or pinching.	Turning the main switch to “ON”.
2	Connections <ul style="list-style-type: none">• Coolant temperature sensor coupler• Wire harness ECU coupler		<ul style="list-style-type: none">• Check the coupler for any pins that may be pulled out.• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.		<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit between coolant temperature sensor coupler and ECU coupler. (black/blue–black/blue) (green/white–green/white)	
4	Defective coolant temperature sensor.		<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 06)• Replace if defective. Refer to “CHECKING THE COOLANT TEMPERATURE SENSOR” on page 8-113.	

FUEL INJECTION SYSTEM

Fault code No.	22	Symptom	Air temperature sensor: open or short circuit detected.	
Diagnostic code No.	05	Air temperature sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Installed condition of air temperature sensor.		Check for looseness or pinching.	Turning the main switch to "ON".
2	Connections <ul style="list-style-type: none">• Air temperature sensor coupler• Wire harness ECU coupler		<ul style="list-style-type: none">• Check the coupler for any pins that may be pulled out.• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.		<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit between air temperature sensor coupler and ECU coupler. (brown/white–brown/white) (black/blue–black/blue)	
4	Defective air temperature sensor.		<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 05)• Replace if defective. Refer to "CHECKING THE AIR TEMPERATURE SENSOR" on page 8-114.	

FUEL INJECTION SYSTEM

Fault code No.	24	Symptom	No normal signal is received from the O₂ sensor.	
Diagnostic code No.	—	—		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Installed condition of O ₂ sensor.		Check for looseness or pinching.	Starting the engine and operating it at idle.
2	Connections <ul style="list-style-type: none"> • O₂ sensor coupler • Wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	
3	Open or short circuit in wire harness.		<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between O₂ sensor coupler and ECU coupler. (gray/white—gray/white) (red/white—red/white) (gray/green—gray/green) (black/blue—black/blue) 	
4	Check fuel pressure.		<ul style="list-style-type: none"> • Refer to “CHECKING THE FUEL PRESSURE” on page 7-14. 	
5	Defective O ₂ sensor.		<ul style="list-style-type: none"> • Replace if defective. 	

Fault code No.	30	Symptom	The vehicle has overturned.	
Diagnostic code No.	08	Lean angle sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	The vehicle has overturned.		Raise the vehicle upright.	Turning the main switch to “ON” (however, the engine cannot be restarted unless the main switch is first turned “OFF”).
2	Installed condition of lean angle sensor.		Check for looseness or pinching.	
3	Connections <ul style="list-style-type: none"> • Lean angle sensor coupler • Wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	
4	Defective lean angle sensor.		<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No. 08) • Replace if defective. Refer to “CHECKING THE LEAN ANGLE SENSOR” on page 8-109. 	

FUEL INJECTION SYSTEM

Fault code No.	33	Symptom	Malfunction detected in the primary wire of the front cylinder ignition coil.	
Diagnostic code No.		30	Front cylinder ignition coil	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Installed condition of front cylinder ignition coil.		• Check for looseness or pinching.	Start the engine and let it idle for approximately 5 seconds.
2	Connections <ul style="list-style-type: none">• Front cylinder ignition coil connector (primary coil side)• Wire harness ECU coupler		• Check the connector and coupler for any pins that may be pulled out. • Check the locking condition of the connector and coupler. • If there is a malfunction, repair it and connect the coupler securely.	
3	Open or short circuit in wire harness.		• Repair or replace if there is an open or short circuit. • Between front cylinder ignition coil connector and ECU coupler. (orange—orange) • Between front cylinder ignition coil connector and right handlebar switch coupler. (black/red—black/red)	
4	Defective front cylinder ignition coil.		• Execute the diagnostic mode. (Code No. 30) • Check the primary and secondary coils for continuity. • Replace if defective. Refer to “CHECKING THE IGNITION COILS” on page 8-108.	

FUEL INJECTION SYSTEM

Fault code No.		34	Symptom	Malfunction detected in the primary wire of the rear cylinder ignition coil.		
Diagnostic code No.		31	Rear cylinder ignition coil			
Order	Item/components and probable cause			Check or maintenance job	Reinstatement method	
1	Installed condition of rear cylinder ignition coil.			<ul style="list-style-type: none">• Check for looseness or pinching.	Start the engine and let it idle for approximately 5 seconds.	
2	<p>Connections</p> <ul style="list-style-type: none">• Rear cylinder ignition coil connector (primary coil side)• Wire harness ECU coupler			<ul style="list-style-type: none">• Check the connector and coupler for any pins that may be pulled out.• Check the locking condition of the connector and coupler.• If there is a malfunction, repair it and connect the coupler securely.		
3	Open or short circuit in wire harness.			<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit.• Between rear cylinder ignition coil connector and ECU coupler. (gray/red–gray/red)• Between rear cylinder ignition coil connector and right handlebar switch coupler. (black/red–black/red)		
4	Defective rear cylinder ignition coil.			<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 31)• Check the primary and secondary coils for continuity.• Replace if defective. Refer to “CHECKING THE IGNITION COILS” on page 8-108.		

FUEL INJECTION SYSTEM

Fault code No.	37	Symptom	Engine speed is high when the engine is idling.	
Diagnostic code No.	A	54	Component other than ISC (idle speed control) unit is defective (ISC operating sound is heard).	
	B	54	Defective ISC (idle speed control) unit (ISC operating sound is not heard).	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
A-1	Incorrect speed sensor signal.		<ul style="list-style-type: none"> • Replace if defective. Refer to "CHECKING THE SPEED SENSOR" on page 8-112. 	Start the engine and let it idle for approximately 10 seconds.
A-2	Throttle valve does not fully close.		<ul style="list-style-type: none"> • Check the throttle bodies. Refer to "THROTTLE BODIES" on page 7-9. • Check the throttle cables. Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" on page 3-8. 	
A-3	ISC valve is not moving correctly.		<ul style="list-style-type: none"> • Replace the throttle body assembly. 	
B-1	Installed condition of ISC (idle speed control) unit		<ul style="list-style-type: none"> • Check for looseness or pinching. 	Start the engine and let it idle for approximately 10 seconds.
B-2	Connections <ul style="list-style-type: none"> • ISC (idle speed control) unit coupler • Wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	
B-3	Open or short circuit in wire harness and/or injector sub-wire harness.		<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between ISC (idle speed control) unit coupler and ECU coupler. (red/green–violet/green) (pink/blue–pink) (white/green–white/blue) (brown/blue–yellow) 	
B-4	ISC valve is not moving correctly.		<ul style="list-style-type: none"> • Replace the throttle body assembly. 	

Fault code No.		39	Symptom	Fuel injector: open or short circuit detected.	
Diagnostic code No.		36, 37		Fuel injector	
Order	Item/components and probable cause			Check or maintenance job	Reinstatement method
1	Connections <ul style="list-style-type: none">• Fuel injector coupler• Wire harness ECU coupler			<ul style="list-style-type: none">• Check the couplers for any pins that may have pulled out.• Check the locking condition of the couplers.• If there is a malfunction, repair it and connect the coupler securely.	Start the engine and let it idle for approximately 5 seconds.
2	Open or short circuit in wire harness and/or injector sub-wire harness. (for XVS13AA(C)/XVS13CTA(C))			<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit.• Between rear cylinder injector coupler and ECU coupler. (gray-gray) (white-red/blue)• Between front cylinder injector coupler and ECU coupler. (green-green) (white-red/blue)	
3	Open or short circuit in wire harness (for XVS13CA(C)).			<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit.• Between rear cylinder injector coupler and ECU coupler. (gray-gray) (white-red/blue)• Between front cylinder injector coupler and ECU coupler. (green-green) (white-red/blue)	
4	Defective fuel injector.			<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No.37)• Replace if defective. Refer to “CHECKING THE INJECTORS” on page 7-14.	

FUEL INJECTION SYSTEM

Fault code No.	41	Symptom	Lean angle sensor: open or short circuit detected.	
Diagnostic code No.	08	Lean angle sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connections <ul style="list-style-type: none">• Lean angle sensor coupler• Wire harness ECU coupler		<ul style="list-style-type: none">• Check the coupler for any pins that may be pulled out.• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely.	Turning the main switch to “ON”.
2	Open or short circuit in lead.		<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit between lean angle sensor coupler and ECU coupler. (blue–blue) (yellow/green–yellow/green) (black/blue–black/blue)	
3	Defective lean angle sensor.		<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 08)• Replace if defective. Refer to “CHECKING THE LEAN ANGLE SENSOR” on page 8-109.	

Fault code No.	42	Symptom	A. No normal signals are received from the speed sensor. B. Open circuit is detected in the neutral switch. C. Open circuit is detected in the clutch switch.	
Diagnostic code No.	A	07	Speed sensor	
	B	21	Neutral switch	
	C	—	Clutch switch	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
A-1	Connections <ul style="list-style-type: none"> • Speed sensor coupler • Wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Starting the engine, and activating the speed sensor by operating the vehicle at 20 to 30 km/h.
A-2	Open or short circuit in speed sensor lead.		<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between speed sensor coupler and ECU coupler. (blue—blue) (white/yellow—white/yellow) (black/blue—black/blue) 	
A-3	Defective speed sensor.		<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No. 07) • Replace if defective. Refer to “CHECKING THE SPEED SENSOR” on page 8-112. 	

FUEL INJECTION SYSTEM

Fault code No.	42	Symptom	A. No normal signals are received from the speed sensor. B. Open circuit is detected in the neutral switch. C. Open circuit is detected in the clutch switch.	
Diagnostic code No.	A	07	Speed sensor	
	B	21	Neutral switch	
	C	—	Clutch switch	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
B-1	Connections <ul style="list-style-type: none"> • Neutral switch coupler • Wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Starting the engine, and activating the speed sensor by operating the vehicle at 20 to 30 km/h.
B-2	Open circuit in neutral switch lead.		<ul style="list-style-type: none"> • Repair or replace if there is an open circuit. • Between neutral switch coupler and relay unit coupler (fuel pump relay). (sky blue–sky blue) • Between relay unit coupler and main switch. (blue/yellow–blue/yellow) • Between main switch and ECU coupler. (blue/black–blue/black) 	
B-3	Faulty shift drum (neutral detection area).		<ul style="list-style-type: none"> • Replace if defective. Refer to “TRANSMISSION” on page 5-88. 	
B-4	Defective neutral switch.		<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No. 21) • Replace if defective. Refer to “CHECKING THE SWITCHES” on page 8-93. 	

FUEL INJECTION SYSTEM

Fault code No.	42	Symptom	A. No normal signals are received from the speed sensor. B. Open circuit is detected in the neutral switch. C. Open circuit is detected in the clutch switch.	
Diagnostic code No.	A	07	Speed sensor	
	B	21	Neutral switch	
	C	—	Clutch switch	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
C-1	Clutch lever free play adjustment.		Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-13.	Starting the engine, and activating the speed sensor by operating the vehicle at 20 to 30 km/h.
C-2	Connections <ul style="list-style-type: none"> • Clutch switch coupler • Wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	
C-3	Open circuit in clutch switch lead.		<ul style="list-style-type: none"> • Repair or replace if there is an open circuit. • Between clutch switch coupler and relay unit coupler (fuel pump relay). (black/yellow–black/yellow) (blue/yellow–blue/yellow) • Between relay unit coupler and main switch. (blue/yellow–blue/yellow) • Between clutch switch coupler and ECU coupler. (black/yellow–black/yellow) 	
C-4	Defective neutral switch.		<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No. 21) • Replace if defective. Refer to “CHECKING THE SWITCHES” on page 8-93. 	

FUEL INJECTION SYSTEM

Fault code No.	43	Symptom	The ECU is unable to monitor the battery voltage (an open or short circuit in the line to the ECU).	
Diagnostic code No.		09 50	Fuel system voltage Fuel pump relay	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connections <ul style="list-style-type: none">• Relay unit coupler (fuel pump relay)• Wire harness ECU coupler		<ul style="list-style-type: none">• Check the coupler for any pins that may be pulled out.• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely.	Start the engine and let it idle for approximately 5 seconds.
2	Open or short circuit in the wire harness.		<ul style="list-style-type: none">• Repair or replace if there is an open or short circuit.• Between relay unit coupler (fuel pump relay) and ECU coupler. (blue/red–blue/red) (red/blue–red/blue)• Between relay unit coupler (fuel pump relay) and starter relay coupler. (red–red)• Between relay unit coupler (fuel pump relay) and right handlebar switch coupler. (black/red–black/red)	
3	Malfunction or open circuit in relay unit (fuel pump relay).		<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 09 and/or 50)• Replace if defective.• If there is no malfunction with the relay unit (fuel pump relay), replace the ECU.	

Fault code No.		44	Symptom	Error is detected while reading or writing on EEPROM (CO adjustment value).		
Diagnostic code No.		60	EEPROM improper cylinder indication			
Order	Item/components and probable cause			Check or maintenance job	Reinstatement method	
1	Malfunction in ECU.			<ul style="list-style-type: none">• Execute the diagnostic mode. (Code No. 60)<ul style="list-style-type: none">1. Check the faulty cylinder. (If multiple cylinders are defective, the numbers of the faulty cylinders are displayed alternately at 2-second intervals.)• Replace ECU if defective.	Turning the main switch to “ON”.	

FUEL INJECTION SYSTEM

Fault code No.	46	Symptom	Charging voltage is abnormal.	
Diagnostic code No.	—	—		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Malfunction in charging system.		<ul style="list-style-type: none"> • Check the charging system. Refer to “CHARGING SYSTEM” on page 8-17. 	Start the engine and let it idle for approximately 5 seconds.
2	Malfunction in rectifier/regulator.		<ul style="list-style-type: none"> • Replace if defective. Refer to “CHARGING SYSTEM” on page 8-17. 	
3	Malfunction in AC magneto.		<ul style="list-style-type: none"> • Replace if defective. Refer to “CHARGING SYSTEM” on page 8-17. 	

Fault code No.	50	Symptom	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	
Diagnostic code No.	—	—		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Malfunction in ECU.		Replace the ECU. TIP _____ Do not perform this procedure with the main switch turned to “ON”. _____	Turning the main switch to “ON”.

FUEL INJECTION SYSTEM

Fault code No.	Er-1	Symptom	No signals are received from the ECU.	
Diagnostic code No.		—	—	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connections <ul style="list-style-type: none"> • Wire harness ECU coupler • Meter assembly coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Turning the main switch to "ON".
2	Open or short circuit in wire harness.		<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit between meter assembly coupler and ECU coupler. (yellow/blue–yellow/blue) 	
3	Malfunction in meter assembly.		Replace the meter assembly.	
4	Malfunction in ECU.		Replace the ECU.	

Fault code No.	Er-2	Symptom	No signals are received from the ECU within the specified duration.	
Diagnostic code No.		—	—	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connections <ul style="list-style-type: none"> • Wire harness ECU coupler • Meter assembly coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Turning the main switch to "ON".
2	Open or short circuit in wire harness.		<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit between meter assembly coupler and ECU coupler. (yellow/blue–yellow/blue) 	
3	Malfunction in meter assembly.		Replace the meter assembly.	
4	Malfunction in ECU.		Replace the ECU.	

FUEL INJECTION SYSTEM

Fault code No.	Er-3	Symptom	Data from the ECU cannot be received correctly.	
Diagnostic code No.	—	—		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connections <ul style="list-style-type: none"> • Wire harness ECU coupler • Meter assembly coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Turning the main switch to "ON".	
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit between meter assembly coupler and ECU coupler. (yellow/blue–yellow/blue) 		
3	Malfunction in meter assembly.	Replace the meter assembly.		
4	Malfunction in ECU.	Replace the ECU.		

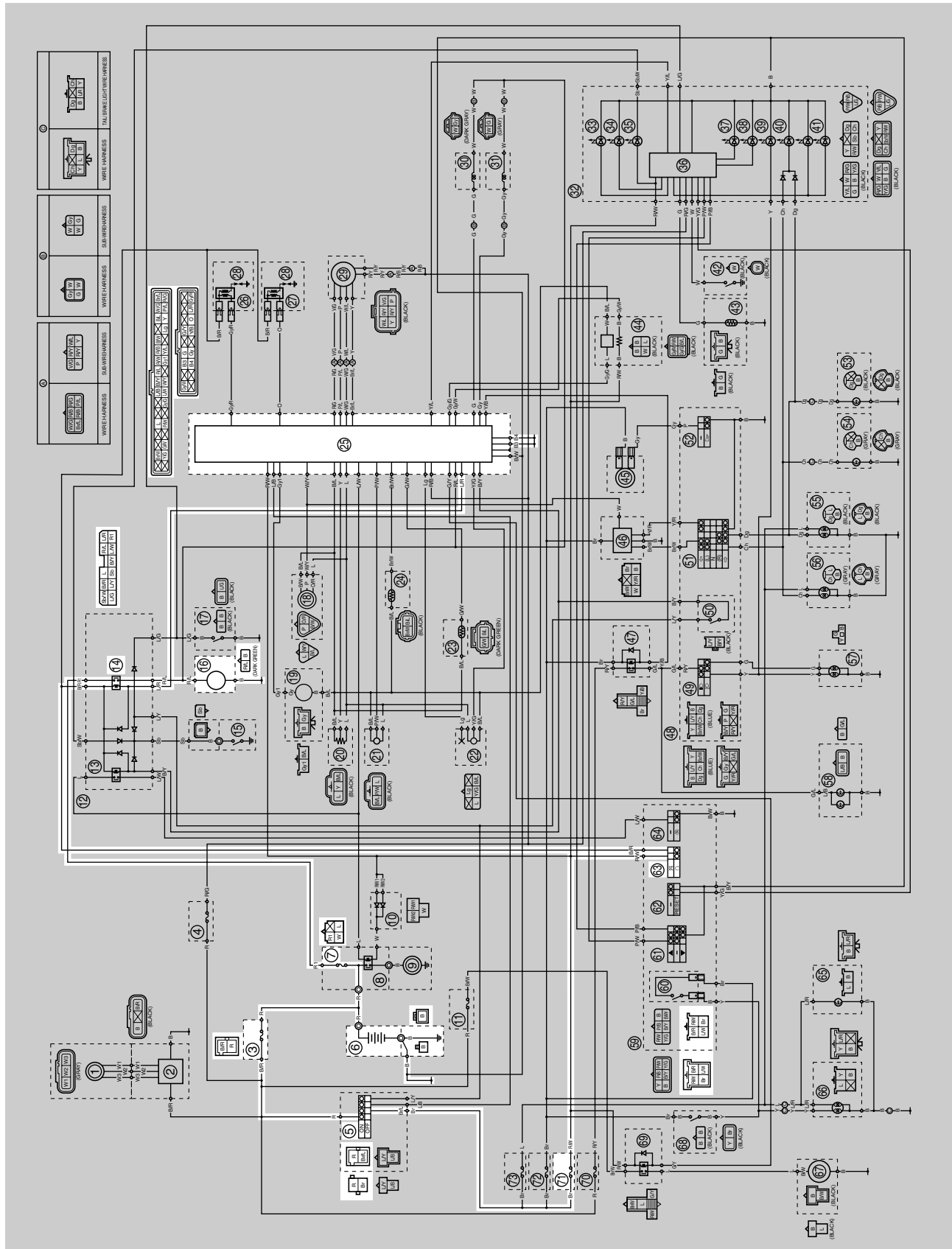
Fault code No.	Er-4	Symptom	Non-registered data has been received from the meter.	
Diagnostic code No.	—	—		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connections <ul style="list-style-type: none"> • Wire harness ECU coupler • Meter assembly coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Turning the main switch to "ON".	
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit between meter assembly coupler and ECU coupler. (yellow/blue–yellow/blue) 		
3	Malfunction in meter assembly.	Replace the meter assembly.		
4	Malfunction in ECU.	Replace the ECU.		

EAS27550

FUEL PUMP SYSTEM

EAS27560

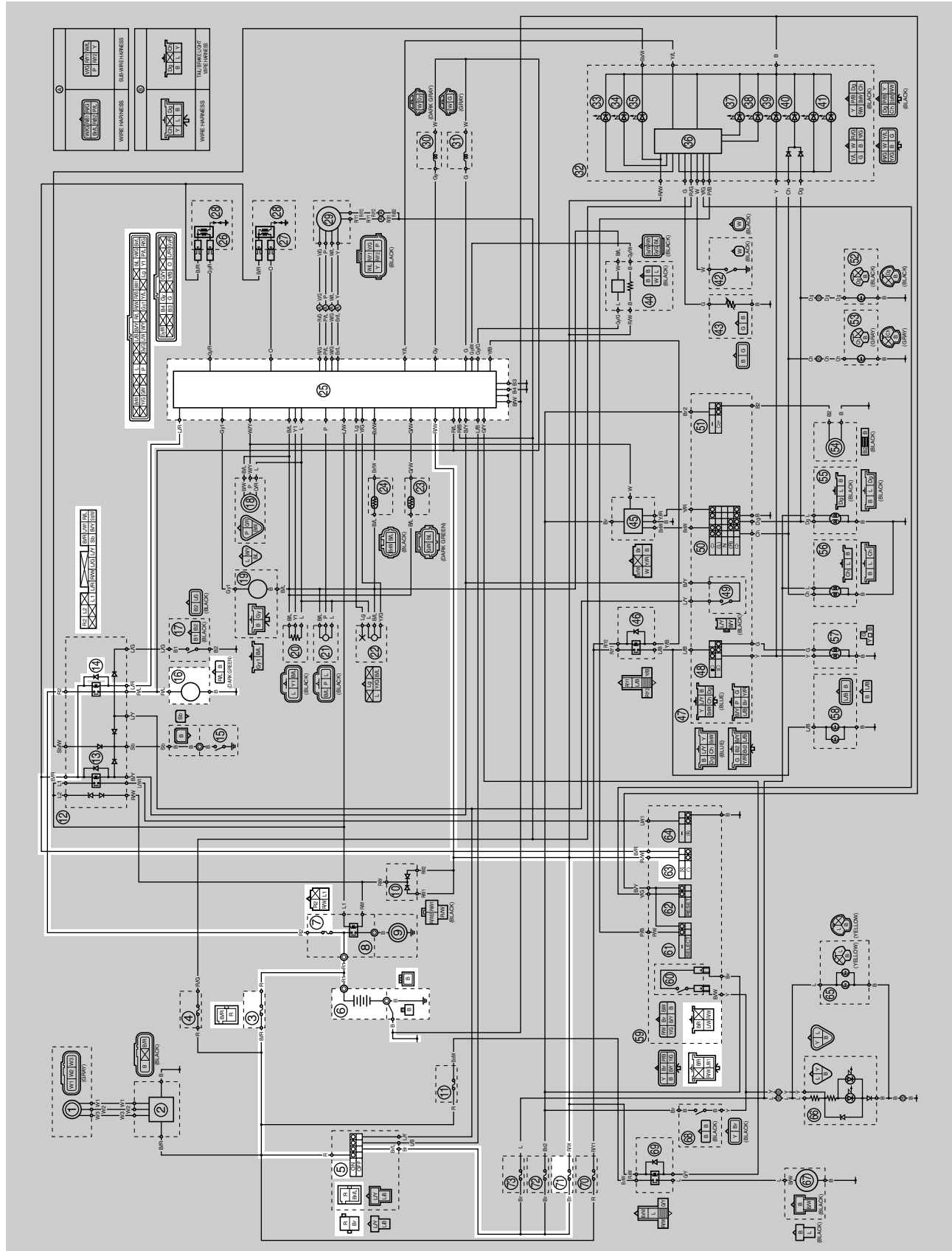
CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 7. Fuel injection system fuse
- 14. Fuel pump relay
- 16. Fuel pump
- 25. ECU (engine control unit)
- 63. Engine stop switch
- 71. Ignition fuse

EAS27D1017

CIRCUIT DIAGRAM (for XVS13CA(C))



- 3. Main fuse
- 5. Main switch
- 6. Battery
- 7. Fuel injection system fuse
- 14. Fuel pump relay
- 16. Fuel pump
- 25. ECU (engine control unit)
- 63. Engine stop switch
- 71. Ignition fuse

EAS27570

TROUBLESHOOTING

The fuel pump fails to operate.

TIP

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

1. Rider seat (for XVS13AA(C)/XVS13CTA(C))
2. Seat (for XVS13CA(C))
3. Tool kit tray
4. Fuel tank
5. Battery box
6. Headlight lens unit

1. Check the fuses. (Main, ignition and fuel injection system) Refer to "CHECKING THE FUSES" on page 8-99.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-100.	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 8-93.	NG →	Replace the main switch.
OK ↓		
4. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-93.	NG →	The engine stop switch is faulty. Replace the right handlebar switch.
OK ↓		
5. Check the relay unit (fuel pump relay). Refer to "CHECKING THE RELAYS" on page 8-103.	NG →	Replace the relay unit.
OK ↓		
6. Check the fuel pump. Refer to "CHECKING THE FUEL PUMP BODY" on page 7-7.	NG →	Replace the fuel pump.
OK ↓		

7. Check the entire fuel pump system's wiring.
Refer to "CIRCUIT DIAGRAM (for XVS13AA(C)/XVS13CTA(C))" on page 8-83 and "CIRCUIT DIAGRAM (for XVS13CA(C))" on page 8-85.

OK ↓

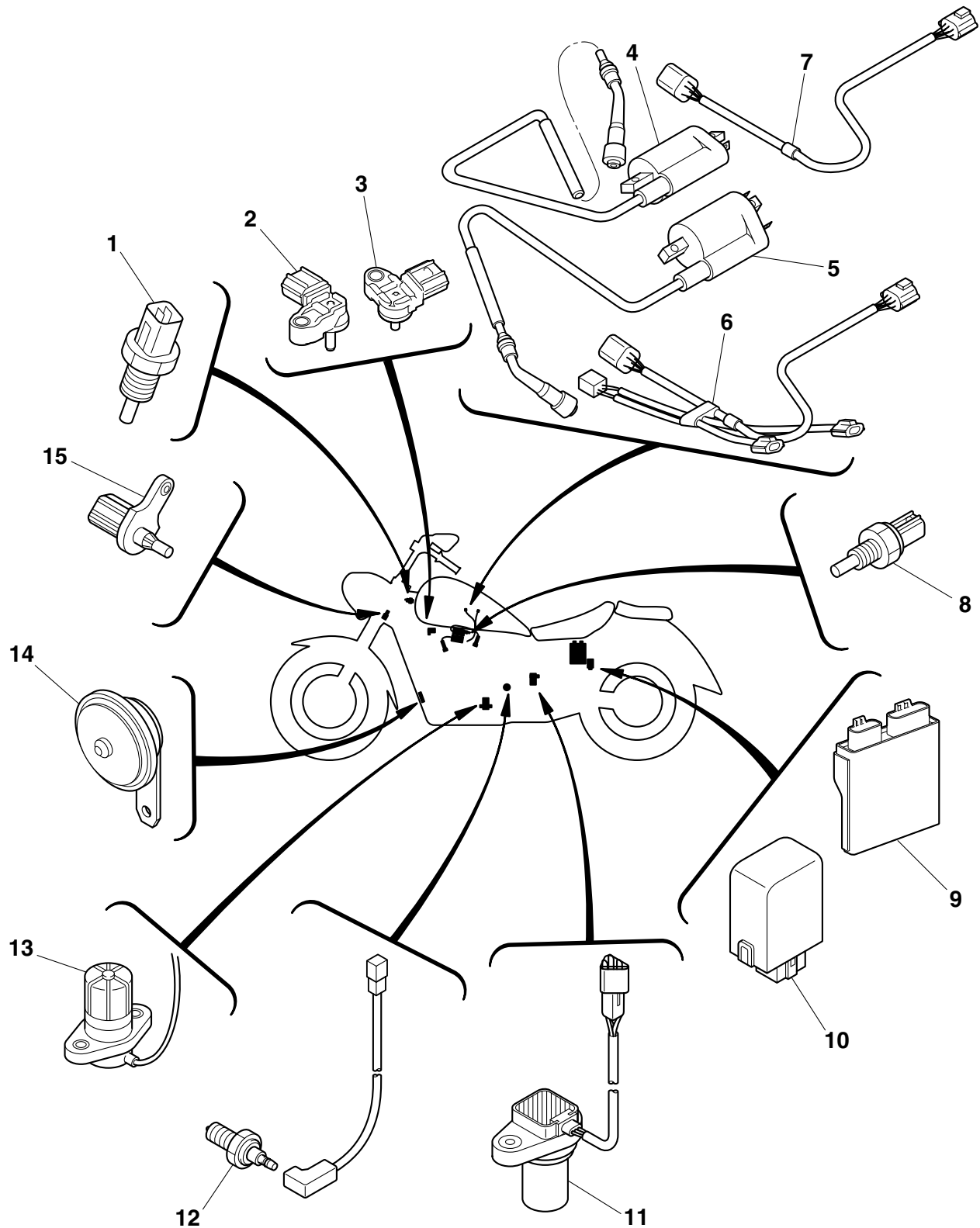
Replace the ECU.

NG →

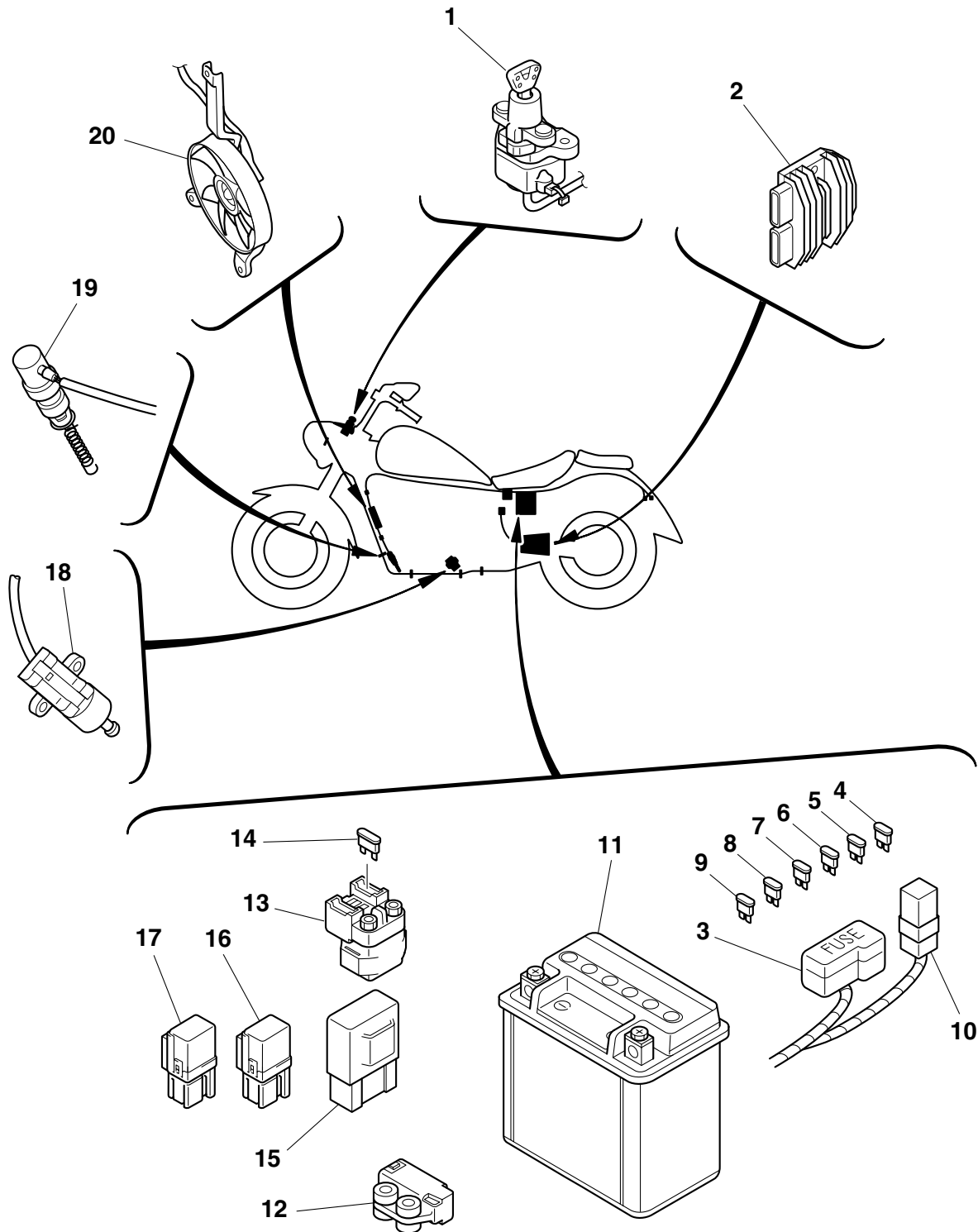
Properly connect or repair the fuel pump system's wiring.

EAS27970

ELECTRICAL COMPONENTS



1. Coolant temperature sensor (for XVS13AA(C)/XVS13CTA(C))
2. Intake air pressure sensor (for XVS13CA(C))
3. Intake air pressure sensor (for XVS13AA(C)/XVS13CTA(C))
4. Rear cylinder ignition coil
5. Front cylinder ignition coil
6. Sub-wire harness (for XVS13AA(C)/XVS13CTA(C))
7. Sub-wire harness (for XVS13CA(C))
8. Coolant temperature sensor (for XVS13CA(C))
9. ECU (engine control unit)
10. Turn signal relay
11. Speed sensor
12. Neutral switch
13. Oil level switch
14. Horn
15. Air temperature sensor

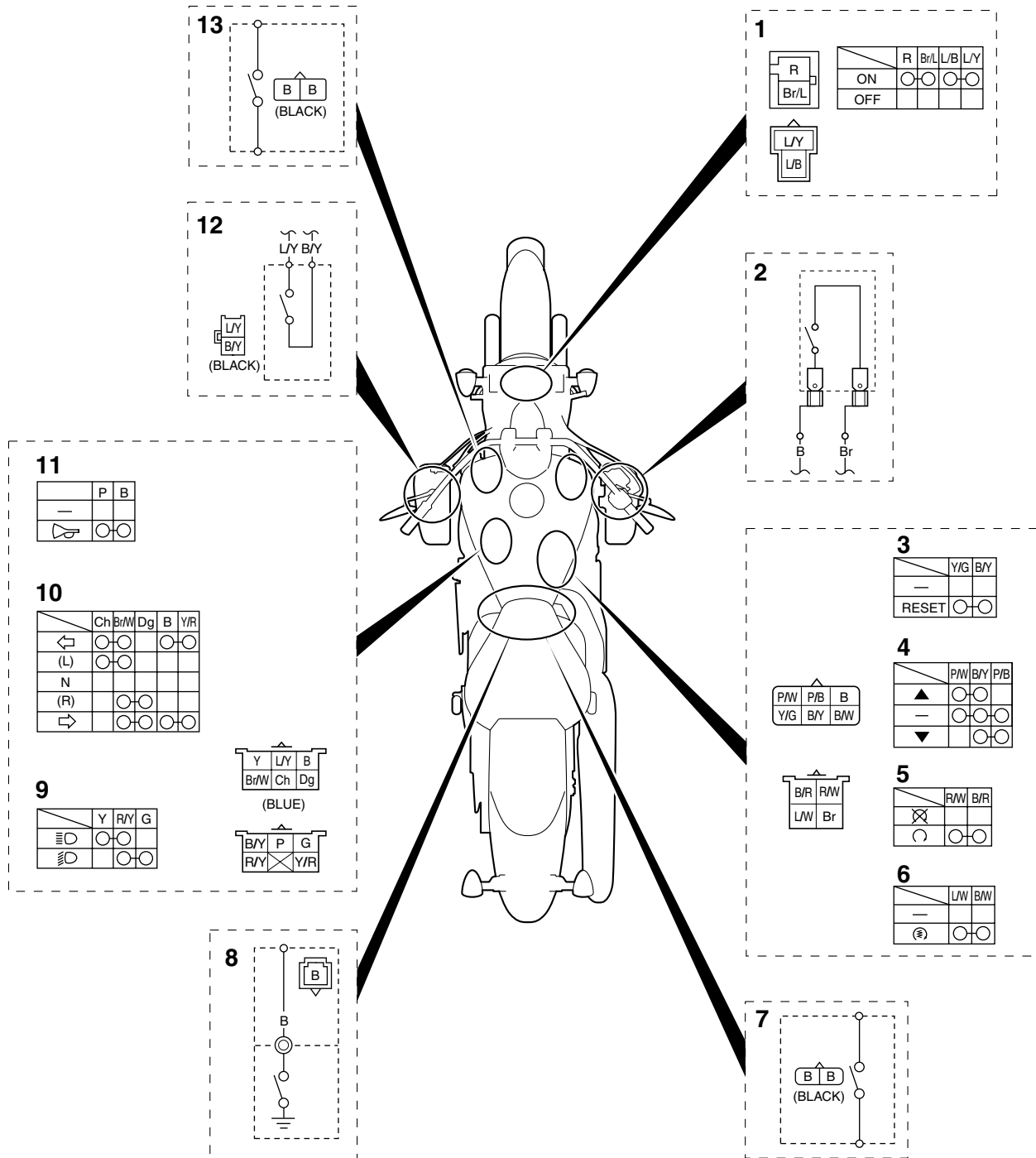


1. Main switch
2. Rectifier/regulator
3. Fuse box
4. Headlight fuse
5. Backup fuse
6. Radiator fan motor fuse
7. Taillight fuse
8. Ignition fuse
9. Signaling system fuse
10. Main fuse
11. Battery
12. Lean angle sensor
13. Starter relay
14. Fuel injection system fuse
15. Relay unit
16. Radiator fan motor relay
17. Headlight relay
18. Sidestand switch
19. Rear brake light switch
20. Radiator fan motor

EAS27980

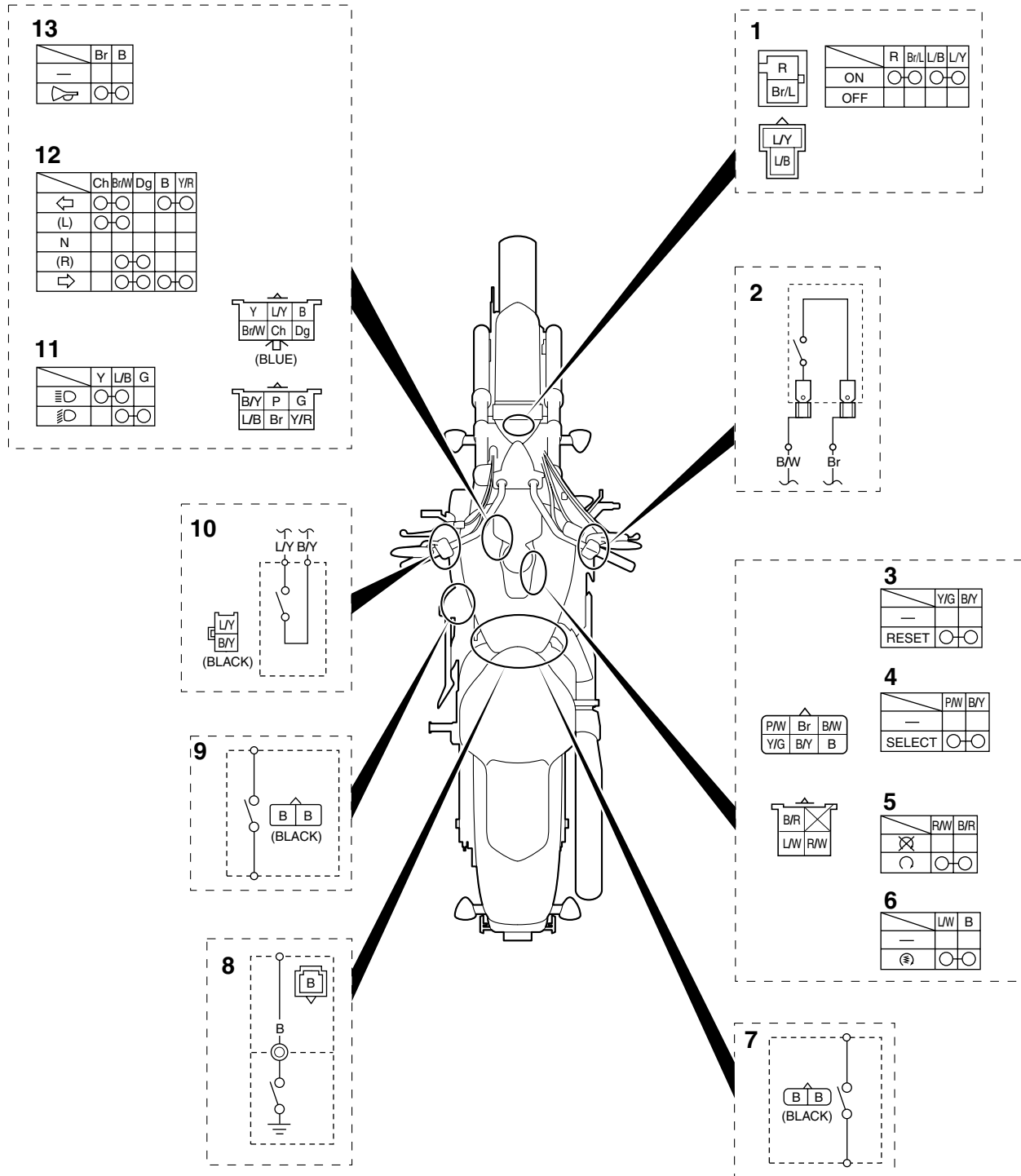
CHECKING THE SWITCHES

XVS13AA(C)/XVS13CTA(C)



1. Main switch
2. Front brake light switch
3. Reset switch
4. Select switch
5. Engine stop switch
6. Start switch
7. Rear brake light switch
8. Neutral switch
9. Dimmer switch
10. Turn signal switch
11. Horn switch
12. Clutch switch
13. Sidestand switch

XVS13CA(C)



1. Main switch
2. Front brake light switch
3. Reset switch
4. Select switch
5. Engine stop switch
6. Start switch
7. Rear brake light switch
8. Neutral switch
9. Sidestand switch
10. Clutch switch
11. Dimmer switch
12. Turn signal switch
13. Horn 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

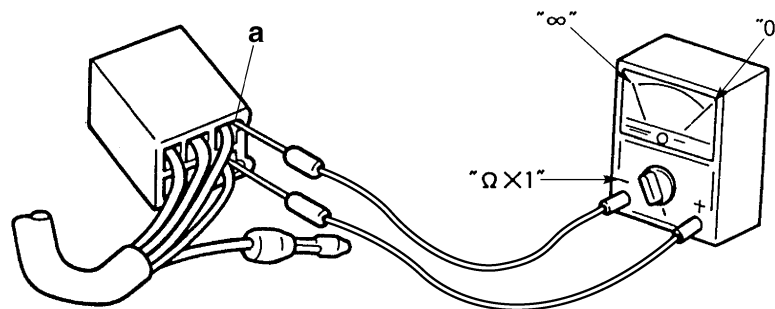
Never insert the tester probes into the coupler terminal slots "a". Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



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

TIP

- Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times 1$ " range.
- When checking for continuity, switch back and forth between the switch positions a few times.

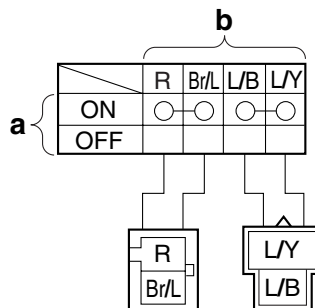


The switches and their terminal connections are illustrated as in the following example of the main switch.

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/yellow leads when the switch is set to "ON".



EAS27990

CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

Damage/wear → Repair or replace the bulb, bulb socket or both.

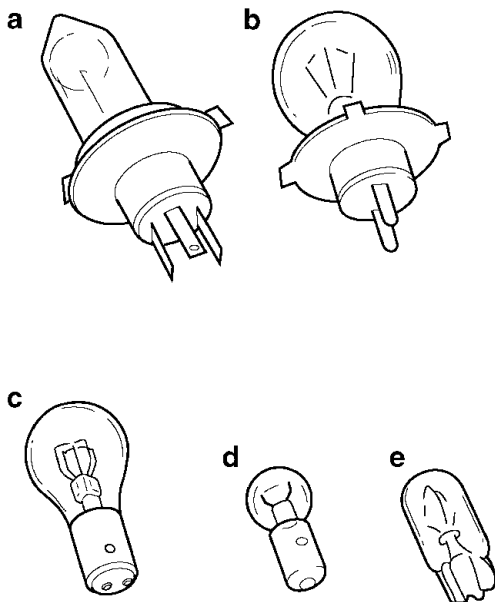
Improperly connected → Properly connect.

No continuity → Repair or replace the bulb, bulb socket or both.

Types of bulbs

The bulbs used on this vehicle are shown in the following illustration.

- Bulbs “a” and “b” are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective sockets by turning them counterclockwise.
- Bulbs “c” is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs “d” and “e” are used for meter and indicator lights and can be removed from their respective sockets by carefully pulling them out.



Checking the condition of the bulbs

The following procedure applies to all of the bulbs.

1. Remove:
 - Bulb

EWA13320

WARNING

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

ECA3D81021

NOTICE

- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.
- Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

2. Check:

- Bulb (for continuity)
(with the pocket tester)
No continuity → Replace.

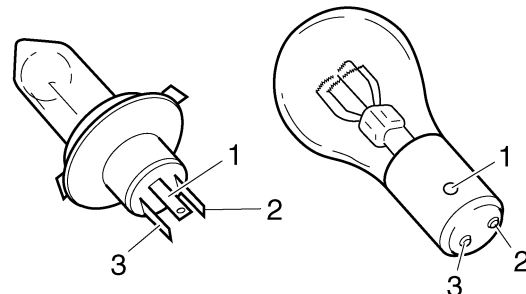


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

TIP

Before checking for continuity, set the pocket tester to “0” and to the “Ω × 1” range.

- a. Connect the positive tester probe to terminal “1” and the negative tester probe to terminal “2”, and check the continuity.
- b. Connect the positive tester probe to terminal “1” and the negative tester probe to terminal “3”, and check the continuity.
- c. If either of the readings indicates no continuity, replace the bulb.



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.

**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

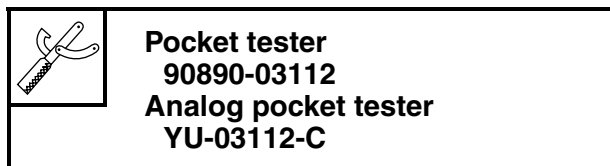
To avoid a short circuit, always set the main switch to “OFF” when checking or replacing a fuse.

1. Remove:
 - Rider seat (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
 Refer 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”.



- 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	50 A	1
Headlight	20 A	1
Ignition	15 A	1
Radiator fan motor	20 A	1
Fuel injection system	10 A	1
Signaling system	10 A	1
Taillight	10 A	1
Backup (odometer and clock)	10 A	1
Spare	20 A	1
Spare	15 A	1
Spare	10 A	2

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 (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
 Refer to “GENERAL CHASSIS” on page 4-1.

EAS28030

CHECKING AND CHARGING THE BATTERY

EWA13290



Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- **Wear protective eye gear when handling or working near batteries.**
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).**
- **DO NOT SMOKE when charging or handling batteries.**
- **KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.**
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

- **Skin — Wash with water.**
- **Eyes — Flush with water for 15 minutes and get immediate medical attention.**

INTERNAL

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

ECA13661

NOTICE

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

TIP

Since VRLA (Valve Regulated Lead Acid) batteries are sealed, it is not possible to check the charge state of the battery by measuring the

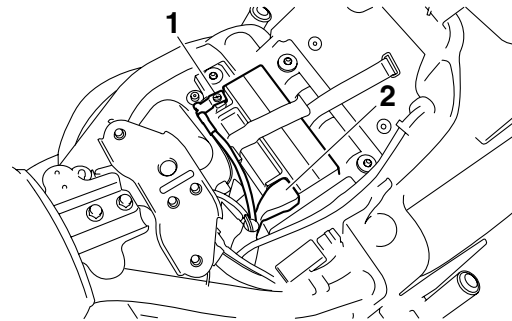
specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
 - Rider seat (for XVS13AA(C)/XVS13CTA(C))
 - Seat (for XVS13CA(C))
 - Tool kit trayRefer 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

- a. Connect a pocket tester to the battery terminals.

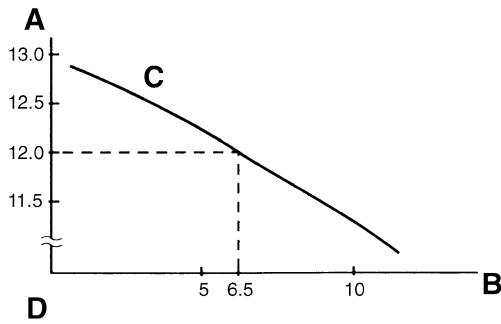
- Positive tester probe → positive battery terminal
- Negative tester probe → negative battery terminal

TIP

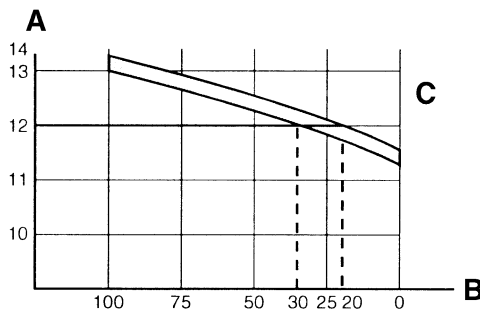
- The charge state of a VRLA (Valve Regulated Lead Acid) battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).
 - No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.
-
- b. Check the charge of the battery, as shown in the charts and the following example.

Example

Open-circuit voltage = 12.0 V
Charging time = 6.5 hours
Charge of the battery = 20–30%



- A. Open-circuit voltage (V)
 B. Charging time (hours)
 C. Relationship between the open-circuit voltage and the charging time at 20 °C (68 °F)
 D. These values vary with the temperature, the condition of the battery plates, and the electrolyte level.



- A. Open-circuit voltage (V)
 B. Charging condition of the battery (%)
 C. Ambient temperature 20 °C (68 °F)

5. Charge:

- Battery
 (refer to the appropriate charging method)

EWA13300



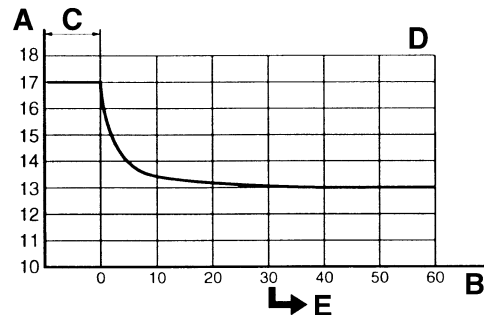
Do not quick charge a battery.

ECA13671

NOTICE

- Never remove the VRLA (Valve Regulated Lead Acid) 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 a VRLA (Valve Regulated Lead Acid) battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.



- A. Open-circuit voltage (V)
 B. Time (minutes)
 C. Charging
 D. Ambient temperature 20 °C (68 °F)
 E. Check the open-circuit voltage.

Charging method using a variable-current (voltage) charger

- 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 VRLA (Valve Regulated Lead Acid) 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.



- Install:
 - Battery
- Connect:
 - Battery leads
(to the battery terminals)

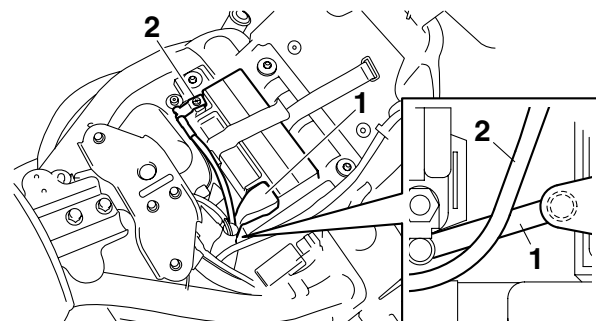
TIP

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”.



- Check:
 - Battery terminals
Dirt → Clean with a wire brush.
Loose connection → Connect properly.
- Lubricate:
 - Battery terminals



Recommended lubricant
Dielectric grease

10. Install:

- Rider seat (for XVS13AA(C)/XVS13CTA(C))
- Seat (for XVS13CA(C))
- 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.

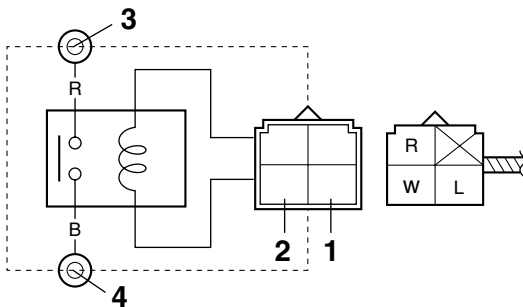


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

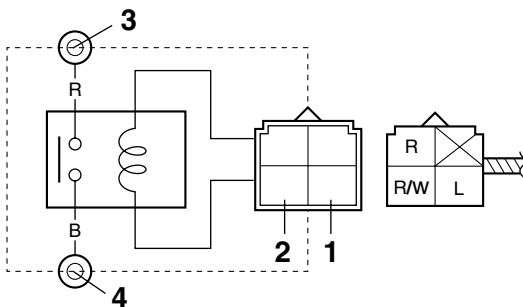
1. Disconnect the relay from the wire harness.
2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown. Check the relay operation. Out of specification → Replace.

Starter relay

A



B



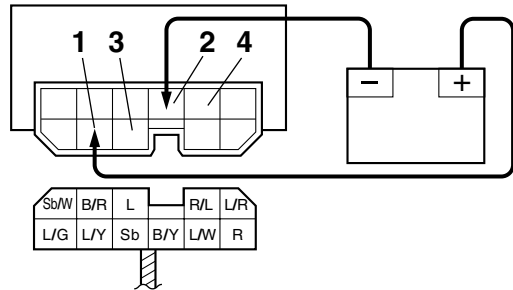
1. Positive battery terminal
 2. Negative battery terminal
 3. Positive tester probe
 4. Negative tester probe
- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)



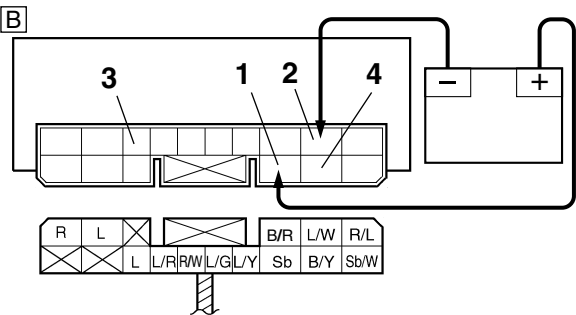
Result
Continuity
(between "3" and "4")

Relay unit (starting circuit cut-off relay)

A



B

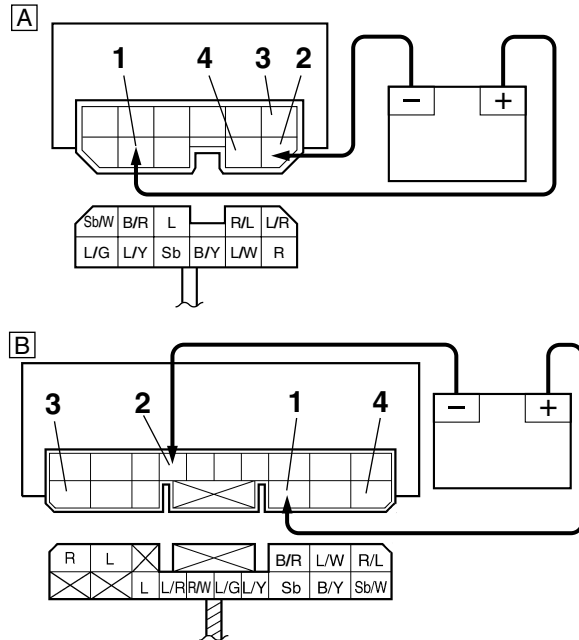


1. Positive battery terminal
 2. Negative battery terminal
 3. Positive tester probe
 4. Negative tester probe
- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)



Result
Continuity
(between "3" and "4")

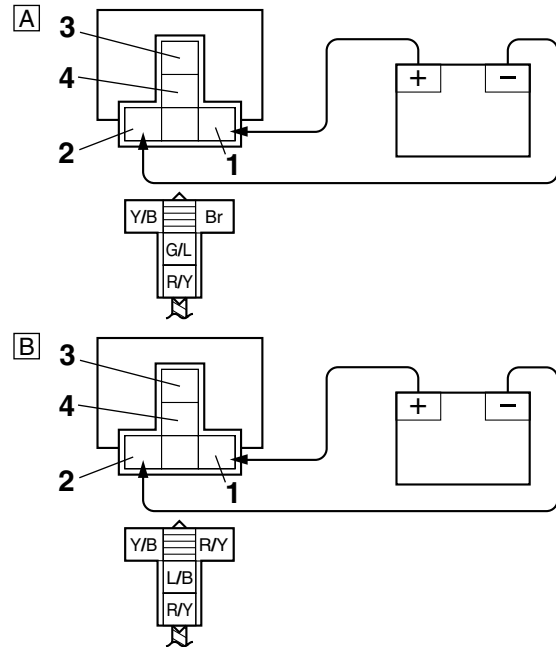
Relay unit (fuel pump relay)



1. Positive battery terminal
 2. Negative battery terminal
 3. Positive tester probe
 4. Negative tester probe
- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)



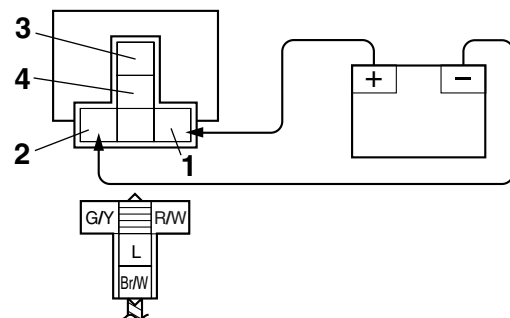
Headlight relay



1. Positive battery terminal
 2. Negative battery terminal
 3. Positive tester probe
 4. Negative tester probe
- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)



Radiator fan motor relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



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.



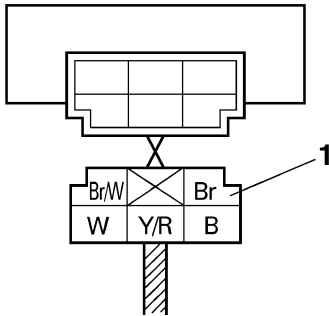
Turn signal relay input voltage
DC 12 V

- 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

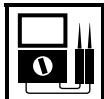


- b. Turn the main switch to “ON”.
- c. Measure the turn signal relay input voltage.



2. Check:

- Turn signal relay output voltage
Out of specification → Replace.



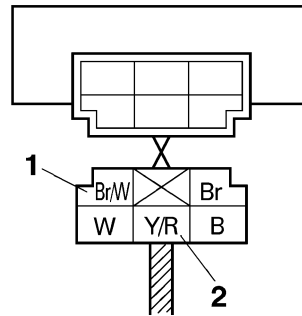
Turn signal relay output voltage
DC 12 V

- 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” or yellow/red “2”
- Negative tester probe → ground



- b. Turn the main switch to “ON”.
- c. Measure the turn signal relay output voltage.



EAS28050

CHECKING THE DIODES

Relay unit (diode)

1. Check:

- Relay unit (diode)
Out of specification → Replace.



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

TIP

The pocket tester or the analog pocket tester readings are shown in the following table.

Positive tester probe → sky blue
“1”

Positive tester probe → black/yellow “2”

Positive tester probe → sky blue
“1”

Positive tester probe → blue/yellow “3”

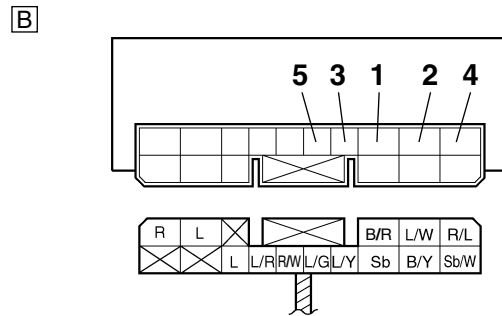
Positive tester probe → sky blue
“1”

Positive tester probe → sky blue/white “4”

Positive tester probe → blue/green “5”

Positive tester probe → blue/yellow “3”

Negative tester probe → blue/green "5"



B. For XVS13CA(C)

- Disconnect the relay unit from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the relay unit terminals as shown.
- Check the relay unit (diode) for continuity.
- Check the relay unit (diode) for no continuity.

- Diode

Out of specification → Replace.



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

The pocket tester and the analog pocket tester readings are shown in the following table.



Continuity

Positive tester probe → white “1” or red/white “1”

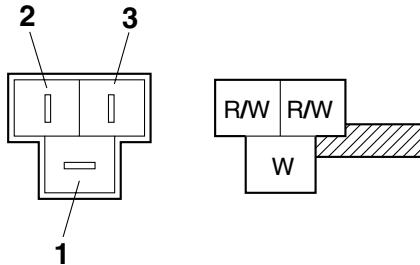
Negative tester probe → red/white “2” or red/white “3”

No continuity

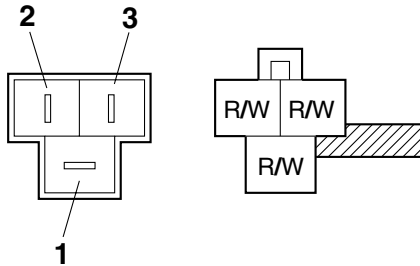
Positive tester probe → red/white “2” or red/white “3”

Negative tester probe → white “1” or red/white “1”

A



B



A. For XVS13AA(C)/XVS13CTA(C)

B. For XVS13CA(C)

- Disconnect the diode from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the diode terminals as shown.
- Check the diode for continuity.
- Check the diode for no continuity.

EAS3D81017

CHECKING THE IGNITION SPARK GAP

1. Check:

- Ignition spark gap
Out of specification → Perform the ignition system troubleshooting, starting with step 5. Refer to “TROUBLESHOOTING” on page 8-6.



Minimum ignition spark gap
6.0 mm (0.24 in)

TIP

If the ignition spark gap is within specification, the ignition system circuit is operating normally.

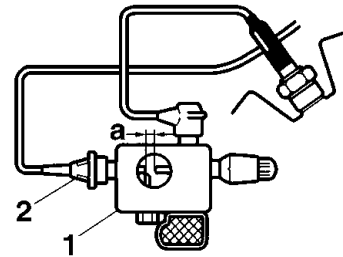
- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker “1” as shown.



Ignition checker

90890-06754

Oppama pet-4000 spark checker
YM-34487



2. Spark plug cap

- Turn the main switch to “ON” and set the engine stop switch to “○”.
- Measure the ignition spark gap “a”.
- Crank the engine by pushing the start switch “⊗” and gradually increase the spark gap until a misfire occurs.

EAS28070

CHECKING THE SPARK PLUG CAPS

The following procedure applies to all of the spark plug caps.

1. Check:

- Spark plug cap resistance
Out of specification → Replace.



Resistance

10.0 k Ω

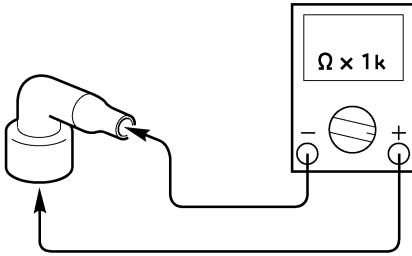
- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ($\Omega \times 1k$) to the spark plug cap as shown.



Pocket tester

90890-03112

Analog pocket tester
YU-03112-C



c. Measure the spark plug cap resistance.



EAS28100

CHECKING THE IGNITION COILS

The following procedure applies to all of the ignition coils.

1. Check:

- Primary coil resistance
Out of specification → Replace.



Primary coil resistance
2.16–2.64 Ω

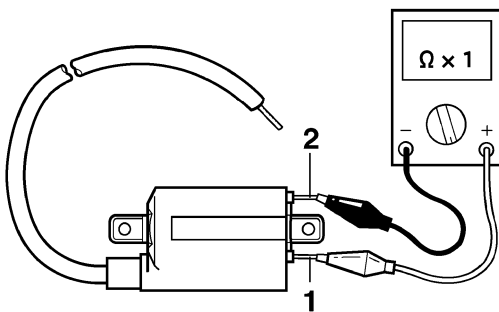


- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.



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

- Positive tester probe → black/red “1”
- Negative tester probe → 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

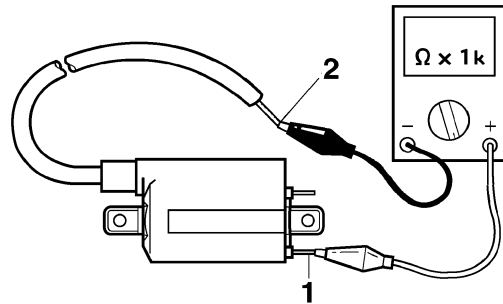


- Disconnect the spark plug cap from the ignition coil.
- Connect the pocket tester ($\Omega \times 1k$) to the ignition coil as shown.



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

- Positive tester probe → black/red “1”
- Negative tester probe → spark plug lead “2”



c. Measure the secondary coil resistance.



EAS28120

CHECKING THE CRANKSHAFT POSITION SENSOR

1. Disconnect:

- Crankshaft position sensor coupler (from the wire harness)

2. Check:

- Crankshaft position sensor resistance
Out of specification → Replace the crankshaft position sensor/stator assembly.



Crankshaft position sensor resistance
248–372 Ω

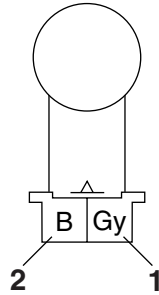


- Connect the pocket tester ($\Omega \times 100$) to the crankshaft position sensor coupler as shown.



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

- Positive tester probe → gray “1”
- Negative tester probe → black “2”



- b. Measure the crankshaft position sensor resistance.



EAS28130

CHECKING THE LEAN ANGLE SENSOR

1. Remove:
 - Lean angle sensor
2. Check:
 - Lean angle sensor output voltage
 Out of specification → Replace.



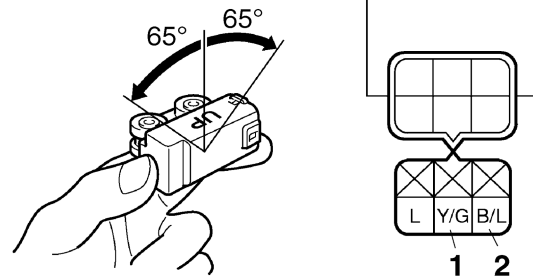
Lean angle sensor output voltage
 Less than 65°: 0.4–1.4 V
 More than 65°: 3.7–4.4 V

- a. Connect the lean angle sensor coupler to the wire harness.
- b. Connect the pocket tester (DC 20 V) to the lean angle sensor coupler as shown.



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

- Positive tester probe → yellow/green “1”
- Negative tester probe → black/blue “2”



- c. Turn the main switch to “ON”.
- d. Tilt the lean angle sensor 65°.
- e. Measure the lean angle sensor output voltage.



EAS3D81011

CHECKING THE STARTER MOTOR OPERATION

1. Check:
 - Starter motor operation
 Does not operate → Perform the electric starting system troubleshooting, starting with step 4.
 Refer to “TROUBLESHOOTING” on page 8-15.

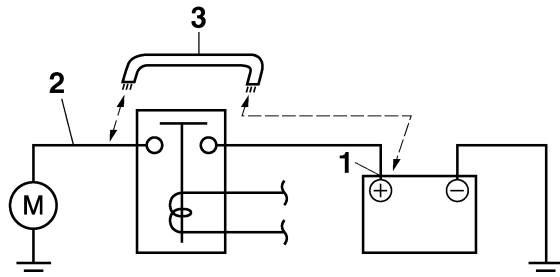


- a. Connect the positive battery terminal “1” and starter motor lead “2” with a jumper lead “3”.

EWA13810



- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.**



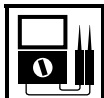
- b. Check the starter motor operation.



EAS28150

CHECKING THE STATOR COIL

1. Disconnect:
 - Stator coil coupler
(from the wire harness)
2. Check:
 - Stator coil resistance
Out of specification → Replace the crankshaft position sensor/stator assembly.



Stator coil resistance
0.112–0.168 Ω

- a. Connect the pocket tester ($\Omega \times 1$) to the stator coil coupler as shown.

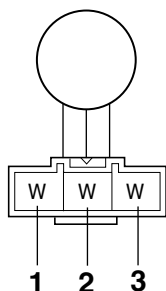


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- 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”



- b. Measure the stator coil resistance.

EAS28170

CHECKING THE RECTIFIER/REGULATOR

1. Check:
 - Charging voltage
Out of specification → Replace the rectifier/regulator.



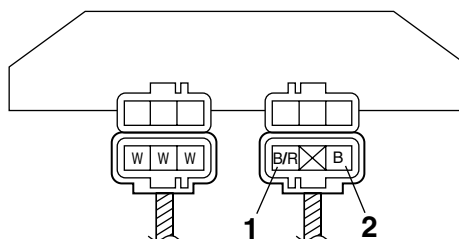
Charging voltage
14 V at 5000 r/min

- a. Attach the engine tachometer to the spark plug lead of the front cylinder.
- b. 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 →
black/red “1”
- Negative tester probe →
black “2”



- c. Start the engine and operate it run at approximately 5000 r/min.
- d. Measure the charging voltage.

EAS3D81012

CHECKING THE OIL LEVEL SWITCH

1. Drain:
 - Engine oil
2. Remove:
 - Oil level switch
(from the crankcase)
3. Check:
 - Oil level switch resistance
Out of specification → Replace the oil level switch.



Oil level switch resistance
Minimum level position
114–126 Ω
Maximum level position
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

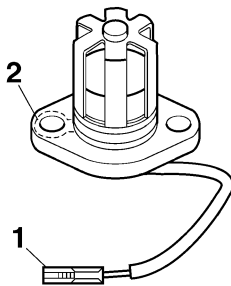
Minimum level position "A"

- Positive tester probe → connector (white) "1"
- Negative tester probe → body ground "2"

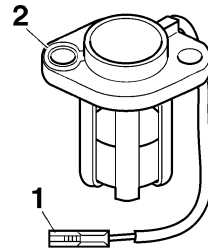
Maximum level position "B"

- Positive tester probe → connector (white) "1"
- Negative tester probe → body ground "2"

A



B



b. Measure the oil level switch resistance.



EAS27D1034

CHECKING THE FUEL SENDER (for XVS13AA(C)/XVS13CTA(C))

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.



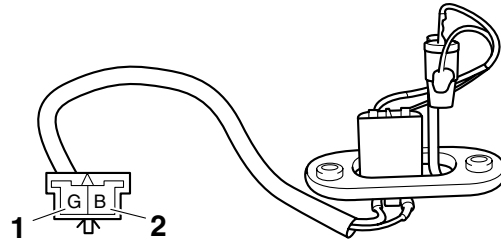
Sender unit resistance
830–1720 Ω at 25 °C (77 °F)

- 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.



EAS27D1038

CHECKING THE FUEL SENDER (for XVS13CA(C))

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.



Sender unit resistance (full)
11.0–13.0 Ω
Sender unit resistance (empty)
140–143 Ω



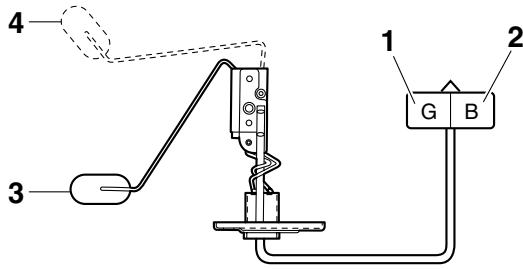
- a. Connect the pocket tester ($\Omega \times 100$) to the fuel sender coupler as shown.



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

- Positive tester probe → green "1"
- Negative tester probe → black "2"

- b. Move the fuel sender float to the empty fuel tank position "3" and to the full fuel tank position "4".



c. Measure the fuel sender resistance.



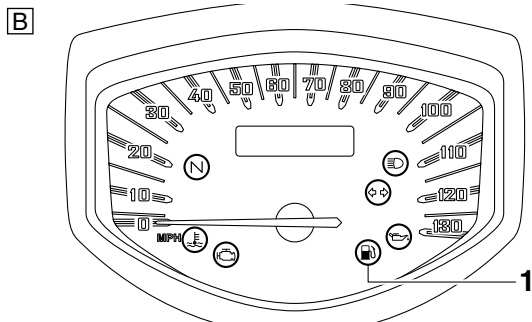
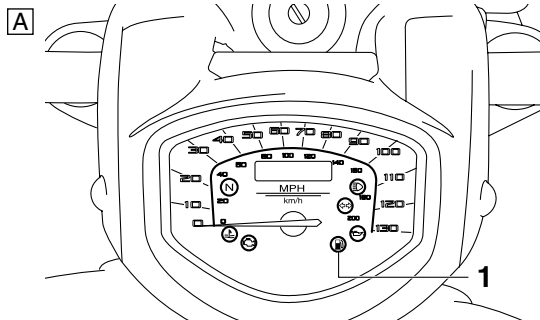
EAS3D81014

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.



- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)

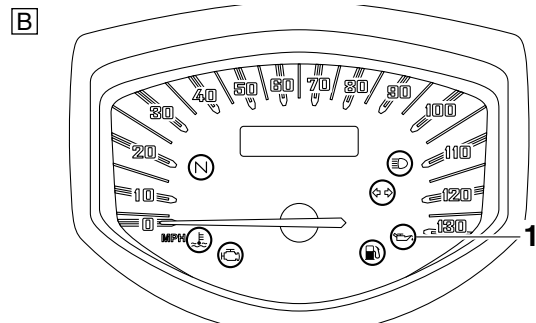
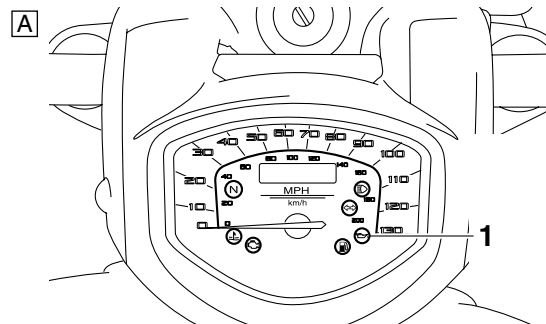
EAS3D81015

CHECKING THE OIL LEVEL WARNING LIGHT

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

1. Check:

- Oil level warning light “1”
(Turn the main switch to “ON”).
Warning light comes on for a few seconds, then goes off → Warning light is OK.
Warning light does not come on → Replace the meter assembly.
Warning light flashes ten times, then goes off for 2.5 seconds in a repeated cycle (malfunction detected in oil level switch) → Replace the oil level switch.



- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)

EAS28240

CHECKING THE SPEED SENSOR

1. Check:

- Speed sensor output voltage
Out of specification → Replace.

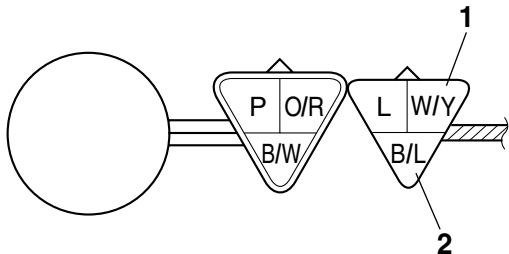
	Output voltage reading cycle 0.6 V to 4.8 V to 0.6 V to 4.8 V
--	--

- a. Connect the pocket tester (DC 20 V) to the speed sensor coupler (wire harness side) as shown.



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

- Positive tester probe → white/yellow “1”
- Negative tester probe → black/blue “2”



- Set the main switch to “ON”.
- Elevate the rear wheel and slowly rotate it.
- Measure the voltage of white/yellow and black/blue. With each full rotation of the rear wheel, the voltage reading should cycle from 0.6 V to 4.8 V to 0.6 V to 4.8 V.

EAS28250

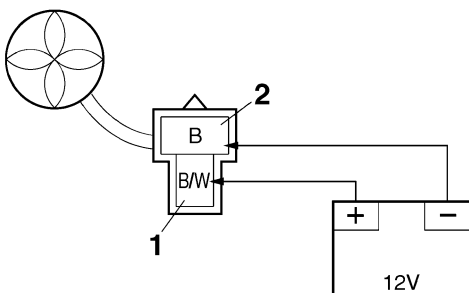
CHECKING THE RADIATOR FAN MOTOR

- Check:

- Radiator fan motor
- Faulty/rough movement → Replace.

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

- Positive tester probe → black/white “1”
- Negative tester probe → black “2”



- Check the radiator fan motor movement.

EAS28260

CHECKING THE COOLANT TEMPERATURE SENSOR

- Remove:

- Coolant temperature sensor
- Refer to “THERMOSTAT” on page 6-4.

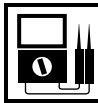
EWA14130

WARNING

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

- Check:

- Coolant temperature sensor resistance
- Out of specification → Replace.

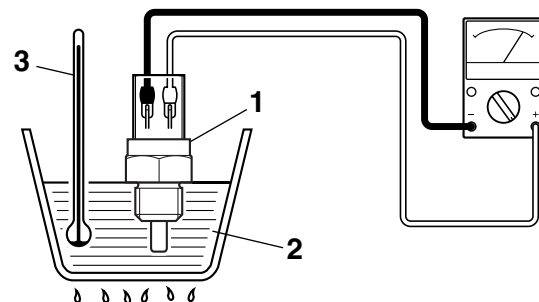


Coolant temperature sensor resistance
290–354 Ω at 80 °C (176 °F)

- Connect the pocket tester ($\Omega \times 100$) to the coolant temperature sensor as shown.



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



- Immerse the coolant temperature sensor “1” in a container filled with coolant “2”.

TIP

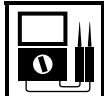
Make sure the coolant temperature sensor terminals do not get wet.

- Place a thermometer “3” in the coolant.
- Slowly heat the coolant, and then let it cool down to the specified temperature.
- Measure the coolant temperature sensor resistance.

EAS28300

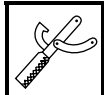
CHECKING THE THROTTLE POSITION SENSOR

1. Remove:
 - Throttle position sensor (from the throttle body)
2. Check:
 - Throttle position sensor maximum resistance Out of specification → Replace the throttle position sensor.



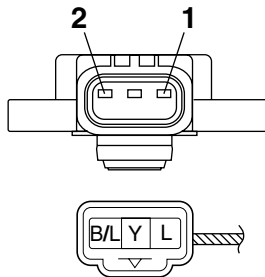
Resistance
3.10–5.70 kΩ

- 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 “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-14.

EAS28410

CHECKING THE INTAKE AIR PRESSURE SENSOR

1. Check:
 - Intake air pressure sensor output voltage
Out of specification → Replace.



Intake air pressure sensor output voltage
3.57–3.71 V

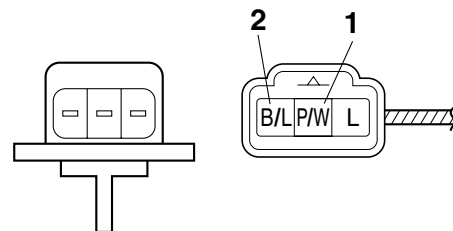
- a. Connect the pocket tester (DC 20 V) to the intake air pressure sensor coupler as shown.



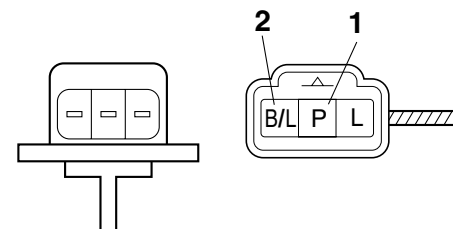
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → pink/white “1” or pink “1”
- Negative tester probe → black/blue “2”

A



B



- A. For XVS13AA(C)/XVS13CTA(C)
B. For XVS13CA(C)

- 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



- **Handle the air temperature sensor with special care.**

TROUBLESHOOTING

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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 fuel tank overflow hose
 - Clogged rollover valve
 - Deteriorated or contaminated fuel
2. Fuel pump
 - Faulty fuel pump
 - Faulty relay unit (fuel pump relay)
3. Fuel cock
 - Clogged or damaged fuel hose

4. 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 9-1.

Engine

1. Air filter
 - Clogged air filter element

Fuel system

1. Fuel pump
 - Faulty fuel pump

EAS28530

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to "Clutch drags".

EAS28540

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork

- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Foreign object between transmission gears
- Improperly assembled transmission

EAS28550

JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

EAS28560

FAULTY CLUTCH

Clutch slips

1. Clutch
 - Improperly assembled clutch
 - Improperly adjusted clutch cable
 - Loose or fatigued clutch spring
 - Worn friction plate
 - Worn clutch plate
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (low)
 - Deteriorated oil

Clutch drags

1. Clutch
 - Unevenly tensioned clutch springs
 - Warped pressure plate
 - Bent clutch plate
 - Swollen friction plate
 - Bent clutch 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. Clogged coolant passages
 - Cylinder head(s) and piston(s)
 - Heavy carbon buildup
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity
 - Inferior oil quality

Cooling system

1. Coolant
 - Low coolant level
2. Radiator
 - Damaged or leaking radiator
 - Faulty radiator cap
 - Bent or damaged radiator fin
3. Water pump
 - Damaged or faulty water pump
4. Thermostat
 - Thermostat stays closed
5. Hose(s) and pipe(s)
 - Damaged hose
 - Improperly connected hose
 - Damaged pipe
 - Improperly connected pipe

Fuel system

1. Throttle body(-ies)
 - Damaged or loose throttle body joint
2. Air filter
 - Clogged air filter element

Chassis

1. Brake(s)
 - Dragging brake

Electrical system

1. Spark plug(s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
2. Ignition system
 - Faulty ECU
3. Cooling system
 - Faulty radiator fan motor relay
 - Faulty coolant temperature sensor
 - Faulty ECU

EAS28610

OVERCOOLING

Cooling system

1. Thermostat
 - Thermostat stays open

EAS28620

POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

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 (for XVS13AA(C)/XVS13CTA(C))
- Wrong tail/brake light LED (for XVS13CA(C))
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb (for XVS13AA(C)/XVS13CTA(C))

- Faulty tail/brake light LED (for XVS13CA(C))

Tail/brake light bulb burnt out

- Wrong tail/brake light bulb (for XVS13AA(C)/XVS13CTA(C))
- Wrong tail/brake light LED (for XVS13CA(C))
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired (for XVS13AA(C)/XVS13CTA(C))
- Tail/brake light LED life expired (for XVS13CA(C))

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

- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

WIRING DIAGRAM**XVS13AA(C)/XVS13CTA(C)
2011**

1. AC magneto
2. Rectifier/regulator
3. Main fuse
4. Backup fuse (odometer and clock)
5. Main switch
6. Battery
7. Fuel injection system fuse
8. Starter relay
9. Starter motor
10. Diode
11. Radiator fan motor fuse
12. Relay unit
13. Starting circuit cut-off relay
14. Fuel pump relay
15. Neutral switch
16. Fuel pump
17. Sidestand switch
18. Speed sensor
19. Crankshaft position sensor
20. Throttle position sensor
21. Intake air pressure sensor
22. Lean angle sensor
23. Coolant temperature sensor
24. Air temperature sensor
25. ECU (engine control unit)
26. Rear cylinder ignition coil
27. Front cylinder ignition coil
28. Spark plug
29. ISC (idle speed control) unit
30. Front cylinder injector
31. Rear cylinder injector
32. Meter assembly
33. Fuel level warning light
34. Oil level warning light
35. Neutral indicator light
36. Multi-function meter
37. Engine trouble warning light
38. Coolant temperature warning light
39. High beam indicator light
40. Turn signal indicator light
41. Meter light
42. Oil level switch
43. Fuel sender
44. O₂ sensor
45. Horn
46. Turn signal relay
47. Headlight relay
48. Left handlebar switch
49. Dimmer switch
50. Clutch switch
51. Turn signal switch
52. Horn switch
53. Rear right turn signal light
54. Rear left turn signal light

55. Front right turn signal/position light
56. Front left turn signal/position light
57. Headlight
58. Accessory light (OPTION)
59. Right handlebar switch
60. Front brake light switch
61. Select switch
62. Reset switch
63. Engine stop switch
64. Start switch
65. License plate light
66. Tail/brake light
67. Radiator fan motor
68. Rear brake light switch
69. Radiator fan motor relay
70. Headlight fuse
71. Ignition fuse
72. Signaling system fuse
73. Taillight fuse

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
Lg	Light green
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
G/W	Green/White
G/Y	Green/Yellow
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/B	Pink/Black
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
V/G	Violet/Green
W/G	White/Green
W/L	White/Blue
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

WIRING DIAGRAM**XVS13CA(C) 2011**

1. AC magneto
2. Rectifier/regulator
3. Main fuse
4. Backup fuse (odometer and clock)
5. Main switch
6. Battery
7. Fuel injection system fuse
8. Starter relay
9. Starter motor
10. Diode
11. Radiator fan motor fuse
12. Relay unit
13. Starting circuit cut-off relay
14. Fuel pump relay
15. Neutral switch
16. Fuel pump
17. Sidestand switch
18. Speed sensor
19. Crankshaft position sensor
20. Throttle position sensor
21. Intake air pressure sensor
22. Lean angle sensor
23. Coolant temperature sensor
24. Air temperature sensor
25. ECU (engine control unit)
26. Rear cylinder ignition coil
27. Front cylinder ignition coil
28. Spark plug
29. ISC (idle speed control) unit
30. Front cylinder injector
31. Rear cylinder injector
32. Meter assembly
33. Fuel level warning light
34. Oil level warning light
35. Neutral indicator light
36. Multi-function meter
37. Engine trouble warning light
38. Coolant temperature warning light
39. High beam indicator light
40. Turn signal indicator light
41. Meter light
42. Oil level switch
43. Fuel sender
44. O₂ sensor
45. Turn signal relay
46. Headlight relay
47. Left handlebar switch
48. Dimmer switch
49. Clutch switch
50. Turn signal switch
51. Horn switch
52. Rear right turn signal light
53. Rear left turn signal light
54. Horn

55. Front right turn signal/position light
56. Front left turn signal/position light
57. Headlight
58. Accessory light (OPTION)
59. Right handlebar switch
60. Front brake light switch
61. Select switch
62. Reset switch
63. Engine stop switch
64. Start switch
65. License plate light
66. Tail/brake light
67. Radiator fan motor
68. Rear brake light switch
69. Radiator fan motor relay
70. Headlight fuse
71. Ignition fuse
72. Signaling system fuse
73. Taillight fuse

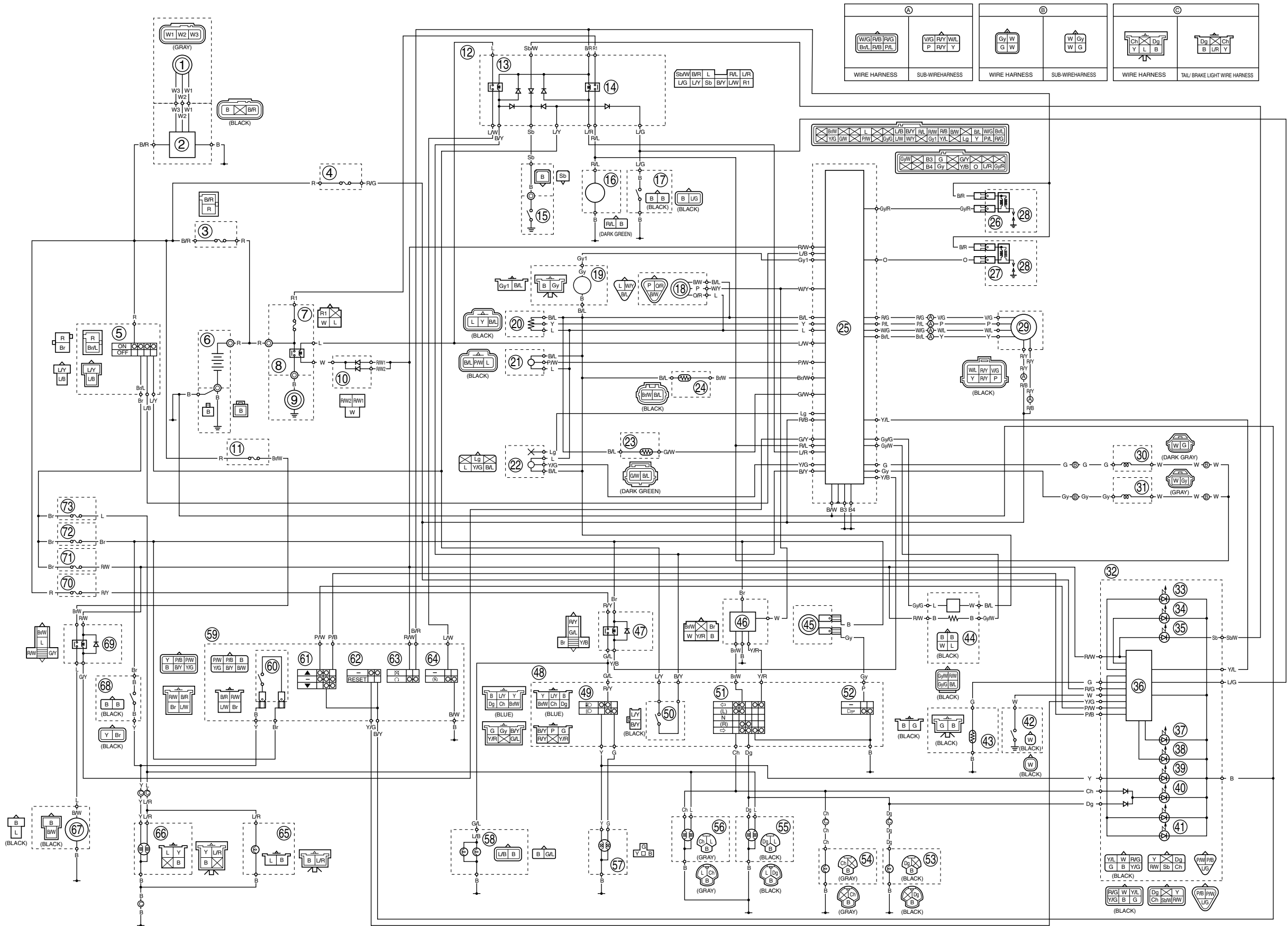
COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
Lg	Light green
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/W	Green/White
G/Y	Green/Yellow
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/B	Pink/Black
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
V/G	Violet/Green
W/G	White/Green
W/L	White/Blue
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red

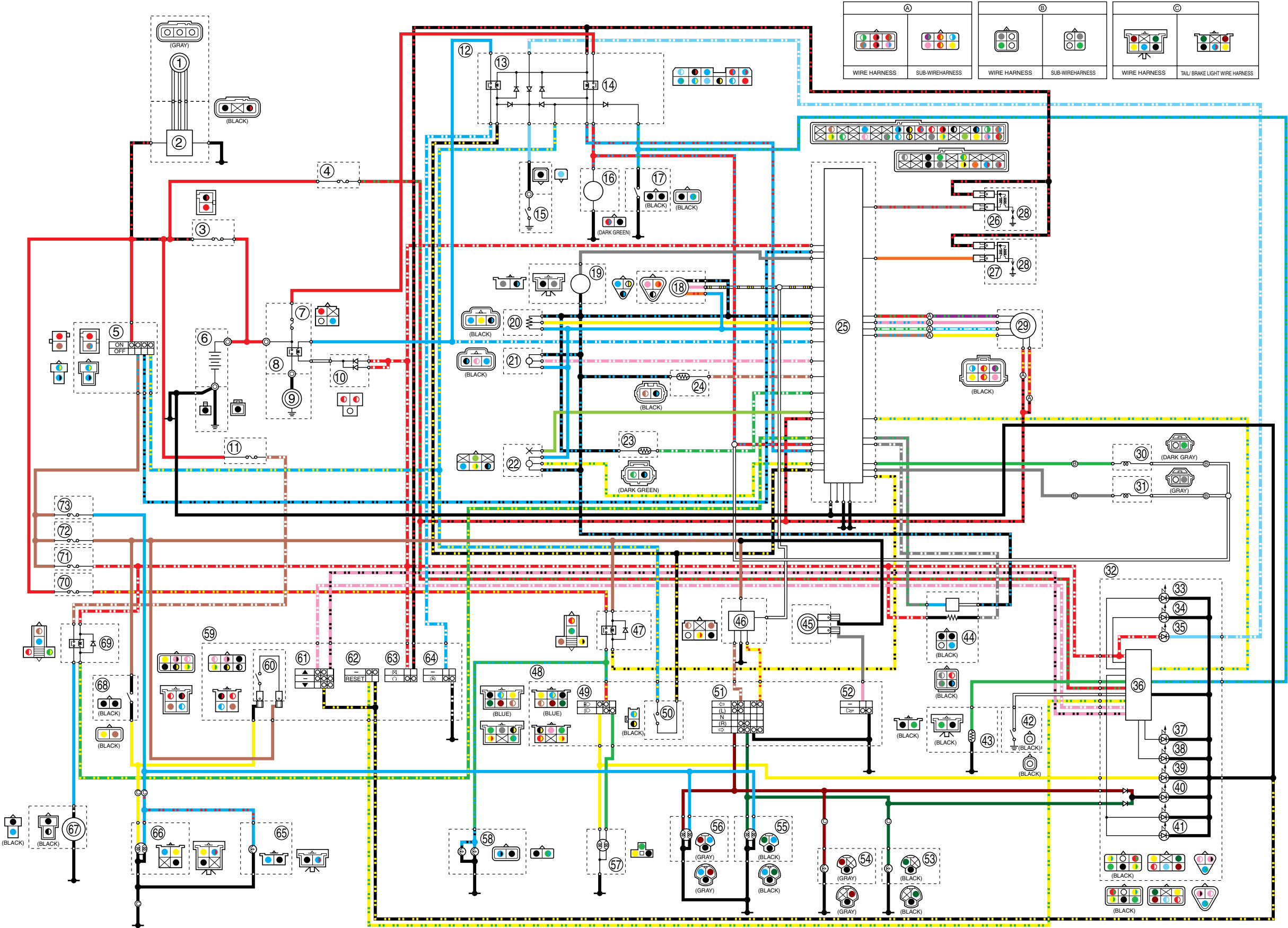


YAMAHA MOTOR CO., LTD.
2500 SHINGAI IWATA SHIZUOKA JAPAN

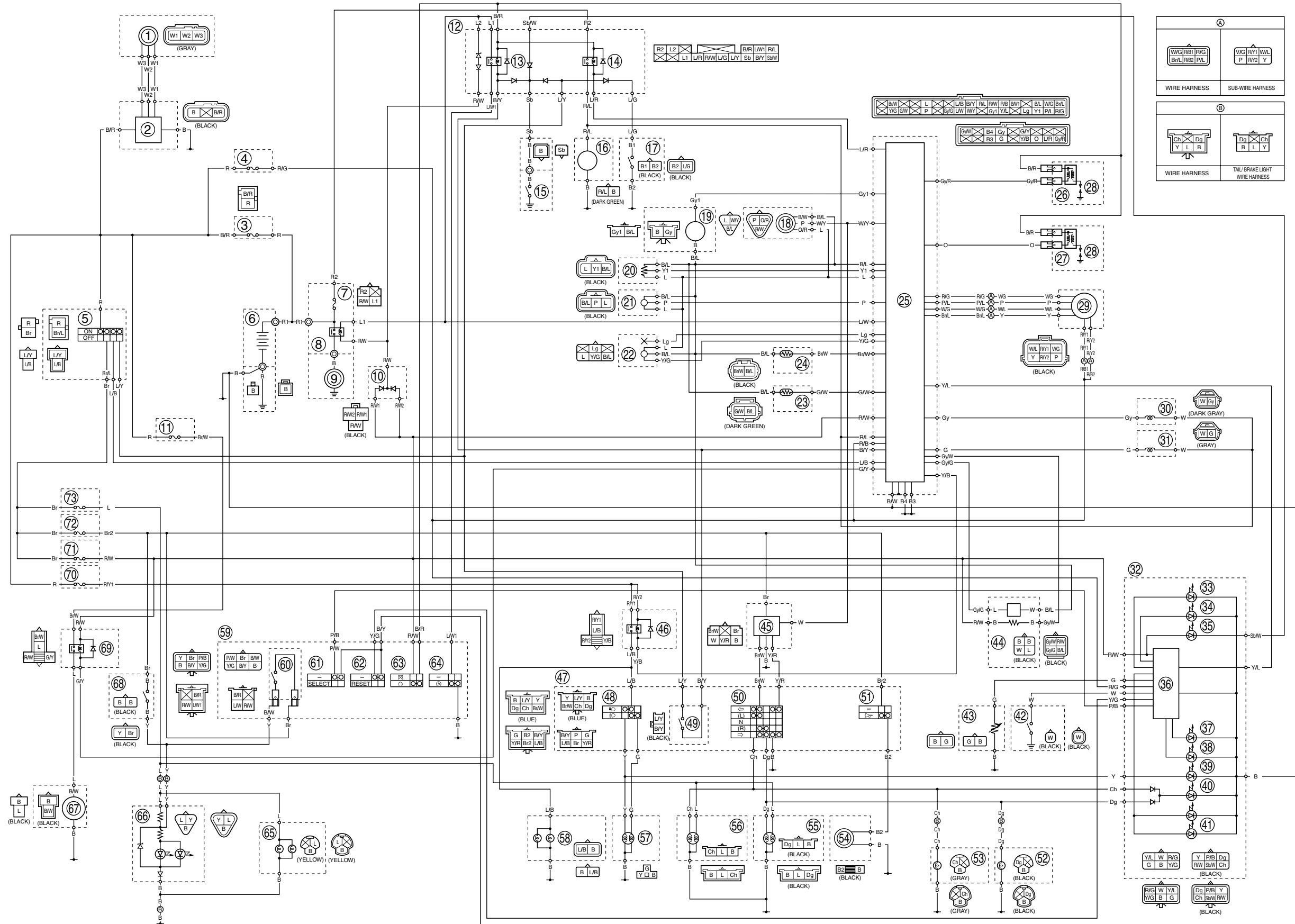
XVS13AA(C)/XVS13CTA(C) 2011 WIRING DIAGRAM



XVS13AA(C)/XVS13CTA(C) 2011 WIRING DIAGRAM



XVS13CA(C) 2011 WIRING DIAGRAM



XVS13CA(C) 2011 WIRING DIAGRAM

