



SERVICE MANUAL

X-MAX 300 EVOLIS 300

**CZD300-A
CZD300-AH**

B74-F8197-E0

IMPORTANT

This manual was produced by the PT Yamaha Indonesia Motor Manufacturing 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. Please refer to "BASIC INFORMATION" (separate volume, Y0A-28197-E0*) for basic instructions that must be observed during servicing. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.



PT Yamaha Indonesia Motor Manufacturing 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

- * If the contents of the manual are revised, the last digit of the manual number will be increased by one.
- 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.

CZD300-A/CZD300-AH
SERVICE MANUAL
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- 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. This step explains removal and disassembly procedure only. For installation and assembly procedure, reverse the steps.
- Jobs “7” requiring more information (such as special tools and technical data) are described sequentially.

GENERATOR AND STARTER CLUTCH

Removing the stator coil, generator rotor and starter clutch

1 2

3 4 5 6

7 8 9 10

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

10 N·m (1.0 kgf-m, 7.4 lb-ft)

1.5 N·m (0.15 kgf-m, 1.1 lb-ft)

13 N·m (1.3 kgf-m, 9.6 lb-ft)

10 N·m (1.0 kgf-m, 7.4 lb-ft)

2.0 N·m (0.20 kgf-m, 1.5 lb-ft)

75 N·m (7.5 kgf-m, 55 lb-ft)

13 N·m (1.3 kgf-m, 9.6 lb-ft)

* Apply Yamaha bond No.1215 (90890-85505).

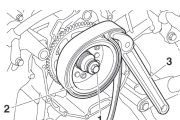
Order	Job/Parts to remove	O/y	Remarks
1	Crankshaft position sensor coupler	1	Disconnect.
2	Stator coil coupler	1	Disconnect.
3	Crankshaft end cover	1	
4	Timing mark accessing bolt	1	
5	Engine oil filler cap	1	
6	Generator cover	1	
7	Generator cover gasket	1	
8	Dowel pin	2	
9	Plate	1	
10	Stator coil assembly (Stator coil/Crankshaft position sensor)	1	

REMOVING THE GENERATOR

- Remove:
 - Generator rotor bolt "1"
 - Washer

TIP

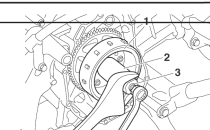
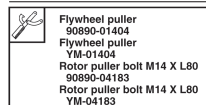
While holding the generator rotor "2" with the rotor holding tool "3", loosen the generator rotor bolt.



2. Remove:
 - Generator rotor assembly "1"
(with the flywheel puller "2" and rotor puller bolt "3")
 - Woodruff key

NOTICE

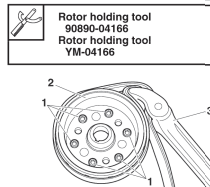
NOTICE
To protect the end of the crankshaft, place an appropriate sized socket between the fly-wheel puller set center bolt and the crankshaft.



REMOVING THE STARTER CLUTCH

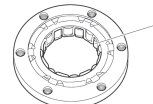
1. Remove:
 - Starter clutch bolts "1"
 - Generator rotor "2"
 - Starter clutch

TIP While holding the generator rotor with the rotor holding tool "3", loosen the starter clutch bolts.



EXERCISES

- Starter clutch rollers "1"
- Damage/wear → Replace the starter clutch.



- 2. Check:
 - Starter clutch idle gear

SYMBOLS

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

TIP

The following symbols are not relevant to every vehicle.





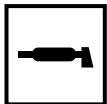









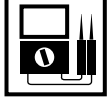




SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Serviceable with engine mounted		Gear oil
	Filling fluid		Molybdenum disulfide oil
	Lubricant		Brake fluid
	Special tool		Wheel bearing grease
	Tightening torque		Lithium-soap-based grease
	Wear limit, clearance		Molybdenum disulfide grease
	Engine speed		Silicone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

TABLE OF CONTENTS

GENERAL INFORMATION	1
SPECIFICATIONS	2
PERIODIC CHECKS AND ADJUSTMENTS	3
CHASSIS	4
ENGINE	5
COOLING SYSTEM	6
FUEL SYSTEM	7
ELECTRICAL SYSTEM	8
TROUBLESHOOTING	9

GENERAL INFORMATION

IDENTIFICATION	1-1
VEHICLE IDENTIFICATION NUMBER	1-1
MODEL LABEL.....	1-1
 FEATURES.....	 1-2
MULTI-FUNCTION DISPLAY	1-2
 SPECIAL TOOLS	 1-8

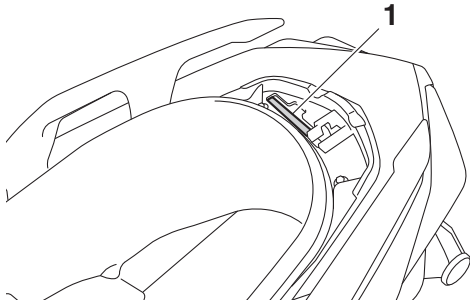
EAS20007

IDENTIFICATION

EAS30002

VEHICLE IDENTIFICATION NUMBER

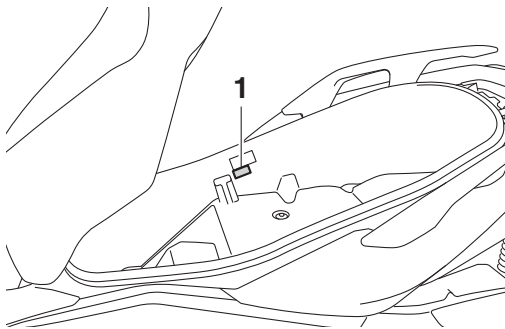
The vehicle identification number “1” is stamped into the frame.



EAS30003

MODEL LABEL

The model label “1” is affixed to the inside of the storage box.

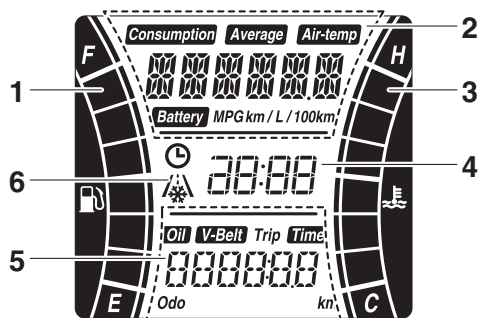


EAS20008

FEATURES

EAS30618

MULTI-FUNCTION DISPLAY



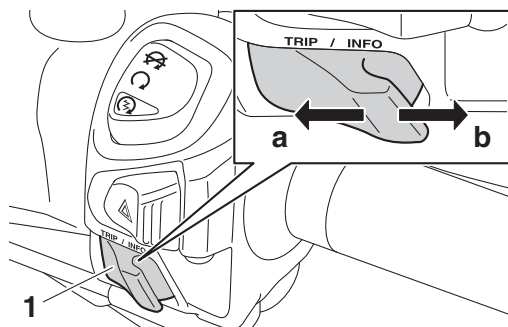
1. Fuel meter
2. Information display
3. Coolant temperature meter
4. Clock
5. Tripmeter display
6. Icy road warning indicator “ ”

EWA12423

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 “TRIP/INFO” switch is located on the right side of the handlebar. This switch allows you to control or change the settings of the multi-function meter unit. To use the “TRIP” switch, move the “TRIP/INFO” switch in direction “a”. To use the “INFO” switch, move the “TRIP/INFO” switch in direction “b”.



1. “TRIP/INFO” switch

The multi-function display is equipped with the following:

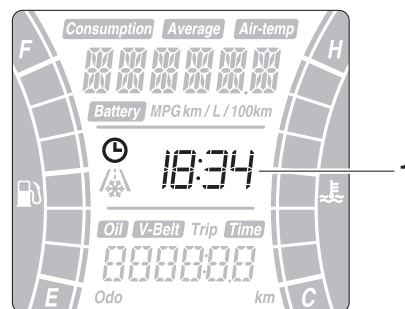
- clock
- fuel meter
- coolant temperature meter
- tripmeter display

- information display

TIP

For the UK: To switch the displays between kilometers and miles, turn the main switch to “ON” while pushing the “INFO” switch, and then continue to push the “INFO” switch for eight seconds.

Clock



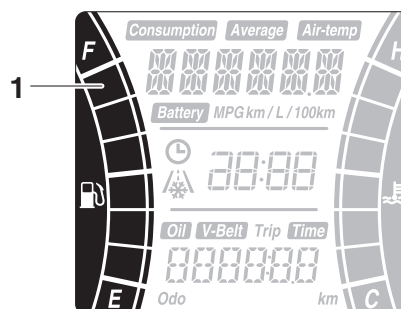
1. Clock

The clock uses a 24-hour time system.

[To set the clock]

1. Turn the main switch to “OFF”.
2. Push and hold the “TRIP” switch.
3. Turn the main switch to “ON” while pushing the “TRIP” switch, and then continue to push the “TRIP” switch for eight seconds. The hour digits will start flashing.
4. Use the “TRIP” switch to set the hours.
5. Push the “TRIP” switch for three seconds, and then release it. The minute digits will start flashing.
6. Use the “TRIP” switch to set the minutes.
7. Push the “TRIP” switch for three seconds, and then release it to start the clock.

Fuel meter



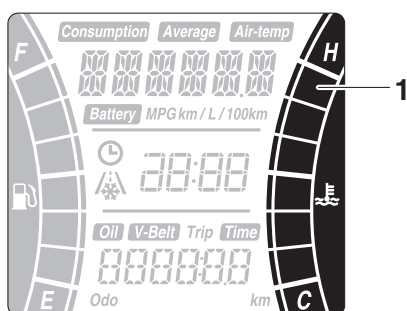
1. Fuel meter

The fuel meter indicates the amount of fuel in the fuel tank. The segments of the fuel meter disappear from “F” (full) towards “E” (empty) as the fuel level decreases. When the last segment of the fuel meter starts flashing, refuel as soon as possible.

TIP

- If a problem is detected in the fuel meter, the all segments will flash repeatedly. If this occurs, check the electrical circuit. Refer to “SIGNALING SYSTEM” on page 8-19.
- When approximately 2.4 L (0.63 US gal, 0.53 Imp.gal) of fuel remains in the fuel tank, the last segment of the fuel meter will start flashing. The display will automatically change to the fuel reserve tripmeter “F Trip” and start counting the distance traveled from that point.

Coolant temperature meter



1. Coolant temperature meter

The coolant temperature meter indicates the temperature of the coolant. If the top segment flashes, stop the vehicle, then stop the engine, and let the engine cool.

ECA10022

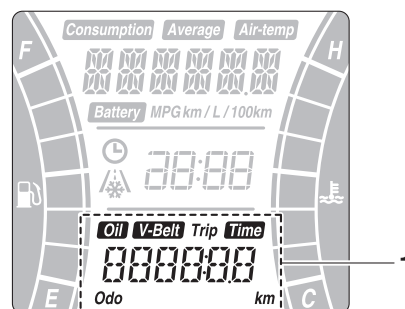
NOTICE

Do not continue to operate the engine if it is overheating.

TIP

- If a problem is detected in the coolant temperature meter, all segments will flash repeatedly. If this occurs, check the electrical circuit. Refer to “COOLING SYSTEM” on page 8-27.
- The coolant temperature varies with changes in the weather and engine load.

Tripmeter display



1. Tripmeter display

The tripmeter display is equipped with the following:

- odometer
- tripmeter
- time tripmeter
- fuel reserve tripmeter
- oil change tripmeter
- V-belt replacement tripmeter

Push the “TRIP” switch to change the display between the odometer “Odo”, tripmeter “Trip”, time tripmeter “Trip Time”, oil change tripmeter “Oil Trip”, and V-belt replacement tripmeter “V-Belt Trip” in the following order:

Odo → Trip → Trip Time → Oil Trip → V-Belt Trip → Odo

TIP

When approximately 2.4 L (0.63 US gal, 0.53 Imp.gal) of fuel remains in the fuel tank, the last segment of the fuel meter will start flashing. The display will automatically change to the fuel reserve tripmeter “F Trip” and start counting the distance traveled from that point.

Odometer “Odo” and tripmeter “Trip”

The odometer shows the total distance traveled by the vehicle.

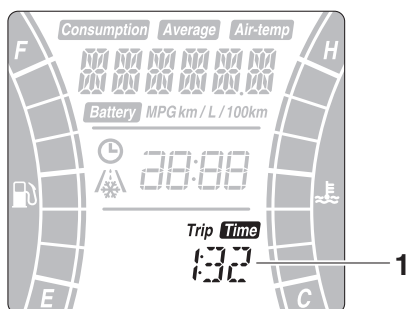
The tripmeter shows the distance traveled since it was last reset.

To reset the tripmeter, select it by pushing the “TRIP” switch, and then push the “TRIP” switch for three seconds.

TIP

- The odometer will lock at 999999.
- The tripmeter will reset and continue counting after 9999.9 is reached.

Time tripmeter “Time”



1. Time tripmeter

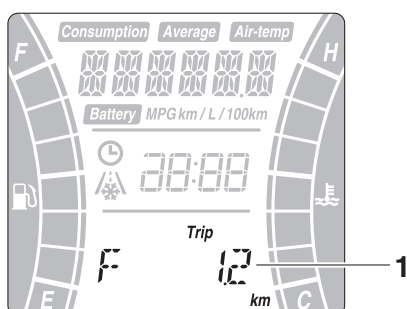
The time tripmeter displays the time that has elapsed while the main switch was in the “ON” position since it was last reset.

The maximum time that can be shown is 99:59.

TIP

To reset the time tripmeter, select it by pushing the “TRIP” switch, and then push the “TRIP” switch for three seconds.

Fuel reserve tripmeter “F Trip”



1. Fuel reserve tripmeter

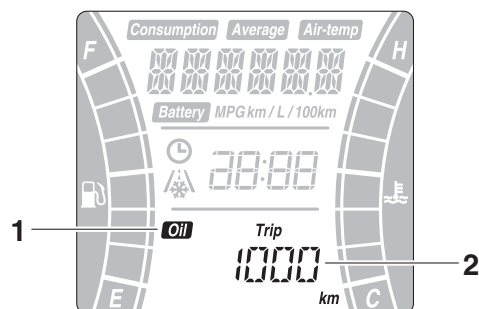
When approximately 2.4 L (0.63 US gal, 0.53 Imp.gal) of fuel remains in the fuel tank, the last segment of the fuel meter will start flashing. The display will automatically change to the fuel reserve tripmeter “F Trip” and start counting the distance traveled from that point. In this case, push the “TRIP” switch to switch the display in the following order:

F Trip → Oil Trip → V-Belt Trip → Odo → Trip → Trip Time → F Trip

To reset the fuel reserve tripmeter, select it by pushing the “TRIP” switch, and then push the “TRIP” switch for three seconds.

The fuel reserve tripmeter will reset automatically and disappear after refueling and traveling 5 km (3 mi).

Oil change tripmeter “Oil Trip”



1. Oil change indicator “Oil”
2. Oil change tripmeter

The oil change tripmeter shows the distance traveled since the oil was last changed.

The oil change indicator “OIL” flashes at the initial 1000 km (600 mi), then at 4000 km (2400 mi) and every 5000 km (3000 mi) thereafter to indicate that the engine oil should be changed.

After changing the engine oil, reset the oil change indicator and the oil change tripmeter. To reset them both, select the oil change tripmeter, and then push the “TRIP” switch for three seconds.

While the oil change tripmeter is flashing, push the “TRIP” switch for 15 to 20 seconds. Release the “TRIP” switch, and the oil trip value will reset to zero.

TIP

If the engine oil is changed before the oil change indicator comes on (i.e., before the periodic oil change interval has been reached), the oil change tripmeter must be reset for the oil change indicator to come on at the correct time.

V-belt replacement tripmeter “V-Belt Trip”



1. V-belt replacement indicator “V-Belt”
2. V-belt replacement tripmeter

The V-belt replacement tripmeter shows the distance traveled since the V-belt was last replaced.

The V-belt replacement indicator “V-Belt” will flash every 20000 km (12000 mi) to indicate that the V-belt should be replaced.

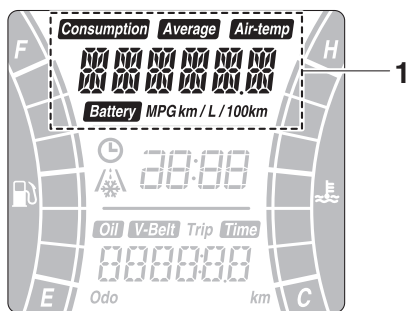
After replacing the V-belt, reset the V-belt replacement indicator and the V-belt replacement tripmeter. To reset them both, select the V-belt replacement tripmeter, and then push the “TRIP” switch for three seconds.

While the V-belt replacement tripmeter is flashing, push the “TRIP” switch for 15 to 20 seconds. Release the “TRIP” switch, and the V-belt trip value will reset to zero.

TIP

If the V-belt is replaced before the V-belt replacement indicator comes on (i.e., before the periodic V-belt replacement interval has been reached), the V-belt replacement tripmeter must be reset for the V-belt replacement indicator to come on at the correct time.

Information display



1. Information display

The information display is equipped with the following:

- air temperature display
- battery voltage display
- traction control system display
- average fuel consumption display
- instantaneous fuel consumption display
- average speed display
- warning message function

Navigating the information display

Push the “INFO” switch to change the display between the air temperature display “Air-temp”, battery voltage display “Battery”, traction control system display “TCS ON” or “TCOFF”, average fuel consumption display “Consumption/Average_ _ _ km/L” or “Consumption/Average_ _ _ L/100 km”, instantaneous fuel consumption

display “Consumption_ _ _ km/L” or “Consumption_ _ _ L/100 km” and average speed display “Average” in the following order:

Air-temp → Battery → TCS ON or TCSOFF → Consumption/Average_ _ _ km/L → Consumption/Average_ _ _ L/100 km → Consumption_ _ _ km/L → Consumption_ _ _ L/100 km → Average → Air-temp

For the UK:

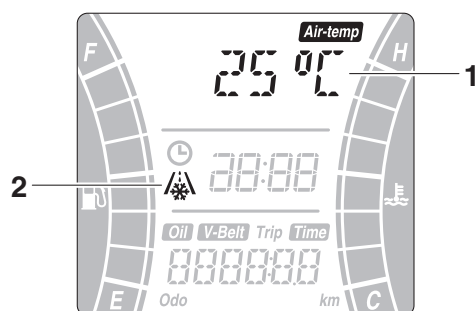
Push the “TRIP” switch to change the display between the air temperature display “Air-temp”, battery voltage display “Battery”, traction control system display “TCS ON” or “TCOFF”, average fuel consumption display “Consumption/Average_ _ _ km/L”, “Consumption/Average_ _ _ L/100 km” or “Consumption/Average_ _ _ MPG”, instantaneous fuel consumption display “Consumption_ _ _ km/L”, “Consumption_ _ _ L/100 km” or “Consumption_ _ _ MPG” and average speed display “Average” in the following order:


Air-temp → Battery → TCS ON or TCSOFF → Consumption/Average_ _ _ km/L → Consumption/Average_ _ _ L/100 km → Consumption/Average_ _ _ MPG → Consumption_ _ _ km/L → Consumption_ _ _ L/100 km → Consumption_ _ _ MPG → Average → Air-temp

TIP


- When kilometers are selected for the display units, “Consumption/Average_ _ _ MPG” and “Consumption_ _ _ MPG” are not displayed.
- When miles are selected for the display units, “Consumption/Average_ _ _ km/L”, “Consumption/Average_ _ _ L/100 km”, “Consumption_ _ _ km/L”, and “Consumption_ _ _ L/100 km” are not displayed.

Air temperature display



1. Air temperature display
2. Icy road warning indicator “”

This display shows the air temperature from -10°C to 50°C in 1°C increments.

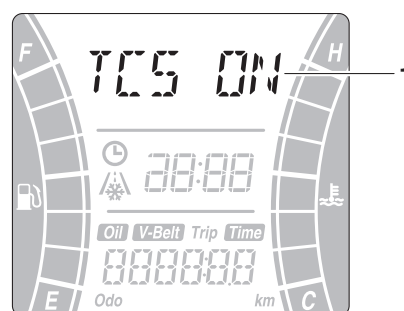
The icy road warning indicator “” will flash when the temperature is below 4°C .

The temperature displayed may vary from the actual ambient temperature.

TIP

The accuracy of the temperature reading may be affected by engine heat when riding slowly (under 20 km/h [12 mi/h]) or when stopped at traffic signals, etc.

Traction control system mode display



1. Traction control system mode display

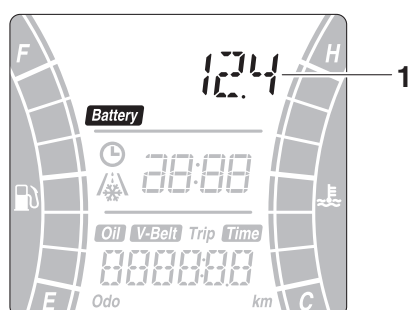
This display shows the current status of the traction control system.

- “TCS ON”: the system is on
- “TCSOFF”: the system is off

TIP

If only “TCS” is displayed, there is a communication error within the vehicle. Check the electrical circuit. Refer to “SIGNALING SYSTEM” on page 8-19.

Battery voltage display



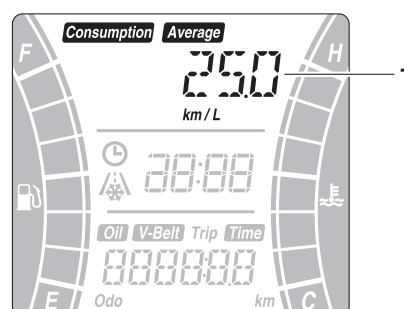
1. Battery voltage display

This display shows the current charge state of the battery.

TIP

- If the engine turns over slowly when using the start switch, check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-128.
- If “---” appears in the battery voltage display, check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-128.

Average fuel consumption display



1. Average fuel consumption display

This function calculates the average fuel consumption since it was last reset.

The average fuel consumption can be displayed as either “Consumption/Average_ _ km/L”, “Consumption/Average_ _ L/100 km” or “Consumption/Average_ _ MPG” (for the UK).

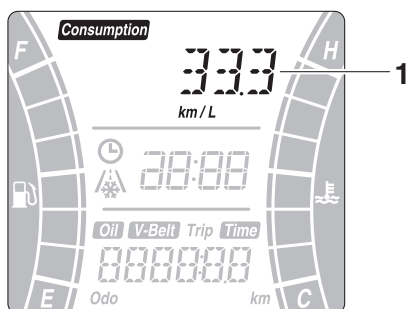
- “Consumption/Average_ _ km/L”: The average distance that can be traveled on 1.0 L of fuel is shown.
- “Consumption/Average_ _ L/100 km”: The average amount of fuel necessary to travel 100 km is shown.
- “Consumption/Average_ _ MPG” (for the UK): The average distance that can be traveled on 1.0 Imp.gal of fuel is shown.

To reset the average fuel consumption, push the “INFO” switch for at least three seconds.

TIP

After resetting the average fuel consumption, “_ _ _” will be shown until the vehicle has traveled 1 km (0.6 mi).

Instantaneous fuel consumption display



1. Instantaneous fuel consumption display

This function calculates the fuel consumption under current riding conditions.

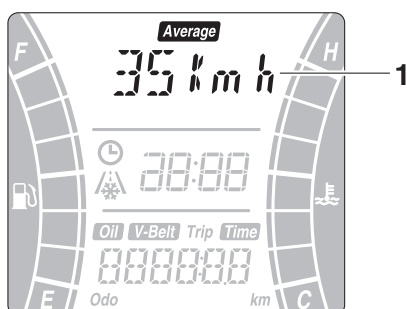
The instantaneous fuel consumption can be displayed as either “Consumption_ _ _ km/L”, “Consumption_ _ _ L/100 km” or “Consumption_ _ _ MPG” (for the UK).

- “Consumption_ _ _ km/L”: The distance that can be traveled on 1.0 L of fuel under the current riding conditions is shown.
- “Consumption_ _ _ L/100 km”: The amount of fuel necessary to travel 100 km under the current riding conditions is shown.
- “Consumption_ _ _ MPG” (for the UK): The distance that can be traveled on 1.0 Imp.gal of fuel under the current riding conditions is shown.

TIP

If traveling at speeds under 10 km/h (6 mi/h), “_ _ _” is displayed.

Average speed display



1. Average speed display

The average speed “Average_ _ _ kmh” or “Average_ _ _ MPH” (for the UK) is displayed.

The average speed is the total distance divided by the total time (with the main switch in the “ON” position) since the display was last reset to zero. This display shows the average speed since it was last reset.


To reset the average speed display, select it by pushing the “INFO” switch, and then push the “INFO” switch for three seconds.

Warning message function

This function displays a warning message corresponding to the current warning.

“L FUEL”: Appears when the last segment of the fuel meter starts flashing. If “L FUEL” is displayed, refuel as soon as possible.

“H TEMP”: Appears when the top segment of the coolant temperature meter starts flashing. If “H TEMP” is displayed, stop the vehicle, then stop the engine, and let the engine cool.

“ICE”: Appears when the icy road warning indicator “” starts flashing. If “ICE” is displayed, be careful of icy roads.

“OIL SERV”: Appears when the oil change indicator “OIL” starts flashing. If “OIL SERV” is displayed, change the engine oil, and then reset the oil change indicator and oil change tripmeter.

“V-BELT SERV”: Appears when the V-belt replacement indicator “V-Belt” starts flashing. If “V-BELT SERV” is displayed, replace the V-belt, and then reset the V-belt replacement indicator and V-belt replacement tripmeter.

When there are two or more warnings, the warning messages are displayed in the following order:

L FUEL → H TEMP → ICE → OIL SERV → VBELT SERV → L FUEL


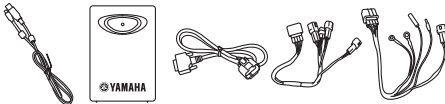
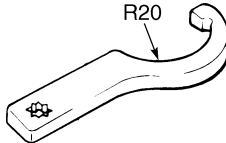
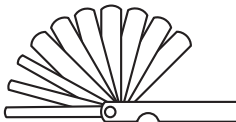
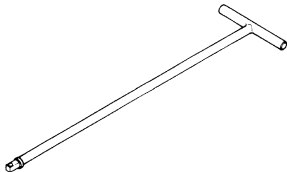

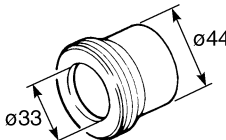
EAS20012

SPECIAL TOOLS

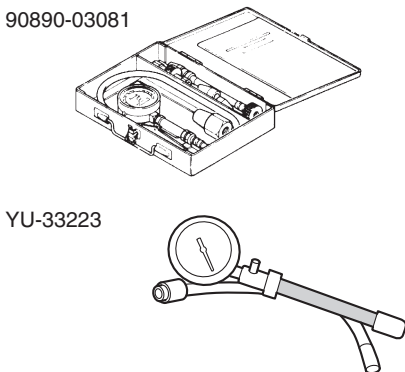

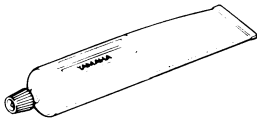
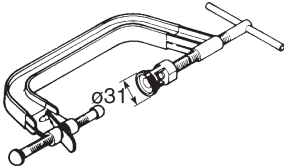
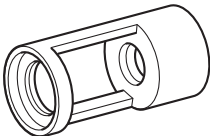
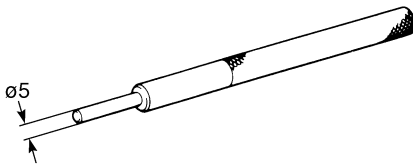
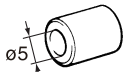
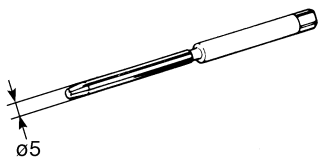
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

TIP

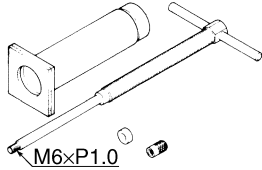
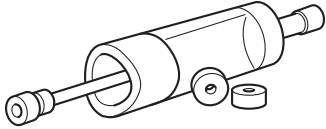
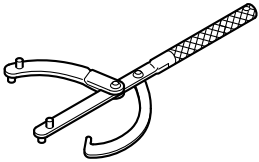
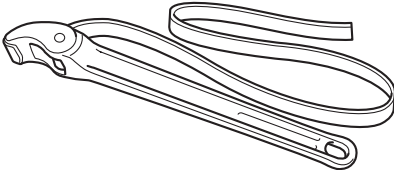
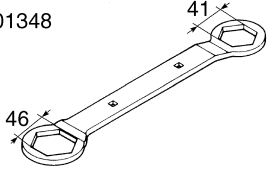
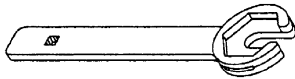
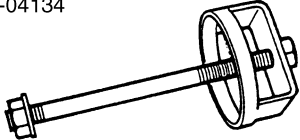
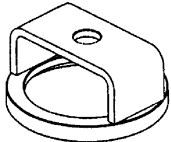
- For U.S.A. and Canada, use part numbers starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part numbers starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Yamaha diagnostic tool USB 90890-03256		3-4, 3-7, 3-8, 4-68, 4-69, 7-17, 7-17, 7-18, 7-18, 8-34, 8-88, 8-110, 8-128
Yamaha diagnostic tool (A/I) 90890-03254		3-4, 3-7, 3-8, 4-68, 4-69, 7-17, 7-17, 7-18, 7-18, 8-34, 8-88, 8-110, 8-128
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472		3-16, 4-89
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		4-32, 4-36
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-82, 4-84
Fork seal driver weight 90890-01184 Replacement hammer YM-A9409-7		4-85, 4-85, 4-85
Fork seal driver attachment (ø33) 90890-01368 Replacement 33 mm YM-A9409-4		4-85, 4-85

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Compression gauge 90890-03081 Engine compression tester YU-33223	 <p>90890-03081</p> <p>YU-33223</p>	5-5
Camshaft sprocket stopper 90890-04182 Camshaft sprocket stopper YM-04182		5-17, 5-20
Yamaha bond No. 1215 90890-85505 (Three bond No.1215®)		5-20, 5-51, 5-63
Valve spring compressor 90890-04019 Valve spring compressor YM-04019		5-27, 5-31
Valve spring compressor attachment 90890-06320		5-27, 5-31
Valve guide remover (ø5) 90890-04097 Valve guide remover (5.0 mm) YM-04097		5-28
Valve guide installer (ø5) 90890-04098 Valve guide installer (5.0 mm) YM-04098		5-28
Valve guide reamer (ø5) 90890-04099 Valve guide reamer (5.0 mm) YM-04099		5-28

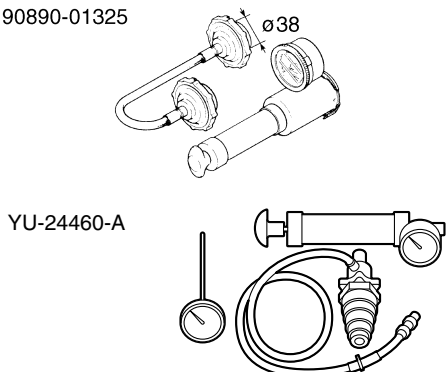
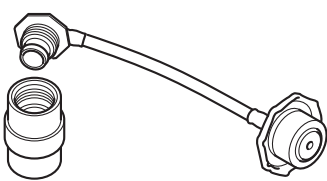
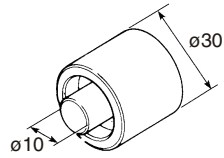
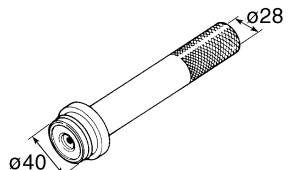
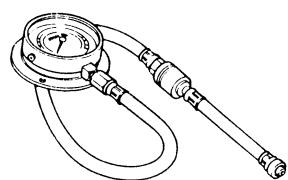
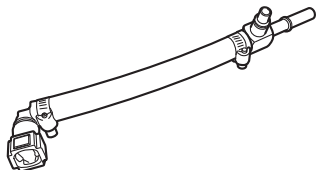
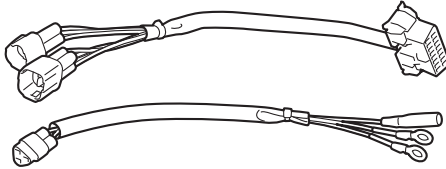
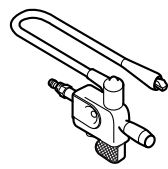
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304  YU-01304 	5-33
Rotor holding tool 90890-01235 Universal magneto and rotor holder YU-01235		5-40, 5-45
Rotor holding tool 90890-04166 Rotor holding tool YM-04166		5-40, 5-40, 5-44, 5-45, 5-49, 5-49, 5-50, 5-51
Locknut wrench 90890-01348 Locknut wrench YM-01348	90890-01348  YM-01348 	5-40, 5-44
Sheave spring compressor 90890-04134 Sheave spring compressor YM-04134	90890-04134  YM-04134 	5-40, 5-43

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Sheave fixed block 90890-04135 Sheave fixed bracket YM-04135	<p>90890-04135</p> <p>YM-04135</p>	5-40, 5-43
Oil seal guide (40mm) 90890-01590 Sliding sheave guide 40mm YM-01590	<p>ø40</p>	5-43
Flywheel puller 90890-01404 Flywheel puller YM-01404	<p>M35xP1.5</p>	5-49
Rotor puller bolt M14 X L80 90890-04183 Rotor puller bolt M14 X L80 YM-04183	<p>M14xP1.5</p> <p>L80</p>	5-49
Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927		5-54, 8-128, 8-129, 8-130, 8-131, 8-131, 8-132, 8-133, 8-133, 8-133, 8-134, 8-134, 8-135, 8-135, 8-136, 8-137, 8-137, 8-138
Crankshaft metal installation base set 90890-04181 Crankshaft metal installation base set YM-04181		5-67, 5-72

SPECIAL TOOLS

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>	6-4, 6-5
Radiator cap tester adapter 31mm 90890-05375 Radiator cap tester adapter 31mm YM-05375		6-4, 6-5
Mechanical seal installer 90890-04145	 <p>30</p> <p>10</p>	6-10
Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 & 50 mm YM-04058	 <p>28</p> <p>40</p>	6-10
Pressure gauge 90890-03153 Pressure gauge YU-03153		7-7
Fuel pressure adapter 90890-03186 Fuel pressure adapter YM-03186		7-7
OBD/ GST Leadwire kit 90890-03249		8-34
Ignition checker 90890-06754 Oppama pet-4000 spark checker YM-34487		8-132

SPECIFICATIONS

GENERAL SPECIFICATIONS	2-1
ENGINE SPECIFICATIONS	2-2
CHASSIS SPECIFICATIONS	2-7
ELECTRICAL SPECIFICATIONS	2-9
TIGHTENING TORQUES	2-11
ENGINE TIGHTENING TORQUES	2-11
CHASSIS TIGHTENING TORQUES	2-11
CABLE ROUTING	2-13

GENERAL SPECIFICATIONS

EAS20013

GENERAL SPECIFICATIONS

Model

Model	B741 (CZD300-A_EUR/GLP/HRV/MTQ/TUR/ ZAF) B742 (CZD300-A_EUR) B743 (CZD300-AH) B749 (CZD300-A_EUR)
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Dimensions

Overall length	2185 mm (86.0 in)
Overall width	775 mm (30.5 in)
Overall height	1415/1465 mm (55.7/57.7 in)
Wheelbase	1540 mm (60.6 in)
Ground clearance	135 mm (5.31 in)
Minimum turning radius	2.6 m (8.53 ft)

Weight

Curb weight	179 kg (395 lb)
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Loading

Maximum load	161 kg (355 lb)
Riding capacity	2 person
Storage compartment_1 location	Left leg shield
Storage compartment_1 maximum load	1.0 kg (2 lb)
Storage compartment_2 location	Right leg shield
Storage compartment_2 maximum load	0.5 kg (1 lb)
Storage compartment_3 location	Under seat
Storage compartment_3 maximum load	5.0 kg (11 lb)

ENGINE SPECIFICATIONS

EAS20014

ENGINE SPECIFICATIONS

Engine

Combustion cycle	4-stroke
Cooling system	Liquid cooled
Valve train	SOHC
Displacement	292 cm ³
Number of cylinders	Single cylinder
Bore × stroke	70.0 × 75.9 mm (2.76 × 2.99 in)
Compression ratio	10.9 : 1
Compression pressure	783–1008 kPa/860 r/min (7.8–10.1 kgf/cm ² /860 r/min, 111.4–143.4 psi/860 r/min)
Starting system	Electric starter

Fuel

Recommended fuel	Regular unleaded gasoline (Gasohol [E10] acceptable)
Fuel tank capacity	13 L (3.4 US gal, 2.9 Imp.gal)
Fuel reserve amount	2.4 L (0.63 US gal, 0.53 Imp.gal)

Engine oil

Recommended brand	YAMALUBE
SAE viscosity grades	10W-40
Recommended engine oil grade	API service SG type or higher, JASO standard MA or MB
Lubrication system	Wet sump
Engine oil quantity	
Oil change	1.50 L (1.59 US qt, 1.32 Imp.qt)
With oil filter removal	1.60 L (1.69 US qt, 1.41 Imp.qt)
Quantity (disassembled)	1.70 L (1.80 US qt, 1.50 Imp.qt)

Final transmission oil

Type	Motor oil SAE 10W-30 type SE or higher or Gear oil SAE 85W GL-3
Quantity (disassembled)	0.23 L (0.24 US qt, 0.20 Imp.qt)
Quantity	0.20 L (0.21 US qt, 0.18 Imp.qt)

Oil filter

Oil filter type	Paper
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Oil pump

Inner-rotor-to-outer-rotor-tip clearance	0.100–0.150 mm (0.0039–0.0059 in)
Limit	0.23 mm (0.0091 in)
Outer-rotor-to-oil-pump-housing clearance	0.10–0.15 mm (0.0039–0.0059 in)
Limit	0.22 mm (0.0087 in)
Relief valve operating pressure	390.0 kPa (3.90 kgf/cm ² , 56.6 psi)

Cooling system

Coolant quantity	
Radiator (including all routes)	1.10 L (1.16 US qt, 0.97 Imp.qt)
Coolant reservoir (up to the maximum level mark)	0.18 L (0.19 US qt, 0.16 Imp.qt)

ENGINE SPECIFICATIONS

Radiator cap valve opening pressure	108.0–137.4 kPa (1.08–1.37 kgf/cm ² , 15.7–19.9 psi)
Thermostat	
Valve opening temperature	74.0–78.0 °C (165.20–172.40 °F)
Valve full open temperature	90.0 °C (194.00 °F)
Valve lift (full open)	7.0 mm (0.28 in)
Water pump	
Water pump type	Single suction centrifugal pump
Impeller shaft tilt limit	0.15 mm (0.006 in)
Spark plug(s)	
Manufacturer/model	NGK/LMAR8A-9
Spark plug gap	0.8–0.9 mm (0.031–0.035 in)
Cylinder head	
Warpage limit	0.05 mm (0.0020 in)
Camshaft	
Camshaft lobe dimensions	
Lobe height (Intake)	40.017–40.117 mm (1.5755–1.5794 in)
Limit	39.917 mm (1.5715 in)
Lobe height (Exhaust)	39.954–40.054 mm (1.5730–1.5769 in)
Limit	39.854 mm (1.5691 in)
Camshaft runout limit	0.030 mm (0.0012 in)
Rocker arm/rocker arm shaft	
Rocker arm inside diameter	11.985–12.000 mm (0.4719–0.4724 in)
Limit	12.015 mm (0.4730 in)
Rocker arm shaft outside diameter	11.966–11.976 mm (0.4711–0.4715 in)
Limit	11.935 mm (0.4699 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.009–0.034 mm (0.0004–0.0013 in)
Limit	0.080 mm (0.0032 in)
Valve, valve seat, valve guide	
Valve clearance (cold)	
Intake	0.06–0.12 mm (0.0024–0.0047 in)
Exhaust	0.20–0.26 mm (0.0079–0.0102 in)
Valve dimensions	
Valve seat contact width (intake)	0.90–1.20 mm (0.0354–0.0472 in)
Limit	1.7 mm (0.07 in)
Valve seat contact width (exhaust)	0.90–1.20 mm (0.0354–0.0472 in)
Limit	1.7 mm (0.07 in)
Valve stem diameter (intake)	4.975–4.990 mm (0.1959–0.1965 in)
Limit	4.945 mm (0.1947 in)
Valve stem diameter (exhaust)	4.960–4.975 mm (0.1953–0.1959 in)
Limit	4.930 mm (0.1941 in)
Valve guide inside diameter (intake)	5.000–5.012 mm (0.1969–0.1973 in)
Valve guide inside diameter (exhaust)	5.000–5.012 mm (0.1969–0.1973 in)
Valve-stem-to-valve-guide clearance (intake)	0.010–0.037 mm (0.0004–0.0015 in)
Limit	0.080 mm (0.0032 in)

ENGINE SPECIFICATIONS

Valve-stem-to-valve-guide clearance (exhaust)	0.025–0.052 mm (0.0010–0.0020 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.010 mm (0.0004 in)
Valve spring	
Free length (intake)	35.87 mm (1.41 in)
Limit	34.07 mm (1.34 in)
Free length (exhaust)	35.87 mm (1.41 in)
Limit	34.07 mm (1.34 in)
Cylinder	
Bore	70.000–70.025 mm (2.7559–2.7569 in)
Wear limit	70.075 mm (2.7589 in)
Piston	
Diameter	69.962–69.985 mm (2.7544–2.7553 in)
Measuring point (from piston skirt bottom)	8.0 mm (0.31 in)
Piston-to-cylinder clearance	0.031–0.047 mm (0.0012–0.0019 in)
Piston pin bore inside diameter	16.002–16.013 mm (0.6300–0.6304 in)
Limit	16.043 mm (0.6316 in)
Piston pin outside diameter	15.995–16.000 mm (0.6297–0.6299 in)
Limit	15.975 mm (0.6289 in)
Piston-pin-to-piston-pin-bore clearance	0.002–0.018 mm (0.0001–0.0007 in)
Piston ring	
Top ring	
Ring type	Barrel
End gap limit	0.50 mm (0.0197 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 in)
Side clearance limit	0.115 mm (0.0045 in)
2nd ring	
Ring type	Taper
End gap limit	1.15 mm (0.0453 in)
Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)
Side clearance limit	0.115 mm (0.0045 in)
Connecting rod	
Oil clearance	0.033–0.057 mm (0.0013–0.0022 in)
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green
Crankshaft	
Runout limit	0.030 mm (0.0012 in)
Crankshaft journal diameter	39.976–40.000 mm (1.5739–1.5748 in)
Crankshaft journal bearing inside diameter	40.015–40.056 mm (1.5754–1.5770 in)
Journal oil clearance	0.031–0.064 mm (0.0012–0.0025 in)
Code 0	White
Code 1	Blue
Code 2	Black
Code 3	Brown

ENGINE SPECIFICATIONS

Code 4	Green
Code 5	Yellow
Code 6	Pink
Balancer shaft runout limit	0.030 mm (0.0012 in)
Clutch	
Clutch type	Dry, centrifugal, shoe
Automatic centrifugal clutch	
Clutch shoe thickness	3.0 mm (0.12 in)
Limit	1.5 mm (0.06 in)
Clutch housing inside diameter	150.0 mm (5.91 in)
Limit	150.5 mm (5.93 in)
Clutch weight spring free length	30.0 mm (1.18 in)
Spring quantity	5 pcs
Clutch-in revolution	2000–2400 r/min
Clutch-stall revolution	4500–5100 r/min
V-belt	
V-belt width	27.7 mm (1.09 in)
Limit	26.7 mm (1.05 in)
Drivetrain	
Primary reduction ratio	1.000
Transmission type	V-belt automatic
Transmission ratio	2.386–0.746 : 1
Weight outside diameter	23.0 mm (0.91 in)
Limit	22.5 mm (0.89 in)
Compression spring free length	111.0 mm (4.37 in)
Limit	99.9 mm (3.93 in)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)
Secondary reduction ratio	7.590 (48/18 × 37/13)
Final drive	Gear
Air filter	
Air filter element	Oil-coated paper element/Dry element
V-belt filter element	Dry element
Fuel pump	
Pump type	Electrical
Maximum consumption amperage	1.7 A
Type × quantity	AC35 × 1
Fuel injector	
Resistance	12.2 Ω
Throttle body	
ID mark	B741 00
Idling condition	
Engine idling speed	1500–1700 r/min
O2 feedback control	Active

ENGINE SPECIFICATIONS

Exhaust gas sampling point

CO%

Fuel line pressure (at idle)

Throttle grip free play

Muffler tail pipe

0.0–1.0 %

220–300 kPa (2.2–3.0 kgf/cm², 31.9–43.5 psi)

3.0–5.0 mm (0.12–0.20 in)

CHASSIS SPECIFICATIONS

EAS20015

CHASSIS SPECIFICATIONS

Chassis

Frame type	Backbone
Caster angle	26.5 °
Trail	95 mm (3.7 in)

Front wheel

Wheel type	Cast wheel
Rim size	J15M/C × MT3.5
Rim material	Aluminum
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	1.0 mm (0.04 in)

Rear wheel

Wheel type	Cast wheel
Rim size	J14M/C × MT4.0
Rim material	Aluminum
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	1.0 mm (0.04 in)

Front tire

Type	Tubeless
Size	120/70–15 M/C 56P
Manufacturer/model	DUNLOP/SCOOTSMART

Rear tire

Type	Tubeless
Size	140/70–14 M/C 62P
Manufacturer/model	DUNLOP/SCOOTSMART

Tire air pressure (measured on cold tires)

1 person	
Front	200 kPa (2.00 kgf/cm ² , 29 psi)
Rear	225 kPa (2.25 kgf/cm ² , 33 psi)
2 persons	
Front	200 kPa (2.00 kgf/cm ² , 29 psi)
Rear	225 kPa (2.25 kgf/cm ² , 33 psi)

Front brake

Type	Hydraulic single disc brake
Disc outside diameter × thickness	267.0 × 4.5 mm (10.51 × 0.18 in)
Brake disc thickness limit	4.0 mm (0.16 in)
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059 in)
Brake pad lining thickness	5.3 mm (0.21 in)
Limit	0.8 mm (0.03 in)
Master cylinder inside diameter	12.70 mm (0.50 in)
Caliper cylinder inside diameter (right)	26.99 mm, 26.99 mm (1.06 in, 1.06 in)
Specified brake fluid	DOT 4

Rear brake

Type	Hydraulic single disc brake
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CHASSIS SPECIFICATIONS

Disc outside diameter × thickness	245.0 × 5.0 mm (9.65 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059 in)
Brake pad lining thickness	6.7 mm (0.26 in)
Limit	0.8 mm (0.03 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	33.34 mm (1.31 in)
Specified brake fluid	DOT 4

Front suspension

Type	Telescopic fork
Spring	Coil spring
Shock absorber	Hydraulic damper
Fork spring free length	348.3 mm (13.71 in)
Limit	341.3 mm (13.44 in)
Recommended oil	Yamaha Suspension Oil G10
Quantity (left)	235.0 cm ³ (7.95 US oz, 8.29 Imp.oz)
Quantity (right)	235.0 cm ³ (7.95 US oz, 8.29 Imp.oz)
Level (left)	155 mm (6.1 in)
Level (right)	155 mm (6.1 in)

Rear suspension

Type	Unit swing
Spring	Coil spring
Shock absorber	Hydraulic damper
Spring preload	
Adjusting system	Mechanical adjustable type
Unit for adjustment	Cam position
Adjustment value (Soft)	1
Adjustment value (STD)	3
Adjustment value (Hard)	5

ELECTRICAL SPECIFICATIONS

EAS20016

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.)	10.0 °/1600 r/min

Engine control unit

Model/manufacture	B740/PT. YAMAHA MOTOR ELECTRONICS INDONESIA
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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

Resistance	3.75–6.25 k Ω
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Lean angle sensor output voltage

Operating angle	50 °
Output voltage up to operating angle	0.4–1.4 V
Output voltage over operating angle	3.7–4.4 V

Charging system

Charging system	AC magneto
Standard output	14.0 V, 12.5 A at 5000 r/min
Standard output	14.0 V, 175 W at 5000 r/min
Stator coil resistance	0.360–0.540 Ω

Rectifier/regulator

Regulator type	Single-phase
Regulated voltage (DC)	14.0–15.0 V
Rectifier capacity (DC)	20.0 A

Battery

Model	GTZ8V
Voltage, capacity	12 V, 7.0 Ah (10 HR)

Bulb wattage

Headlight	LED
Tail/brake light	LED
Front turn signal light	10.0 W
Rear turn signal light	10.0 W
Auxiliary light	LED
License plate light	5.0 W
Meter lighting	LED
High beam indicator light	LED
Turn signal indicator light	LED

ELECTRICAL SPECIFICATIONS

Engine trouble warning light	LED
ABS warning light	LED
Smart key system indicator light	LED
Traction control system indicator light	LED

Starter motor

Power output	0.40 kW
Armature coil resistance	0.063–0.077 Ω
Brush overall length	7.0 mm (0.28 in)
Limit	3.00 mm (0.12 in)
Brush spring force	6.08–9.12 N (620–930 gf, 21.89–32.83 oz)
Commutator diameter	24.5 mm (0.96 in)
Limit	23.5 mm (0.93 in)
Mica undercut (depth)	1.50 mm (0.06 in)

Fuel sender unit

Sender unit resistance (full)	10.0–14.0 Ω
Sender unit resistance (empty)	267.0–273.0 Ω

Fuel injection sensor

Crankshaft position sensor resistance	228–342 Ω
Intake air temperature sensor resistance	5700–6300 Ω at 0 °C (5700–6300 Ω at 32 °F)
Coolant temperature sensor resistance	2513–2777 Ω at 20 °C (2513–2777 Ω at 68 °F)
Coolant temperature sensor resistance	210–221 Ω at 100 °C (210–221 Ω at 212 °F)

Fuse(s)

Main fuse	20.0 A
Main fuse 2	7.5 A
Signaling system fuse	10.0 A
Signaling system fuse 2	7.5 A
Radiator fan motor fuse	7.5 A
Turn signal light and hazard fuse	7.5 A
ABS control unit fuse	7.5 A
ABS motor fuse	30.0 A
ABS solenoid fuse	15.0 A
Terminal fuse	2.0 A
Answer back fuse	2.0 A
Backup fuse	7.5 A





TIGHTENING TORQUES

EAS20017

TIGHTENING TORQUES

EAS30016

ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Exhaust pipe nut	M8	2	15 N·m (1.5 kgf·m, 11 lb·ft)	
Clamp bolt	M8	1	20 N·m (2.0 kgf·m, 15 lb·ft)	
Muffler bolt	M10	3	53 N·m (5.3 kgf·m, 39 lb·ft)	
Muffler protector bolt	M6	2	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Muffler cap bolt	M6	1	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Coolant drain bolt (water pump side)	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Coolant drain bolt (radiator side)	M10	1	1.6 N·m (0.16 kgf·m, 1.2 lb·ft)	
Engine oil drain bolt	M12	1	20 N·m (2.0 kgf·m, 15 lb·ft)	
Final transmission oil drain bolt	M8	1	20 N·m (2.0 kgf·m, 15 lb·ft)	
Oil filter element cover bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Clutch housing nut	M14	1	75 N·m (7.5 kgf·m, 55 lb·ft)	
Cylinder head cover bolt	M6	6	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Spark plug	M10	1	13 N·m (1.3 kgf·m, 9.6 lb·ft)	
Generator rotor bolt	M10	1	75 N·m (7.5 kgf·m, 55 lb·ft)	
Generator cover bolt	M6	11	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Primary fixed sheave bolt	M12	1	See TIP.	
Secondary sheave nut	M30	1	85 N·m (8.5 kgf·m, 63 lb·ft)	

TIP



115 N·m (11.5 kgf·m, 85 lb·ft): Tightening torque when reusing the primary fixed sheave bolt and washer

120 N·m (12 kgf·m, 89 lb·ft): Tightening torque when installing a new primary fixed sheave bolt and washer

TIGHTENING TORQUES

EAS30017

CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Upper handlebar holder bolt	M8	4	21 N·m (2.1 kgf·m, 15 lb·ft)	
Front brake caliper bolt	M10	2	35 N·m (3.5 kgf·m, 26 lb·ft)	
Brake caliper bleed screw	M7	2	6 N·m (0.6 kgf·m, 4.4 lb·ft)	
Front wheel axle nut	M14	1	52 N·m (5.2 kgf·m, 38 lb·ft)	
Rear brake caliper bolt	M10	2	35 N·m (3.5 kgf·m, 26 lb·ft)	
Rear wheel axle nut	M16	1	125 N·m (12.5 kgf·m, 92 lb·ft)	
Upper bracket pinch bolt	M8	2	23 N·m (2.3 kgf·m, 17 lb·ft)	
Lower bracket pinch bolt	M10	2	30 N·m (3.0 kgf·m, 22 lb·ft)	
Steering stem nut	M22	1	91 N·m (9.1 kgf·m, 67 lb·ft)	
Lower ring nut	M22	1	See TIP.	

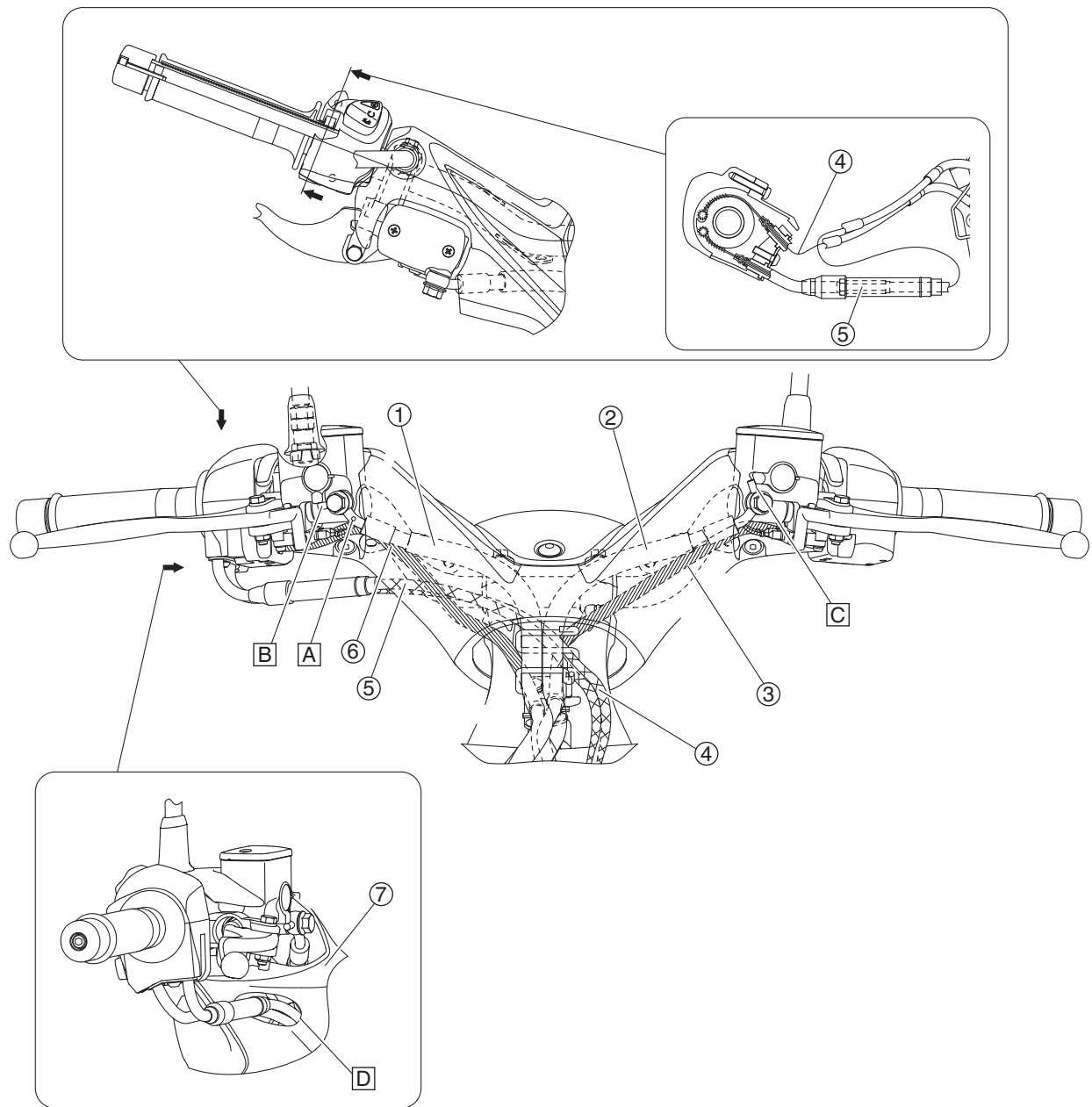
TIP

1. Tighten the lower ring nut 48 N·m (4.8 kgf·m, 35 lb·ft) with a torque wrench and the steering nut wrench, and then loosen the nut completely.
2. Tighten the lower ring nut 14 N·m (1.4 kgf·m, 10 lb·ft) with a torque wrench and the steering nut wrench.

EAS20021

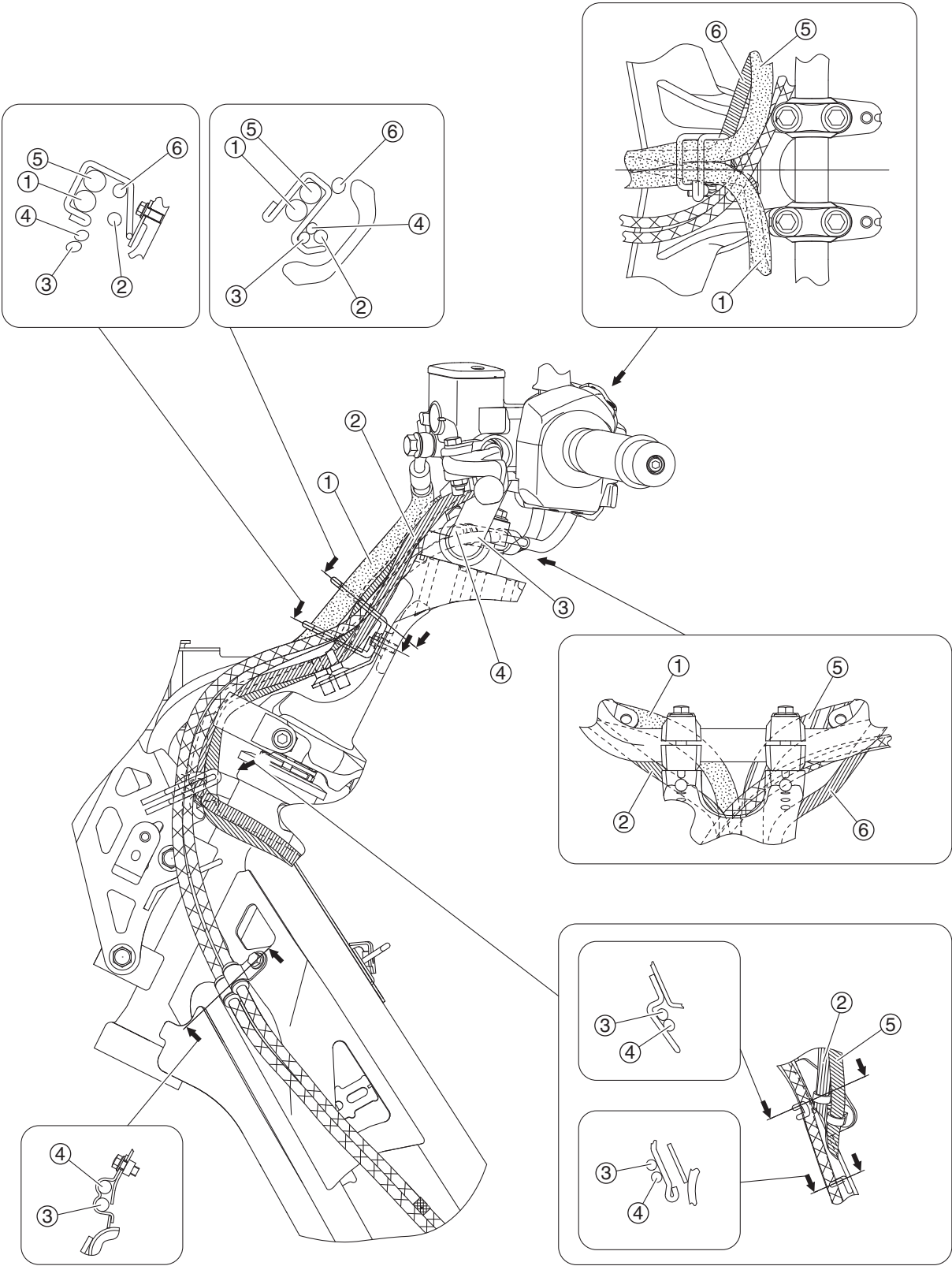
CABLE ROUTING

Handlebar (front view)



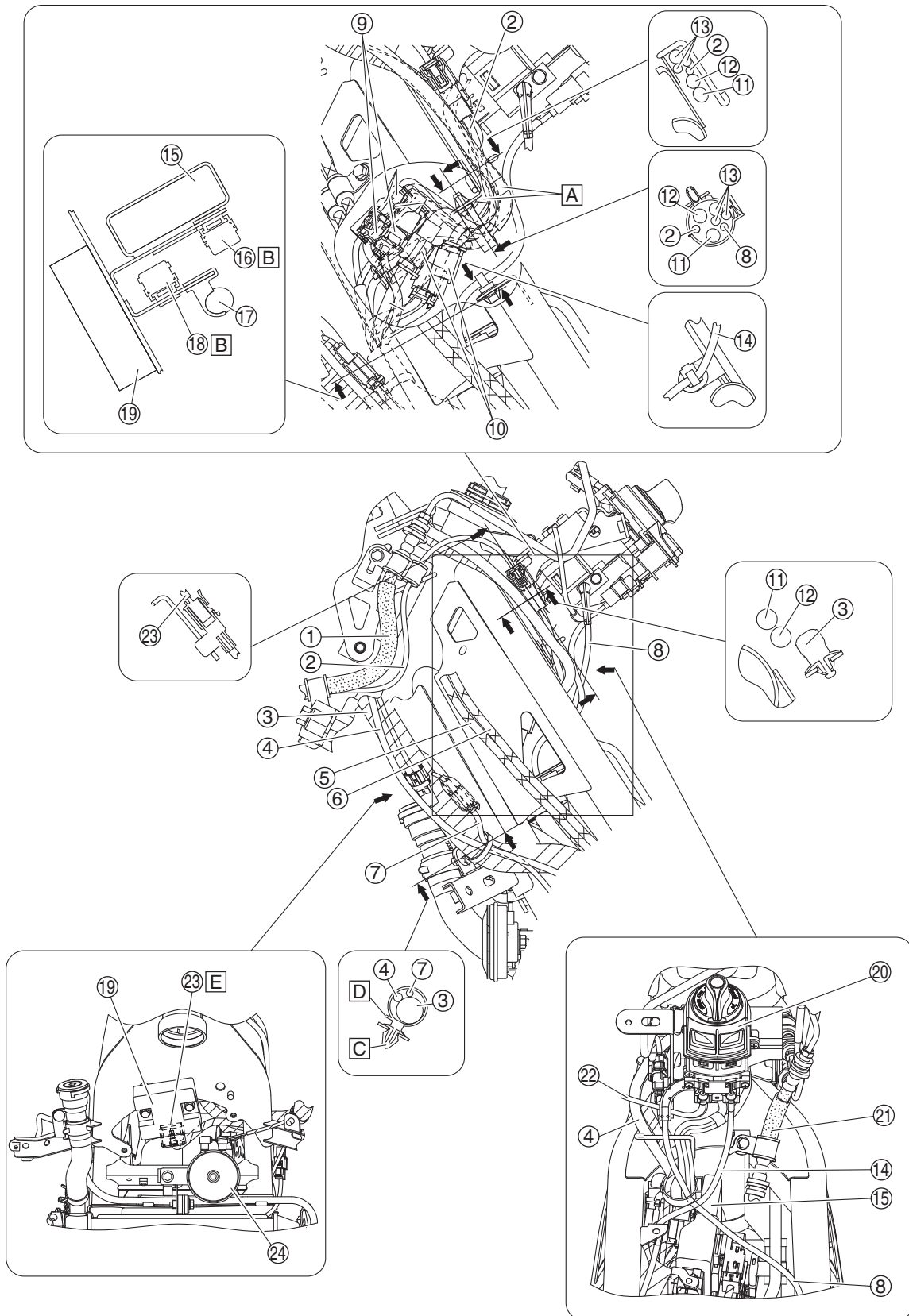
1. Front brake hose (front brake master cylinder to hydraulic unit)
2. Rear brake hose (rear brake master cylinder to hydraulic unit)
3. Handlebar switch lead (left handlebar switch)
4. Throttle cable (decelerator cable)
5. Throttle cable (accelerator cable)
6. Handlebar switch lead (right handlebar switch)
7. Lower handlebar cover
- A. Face the paint mark on the front brake hose (front brake master cylinder to hydraulic unit) to the front.
- B. Position the front brake hose (front brake master cylinder to hydraulic unit) so that its projection contacts the front brake master cylinder.
- C. Position the rear brake hose (rear brake master cylinder to hydraulic unit) so that its projection contacts the rear brake master cylinder.
- D. Route the throttle cables through the hole in the lower handlebar cover.

Handlebar (left side view)



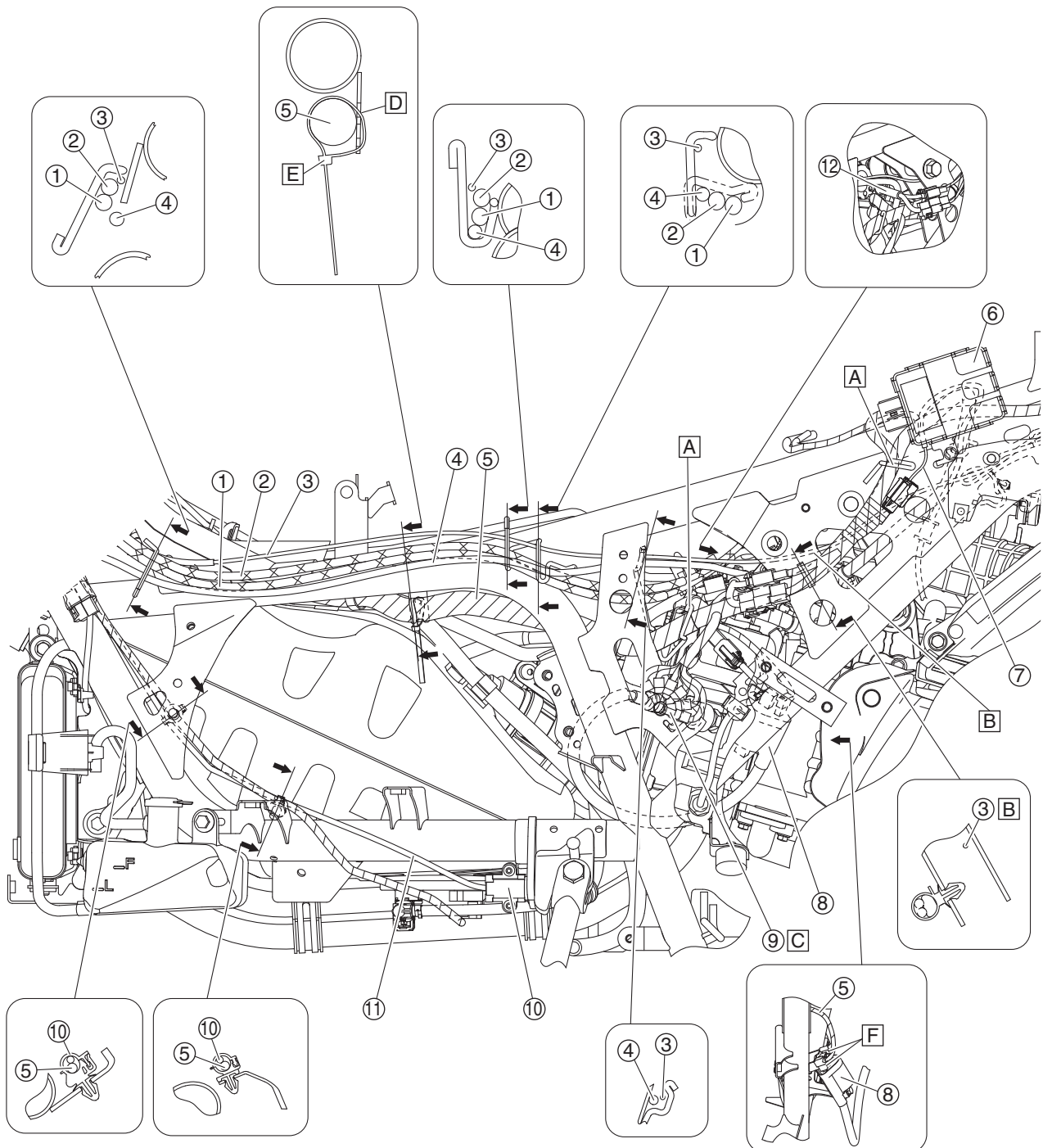
1. Rear brake hose (rear brake master cylinder to hydraulic unit)
2. Handlebar switch lead (left handlebar switch)
3. Throttle cable (decelerator cable)
4. Throttle cable (accelerator cable)
5. Front brake hose (front brake master cylinder to hydraulic unit)
6. Handlebar switch lead (right handlebar switch)

Steering (left side view)



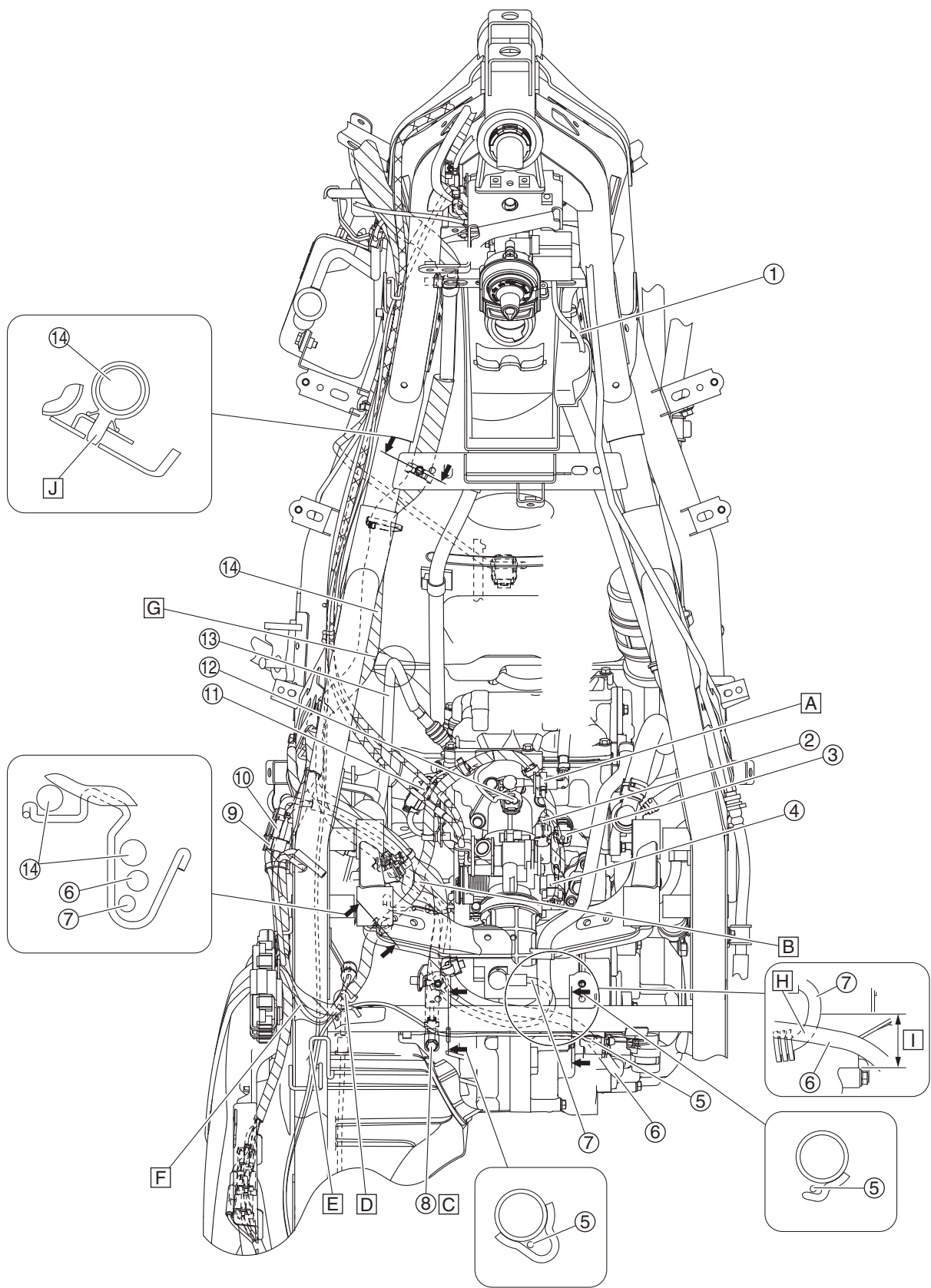
1. Front brake hose (hydraulic unit to front brake caliper)
2. Front wheel sensor lead
3. Wire harness
4. Starter motor lead
5. Throttle cable (decelerator cable)
6. Throttle cable (accelerator cable)
7. Sidestand switch lead
8. Fuel tank cap lid lock cable
9. Main switch coupler
10. Handlebar switch coupler (right handlebar switch)
11. Handlebar switch lead (left handlebar switch)
12. Handlebar switch lead (right handlebar switch)
13. Main switch lead
14. Seat lock cable
15. ECU (Engine Control Unit)
16. Radiator fan motor relay
17. Rollover valve
18. Starting circuit cut-off relay
19. Rectifier/regulator
20. Main switch
21. Rear brake hose (hydraulic unit to rear brake caliper)
22. Front storage compartment lock cable
23. Rectifier/regulator coupler
24. Horn
 - A. Position the tapes on the right handlebar switch lead and left handlebar switch lead to the rear of the guide on the frame.
 - B. Position the fan motor relay and starting circuit cut-off relay in any order.
 - C. Insert the projection on the wire harness holder (tape) into the hole in the frame.
 - D. Point the end of the plastic band outward.
 - E. Install the coupler cover completely until it contacts the rectifier/regulator.

Frame (left side view)



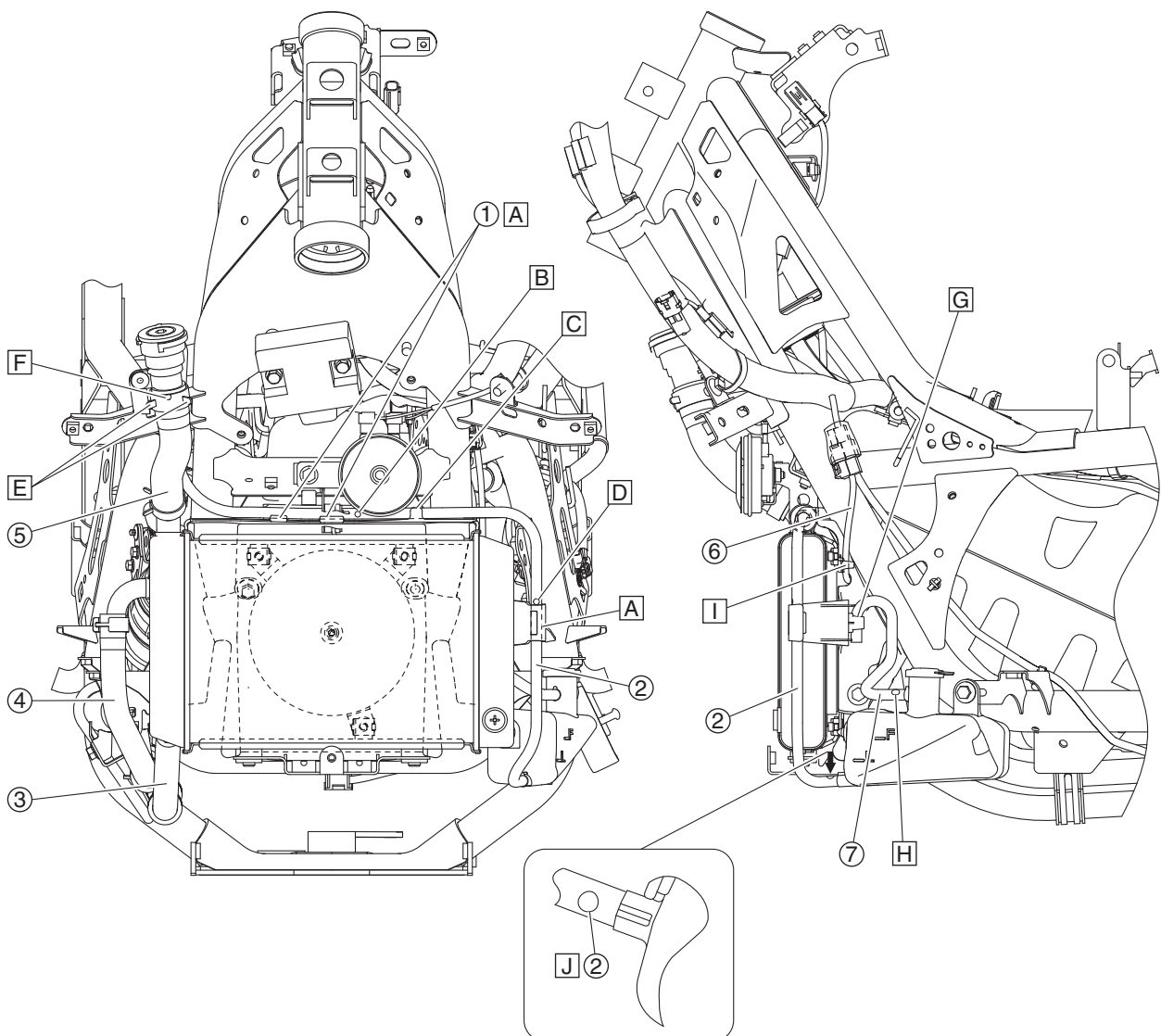
1. Throttle cable (decelerator cable)
 2. Throttle cable (accelerator cable)
 3. Seat lock cable
 4. Starter motor lead
 5. Wire harness
 6. Smart key unit
 7. Rear wheel sensor lead
 8. Ignition coil
 9. Frame ground
 10. Sidestand switch
 11. Sidestand switch lead
 12. AC magneto lead
- A. Route the wire harness through the guide on the frame.
 - B. Route the seat lock cable to the inside of the frame.
 - C. Make sure that the frame ground terminal contact the frame.
 - D. Fasten the wire harness with the plastic band. Route the plastic band through the upper hole of the stay on the frame.
 - E. Point the end of plastic band downward. Make sure that the end does not contact the fuel tank.
 - F. Connect the wire harness to the ignition coil as shown in the illustration.

Frame (top view)



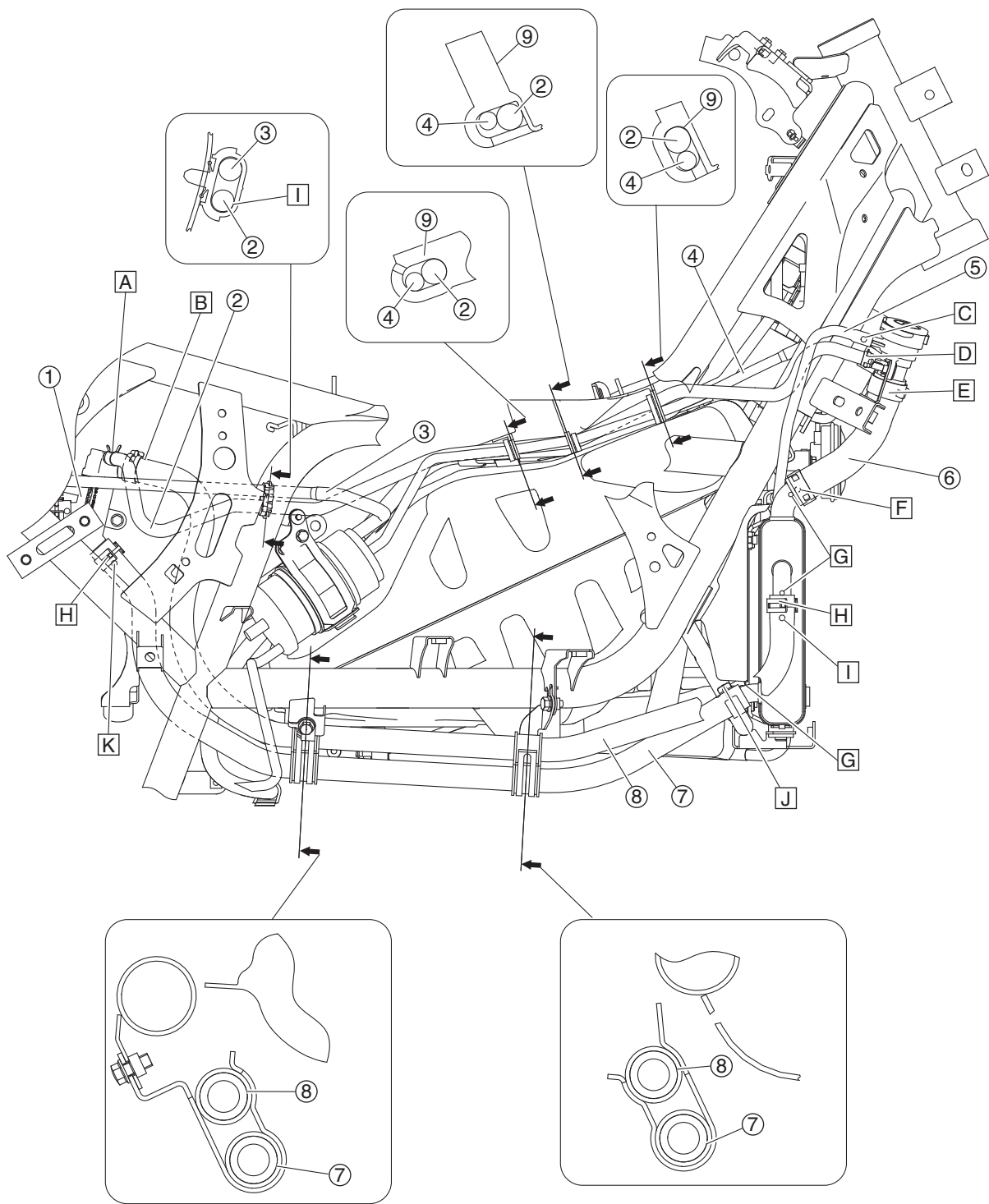
1. Fuel tank cap lid lock cable
2. ISC (Idle Speed Control) unit coupler
3. Coolant temperature sensor coupler
4. Throttle body sensor assembly coupler
5. Seat lock cable
6. AC magneto lead
7. Starter motor lead
8. Engine ground lead
9. Crankshaft position sensor coupler
10. Stator coil coupler
11. O₂ sensor coupler
12. Fuel injector coupler
13. Spark plug lead
14. Wire harness
 - A. Route the wire harness under the fuel hose.
 - B. Route the wire harness under the engine ground lead and over the AC magneto lead.
 - C. Make sure that the engine ground lead terminal contacts the stopper on the crankcase.
 - D. Route the wire harness and rear wheel sensor lead through the guide.
 - E. Route the seat lock cable through the guide.
 - F. Route the rear wheel sensor lead to the rear of wire harness.
 - G. When routing the spark plug lead, make sure that the distance between the lead and the frame is 5 mm (0.20 in) or more.
 - H. Route the AC magneto lead over the starter motor lead.
 - I. Route the AC magneto lead between the starter motor and the right crankcase.
 - J. Insert the projection on the wire harness holder into the hole in the frame.

Radiator (front and left view)



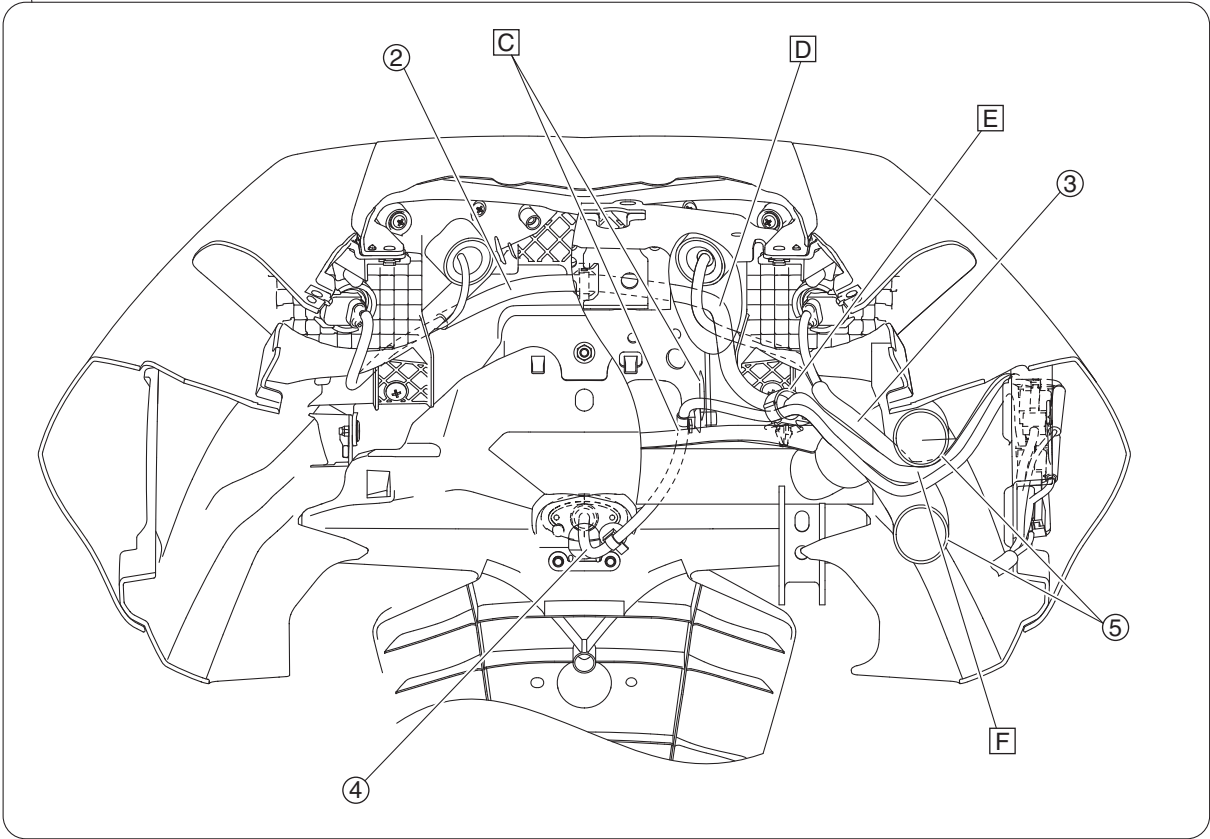
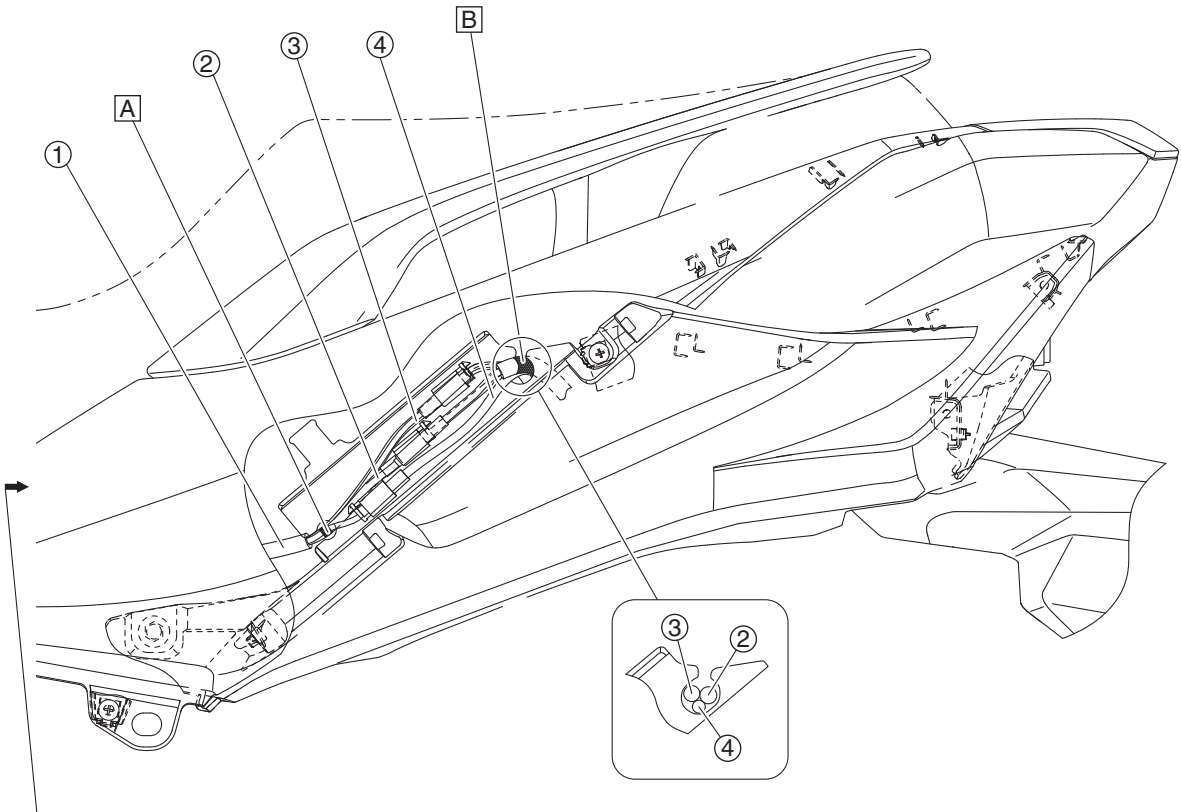
1. Radiator rear cover
2. Coolant reservoir hose
3. Radiator outlet hose
4. Radiator inlet hose
5. Radiator filler hose
6. Radiator fan motor lead
7. Coolant reservoir breather hose
- A. Fasten the coolant reservoir hose with the holder on the radiator rear cover.
- B. Align the holder with the paint mark on the coolant reservoir hose.
- C. Route the coolant reservoir hose to the rear of the projection on the radiator rear cover.
- D. Install the coolant reservoir hose with its paint mark facing forward.
- E. Point the ends of the hose clamp forward.
- F. Face the paint mark on the radiator filler hose forward.
- G. Fasten the coolant reservoir breather hose with the clamp on the radiator rear cover.
- H. Install the coolant reservoir hose with its paint mark facing upward.
- I. Fasten the radiator fan motor lead with the holder on the radiator rear cover.
- J. Align the paint mark on the coolant reservoir hose with the projection on the coolant reservoir.

Radiator (right side view)



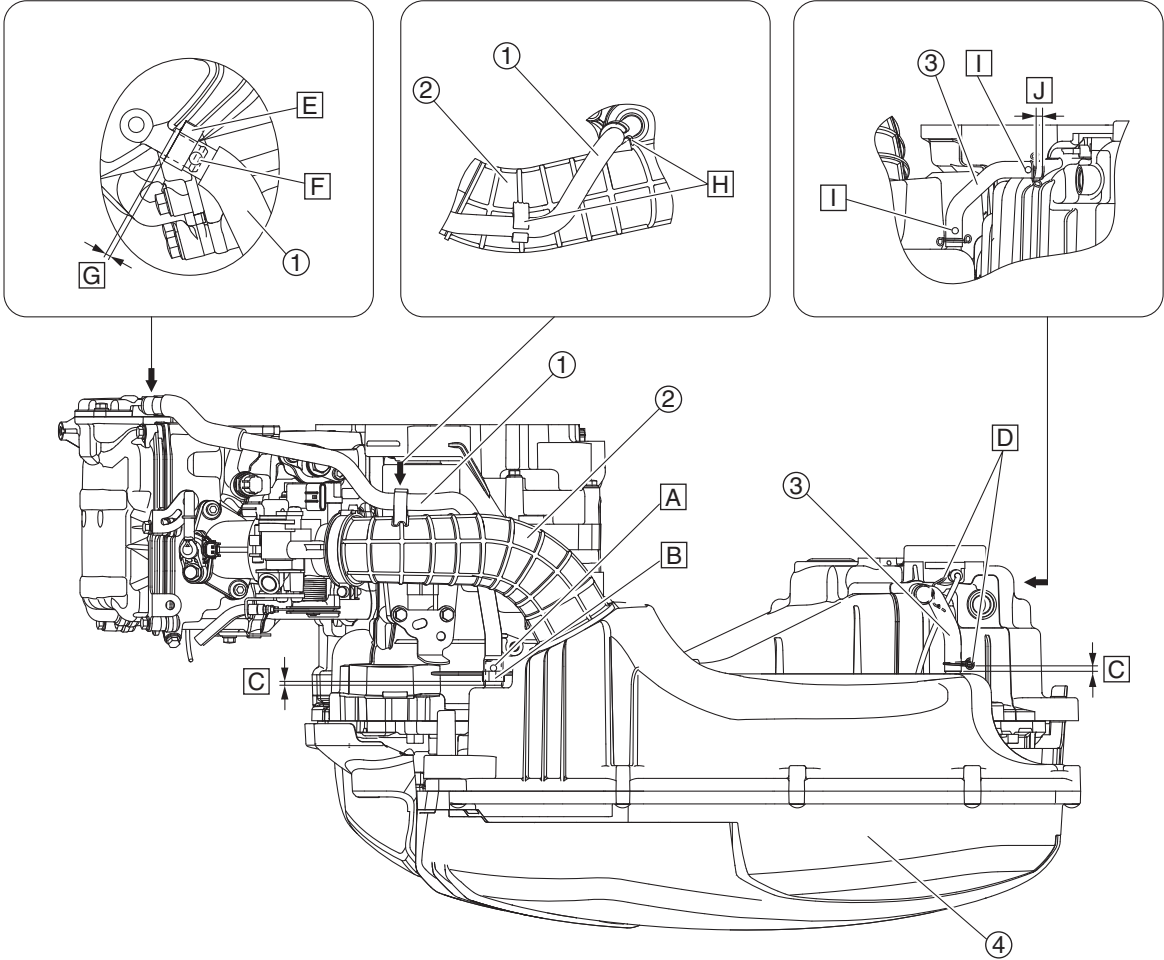
1. Thermostat
2. Cooling system air bleed hose
3. Canister purge hose
4. Fuel tank breather hose (rollover valve to canister)
5. Coolant reservoir hose
6. Radiator filler hose
7. Radiator outlet hose
8. Radiator inlet hose
9. Fuel tank overflow tray
- A. Install the cooling system air bleed hose with its paint mark facing upward. Point the end of clamp upward.
- B. Install the radiator inlet hose with its paint mark facing upward. Point the end of clamp upward.
- C. Install the coolant reservoir hose with its paint mark facing to the right.
- D. Install the cooling system air bleed hose with its paint mark facing to the right. Point the end of clamp to the right.
- E. Install the radiator filler hose with its paint mark facing forward. Point the end of clamp forward.
- F. Install the radiator filler hose with its paint mark facing to the right. Point the end of clamp to the right.
- G. Make sure that the end of the hoses contact the projections on the radiator.
- H. Point the end of clamp to the right.
- I. Install the radiator inlet hose with its paint mark to the right.
- J. Install the radiator outlet hose with its paint mark facing upward. Point the end of clamp upward.
- K. Install the radiator outlet hose with its paint mark to the right.

Tail/brake light (left side view)



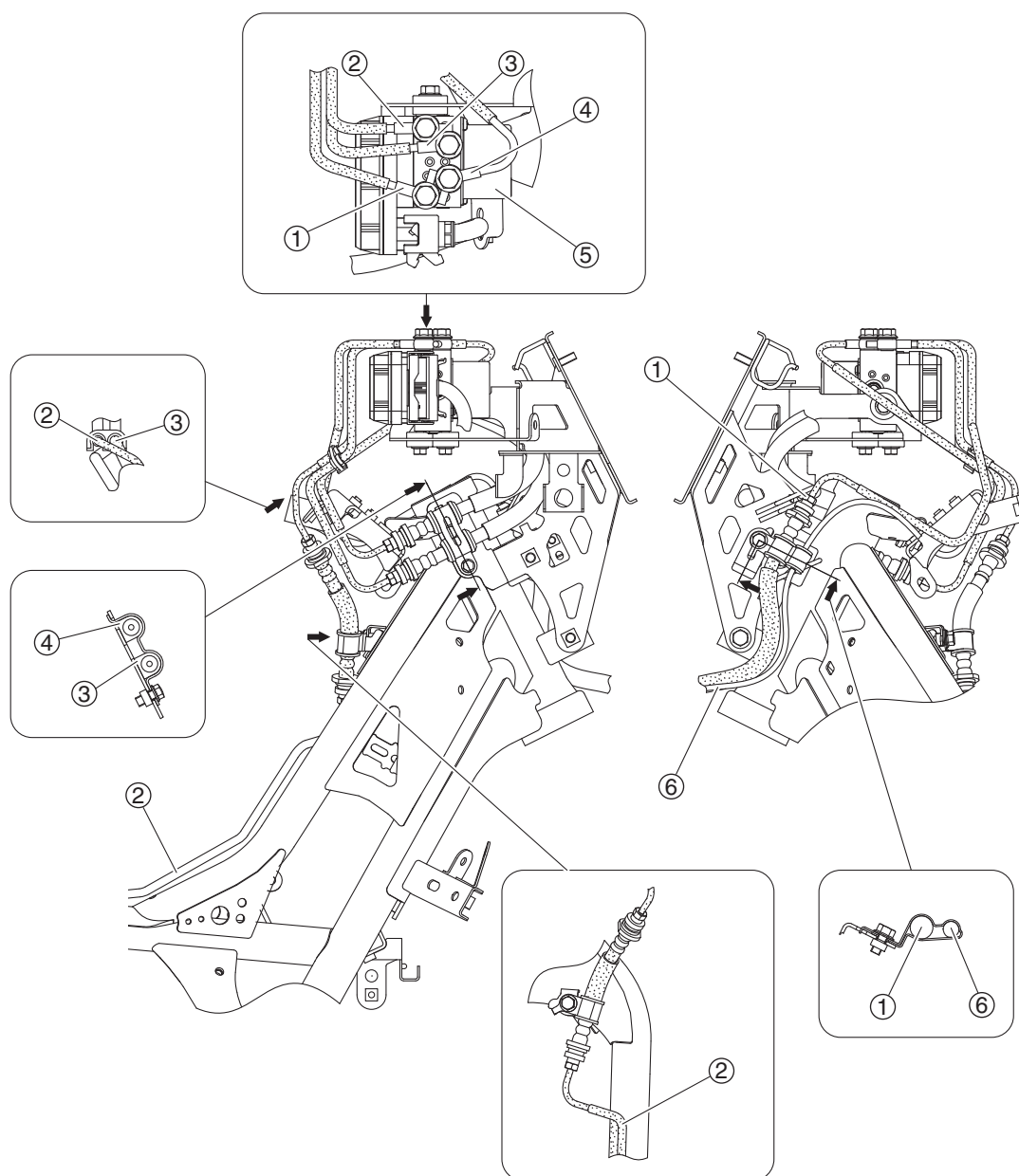
1. Wire harness
2. Tail/brake light lead (right tail/brake light)
3. Tail/brake light lead (left tail/brake light)
4. License plate light lead
5. Frame
 - A. Route the wire harness through the hole in the rear lower cowl assembly. Align the tape on the wire harness with the hole.
 - B. Route the tail/brake light leads and license plate light lead through the hole in the rear lower cowl assembly. Align the tapes on the leads with the hole.
 - C. Route the license plate light lead to the hole on the frame.
 - D. Route the tail/brake light lead (left tail/brake light) to the rear of the turn signal light lead and the front of the rear lower cowl assembly.
 - E. Route the tail/brake light lead (right tail/brake light) and license plate light lead through the guide.
 - F. Route the tail/brake light lead (left tail/brake light), tail/brake light lead (right tail/brake light) and license plate light lead between the frame.

Air filter case (top view)



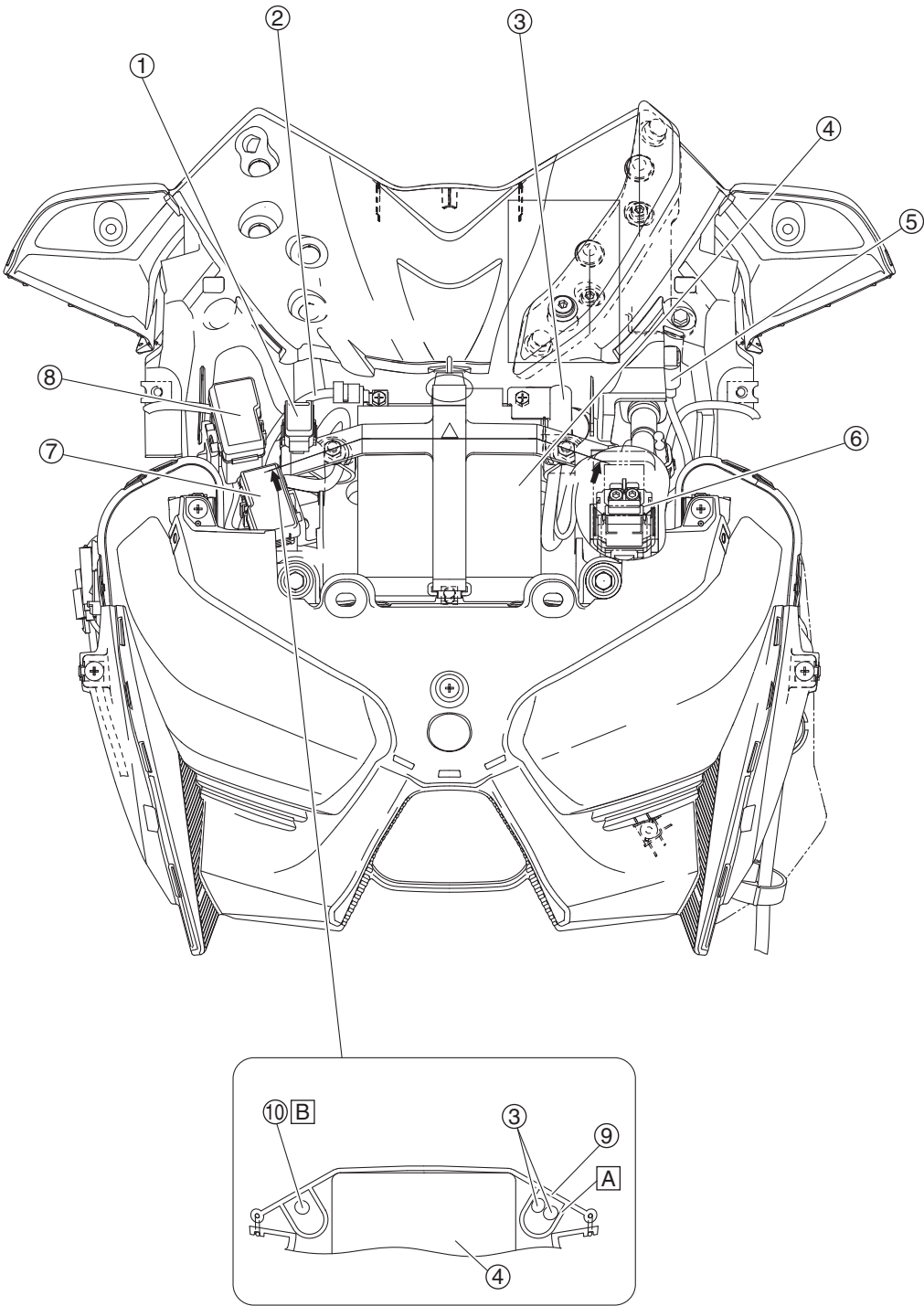
1. Cylinder head breather hose
2. Air filter case joint
3. Transmission case breather hose
4. Air filter case
- A. Install the cylinder head breather hose with its paint mark facing upward and completely onto the hose fitting.
- B. Fasten the hose with the clamp with its end facing upward.
- C. 1–5 mm (0.04–0.20 in)
- D. Point the ends of hose clamp to the rearward.
- E. Fasten the hose with the clamp with its end facing downward.
- F. Install the cylinder head breather hose with its paint mark facing to the right and completely onto the hose fitting.
- G. 1–3 mm (0.04–0.12 in)
- H. Route the cylinder head breather hose through the guide on the air filter case joint.
- I. Install the cylinder head breather hose with its paint mark facing rightward and completely onto the hose fitting.
- J. 5–6 mm (0.20–0.24 in)

Hydraulic unit (top and left/right side view)



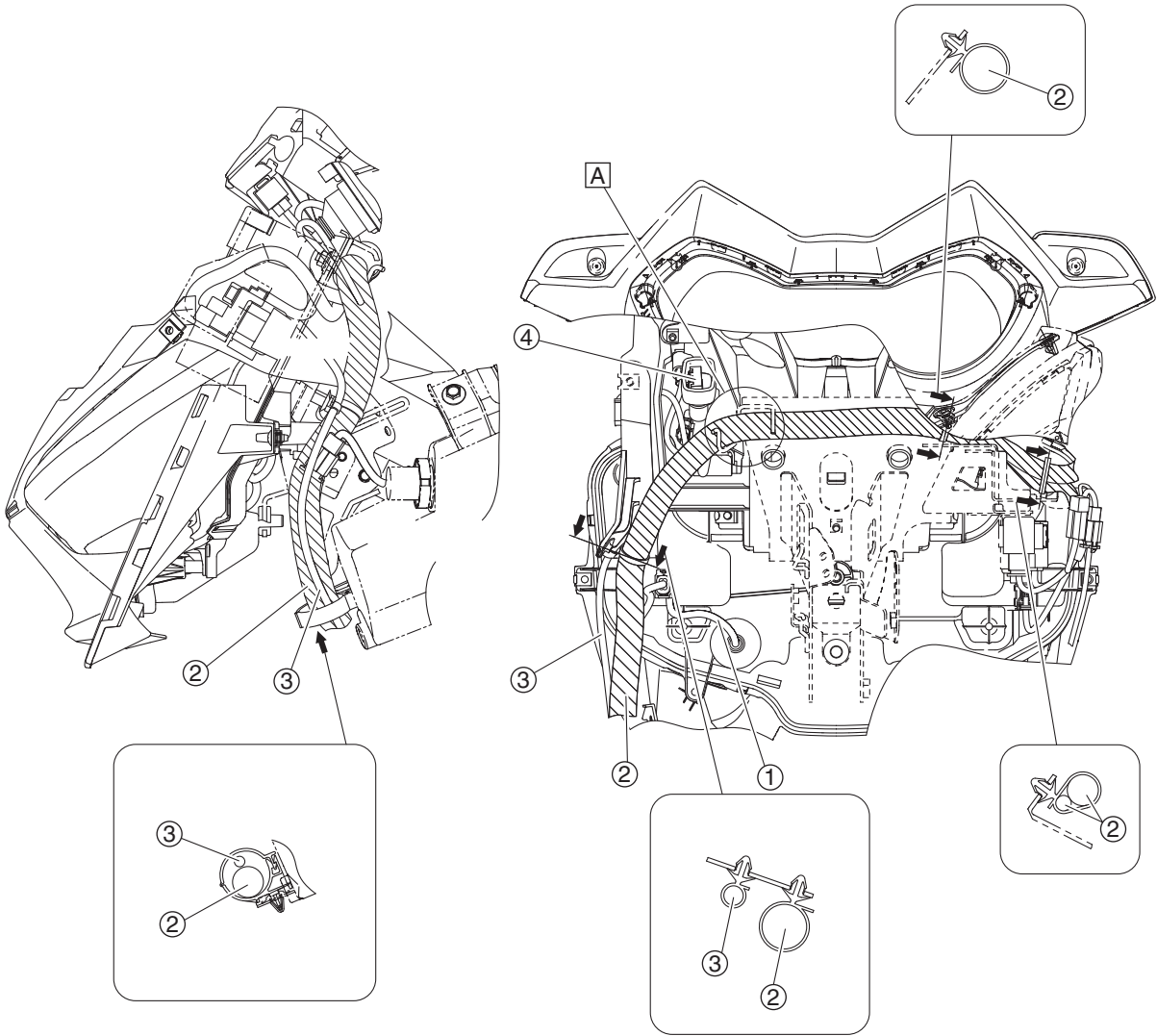
1. Front brake hose (hydraulic unit to front brake caliper)
2. Rear brake hose (hydraulic unit to rear brake caliper)
3. Rear brake hose (rear brake master cylinder to hydraulic unit)
4. Front brake hose (front brake master cylinder to hydraulic unit)
5. Hydraulic unit assembly
6. Front wheel sensor lead

Battery (front side view)



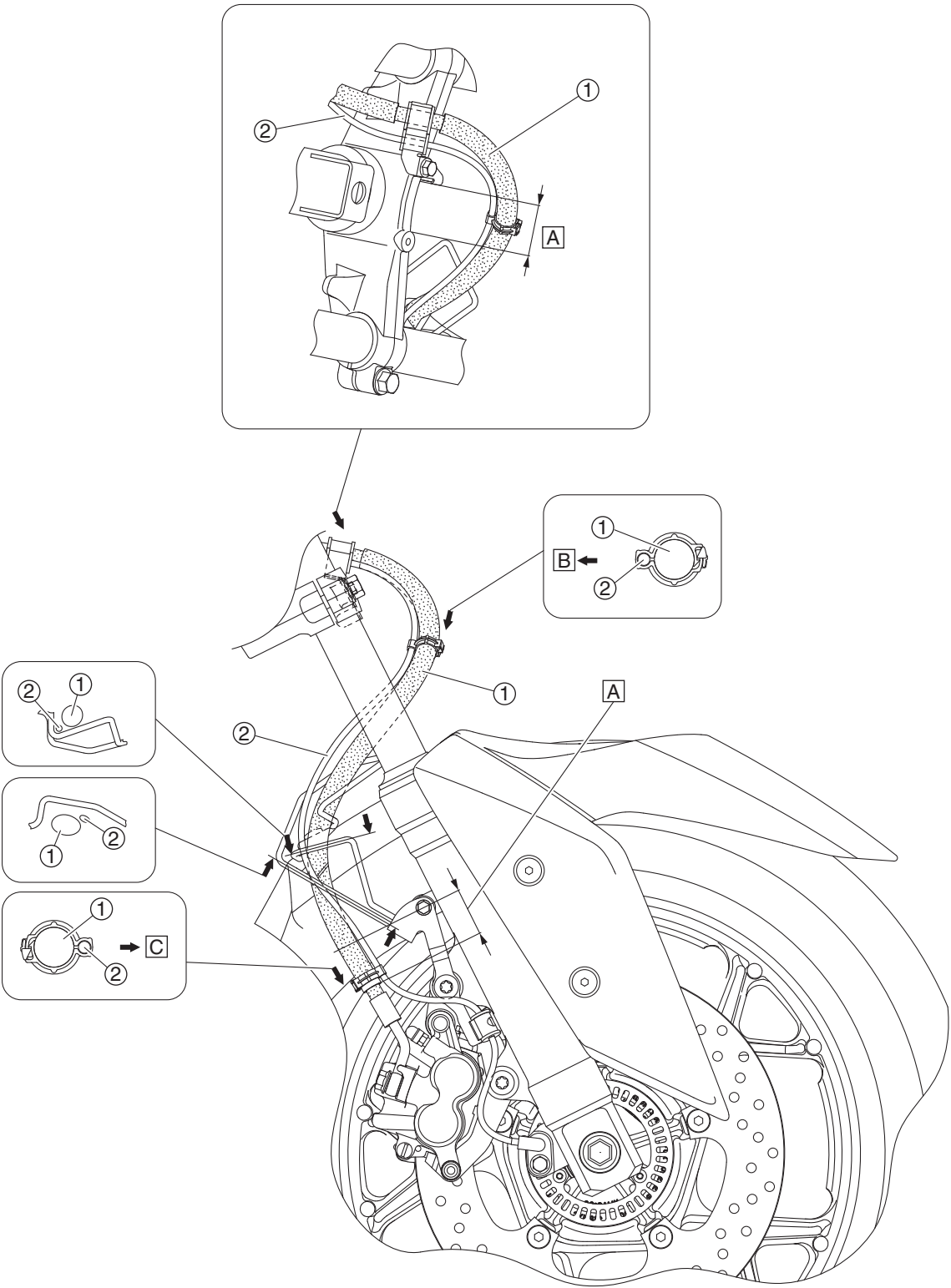
1. ABS test coupler
2. Negative battery lead
3. Positive battery lead
4. Battery
5. Yamaha diagnostic tool coupler
6. Starter relay
7. Fuse box 2
8. Fuse box 1
9. Battery band
10. ABS test coupler lead
 - A. Route the positive battery leads through the battery band.
 - B. Route the ABS test coupler lead through the battery band.

Battery (rear view)



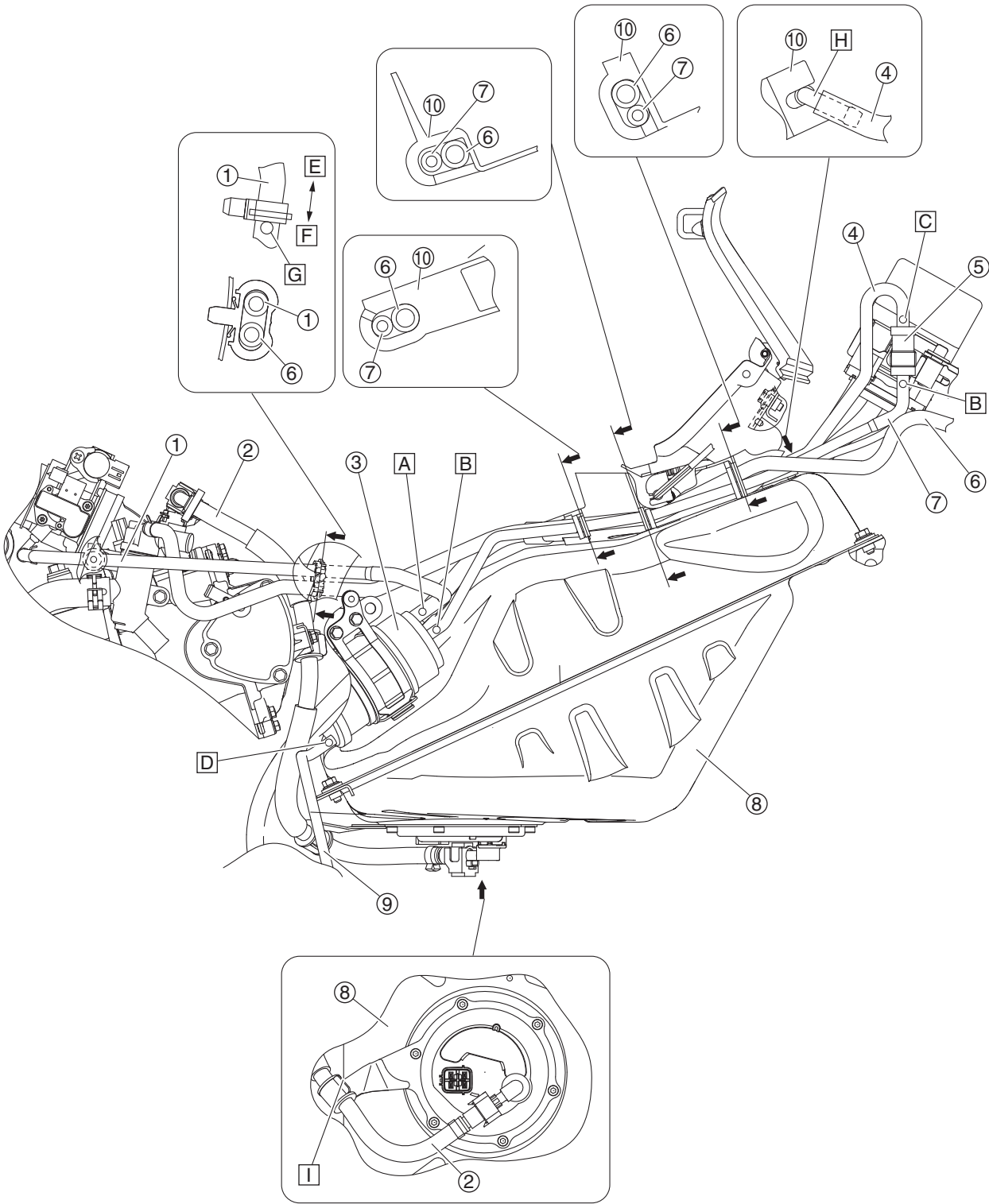
1. Headlight lead
 2. Wire harness
 3. Starter relay lead
 4. Meter assembly coupler
- A. Route the wire harness through the guide.

Front fork (right side view)



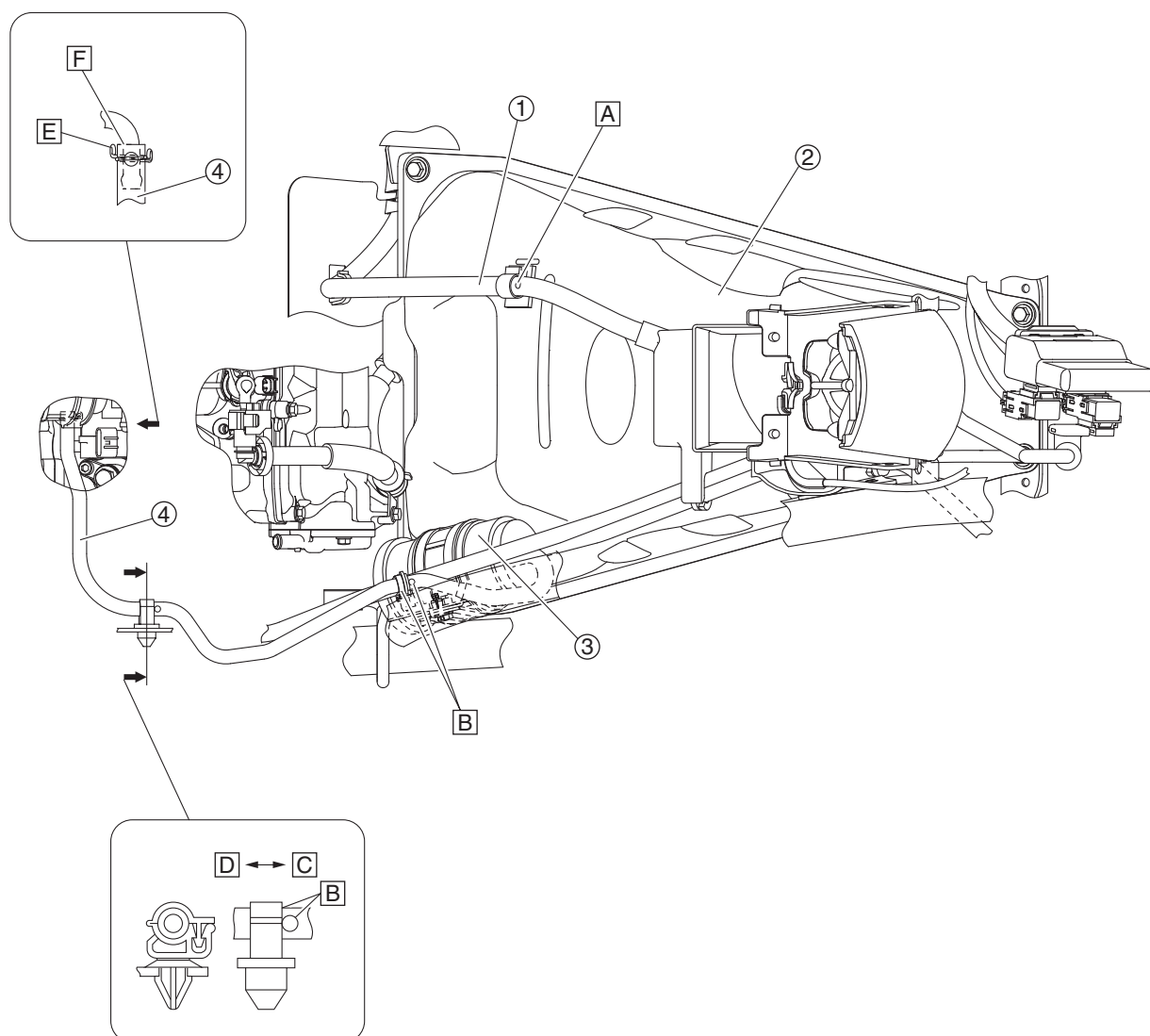
1. Front brake hose (hydraulic unit to front brake caliper)
2. Front wheel sensor
 - A. Fasten the front brake hose (hydraulic unit to front brake caliper) and front wheel sensor with the clamp in the area shown in the illustration.
 - B. Rearward
 - C. Forward

Fuel tank (right side view)



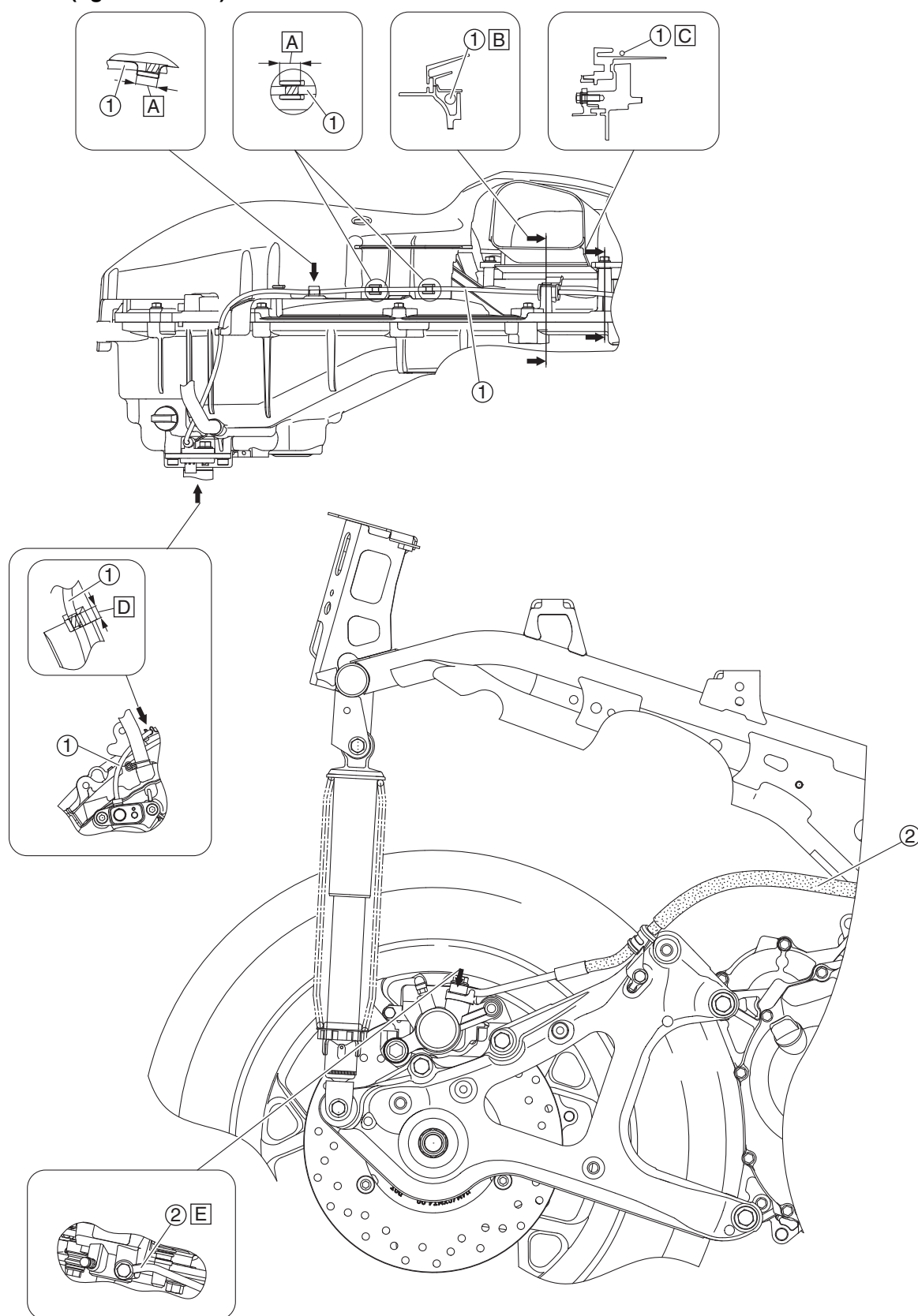
1. Canister purge hose
2. Fuel hose
3. Canister
4. Fuel tank breather hose (fuel tank to rollover valve)
5. Rollover valve
6. Cooling system air bleed hose
7. Fuel tank breather hose (rollover valve to canister)
8. Fuel tank
9. Canister breather hose
10. Fuel tank overflow tray
- A. Face the paint mark on the canister purge hose to the right.
- B. Face the paint mark on the fuel tank breather hose (rollover valve to canister) to the right.
- C. Face the paint mark on the fuel tank breather hose (fuel tank to rollover valve) to the right.
- D. Face the paint mark on the canister breather hose to the right.
- E. Rearward
- F. Forward
- G. Fasten the canister purge hose and cooling system air bleed hose with the holder. Align the holder with the paint mark on the canister purge hose.
- H. Install the fuel tank breather hose (fuel tank to rollover valve) completely onto the hose fitting.
- I. Position the grommet on the fuel hose to the fuel pump bracket.

Fuel tank (top view)



1. Fuel tank overflow hose
2. Fuel tank
3. Canister
4. Canister purge hose
- A. Face the paint mark on the fuel tank overflow hose upward.
- B. Fasten the canister purge hose with the holder. Align the holder with the paint mark on the canister purge hose.
- C. Forward
- D. Rearward
- E. Face the paint mark on the canister purge hose forward. Point the end of hose clamp forward.
- F. Install the canister purge hose up to the bend in the hose fitting on the throttle body.

Rear brake (right side view)



1. Rear wheel sensor lead
2. Rear brake hose (hydraulic unit to rear brake caliper)
 - A. Route the rear wheel sensor lead through the guide on the V-belt case air filter element cover. Position the rearside edge of the tape on the lead in the area shown in the illustration.
 - B. Position the grommet on the rear wheel sensor lead to the holder on the V-belt case air filter element cover.
 - C. Route the rear wheel sensor lead to the upward of the V-belt case air filter element cover rib.
 - D. Route the rear wheel sensor lead through the guide on the V-belt case air filter element cover. Position the inside edge of the tape on the lead in the area shown in the illustration.
 - E. Position the rear brake hose (hydraulic unit to rear brake caliper) so that the projection on the rear brake caliper contacts the hose.

PERIODIC CHECKS AND ADJUSTMENTS

PERIODIC MAINTENANCE	3-1
INTRODUCTION	3-1
PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM	3-1
GENERAL MAINTENANCE AND LUBRICATION CHART	3-1
CHECKING THE VEHICLE USING THE YAMAHA DIAGNOSTIC TOOL	3-4
CHECKING THE FUEL LINE	3-4
CHECKING THE SPARK PLUG	3-4
ADJUSTING THE VALVE CLEARANCE	3-5
CHECKING THE ENGINE IDLING SPEED	3-7
CHECKING THE EXHAUST SYSTEM	3-8
ADJUSTING THE EXHAUST GAS VOLUME	3-8
CHECKING THE CANISTER	3-8
REPLACING THE AIR FILTER ELEMENT AND CLEANING THE CHECK HOSE	3-9
CLEANING THE V-BELT CASE AIR FILTER ELEMENT	3-10
CHECKING THE BRAKE OPERATION	3-11
CHECKING THE FRONT BRAKE PADS	3-11
CHECKING THE REAR BRAKE PADS	3-11
CHECKING THE BRAKE FLUID LEVEL	3-11
CHECKING THE FRONT BRAKE HOSES	3-12
CHECKING THE REAR BRAKE HOSES	3-12
BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)	3-12
CHECKING THE WHEELS	3-13
CHECKING THE TIRES	3-14
CHECKING THE WHEEL BEARINGS	3-15
CHECKING AND ADJUSTING THE STEERING HEAD	3-15
LUBRICATING THE STEERING HEAD	3-16
CHECKING THE CHASSIS FASTENERS	3-16
LUBRICATING THE LEVERS	3-17
CHECKING THE SIDESTAND	3-17
LUBRICATING THE SIDESTAND	3-17
CHECKING THE CENTERSTAND	3-17
LUBRICATING THE CENTERSTAND	3-17
CHECKING THE SIDESTAND SWITCH	3-17
CHECKING THE FRONT FORK	3-17
CHECKING THE REAR SHOCK ABSORBER ASSEMBLIES	3-17
ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLIES	3-17
CHECKING THE ENGINE OIL LEVEL	3-18
CHANGING THE ENGINE OIL	3-19
CHANGING THE FINAL TRANSMISSION OIL	3-20
CHECKING THE COOLANT LEVEL	3-20
CHECKING THE COOLING SYSTEM	3-21
CHANGING THE COOLANT	3-21
REPLACING THE V-BELT	3-24
CHECKING THE BRAKE LIGHT SWITCHES	3-24
CHECKING AND LUBRICATING THE CABLES	3-24
CHECKING THE THROTTLE GRIP OPERATION	3-24
CHECKING THE SWITCHES, LIGHTS AND SIGNALS	3-25

ADJUSTING THE HEADLIGHT BEAM	3-25
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PERIODIC MAINTENANCE

EAS20022

PERIODIC MAINTENANCE

EAS30022

INTRODUCTION

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

EAS30614

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

TIP

- The annual checks must be performed every year, except if a kilometerbased maintenance, or for the UK, a mileage-based maintenance, is performed instead.
- From 50000 km (30000 mi), repeat the maintenance intervals starting from 10000 km (6000 mi).
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READINGS					ANNUAL CHECK	
				X 1000 km	1	10	20	30		40
				X 1000 mi	0.6	6	12	18		24
1	*	Fuel line	<ul style="list-style-type: none">• Check fuel hoses for cracks or damage.• Replace if necessary.		√	√	√	√	√	
2	*	Spark plug	<ul style="list-style-type: none">• Check condition.• Adjust gap and clean.		√		√			
			<ul style="list-style-type: none">• Replace.			√		√		
3	*	Valve clearance	<ul style="list-style-type: none">• Check and adjust.	Every 20000 km (12000 mi)						
4	*	Fuel injection	<ul style="list-style-type: none">• Check engine idle speed.	√	√	√	√	√	√	
5	*	Exhaust system	<ul style="list-style-type: none">• Check for leakage.• Tighten if necessary.• Replace gasket if necessary.	√	√	√	√	√		
6	*	Evaporative emission control system	<ul style="list-style-type: none">• Check control system for damage.• Replace if necessary.			√		√		

EAS30615

GENERAL MAINTENANCE AND LUBRICATION CHART

TIP

- The annual checks must be performed every year, except if a kilometerbased maintenance, or for the UK, a mileage-based maintenance, is performed instead.
- From 50000 km (30000 mi), repeat the maintenance intervals starting from 10000 km (6000 mi).
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READINGS					ANNUAL CHECK
				X 1000 km	1	10	20	30	
			X 1000 mi	0.6	6	12	18	24	
1	*	Diagnostic system check	<ul style="list-style-type: none">• Perform dynamic inspection using Yamaha diagnostic tool.• Check the fault codes.	√	√	√	√	√	√
2	*	Air filter element	<ul style="list-style-type: none">• Replace.			√		√	

PERIODIC MAINTENANCE

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READINGS					ANNUAL CHECK
			1	10	20	30	40	
			0.6	6	12	18	24	
		X 1000 km						
		X 1000 mi						
3	* Pre air filter element	• Clean.			√		√	
4	* Sub air filter element	• Replace.			√		√	
5	Air filter case check hose	• Clean.	√	√	√	√	√	
6	* V-belt case air filter element	• Clean. • Replace if necessary.		√	√	√	√	√
7	* Front brake	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	√	√	√	√	√	√
8	* Rear brake	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	√	√	√	√	√	√
9	* Brake hoses	• Check for cracks or damage. • Replace.		√	√	√	√	√
10	* Brake fluid	• Change.	Every 4 years					
11	* Wheels	• Check runout and for damage. • Replace if necessary.		√	√	√	√	
12	* Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
13	* Wheel bearings	• Check bearing for looseness or damage.		√	√	√	√	
14	* Steering bearings	• Check bearing assemblies for looseness. • Moderately repack with lithium-soap-based grease.	√	√		√		
15	* Chassis fasteners	• Make sure that all nuts, bolts and screws are properly tightened.		√	√	√	√	√
16	Front and rear brake lever pivot shaft	• Lubricate with silicone grease.		√	√	√	√	√
17	Sidestand, center-stand	• Check operation. • Lubricate with lithium-soap-based grease.		√	√	√	√	√
18	* Sidestand switch	• Check operation and replace if necessary.	√	√	√	√	√	√
19	* Front fork	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	
20	* Shock absorber assemblies	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	
21	Engine oil	• Change (warm engine before draining). • Check oil level and vehicle for oil leakage.	At the initial interval and when the oil change indicator flashes or comes on.					√
22	Engine oil filter element	• Replace.	√		√		√	
23	* Final transmission oil	• Check vehicle for oil leakage. • Change.	√	√	√	√	√	

PERIODIC MAINTENANCE

NO.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READINGS					ANNUAL CHECK
				X 1000 km	1	10	20	30	
			X 1000 mi	0.6	6	12	18	24	
24	*	Cooling system	• Check coolant level and vehicle for coolant leakage.		√	√	√	√	√
			• Change.	Every 3 years					
25	*	V-belt	• Replace.	When the V-belt replacement indicator flashes [every 20000 km (12000 mi)]					
26	*	Front and rear brake switches	• Check operation.	√	√	√	√	√	√
27	*	Moving parts and cables	• Lubricate.		√	√	√	√	√
28	*	Throttle grip housing and cable	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		√	√	√	√	√
29	*	Lights, signals and switches	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

TIP

- Engine air filter and V-belt air filter
 - This model's engine air filter is equipped with a disposable oil-coated paper element, which must not be cleaned with compressed air to avoid damaging it.
 - The engine air filter element and sub air filter element need to be replaced and the V-belt air filter element needs to be serviced 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.

EAS32024

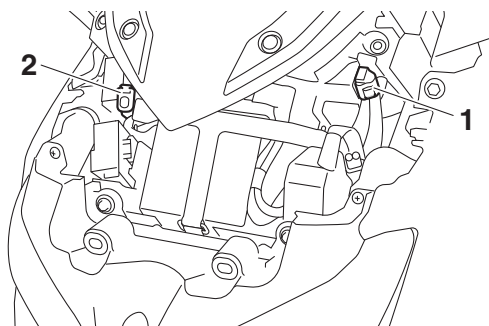
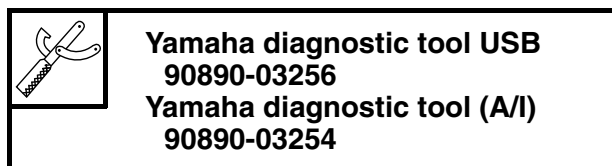
CHECKING THE VEHICLE USING THE YAMAHA DIAGNOSTIC TOOL

Use the Yamaha diagnostic tool and check the vehicle according to the following procedure.

1. Remove:

- Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.

2. Remove the protective cap, and then connect the Yamaha diagnostic tool to the coupler.



1. Yamaha diagnostic tool coupler
2. ABS test coupler

3. Check:

- Fault codes (fuel injection system and ABS)

TIP

Use the “Diagnosis of malfunction” function of the Yamaha diagnostic tool to check the fault codes. For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.

Fault code number is displayed → Check and repair the probable cause of the malfunction. Refer to “TROUBLESHOOTING DETAILS” on page 8-34 and “[B-2] DIAGNOSIS USING THE FAULT CODES” on page 8-88.

4. Perform:

- Dynamic inspection

TIP

Use the “Dynamic inspection” function of the Yamaha diagnostic tool version 3.0 and after to perform the dynamic inspection. For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.

5. Install:

- Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.

EAS30619

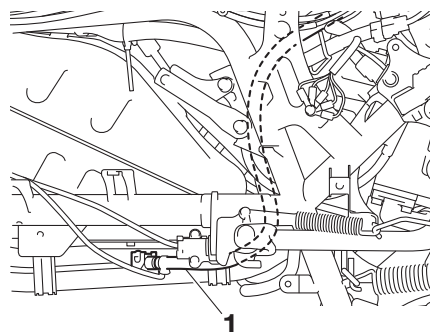
CHECKING THE FUEL LINE

1. Remove:

- Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.
- Front cowling assemblies
Refer to “GENERAL CHASSIS (2)” on page 4-4.
- Lower side covers
Refer to “GENERAL CHASSIS (4)” on page 4-10.
- Bottom cover assembly
Refer to “GENERAL CHASSIS (5)” on page 4-13.

2. Check:

- Fuel hose “1”
Cracks/damage → Replace.
Loose connections → Connect properly.



3. Install:

- Bottom cover assembly
Refer to “GENERAL CHASSIS (5)” on page 4-13.
- Lower side covers
Refer to “GENERAL CHASSIS (4)” on page 4-10.
- Front cowling assemblies
Refer to “GENERAL CHASSIS (2)” on page 4-4.
- Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.

EAS30620

CHECKING THE SPARK PLUG

1. Remove:

- Storage box
Refer to “GENERAL CHASSIS (4)” on page 4-10.

PERIODIC MAINTENANCE

2. Remove:
 - Spark plug cap
 - Spark plug

ECA13330

NOTICE

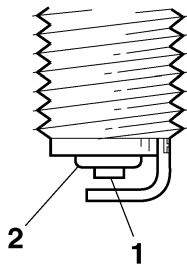
Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

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



Manufacturer/model
NGK/LMAR8A-9

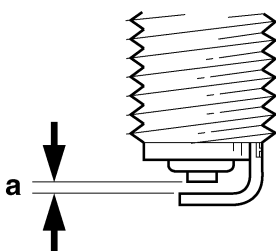
4. Check:
 - Electrode "1"
Damage/wear → Replace the spark plug.
 - Insulator "2"
Abnormal color → Replace the spark plug.
Normal color is medium-to-light tan.



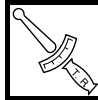
5. Clean:
 - Spark plug
(with a spark plug cleaner or wire brush)
6. Measure:
 - Spark plug gap "a"
(with a wire thickness gauge)
Out of specification → Regap.



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



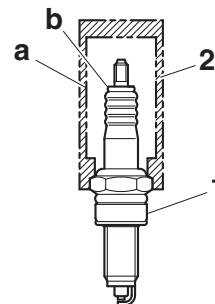
7. Install:
 - Spark plug "1"
 - Spark plug cap



Spark plug
13 N·m (1.3 kgf·m, 9.6 lb·ft)

TIP

- Before installing the spark plug, clean the spark plug and gasket surface.
- When tightening the spark plug, make sure that the inside "a" of the spark plug wrench "2" does not contact the portion "b" of the spark plug.



8. Install:
 - Storage box
Refer to "GENERAL CHASSIS (4)" on page 4-10.

EAS30622

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.

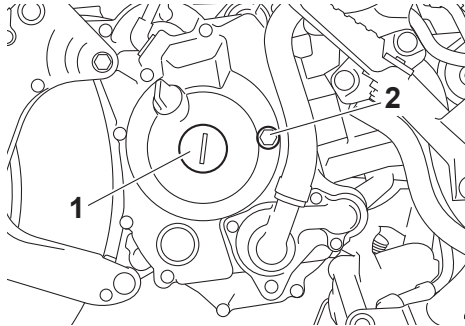
1. Remove:
 - Battery cover assembly
Refer to "GENERAL CHASSIS (1)" on page 4-1.
 - Front cowling assemblies
Refer to "GENERAL CHASSIS (2)" on page 4-4.
 - Lower side covers
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Bottom cover assembly
Refer to "GENERAL CHASSIS (5)" on page 4-13.

PERIODIC MAINTENANCE

- Muffler assembly
Refer to "ENGINE REMOVAL" on page 5-7.
- Cylinder head cover
Refer to "CYLINDER HEAD" on page 5-13.

2. Remove:

- Crankshaft end cover "1"
- Timing mark accessing bolt "2"

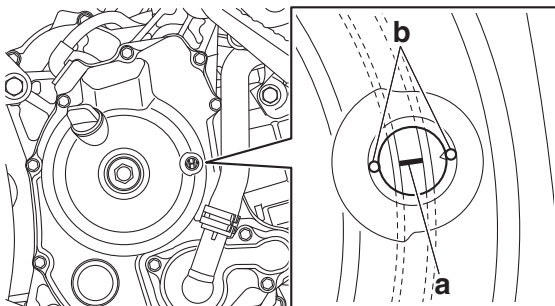


3. Measure:

- Valve clearance
Out of specification → Adjust.

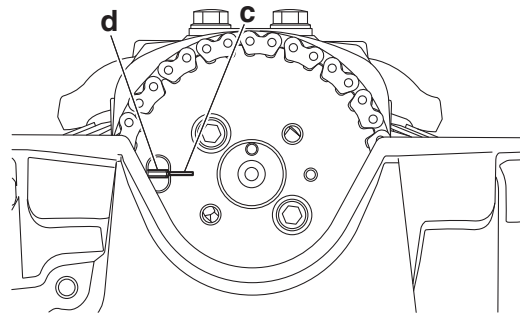
	Valve clearance (cold)
	Intake
	0.06–0.12 mm (0.0024–0.0047 in)
	Exhaust
	0.20–0.26 mm (0.0079–0.0102 in)

- Turn the crankshaft clockwise.
- Position the mark "a" on the generator rotor on both sides of the slots "b" in the generator rotor cover.

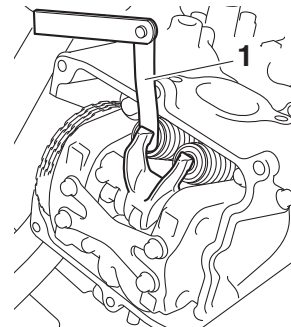


TIP

When the piston is at TDC on the compression stroke, align the "I" mark "c" on the camshaft sprocket with the match mark "d" on the cylinder head.

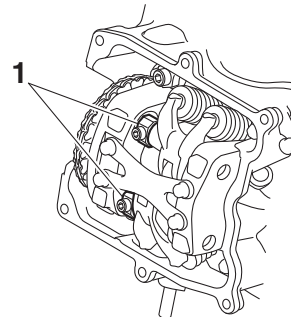


- Measure the valve clearance with a thickness gauge "1".
Out of specification → Adjust.

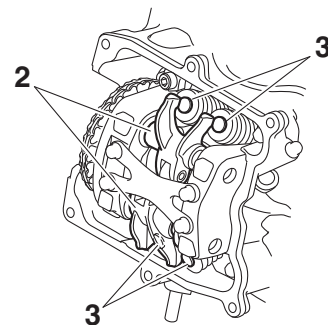


4. Adjust:

- Valve clearance
 - Remove the collars "1".



- Slide the rocker arms "2" toward the timing chain, and then remove the valve pads "3".



TIP

- Before removing the valve pads, cover the crankcase opening with a clean rag to prevent them from falling into the crankcase.

PERIODIC MAINTENANCE

- Make a note of the position of each valve pad so that they can be reinstalled in their original place.

- Calculate the difference between the specified valve clearance and the measured valve clearance.

Example:

Specified valve clearance = 0.06–0.12 mm (0.0024–0.0047 in)

Measured valve clearance = 0.17 mm (0.0067 in)

0.17 mm (0.0067 in)–0.09 mm (0.0035 in) = 0.08 mm (0.0031 in)

- Check the thickness of the current valve pad.

TIP

The thickness of each valve pad is marked in hundredths of millimeters on the side that touches the valve cotter.

Example:

If the valve pad is marked “158”, the pad thickness is 1.58 mm (0.0622 in).

- Calculate the sum of the values obtained in steps (b) and (c) to determine the required valve pad thickness and the valve pad number.

Example:

1.58 mm (0.0622 in) + 0.05 mm (0.0020 in) = 1.63 mm (0.0641 in)

The valve pad number is 163.

- Round off the valve pad number according to the following table, and then select the suitable valve pad.

Last digit	Rounded value
1	0
3, 4	5
6, 7	8
9	10

TIP

Refer to the following table for the available valve pads.

Valve pad range	No. 150–350
Valve pad thickness	1.50–3.50 mm (0.0590–0.1378 in)
Available valve pads	81 thicknesses in 0.025 mm (0.0010 in) increments

Example:

Valve pad number = 163

Rounded value = 165

New valve pad number = 165

- Install the new valve pad.

TIP

- Lubricate the valve pad with molybdenum disulfide oil.
- Install the valve pad in the correct place.

- Measure the valve clearance again.

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

- Install:

- All removed parts

TIP

For installation, reverse the removal procedure.

EAS31017

CHECKING THE ENGINE IDLING SPEED

TIP

Prior to checking the engine idling speed, the air filter element should be clean, and the engine should have adequate compression.

- Start the engine and let it warm up for several minutes.
- Check:
 - Engine idling speed
 Out of specification → Go to next step.



Engine idling speed
1500–1700 r/min

- Check:

- ISC (idle speed control) learning value “00” or “01” → Check the intake system. “02” → Clean the ISC (idle speed control) unit and throttle body.

Refer to “CLEANING THE ISC (IDLE SPEED CONTROL) UNIT AND THROTTLE BODY” on page 7-15.

- Connect the Yamaha diagnostic tool.

Use the diagnostic code number “67”.

Refer to “SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE” on page 9-1.



Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254

EAS30625

CHECKING THE EXHAUST SYSTEM

1. Check:

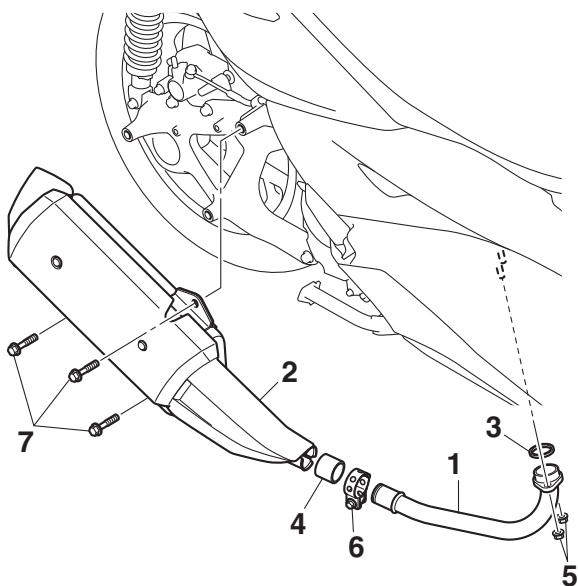
- Exhaust pipe "1"
- Muffler assembly "2"
Cracks/damage → Replace.
- Gaskets "3", "4"
Exhaust gas leaks → Replace.

2. Check:

- Tightening torque
- Exhaust pipe nuts "5"
- Clamp bolt "6"
- Muffler assembly bolts "7"



Exhaust pipe nut
15 N·m (1.5 kgf·m, 11 lb·ft)
Clamp bolt
20 N·m (2.0 kgf·m, 15 lb·ft)
Muffler assembly bolt
53 N·m (5.3 kgf·m, 39 lb·ft)



EAS30799

ADJUSTING THE EXHAUST GAS VOLUME

TIP

- Be sure to set the CO density level to standard, and then adjust the exhaust gas volume.
- To adjust the exhaust gas volume, use the CO adjustment mode of the Yamaha diagnostic tool. For more information, refer to the operation manual of the Yamaha diagnostic tool.

1. Connect the Yamaha diagnostic tool to the connector. For information about connecting the Yamaha diagnostic tool, refer to

"YAMAHA DIAGNOSTIC TOOL" on page 8-34.



Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254

EAS31922

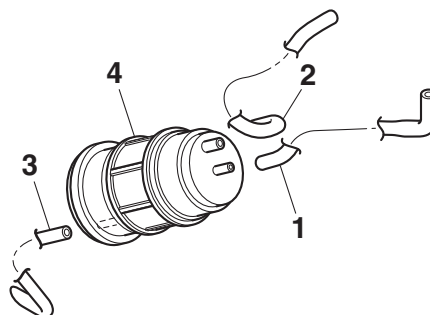
CHECKING THE CANISTER

1. Remove:

- Battery
Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Front cowling assemblies
Refer to "GENERAL CHASSIS (2)" on page 4-4.
- Meter assembly
Refer to "GENERAL CHASSIS (3)" on page 4-7.
- Lower side covers
Refer to "GENERAL CHASSIS (4)" on page 4-10.
- Footrest board assembly
Refer to "GENERAL CHASSIS (5)" on page 4-13.
- Leg shield assembly
Refer to "GENERAL CHASSIS (6)" on page 4-16.

2. Check:

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



3. Install:

- Leg shield assembly
Refer to "GENERAL CHASSIS (6)" on page 4-16.
- Footrest board assembly
Refer to "GENERAL CHASSIS (5)" on page 4-13.

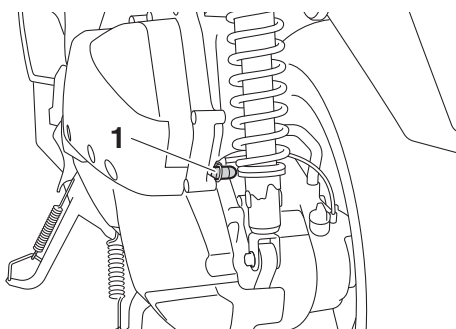
- Lower side covers
Refer to "GENERAL CHASSIS (4)" on page 4-10.
- Meter assembly
Refer to "GENERAL CHASSIS (3)" on page 4-7.
- Front cowling assemblies
Refer to "GENERAL CHASSIS (2)" on page 4-4.
- Battery
Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS31130

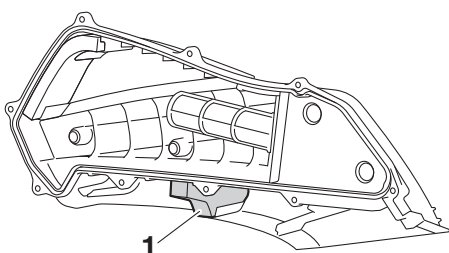
REPLACING THE AIR FILTER ELEMENT AND CLEANING THE CHECK HOSE

TIP

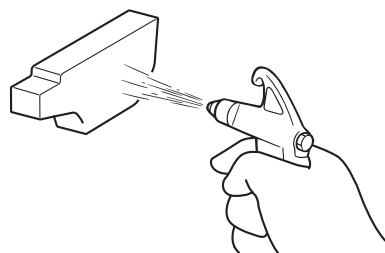
Check the air filter check hose "1" that is located on the rear side of the air filter case. If dust or water or both collects in the hose, clean the hose and replace the air filter element.



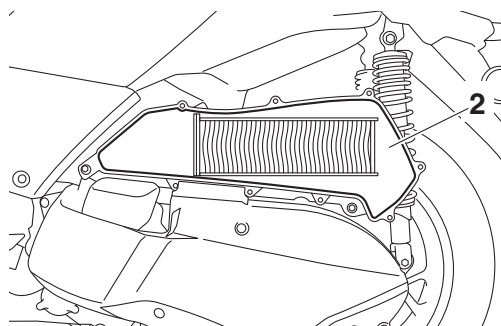
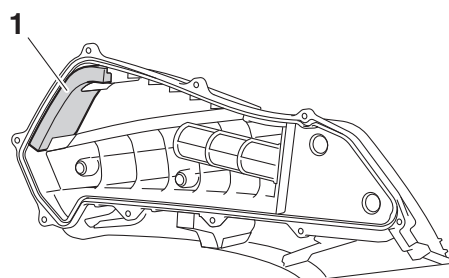
1. Remove:
 - Air filter case cover
 - Pre air filter element "1"
 Refer to "AIR FILTER CASE" on page 7-11.



2. Clean:
 - Pre air filter element
 Blow the compressed air to the outer surface of the pre air filter element.



3. Install:
 - Pre air filter element
Refer to "INSTALLING THE AIR FILTER CASE" on page 7-12.
4. Remove:
 - Sub air filter element "1"
 - Air filter element "2"
 Refer to "AIR FILTER CASE" on page 7-11.



5. Check:
 - Sub air filter element
 - Air filter element
 Damage → Replace.

TIP

- Replace the air filter element every 20000 km (12000 mi) of operation.
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

6. Install:
 - Sub air filter element
 - Air filter element
 - Air filter case cover



Air filter case cover screw
1.2 N·m (0.12 kgf·m, 0.88 lb·ft)

ECA20480

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 tuning, 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.

EAS31181

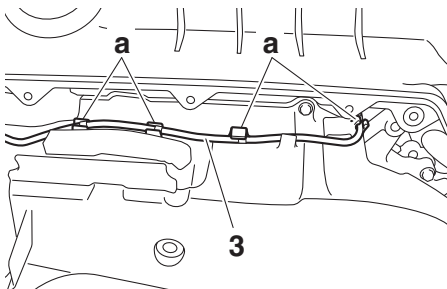
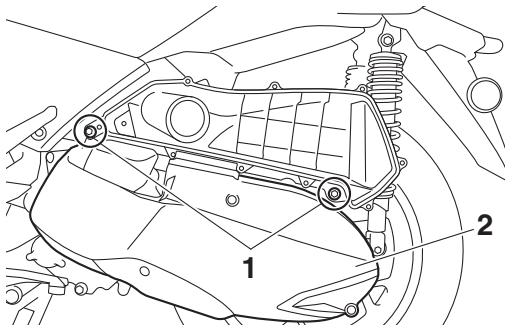
CLEANING THE V-BELT CASE AIR FILTER ELEMENT

1. Remove:

- Air filter case cover
- Refer to “AIR FILTER CASE” on page 7-11.
- Air filter cover bolts “1”
- V-belt case air filter element cover “2”

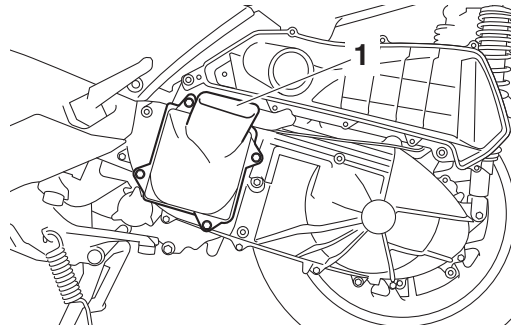
TIP

Lift up the air filter case slightly, remove the rear wheel sensor lead “3” from the holders “a” on the V-belt case air filter element cover, and then remove the V-belt case air filter element cover.



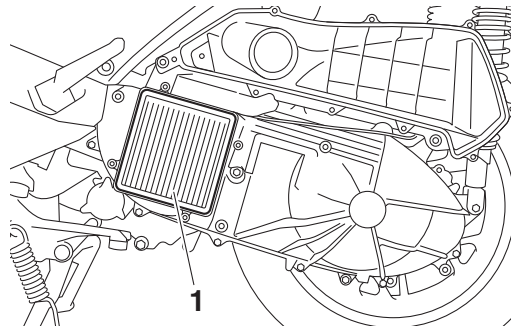
2. Remove:

- V-belt case air duct “1”



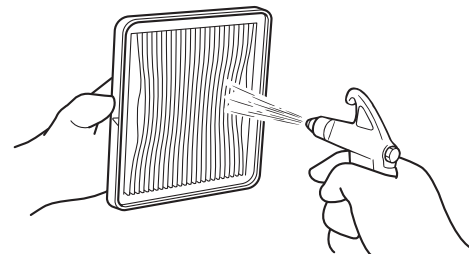
3. Remove:

- V-belt case air filter element “1”



4. Clean:

- V-belt case air filter element
- Blow the compressed air to the outer surface of the V-belt case air filter element.



5. Check:

- V-belt case air filter element
- Damage → Replace.

ECA13441

NOTICE

Since the V-belt case air filter element is a dry type, do not let grease or water contact it.

6. Install:

- V-belt case air filter element
- V-belt case air duct
- V-belt case air filter element cover
- Air filter case bolts



V-belt case air duct bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)
V-belt case air filter element cover bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)
Air filter case bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

To route the rear wheel sensor lead, refer to "CABLE ROUTING" on page 2-13.

7. Install:

- Air filter case cover
Refer to "AIR FILTER CASE" on page 7-11.

EAS30801

CHECKING THE BRAKE OPERATION

1. Check:

- Brake operation
Brake not working properly → Check the brake system.
Refer to "FRONT BRAKE" on page 4-38 and "REAR BRAKE" on page 4-51.

TIP

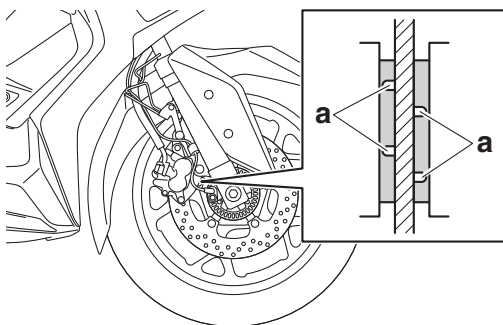
Drive on the road, operate the front and rear brakes separately and check to see if the brakes are operating properly.

EAS30633

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 4-38.

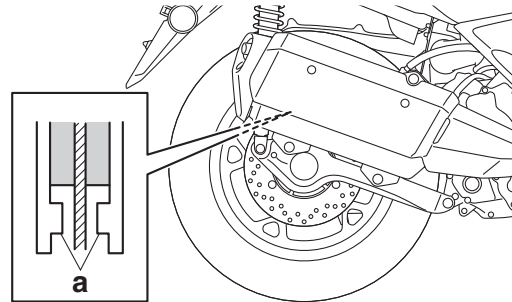


EAS30634

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 and brake pad shims as a set.
Refer to "REAR BRAKE" on page 4-51.



EAS30632

CHECKING THE BRAKE FLUID LEVEL

1. Stand the vehicle on a level surface.

TIP

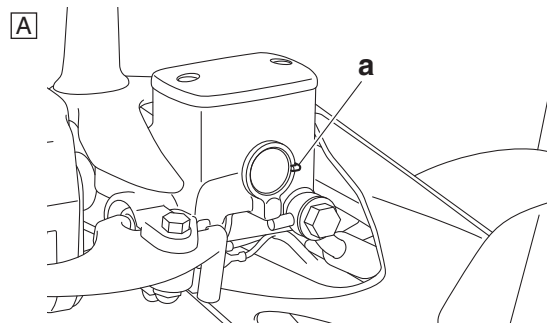
- Place the vehicle on the centerstand.
- Make sure the vehicle is upright.
- In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

2. Check:

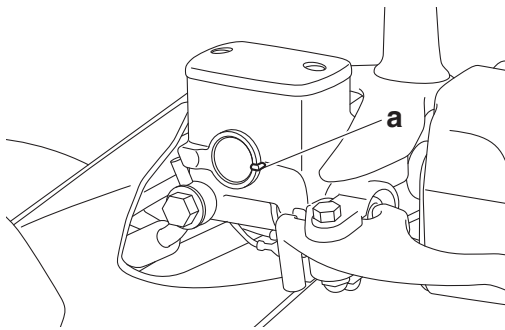
- Brake fluid level
Below the minimum level mark "a" → Add the specified brake fluid to the proper level.



Specified brake fluid
DOT 4



B



- A. Front brake
- B. Rear brake

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.

EAS30635

CHECKING THE FRONT BRAKE HOSES

1. Check:

- Brake hoses "1"
- Cracks/damage → Replace.



2. Check:

- Front brake hose/lead guide
- Front brake hose holder
- Loose → Tighten the holder and guide bolt.

3. Hold the vehicle upright and apply the front brake several times.

4. Check:

- Brake hoses
- Brake fluid leakage → Replace the damaged hose.

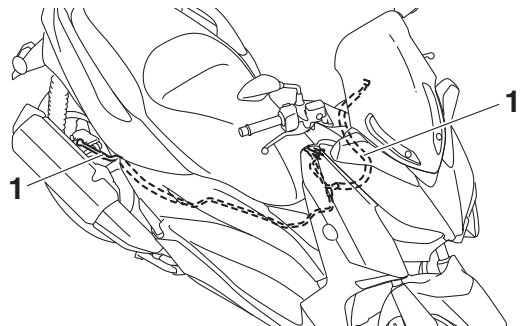
Refer to "FRONT BRAKE" on page 4-38 and "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

EAS30636

CHECKING THE REAR BRAKE HOSES

1. Check:

- Brake hoses "1"
- Cracks/damage → Replace.



2. Check:

- Rear brake hose holder
- Loose → Tighten the holder bolt.

3. Hold the vehicle upright and apply the rear brake several times.

4. Check:

- Brake hoses
- Brake fluid leakage → Replace the brake hose.

Refer to "REAR BRAKE" on page 4-51 and "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

EAS30893

BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)

EWA14000

WARNING

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

ECA22780

NOTICE

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

EWA16530

WARNING

Bleed the ABS whenever:

PERIODIC MAINTENANCE

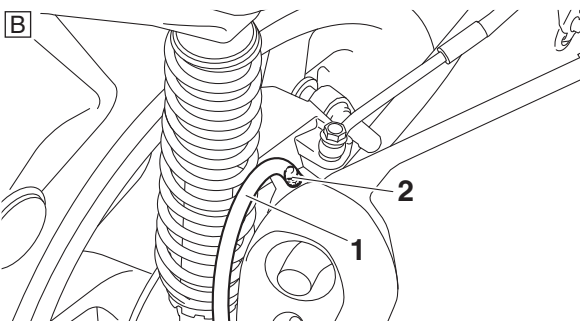
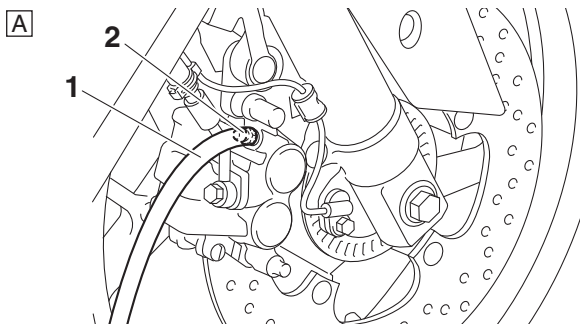
- the system is disassembled.
- a brake hose is loosened, disconnected or replaced.
- the brake fluid level is very low.
- brake operation is faulty.

TIP

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

1. Bleed:

- ABS
 - a. Fill the brake master cylinder reservoir to the proper level with the specified brake fluid.
 - b. Install the brake master cylinder diaphragm.
 - c. Connect a clear plastic hose "1" tightly to the bleed screw "2".



A. Front brake caliper
B. Rear brake caliper

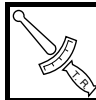
- d. Place the other end of the hose into a container.
- e. Slowly apply the brake several times.

- f. Fully squeeze the brake lever 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 handlebar grip.

- h. Tighten the bleed screw and then release the brake lever.
- i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
- j. Check the operation of the hydraulic unit. Refer to "HYDRAULIC UNIT OPERATION TESTS" on page 4-67.
- k. After operating the ABS, repeat steps (e) to (i), and then fill the brake master cylinder reservoir to the proper level with the specified brake fluid.
- l. Tighten the bleed screw to specification.



Brake caliper bleed screw
6 N·m (0.6 kgf·m, 4.4 lb·ft)

- m. Fill the brake master cylinder reservoir to the proper level with the specified brake fluid.

Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-11.

EWA13110

WARNING

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

EAS30638

CHECKING THE WHEELS

The following procedure applies to all of the wheels.

1. Check:
 - WheelDamage/out-of-round → Replace.

EWA13260

WARNING

Never attempt to make any repairs to the wheel.

TIP

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

2. Measure:
 - Radial wheel runout

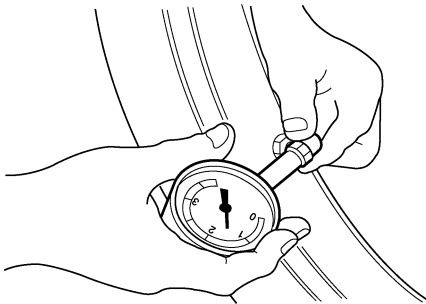
- Lateral wheel runout
Refer to "CHECKING THE FRONT WHEEL" on page 4-29 and "CHECKING THE REAR WHEEL" on page 4-35.

EAS30640

CHECKING THE TIRES

The following procedure applies to all of the tires.

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



EWA13181

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)

1 person

Front

200 kPa (2.00 kgf/cm², 29 psi)

Rear

225 kPa (2.25 kgf/cm², 33 psi)

2 persons

Front

200 kPa (2.00 kgf/cm², 29 psi)

Rear

225 kPa (2.25 kgf/cm², 33 psi)

Maximum load

161 kg (355 lb)

* Total weight of rider, passenger, cargo and accessories

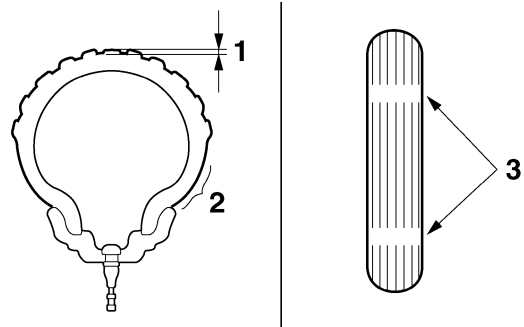
EWA13190

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)

1.6 mm (0.06 in) (EUR/MBK brand)

1.5 mm (0.06 in) (OCE)

Wear limit (rear)

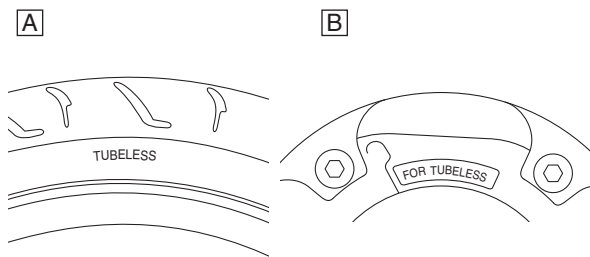
1.6 mm (0.06 in) (EUR/MBK brand)

1.5 mm (0.06 in) (OCE)

EWA14080

WARNING

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




A. Tire
B. Wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire


EWA14090

WARNING

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



Front tire
Size
120/70-15 M/C 56P
Manufacturer/model
DUNLOP/SCOOTSMART



Rear tire
Size
140/70-14 M/C 62P
Manufacturer/model
DUNLOP/SCOOTSMART

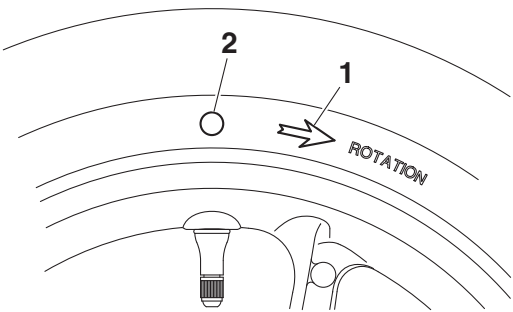
EWA13210

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.



EAS30641

CHECKING THE WHEEL BEARINGS

The following procedure applies to all of the wheel bearings.

1. Check:
 - Wheel bearings
Refer to "CHECKING THE FRONT WHEEL" on page 4-29.

EAS30645

CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

EWA13120

WARNING

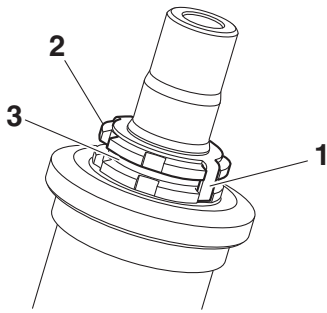
Securely support the vehicle so that there is no danger of it falling over.

TIP

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

2. Check:
 - Steering head
Grasp the handlebar and gently rock the handlebar.
Binding/looseness → Adjust the steering head.
3. Remove:
 - Battery
Refer to "GENERAL CHASSIS (1)" on page 4-1.
 - Front cowling assemblies
Refer to "GENERAL CHASSIS (2)" on page 4-4.
 - Meter panel assembly
Refer to "GENERAL CHASSIS (3)" on page 4-7.
 - Handlebar
Refer to "HANDLEBAR" on page 4-71.
4. Adjust:
 - Steering head
 - a. Remove the lock washer "1", upper ring nut "2" and rubber washer "3".

PERIODIC MAINTENANCE



- b. Loosen the lower ring nut “4” and then tighten it to specification with a steering nut wrench “5”.

TIP

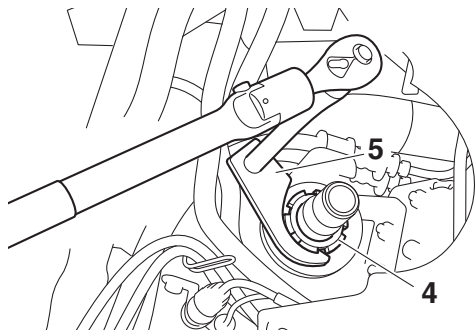
Set the torque wrench at a right angle to the steering nut wrench.



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



Lower ring nut (initial tightening torque)
48 N·m (4.8 kgf·m, 35 lb·ft)



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

EWA13140



WARNING

Do not overtighten the lower ring nut.



Lower ring nut (final tightening torque)
14 N·m (1.4 kgf·m, 10 lb·ft)

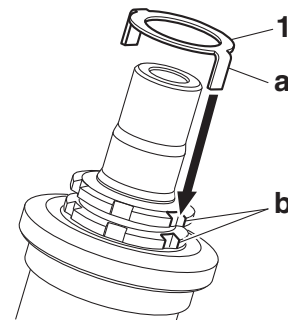
- d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.

Refer to “STEERING HEAD” on page 4-87.

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

TIP

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



5. Install:

- Handlebar
Refer to “HANDLEBAR” on page 4-71.
- Meter panel assembly
Refer to “GENERAL CHASSIS (3)” on page 4-7.
- Front cowling assemblies
Refer to “GENERAL CHASSIS (2)” on page 4-4.
- Battery
Refer to “GENERAL CHASSIS (1)” on page 4-1.

EAS30646

LUBRICATING THE STEERING HEAD

1. Lubricate:

- Bearing cover
- Upper bearing
- Lower bearing
- Dust seal



Recommended lubricant
Lithium-soap-based grease

EAS31186

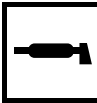
CHECKING THE CHASSIS FASTENERS

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

EAS30648

LUBRICATING THE LEVERS

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



Recommended lubricant
Silicone grease

EAS30650

CHECKING THE SIDESTAND

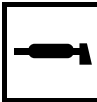
1. Check:

- Sidestand operation
Check that the sidestand moves smoothly.
Rough movement → Repair or replace.

EAS30651

LUBRICATING THE SIDESTAND

Lubricate the pivoting point, metal-to-metal moving parts, and spring contact point of the side-stand.



Recommended lubricant
Lithium-soap-based grease

EAS30656

CHECKING THE CENTERSTAND

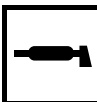
1. Check:

- Centerstand operation
Check that the centerstand moves smoothly.
Rough movement → Repair or replace.

EAS30657

LUBRICATING THE CENTERSTAND

Lubricate the pivoting point, metal-to-metal moving parts, and spring contact points of the center-stand.



Recommended lubricant
Lithium-soap-based grease

EAS30652

CHECKING THE SIDESTAND SWITCH

Refer to "CHECKING THE SWITCHES" on page 8-127.

EAS30653

CHECKING THE FRONT FORK

1. Stand the vehicle on a level surface.

EWA13120



WARNING

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

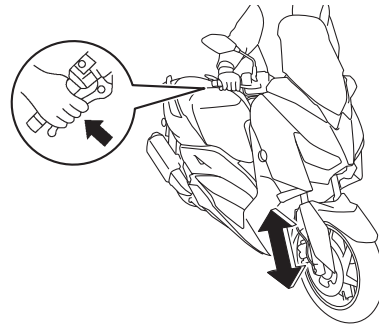
2. Check:

- Inner tube
Damage/scratches → Replace.
- Oil seal
Oil leakage → Replace.

3. Hold the vehicle upright and apply the front brake.

4. Check:

- Front fork operation
Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
Rough movement → Repair.
Refer to "FRONT FORK" on page 4-78.



EAS30808

CHECKING THE REAR SHOCK ABSORBER ASSEMBLIES

The following procedure applies to both of the rear shock absorber assemblies.

1. Stand the vehicle on a level surface.

EWA13120



WARNING

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

2. Check:

- Rear shock absorber assembly
Oil leaks → Replace the rear shock absorber assembly.
Refer to "CHECKING THE REAR SHOCK ABSORBER ASSEMBLY" on page 4-92.

3. Check:

- Rear shock absorber assembly operation
Push down seat on the vehicle several times and check if the rear shock absorber assembly rebounds smoothly.
Rough movement → Replace.
Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" on page 4-91.

EAS30655

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLIES

The following procedure applies to both of the rear shock absorber assemblies.

EWA17520



WARNING

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

- Always adjust both rear shock absorber assemblies evenly. Uneven adjustment can result in poor handling and loss of stability.

Spring preload

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
 - Spring preload

TIP

Adjust the spring preload with the special wrench and extension bar included in the owner's tool kit.

- a. Turn the adjusting ring "1" in direction "a" or "b".
- b. Align the desired position on the adjusting ring with the position indicator "2".

Direction "a"

Spring preload is increased (suspension is harder).

Direction "b"

Spring preload is decreased (suspension is softer).



Adjusting positions

Adjustment value (Soft)

1

Adjustment value (STD)

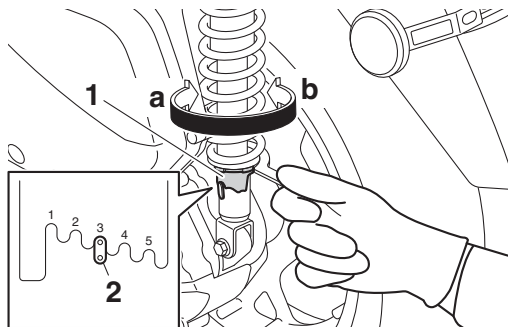
3

Adjustment value (Hard)

5

TIP

The adjustment value is the adjusting ring position number.



EAS30656

CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

TIP

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

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

3. Check:

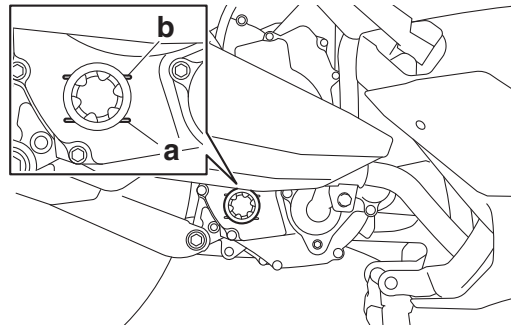
- Engine oil level

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

Below the minimum level mark → Add the recommended engine oil to the proper level.

TIP

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



Recommended brand

YAMALUBE

SAE viscosity grades

10W-40

Recommended engine oil grade

API service SG type or higher,

JASO standard MA or MB

ECA13370

NOTICE

Do not allow foreign materials to enter the crankcase.

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

5. Check the engine oil level again.

TIP

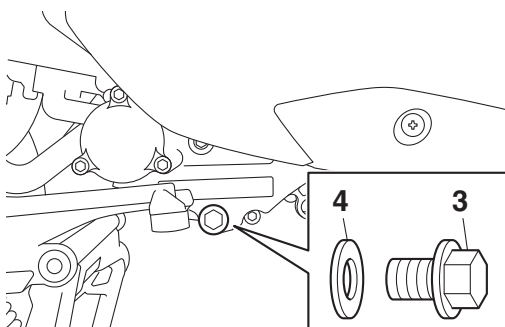
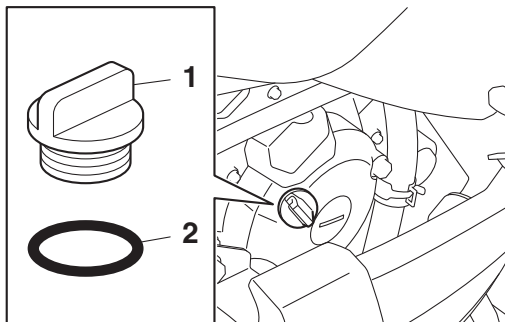
Before checking the engine oil level, wait a few minutes until the oil has settled.

PERIODIC MAINTENANCE

EAS30657

CHANGING THE ENGINE OIL

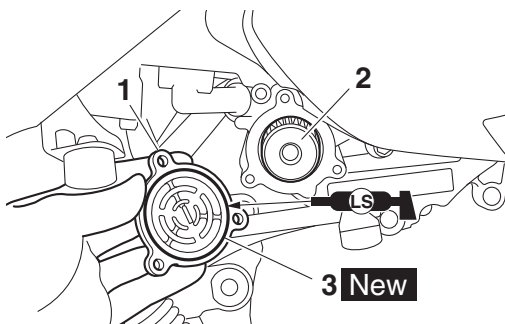
1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
 - Engine oil filler cap “1” (along with the O-ring “2”)
 - Engine oil drain bolt “3” (along with the gasket “4”)



4. Drain:
 - Engine oil (completely from the crankcase)
5. If the oil strainer is also to be cleaned, perform the following procedure.
 - a. Remove the oil filter element cover “1” and oil filter element “2”.
 - b. Install a new O-ring “3” **New**.

TIP

Lubricate the O-ring with lithium-soap-based grease.



- c. Install the oil filter element and oil filter element cover.



Oil filter element cover bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

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



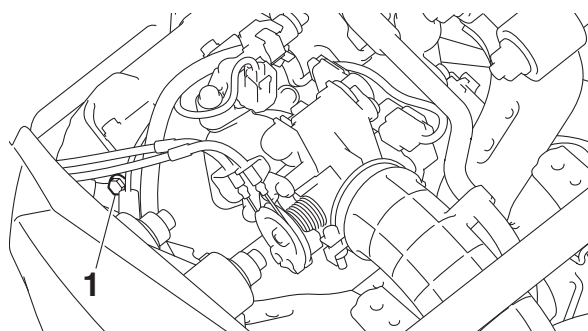
Engine oil drain bolt
20 N·m (2.0 kgf·m, 15 lb·ft)

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



Engine oil quantity
Oil change
1.50 L (1.59 US qt, 1.32 Imp.qt)
With oil filter removal
1.60 L (1.69 US qt, 1.41 Imp.qt)
Quantity (disassembled)
1.70 L (1.80 US qt, 1.50 Imp.qt)

8. Install:
 - Engine oil filler cap (along with the O-ring **New**)
9. Start the engine, warm it up for several minutes, and then turn it off.
10. Check:
 - Engine (for engine oil leaks)
11. Check:
 - Engine oil level
Refer to “CHECKING THE ENGINE OIL LEVEL” on page 3-18.
12. Remove:
 - Storage box
Refer to “GENERAL CHASSIS (4)” on page 4-10.
13. Check:
 - Engine oil pressure
 - a. Slightly loosen the oil check bolt “1”.



- b. Start the engine and keep it idling until engine oil starts to seep from the oil check bolt. 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 and the oil pump for damage or leakage. Refer to "OIL PUMP" on page 5-56.
- d. Start the engine after solving the problem(s) and check the engine oil pressure again.
- e. Tighten the oil check bolt to specification.



Engine oil check bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

EAS31187

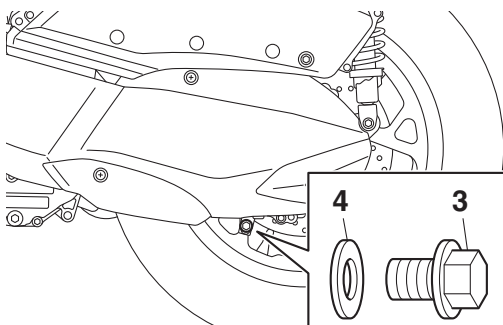
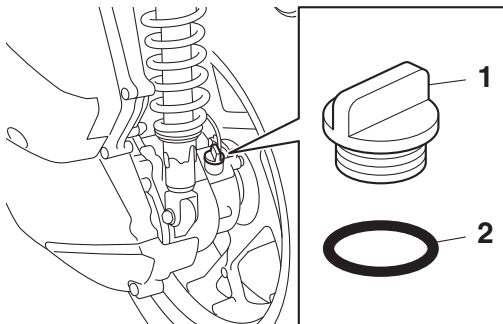
CHANGING THE FINAL TRANSMISSION OIL

1. Stand the vehicle on a level surface.

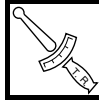
TIP

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

2. Start the engine, warm it up for several minutes, and then turn it off.
3. Place a container under the final transmission.
4. Remove:
 - Final transmission oil filler cap "1"
 - (along with the O-ring "2")
 - Final transmission oil drain bolt "3"
 - (along with the copper washer "4")
 Completely drain the final transmission oil.



5. Install:
 - Final transmission oil drain bolt
 - (along with the copper washer **New**)



Final transmission oil drain bolt
20 N·m (2.0 kgf·m, 15 lb·ft)

6. Fill:
 - Final transmission oil
 - (with the specified amount of the recommended final transmission oil)



Final transmission oil
Type
Motor oil SAE 10W-30 type SE or higher or Gear oil SAE 85W GL-3
Quantity (disassembled)
0.23 L (0.24 US qt, 0.20 Imp.qt)
Quantity
0.20 L (0.21 US qt, 0.18 Imp.qt)

7. Install:
 - Final transmission oil filler cap
 - (along with the O-ring **New**)

TIP

Lubricate the O-ring with lithium-soap-based grease.

8. Start the engine, warm it up for several minutes, and then turn it off.
9. Check:
 - Final transmission oil leakage

EAS30811

CHECKING THE COOLANT LEVEL

1. Stand the vehicle on a level surface.

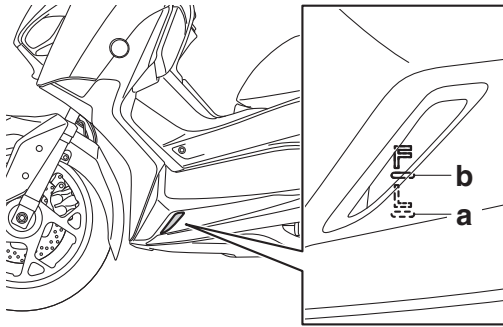
TIP

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

2. Check:
 - Coolant level

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

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



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

4. Check:

- Coolant level

TIP

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

EAS30812

CHECKING THE COOLING SYSTEM

1. Remove:

- Battery cover assembly
Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Front cowling assemblies
Refer to "GENERAL CHASSIS (2)" on page 4-4.
- Lower side covers
Refer to "GENERAL CHASSIS (4)" on page 4-10.
- Radiator cover
Refer to "GENERAL CHASSIS (5)" on page 4-13.
- Exhaust pipe
Refer to "ENGINE REMOVAL" on page 5-7.

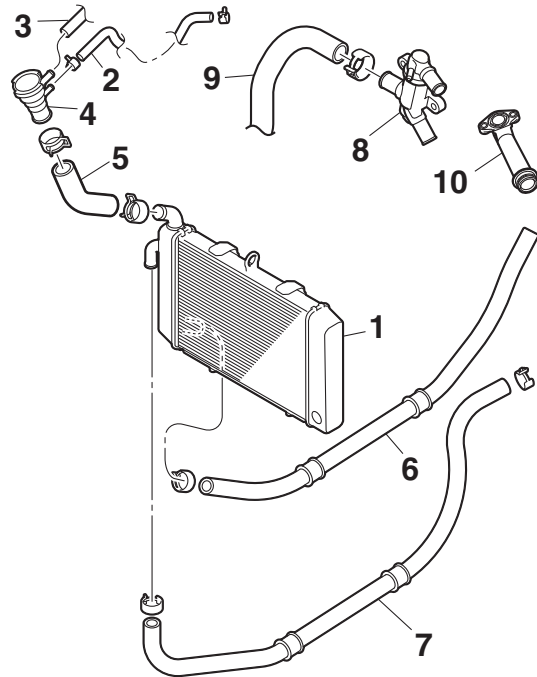
2. Check:

- Radiator "1"
- Cooling system air bleed hose "2"
- Coolant reservoir hose "3"
- Radiator filler pipe "4"
- Radiator filler hose "5"
- Radiator outlet hose "6"
- Radiator inlet hose "7"

- Thermostat assembly "8"
- Water pump inlet hose "9"
- Water pump outlet pipe "10"

Cracks/tears → Replace.

Refer to "RADIATOR" on page 6-2, "THERMOSTAT" on page 6-6 and "WATER PUMP" on page 6-8.



3. Install:

- Exhaust pipe
Refer to "ENGINE REMOVAL" on page 5-7.
- Radiator cover
Refer to "GENERAL CHASSIS (5)" on page 4-13.
- Lower side covers
Refer to "GENERAL CHASSIS (4)" on page 4-10.
- Front cowling assemblies
Refer to "GENERAL CHASSIS (2)" on page 4-4.
- Battery cover assembly
Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30813

CHANGING THE COOLANT

1. Remove:

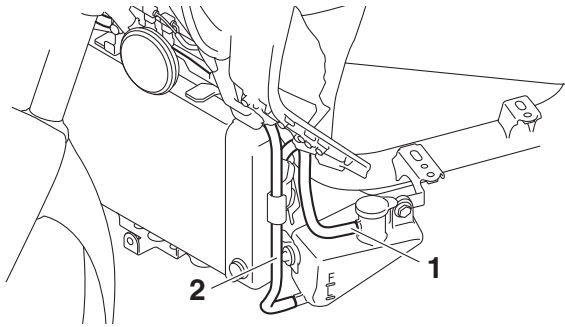
- Battery cover assembly
Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Front cowling assemblies
Refer to "GENERAL CHASSIS (2)" on page 4-4.

PERIODIC MAINTENANCE

- Lower side covers
Refer to "GENERAL CHASSIS (4)" on page 4-10.
- Radiator cover
Refer to "GENERAL CHASSIS (5)" on page 4-13.

2. Disconnect:

- Coolant reservoir breather hose "1"
- Coolant reservoir hose "2"



3. Drain:

- Coolant
(from the coolant reservoir)

4. Remove:

- Radiator cap "1"

EWA13030



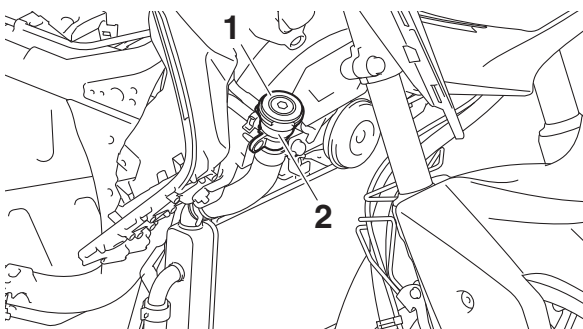
WARNING

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.

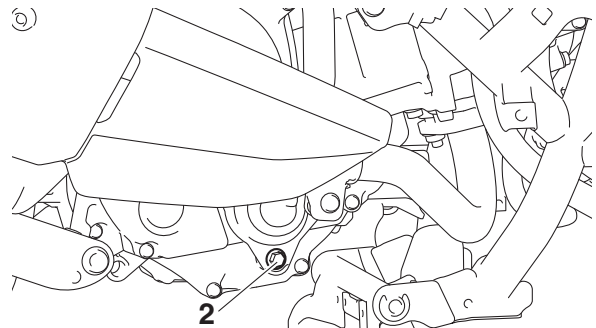
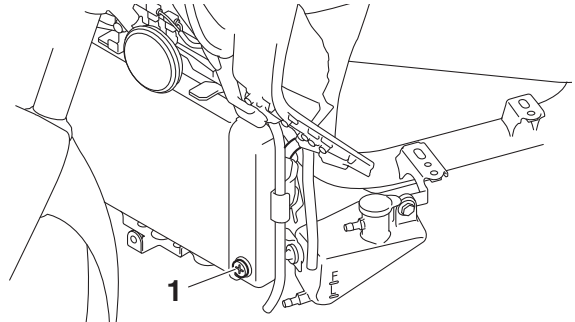
TIP

When removing the radiator cap, hold the radiator filler pipe "2".



5. Remove:

- Coolant drain bolt (radiator side) "1"
(along with the O-ring)
- Coolant drain bolt (water pump side) "2"
(along with the copper washer)



6. Drain:

- Coolant
(from the engine and radiator)

7. Install:

- Coolant drain bolt (water pump side)
(along with the copper washer **New**)
- Coolant drain bolt (radiator side)
(along with the O-ring **New**)



Coolant drain bolt (water pump side)

10 N·m (1.0 kgf·m, 7.4 lb·ft)

Coolant drain bolt (radiator side)

1.6 N·m (0.16 kgf·m, 1.2 lb·ft)

8. Fill:

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



Mixing ratio 1:1 (antifreeze: water)

Radiator (including all routes)

1.10 L (1.16 US qt, 0.97 Imp.qt)

Coolant reservoir (up to the maximum level mark)

0.18 L (0.19 US qt, 0.16 Imp.qt)

Handling notes for coolant

PERIODIC MAINTENANCE

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.

ECA13481

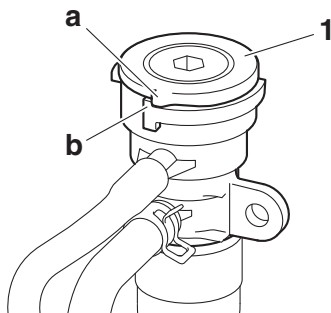
NOTICE

- 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.

9. Install:
- Radiator cap “1”

TIP

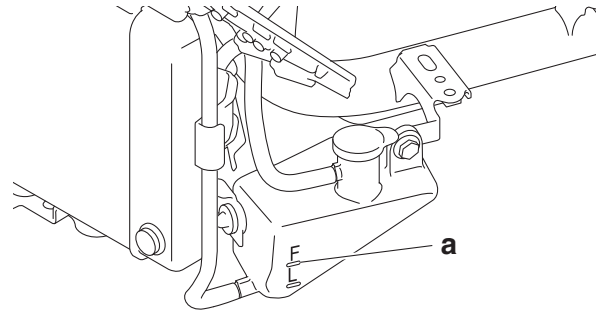
Make sure that the projection “a” on the radiator cap contacts the projection “b” on the radiator filler pipe.



10. Connect:
- Coolant reservoir hose
 - Coolant reservoir breather hose

11. Remove:
- Coolant reservoir cap

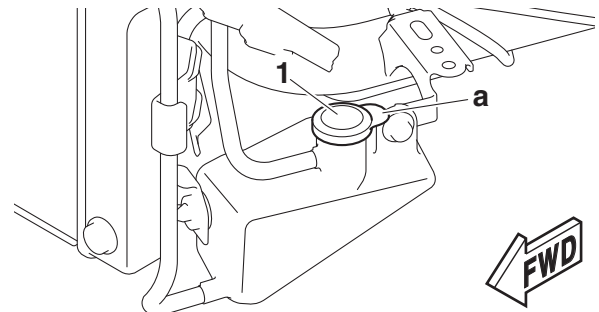
12. Fill:
- Coolant reservoir
(with the recommended coolant to the maximum level mark “a”)



13. Install:
- Coolant reservoir cap “1”

TIP

Point the tab “a” on the coolant reservoir cap rearward.



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

15. Check:

- Coolant level
Refer to “CHECKING THE COOLANT LEVEL” on page 3-20.

TIP

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

16. Install:

- Radiator cover
Refer to “GENERAL CHASSIS (5)” on page 4-13.
- Lower side covers
Refer to “GENERAL CHASSIS (4)” on page 4-10.
- Front cowling assemblies
Refer to “GENERAL CHASSIS (2)” on page 4-4.
- Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.

EAS31188

REPLACING THE V-BELT

1. Remove:
 - Storage box
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Air filter case
Refer to "AIR FILTER CASE" on page 7-11.
 - V-belt case
Refer to "V-BELT AUTOMATIC TRANSMISSION" on page 5-37.
2. Check:
 - V-belt
Damage/wear → Replace.
Grease/oil → Clean the primary and secondary pulleys.
Refer to "V-BELT AUTOMATIC TRANSMISSION" on page 5-37.

TIP

Replace the V-belt every 20000 km (12000 mi) of operation.

3. Install:
 - V-belt case
Refer to "V-BELT AUTOMATIC TRANSMISSION" on page 5-37.
 - Air filter case
Refer to "AIR FILTER CASE" on page 7-11.
 - Storage box
Refer to "GENERAL CHASSIS (4)" on page 4-10.

EAS30658

CHECKING THE BRAKE LIGHT SWITCHES

1. Check:
 - Front brake light switch operation
 - Rear brake light switch operation
When operating the brake levers, confirm that the brake light comes on.
Faulty → Refer to "CHECKING THE SWITCHES" on page 8-127.

EAS30660

CHECKING AND LUBRICATING THE CABLES

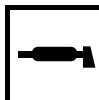
The following procedure applies to all of the inner and outer cables.

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.

EAS30861

CHECKING THE THROTTLE GRIP OPERATION

1. Check:
 - Throttle cables
Damage/deterioration → Replace.
 - Throttle cable installation
Incorrect → Reinstall the throttle cables.
Refer to "HANDLEBAR" on page 4-71.
2. Check:
 - Throttle grip movement
Rough movement → Lubricate or replace the defective part(s).



Recommended lubricant
Suitable cable lubricant

TIP

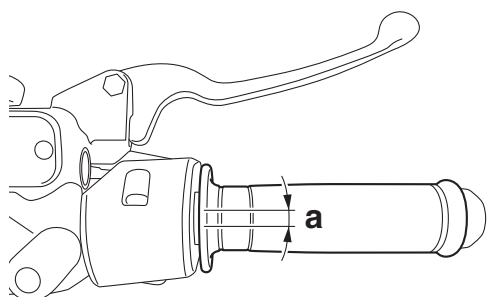
With the engine stopped, turn the throttle grip slowly and release it. Make sure that the throttle grip turns smoothly and returns properly when released.

Repeat this check with the handlebar turned all the way to the left and right.

3. Check:
 - Throttle grip free play "a"
Out of specification → Adjust.

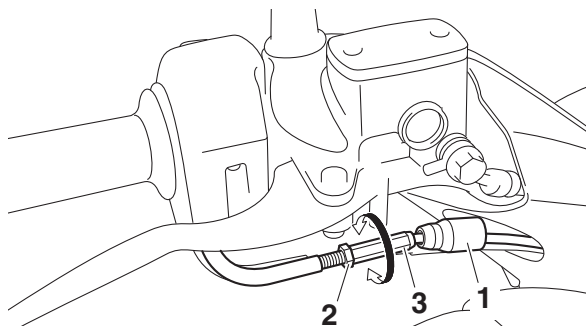


Throttle grip free play
3.0–5.0 mm (0.12–0.20 in)



4. Adjust:

- Throttle grip free play
 - a. Slide back the rubber cover "1".
 - b. Loosen the locknut "2".
 - c. Turn the adjusting nut "3" until the specified throttle grip free play is obtained.



- d. Tighten the locknut.



Throttle cable adjusting locknut
3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

- e. Slide the rubber cover its original position.

TIP

Make sure that the adjusting nut is covered completely by the rubber cover.

EWA17990

WARNING

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

EAS30663

CHECKING THE SWITCHES, LIGHTS AND SIGNALS

1. Check that all switches operate and that all lights come on.
 Refer to "Instrument and control functions" in OWNER'S MANUAL.

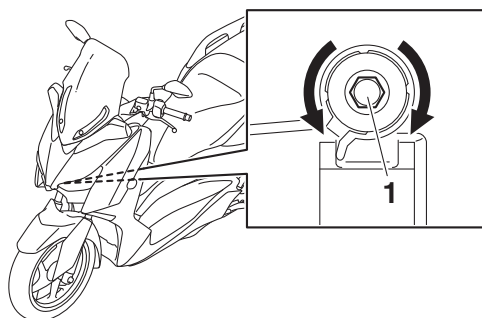
Faulty → Refer to "CHECKING THE SWITCHES" on page 8-127 and "CHECKING THE BULBS AND BULB SOCKETS" in "BASIC INFORMATION" (separate volume).

EAS30664

ADJUSTING THE HEADLIGHT BEAM

1. Adjust:

- Headlight beam (vertically)
 - a. Turn the adjusting bolt "1".



CHASSIS

GENERAL CHASSIS (1)	4-1
INSTALLING THE BATTERY BAND	4-2
REMOVING THE BATTERY COVER ASSEMBLY	4-2
INSTALLING THE BATTERY COVER ASSEMBLY	4-2
DISASSEMBLING THE BATTERY COVER ASSEMBLY	4-3
ASSEMBLING THE BATTERY COVER ASSEMBLY	4-3
ADJUSTING THE WINDSHIELD HEIGHT	4-3
 GENERAL CHASSIS (2)	4-4
REMOVING THE FRONT COWLING ASSEMBLIES	4-5
INSTALLING THE FRONT COWLING ASSEMBLIES	4-5
DISASSEMBLING THE FRONT COWLING ASSEMBLIES	4-5
ASSEMBLING THE FRONT COWLING ASSEMBLIES	4-5
 GENERAL CHASSIS (3)	4-7
REMOVING THE METER ASSEMBLY PANEL MOLDING	4-9
INSTALLING THE METER ASSEMBLY PANEL MOLDING	4-9
 GENERAL CHASSIS (4)	4-10
REMOVING THE UPPER SIDE COVERS	4-11
INSTALLING THE UPPER SIDE COVERS	4-11
REMOVING THE LOWER CENTER COVER	4-11
INSTALLING THE LOWER CENTER COVER	4-11
REMOVING THE LOWER SIDE COVERS	4-12
INSTALLING THE LOWER SIDE COVERS	4-12
 GENERAL CHASSIS (5)	4-13
DISASSEMBLING THE FOOTREST BOARD ASSEMBLIES	4-15
ASSEMBLING THE FOOTREST BOARD ASSEMBLIES	4-15
INSTALLING THE RADIATOR COVER	4-15
 GENERAL CHASSIS (6)	4-16
REMOVING THE FUEL TANK CAP LID COVER	4-19
INSTALLING THE FUEL TANK CAP LID COVER	4-19
REMOVING THE UPPER CENTER COVER	4-19
INSTALLING THE UPPER CENTER COVER	4-19
 GENERAL CHASSIS (7)	4-21
INSTALLING THE SEAT DAMPER	4-22
 GENERAL CHASSIS (8)	4-23
REMOVING THE REAR CENTER COVER	4-25
INSTALLING THE REAR CENTER COVER	4-25
REMOVING THE REAR UPPER COWLINGS	4-25
INSTALLING THE REAR UPPER COWLINGS	4-26

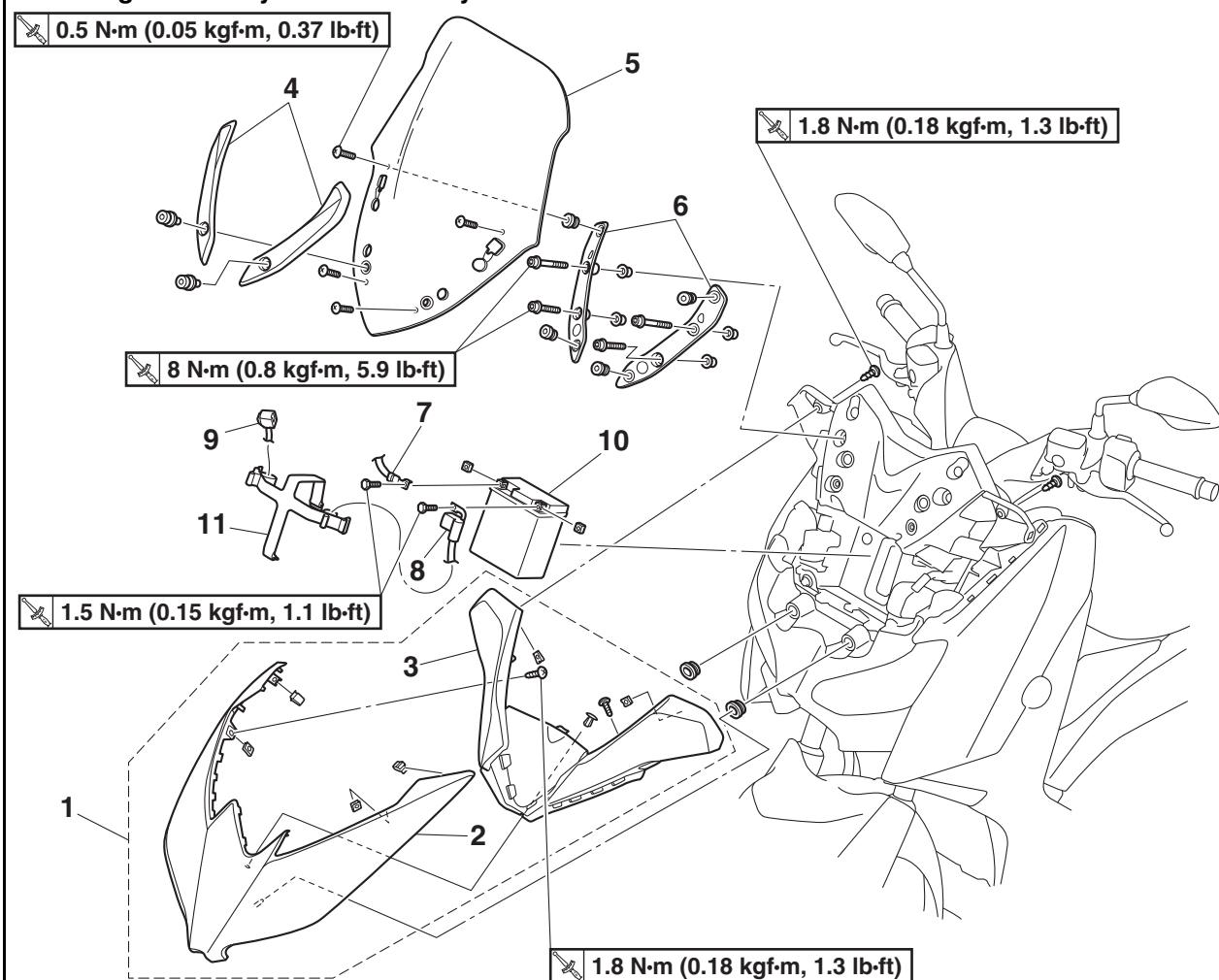
FRONT WHEEL	4-27
REMOVING THE FRONT WHEEL.....	4-29
DISASSEMBLING THE FRONT WHEEL.....	4-29
CHECKING THE FRONT WHEEL	4-29
MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR	
ROTOR.....	4-30
ASSEMBLING THE FRONT WHEEL.....	4-30
ADJUSTING THE FRONT WHEEL STATIC BALANCE	4-31
INSTALLING THE FRONT WHEEL (FRONT BRAKE DISC).....	4-31
 REAR WHEEL	4-34
REMOVING THE REAR WHEEL (DISC)	4-35
CHECKING THE REAR WHEEL.....	4-35
MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR	
ROTOR.....	4-35
ADJUSTING THE REAR WHEEL STATIC BALANCE.....	4-35
INSTALLING THE REAR WHEEL SENSOR	4-35
INSTALLING THE REAR WHEEL (REAR BRAKE DISC)	4-36
 FRONT BRAKE	4-38
INTRODUCTION	4-44
CHECKING THE FRONT BRAKE DISC	4-44
REPLACING THE FRONT BRAKE PADS	4-45
REMOVING THE FRONT BRAKE CALIPER.....	4-46
DISASSEMBLING THE FRONT BRAKE CALIPER	4-46
CHECKING THE FRONT BRAKE CALIPER	4-47
ASSEMBLING THE FRONT BRAKE CALIPER	4-47
INSTALLING THE FRONT BRAKE CALIPER	4-47
REMOVING THE FRONT BRAKE MASTER CYLINDER	4-48
CHECKING THE FRONT BRAKE MASTER CYLINDER.....	4-49
ASSEMBLING THE FRONT BRAKE MASTER CYLINDER	4-49
INSTALLING THE FRONT BRAKE MASTER CYLINDER.....	4-49
 REAR BRAKE	4-51
INTRODUCTION	4-57
CHECKING THE REAR BRAKE DISC.....	4-57
REPLACING THE REAR BRAKE PADS.....	4-57
REMOVING THE REAR BRAKE CALIPER	4-58
DISASSEMBLING THE REAR BRAKE CALIPER	4-59
CHECKING THE REAR BRAKE CALIPER.....	4-59
ASSEMBLING THE REAR BRAKE CALIPER	4-59
INSTALLING THE REAR BRAKE CALIPER.....	4-60
REMOVING THE REAR BRAKE MASTER CYLINDER	4-61
CHECKING THE REAR BRAKE MASTER CYLINDER	4-61
ASSEMBLING THE REAR BRAKE MASTER CYLINDER.....	4-61
INSTALLING THE REAR BRAKE MASTER CYLINDER.....	4-61

ABS (ANTI-LOCK BRAKE SYSTEM)	4-63
REMOVING THE HYDRAULIC UNIT ASSEMBLY	4-65
CHECKING THE HYDRAULIC UNIT ASSEMBLY	4-65
INSTALLING THE HYDRAULIC UNIT ASSEMBLY	4-65
HYDRAULIC UNIT OPERATION TESTS.....	4-67
CHECKING THE ABS WARNING LIGHT	4-70
 HANDLEBAR	4-71
ADJUSTING THE HANDLEBAR POSITION.....	4-74
REMOVING THE UPPER HANDLEBAR COVER.....	4-74
REMOVING THE HANDLEBAR.....	4-74
CHECKING THE HANDLEBAR	4-75
INSTALLING THE HANDLEBAR	4-75
INSTALLING THE UPPER HANDLEBAR COVER	4-77
 FRONT FORK	4-78
REMOVING THE FRONT FORK LEGS.....	4-82
DISASSEMBLING THE FRONT FORK LEGS	4-82
CHECKING THE FRONT FORK LEGS	4-83
ASSEMBLING THE FRONT FORK LEGS	4-83
INSTALLING THE FRONT FORK LEGS	4-86
 STEERING HEAD	4-87
REMOVING THE LOWER BRACKET	4-89
CHECKING THE STEERING HEAD	4-89
INSTALLING THE STEERING HEAD	4-89
 REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM	4-91
REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES	4-92
REMOVING THE SWINGARM.....	4-92
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY	4-92
CHECKING THE SWINGARM	4-92
INSTALLING THE SWINGARM	4-92

EAS20026

GENERAL CHASSIS (1)

Removing the battery cover assembly and windshield



Order	Job/Parts to remove	Q'ty	Remarks
1	Battery cover assembly	1	
2	Battery front cover	1	
3	Battery rear cover	1	
4	Windshield cover	2	
5	Windshield	1	
6	Windshield bracket	2	
7	Negative battery lead	1	Disconnect.
8	Positive battery lead	1	Disconnect.
9	ABS test coupler	1	
10	Battery	1	
11	Battery band	1	

EAS32305

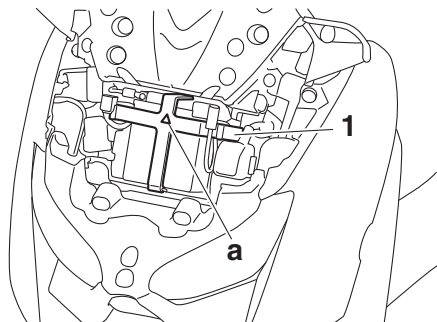
INSTALLING THE BATTERY BAND

1. Install:

- Battery band "1"

TIP

Install the battery band with the arrow mark "a" pointing up.

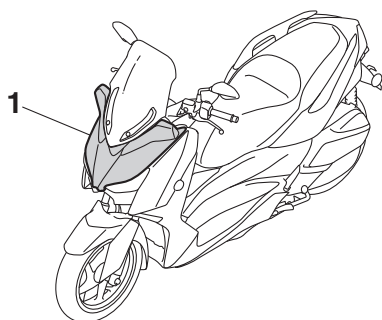


EAS32306

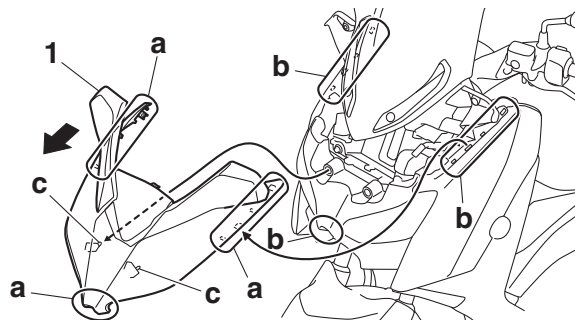
REMOVING THE BATTERY COVER ASSEMBLY

1. Remove:

- Battery cover assembly "1"



- Remove the battery cover assembly screws.
- Remove the projections "a" on the battery cover assembly from the holes "b" in the front upper cowlings.
- Pull the battery cover assembly forward to remove the projections "c" on the battery cover assembly from the grommets.

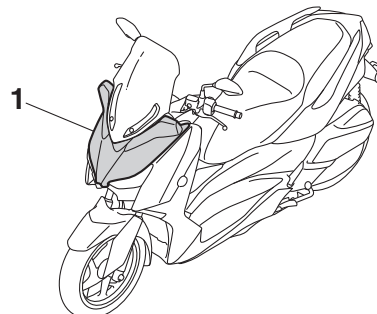


EAS32307

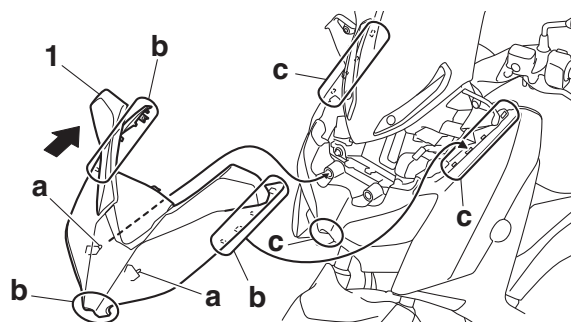
INSTALLING THE BATTERY COVER ASSEMBLY

1. Install:

- Battery cover assembly "1"



- Fit the projections "a" on the battery cover assembly into the grommets.
- Fit the projections "b" on the battery cover assembly into the holes "c" in the front upper cowlings.



- Install the battery cover assembly screws, and then tighten the screws to specification.

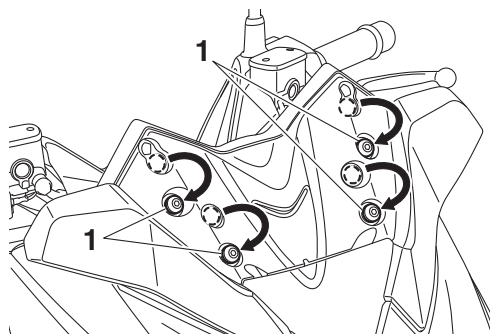
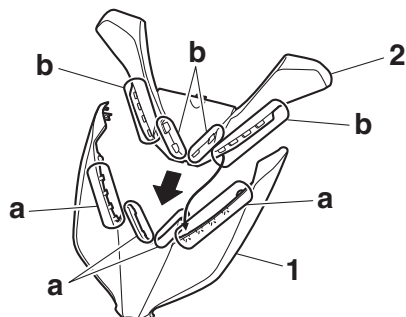


Battery cover assembly screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS32308

DISASSEMBLING THE BATTERY COVER ASSEMBLY

1. Remove the battery cover screws and quick fastener.
2. Remove the projections "a" on the battery front cover "1" from the holes "b" in the battery rear cover "2".



3. Install:
 - Windshield
 - Windshield covers

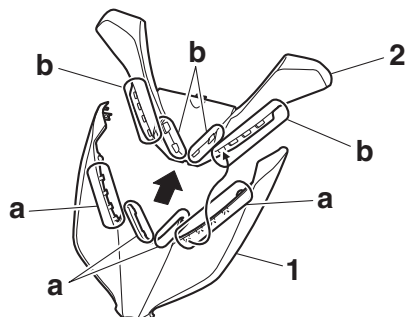


Windshield screw
0.5 N·m (0.05 kgf·m, 0.37 lb·ft)

EAS32309

ASSEMBLING THE BATTERY COVER ASSEMBLY

1. Fit the projections "a" on the battery front cover "1" into the holes "b" in the battery rear cover "2".



2. Install the battery cover screws and quick fastener, and then tighten the screws to specification.



Battery cover screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS31397

ADJUSTING THE WINDSHIELD HEIGHT

1. Remove:
 - Windshield covers
 - Windshield
2. Adjust:
 - Windshield height position

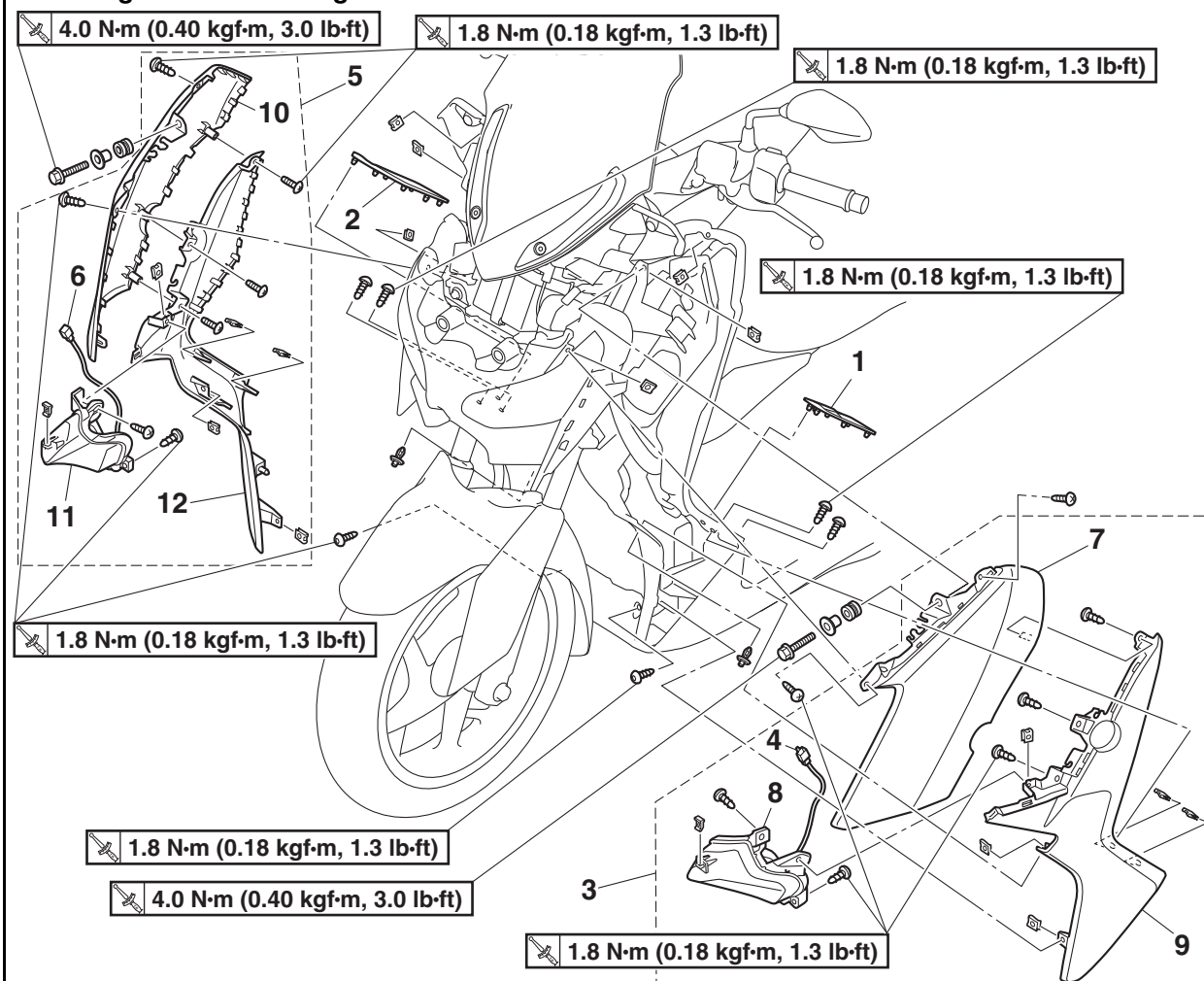
TIP

Remove the bolts, and then install the bolts "1" in the desired position.

EAS20155

GENERAL CHASSIS (2)

Removing the front cowlings



Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
1	Footrest board mat (left)	1	
2	Footrest board mat (right)	1	
3	Front cowling assembly (left)	1	
4	Front turn signal light coupler (left)	1	Disconnect.
5	Front cowling assembly (right)	1	
6	Front turn signal light coupler (right)	1	Disconnect.
7	Front upper cowling (left)	1	
8	Front turn signal light (left)	1	
9	Front lower cowling (left)	1	
10	Front upper cowling (right)	1	
11	Front turn signal light (right)	1	
12	Front lower cowling (right)	1	

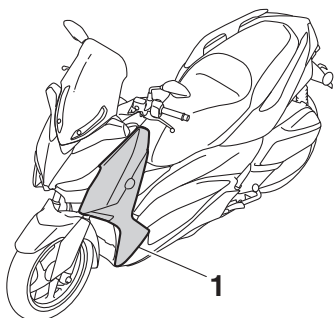
EAS32310

REMOVING THE FRONT COWLING ASSEMBLIES

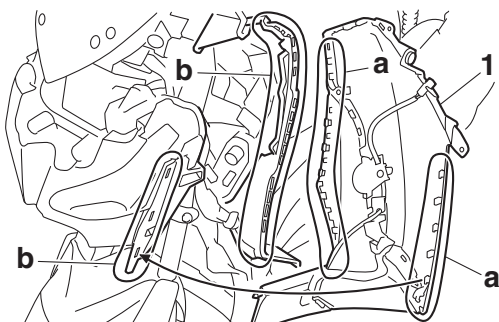
The following procedure applies to both of the front cowlings assemblies.

1. Remove:

- Front cowlings assembly "1"



- Remove the front cowlings assembly bolt, screws, and quick fasteners.
- Pull the front cowlings assembly outward to remove the projections "a" on the front cowlings assembly from the holes "b" in the leg shield assembly and headlight unit cover.



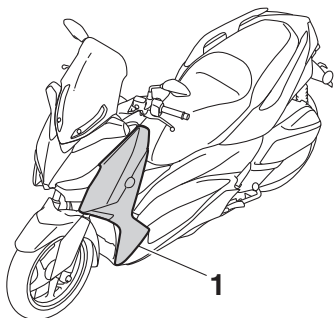
EAS32311

INSTALLING THE FRONT COWLING ASSEMBLIES

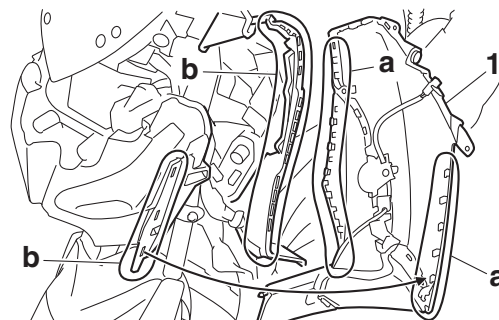
The following procedure applies to both of the front cowlings assemblies.

1. Install:

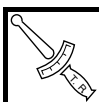
- Front cowlings assembly "1"



- Fit the projections "a" on the front cowlings assembly into the holes "b" in the leg shield assembly and headlight unit cover.



- Install the front cowlings assembly bolt, screws, and quick fasteners, and then tighten the bolt and screws to specification.



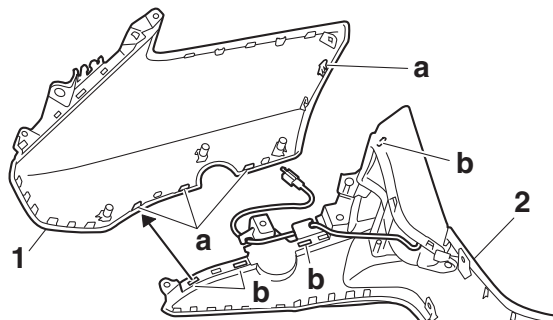
Front cowlings assembly bolt
4.0 N·m (0.40 kgf·m, 3.0 lb·ft)
Front cowlings assembly screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS32312

DISASSEMBLING THE FRONT COWLING ASSEMBLIES

The following procedure applies to both of the front cowlings assemblies.

- Remove the front cowlings screws and clamp.
- Remove the projections "a" on the front upper cowlings "1" from the holes "b" in the front lower cowlings "2".

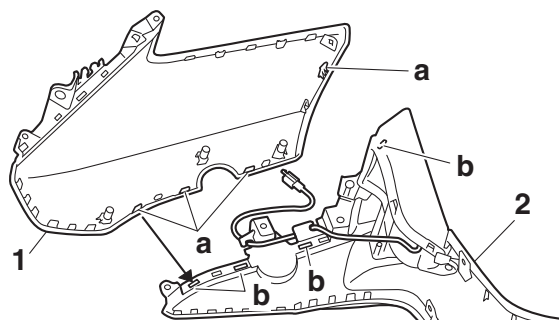


EAS32313

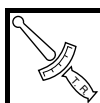
ASSEMBLING THE FRONT COWLING ASSEMBLIES

The following procedure applies to both of the front cowlings assemblies.

1. Fit the projections “a” on the front upper cowling “1” into the holes “b” in the front lower cowling “2”.

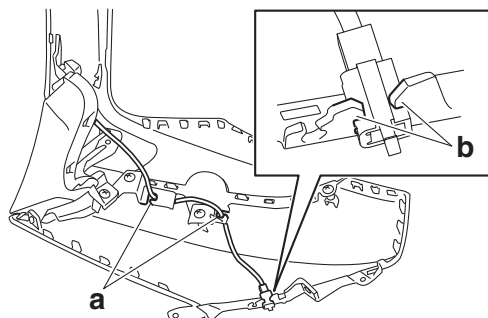


2. Install the front cowling screws and clamp, and then tighten the screws to specification.



Front cowling screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

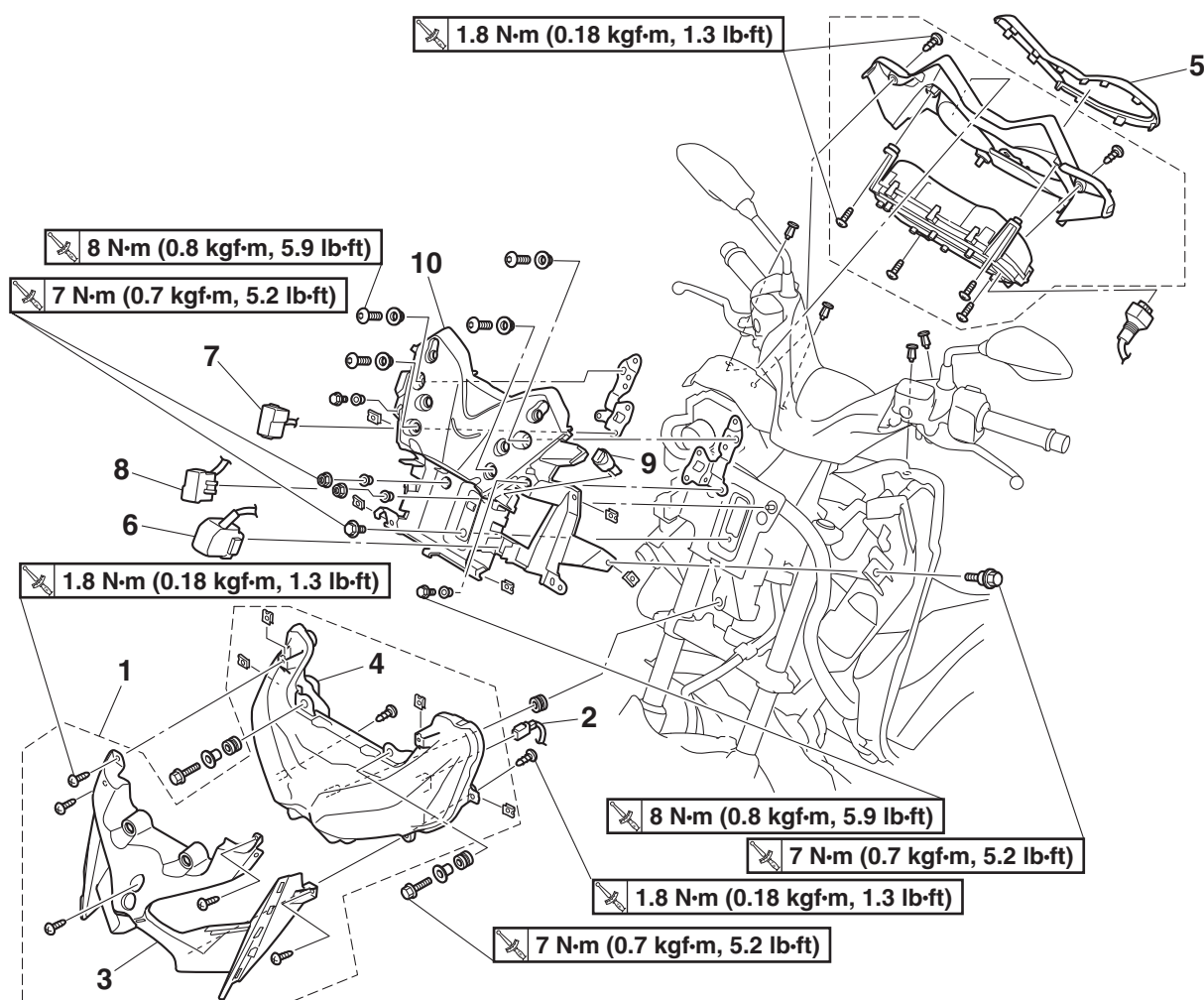
3. Route the front turn signal light lead through the guides “a” on the front upper cowling and front lower cowling.
4. Fit the front turn signal light coupler into the slot “b” in the front upper cowling.



EAS20156

GENERAL CHASSIS (3)

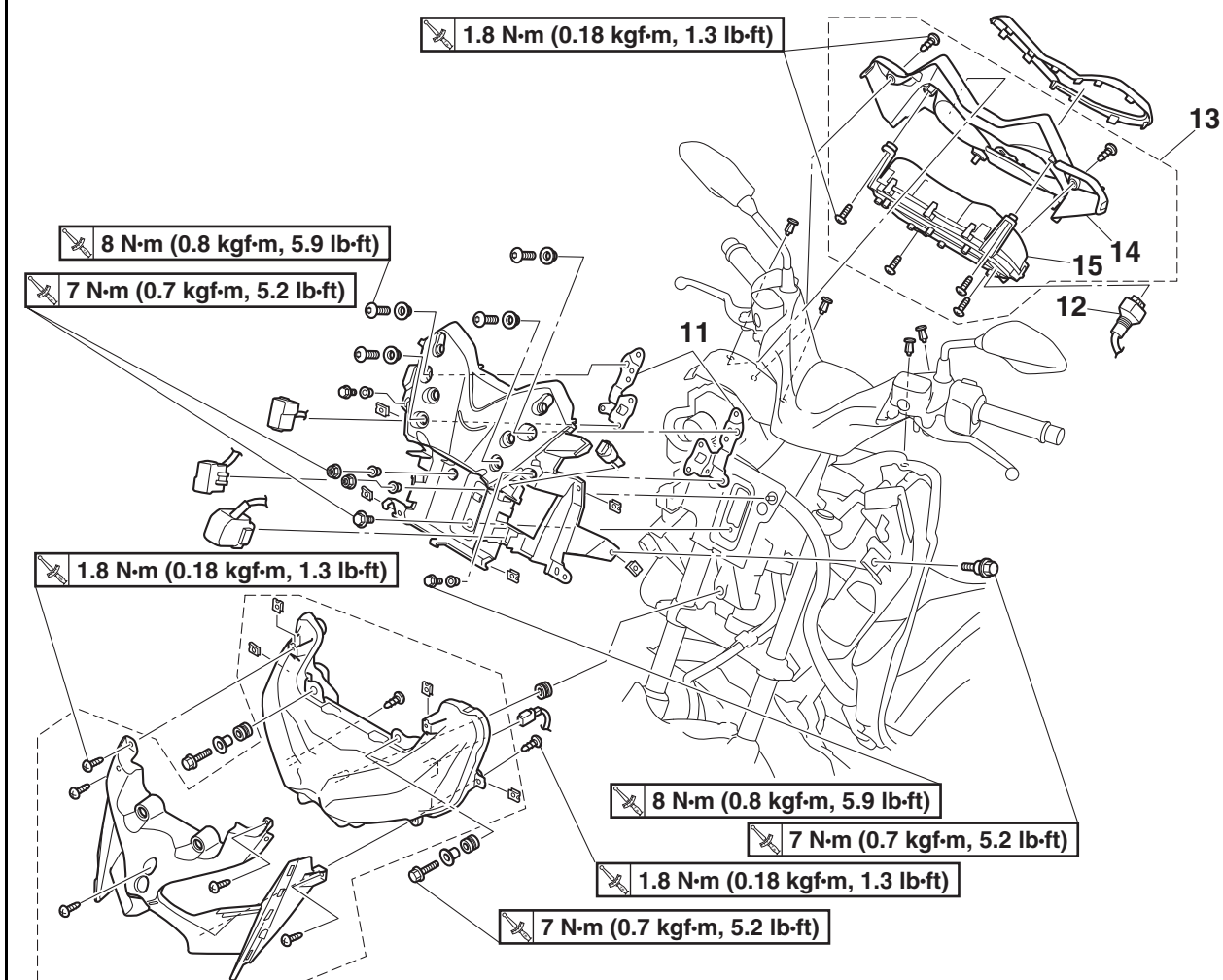
Removing the headlight unit and meter assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Battery		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
1	Headlight assembly	1	
2	Headlight unit coupler	1	Disconnect.
3	Headlight unit cover	1	
4	Headlight unit	1	
5	Meter assembly panel molding	1	
6	Starter relay	1	
7	Fuse box 1	1	
8	Fuse box 2	1	
9	Yamaha diagnostic tool coupler	1	
10	Battery box	1	

GENERAL CHASSIS (3)

Removing the headlight unit and meter assembly



Order	Job/Parts to remove	Q'ty	Remarks
11	Windshield plate	2	
12	Meter assembly coupler	1	Disconnect.
13	Meter panel assembly	1	
14	Meter assembly panel	1	
15	Meter assembly	1	

EAS32314

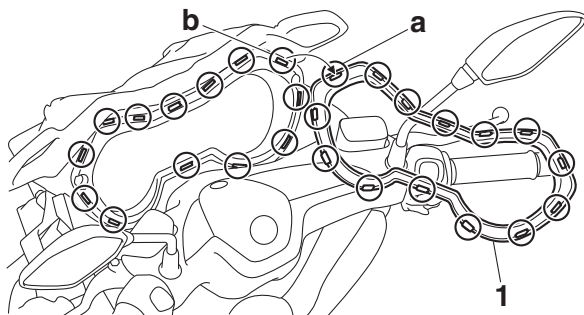
REMOVING THE METER ASSEMBLY PANEL MOLDING

1. Remove:

- Meter assembly panel molding “1”

TIP

Remove the projections “a” on the meter assembly panel molding from the holes “b” in the meter assembly panel.



EAS32315

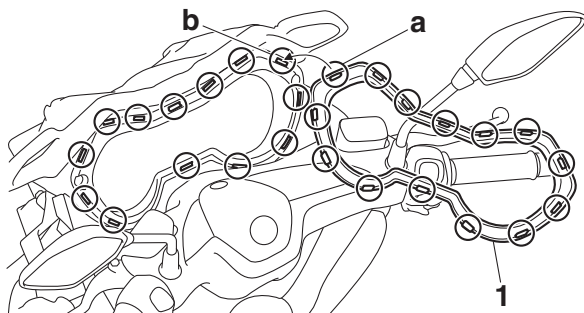
INSTALLING THE METER ASSEMBLY PANEL MOLDING

1. Install:

- Meter assembly panel molding “1”

TIP

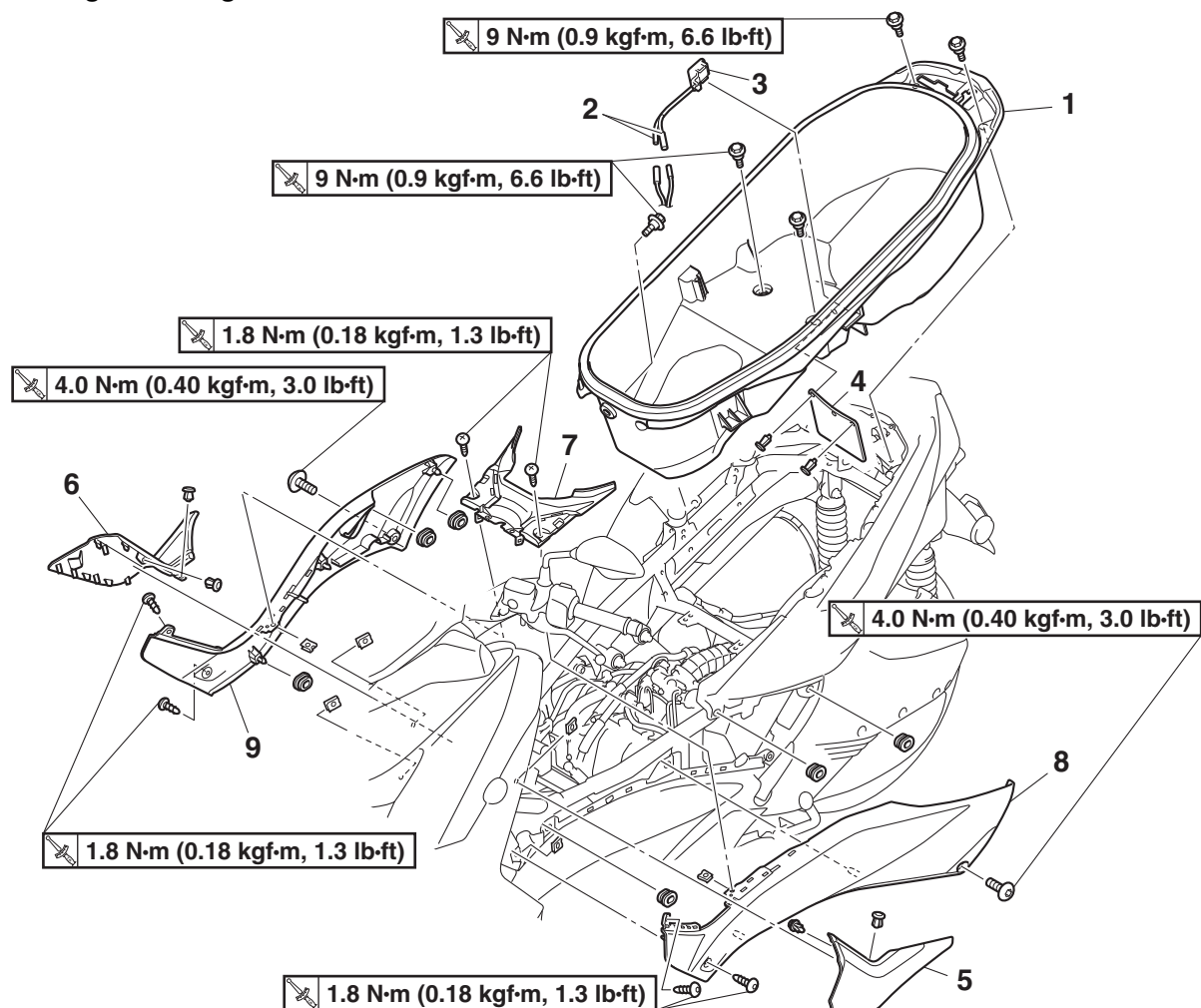
Fit the projections “a” on the meter assembly panel molding into the holes “b” in the meter assembly panel.



EAS20157

GENERAL CHASSIS (4)

Removing the storage box and side covers



Order	Job/Parts to remove	Q'ty	Remarks
1	Storage box	1	
2	Storage box light connector	2	Disconnect.
3	Storage box light	1	
4	Flap	1	
5	Upper side cover (left)	1	
6	Upper side cover (right)	1	
7	Lower center cover	1	
8	Lower side cover (left)	1	
9	Lower side cover (right)	1	

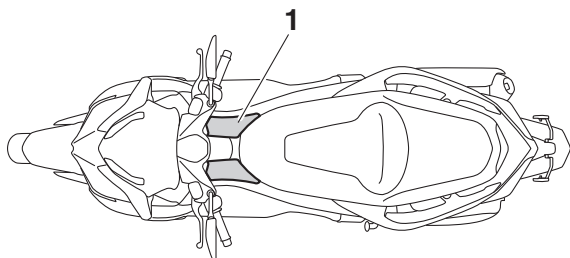
EAS32316

REMOVING THE UPPER SIDE COVERS

The following procedure applies to both of the upper side covers.

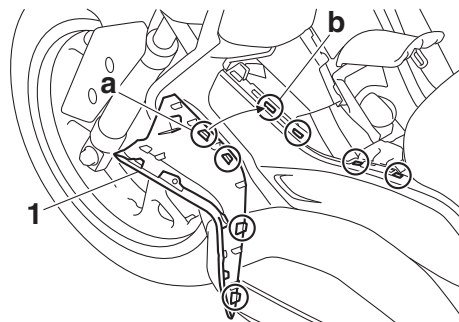
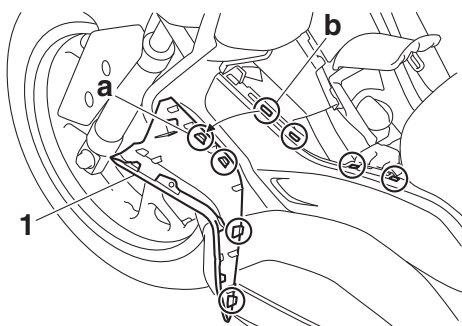
1. Remove:

- Upper side cover "1"



a. Remove the quick fasteners.

b. Pull the upper side cover outward to remove the projections "a" from the holes "b" in the lower side covers.



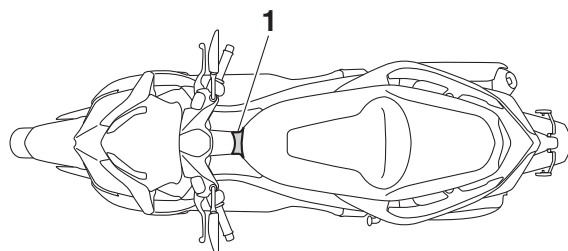
b. Install the quick fasteners.

EAS32318

REMOVING THE LOWER CENTER COVER

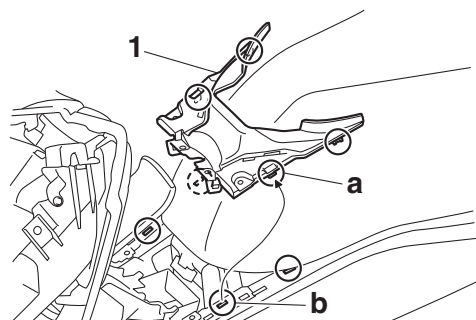
1. Remove:

- Lower center cover "1"



a. Remove the lower center cover screws.

b. Pull the lower center cover outward to remove the projections "a" on the cover from the holes "b" in the lower side cover.



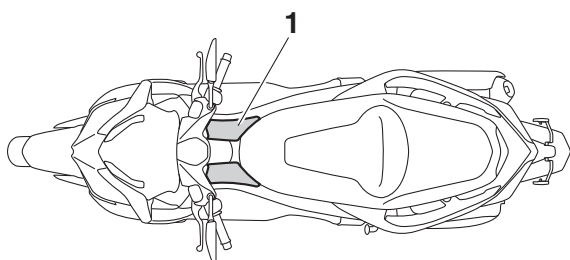
EAS32317

INSTALLING THE UPPER SIDE COVERS

The following procedure applies to both of the upper side covers.

1. Install:

- Upper side cover "1"



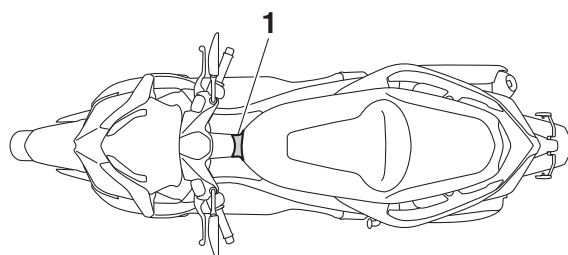
a. Fit the projections "a" on the upper side cover into the holes "b" in the lower side covers.

EAS32319

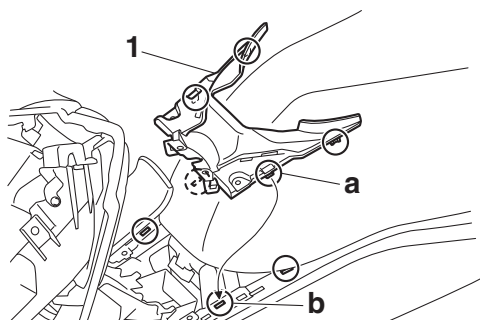
INSTALLING THE LOWER CENTER COVER

1. Install:

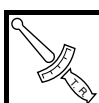
- Lower center cover "1"



- a. Fit the projections “a” on the lower center cover into the holes “b” in the lower side cover.



- b. Install the lower center cover screws, and then tighten the screws to specification.



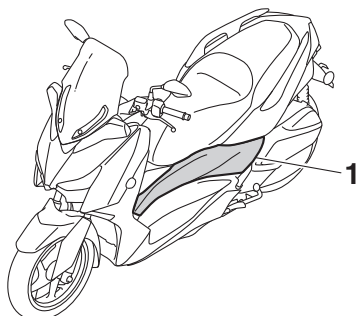
Lower center cover screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS32320

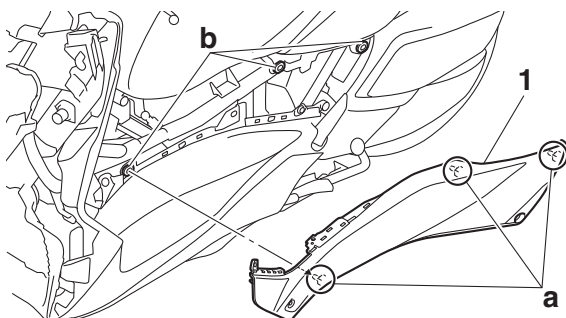
REMOVING THE LOWER SIDE COVERS

The following procedure applies to both of the lower side covers.

1. Remove:
 - Lower side cover “1”



- a. Remove the lower side cover bolt and screws.
- b. Pull the lower side cover outward to remove the projections “a” on the cover from the grommets “b”.

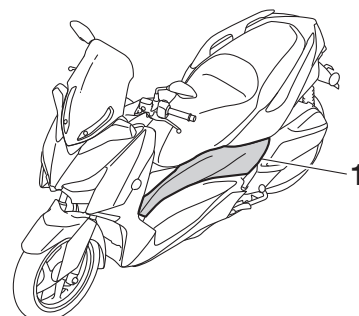


EAS32321

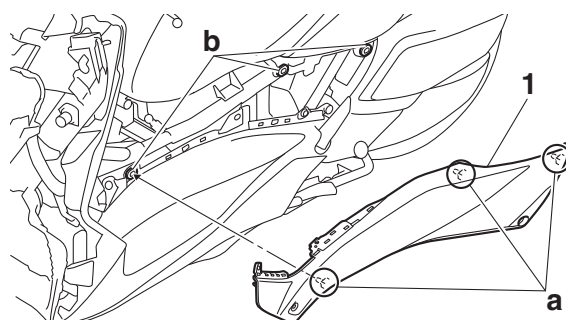
INSTALLING THE LOWER SIDE COVERS

The following procedure applies to both of the lower side covers.

1. Install:
 - Lower side cover “1”



- a. Fit the projections “a” on the lower side cover into the grommets “b”.



- b. Install the lower side cover bolt and screws, and then tighten the bolt to specification.

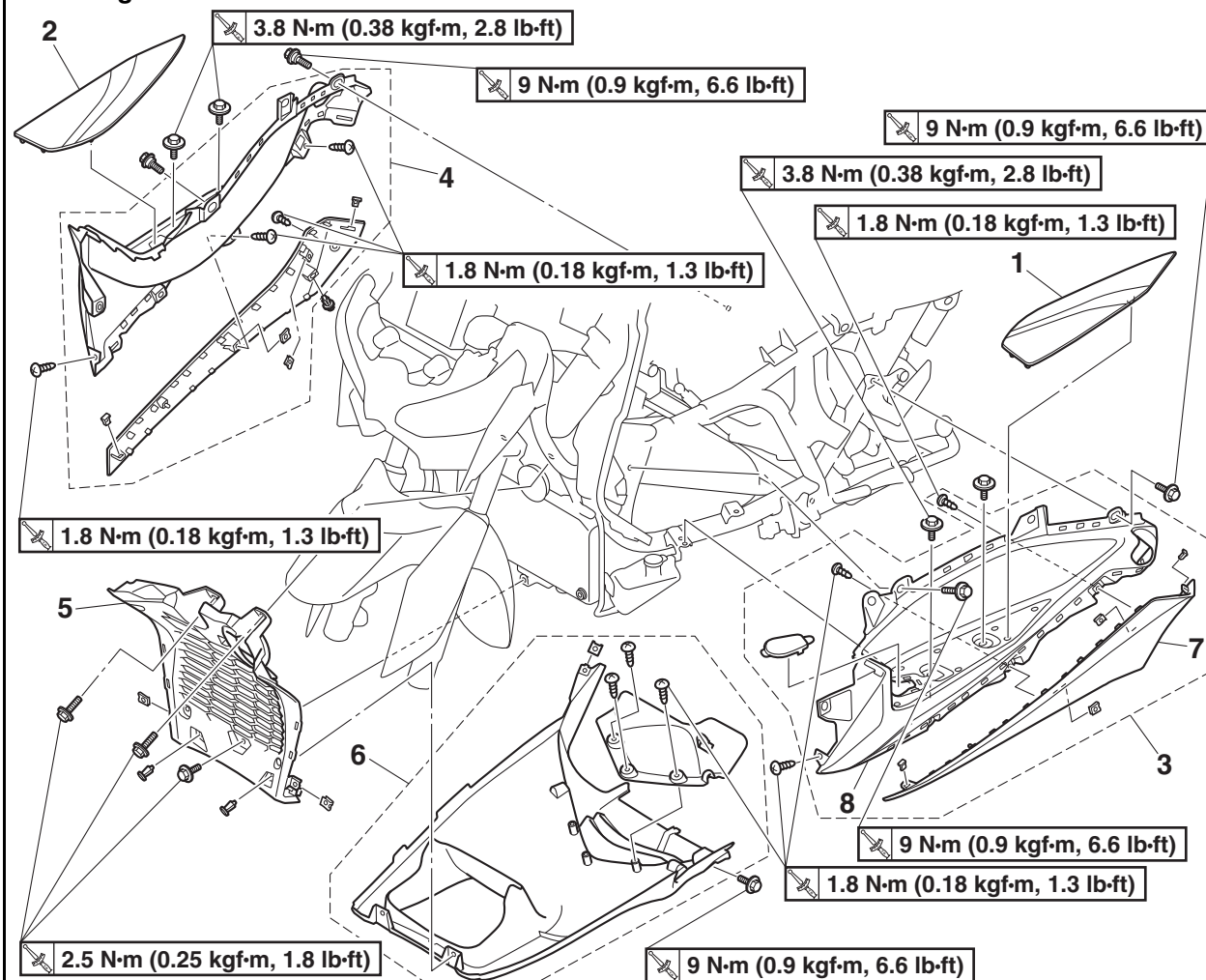


Lower side cover bolt
4.0 N·m (0.40 kgf·m, 3.0 lb·ft)
Lower side cover screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS20158

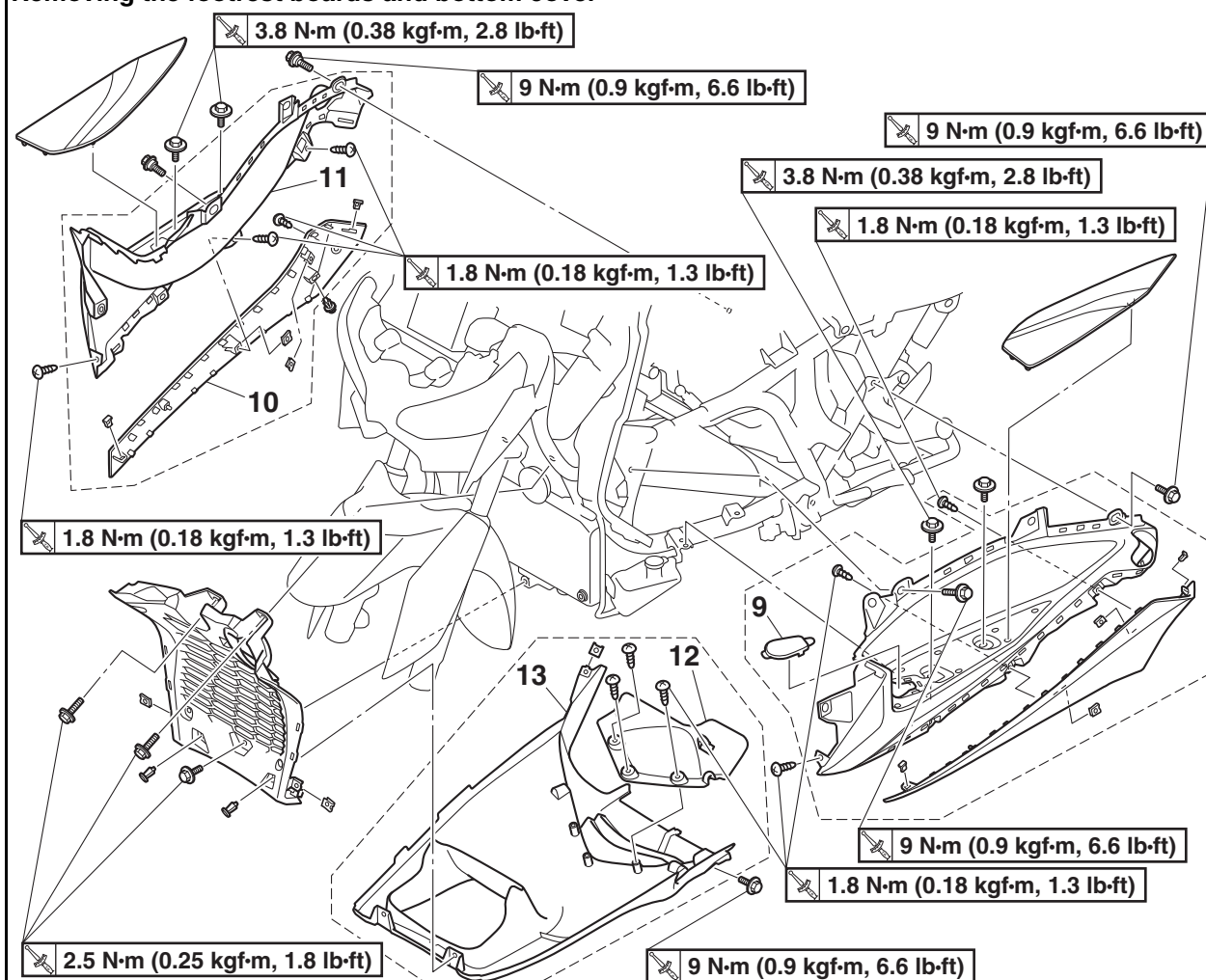
GENERAL CHASSIS (5)

Removing the footrest boards and bottom cover



Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
1	Footrest board mat (left)	1	
2	Footrest board mat (right)	1	
3	Footrest board assembly (left)	1	
4	Footrest board assembly (right)	1	
5	Radiator cover	1	
6	Bottom cover assembly	1	
7	Footrest board molding (left)	1	
8	Footrest board (left)	1	

Removing the footrest boards and bottom cover



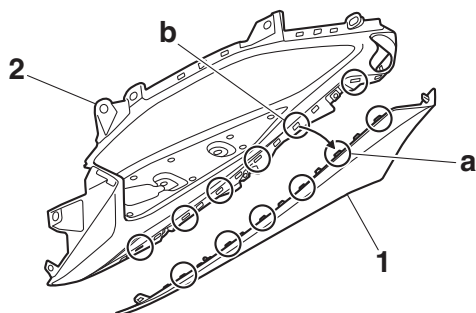
Order	Job/Parts to remove	Q'ty	Remarks
9	Coolant reservoir cap cover	1	
10	Footrest board molding (right)	1	
11	Footrest board (right)	1	
12	Bottom cover 1	1	
13	Bottom cover 2	1	

EAS32326

DISASSEMBLING THE FOOTREST BOARD ASSEMBLIES

The following procedure applies to both of the footrest board assemblies.

1. Remove the footrest board screws and clamps.
2. Remove the projections "a" on the footrest board molding "1" from the holes "b" in the footrest board "2".

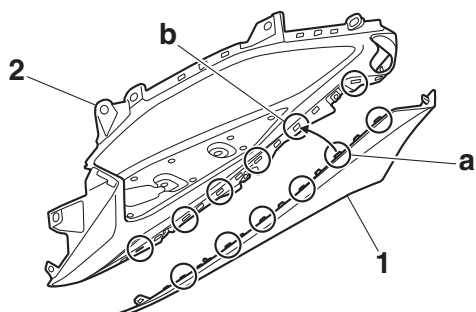


EAS32327

ASSEMBLING THE FOOTREST BOARD ASSEMBLIES

The following procedure applies to both of the footrest board assemblies.

1. Fit the projections "a" on the footrest board molding "1" into the holes "b" in the footrest board "2".



2. Install the footrest board screws and clamps, and then tighten the screws to specification.



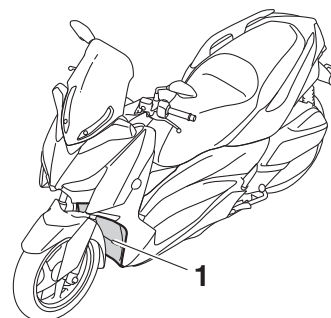
Footrest board screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS32348

INSTALLING THE RADIATOR COVER

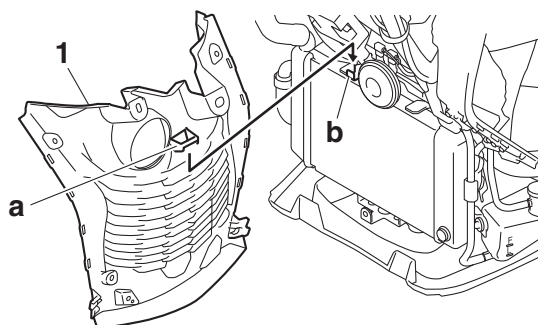
1. Install:
 - Radiator cover "1"

Radiator cover bolt
2.5 N·m (0.25 kgf·m, 1.8 lb·ft)



TIP

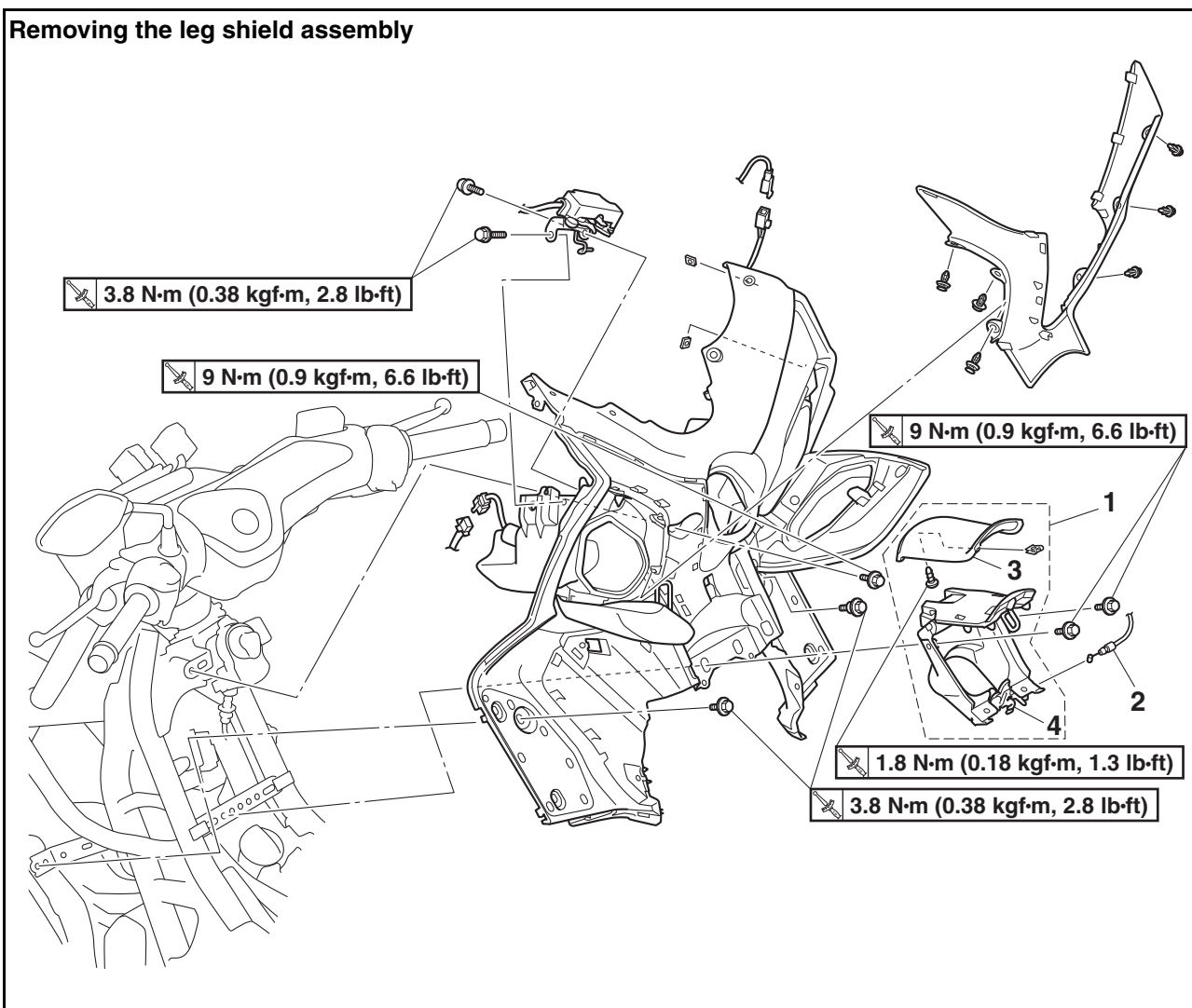
Fit the hole "a" in the radiator cover the hook "b" on the frame.



EAS20159

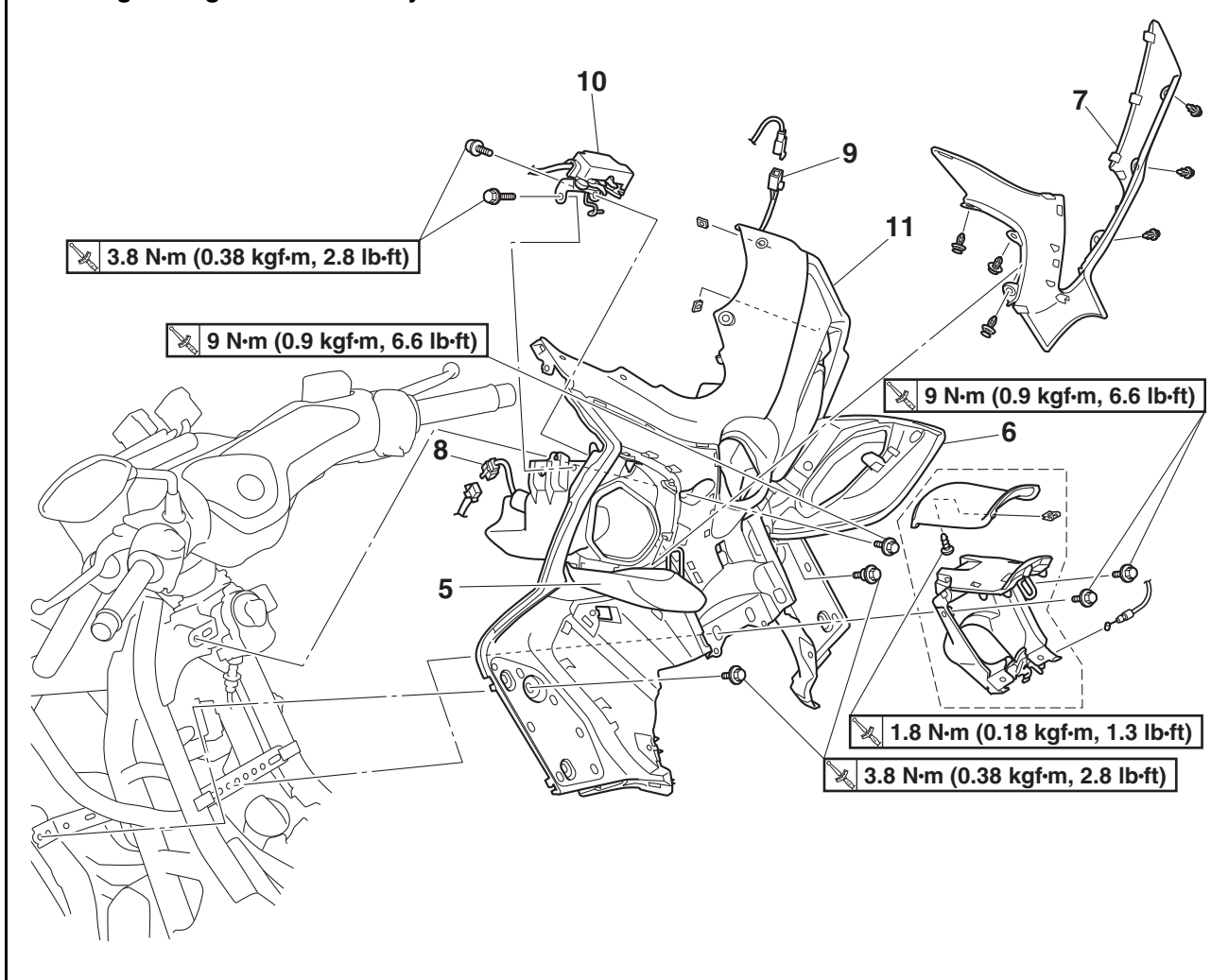
GENERAL CHASSIS (6)

Removing the leg shield assembly



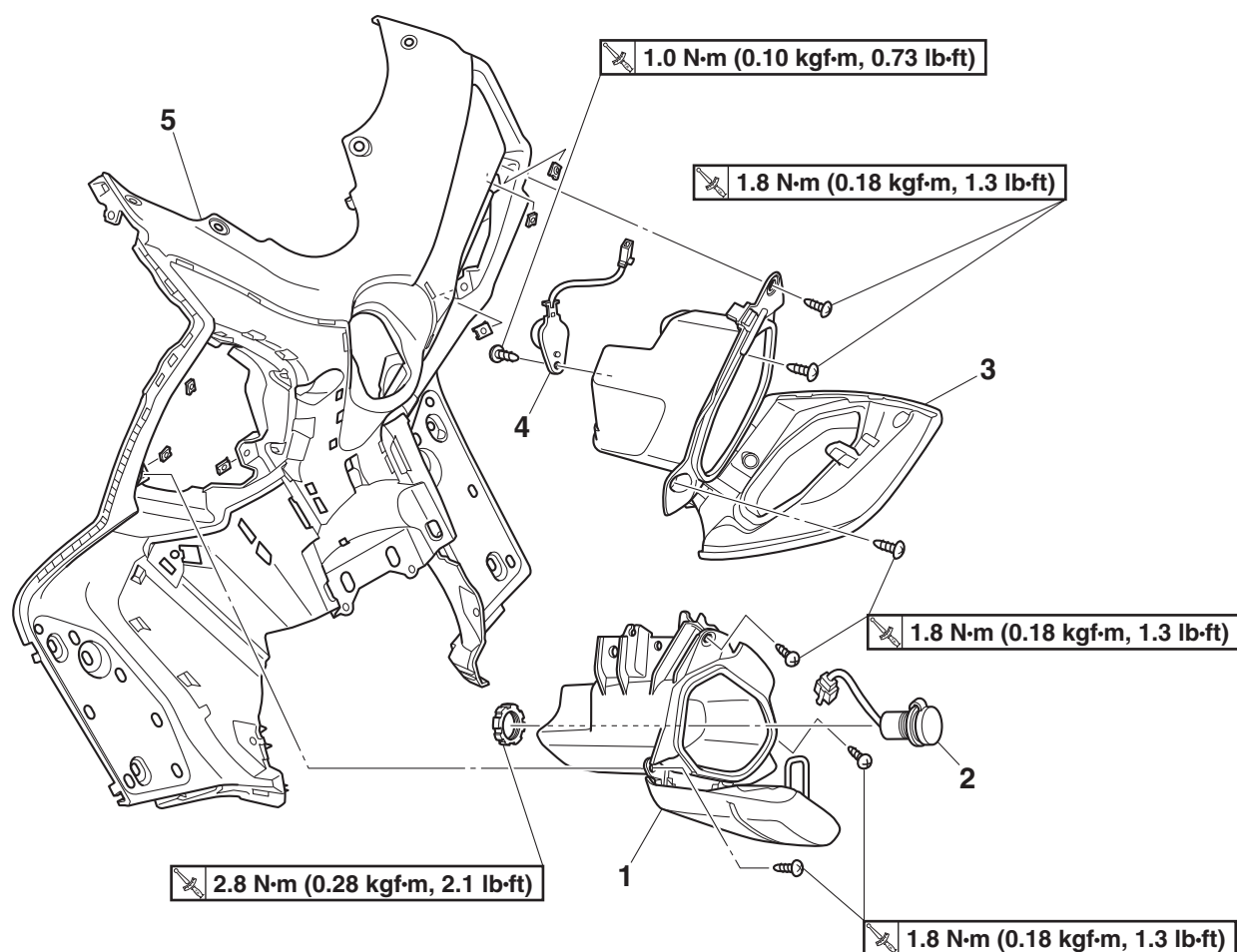
Order	Job/Parts to remove	Q'ty	Remarks
	Battery		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Meter assembly		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Footrest board assemblies		Refer to "GENERAL CHASSIS (5)" on page 4-13.
1	Fuel tank cap lid assembly	1	
2	Fuel tank cap lid lock cable	1	Disconnect.
3	Fuel tank cap lid cover	1	
4	Fuel tank cap lid	1	

Removing the leg shield assembly



Order	Job/Parts to remove	Q'ty	Remarks
5	Front storage box (left)	1	Open.
6	Front storage box (right)	1	Open.
7	Upper center cover	1	
8	Auxiliary DC jack coupler	1	Disconnect.
9	Buzzer coupler	1	Disconnect.
10	Front storage compartment lock cable assembly	1	
11	Leg shield assembly	1	

Disassembling the leg shield assembly



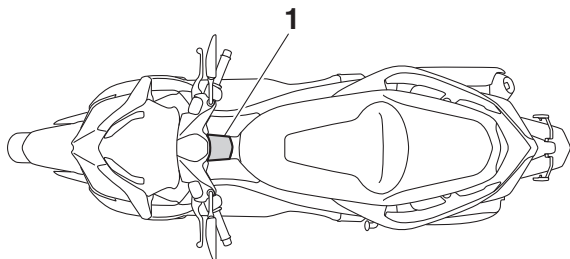
Order	Job/Parts to remove	Q'ty	Remarks
1	Front storage box (left)	1	
2	Auxiliary DC jack	1	
3	Front storage box (right)	1	
4	Buzzer	1	
5	Leg shield	1	

EAS32349

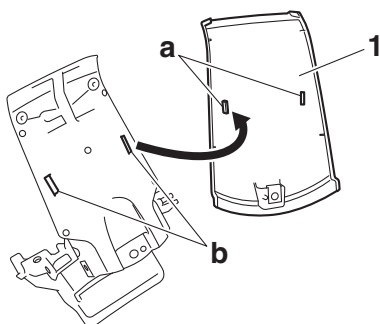
REMOVING THE FUEL TANK CAP LID COVER

1. Remove:

- Fuel tank cap lid cover “1”



- Remove the screw.
- Remove the projections “a” on the fuel tank cap lid cover from the holes “b” in the fuel tank cap lid.

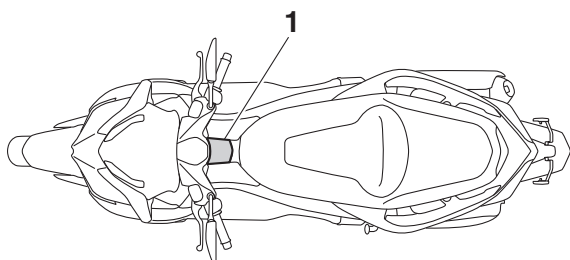


EAS32350

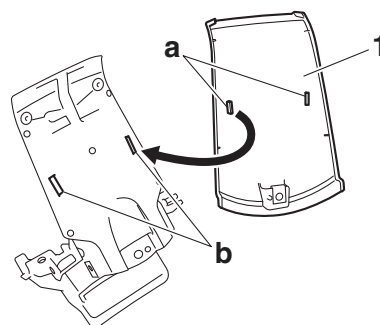
INSTALLING THE FUEL TANK CAP LID COVER

1. Install:

- Fuel tank cap lid cover “1”



- Fit the projections “a” on the fuel tank cap lid cover into the holes “b” in the fuel tank cap lid.



- Install the fuel tank cap lid cover screw, and then tighten the screw to specification.



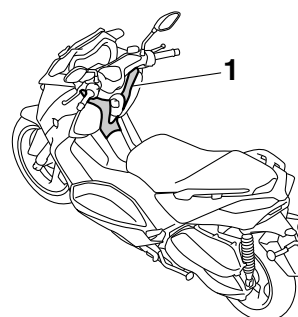
Fuel tank cap lid cover screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS32329

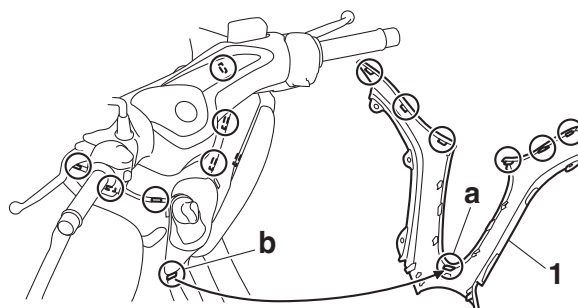
REMOVING THE UPPER CENTER COVER

1. Remove:

- Upper center cover “1”



- Remove the quick fasteners.
- Pull the upper center cover outward to remove the projections “a” on the cover from the holes “b” in the leg shield.

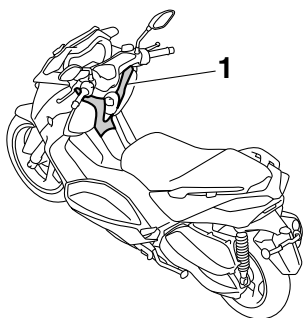


EAS32330

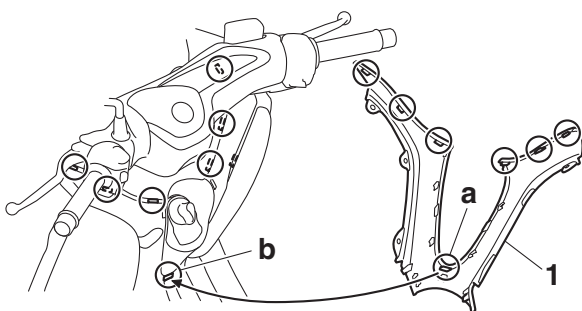
INSTALLING THE UPPER CENTER COVER

1. Install:

- Upper center cover “1”



- a. Fit the projections “a” on the upper center cover into the holes “b” in the leg shield.

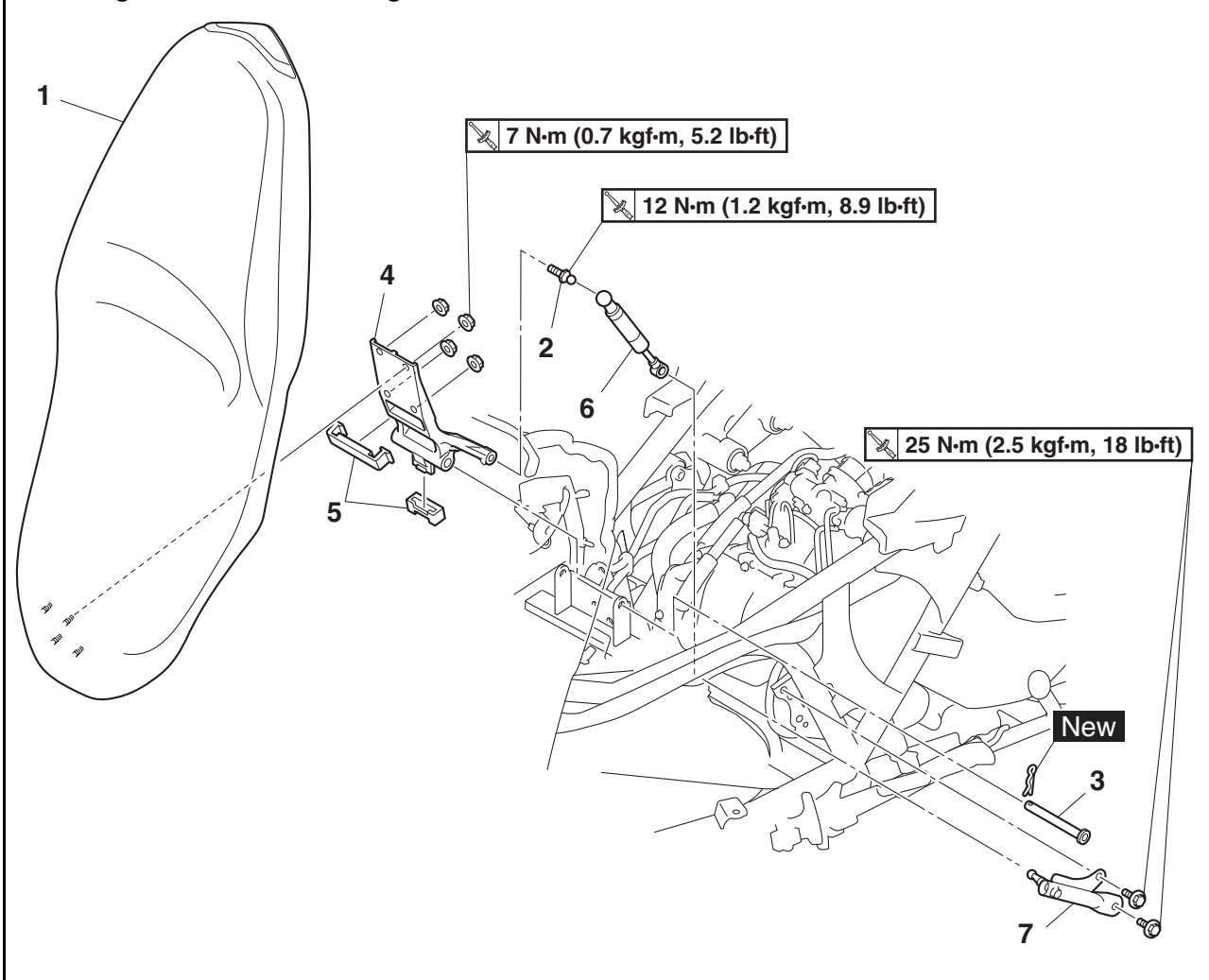


- b. Install the quick fasteners.

EAS20193

GENERAL CHASSIS (7)

Removing the seat and seat hinge



Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side cover		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Footrest board assemblies		Refer to "GENERAL CHASSIS (5)" on page 4-13.
1	Seat	1	
2	Seat damper pivot	1	
3	Seat hinge pin	1	
4	Seat hinge	1	
5	Seat hinge molding	2	
6	Seat damper	1	
7	Seat damper bracket	1	

EAS32331

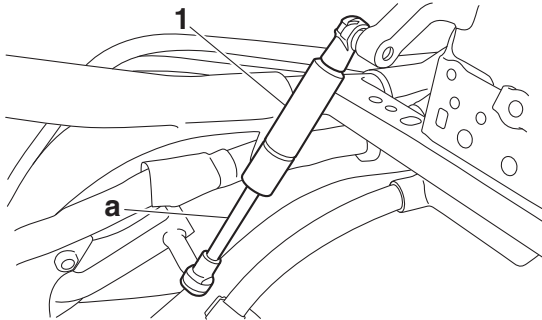
INSTALLING THE SEAT DAMPER

1. Install:

- Seat damper “1”

TIP

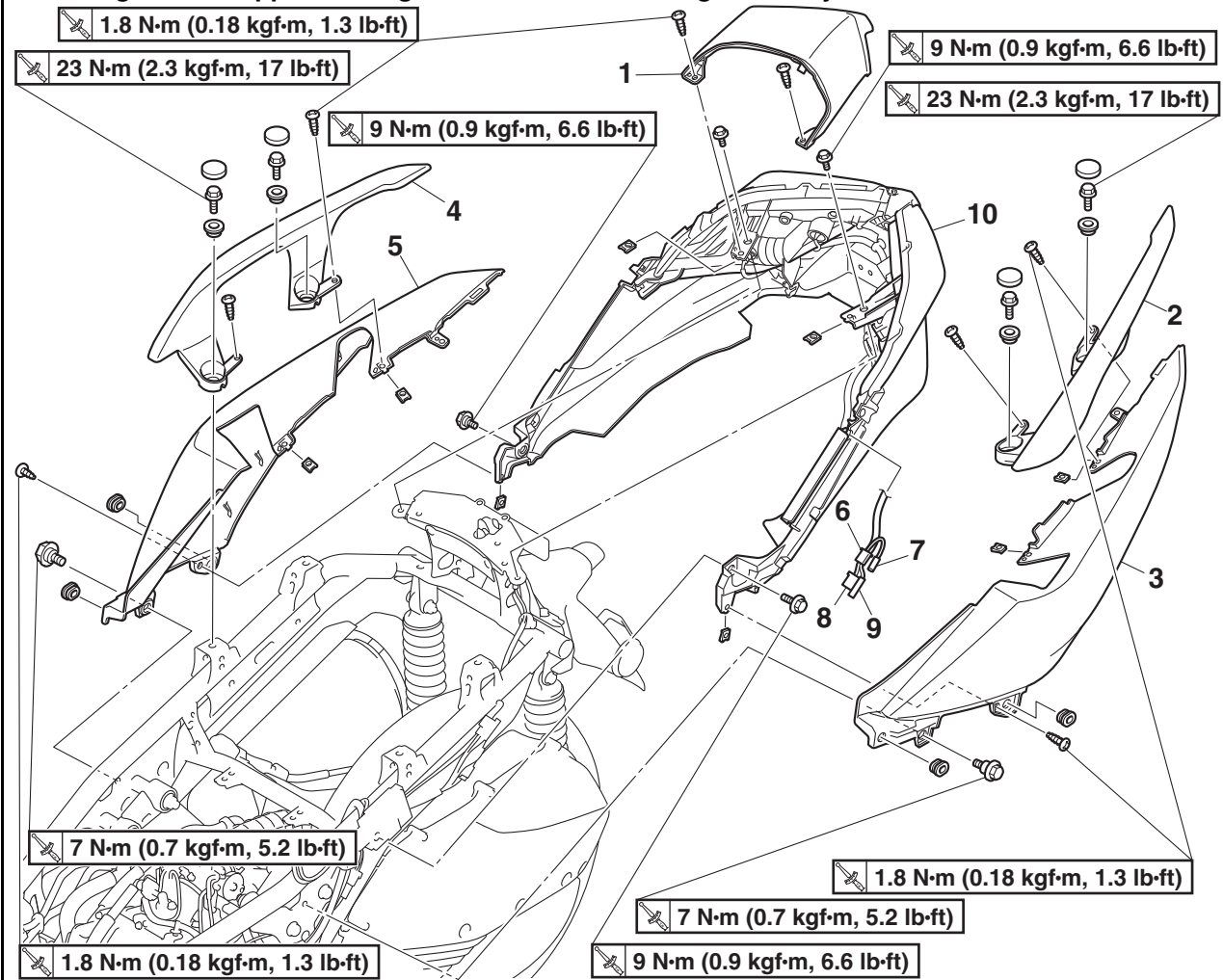
Install the seat damper so that the rod “a” is pointing downward as shown in the illustration.



EAS20194

GENERAL CHASSIS (8)

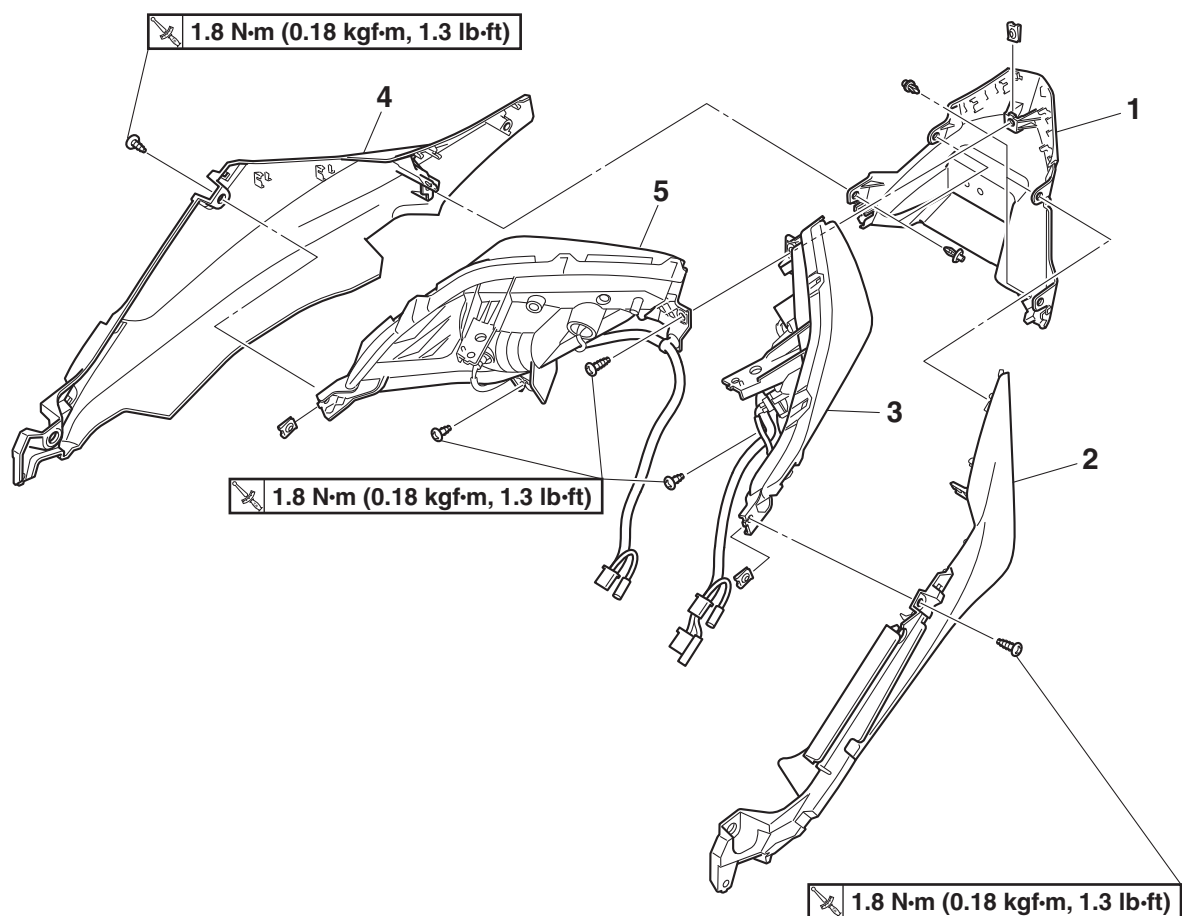
Removing the rear upper cowlings and rear lower cowling assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
1	Rear center cover	1	
2	Grab bar (left)	1	
3	Rear upper cowling (left)	1	
4	Grab bar (right)	1	
5	Rear upper cowling (right)	1	
6	Tail/brake light coupler (left tail/brake light)	1	Disconnect.
7	Tail/brake light connector (left tail/brake light)	1	Disconnect.
8	Tail/brake light coupler (right tail/brake light)	1	Disconnect.
9	Tail/brake light connector (right tail/brake light)	1	Disconnect.
10	Rear lower cowling assembly	1	

GENERAL CHASSIS (8)

Disassembling the rear lower cowling assembly



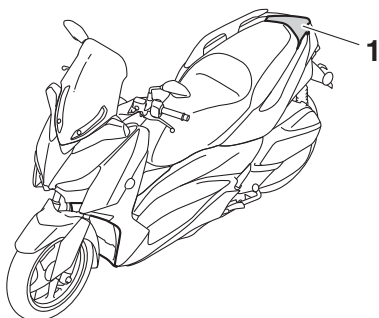
Order	Job/Parts to remove	Q'ty	Remarks
1	Tail/brake light cover	1	
2	Rear lower cowling (left)	1	
3	Tail/brake light (left)	1	
4	Rear lower cowling (right)	1	
5	Tail/brake light (right)	1	

EAS32351

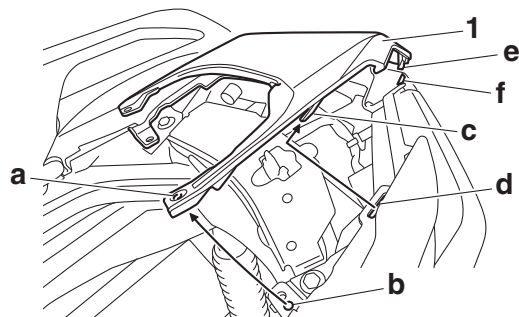
REMOVING THE REAR CENTER COVER

1. Remove:

- Rear center cover "1"



- Remove the rear center cover screws.
- Remove the holes "a" in the rear center cover from the projections "b" on the tail/brake light cover.
- Pull the rear center cover rearward to remove the projections "c" on the rear center cover from the holes "d" in the rear upper cowlings.
- Pull the rear center cover upward to remove the projections "e" on the rear center cover from the holes "f" in the tail/brake light cover.

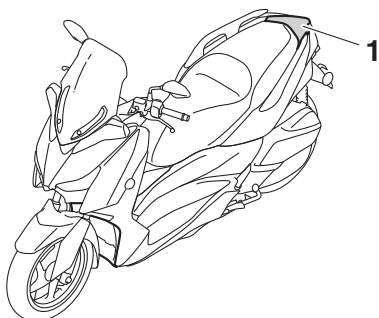


EAS32352

INSTALLING THE REAR CENTER COVER

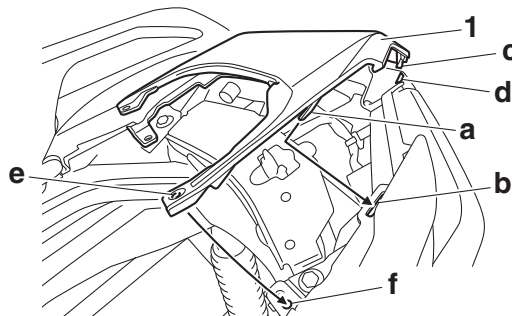
1. Install:

- Rear center cover "1"



- Fit the projections "a" on the rear center cover into the holes "b" in the rear upper cowling.

- Fit the projections "c" on the rear center cover into the holes "d" in the tail/brake light cover.
- Fit the holes "e" in the rear center cover to the projection "f" on the tail/brake light cover.



- Tighten the rear center cover screws to specification.



Rear center cover screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

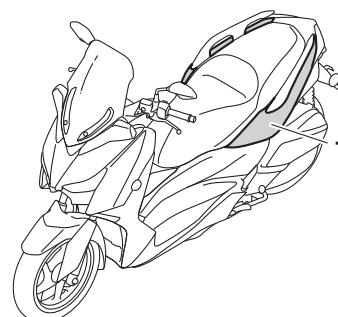
EAS32354

REMOVING THE REAR UPPER COWLINGS

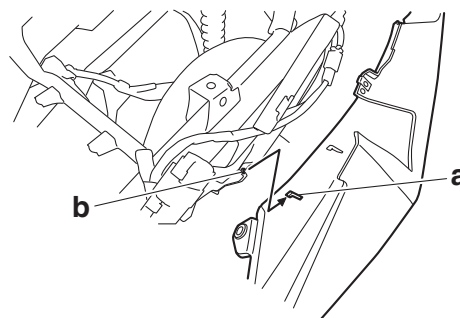
The following procedure applies to both of the rear upper cowlings.

1. Remove:

- Rear upper cowling "1"



- Remove the rear upper cowling screw and bolt.
- Pull the rear upper cowling rearward to remove the projection "a" on the rear upper cowling from the hole "b" in the rear lower cowling.



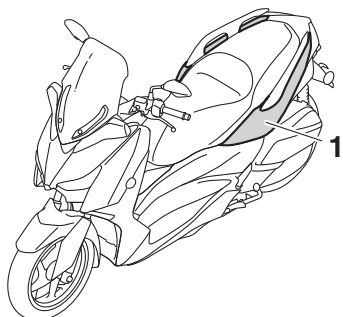
EAS32353

INSTALLING THE REAR UPPER COWLINGS

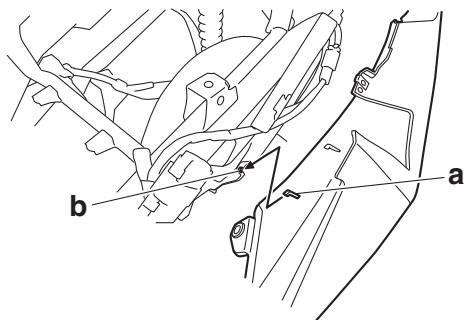
The following procedure applies to both of the rear upper cowlings.

1. Install:

- Rear upper cowling “1”



- a. Fit the projection “a” on the rear upper cowling into the hole “b” in the rear lower cowling.



- b. Tighten the rear upper cowling bolt and screw to specification.

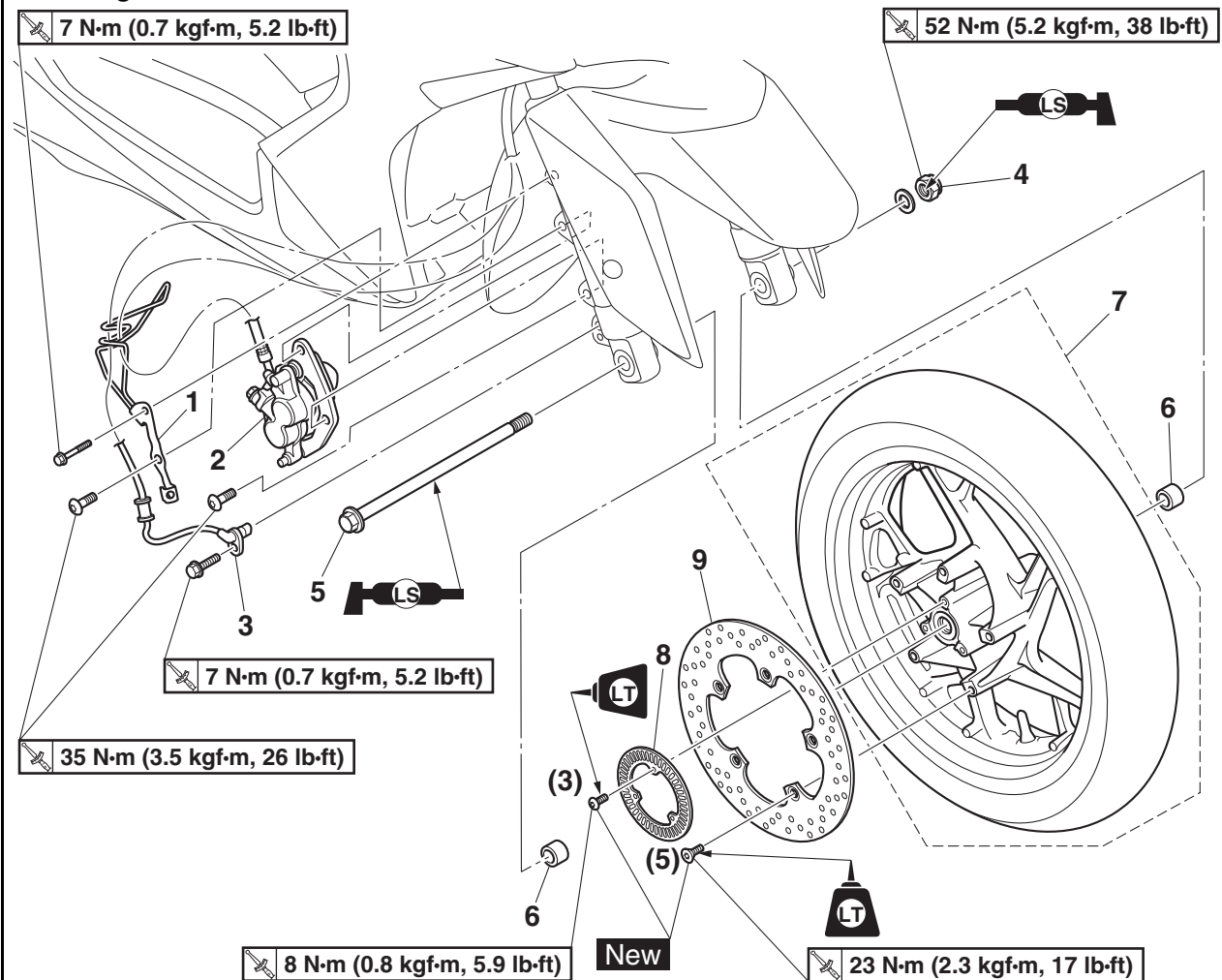


Rear upper cowling bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)
Rear upper cowling screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS20028

FRONT WHEEL

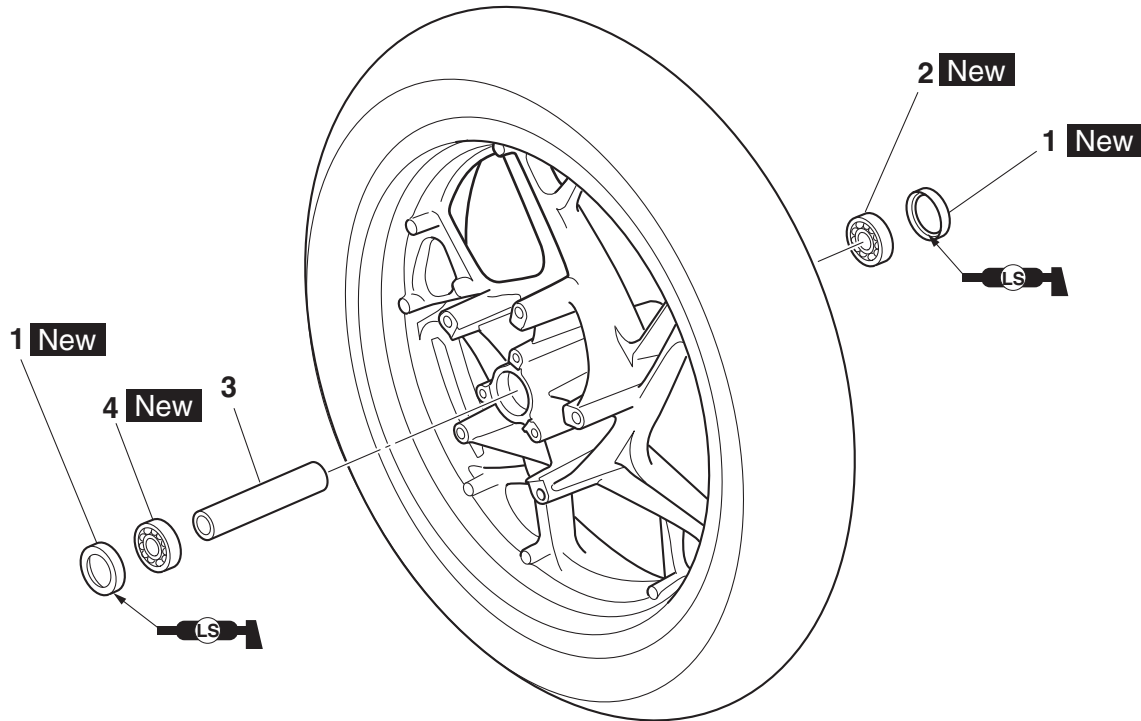
Removing the front wheel and brake disc



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

FRONT WHEEL

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	2	
2	Wheel bearing (left)	1	
3	Spacer	1	
4	Wheel bearing (right)	1	

EAS30145

REMOVING THE FRONT WHEEL

ECA20981

NOTICE

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

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

ECA21830

NOTICE

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

3. Elevate:
 - Front wheel

TIP

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

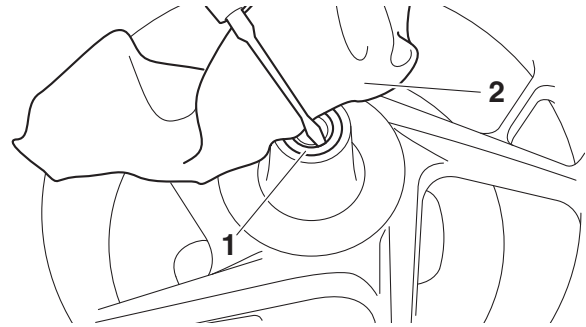
EAS30146

DISASSEMBLING THE FRONT WHEEL

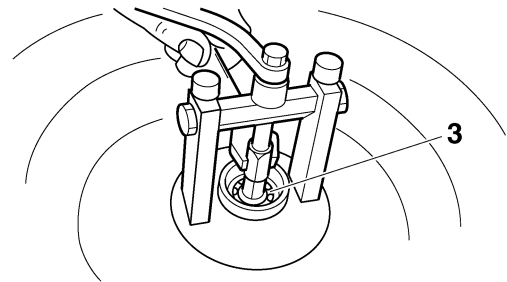
1. Remove:
 - Oil seals
 - Wheel bearings
 - a. Clean the surface of the front wheel hub.
 - b. Remove the oil seals "1" with a flat-head screwdriver.

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.



EAS30147

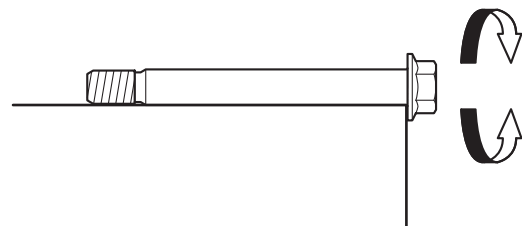
CHECKING THE FRONT WHEEL

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

EWA13460

WARNING

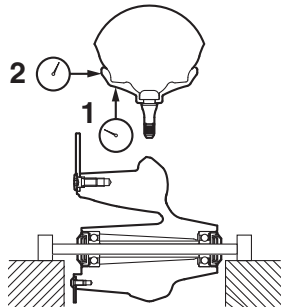
Do not attempt to straighten a bent wheel axle.



2. Check:
 - Tire
 - Front wheel
 - Damage/wear → Replace.
 - Refer to "CHECKING THE TIRES" on page 3-14 and "CHECKING THE WHEELS" on page 3-13.
3. Measure:
 - Radial wheel runout "1"
 - Lateral wheel runout "2"
 - Over the specified limits → Replace.

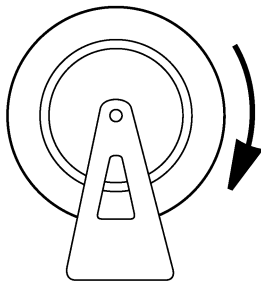


Radial wheel runout limit
1.0 mm (0.04 in)
Lateral wheel runout limit
1.0 mm (0.04 in)



4. Check:

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



EAS30155

MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR

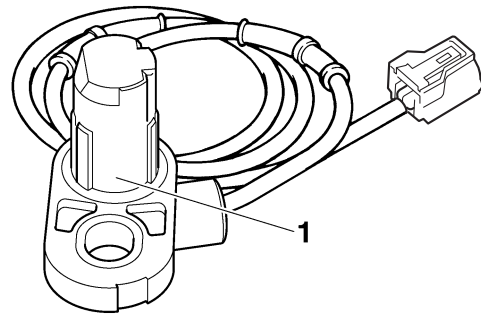
ECA21070

NOTICE

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

1. Check:

- Front wheel sensor "1"
Cracks/bends/distortion → Replace.
Iron powder/dust → Clean.

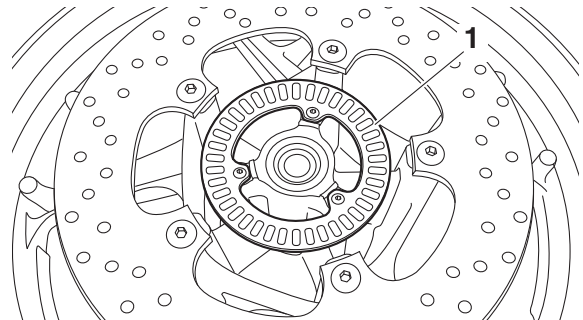


2. Check:

- Front wheel sensor rotor "1"
Cracks/damage/scratches → Replace the front wheel sensor rotor.
Iron powder/dust/solvent → Clean.

TIP

When cleaning the wheel sensor rotor, be careful not to damage the surface of the sensor rotor.



EAS30151

ASSEMBLING THE FRONT WHEEL

1. Lubricate:

- Oil seal lips



Recommended lubricant
Lithium-soap-based grease

2. Install:

- Wheel bearings **New**
- Oil seals **New**
 - a. Install the new wheel bearing (right side).

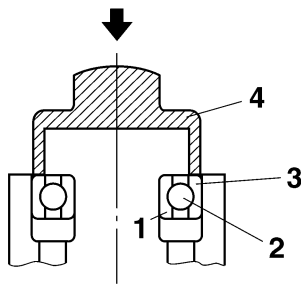
ECA18110

NOTICE

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

TIP

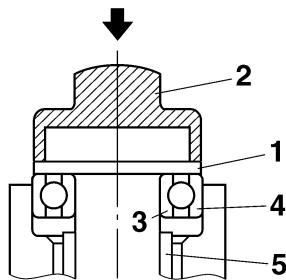
Use a socket "4" that matches the diameter of the wheel bearing outer race.



- b. Install the spacer.
- c. Install the new wheel bearing (left side).

TIP

Place a suitable washer "1" between the socket "2" and the bearing so that both the inner race "3" and outer race "4" are pressed at the same time, and then press the bearing until the inner race makes contact with the spacer "5".



EAS30152

ADJUSTING THE FRONT WHEEL STATIC BALANCE

TIP

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

1. Remove:
 - Balancing weight(s)
2. Find:
 - Front wheel's heavy spot
3. Adjust:
 - Front wheel static balance
4. Check:
 - Front wheel static balance

EAS30154

INSTALLING THE FRONT WHEEL (FRONT BRAKE DISC)

1. Install:
 - Front brake disc "1"
 - Front wheel sensor rotor "2"



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

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

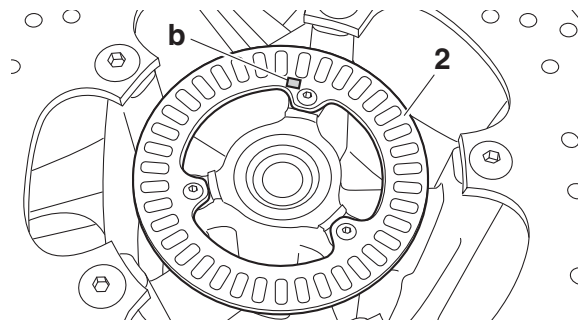
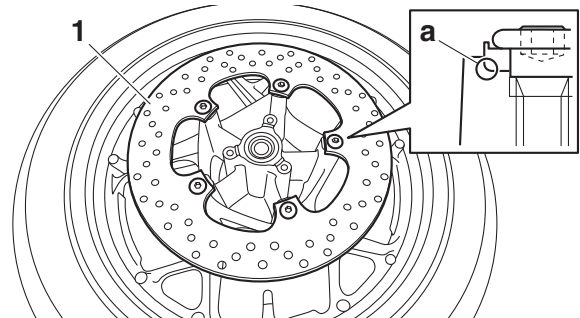
ECA21011

NOTICE

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

TIP

- Install the brake disc with its chamfered side "a" facing inward.
- Install the front wheel sensor rotor with the stamped mark "b" facing away from the wheel.
- Tighten the bolts in stages.



2. Check:
 - Front brake disc
 Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-44.
3. Lubricate:
 - Front wheel axle
 - Front wheel axle nut



Recommended lubricant
 Lithium-soap-based grease

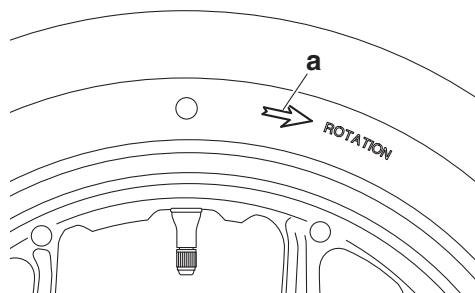
FRONT WHEEL

4. Install:

- Front wheel
- Collars
- Front wheel axle
- Front wheel axle nut

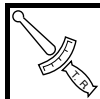
TIP

Install the front wheel with the mark “a” on the front tire pointing in the direction of wheel rotation.



5. Tighten:

- Front wheel axle nut



Front wheel axle nut
52 N·m (5.2 kgf·m, 38 lb·ft)

ECA14140

NOTICE

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

6. Install:

- Front wheel sensor



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

ECA21020

NOTICE

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

TIP

- When installing the front wheel sensor, check the wheel sensor lead for twists.
- To route the front wheel sensor lead, refer to “CABLE ROUTING” on page 2-13.

7. Measure:

- Distance “a”

(between the front wheel sensor rotor “1” and front wheel sensor “2”)

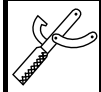
Out of specification → Check the wheel bearing for looseness, and the front wheel sensor and sensor rotor installation conditions (warpage caused by overtorque, wrong installation direction, rotor decentering, LOC-TITE® on the mounting surface of the rotor, deformation caused by an impact during service and caught foreign materials). If there is any defective part, repair or replace the defective part.



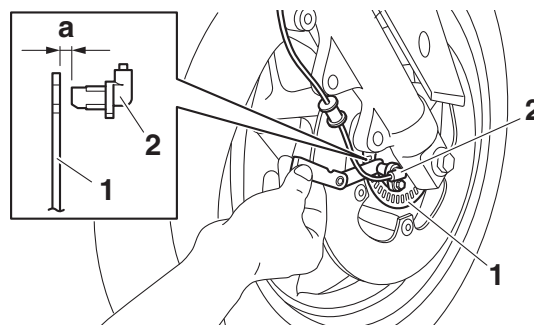
Distance “a” (between the front wheel sensor rotor and front wheel sensor)
0.83–1.55 mm (0.033–0.061 in)

TIP

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



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



8. Install:

- Front brake caliper
- Front brake hose/lead guide



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

EWA13500

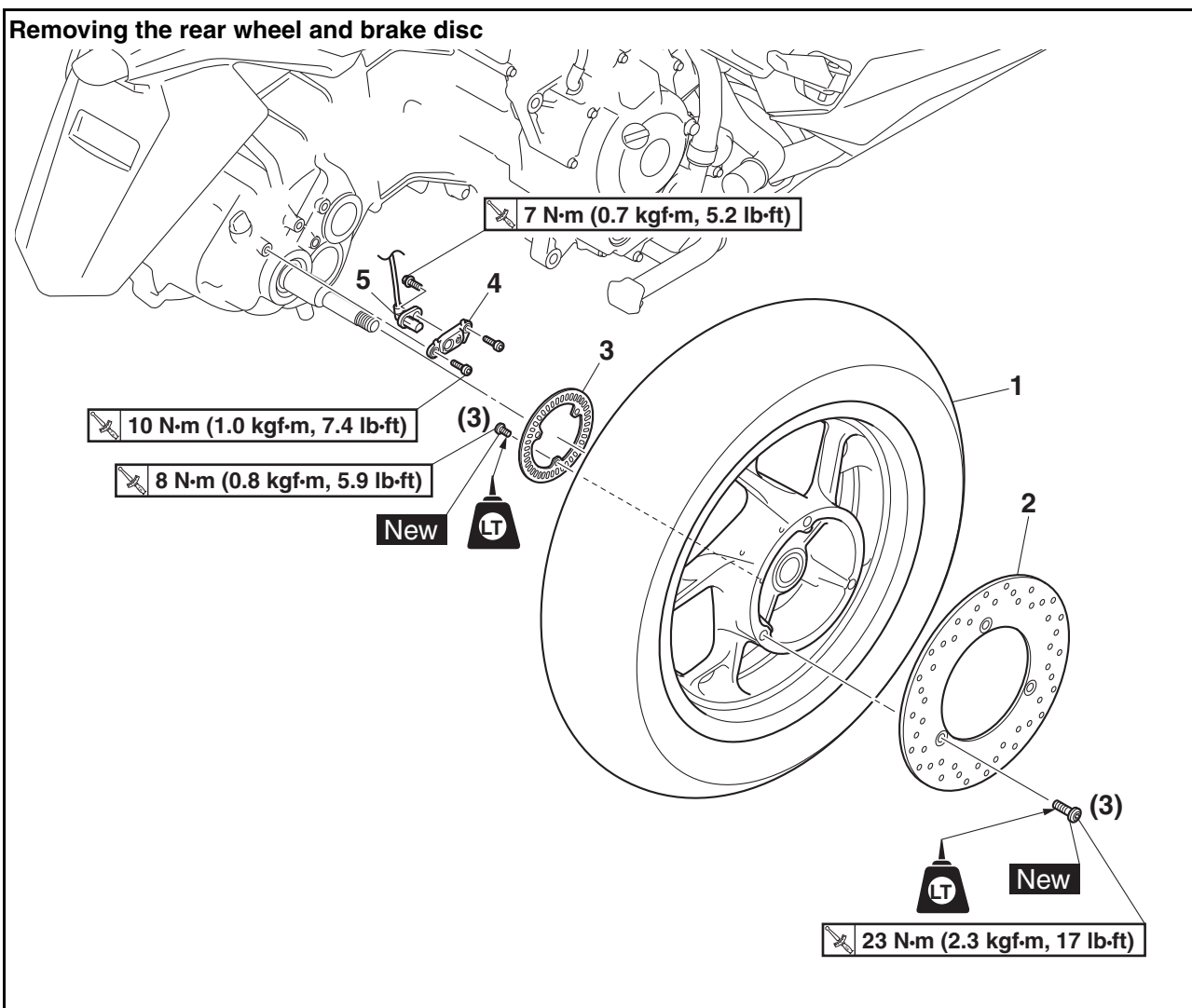


Make sure the brake hose is routed properly.

EAS20029

REAR WHEEL

Removing the rear wheel and brake disc



Order	Job/Parts to remove	Q'ty	Remarks
	Muffler		Refer to "ENGINE REMOVAL" on page 5-7.
	Swingarm assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" on page 4-91.
1	Rear wheel	1	
2	Rear brake disc	1	
3	Rear wheel sensor rotor	1	
4	Rear wheel sensor bracket	1	
5	Rear wheel sensor	1	

EAS30156

REMOVING THE REAR WHEEL (DISC)

ECA21030

NOTICE

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

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

EAS30159

CHECKING THE REAR WHEEL

1. Check:

- Tire
- Rear wheel

Damage/wear → Replace.

Refer to "CHECKING THE TIRES" on page 3-14 and "CHECKING THE WHEELS" on page 3-13.

2. Measure:

- Radial wheel runout
- Lateral wheel runout

Refer to "CHECKING THE FRONT WHEEL" on page 4-29.



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

EAS30167

MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR

ECA21060

NOTICE

- Handle the ABS components with care since they have been accurately adjusted. Keep them away from dirt and do not subject them to shocks.

- The rear wheel sensor cannot be disassembled. Do not attempt to disassemble it. If faulty, replace with a new one.
- Keep any type of magnets (including magnetic pick-up tools, magnetic screwdrivers, etc.) away from the rear wheel sensor or rear wheel sensor rotor.
- Do not drop or shock the wheel sensor or the wheel sensor rotor.

1. Check:

- Rear wheel sensor

Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.

2. Check:

- Rear wheel sensor rotor

Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.

EAS30164

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 installed.

1. Adjust:

- Rear wheel static balance

Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-31.

EAS32332

INSTALLING THE REAR WHEEL SENSOR

1. Install:

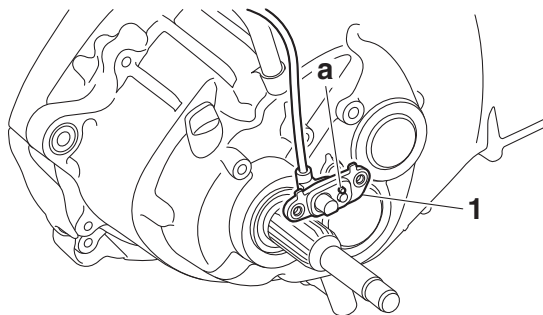
- Rear wheel sensor
(to rear wheel sensor bracket)
- Rear wheel sensor bracket "1"



Rear wheel sensor bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)
Rear wheel sensor bracket bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

Face the projection "a" on the rear wheel sensor bracket outward.



EAS30165

INSTALLING THE REAR WHEEL (REAR BRAKE DISC)

1. Install:

- Rear wheel sensor rotor “1”
- Rear brake disc “2”



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

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

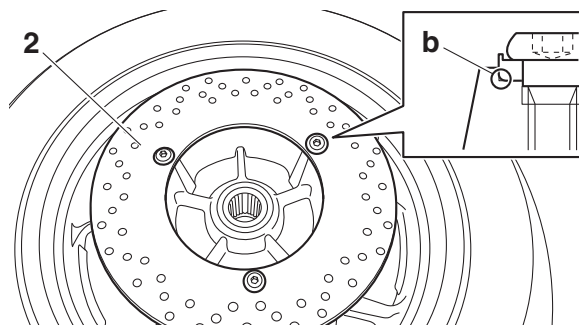
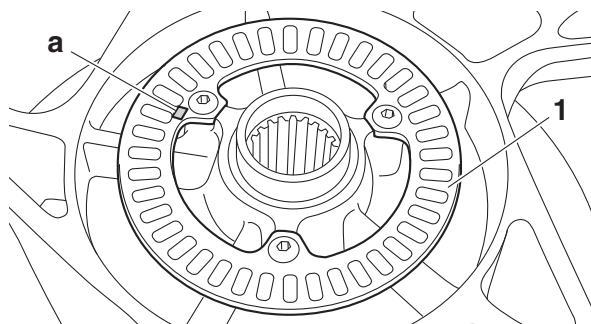
ECA21011

NOTICE

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

TIP

- Install the rear wheel sensor rotor with the stamped mark “a” facing away from the wheel.
- Install the brake disc with its chamfered side “b” facing inward.



2. Check:

- Rear brake disc
Refer to “CHECKING THE REAR BRAKE DISC” on page 4-57.

3. Install:

- Swingarm assembly
Refer to “REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM” on page 4-91.

4. Measure:

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



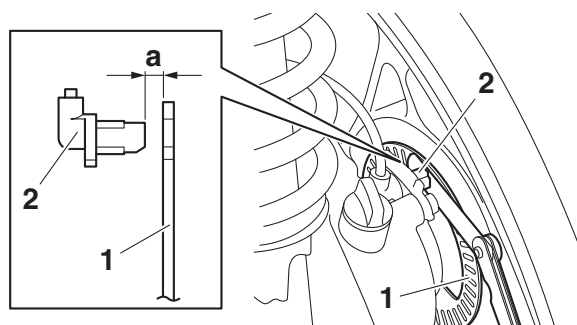
Distance “a” (between the rear wheel sensor rotor and rear wheel sensor)
1.03–1.97 mm (0.04–0.08 in)

TIP

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



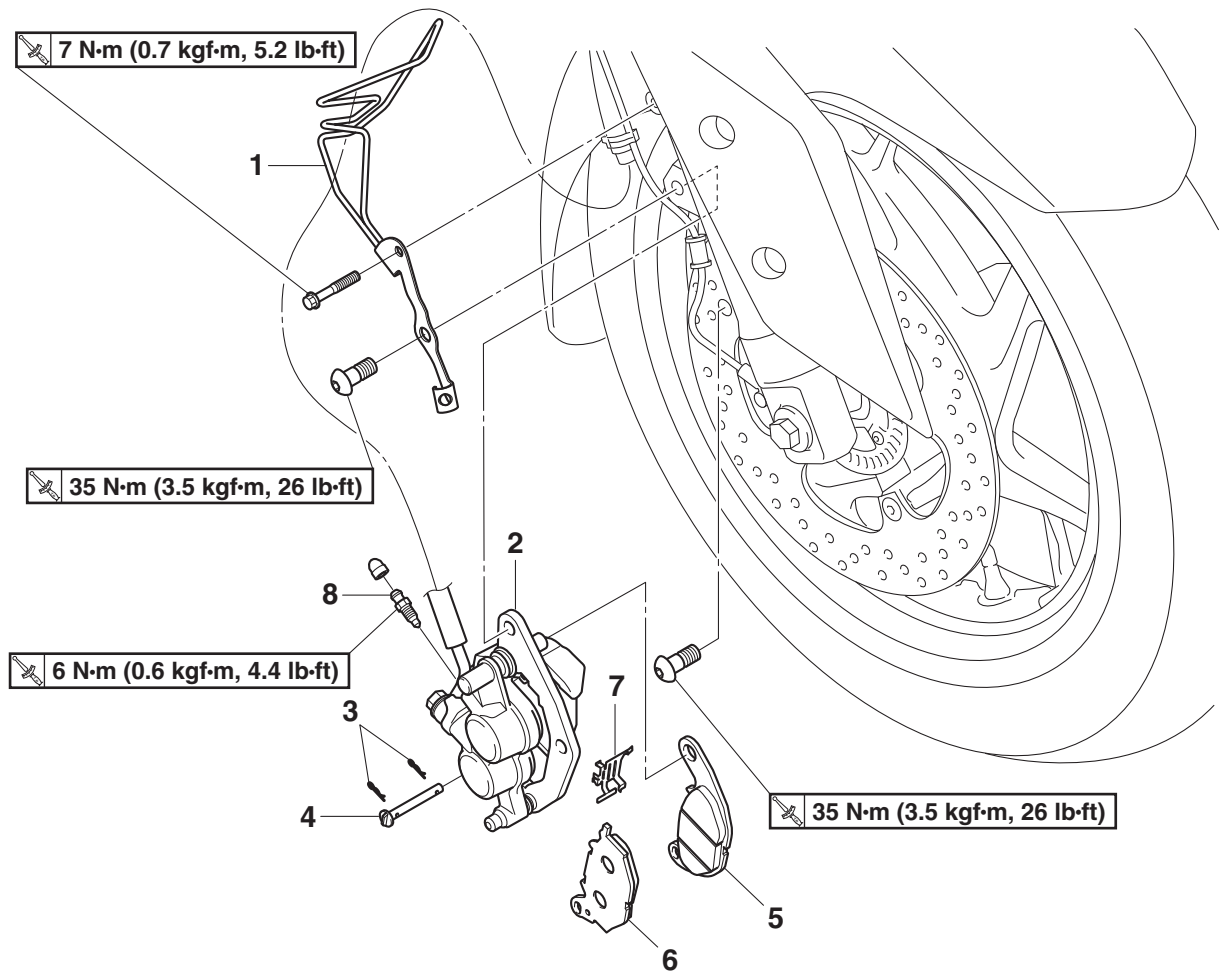
Thickness gauge
90890-03180
Feeler gauge set
YU-26900-9



EAS20030

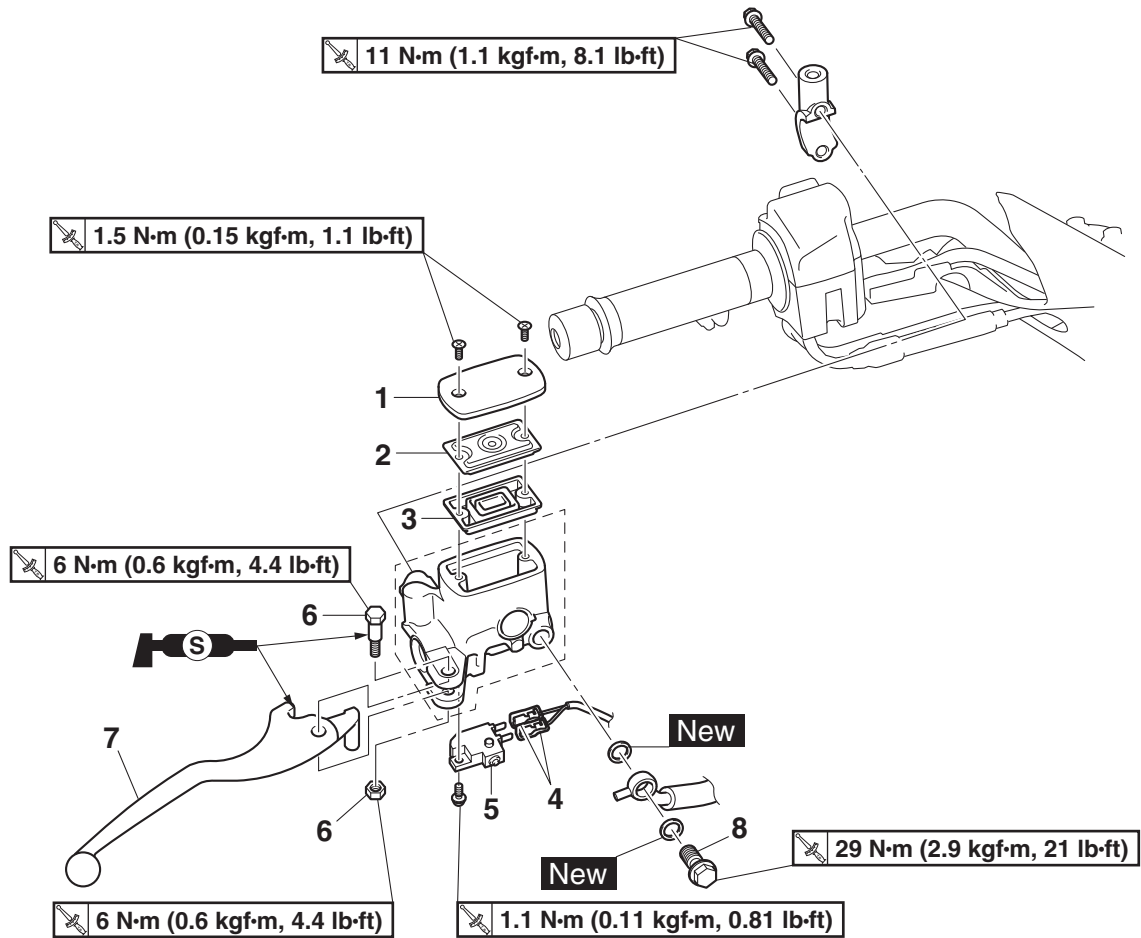
FRONT BRAKE

Removing the front brake pads



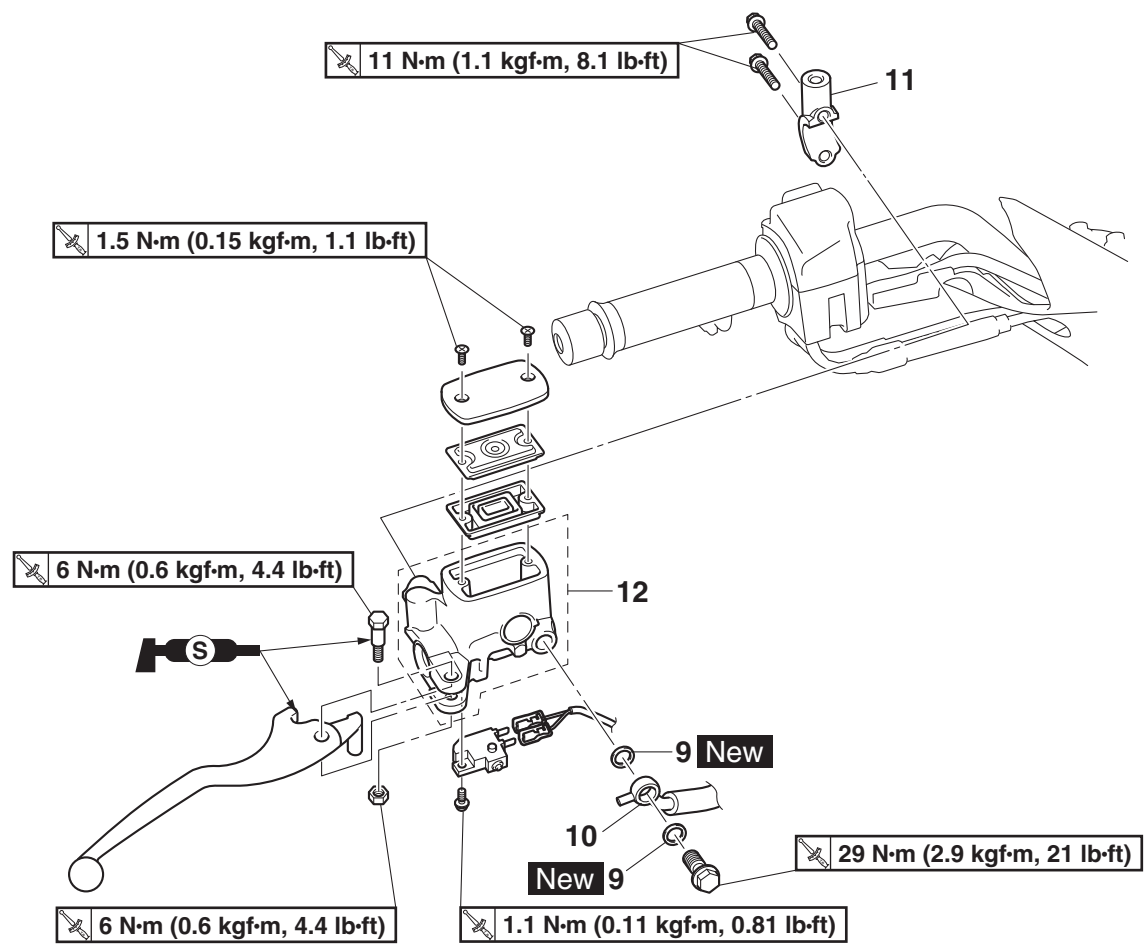
Order	Job/Parts to remove	Q'ty	Remarks
1	Front brake hose/lead guide	1	
2	Front brake caliper	1	
3	Brake pad clip	2	
4	Brake pad pin	1	
5	Brake pad (inner)	1	
6	Brake pad (outer)	1	
7	Brake pad spring	1	
8	Brake caliper bleed screw	1	Loosen.

Removing the front brake master cylinder



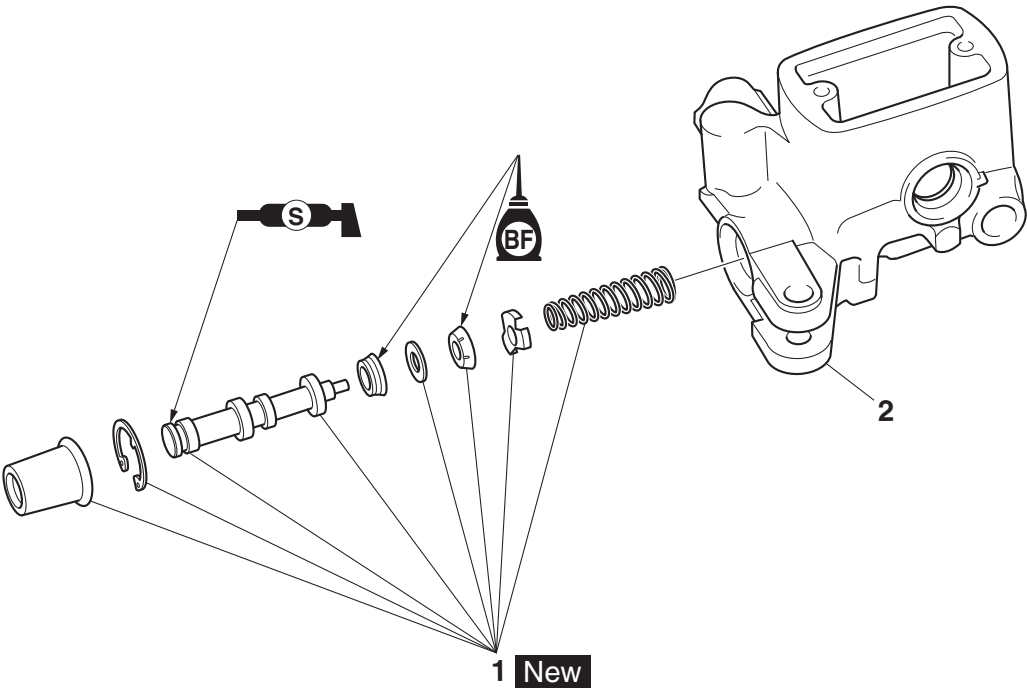
Order	Job/Parts to remove	Q'ty	Remarks
	Upper handlebar cover		Refer to "HANDLEBAR" on page 4-71.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-12.
1	Brake master cylinder reservoir cap	1	
2	Brake master cylinder reservoir diaphragm holder	1	
3	Brake master cylinder reservoir diaphragm	1	
4	Front brake light switch connector	2	Disconnect.
5	Front brake light switch	1	
6	Front brake lever pivot bolt/nut	1/1	
7	Front brake lever	1	
8	Front brake hose union bolt (master cylinder side)	1	

Removing the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
9	Brake hose gasket	2	
10	Front brake hose (front brake master cylinder to hydraulic unit)	1	Disconnect.
11	Front brake master cylinder holder	1	
12	Front brake master cylinder assembly	1	

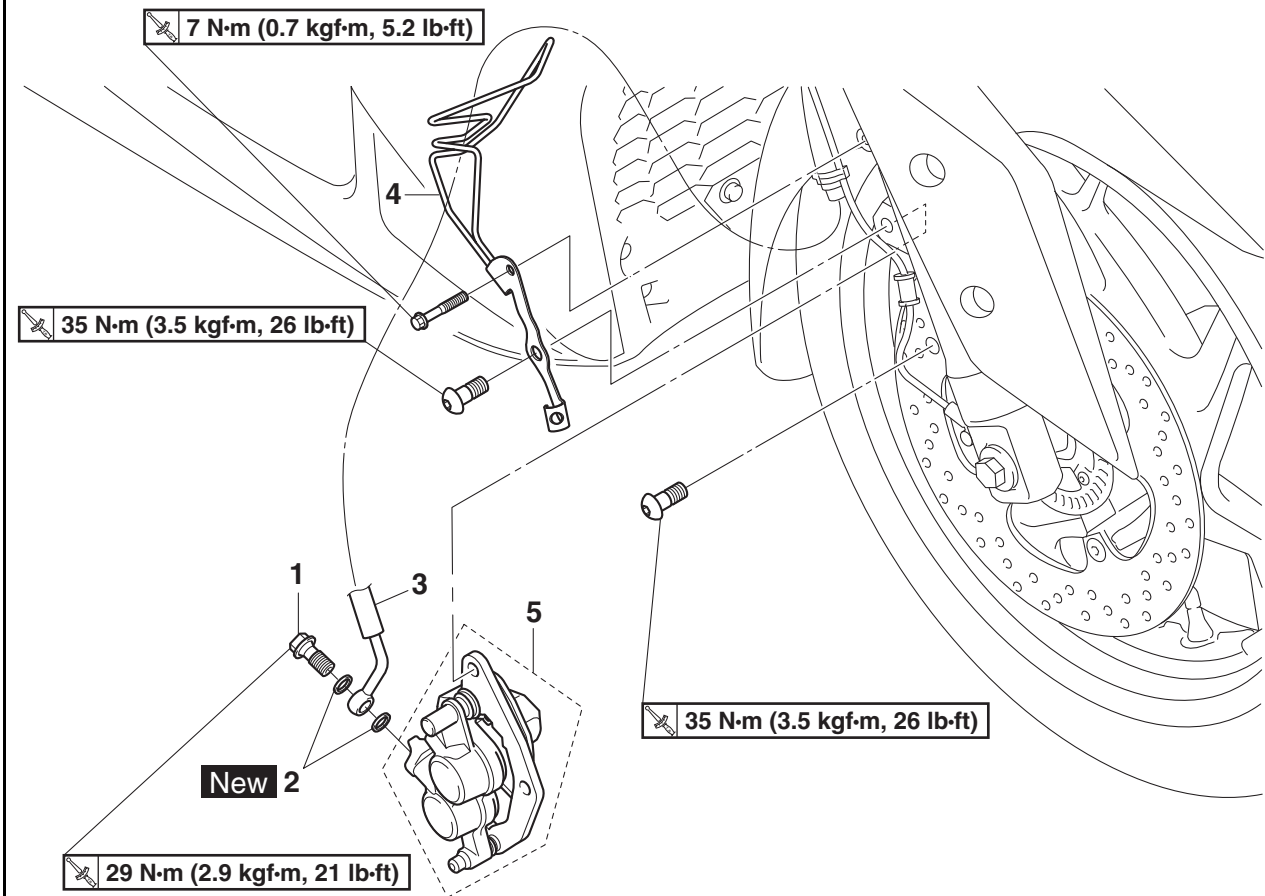
Disassembling the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Brake master cylinder body	1	

FRONT BRAKE

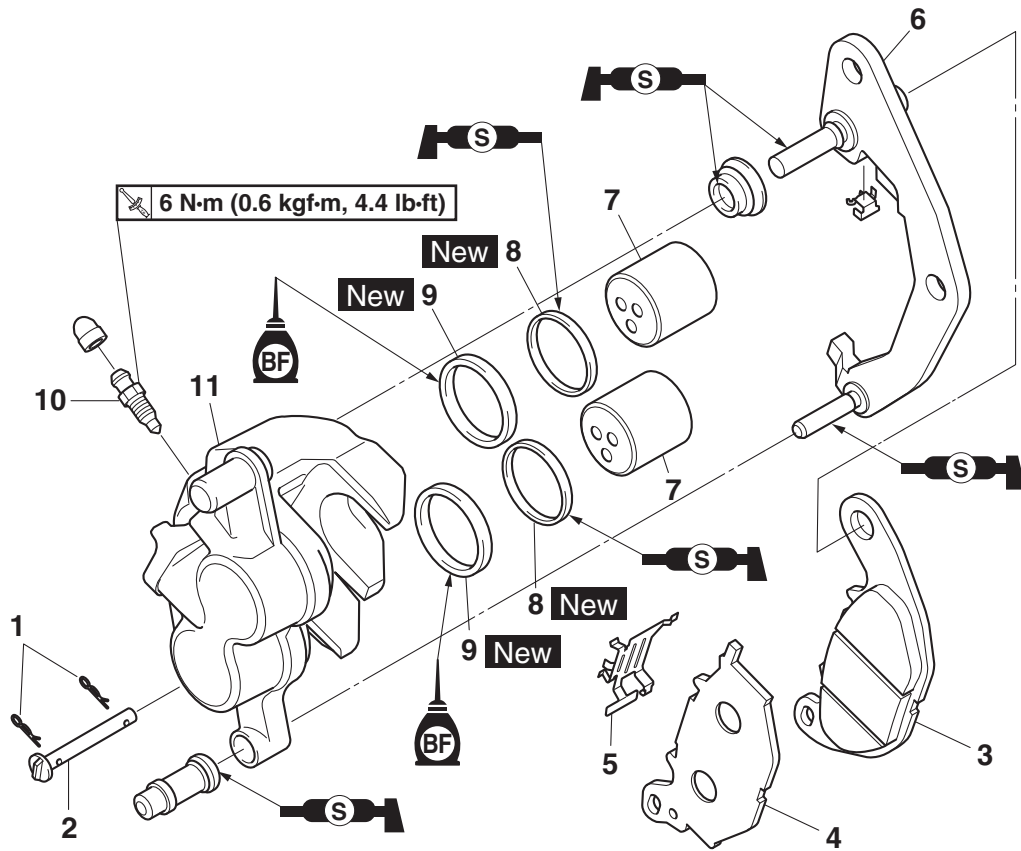
Removing the front brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-12.
1	Front brake hose union bolt (brake caliper side)	1	
2	Brake hose gasket	2	
3	Front brake hose (hydraulic unit to front brake caliper)	1	Disconnect.
4	Front brake hose/lead guide	1	
5	Front brake caliper	1	

FRONT BRAKE

Disassembling the front brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad (inner)	1	
4	Brake pad (outer)	1	
5	Brake pad spring	1	
6	Front brake caliper bracket	1	
7	Brake caliper piston	2	
8	Brake caliper piston dust seal	2	
9	Brake caliper piston seal	2	
10	Brake caliper bleed screw	1	
11	Brake caliper body	1	

EAS30168

INTRODUCTION

EWA14101

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.

EAS30169

CHECKING THE FRONT BRAKE DISC

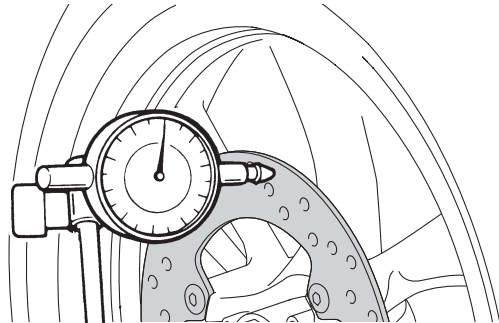
1. Remove:
 - Front wheel
Refer to "FRONT WHEEL" on page 4-27.
2. Check:
 - Brake disc
Damage/galling → Replace.
3. Measure:
 - Brake disc runout
Out of specification → Correct the brake disc runout or replace the brake disc.



Brake disc runout limit (as measured on wheel)
0.15 mm (0.0059 in)

- a. Place the vehicle on a suitable stand so that the front wheel is elevated.
- b. Before measuring the front brake disc runout, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- c. Remove the brake caliper.
- d. Hold the dial gauge at a right angle against the brake disc surface.

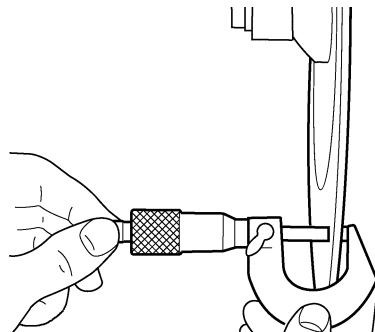
- e. Measure the runout 1.5 mm (0.06 in) below the edge of the brake disc.



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



Brake disc thickness limit
4.0 mm (0.16 in)



5. Adjust:
 - Brake disc runout
 - a. Remove the brake disc.
 - b. Rotate the brake disc by one bolt hole.
 - c. Install the brake disc.



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

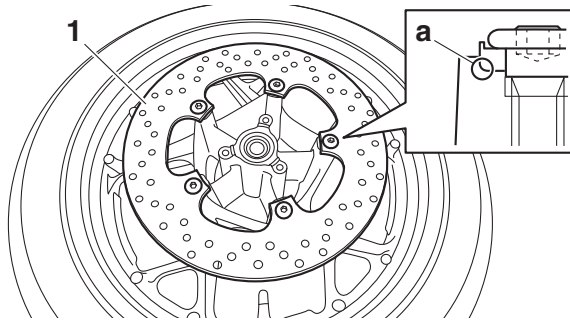
ECA19150

NOTICE

Replace the brake disc bolts with new ones.

TIP

- Install the brake disc "1" with its chamfered side "a" facing inward.
- Tighten the brake disc bolts in stages.



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

6. Install:

- Front wheel

Refer to "FRONT WHEEL" on page 4-27.

EAS30170

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
5.3 mm (0.21 in)
Limit
0.8 mm (0.03 in)

A

a

B

a

- A. Inner
- B. Outer

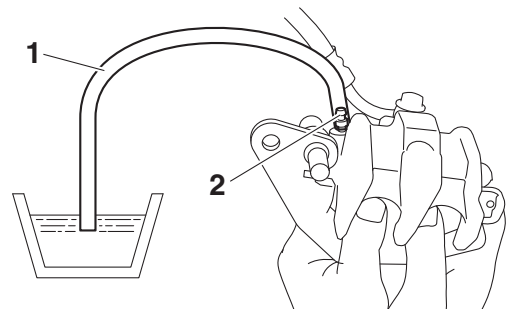
2. Install:

- Brake pad spring
- Brake pads

TIP

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

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



- c. Tighten the bleed screw.

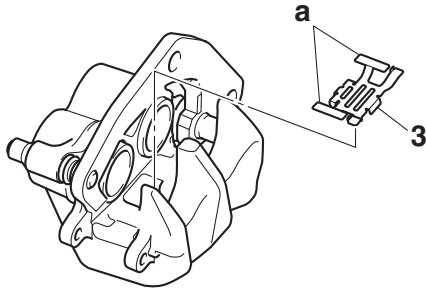


Brake caliper bleed screw
6 N·m (0.6 kgf·m, 4.4 lb·ft)

- d. Install new brake pad spring "3" and new brake pads.

TIP

The longer tangs “a” of the brake pad spring must point in the direction of the brake caliper piston.



3. Install:

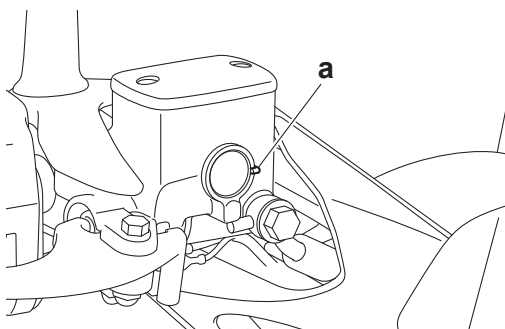
- Brake pad pin
- Brake pad clips
- Front brake caliper
- Front brake hose/lead guide
- Front brake caliper bolts
- Front brake hose/lead guide bolt



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

4. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-11.



5. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.

EAS31328

REMOVING THE FRONT BRAKE CALIPER

TIP

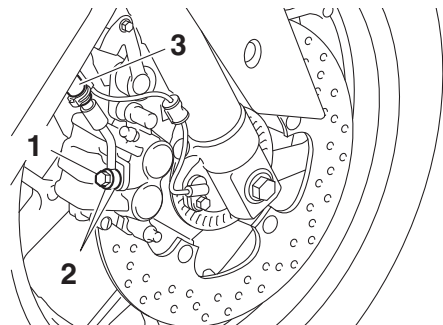
Before removing the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:

- Front brake hose union bolt “1”
- Brake hose gaskets “2”
- Front brake hose “3”

TIP

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

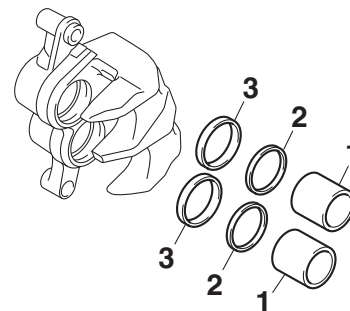


EAS30172

DISASSEMBLING THE FRONT BRAKE CALIPER

1. Remove:

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



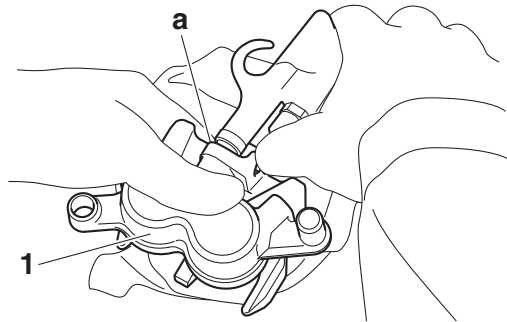
- Blow compressed air into the brake hose joint opening “a” to force out the pistons from the brake caliper “1”.

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 seals and brake caliper piston seals.

EAS30173

CHECKING THE FRONT BRAKE CALIPER

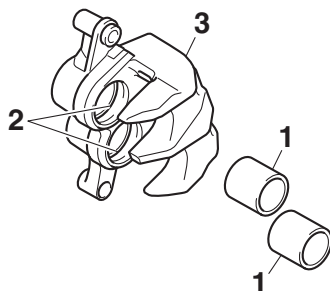
Recommended brake component replacement schedule	
Brake pads	If necessary
Piston seals	Every two years
Piston dust seals	Every two years
Brake hose	Every four years
Brake fluid	Every two years and whenever the brake is disassembled

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

EWA17070

WARNING

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



2. Check:

- Brake caliper bracket
Cracks/damage → Replace.

EAS30174

ASSEMBLING THE FRONT BRAKE CALIPER

EWA13621

WARNING

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

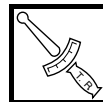


**Specified brake fluid
DOT 4**

EAS30934

INSTALLING THE FRONT BRAKE CALIPER

1. Install:
- Front brake caliper "1"
(temporarily)
 - Front brake hose/lead guide "2"
 - Brake hose gaskets "3" **New**
 - Front brake hose "4"
 - Front brake hose union bolt "5"



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

EWA13531

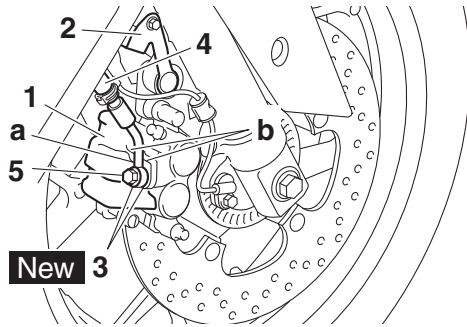
WARNING

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

ECA19080

NOTICE

When installing the brake hose onto the brake caliper "1", make sure the brake pipe "a" passes between the projections "b" on the brake caliper.



2. Remove:
 - Front brake caliper
3. Install:
 - Brake pad spring
 - Brake pads
 - Brake pad pin
 - Brake pad clips
 - Front brake caliper
 - Front brake hose/lead guide
 - Front brake caliper bolts
 - Front brake hose/lead guide bolt



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

Refer to “REPLACING THE FRONT BRAKE PADS” on page 4-45.

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



Specified brake fluid
 DOT 4

EWA13540

⚠ WARNING

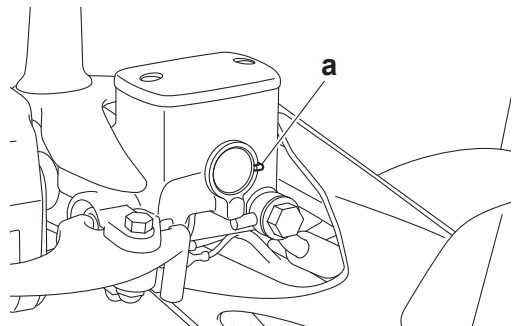
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

5. Bleed:
 - Brake system
 Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.
6. Check:
 - Brake fluid level
 Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
 Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.



7. Check:
 - Brake lever operation
 Soft or spongy feeling → Bleed the brake system.
 Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.

EAS30179

REMOVING THE FRONT BRAKE MASTER CYLINDER

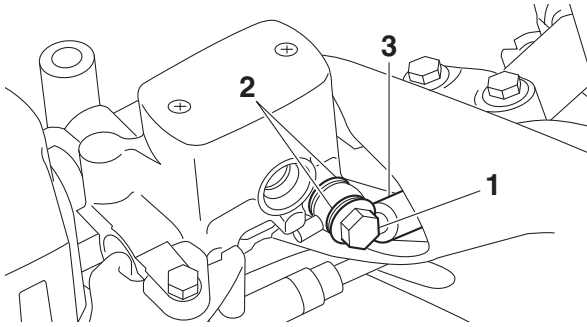
TIP

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

1. Remove:
 - Front brake hose union bolt “1”
 - Brake hose gaskets “2”
 - Front brake hose “3”

TIP

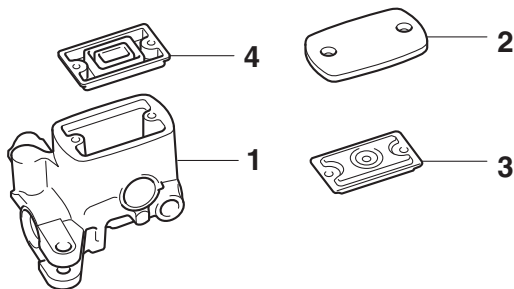
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.



EAS30725

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 “1”
 - Brake master cylinder reservoir cap “2”
 - Brake master cylinder reservoir diaphragm holder “3”
 - Brake master cylinder reservoir diaphragm “4”
Damage/wear → Replace.



4. Check:
 - Front brake hose
Cracks/damage/wear → Replace.

EAS30181

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.

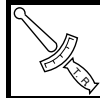


Specified brake fluid
DOT 4

EAS30182

INSTALLING THE FRONT BRAKE MASTER CYLINDER

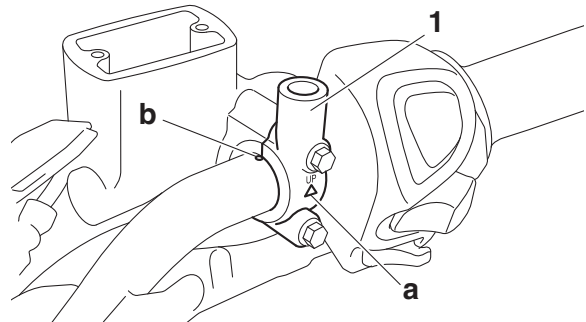
1. Install:
 - Front brake master cylinder assembly
 - Front brake master cylinder holder “1”



Front brake master cylinder holder bolt
11 N·m (1.1 kgf·m, 8.1 lb·ft)

TIP

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



2. Install:
 - Brake hose gaskets “1” **New**
 - Front brake hose “2”
 - Front brake hose union bolt “3”



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

EWA13531

⚠ WARNING

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

ECA14160

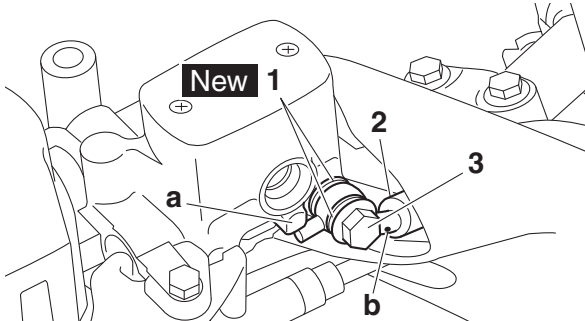
NOTICE

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

TIP

- Install the brake pipe so that paint mark “b” on the pipe faces to the front of the vehicle.

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



3. Fill:

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



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

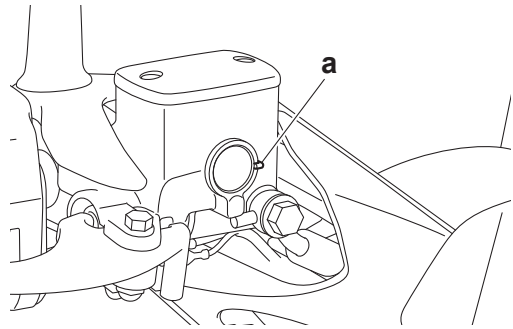
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.

5. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-11.



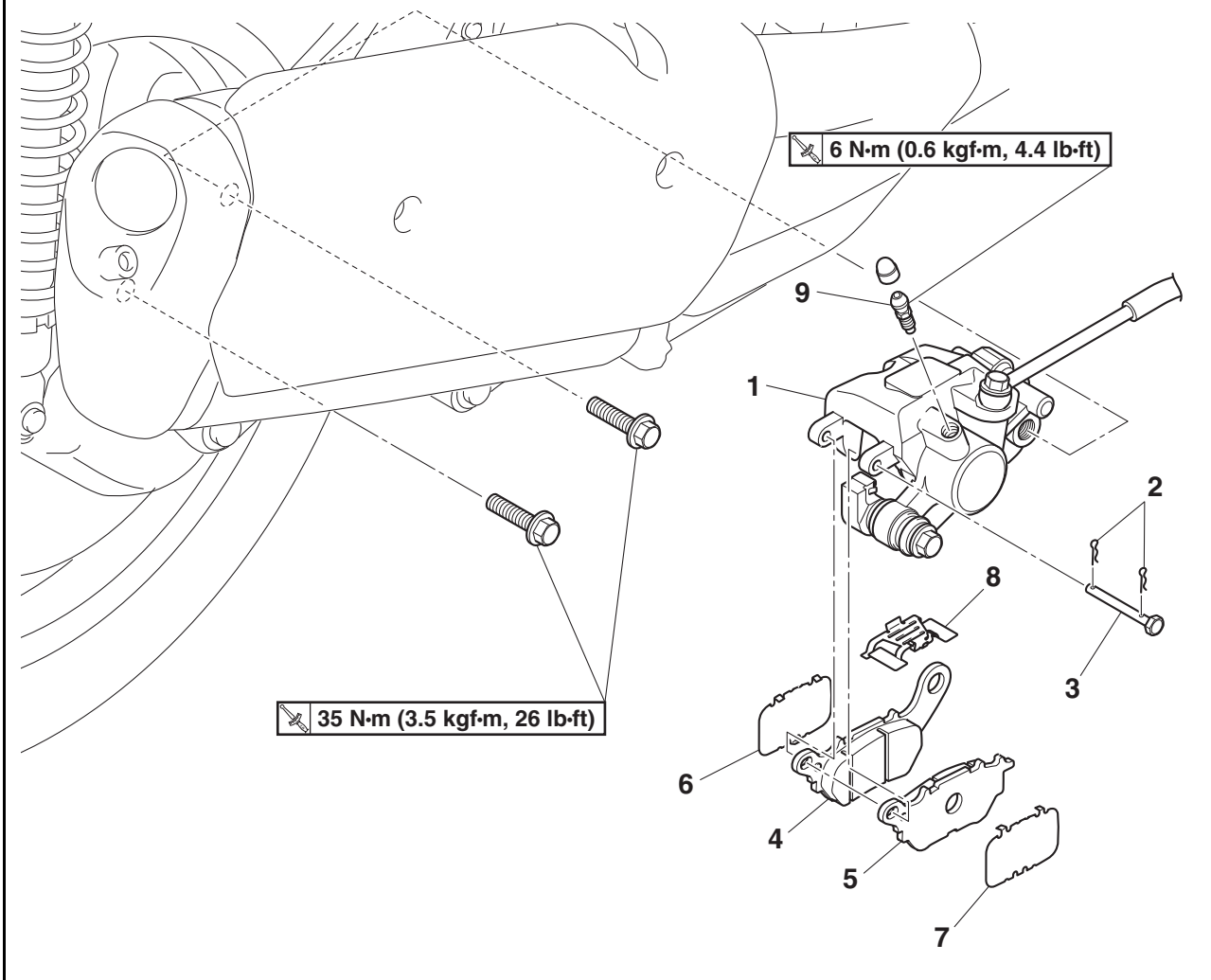
6. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.

EAS20031

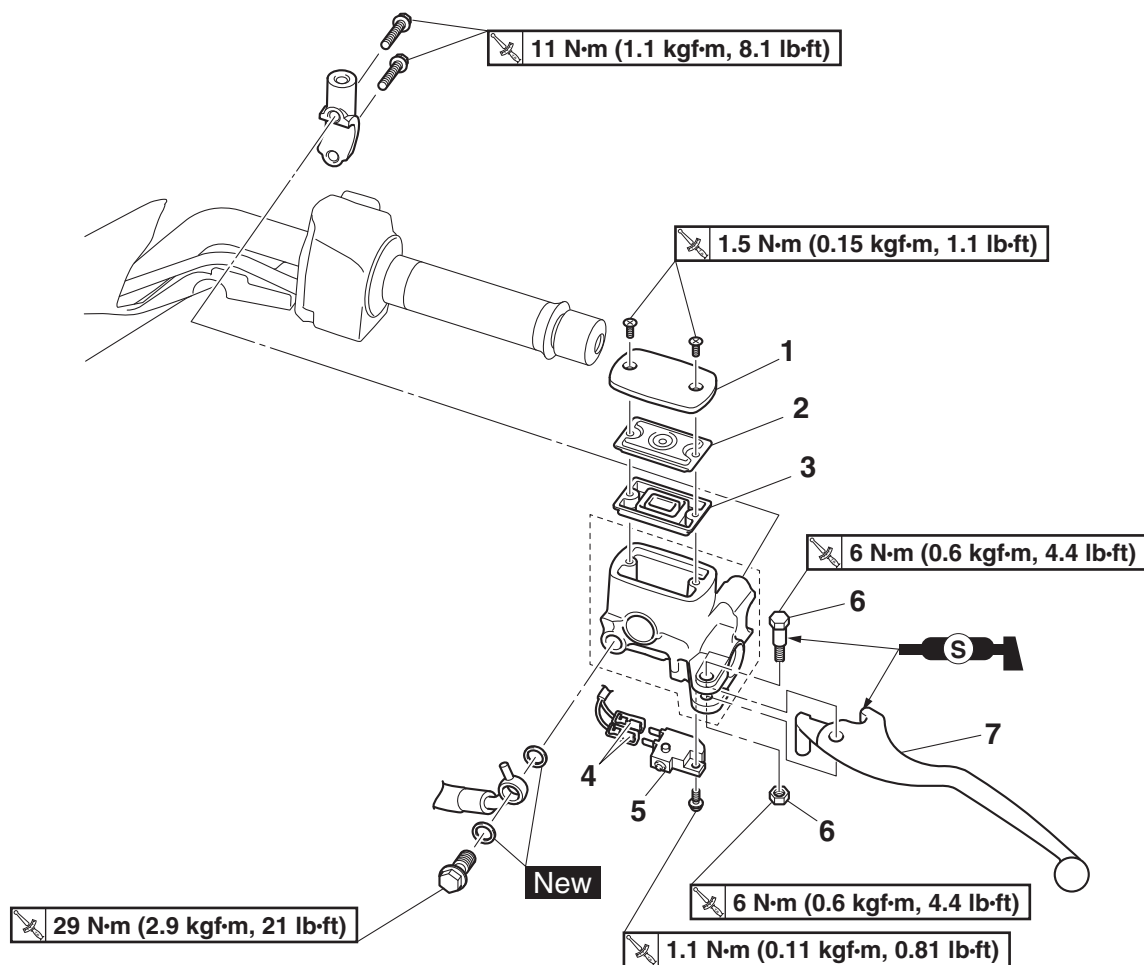
REAR BRAKE

Removing the rear brake pads



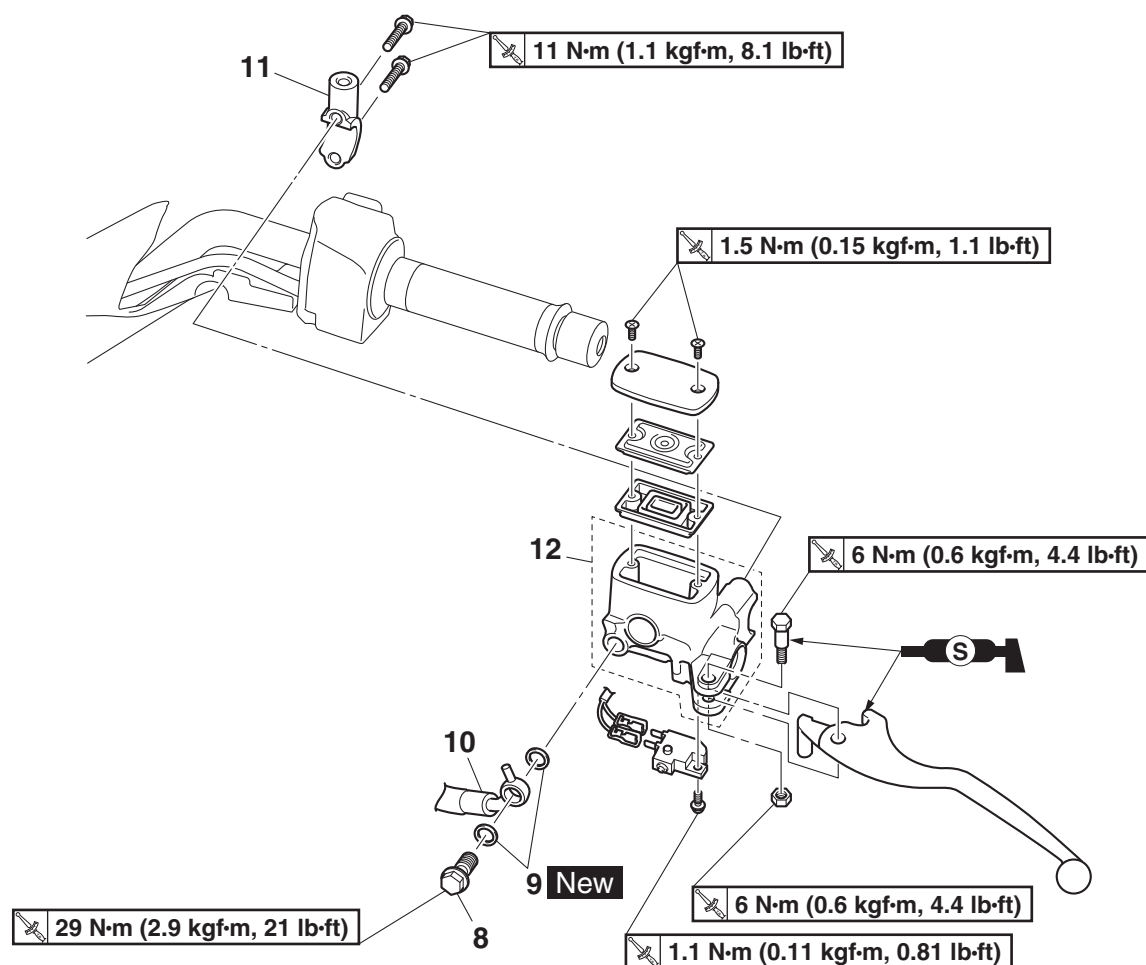
Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake caliper	1	
2	Brake pad clip	2	
3	Brake pad pin	1	
4	Brake pad (inner)	1	
5	Brake pad (outer)	1	
6	Brake pad shim (inner)	1	
7	Brake pad shim (outer)	1	
8	Brake pad spring	1	
9	Brake caliper bleed screw	1	Loosen.

Removing the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Upper handlebar cover		Refer to "HANDLEBAR" on page 4-71.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-12.
1	Brake master cylinder reservoir cap	1	
2	Brake master cylinder reservoir diaphragm holder	1	
3	Brake master cylinder reservoir diaphragm	1	
4	Rear brake light switch connector	2	Disconnect.
5	Rear brake light switch	1	
6	Rear brake lever pivot bolt/nut	1/1	
7	Rear brake lever	1	

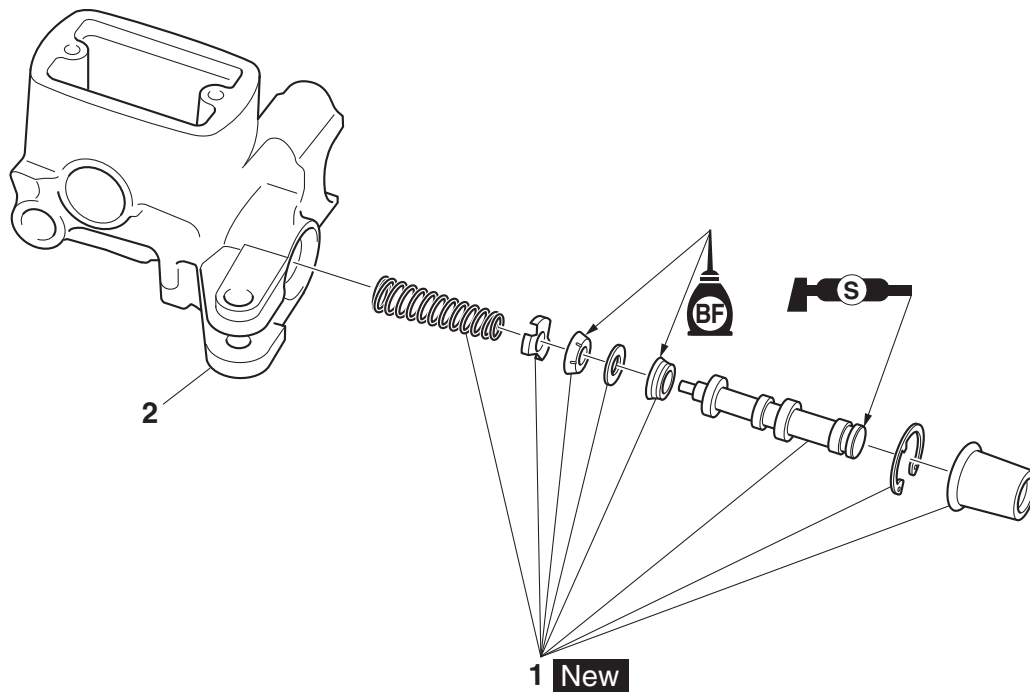
Removing the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
8	Rear brake hose union bolt (master cylinder side)	1	
9	Brake hose gasket	2	
10	Rear brake hose (rear brake master cylinder to hydraulic unit)	1	Disconnect.
11	Rear brake master cylinder holder	1	
12	Rear brake master cylinder assembly	1	

REAR BRAKE

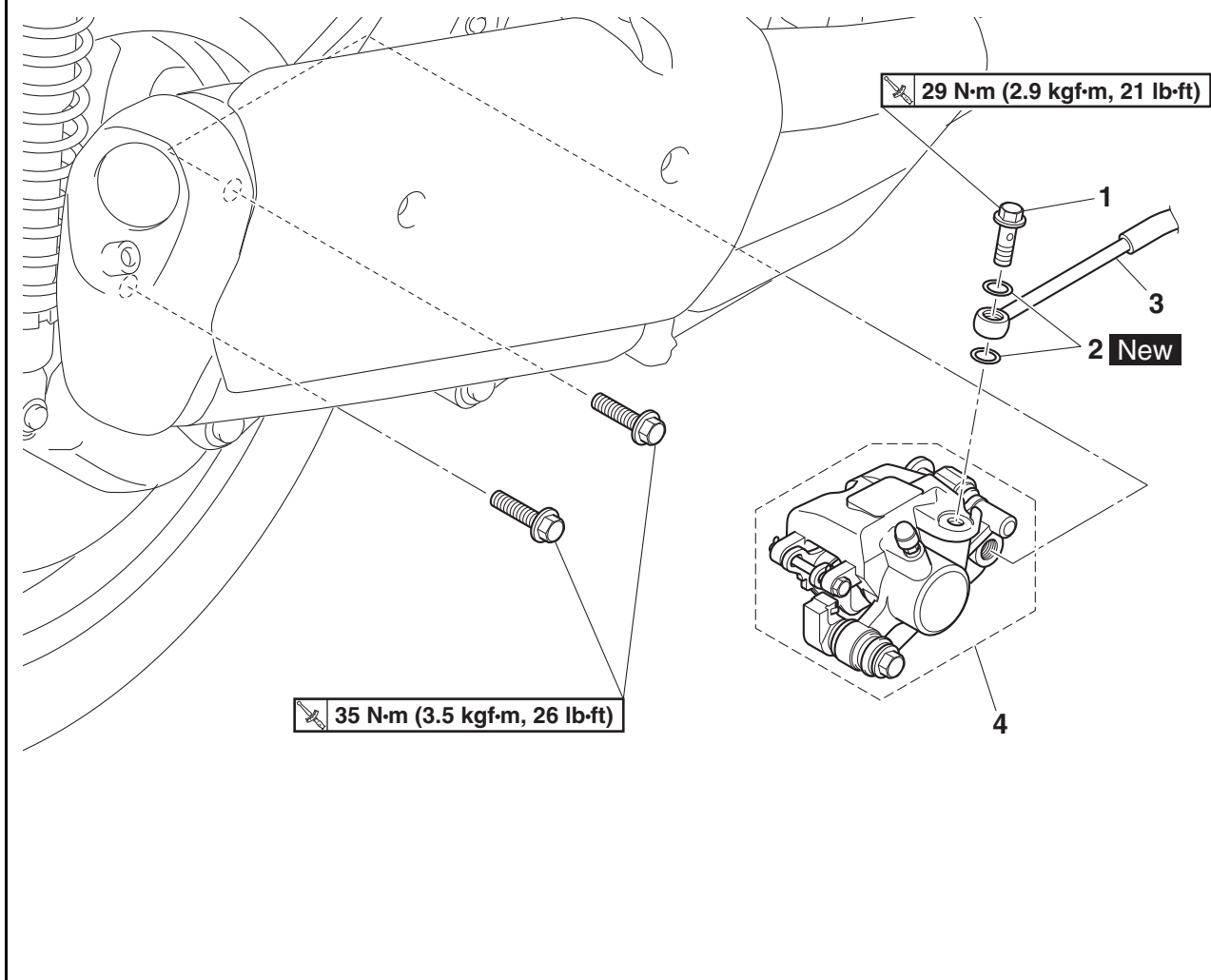
Disassembling the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Brake master cylinder body	1	

REAR BRAKE

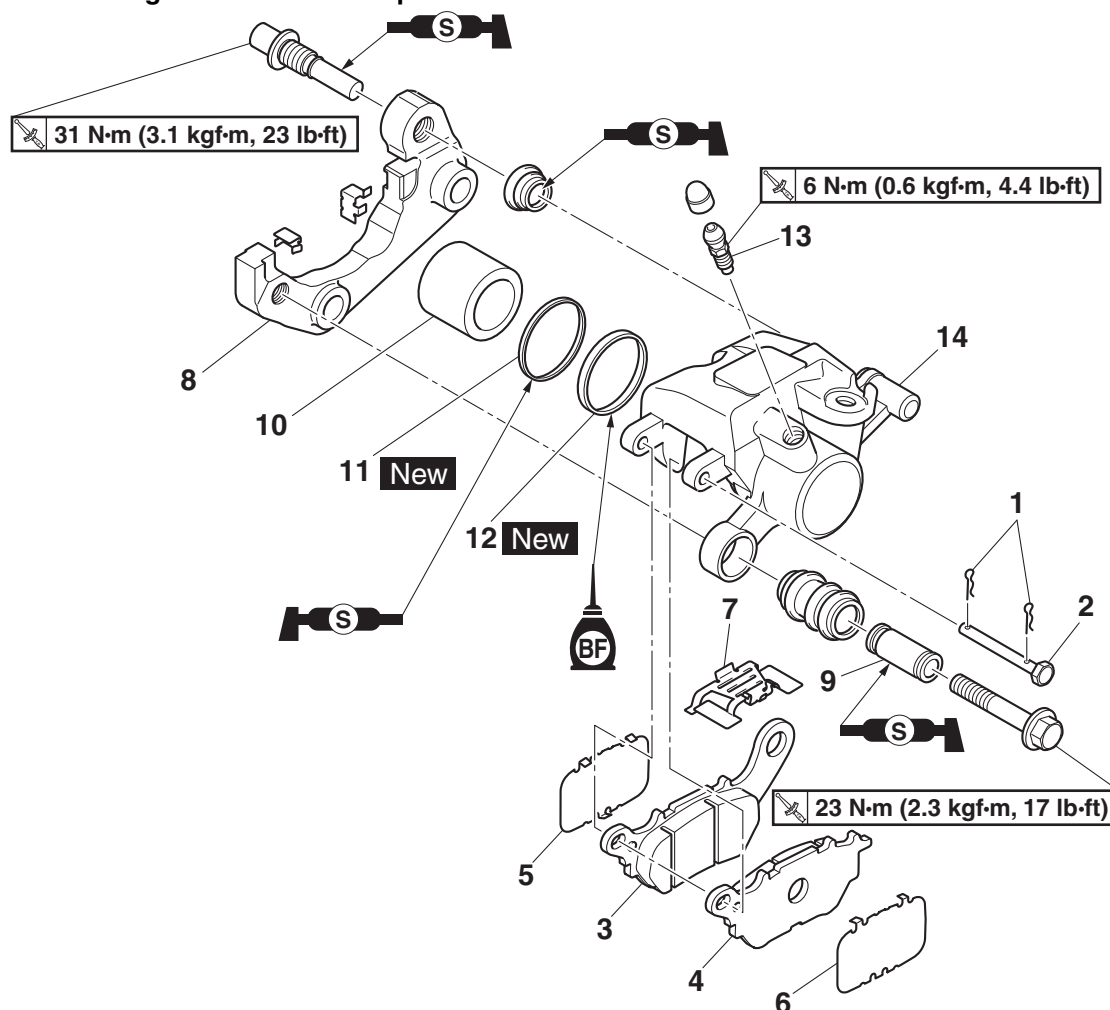
Removing the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-12.
1	Rear brake hose union bolt (brake caliper side)	1	
2	Brake hose gasket	2	
3	Rear brake hose (hydraulic unit to rear brake caliper)	1	Disconnect.
4	Rear brake caliper	1	

REAR BRAKE

Disassembling the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad (inner)	1	
4	Brake pad (outer)	1	
5	Brake pad shim (inner)	1	
6	Brake pad shim (outer)	1	
7	Brake pad spring	1	
8	Brake caliper bracket	1	
9	Collar	1	
10	Brake caliper piston	1	
11	Brake caliper piston dust seal	1	
12	Brake caliper piston seal	1	
13	Brake caliper bleed screw	1	
14	Brake caliper body	1	

EAS30183

INTRODUCTION

EWA14101

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.

EAS30184

CHECKING THE REAR BRAKE DISC

1. Remove:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-34.
2. Check:
 - Brake disc
Damage/galling → Replace.
3. Measure:
 - Brake disc runout
Out of specification → Correct the brake disc runout or replace the brake disc.
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-44.



Brake disc runout limit (as measured on wheel)
0.15 mm (0.0059 in)

4. Measure:
 - Brake disc thickness
Measure the brake disc thickness at a few different locations.
Out of specification → Replace.
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-44.

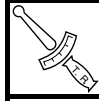


Brake disc thickness limit
4.5 mm (0.18 in)

5. Adjust:

- Brake disc runout

Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-44.



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

6. Install:

- Rear wheel

Refer to "REAR WHEEL" on page 4-34.

EAS30185

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:

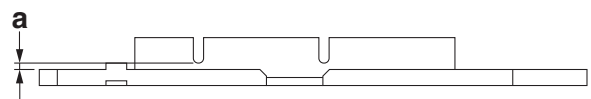
- Brake pad wear limit "a"

Out of specification → Replace the brake pads as a set.

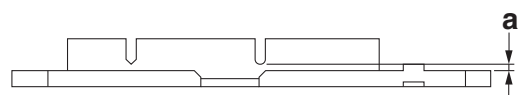


Brake pad lining thickness
6.7 mm (0.26 in)
Limit
0.8 mm (0.03 in)

A



B



A. Inner

B. Outer

REAR BRAKE

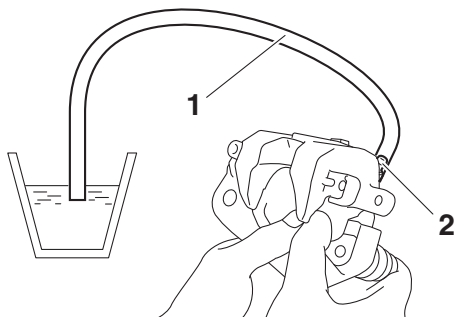
2. Install:

- Brake pad spring
- Brake pad shims
- Brake pads

TIP

Always install new brake pads, brake pad shims and brake pad spring 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 finger.



- Tighten the bleed screw.

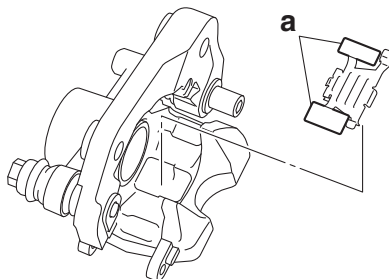


Brake caliper bleed screw
6 N·m (0.6 kgf·m, 4.4 lb·ft)

- Install the brake pad shims onto each brake pads.
- Install new brake pad spring and new brake pads.

TIP

The longer tangs "a" of the brake pad spring must point in the direction of the brake caliper position.



3. Install:

- Brake pad pin
- Brake pad clips
- Rear brake caliper
- Rear brake caliper bolts

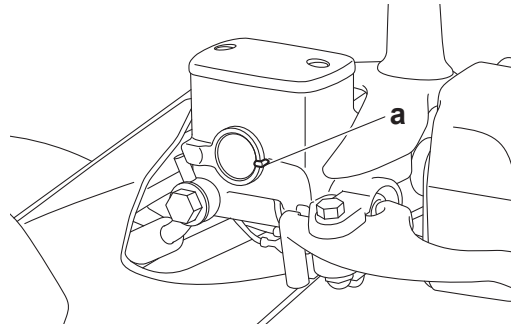


Rear brake caliper bolt
35 N·m (3.5 kgf·m, 26 lb·ft)

4. Check:

- Brake fluid level

Below the minimum level mark "a" → Add the specified brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-11.



5. Check:

- Brake lever operation

Soft or spongy feeling → Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-12.

EAS30186

REMOVING THE REAR BRAKE CALIPER

TIP

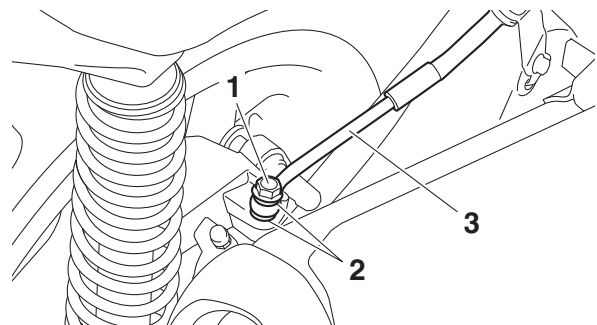
Before removing the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:

- Rear brake hose union bolt "1"
- Brake hose gaskets "2"
- Rear brake hose "3"

TIP

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

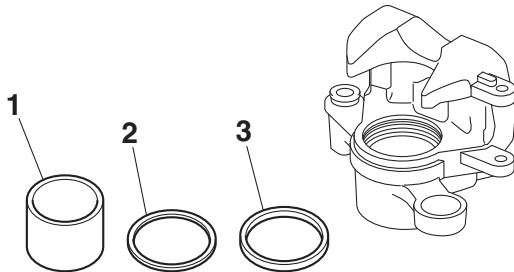


EAS30187

DISASSEMBLING THE REAR BRAKE CALIPER

1. Remove:

- Brake caliper piston “1”
- Brake caliper piston dust seal “2”
- Brake caliper piston seal “3”

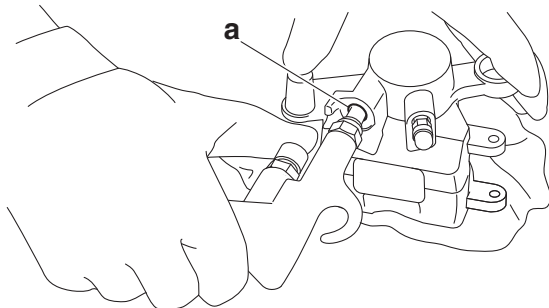


- a. Blow compressed air into the brake hose joint opening “a” to force out the piston from the brake caliper.

EWA13550

⚠ WARNING

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



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

EAS30188

CHECKING THE REAR BRAKE CALIPER

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

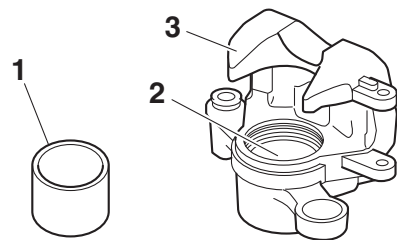
1. Check:

- 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.

EWA17070

⚠ WARNING

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



2. Check:

- Brake caliper bracket
Cracks/damage → Replace.

EAS30189

ASSEMBLING THE REAR BRAKE CALIPER

EWA17080

⚠ WARNING

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



REAR BRAKE

EAS30190

INSTALLING THE REAR BRAKE CALIPER

1. Install:

- Rear brake caliper “1” (temporarily)
- Brake hose gaskets “2” **New**
- Rear brake hose “3”
- Rear brake hose union bolt “4”



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

EWA13531

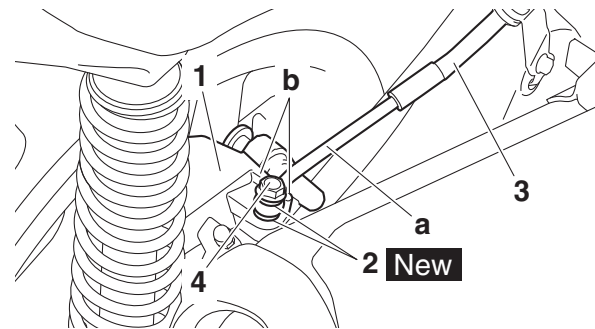
WARNING

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

ECA19080

NOTICE

When installing the brake hose onto the brake caliper “1”, make sure the brake pipe “a” passes between the projections “b” on the brake caliper.



2. Remove:

- Rear brake caliper

3. Install:

- Brake pad spring
- Brake pad shims
- Brake pads
- Brake pad pin
- Brake pad clips
- Rear brake caliper



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

Refer to “REPLACING THE REAR BRAKE PADS” on page 4-57.

4. Fill:

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



Specified brake 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

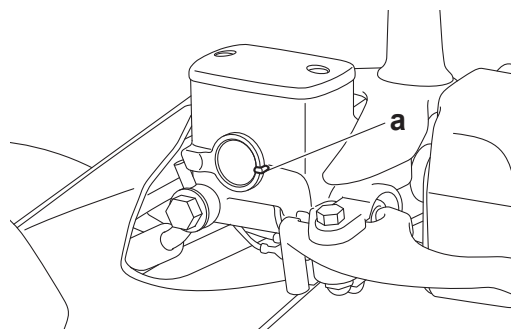
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.

6. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-11.



7. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.

EAS30193

REMOVING THE REAR BRAKE MASTER CYLINDER

TIP

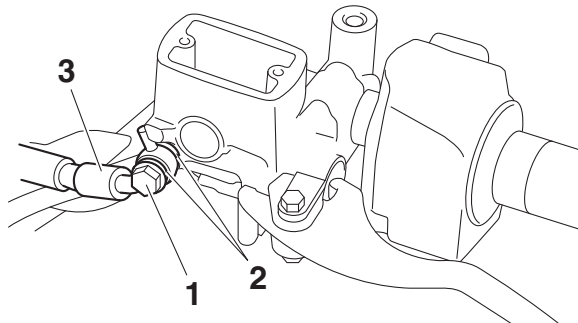
Before removing the rear brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:

- Rear brake hose union bolt "1"
- Brake hose gaskets "2"
- Brake hose "3"

TIP

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



EAS30194

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:

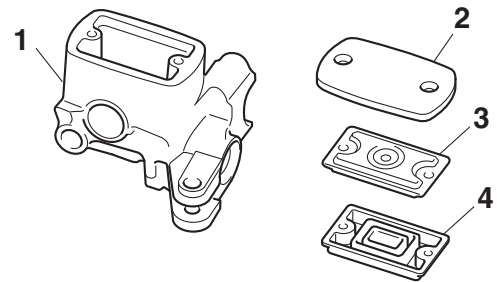
- Brake master cylinder kit
Damage/scratches/wear → Replace.

3. Check:

- Brake master cylinder reservoir "1"
 - Brake master cylinder reservoir cap "2"
 - Brake master cylinder reservoir diaphragm holder "3"
 - Brake master cylinder reservoir diaphragm "4"
- Damage/wear → Replace.

4. Check:

- Brake hose
Cracks/damage/wear → Replace.



EAS30195

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.



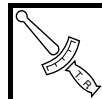
**Specified brake fluid
DOT 4**

EAS30196

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:

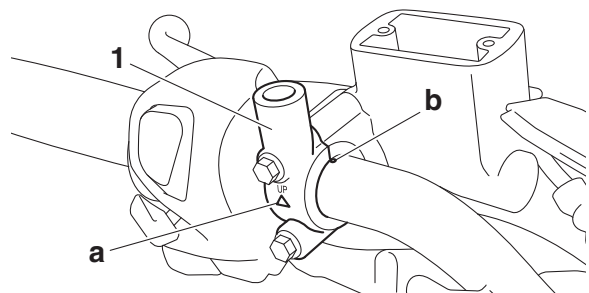
- Rear brake master cylinder assembly
- Rear brake master cylinder holder "1"



**Rear brake master cylinder holder bolt
11 N·m (1.1 kgf·m, 8.1 lb·ft)**

TIP

- Install the brake master cylinder holder with the "UP" mark "a" facing up.
- Align the end of the rear brake master cylinder holder with the punch mark "b" on the handle-bar.
- First, tighten the upper bolt, then the lower bolt.



REAR BRAKE

2. Install:

- Brake hose gaskets “1” **New**
- Rear brake hose “2”
- Rear brake hose union bolt “3”



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

ECA14160

NOTICE

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

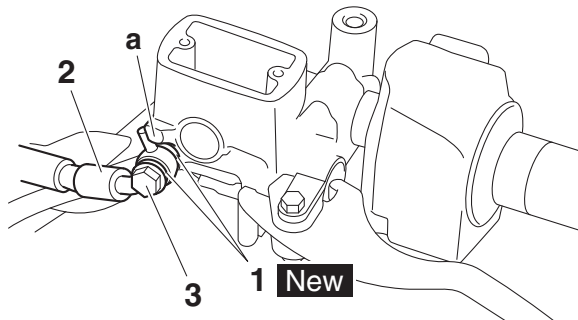
EWA13531

WARNING

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

TIP

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



3. Fill:

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



Specified brake 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

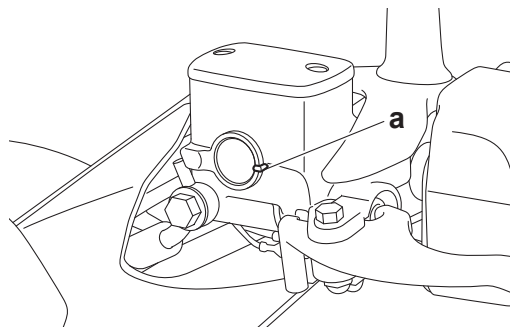
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.

5. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-11.



6. Check:

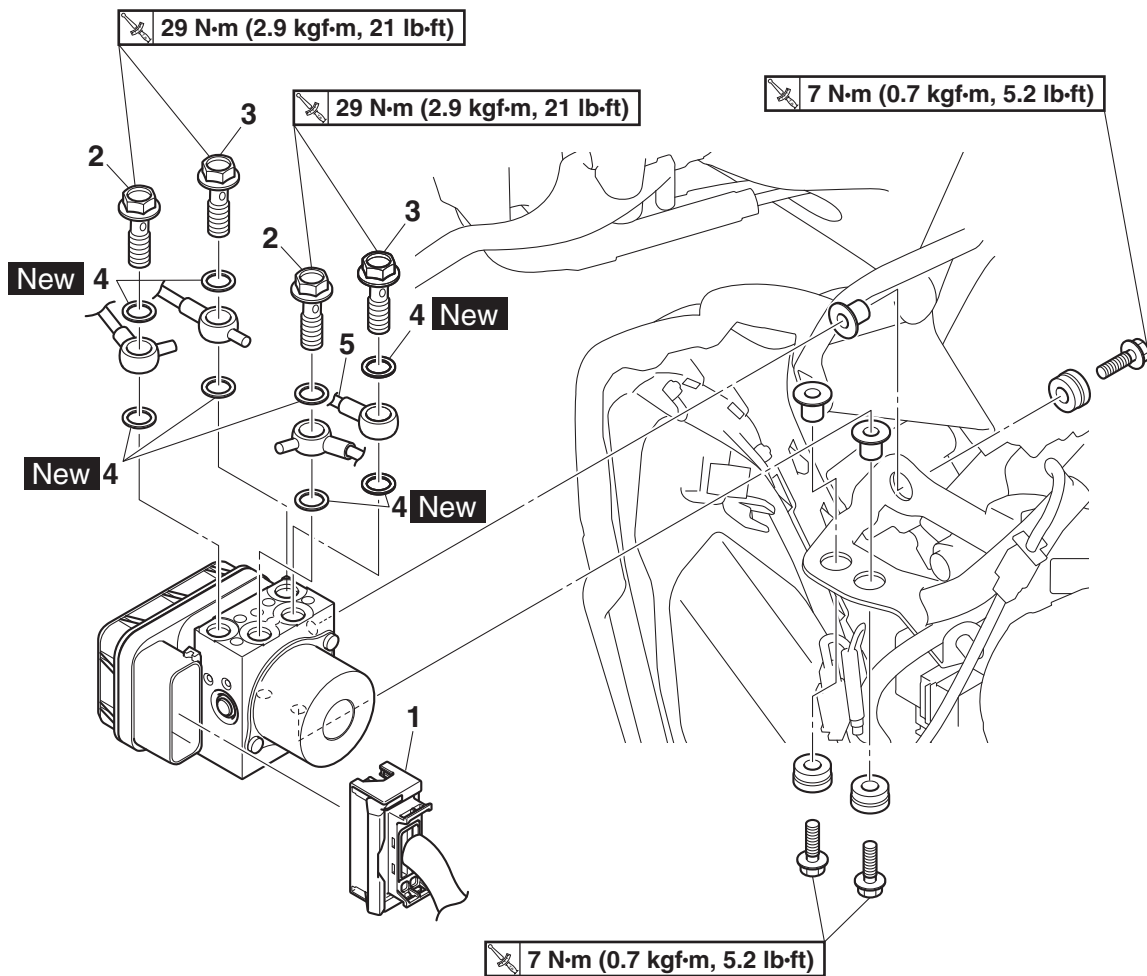
- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-12.

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS20032

ABS (ANTI-LOCK BRAKE SYSTEM)

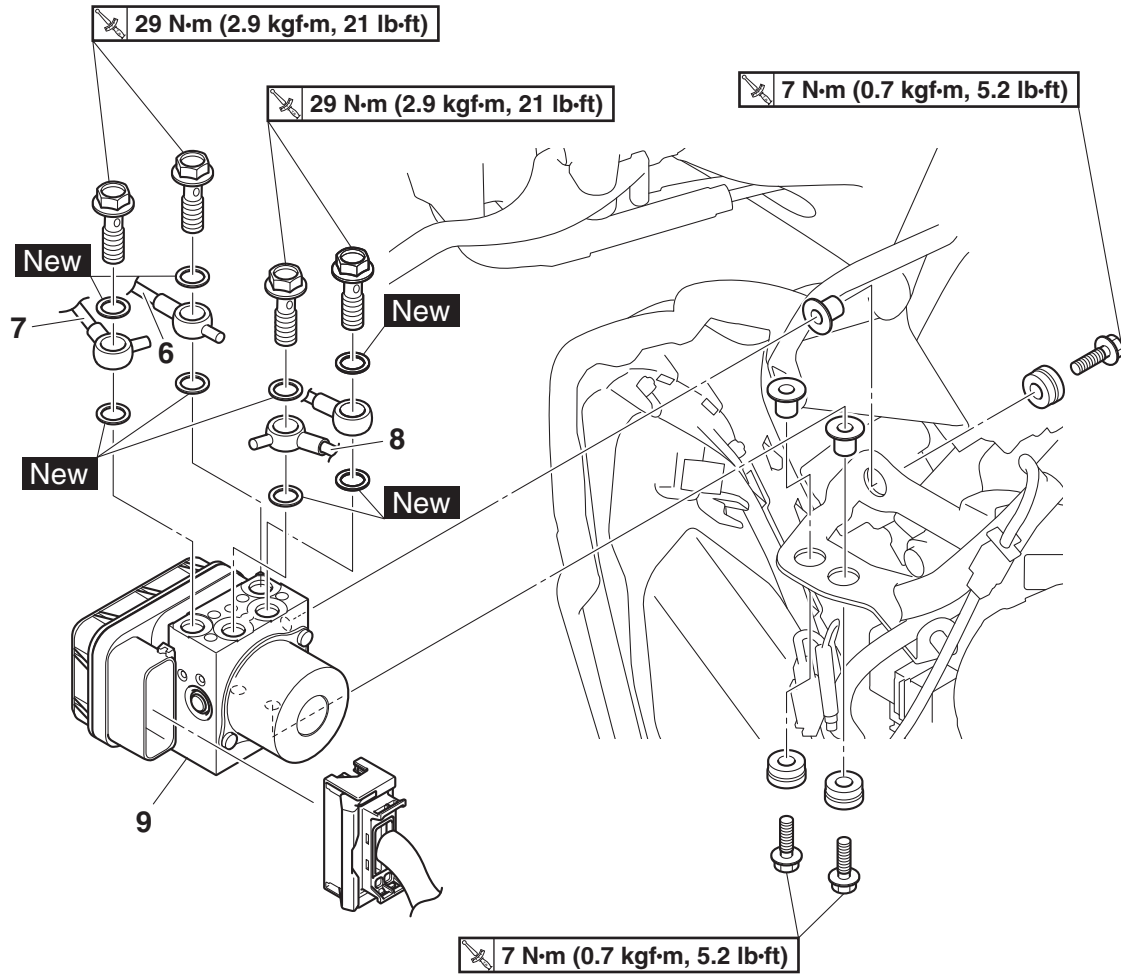
Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-12.
	Battery		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Battery box		Refer to "GENERAL CHASSIS (3)" on page 4-7.
1	ABS ECU coupler	1	Disconnect.
2	Front brake hose union bolt (hydraulic unit assembly side)	2	
3	Rear brake hose union bolt (hydraulic unit assembly side)	2	
4	Brake hose gasket	8	
5	Rear brake hose (rear brake master cylinder to hydraulic unit)	1	Disconnect.

ABS (ANTI-LOCK BRAKE SYSTEM)

Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
6	Rear brake hose (hydraulic unit to rear brake caliper)	1	Disconnect.
7	Front brake hose (hydraulic unit to front brake caliper)	1	Disconnect.
8	Front brake hose (front brake master cylinder to hydraulic unit)	1	Disconnect.
9	Hydraulic unit assembly	1	

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS30197

REMOVING THE HYDRAULIC UNIT ASSEMBLY

ECA21091

NOTICE

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

EWA13930

WARNING

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

ECA18241

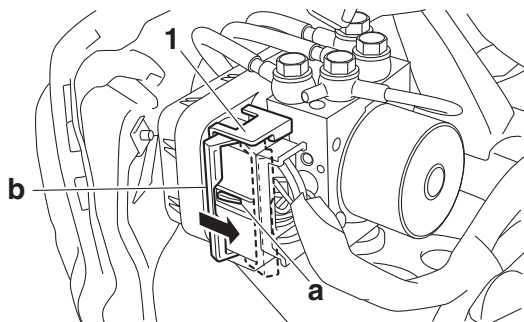
NOTICE

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

1. Disconnect:
 - ABS ECU coupler “1”

TIP

While pushing the portion “a” of the ABS ECU coupler, move the lock lever “b” in the direction of the arrow shown to disconnect the coupler.



2. Remove:
 - Brake hoses

TIP

Do not operate the brake levers while removing the brake hoses.

ECA14530

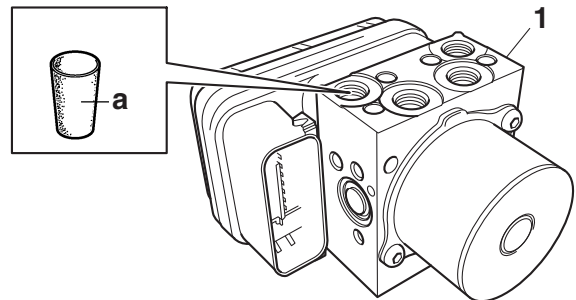
NOTICE

When removing the brake hoses, cover the area around the hydraulic unit to catch any spilt brake fluid. Do not allow the brake fluid to contact other parts.

3. Remove:
 - Hydraulic unit assembly “1”

TIP

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



EAS30198

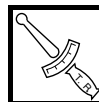
CHECKING THE HYDRAULIC UNIT ASSEMBLY

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

EAS30200

INSTALLING THE HYDRAULIC UNIT ASSEMBLY

1. Install:
 - Hydraulic unit assembly



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

ABS (ANTI-LOCK BRAKE SYSTEM)

ECA21110

NOTICE

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

TIP

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

2. Remove:

- Rubber plugs or bolts (M10 × 1.25)

3. Install:

- Front brake hose (front brake master cylinder to hydraulic unit) "1"
- Front brake hose (hydraulic unit to front brake caliper) "2"
- Rear brake hose (hydraulic unit to rear brake caliper) "3"
- Rear brake hose (rear brake master cylinder to hydraulic unit) "4"



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

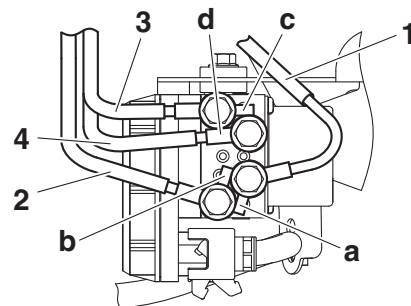
ECA21121

NOTICE

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

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

- Position the rear brake hose (hydraulic unit to rear brake caliper) "3" so that its projection "c" contacts the rear brake hose (rear brake master cylinder to hydraulic unit) "4", and then temporarily tighten the union bolt for the rear brake hose (hydraulic unit to rear brake caliper).
- Position the rear brake hose (rear brake master cylinder to hydraulic unit) "4" so that its pipe "d" contacts the rear brake hose (hydraulic unit to rear brake caliper) "3".
- Tighten the brake hose union bolts to specification.

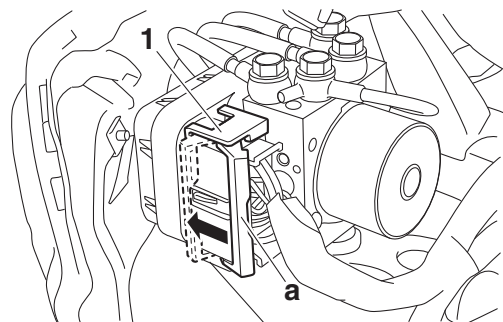


4. Connect:

- ABS ECU coupler "1"

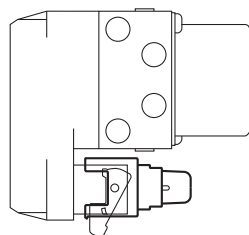
TIP

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

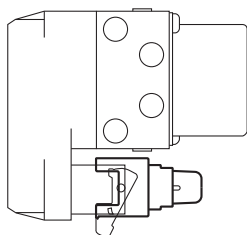


ABS (ANTI-LOCK BRAKE SYSTEM)

A



B



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

5. Fill:

- Brake master cylinder reservoir



**Specified brake fluid
DOT 4**

EWA13090

WARNING

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

ECA13540

NOTICE

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

6. Bleed:

- Brake system

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-12.

7. Check the operation of the hydraulic unit according to the brake levers response. (Refer to "HYDRAULIC UNIT OPERATION TESTS" on page 4-67.)

ECA14550

NOTICE

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

8. Delete the fault codes. (Refer to "[B-3] DELETING THE FAULT CODES" on page 8-110.)
9. Perform a trial run. (Refer to "CHECKING THE ABS WARNING LIGHT" on page 4-70.)

EAS30201

HYDRAULIC UNIT OPERATION TESTS

The reaction-force pulsating action generated in the brake levers when the ABS is activated can be tested when the vehicle is stopped.

The hydraulic unit operation can be tested using the following two methods.

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

Brake line routing confirmation

EWA13120

WARNING

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

TIP

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

1. Place the vehicle on a centerstand.

2. Turn the main switch to "OFF".

3. Remove:

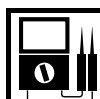
- Battery cover assembly

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

4. Check:

- Battery voltage

Lower than 12.8 V → Charge or replace the battery.

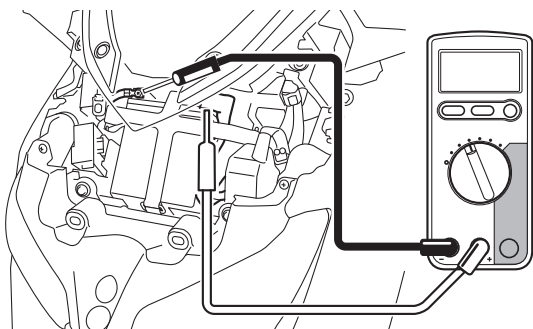


**Battery voltage
Higher than 12.8 V**

TIP

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

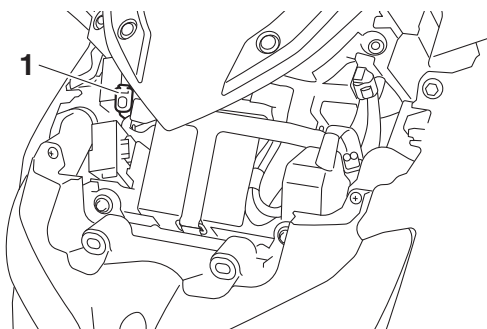
ABS (ANTI-LOCK BRAKE SYSTEM)



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



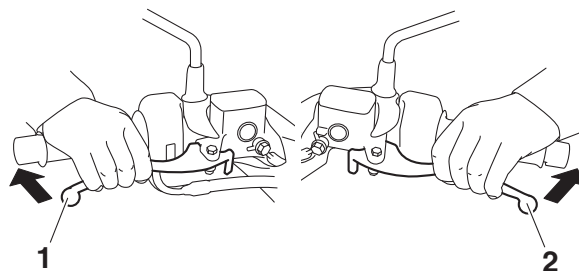
Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254



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

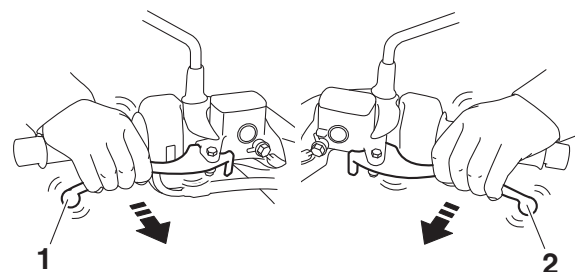
TIP

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



9. Check:

- Hydraulic unit operation
Click “Actuator Check”, a single pulse will be generated in the front brake lever “1”, rear brake lever “2”, and again in the front brake lever “1”, in this order.



TIP

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

ECA22080

NOTICE

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

ABS (ANTI-LOCK BRAKE SYSTEM)

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

ABS reaction-force confirmation

EWA13120



WARNING

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

TIP

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

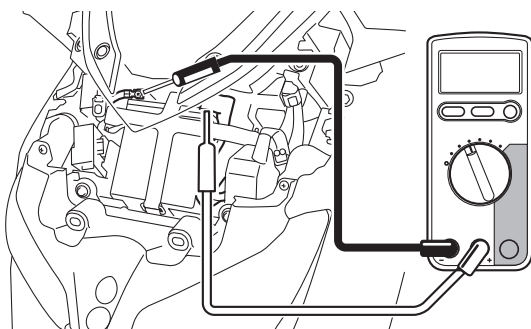
1. Place the vehicle on a centerstand.
2. Turn the main switch to "OFF".
3. Remove:
 - Battery cover assembly
Refer to "GENERAL CHASSIS (1)" on page 4-1.
4. Check:
 - Battery voltage
Lower than 12.8 V → Charge or replace the battery.



**Battery voltage
Higher than 12.8 V**

TIP

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

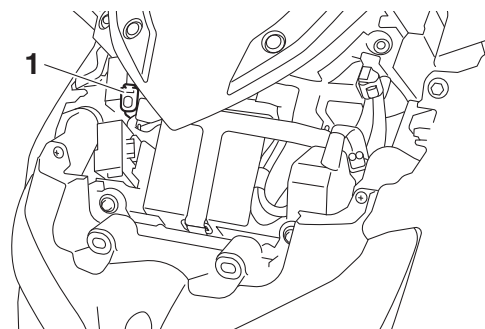


5. Removing the protective cap "1", and then connect the Yamaha diagnostic tool to the ABS test coupler (4P).



**Yamaha diagnostic tool USB
90890-03256**

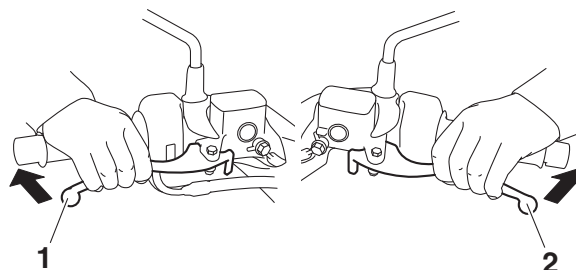
**Yamaha diagnostic tool (A/I)
90890-03254**



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

TIP

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

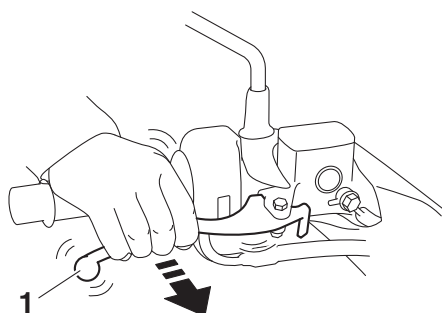


ABS (ANTI-LOCK BRAKE SYSTEM)

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

TIP

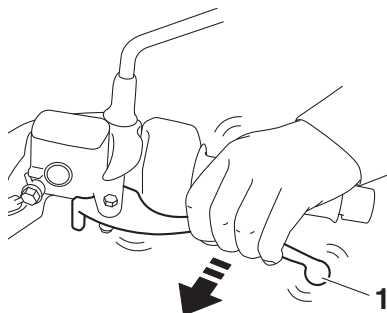
- The reaction-force pulsating action consists of quick pulses.
- Be sure to continue operating the front brake lever and rear brake lever even after the pulsating action has stopped.
- "ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.



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

TIP

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



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

TIP

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

ECA22080

NOTICE

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

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

EAS30202

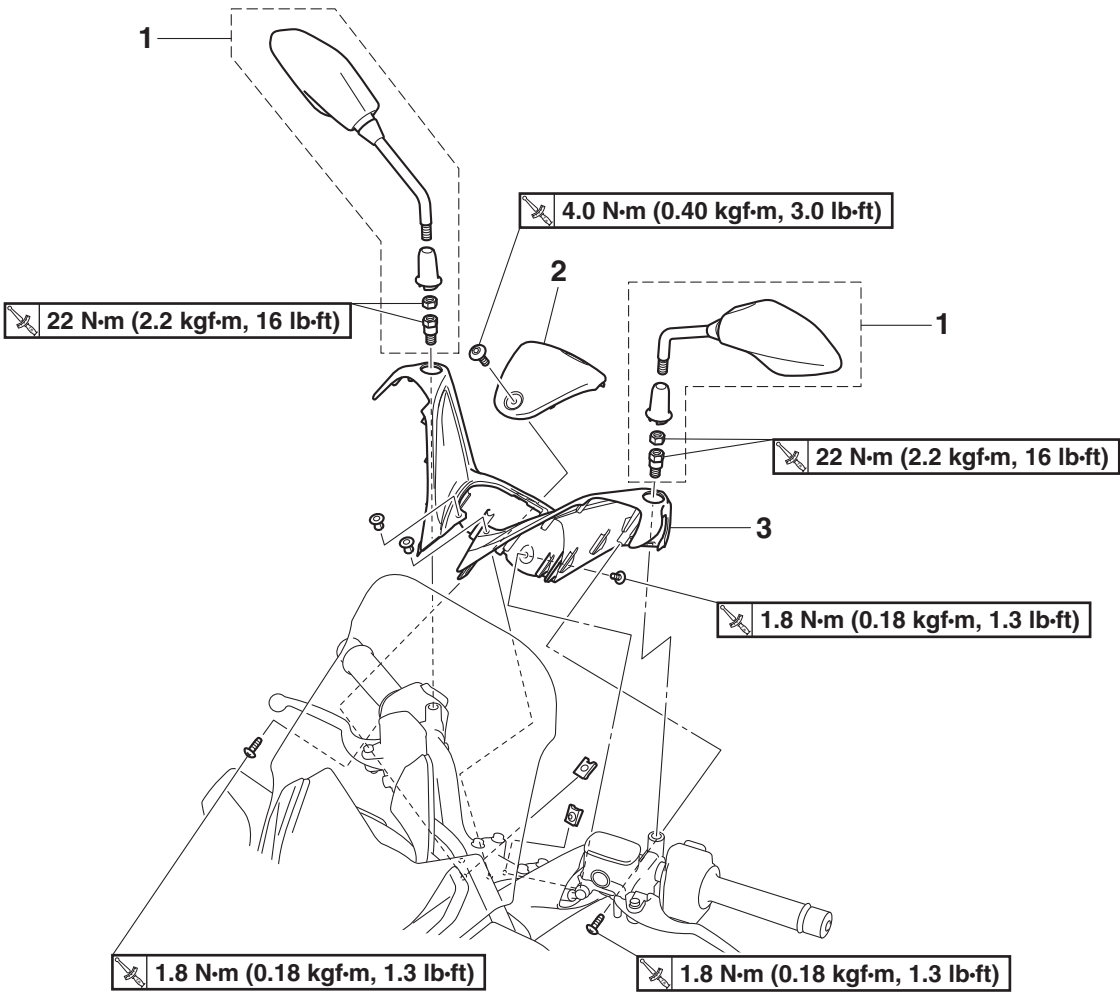
CHECKING THE ABS WARNING LIGHT

After all checks and servicing are completed, ensure that the ABS warning light goes off by walking the vehicle at a speed of faster than 10 km/h (6 mph) or performing a trial run.

EAS20033

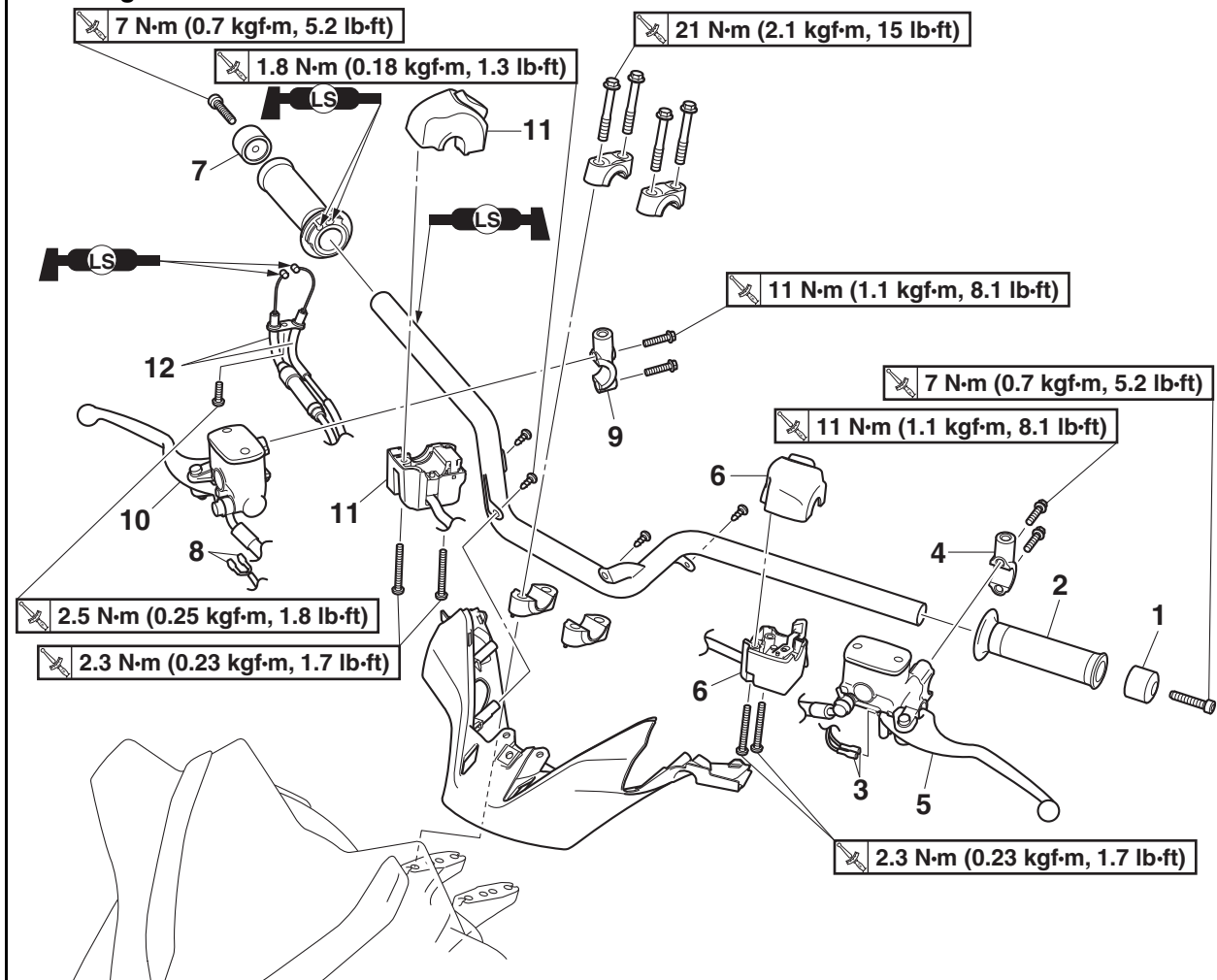
HANDLEBAR

Removing the rearview mirror and handlebar cover



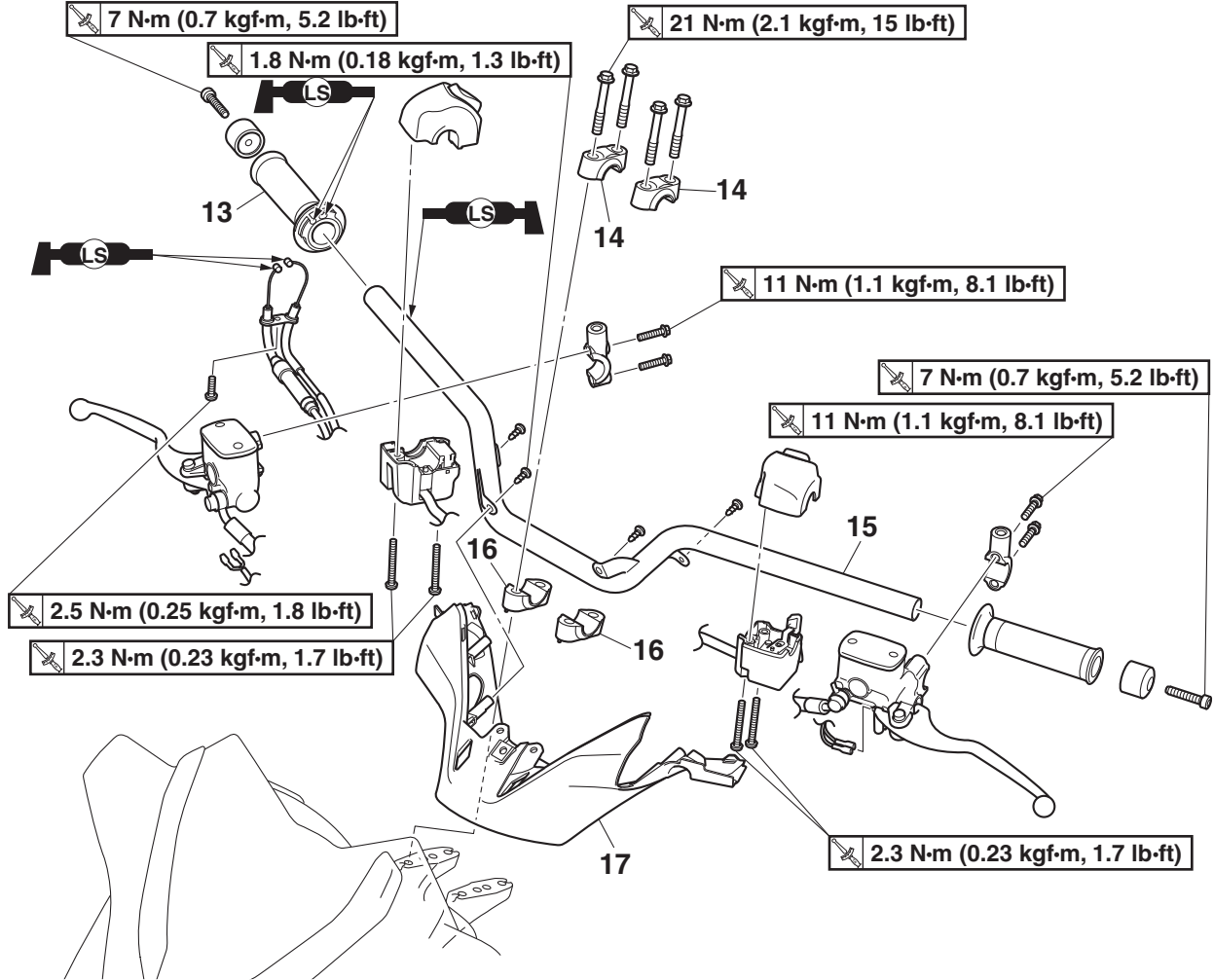
Order	Job/Parts to remove	Q'ty	Remarks
1	Rearview mirror	2	
2	Upper handlebar panel	1	
3	Upper handlebar cover	1	

Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
1	Grip end (left)	1	
2	Handlebar grip	1	
3	Rear brake light switch connector	2	Disconnect.
4	Rear brake master cylinder holder	1	
5	Rear brake master cylinder	1	
6	Handlebar switch (left)	1	
7	Grip end (right)	1	
8	Front brake light switch connector	2	Disconnect.
9	Front brake master cylinder holder	1	
10	Front brake master cylinder	1	
11	Handlebar switch (right)	1	
12	Throttle cable	2	Disconnect.

Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
13	Throttle grip	1	
14	Upper handlebar holder	2	
15	Handlebar	1	
16	Lower handlebar holder	2	
17	Lower handlebar cover	1	

EAS31396

ADJUSTING THE HANDLEBAR POSITION

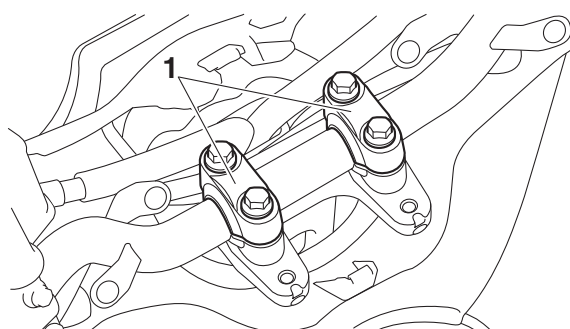
1. Remove:
 - Upper handlebar cover
Refer to “REMOVING THE UPPER HANDLEBAR COVER” on page 4-74.

2. Check:
 - Handlebar position

TIP

The handlebar position can be adjusted to one of two positions to suit the rider's preference.

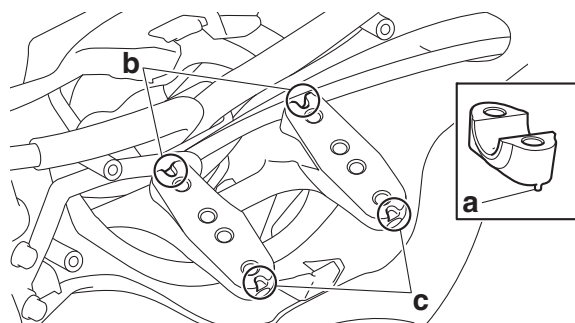
3. Adjust:
 - Handlebar position
 - a. Remove the upper handlebar holders “1”.



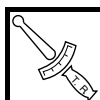
- b. Remove the handlebar.
 - c. Fit the projections “a” on the lower handlebar holders into the slots shown in the illustration for the desired position.

TIP

Make sure that the lower handlebar holders are installed in the same position.



- b. Standard position
 - c. Rear position
 - d. Install the handlebar.
 - e. Install the upper handlebar holders.



Upper handlebar holder bolt
21 N·m (2.1 kgf·m, 15 lb·ft)

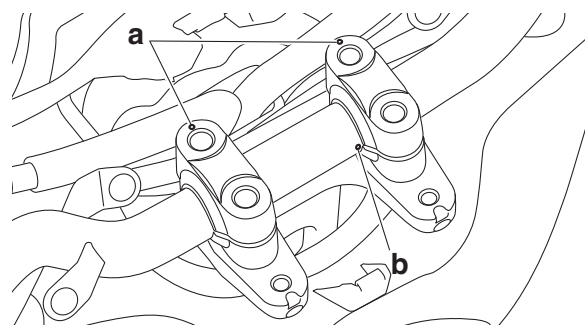
ECA18300

NOTICE

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

TIP

- The upper handlebar holders should be installed with the punch mark “a” facing forward.
- Align the punch mark “b” on the handlebar with the inner edge of the upper surface of the right lower handlebar holder.

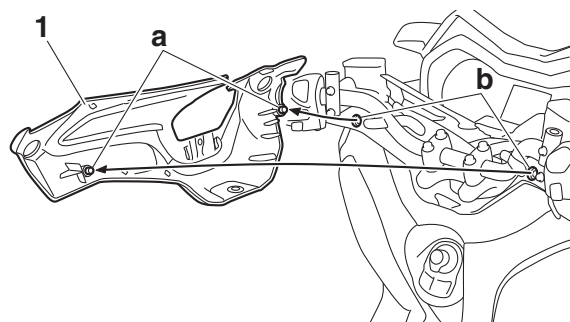


4. Install:
 - Upper handlebar cover
Refer to “INSTALLING THE UPPER HANDLEBAR COVER” on page 4-77.

EAS32355

REMOVING THE UPPER HANDLEBAR COVER

1. Remove:
 - Upper handlebar cover “1”
 - a. Remove the quick fasteners and upper handlebar cover screws.
 - b. Remove the projections “a” on the upper handlebar cover from the holes “b” in the lower handlebar cover.



EAS30203

REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120



WARNING

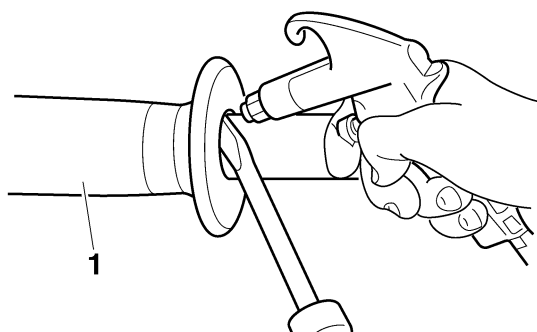
Securely support the vehicle so that there is no danger of it falling over.

2. Remove:

- Handlebar grip “1”

TIP

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



EAS30204

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.

EAS30205

INSTALLING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

⚠ WARNING

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

2. Install:

- Lower handlebar holders “1”
- Handlebar “2”
- Upper handlebar holders “3”



Upper handlebar holder bolt
21 N·m (2.1 kgf·m, 15 lb·ft)

ECA18300

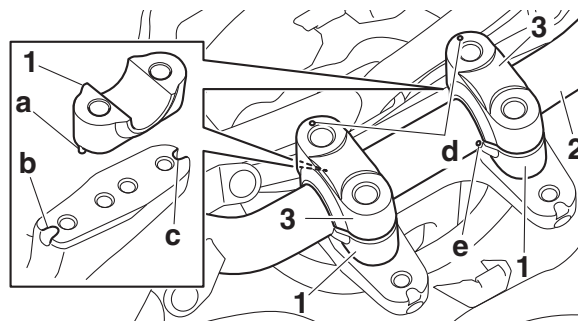
NOTICE

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

TIP

- Fit the projection “a” on the lower handlebar holders into the slots shown in the illustration for the desired position, make sure that the lower handlebar holders are installed in the same position.

- The upper handlebar holders should be installed with the punch mark “d” facing forward.
- Align the punch mark “e” on the handlebar with the inner edge of the upper surface of the right lower handlebar holder.



- b. Standard position
- c. Rear position

3. Install:

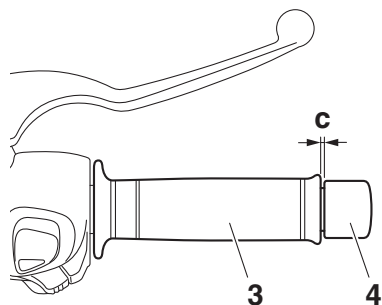
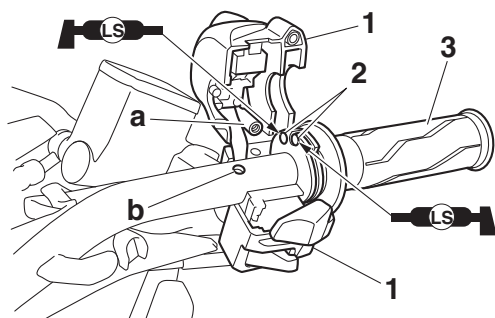
- Handlebar switch (right) “1”
- Throttle cables “2”
- Throttle grip “3”
- Grip end (right) “4”



Handlebar switch screw (right handlebar switch)
2.3 N·m (0.23 kgf·m, 1.7 lb·ft)
Throttle cable holder bolt (handlebar switch side)
2.5 N·m (0.25 kgf·m, 1.8 lb·ft)
Grip end bolt (right)
7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP

- Lubricate the end of the throttle cables and the inside of the throttle grip with a thin coat of lithium-soap-based grease.
- Align the projection “a” on the right handlebar switch with the hole “b” in the handlebar.
- First, tighten the front screw, then the rear screw.
- There should be 1.0–5.0 mm (0.04–0.20 in) of clearance “c” between the throttle grip and the grip end.



4. Install:

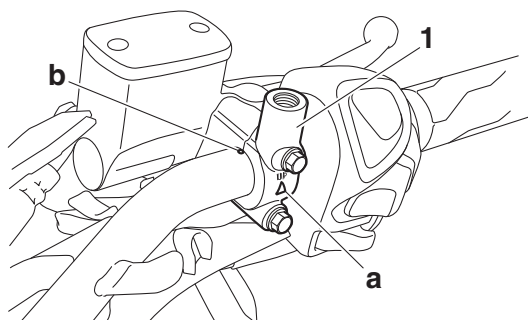
- Front brake master cylinder
- Front brake master cylinder holder "1"



Front brake master cylinder holder bolt
11 N·m (1.1 kgf·m, 8.1 lb·ft)

TIP

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



5. Adjust:

- Throttle grip free play
Refer to "CHECKING THE THROTTLE GRIP OPERATION" on page 3-24.



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

6. Install:

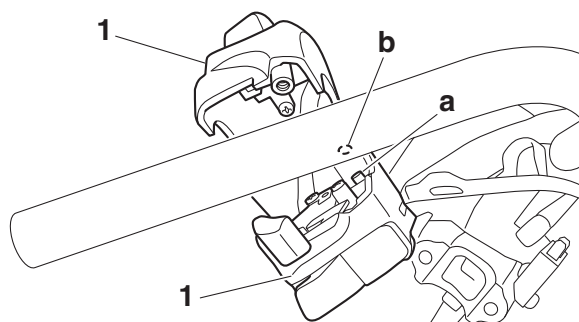
- Handlebar switch (left) "1"



Handlebar switch screw (left handlebar switch)
2.3 N·m (0.23 kgf·m, 1.7 lb·ft)

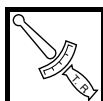
TIP

- Align the projection "a" on the left handlebar switch with the hole "b" in the handlebar.
- First, tighten the front screw, then the rear screw.



7. Install:

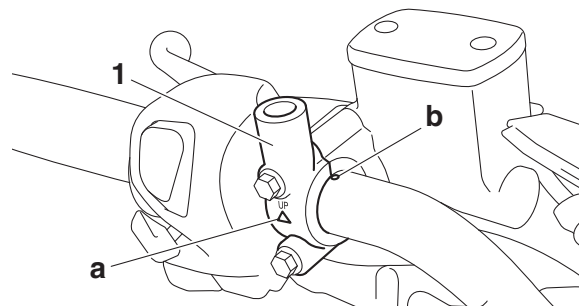
- Rear brake master cylinder
- Rear brake master cylinder holder "1"



Rear brake master cylinder holder bolt
11 N·m (1.1 kgf·m, 8.1 lb·ft)

TIP

- Install the brake master cylinder holder with the "UP" mark "a" facing up.
- Align the end of the rear brake master cylinder holder with the punch mark "b" on the handlebar.
- First, tighten the front bolt, then the rear bolt.



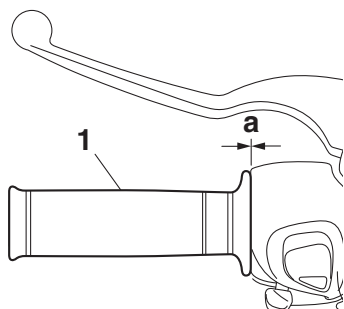
8. Install:

- Handlebar grip "1"
- Grip end (left) "2"
- a. Apply a thin coat of a rubber adhesive to the left end of the handlebar.

- b. Slide the handlebar grip over the left end of the handlebar.

TIP

Make sure that the distance “a” between the end of the left handlebar switch and the end of the handlebar grip is 0 mm (0 in).



- 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.

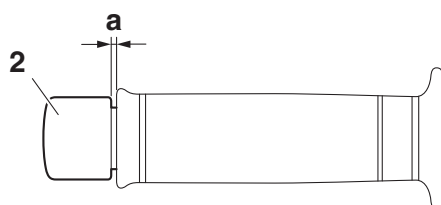
- d. Install the left grip end.



Grip end bolt (left)
7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP

There should be 1.0–5.0 mm (0.04–0.20 in) of clearance “a” between the handlebar grip and the grip end.



EAS32356

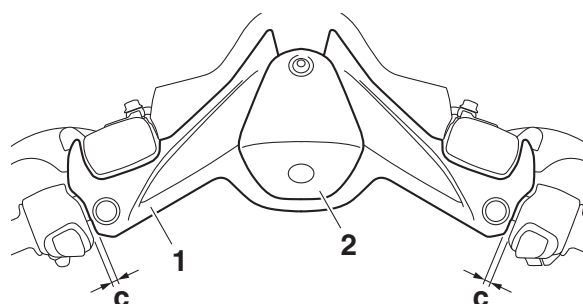
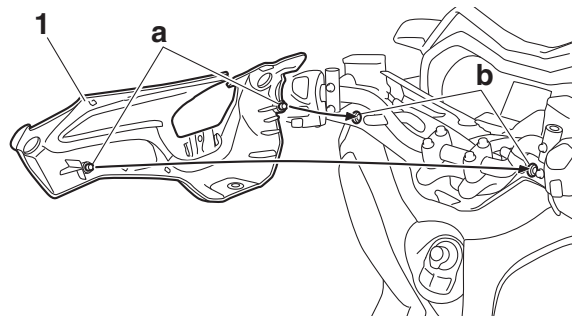
INSTALLING THE UPPER HANDLEBAR COVER

1. Install:

- Upper handlebar cover “1”
- Upper handlebar panel “2”
 - a. Fit the projections “a” on the upper handlebar cover into the holes “b” in the lower handlebar cover.

TIP

There should be 0.5–4.0 mm (0.02–0.16 in) of clearance “c” between the upper handlebar cover and handlebar switch.



- b. Install the quick fasteners and upper handlebar cover screws, and then tighten the screws to specification.

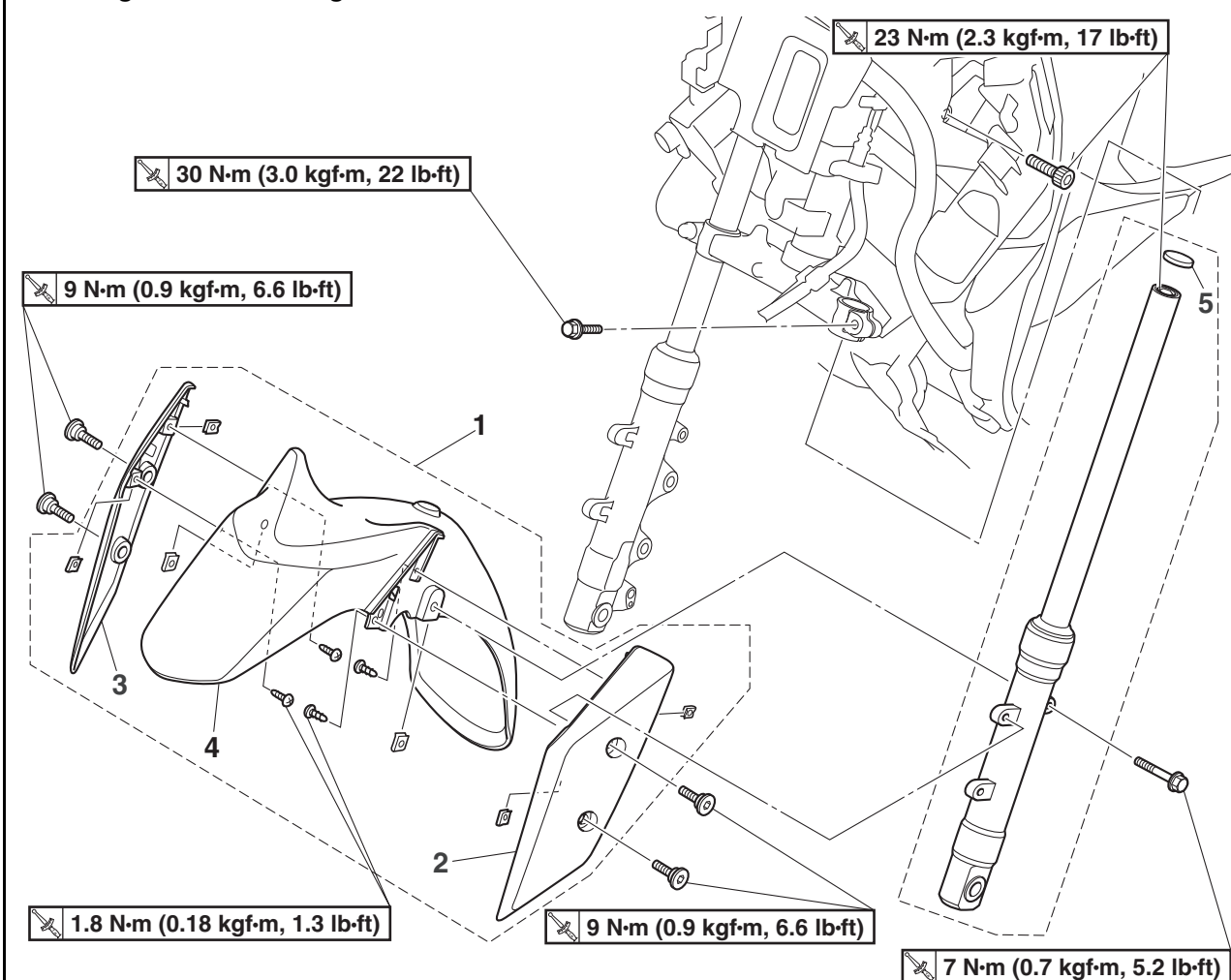


Upper handlebar cover screw
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

EAS20034

FRONT FORK

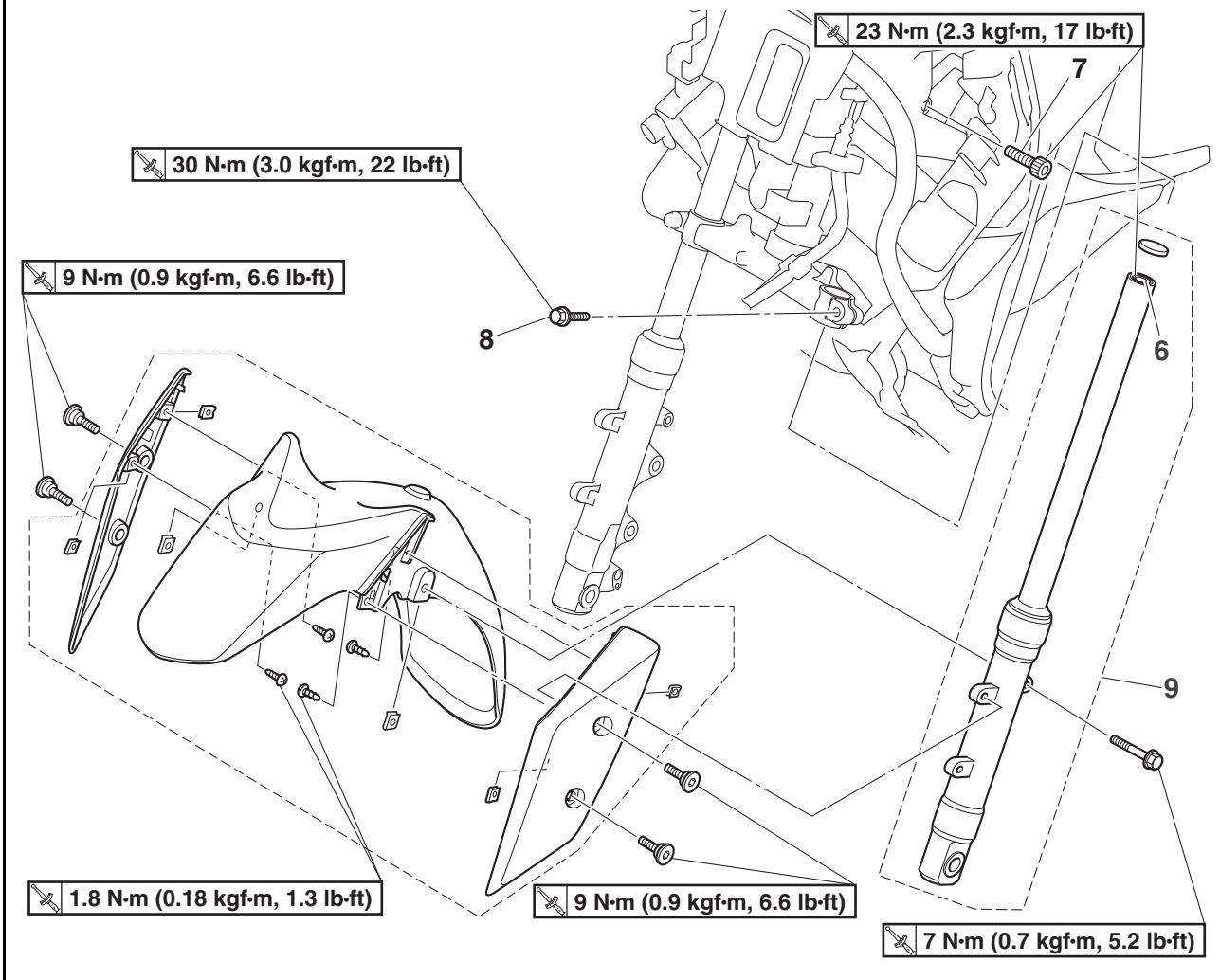
Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Battery		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Meter panel assembly		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Front wheel		Refer to "FRONT WHEEL" on page 4-27.
1	Front fender assembly	1	
2	Front fender side cover (left)	1	
3	Front fender side cover (right)	1	
4	Front fender	1	
5	Front fork cap	1	

FRONT FORK

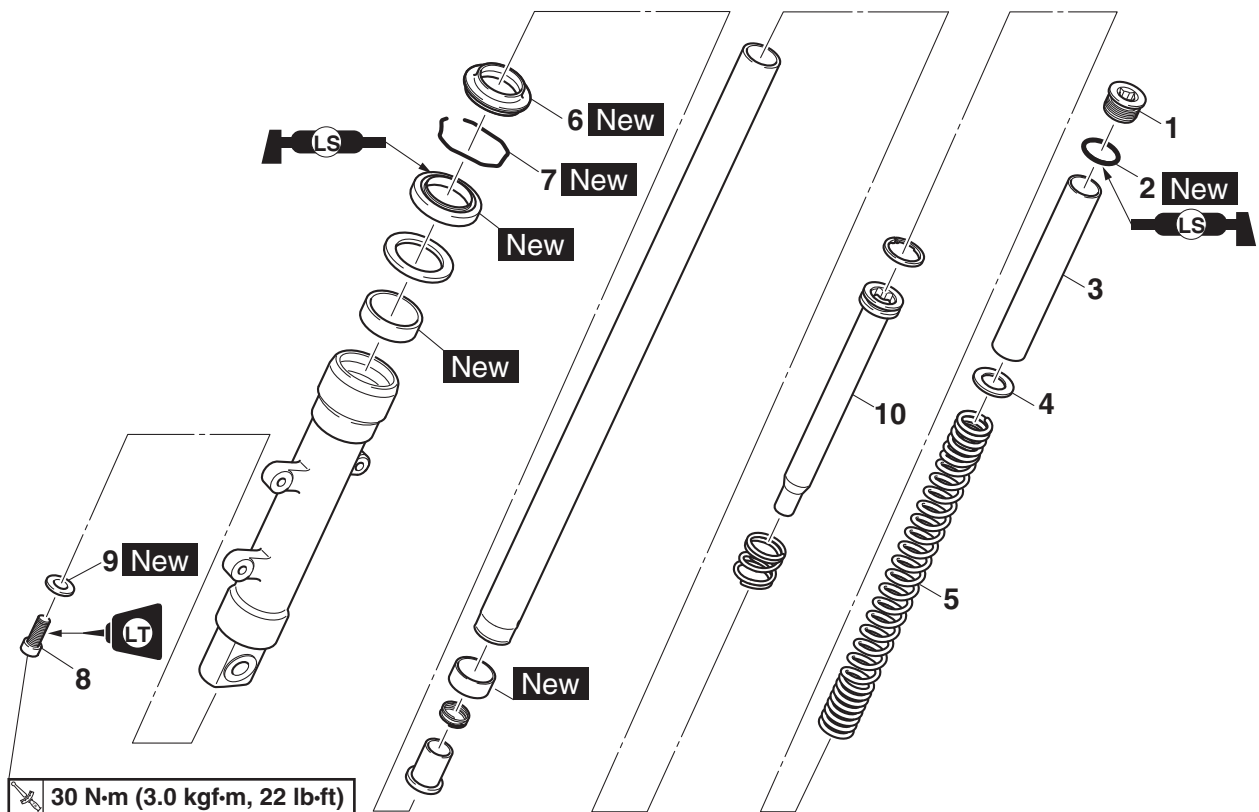
Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
6	Front fork cap bolt	1	Loosen.
7	Upper bracket pinch bolt	1	Loosen.
8	Lower bracket pinch bolt	1	Loosen.
9	Front fork leg	1	

FRONT FORK

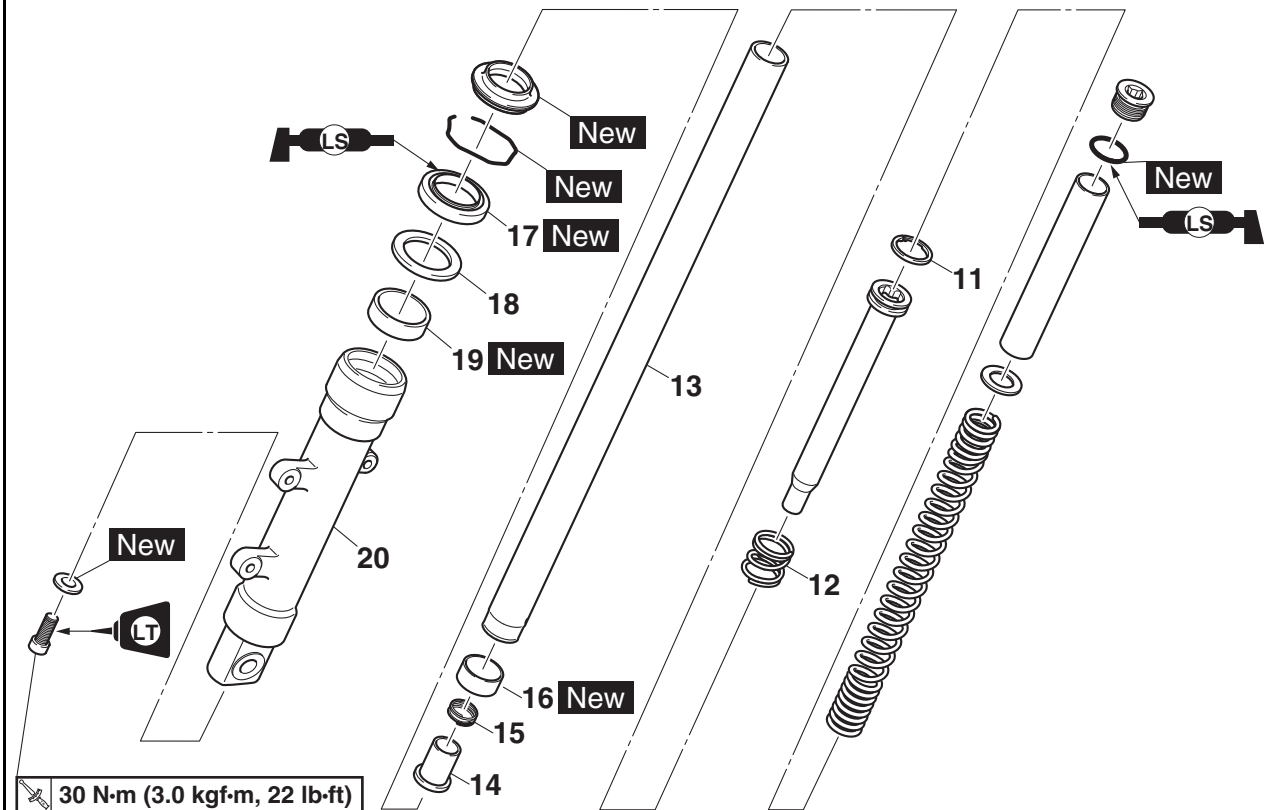
Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
1	Front fork 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	Front fork damper rod bolt	1	
9	Copper washer	1	
10	Damper rod	1	

FRONT FORK

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
11	Damper rod ring	1	
12	Rebound spring	1	
13	Inner tube	1	
14	Oil flow stopper	1	
15	Oil flow stopper spring	1	
16	Inner tube bushing	1	
17	Oil seal	1	
18	Washer	1	
19	Outer tube bushing	1	
20	Outer tube	1	

EAS30206

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.

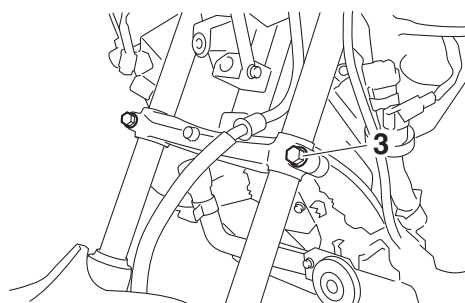
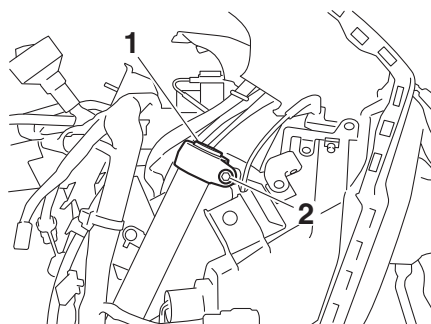
2. Loosen:

- Front fork cap bolt "1"
- Upper bracket pinch bolt "2"
- Lower bracket pinch bolt "3"

EWA13640

WARNING

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



EAS30207

DISASSEMBLING THE FRONT FORK LEGS

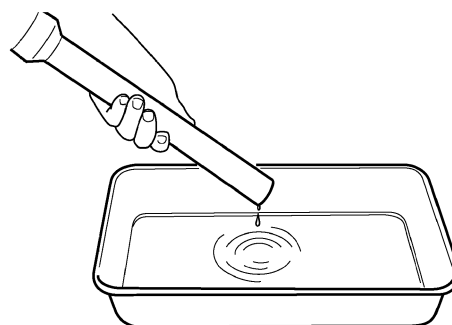
The following procedure applies to both of the front fork legs.

1. Drain:

- Fork oil

TIP

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



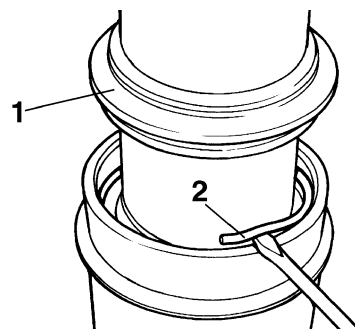
2. Remove:

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

ECA14180

NOTICE

Do not scratch the inner tube.



3. Remove:

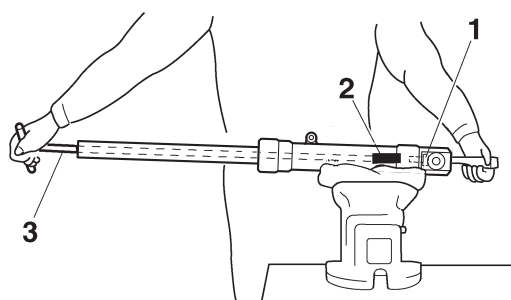
- Front fork damper rod bolt "1"
- Copper washer

TIP

While holding the damper rod with a hexagon bit socket (14 mm) "2" and the T-handle "3", loosen the front fork damper rod bolt.



T-handle
90890-01326
T-handle 3/8" drive 60 cm long
YM-01326



4. Remove:

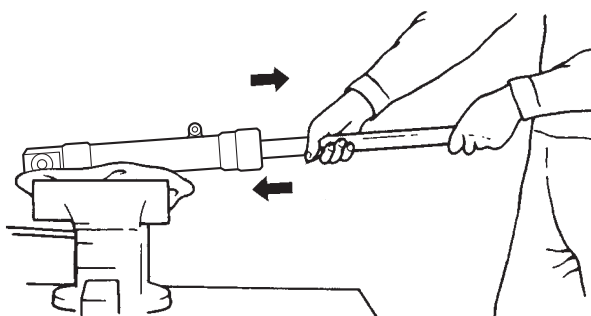
- Inner tube
 - a. Hold the front fork leg horizontally.

- 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.



EAS30208

CHECKING THE FRONT FORK LEGS

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

1. Check:
 - Inner tube
 - Outer tube
 Bends/damage/scratches → Replace.

EWA13650

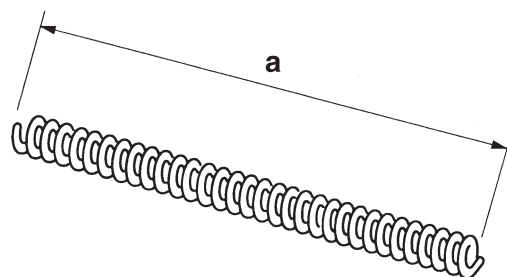
WARNING

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

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



Fork spring free length
348.3 mm (13.71 in)
Limit
341.3 mm (13.44 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.

EAS30209

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:
 - Outer tube bushing
 - Inner tube bushing
 - Oil seal
 - Oil seal clip
 - Dust seal
 - O-ring
- Before assembling the front fork leg, make sure all of the components are clean.

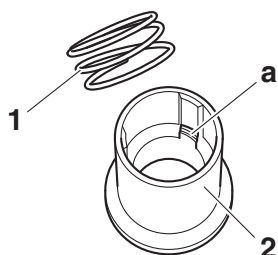
1. Install:
 - Inner tube bushing **New**
2. Install:
 - Oil flow stopper spring "1"

FRONT FORK

- Oil flow stopper "2"
- Damper rod ring "3"
- Damper rod "4"
- Rebound spring
 - a. Install the oil flow stopper spring into the oil flow stopper.

TIP

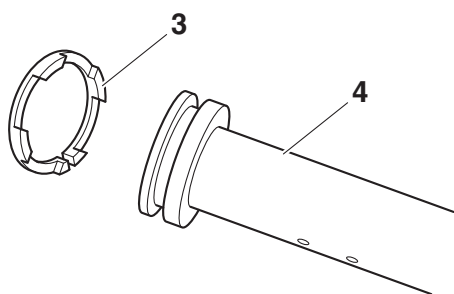
Make sure that the oil flow stopper spring is installed securely into the grooves "a" in the oil flow stopper.



- b. Install the damper rod ring onto the damper rod.

TIP

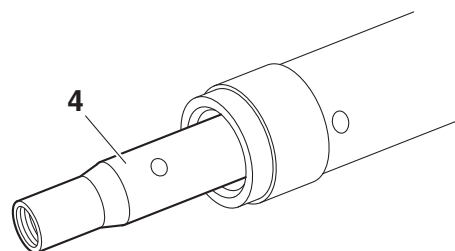
Fit the damper rod ring into the damper rod groove so that the side of the ring with the projections is facing in the direction shown in the illustration.



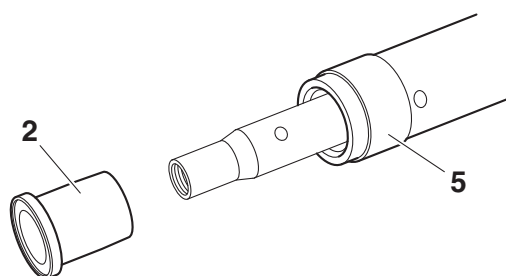
- c. Install the damper rod and rebound spring to the inner tube.

TIP

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



- d. Install the oil flow stopper onto the inner tube "5".



3. Lubricate:

- Inner tube's outer surface



Recommended oil
Yamaha fork oil 10WT

4. Install:

- Inner tube
(in the outer tube)

5. Install:

- Copper washer **New**
- Front fork damper rod bolt

6. Tighten:

- Front fork damper rod bolt "1"



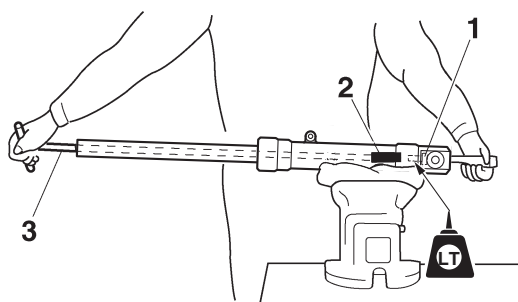
Front fork damper rod bolt
30 N·m (3.0 kgf·m, 22 lb·ft)
LOCTITE®

TIP

While holding the damper rod assembly with a hexagon bit socket (14 mm) "2" and the T-handle "3", tighten the front fork damper rod bolt.



T-handle
90890-01326
T-handle 3/8" drive 60 cm long
YM-01326



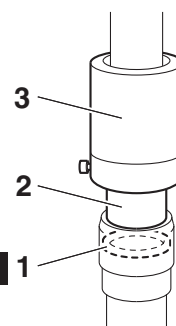
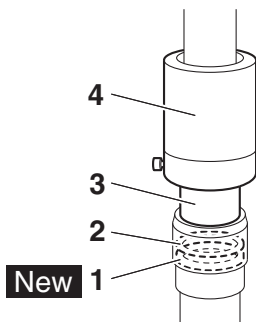
Fork seal driver weight
90890-01184
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø33)
90890-01368
Replacement 33 mm
YM-A9409-4

7. Install:

- Outer tube bushing “1” **New**
- Washer “2”
(with the fork seal driver attachment “3” and
fork seal driver weight “4”)



Fork seal driver weight
90890-01184
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø33)
90890-01368
Replacement 33 mm
YM-A9409-4



New 1

9. Install:

- Oil seal clip “1” **New**

TIP

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

8. Install:

- Oil seal “1” **New**
(with the fork seal driver attachment “2” and
fork seal driver weight “3”)

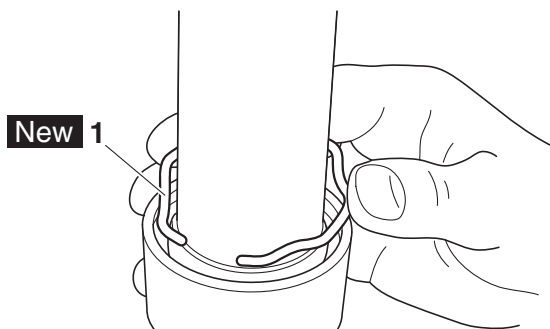
ECA14220

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.



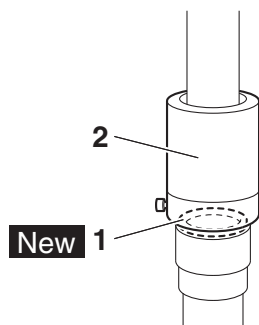
New 1

10. Install:

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



Fork seal driver weight
90890-01184
Replacement hammer
YM-A9409-7



11.Fill:

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



Recommended oil
Yamaha Suspension Oil G10
Quantity (left)
 235.0 cm³ (7.95 US oz, 8.29 Imp.oz)
Quantity (right)
 235.0 cm³ (7.95 US oz, 8.29 Imp.oz)

12.Measure:

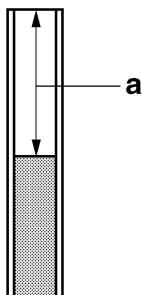
- Front fork leg oil level "a"
(from the top of the inner tube, with the outer tube fully compressed and without the fork spring)
Out of specification → Correct.



Level (left)
 155 mm (6.1 in)
Level (right)
 155 mm (6.1 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.



13.Install:

- Fork spring
- Spring seat
- Spacer

- Front fork cap bolt
(along with the O-ring **New**)

TIP

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

EAS30210

INSTALLING THE FRONT FORK LEGS

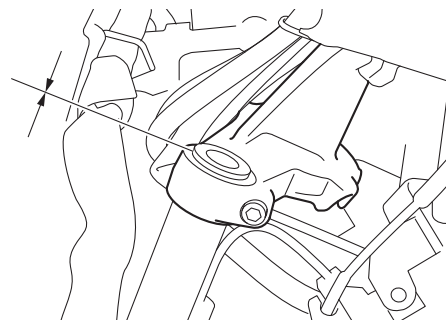
The following procedure applies to both of the front fork legs.

1. Install:

- Front fork leg
Temporarily tighten the lower bracket pinch bolt.

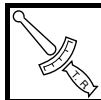
TIP

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



2. Tighten:

- Lower bracket pinch bolt
- Upper bracket pinch bolt
- Front fork cap bolt

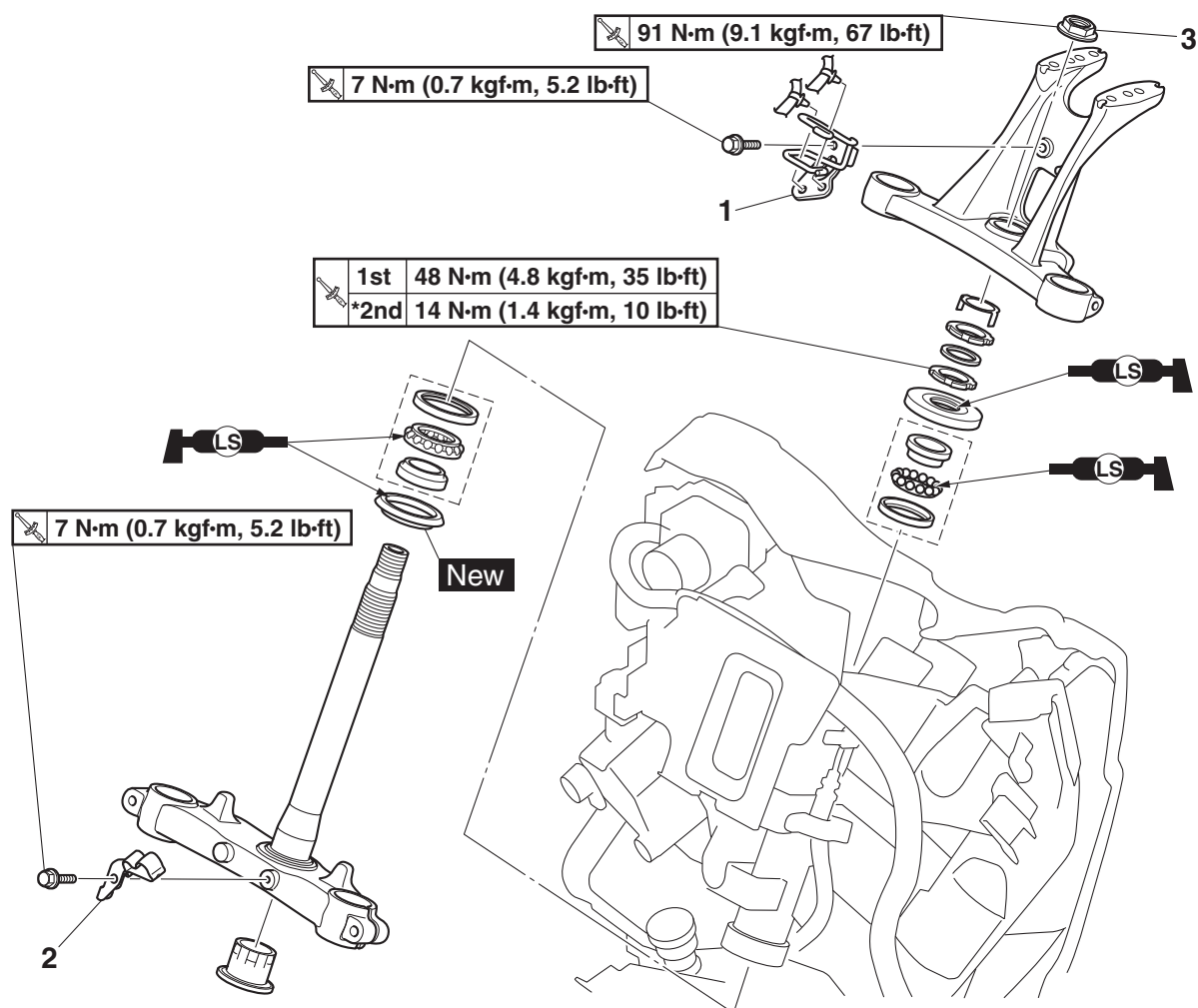


Lower bracket pinch bolt
 30 N·m (3.0 kgf·m, 22 lb·ft)
Upper bracket pinch bolt
 23 N·m (2.3 kgf·m, 17 lb·ft)
Front fork cap bolt
 23 N·m (2.3 kgf·m, 17 lb·ft)

EAS20035

STEERING HEAD

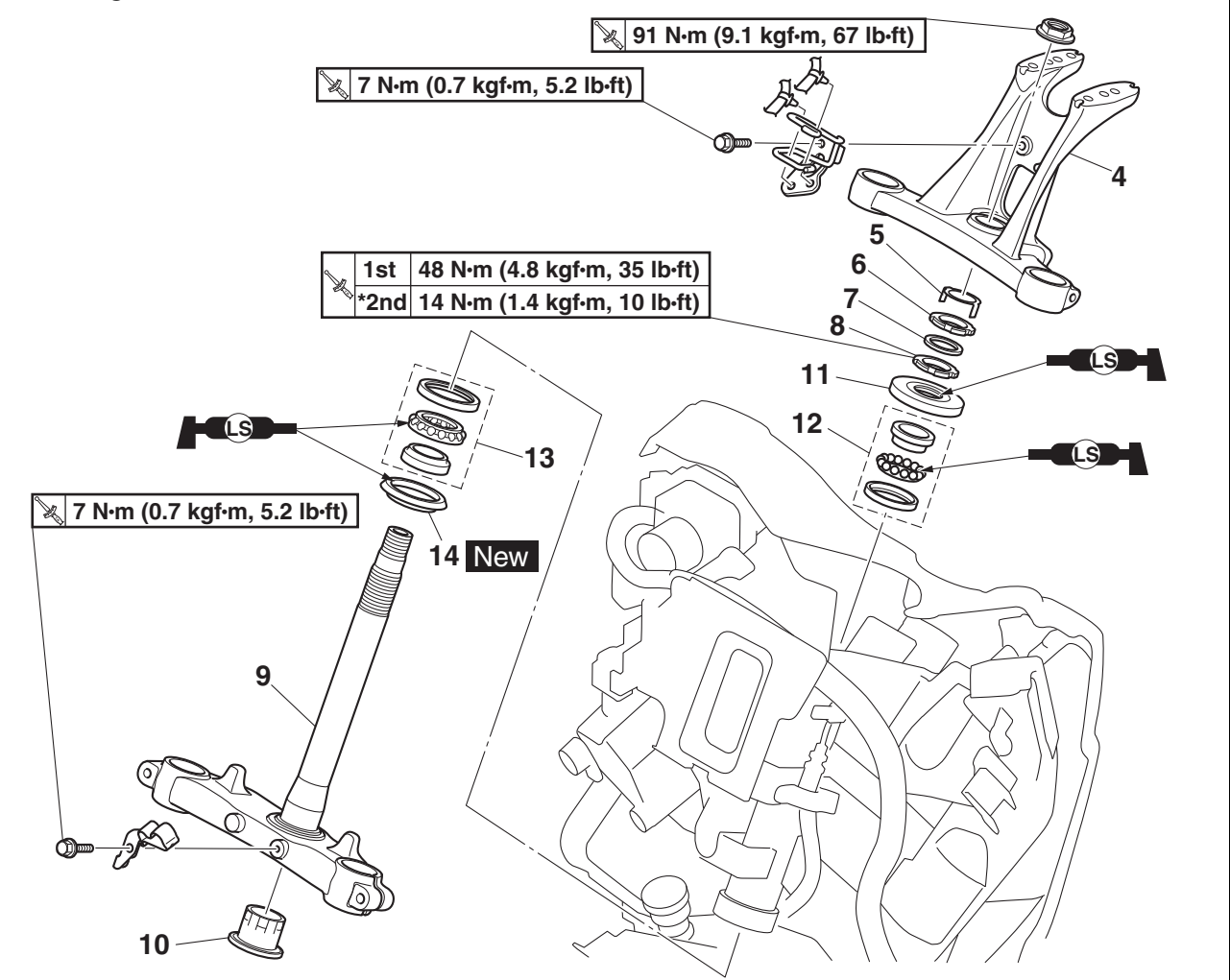
Removing the lower bracket



* Loosen the lower ring nut completely, and then tighten it to specification.

Order	Job/Parts to remove	Q'ty	Remarks
	Battery		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Meter panel assembly		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Front wheel		Refer to "FRONT WHEEL" on page 4-27.
	Handlebar		Refer to "HANDLEBAR" on page 4-71.
	Front fork legs		Refer to "FRONT FORK" on page 4-78.
1	Front brake hose guide	1	
2	Front brake hose holder	1	
3	Steering stem nut	1	

Removing the lower bracket



* Loosen the lower ring nut completely, and then tighten it to specification.

Order	Job/Parts to remove	Q'ty	Remarks
4	Upper bracket	1	
5	Lock washer	1	
6	Upper ring nut	1	
7	Rubber washer	1	
8	Lower ring nut	1	
9	Lower bracket	1	
10	Lower bracket cap	1	
11	Bearing cover	1	
12	Upper bearing	1	
13	Lower bearing	1	
14	Dust seal	1	

EAS30213

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

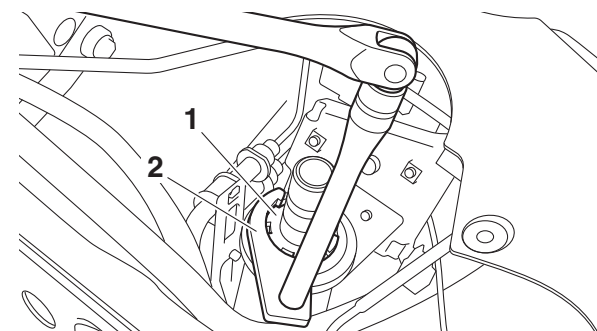
Securely support the lower bracket so that there is no danger of it falling.

TIP

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



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



EAS30214

CHECKING THE STEERING HEAD

1. Wash:

- Bearings
- Bearing races



Recommended cleaning solvent
Kerosene

2. Check:

- Bearings
 - Bearing races
- Damage/pitting → Replace the bearings and bearing races as a set.

3. Replace:

- Bearings
- Bearing races

- Remove the bearing races from the steering head pipe "1" with a long rod "2" and hammer.
- Remove the bearing race "3" from the lower bracket with a floor chisel "4" and hammer.
- Install a new dust seal and new bearing races.

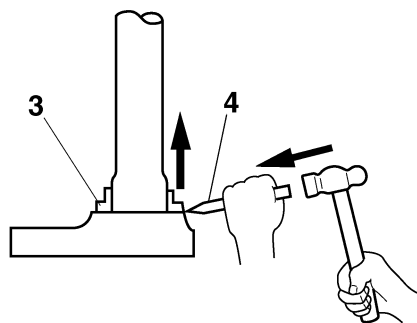
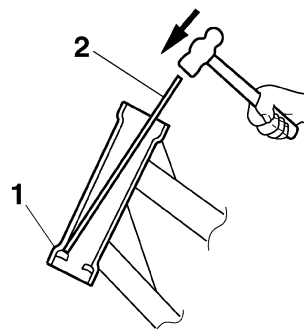
ECA14270

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:

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

EAS30216

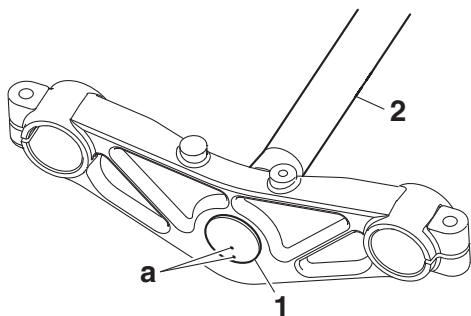
INSTALLING THE STEERING HEAD

1. Install:

- Lower bracket cap "1"
(onto the lower bracket "2")

TIP

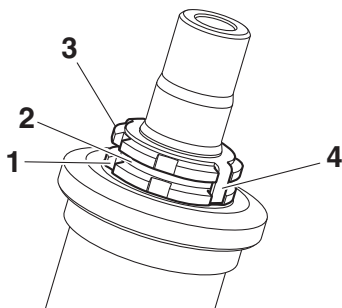
Face the holes "a" in the lower bracket cap rearward.



2. Install:

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

Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” on page 3-15.



3. Install:

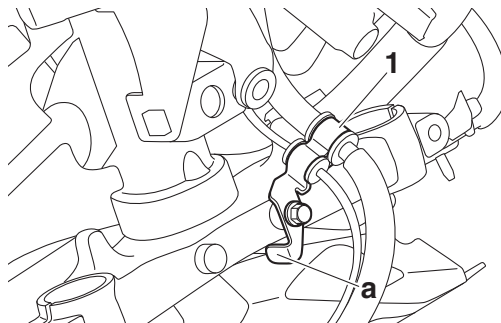
- Front brake hose holder “1”



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

TIP

While holding the front brake hose holder so that the portion “a” of the holder contacts the lower bracket, tighten the bolt to specification.

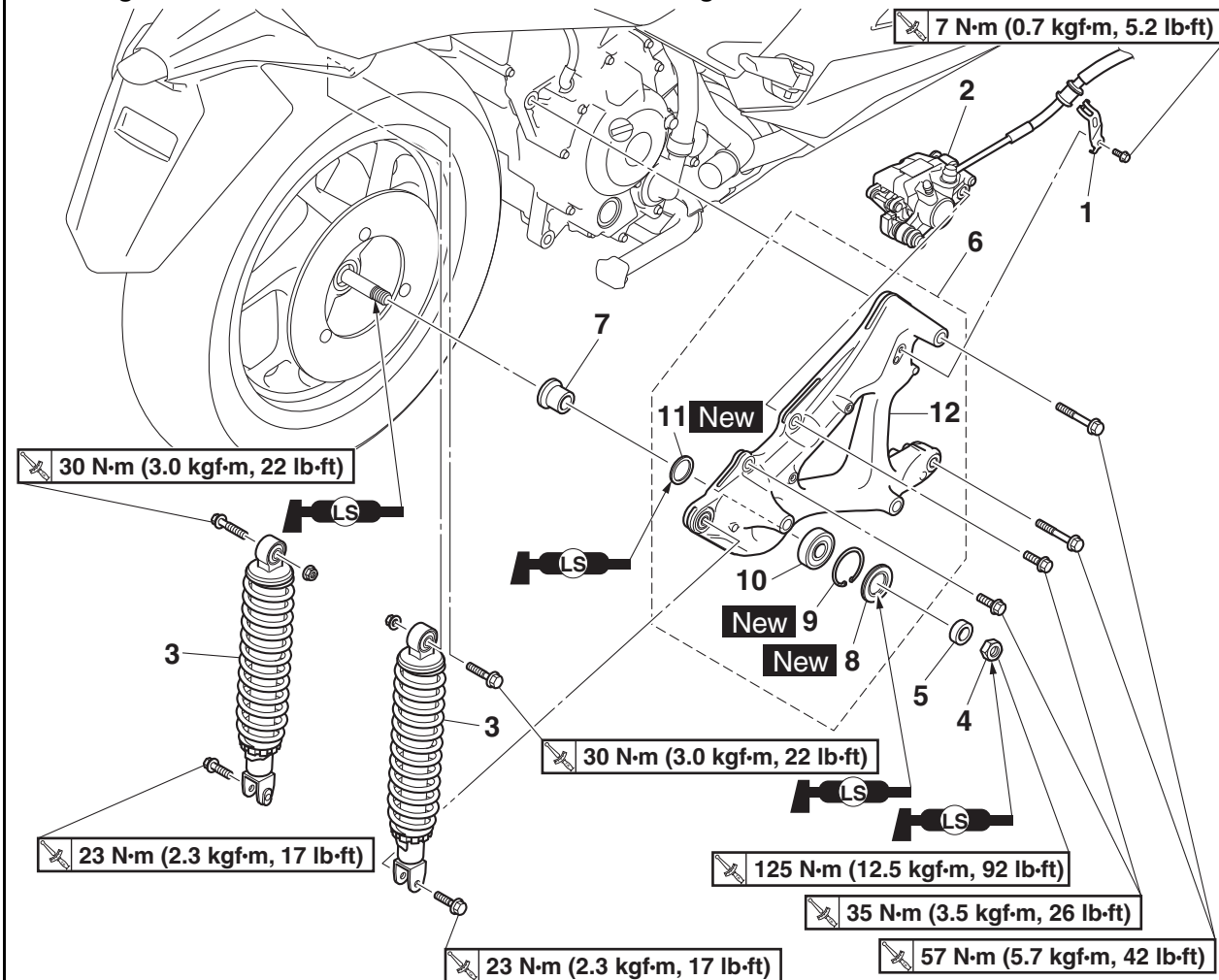


REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM

EAS20189

REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM

Removing the rear shock absorber assemblies and swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Muffler		Refer to "ENGINE REMOVAL" on page 5-7.
1	Rear brake hose holder	1	
2	Rear brake caliper	1	
3	Rear shock absorber assembly	2	
4	Rear wheel axle nut	1	
5	Spacer	1	
6	Swingarm assembly	1	
7	Collar	1	
8	Oil seal	1	
9	Circlip	1	
10	Bearing	1	
11	Oil seal	1	
12	Swingarm	1	

REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM

EAS31227

REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES

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 centerstand so that the rear wheel is elevated.

EAS31228

REMOVING THE SWINGARM

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 centerstand so that the rear wheel is elevated.

2. Remove:

- Rear brake hose holder
- Rear brake caliper

ECA21830

NOTICE

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

EAS31229

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:

- Rear shock absorber rod
Bends/damage → Replace the rear shock absorber assembly.
- Rear shock absorber assembly
Oil leaks → Replace the rear shock absorber assembly.
- Spring
Damage/wear → Replace the rear shock absorber assembly.
- Bushings
Damage/wear → Replace the rear shock absorber assembly.
- Bolts
Bends/damage/wear → Replace.

EAS31230

CHECKING THE SWINGARM

1. Check:

- Swingarm
Bends/cracks/damage → Replace.

2. Check:

- Circlip
- Oil seals
- Bearing
Damage/wear → Replace.

EAS31231

INSTALLING THE SWINGARM

1. Lubricate:

- Oil seal lips



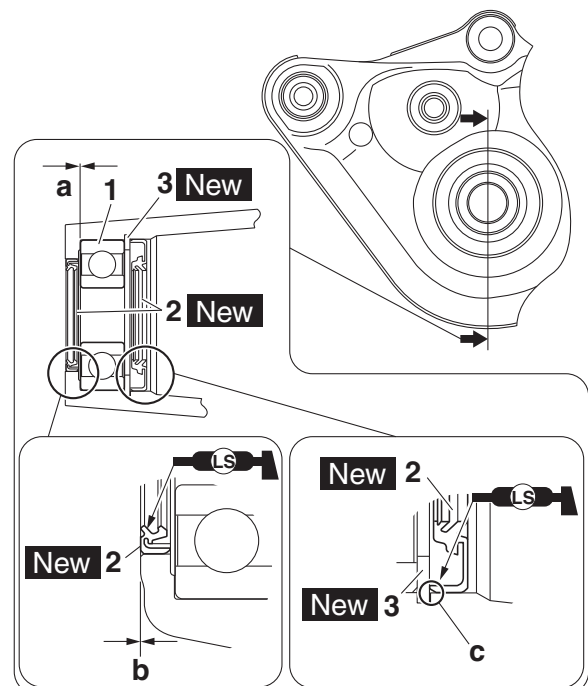
**Recommended lubricant
Lithium-soap-based grease**

2. Assemble:

- Bearing “1”
- Oil seals “2” **New**
- Circlip “3” **New**

TIP

- Install the bearing until it is flush with the surface “a” of the swingarm.
- Install the oil seal until it is flush with the surface “b” of the swingarm.
- Install the oil seal until it is contact with the surface “c” of the circlip.



3. Install:

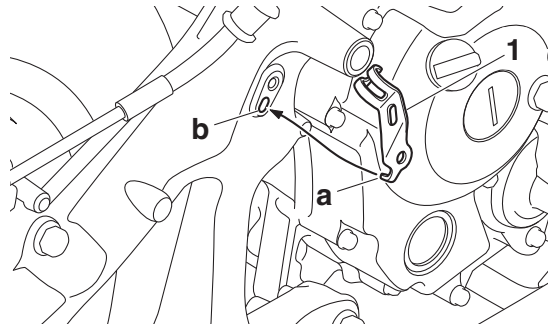
- Swingarm assembly “1”
- Spacer

REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM

- Rear wheel axle nut “2”
(temporarily tighten)
 - Swingarm mounting bolt (upper side) “3”
(temporarily tighten)
 - Swingarm mounting bolt (lower side) “4”
(temporarily tighten)
4. Tighten:
- Rear wheel axle nut “2”
 - Swingarm mounting bolt (upper side) “3”
 - Swingarm mounting bolt (lower side) “4”

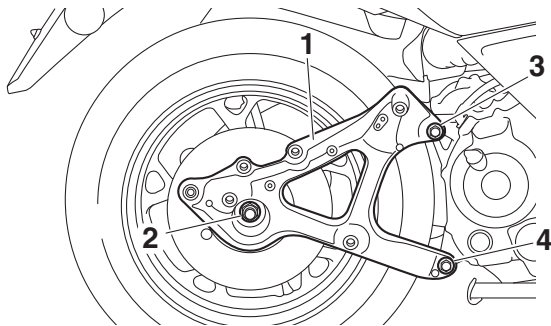


Rear wheel axle nut
125 N·m (12.5 kgf·m, 92 lb·ft)
Swingarm mounting bolt
57 N·m (5.7 kgf·m, 42 lb·ft)



TIP

Tighten the rear wheel axle nut “2”, then the swingarm mounting bolts “3”, “4”.



5. Install:

- Rear shock absorber assemblies



Rear shock absorber assembly bolt
30 N·m (3.0 kgf·m, 22 lb·ft)
Rear shock absorber assembly bolt
23 N·m (2.3 kgf·m, 17 lb·ft)

TIP

Tighten the rear shock absorber assembly bolts temporarily, and then tighten them to specification.

6. Install:

- Rear brake hose holder “1”



Rear brake hose holder bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP

Fit the projection “a” on the rear brake hose holder into the hole “b” in the swingarm.

ENGINE

LUBRICATION SYSTEM CHART AND DIAGRAMS	5-1
ENGINE OIL LUBRICATION CHART	5-1
LUBRICATION DIAGRAMS	5-2
ENGINE INSPECTION	5-5
MEASURING THE COMPRESSION PRESSURE	5-5
CHECKING THE BREATHER HOSES	5-6
ENGINE REMOVAL	5-7
INSTALLING THE ENGINE.....	5-11
CONNECTING THE LEADS	5-11
INSTALLING THE EXHAUST PIPE AND MUFFLER.....	5-12
CYLINDER HEAD	5-13
REMOVING THE CYLINDER HEAD.....	5-17
CHECKING THE CYLINDER HEAD	5-17
CHECKING THE CAMSHAFT SPROCKET	5-18
CHECKING THE TIMING CHAIN TENSIONER.....	5-18
INSTALLING THE CYLINDER HEAD	5-18
CAMSHAFT	5-22
REMOVING THE CAMSHAFT	5-23
CHECKING THE CAMSHAFT ASSEMBLY	5-23
CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS	5-23
INSTALLING THE CAMSHAFT.....	5-24
VALVES AND VALVE SPRINGS	5-26
REMOVING THE VALVES.....	5-27
CHECKING THE VALVES AND VALVE GUIDES	5-27
CHECKING THE VALVE SEATS.....	5-29
CHECKING THE VALVE SPRINGS.....	5-30
INSTALLING THE VALVES	5-30
CYLINDER AND PISTON	5-32
REMOVING THE PISTON	5-33
CHECKING THE CYLINDER AND PISTON	5-33
CHECKING THE PISTON RINGS.....	5-34
CHECKING THE PISTON PIN	5-35
CHECKING THE TIMING CHAIN GUIDE (EXHAUST SIDE)	5-35
INSTALLING THE PISTON AND CYLINDER	5-35

V-BELT AUTOMATIC TRANSMISSION	5-37
REMOVING THE PRIMARY FIXED SHEAVE	5-40
REMOVING THE SECONDARY SHEAVE	5-40
DISASSEMBLING THE SECONDARY SHEAVE.....	5-40
CHECKING THE CLUTCH HOUSING	5-41
CHECKING THE CLUTCH SHOES	5-41
CHECKING THE V-BELT	5-41
CHECKING THE PRIMARY SHEAVE	5-41
CHECKING THE PRIMARY SHEAVE WEIGHTS.....	5-42
CHECKING THE PRIMARY SHEAVE SLIDERS	5-42
CHECKING THE SECONDARY SHEAVE	5-42
ASSEMBLING THE SECONDARY SHEAVE.....	5-42
ASSEMBLING THE PRIMARY FIXED SHEAVE	5-43
INSTALLING THE PRIMARY SHEAVE, V-BELT AND SECONDARY SHEAVE	5-44
 GENERATOR AND STARTER CLUTCH.....	 5-46
REMOVING THE GENERATOR.....	5-49
REMOVING THE STARTER CLUTCH	5-49
CHECKING THE STARTER CLUTCH	5-49
INSTALLING THE STARTER CLUTCH	5-50
INSTALLING THE GENERATOR.....	5-50
 ELECTRIC STARTER	 5-52
CHECKING THE STARTER MOTOR	5-54
ASSEMBLING THE STARTER MOTOR.....	5-55
INSTALLING THE STARTER MOTOR	5-55
 OIL PUMP.....	 5-56
CHECKING THE OIL STRAINER	5-59
CHECKING THE OIL PUMP	5-59
CHECKING THE OIL PUMP DRIVE CHAIN	5-59
ASSEMBLING THE OIL PUMP.....	5-59
INSTALLING THE OIL PUMP	5-60
 CRANKCASE	 5-61
DISASSEMBLING THE CRANKCASE.....	5-63
CHECKING THE CRANKCASE	5-63
CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDE	5-63
CHECKING THE RELIEF VALVE	5-63
CHECKING THE OIL STRAINER	5-63
ASSEMBLING THE CRANKCASE.....	5-63

CRANKSHAFT	5-65
REMOVING THE CRANKSHAFT JOURNAL BEARINGS	5-67
CHECKING THE CRANKSHAFT AND CONNECTING ROD	5-67
CHECKING THE BALANCER SHAFT ASSEMBLY	5-70
INSTALLING THE CONNECTING ROD	5-70
INSTALLING THE CRANKSHAFT JOURNAL BEARINGS.....	5-71
INSTALLING THE CRANKSHAFT ASSEMBLY AND BALANCER SHAFT ASSEMBLY	5-72
 TRANSMISSION.....	 5-73
CHECKING THE TRANSMISSION	5-75
INSTALLING THE TRANSMISSION	5-75

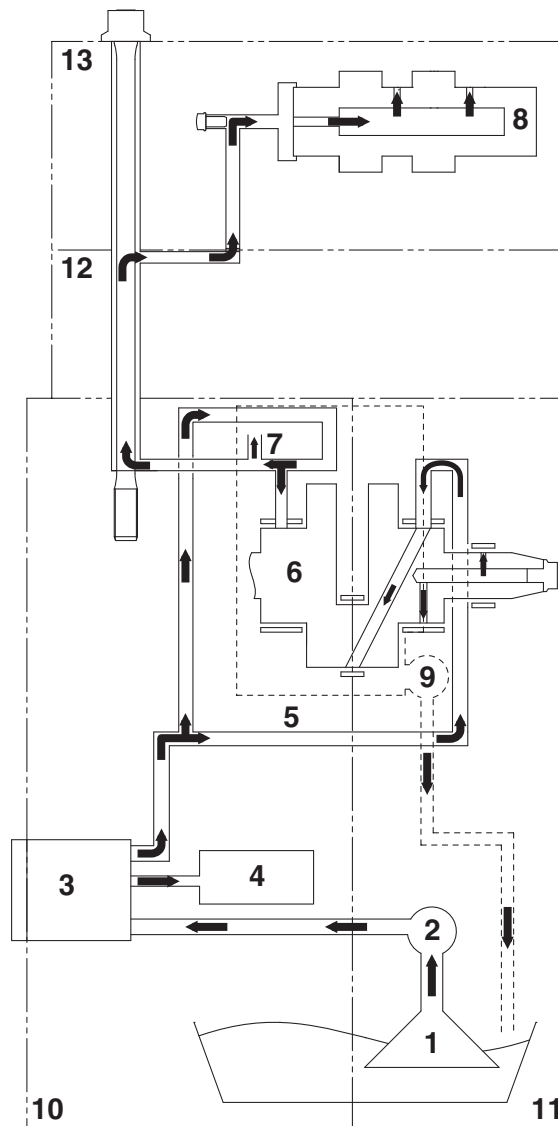
LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20298

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS32362

ENGINE OIL LUBRICATION CHART

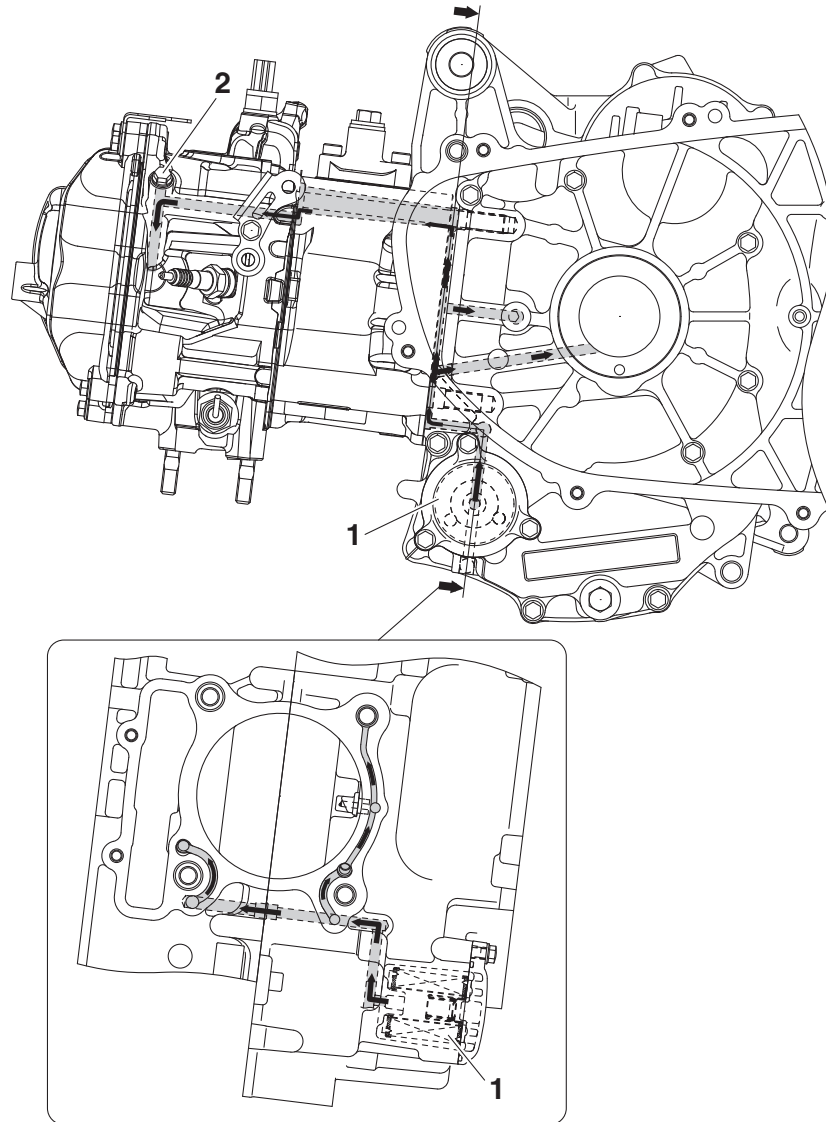


1. Oil strainer
2. Oil pump (feed)
3. Oil filter element
4. Relief valve assembly
5. Main gallery
6. Crankshaft
7. To piston
8. Camshaft
9. Oil pump (scavenge)
10. Crankcase (left)
11. Crankcase (right)
12. Cylinder
13. Cylinder head

LUBRICATION SYSTEM CHART AND DIAGRAMS

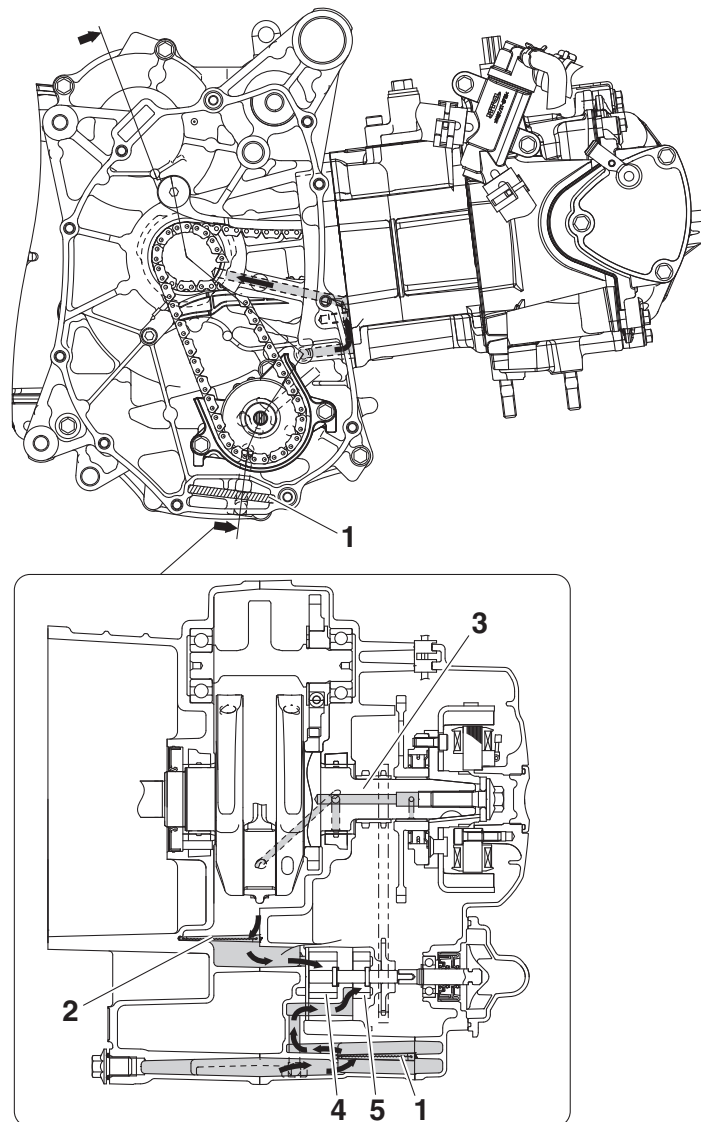
EAS32363

LUBRICATION DIAGRAMS



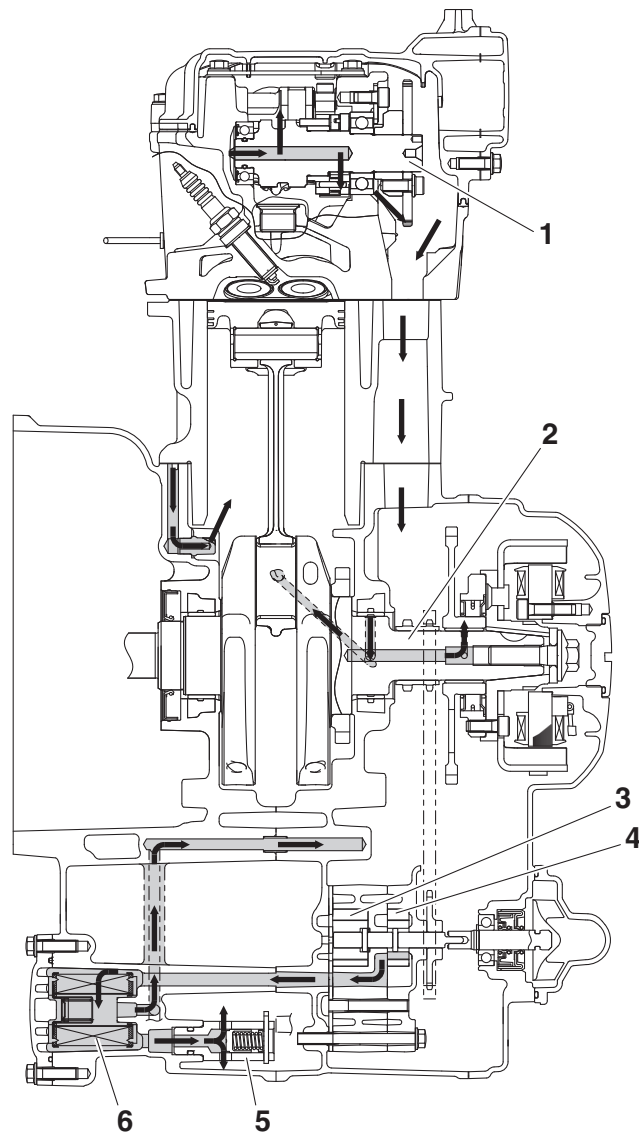
- 1. Oil filter element
- 2. Engine oil check bolt

LUBRICATION SYSTEM CHART AND DIAGRAMS



1. Oil strainer (feed)
2. Oil strainer (scavenge)
3. Crankshaft
4. Oil pump (scavenge)
5. Oil pump (feed)

LUBRICATION SYSTEM CHART AND DIAGRAMS



1. Camshaft
2. Crankshaft
3. Oil pump (scavenge)
4. Oil pump (feed)
5. Relief valve assembly
6. Oil filter element

EAS20041

ENGINE INSPECTION

EAS30249

MEASURING THE COMPRESSION PRESSURE

TIP

Insufficient compression pressure will result in a loss of performance.

1. Measure:

- Valve clearance
Out of specification → Adjust.
Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-5.

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

3. Remove:

- Storage box
Refer to “GENERAL CHASSIS (4)” on page 4-10.

4. Disconnect:

- Spark plug cap

5. Remove:

- Spark plug

ECA20470

NOTICE

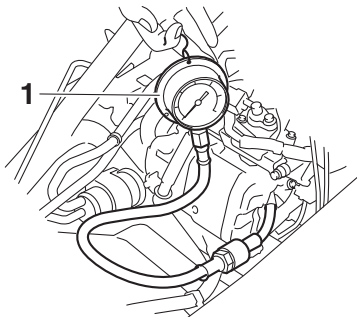
Before removing the spark plug, use compressed air to blow away any dirt accumulated in the spark plug well to prevent it from falling into the cylinder.

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).



Compression pressure
783–1008 kPa/860 r/min (7.8–
10.1 kgf/cm²/860 r/min, 111.4–
143.4 psi/860 r/min)

- Turn the main switch to “ON”.
- With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

EWA12960

WARNING

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

- 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 ring(s) possibly defective → Repair.

8. Install:

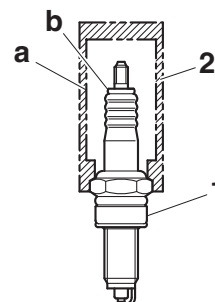
- Spark plug “1”



Spark plug
13 N·m (1.3 kgf·m, 9.6 lb·ft)

TIP

When tightening the spark plug, make sure that the inside “a” of the spark plug wrench “2” does not contact the portion “b” of the spark plug.



9. Connect:
 - Spark plug cap
10. Install:
 - Storage boxRefer to “GENERAL CHASSIS (4)” on page 4-10.

EAS31742

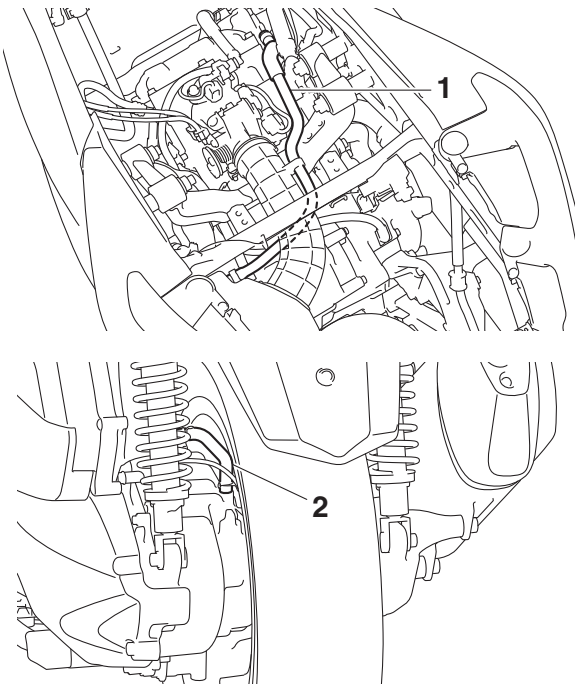
CHECKING THE BREATHER HOSES

1. Remove:
 - Storage boxRefer to “GENERAL CHASSIS (4)” on page 4-10.
2. Check:
 - Cylinder head breather hose “1”
 - Transmission case breather hose “2”Cracks/damage → Replace.
Loose connections → Connect properly.

ECA21600

NOTICE

Make sure the cylinder head breather hose and transmission case breather hose are routed correctly.

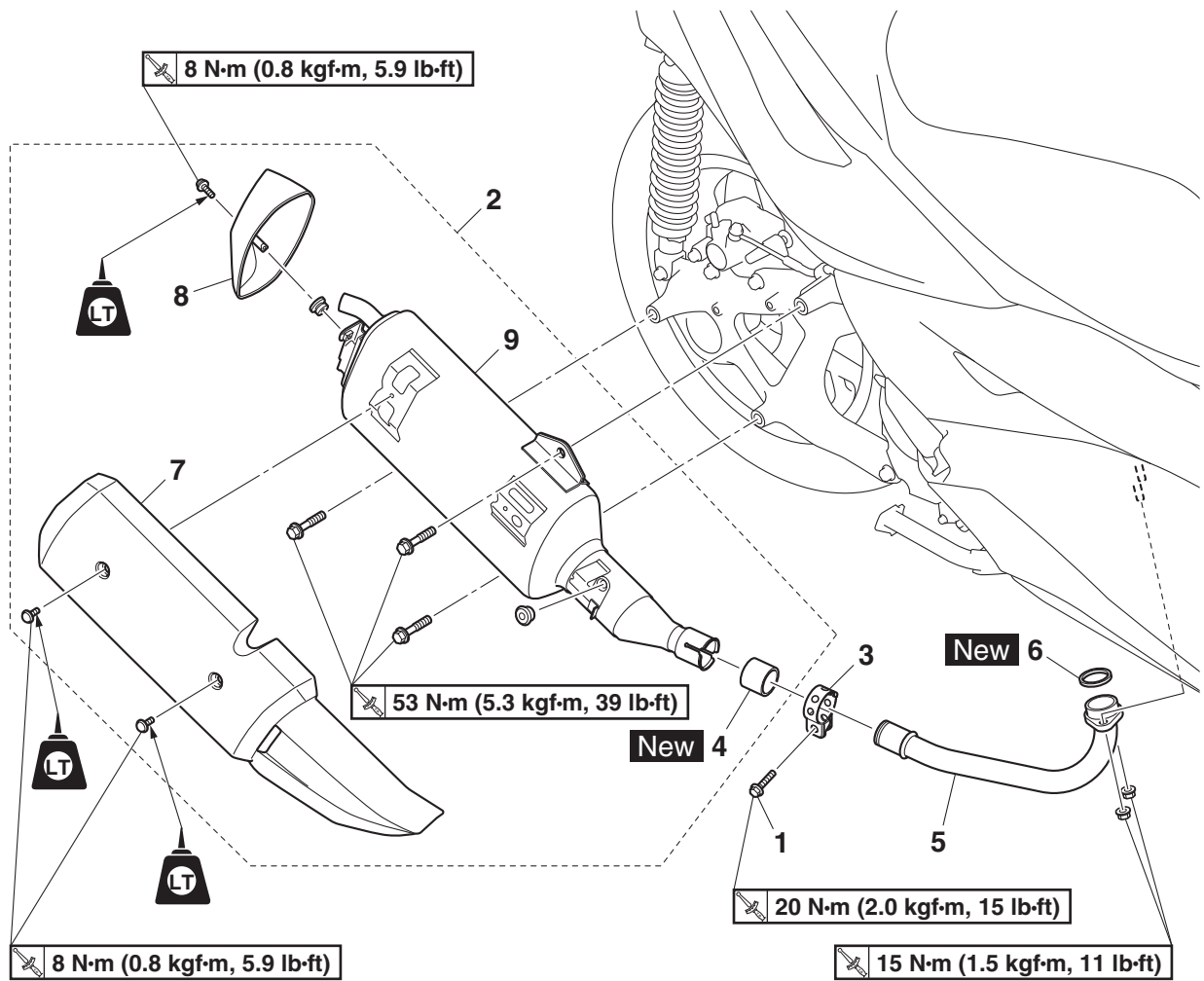


3. Install:
 - Storage boxRefer to “GENERAL CHASSIS (4)” on page 4-10.

EAS20042

ENGINE REMOVAL

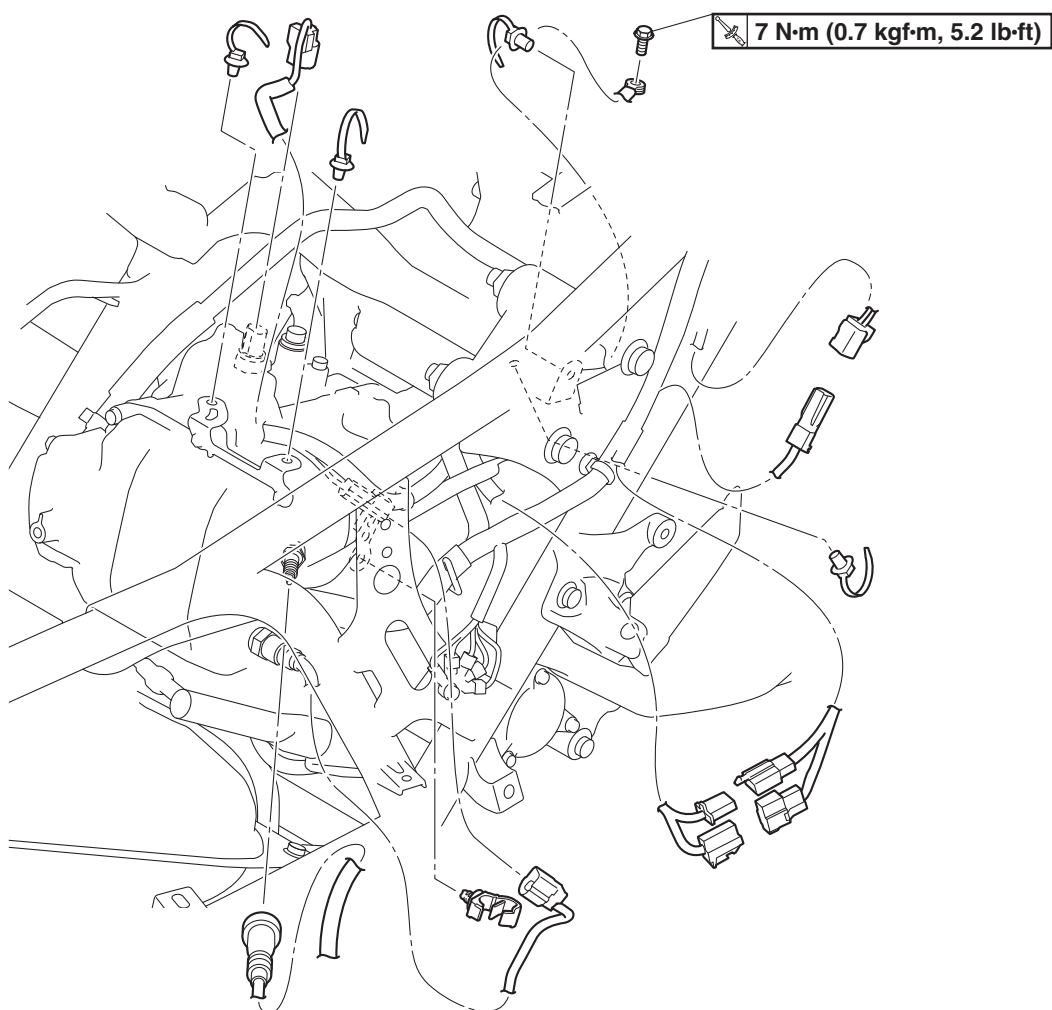
Removing the muffler and exhaust pipe



Order	Job/Parts to remove	Q'ty	Remarks
1	Clamp bolt	1	Loosen.
2	Muffler assembly	1	
3	Clamp	1	
4	Gasket	1	
5	Exhaust pipe	1	
6	Exhaust gasket	1	
7	Muffler protector	1	
8	Muffler cap	1	
9	Muffler	1	

ENGINE REMOVAL

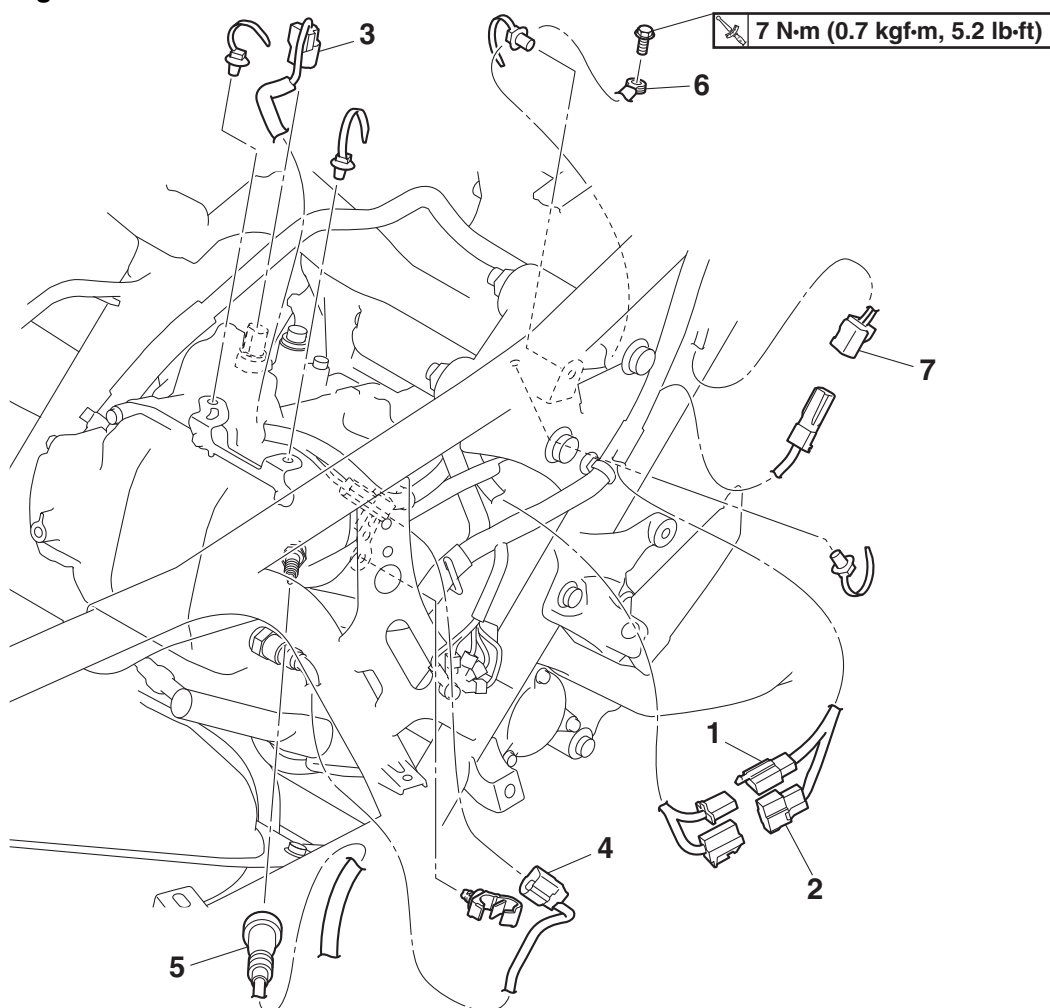
Disconnecting the leads



Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-19.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-21.
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Bottom cover assembly		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Rear lower cowling assembly		Refer to "GENERAL CHASSIS (8)" on page 4-23.
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-51.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-7.

ENGINE REMOVAL

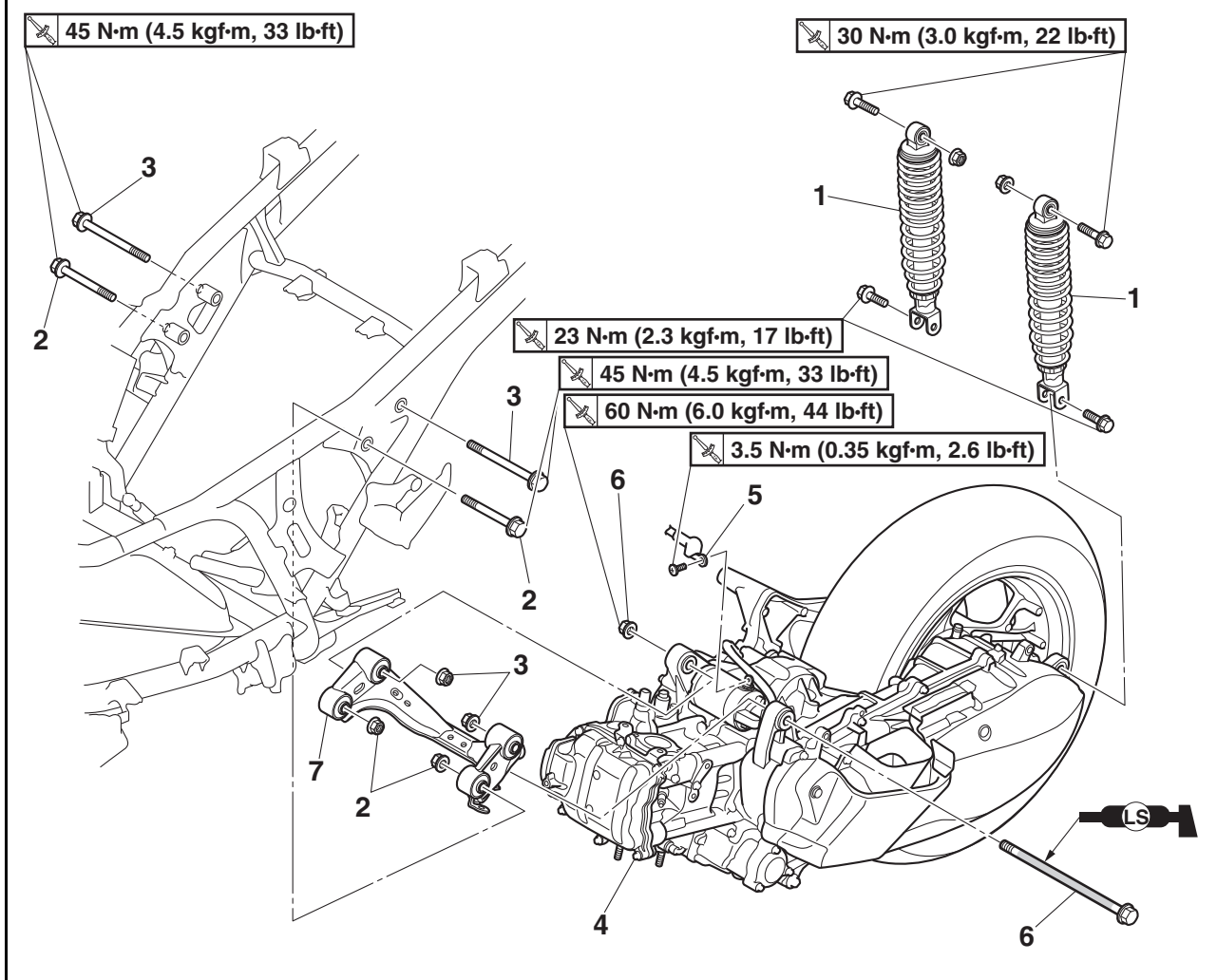
Disconnecting the leads



Order	Job/Parts to remove	Q'ty	Remarks
	Thermostat assembly		Refer to "THERMOSTAT" on page 6-6.
	Fuel injector		Refer to "FUEL INJECTOR" on page 7-8.
	Air filter case joint		Refer to "AIR FILTER CASE" on page 7-11.
	Intake manifold		Refer to "THROTTLE BODY" on page 7-13.
1	Crankshaft position sensor coupler	1	Disconnect.
2	Stator coil coupler	1	Disconnect.
3	Coolant temperature sensor coupler	1	Disconnect.
4	O ₂ sensor coupler	1	Disconnect.
5	Spark plug cap	1	Disconnect.
6	Engine ground lead	1	Disconnect.
7	Rear wheel sensor coupler	1	Disconnect.

ENGINE REMOVAL

Removing the engine



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear shock absorber assembly	2	
2	Engine mounting nut/bolt (front side)	2/2	
3	Engine mounting nut/bolt (rear side)	2/2	
4	Engine	1	
5	Starter motor lead	1	Disconnect.
6	Engine bracket nut/bolt	1/1	
7	Engine bracket	1	

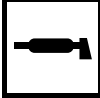
ENGINE REMOVAL

EAS30251

INSTALLING THE ENGINE

1. Lubricate:

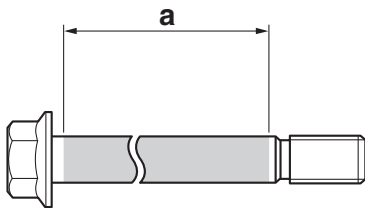
- Engine bracket bolt "1"



Recommended lubricant
Lithium-soap-based grease

TIP

Apply lithium-soap-based grease to the area "a" shown in the illustration. Do not apply lithium-soap-based grease to the threads on the end of the bolt.



2. Install:

- Engine bracket "1"
- (to the engine)
- Engine bracket bolt/nut "2"

TIP

Do not fully tighten the nut.

3. Tighten:

- Engine bracket nut



Engine bracket nut
60 N·m (6.0 kgf·m, 44 lb·ft)

4. Connect:

- Starter motor lead "3"



Starter motor lead screw
3.5 N·m (0.35 kgf·m, 2.6 lb·ft)

5. Install:

- Engine "4"
- Engine mounting bolt/nut (rear side) "5"
- Engine mounting bolt/nut (front side) "6"

TIP

Do not fully tighten the nut.

6. Tighten:

- Engine mounting bolt (rear side)
- Engine mounting bolt (front side)



Engine mounting bolt (rear side)
45 N·m (4.5 kgf·m, 33 lb·ft)
Engine mounting bolt (front side)
45 N·m (4.5 kgf·m, 33 lb·ft)

7. Install:

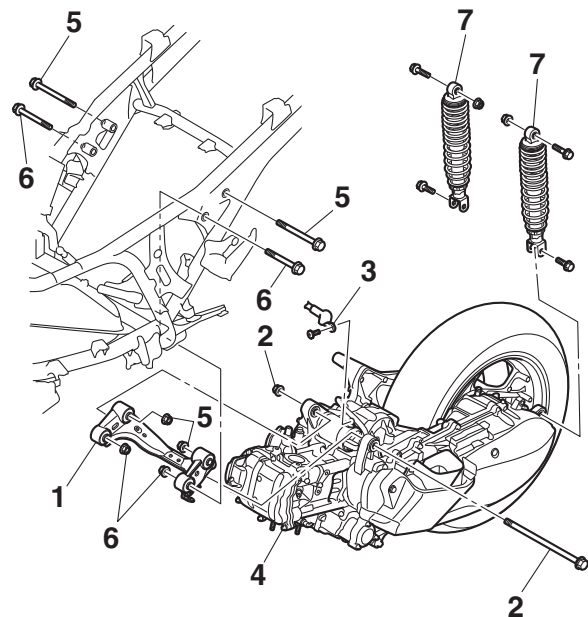
- Rear shock absorber assemblies "7"



Rear shock absorber assembly bolt
30 N·m (3.0 kgf·m, 22 lb·ft)
Rear shock absorber assembly bolt
23 N·m (2.3 kgf·m, 17 lb·ft)

TIP

Tighten the rear shock absorber assembly bolts temporarily, and then tighten them to specification.



EAS31717

CONNECTING THE LEADS

1. Connect:

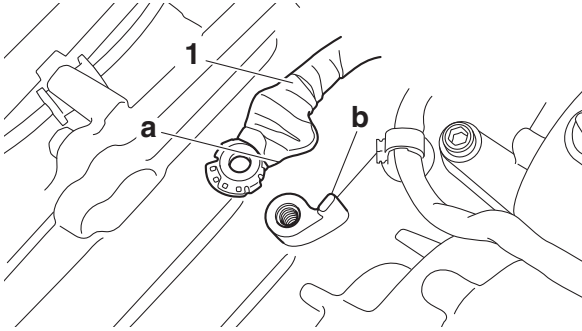
- Engine ground lead "1"



Engine ground lead bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP

Make sure that the engine ground lead terminal "a" contacts the stopper "b" on the crankcase.



EAS30252

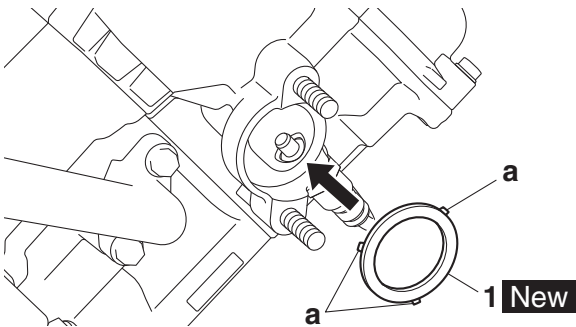
INSTALLING THE EXHAUST PIPE AND MUFFLER

1. Install:

- Exhaust gasket “1” **New**
(to the cylinder head)

TIP

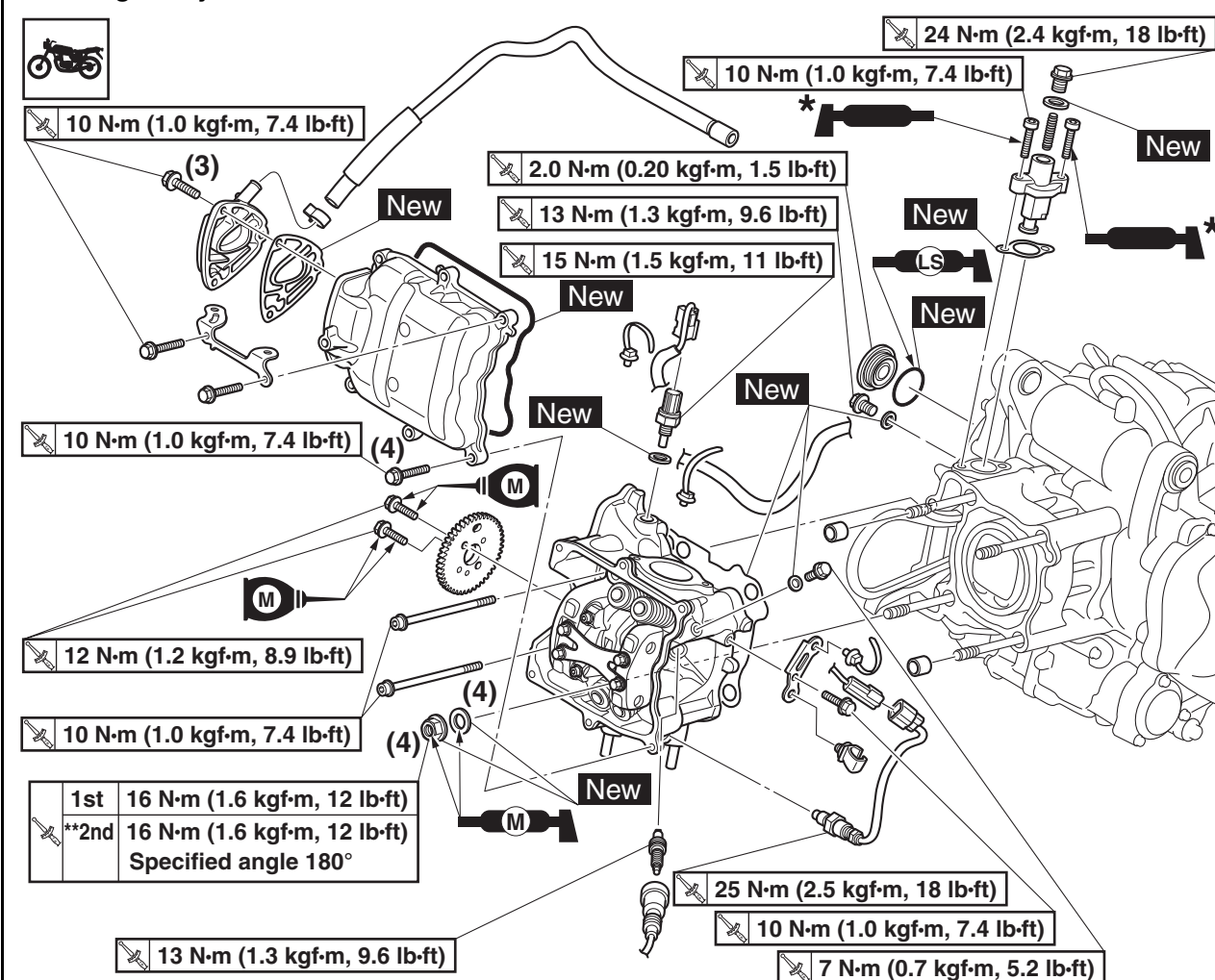
Install the exhaust gasket with its projections “a” facing toward the cylinder head.



EAS20044

CYLINDER HEAD

Removing the cylinder head

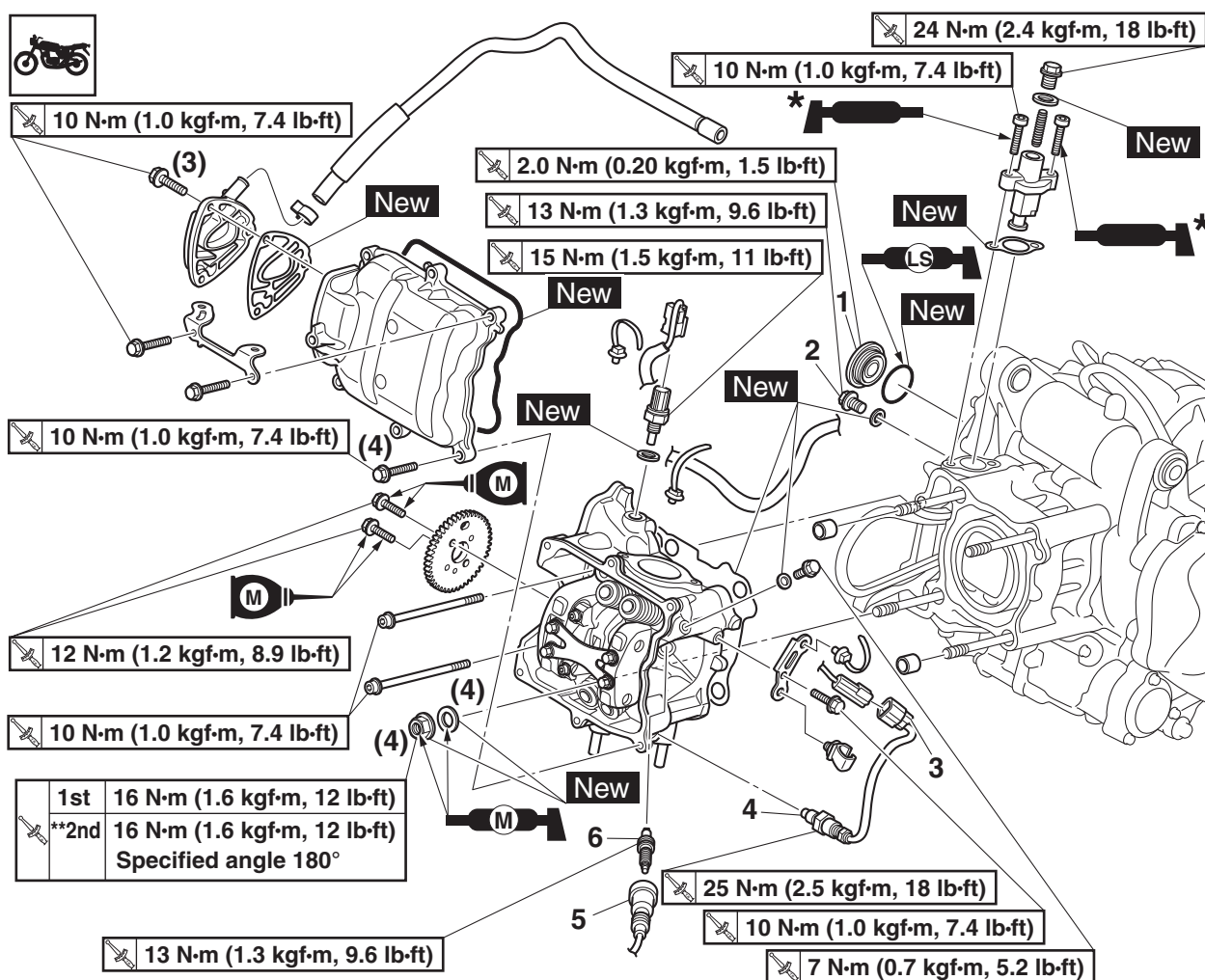


* Apply Yamaha bond No.1215 (90890-85505).

** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque (after loosening the bolt, retighten it before loosening the next bolt).

Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Bottom cover assembly		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-7.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-21.
	Thermostat assembly		Refer to "THERMOSTAT" on page 6-6.

Removing the cylinder head



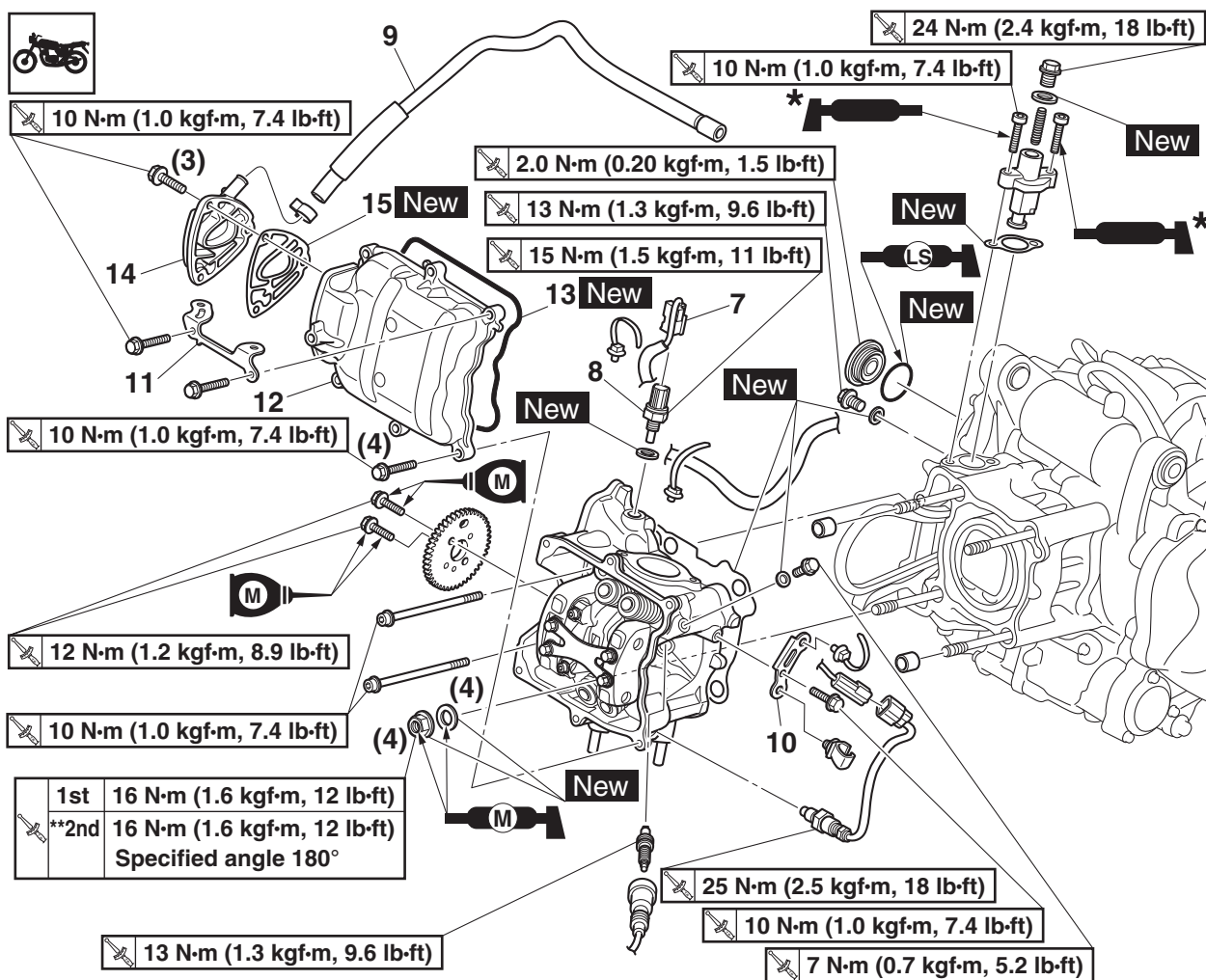
* Apply Yamaha bond No.1215 (90890-85505).

** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque (after loosening the bolt, retighten it before loosening the next bolt).

Order	Job/Parts to remove	Q'ty	Remarks
	Fuel injector		Refer to "FUEL INJECTOR" on page 7-8.
	Air filter case joint		Refer to "AIR FILTER CASE" on page 7-11.
	Intake manifold		Refer to "THROTTLE BODY" on page 7-13.
1	Crankshaft end cover	1	
2	Timing mark accessing bolt	1	
3	O ₂ sensor coupler	1	Disconnect.
4	O ₂ sensor	1	TIP Remove the O ₂ sensor only when necessary.
5	Spark plug cap	1	Disconnect.
6	Spark plug	1	

CYLINDER HEAD

Removing the cylinder head



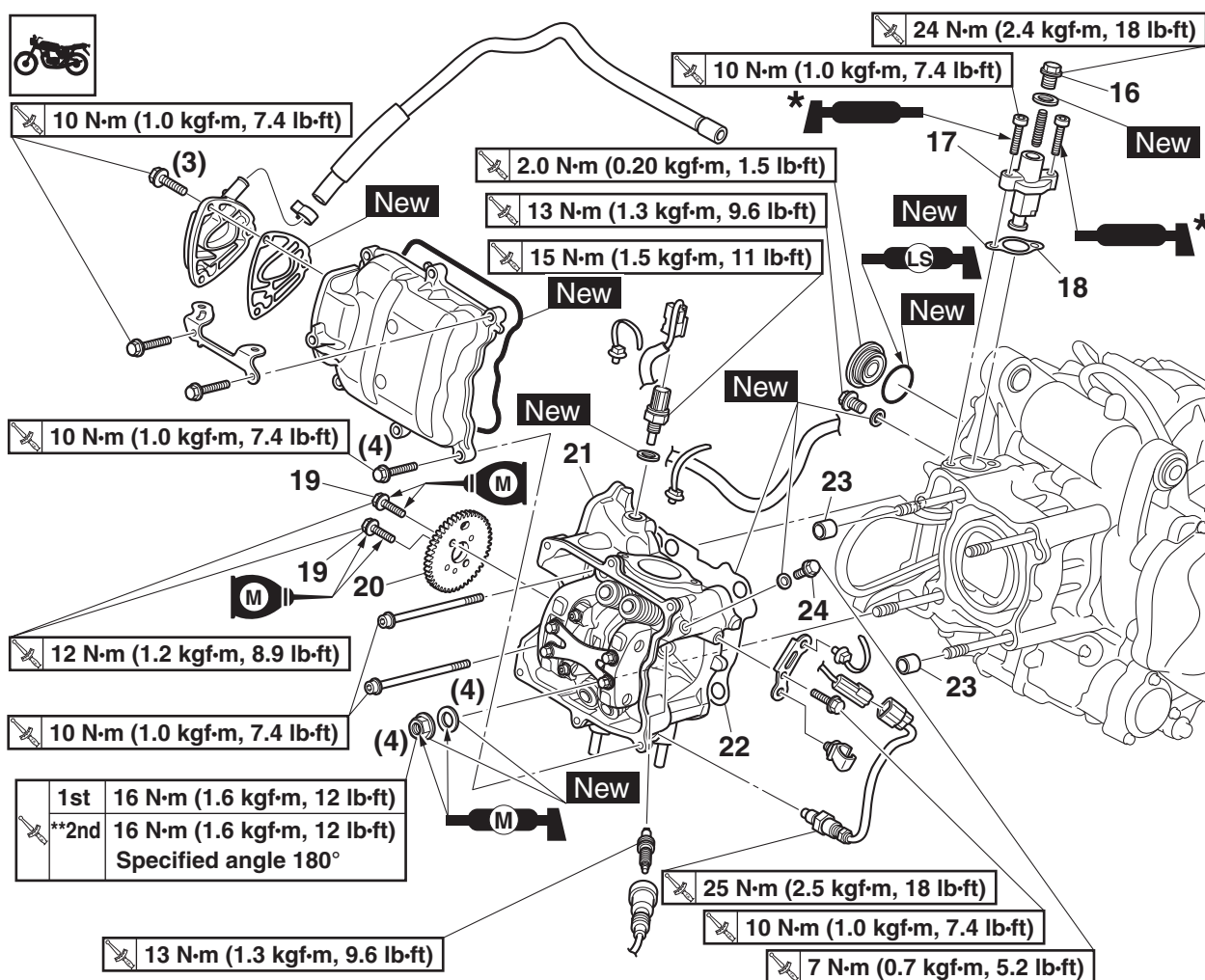
*** Apply Yamaha bond No.1215 (90890-85505).**

**** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque (after loosening the bolt, retighten it before loosening the next bolt).**

Order	Job/Parts to remove	Q'ty	Remarks
7	Coolant temperature sensor coupler	1	Disconnect.
8	Coolant temperature sensor	1	
9	Cylinder head breather hose	1	
10	Bracket 1	1	
11	Bracket 2	1	
12	Cylinder head cover	1	
13	Cylinder head cover gasket	1	
14	Cylinder head breather cover	1	
15	Cylinder head breather cover gasket	1	

CYLINDER HEAD

Removing the cylinder head



* Apply Yamaha bond No.1215 (90890-85505).

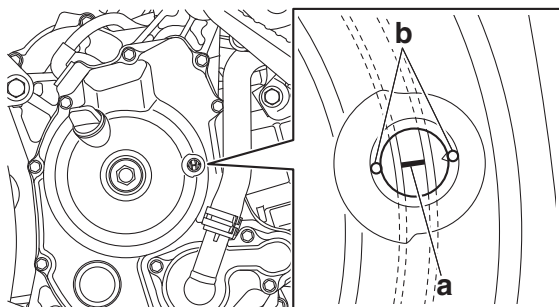
** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque (after loosening the bolt, retighten it before loosening the next bolt).

Order	Job/Parts to remove	Q'ty	Remarks
16	Timing chain tensioner cap bolt	1	
17	Timing chain tensioner	1	
18	Timing chain tensioner gasket	1	
19	Camshaft sprocket bolt	2	
20	Camshaft sprocket	1	
21	Cylinder head	1	
22	Cylinder head gasket	1	
23	Dowel pin	2	
24	Engine oil check bolt	1	

EAS30276

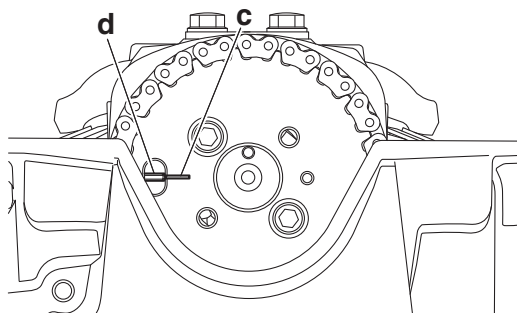
REMOVING THE CYLINDER HEAD

1. Remove:
 - Crankshaft end cover
 - Timing mark accessing bolt
2. Align:
 - Mark "a" on the generator rotor (with the slots "b" in the generator rotor cover)
 - a. Turn the crankshaft clockwise.
 - b. Position the mark "a" on the generator rotor on both sides of the slots "b" in the generator rotor cover.



TIP

When the piston is at TDC on the compression stroke, align the "I" mark "c" on the camshaft sprocket with the match mark "d" on the cylinder head.



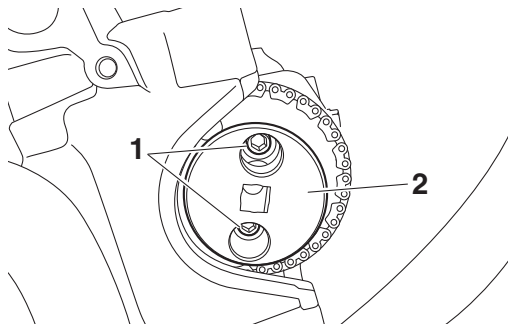
3. Remove:
 - Camshaft sprocket bolts "1"
 - Camshaft sprocket

TIP

- Use the camshaft sprocket stopper "2" and loosen the camshaft sprocket bolts.
- To prevent the timing chain from falling into the crankcase, fasten it with a wire.



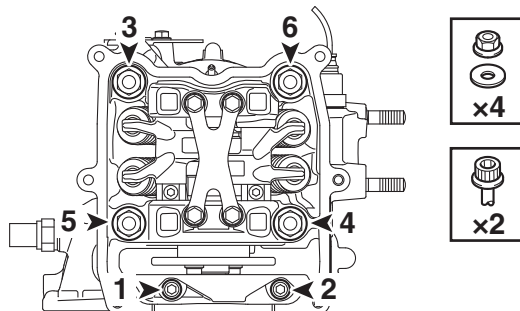
Camshaft sprocket stopper
90890-04182
Camshaft sprocket stopper
YM-04182



4. Remove:
 - Cylinder head

TIP

- Loosen the bolts and nuts in the proper sequence as shown.
- Loosen each bolt and nuts 1/2 of a turn at a time. After all of the bolts and nuts are fully loosened, remove them.



EAS30277

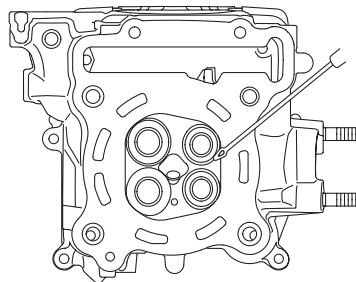
CHECKING THE CYLINDER HEAD

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 head

Damage/scratches → Replace.

- Cylinder head water jacket
Mineral deposits/rust → Eliminate.

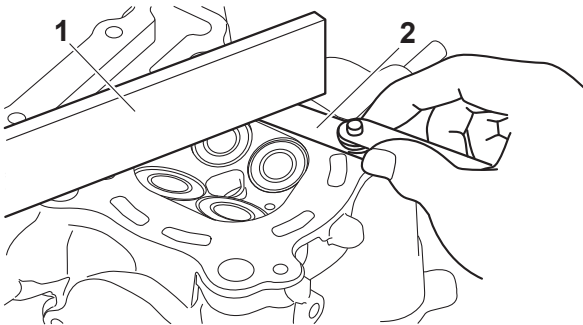
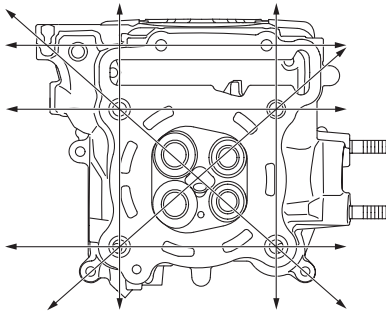
3. Measure:

- Cylinder head warpage
Out of specification → Resurface the cylinder head.



Warpage limit
0.05 mm (0.0020 in)

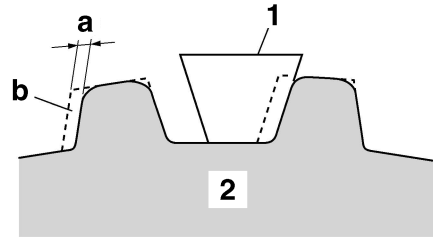
- Place a straightedge "1" and a thickness gauge "2" across the cylinder head.



- Measure the warpage.
- If the limit is exceeded, resurface the cylinder head as follows.
- Place 400–600 grit wet sandpaper on the 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.

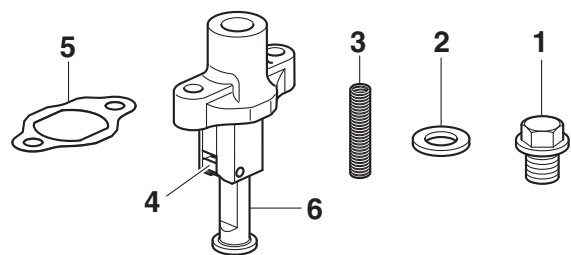


- 1/4 tooth
 - Correct
- Timing chain roller
 - Camshaft sprocket

EAS30279

CHECKING THE TIMING CHAIN TENSIONER

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



EAS31232

CHECKING THE CAMSHAFT SPROCKET

- Check:
 - Camshaft sprocket
More than 1/4 tooth wear "a" → Replace the camshaft sprocket, timing chain and crankshaft as a set.

EAS30282

INSTALLING THE CYLINDER HEAD

- Tighten:
 - Cylinder head nuts "1"
 - Cylinder head bolts "2"

CYLINDER HEAD



Cylinder head nut

1st: 16 N·m (1.6 kgf·m, 12 lb·ft)

*2nd: 16 N·m (1.6 kgf·m, 12 lb·ft),
and then tighten the bolts to the
specified angle 180°

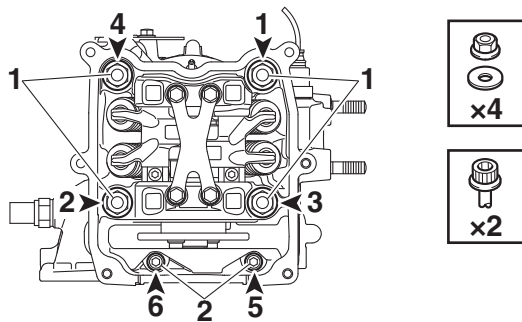
Cylinder head bolt

10 N·m (1.0 kgf·m, 7.4 lb·ft)

*Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque (after loosening the bolt, retighten it before loosening the next bolt).

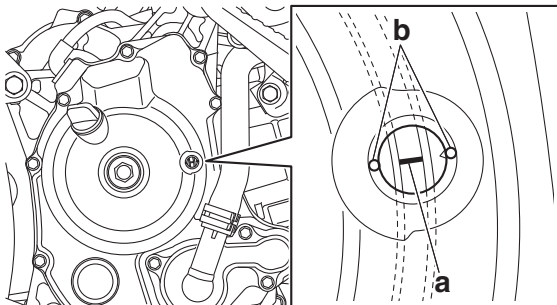
TIP

- Lubricate the cylinder head nuts and washers with molybdenum disulfide grease.
- Replace the cylinder head bolts, nuts and washers with new ones.
- Tighten the cylinder head nuts and bolts in the proper tightening sequence as shown.



2. Align:

- Mark "a" on the generator rotor (with the slots "b" in the generator rotor cover)
 - a. Turn the crankshaft clockwise.
 - b. Position the mark "a" on the generator rotor on both sides of the slots "b" in the generator rotor cover.



3. Install:

- Camshaft sprocket "1"
- Timing chain "2"
- Camshaft sprocket bolts

- a. Install the timing chain onto the camshaft sprocket, then the camshaft sprocket onto the camshaft, and then finger tighten the camshaft sprocket bolts.

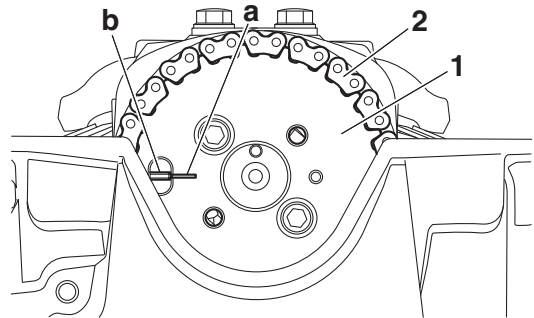
ECA20600

NOTICE

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

TIP

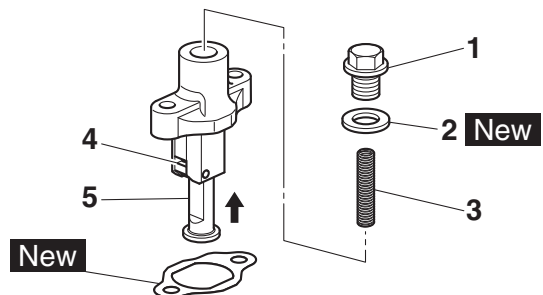
Align the "I" mark "a" on the camshaft sprocket with the match mark "b" on the cylinder head.



- b. While holding the camshaft, temporarily tighten the camshaft sprocket bolts.

4. Install:

- Timing chain tensioner gasket **New**
- Timing chain tensioner
 - a. Remove the timing chain tensioner cap bolt "1", washer "2" and spring "3".
 - b. Release the timing chain tensioner one-way cam "4" and push the timing chain tensioner rod "5" all the way into the timing chain tensioner housing.



- c. Install the gasket and the timing chain tensioner "6" onto the cylinder.

EWA17620

WARNING

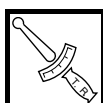
Always use a new gasket.

TIP

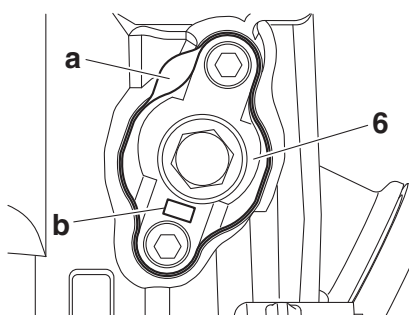
- Install the timing chain tensioner gasket so that the tab “a” on the gasket is protruding in the direction shown in the illustration.
- The mark “b” on the timing chain tensioner should face in the direction shown in the illustration.
- Apply Yamaha bond No. 1215 to the threads of the timing chain tensioner bolts.



Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)



Timing chain tensioner bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

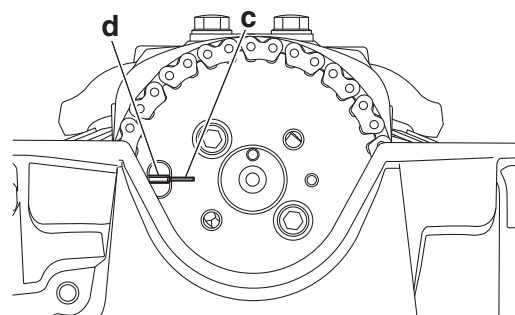
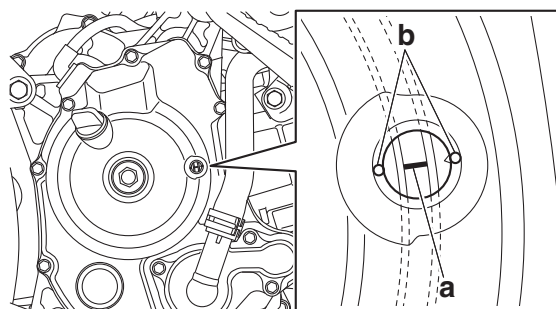


d. Install the spring, washer, and timing chain tensioner cap bolt.



Timing chain tensioner cap bolt
24 N·m (2.4 kgf·m, 18 lb·ft)

- Turn:
 - Crankshaft
(several turns clockwise)
 - Check:
 - Mark “a”
Make sure that the mark “a” on the generator rotor is positioned between the slots “b” in the generator rotor cover.
 - “I” mark “c”
Make sure the “I” mark “c” on the camshaft sprocket is aligned with the match mark “d” on the cylinder head.
- Out of alignment → Correct.
 Refer to the installation steps above.



- Tighten:
 - Camshaft sprocket bolts “1”



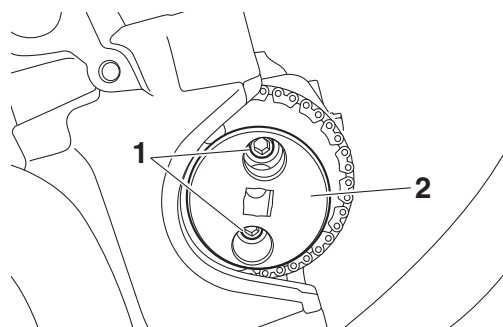
Camshaft sprocket bolt
12 N·m (1.2 kgf·m, 8.9 lb·ft)



Camshaft sprocket stopper
90890-04182
Camshaft sprocket stopper
YM-04182

TIP

Tighten the camshaft sprocket bolts with the camshaft sprocket stopper “2”.



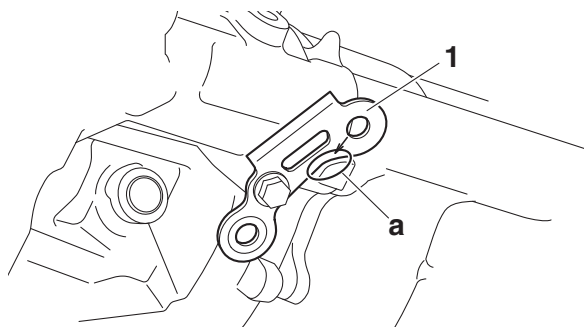
- Measure:
 - Valve clearance
Out of specification → Adjust.
Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-5.
- Install:
 - Bracket 1 “1”



Bracket bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

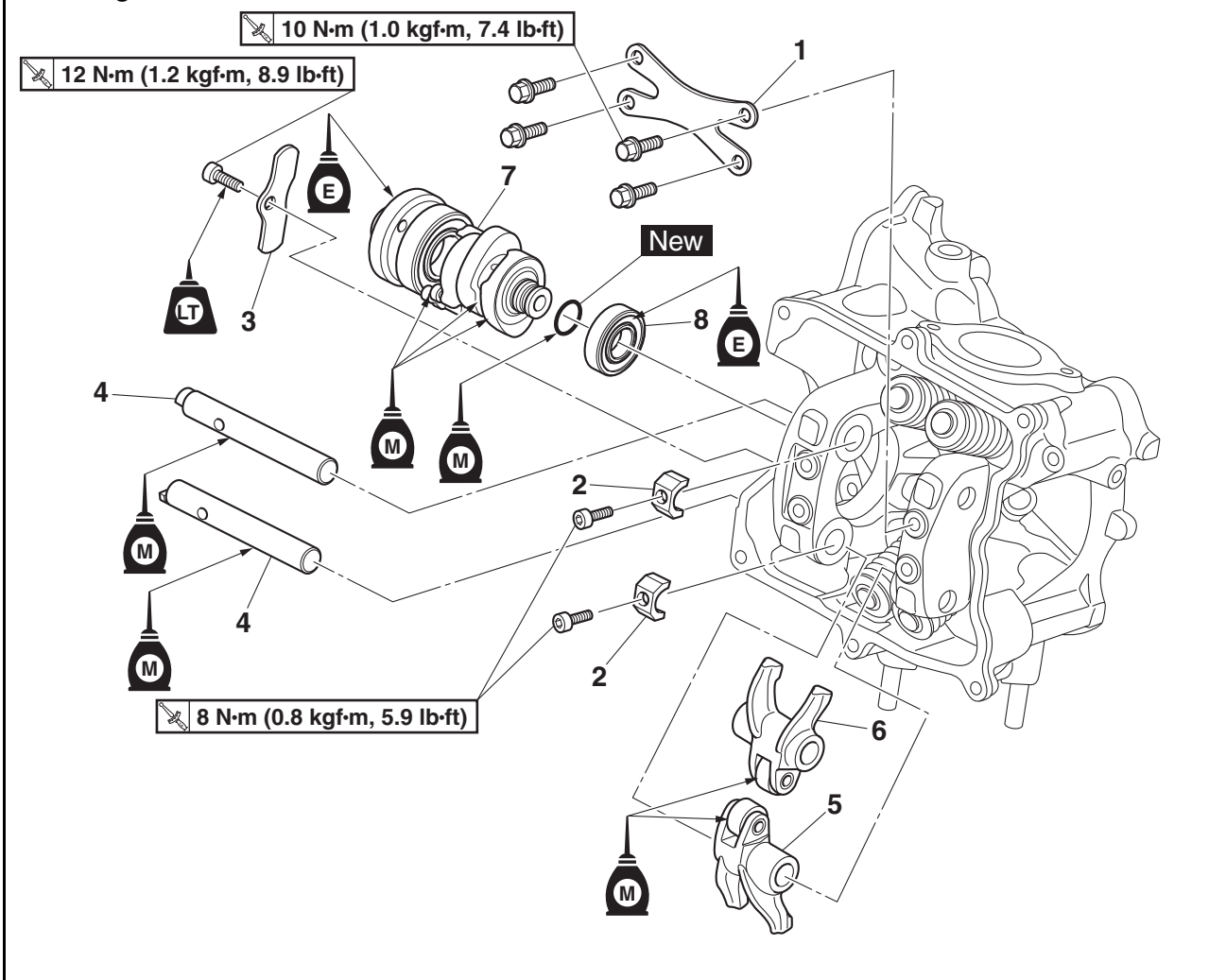
While holding the bracket 1 so that the bracket 1 the portion “a” of the cylinder head, tighten the bolt to specification.



EAS20043

CAMSHAFT

Removing the rocker arms and camshaft



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-13.
1	Camshaft stopper plate	1	
2	Collar	2	
3	Rocker arm shaft retainer	1	
4	Rocker arm shaft	2	
5	Exhaust rocker arm	1	
6	Intake rocker arm	1	
7	Camshaft assembly	1	
8	Bearing	1	

EAS30256

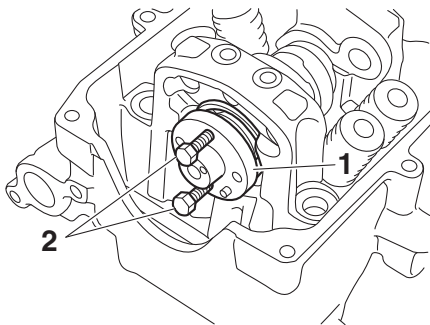
REMOVING THE CAMSHAFT

1. Remove:

- Camshaft assembly “1”

TIP

Screw the M6 bolts “2” into the threaded end of the camshaft assembly, and then pull out the camshaft.



EAS32364

CHECKING THE CAMSHAFT ASSEMBLY

1. Check:

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

2. Measure:

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



Camshaft lobe dimensions

Lobe height (Intake)

40.017–40.117 mm (1.5755–1.5794 in)

Limit

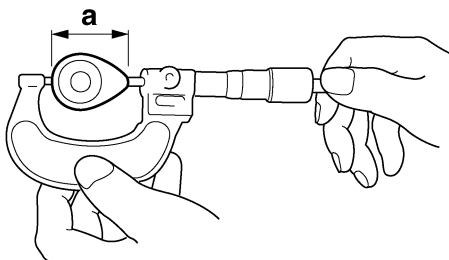
39.917 mm (1.5715 in)

Lobe height (Exhaust)

39.954–40.054 mm (1.5730–1.5769 in)

Limit

39.854 mm (1.5691 in)



3. Measure:

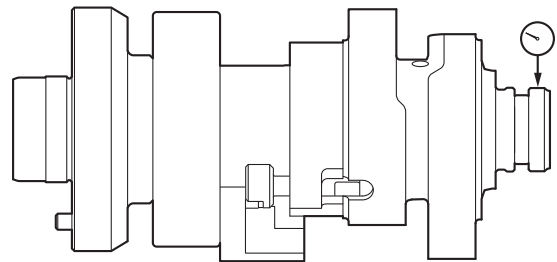
- Camshaft runout

Out of specification → Replace the camshaft assembly.



Camshaft runout limit

0.030 mm (0.0012 in)



4. Check:

- Camshaft oil passage

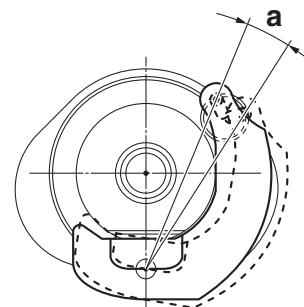
Obstruction → Blow out with compressed air.

5. Check:

- Decompression system

TIP

- Check that the decompression lever moves smoothly.
- Check that the operating range “a” of the decompression lever is the same as the range shown in the illustration.



a. 9.69°

EAS30259

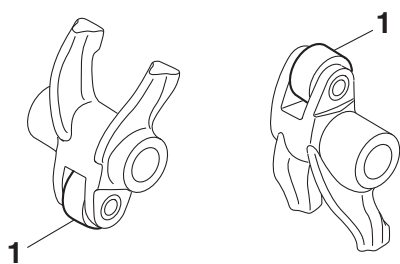
CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

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

1. Check:

- Rocker arm
- Rocker arm roller “1”

Damage/wear → Replace.



2. Check:

- Rocker arm shaft

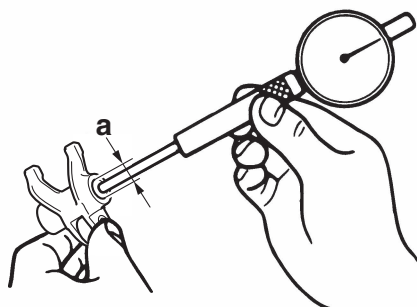
Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.

3. Measure:

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



Rocker arm inside diameter
11.985–12.000 mm (0.4719–0.4724 in)
Limit
12.015 mm (0.4730 in)

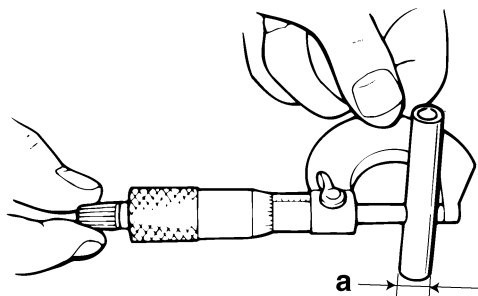


4. Measure:

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



Rocker arm shaft outside diameter
11.966–11.976 mm (0.4711–0.4715 in)
Limit
11.935 mm (0.4699 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
0.009–0.034 mm (0.0004–0.0013 in)
Limit
0.080 mm (0.0032 in)

EAS30269

INSTALLING THE CAMSHAFT

1. Lubricate:

- Camshaft assembly



Recommended lubricant
Camshaft
Molybdenum disulfide oil
Camshaft bearing
Engine oil

2. Lubricate:

- Rocker arms
- Rocker arm shafts



Recommended lubricant
Rocker arm shaft
Rocker arm roller
Molybdenum disulfide oil

3. Install:

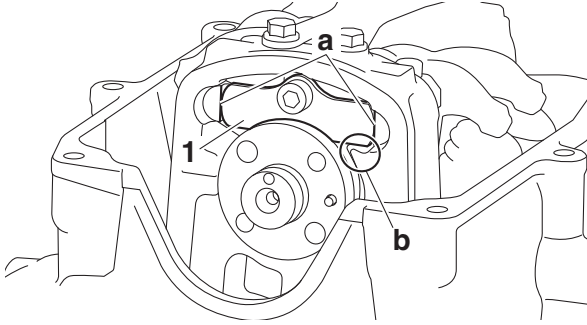
- Rocker arm shaft retainer “1”



Rocker arm shaft retainer bolt
12 N·m (1.2 kgf·m, 8.9 lb·ft)
LOCTITE®

TIP

- Before installing the rocker arm shaft retainer, make sure that the notches “a” in the rocker arm shafts face inward.
 - While holding the rocker arm shaft retainer so that the portion “b” of the retainer contact the cylinder head, tighten the bolt to specification.
-

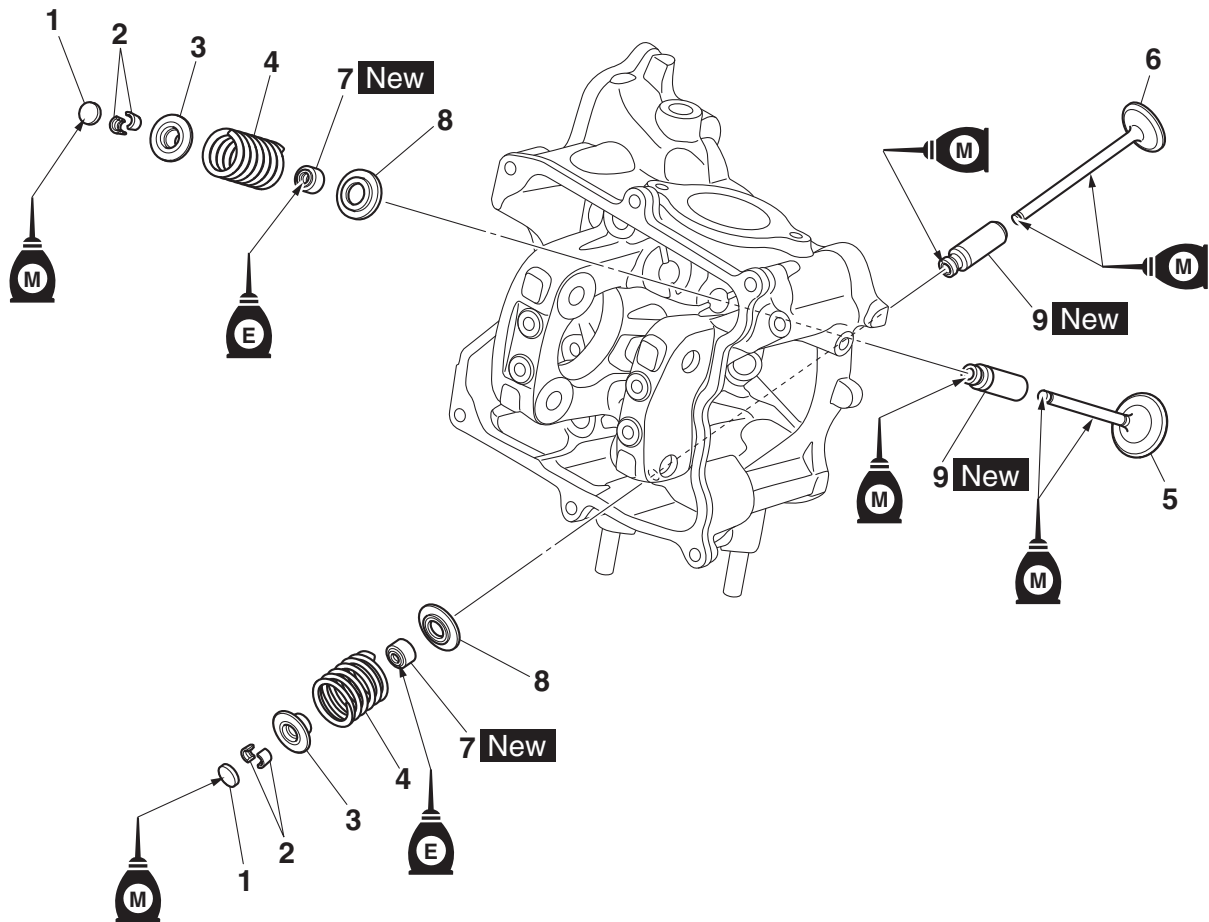


VALVES AND VALVE SPRINGS

EAS20045

VALVES AND VALVE SPRINGS

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-13.
	Camshaft/Rocker arms		Refer to "CAMSHAFT" on page 5-22.
1	Valve pad	4	
2	Valve cotter	8	
3	Valve spring retainer	4	
4	Valve spring	4	
5	Intake valve	2	
6	Exhaust valve	2	
7	Valve stem seal	4	
8	Valve spring seat	4	
9	Valve guide	4	

VALVES AND VALVE SPRINGS

EAS30283

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, valve seats), make sure the valves properly seal.

1. Check:

- Valve sealing

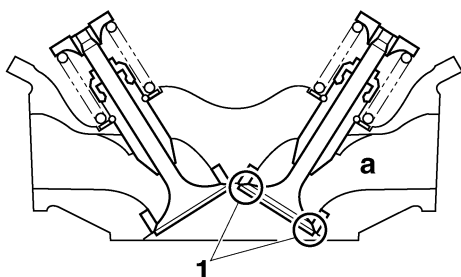
Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.

Refer to “CHECKING THE VALVE SEATS” on page 5-29.

- a. Pour a clean solvent “a” into the intake and exhaust ports.
- b. Check that the valves properly seal.

TIP

There should be no leakage at the valve seat “1”.



2. Remove:

- Valve pads
- Valve cotters “1”

TIP

Remove the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment “2”.



Valve spring compressor

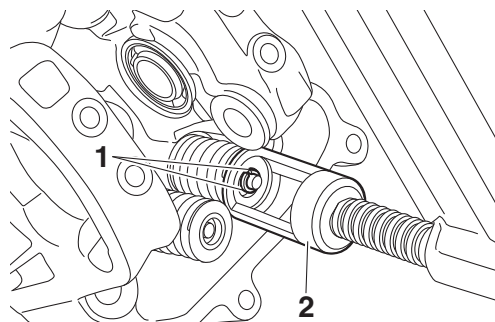
90890-04019

Valve spring compressor

YM-04019

Valve spring compressor attachment

90890-06320

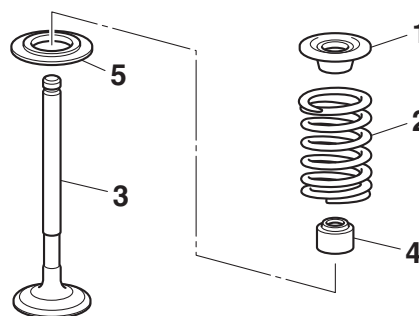


3. Remove:

- Valve spring retainer “1”
- Valve spring “2”
- Valve “3”
- Valve stem seal “4”
- Valve spring seat “5”

TIP

Identify the position of each part very carefully so that it can be reinstalled in its original place.



EAS30284

CHECKING THE VALVES AND VALVE GUIDES

The following procedure applies to all of the valves and valve guides.

1. Measure:

- Valve-stem-to-valve-guide clearance
Out of specification → Replace the valve guide.

Valve-stem-to-valve-guide clearance =
Valve guide inside diameter “a” -
Valve stem diameter “b”

VALVES AND VALVE SPRINGS



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

0.010–0.037 mm (0.0004–0.0015 in)

Limit

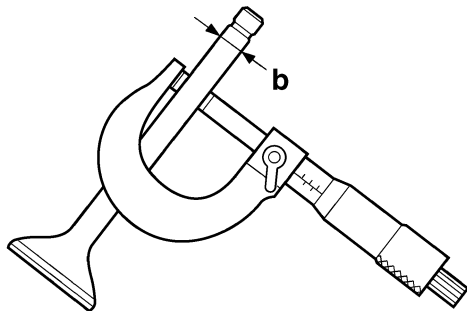
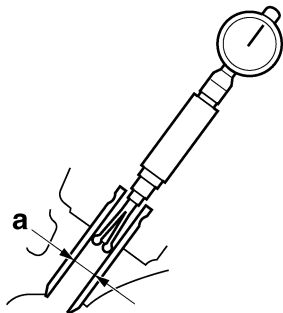
0.080 mm (0.0032 in)

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

0.025–0.052 mm (0.0010–0.0020 in)

Limit

0.100 mm (0.0039 in)



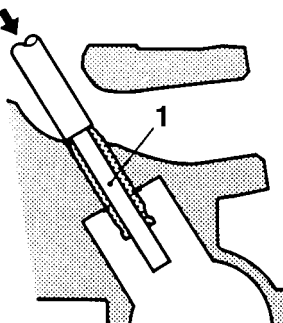
2. Replace:

- Valve guide **New**

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.

- Remove the valve guide with the valve guide remover “1”.

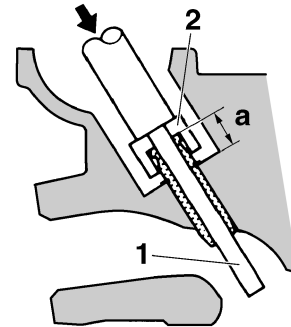


- Install the new valve guide with the valve guide installer “2” and valve guide remover “1”.



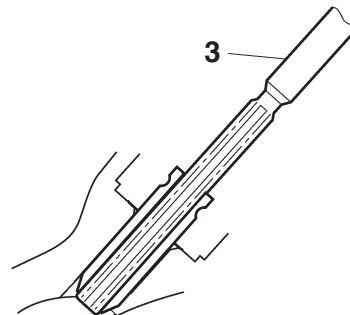
Valve guide position

11.98–12.02 mm (0.471–0.473 in)



- Valve guide position

- 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 (ø5)

90890-04097

Valve guide remover (5.0 mm)

YM-04097

Valve guide installer (ø5)

90890-04098

Valve guide installer (5.0 mm)

YM-04098

Valve guide reamer (ø5)

90890-04099

Valve guide reamer (5.0 mm)

YM-04099

3. Eliminate:

- Carbon deposits
(from the valve face and valve seat)

VALVES AND VALVE SPRINGS

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:

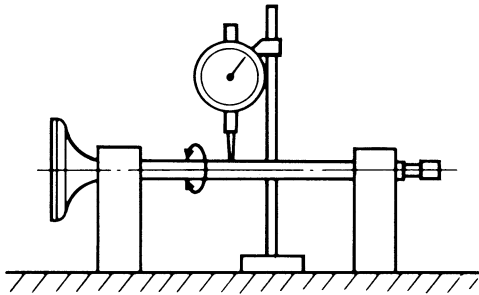
- Valve stem runout
Out of specification → Replace the valve.

TIP

- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the valve stem seal.



Valve stem runout
0.010 mm (0.0004 in)



EAS30285

CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.

1. Eliminate:

- Carbon deposits
(from the valve face and valve seat)

2. Check:

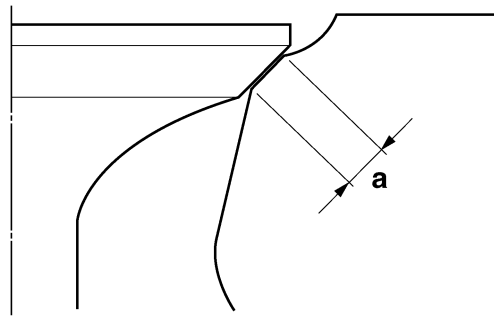
- Valve seat
Pitting/wear → Replace the cylinder head.

3. Measure:

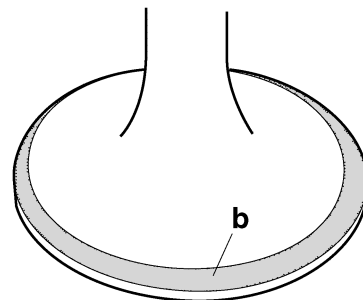
- Valve seat width “a”
Out of specification → Replace the cylinder head.



Valve seat contact width (intake)
0.90–1.20 mm (0.0354–0.0472 in)
Limit
1.7 mm (0.07 in)
Valve seat contact width (exhaust)
0.90–1.20 mm (0.0354–0.0472 in)
Limit
1.7 mm (0.07 in)



- a. Apply Blue layout fluid “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 blue layout fluid will have been removed.

4. Lap:

- Valve face
- Valve seat

TIP

After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

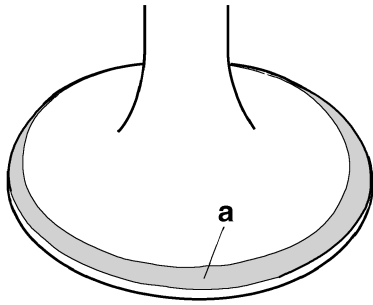
- a. Apply a coarse lapping compound “a” to the valve face.

ECA13790

NOTICE

Do not let the lapping compound enter the gap between the valve stem and the valve guide.

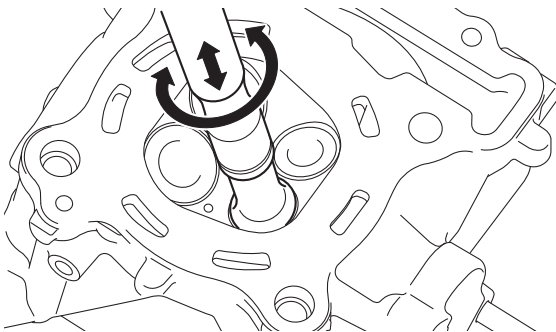
VALVES AND VALVE SPRINGS



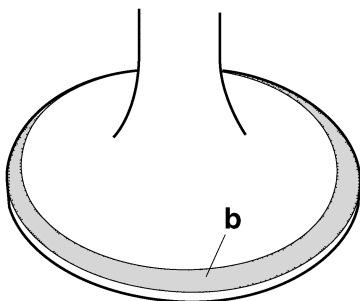
- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, and then clean off all of the lapping compound.

TIP

For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply blue layout fluid "b" onto the valve face.



- h. Install the valve into the cylinder head.
- i. Press the valve through the valve guide and onto the valve seat to make a clear impression.

- j. Measure the valve seat width again. If the valve seat width is out of specification, re-face and lap the valve seat.

EAS30286

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

1. Measure:

- Valve spring free length "a"

Out of specification → Replace the valve spring.



Free length (intake)

35.87 mm (1.41 in)

Limit

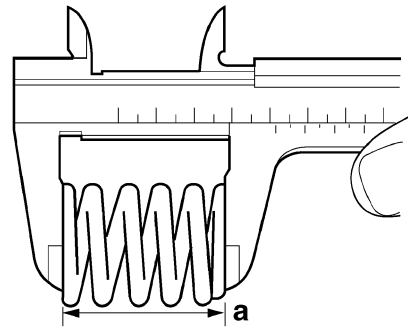
34.07 mm (1.34 in)

Free length (exhaust)

35.87 mm (1.41 in)

Limit

34.07 mm (1.34 in)



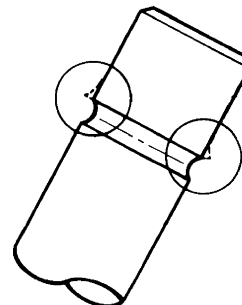
EAS30288

INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

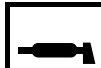
1. Deburr:

- Valve stem end
(with an oil stone)



2. Lubricate:

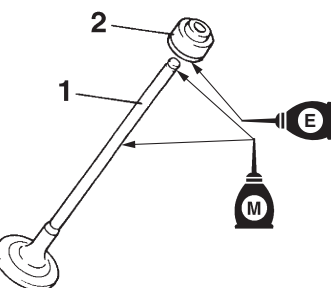
- Valve stem "1"



Recommended lubricant
Molybdenum disulfide oil

VALVES AND VALVE SPRINGS

- Valve stem seal “2”
(with the recommended lubricant)

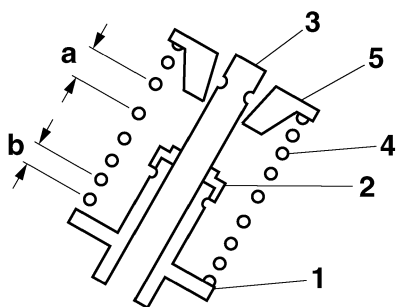
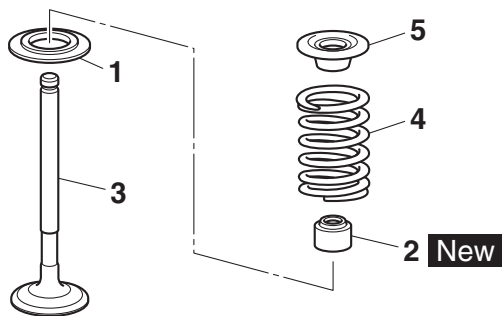


3. Install:

- Valve spring seat “1”
- Valve stem seal “2” **New**
- Valve “3”
- Valve spring “4”
- Valve spring retainer “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

4. Install:

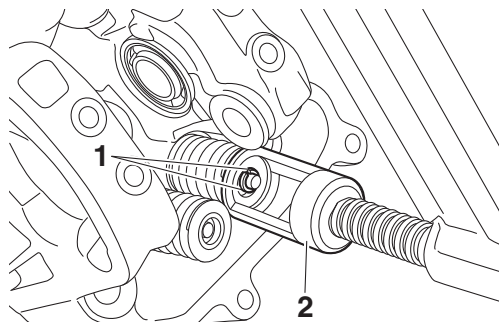
- Valve cotters “1”

TIP

Install the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment “2”.



Valve spring compressor
90890-04019
Valve spring compressor
YM-04019
Valve spring compressor attach-
ment
90890-06320

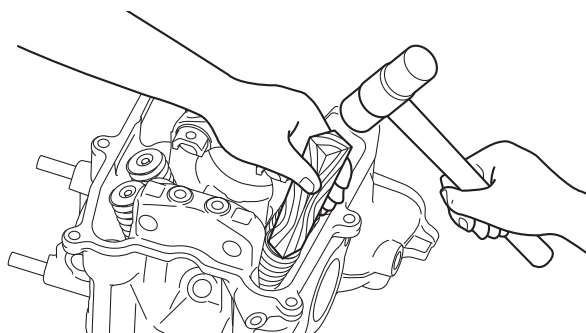


- To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

NOTICE

Hitting the valve tip with excessive force could damage the valve.



6. Install:

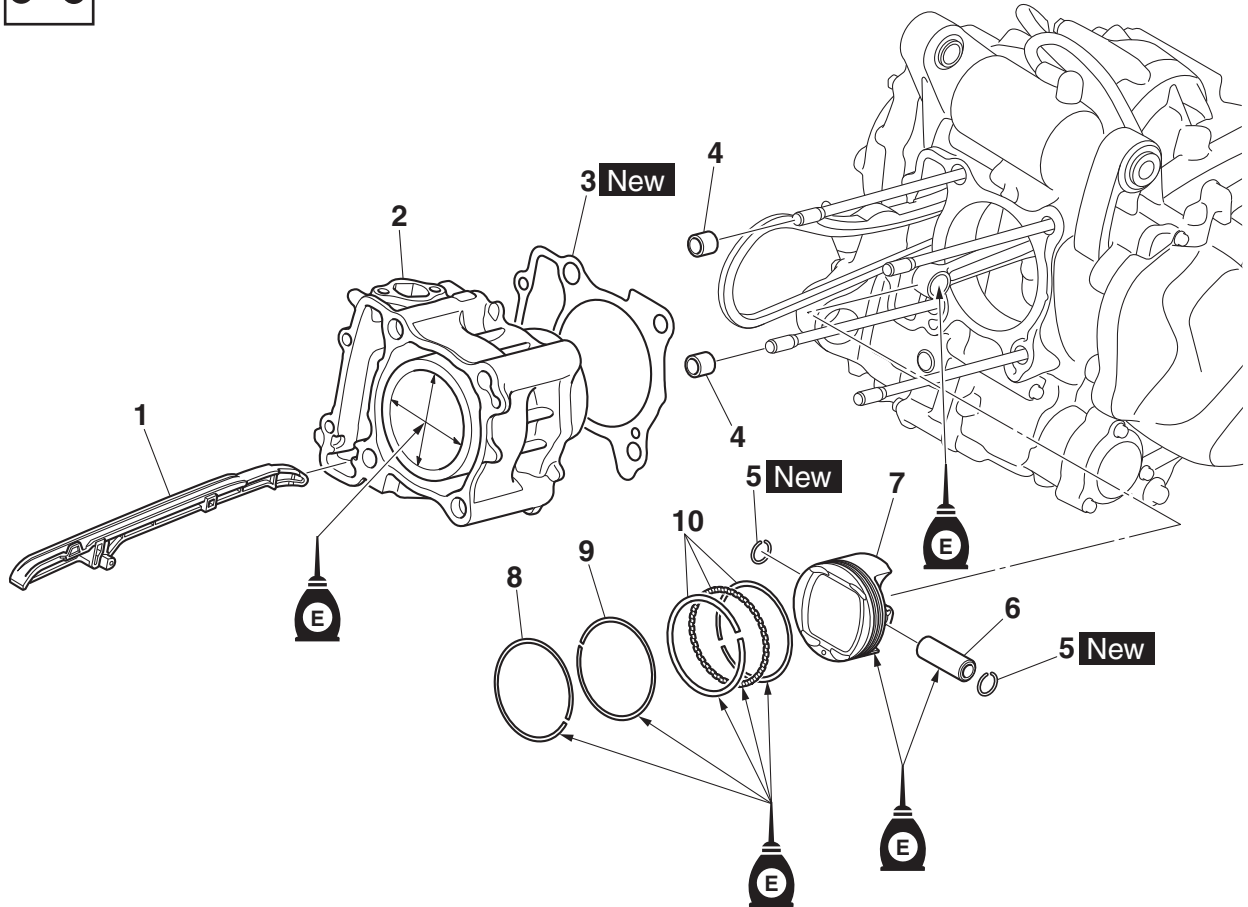
- Valve pads

CYLINDER AND PISTON

EAS20046

CYLINDER AND PISTON

Removing the cylinder and piston



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-13.
	Water pump outlet pipe		Refer to "WATER PUMP" on page 6-8.
1	Timing chain guide (exhaust side)	1	
2	Cylinder	1	
3	Cylinder gasket	1	
4	Dowel pin	2	
5	Piston pin clip	2	
6	Piston pin	1	
7	Piston	1	
8	Top ring	1	
9	2nd ring	1	
10	Oil ring	1	

EAS30289

REMOVING THE PISTON

1. Remove:

- Piston pin clips “1”
- Piston pin “2”
- Piston “3”

ECA13810

NOTICE

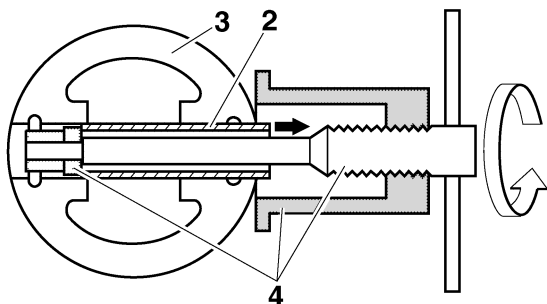
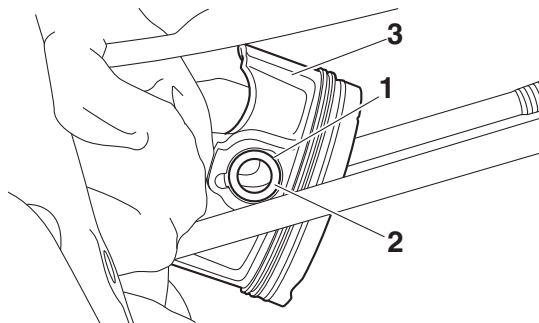
Do not use a hammer to drive the piston pin out.

TIP

- Before removing the piston pin clips, cover the crankcase opening with a clean rag to prevent them from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set “4”.



**Piston pin puller set
90890-01304
Piston pin puller
YU-01304**

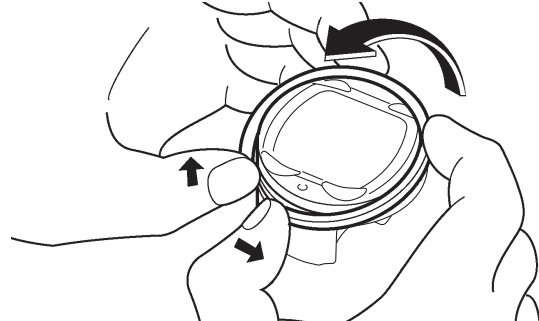


2. Remove:

- 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.



EAS30291

CHECKING THE CYLINDER AND PISTON

1. Check:

- Piston wall
- Cylinder wall

Vertical scratches → Replace the cylinder, piston, and piston rings as a set.

2. Measure:

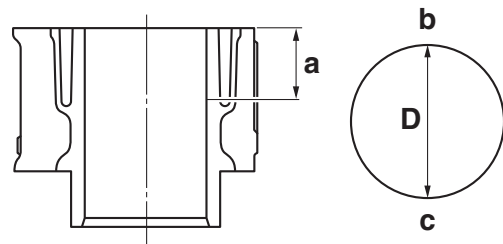
- Piston-to-cylinder clearance
 - a. Measure cylinder bore “D” with the cylinder bore gauge.

TIP

Measure cylinder bore “D” between the intake and exhaust sides of the cylinder.



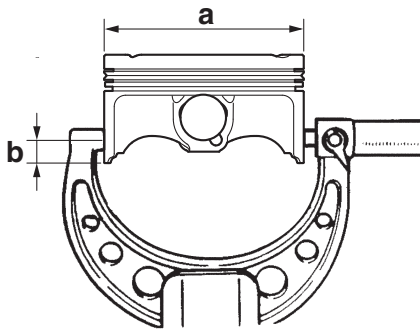
**Bore
70.000–70.025 mm (2.7559–
2.7569 in)**



- a. 40 mm (1.57 in) from the top of the cylinder
- b. Intake side
- c. Exhaust side

- b. If out of specification, replace the cylinder, piston, and piston rings as a set.
- c. Measure piston skirt diameter D “a” with the micrometer.

CYLINDER AND PISTON



- b. 8.0 mm (0.31 in) from the bottom edge of the piston



Piston Diameter

69.962–69.985 mm (2.7544–2.7553 in)

- d. If out of specification, replace the piston and piston rings as a set.
- e. Calculate the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance =
Cylinder bore "C" -
Piston skirt diameter "D"



Piston-to-cylinder clearance
0.031–0.047 mm (0.0012–0.0019 in)

- f. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.

EAS30292

CHECKING 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

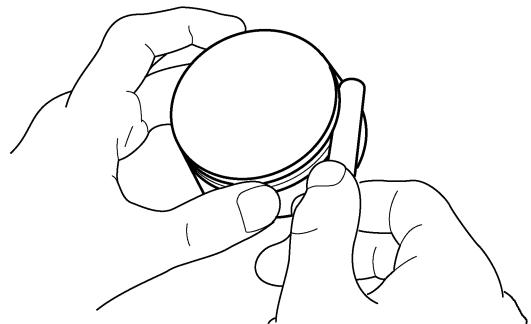
Ring side clearance
0.030–0.065 mm (0.0012–0.0026 in)

Side clearance limit
0.115 mm (0.0045 in)

2nd ring

Ring side clearance
0.020–0.055 mm (0.0008–0.0022 in)

Side clearance limit
0.115 mm (0.0045 in)

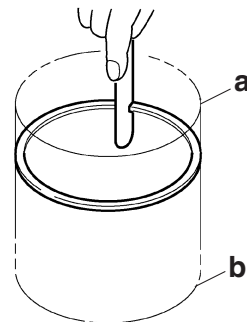


2. Install:

- Piston ring
(into the cylinder)

TIP

Use the piston crown to level the position ring near the bottom of the cylinder "a" where the cylinder wear is lowest.



- b. Top of cylinder

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 gap is excessive, replace all three piston rings.



Piston ring
Top ring
 End gap limit
 0.50 mm (0.0197 in)
2nd ring
 End gap limit
 1.15 mm (0.0453 in)

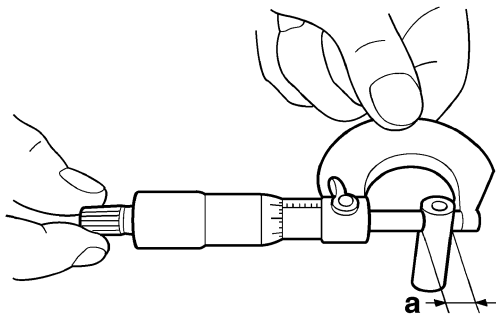
EAS30293

CHECKING THE PISTON PIN

1. Check:
 - Piston pin
 Blue discoloration/grooves → Replace the piston pin, and then check the lubrication system.
2. Measure:
 - Piston pin outside diameter “a”
 Out of specification → Replace the piston pin.



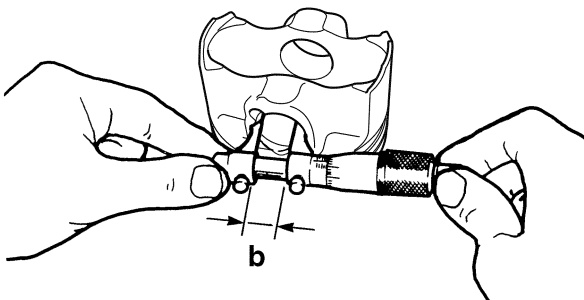
Piston pin outside diameter
 15.995–16.000 mm (0.6297–0.6299 in)
Limit
 15.975 mm (0.6289 in)



3. Measure:
 - Piston pin bore diameter “b”
 Out of specification → Replace the piston.



Piston pin bore inside diameter
 16.002–16.013 mm (0.6300–0.6304 in)
Limit
 16.043 mm (0.6316 in)



4. Calculate:
 - Piston-pin-to-piston-pin-bore clearance
 Out of specification → Replace the piston pin and piston as a set.

Piston-pin-to-piston-pin-bore clearance =
 Piston pin bore diameter “b” -
 Piston pin outside diameter “a”



Piston-pin-to-piston-pin-bore clearance
 0.002–0.018 mm (0.0001–0.0007 in)

EAS30290

CHECKING THE TIMING CHAIN GUIDE (EXHAUST SIDE)

1. Check:
 - Timing chain guide (exhaust side)
 Damage/wear → Replace.

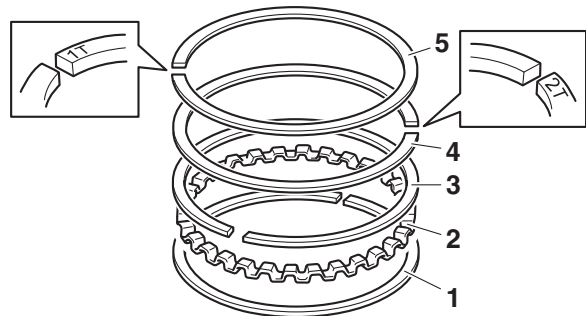
EAS30294

INSTALLING THE PISTON AND CYLINDER

1. Install:
 - Lower oil ring rail “1”
 - Oil ring expander “2”
 - Upper oil ring rail “3”
 - 2nd ring “4”
 - Top ring “5”

TIP

Be sure to install the piston rings so that the manufacturer marks face up.



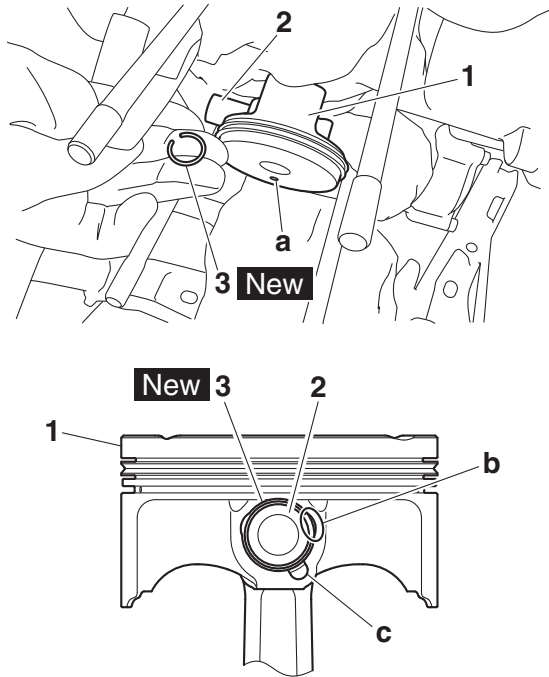
2. Install:
 - Piston “1”
 - Piston pin “2”
 - Piston pin clips “3” **New**

TIP

- Apply engine oil to the piston pin and connecting rod.
- Make sure the punch mark “a” on the piston points towards the exhaust 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.

CYLINDER AND PISTON

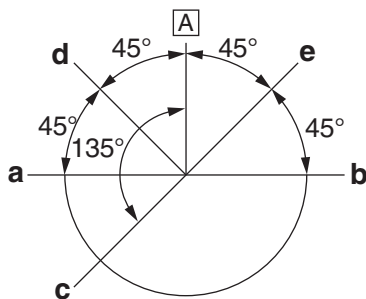
- When installing a piston pin clip, make sure that the clip ends “b” are positioned away from the cutout “c” in the piston as shown in the illustration.



3. Lubricate:
- Piston
 - Piston rings
 - Cylinder
- (with the recommended lubricant)



4. Offset:
- Piston ring end gaps

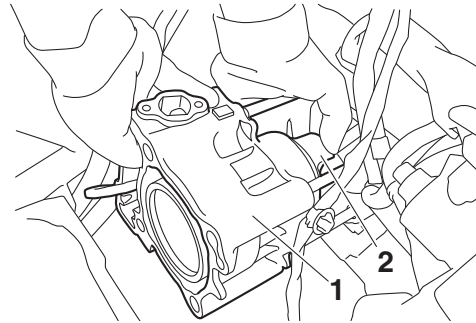


- a. Top ring
- b. 2nd ring
- c. Upper oil ring rail
- d. Oil ring expander
- e. Lower oil ring rail
- A. Exhaust side

5. Install:
- Dowel pins
 - Cylinder gasket **New**
 - Cylinder “1”

TIP

- While holding the piston “2” with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (intake side) through the timing chain cavity.

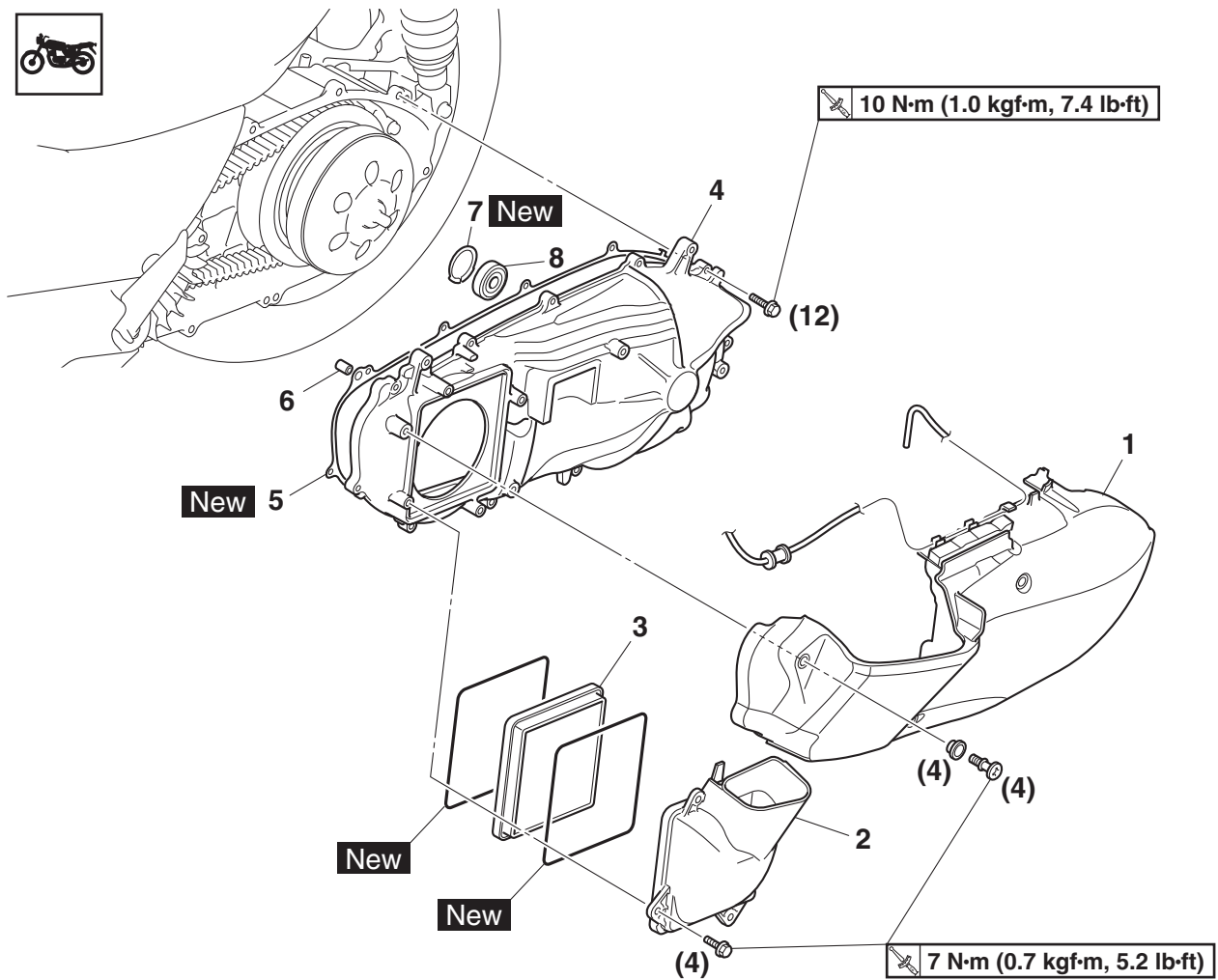


V-BELT AUTOMATIC TRANSMISSION

EAS20050

V-BELT AUTOMATIC TRANSMISSION

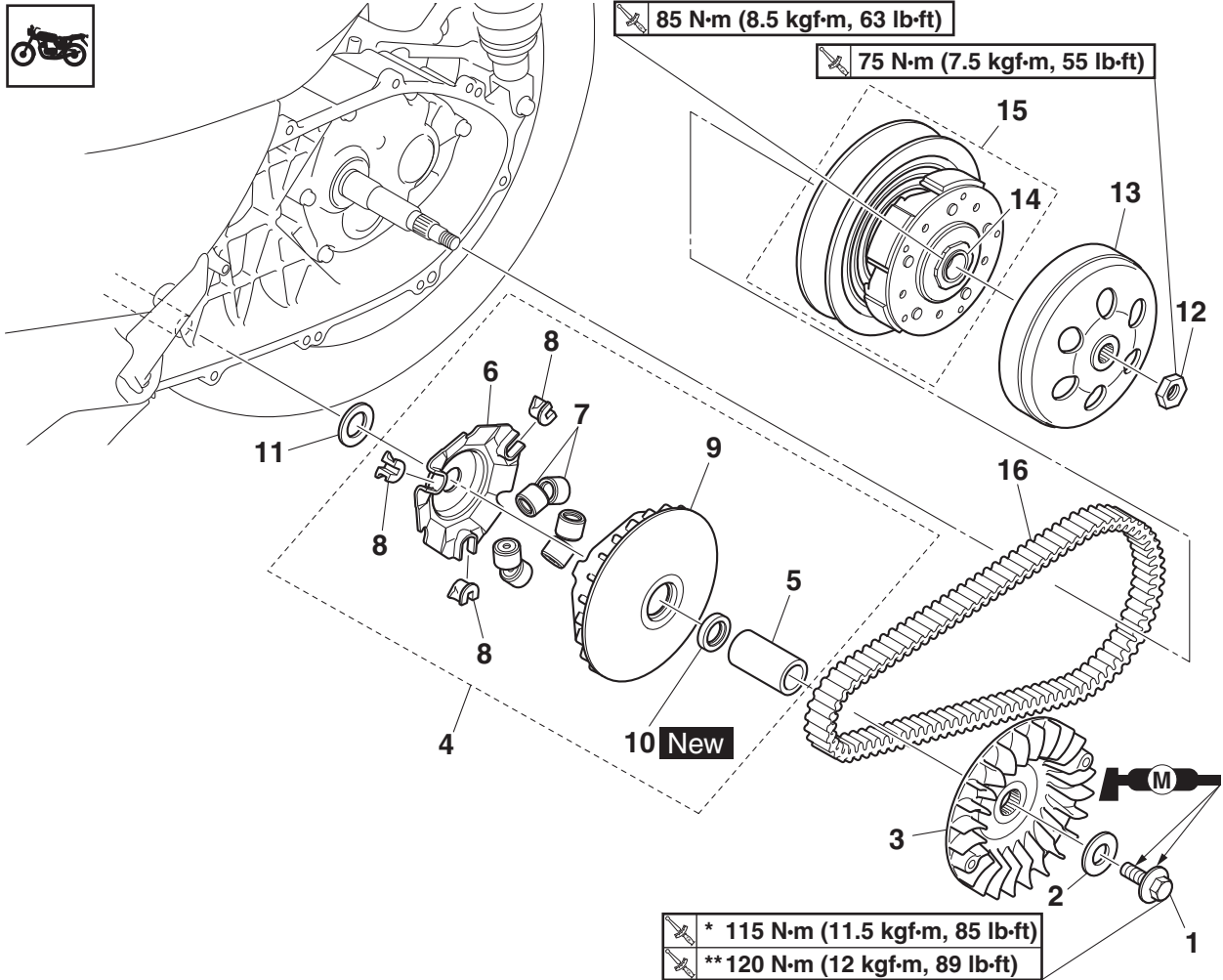
Removing the V-belt case



Order	Job/Parts to remove	Q'ty	Remarks
	Storage box		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-11.
1	V-belt case air filter element cover	1	
2	V-belt case air duct	1	
3	V-belt case air filter element	1	
4	V-belt case	1	
5	V-belt case gasket	1	
6	Dowel pin	1	
7	Circlip	1	
8	Bearing	1	

V-BELT AUTOMATIC TRANSMISSION

Removing the V-belt, primary sliding sheave assembly and secondary sheave assembly



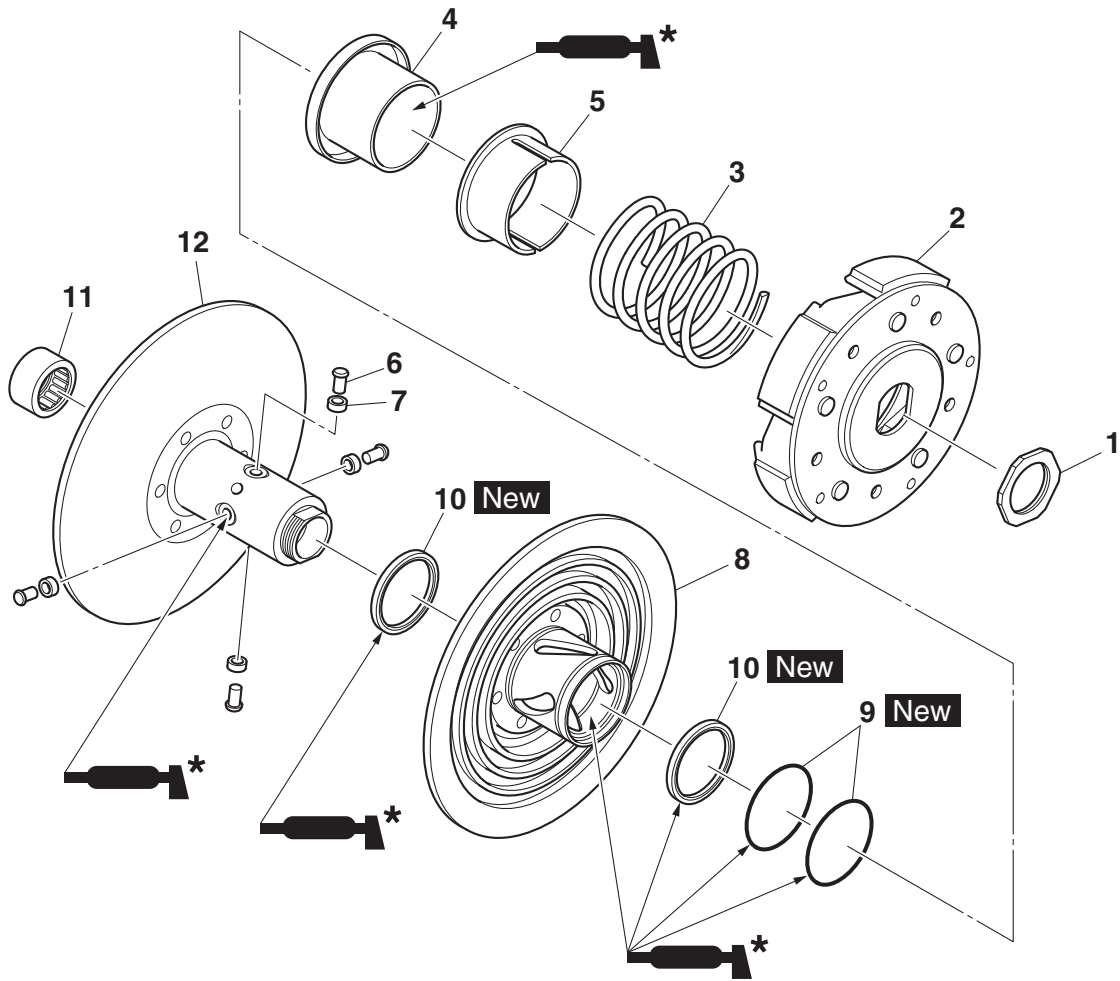
* Tightening torque when reusing the primary fixed sheave bolt and washer

** Tightening torque when installing a new primary fixed sheave bolt and washer

Order	Job/Parts to remove	Q'ty	Remarks
1	Primary fixed sheave bolt	1	
2	Washer	1	
3	Primary fixed sheave	1	
4	Primary sliding sheave assembly	1	
5	Collar	1	
6	Cam	1	
7	Primary sheave weight	6	
8	Slider	3	
9	Primary sliding sheave	1	
10	Oil seal	1	
11	Washer	1	
12	Clutch housing nut	1	
13	Clutch housing	1	
14	Secondary sheave nut	1	Loosen.
15	Secondary sheave assembly	1	
16	V-belt	1	

V-BELT AUTOMATIC TRANSMISSION

Disassembling the secondary sheave assembly



* Apply Shell dolium grease R®.

Order	Job/Parts to remove	Q'ty	Remarks
1	Secondary sheave nut	1	
2	Clutch carrier assembly	1	
3	Compression spring	1	
4	Spring seat 1	1	
5	Spring seat 2	1	
6	Guide pin	4	
7	Collar	4	
8	Secondary sliding sheave	1	
9	O-ring	2	
10	Oil seal	2	
11	Bearing	1	
12	Secondary fixed sheave	1	

V-BELT AUTOMATIC TRANSMISSION

EAS32357

REMOVING THE PRIMARY FIXED SHEAVE

1. Remove:

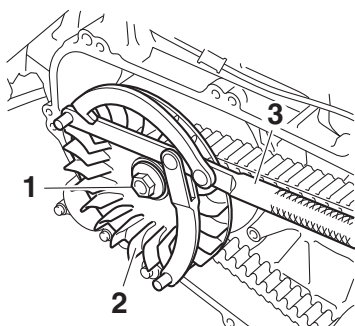
- Primary fixed sheave bolt "1"
- Washer
- Primary fixed sheave "2"

TIP

While holding the primary fixed sheave with the rotor holding tool "3", loosen the primary fixed sheave bolt.



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



EAS30311

REMOVING THE SECONDARY SHEAVE

1. Remove:

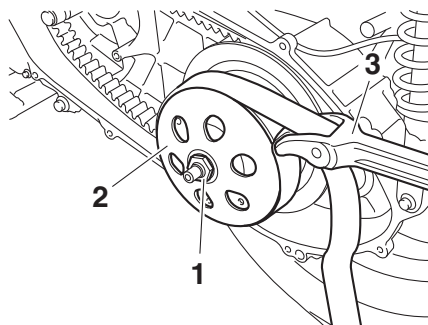
- Clutch housing nut "1"
- Clutch housing "2"

TIP

While holding the clutch housing with the rotor holding tool "3", loosen the clutch housing nut.



Rotor holding tool
90890-04166
Rotor holding tool
YM-04166



2. Loosen:

- Secondary sheave nut "1"

ECA21820

NOTICE

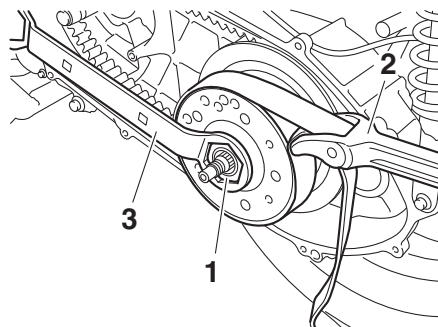
Do not remove the secondary sheave nut at this stage.

TIP

While holding the secondary sheave with the rotor holding tool "2", loosen the secondary sheave nut one full turn with the locknut wrench "3".



Rotor holding tool
90890-04166
Rotor holding tool
YM-04166
Locknut wrench
90890-01348
Locknut wrench
YM-01348



EAS30312

DISASSEMBLING THE SECONDARY SHEAVE

1. Remove:

- Secondary sheave nut "1"

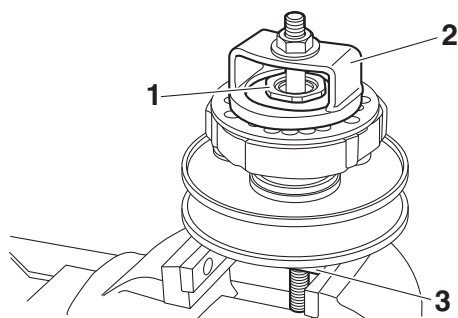
TIP

Install the sheave spring compressor "2" and sheave fixed block "3" onto the secondary sheave as shown. Then, compress the spring, and remove the secondary sheave nut.



Sheave spring compressor
90890-04134
Sheave spring compressor
YM-04134
Sheave fixed block
90890-04135
Sheave fixed bracket
YM-04135

V-BELT AUTOMATIC TRANSMISSION



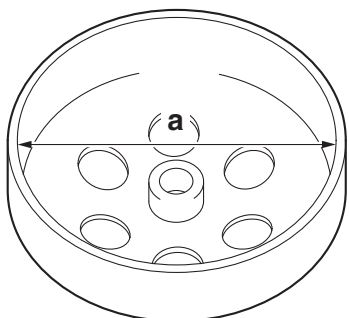
EAS30313

CHECKING THE CLUTCH HOUSING

1. Check:
 - Clutch housing
Damage/wear → Replace.
2. Measure:
 - Clutch housing inside diameter “a”
Out of specification → Replace the clutch housing.



Clutch housing inside diameter
150.0 mm (5.91 in)
Limit
150.5 mm (5.93 in)



EAS30314

CHECKING THE CLUTCH SHOES

The following procedure applies to all of the clutch shoes.

1. Check:
 - Clutch shoe
Damage/wear → Replace the clutch shoes and springs as a set.
Glazed areas → Sand with coarse sandpaper.

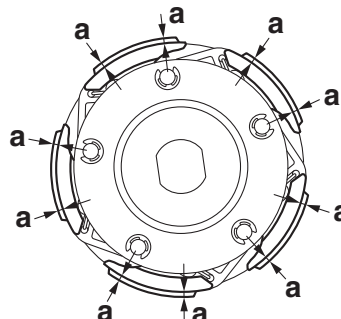
TIP

After sanding the glazed areas, clean the clutch with a cloth.

2. Measure:
 - Clutch shoe thickness “a”
Out of specification → Replace the clutch shoes and springs as a set.



Clutch shoe thickness
3.0 mm (0.12 in)
Limit
1.5 mm (0.06 in)



EAS30315

CHECKING THE V-BELT

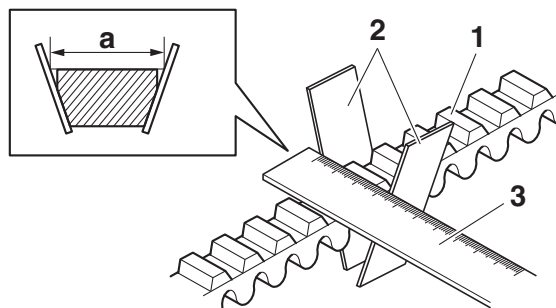
1. Check:
 - V-belt “1”
Cracks/damage/wear → Replace.
Grease/oil → Clean the primary and secondary sheave.
2. Measure:
 - V-belt width “a”
Out of specification → Replace.

TIP

Measure the V-belt width as illustration.



V-belt width
27.7 mm (1.09 in)
Limit
26.7 mm (1.05 in)



2. Plastic board
3. Ruler

EAS30316

CHECKING THE PRIMARY SHEAVE

1. Check:
 - Primary sliding sheave
 - Primary fixed sheave

V-BELT AUTOMATIC TRANSMISSION

- Collar
Cracks/damage/wear → Replace the primary sliding sheave, primary fixed sheave, and collar as a set.

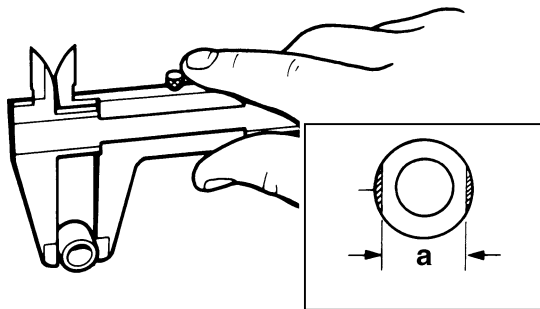
EAS30317

CHECKING THE PRIMARY SHEAVE WEIGHTS

The following procedure applies to all of the primary sheave weights.

1. Check:
 - Primary sheave weight
Cracks/damage/wear → Replace.
2. Measure:
 - Primary sheave weight outside diameter "a"
Out of specification → Replace.

	Weight outside diameter 23.0 mm (0.91 in) Limit 22.5 mm (0.89 in)
--	--



EAS31233

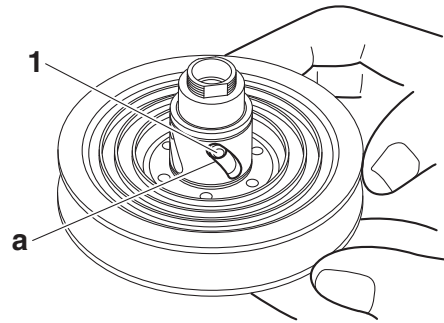
CHECKING THE PRIMARY SHEAVE SLIDERS

1. Check:
 - Primary sheave slider
Cracks/damage/wear → Replace.

EAS30319

CHECKING THE SECONDARY SHEAVE

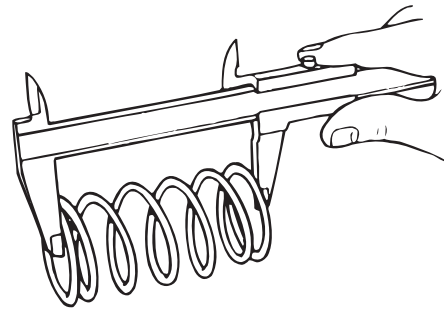
1. Check:
 - Secondary fixed sheave
 - Secondary sliding sheave
Cracks/damage/wear → Replace the secondary fixed and sliding sheaves as a set.
2. Check:
 - Torque cam groove "a"
Damage/wear → Replace the secondary fixed and sliding sheaves as a set.
3. Check:
 - Guide pins "1"
Damage/wear → Replace the secondary fixed and sliding sheaves as a set.



4. Check:
 - Spring free length
Out of specification → Replace the spring.



Compression spring free length
111.0 mm (4.37 in)
Limit
99.9 mm (3.93 in)



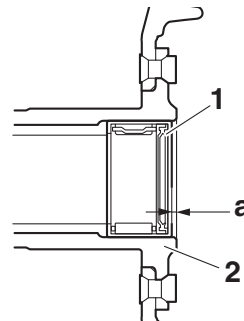
EAS30321

ASSEMBLING THE SECONDARY SHEAVE

1. Install:
 - Bearing "1"
(into the secondary fixed sheave "2")



Install depth "a"
1.0–2.0 mm (0.04–0.08 in)



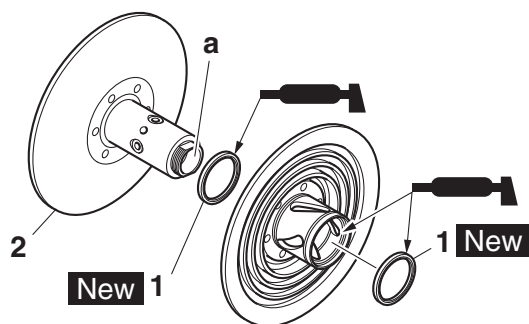
2. Lubricate:
 - Secondary sliding sheave inner surface
 - Oil seals "1" **New**
(with the recommended lubricant)

V-BELT AUTOMATIC TRANSMISSION



TIP

Do not apply grease to the inner surface "a" of the secondary fixed sheave "2". If any grease gets on the inner surface of the secondary fixed sheave, be sure to wipe it off thoroughly.



3. Install:

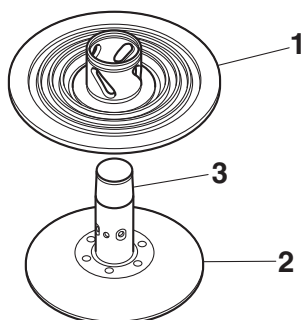
- Oil seals **New**
- Secondary sliding sheave "1"

TIP

- Make sure the mark side of the oil seal outward.
- Install the secondary sliding sheave onto the secondary fixed sheave "2" with the oil seal guide "3".



Oil seal guide (40mm)
90890-01590
Sliding sheave guide 40mm
YM-01590

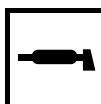


4. Install:

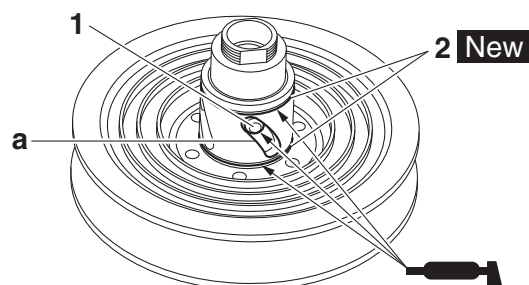
- Guide pins "1"

5. Lubricate:

- Guide pin grooves "a"
- O-rings "2" **New**
(with the recommended lubricant)



Recommended lubricant
Shell dolium grease R®



6. Install:

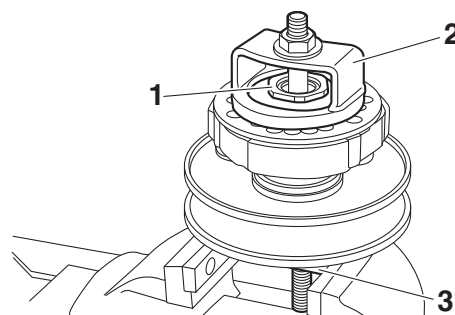
- Spring seat 2
- Spring seat 1
- Compression spring
- Clutch carrier assembly
- Secondary sheave nut "1"

TIP

- Install the sheave spring compressor "2" and sheave fixed block "3" onto the secondary sheave as shown. Then, compress the spring, and install the secondary sheave nut.
- Install the secondary sheave nut with its tapered side facing the clutch carrier.



Sheave spring compressor
90890-04134
Sheave spring compressor
YM-04134
Sheave fixed block
90890-04135
Sheave fixed bracket
YM-04135



EAS32361

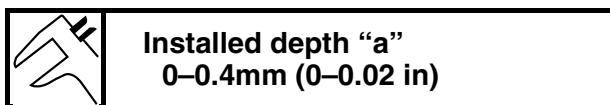
ASSEMBLING THE PRIMARY FIXED SHEAVE

1. Clean:

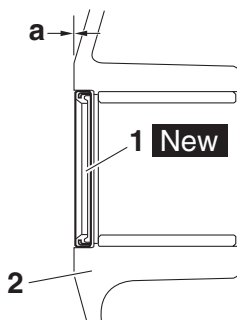
- Primary fixed sheave
- Primary sliding sheave
- Primary sheave weights

V-BELT AUTOMATIC TRANSMISSION

- Cam
2. Install:
- Oil seal “1” **New**
(into the primary sliding sheave “2”)



Installed depth “a”
0–0.4mm (0–0.02 in)



EAS31234

INSTALLING THE PRIMARY SHEAVE, V-BELT AND SECONDARY SHEAVE

1. Install:
- V-belt “1”
(to the secondary sheave assembly)
 - Secondary sheave assembly “2”

TIP

Before installing the secondary sheave assembly, check that there is no grease on the splines “a” of the primary drive gear. If there is any grease on the splines, be sure to wipe it off thoroughly.

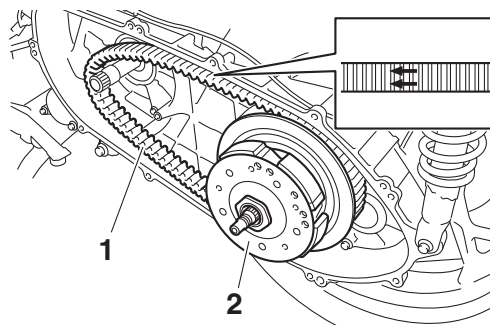
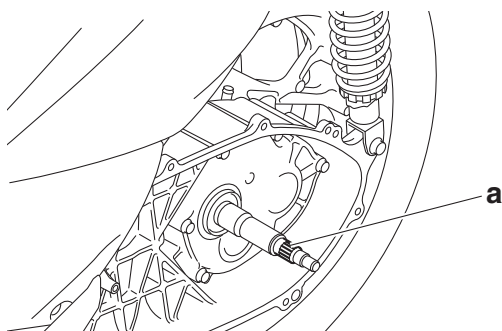
ECA21720

NOTICE

Do not allow grease to come in contact with the V-belt.

TIP

- Install the V-belt with the printed arrow mark on the V-belt facing in the direction shown in the illustration.
- Install the V-belt onto the primary sheave side.



2. Tighten:
- Secondary sheave nut “1”



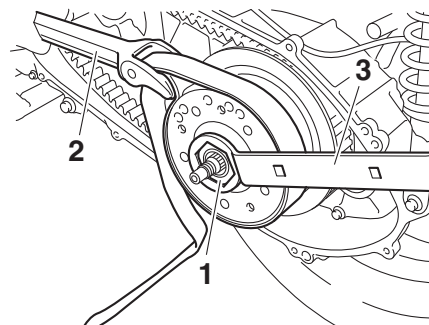
Secondary sheave nut
85 N·m (8.5 kgf·m, 63 lb·ft)

TIP

While holding the secondary sheave with the rotor holding tool “2”, tighten the secondary sheave nut with the locknut wrench “3”.



Rotor holding tool
90890-04166
Rotor holding tool
YM-04166
Locknut wrench
90890-01348
Locknut wrench
YM-01348



3. Install:
- Clutch housing “1”
 - Clutch housing nut “2”



Clutch housing nut
75 N·m (7.5 kgf·m, 55 lb·ft)

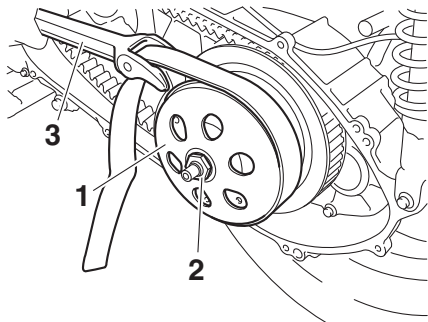
TIP

While holding the clutch housing with the rotor holding tool “3”, tighten the clutch housing nut.

V-BELT AUTOMATIC TRANSMISSION



Rotor holding tool
90890-04166
Rotor holding tool
YM-04166

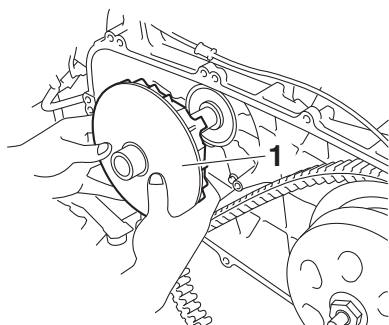


4. Install:

- Primary sliding sheave assembly “1”

TIP

When installing the primary sliding sheave assembly, hold the cam to prevent the primary sheave weights from falling out of the primary sliding sheave.



5. Lubricate:

- Primary fixed sheave bolt threads and mating surface



Recommended lubricant
Molybdenum disulfide grease

6. Install:

- Primary fixed sheave
- Washer
- Primary fixed sheave bolt

ECA21730

NOTICE

Do not allow grease to contact the primary sheave assembly.

TIP

Install the V-belt in the primary sheave (when the pulley is at its widest position) and in the secondary sheave (when the pulley is at its narrowest position), and make sure the V-belt is tight.

7. Tighten:

- Primary fixed sheave bolt “1”



*** Primary fixed sheave bolt**
115 N·m (11.5 kgf·m, 85 lb·ft)
**** Primary fixed sheave bolt**
120 N·m (12 kgf·m, 89 lb·ft)

* Tightening torque when reusing the primary fixed sheave bolt and washer

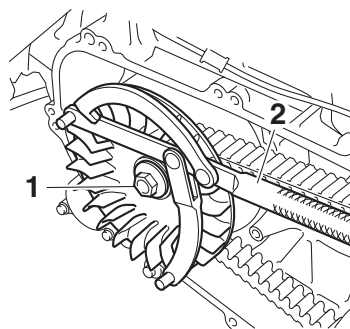
** Tightening torque when installing a new primary fixed sheave bolt and washer

TIP

While holding the primary fixed sheave with the rotor holding tool “2”, tighten the primary fixed sheave bolt.



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

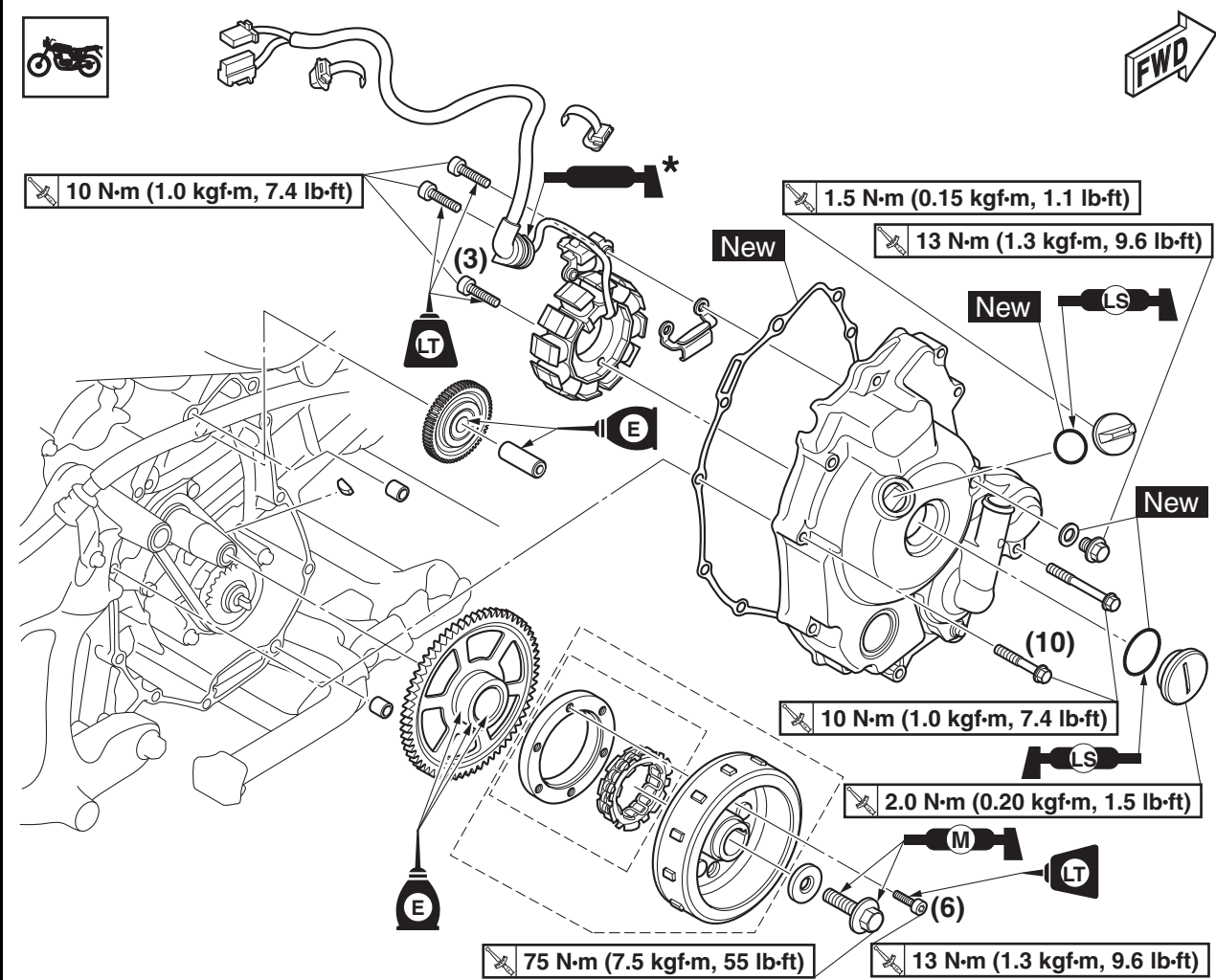


GENERATOR AND STARTER CLUTCH

EAS20140

GENERATOR AND STARTER CLUTCH

Removing the stator coil, generator rotor and starter clutch

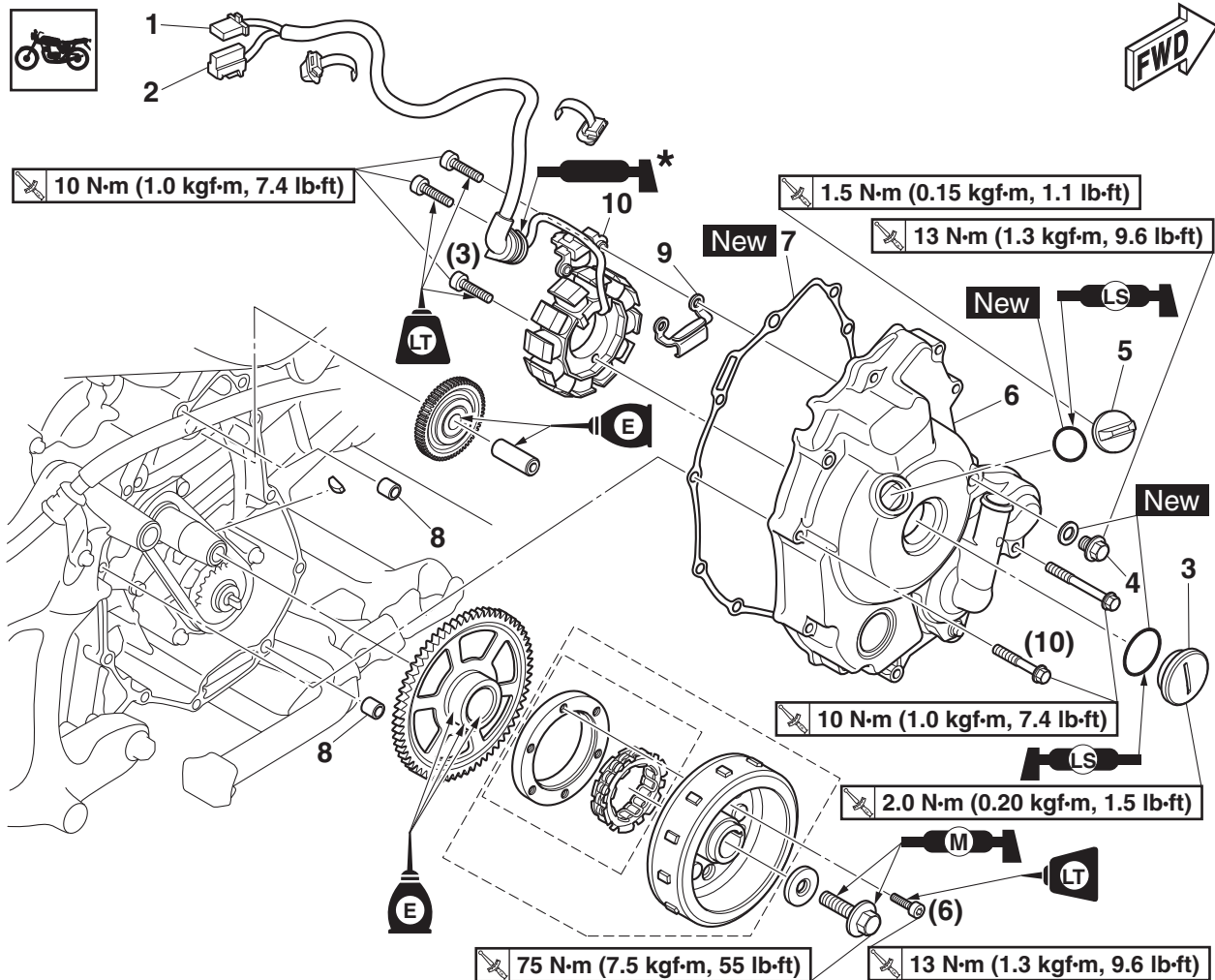


* Apply Yamaha bond No.1215 (90890-85505).

Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side cover (left)		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Radiator cover		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-7.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-21.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-19.
	Water pump inlet hose/water pump outlet pipe		Refer to "WATER PUMP" on page 6-8.

GENERATOR AND STARTER CLUTCH

Removing the stator coil, generator rotor and starter clutch

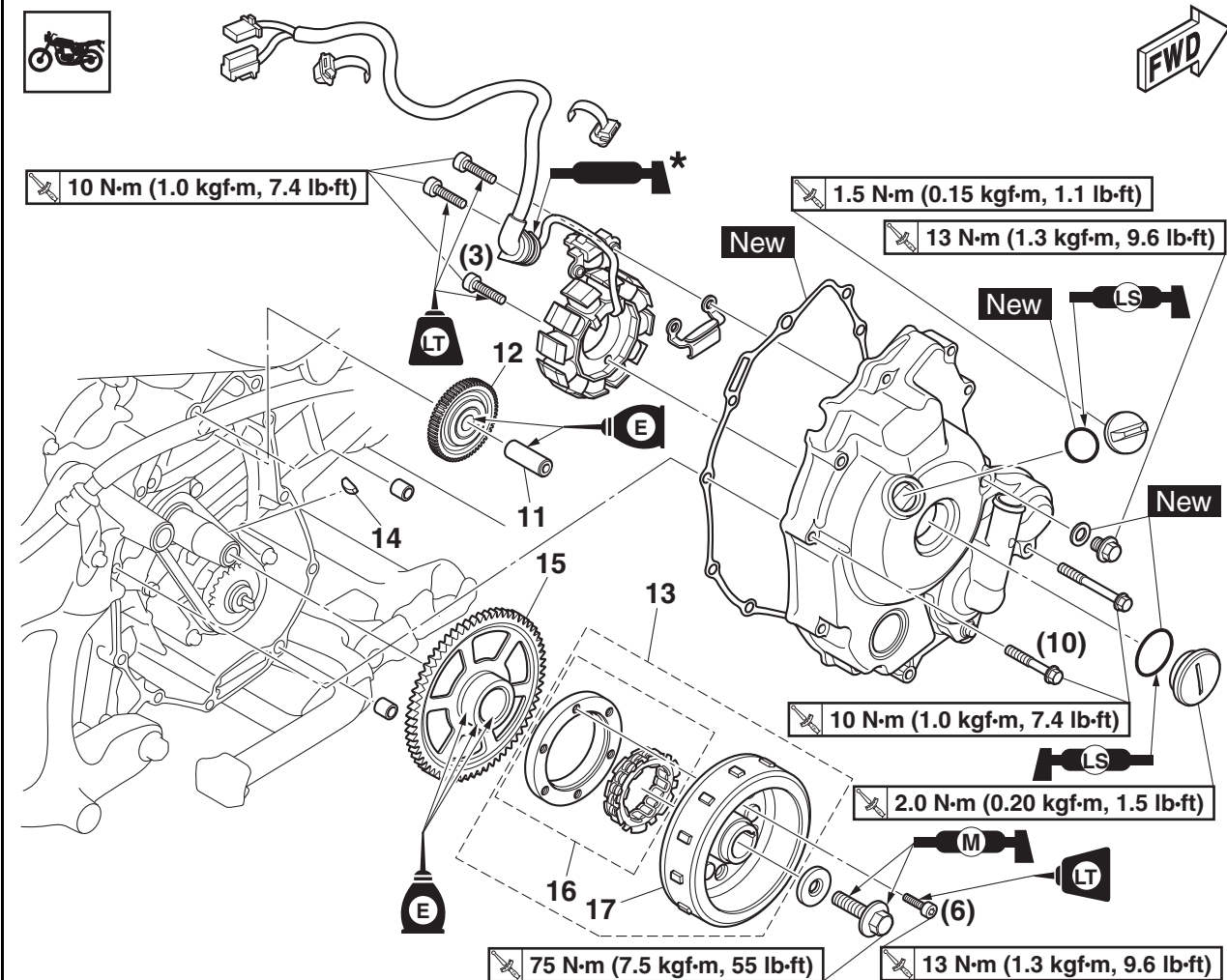


* Apply Yamaha bond No.1215 (90890-85505).

Order	Job/Parts to remove	Q'ty	Remarks
1	Crankshaft position sensor coupler	1	Disconnect.
2	Stator coil coupler	1	Disconnect.
3	Crankshaft end cover	1	
4	Timing mark accessing bolt	1	
5	Engine oil filler cap	1	
6	Generator cover	1	
7	Generator cover gasket	1	
8	Dowel pin	2	
9	Plate	1	
10	Stator coil assembly (Stator coil/Crankshaft position sensor)	1	

GENERATOR AND STARTER CLUTCH

Removing the stator coil, generator rotor and starter clutch



* Apply Yamaha bond No.1215 (90890-85505).

Order	Job/Parts to remove	Q'ty	Remarks
11	Starter clutch idle gear shaft	1	
12	Starter clutch idle gear	1	
13	Generator rotor assembly	1	
14	Woodruff key	1	
15	Starter clutch gear	1	
16	Starter clutch	1	
17	Generator rotor	1	

GENERATOR AND STARTER CLUTCH

EAS30867

REMOVING THE GENERATOR

1. Remove:

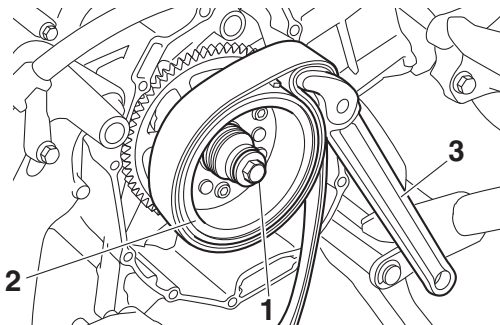
- Generator rotor bolt "1"
- Washer

TIP

While holding the generator rotor "2" with the rotor holding tool "3", loosen the generator rotor bolt.



Rotor holding tool
90890-04166
Rotor holding tool
YM-04166



2. Remove:

- Generator rotor assembly "1"
(with the flywheel puller "2" and rotor puller bolt "3")
- Woodruff key

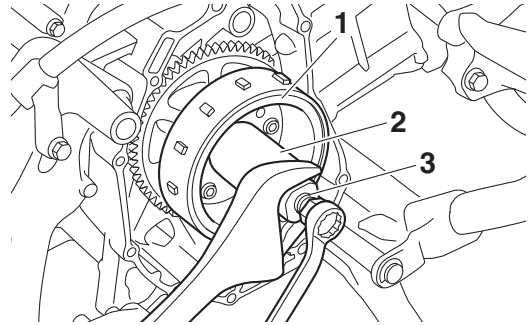
ECA13880

NOTICE

To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set center bolt and the crankshaft.



Flywheel puller
90890-01404
Flywheel puller
YM-01404
Rotor puller bolt M14 X L80
90890-04183
Rotor puller bolt M14 X L80
YM-04183



EAS30868

REMOVING THE STARTER CLUTCH

1. Remove:

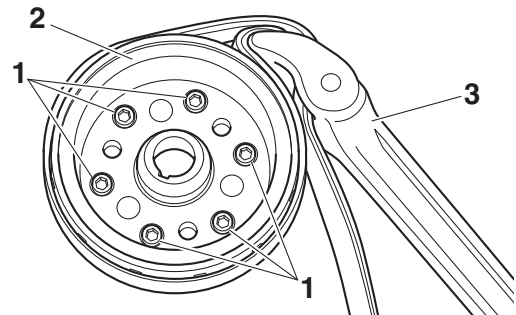
- Starter clutch bolts "1"
- Generator rotor "2"
- Starter clutch

TIP

While holding the generator rotor with the rotor holding tool "3", loosen the starter clutch bolts.



Rotor holding tool
90890-04166
Rotor holding tool
YM-04166

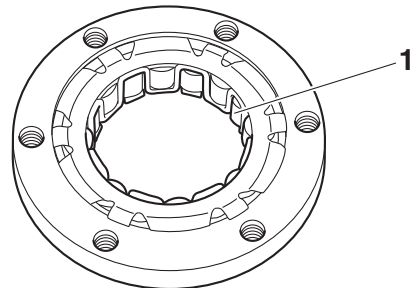


EAS30869

CHECKING THE STARTER CLUTCH

1. Check:

- Starter clutch rollers "1"
Damage/wear → Replace the starter clutch.



2. Check:

- Starter clutch idle gear

GENERATOR AND STARTER CLUTCH

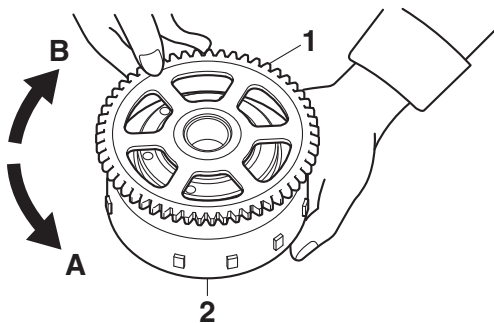
- Starter clutch gear
Burrs/chips/roughness/wear → Replace the defective part(s).

3. Check:

- Starter clutch gear contact surfaces
Damage/pitting/wear → Replace the starter clutch gear.

4. Check:

- Starter clutch operation
 - a. Install the starter clutch and starter clutch gear “1” onto the generator rotor “2” and hold the generator rotor. Refer to “INSTALLING THE STARTER CLUTCH” on page 5-50.
 - b. When turning the starter clutch gear counterclockwise “A”, it should turn freely, otherwise the starter clutch is faulty and must be replaced.
 - c. When turning the starter clutch gear clockwise “B”, the starter clutch and the starter clutch gear should engage, otherwise the starter clutch is faulty and must be replaced.



EAS30871

INSTALLING THE STARTER CLUTCH

1. Install:

- Starter clutch “1”
(to the generator rotor “2”)



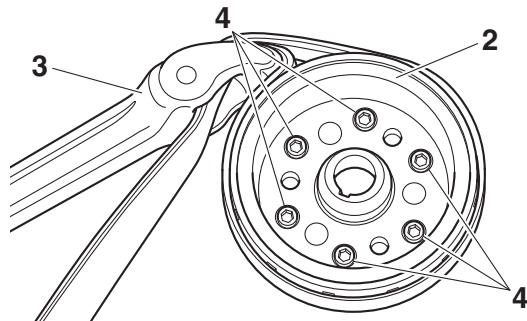
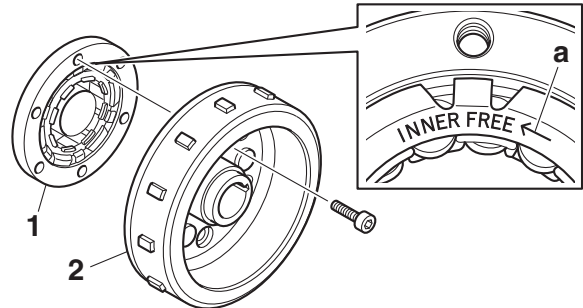
Starter clutch bolt
13 N·m (1.3 kgf·m, 9.6 lb·ft)
LOCTITE®

TIP

- Starter clutch with the arrow mark “a” is toward the generator rotor.
- While holding the generator rotor with the rotor holding tool “3”, tighten the starter clutch bolts “4”.



Rotor holding tool
90890-04166
Rotor holding tool
YM-04166



EAS30872

INSTALLING THE GENERATOR

1. Install:

- Starter clutch gear
- Woodruff key
- Generator rotor assembly
- Washer
- Generator rotor bolt

TIP

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

2. Tighten:

- Generator rotor bolt “1”



Generator rotor bolt
75 N·m (7.5 kgf·m, 55 lb·ft)

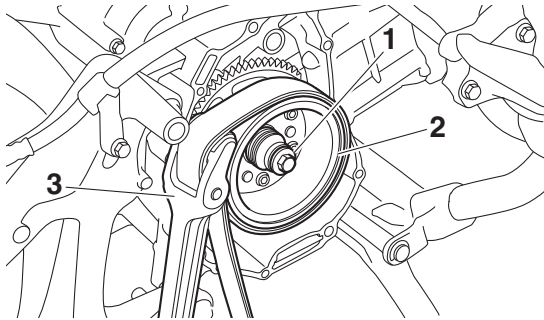
GENERATOR AND STARTER CLUTCH

TIP

While holding the generator rotor “2” with the rotor holding tool “3”, tighten the generator rotor bolt.



Rotor holding tool
90890-04166
Rotor holding tool
YM-04166

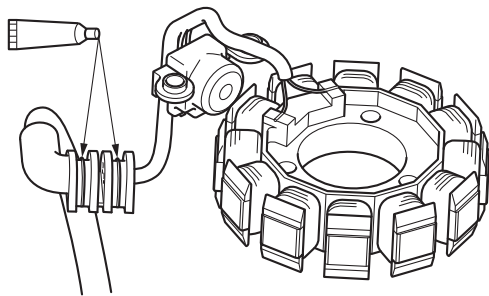


3. Apply:

- Sealant
(onto the stator coil lead grommet)



Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)



4. Install:

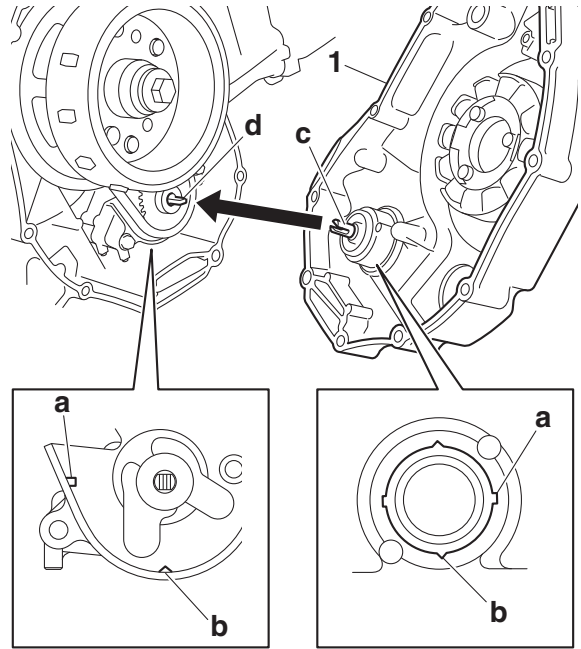
- Generator cover gasket **New**
- Generator cover “1”



Generator cover bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

- Align the projections “a” and “b” on the water pump with the respective projections “a” and “b” on the oil pump.
- Align the slit “c” on the impeller shaft with the projection “d” on the oil pump shaft.
- Tighten the generator cover bolts in stages and in a crisscross pattern.



5. Connect:

- Stator coil coupler
- Crankshaft position sensor coupler

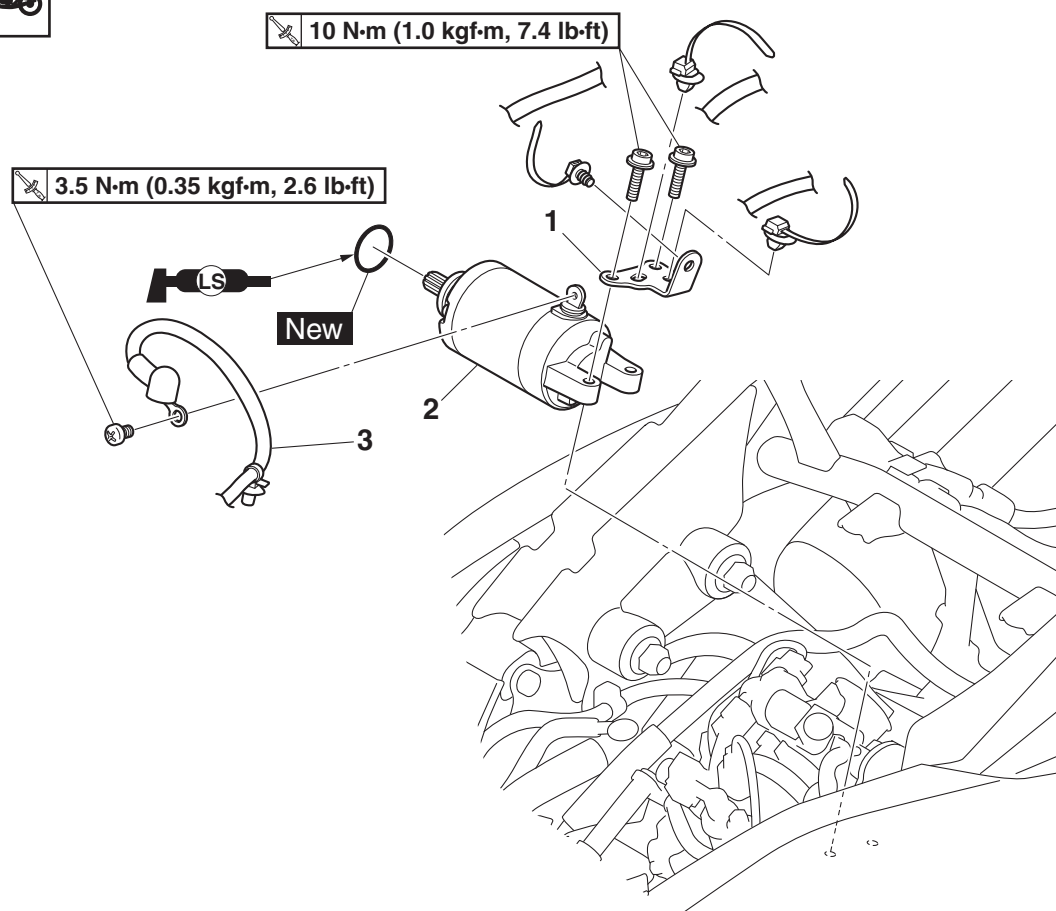
TIP

To route the stator coil/crankshaft position sensor lead, refer to “CABLE ROUTING” on page 2-13.

EAS20052

ELECTRIC STARTER

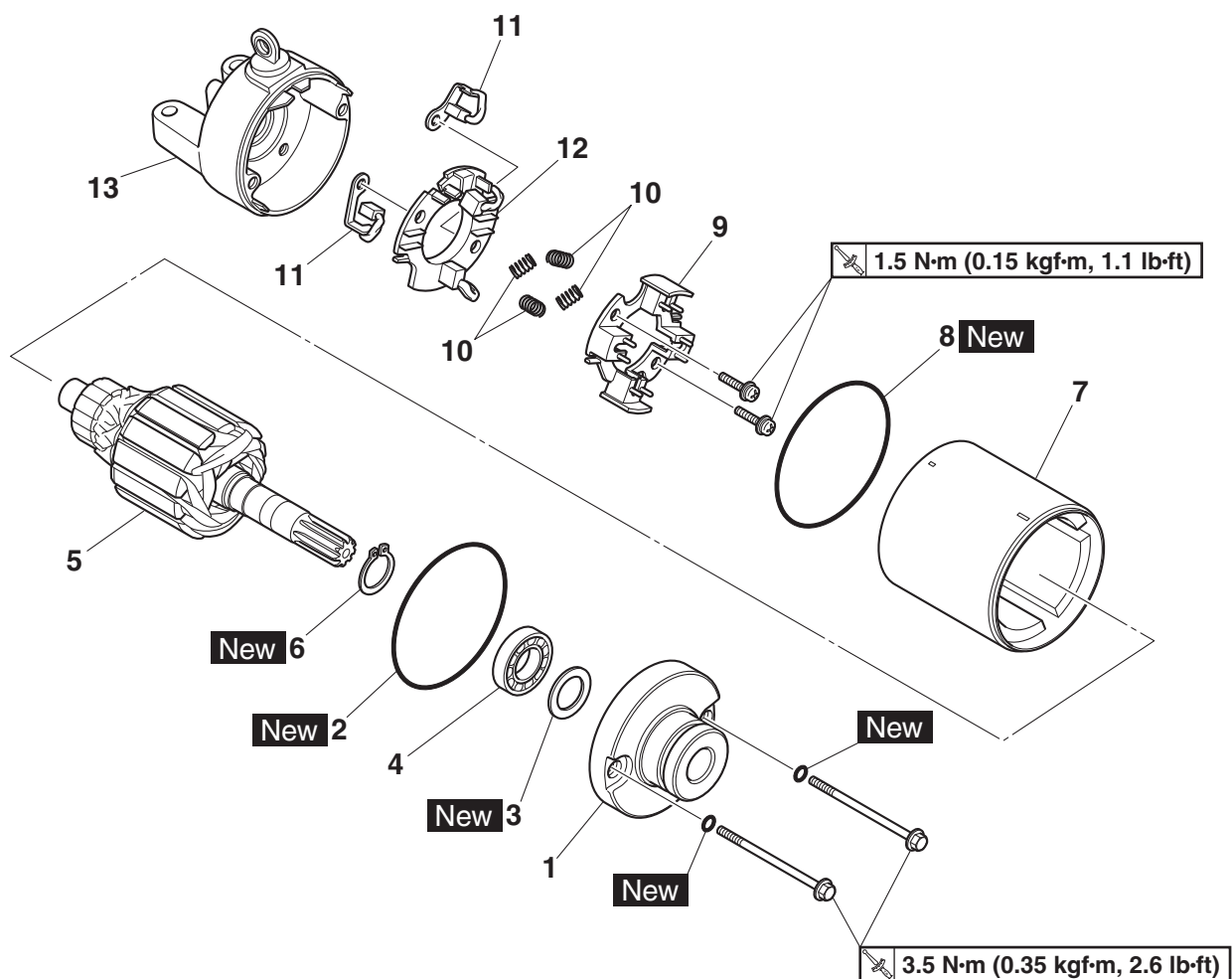
Removing the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
	Storage box		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-11.
1	Starter motor bracket	1	
2	Starter motor	1	
3	Starter motor lead	1	Disconnect.

ELECTRIC STARTER

Disassembling the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
1	Starter motor front cover	1	
2	Gasket	1	
3	Oil seal	1	
4	Bearing	1	
5	Armature assembly	1	
6	Circlip	1	
7	Stator	1	
8	Gasket	1	
9	Brush holder	1	
10	Brush spring	4	
11	Brush	2	
12	Brush and holder set	1	
13	Starter motor rear cover	1	

ELECTRIC STARTER

EAS30325

CHECKING THE STARTER MOTOR

1. Check:

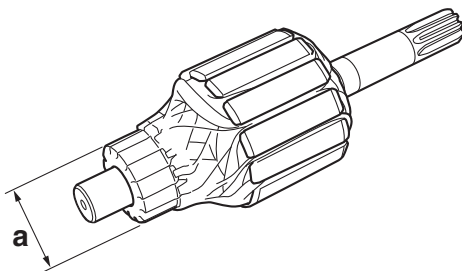
- Commutator
Dirt → Clean with 600 grit sandpaper.

2. Measure:

- Commutator diameter “a”
Out of specification → Replace the starter motor.



Commutator diameter
24.5 mm (0.96 in)
Limit
23.5 mm (0.93 in)



3. Measure:

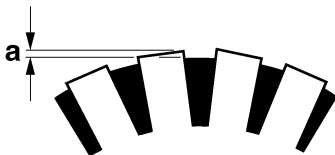
- Mica undercut “a”
Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.



Mica undercut (depth)
1.50 mm (0.06 in)

TIP

The mica of the commutator must be undercut to ensure proper operation of the commutator.



4. Measure:

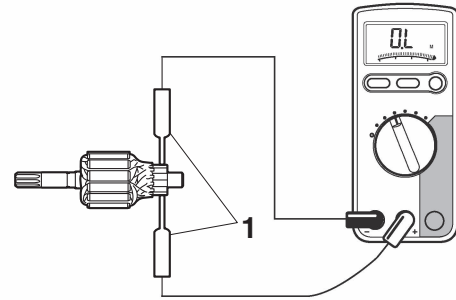
- Armature assembly resistance
Out of specification → Replace the starter motor.
a. Measure the armature assembly resistance with the digital circuit tester.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927



Armature coil resistance
0.063–0.077 Ω



1. Armature coil resistance

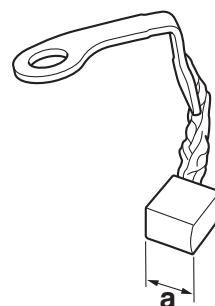
- b. If the resistance is out of specification, replace the starter motor.

5. Measure:

- Brush length “a”
Out of specification → Replace the brushes as a set.



Brush overall length
7.0 mm (0.28 in)
Limit
3.00 mm (0.12 in)

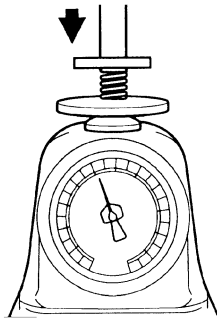


6. Measure:

- Brush spring force
Out of specification → Replace the brush springs as a set.



Brush spring force
6.08–9.12 N (620–930 gf, 21.89–32.83 oz)



7. Check:
 - Gear teeth
Damage/wear → Replace the gear.
8. Check:
 - Bearing
 - Oil seal
Damage/wear → Replace the defective part(s).

EAS30326

ASSEMBLING THE STARTER MOTOR

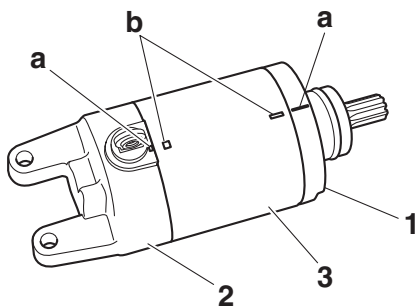
1. Assemble:
 - Starter motor front cover “1”
 - Starter motor rear cover “2”
 - Stator “3”



Starter motor cover bolt
3.5 N·m (0.35 kgf·m, 2.6 lb·ft)

TIP

Align the match marks “a” on the starter motor front cover and rear cover with the match marks “b” on the stator.



EAS30327

INSTALLING THE STARTER MOTOR

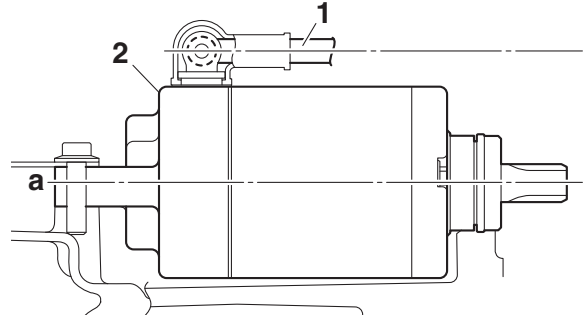
1. Connect:
 - Starter motor lead “1”
(to the starter motor “2”)



Starter motor lead screw
3.5 N·m (0.35 kgf·m, 2.6 lb·ft)

TIP

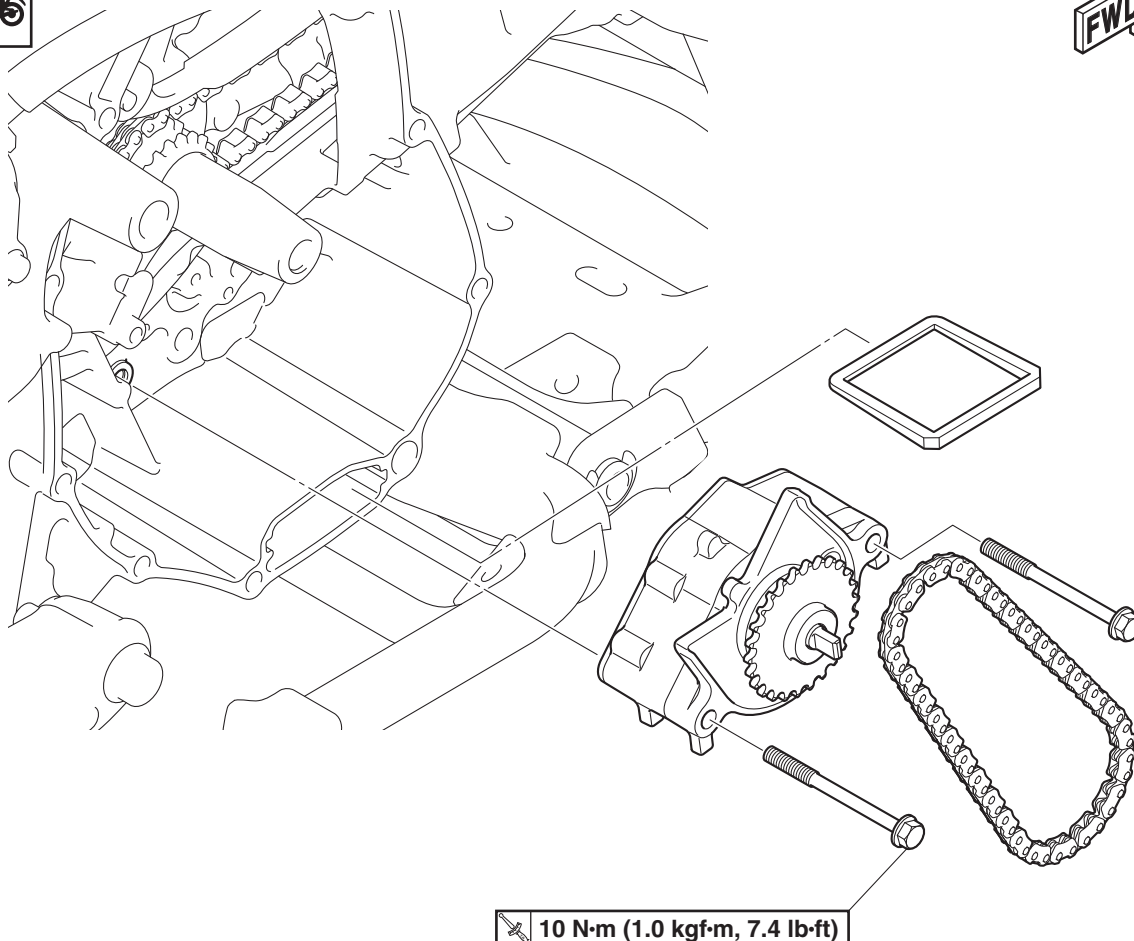
Connect the starter motor lead to the starter motor so that the lead is parallel to the starter motor axis “a”.



EAS20054

OIL PUMP

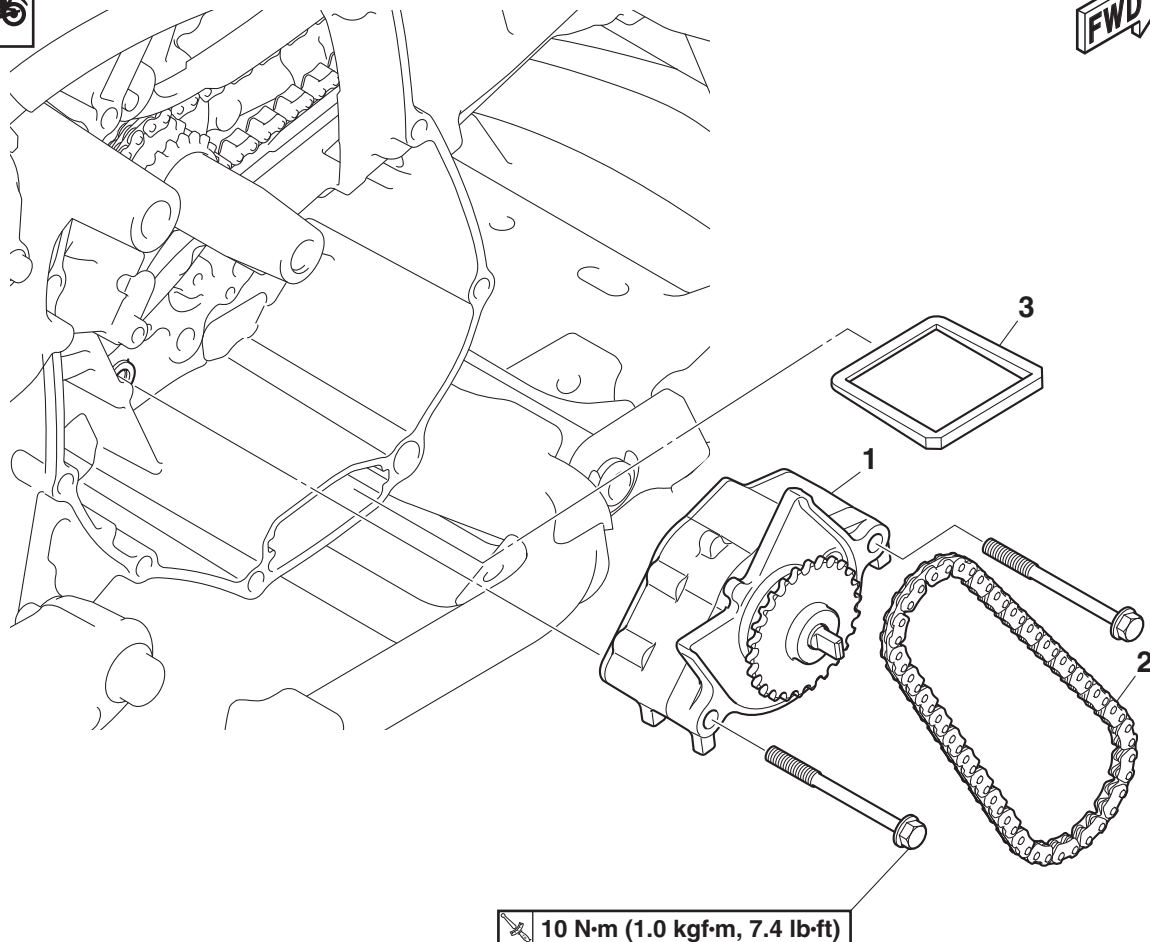
Removing the oil pump assembly



10 N·m (1.0 kgf·m, 7.4 lb·ft)

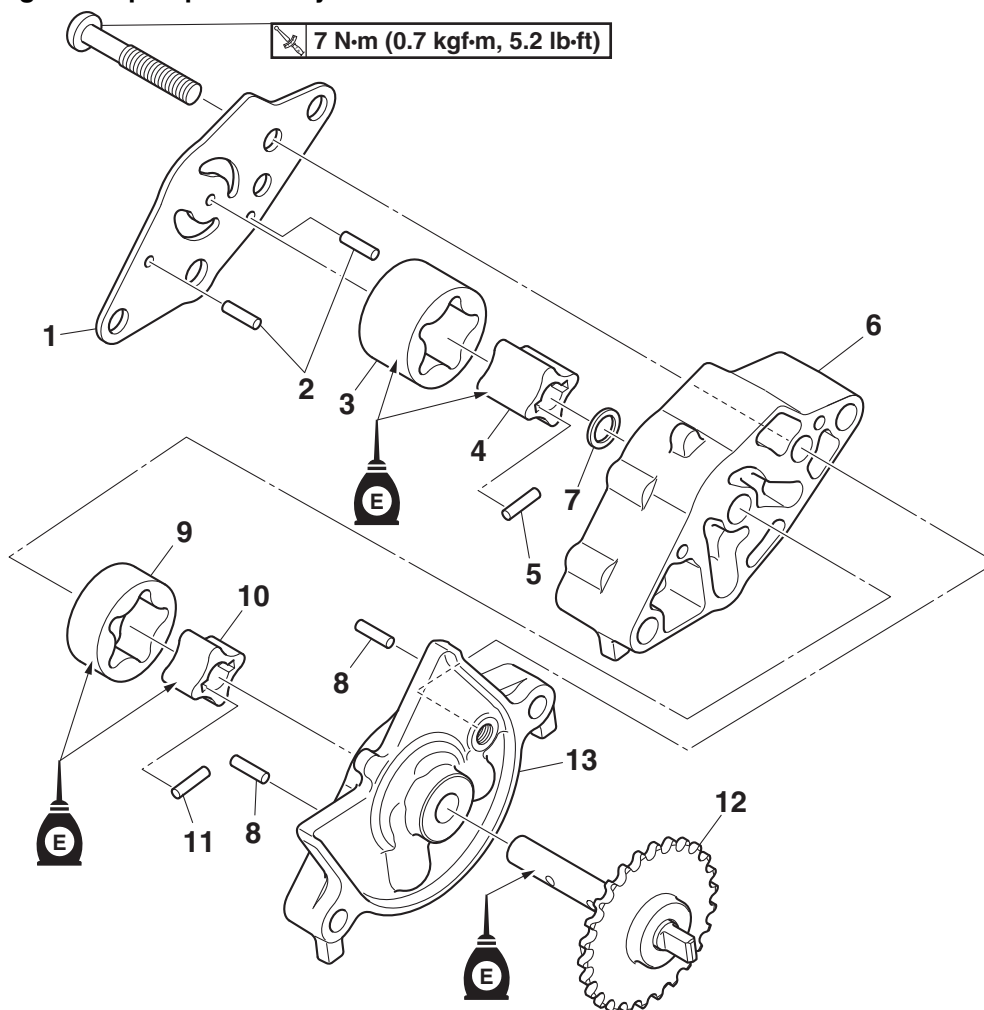
Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side cover (left)		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Radiator cover		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-7.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-21.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-19.

Removing the oil pump assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Water pump inlet hose/water pump outlet pipe		Refer to "WATER PUMP" on page 6-8.
	Generator rotor assembly/Starter clutch gear		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-46.
1	Oil pump assembly	1	
2	Oil pump drive chain	1	
3	Oil strainer (feed)	1	

Disassembling the oil pump assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump housing cover	1	
2	Dowel pin	2	
3	Oil pump outer rotor (scavenge)	1	
4	Oil pump inner rotor (scavenge)	1	
5	Pin	1	
6	Oil pump housing (scavenge)	1	
7	Washer	1	
8	Dowel pin	2	
9	Oil pump outer rotor (feed)	1	
10	Oil pump inner rotor (feed)	1	
11	Pin	1	
12	Oil pump driven gear	1	
13	Oil pump housing (feed)	1	

EAS30340

CHECKING THE OIL STRAINER

1. Check:
 - Oil strainer (feed)
 - Damage → Replace.
 - Contaminants → Clean with solvent.

EAS30337

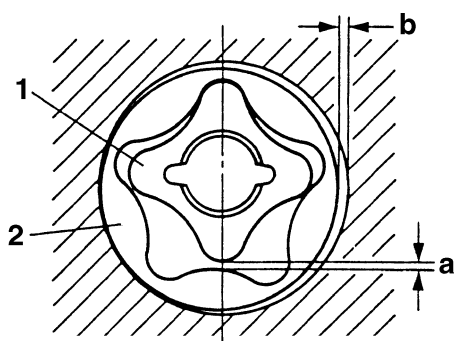
CHECKING THE OIL PUMP

1. Check:
 - Oil pump driven gear
 - Oil pump housings
 - Oil pump housing cover
 - Cracks/damage/wear → Replace the oil pump.
2. Measure:
 - Inner-rotor-to-outer-rotor-tip clearance “a”
 - Outer-rotor-to-oil-pump-housing clearance “b”

Out of specification → Replace the oil pump.

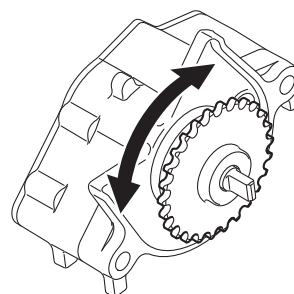


Inner-rotor-to-outer-rotor-tip clearance
 0.100–0.150 mm (0.0039–0.0059 in)
Limit
 0.23 mm (0.0091 in)
Outer-rotor-to-oil-pump-housing clearance
 0.10–0.15 mm (0.0039–0.0059 in)
Limit
 0.22 mm (0.0087 in)



1. Inner rotor
2. Outer rotor

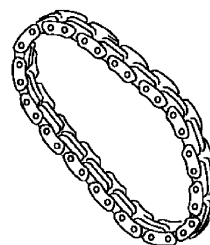
3. Check:
 - Oil pump operation
 - Rough movement → Repeat steps (1) and (2) or replace the oil pump.



EAS30785

CHECKING THE OIL PUMP DRIVE CHAIN

1. Check:
 - Oil pump drive chain
 - Cracks/stiffness → Replace the oil pump chain and oil pump assembly as a set.



EAS30342

ASSEMBLING THE OIL PUMP

1. Lubricate:
 - Inner rotors
 - Outer rotors
 - Oil pump shaft
 - (with the recommended lubricant)

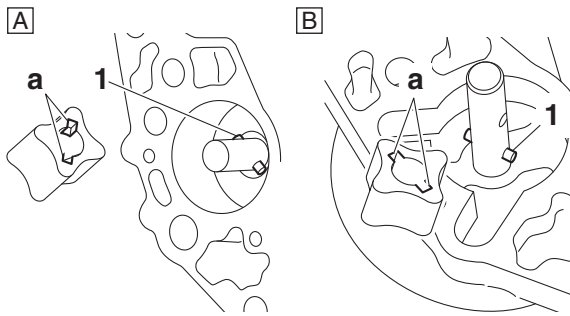


Recommended lubricant
Engine oil

2. Install:
 - Inner rotors

TIP

When installing the inner rotor, align the pins “1” in the oil pump shaft with the grooves “a” in the inner rotor.



- A. Scavenge
B. Feed

3. Check:

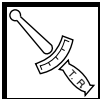
- Oil pump operation
Refer to “CHECKING THE OIL PUMP” on page 5-59.

EAS30343

INSTALLING THE OIL PUMP

1. Install:

- Oil pump assembly



Oil pump bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

ECA13890

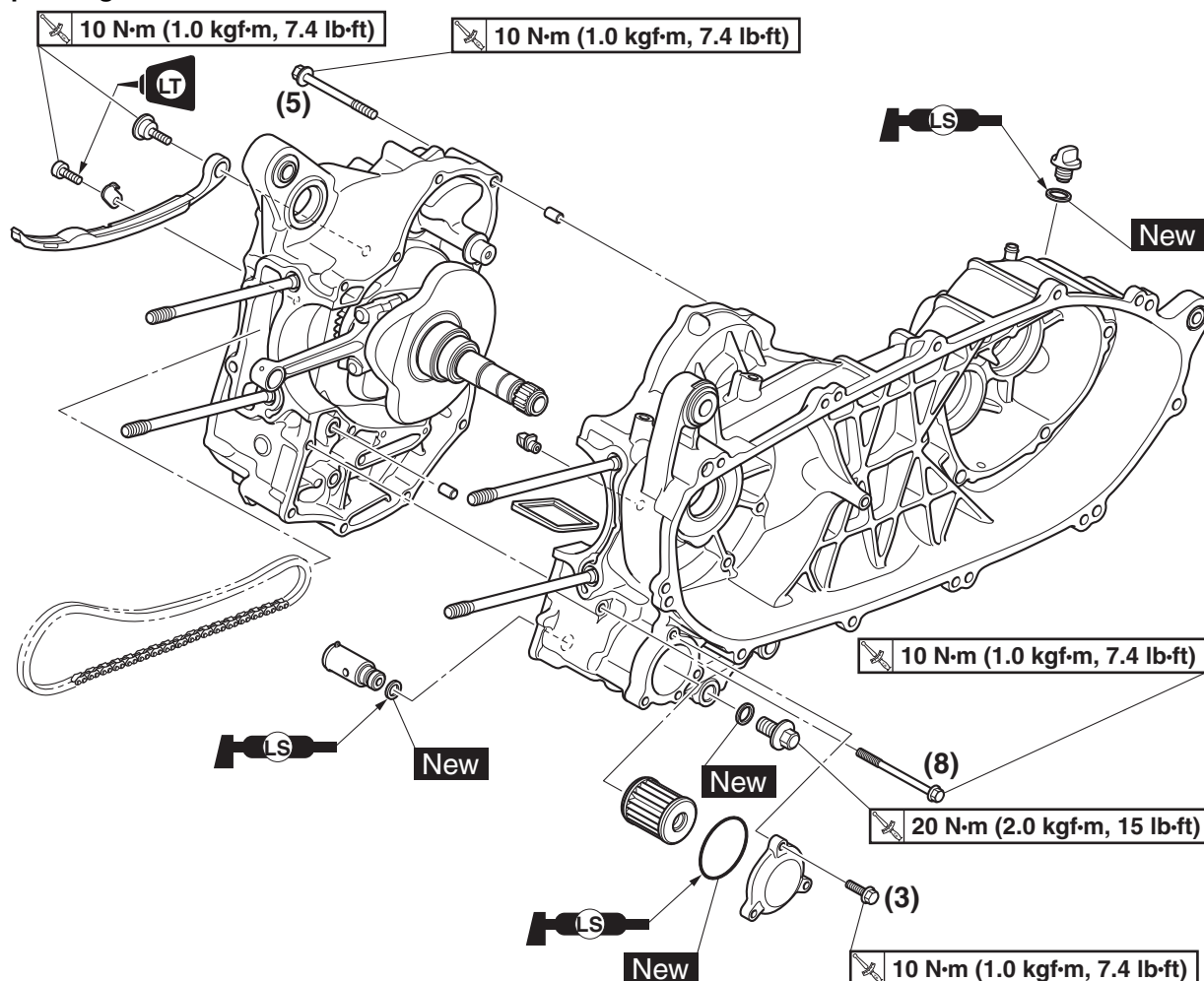
NOTICE

After tightening the bolts, make sure the oil pump turns smoothly.

EAS20059

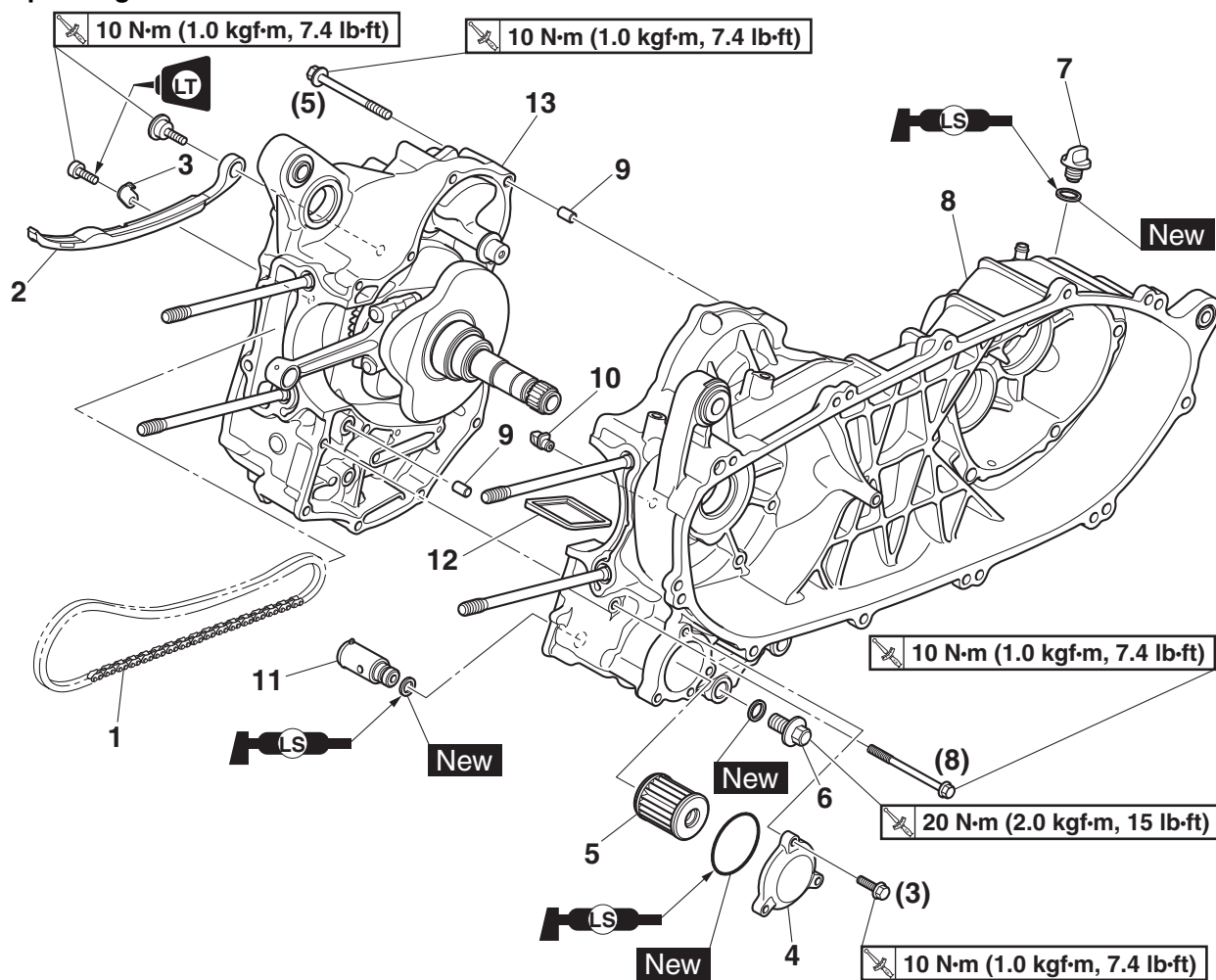
CRANKCASE

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-7.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-13.
	Cylinder/Pistons		Refer to "CYLINDER AND PISTON" on page 5-32.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-52.
	Generator rotor assembly		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-46.
	Oil pump assembly		Refer to "OIL PUMP" on page 5-56.
	Secondary sheave assembly		Refer to "V-BELT AUTOMATIC TRANSMISSION" on page 5-37.
	Swingarm assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" on page 4-91.
	Rear wheel/Rear wheel sensor		Refer to "REAR WHEEL" on page 4-34.

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
	Primary driven gear		Refer to "TRANSMISSION" on page 5-73.
1	Timing chain	1	
2	Timing chain guide (intake side)	1	
3	Timing chain guide retainer	1	
4	Oil filter element cover	1	
5	Oil filter element	1	
6	Engine oil drain bolt	1	
7	Final transmission oil filler cap	1	
8	Crankcase (left)	1	
9	Dowel pin	2	
10	Oil nozzle	1	
11	Relief valve assembly	1	
12	Oil strainer (scavenge)	1	
13	Crankcase (right)	1	

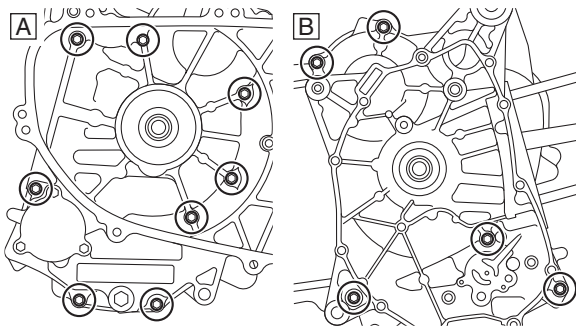
EAS30389

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.



- A. Left side
B. Right side

2. Remove:
 - Crankcase (left)

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.

EAS30390

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.

EAS30391

CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDE

1. Check:
 - Timing chain
Damage/stiffness → Replace the timing chain, camshaft and crankshaft sprocket as a set.

2. Check:
 - Timing chain guide (intake side)
Damage/wear → Replace.

EAS30338

CHECKING THE RELIEF VALVE

1. Check:
 - Relief valve body
Damage/wear → Replace.

EAS31069

CHECKING THE OIL STRAINER

1. Check:
 - Oil strainer (scavenge)
Damage → Replace.
Contaminants → Clean with solvent.

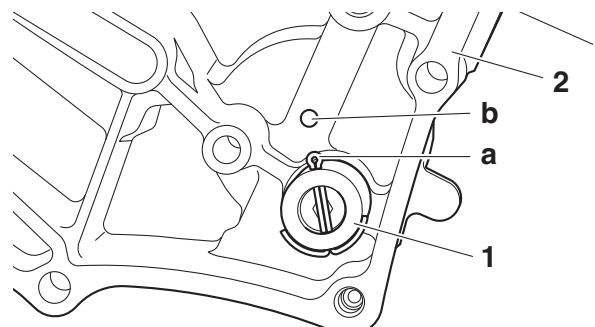
EAS30397

ASSEMBLING THE CRANKCASE

1. Install:
 - Relief valve assembly “1”
(to the crankcase (left) “2”)

TIP

Align the end of the pin “a” in the relief valve assembly with the projection “b” on the left crankcase.



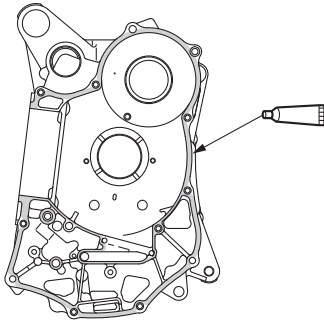
2. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
3. Apply:
 - Sealant
(onto the crankcase mating surfaces)



Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)


TIP

Do not allow any sealant to come into contact with the oil gallery.



4. Install:

- Dowel pins
- Crankcase (left)
- Crankcase bolts

	Crankcase bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)
---	---

TIP

- Thoroughly wipe off any sealant that protrudes from between the left crankcase and the right crankcase.
- Tighten each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.

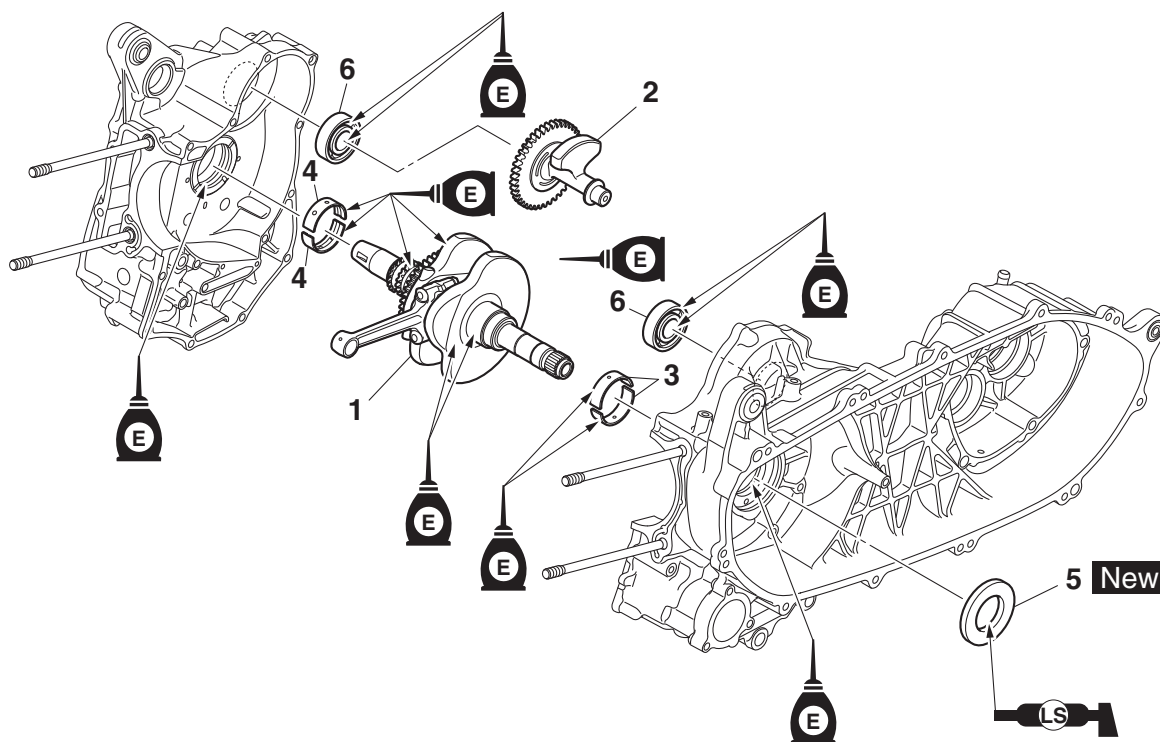
5. Check:

- Crankshaft operation
Rough movement → Repair.

EAS20061

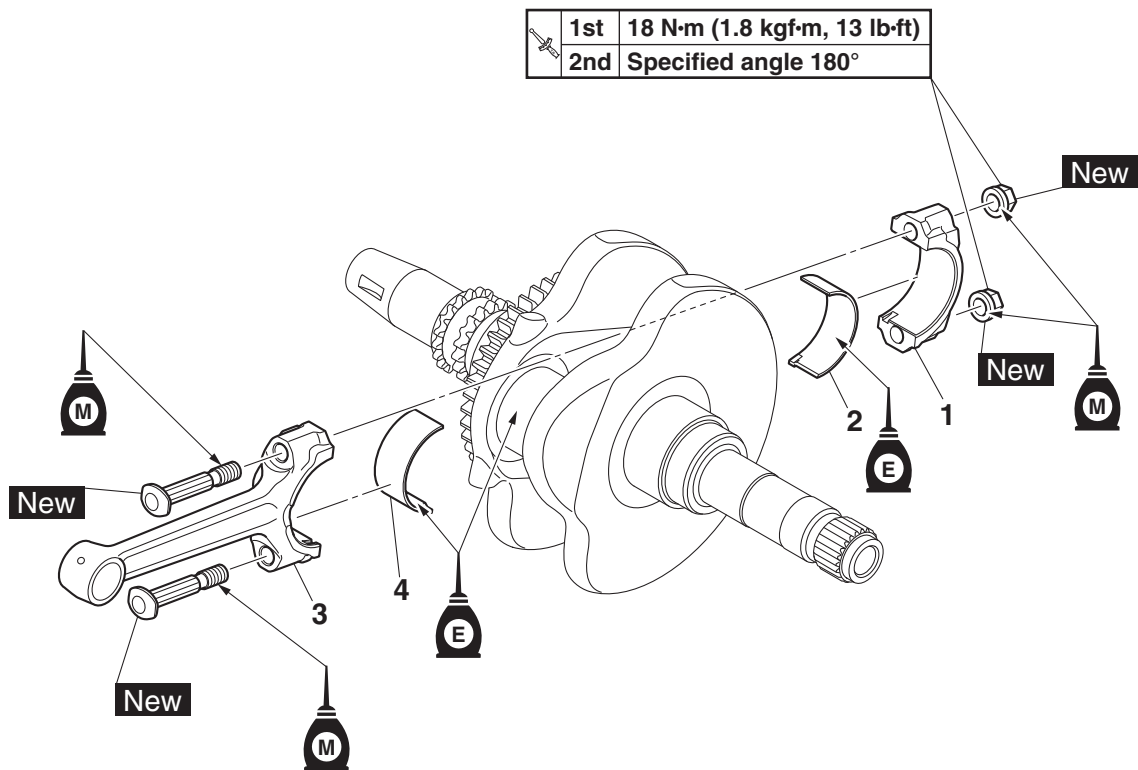
CRANKSHAFT

Removing the crankshaft assembly and balancer shaft assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-61.
1	Crankshaft assembly	1	
2	Balancer shaft assembly	1	
3	Crankshaft journal bearing (left crankcase side)	2	
4	Crankshaft journal bearing (right crankcase side)	2	
5	Oil seal	1	
6	Bearing	2	

Removing the connecting rod



Order	Job/Parts to remove	Q'ty	Remarks
1	Connecting rod cap	1	
2	Big end lower bearing	1	
3	Connecting rod	1	
4	Big end upper bearing	1	

EAS30419

REMOVING THE CRANKSHAFT JOURNAL BEARINGS

The following procedure applies to both of the crankshaft journal bearings.

1. Remove:

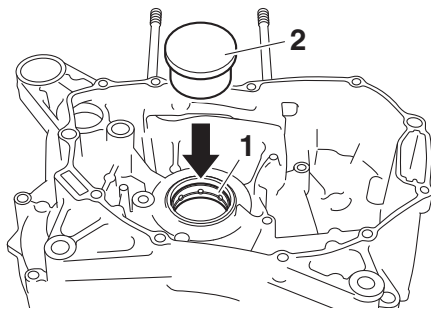
- Crankshaft assembly
- Balancer shaft assembly
- Crankshaft journal bearings "1"

TIP

Remove the crankshaft journal bearings using the pressure tool "2".



Crankshaft metal installation base set
90890-04181
Crankshaft metal installation base set
YM-04181



TIP

Identify the position of each crankshaft journal bearing so that it can be reinstalled in its original place.

EAS30423

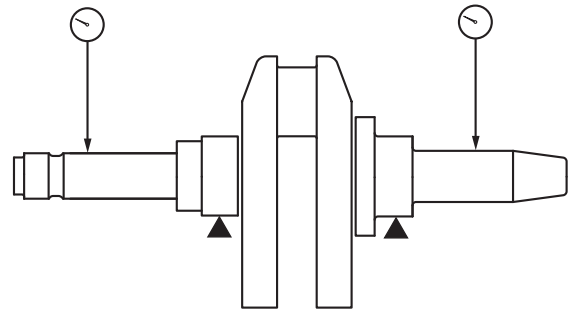
CHECKING THE CRANKSHAFT AND CONNECTING ROD

1. Measure:

- Crankshaft runout
 Out of specification → Replace the crankshaft.



Runout limit
0.030 mm (0.0012 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.

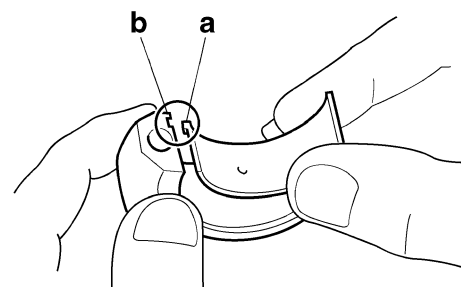


Connecting rod Oil clearance
0.033–0.057 mm (0.0013–0.0022 in)

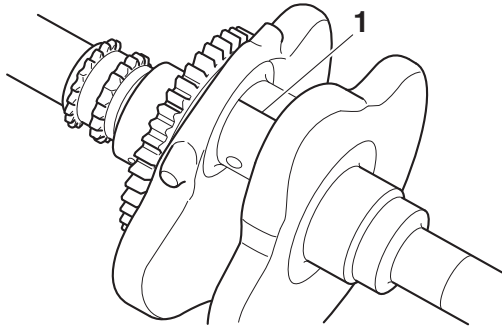
- Clean the big end bearings, crankshaft pins, and the inside of the connecting rod halves.
- Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

TIP

Align the projections "a" on the big end bearings with the notches "b" in the connecting rod and connecting rod cap.



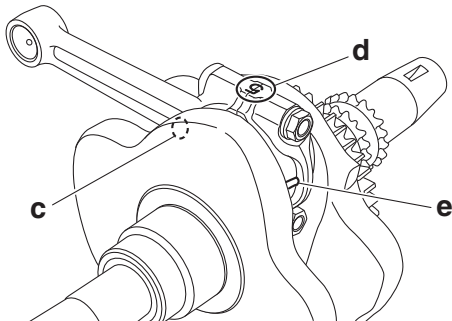
- Put a piece of Plastigauge® "1" on the crankshaft pin.



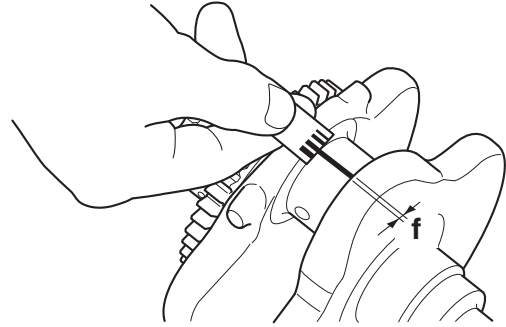
d. Assemble the connecting rod halves.

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 oil.
- Make sure the “Y” mark “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.
- Make sure that the projection “e” on the connecting rod cap faces the same direction as the “Y” mark “c” on the connecting rod.



- e. Tighten the connecting rod nuts. Refer to “INSTALLING THE CONNECTING ROD” on page 5-70.
- f. Remove the connecting rod and big end bearings.
- g. Measure the compressed Plastigauge® width “f” on the crankshaft pin. If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



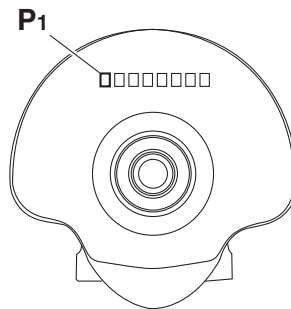
4. Select:

- Big end bearings (P_1)

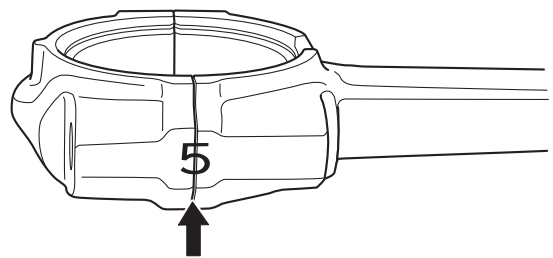
TIP

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.

A



B



For example, if the connecting rod P_1 and the crankshaft web P_1 numbers are 5 and 1 respectively, then the bearing size for P_1 is:

P_1 (connecting rod) - P_1 (crankshaft) $= 5 - 1$ $= 4$ (green)



Bearing color code

- Code 1
Blue
- Code 2
Black
- Code 3
Brown
- Code 4
Green

5. Measure:

- Crankshaft-journal-to-crankshaft-journal bearing clearance.
Out of specification → Replace the crankshaft journal bearings.



Journal oil clearance

0.031–0.064 mm (0.0012–0.0025 in)

TIP

On the journal, the larger value is used as a basis for calculation of the oil clearance, and on the journal bearing, the smaller value is used.

The following procedure applies to all of the crankshaft journal bearings.

ECA13920

NOTICE

Do not interchange the crankshaft journal bearings. To obtain the correct crankshaft-journal-to-crankshaft-journal-bearing clearance and prevent engine damage, the crankshaft journal bearings must be installed in their original positions.

- a. Clean the crankshaft journal bearings, crankshaft journals, and bearing portions of the crankcase.
- b. Check the bearing surface. If the bearing surface is worn or scratched, both bearings should be replaced.

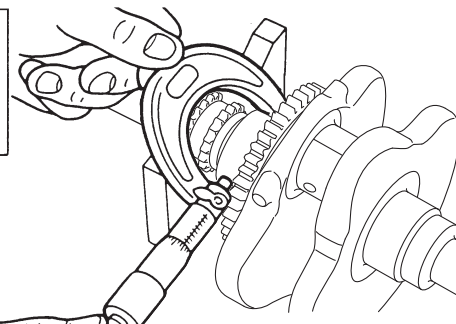
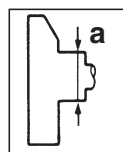
TIP

If either of the right or left journal bearing is worn or scratched, both bearings should be replaced as a set.

- c. Measure the crankshaft journal diameter “a” of each crankshaft journal. If it is out of specification, replace the crankshaft.



Crankshaft journal diameter
39.976–40.000 mm (1.5739–1.5748 in)



- d. Measure the crankshaft journal bearing inside diameter “b” of each crankshaft journal bearing.

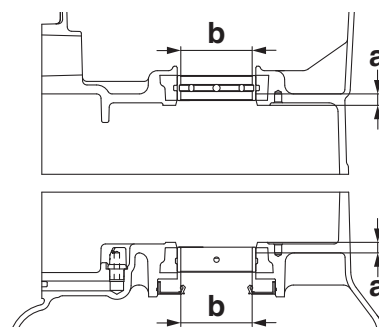


Crankshaft journal bearing inside diameter

40.015–40.056 mm (1.5754–1.5770 in)

TIP

Measure the crankshaft journal bearing inside diameter at the distance “a” shown in the illustration.



- a. 5.8 mm (0.24 in)

- e. If crankshaft journal bearing inside diameter is “40.03” and crankshaft journal diameter is “39.98”, then the journal oil clearance is:

Journal oil clearance:
Crankshaft journal bearing inside diameter -
Crankshaft journal diameter
= 40.03 - 39.98
= 0.05 mm

If the oil clearance is out of specification, select replacement bearings.

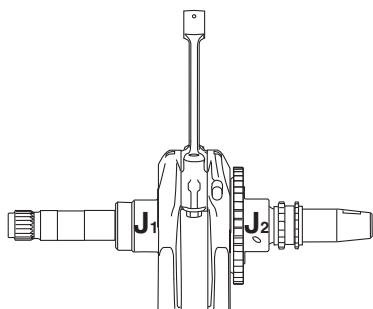
6. Select:

- Crankshaft journal bearings (J₁–J₂)

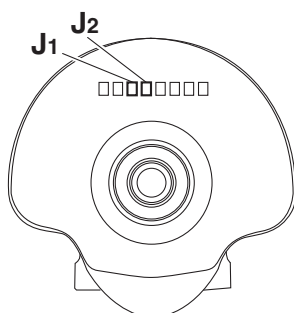
TIP

- The numbers “A” stamped into the crankshaft web and the numbers “B” on the crankcase are used to determine the replacement crankshaft journal bearing size.

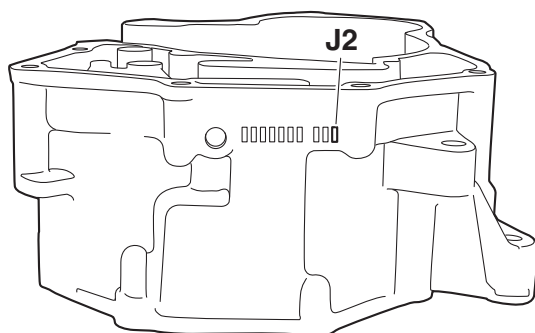
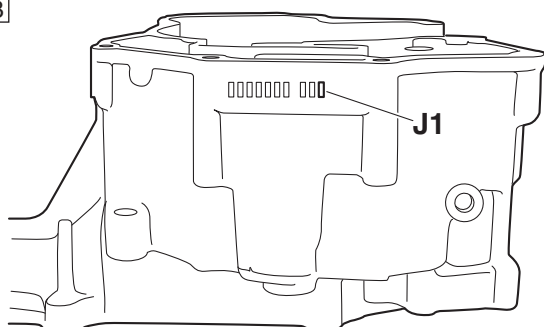
- J₁–J₂ refer to the bearings shown in the crankshaft illustration.



A



B



For example, if the crankcase J₁ and the crankshaft web J₁ numbers are 4 and 2 respectively, then the bearing size for J₁ is:

J₁ (crankcase) - J₁ (crankshaft web)
= 4 - 2
= 2 (black)



Bearing color code

Code 0

White

Code 1

Blue

Code 2

Black

Code 3

Brown

Code 4

Green

Code 5

Yellow

Code 6

Pink

EAS31142

CHECKING THE BALANCER SHAFT ASSEMBLY

1. Check:
 - Balancer shaft assembly
 - Scratches/wear/damage → Replace the balancer shaft assembly.

EAS31316

INSTALLING THE CONNECTING ROD

1. Lubricate:
 - Bolt threads **New**
 - Nut seats **New**
(with the recommended lubricant)



Recommended lubricant
Molybdenum disulfide oil

2. Lubricate:
 - Crankshaft pins
 - Big end bearings inner surface
 - Balancer big end bearings inner surface
(with the recommended lubricant)



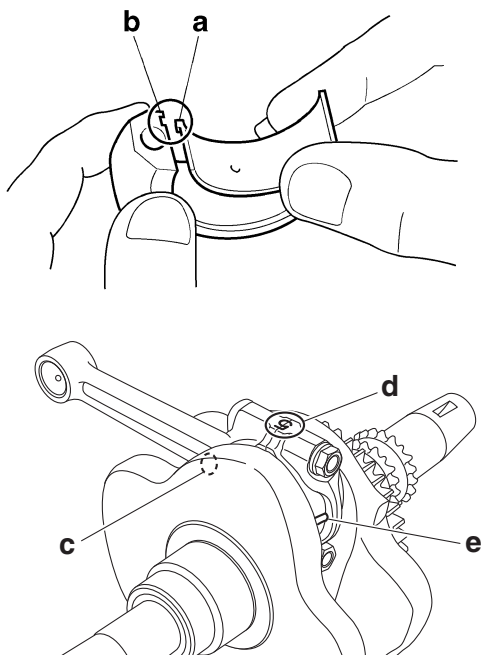
Recommended lubricant
Engine oil

3. Install:
 - Big end bearings
 - Connecting rods
 - Connecting rod caps
(onto the crankshaft pins)

TIP

- Be sure to reinstall each big end bearing in its original place.
- Align the projections “a” on the big end bearings with the notches “b” in the connecting rods and connecting rod caps.

- Make sure the “Y” marks “c” on the connecting rods face towards the left side of the crankshaft.
- Make sure the characters “d” on both the connecting rod and connecting rod cap are aligned.
- Make sure that the projection “e” on the connecting rod cap faces the same direction as the “Y” mark “c” on the connecting rod.



4. Tighten:

- Connecting rod nuts

EWA13390

WARNING

- Replace the connecting rod bolts and nuts with new ones.
- Clean the connecting rod bolts and nuts.

TIP

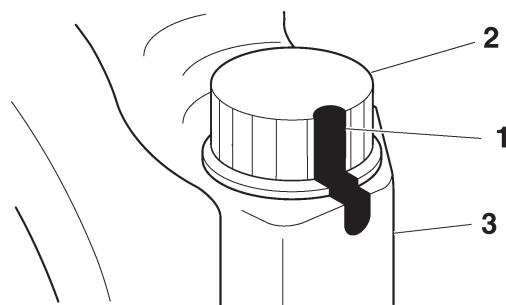
Tighten the connecting rod nuts using the following procedure.

- Tighten the connecting rod nuts with a torque wrench.



Connecting rod nut (1st)
18 N·m (1.8 kgf·m, 13 lb·ft)

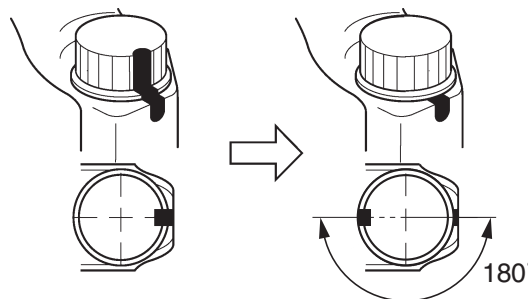
- Put a mark “1” on the corner of the connecting rod nut “2” and the connecting rod cap “3”.



- Tighten the connecting rod nuts further to reach the specified angle 180°.



Connecting rod nut (2nd)
Specified angle 180°



EWA13400

WARNING

If the connecting rod nut is tightened more than the specified angle, do not loosen the nut and then retighten it. Instead, replace the connecting rod bolt and nut with a new one and perform the procedure again.

ECA19930

NOTICE

- Do not use a torque wrench to tighten the connecting rod nut to the specified angle.
- Tighten the nut until it is at the specified angle.

TIP

On a hexagonal nut, note that the angle from one corner to another is 60°.

EAS31446

INSTALLING THE CRANKSHAFT JOURNAL BEARINGS

The following procedure applies to both of the crankshaft journal bearings.

1. Install:

- Crankshaft journal bearing

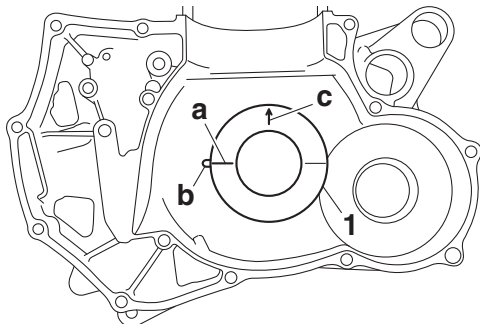


**Crankshaft metal installation
base set
90890-04181**
**Crankshaft metal installation
base set
YM-04181**

- a. Set the bearing installer "1" on the crankcase.

TIP

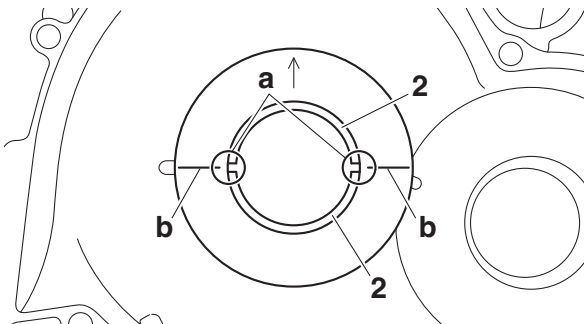
- Align the mark "a" on the bearing installer with the punch mark "b" on the crankcase.
- The arrow mark "c" on the bearing installer should point in the direction shown in the illustration.



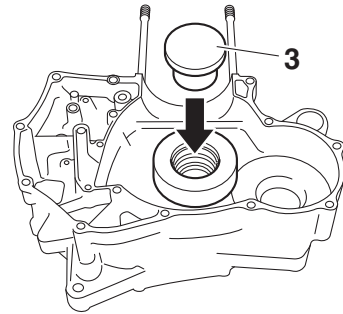
- b. Fit the crankshaft journal bearings "2" into the bearing installer.

TIP

- Lubricate the crankshaft journal bearings with engine oil.
- Align the parting edges "a" of the crankshaft journal bearings with the marks "b" on the bearing installer.



- c. Press the crankshaft journal bearings into the crankcase using the pressure tool "3" and a press.

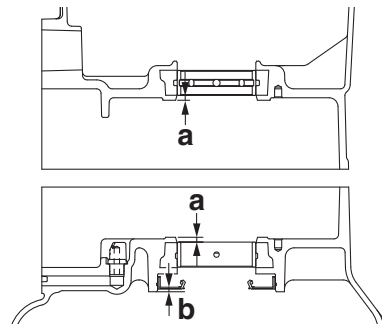


2. Measure:

- Install depth of crankshaft journal bearings
- Install depth of oil seal



Installed depth "a"
2.3–3.1 mm (0.09–0.12 in)
Installed depth "b"
1.0–2.0 mm (0.04–0.08 in)



EAS32341

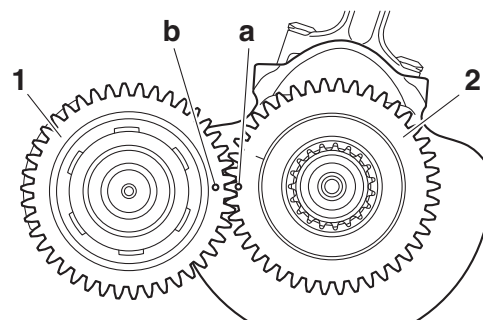
INSTALLING THE CRANKSHAFT ASSEMBLY AND BALANCER SHAFT ASSEMBLY

1. Install:

- Balancer shaft assembly "1"
- Crankshaft assembly "2"
(to the right crankcase)

TIP

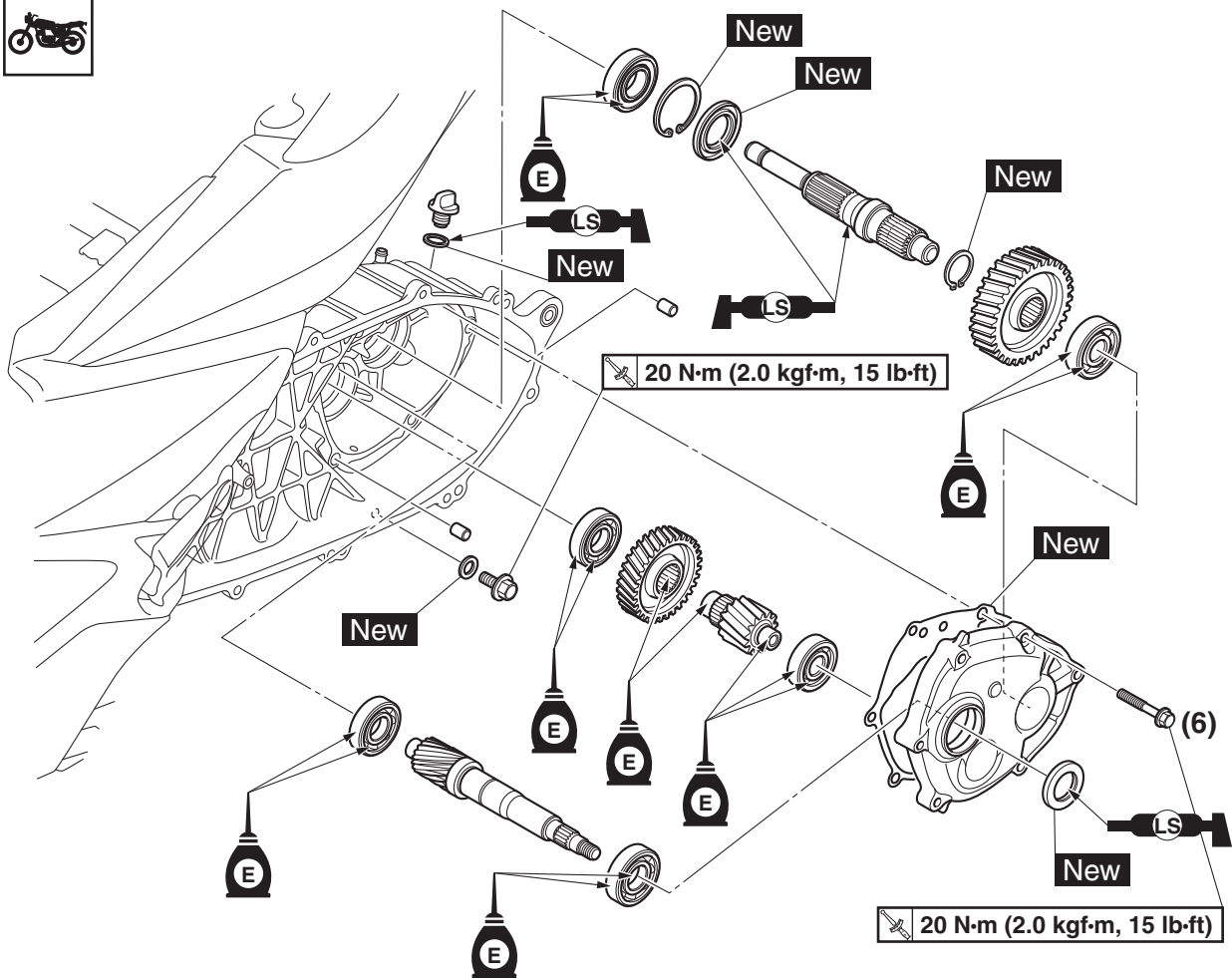
Align the punch mark "a" on the crankshaft assembly with the punch mark "b" on the balancer shaft assembly when installing the parts into the right crankcase.



EAS20062

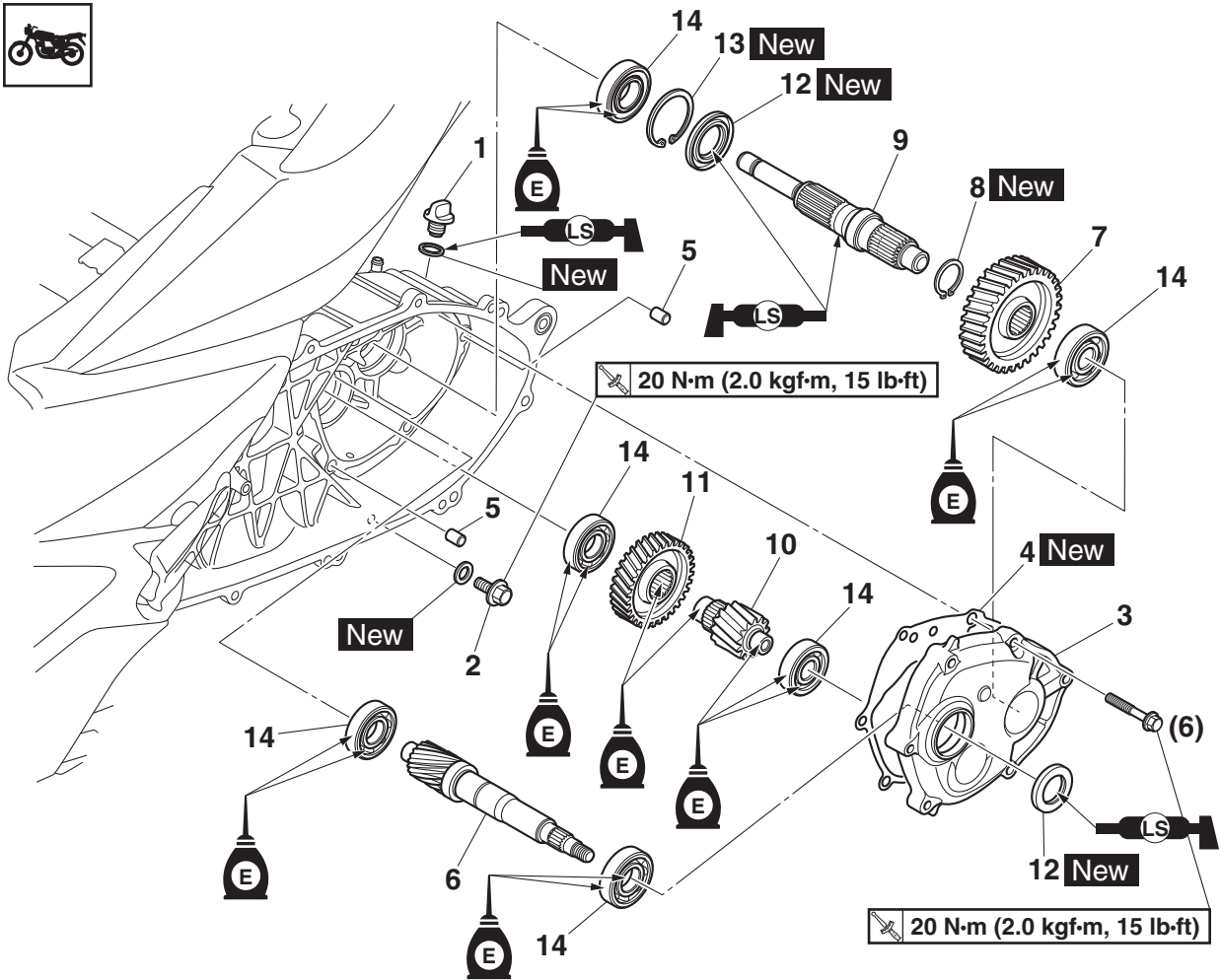
TRANSMISSION

Removing the transmission



Order	Job/Parts to remove	Q'ty	Remarks
	Final transmission oil		Drain. Refer to "CHANGING THE FINAL TRANSMISSION OIL" on page 3-20.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-7.
	Storage box		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Air filter case		Refer to "AIR FILTER CASE" on page 7-11.
	Swingarm		Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" on page 4-91.
	Rear wheel		Refer to "REAR WHEEL" on page 4-34.
	Secondary sheave assembly		Refer to "V-BELT AUTOMATIC TRANSMISSION" on page 5-37.

Removing the transmission



Order	Job/Parts to remove	Q'ty	Remarks
1	Final transmission oil filler cap	1	
2	Final transmission oil drain bolt	1	
3	Transmission case cover	1	
4	Transmission case cover gasket	1	
5	Dowel pin	2	
6	Primary drive gear	1	
7	1st wheel gear	1	
8	Circlip	1	
9	Drive axle	1	
10	Main axle	1	
11	Primary driven gear	1	
12	Oil seal	2	
13	Circlip	1	
14	Bearing	6	

EAS30433

CHECKING THE TRANSMISSION

1. Check:
 - Transmission gears
Blue discoloration/pitting/wear → Replace the defective gear(s).
 - Transmission gear dogs
Cracks/damage/rounded edges → Replace the defective gear(s).
2. Check:
 - Transmission gear engagement
(each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.
3. Check:
 - Transmission gear movement
Rough movement → Replace the defective part(s).

EAS30438

INSTALLING THE TRANSMISSION

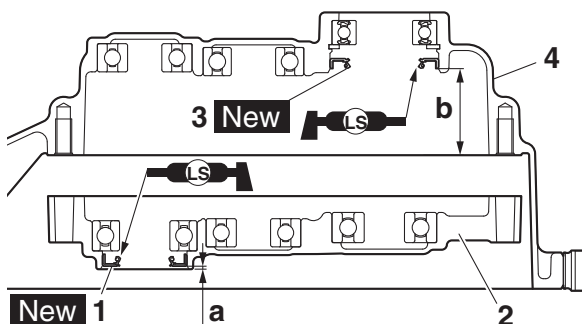
1. Install:
 - Oil seal “1” **New**
(to the transmission case cover “2”)
 - Oil seal “3” **New**
(to the left crankcase “4”)



Installed depth “a”
1.3–2.0 mm (0.05–0.08 in)
Installed depth “b”
43.0–44.0 mm (1.69–1.73 in)

TIP

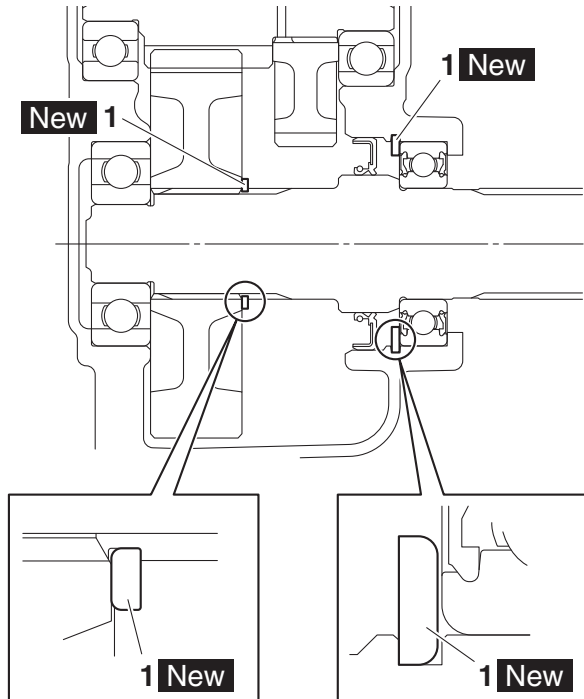
Lubricate the oil seal with lithium-soap-based grease.



2. Install:
 - Circlips “1” **New**

TIP

Install the circlip with its chamfered side facing as shown.



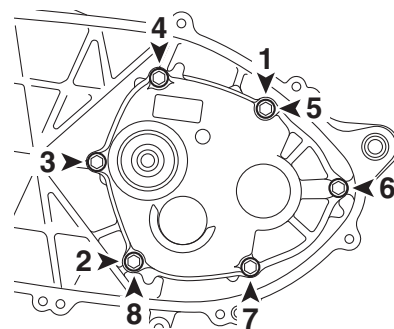
3. Install:
 - Transmission case cover “1”



Transmission case cover bolt
20 N·m (2.0 kgf·m, 15 lb·ft)

TIP

Tighten the transmission case cover bolts in the proper tightening sequence as shown.

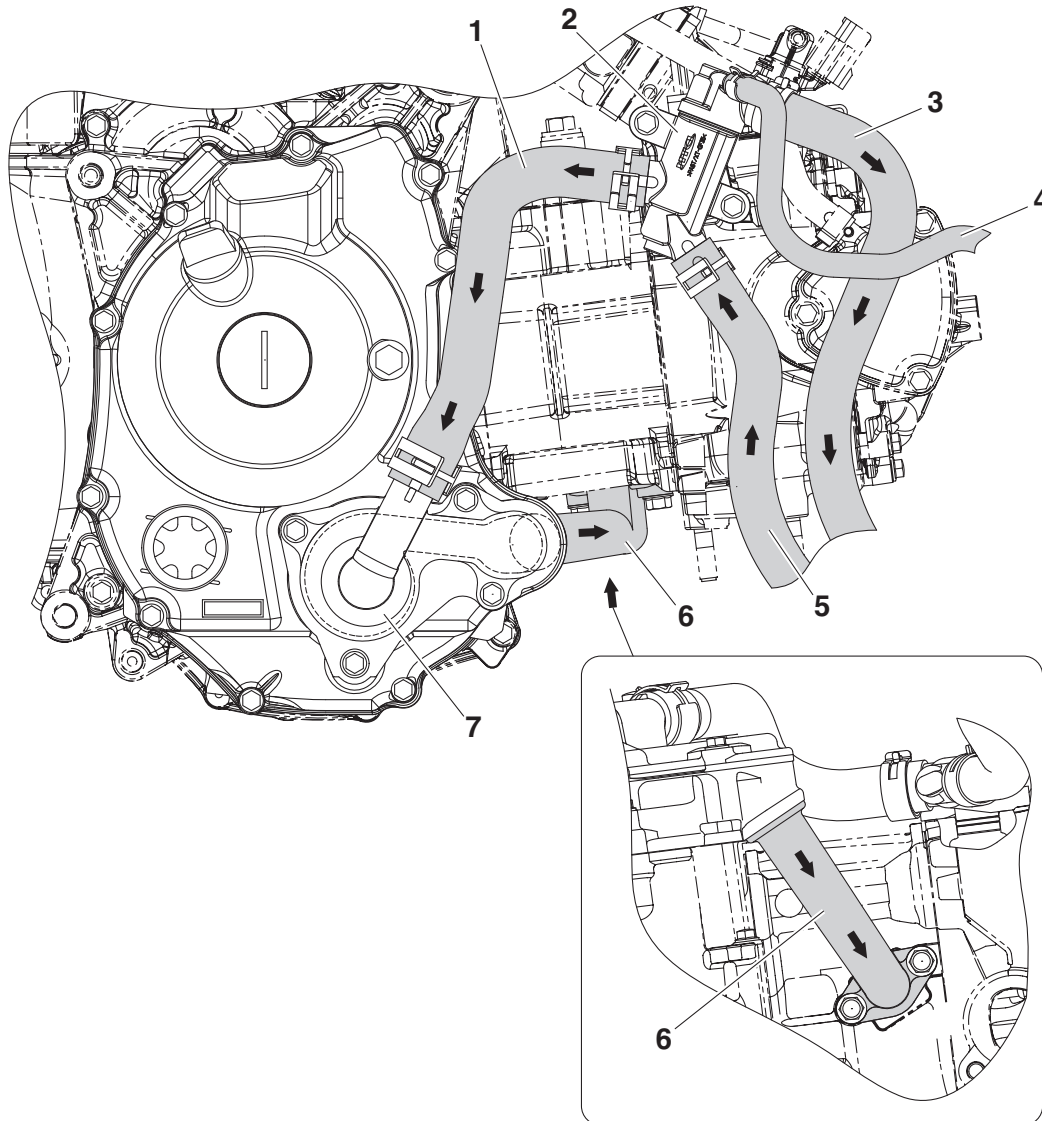


COOLING SYSTEM

COOLING SYSTEM DIAGRAMS	6-1
RADIATOR	6-2
CHECKING THE RADIATOR.....	6-4
INSTALLING THE RADIATOR.....	6-4
THERMOSTAT	6-6
CHECKING THE THERMOSTAT ASSEMBLY	6-7
INSTALLING THE THERMOSTAT ASSEMBLY	6-7
WATER PUMP.....	6-8
DISASSEMBLING THE WATER PUMP.....	6-10
CHECKING THE WATER PUMP	6-10
ASSEMBLING THE WATER PUMP.....	6-10
INSTALLING THE GENERATOR COVER.....	6-10

EAS20299

COOLING SYSTEM DIAGRAMS

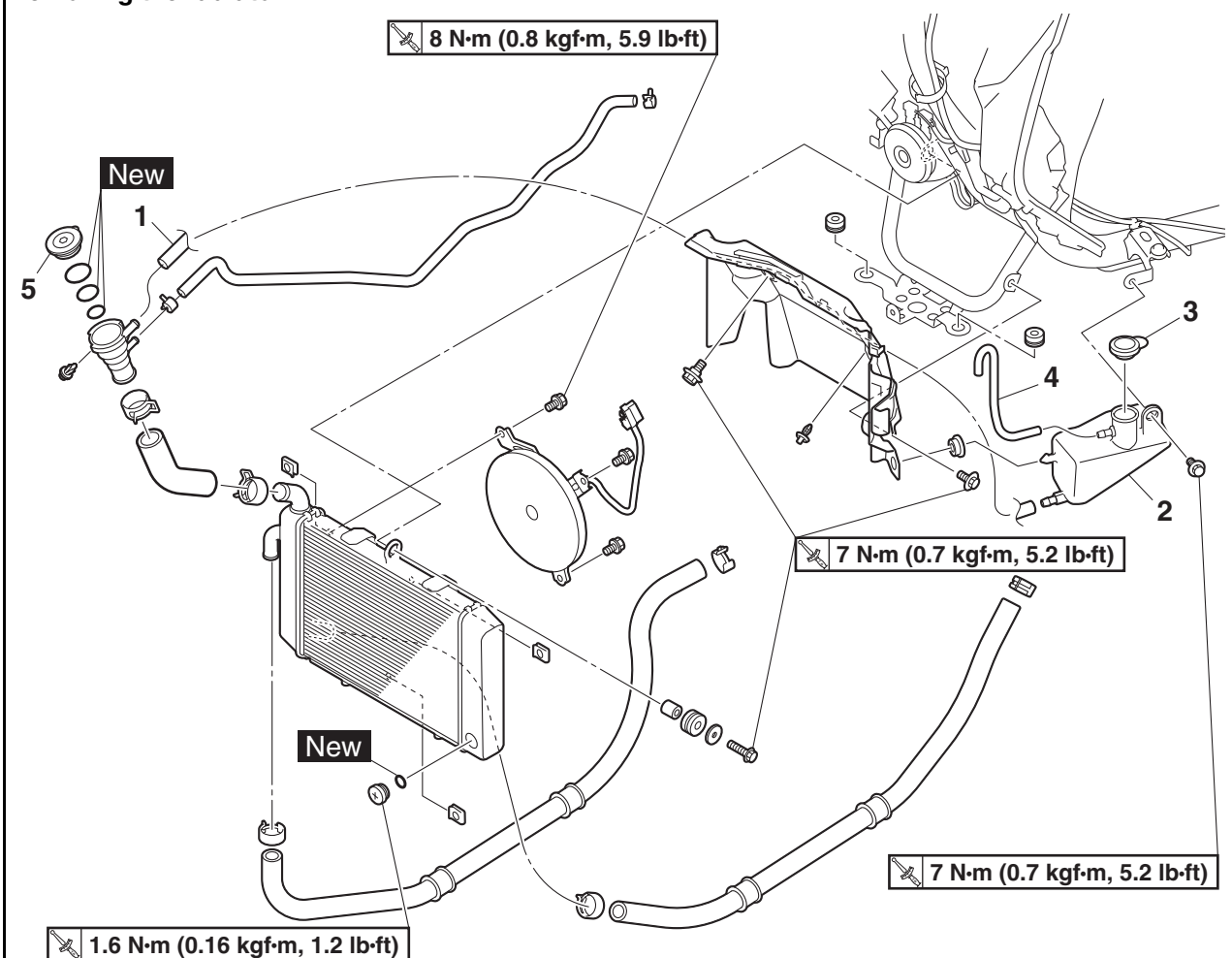


1. Water pump inlet hose
2. Thermostat assembly
3. Radiator inlet hose
4. Cooling system air bleed hose
5. Radiator outlet hose
6. Water pump outlet pipe
7. Water pump assembly

EAS20063

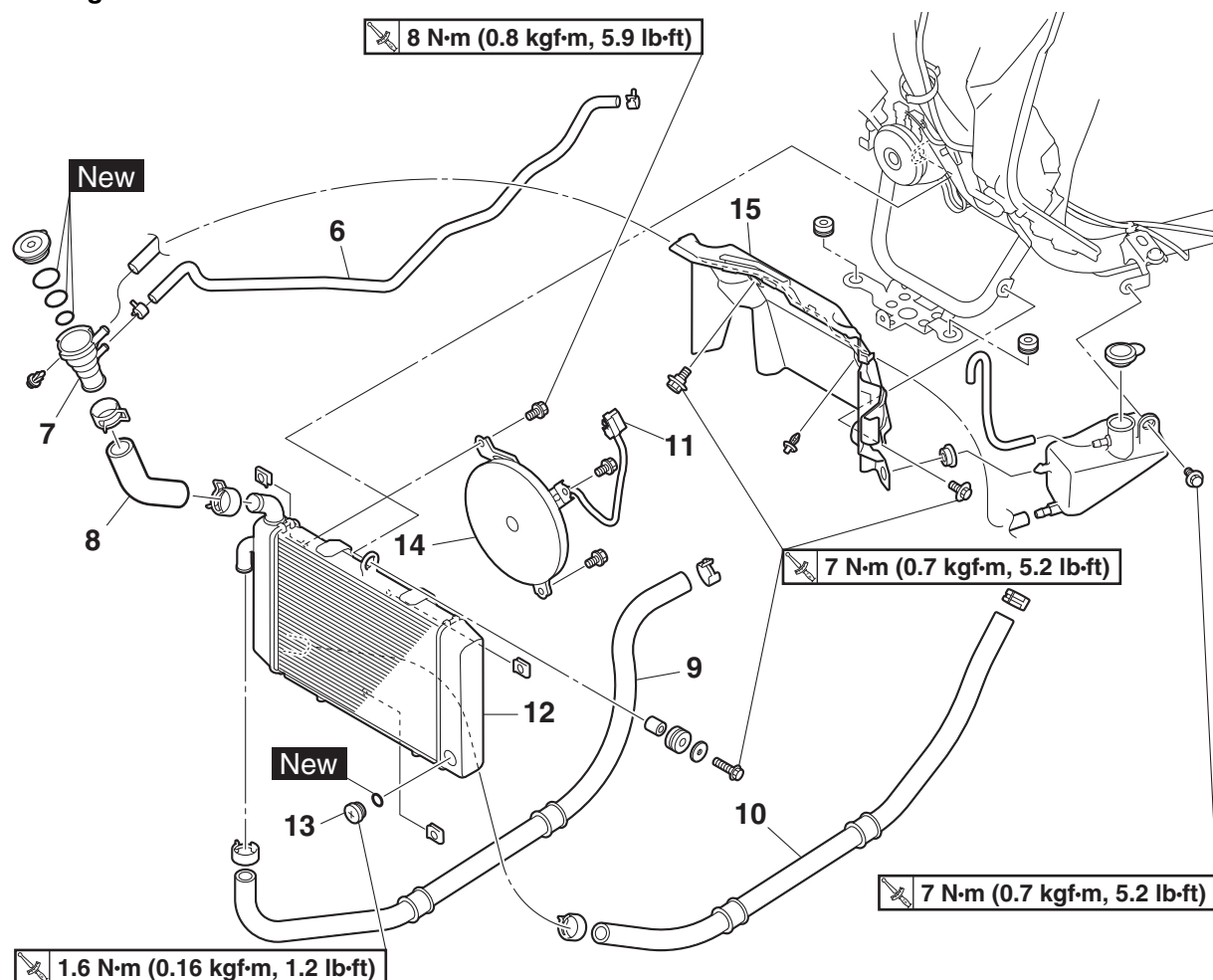
RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Radiator cover		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-21.
1	Coolant reservoir hose	1	
2	Coolant reservoir	1	
3	Coolant reservoir cap	1	
4	Coolant reservoir breather hose	1	
5	Radiator cap	1	TIP _____ Remove/Install it with the radiator filler pipe held. _____

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
6	Cooling system air bleed hose	1	
7	Radiator filler pipe	1	
8	Radiator filler hose	1	
9	Radiator inlet hose	1	
10	Radiator outlet hose	1	
11	Radiator fan motor coupler	1	Disconnect.
12	Radiator	1	
13	Coolant drain bolt	1	
14	Radiator fan	1	
15	Radiator rear cover	1	

EAS30439

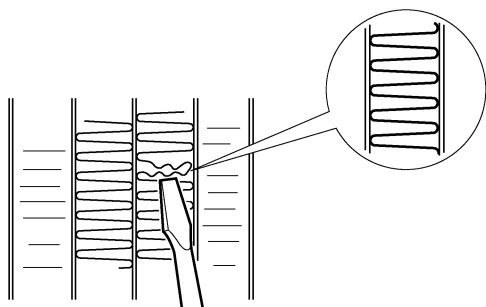
CHECKING THE RADIATOR

1. Check:

- Radiator fins
Obstruction → Clean.
Apply compressed air to the rear of the radiator.
- Damage → Repair or replace.

TIP

Straighten any flattened fins with a thin, flathead screwdriver.



2. Check:

- Radiator hoses
Cracks/damage → Replace.

3. Measure:

- Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.



Radiator cap valve opening pressure

108.0–137.4 kPa (1.08–1.37 kgf/cm², 15.7–19.9 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

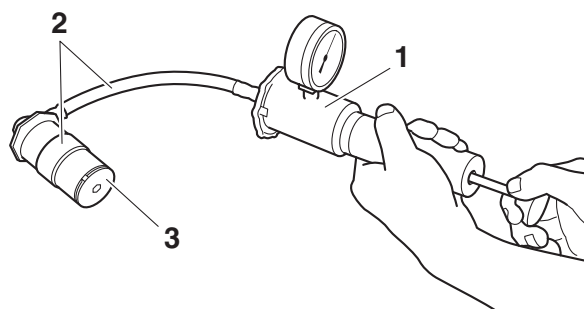
31mm

90890-05375

Radiator cap tester adapter

31mm

YM-05375



- 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 8-27.

EAS30440

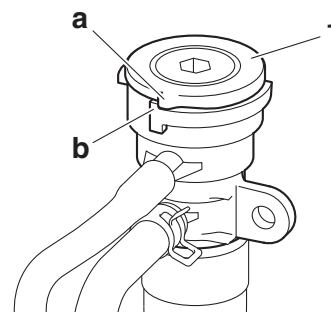
INSTALLING THE RADIATOR

1. Install:

- Radiator cap “1”

TIP

Make sure that the projection “a” on the radiator cap contacts the projection “b” on the radiator filler pipe.

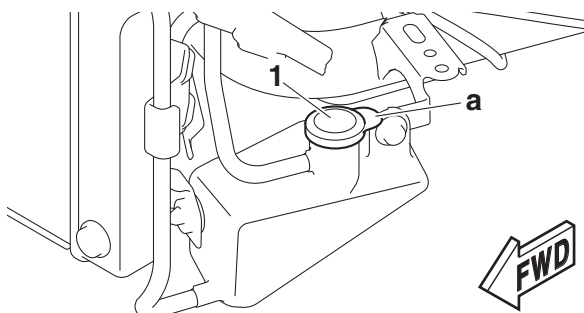


2. Install:

- Coolant reservoir cap “1”

TIP

Point the tab “a” on the coolant reservoir cap rearward.

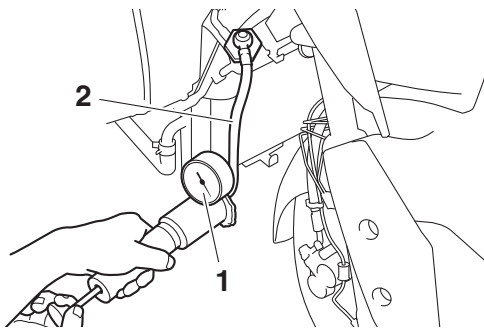
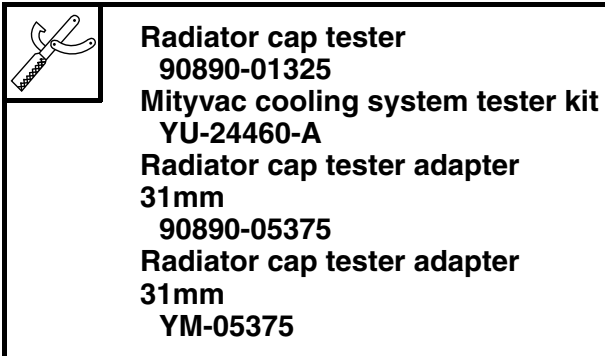


3. Fill:

- Cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT" on page 3-21.

4. Check:

- Cooling system
Leaks → Repair or replace any faulty part.
 - a. Attach the radiator cap tester "1" and radiator cap tester adapter "2" to the radiator.

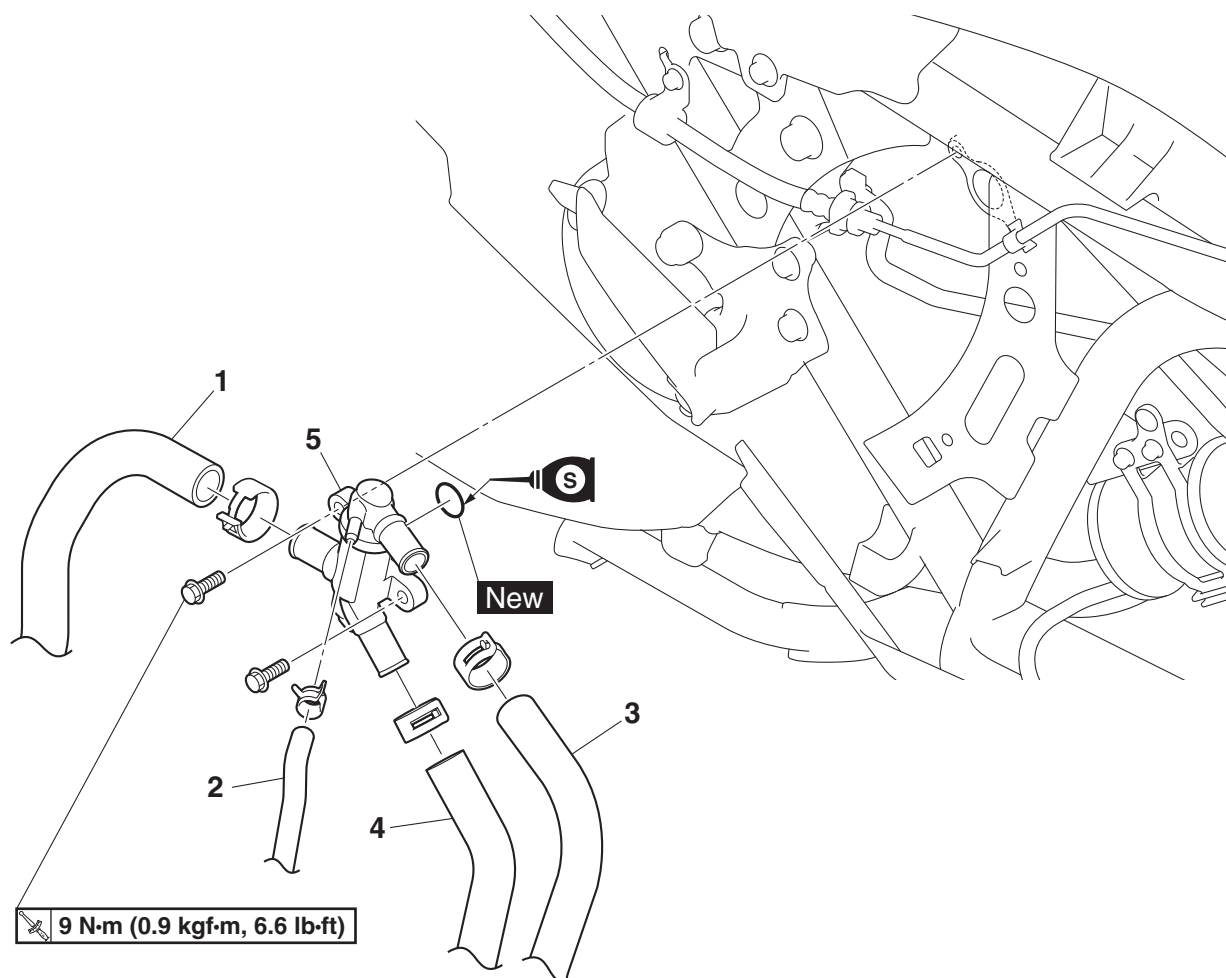


- b. Apply 196 kPa (1.96 kgf/cm², 27.9 psi) of pressure.
- c. Measure the indicated pressure with the gauge.

EAS20065

THERMOSTAT

Removing the thermostat assembly



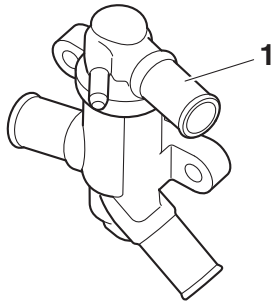
Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Radiator cover		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-21.
1	Water pump inlet hose	1	Disconnect.
2	Cooling system air bleed hose	1	Disconnect.
3	Radiator inlet hose	1	Disconnect.
4	Radiator outlet hose	1	Disconnect.
5	Thermostat assembly	1	

EAS31248

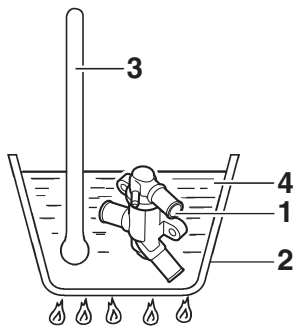
CHECKING THE THERMOSTAT ASSEMBLY

1. Check:

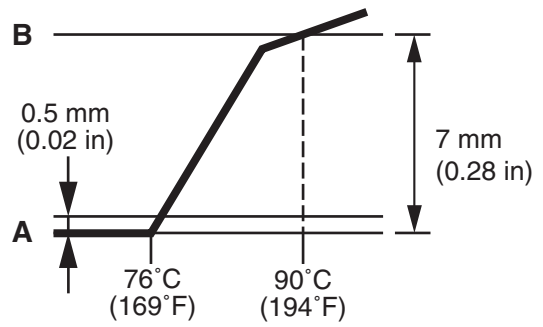
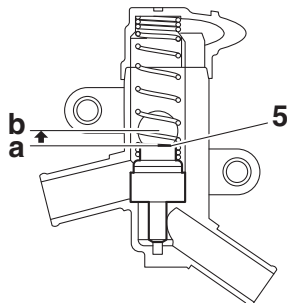
- Thermostat "1"
Does not open at 74–78 °C (165–172 °F) → Replace.



- Suspend the thermostat "1" in a container "2" filled with water.
- Slowly heat the water.
- Place a thermometer "3" in the water.
- While stirring the water "4", observe the thermostat and thermometer's indicated temperature.



- Check the thermostat element position "5".
Same level for the thermostat element upper end "a" and the hole center line "b" at 90 °C (194 °F).



- 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.

EAS30445

INSTALLING THE THERMOSTAT ASSEMBLY

1. Fill:

- Cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT" on page 3-21.

2. Check:

- Cooling system
Leaks → Repair or replace any faulty part.
Refer to "INSTALLING THE RADIATOR" on page 6-4.

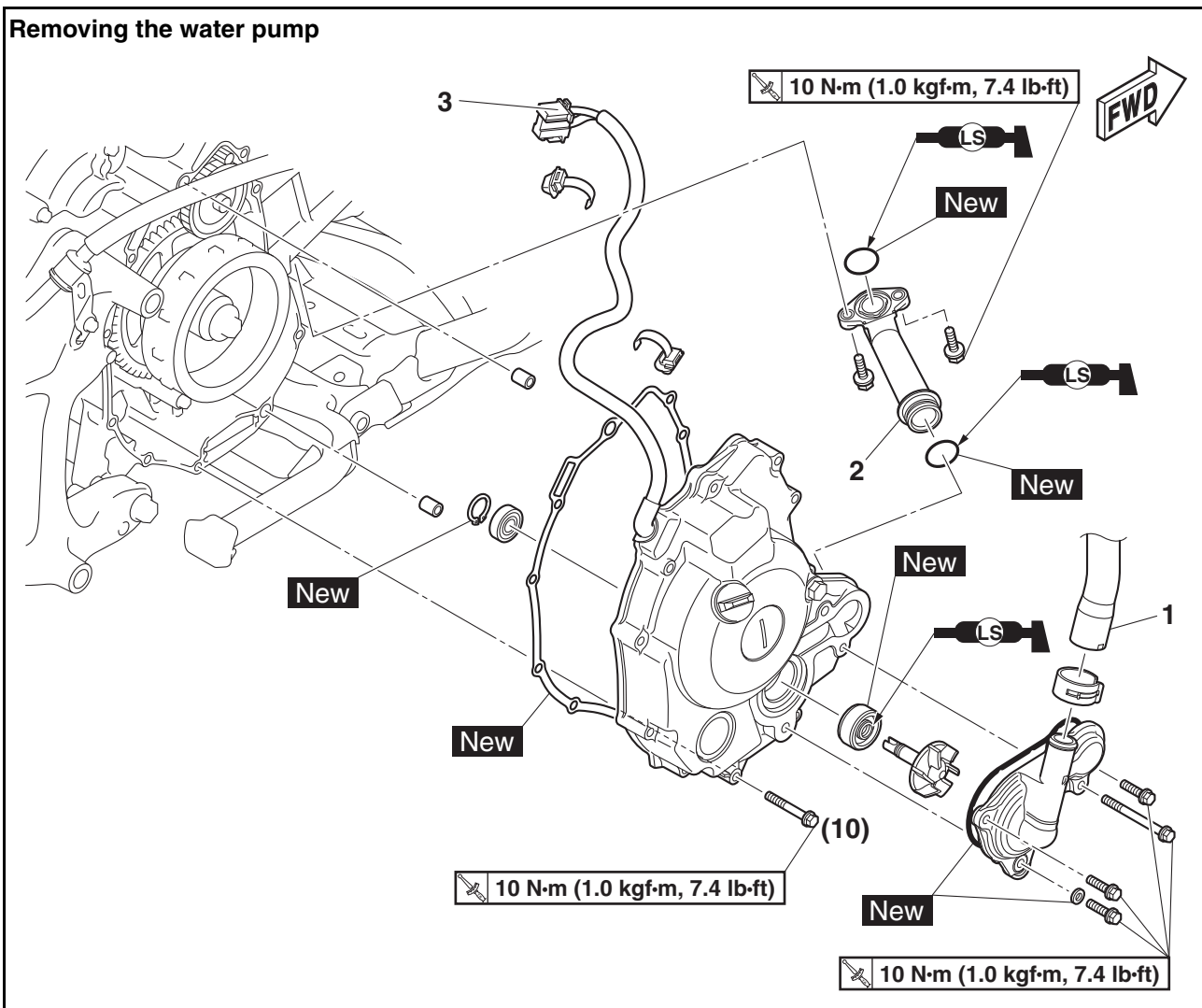
3. Measure:

- Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to "CHECKING THE RADIATOR" on page 6-4.

EAS20066

WATER PUMP

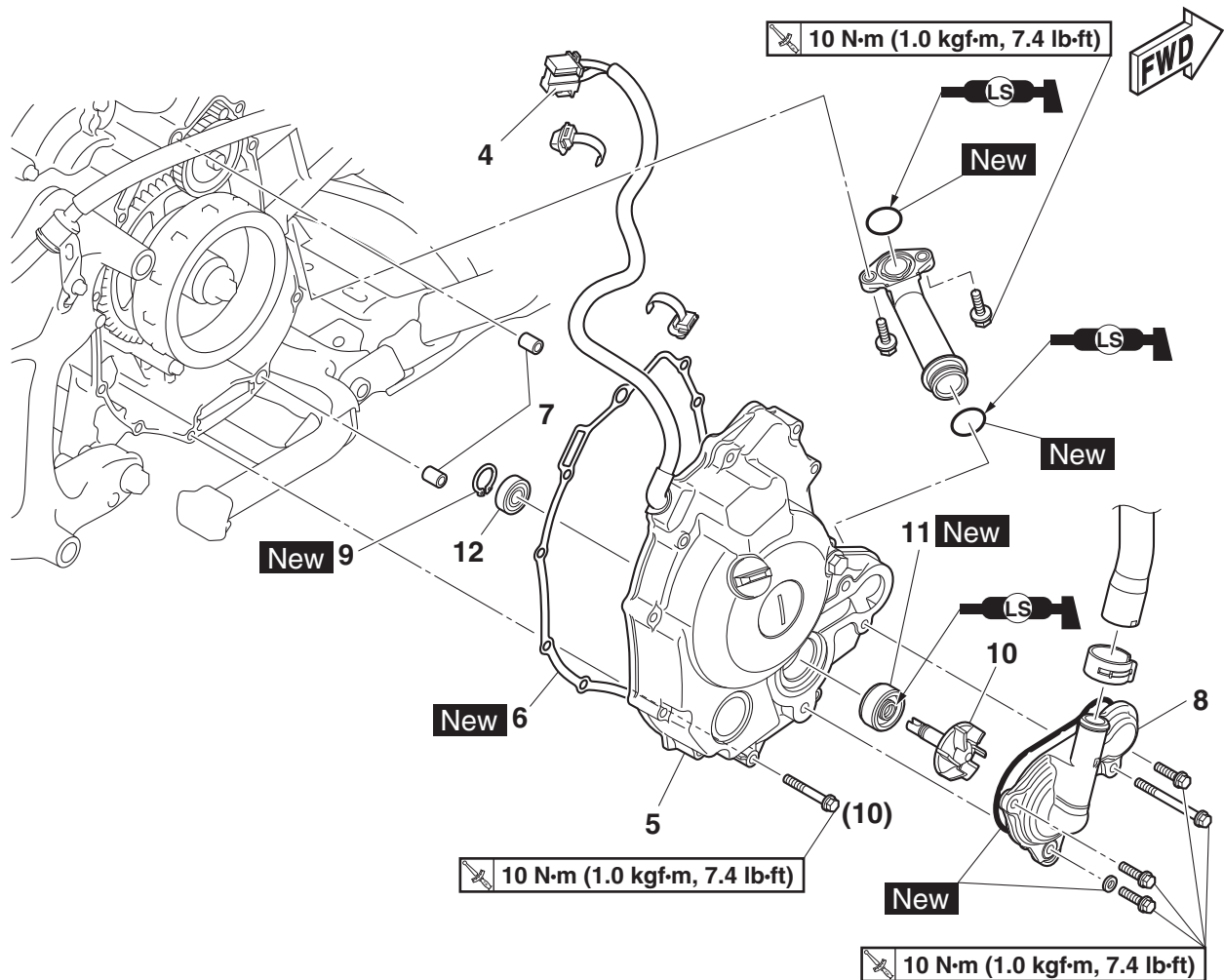
Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Radiator cover		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Exhaust pipe		Refer to "ENGINE REMOVAL" on page 5-7.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-21.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-19.
1	Water pump inlet hose	1	Disconnect.
2	Water pump outlet pipe	1	
3	Crankshaft position sensor coupler	1	Disconnect.

WATER PUMP

Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
4	Stator coil coupler	1	Disconnect.
5	Generator cover	1	
6	Generator cover gasket	1	
7	Dowel pin	2	
8	Water pump housing	1	
9	Circlip	1	
10	Impeller shaft	1	
11	Water pump seal	1	
12	Bearing	1	

EAS30446

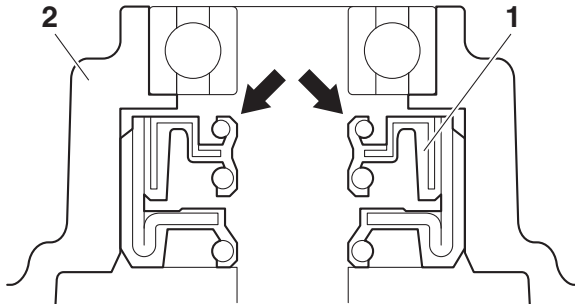
DISASSEMBLING THE WATER PUMP

1. Remove:

- Water pump seal “1”

TIP

Remove the water pump seal from the outside of the generator cover “2”.



EAS30447

CHECKING THE WATER PUMP

1. Check:

- Water pump housing
 - Generator cover
 - Impeller shaft
- Cracks/damage/wear → Replace.

EAS30448

ASSEMBLING THE WATER PUMP

1. Install:

- Water pump seal “1” **New**
(into the generator cover “2”)

TIP

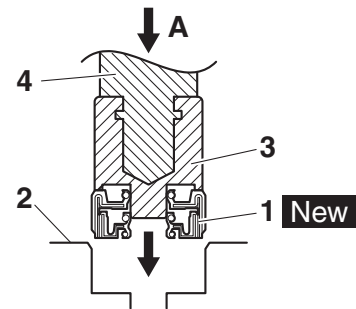
Install the water pump seal with the special tools to the specified depth as shown in the illustration.



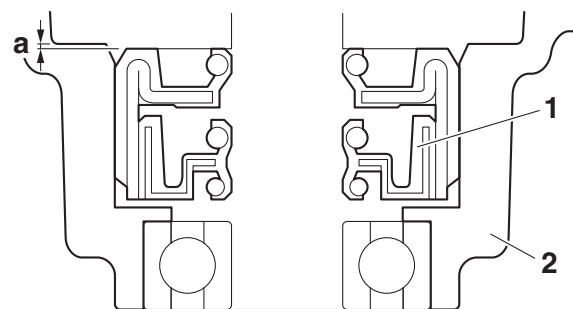
Installed depth of water pump seal
0.2–0.7 mm (0.01–0.03 in)



Mechanical seal installer
90890-04145
Middle driven shaft bearing driver
90890-04058
Middle drive bearing installer 40 & 50 mm
YM-04058



- A. Push down
3. Mechanical seal installer
4. Middle driven shaft bearing driver



- a. Installed depth of water pump seal

2. Lubricate:

- Water pump seal



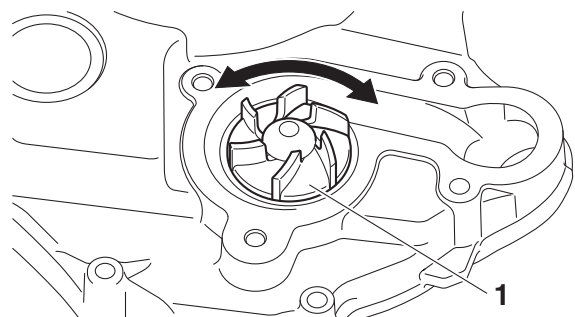
Recommended lubricant
Lithium-soap-based grease

3. Install:

- Impeller shaft “1”
- Circlip **New**

TIP

After installation, check that the impeller shaft rotates smoothly.



EAS32358

INSTALLING THE GENERATOR COVER

1. Install:

- Dowel pins
- Generator cover gasket **New**

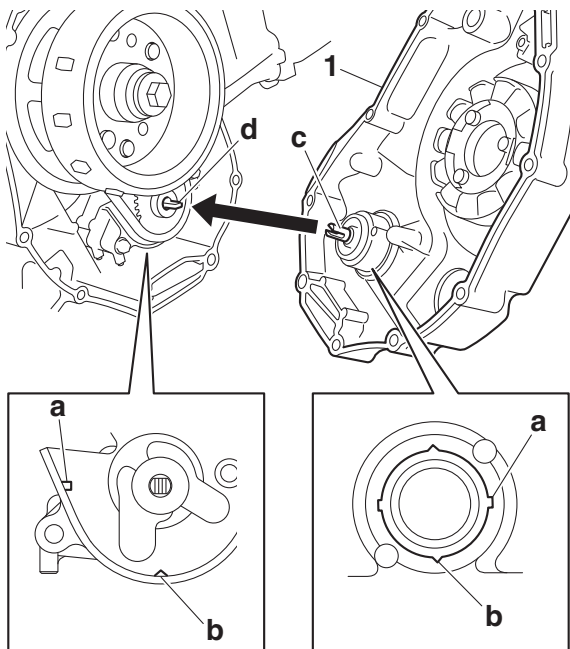
- Generator cover “1”



**Generator cover bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)**

TIP

- Align the projections “a” and “b” on the water pump with the respective projections “a” and “b” on the oil pump.
- Align the slit “c” on the impeller shaft with the projection “d” on the oil pump shaft.
- Tighten the generator cover bolts in stages and in a crisscross pattern.



2. Connect:

- Stator coil coupler
- Crankshaft position sensor coupler

TIP

To route the stator coil/crankshaft position sensor lead, refer to “CABLE ROUTING” on page 2-13.

3. Fill:

- Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-21.

4. Check:

- Cooling system
Leaks → Repair or replace any faulty part.
Refer to “INSTALLING THE RADIATOR” on page 6-4.

5. Measure:

- Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to “CHECKING THE RADIATOR” on page 6-4.

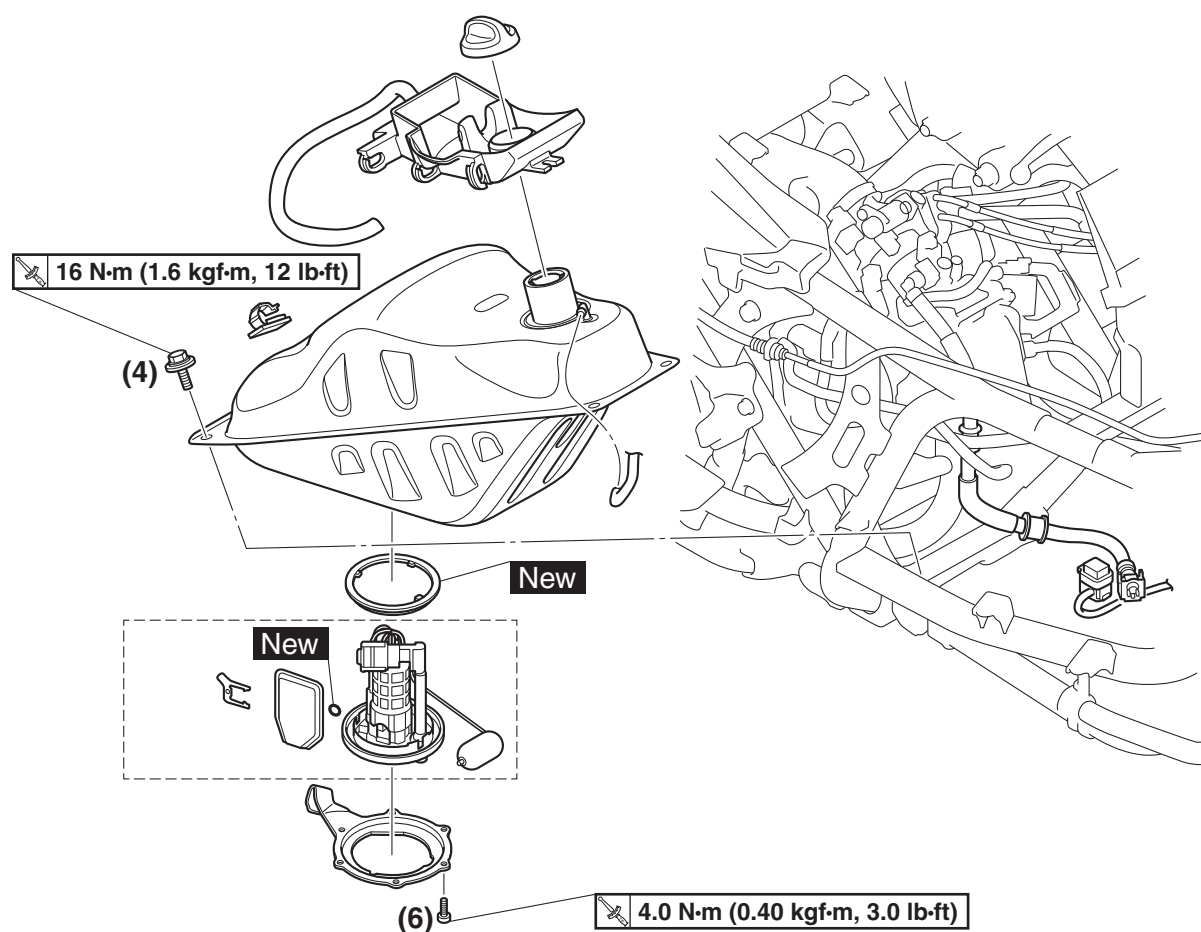
FUEL SYSTEM

FUEL TANK	7-1
REMOVING THE FUEL TANK.....	7-5
REMOVING THE FUEL PUMP.....	7-5
REMOVING THE FUEL FILTER.....	7-5
CHECKING THE FUEL PUMP BODY.....	7-5
CHECKING THE FUEL FILTER.....	7-5
CHECKING THE ROLLOVER VALVE.....	7-5
INSTALLING THE FUEL FILTER.....	7-6
INSTALLING THE FUEL PUMP.....	7-6
INSTALLING THE FUEL TANK.....	7-6
CHECKING THE FUEL PRESSURE.....	7-7
 FUEL INJECTOR	7-8
REMOVING THE FUEL HOSE.....	7-9
CHECKING THE FUEL INJECTOR.....	7-9
INSTALLING THE FUEL INJECTOR.....	7-9
INSTALLING THE FUEL HOSE.....	7-9
 AIR FILTER CASE	7-11
INSTALLING THE AIR FILTER CASE.....	7-12
 THROTTLE BODY	7-13
REMOVING THE THROTTLE BODY.....	7-15
CHECKING THE THROTTLE BODY.....	7-15
CLEANING THE ISC (IDLE SPEED CONTROL) UNIT AND THROTTLE BODY.....	7-15
REPLACING THE THROTTLE BODY.....	7-18
INSTALLING THE THROTTLE BODY.....	7-18

EAS20067

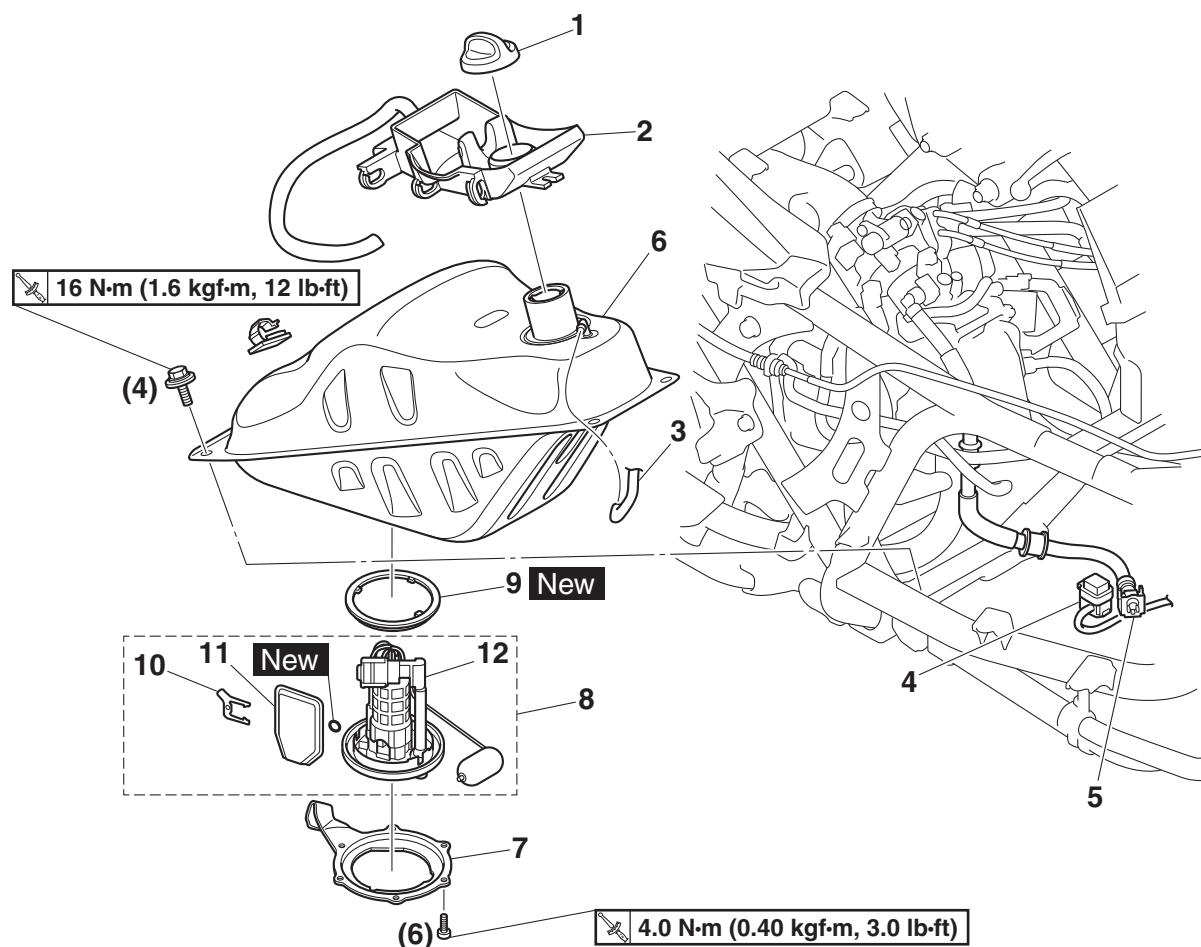
FUEL TANK

Removing the fuel tank



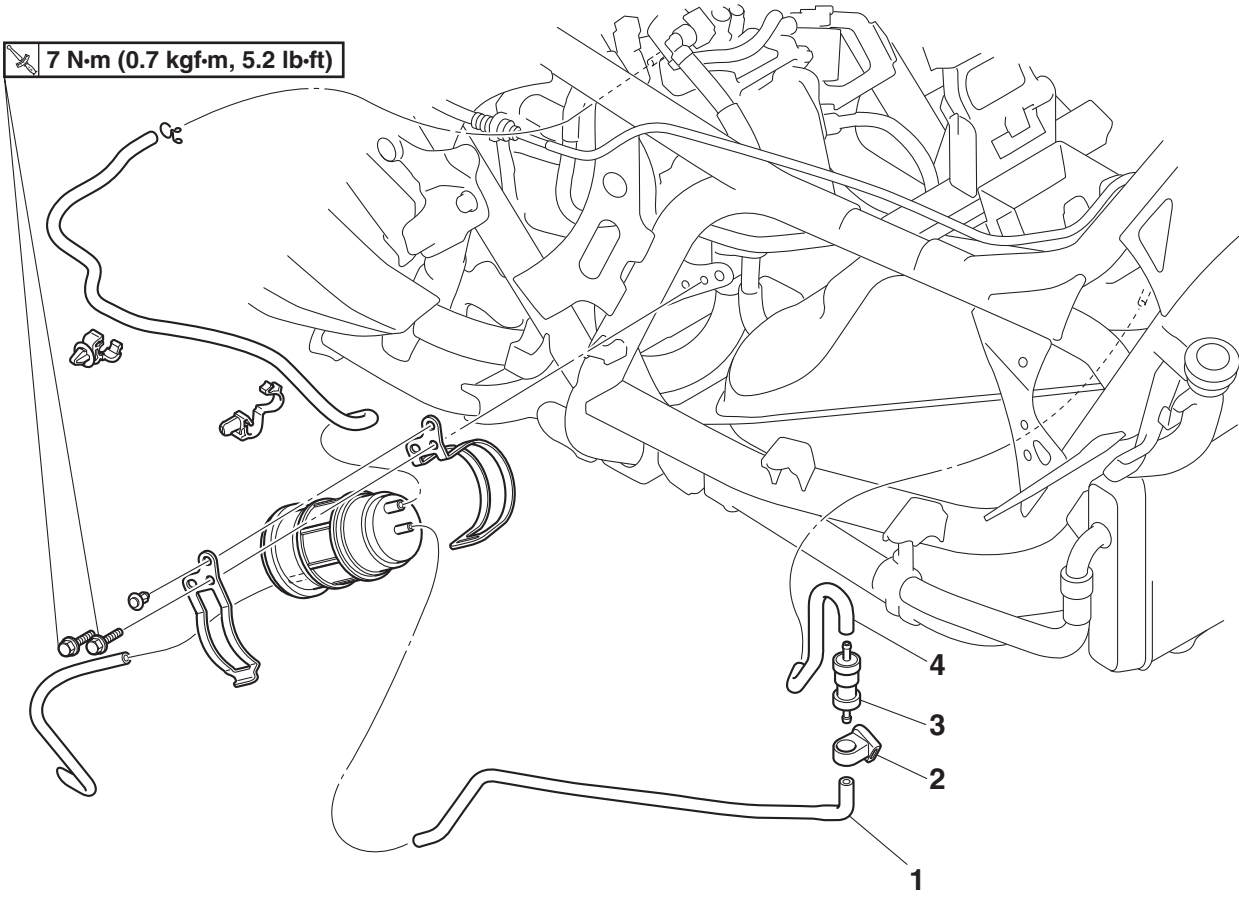
Order	Job/Parts to remove	Q'ty	Remarks
	Battery		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Meter assembly		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Bottom cover assembly		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Leg shield assembly		Refer to "GENERAL CHASSIS (6)" on page 4-16.
	Seat damper/Seat damper bracket		Refer to "GENERAL CHASSIS (7)" on page 4-21.
	Canister		Refer to "FUEL TANK" on page 7-1.

Removing the fuel tank



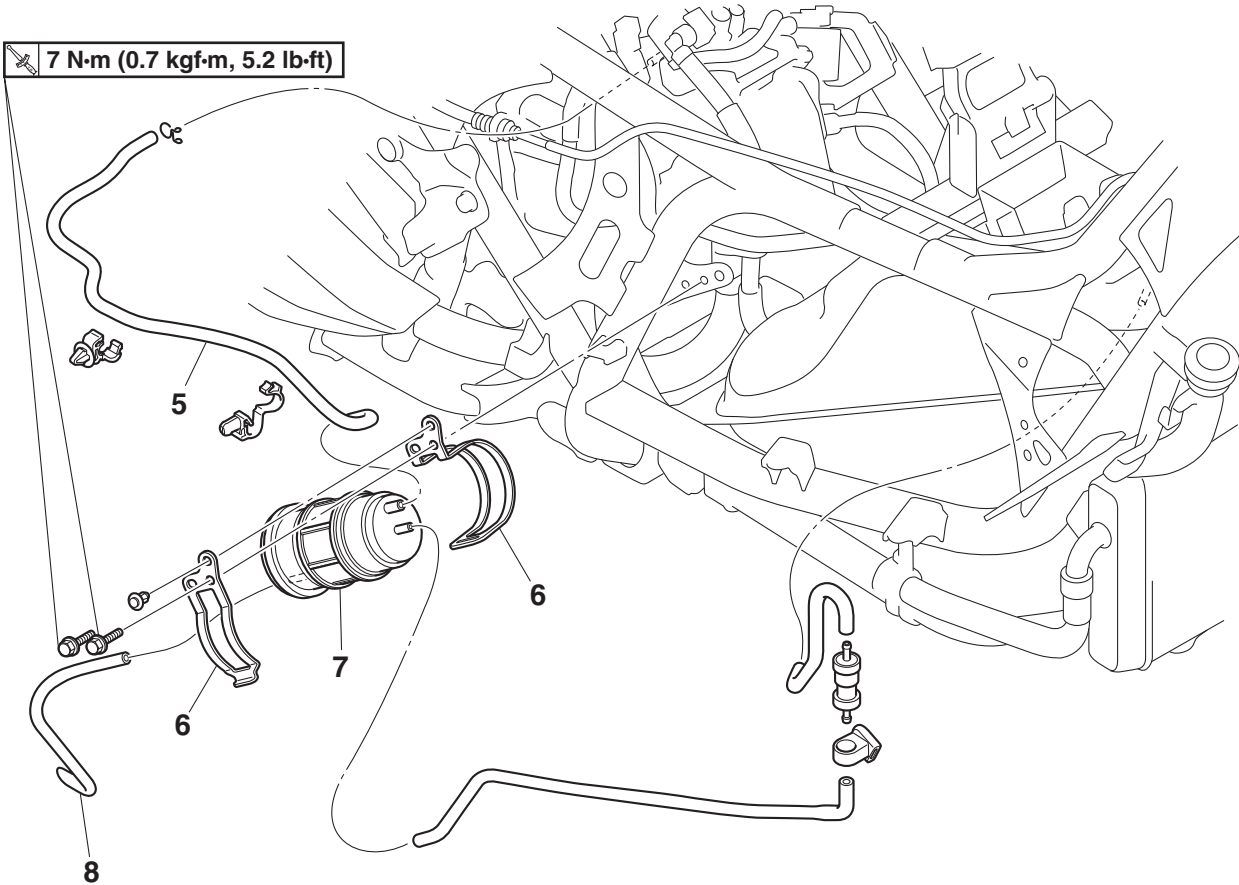
Order	Job/Parts to remove	Q'ty	Remarks
	Thermostat assembly		Refer to "THERMOSTAT" on page 6-6.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-13.
1	Fuel tank cap	1	
2	Fuel tank overflow tray	1	
3	Fuel tank breather hose (fuel tank to rollover valve)	1	Disconnect.
4	Fuel pump coupler	1	Disconnect.
5	Fuel hose	1	Disconnect.
6	Fuel tank	1	
7	Fuel pump bracket	1	
8	Fuel pump assembly	1	
9	Fuel pump gasket	1	
10	Fuel filter holder	1	
11	Fuel filter	1	
12	Fuel pump	1	

Removing the canister



Order	Job/Parts to remove	Q'ty	Remarks
	Battery		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Meter assembly		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Footrest board assembly		Refer to "GENERAL CHASSIS (5)" on page 4-13.
	Leg shield assembly		Refer to "GENERAL CHASSIS (6)" on page 4-16.
1	Fuel tank breather hose (rollover valve to canister)	1	
2	Rollover valve holder	1	
3	Rollover valve	1	
4	Fuel tank breather hose (fuel tank to rollover valve)	1	

Removing the canister



Order	Job/Parts to remove	Q'ty	Remarks
5	Canister purge hose	1	
6	Canister bracket	2	
7	Canister	1	
8	Canister breather hose	1	

EAS30450

REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Disconnect:
 - Fuel hose

EWA18020

WARNING

Cover the fuel hose connection with a cloth when disconnecting it. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

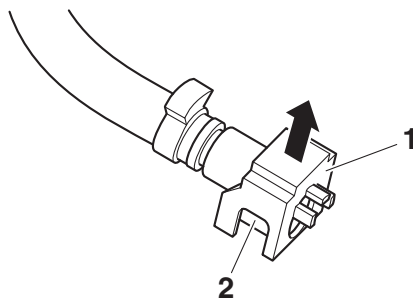
ECA20020

NOTICE

Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.

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.



EAS30451

REMOVING THE FUEL PUMP

1. Remove:
 - Fuel pump

ECA14721

NOTICE

- Do not drop the fuel pump or give it a strong shock.
- Do not touch the base section of the fuel sender.

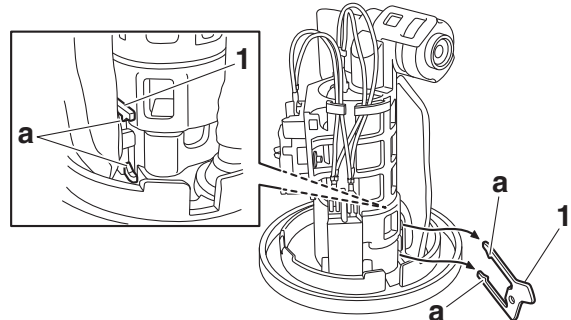
EAS31376

REMOVING THE FUEL FILTER

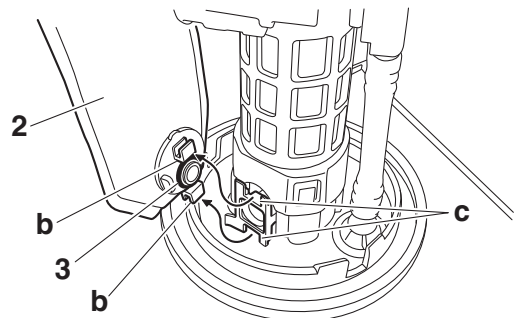
1. Remove:
 - Fuel filter holder "1"

- Fuel filter "2"
- O-ring "3"

- a. Unhook the projections "a" on fuel filter holder from the fuel pump, and then slide the holder sideways to remove it.



- b. Remove the projections "b" on the fuel filter from the slots "c" in the fuel pump, and then remove the filter.



EAS30454

CHECKING THE FUEL PUMP BODY

1. Check:
 - Fuel pump body
 - Obstruction → Clean.
 - Cracks/damage → Replace fuel pump assembly.

EAS31249

CHECKING THE FUEL FILTER

1. Check:
 - Fuel filter
 - Damage → Replace.
 - Contaminants → Clean with solvent.

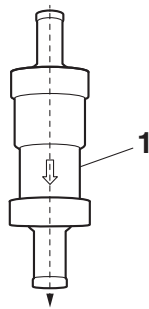
EAS30699

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.

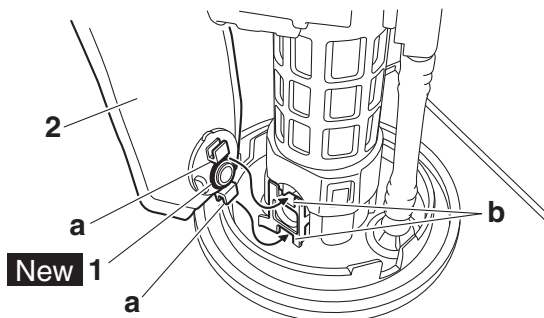


EAS31377

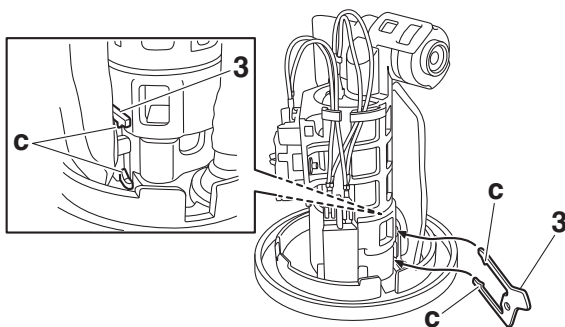
INSTALLING THE FUEL FILTER

1. Install:

- O-ring "1" **New**
 - Fuel filter "2"
 - Fuel filter holder "3"
- a. Fit the projections "a" on the fuel filter into the slots "b" in the fuel pump.



- b. Hook the projections "c" on fuel filter holder onto the fuel pump.



EAS30456

INSTALLING THE FUEL PUMP

1. Install:

- Fuel pump gasket "1" **New**
- Fuel pump "2"
- Fuel pump bracket "3"

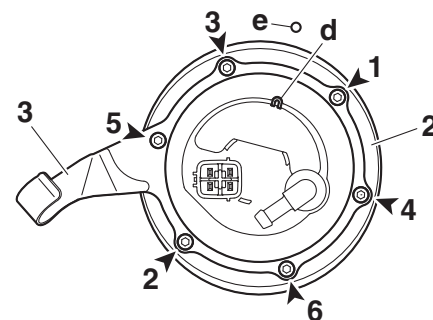
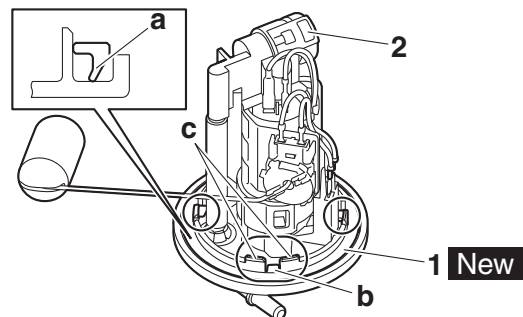


Fuel pump bracket bolt
4.0 N·m (0.40 kgf·m, 3.0 lb·ft)

TIP

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.

- Always use a new fuel pump gasket.
- When installing the fuel pump gasket, make sure that there is no foreign material between the gasket and the surrounding parts.
- The gasket lip "a" shall face toward the fuel pump.
- Align the projections "b" (three locations) on the fuel pump gasket with the slots "c" in the fuel pump.
- Align the projection "d" on the fuel pump with the slot in the fuel pump bracket.
- Align the projection "d" on the fuel pump with the projection "e" on the fuel tank.
- Tighten the fuel pump bolts in the proper tightening sequence as shown.



EAS30457

INSTALLING THE FUEL TANK

1. Install:

- Fuel hose

ECA17500

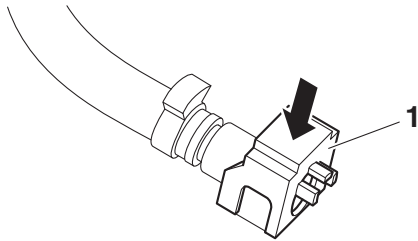
NOTICE

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, slide the fuel hose connector cover "1" on each end of the hose in the direction of the arrow shown.

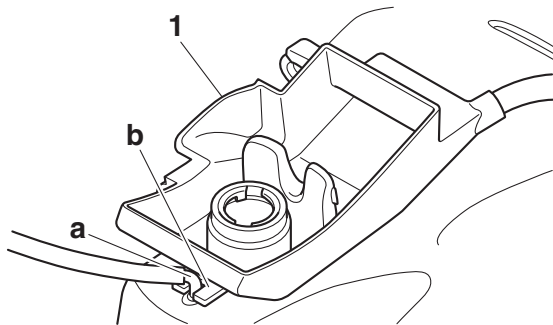


2. Install:

- Fuel tank overflow tray "1"

TIP

Align the pipe "a" on the fuel tank with the slot "b" in the fuel tank overflow tray.



EAS30703

CHECKING THE FUEL PRESSURE

1. Remove:
 - Storage box
Refer to "GENERAL CHASSIS (4)" on page 4-10.
2. Check:
 - Pressure regulator operation
 - a. Disconnect the fuel hose from the fuel injector.

EWA18020

WARNING

Cover the fuel hose connection with a cloth when disconnecting it. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

ECA20020

NOTICE

Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.

TIP

Before removing the hose, place a few rags in the area under where it will be removed.

- b. Connect the pressure gauge "1" and fuel pressure adapter "2" to the fuel hose "3".



Pressure gauge

90890-03153

Pressure gauge

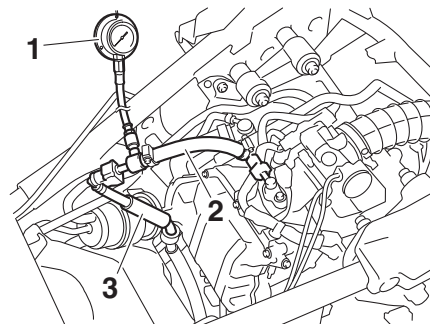
YU-03153

Fuel pressure adapter

90890-03186

Fuel pressure adapter

YM-03186



- c. Start the engine.
- d. Measure the fuel pressure.



Fuel line pressure (at idle)

**220–300 kPa (2.2–3.0 kgf/cm²,
31.9–43.5 psi)**

Faulty → Replace the fuel pump.

- e. Connect the fuel hose.

Refer to "INSTALLING THE FUEL TANK" on page 7-6.

3. Install:

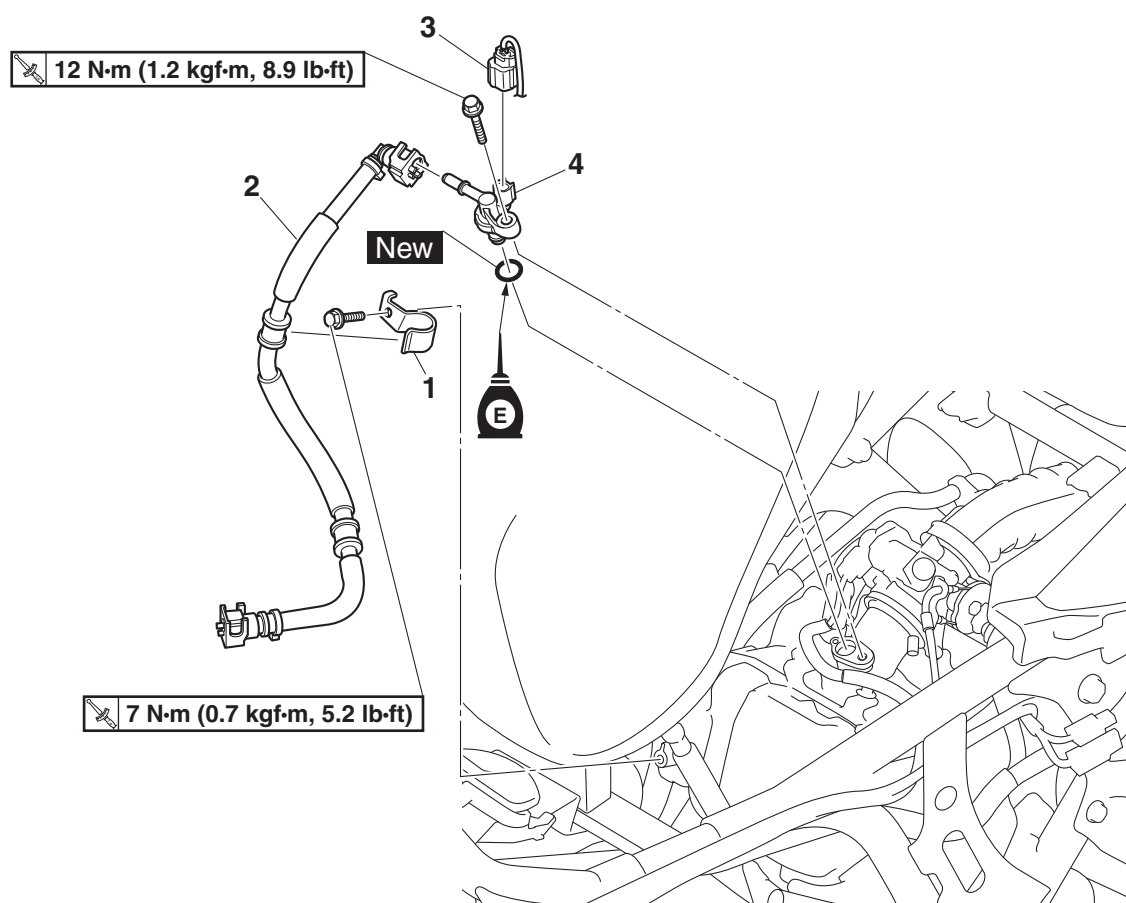
- Storage box

Refer to "GENERAL CHASSIS (4)" on page 4-10.

EAS20191

FUEL INJECTOR

Removing the fuel injector



Order	Job/Parts to remove	Q'ty	Remarks
	Battery cover assembly		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front cowling assemblies		Refer to "GENERAL CHASSIS (2)" on page 4-4.
	Lower side covers		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Bottom cover assembly		Refer to "GENERAL CHASSIS (5)" on page 4-13.
1	Fuel hose holder	1	
2	Fuel hose	1	
3	Fuel injector coupler	1	Disconnect.
4	Fuel injector	1	

EAS31250

REMOVING THE FUEL HOSE

1. Disconnect:

- Fuel hose

EWA17610

WARNING

Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

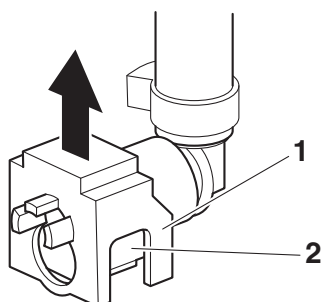
ECA20020

NOTICE

Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.

TIP

- To remove the fuel hose from the fuel injector, 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.



EAS31251

CHECKING THE FUEL INJECTOR

1. Check:

- Injector
 - Obstruction → Replace and check the fuel pump/fuel supply system.
 - Deposit → Replace.
 - Damage → Replace.

2. Check:

- Injector resistance
 - Refer to "CHECKING THE FUEL INJECTOR" on page 8-137.

EAS31617

INSTALLING THE FUEL INJECTOR

1. Install:

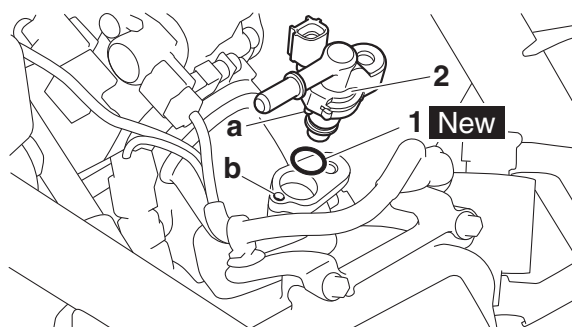
- O-ring "1" **New** (to the fuel injector)
- Fuel injector "2"



Fuel injector bolt
12 N·m (1.2 kgf·m, 8.9 lb·ft)

TIP

- Lubricate the O-ring with engine oil.
- Align the projection "a" on the fuel injector with the hole "b" in the intake manifold.



EAS31253

INSTALLING THE FUEL HOSE

1. Install:

- Fuel hose

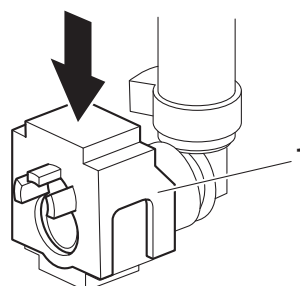
ECA17500

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 injector until a distinct "click" is heard.
- To install the fuel hose onto the fuel injector, slide the fuel hose connector cover "1" on the end of the hose in the direction of the arrow shown.



2. Install:

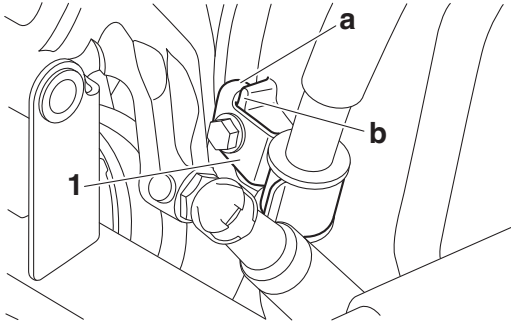
- Fuel hose holder “1”



Fuel hose holder bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP

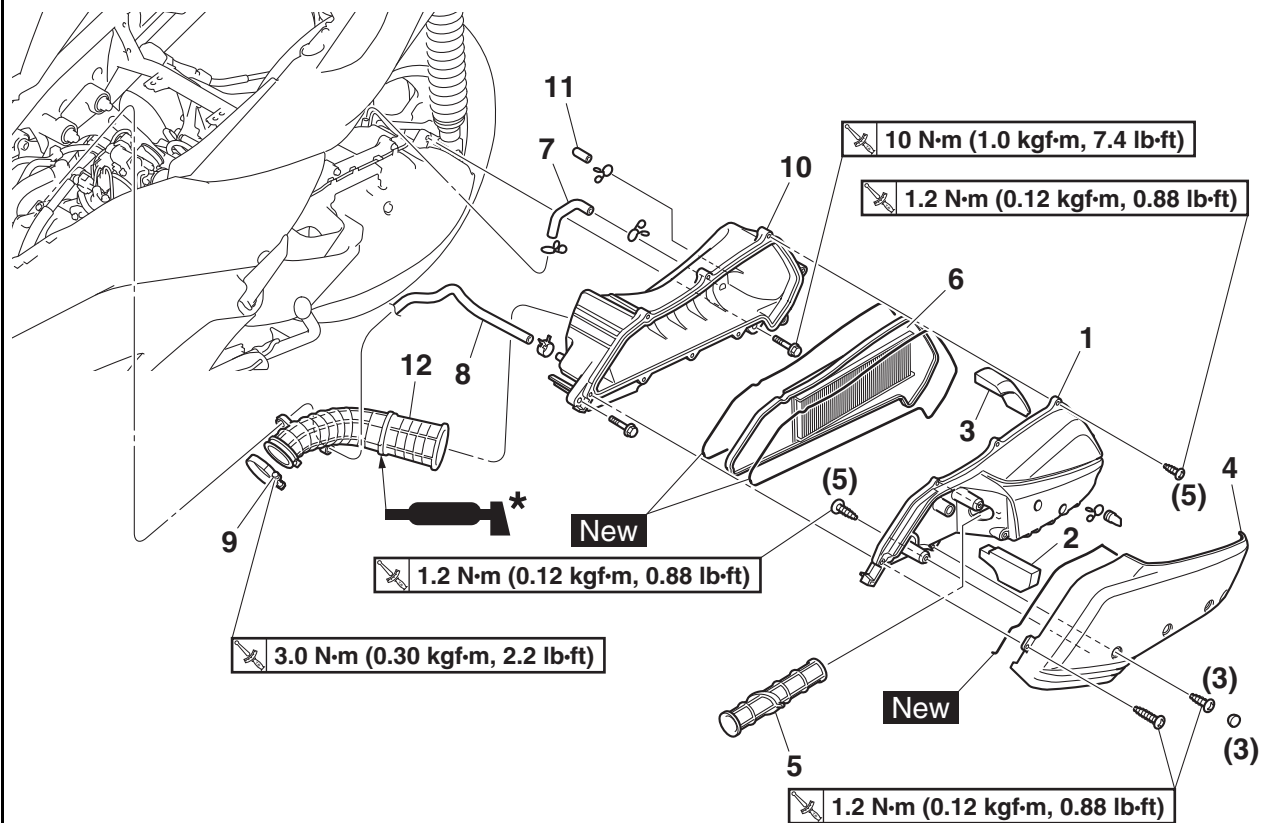
While holding the fuel hose holder so that the portion “a” of the holder contacts the portion “b” of the cylinder head cover.



EAS20068

AIR FILTER CASE

Removing the air filter case



* Apply three Bond 1521.

Order	Job/Parts to remove	Q'ty	Remarks
	Storage box		Refer to "GENERAL CHASSIS (4)" on page 4-10.
1	Air filter case cover	1	
2	Pre air filter element	1	
3	Sub air filter element	1	
4	Air filter case duct cover	1	
5	Air filter case duct	1	
6	Air filter element	1	
7	Transmission case breather hose	1	
8	Cylinder head breather hose	1	Disconnect.
9	Air filter case joint clamp screw	1	Loosen.
10	Air filter case	1	
11	Air filter check hose	1	
12	Air filter case joint	1	

EAS31618

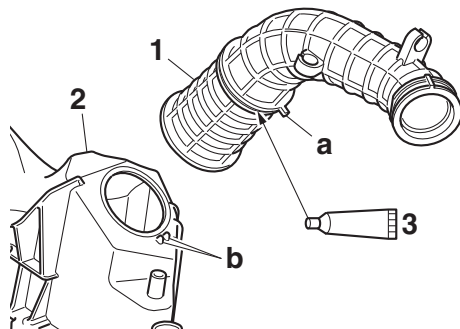
INSTALLING THE AIR FILTER CASE

1. Install:

- Air filter case joint “1”
(to the air filter case “2”)

TIP

- Apply Three Bond 1521 “3” onto the mating surfaces of the air filter case joint and air filter case.
- Fit the projection “a” on the air filter case joint between the projections “b” on the air filter case.



2. Install:

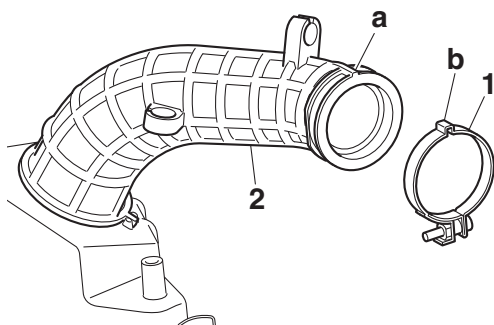
- Air filter case joint clamp “1”
(to the air filter case joint “2”)



Air filter case joint clamp screw
3.0 N·m (0.30 kgf·m, 2.2 lb·ft)

TIP

Align the projection “a” on the air filter case joint with the slot “b” in the air filter case joint clamp.

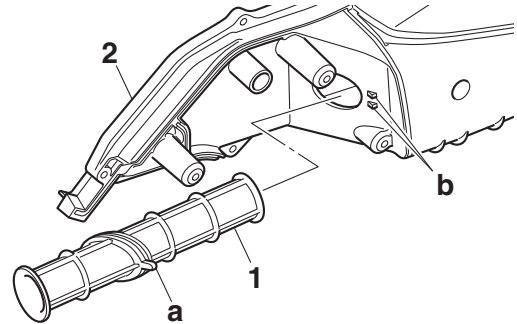


3. Install:

- Air filter case duct “1”
(to the air filter case cover “2”)

TIP

Fit the projection “a” on the air filter case duct between the projections “b” on the air filter case cover.

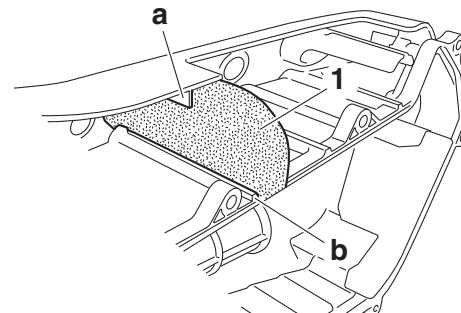


4. Install:

- Pre air filter element “1”

TIP

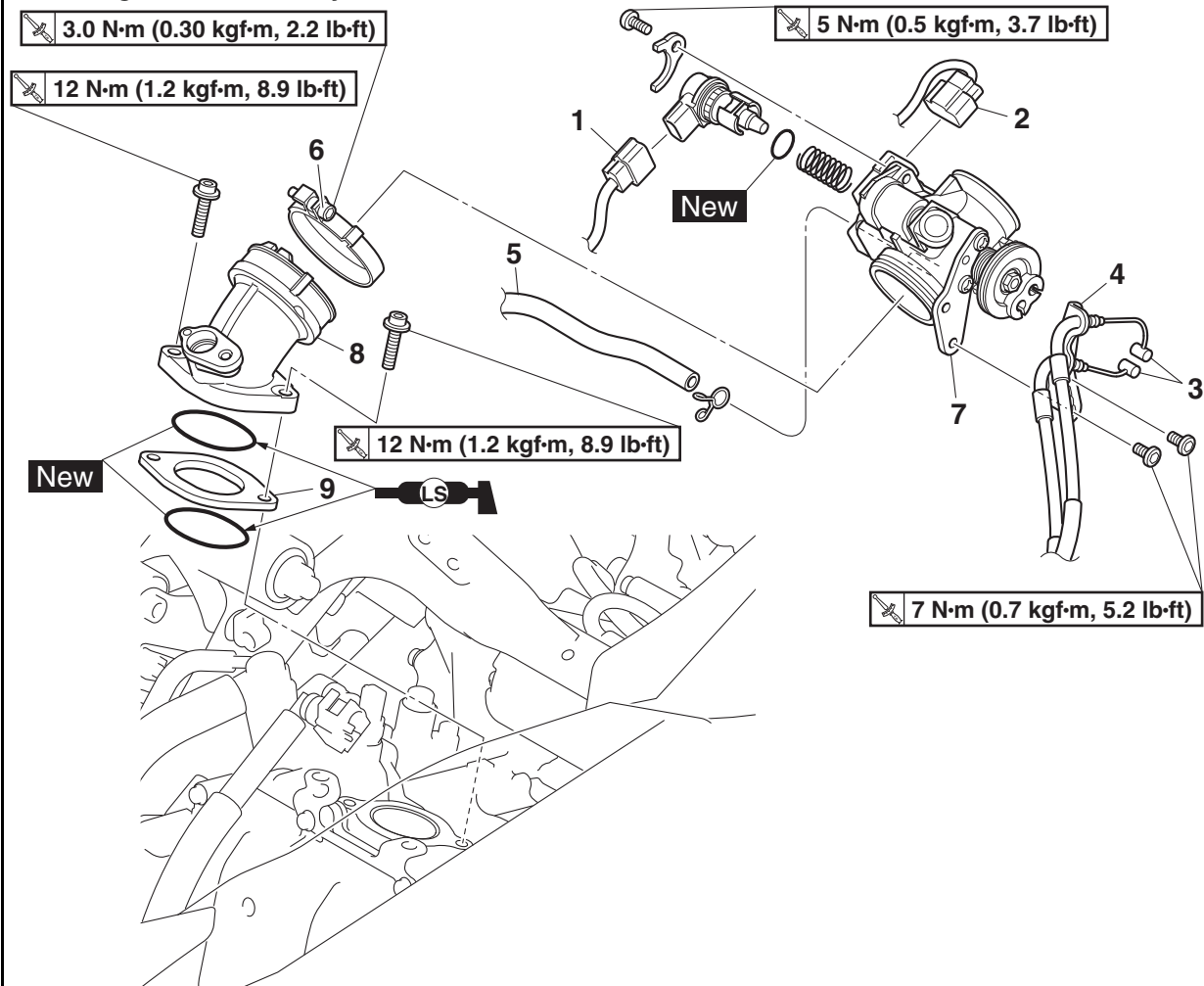
Fit pre air filter element into the slot “a” in the air filter case duct cover and the slot “b” in the air filter case cover.



EAS20070

THROTTLE BODY

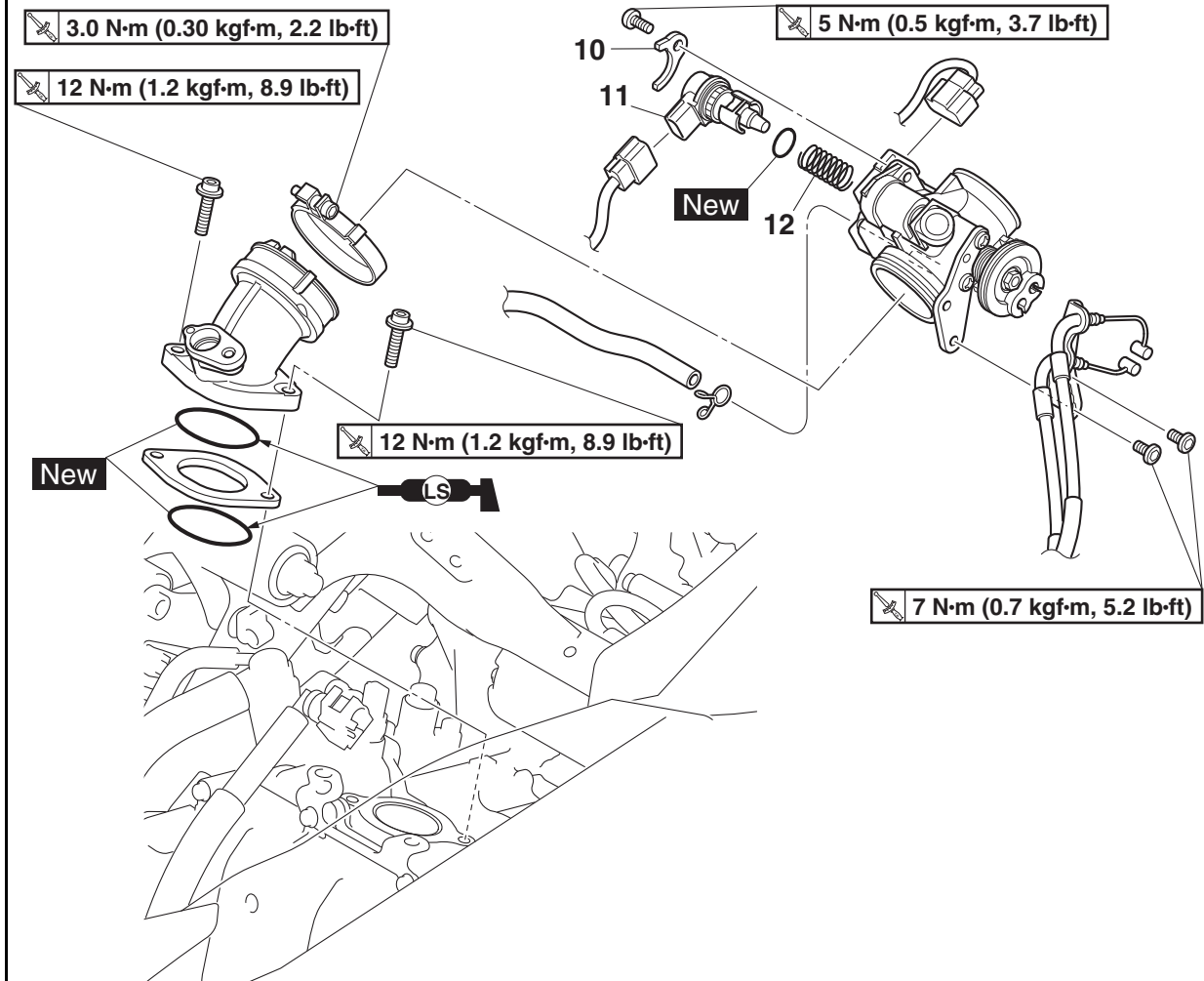
Removing the throttle body



Order	Job/Parts to remove	Q'ty	Remarks
	Storage box		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Fuel injector		Refer to "FUEL INJECTOR" on page 7-8.
	Air filter case joint		Refer to "AIR FILTER CASE" on page 7-11.
1	ISC (Idle Speed Control) unit coupler	1	Disconnect.
2	Throttle body sensor assembly coupler	1	Disconnect.
3	Throttle cable	2	Disconnect.
4	Throttle cable holder	1	
5	Canister purge hose	1	Disconnect.
6	Intake manifold clamp screw	1	Loosen.
7	Throttle body	1	
8	Intake manifold	1	
9	Intake manifold joint	1	

THROTTLE BODY

Removing the throttle body



Order	Job/Parts to remove	Q'ty	Remarks
10	ISC (Idle Speed Control) unit holder	1	
11	ISC (Idle Speed Control) unit	1	
12	Spring	1	

EAS30979

REMOVING THE THROTTLE BODY

1. Remove:
 - Throttle body

ECA20500

NOTICE

Do not remove the throttle body sensor assembly from the throttle body.

EAS30479

CHECKING THE THROTTLE BODY

TIP

Before checking the throttle body, check the following items:

- Valve clearance
- Spark plug
- Air filter element
- Intake manifold
- Fuel hose
- Exhaust system
- Cylinder head breather hose

EWA18030

WARNING

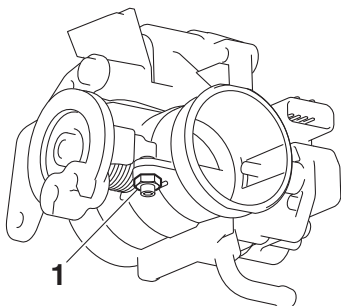
If the throttle body is subjected to strong shocks or dropped during, replace it.

1. Check:
 - Throttle body
Cracks/damage → Replace the throttle body.
2. Check:
 - Butterfly valve
Damage/scratches/wear → Replace the throttle body.

ECA21770

NOTICE

Do not adjust the stop screw "1".



EAS31254

CLEANING THE ISC (IDLE SPEED CONTROL) UNIT AND THROTTLE BODY

1. Remove the throttle body from the vehicle.

TIP

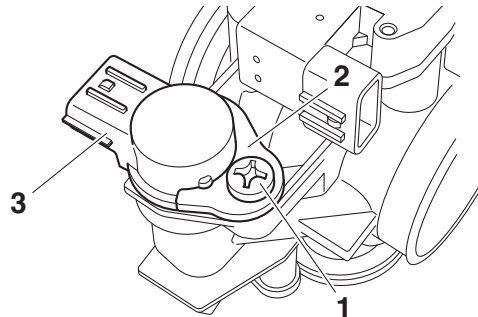
Before removing the throttle body, disconnect the throttle cables, canister purge hose, and couplers.

2. Remove:
 - Screw "1"
 - ISC (Idle Speed Control) unit holder "2"
 - ISC (Idle Speed Control) unit "3"

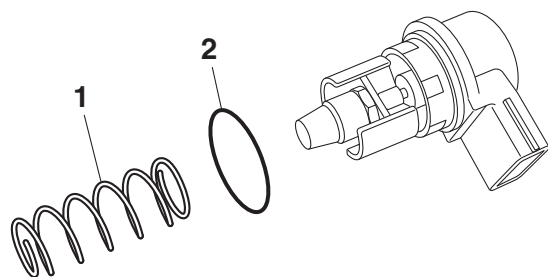
ECA21780

NOTICE

Because the force of the spring may push out the ISC unit unexpectedly, be sure to hold the ISC unit when removing the components.

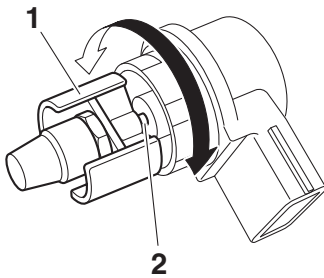


3. Remove:
 - Spring "1"
 - O-ring "2"

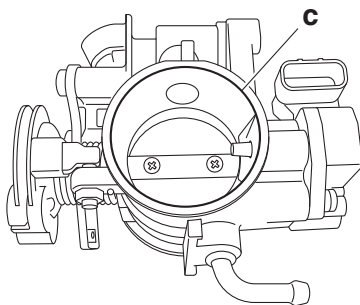
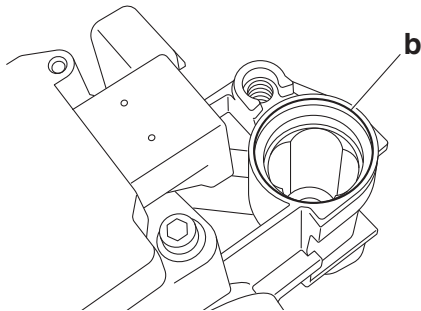
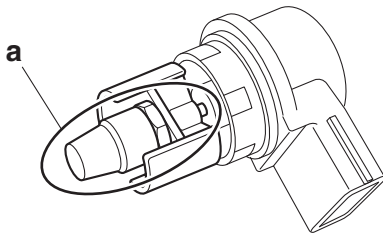


4. Check:
 - ISC (Idle Speed Control) unit
Plunger "1" does not rotate smoothly/plunger rotates together with the motor shaft "2" → Replace.

THROTTLE BODY



5. Check:
 - Spring
Damage/bent → Replace.
6. Clean:
 - Area “a” of the ISC unit
 - Areas “b” and “c” of the throttle body
Clogs or foreign materials cannot be removed → Replace.



- a. Use a rag soaked in the recommended cleaning agent to wipe off any deposits and foreign materials.



Recommended cleaning agent
Yamaha oil & brake cleaner

ECA21790

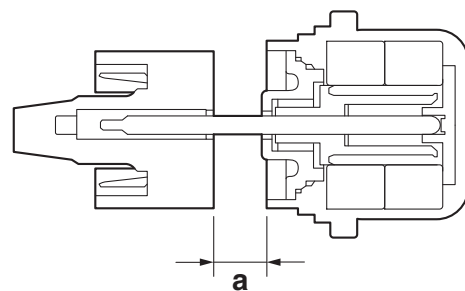
NOTICE

- Be sure to use the recommended cleaning agent.
- Do not spray the cleaning agent directly onto the ISC unit or throttle body and do not immerse them in the cleaning agent.
- To prevent scratching the components, do not use a brush, metal file, or other abrasive tool.
- Do not clean with compressed air.
- Do not allow the removed deposits or foreign materials to adhere to the sealing surfaces of the O-ring.
- Do not scratch or deform the ISC valve or air passage; otherwise, poor starting performance, an unstable engine idling speed, or uncontrollable engine speed could result.
- Do not clean any areas other than the areas “a”, “b”, and “c”. If the cleaning agent enters the ISC unit or throttle body, thoroughly wipe it off.

7. Adjust the ISC unit plunger to the specified distance “a” from the motor assembly body.



Distance “a”
3.0–6.0 mm (0.12–0.24 in)



8. Install:
 - Spring
 - O-ring “1” **New**
(to the ISC (Idle Speed Control) unit)
 - ISC (Idle Speed Control) unit “2”

ECA21800

NOTICE

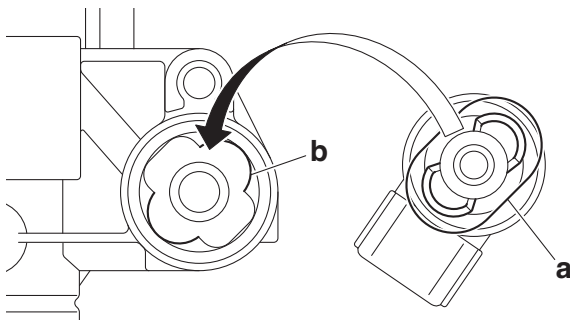
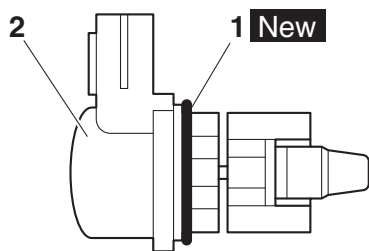
- Do not use the ISC unit if it was dropped.
- Do not allow water to enter the ISC unit and do not allow foreign materials to adhere to the assembly.

THROTTLE BODY

- Do not touch the terminals of the coupler directly.
- Because the force of the spring may push out the ISC unit unexpectedly, be sure to hold the motor assembly when installing the components.

TIP

- Install the new O-ring until it contacts the raised portion of the ISC unit body.
- When installing the ISC unit, be sure to align the oval portion "a" of the ISC unit with the oval hole "b" in the throttle body.



9. Install:

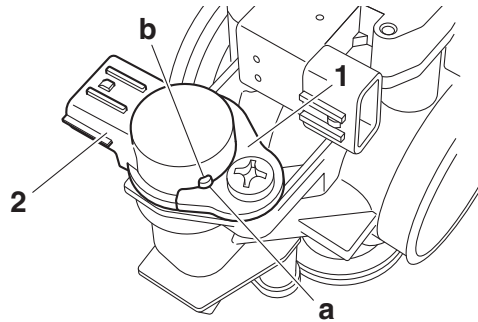
- ISC (Idle Speed Control) unit holder "1"
- Screw



ISC (Idle Speed Control) unit holder screw
5 N·m (0.5 kgf·m, 3.7 lb·ft)

TIP

Align the slot "a" in the ISC unit holder with the projection "b" on the ISC unit "2".



10. Install the throttle body to the vehicle.

11. Reset:

- ISC learning values
Use the diagnostic code number "67".
Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-1.
- ISC valve position
Use the diagnostic code number "54".
Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-1.



Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254

12. Reset:

- A/F control learning values
Use the diagnostic code number "87".
Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-1.



Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254

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

14. Check:

- Engine idling speed
Start the engine, warm it up, and then measure the engine idling speed. Within specification → Service is finished.
Out of specification → Replace the throttle body.
Refer to "REPLACING THE THROTTLE BODY" on page 7-18.



Engine idling speed
1500–1700 r/min

EAS31160

REPLACING THE THROTTLE BODY

1. Remove the throttle body from the vehicle.
2. Install a new throttle body to the vehicle.
3. Reset:
 - ISC learning values
Use the diagnostic code number "67".
Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-1.
 - ISC valve position
Use the diagnostic code number "54".
Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-1.



Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254

4. Reset:
 - A/F control learning values
Use the diagnostic code number "87".
Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-1.



Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254

5. Place the vehicle on the centerstand so that the rear wheel is elevated.
6. Check:
 - Engine idling speed
Start the engine, warm it up, and then measure the engine idling speed.



Engine idling speed
1500–1700 r/min

EAS30980

INSTALLING THE THROTTLE BODY

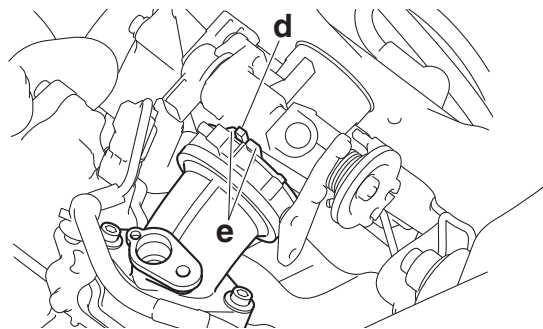
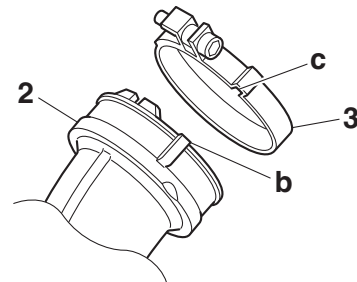
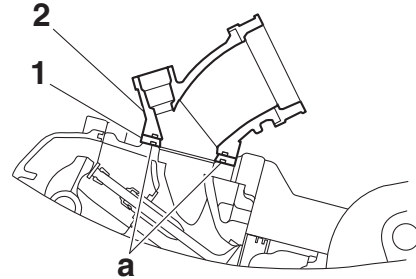
1. Install:
 - Intake manifold joint "1"
 - Intake manifold "2"
 - Throttle body



Intake manifold clamp screw
3.0 N·m (0.30 kgf·m, 2.2 lb·ft)

TIP

- Make sure that the groove "a" in the intake manifold joint is facing toward the cylinder head.
- Align the projection "b" on the intake manifold with slot "c" in the intake manifold clamp "3".
- Be sure to fit the projections "d" on the throttle body between the projections "e" on the intake manifold.



ELECTRICAL SYSTEM

IGNITION SYSTEM	8-1
CIRCUIT DIAGRAM	8-1
TROUBLESHOOTING	8-3
ELECTRIC STARTING SYSTEM	8-5
CIRCUIT DIAGRAM	8-5
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION	8-7
TROUBLESHOOTING	8-8
CHARGING SYSTEM	8-11
CIRCUIT DIAGRAM	8-11
TROUBLESHOOTING	8-13
LIGHTING SYSTEM	8-15
CIRCUIT DIAGRAM	8-15
TROUBLESHOOTING	8-17
SIGNALING SYSTEM	8-19
CIRCUIT DIAGRAM	8-19
TROUBLESHOOTING	8-21
COOLING SYSTEM	8-27
CIRCUIT DIAGRAM	8-27
TROUBLESHOOTING	8-29
FUEL INJECTION SYSTEM	8-31
CIRCUIT DIAGRAM	8-31
ECU SELF-DIAGNOSTIC FUNCTION	8-33
TROUBLESHOOTING METHOD	8-33
YAMAHA DIAGNOSTIC TOOL	8-34
TROUBLESHOOTING DETAILS	8-34
FUEL PUMP SYSTEM	8-77
CIRCUIT DIAGRAM	8-77
TROUBLESHOOTING	8-79

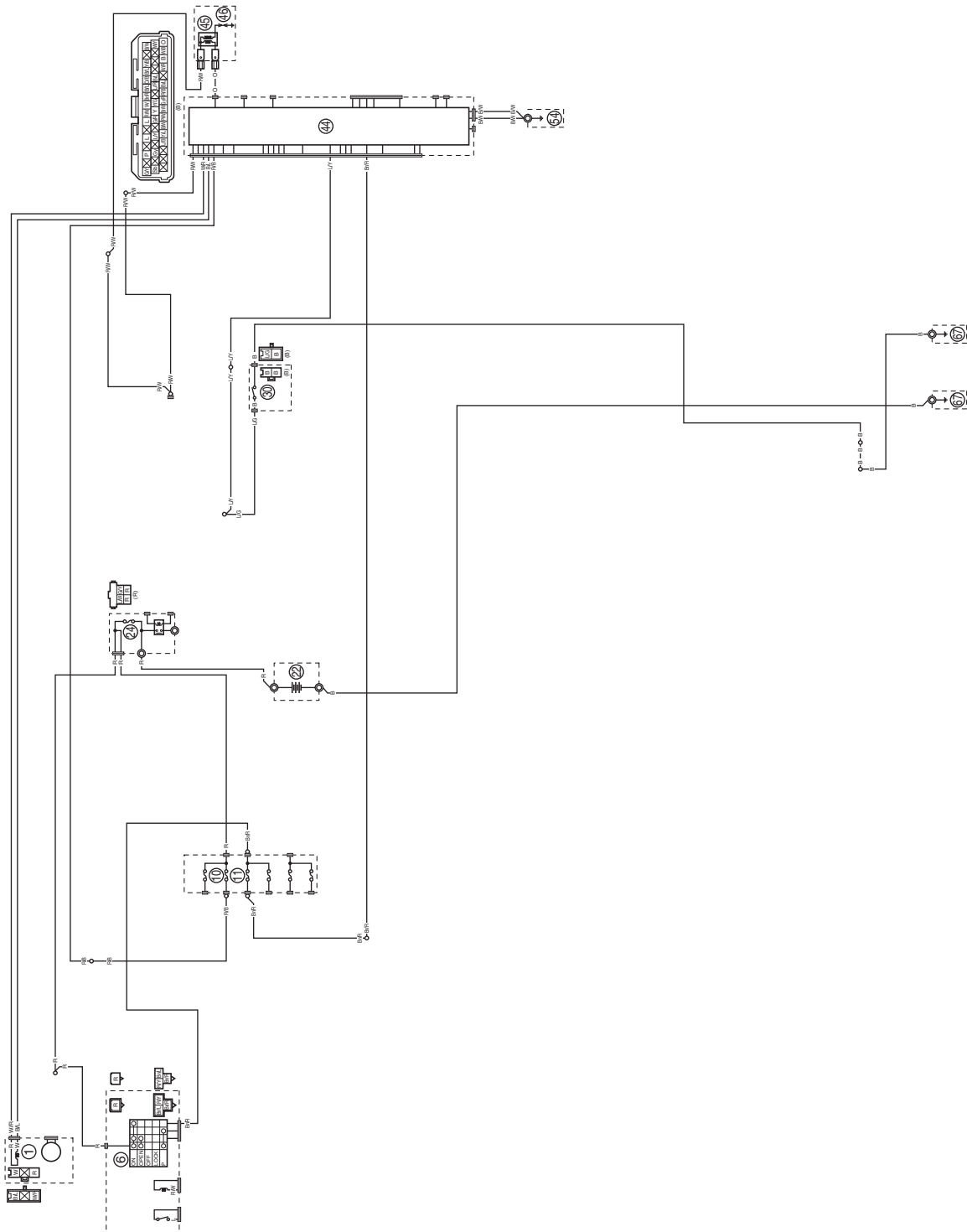
ABS (ANTI-LOCK BRAKE SYSTEM)	8-81
CIRCUIT DIAGRAM	8-81
ABS COUPLER LOCATION CHART	8-83
MAINTENANCE OF THE ABS ECU	8-84
ABS TROUBLESHOOTING OUTLINE.....	8-84
BASIC INSTRUCTIONS FOR TROUBLESHOOTING	8-85
BASIC PROCESS FOR TROUBLESHOOTING	8-86
[A] CHECKING THE ABS WARNING LIGHT	8-87
[A-1] ONLY THE ABS WARNING LIGHT FAILS TO COME ON.....	8-87
[A-2] ALL INDICATOR LIGHTS FAIL TO COME ON	8-87
[A-3] THE ABS WARNING LIGHT COMES ON	8-87
[B-1] MALFUNCTION ARE CURRENTLY DETECTED	8-88
[B-2] DIAGNOSIS USING THE FAULT CODES	8-88
[B-3] DELETING THE FAULT CODES.....	8-110
[C-1] FINAL CHECK.....	8-110
 SMART KEY SYSTEM	8-111
CIRCUIT DIAGRAM	8-111
TROUBLESHOOTING	8-113
SMART KEY SYSTEM SELF-DIAGNOSIS.....	8-117
SMART KEY SYSTEM EMERGENCY MODE	8-119
REGISTERING A SMART KEY.....	8-120
DISABLING A SMART KEY	8-122
DISABLING THE POWER-ON ALARM.....	8-123
REPLACEMENT PARTS LIST	8-124
 ELECTRICAL COMPONENTS	8-125
CHECKING THE SWITCHES	8-127
CHECKING THE FUSES	8-128
REPLACING THE ECU (Engine Control Unit)	8-128
CHECKING AND CHARGING THE BATTERY	8-128
CHECKING THE RELAYS	8-129
CHECKING THE TURN SIGNAL/HAZARD RELAY.....	8-130
CHECKING THE DIODES.....	8-131
CHECKING THE IGNITION SPARK GAP.....	8-132
CHECKING THE SPARK PLUG CAP	8-132
CHECKING THE IGNITION COIL	8-132
CHECKING THE LEAN ANGLE SENSOR.....	8-133
CHECKING THE CRANKSHAFT POSITION SENSOR.....	8-134
CHECKING THE STARTER MOTOR OPERATION	8-134
CHECKING THE STATOR COIL	8-134
CHECKING THE RECTIFIER/REGULATOR	8-135
CHECKING THE FUEL SENDER	8-135
CHECKING THE FUEL METER.....	8-135
CHECKING THE RADIATOR FAN MOTOR	8-136
CHECKING THE COOLANT TEMPERATURE SENSOR.....	8-136
CHECKING THE FUEL INJECTOR	8-137
CHECKING THE SMART KEY BATTERY	8-137
CHECKING THE BUZZER.....	8-137
CHECKING THE MAIN SWITCH SOLENOID.....	8-137

EAS20072

IGNITION SYSTEM

EAS30490

CIRCUIT DIAGRAM



- 1. Crankshaft position sensor
- 6. Main switch
- 10.Backup fuse
- 11.Main fuse
- 22.Battery
- 24.Main fuse 2
- 30.Sidestand switch
- 44.ECU (Engine Control Unit)
- 45.Ignition coil
- 46.Spark plug
- 54.Engine ground
- 67.Frame ground

EAS30492

TROUBLESHOOTING

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

TIP

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

1. Battery cover assembly
2. Storage box
3. Lower side cover
4. Exhaust pipe

1. Check the fuse. (Main, main 2, backup) Refer to "CHECKING THE FUSES" on page 8-128.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.	NG →	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
3. Check the spark plug. Refer to "CHECKING THE SPARK PLUG" on page 3-4.	NG →	Re-gap or replace the spark plug.
OK ↓		
4. Check the ignition spark gap. Refer to "CHECKING THE IGNITION SPARK GAP" on page 8-132.	OK →	Ignition system is OK.
NG ↓		
5. Check the spark plug cap. Refer to "CHECKING THE SPARK PLUG CAP" on page 8-132.	NG →	Replace the spark plug cap.
OK ↓		
6. Check the ignition coil. Refer to "CHECKING THE IGNITION COIL" on page 8-132.	NG →	Replace the ignition coil.
OK ↓		
7. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-134.	NG →	Replace the stator coil assembly.
OK ↓		

IGNITION SYSTEM

8. Check the main switch.
Refer to "CHECKING THE SWITCHES" on page 8-127.

NG →

Replace the main switch.

OK ↓

9. Check the sidestand switch.
Refer to "CHECKING THE SWITCHES" on page 8-127.

NG →

Replace the sidestand switch.

OK ↓

10. Check the entire ignition system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-1.

NG →

Properly connect or replace the wire harness.

OK ↓

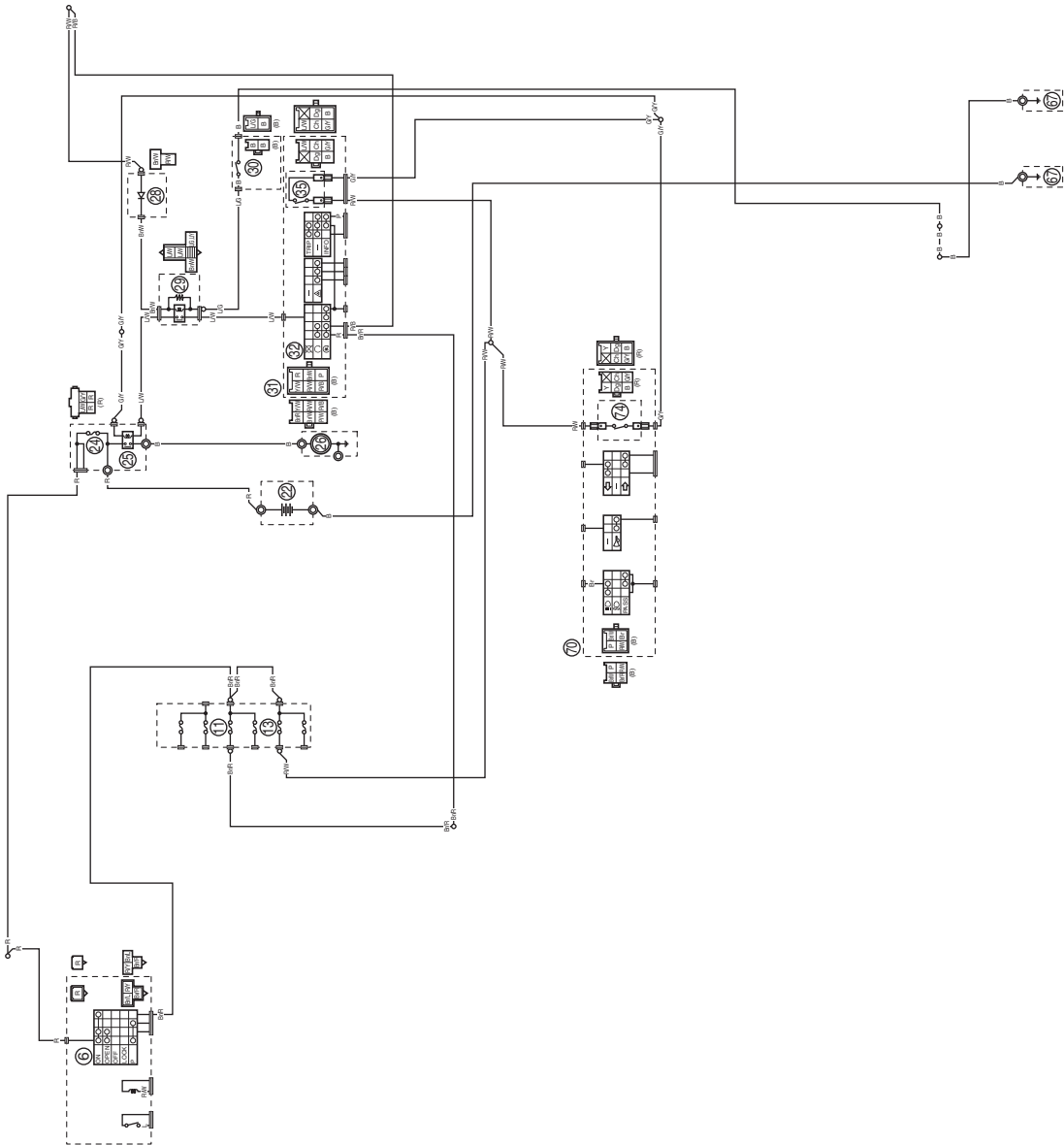
Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.

EAS20073

ELECTRIC STARTING SYSTEM

EAS30493

CIRCUIT DIAGRAM




ELECTRIC STARTING SYSTEM

- 6. Main switch
- 11. Main fuse
- 13. Signaling system fuse
- 22. Battery
- 24. Main fuse 2
- 25. Starter relay
- 26. Starter motor
- 28. Diode 3
- 29. Starting circuit cut-off relay
- 30. Sidestand switch
- 31. Handlebar switch (right)
- 32. Start/engine stop switch
- 35. Front brake light switch
- 67. Frame ground
- 70. Handlebar switch (left)
- 74. Rear brake light switch

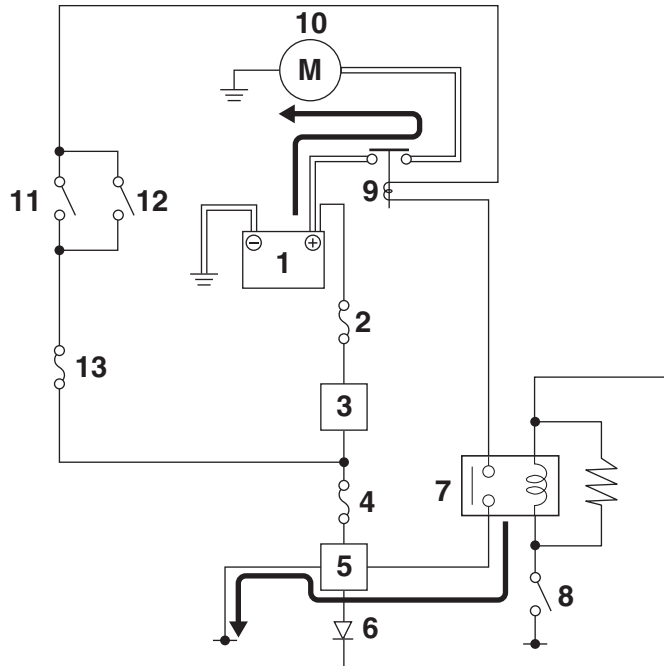
ELECTRIC STARTING SYSTEM

EAS30494

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the main switch is turned to “ON” and the “” side of the start/engine stop switch is pushed, the starter motor can only operate if at least one of the following conditions is met:

- The front brake lever is pulled to the handlebar (the front brake light switch is closed) and the side-stand is up (the sidestand switch is closed).
- The rear brake lever is pulled to the handlebar (the rear brake light switch is closed) and the side-stand is up (the sidestand switch is closed).



1. Battery
2. Main fuse
3. Main switch
4. Main fuse 2
5. Start/engine stop switch
6. Diode 3
7. Starting circuit cut-off relay
8. Sidestand switch
9. Starter relay
10. Starter motor
11. Front brake light switch
12. Rear brake light switch
13. Signaling system fuse

EAS30495

TROUBLESHOOTING

The starter motor fails to turn.

TIP

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

1. Battery cover assembly
2. Front cowlings
3. Footrest board assemblies
4. Lower side cover

1. Check the fuses. (Main, main 2 and signaling system) Refer to "CHECKING THE FUSES" on page 8-128.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.	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 8-134.	OK →	Starter motor is OK. Perform the electric starting system troubleshooting, starting with step 5.
NG ↓		
4. Check the starter motor. Refer to "CHECKING THE STARTER MOTOR" on page 5-54.	NG →	Repair or replace the starter motor.
OK ↓		
5. Check the starting circuit cut-off relay. Refer to "CHECKING THE RELAYS" on page 8-129.	NG →	Replace the starting circuit cut-off relay.
OK ↓		
6. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-129.	NG →	Replace the starter relay.
OK ↓		
7. Check the diode 3. Refer to "CHECKING THE DIODES" on page 8-131.	NG →	Replace the diode 3.
OK ↓		

ELECTRIC STARTING SYSTEM

8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-127.	NG →	Replace the main switch.
OK ↓		
9. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-127.	NG →	Replace the sidestand switch.
OK ↓		
10. Check the start/engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-127.	NG →	The start/engine stop switch is faulty. Replace the right handlebar switch.
OK ↓		
11. Check the brake light switches. (Front and rear) Refer to "CHECKING THE SWITCHES" on page 8-127.	NG →	Replace the brake light switch(es).
OK ↓		
12. Check the entire starting system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-5.	NG →	Properly connect or replace the wire harness.
OK ↓		
The starting system circuit is OK.		

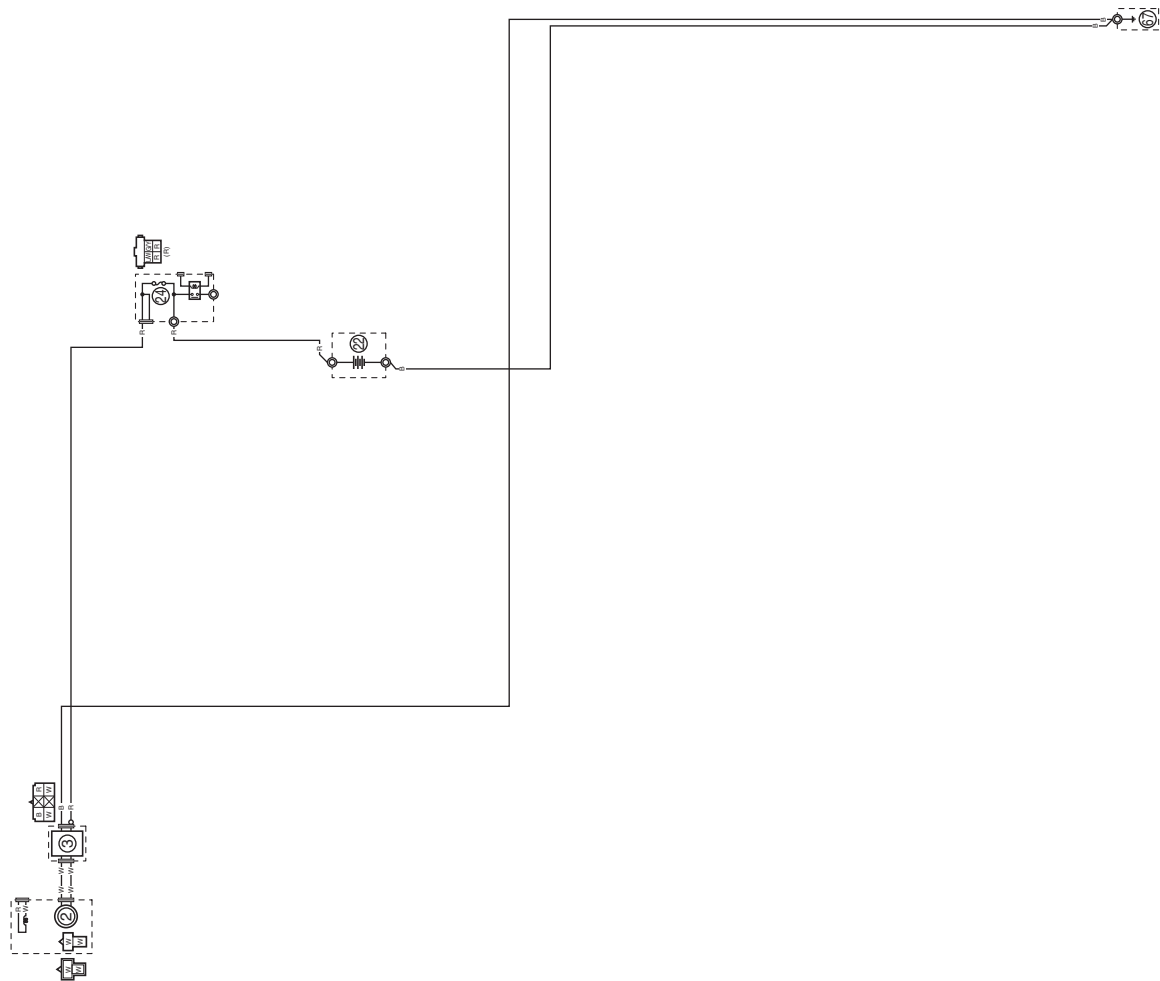
ELECTRIC STARTING SYSTEM

EAS20074

CHARGING SYSTEM

EAS30496

CIRCUIT DIAGRAM



CHARGING SYSTEM

- 2. AC magneto
- 3. Rectifier/regulator
- 22. Battery
- 24. Main fuse 2
- 67. Frame ground

EAS30497

TROUBLESHOOTING

The battery is not being charged.

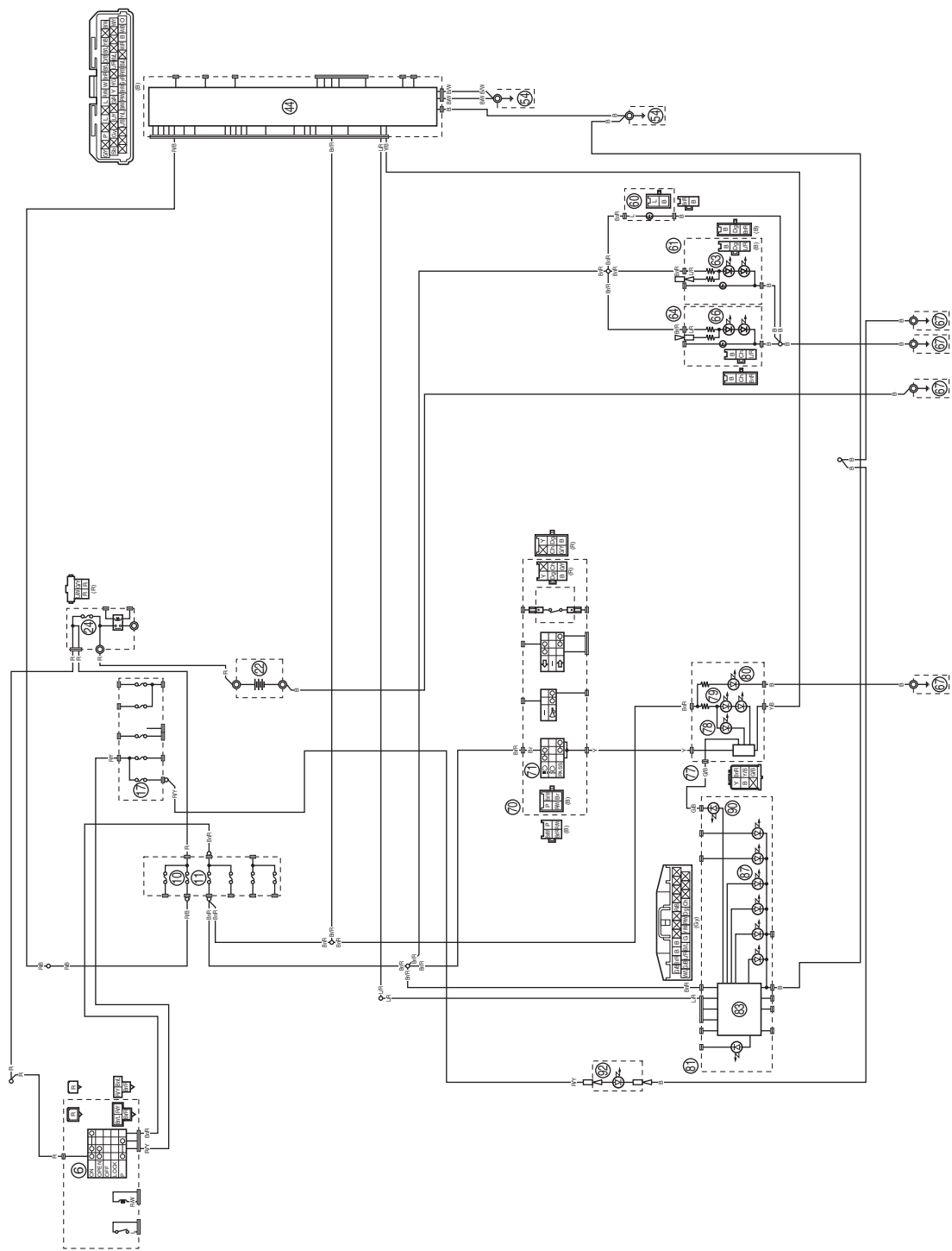
TIP

- Before troubleshooting, remove the following part(s):
 1. Battery cover assembly
 2. Lower side cover (left)
 3. Radiator cover
 4. Exhaust pipe

1. Check the fuse. (Main 2) Refer to "CHECKING THE FUSES" on page 8-128.	NG →	Replace the fuse.
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.	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 8-134.	NG →	Replace the stator coil assembly.
OK ↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 8-135.	NG →	Replace the rectifier/regulator.
OK ↓		
5. Check the entire charging system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-11.	NG →	Properly connect or replace the wire harness.
OK ↓		
The charging system circuit is OK.		

EAS20075
LIGHTING SYSTEM

EAS30498
CIRCUIT DIAGRAM



- 6. Main switch
- 10.Backup fuse
- 11.Main fuse
- 17.Answer back fuse
- 22.Battery
- 24.Main fuse 2
- 44.ECU (Engine Control Unit)
- 54.Engine ground
- 60.License plate light
- 61.Tail/brake light assembly (right)
- 63.Tail/brake light (right)
- 64.Tail/brake light assembly (left)
- 66.Tail/brake light (left)
- 67.Frame ground
- 70.Handlebar switch (left)
- 71.Dimmer switch
- 77.Headlight assembly
- 78.Headlight (low beam)
- 79.Headlight (high beam)
- 80.Auxiliary light
- 81.Meter assembly
- 83.Multi-function meter
- 87.Meter light
- 90.High beam indicator light
- 92.Storage box light

EAS30499

TROUBLESHOOTING

Any of the following fail to light: headlight, auxiliary light, high beam indicator light, tail/brake light, license plate light, meter light or storage box light.

TIP

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

1. Battery cover assembly
2. Front cowling assemblies
3. Meter panel assembly
4. Lower side covers
5. Footrest board assemblies
6. Leg shield assembly

1. Check the condition of each bulb and bulb socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" in "BASIC INFORMATION" (separate volume).	NG →	Replace the bulb(s) and bulb socket(s).
OK ↓		
2. Check the fuses. (Main, main 2, backup and answer back) Refer to "CHECKING THE FUSES" on page 8-128.	NG →	Replace the fuse(s).
OK ↓		
3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.	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 8-127.	NG →	Replace the main switch.
OK ↓		
5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-127.	NG →	The dimmer switch is faulty. Replace the left handlebar switch.
OK ↓		

6. Check the entire lighting system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-15.

NG →

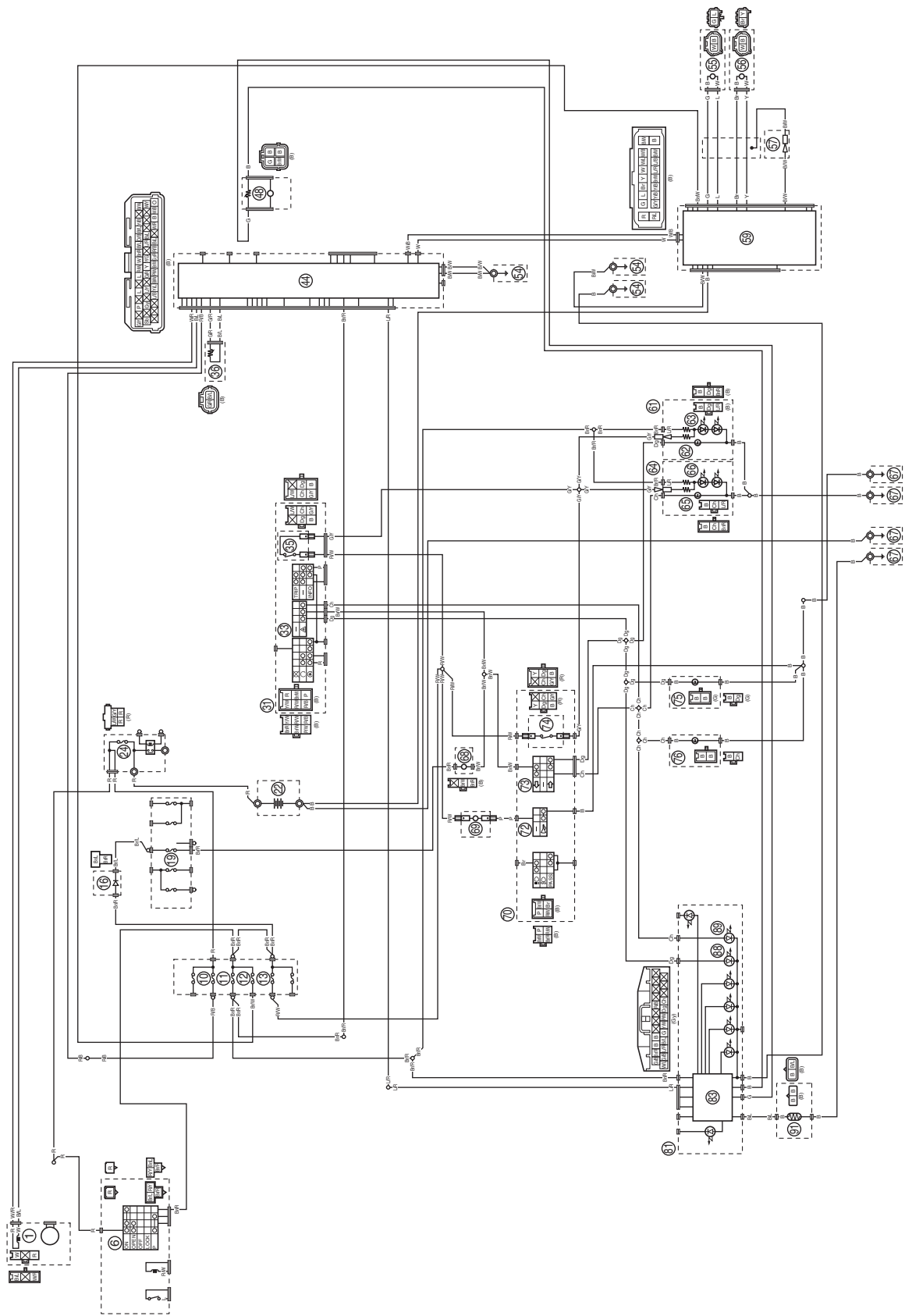
Properly connect or replace the wire harness.

OK ↓

Replace the ECU, meter assembly, tail/brake light assembly, storage box light or headlight assembly. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.

EAS20076
SIGNALING SYSTEM

EAS30500
CIRCUIT DIAGRAM



1. Crankshaft position sensor
6. Main switch
- 10.Backup fuse
- 11.Main fuse
- 12.ABS control unit fuse
- 13.Signaling system fuse
- 16.Diode 1
- 19.Turn signal light and hazard fuse
- 22.Battery
- 24.Main fuse 2
- 31.Handlebar switch (right)
- 33.Hazard switch
- 35.Front brake light switch
- 36.Coolant temperature sensor
- 44.ECU (Engine Control Unit)
- 48.Fuel sender
- 54.Engine ground
- 55.Front wheel sensor
- 56.Rear wheel sensor
- 57.Joint connector
- 59.ABS ECU
- 61.Tail/brake light assembly (right)
- 62.Rear turn signal light (right)
- 63.Tail/brake light (right)
- 64.Tail/brake light assembly (left)
- 65.Rear turn signal light (left)
- 66.Tail/brake light (left)
- 67.Frame ground
- 68.Turn signal/hazard relay
- 69.Horn
- 70.Handlebar switch (left)
- 72.Horn switch
- 73.Turn signal switch
- 74.Rear brake light switch
- 75.Front turn signal light (right)
- 76.Front turn signal light (left)
- 81.Meter assembly
- 83.Multi-function meter
- 88.Turn signal indicator light (right)
- 89.Turn signal indicator light (left)
- 91.Air temperature sensor

EAS30501

TROUBLESHOOTING

- Any of the following fail to light: turn signal lights, tail/brake light or indicator lights.
- The horn fails to sound.
- The fuel meter fails to flash.
- The speedometer fails to operate.
- The instantaneous fuel consumption meter fails to operation.
- The tachometer fails to operate.
- The coolant temperature meter fails to operate.
- The ambient temperature meter fails to operate.
- The V-belt replacement meter fails to operate.
- The oil change meter fails to operate.
- The traction control system meter fails to operate.

TIP

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

1. Battery cover assembly
2. Front cowling assemblies
3. Meter panel assembly
4. Lower side covers
5. Footrest board assemblies
6. Leg shield assembly

1. Check the fuses. (Main, main 2, backup, turn signal/ light and hazard, signaling system, and ABS control unit) Refer to "CHECKING THE FUS- ES" on page 8-128.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.	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 8-127.	NG →	Replace the main switch.
OK ↓		
4. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-19.	NG →	Properly connect or replace the wire har- ness.
OK ↓		
Check the condition of each of the sig- naling system circuits. Refer to "Checking the signaling system" on page 8-22.		

Checking the signaling system

The horn fails to sound.

1. Check the horn switch.
Refer to "CHECKING THE SWITCHES" on page 8-127.

NG →

The horn switch is faulty. Replace the left handlebar switch.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the horn.

The tail/brake light fails to come on.

1. Check the front brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-127.

NG →

Replace the front brake light switch.

OK ↓

2. Check the rear brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-127.

NG →

Replace the rear brake light switch.

OK ↓

3. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the tail/brake light assembly.

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

1. Check the turn signal light bulbs and sockets.
Refer to "CHECKING THE BULBS AND BULB SOCKETS" in "BASIC INFORMATION" (separate volume).

NG →

Replace the turn signal light bulb, socket or both.

OK ↓

2. Check the turn signal switch.
Refer to "CHECKING THE SWITCHES" on page 8-127.

NG →

The turn signal switch is faulty. Replace the left handlebar switch.

OK ↓

SIGNALING SYSTEM

3. Check the hazard switch.
Refer to "CHECKING THE SWITCHES" on page 8-127.

NG →

The hazard switch is faulty. Replace the right handlebar switch.

OK ↓

4. Check the turn signal/hazard relay.
Refer to "CHECKING THE TURN SIGNAL/HAZARD RELAY" on page 8-130.

NG →

Replace the turn signal/hazard relay.

OK ↓

5. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the meter assembly.

The coolant temperature meter fails to operate.

1. Check the coolant temperature sensor.
Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-136.

NG →

Replace the coolant temperature sensor.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the meter assembly or ECU.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.

The speedometer fails to operate.

1. Check the front wheel sensor.
Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.

NG →

Replace the front wheel sensor.

OK ↓

SIGNALING SYSTEM

2. Check the entire wheel sensor wiring.
Refer to TIP.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the hydraulic unit assembly, ECU or meter assembly.

TIP

Replace if there is an open or short circuit.

- Between front wheel sensor coupler and ABS ECU coupler.
(green–green)
(blue–blue)
- Between ABS ECU coupler and ECU coupler.
(white–white)
- Between ECU coupler and meter assembly coupler.
(blue/red–blue/red)

The tachometer fails to operate.

1. Check the crankshaft position sensor.
Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” on page 8-134.

NG →

Replace the stator coil assembly.

OK ↓

2. Check the entire signaling system wiring.
Refer to “CIRCUIT DIAGRAM” on page 8-19.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the meter assembly or ECU.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.

The ambient temperature meter fails to operate.

1. Check the air temperature sensor.
Refer to “CIRCUIT DIAGRAM” on page 8-19.

NG →

Replace the air temperature sensor.

OK ↓

2. Check the entire signaling system wiring.
Refer to “CIRCUIT DIAGRAM” on page 8-19.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the meter assembly.

SIGNALING SYSTEM

The fuel meter fails to operate.

1. Check the fuel sender.
Refer to "CHECKING THE FUEL SENDER" on page 8-135.

NG →

Replace the fuel pump.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the meter assembly.

The traction control system meter fails to operate.

1. Check the rear wheel sensor.
Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.

NG →

Replace the rear wheel sensor.

OK ↓

2. Check the entire wheel sensor wiring.
Refer to TIP.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the hydraulic unit assembly, ECU or meter assembly.

TIP

Replace if there is an open or short circuit.

- Between rear wheel sensor coupler and ABS ECU coupler.
(brown–brown)
(yellow–yellow)
- Between ABS ECU coupler and ECU coupler.
(white/black–white/black)
- Between ECU coupler and meter assembly coupler.
(blue/red–blue/red)

The V-belt replacement indicator, engine oil change indicator, instantaneous fuel consumption meter fails to operate.

1. Check the entire wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or replace the wiring harness.

OK ↓

Replace the meter assembly.

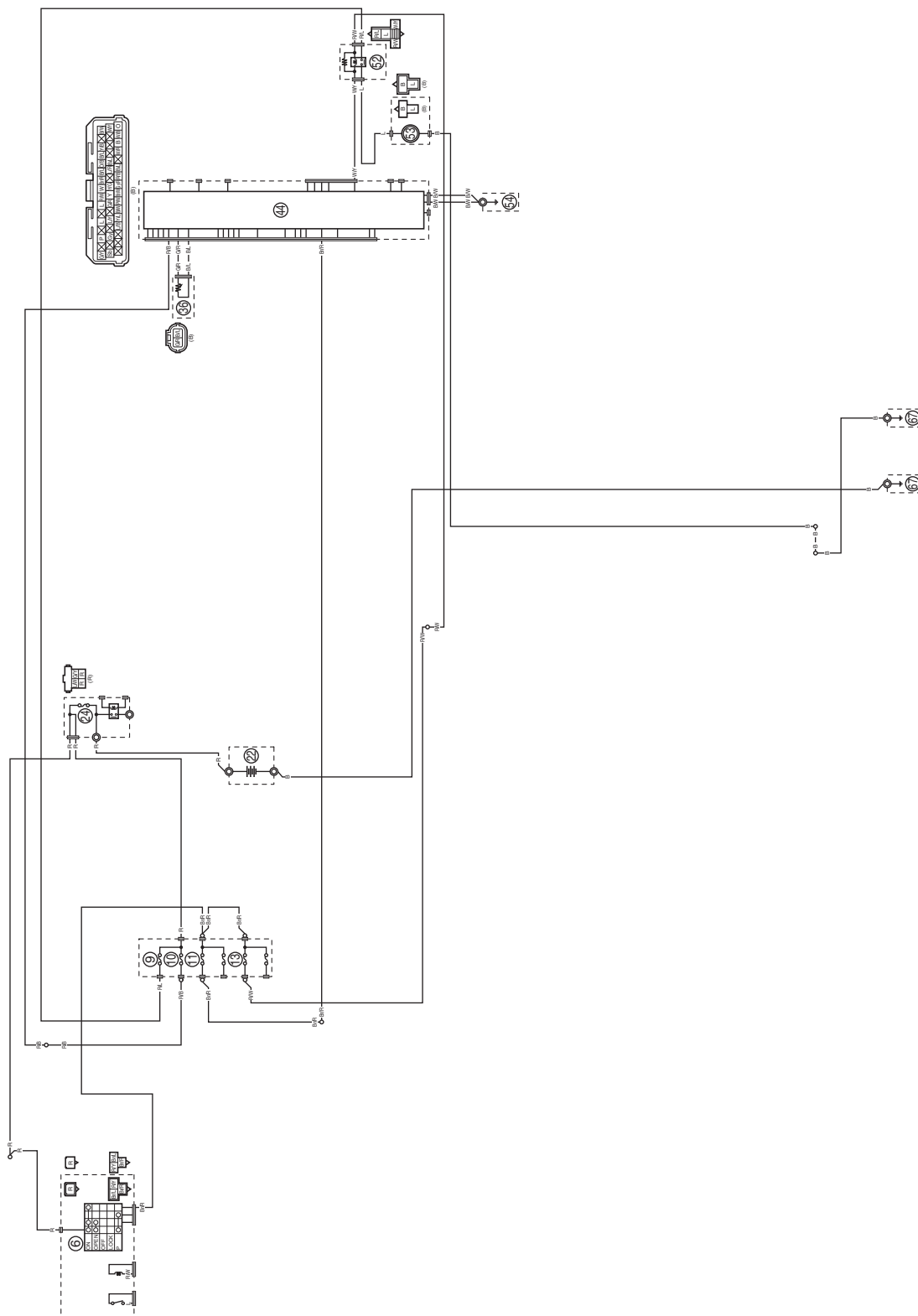
COOLING SYSTEM

EAS20077

COOLING SYSTEM

EAS30502

CIRCUIT DIAGRAM



- 6. Main switch
- 9. Radiator fan motor fuse
- 10.Backup fuse
- 11.Main fuse
- 13.Signaling system fuse
- 22.Battery
- 24.Main fuse 2
- 36.Coolant temperature sensor
- 44.ECU (Engine Control Unit)
- 52.Radiator fan motor relay
- 53.Radiator fan motor
- 54.Engine ground
- 67.Frame ground

EAS30503

TROUBLESHOOTING

TIP

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

1. Battery cover assembly
2. Front cowling assemblies
3. Lower side covers
4. Radiator cover

1. Check the fuses. (Main, main 2, signaling system radiator fan motor and backup) Refer to "CHECKING THE FUSES" on page 8-128.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.	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 8-127.	NG →	Replace the main switch.
OK ↓		
4. Check the radiator fan motor. Refer to "CHECKING THE RADIATOR FAN MOTOR" on page 8-136.	NG →	Replace the radiator fan motor.
OK ↓		
5. Check the radiator fan motor relay. Refer to "CHECKING THE RELAYS" on page 8-129.	NG →	Replace the radiator fan motor relay.
OK ↓		
6. Check the coolant temperature sensor. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-136.	NG →	Replace the coolant temperature sensor.
OK ↓		

7. Check the entire cooling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-27.

NG →

Properly connect or replace the wire harness.

OK ↓

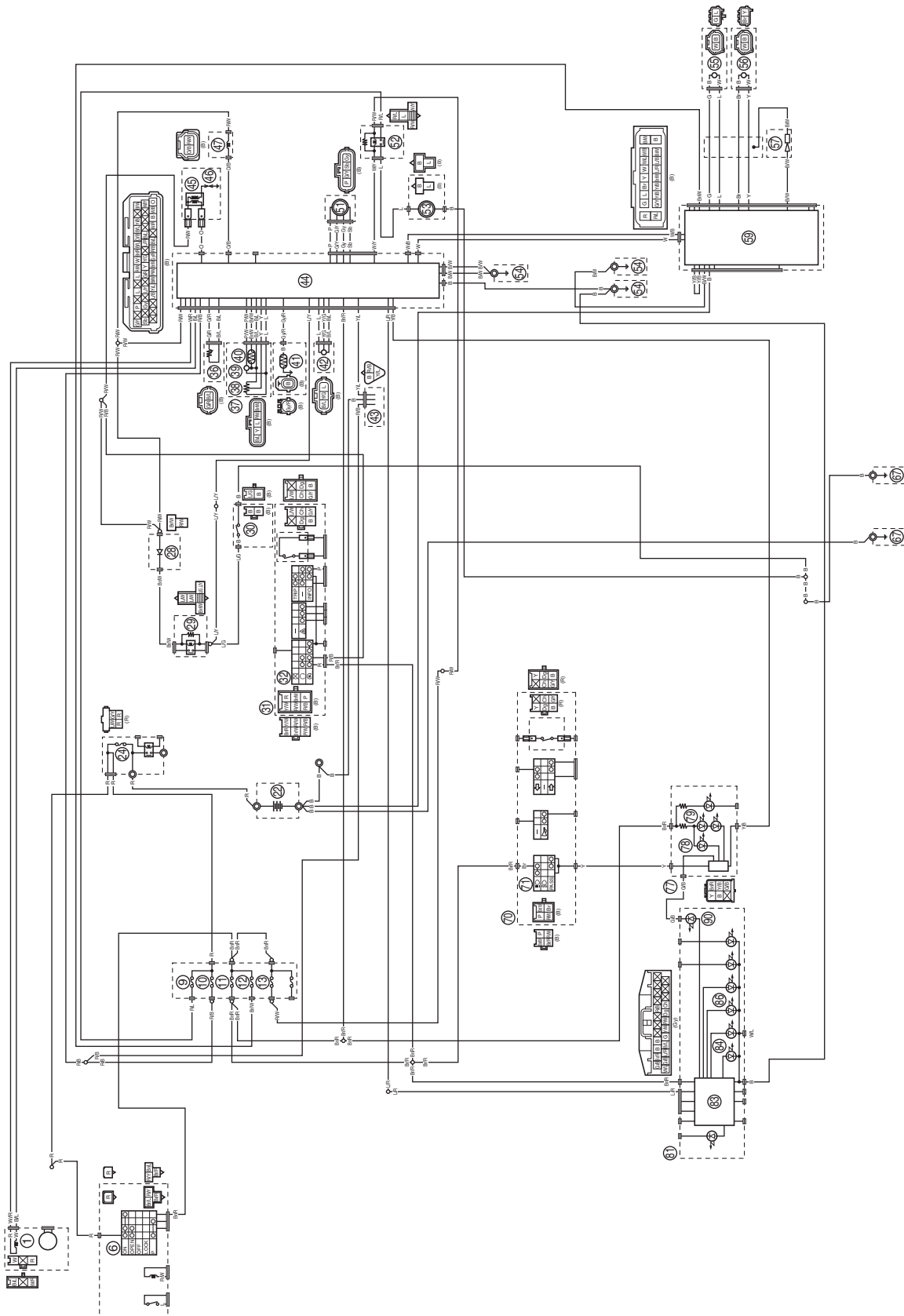
Replace the ECU.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.

EAS20078

FUEL INJECTION SYSTEM

EAS30504

CIRCUIT DIAGRAM



1. Crankshaft position sensor
6. Main switch
9. Radiator fan motor fuse
- 10.Backup fuse
- 11.Main fuse
- 12.ABS control unit fuse
- 13.Signaling system fuse
- 22.Battery
- 24.Main fuse 2
- 28.Diode 3
- 29.Starting circuit cut-off relay
- 30.Sidestand switch
- 31.Handlebar switch (right)
- 32.Start/engine stop switch
- 36.Coolant temperature sensor
- 37.Throttle body sensor assembly
- 38.Throttle position sensor
- 39.Intake air pressure sensor
- 40.Intake air temperature sensor
- 41.O₂ sensor
- 42.Lean angle sensor
- 43.Yamaha diagnostic tool coupler
- 44.ECU (Engine Control Unit)
- 45.Ignition coil
- 46.Spark plug
- 47.Fuel injector
- 51.ISC (Idle Speed Control) unit
- 52.Radiator fan motor relay
- 53.Radiator fan motor
- 54.Engine ground
- 55.Front wheel sensor
- 56.Rear wheel sensor
- 57.Joint connector
- 59.ABS ECU
- 67.Frame ground
- 70.Handlebar switch (left)
- 71.Dimmer switch
- 77.Headlight assembly
- 78.Headlight (low beam)
- 79.Headlight (high beam)
- 81.Meter assembly
- 83.Multi-function meter
- 84.Traction control system indicator light
- 86.Engine trouble warning light
- 90.High beam indicator light

EAS30505

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 number is stored in the memory of the ECU.

Checking the engine trouble warning light

The engine trouble warning light comes on for around 2 seconds after the main switch has been set to "ON". If the warning light does not come on, the warning light (LED) may be defective.

ECU detects an abnormal signal from a sensor

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 operating or stop operating, depending on the conditions.

EAS30506

TROUBLESHOOTING METHOD

The engine operation is not normal and the engine trouble warning light comes on.

- Check:
 - Fault code number
 - Check the fault code numbers that have a condition of "Malfunction" using the Yamaha diagnostic tool.
 - Identify the faulty system with the fault code number.
 - Identify the probable cause of the malfunction.
- Check and repair the probable cause of the malfunction.

Fault code No.	No fault code No.
Check and repair. Refer to "TROUBLESHOOTING DETAILS" on page 8-34. Monitor the operation of the sensors and actuators in the diagnostic mode. Refer to "TROUBLESHOOTING DETAILS" on page 8-34 and "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-1.	Check and repair.

- Perform the reinstatement action for the fuel injection system.
Refer to "Confirmation of service completion" in the appropriate table in "TROUBLESHOOTING DETAILS" on page 8-34.

TIP

- If another fault code number is displayed, repeat steps (1) to (3) until no fault code number is displayed.
- Turning the main switch to "OFF" will not erase the malfunction history.

The engine operation is not normal, but the engine trouble warning light does not come on.

- Check the operation of the following sensors and actuators in the diagnostic mode.
Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-8 and "DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE" on page 9-9.

FUEL INJECTION SYSTEM

01: Throttle position sensor signal (throttle angle)
30: Ignition coil
36: Fuel injector

If a malfunction is detected in the sensors or actuators, repair or replace all faulty parts.

If no malfunction is detected in the sensors and actuators, check and repair the inner parts of the engine.

EAS30951

YAMAHA DIAGNOSTIC TOOL

This model uses the Yamaha diagnostic tool to identify malfunctions.

For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.



Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254

TIP

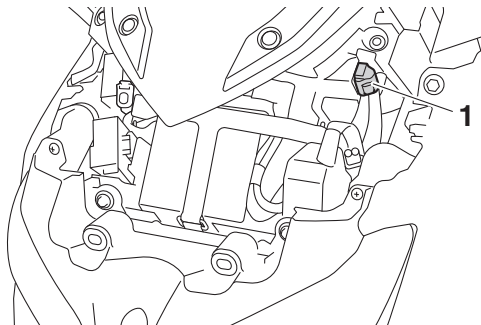
A generic scan tool can also be used to identify malfunctions.



OBD/ GST Leadwire kit
90890-03249

Connecting the Yamaha diagnostic tool

Remove the protective cap "1", and then connect the Yamaha diagnostic tool to the coupler.



EAS30508

TROUBLESHOOTING DETAILS

This section describes the measures per fault code number displayed on the Yamaha diagnostic tool. 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 have been completed, delete the fault codes displayed on the Yamaha diagnostic tool according to the reinstatement method.

Fault code No.:

Fault code number displayed on the Yamaha diagnostic tool when the engine failed to work normally.

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-1.

FUEL INJECTION SYSTEM

Parts connected to the ECU

The following parts are connected to the ECU.

When checking for a power short circuit, the couplers must be disconnected from all of the following parts beforehand.

- Crankshaft position sensor
- AC magneto
- Fuel injector
- Fuel pump
- Ignition coil
- ISC (Idle Speed Control) unit
- Coolant temperature sensor
- Throttle body sensor assembly
- O₂ sensor
- ABS ECU
- Sidestand switch
- Main switch
- Handlebar switch (right)
- Headlight
- Meter assembly
- Rectifier/regulator
- Front wheel sensor
- Rear wheel sensor
- Lean angle sensor
- Fuel pump relay
- Radiator fan motor relay

Fault code No. P0106


ECA20500

NOTICE

Do not remove the throttle body sensor assembly from the throttle body.

TIP

If fault code numbers “P0106” and “P0107/P0108” are both indicated, take the actions specified for fault code number “P0107/P0108” first.

Fault code No.		P0106	
Item		Intake air pressure sensor: system malfunction (clogged or detached).	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		03	
Tool display		Displays the intake air pressure.	
Procedure		Operate the throttle while pulling the brake lever and pushing the “  ” side of the start/engine stop switch. (If the display value changes, the performance is OK.)	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed condition of throttle body sensor assembly.	Check for looseness or pinching. Improperly installed sensor → Reinstall the throttle body. Refer to “THROTTLE BODY” on page 7-13.	Start the engine and let it idle for approximately 5 seconds, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 3 and finish the service. Condition is “Malfunction” → Go to item 2.

FUEL INJECTION SYSTEM

Fault code No.		P0106	
Item		Intake air pressure sensor: system malfunction (clogged or detached).	
2	Defective intake air pressure sensor.	<p>Execute the diagnostic mode. (Code No. 03)</p> <p>When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. At sea level: Approx. 101 kPa (757.6 mmHg, 29.8 inHg) 1000 m (3300 ft) above sea level: Approx. 90 kPa (675.1 mmHg, 26.6 inHg) 2000 m (6700 ft) above sea level: Approx. 80 kPa (600.0 mmHg, 23.6 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg)</p> <p>When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking. → Replace the throttle body. Refer to "REPLACING THE THROTTLE BODY" on page 7-18.</p>	Service is finished.
3	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0107, P0108

ECA20500

NOTICE


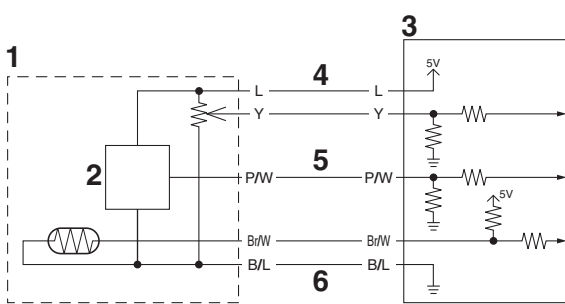
Do not remove the throttle body sensor assembly from the throttle body.

TIP

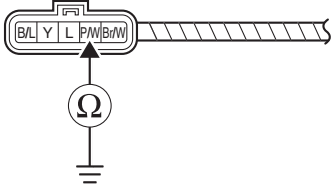
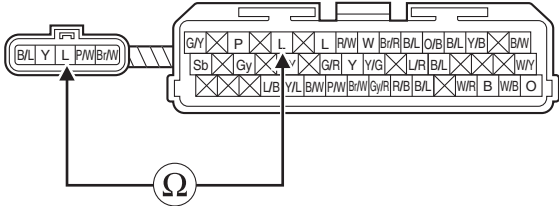
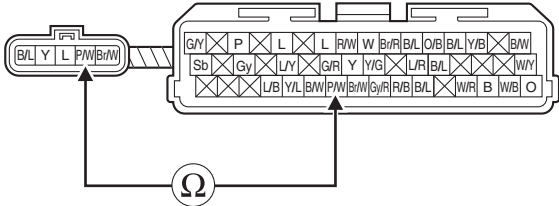
If fault code numbers "P0106" and "P0107/P0108" are both indicated, take the actions specified for fault code number "P0107/P0108" first.

Fault code No.		P0107, P0108	
Item		<p>No normal signals are received from the intake air pressure sensor. [P0107] Intake air pressure sensor: open or ground short circuit detected. [P0108] Intake air pressure sensor: open or power short circuit detected.</p>	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		03	
Tool display		Displays the intake air pressure.	

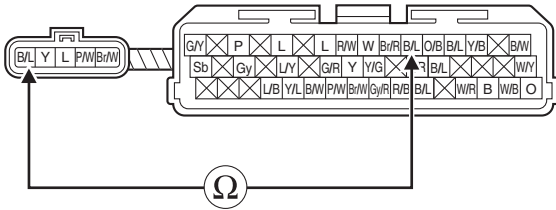
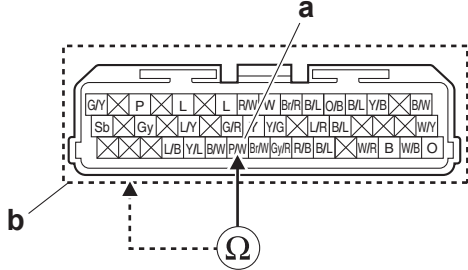
FUEL INJECTION SYSTEM

Fault code No.		P0107, P0108	
Item		No normal signals are received from the intake air pressure sensor. [P0107] Intake air pressure sensor: open or ground short circuit detected. [P0108] Intake air pressure sensor: open or power short circuit detected.	
Procedure		Operate the throttle while pulling the brake lever and pushing the “  ” side of the start/engine stop switch. (If the display value changes, the performance is OK.)	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of throttle body sensor assembly coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 4.
3-1	 <p>1. Throttle body sensor assembly 2. Intake air pressure sensor 3. ECU 4. Sensor input lead 5. Sensor output lead 6. Sensor ground lead</p>		
3-2	Disconnect the ECU coupler from the ECU. Disconnect the throttle body sensor assembly coupler from the throttle body.		

FUEL INJECTION SYSTEM

Fault code No.	P0107, P0108
Item	<p>No normal signals are received from the intake air pressure sensor.</p> <p>[P0107] Intake air pressure sensor: open or ground short circuit detected.</p> <p>[P0108] Intake air pressure sensor: open or power short circuit detected.</p>
3-3	<p>[For P0107] Ground short circuit</p> <p>Between throttle body sensor assembly coupler and ground: pink/white–ground</p> <p>If there is continuity, replace the wire harness.</p> 
3-4	<p>[For P0107] Open circuit</p> <p>Between throttle body sensor assembly coupler and ECU coupler: blue–blue</p> <p>If there is no continuity, replace the wire harness.</p> 
3-5	<p>[For P0107] Open circuit</p> <p>Between throttle body sensor assembly coupler and ECU coupler: pink/white–pink/white</p> <p>If there is no continuity, replace the wire harness.</p> 

FUEL INJECTION SYSTEM

Fault code No.	P0107, P0108		
Item	<p>No normal signals are received from the intake air pressure sensor. [P0107] Intake air pressure sensor: open or ground short circuit detected. [P0108] Intake air pressure sensor: open or power short circuit detected.</p>		
3-6	<p>[For P0108] Open circuit Between throttle body sensor assembly coupler and ECU coupler: black/blue–black/blue If there is no continuity, replace the wire harness.</p> 		
3-7	<p>Disconnect the couplers from the parts that are connected to the ECU. Refer to “Parts connected to the ECU” on page 8-35.</p>		
3-8	<p>[For P0107, P0108] Short circuit Between intake air pressure sensor output terminal (pink/white) “a” of ECU coupler and any other ECU coupler terminal “b”. If there is continuity, replace the wire harness.</p> 		
4	<p>Installed condition of throttle body sensor assembly.</p>	<p>Check for looseness or pinching. Improperly installed sensor → Reinstall the throttle body. Refer to “THROTTLE BODY” on page 7-13.</p>	<p>Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 5.</p>

FUEL INJECTION SYSTEM

Fault code No.		P0107, P0108	
Item		No normal signals are received from the intake air pressure sensor. [P0107] Intake air pressure sensor: open or ground short circuit detected. [P0108] Intake air pressure sensor: open or power short circuit detected.	
5	Defective intake air pressure sensor.	Execute the diagnostic mode. (Code No. 03) When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. At sea level: Approx. 101 kPa (757.6 mmHg, 29.8 inHg) 1000 m (3300 ft) above sea level: Approx. 90 kPa (675.1 mmHg, 26.6 inHg) 2000 m (6700 ft) above sea level: Approx. 80 kPa (600.0 mmHg, 23.6 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg) When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking. → Replace the throttle body. Refer to "REPLACING THE THROTTLE BODY" on page 7-18.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

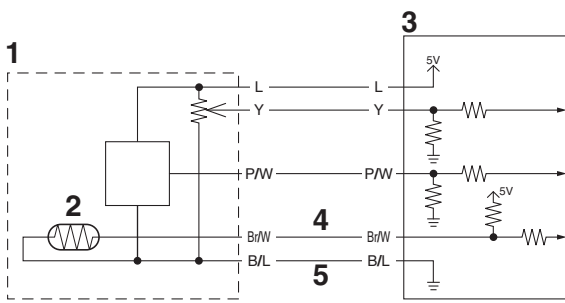
Fault code No. P0112, P0113

TIP

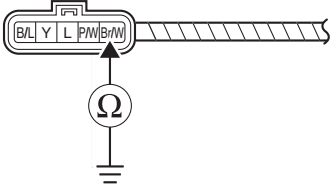
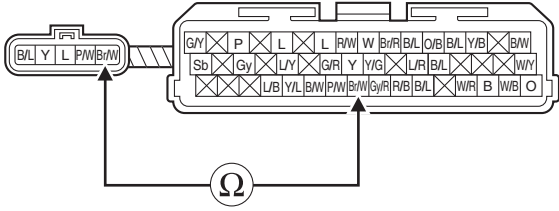
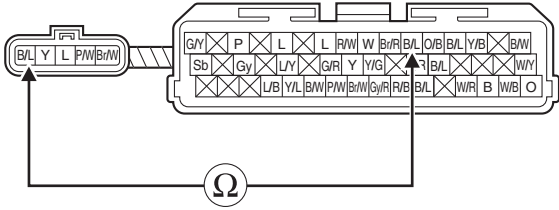
Perform this procedure when the engine is cold.

Fault code No.		P0112, P0113	
Item		No normal signals are received from the intake air temperature sensor. [P0112] Intake air temperature sensor: ground short circuit detected. [P0113] Intake air temperature sensor: open or power short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		05	

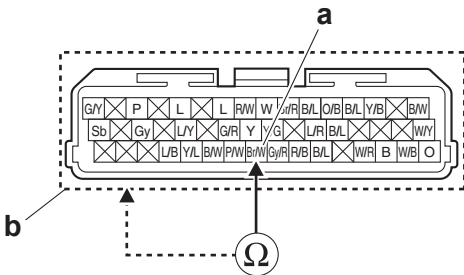
FUEL INJECTION SYSTEM

Fault code No.		P0112, P0113	
Item		No normal signals are received from the intake air temperature sensor. [P0112] Intake air temperature sensor: ground short circuit detected. [P0113] Intake air temperature sensor: open or power short circuit detected.	
Tool display		When engine is cold: Displays temperature closer to air temperature. When engine is hot: Air temperature + approx. 20 °C (68 °F).	
Procedure		Compare the actually measured air temperature with the tool display value.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of throttle body sensor assembly coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 4.
3-1	 <p>1. Throttle body sensor assembly 2. Intake air temperature sensor 3. ECU 4. Sensor output lead 5. Sensor ground lead</p>		
3-2	Disconnect the ECU coupler from the ECU. Disconnect the throttle body sensor assembly coupler from the throttle body.		

FUEL INJECTION SYSTEM

Fault code No.	P0112, P0113
Item	<p>No normal signals are received from the intake air temperature sensor.</p> <p>[P0112] Intake air temperature sensor: ground short circuit detected.</p> <p>[P0113] Intake air temperature sensor: open or power short circuit detected.</p>
3-3	<p>[For P0112] Ground short circuit</p> <p>Between throttle body sensor assembly coupler and ground: brown/white–ground</p> <p>If there is continuity, replace the wire harness.</p> 
3-4	<p>[For P0113] Open circuit</p> <p>Between throttle body sensor assembly coupler and ECU coupler: brown/white–brown/white</p> <p>If there is no continuity, replace the wire harness.</p> 
3-5	<p>[For P0113] Open circuit</p> <p>Between throttle body sensor assembly coupler and ECU coupler: black/blue–black/blue</p> <p>If there is no continuity, replace the wire harness.</p> 
3-6	<p>Disconnect the couplers from the parts that are connected to the ECU.</p> <p>Refer to “Parts connected to the ECU” on page 8-35.</p>

FUEL INJECTION SYSTEM

Fault code No.	P0112, P0113		
Item	No normal signals are received from the intake air temperature sensor. [P0112] Intake air temperature sensor: ground short circuit detected. [P0113] Intake air temperature sensor: open or power short circuit detected.		
3-7	<p>[For P0112, P0113] Short circuit Between intake air temperature sensor output terminal (brown/white) "a" of ECU coupler and any other ECU coupler terminal "b". If there is continuity, replace the wire harness.</p> 		
4	Installed condition of throttle body sensor assembly.	Check for looseness or pinching. Improperly installed sensor → Reinstall the throttle body. Refer to "THROTTLE BODY" on page 7-13.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 5.
5	Defective intake air temperature sensor.	Execute the diagnostic mode. (Code No. 05) When engine is cold: Displayed temperature is close to the ambient temperature. The displayed temperature is not close to the ambient temperature. → Replace the throttle body. Refer to "REPLACING THE THROTTLE BODY" on page 7-18.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

FUEL INJECTION SYSTEM

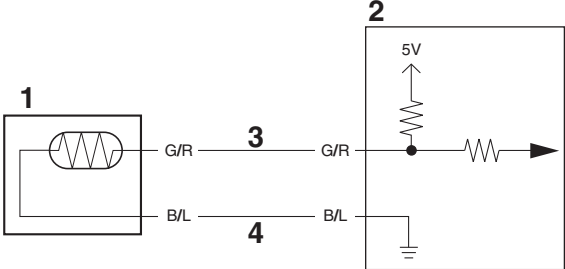
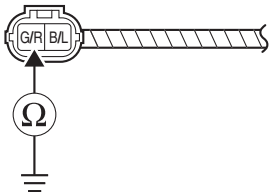
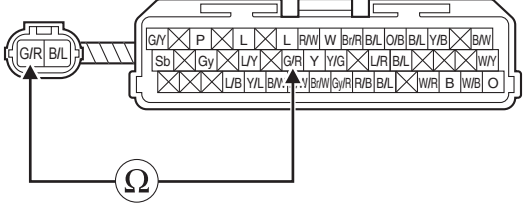
Fault code No. P0117, P0118

TIP

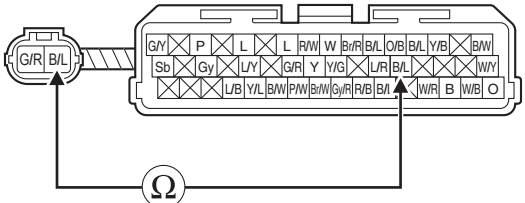
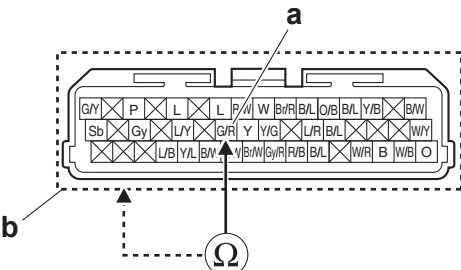
Perform this procedure when the engine is cold.

Fault code No.		P0117, P0118	
Item		No normal signals are received from the coolant temperature sensor. [P0117] Coolant temperature sensor: ground short circuit detected. [P0118] Coolant temperature sensor: open or power short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		06	
Tool display		When engine is cold: Displays temperature closer to air temperature. When engine is hot: Displays current coolant temperature.	
Procedure		Compare the actually measured coolant temperature with the tool display value.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of coolant temperature sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 4.

FUEL INJECTION SYSTEM

Fault code No.	P0117, P0118
Item	No normal signals are received from the coolant temperature sensor. [P0117] Coolant temperature sensor: ground short circuit detected. [P0118] Coolant temperature sensor: open or power short circuit detected.
3-1	 <p>1. Coolant temperature sensor 2. ECU 3. Sensor output lead 4. Sensor ground lead</p>
3-2	Disconnect the ECU coupler from the ECU. Disconnect the coolant temperature sensor coupler from the coolant temperature sensor.
3-3	<p>[For P0117] Ground short circuit Between coolant temperature sensor coupler and ground: green/red–ground If there is continuity, replace the wire harness.</p> 
3-4	<p>[For P0118] Open circuit Between coolant temperature sensor coupler and ECU coupler: green/red–green/red If there is no continuity, replace the wire harness.</p> 

FUEL INJECTION SYSTEM

Fault code No.	P0117, P0118		
Item	No normal signals are received from the coolant temperature sensor. [P0117] Coolant temperature sensor: ground short circuit detected. [P0118] Coolant temperature sensor: open or power short circuit detected.		
3-5	[For P0118] Open circuit Between coolant temperature sensor coupler and ECU coupler: black/blue–black/blue If there is no continuity, replace the wire harness.		
3-6		Disconnect the couplers from the parts that are connected to the ECU. Refer to “Parts connected to the ECU” on page 8-35.	
3-7	[For P0117, P0118] Short circuit Between coolant temperature sensor output terminal (green/red) “a” of ECU coupler and any other ECU coupler terminal “b”. If there is continuity, replace the wire harness.		
4	Installed condition of coolant temperature sensor.	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor. Refer to “CYLINDER HEAD” on page 5-13.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 5.
5	Defective coolant temperature sensor.	Execute the diagnostic mode. (Code No. 06) When engine is cold: Displayed temperature is close to the ambient temperature. The displayed temperature is not close to the ambient temperature. → Replace the coolant temperature sensor. Refer to “CYLINDER HEAD” on page 5-13.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 6.

FUEL INJECTION SYSTEM

Fault code No.		P0117, P0118	
Item		No normal signals are received from the coolant temperature sensor. [P0117] Coolant temperature sensor: ground short circuit detected. [P0118] Coolant temperature sensor: open or power short circuit detected.	
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0122, P0123

ECA20500

NOTICE

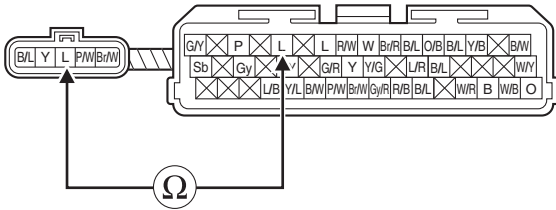
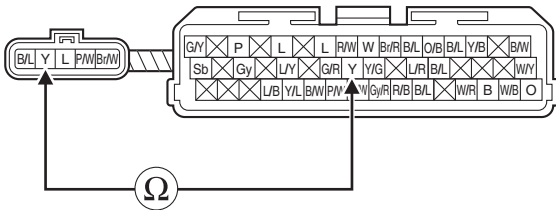
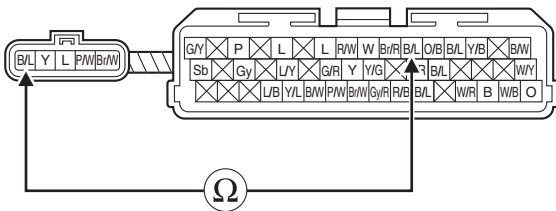
Do not remove the throttle body sensor assembly from the throttle body.

Fault code No.		P0122, P0123	
Item		No normal signals are received from the throttle position sensor. [P0122] Throttle position sensor: open or ground short circuit detected. [P0123] Throttle position sensor: open or power short circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		01	
Tool display		Throttle position sensor signal • 13–21 (fully closed position) • 97–107 (fully open position)	
Procedure		• Check with throttle valves fully closed. • Check with throttle valves fully open.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of throttle body sensor assembly coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 3.

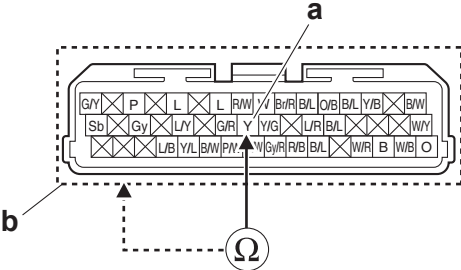
FUEL INJECTION SYSTEM

Fault code No.	P0122, P0123		
Item	<p>No normal signals are received from the throttle position sensor. [P0122] Throttle position sensor: open or ground short circuit detected. [P0123] Throttle position sensor: open or power short circuit detected.</p>		
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	<p>Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool.</p> <p>Condition is “Recover” → Go to item 7 and finish the service.</p> <p>Condition is “Malfunction” → Go to item 4.</p>
3-1	<div> </div> <p>1. Throttle body sensor assembly 2. Throttle position sensor 3. ECU 4. Sensor input lead 5. Sensor output lead 6. Sensor ground lead</p>		
3-2	<p>Disconnect the ECU coupler from the ECU.</p> <p>Disconnect the throttle body sensor assembly coupler from the throttle body.</p>		
3-3	<p>[For P0122] Ground short circuit</p> <p>Between throttle body sensor assembly coupler and ground: yellow-ground</p> <p>If there is continuity, replace the wire harness.</p> <div> </div>		

FUEL INJECTION SYSTEM

Fault code No.	P0122, P0123
Item	<p>No normal signals are received from the throttle position sensor.</p> <p>[P0122] Throttle position sensor: open or ground short circuit detected.</p> <p>[P0123] Throttle position sensor: open or power short circuit detected.</p>
3-4	<p>[For P0122] Open circuit</p> <p>Between throttle body sensor assembly coupler and ECU coupler: blue–blue</p> <p>If there is no continuity, replace the wire harness.</p> 
3-5	<p>[For P0122] Open circuit</p> <p>Between throttle body sensor assembly coupler and ECU coupler: yellow–yellow</p> <p>If there is no continuity, replace the wire harness.</p> 
3-6	<p>[For P0123] Open circuit</p> <p>Between throttle body sensor assembly coupler and ECU coupler: black/blue–black/blue</p> <p>If there is no continuity, replace the wire harness.</p> 
3-7	<p>Disconnect the couplers from the parts that are connected to the ECU.</p> <p>Refer to “Parts connected to the ECU” on page 8-35.</p>

FUEL INJECTION SYSTEM

Fault code No.	P0122, P0123		
Item	No normal signals are received from the throttle position sensor. [P0122] Throttle position sensor: open or ground short circuit detected. [P0123] Throttle position sensor: open or power short circuit detected.		
3-8	<p>[For P0122, P0123] Short circuit Between throttle position sensor output terminal (yellow) "a" of ECU coupler and any other ECU coupler terminal "b" If there is continuity, replace the wire harness.</p> 		
4	Installed condition of throttle body sensor assembly.	Check for looseness or pinching. Improperly installed sensor → Reinstall the throttle body. Refer to "THROTTLE BODY" on page 7-13.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 5.
5	Defective throttle position sensor.	Check throttle position sensor signal. Execute the diagnostic mode. (Code No. 01) When the throttle valves are fully closed: A value of 13–21 is indicated. When throttle valves are fully open: A value of 97–107 is indicated. An indicated value is out of the specified range. → Replace the throttle body. Refer to "REPLACING THE THROTTLE BODY" on page 7-18.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

FUEL INJECTION SYSTEM

Fault code No. P0132

Fault code No.		P0132	
Item		O ₂ sensor: power short circuit detected (no normal signals are received from the O ₂ sensor).	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Tool display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed condition of O ₂ sensor.	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor. Refer to "CYLINDER HEAD" on page 5-13.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Connection of O ₂ sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 4.
4	Wire harness continuity.	Open or short circuit → Properly connect or replace the wire harness. Between O ₂ sensor coupler and ECU coupler. gray/red-gray/red	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 5.

FUEL INJECTION SYSTEM

Fault code No.		P0132	
Item		O₂ sensor: power short circuit detected (no normal signals are received from the O₂ sensor).	
5	Defective O ₂ sensor.	Check the O ₂ sensor. Defective → Replace the O ₂ sensor. Refer to "CYLINDER HEAD" on page 5-13.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0201

Fault code No.		P0201	
Item		Fuel injector: no normal signals are received from the fuel injector circuit.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		36	
Actuation		Actuates fuel injector five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen comes on each time the fuel injector is actuated.	
Procedure		Disconnect the fuel pump coupler. Check that fuel injector is actuated five times by listening for the operating sound.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of fuel injector coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 36) Operating sound → Go to item 6. No operating sound → Go to item 2.
2	Defective fuel injector.	Measure the fuel injector resistance. Refer to "CHECKING THE FUEL INJECTOR" on page 8-137. Replace if out of specification.	Execute the diagnostic mode. (Code No. 36) Operating sound → Go to item 6. No operating sound → Go to item 3.

FUEL INJECTION SYSTEM

Fault code No.		P0201	
Item		Fuel injector: no normal signals are received from the fuel injector circuit.	
3	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 36) Operating sound → Go to item 6. No operating sound → Go to item 4.
4	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between fuel injector coupler and ECU coupler. orange/black–orange/black Between fuel injector coupler and start/engine stop switch. red/white–red/black Between start/engine stop switch and main fuse. brown/red–brown/red	Execute the diagnostic mode. (Code No. 36) Operating sound → Go to item 6. No operating sound → Go to item 5.
5	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.	
6	Delete the fault code and check that the engine trouble warning light goes off.	Start the engine and let it idle for approximately 5 seconds. Confirm that the fault code has a condition of “Recover” using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0335

Fault code No.		P0335	
Item		Crankshaft position sensor: no normal signals are received from the crankshaft position sensor.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		—	
Tool display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of crankshaft position sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 2.

FUEL INJECTION SYSTEM

Fault code No.		P0335	
Item		Crankshaft position sensor: no normal signals are received from the crankshaft position sensor.	
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between crankshaft position sensor coupler and ECU coupler. white/red–white/red black/blue–black/blue	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 4.
4	Installed condition of crankshaft position sensor. Check for looseness or pinching.	Improperly installed sensor → Reinstall or replace the sensor. Refer to "GENERATOR AND STARTER CLUTCH" on page 5-46.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 5.
5	Defective crankshaft position sensor.	Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-134. Replace if defective.	Crank the engine, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0351

Fault code No.	P0351
Item	Ignition coil: no normal signals are received from the ignition circuit.
Fail-safe system	Unable to start engine
	Unable to drive vehicle
Diagnostic code No.	30

FUEL INJECTION SYSTEM

Fault code No.		P0351	
Item		Ignition coil: no normal signals are received from the ignition circuit.	
Actuation		Actuates the ignition coil five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen comes on each time the ignition coil is actuated.	
Procedure		Check that a spark is generated five times. • Connect an ignition checker.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of ignition coil coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between ignition coil coupler and ECU coupler. orange–orange Between ignition coil coupler and start/engine stop switch. red/white–red/black Between start/engine stop switch and main fuse. brown/red–brown/red	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 4.
4	Installed condition of ignition coil.	Check for looseness or pinching. Improperly installed ignition coil → Reinstall or replace the ignition coil.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 5.

FUEL INJECTION SYSTEM

Fault code No.		P0351	
Item		Ignition coil: no normal signals are received from the ignition circuit.	
5	Defective ignition coil.	Measure the primary coil resistance of the ignition coil. Refer to "CHECKING THE IGNITION COIL" on page 8-132. Replace if out of specification.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 6.
6	Malfunction in ECU.	Execute the diagnostic mode. (Code No. 30) No spark → Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0480

Fault code No.		P0480	
Item		No normal signals are received from the radiator fan motor relay. Radiator fan motor relay: open circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Tool display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of radiator fan motor relay coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 3.

FUEL INJECTION SYSTEM

Fault code No.		P0480	
Item		No normal signals are received from the radiator fan motor relay. Radiator fan motor relay: open circuit detected.	
3	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between radiator fan motor relay coupler and ECU coupler. white/yellow–white/yellow Between radiator fan motor relay and signaling system fuse. red/white–red/white Between radiator fan motor relay and radiator fan motor fuse. red/blue–red/blue	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 6 and finish the service. Condition is “Malfunction” → Go to item 4.
4	Defective radiator fan motor relay.	Check the radiator fan motor relay. Refer to “CHECKING THE RELAYS” on page 8-129. Replace if defective.	Turn the main switch to “ON”, and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 6 and finish the service. Condition is “Malfunction” → Go to item 5.
5	Defective radiator fan motor relay driver.	Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.	Service is finished.
6	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recover” using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0500

Fault code No.		P0500	
Item		Front wheel sensor: no normal signals are received from the front wheel sensor.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		07	
Tool display		Front wheel speed pulse 0–999	
Procedure		Check that the number increases when the front wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of front wheel sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 07) Rotate the front wheel by hand and check that the indicated value increases. Value increases → Go to item 7. Value does not increase → Go to item 2.

FUEL INJECTION SYSTEM

Fault code No.		P0500	
Item		Front wheel sensor: no normal signals are received from the front wheel sensor.	
2	Connection of ABS ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 07) Rotate the front wheel by hand and check that the indicated value increases. Value increases → Go to item 7. Value does not increase → Go to item 3.
3	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 07) Rotate the front wheel by hand and check that the indicated value increases. Value increases → Go to item 7. Value does not increase → Go to item 4.
4	Front wheel sensor lead continuity, or defective front wheel sensor.	Open or short circuit, or defective sensor → Replace the front wheel sensor. Between front wheel sensor coupler and ABS ECU coupler. green–green blue–blue Between ABS ECU coupler and ECU coupler. white–white	Execute the diagnostic mode. (Code No. 07) Rotate the front wheel by hand and check that the indicated value increases. Value increases → Go to item 7. Value does not increase → Go to item 5.
5	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.	Execute the diagnostic mode. (Code No. 07) Rotate the front wheel by hand and check that the indicated value increases. Value increases → Go to item 7. Value does not increase → Go to item 6.
6	Malfunction in ABS ECU.	Replace the ABS ECU. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-63.	Go to item 7.
7	Delete the fault code and check that the engine trouble warning light goes off.	Turn the main switch to “ON”, and then rotate the front wheel by hand. Confirm that the fault code has a condition of “Recover” using the malfunction mode of the Yamaha diagnostic tool, and then delete the fault code.	

FUEL INJECTION SYSTEM

Fault code No. P0507

TIP

- If fault code numbers “P0507” and “P0560” are both indicated, take the actions specified for fault code number “P0560” first.
- If fault code numbers “P0507” and “P0500” are both indicated, take the actions specified for fault code number “P0500” first.
- If fault code numbers “P0507” and “P0511” are both indicated, take the actions specified for fault code number “P0511” first.

Fault code No.		P0507	
Item	A	Component other than ISC (Idle Speed Control) unit is defective (ISC operating sound is heard).	
	B	Defective ISC (Idle Speed Control) unit (ISC operating sound is not heard).	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		54	
Action		Actuates and fully closes the ISC valve, then opens it to the standby opening position. This operation takes approximately 3 seconds until it is completed. The “check” indicator on the Yamaha diagnostic tool screen come on.	
Procedure		The ISC unit vibrates when the ISC valve operates.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
A-1	Locate the malfunction.	Execute the diagnostic mode. (Code No. 54) Fully closes the ISC (Idle Speed Control) valve, and then fully opens the valve. This operation takes approximately 3 seconds.	ISC operating sound is heard → Go to item A-2. ISC operating sound is not heard → Go to item B-2 for the defective ISC (Idle Speed Control) unit.
A-2	Incorrect front wheel sensor signal.	Check the front wheel sensor. Execute the diagnostic mode. (Code No. 07) Front wheel stop: The pulse integrated value should be constant. Rotate the front wheel by hand and check that the indicated value increases. Value does not increase → Go to fault code No. P0500.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item A-9 and finish the service. Condition is “Malfunction” → Go to item A-3.
A-3	Throttle valve does not fully close due to malfunction in throttle cables.	Check the throttle grip free play. Refer to “CHECKING THE THROTTLE GRIP OPERATION” on page 3-24.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item A-9 and finish the service. Condition is “Malfunction” → Go to item A-4.

FUEL INJECTION SYSTEM

Fault code No.		P0507	
Item		A	Component other than ISC (Idle Speed Control) unit is defective (ISC operating sound is heard).
		B	Defective ISC (Idle Speed Control) unit (ISC operating sound is not heard).
A-4	Air leak from the throttle body.	Check the throttle body. Refer to "CHECKING THE THROTTLE BODY" on page 7-15.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item A-9 and finish the service. Condition is "Malfunction" → Go to item A-5.
A-5	Air leak from the ISC (Idle Speed Control) unit.	Improperly installed ISC (Idle Speed Control) unit → Reinstall the ISC (Idle Speed Control) unit. Refer to "THROTTLE BODY" on page 7-13. Check the intake air passages for air leaks.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item A-9 and finish the service. Condition is "Malfunction" → Go to item A-6.
A-6	The air volume for the throttle body and ISC (Idle Speed Control) unit is excessive.	Clean the throttle body and ISC (Idle Speed Control) unit. Refer to "CLEANING THE ISC (IDLE SPEED CONTROL) UNIT AND THROTTLE BODY" on page 7-15.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item A-9 and finish the service. Condition is "Malfunction" → Go to item A-7.
A-7	ISC (Idle Speed Control) unit is not moving correctly.	Replace the ISC (Idle Speed Control) unit. Refer to "CLEANING THE ISC (IDLE SPEED CONTROL) UNIT AND THROTTLE BODY" on page 7-15 and "REPLACING THE THROTTLE BODY" on page 7-18.	Start the engine and let it idle for approximately 10 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item A-9 and finish the service. Condition is "Malfunction" → Go to item A-8.
A-8	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Execute the diagnostic mode. (Code No. 54) Return the ISC (Idle Speed Control) valve to the initial opening position.
A-9	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

FUEL INJECTION SYSTEM

Fault code No.		P0507	
Item	A	Component other than ISC (Idle Speed Control) unit is defective (ISC operating sound is heard).	
	B	Defective ISC (Idle Speed Control) unit (ISC operating sound is not heard).	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		54	
Action		Actuates and fully closes the ISC valve, then opens it to the standby opening position. This operation takes approximately 3 seconds until it is completed. The "check" indicator on the Yamaha diagnostic tool screen come on.	
Procedure		The ISC unit vibrates when the ISC valve operates.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
B-1	Locate the malfunction.	Execute the diagnostic mode. (Code No. 54) Fully closes the ISC (Idle Speed Control) valve, and then fully opens the valve. This operation takes approximately 3 seconds.	ISC operating sound is heard → Go to item A-2 for the component other than ISC (Idle Speed Control) unit is defective. ISC operating sound is not heard → Go to item B-2.
B-2	Connection of ISC (Idle Speed Control) unit coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 54) ISC operating sound is heard → Go to item B-9 and delete the fault code. ISC operating sound is not heard → Go to item B-3.
B-3	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Execute the diagnostic mode. (Code No. 54) ISC operating sound is heard → Go to item B-9 and delete the fault code. ISC operating sound is not heard → Go to item B-4.
B-4	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between ISC (Idle Speed Control) unit coupler and ECU coupler. pink–pink green/yellow–green/yellow gray–gray sky blue–sky blue	Execute the diagnostic mode. (Code No. 54) ISC operating sound is heard → Go to item B-9 and delete the fault code. ISC operating sound is not heard → Go to item B-5.
B-5	Installed condition of ISC (Idle Speed Control) unit.	Check for looseness or pinching. Improperly installed ISC (Idle Speed Control) unit → Reinstall the ISC (Idle Speed Control) unit. Refer to "THROTTLE BODY" on page 7-13. Check the intake air passages for air leaks.	Execute the diagnostic mode. (Code No. 54) ISC operating sound is heard → Go to item B-9 and delete the fault code. ISC operating sound is not heard → Go to item B-6.

FUEL INJECTION SYSTEM

Fault code No.		P0507	
Item		A	Component other than ISC (Idle Speed Control) unit is defective (ISC operating sound is heard).
		B	Defective ISC (Idle Speed Control) unit (ISC operating sound is not heard).
B-6	Battery malfunction	Check the battery voltage. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.	Execute the diagnostic mode. (Code No. 54) ISC operating sound is heard → Go to item B-9 and delete the fault code. ISC operating sound is not heard → Go to item B-7.
B-7	ISC (Idle Speed Control) unit is not moving correctly.	Replace the ISC (Idle Speed Control) unit. Refer to "CLEANING THE ISC (IDLE SPEED CONTROL) UNIT AND THROTTLE BODY" on page 7-15.	Execute the diagnostic mode. (Code No. 54) ISC operating sound is heard → Go to item B-9 and delete the fault code. ISC operating sound is not heard → Go to item B-8.
B-8	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Execute the diagnostic mode. (Code No. 54) Return the ISC (Idle Speed Control) valve to the initial opening position.
B-9	Delete the fault code and check that the engine trouble warning light goes off.	Start the engine and let it idle for approximately 10 seconds. Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0511

Fault code No.		P0511	
Item		ISC (Idle Speed Control) unit: ISC unit does not operate.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Action		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of ISC unit coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 2.

FUEL INJECTION SYSTEM

Fault code No.		P0511	
Item		ISC (Idle Speed Control) unit: ISC unit does not operate.	
2	Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between ISC unit coupler and ECU coupler. pink–pink green/yellow–green/yellow gray–gray sky blue–sky blue	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 4.
4	Faulty ISC unit operation.	Execute the diagnostic mode. (Code No. D54) ISC unit operation sound is not heard. → Replace the ISC unit. Refer to "CLEANING THE ISC (IDLE SPEED CONTROL) UNIT AND THROTTLE BODY" on page 7-15.	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 5.
5	Malfunction in ECU	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.
6	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0560

Fault code No.		P0560	
Item		Charging voltage is abnormal.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Tool display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion

FUEL INJECTION SYSTEM

Fault code No.		P0560	
Item		Charging voltage is abnormal.	
1	Malfunction in charging system.	Check the charging system. Refer to "CHARGING SYSTEM" on page 8-11. Defective rectifier/regulator or stator coil assembly → Replace. Defective connection in the charging system circuit → Properly connect or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 2 and finish the service. Condition is "Malfunction" → Repeat item 1.
2	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0601

Fault code No.		P0601	
Item		Faulty ECU memory.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		—	
Tool display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Turn the main switch to "ON". Check that the engine trouble warning light does not come on.

Fault code No. P062F

Fault code No.		P062F	
Item		EEPROM fault code number: an error is detected while reading or writing on EEPROM.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		60	
Tool display		00	
		• No malfunctions detected (If the self-diagnosis fault code P062F is indicated, the ECU is defective.)	
		01 (CO adjustment value)	
		11 (Data error for ISC (Idle Speed Control) learning values)	
		12 (O ₂ feedback learning value)	
		14 Tire diameter learning value	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion

FUEL INJECTION SYSTEM

Fault code No.		P062F	
Item		EEPROM fault code number: an error is detected while reading or writing on EEPROM.	
1	Locate the malfunction.	Execute the diagnostic mode. (Code No. 60) 00: Go to item 6. 01: Go to item 2. 11–12: Go to item 3.	
2	"01" is indicated in diagnostic mode (Code No. 60). EEPROM data error for adjustment of CO concentration.	Change the CO concentration, and rewrite in EEPROM. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-8. After this adjustment is made, turn the main switch to "OFF".	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Repeat item 1. If the same number is indicated, go to item 6.
3	"11" is indicated in diagnostic mode (Code No. 60). EEPROM data error for ISC (Idle Speed Control) learning values.	Turn the main switch to "OFF".	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Execute the diagnostic mode (Code No. 67) and then repeat item 1. If the same number is indicated, go to item 6.
4	"12" is indicated in the diagnostic mode. (Code No. 60) EEPROM data error for A/F control learning values.	Turn the main switch to "OFF".	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Execute the diagnostic mode (Code No. 87) and then repeat item 1. If the same number is indicated, go to item 6.
5	"14" is indicated in the diagnostic mode. (Code No. 60) EEPROM data error for tire diameter learning values.	Turn the main switch to "OFF".	Turn the main switch to "ON", and then check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Execute the diagnostic mode (Code No. 87) and then repeat item 1. If the same number is indicated, go to item 6.

FUEL INJECTION SYSTEM

Fault code No.		P062F	
Item		EEPROM fault code number: an error is detected while reading or writing on EEPROM.	
6	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P0657

Fault code No.		P0657	
Item		Fuel system voltage: incorrect voltage supplied to the fuel injector and fuel pump.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		09	
09	Tool display	Fuel system voltage (battery voltage) Approximately 12.0	
	Procedure	Compare the actually measured battery voltage with the tool display value. (If the actually measured battery voltage is low, recharge the battery.)	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 4 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between battery terminal and main fuse 2. red-red Between main fuse 2 and main switch. red-red Between main switch and main fuse. brown/red-brown/red Between main fuse and ECU. brown/red-brown/red	Start the engine and let it idle for approximately 5 seconds. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 4 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Malfunction in ECU.	Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.	Service is finished.

FUEL INJECTION SYSTEM

Fault code No.		P0657	
Item		Fuel system voltage: incorrect voltage supplied to the fuel injector and fuel pump.	
4	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of "Recover" using the Yamaha diagnostic tool, and then delete the fault code.	

Fault code No. P1601

Fault code No.		P1601	
Item		No normal signals are received from the sidestand switch. Sidestand switch: open or short circuit detected.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		20	
Tool display		Sidestand switch • "ON" (sidestand retracted) • "OFF" (sidestand extended)	
Procedure		Extend and retract the sidestand.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Connection of sidestand switch coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Connection of main switch coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", and then extend and retract the sidestand. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 7 and finish the service. Condition is "Malfunction" → Go to item 4.

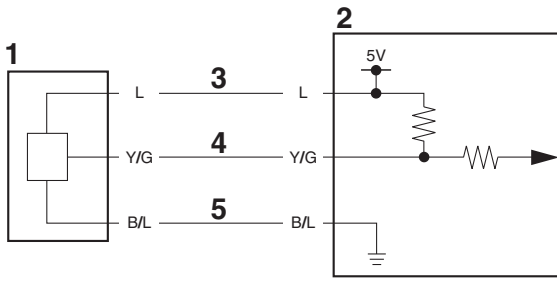
FUEL INJECTION SYSTEM

Fault code No.		P1601	
Item		No normal signals are received from the sidestand switch. Sidestand switch: open or short circuit detected.	
4	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between starting circuit cut-off relay coupler and ECU coupler. blue/yellow–blue/yellow Between starting circuit cut-off relay coupler and sidestand switch coupler. blue/green–blue/green	Turn the main switch to “ON”, and then extend and retract the sidestand. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 5.
5	Defective sidestand switch.	Execute the diagnostic mode. (Code No. 20) Sidestand retracted: “ON” Sidestand extended: “OFF” Replace if defective.	Turn the main switch to “ON”, and then extend and retract the sidestand. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 7 and finish the service. Condition is “Malfunction” → Go to item 6.
6	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.	Service is finished.
7	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recover” using the Yamaha diagnostic tool, and then delete the fault code.	

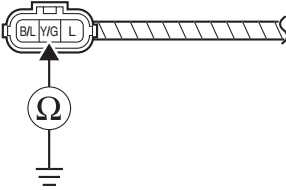
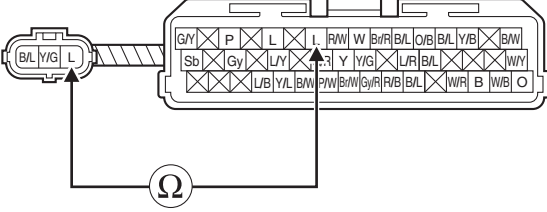
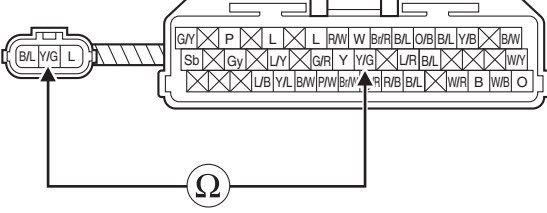
Fault code No. P1604, P1605

Fault code No.		P1604, P1605	
Item		[P1604] Lean angle sensor: ground short circuit detected. [P1605] Lean angle sensor: open or power short circuit detected.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		08	
Tool display		Lean angle sensor output voltage • 0.4–1.4 (upright) • 3.7–4.4 (overtuned)	
Procedure		Remove the lean angle sensor and incline it more than 50 degrees.	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion

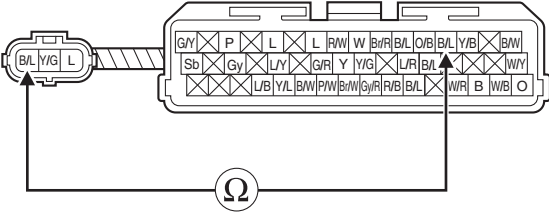
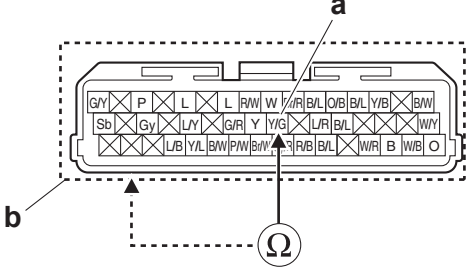
FUEL INJECTION SYSTEM

Fault code No.		P1604, P1605	
Item		[P1604] Lean angle sensor: ground short circuit detected. [P1605] Lean angle sensor: open or power short circuit detected.	
1	Connection of lean angle sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 2.
2	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 3.
3	Wire harness continuity.	Open or short circuit → Replace the wire harness.	Turn the main switch to "ON", then to "OFF", and then back to "ON". Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 6 and finish the service. Condition is "Malfunction" → Go to item 4.
3-1	<div style="text-align: center;">  </div> <div style="margin-top: 10px;"> 1. Lean angle sensor 2. ECU 3. Sensor input lead 4. Sensor output lead 5. Sensor ground lead </div>		
3-2	Disconnect the ECU coupler from the ECU. Disconnect the lean angle sensor coupler from the lean angle sensor.		

FUEL INJECTION SYSTEM

Fault code No.	P1604, P1605
Item	<p>[P1604] Lean angle sensor: ground short circuit detected.</p> <p>[P1605] Lean angle sensor: open or power short circuit detected.</p>
3-3	<p>[For P1604] Ground short circuit Between lean angle sensor coupler and ground: yellow/green–ground If there is continuity, replace the wire harness.</p> 
3-4	<p>[For P1605] Open circuit Between lean angle sensor coupler and ECU coupler: blue–blue If there is no continuity, replace the wire harness.</p> 
3-5	<p>[For P1605] Open circuit Between lean angle sensor coupler and ECU coupler: yellow/green–yellow/green If there is no continuity, replace the wire harness.</p> 

FUEL INJECTION SYSTEM

Fault code No.	P1604, P1605		
Item	[P1604] Lean angle sensor: ground short circuit detected. [P1605] Lean angle sensor: open or power short circuit detected.		
3-6	<p>[For P1605] Open circuit Between lean angle sensor coupler and ECU coupler: black/blue–black/blue If there is no continuity, replace the wire harness.</p> 		
3-7	<p>Disconnect the couplers from the parts that are connected to the ECU. Refer to “Parts connected to the ECU” on page 8-35.</p>		
3-8	<p>[For P1604/P1605] Short circuit Between lean angle sensor output terminal (yellow/green) “a” of ECU coupler and any other ECU coupler terminal “b”. If there is continuity, replace the wire harness.</p> 		
4	Defective lean angle sensor.	<p>Execute the diagnostic mode. (Code No. D08) Upright 0.4–1.4 V Overtuned 3.7–4.4 V An indicated value is out of the specified range. → Replace the lean angle sensor.</p>	<p>Turn the main switch to “ON”, then to “OFF”, and then back to “ON”. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 6 and finish the service. Condition is “Malfunction” → Go to item 5.</p>
5	Malfunction in ECU.	<p>Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.</p>	Service is finished.
6	Delete the fault code and check that the engine trouble warning light goes off.	<p>Confirm that the fault code has a condition of “Recover” using the Yamaha diagnostic tool, and then delete the fault code.</p>	

FUEL INJECTION SYSTEM

Fault code No. P2158

Fault code No.		P2158	
Item		Rear wheel sensor: no normal signals are received from the rear wheel sensor.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Tool display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Locate the malfunction.	<p>If the ABS warning light is on, refer to “BASIC INSTRUCTIONS FOR TROUBLESHOOTING” on page 8-85.</p> <p>If the ABS warning light is off, perform the following procedure. Use the monitoring function of the Yamaha diagnostic tool to check the rear wheel speed pulse. For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.</p> <p>Rotate the rear wheel by hand and check the display value for the rear wheel speed pulse. Display value for the rear wheel speed pulse is greater than 0 (km/h) → Go to item 9 and delete the fault code.</p> <p>Display value for the rear wheel speed pulse is 0 (km/h) → Go to item 2.</p>	
2	Connection of rear wheel sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	<p>Rotate the rear wheel by hand and check the display value for the rear wheel speed pulse using the monitoring function.</p> <p>Display value for the rear wheel speed pulse is greater than 0 (km/h) → Go to item 9 and delete the fault code.</p> <p>Display value for the rear wheel speed pulse is 0 (km/h) → Go to item 3.</p>
3	Connection of ABS ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	<p>Rotate the rear wheel by hand and check the display value for the rear wheel speed pulse using the monitoring function.</p> <p>Display value for the rear wheel speed pulse is greater than 0 (km/h) → Go to item 9 and delete the fault code.</p> <p>Display value for the rear wheel speed pulse is 0 (km/h) → Go to item 4.</p>

FUEL INJECTION SYSTEM

Fault code No.		P2158	
Item		Rear wheel sensor: no normal signals are received from the rear wheel sensor.	
4	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Rotate the rear wheel by hand and check the display value for the rear wheel speed pulse using the monitoring function. Display value for the rear wheel speed pulse is greater than 0 (km/h) → Go to item 9 and delete the fault code. Display value for the rear wheel speed pulse is 0 (km/h) → Go to item 5.
5	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between rear wheel sensor coupler and ECU coupler. brown–brown yellow–yellow Between ABS ECU coupler and ECU coupler. white/black–white/black	Rotate the rear wheel by hand and check the display value for the rear wheel speed pulse using the monitoring function. Display value for the rear wheel speed pulse is greater than 0 (km/h) → Go to item 9 and delete the fault code. Display value for the rear wheel speed pulse is 0 (km/h) → Go to item 6.
6	Defective rear wheel sensor.	Improperly installed sensor → Reinstall or replace the sensor. Refer to “INSTALLING THE REAR WHEEL (REAR BRAKE DISC)” on page 4-36.	Rotate the rear wheel by hand and check the display value for the rear wheel speed pulse using the monitoring function. Display value for the rear wheel speed pulse is greater than 0 (km/h) → Go to item 9 and delete the fault code. Display value for the rear wheel speed pulse is 0 (km/h) → Go to item 7.
7	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.	Rotate the rear wheel by hand and check the display value for the rear wheel speed pulse using the monitoring function. Display value for the rear wheel speed pulse is greater than 0 (km/h) → Go to item 9 and delete the fault code. Display value for the rear wheel speed pulse is 0 (km/h) → Go to item 8.
8	Malfunction in ABS ECU.	Replace the ABS ECU. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-63.	Go to item 9.
9	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recover” using the Yamaha diagnostic tool, and then delete the fault code.	

FUEL INJECTION SYSTEM

Fault code No. P2195

Fault code No.		P2195	
Item		No normal signals are received from the O ₂ sensor. O ₂ sensor: open circuit detected.	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
Tool display		—	
Procedure		—	
Item	Probable cause of malfunction and check	Maintenance job	Confirmation of service completion
1	Installed condition of O ₂ sensor.	Check for looseness or pinching. Improperly installed sensor → Reinstall or replace the sensor. Refer to "CYLINDER HEAD" on page 5-13.	Start the engine, warm it up, and then race it. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 8 and finish the service. Condition is "Malfunction" → Go to item 2. Also, delete this fault code, which has a condition of "Malfunction".
2	Connection of O ₂ sensor coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine, warm it up, and then race it. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 8 and finish the service. Condition is "Malfunction" → Go to item 3. Also, delete this fault code, which has a condition of "Malfunction".
3	Connection of ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).	Improperly connected → Connect the coupler securely or replace the wire harness.	Start the engine, warm it up, and then race it. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is "Recover" → Go to item 8 and finish the service. Condition is "Malfunction" → Go to item 4. Also, delete this fault code, which has a condition of "Malfunction".

FUEL INJECTION SYSTEM

Fault code No.		P2195	
Item		No normal signals are received from the O ₂ sensor. O ₂ sensor: open circuit detected.	
4	Wire harness continuity.	Open or short circuit → Replace the wire harness. Between O ₂ sensor coupler and ECU coupler. gray/red–gray/red	Start the engine, warm it up, and then race it. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 8 and finish the service. Condition is “Malfunction” → Go to item 5. Also, delete this fault code, which has a condition of “Malfunction”.
5	Check fuel pressure.	Refer to “CHECKING THE FUEL PRESSURE” on page 7-7.	Start the engine, warm it up, and then race it. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 8 and finish the service. Condition is “Malfunction” → Go to item 6. Also, delete this fault code, which has a condition of “Malfunction”.
6	Defective O ₂ sensor.	Check the O ₂ sensor. Replace if defective. Refer to “CYLINDER HEAD” on page 5-13.	Start the engine, warm it up, and then race it. Check the condition of the fault code using the malfunction mode of the Yamaha diagnostic tool. Condition is “Recover” → Go to item 8 and finish the service. Condition is “Malfunction” → Go to item 7. Also, delete this fault code, which has a condition of “Malfunction”.
7	Malfunction in ECU.	Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.	Service is finished.
8	Delete the fault code and check that the engine trouble warning light goes off.	Confirm that the fault code has a condition of “Recover” using the Yamaha diagnostic tool, and then delete the fault code.	

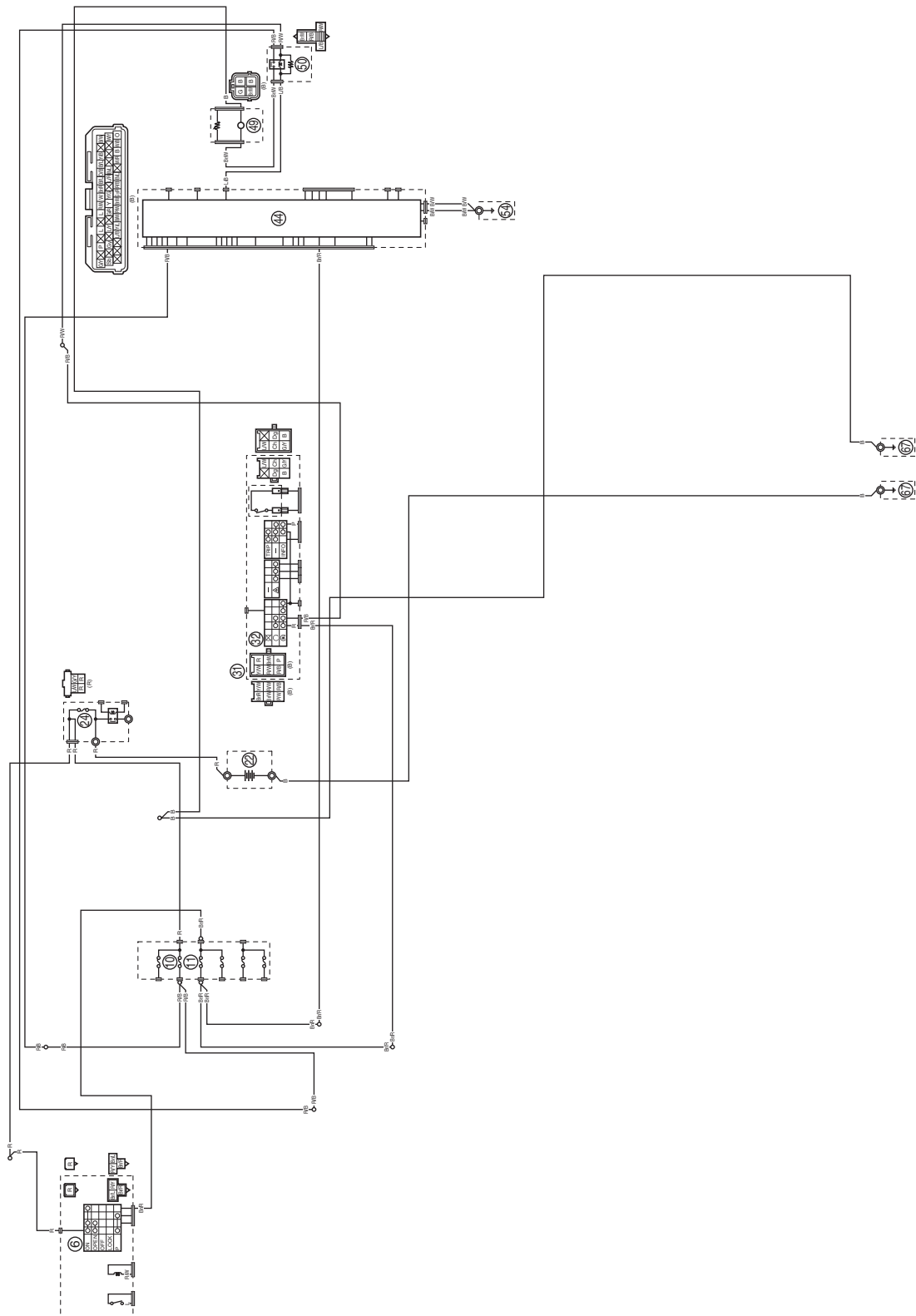
FUEL PUMP SYSTEM

EAS20081

FUEL PUMP SYSTEM

EAS30513

CIRCUIT DIAGRAM



- 6. Main switch
- 10.Backup fuse
- 11.Main fuse
- 22.Battery
- 24.Main fuse 2
- 31.Handlebar switch (right)
- 32.Start/engine stop switch
- 44.ECU (Engine Control Unit)
- 49.Fuel pump
- 50.Fuel pump relay
- 54.Engine ground
- 67.Frame ground

EAS30514

TROUBLESHOOTING

If the fuel pump fails to operate.

TIP

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

1. Battery cover assembly
2. Front cowling assemblies
3. Lower side covers
4. Bottom cover assembly
5. Leg shield assembly

1. Check the fuses. (Main, main 2 and backup) Refer to "CHECKING THE FUSES" on page 8-128.	NG →	Replace the fuse(s).
OK ↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.	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 8-127.	NG →	Replace the main switch.
OK ↓		
4. Check the start/engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-127.	NG →	The start/engine stop switch is faulty. Replace the right handlebar switch.
OK ↓		
5. Check the fuel pump relay. Refer to "CHECKING THE RELAYS" on page 8-129.	NG →	Replace the fuel pump relay.
OK ↓		
6. Check the fuel pump. Refer to "CHECKING THE FUEL PRESSURE" on page 7-7.	NG →	Replace the fuel pump.
OK ↓		
7. Check the entire fuel pump system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-77.	NG →	Properly connect or replace the wiring harness.
OK ↓		
Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-128.		

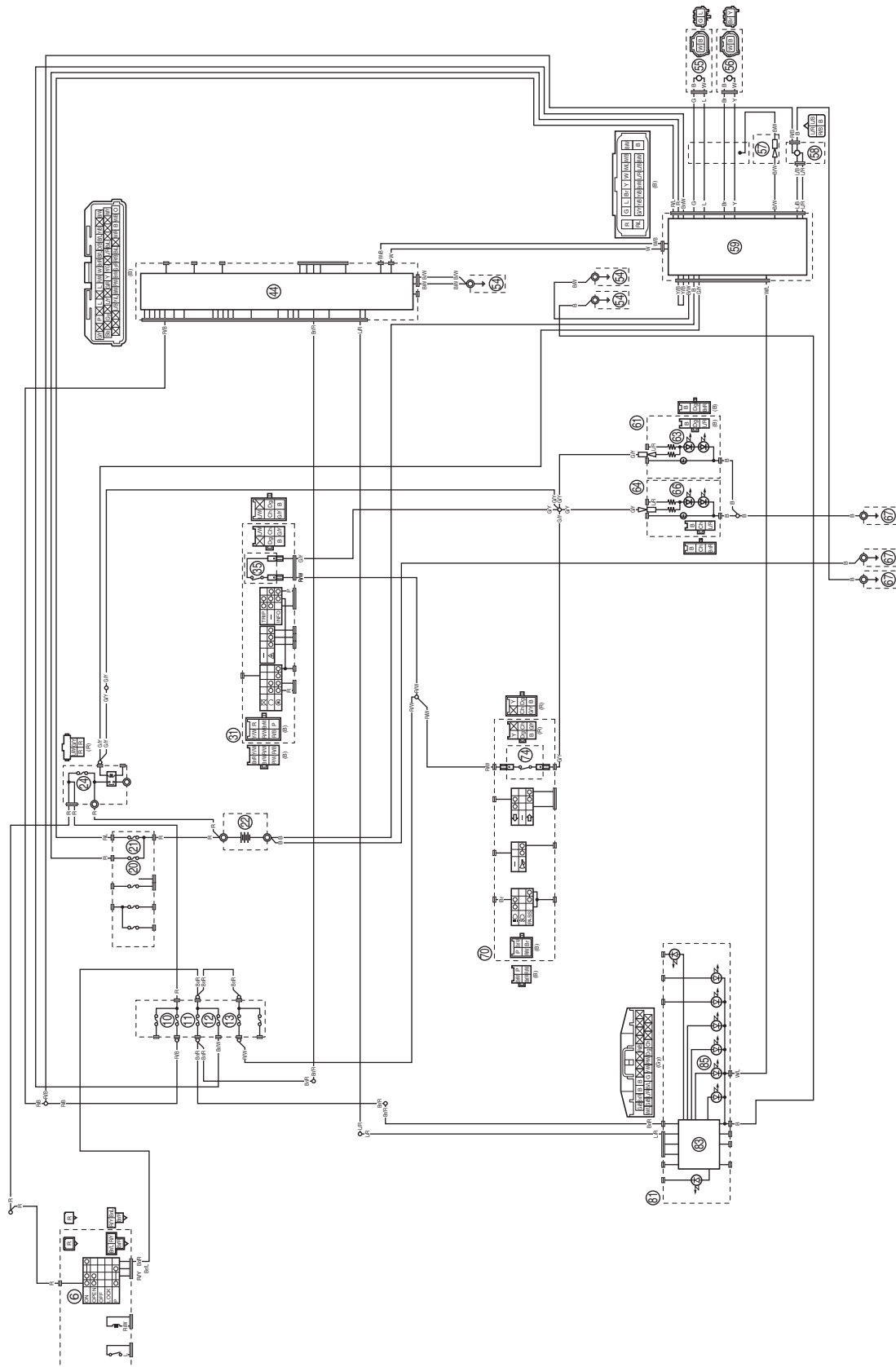
ABS (ANTI-LOCK BRAKE SYSTEM)

EAS20085

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS30843

CIRCUIT DIAGRAM



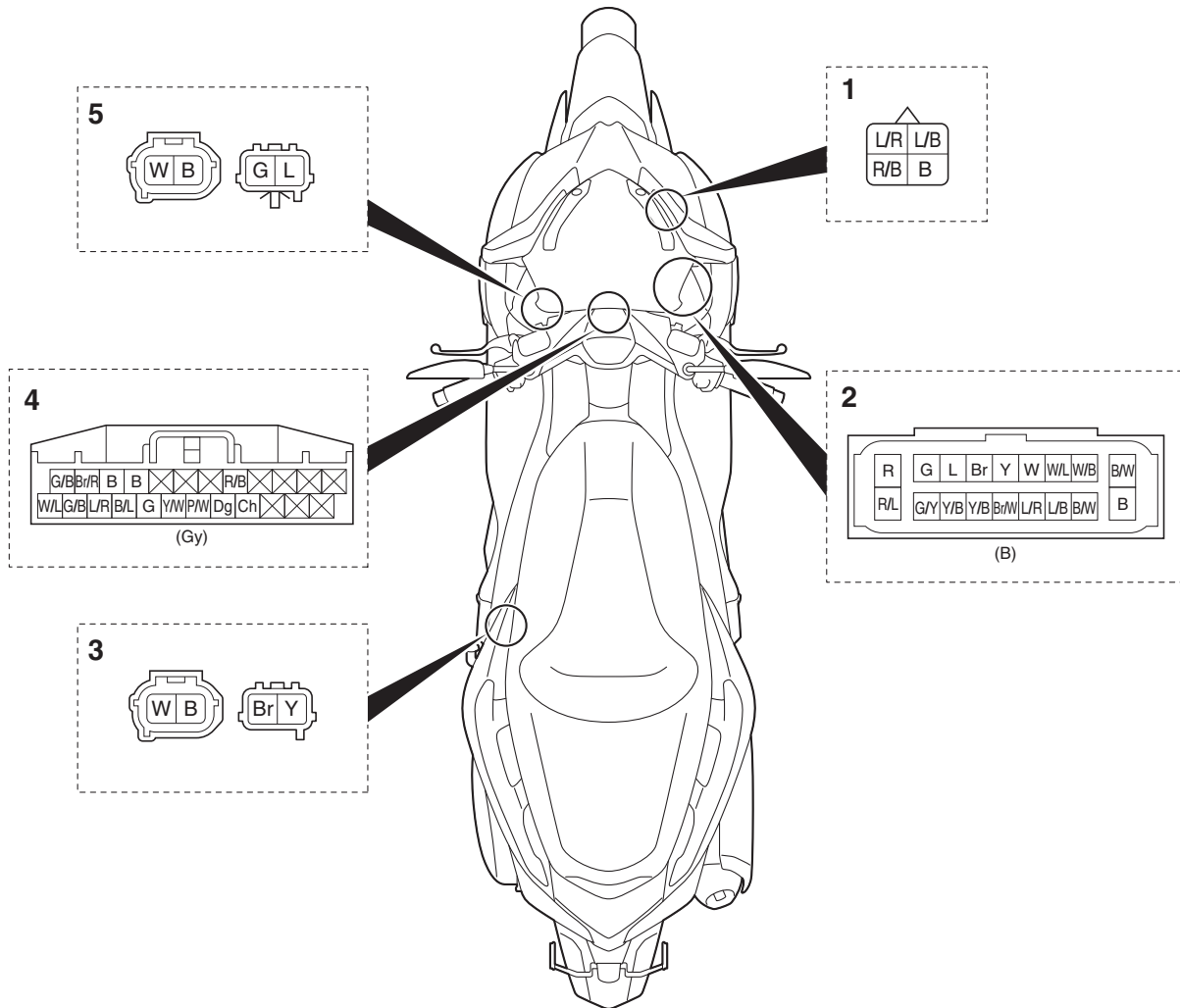
ABS (ANTI-LOCK BRAKE SYSTEM)

- 6. Main switch
- 10.Backup fuse
- 11.Main fuse
- 12.ABS control unit fuse
- 13.Signaling system fuse
- 20.ABS solenoid fuse
- 21.ABS motor fuse
- 22.Battery
- 24.Main fuse 2
- 31.Handlebar switch (right)
- 35.Front brake light switch
- 44.ECU (Engine Control Unit)
- 54.Engine ground
- 55.Front wheel sensor
- 56.Rear wheel sensor
- 57.Joint connector
- 58.ABS test coupler
- 59.ABS ECU
- 61.Tail/brake light assembly (right)
- 63.Tail/brake light (right)
- 64.Tail/brake light assembly (left)
- 66.Tail/brake light (left)
- 67.Frame ground
- 70.Handlebar switch (left)
- 74.Rear brake light switch
- 81.Meter assembly
- 83.Multi-function meter
- 85.ABS warning light

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS30844

ABS COUPLER LOCATION CHART



1. ABS test coupler
2. ABS ECU coupler
3. Rear wheel sensor coupler
4. Meter assembly coupler
5. Front wheel sensor coupler

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS30845

MAINTENANCE OF THE ABS ECU

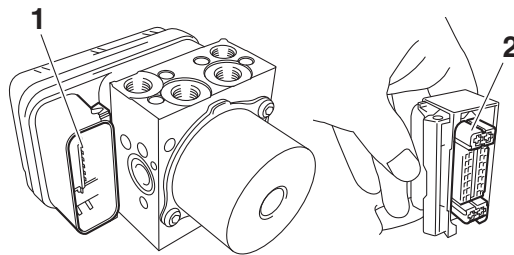
Checking the ABS ECU

1. Check:

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

TIP

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



EAS30528

ABS TROUBLESHOOTING OUTLINE

This section describes the troubleshooting for the ABS in detail. Read this service manual carefully and make sure you fully understand the information provided before repairing any malfunctions or performing service.

The ABS ECU has a self-diagnosis function. When failures occur in the system, the ABS warning light on the meter assembly indicates a malfunction.

The following troubleshooting describes the problem identification and service method using the Yamaha diagnostic tool. For information about using the Yamaha diagnostic tool, refer to “[B-2] DIAGNOSIS USING THE FAULT CODES” on page 8-88. For troubleshooting items other than the following items, follow the normal service method.

EWA16710



WARNING

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

TIP

To final check, refer to “[C-1] FINAL CHECK” on page 8-110.

ABS operation when the ABS warning light comes on

1. The ABS warning light remains on → ABS operates as a normal brake system.
 - A malfunction was detected using the ABS self-diagnosis function.
 - The ABS self-diagnosis has not been completed.
The ABS self-diagnosis starts when the main switch is turned to “ON” and finishes when the vehicle has traveled at a speed of approximately 10 km/h (6 mi/h).
2. The ABS warning light comes on after the engine starts, and then goes off when the vehicle starts moving (traveling at a speed of approximately 10 km/h (6 mi/h)). → ABS operation is normal.
3. The ABS warning light flashes → ABS operation is normal.
 - Refer to “BASIC INSTRUCTIONS FOR TROUBLESHOOTING” on page 8-85.

ABS (ANTI-LOCK BRAKE SYSTEM)

Self-diagnosis and servicing

The ABS ECU has a self-diagnosis function. By utilizing this function, quick problem identification and service are possible. Previous malfunctions can be checked since the ABS ECU also stores the malfunction history.

The fault codes recorded in the ABS ECU can be checked using the Yamaha diagnostic tool. When the service is finished, check the normal operation of the vehicle, and then delete the fault code(s). For information about deleting the fault codes, refer to “[B-3] DELETING THE FAULT CODES” on page 8-110. By deleting the fault codes stored in the ABS ECU memory, it is possible to pursue the cause correctly if another malfunction occurs.

TIP

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

Self-diagnosis using the ABS ECU

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

Special precautions for handling and servicing a vehicle equipped with ABS

ECA18490

NOTICE

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

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

EAS30529

BASIC INSTRUCTIONS FOR TROUBLESHOOTING

EWA17420

WARNING

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

[A] Malfunction check using the ABS warning light

[B] Use the Yamaha diagnostic tool and determine the location of the malfunction and the cause from the recorded fault code.

Determine the cause of the malfunction from the condition and place where the malfunction occurred.

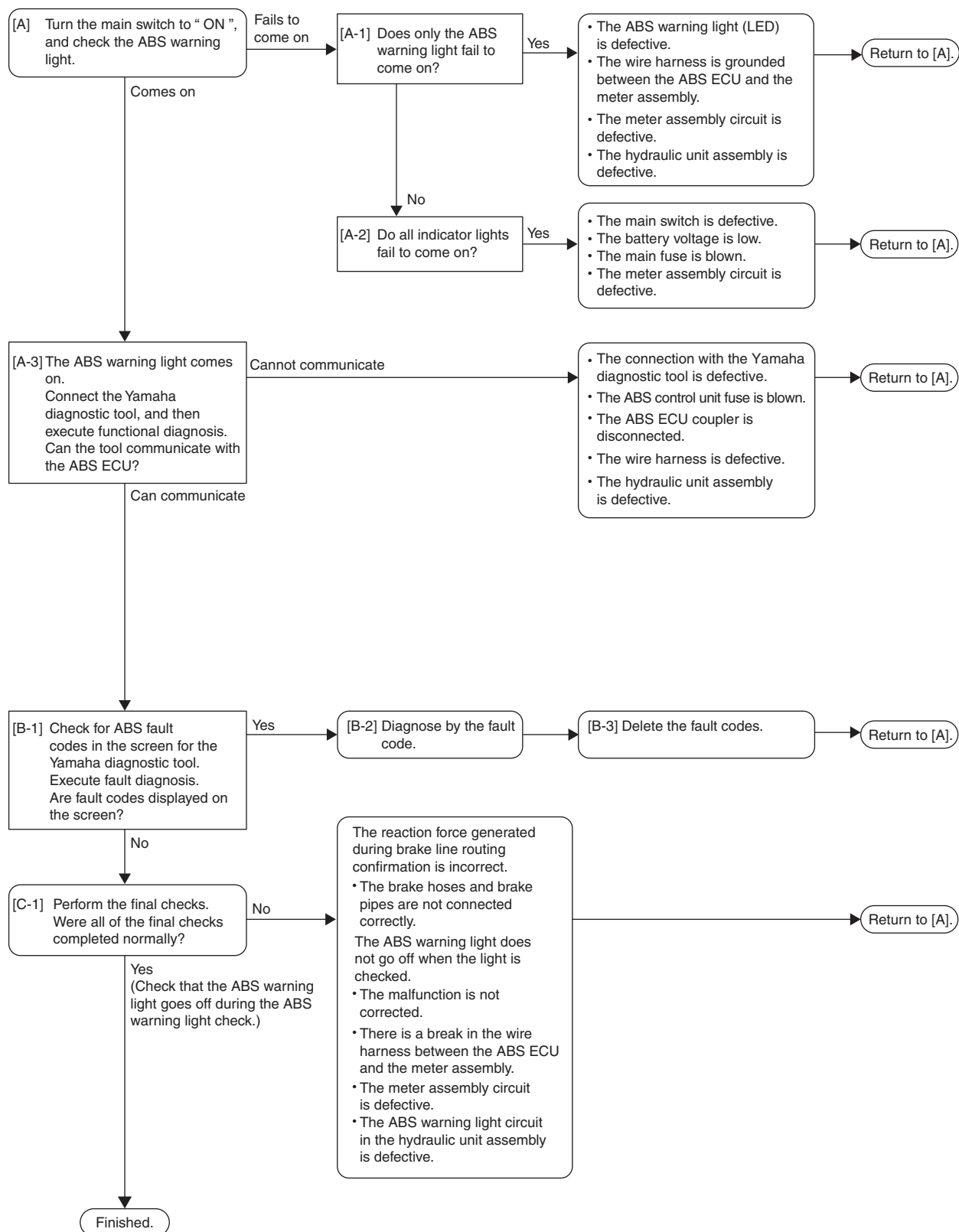
[C] Servicing the ABS

Execute the final check after disassembly and assembly.

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS30530

BASIC PROCESS FOR TROUBLESHOOTING



ABS (ANTI-LOCK BRAKE SYSTEM)

EWA16710



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

TIP

To final check, refer to "[C-1] FINAL CHECK" on page 8-110.

EAS30531

[A] CHECKING THE ABS WARNING LIGHT

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

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

EAS30532

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

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

EAS30964

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

1. Main switch
 - Check the main switch for continuity.
Refer to "CHECKING THE SWITCHES" on page 8-127.
 - If there is no continuity, replace the main switch.
2. Battery
 - Check the condition of the battery.
Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.
 - If the battery is defective, clean the battery terminals and recharge it, or replace the battery.
3. Main fuse
 - Check the fuse for continuity.
Refer to "CHECKING THE FUSES" on page 8-128.
 - If the main fuse is blown, replace the fuse.
4. Circuit
 - Check the meter assembly circuit.
Refer to "CIRCUIT DIAGRAM" on page 8-81.
 - If the meter assembly circuit is open, replace the wire harness.

EAS31162

[A-3] THE ABS WARNING LIGHT COMES ON

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

Check that communication with the ABS ECU is possible.

1. Yamaha diagnostic tool
 - Check if the Yamaha diagnostic tool is connected correctly.

ABS (ANTI-LOCK BRAKE SYSTEM)

2. ABS control unit fuse

- Check the ABS control unit fuse for continuity.
Refer to "CHECKING THE FUSES" on page 8-128.
- If the ABS control unit fuse is blown, replace the fuse.

3. ABS ECU coupler

- Check that the ABS ECU coupler is connected properly.
For information about connecting the ABS ECU coupler properly, refer to "INSTALLING THE HYDRAULIC UNIT ASSEMBLY" on page 4-65.

4. Wire harness

- Open circuit between the main switch and the ABS ECU, or between the ABS ECU and the ground.
Check for continuity between brown/red terminal of the main switch coupler and brown/white terminal of the ABS ECU coupler.
Check for continuity between black/white terminal of the ABS ECU coupler and the ground, and between the black terminal of the ABS ECU coupler and ground.
If there is no continuity, the wire harness is defective. Replace the wire harness.
- Open circuit in the wire harness between the ABS ECU coupler and the ABS test coupler.
Check for continuity between blue/red terminal of the ABS ECU coupler and blue/red terminal of the ABS test coupler. (CANH)
Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the ABS test coupler. (CANL)

5. ABS ECU malfunction

Replace the hydraulic unit assembly.

EAS31165

[B-1] MALFUNCTION ARE CURRENTLY DETECTED

When the Yamaha diagnostic tool is connected to the ABS test coupler, the fault codes will be displayed on the computer screen.

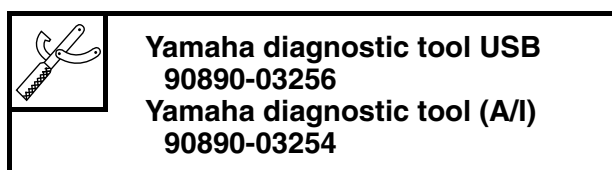
- A fault code is displayed. [B-2]
- A fault code is not displayed. [C-1]

EAS31166

[B-2] DIAGNOSIS USING THE FAULT CODES

This model uses the Yamaha diagnostic tool to identify malfunctions.

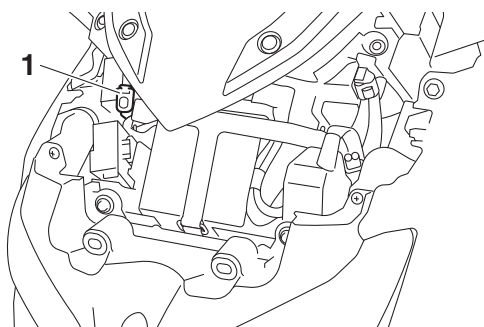
For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.



Connecting the Yamaha diagnostic tool

Remove the battery cover assembly. Refer to "GENERAL CHASSIS (1)" on page 4-1.

Remove the protective cap "1", and then connect the Yamaha diagnostic tool to the coupler.



ABS (ANTI-LOCK BRAKE SYSTEM)

Details about the displayed fault codes are shown in the following chart. Refer to this chart and check the vehicle.

Once all the work is complete, delete the fault codes. [B-3]

TIP

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

Fault code table

TIP

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

Fault code No.	Item	Symptom	Check point
11* 25*	Front wheel sensor (intermittent pulses or no pulses)	Front wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	<ul style="list-style-type: none">• Foreign material adhered around the front wheel sensor• Incorrect installation of the front wheel• Defective sensor rotor or incorrect installation of the rotor• Defective front wheel sensor or incorrect installation of the sensor
12	Rear wheel sensor (intermittent pulses or no pulses)	Rear wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	<ul style="list-style-type: none">• Foreign material adhered around the rear wheel sensor• Incorrect installation of the rear wheel• Defective sensor rotor or incorrect installation of the rotor• Defective rear wheel sensor or incorrect installation of the sensor
13* 26*	Front wheel sensor (abnormal pulse period)	Front wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	<ul style="list-style-type: none">• Foreign material adhered around the front wheel sensor• Incorrect installation of the front wheel• Defective sensor rotor or incorrect installation of the rotor• Defective front wheel sensor or incorrect installation of the sensor
14* 27*	Rear wheel sensor (abnormal pulse period)	Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	<ul style="list-style-type: none">• Foreign material adhered around the rear wheel sensor• Incorrect installation of the rear wheel• Defective sensor rotor or incorrect installation of the rotor• Defective rear wheel sensor or incorrect installation of the sensor

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.	Item	Symptom	Check point
15	Front wheel sensor (open or short circuit)	Open or short circuit is detected in the front wheel sensor.	<ul style="list-style-type: none"> • Defective coupler between the front wheel sensor and the hydraulic unit assembly • Open or short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly • Defective front wheel sensor or hydraulic unit assembly
16	Rear wheel sensor (open or short circuit)	Open or short circuit is detected in the rear wheel sensor.	<ul style="list-style-type: none"> • Defective coupler between the rear wheel sensor and the hydraulic unit assembly • Open or short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly • Defective rear wheel sensor or hydraulic unit assembly
17* 45*	Front wheel sensor (missing pulses)	Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	<ul style="list-style-type: none"> • Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
18* 46*	Rear wheel sensor (missing pulses)	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	<ul style="list-style-type: none"> • Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
21	Hydraulic unit assembly (defective solenoid drive circuit)	Solenoid drive circuit in the hydraulic unit assembly is open or short-circuited.	<ul style="list-style-type: none"> • Defective hydraulic unit assembly

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.	Item	Symptom	Check point
24	Brake light switch or brake light	Brake light signal is not received properly while the vehicle is traveling. (Brake light circuit, or front or rear brake light switch circuit)	<ul style="list-style-type: none"> • Defective signaling system (brake light or brake light switch) • Defective coupler between the signaling system (brake light or brake light switch) and the hydraulic unit assembly • Open or short circuit in the wire harness between the signaling system (brake light or brake light switch) and the hydraulic unit assembly • Defective hydraulic unit assembly
31	Hydraulic unit assembly (abnormal ABS solenoid power supply)	Power is not supplied to the solenoid circuit in the hydraulic unit assembly.	<ul style="list-style-type: none"> • Blown ABS solenoid fuse • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective hydraulic unit assembly
32	Hydraulic unit assembly (short circuit in ABS solenoid power supply circuit)	Short circuit is detected in the solenoid power supply circuit in the hydraulic unit assembly.	<ul style="list-style-type: none"> • Defective hydraulic unit assembly
33	Hydraulic unit assembly (abnormal ABS motor power supply)	Power is not supplied to the motor circuit in the hydraulic unit assembly.	<ul style="list-style-type: none"> • Blown ABS motor fuse • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective hydraulic unit assembly
34	Hydraulic unit assembly (short circuit in ABS motor power supply circuit)	Short circuit is detected in the motor power supply circuit in the hydraulic unit assembly.	<ul style="list-style-type: none"> • Defective hydraulic unit assembly
41	Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	<ul style="list-style-type: none"> • Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. • Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure. 	<ul style="list-style-type: none"> • Incorrect installation of the front wheel sensor • Incorrect rotation of the front wheel • Front brake dragging • Defective hydraulic unit assembly

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.	Item	Symptom	Check point
42 47	Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	<ul style="list-style-type: none"> • Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. (for fault code No. 42) • Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure. 	<ul style="list-style-type: none"> • Incorrect installation of the rear wheel sensor (for fault code No. 42) • Incorrect rotation of the rear wheel • Rear brake dragging • Defective hydraulic unit assembly
43	Front wheel sensor (missing pulses)	Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	<ul style="list-style-type: none"> • Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
44	Rear wheel sensor (missing pulses)	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	<ul style="list-style-type: none"> • Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
51 52	<ul style="list-style-type: none"> • Vehicle system power supply (voltage of ABS ECU power supply is high) (for fault code No. 51) • Vehicle system power supply (voltage of wheel sensor power supply is high) (for fault code No. 52) 	<ul style="list-style-type: none"> • Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too high. (for fault code No. 51) • Power voltage supplied to the wheel sensor is too high. (for fault code No. 52) 	<ul style="list-style-type: none"> • Defective battery • Disconnected battery terminal • Defective charging system
53	Vehicle system power supply (voltage of ABS ECU power supply is low)	Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too low.	<ul style="list-style-type: none"> • Defective battery • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective charging system

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.	Item	Symptom	Check point
54	Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)	Abnormality is detected in the solenoid or motor power supply circuit in the hydraulic unit assembly.	<ul style="list-style-type: none"> Defective battery Defective coupler between the battery and the hydraulic unit assembly Open or short circuit in the wire harness between the battery and the hydraulic unit assembly Defective charging system Defective hydraulic unit assembly
55	Hydraulic unit assembly (defective ABS ECU)	Abnormal data is detected in the hydraulic unit assembly.	<ul style="list-style-type: none"> Defective hydraulic unit assembly
56	Hydraulic unit assembly (abnormal internal power supply)	Abnormality is detected in the power supply circuit in the hydraulic unit assembly.	<ul style="list-style-type: none"> Defective hydraulic unit assembly
63	Front wheel sensor power supply (voltage of power supply is low)	Power voltage supplied from the ABS ECU to the front wheel sensor is too low.	<ul style="list-style-type: none"> Short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly Defective front wheel sensor Defective hydraulic unit assembly
64	Rear wheel sensor power supply (voltage of power supply is low)	Power voltage supplied from the ABS ECU to the rear wheel sensor is too low.	<ul style="list-style-type: none"> Short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly Defective rear wheel sensor Defective hydraulic unit assembly

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

Fault code No. 11, 25

TIP

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

Fault code No.		11 25
Item		Front wheel sensor (intermittent pulses or no pulses)
Symptom		Front wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the front wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE FRONT WHEEL" on page 4-29.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		11 25
Item		Front wheel sensor (intermittent pulses or no pulses)
Symptom		Front wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.
4	Defective front wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.

Fault code No. 12

Fault code No.		12
Item		Rear wheel sensor (intermittent pulses or no pulses)
Symptom		Rear wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the rear wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the rear wheel	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-35.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.
4	Defective rear wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No. 13, 26

TIP

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

Fault code No.		13 26
Item		Front wheel sensor (abnormal pulse period)
Symptom		Front wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the front wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE FRONT WHEEL" on page 4-29.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.
4	Defective front wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.

Fault code No. 14, 27

TIP

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

Fault code No.		14 27
Item		Rear wheel sensor (abnormal pulse period)
Symptom		Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the rear wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the rear wheel	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-35.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		14 27
Item		Rear wheel sensor (abnormal pulse period)
Symptom		Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.
4	Defective rear wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.

Fault code No. 15

TIP

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

Fault code No.		15
Item		Front wheel sensor (open or short circuit)
Symptom		Open or short circuit is detected in the front wheel sensor.
Order	Item/components and probable cause	Check or maintenance job
1	Defective coupler between the front wheel sensor and the hydraulic unit assembly	<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. See TIP.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		15
Item		Front wheel sensor (open or short circuit)
Symptom		Open or short circuit is detected in the front wheel sensor.
Order	Item/components and probable cause	Check or maintenance job
2	Open or short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly	<ul style="list-style-type: none"> • Check for continuity between the green terminal “1” and the green terminal “4” and between the blue terminal “2” and the blue terminal “5”. • If there is no continuity, the wire harness is defective. Replace the wire harness. • Check that there is no short circuit between the green terminal “1” and the blue terminal “2” and between the green terminal “4” and the blue terminal “5”. • If there is short circuit, the wire harness is defective. Replace the wire harness. • Check that there is no short circuit between the black/white terminal “3” and the green terminal “4” and between the black/white terminal “3” and the blue terminal “5”. • If there is short circuit, the wire harness is defective. Replace the wire harness. <p>6. ABS ECU 7. Front wheel sensor</p>
3	Defective front wheel sensor or hydraulic unit assembly	<p>If the above items were performed and no malfunctions were found, the wheel sensor or hydraulic unit assembly is defective. Replace the wheel sensor or hydraulic unit assembly.</p> <p>Refer to “FRONT WHEEL” on page 4-27 and “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-63.</p>

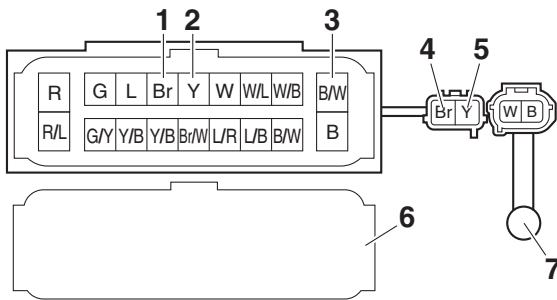
Fault code No. 16

TIP

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

Fault code No.		16
Item		Rear wheel sensor (open or short circuit)
Symptom		Open or short circuit is detected in the rear wheel sensor.
Order	Item/components and probable cause	Check or maintenance job
1	Defective coupler between the rear wheel sensor and the hydraulic unit assembly	<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. <p>See TIP.</p>

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		16
Item		Rear wheel sensor (open or short circuit)
Symptom		Open or short circuit is detected in the rear wheel sensor.
Order	Item/components and probable cause	Check or maintenance job
2	Open or short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly	<ul style="list-style-type: none">• Check for continuity between the brown terminal “1” and the brown terminal “4” and between the yellow terminal “2” and the yellow terminal “5”.• If there is no continuity, the wire harness is defective. Replace the wire harness.• Check that there is no short circuit between the brown terminal “1” and the yellow terminal “2” and between the brown terminal “4” and the yellow terminal “5”.• If there is short circuit, the wire harness is defective. Replace the wire harness.• Check that there is no short circuit between the black/white terminal “3” and the brown terminal “4” and between the black/white terminal “3” and the yellow terminal “5”.• If there is short circuit, the wire harness is defective. Replace the wire harness. <div></div> <p>6. ABS ECU 7. Rear wheel sensor</p>
3	Defective rear wheel sensor or hydraulic unit assembly	<p>If the above items were performed and no malfunctions were found, the wheel sensor or hydraulic unit assembly is defective. Replace the wheel sensor or hydraulic unit assembly.</p> <p>Refer to “REAR WHEEL” on page 4-34 and “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-63.</p>

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No. 17, 45

TIP

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

Fault code No.		17 45
Item		Front wheel sensor (missing pulses)
Symptom		Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the front wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE FRONT WHEEL" on page 4-29.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.
4	Defective front wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.

Fault code No. 18, 46

TIP

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

Fault code No.		18 46
Item		Rear wheel sensor (missing pulses)
Symptom		Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the rear wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the rear wheel	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-35.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		18 46
Item		Rear wheel sensor (missing pulses)
Symptom		Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.
4	Defective rear wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.

Fault code No. 21

Fault code No.		21
Item		Hydraulic unit assembly (defective solenoid drive circuit)
Symptom		Solenoid drive circuit in the hydraulic unit assembly is open or short-circuited.
Order	Item/components and probable cause	Check or maintenance job
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

Fault code No. 24

Fault code No.		24
Item		Brake light switch or brake light
Symptom		Brake light signal is not received properly while the vehicle is traveling (Brake light circuit, or front or rear brake light switch circuit).
Order	Item/components and probable cause	Check or maintenance job
1	Defective signaling system (brake light or brake light switch)	Check the brake light switches. Refer to "CHECKING THE SWITCHES" on page 8-127.
2	Defective coupler between the signaling system (brake light or brake light switch) and the hydraulic unit assembly	<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 the wire harness between the signaling system (brake light or brake light switch) and the hydraulic unit assembly	<ul style="list-style-type: none"> • Between front brake light switch connector and rear brake light switch connector. green/yellow–green/yellow red/white–red/white • Between ABS ECU coupler and rear brake light switch connector. green/yellow–green/yellow
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No. 31

TIP

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

Fault code No.		31
Item		Hydraulic unit assembly (abnormal ABS solenoid power supply)
Symptom		Power is not supplied to the solenoid circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
1	Blown ABS solenoid fuse	Check the ABS solenoid fuse. If the ABS solenoid fuse is blown, replace the fuse and check the wire harness. Refer to "CHECKING THE FUSES" on page 8-128.
2	Defective coupler between the battery and the hydraulic unit assembly	<ul style="list-style-type: none">• Check the locking condition of the coupler.• If there is a malfunction, repair it and connect the coupler securely. See TIP.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly	<ul style="list-style-type: none">• Replace if there is an open or short circuit.• Between ABS ECU coupler and ABS solenoid fuse. (red-red)
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

Fault code No. 32

Fault code No.		32
Item		Hydraulic unit assembly (short circuit in ABS solenoid power supply circuit)
Symptom		Short circuit is detected in the solenoid power supply circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

Fault code No. 33

TIP

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

Fault code No.		33
Item		Hydraulic unit assembly (abnormal ABS motor power supply)
Symptom		Power is not supplied to the motor circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
1	Blown ABS motor fuse	Check the ABS motor fuse. If the ABS motor fuse is blown, replace the fuse and check the wire harness. Refer to "CHECKING THE FUSES" on page 8-128.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		33
Item		Hydraulic unit assembly (abnormal ABS motor power supply)
Symptom		Power is not supplied to the motor circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
2	Defective coupler between the battery and the hydraulic unit assembly	<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. See TIP.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly	<ul style="list-style-type: none"> • Replace if there is an open or short circuit. • Between ABS ECU coupler and ABS motor fuse. red/blue–red/blue • Between ABS ECU coupler and ground. black–black
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-63.

Fault code No. 34

Fault code No.		34
Item		Hydraulic unit assembly (short circuit in ABS motor power supply circuit)
Symptom		Short circuit is detected in the motor power supply circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-63.

Fault code No. 41

Fault code No.		41
Item		Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)
Symptom		<ul style="list-style-type: none"> • Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. • Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.
Order	Item/components and probable cause	Check or maintenance job
1	Incorrect installation of the front wheel sensor	Check the components for looseness, distortion, and bends. Refer to “CHECKING THE FRONT WHEEL” on page 4-29.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		41
Item		Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)
Symptom		<ul style="list-style-type: none"> • Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. • Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.
Order	Item/components and probable cause	Check or maintenance job
2	Incorrect rotation of the front wheel	Check that there is no brake disc drag on the front wheel and make sure that it rotates smoothly. Refer to "CHECKING THE FRONT WHEEL" on page 4-29 and "CHECKING THE FRONT BRAKE DISC" on page 4-44.
3	Front brake dragging	Check that the brake fluid pressure is correctly transmitted to the brake caliper when the brake lever is operated and that the pressure decreases when the lever is released. Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-44.
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

Fault code No. 42, 47

Fault code No.		42 47
Item		Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)
Symptom		<ul style="list-style-type: none"> • Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. (for fault code No. 42) • Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.
Order	Item/components and probable cause	Check or maintenance job
1	Incorrect installation of the rear wheel sensor (for fault code No. 42)	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-35.
2	Incorrect rotation of the rear wheel	Check that there is no brake disc drag on the wheel and make sure that it rotates smoothly. Refer to "CHECKING THE REAR WHEEL" on page 4-35.
3	Rear brake dragging	Check that the brake fluid pressure is correctly transmitted to the brake caliper when the brake lever is operated and that the pressure decreases when the lever is released. Refer to "CHECKING THE REAR BRAKE DISC" on page 4-57.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		42 47
Item		Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)
Symptom		<ul style="list-style-type: none"> • Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. (for fault code No. 42) • Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.
Order	Item/components and probable cause	Check or maintenance job
4	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

Fault code No. 43

Fault code No.		43
Item		Front wheel sensor (missing pulses)
Symptom		Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the front wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.
2	Incorrect installation of the front wheel	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE FRONT WHEEL" on page 4-29.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.
4	Defective front wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-30.

Fault code No. 44

Fault code No.		44
Item		Rear wheel sensor (missing pulses)
Symptom		Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
1	Foreign material adhered around the rear wheel sensor	Check the surface of the sensor rotor and wheel sensor for foreign material, such as metal particles. Clean the sensor rotor and wheel sensor if necessary.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		44
Item		Rear wheel sensor (missing pulses)
Symptom		Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)
Order	Item/components and probable cause	Check or maintenance job
2	Incorrect installation of the rear wheel	Check the components for looseness, distortion, and bends. Refer to "CHECKING THE REAR WHEEL" on page 4-35.
3	Defective sensor rotor or incorrect installation of the rotor	Check the surface of the sensor rotor for damage. Replace the sensor rotor if there is visible damage. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.
4	Defective rear wheel sensor or incorrect installation of the sensor	Check the wheel sensor for damage and the installed condition of the sensor. Repair or replace the wheel sensor if necessary. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-35.

Fault code No. 51, 52

Fault code No.		51 52
Item		<ul style="list-style-type: none"> • Vehicle system power supply (voltage of ABS ECU power supply is high) (for fault code No. 51) • Vehicle system power supply (voltage of wheel sensor power supply is high) (for fault code No. 52)
Symptom		<ul style="list-style-type: none"> • Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too high. (for fault code No. 51) • Power voltage supplied to the wheel sensor is too high. (for fault code No. 52)
Order	Item/components and probable cause	Check or maintenance job
1	Defective battery	Recharge or replace the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.
2	Disconnected battery terminal	Check the connection. Replace or reconnect the terminal if necessary.
3	Defective charging system	Check the charging system. Refer to "CIRCUIT DIAGRAM" on page 8-11.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No. 53

TIP

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

Fault code No.		53
Item		Vehicle system power supply (voltage of ABS ECU power supply is low)
Symptom		Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too low.
Order	Item/components and probable cause	Check or maintenance job
1	Defective battery	Recharge or replace the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.
2	Defective coupler between the battery and the hydraulic unit assembly	<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. See TIP.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly	<ul style="list-style-type: none"> • Replace if there is an open or short circuit. • Between ABS ECU coupler and ABS control unit fuse. (brown/white–brown/white)
4	Defective charging system	Check the charging system. Refer to "CIRCUIT DIAGRAM" on page 8-11.

Fault code No. 54

TIP

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

Fault code No.		54
Item		Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)
Symptom		Abnormality is detected in the solenoid or motor power supply circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
1	Defective battery	Recharge or replace the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.
2	Defective coupler between the battery and the hydraulic unit assembly	<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. See TIP.
3	Open or short circuit in the wire harness between the battery and the hydraulic unit assembly	<ul style="list-style-type: none"> • Replace if there is an open or short circuit. • Between ABS ECU coupler and ABS motor fuse. (red/blue–red/blue) • Between ABS ECU coupler and ABS solenoid fuse. (red–red)
4	Defective charging system	Check the charging system. Refer to "CHARGING SYSTEM" on page 8-11.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No.		54
Item		Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)
Symptom		Abnormality is detected in the solenoid or motor power supply circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
5	Defective hydraulic unit assembly	If the above items were performed and no malfunctions were found, replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

Fault code No. 55

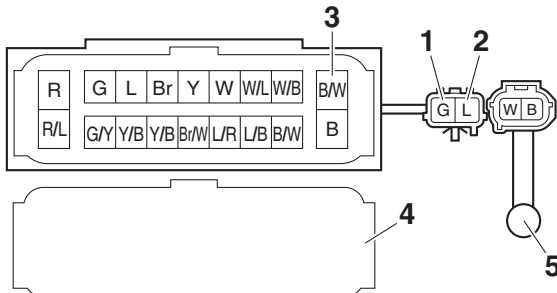
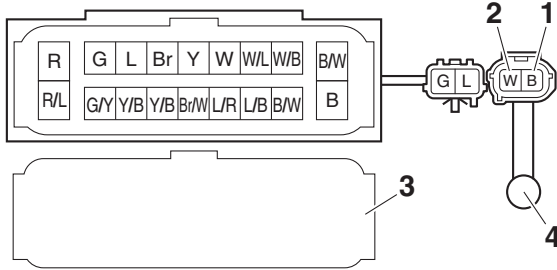
Fault code No.		55
Item		Hydraulic unit assembly (defective ABS ECU)
Symptom		Abnormal data is detected in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

Fault code No. 56

Fault code No.		56
Item		Hydraulic unit assembly (abnormal internal power supply)
Symptom		Abnormality is detected in the power supply circuit in the hydraulic unit assembly.
Order	Item/components and probable cause	Check or maintenance job
1	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-63.

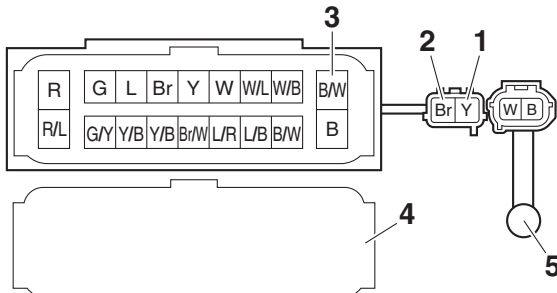
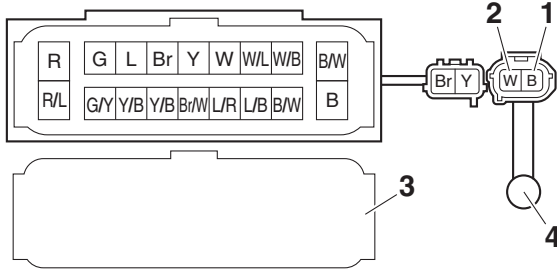
ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No. 63

Fault code No.		63
Item		Front wheel sensor power supply (voltage of power supply is low)
Symptom		Power voltage supplied from the ABS ECU to the front wheel sensor is too low.
Order	Item/components and probable cause	Check or maintenance job
1	Short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly	<ul style="list-style-type: none">• Check that there is no short circuit between the green terminal “1” and the blue terminal “2”.• Check that there is no short circuit between the black/white terminal “3” and the green terminal “1”.• If there is a short circuit, the wire harness is defective. Replace the wire harness. <div><p>4. ABS ECU 5. Front wheel sensor</p></div>
2	Defective front wheel sensor	<ul style="list-style-type: none">• Check that there is no short circuit between the black terminal “1” and the white terminal “2”.• If there is a short circuit, the wheel sensor is defective. Repair or replace the wheel sensor. <div><p>3. ABS ECU 4. Front wheel sensor</p></div>
3	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-63.

ABS (ANTI-LOCK BRAKE SYSTEM)

Fault code No. 64

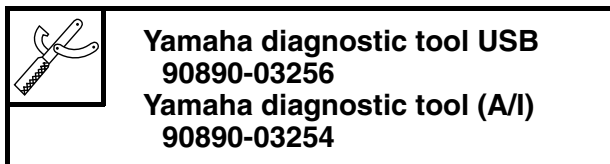
Fault code No.		64
Item		Rear wheel sensor power supply (voltage of power supply is low)
Symptom		Power voltage supplied from the ABS ECU to the rear wheel sensor is too low.
Order	Item/components and probable cause	Check or maintenance job
1	Short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly	<ul style="list-style-type: none">• Check that there is no short circuit between the yellow terminal “1” and the brown terminal “2”.• Check that there is no short circuit between the black/white terminal “3” and the yellow terminal “1”.• If there is a short circuit, the wire harness is defective. Replace the wire harness. <div></div> <p>4. ABS ECU 5. Rear wheel sensor</p>
2	Defective rear wheel sensor	<ul style="list-style-type: none">• Check that there is no short circuit between the black terminal “1” and the white terminal “2”.• If there is a short circuit, the wheel sensor is defective. Repair or replace the wheel sensor. <div></div> <p>3. ABS ECU 4. Rear wheel sensor</p>
3	Defective hydraulic unit assembly	Replace the hydraulic unit assembly. Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-63.

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS31167

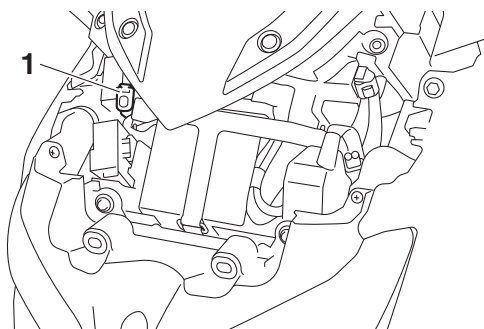
[B-3] DELETING THE FAULT CODES

To delete the fault codes, use the Yamaha diagnostic tool. For information about deleting the fault codes, refer to the operation manual of the Yamaha diagnostic tool.
Check that all the displayed fault codes are deleted.



Connecting the Yamaha diagnostic tool

Remove the protective cap "1", and then connect the Yamaha diagnostic tool to the coupler.



EAS31168

[C-1] FINAL CHECK

Check all the following items to complete the inspection.

If the process is not completed properly, start again from the beginning.

Checking procedures

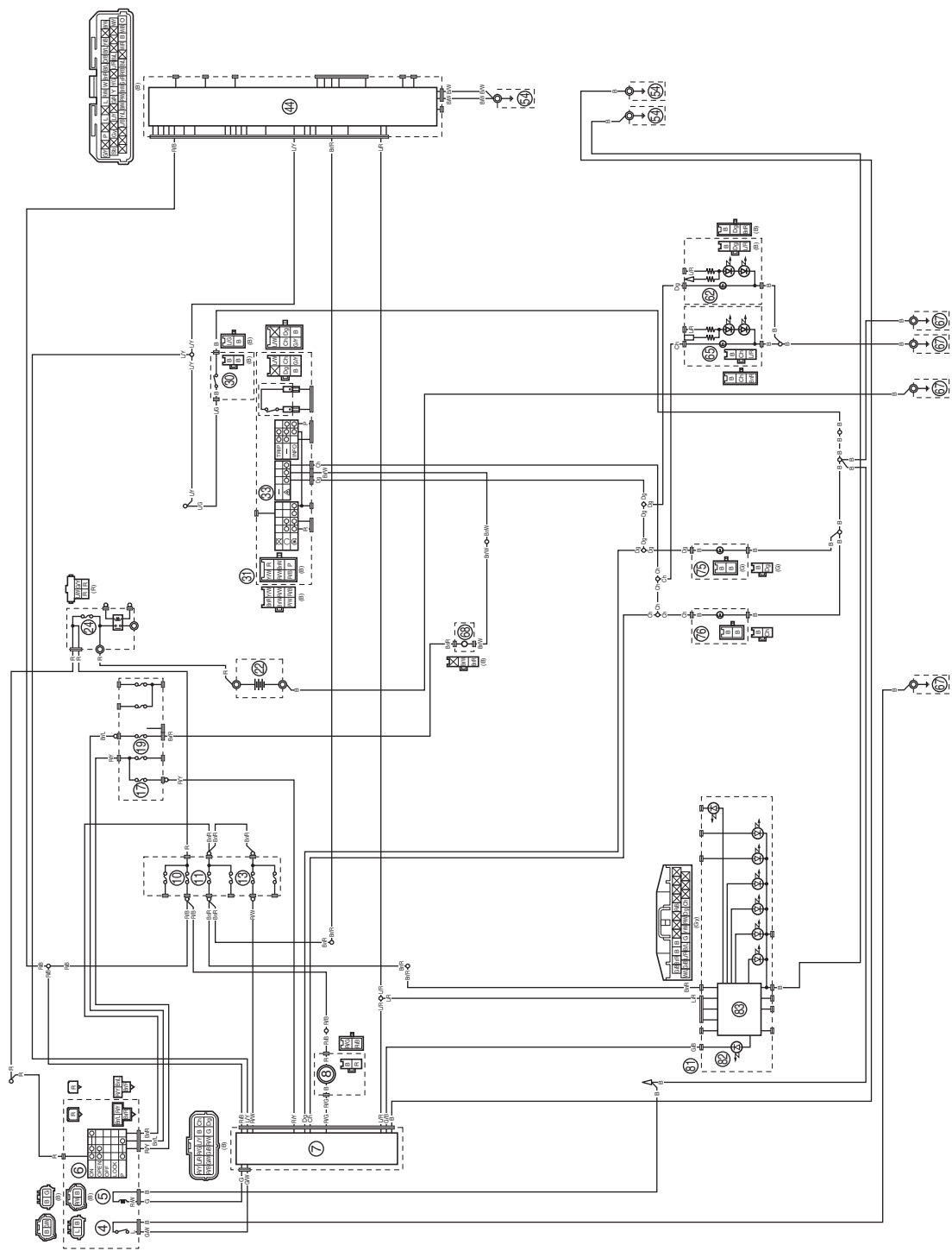
1. Check the brake fluid level in the front brake master cylinder reservoir and rear brake master cylinder reservoir.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-11.
2. Check the wheel sensors for proper installation.
Refer to "INSTALLING THE FRONT WHEEL (FRONT BRAKE DISC)" on page 4-31 and "INSTALLING THE REAR WHEEL (REAR BRAKE DISC)" on page 4-36.
3. Perform brake line routing confirmation.
Refer to "HYDRAULIC UNIT OPERATION TESTS" on page 4-67.
If it does not have reaction-force properly, the brake hose is not properly routed or connected.
4. Delete the fault codes.
Refer to "[B-3] DELETING THE FAULT CODES" on page 8-110.
5. Checking the ABS warning light.
Check that the ABS warning light goes off.
If the ABS warning light does not come on or if it does not go off, refer to "CHECKING THE ABS WARNING LIGHT" on page 4-70.
If the ABS warning light does not turn off, the possible causes are following:
 - The problem is not solved.
 - Open circuit between the ABS ECU and the meter assembly.
Check for continuity between white/blue terminal of the ABS ECU coupler and white/blue terminal of the meter assembly coupler.
 - Malfunction in the meter assembly circuit.
 - Malfunction in the ABS warning light circuit in the hydraulic unit assembly.

EAS20201

SMART KEY SYSTEM

EAS31452

CIRCUIT DIAGRAM



- 4. Request switch
- 5. Main switch solenoid
- 6. Main switch
- 7. Smart key unit
- 8. Buzzer
- 10.Backup fuse
- 11.Main fuse
- 13.Signaling system fuse
- 17.Answer back fuse
- 19.Turn signal light and hazard fuse
- 22.Battery
- 24.Main fuse 2
- 30.Sidestand switch
- 31.Handlebar switch (right)
- 33.Hazard switch
- 44.ECU (Engine Control Unit)
- 54.Engine ground
- 62.Rear turn signal light (right)
- 65.Rear turn signal light (left)
- 67.Frame ground
- 68.Turn signal/hazard relay
- 75.Front turn signal light (right)
- 76.Front turn signal light (left)
- 81.Meter assembly
- 82.Smart key indicator light
- 83.Multi-function meter

EAS31453

TROUBLESHOOTING

Vehicle power does not turn on. (Meter light and tail/brake light do not come on.)

Engine does not start even though vehicle power is turned on.

Seat does not open. (Vehicle power is turned on.)

Left front storage box does not open. (Vehicle power is turned on.)

Fuel tank cap lid does not open.

Answer back function does not operate.

TIP

Before troubleshooting, remove the following part(s):

1. Front cowling assemblies
2. Lower side covers
3. Footrest board assemblies
4. Leg shield assembly

Checking the vehicle power

1. Check the smart key.
→ The smart key indicator light comes on when the smart key button is pushed.
→ Check the button cell battery.
Refer to "CHECKING THE SMART KEY BATTERY" on page 8-137.

NG →

Replace the button cell battery of the smart key. Standard battery: CR2032

OK ↓

2. Check the fuses.
(Main, main 2, backup, signaling system, turn signal and hazard, and answer back)
Refer to "CHECKING THE FUSES" on page 8-128.

NG →

Replace the fuse(s).

OK ↓

3. Check the battery.
Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-128.

NG →

- Clean the battery terminals.
- Recharge or replace the battery.

OK ↓

4. Check the main switch and request switch.
Refer to "CHECKING THE SWITCHES" on page 8-127.

NG →

Replace the main switch.

OK ↓

5. Check the main switch solenoid.
Refer to "CHECKING THE MAIN SWITCH SOLENOID" on page 8-137.

NG →

Replace the main switch.

OK ↓

6. Check the entire smart key system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-111.

NG →

Properly connect or replace the wire harness.

OK ↓

Replace the smart key unit.

Checking the smart key system

Before checking the smart key system, make sure that the smart key is located within the operating range of the smart key system and that the key is turned on.

Vehicle power does not turn on. (Meter light and tail light do not come on.)

TIP

- Before performing this procedure, make sure that there are no sources of strong electromagnetic waves in the vicinity. (Because the amount of electromagnetic waves will change if the vehicle is moved a short distance, move the vehicle away from sources of strong electromagnetic waves before performing the procedure.)
- Use the smart key that is registered to the vehicle.

1. Check the vehicle power.
Refer to "Checking the vehicle power" on page 8-113.

NG →

Repair or replace any defective parts.

OK ↓

- There are sources of strong electromagnetic waves in the vicinity → Move the vehicle.
- Smart key malfunction → Register and use a different smart key.
- Smart key unit malfunction → Replace the smart key unit.

Engine does not start even though vehicle power is turned on.

1. When the vehicle power is turned on, the smart key indicator light "⚡" flashes 4 times.
Refer to "SMART KEY SYSTEM SELF-DIAGNOSIS" on page 8-117.

NO →

Check and repair the electric starting system. Refer to "ELECTRIC STARTING SYSTEM" on page 8-5.

YES ↓

2. Turn the main switch to "OFF", and then push the main switch and check that it can be turned back to "ON".

NG →

Repair or replace any defective parts. Refer to "Checking the vehicle power" on page 8-113.

OK ↓

3. Check for continuity in the communication line between the ECU and the smart key unit (blue/red – blue/red).

NG →

Replace the wire harness.

OK ↓

- Replace the ECU.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.
- Replace the smart key unit.

Seat does not open. (Vehicle power is turned on.)

1. Check the vehicle power.
Refer to “Checking the vehicle power” on page 8-113.

NG →

Repair or replace any defective parts.

OK ↓

- Check the mechanical components of the lock for malfunctions. Repair or replace any defective parts.
- Adjust or replace the seat lock cable.

Left front storage box does not open. (Vehicle power is turned on.)

1. Check the vehicle power.
Refer to “Checking the vehicle power” on page 8-113.

NG →

Repair or replace any defective parts.

OK ↓

- Check the mechanical components of the lock for malfunctions. Repair or replace any defective parts.
- Adjust or replace the left front storage box lock cable.

Fuel tank cap lid does not open.

1. Check that the main switch can be turned counterclockwise.

NG →

Repair or replace any defective parts.

OK ↓

- Check the mechanical components of the lock for malfunctions. Repair or replace any defective parts.
- Adjust or replace the fuel tank cap lid lock cable.

Answer back function does not operate.

1. Check the vehicle power.
Refer to "Checking the vehicle power" on page 8-113.

NG →

Repair or replace any defective parts.

OK ↓

2. Check the buzzer operation.
Refer to "CHECKING THE BUZZER" on page 8-137.

NG →

Replace the buzzer.

OK ↓

3. Check the turn signal light bulbs and sockets.
Refer to "CHECKING THE BULBS AND BULB SOCKETS" in "BASIC INFORMATION" (separate volume).

NG →


Replace the turn signal light bulb, socket or both.

OK ↓


Replace the smart key unit.

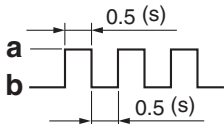
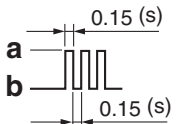
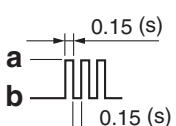
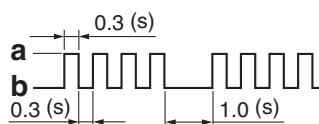
EAS31534

SMART KEY SYSTEM SELF-DIAGNOSIS


The smart key system is equipped with a self-diagnostic function. If a malfunction is detected in the system, the malfunction will be indicated by the flash pattern of the smart key indicator light “”.

TIP


The smart key indicator light “” comes on for about 2 seconds when the vehicle power is on. If one of the following malfunctions is detected, the indicator light starts flashing.

Item	Flash pattern	Flashing time/number of flashes	Malfunction and check point
Low voltage of smart key button cell battery	 <p>a.LED on b.LED off</p>	20 (seconds)	Replace the button cell battery of the smart key. Refer to “SMART KEY SYSTEM” on page 8-111.
Vehicle power off verification error	 <p>a.LED on b.LED off</p>	30 (seconds)	The smart key cannot be recognized. Check that there are no sources of strong electromagnetic waves in the vicinity, the smart key is not lost, and the battery is not discharged.
Running detection error*	 <p>a.LED on b.LED off</p>	Flashes continuously until the error is resolved.	The smart key cannot be recognized. Check that there are no sources of strong electromagnetic waves in the vicinity, the smart key is not lost, and the battery is not discharged.
<ul style="list-style-type: none"> ECU communication error Data error ECU malfunction 	 <p>a.LED on b.LED off</p>	Flashes continuously until the error is resolved./flashes 4 times in a repeating cycle.	Check the wire harness. Check the ECU. Check the smart key unit.

* The running detection error

If the smart key is dropped or can no longer be recognized while the vehicle is traveling. If the vehicle travels while the smart key cannot be recognized, the smart key indicator light “” flashes in 0.15-second intervals.

The vehicle can be ridden, but the vehicle power cannot be turned off.

Although a forced shutdown can be performed to turn off the vehicle power (the main switch is pushed for 4 times within 2 seconds while the smart key indicator light “” is flashing in 0.15-second intervals), the vehicle power cannot be turned back on.

SMART KEY SYSTEM SELF-DIAGNOSIS

If a communication error between the ECU and the smart key unit is detected, the following fault code numbers will be displayed on the meter to indicate the location of the malfunction.

TIP

These fault code numbers are not stored in the memory of the ECU. Note all of the displayed fault code numbers, and then check the vehicle.

Fault code No.	Device that detected the malfunction	Symptom	Cause	Check or maintenance job
51	Smart key unit	Communication error between the smart key and the smart key unit.	Radio wave noise interference. • Lock condition in the smart key • Defective smart key • Defective smart key unit	Perform the checks and maintenance job for "Engine does not start even though vehicle power is turned on."
53	Smart key unit	Communication error between the ECU and the smart key unit.	Radio wave noise interference or disconnected lead. • Obstruction due to radio wave noise • Disconnection in the wire harness • Defective ECU • Defective smart key unit	Perform the checks and maintenance job for "Engine does not start even though vehicle power is turned on."
54	Smart key unit	Codes transmitted between the ECU and the smart key unit do not match.	Radio wave noise interference or disconnected lead. • Obstruction due to radio wave noise. • Disconnection in the wire harness • Defective ECU (when the ECU or smart key unit is replaced with a unit from a different vehicle) • Defective smart key unit	Perform the checks and maintenance job for "Engine does not start even though vehicle power is turned on."
56	ECU	Unidentified code is received.	Radio wave noise interference or disconnected lead. • Obstruction due to radio wave noise • Disconnection in the wire harness • Defective ECU • Defective smart key unit	Perform the checks and maintenance job for "Engine does not start even though vehicle power is turned on."

EAS31535

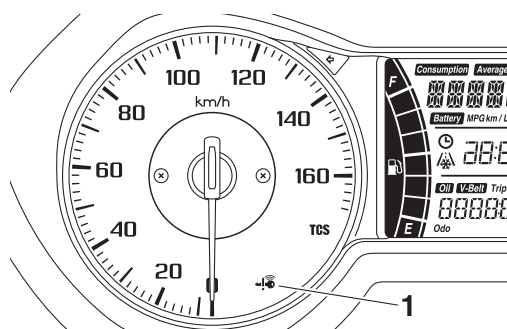
SMART KEY SYSTEM EMERGENCY MODE

If the smart key is lost or if it cannot be used due a discharged battery or malfunction, this mode can be used to turn on the smart key system.

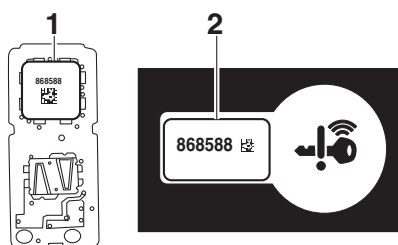
TIP

The emergency mode operation will be canceled if the respective steps are not carried out within the time set for each operation.

1. Stop the vehicle in a safe place and turn the main switch to "OFF".
2. Push the main switch for 5 seconds until the smart key indicator light flashes once, then release it. Repeat two more times. The smart key indicator light "1" will come on for 3 seconds to indicate the transition to emergency mode.




3. After the smart key indicator light "1" goes off, use the main switch to enter the smart key identification number "1" located inside the smart key case (open the smart key case as shown) or the identification number "2" located on the identification number card. (Refer to the following procedure on how to input the identification number.)





4. The input identification number is indicated by the number of flashes of the smart key indicator light "1" while the main switch is pushed.
For example, if the smart key identification number is 123456:
Push and hold the main switch. →
The smart key indicator light "1" will start to flash. →



Release the main switch after the smart key indicator light “” flashes 1 time. →
The first digit of the identification number has been set as 1. →
Push and hold the main switch again. →



- Release the main switch after the smart key indicator light “” flashes 2 times. →
The second digit of the identification number has been set as 2. →
Repeat the above procedure until all 6 digits of the identification number have been set.
5. The smart key indicator light “” will come on for 10 seconds if the correct 6-digit identification number was entered.

TIP

When one of the following situations applies, emergency mode will be terminated and the smart key indicator light will flash quickly for 3 seconds. In this case, start over again from step 2.

- When there are no main switch operations for 10 seconds during the identification number input process.
 - When the smart key indicator light is allowed to flash nine or more times.
 - The identification number is not entered correctly.
-

6. While the smart key indicator light is on, push the main switch once more to complete emergency mode access. The smart key indicator light will go off and then come back on for approximately 4 seconds.
7. While the smart key indicator light is on, turn the main switch to “ON”. The vehicle can now be operated normally.

EAS31536

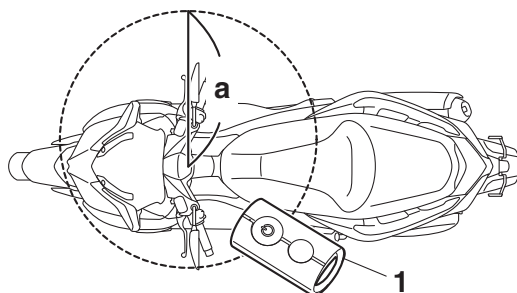
REGISTERING A SMART KEY

The following procedure can be used to register additional smart keys or a new smart key in case the original smart key is lost.

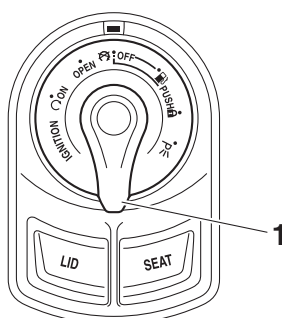
TIP

- A maximum of 6 smart keys can be registered to the smart key unit.
 - Be sure to register the smart keys one at a time. Do not register multiple smart keys at the same time.
-

1. Place the smart key "1" that will be registered within 80 cm (31.5 in) "a" of the main switch.



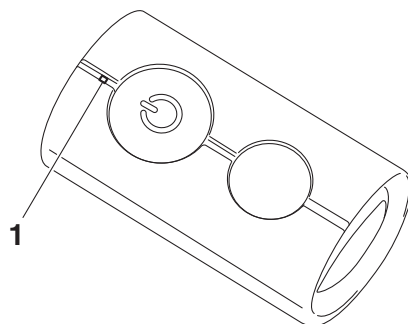
2. Perform steps 1–5 in "SMART KEY SYSTEM EMERGENCY MODE" on page 8-119.
3. While the smart key indicator light "1" is on for 10 seconds, push the main switch "1" for 5 seconds until buzzer sounds once.



4. The smart key indicator light (red) "1" on the new smart key comes on for 10 seconds.

TIP

While the smart key indicator light on the smart key is on, the smart key indicator light "1" flashes according to the number of currently registered smart keys. (For example, if 5 smart keys are registered, the indicator light flashes 5 times.)



5. While the smart key indicator light is on for 10 seconds, push the button on the smart key to transmit a signal from the smart key to the smart key unit.
6. If the smart key is registered successfully, the smart key indicator light "1" will come on for 3 seconds, and then the smart key system will turn off.
If the smart key was not registered successfully, the smart key indicator light "1" will flash for 3 seconds, and then the smart key system will turn off.

TIP

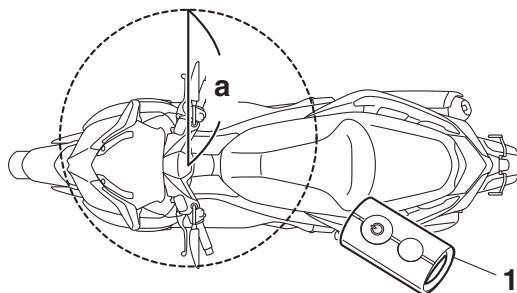
If this registration procedure is performed for a smart key that is already registered, the smart key indicator light "1" will flash for 7 seconds (on for 0.2 second and off for 0.8 second).

EAS31537

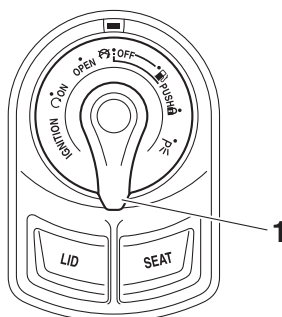
DISABLING A SMART KEY

If a smart key is lost or stolen, the smart key can be disabled.

1. Place all of the smart keys "1" 300 cm (118.1 in) "a" or more away from the vehicle or lock the communication.



2. Perform steps 1–5 in "SMART KEY SYSTEM EMERGENCY MODE" on page 8-119.
3. While the smart key indicator light "⚡" is on for 10 seconds, perform the following procedure.
 - a. Push the main switch "1" 5 times or more until buzzer sounds 3 times.



4. Check that the smart key indicator light "⚡" goes off (the smart key disable mode is activated).
5. Turn on (unlocked setting) the smart keys that you want to enable and place them within 80 cm (31.5 in) of the smart key unit.
6. Push the main switch for 5 seconds or more to start the communication between the smart key unit and the smart keys that are located within 80 cm (31.5 in) of the unit.

TIP

The number of smart keys that currently can be used will be indicated.

Number of flashes = Number of verified smart keys. (1 cycle of on for 0.3 second and off for 0.3 second = 1 smart key)

7. Push the main switch for 5 seconds or more. The use of only the verified smart keys will be enabled. The use of all other smart keys will be disabled.

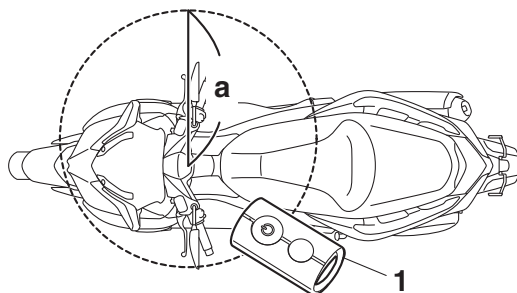
TIP

- If the procedure was not completed successfully, repeat the procedure from step 1.
- To enable a smart key after its use has been disabled, perform this procedure again.

EAS32347

DISABLING THE POWER-ON ALARM

1. Place the smart key "1" that will be registered within 80 cm (31.5 in) "a" of the main switch.



2. Push the main switch and the smart key indicator light will come on for approximately 4 seconds.
3. While the smart key indicator light is on, turn the main switch to "ON".
4. Extend and retract the sidestand by hand for 10 times or more within 15 seconds from vehicle power on.
5. When the buzzer sounds, the setting is complete.
 - If the buzzer sounds 2 times: The power-on alarm is turned off.
 - If the buzzer sounds 1 times: The power-on alarm is turned on.

EAS31719

REPLACEMENT PARTS LIST

TIP

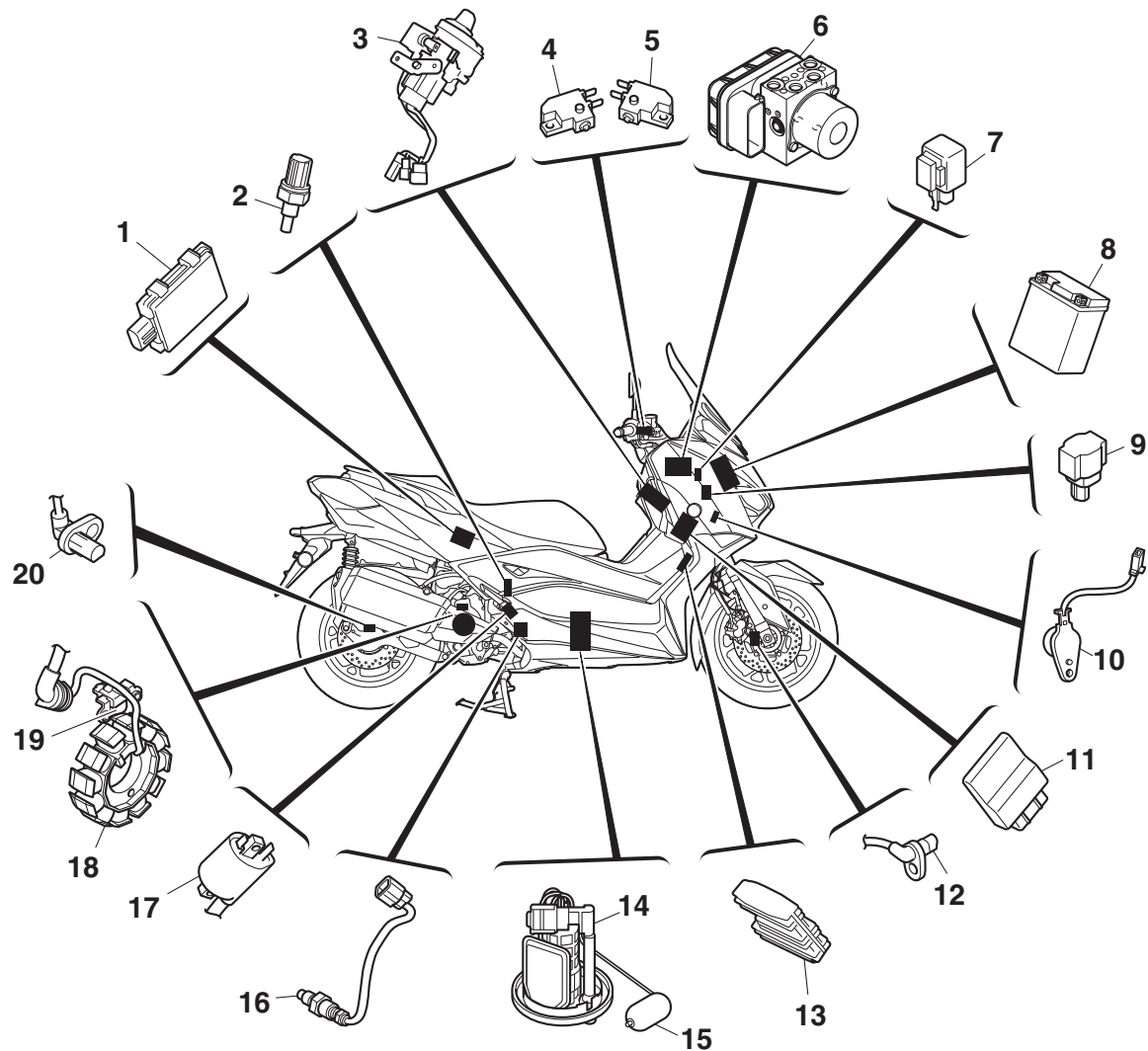
When replacing the parts, refer to the following sections.

- Refer to “SMART KEY SYSTEM EMERGENCY MODE” on page 8-119.
- Refer to “REGISTERING A SMART KEY” on page 8-120.
- Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-128.

Faulty part	Required item when replacing parts		Replacement parts (when an item is required in order to replace parts)			Remarks
	Smart key identification number	Smart key	Smart key	Smart key unit	ECU	
	○ : Required. Smart key identification △ : number or smart key is required. × : Not required.		○ : Replace. × : Do not replace. This part must be re- * : placed even if it is not faulty.			
Smart key	○	×	○	×	×	Register the smart key identification number in the emergency mode.
Smart key unit	×	×	○*	○	○*	Replace the smart key, smart key unit, and ECU as a set.
ECU	△	△	×	×	○	When the vehicle system is turned on, the smart key identification number is automatically registered to the ECU.
Smart key unit/ECU	×	×	○*	○	○	Replace the smart key, smart key unit, and ECU as a set.
Smart key/Smart key unit	×	×	○	○	○*	Replace the smart key, smart key unit, and ECU as a set.
Smart key/ECU	○	×	○	×	○	Register the smart key identification number in the emergency mode. When the vehicle system is turned on, the smart key identification number is automatically registered to the ECU.
Smart key/Smart key unit/ECU	×	×	○	○	○	Replace the smart key, smart key unit, and ECU as a set.

EAS20089

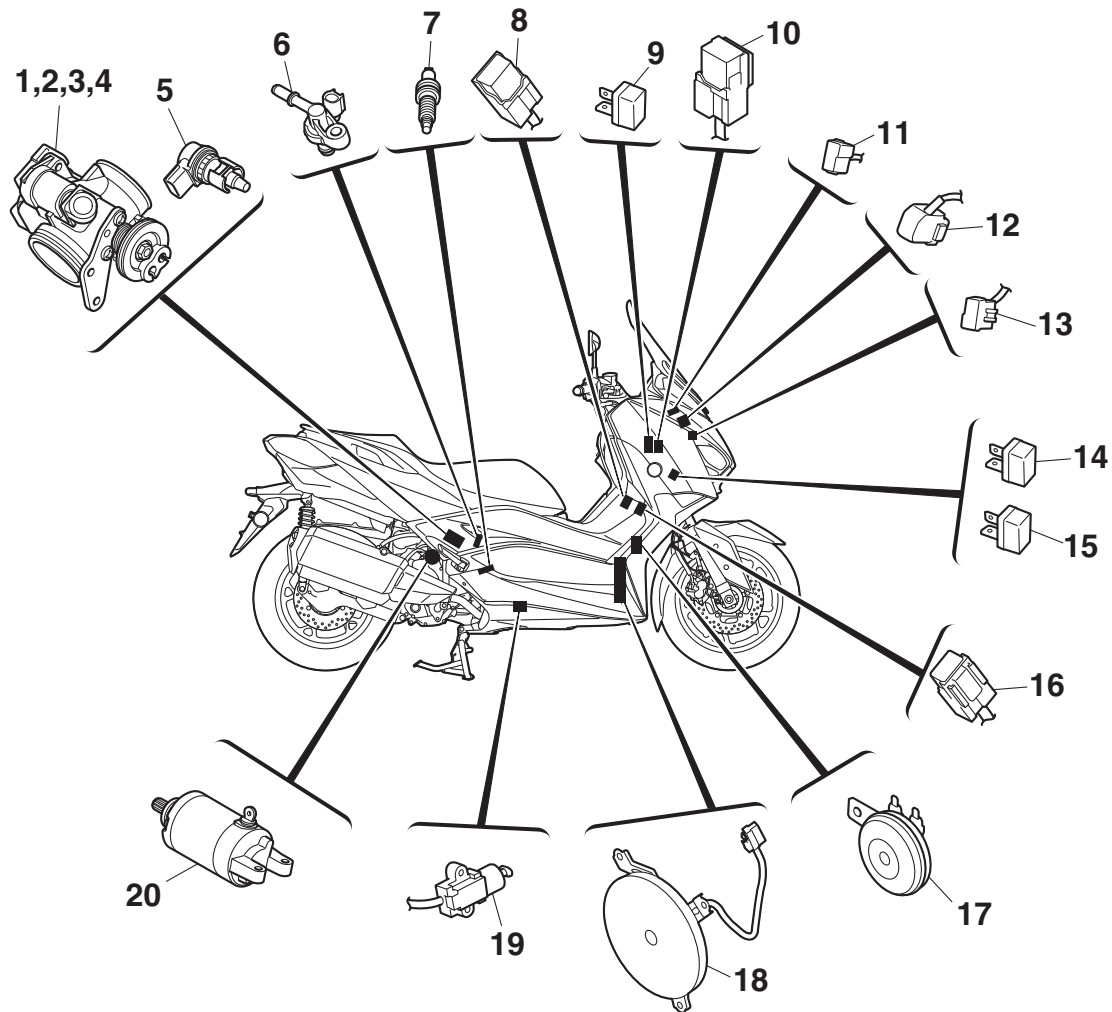
ELECTRICAL COMPONENTS



1. Smart key unit
2. Coolant temperature sensor
3. Main switch
4. Front brake light switch
5. Rear brake light switch
6. ABS ECU
7. Turn signal/hazard relay
8. Battery
9. Lean angle sensor
10. Buzzer
11. ECU (Engine Control Unit)
12. Front wheel sensor
13. Rectifier/regulator
14. Fuel pump
15. Fuel sender
16. O₂ sensor
17. Ignition coil
18. AC magneto

19. Crankshaft position sensor
20. Rear wheel sensor

ELECTRICAL COMPONENTS

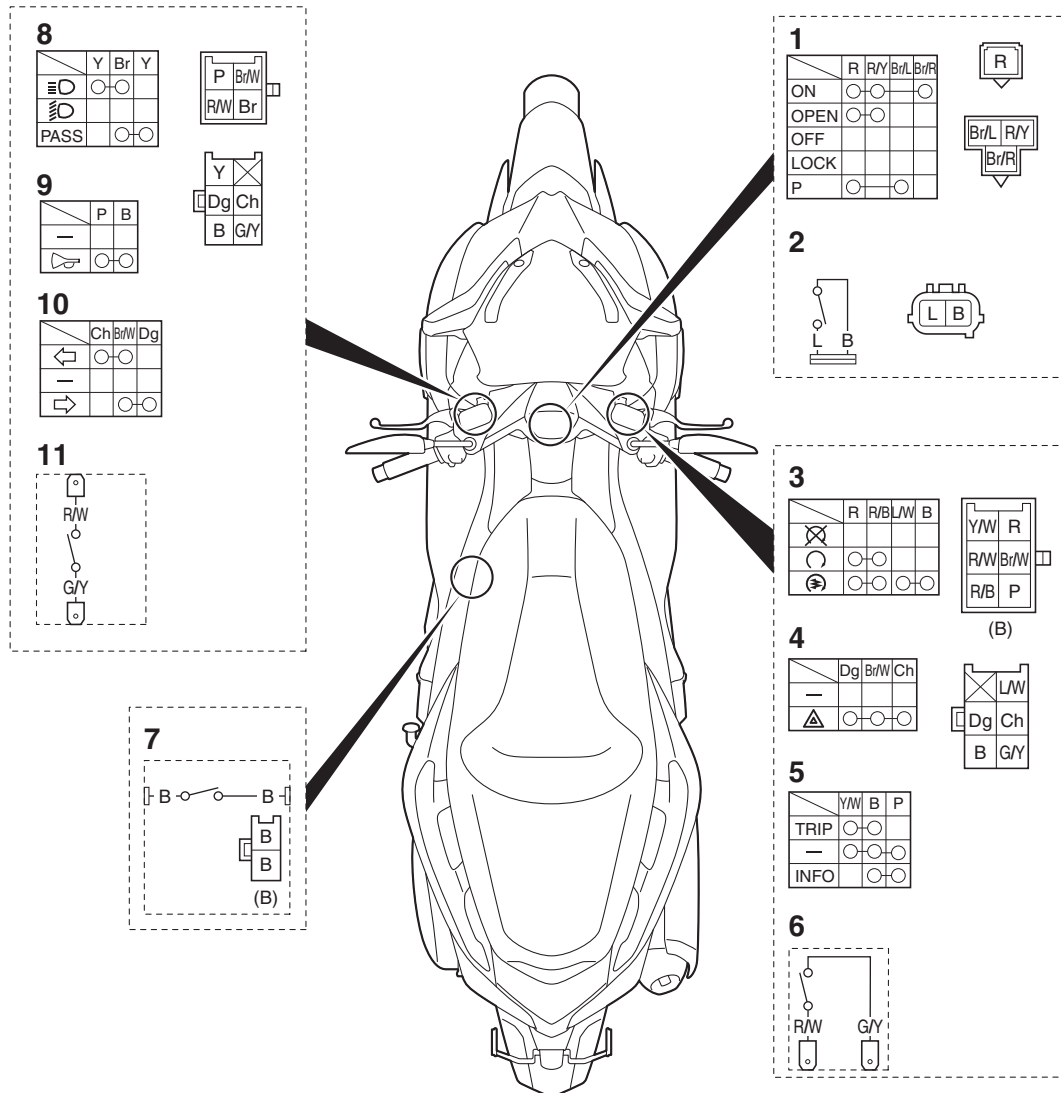


1. Throttle body sensor assembly
2. Throttle position sensor
3. Intake air pressure sensor
4. Intake air temperature sensor
5. ISC (Idle Speed Control) unit
6. Fuel injector
7. Spark plug
8. Starting circuit cut-off relay
9. Diode 1
10. Fuel pump relay
11. Fuse box 1
12. Starter relay
13. Fuse box 2
14. Diode 2
15. Diode 3
16. Radiator fan motor relay
17. Horn
18. Radiator fan motor
19. Sidestand switch
20. Starter motor

EAS30549

CHECKING THE SWITCHES

Check each switch for continuity with the digital circuit tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.



1. Main switch
2. Request switch
3. Start/engine stop switch
4. Hazard switch
5. "TRIP/INFO" switch
6. Front brake light switch
7. Sidestand switch
8. Dimmer switch
9. Horn switch
10. Turn signal switch
11. Rear brake light switch

EAS30551

CHECKING THE FUSES

The following procedure applies to all of the fuses.

ECA20520

NOTICE

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

1. Remove:
 - Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.
2. Check:
 - Fuse
 - a. Connect the digital circuit tester to the fuse and check the continuity.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- b. If the no continuity, replace the fuse.
3. Replace:
 - Fuse (blown fuse)
 - a. Turn 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	20 A	1
Main 2	7.5 A	1
Terminal	2.0 A	1
Signaling system	10 A	1
Signaling system 2	7.5 A	1
Backup	7.5 A	1
Radiator fan motor	7.5 A	1
Turn signal and hazard	7.5 A	1
ABS motor	30 A	1
ABS control unit	7.5 A	1
ABS solenoid	15 A	1
Answer back	2.0 A	1

EWA13310

WARNING

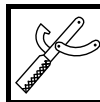
Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

4. Install:
 - Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.

EAS31006

REPLACING THE ECU (Engine Control Unit)

1. Turn the main switch to “OFF”.
2. Replace the ECU (Engine Control Unit).
3. Clean the throttle body.
Refer to “CLEANING THE ISC (IDLE SPEED CONTROL) UNIT AND THROTTLE BODY” on page 7-15.
4. Reset:
 - A/F control learning value
Use the diagnostic code number “87”.
Refer to “SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE” on page 9-1.



Yamaha diagnostic tool USB
90890-03256
Yamaha diagnostic tool (A/I)
90890-03254

5. Check:
 - Engine idling speed
Start the engine, warm it up, and then measure the engine idling speed.



Engine idling speed
1500–1700 r/min

EAS30552

CHECKING AND CHARGING THE BATTERY

Refer to “CHECKING AND CHARGING THE BATTERY” in “BASIC INFORMATION” (separate volume).

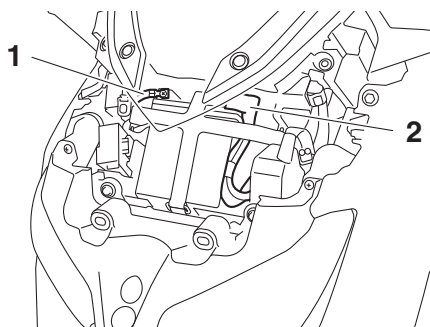
1. Remove:
 - Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.

2. Disconnect:
 - Battery leads
(from the battery terminals)

ECA13640

NOTICE

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

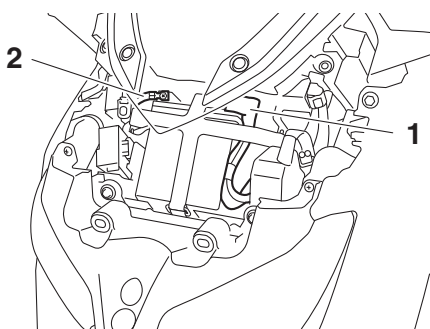


3. Remove:
 - Battery
4. Check:
 - Battery charge
5. Charge:
 - Battery
(refer to the appropriate charging method)
6. Install:
 - Battery
7. Connect:
 - Battery leads
(to the battery terminals)

ECA13630

NOTICE

First, connect the positive battery lead “1”, and then the negative battery lead “2”.



8. Check:
 - Battery terminals
Dirt → Clean with a wire brush.
Loose connection → Connect properly.
9. Lubricate:
 - Battery terminals



Recommended lubricant
Dielectric grease

10. Install:
 - Battery cover assembly
Refer to “GENERAL CHASSIS (1)” on page 4-1.

EAS30553

CHECKING THE RELAYS

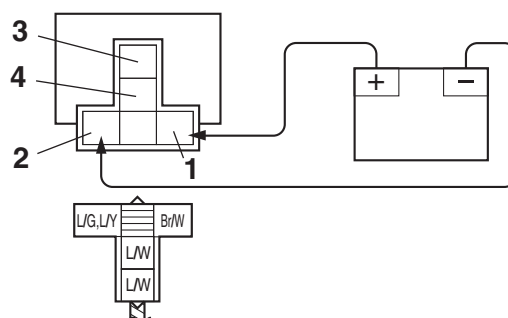
Check each switch for continuity with the digital circuit tester. If the continuity reading is incorrect, replace the relay.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with ta-
chometer
YU-A1927

1. Disconnect the relay from the wire harness.
2. Connect the digital circuit tester and battery (12 V) to the relay terminals as shown.
Check the relay operation.
Out of specification → Replace.

Starting circuit cut-off relay



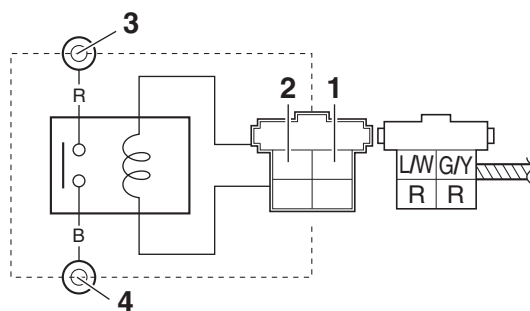
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



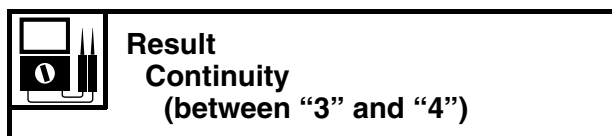
Result
Continuity
(between “3” and “4”)

ELECTRICAL COMPONENTS

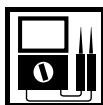
Starter relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result
Continuity
(between "3" and "4")

EAS30794

CHECKING THE TURN SIGNAL/HAZARD RELAY

1. Check:
 - Turn signal/hazard relay input voltage
Out of specification → The wiring circuit from the main switch to the turn signal/hazard relay coupler is faulty and replace the wire harness.



Turn signal/hazard relay input voltage
DC 12V

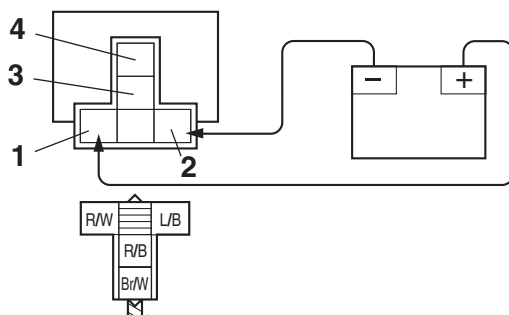
- a. Connect the digital circuit tester to the turn signal/hazard relay terminal as shown.



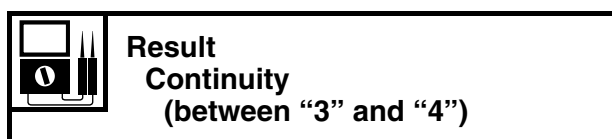
Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe brown/red "1"
- Negative tester probe Ground

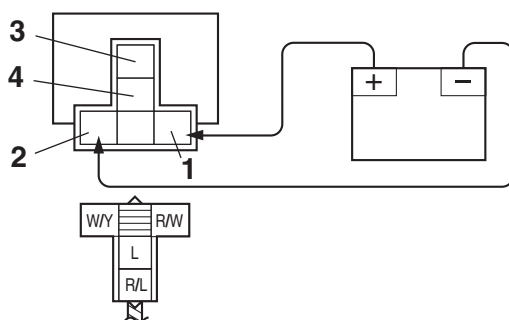
Fuel pump relay



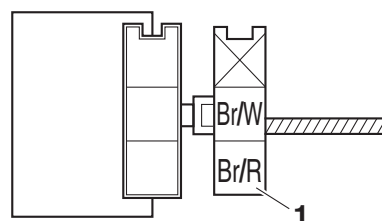
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Radiator fan motor relay



1. Positive battery terminal



- b. Turn the main switch to "ON".
- c. Measure the turn signal/hazard relay input voltage.
2. Check:
 - Turn signal/hazard relay output voltage
Out of specification → Replace.



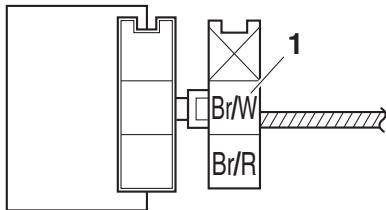
Turn signal/hazard relay output voltage
DC 12V

- a. Connect the digital circuit tester to the turn signal/hazard relay terminal as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe brown/white "1"
- Negative tester probe Ground



- b. Turn the main switch to "ON".
- c. Measure the turn signal/hazard relay output voltage.

EAS30555

CHECKING THE DIODES

1. Check:

- Diodes
Out of specification → Replace.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927



Diode 1

Continuity

Positive tester probe → brown/red "1"

Negative tester probe → brown/blue "2"

No continuity

Positive tester probe → brown/blue "2"

Negative tester probe → brown/red "1"

Diode 2

Continuity

Positive tester probe → blue/white "3"

Negative tester probe → green/yellow "4"

No continuity

Positive tester probe → green/yellow "4"

Negative tester probe → blue/white "3"

Diode 3

Continuity

Positive tester probe → red/white "5"

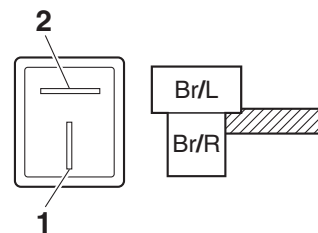
Negative tester probe → brown/white "6"

No continuity

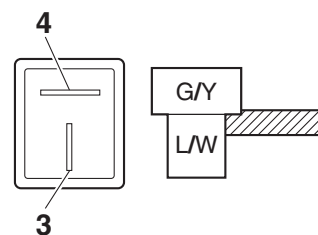
Positive tester probe → brown/white "6"

Negative tester probe → red/white "5"

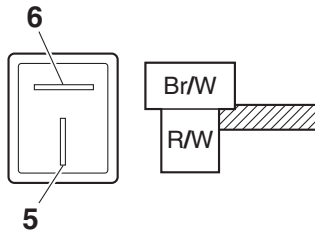
A



B



C



- A. Diode 1
- B. Diode 2
- C. Diode 3

- a. Disconnect the diode from the wire harness.
- b. Connect the digital circuit tester to the diode terminals.
- c. Check the diode for continuity.
- d. Check the diode for no continuity.

EAS30556

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 8-3.



Minimum ignition spark gap
6.0 mm (0.24 in)

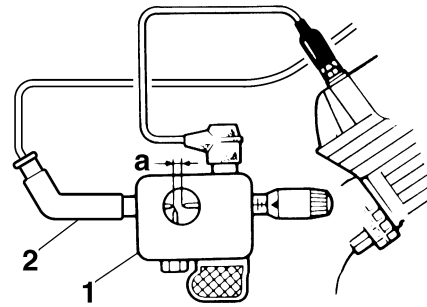
TIP

If the ignition spark gap is within specification, the ignition system circuit is operating normally.

- a. Disconnect the spark plug cap from the spark plug.
- b. Connect the ignition checker "1" as shown.



Ignition checker
90890-06754
Oppama pet-4000 spark checker
YM-34487



2. Ignition coil

- c. Turn the main switch to "ON".
- d. Measure the ignition spark gap "a".
- e. Crank the engine by "⊗" side of the start/engine stop switch is pushed and gradually increase the spark gap until a misfire occurs.

EAS30557

CHECKING THE SPARK PLUG CAP

1. Check:

- Spark plug cap resistance
Out of specification → Replace.

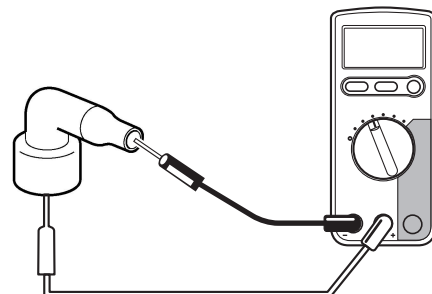


Resistance
3.75–6.25 kΩ

- a. Remove the spark plug cap from the spark plug lead.
- b. Connect the digital circuit tester to the spark plug cap as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927



- c. Measure the spark plug cap resistance.

EAS30558

CHECKING THE IGNITION COIL

1. Check:

- Primary coil resistance
Out of specification → Replace.



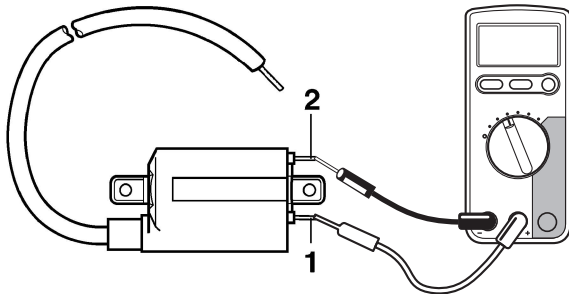
Primary coil resistance 2.16–2.64 Ω

- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the digital circuit tester to the ignition coil as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe → red/white "1"
- Negative tester probe → orange "2"



- Measure the primary coil resistance.
- Check:
 - Secondary coil resistance
 - Out of specification → Replace.



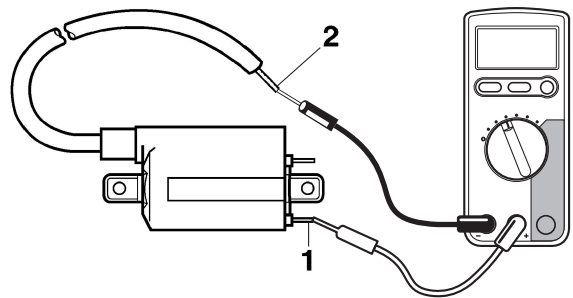
Secondary coil resistance 8.64–12.96 k Ω

- Connect the digital circuit tester to the ignition coil as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe → red/white "1"
- Negative tester probe → High tension cord "2"

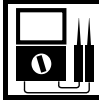


- Measure the secondary coil resistance.

EAS30561

CHECKING THE LEAN ANGLE SENSOR

- Remove:
 - Lean angle sensor
- Check:
 - Lean angle sensor output voltage
 - Out of specification → Replace.



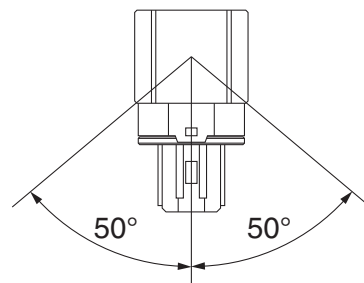
Lean angle sensor output voltage Less than 50°: 0.4–1.4 V More than 50°: 3.7–4.4 V

- Connect the lean angle sensor coupler to the wire harness.
- Connect the digital circuit tester to the lean angle sensor coupler as shown.



Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927

- Positive tester probe → blue
- Negative tester probe → black/blue



- Turn the main switch to "ON".
- Tilt the lean angle sensor to 50°.
- Measure the lean angle sensor output voltage.

EAS30560

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 stator coil assembly.



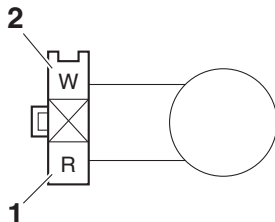
Crankshaft position sensor resistance
228–342 Ω

- a. Connect the digital circuit tester to the crankshaft position sensor coupler as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → red “1”
- Negative tester probe → white “2”



- b. Measure the crankshaft position sensor resistance.

EAS30562

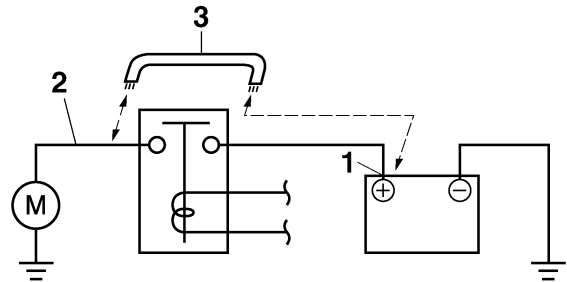
CHECKING THE STARTER MOTOR OPERATION

1. Check:
 - Starter motor operation
Does not operate → Perform the electric starting system troubleshooting, starting with step 4.
Refer to “TROUBLESHOOTING” on page 8-8.
 - a. Connect the positive battery terminal “1” and starter motor lead “2” with a jumper lead “3”.

EWA13810

⚠ WARNING

- A wire that is used as a jumper lead must have at least the same capacity of the battery 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.

EAS30566

CHECKING THE STATOR COIL

1. Disconnect:
 - Stator coil coupler (from the wire harness)
2. Check:
 - Stator coil resistance
Out of specification → Replace the stator coil.



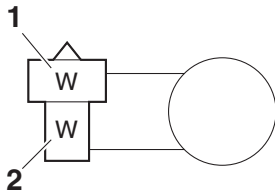
Stator coil resistance
0.360–0.540 Ω

- a. Connect the digital circuit tester to the stator coil coupler as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → white “1”
- Negative tester probe → white “2”



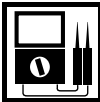
b. Measure the stator coil resistance.

EAS30680

CHECKING THE RECTIFIER/REGULATOR

1. Check:

- Charging voltage
Out of specification → Replace the rectifier/regulator.



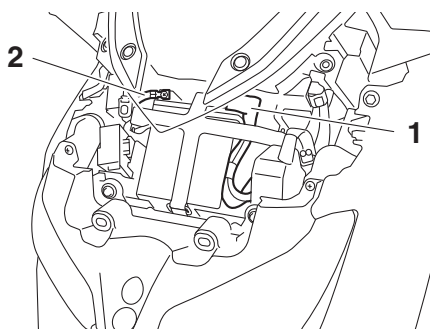
Charging voltage
14–15 V at 5000 r/min

a. Connect the digital circuit tester to the battery terminals as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → positive battery terminal “1”
- Negative tester probe → negative battery terminal “2”



b. Start the engine and let it run at approximately 5000 r/min.

c. Measure the charging voltage.

EAS30573

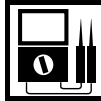
CHECKING THE FUEL SENDER

1. Remove:

- Fuel pump
(from the fuel tank)

2. Check:

- Fuel sender resistance
Out of specification → Replace the fuel pump assembly.



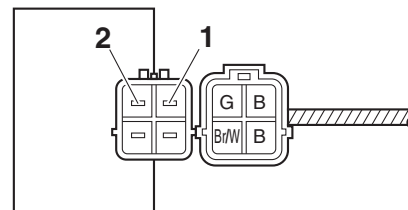
Fuel sender
Sender unit resistance (full)
10.0–14.0 Ω
Sender unit resistance (empty)
267.0–273.0 Ω

a. Connect the digital circuit tester to the fuel sender terminals as shown.

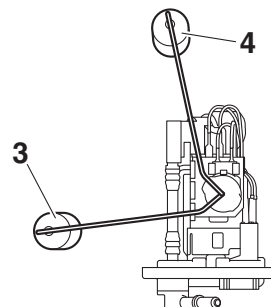


Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → green “1”
- Negative tester probe → black “2”



b. Move the fuel sender float to minimum “3” and maximum “4” level position.



c. Measure the fuel sender resistance.

EAS31372

CHECKING THE FUEL METER

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

1. Check:

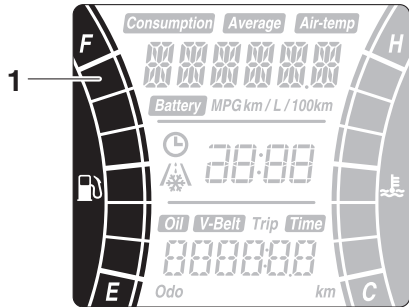
- Fuel meter “1”
(Turn the main switch to “ON”.)

ELECTRICAL COMPONENTS

Fuel meter comes on for a few seconds, then goes off → Fuel meter is OK.

Fuel meter does not come on → Replace the meter assembly.

Fuel meter flashes repeatedly → Replace the fuel pump assembly.



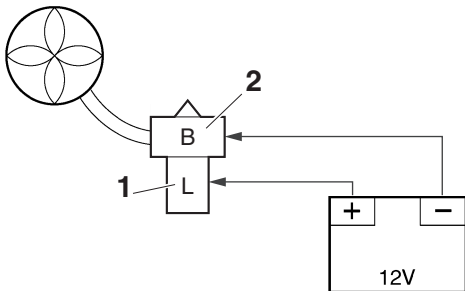
EAS30577

CHECKING THE RADIATOR FAN MOTOR

1. Check:

- Radiator fan motor
Faulty/rough movement → Replace.
- a. Disconnect the radiator fan motor coupler from the wire harness.
- b. Connect the battery (DC 12 V) as shown.

- Positive tester probe
blue "1"
- Negative tester probe
black "2"



- c. Measure the radiator fan motor movement.

EAS30578

CHECKING THE COOLANT TEMPERATURE SENSOR

1. Remove:

- Coolant temperature sensor
Refer to "CYLINDER HEAD" on page 5-13.

EWA14130



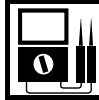
WARNING

- Handle the coolant temperature sensor with special care.

- **Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.**

2. Check:

- Coolant temperature sensor resistance
Out of specification → Replace.



Coolant temperature sensor resistance

2513–2777 Ω at 20 °C (2513–2777 Ω at 68 °F)

Coolant temperature sensor resistance

210–221 Ω at 100 °C (210–221 Ω at 212 °F)

- a. Connect the digital circuit tester to the coolant temperature sensor terminals as shown.



Digital circuit tester (CD732)

90890-03243

Model 88 Multimeter with tachometer

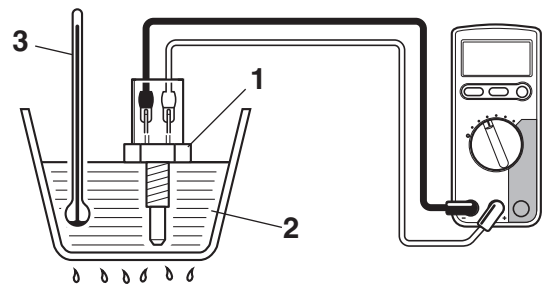
YU-A1927

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

TIP

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

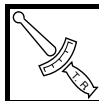
- c. Place a thermometer "3" in the coolant.



- d. Heat the coolant or let it cool down to the specified temperatures.
- e. Measure the coolant temperature sensor resistance.

3. Install:

- Coolant temperature sensor



Coolant temperature sensor

15 N·m (1.5 kgf·m, 11 lb·ft)

EAS30681

CHECKING THE FUEL INJECTOR

1. Check:

- Fuel injector resistance
Out of specification → Replace the fuel injector.



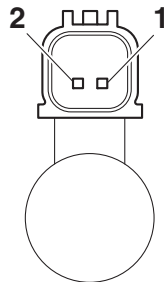
Resistance
12.2 Ω

- Disconnect the fuel injector coupler from fuel injector.
- Connect the digital circuit tester to the fuel injector terminals as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → Injector terminal "1"
- Negative tester probe → Injector terminal "2"



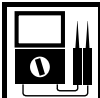
- Measure the fuel injector resistance.

EAS31553

CHECKING THE SMART KEY BATTERY

1. Check:

- Smart key battery voltage
Out of specification → Replace the smart key battery.



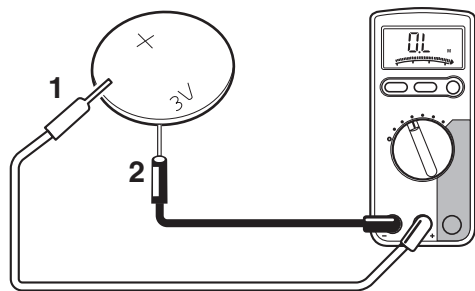
Smart key battery voltage
2.7–3.2 V

- Remove the smart key battery from the smart key.
- Connect the digital circuit tester to the smart key battery as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → positive battery terminal "1"
- Negative tester probe → negative battery terminal "2"



- Measure the smart key battery voltage.

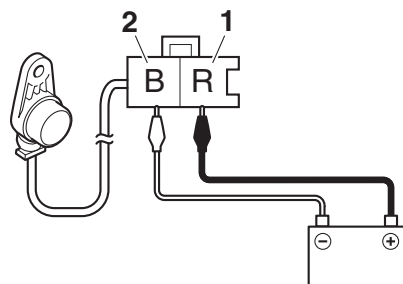
EAS31555

CHECKING THE BUZZER

1. Check:

- Buzzer operation
Buzzer does not sound → Replace.
 - Disconnect the buzzer coupler from the wire harness.
 - Connect the battery (12 V) to the buzzer coupler as shown.

- Positive battery lead → red "1"
- Negative battery lead → black "2"



- Check that the buzzer sounds.

EAS31257

CHECKING THE MAIN SWITCH SOLENOID

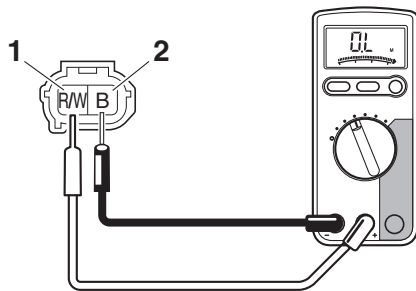
1. Check:

- Main switch solenoid
 - Disconnect the main switch solenoid coupler from the wire harness.

- b. Connect the digital circuit tester to the main switch solenoid as shown.



- Positive tester probe → red/white "1"
- Negative tester probe → black "2"



- c. Check the main switch solenoid continuity.
d. If there is no continuity, replace the main switch assembly.

TROUBLESHOOTING

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE	9-1
SELF-DIAGNOSTIC FUNCTION TABLE	9-1
DIAGNOSTIC CODE: SENSOR OPERATION TABLE	9-8
DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE	9-9
 EVENT CODE TABLE	 9-11

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS20116

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS31118

SELF-DIAGNOSTIC FUNCTION TABLE

TIP

For details of the fault code, refer to "TROUBLESHOOTING METHOD" on page 8-33.

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0106	Intake air pressure sensor (pipes and hoses system)	<ul style="list-style-type: none"> Detached throttle body sensor assembly. Improperly installed throttle body. Clogged intake air pressure sensor hole. 	Engine idling speed is high. Engine idling speed is unstable. Engine response is poor. Loss of engine power. Increased exhaust emissions.	Intake air pressure difference is fixed to 0 [kPa]. Load is detected according to the throttle opening. Intake manifold pressure is calculated using the throttle position sensor. Transient control according to the intake air pressure is not carried out. Intake air pressure is fixed to 101.3 [kPa]. O ₂ feedback is not carried out.
P0107 P0108	[P0107] Intake air pressure sensor (open or ground short circuit detected) [P0108] Intake air pressure sensor (power short circuit detected) (no normal signals are received from the intake air pressure sensor)	[P0107] Low voltage of the intake air pressure sensor circuit (0.2 V or less) [P0108] High voltage of the intake air pressure sensor circuit (4.9 V or more) <ul style="list-style-type: none"> Defective coupler between throttle body sensor assembly and ECU. Open or short circuit in wire harness between throttle body sensor assembly and ECU. Defective intake air pressure sensor. Malfunction in ECU. 	Engine idling speed is high. Engine idling speed is unstable. Engine response is poor. Loss of engine power. Increased exhaust emissions.	Intake air pressure difference is fixed to 0 [kPa]. Load is detected according to the throttle opening. Intake manifold pressure is calculated using the throttle position sensor. Transient control according to the intake air pressure is not carried out. Intake air pressure is fixed to 101.3 [kPa]. O ₂ feedback is not carried out.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0112 P0113	[P0112] Intake air temperature sensor (ground short circuit detected) [P0113] Intake air temperature sensor (open or power short circuit detected) (no normal signals are received from the intake air temperature sensor)	[P0112] Low voltage of the intake air temperature sensor circuit (0.2 V or less) [P0113] High voltage of the intake air temperature sensor circuit (4.8 V or more) <ul style="list-style-type: none"> • Defective coupler between throttle body sensor assembly and ECU. • Open or short circuit in wire harness between throttle body sensor assembly and ECU. • Improperly installed throttle body sensor assembly. • Defective intake air temperature sensor. • Malfunction in ECU. 	Engine is difficult to start. Increased exhaust emissions. Engine idling speed is unstable.	The intake air temperature is fixed to 20 [°C]. O ₂ feedback is not carried out. ISC learning is not carried out.
P0117 P0118	[P0117] Coolant temperature sensor (ground short circuit detected) [P0118] Coolant temperature sensor (open or power short circuit detected) (no normal signals are received from the coolant temperature sensor)	[P0117] Low voltage of the coolant temperature sensor circuit (0.1 V or less) [P0118] High voltage of the coolant temperature sensor circuit (4.8 V or more) <ul style="list-style-type: none"> • Defective coupler between coolant temperature sensor and ECU. • Open or short circuit in wire harness between coolant temperature sensor and ECU. • Improperly installed coolant temperature sensor. • Defective coolant temperature sensor. • Malfunction in ECU. 	Engine is difficult to start. Increased exhaust emissions. Engine idling speed is unstable.	O ₂ feedback is not carried out. ISC learning is not carried out. Coolant temperature is fixed to 30 [°C] when the main switch is turned to "ON" and 80 [°C] when the vehicle is traveling.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0122 P0123	[P0122] Throttle position sensor (open or ground short circuit detected) [P0123] Throttle position sensor (power short circuit detected) (no normal signals are received from the throttle position sensor)	[P0122] Low voltage of the throttle position sensor circuit (0.2 V or less) [P0123] High voltage of the throttle position sensor circuit (4.8 V or more) <ul style="list-style-type: none"> • Defective coupler between throttle body sensor assembly and ECU. • Open or short circuit in wire harness between throttle body sensor assembly and ECU. • Improperly installed throttle body sensor assembly. • Defective throttle position sensor. • Malfunction in ECU. 	Engine idling speed is high. Engine idling speed is unstable. Engine response is poor. Loss of engine power. Deceleration is poor. Increased exhaust emissions.	Change in the throttle opening is 0 (transient control is not carried out). Throttle opening is fixed to 15 [°]. Intake air pressure is fixed to 101.3 [kPa]. Fuel is not cut off due to the throttle opening. O ₂ feedback is not carried out.
P0132	O ₂ sensor (power short circuit detected) (no normal signals are received from the O ₂ sensor)	<ul style="list-style-type: none"> • High voltage of the O₂ sensor circuit (4.8 V or more) • Improperly installed O₂ sensor. • Defective coupler between O₂ sensor and ECU. • Power short circuit in wire harness between O₂ sensor and ECU. • Defective O₂ sensor. • Malfunction in ECU. 	Increased exhaust emissions.	O ₂ feedback is not carried out.
P0201	Fuel injector (no normal signals are received from the fuel injector circuit)	<ul style="list-style-type: none"> • Defective coupler between fuel injector and ECU. • Open or short circuit in wire harness between fuel injector and ECU. • Defective fuel injector. • Malfunction in ECU. • Improperly installed fuel injector. 	Loss of engine power. Engine is difficult to start. Engine cannot be started. Engine stops.	When engine is running: Engine is forcefully stopped. When engine is stopped: Engine cannot be started. Injection is not carried out.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0335	Crankshaft position sensor (no normal signals are received from the crankshaft position sensor)	<ul style="list-style-type: none"> Defective coupler between crankshaft position sensor and ECU. Open or short circuit in wire harness between crankshaft position sensor and ECU. Improperly installed crankshaft position sensor. Defective stator coil. Defective crankshaft position sensor. Malfunction in ECU. 	Engine cannot be started.	Does not operate.
P0351	Ignition system (no normal signals are received from the ignition circuit)	<ul style="list-style-type: none"> Defective coupler between ignition coil and ECU. Open or short circuit in wire harness between ignition coil and ECU. Improperly installed ignition coil. Defective ignition coil. Malfunction in ECU. 	Engine stops. Loss of engine power. Engine is difficult to start. Engine cannot be started.	When engine is running: Engine is forcefully stopped. When engine is stopped: Engine cannot be started. Injection is not carried out.
P0480	Radiator fan motor relay (open circuit detected) (no normal signals are received from the radiator fan motor relay)	<ul style="list-style-type: none"> Open circuit in wire harness between radiator fan motor relay and ECU. Defective coupler between radiator fan motor relay and ECU. Defective driver. Open circuit in radiator fan motor relay. Malfunction in ECU. 	Engine is difficult to start. Loss of engine power. Engine overheats. Increased exhaust emissions.	—
P0500	Front wheel sensor (no normal signals are received from the front wheel sensor)	<ul style="list-style-type: none"> Open or short circuit in wire harness between front wheel sensor and ABS unit. Open or short circuit in wire harness between ABS unit and ECU. Defective front wheel sensor. Malfunction in ABS unit. Malfunction in ECU. 	Vehicle speed is not displayed on the meter. Engine stalls when the vehicle is decelerating to a stop. Engine idling speed is high. Engine idling speed is unstable. Increased exhaust emissions.	O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0507	ISC valve (stuck fully open)	<ul style="list-style-type: none"> • Defective front wheel sensor. • Defective coupler between ISC and ECU. • Defective coupler between front wheel sensor and ABS unit. • Defective coupler between ABS unit and ECU. • Open or short circuit in wire harness between ISC and ECU. • Open or short circuit in wire harness between front wheel sensor and ABS unit. • Open or short circuit in wire harness between ABS unit and ECU. • Improperly installed ISC and front wheel sensor. • Disconnected hose or air leak from intake air passage. • Defective throttle valve or throttle cable. • Defective ISC unit (ISC valve stuck fully open). • Malfunction in ECU. 	Engine idling speed is high.	Idle speed control is not carried out.
P0511	ISC (Idle Speed Control) unit (ISC unit does not operate)	<ul style="list-style-type: none"> • Defective coupler between ISC and ECU. • Open or short circuit in wire harness between ISC and ECU. • Defective ISC stepping motor. • Malfunction in ECU. 	<p>Engine is difficult to start.</p> <p>Engine idling speed is unstable.</p> <p>Engine idling speed is high.</p>	Power is not supplied to the ISC unit.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0560	Charging voltage is abnormal.	<ul style="list-style-type: none"> • Battery overcharging (defective rectifier/regulator). • Battery overcharging (broken or disconnected rectifier/regulator lead). • Battery over-discharging (broken or disconnected lead in charging system). • Battery over-discharging (defective rectifier/regulator). 	Engine is difficult to start. Increased exhaust emissions. Battery performance has deteriorated or battery is defective.	O ₂ feedback is not carried out. ISC learning is not carried out.
P0601	Faulty ECU memory. (ROM data error)	<ul style="list-style-type: none"> • Malfunction in ECU. 	Engine cannot be started.	Engine cannot be started. Ignition and injection are not carried out. Judgment for other fault codes is not carried out. Writing to EEPROM is not carried out.
P062F	EEPROM writing error	<ul style="list-style-type: none"> • ISC learning value is not properly written. • O₂ feedback learning value is not properly written. • CO adjustment value is not properly written. • OBD memory value is not properly written. • Malfunction in ECU. • Tire diameter learning values are not properly written. 	Increased exhaust emissions. Engine cannot be started or is difficult to start. Engine idling speed is unstable. OBD memory value is not correct. Traction control system does not operate properly.	ISC learning values = Default values O ₂ feedback learning value is initialized. CO adjustment value is initialized. OBD memory value is initialized. Tire diameter learning values = Default values
P0657	Fuel system voltage (incorrect voltage supplied to the fuel injector and fuel pump)	<ul style="list-style-type: none"> • Open or short circuit in wire harness between main switch and ECU. • Open circuit in wire harness between battery and ECU. • Malfunction in ECU. 	Engine is difficult to start. Increased exhaust emissions.	Monitor voltage = 12 [V] O ₂ feedback is not carried out.
P1601	Sidestand switch (open or short circuit detected) (no normal signals are received from the sidestand switch)	<ul style="list-style-type: none"> • Defective coupler between sidestand switch and ECU. • Open or short circuit in wire harness between sidestand switch and ECU. • Defective sidestand switch. • Malfunction in ECU. 	Engine cannot be started.	Engine is forcefully stopped.


SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Fault code No.	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P1604 P1605	[P1604] Lean angle sensor (ground short circuit detected) [P1605] Lean angle sensor (open or power short circuit detected)	[P1604] Low voltage of the lean angle sensor circuit (0.2 V or less) [P1605] High voltage of the lean angle sensor circuit (4.8 V or more) <ul style="list-style-type: none"> • Defective connection of lean angle sensor coupler. • Defective connection of ECU coupler. • Open or short circuit in wire harness between lean angle sensor and ECU. • Defective lean angle sensor. • Malfunction in ECU. 	Engine cannot be started. Engine stops.	When engine is running: Engine is forcefully stopped. When engine is stopped: Engine cannot be started.
P2158	Rear wheel sensor (no normal signals are received from the rear wheel sensor)	<ul style="list-style-type: none"> • Open or short circuit in wire harness between rear wheel sensor and ABS unit. • Open or short circuit in wire harness between ABS unit and ECU. • Defective rear wheel sensor. • Defective ABS unit. • Malfunction in ECU. 	Traction control system does not operate. Traction control system indicator light on the multi-function meter comes on. "TCS" indicator light on the multi-function meter cannot be used (the traction control system is turned off).	Traction control system does not operate.
P2195	O ₂ sensor (open circuit detected) (no normal signals are received from the O ₂ sensor)	<ul style="list-style-type: none"> • Signal voltage is 0.25–0.53 V. • Improperly installed O₂ sensor. • Defective coupler between O₂ sensor and ECU. • Open or short circuit in wire harness between O₂ sensor and ECU. • Defective O₂ sensor. • Malfunction in ECU. 	Increased exhaust emissions.	O ₂ feedback is not carried out.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS31120

DIAGNOSTIC CODE: SENSOR OPERATION TABLE

Diagnostic code No.	Item	Tool display	Procedure
01	Throttle position sensor signal <ul style="list-style-type: none"> Fully closed position Fully open position 	13–21 97–107	Check with throttle valve fully closed. Check with throttle valve fully open.
03	Intake air pressure	Displays the intake air pressure.	Operate the throttle while pulling the brake lever and pushing the “  ” side of the start/engine stop switch. (If the display value changes, the performance is OK.)
05	Intake air temperature	When engine is cold: Displays temperature closer to air temperature. When engine is hot: Air temperature + approx. 20 °C (68 °F).	Compare the actually measured air temperature with the tool display value.
06	Coolant temperature	When engine is cold: Displays temperature closer to air temperature. When engine is hot: Displays current coolant temperature.	Compare the actually measured coolant temperature with the tool display value.
07	Front wheel speed pulse	Front wheel speed pulse 0–999	Check that the number increases when the front 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 	Lean angle sensor output voltage 0.4–1.4 3.7–4.4	Remove the lean angle sensor and incline it more than 50 degrees.
09	Fuel system voltage (battery voltage)	Approximately 12.0	Compare the actually measured battery voltage with the tool display value. (If the actually measured battery voltage is low, recharge the battery.)
20	Sidestand switch <ul style="list-style-type: none"> Stand retracted Stand extended 	ON OFF	Extend and retract the side-stand.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Tool display	Procedure
60	EEPROM fault code display <ul style="list-style-type: none"> No history History exists Display the EEPROM writing error for fault code No. P062F. If more than one item is defective, the displays alternates every two seconds to show all the detected numbers. 	00 <ul style="list-style-type: none"> No malfunctions detected (If the self-diagnosis fault code P062F is indicated, the ECU is defective.) 01 (CO adjustment value) 11 (Data error for ISC (Idle Speed Control) learning values) 12 (O ₂ feedback learning value) 14 (Tire diameter learning values)	— —
67	ISC (Idle Speed Control) learning condition display ISC (Idle Speed Control) learning data erasure	00 ISC (Idle Speed Control) learning data has been erased. 01 It is not necessary to erase the ISC (Idle Speed Control) learning data. 02 It is necessary to erase the ISC (Idle Speed Control) learning data.	To erase the ISC (Idle Speed Control) learning data, click the Yamaha diagnostic tool "Actuator Check" button three times in 5 seconds.
70	Control number	0–254 [-]	—
87	A/F control learning data erasure	00 ECU learning data has been erased. 01 ECU learning data has not been erased.	To erase the ECU learning data, click the Yamaha diagnostic tool "Actuator Check" button three times in 5 seconds.

EAS31121

DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE

Diagnostic code No.	Item	Actuation	Procedure
30	Ignition coil	Actuates the ignition coil five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the ignition coil is actuated.	Check that a spark is generated five times. <ul style="list-style-type: none"> Connect an ignition checker.
36	Fuel injector	Actuates the injector five times at one-second intervals. The "check" indicator on the Yamaha diagnostic tool screen come on each time the fuel injector is actuated.	Disconnect the fuel pump coupler. Check that injector is actuated five times by listening for the operating sound.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Actuation	Procedure
51	Radiator fan motor relay	Actuates the radiator fan motor relay five times at five-second intervals. The “check” indicator on the Yamaha diagnostic tool screen comes on each time the relay is actuated.	Check that the radiator fan motor relay is actuated five times by listening for the operating sound.
52	Headlight	Actuates the headlight five times at five-second intervals. The “check” indicator on the Yamaha diagnostic tool screen come on each time the relay is actuated.	Check that the headlight is on five times.
54	ISC (Idle Speed Control) unit	Actuates and fully closes the ISC valve, then opens it to the standby opening position. This operation takes approximately 3 seconds until it is completed. The “check” indicator on the Yamaha diagnostic tool screen come on.	The ISC unit vibrates when the ISC valve operates.

EVENT CODE TABLE

EAS20164

EVENT CODE TABLE

No.	Item	Symptom	Possible cause	Remarks
192	Intake air pressure sensor	Brief abnormality detected in intake air pressure sensor	Same as for fault code number P0107 and P0108	Perform the checks and maintenance jobs for fault code number P0107 and P0108.
193	Throttle position sensor	Brief abnormality detected in throttle position sensor	Same as for fault code number P0122 and P0123	Perform the checks and maintenance jobs for fault code number P0122 and P0123.
196	Coolant temperature sensor	Brief abnormality detected in coolant temperature sensor	Same as for fault code number P0117 and P0118	Perform the checks and maintenance jobs for fault code number P0117 and P0118.
197	Intake air temperature sensor	Brief abnormality detected in intake air temperature sensor	Same as for fault code number P0112 and P0113	Perform the checks and maintenance jobs for fault code number P0112 and P0113.
203	Lean angle sensor	Brief abnormality detected in lean angle sensor	Same as for fault code number P1604 and P1605	Perform the checks and maintenance jobs for fault code number P1604 and P1605.
218	Crankshaft position sensor	Brief abnormality detected in crankshaft position sensor	Same as for fault code number P0335	Perform the checks and maintenance jobs for fault code number P0335.
240	O ₂ sensor (Correction value remains at upper limit)	Correction value remains at upper limit during O ₂ feedback	<ul style="list-style-type: none"> • Open or short circuit in the wire harness between the sensor and the ECU gray/red–gray/red • Low fuel pressure • Clogged fuel injector • Sensor malfunction • Defective ECU • Defective fuel injection system 	<ul style="list-style-type: none"> • If a fault code is indicated, perform the checks and maintenance jobs for the fault code first. * Event code number 240 may be indicated even if the system is normal.
241	O ₂ sensor (Correction value remains at lower limit)	Correction value remains at lower limit during O ₂ feedback	<ul style="list-style-type: none"> • Open or short circuit in the wire harness between the sensor and the ECU gray/red–gray/red • Low fuel pressure • Clogged fuel injector • Sensor malfunction • Defective ECU • Defective fuel injection system 	<ul style="list-style-type: none"> • If a fault code is indicated, perform the checks and maintenance jobs for the fault code first. * Event code number 241 may be indicated even if the system is normal.

EVENT CODE TABLE

No.	Item	Symptom	Possible cause	Remarks
242	ISC (idle speed control) (Correction value remains at upper limit)	Correction value remains at upper limit while the engine is idling	Low engine idling speed <ul style="list-style-type: none"> • Clogged throttle body • Improperly adjusted throttle cable • Defective fuel injection system • Dirty or worn spark plug • Defective battery • Defective ECU 	<ul style="list-style-type: none"> • Execute the diagnostic mode (diagnostic code number 67) and check the ISC maintenance requirements. • If a fault code is indicated, perform the checks and maintenance jobs for the fault code first. * Event code number 242 may be indicated even if the system is normal.
243	ISC (idle speed control) (Correction value remains at lower limit)	Correction value remains at lower limit while the engine is idling	High engine idling speed <ul style="list-style-type: none"> • Improperly adjusted throttle cable • Defective fuel injection system • Dirty or worn spark plug • Defective battery • Defective ECU 	<ul style="list-style-type: none"> • If a fault code is indicated, perform the checks and maintenance jobs for the fault code first. * Event code number 243 may be indicated even if the system is normal.
244	Difficult/unable to start engine	Engine starting difficult/unable condition detected	<ul style="list-style-type: none"> • Empty fuel tank • Defective fuel injection system • Dirty or worn spark plug • Defective battery • Defective ECU 	<ul style="list-style-type: none"> • If a fault code is indicated, perform the checks and maintenance jobs for the fault code first. * Event code number 244 may be indicated even if the system is normal.
245	Engine stall	Engine stall detected	<ul style="list-style-type: none"> • Empty fuel tank • Improperly adjusted throttle cable • Defective fuel injection system • Dirty or worn spark plug • Defective battery • Defective ECU 	<ul style="list-style-type: none"> • If a fault code is indicated, perform the checks and maintenance jobs for the fault code first. * Event code number 245 may be indicated even if the system is normal.

WIRING DIAGRAM**CZD300-A/CZD300-AH 2017**

1. Crankshaft position sensor
2. AC magneto
3. Rectifier/regulator
4. Request switch
5. Main switch solenoid
6. Main switch
7. Smart key unit
8. Buzzer
9. Radiator fan motor fuse
10. Backup fuse
11. Main fuse
12. ABS control unit fuse
13. Signaling system fuse
14. Signaling system fuse 2
15. Grip warmer coupler
16. Diode 1
17. Answer back fuse
18. Terminal fuse
19. Turn signal light and hazard fuse
20. ABS solenoid fuse
21. ABS motor fuse
22. Battery
23. Auxiliary DC jack
24. Main fuse 2
25. Starter relay
26. Starter motor
27. Diode 2
28. Diode 3
29. Starting circuit cut-off relay
30. Sidestand switch
31. Handlebar switch (right)
32. Start/engine stop switch
33. Hazard switch
34. "TRIP/INFO" switch
35. Front brake light switch
36. Coolant temperature sensor
37. Throttle body sensor assembly
38. Throttle position sensor
39. Intake air pressure sensor
40. Intake air temperature sensor
41. O₂ sensor
42. Lean angle sensor
43. Yamaha diagnostic tool coupler
44. ECU (Engine Control Unit)
45. Ignition coil
46. Spark plug
47. Fuel injector
48. Fuel sender
49. Fuel pump
50. Fuel pump relay
51. ISC (Idle Speed Control) unit
52. Radiator fan motor relay
53. Radiator fan motor
54. Engine ground
55. Front wheel sensor
56. Rear wheel sensor

57. Joint connector
58. ABS test coupler
59. ABS ECU
60. License plate light
61. Tail/brake light assembly (right)
62. Rear turn signal light (right)
63. Tail/brake light (right)
64. Tail/brake light assembly (left)
65. Rear turn signal light (left)
66. Tail/brake light (left)
67. Frame ground
68. Turn signal/hazard relay
69. Horn
70. Handlebar switch (left)
71. Dimmer switch
72. Horn switch
73. Turn signal switch
74. Rear brake light switch
75. Front turn signal light (right)
76. Front turn signal light (left)
77. Headlight assembly
78. Headlight (low beam)
79. Headlight (high beam)
80. Auxiliary light
81. Meter assembly
82. Smart key indicator light
83. Multi-function meter
84. Traction control system indicator light
85. ABS warning light
86. Engine trouble warning light
87. Meter light
88. Turn signal indicator light (right)
89. Turn signal indicator light (left)
90. High beam indicator light
91. Air temperature sensor
92. Storage box light

COLOR CODE

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



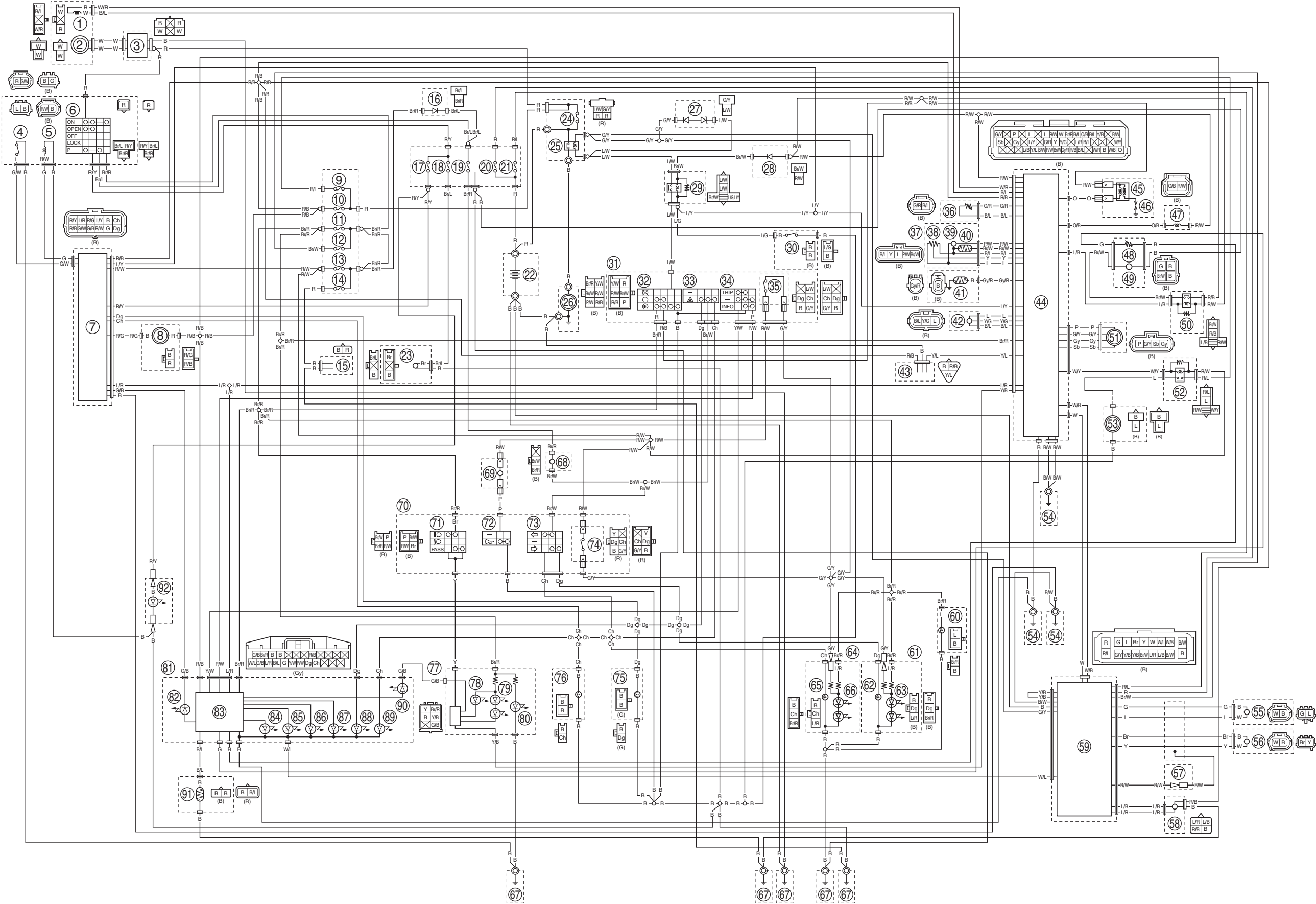
CZD300-A/CZD300-AH 2017
WIRING DIAGRAM

CZD300-A/CZD300-AH 2017
SCHÉMA DE CÂBLAGE

CZD300-A/CZD300-AH 2017
SCHALTPLAN

CZD300-A/CZD300-AH 2017
SCHEMA ELETTRICO

CZD300-A/CZD300-AH 2017
DIAGRAMA ELÉCTRICO



CZD300-A/CZD300-AH 2017
WIRING DIAGRAM

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