YAMAHA 2023

SERVICE MANUAL

MT-07

MT07P
MT07PC

LIT-11616-36-65 **BAT-28197-11**

EAS20003

IMPORTANT

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Please refer to “BASIC INFORMATION” (separate volume, Y0A-28197-10*) 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.

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

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

TIP

- * If the contents of the manual are revised, the last digit of the manual number will be increased by one.
- This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.
- Designs and specifications are subject to change without notice.

EAS30001

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.

EAS20002

MT07P/MT07PC
SERVICE MANUAL

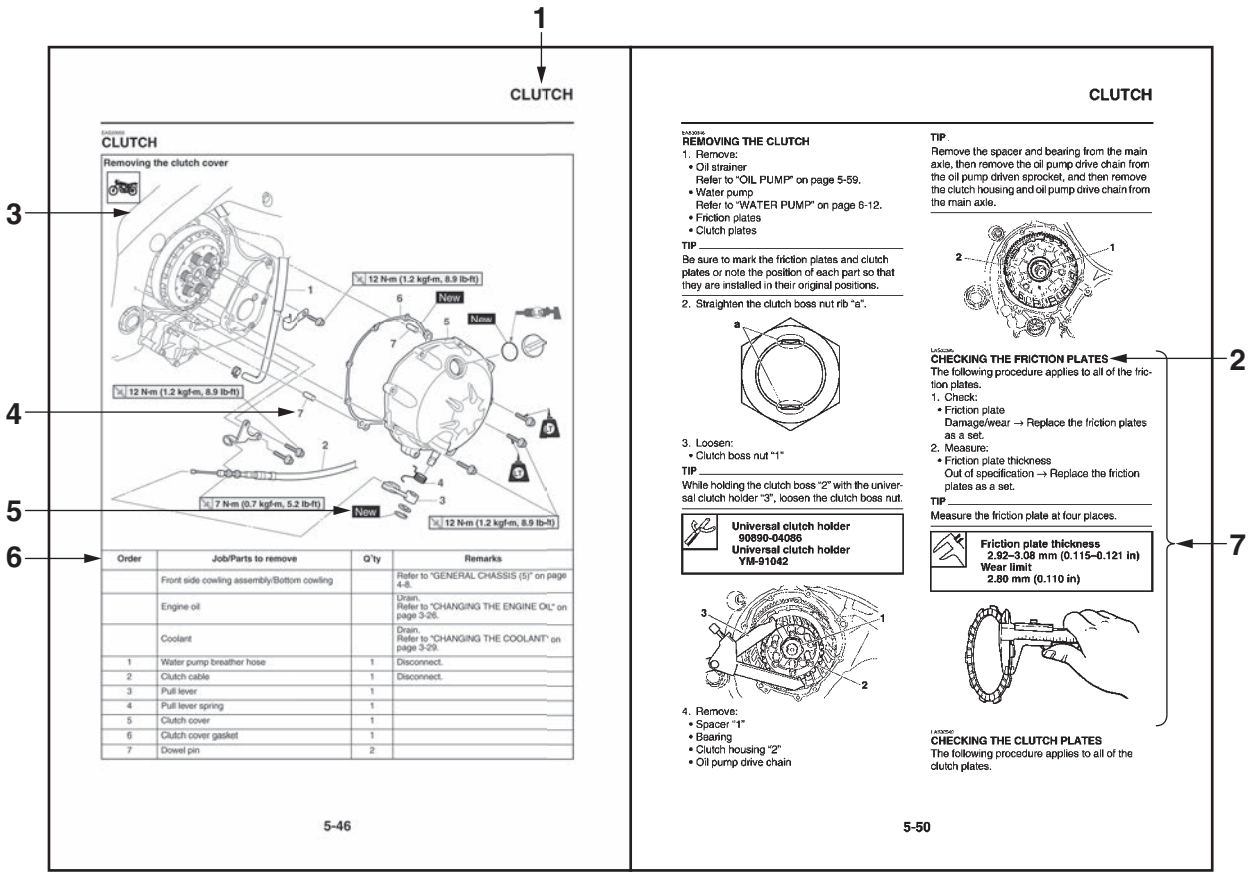
Printed in U.S.A.
P/N LIT-11616-36-65

EAS20004

HOW TO USE THIS MANUAL

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

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



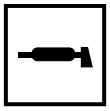
G088877

EAS20005
SYMBOLS

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

TIP

The following symbols are not relevant to every vehicle.

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

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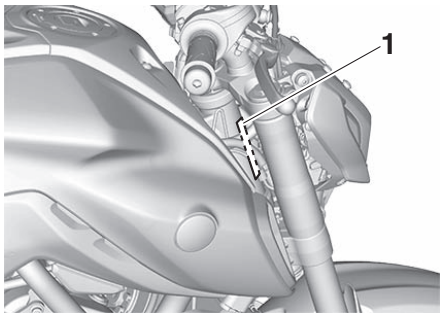
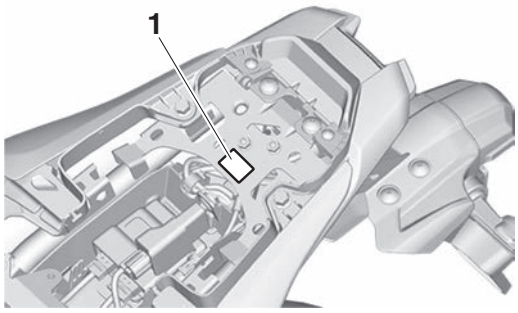
GENERAL INFORMATION

EAS20007
IDENTIFICATION

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



EAS30003
MODEL LABEL
The model label “1” is affixed to the frame under the passenger seat. This information will be needed to order spare parts.



EAS20008
FEATURES

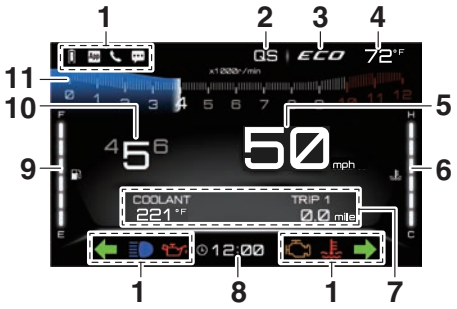
EAS33913
MAIN DISPLAY SCREEN

The main screen of the display has two different visual themes; Street and Touring. All functions are available in both themes. The theme can be selected in the menu system.

EWA18210
WARNING

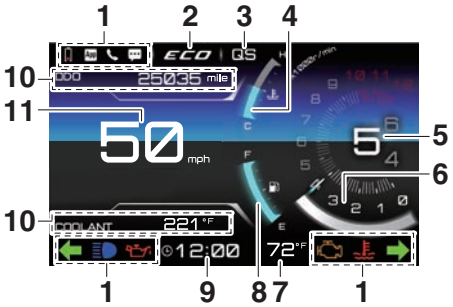
Stop the vehicle before making any setting changes. Changing settings while riding can distract the operator and increase the risk of an accident.

Street theme



1. Indicator icons
2. Quick shifter indicator “QS” (if equipped)
3. Eco indicator “ECO”
4. Air temperature display
5. Speedometer
6. Coolant temperature meter
7. Information display
8. Clock
9. Fuel meter
10. Transmission gear display
11. Tachometer

Touring theme



1. Indicator icons
2. Eco indicator “ECO”
3. Quick shifter indicator “QS” (if equipped)
4. Coolant temperature meter
5. Transmission gear display
6. Tachometer
7. Air temperature display
8. Fuel meter
9. Clock
10. Information display
11. Speedometer

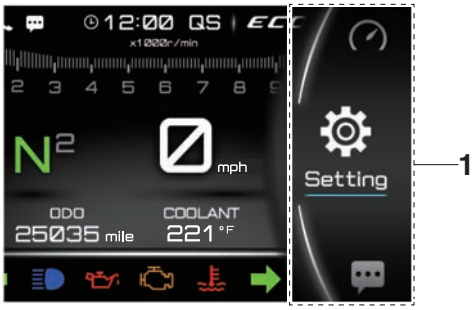
TIP

- This model uses a thin-film-transistor liquid-crystal display (TFT LCD) for good contrast and readability in various lighting conditions. However, due to the nature of this technology, it is normal for a small number of pixels to be inactive.
- The display units can be switched between kilometers/miles and Celsius/Fahrenheit.

Menu pop-out

The first layer of the menu system is a pop-out that appears on the right side of the main display. While the pop-out menu is displayed, various other display items are relocated/hidden as shown:

Street theme



1. Pop-out menu

Touring theme

1. Transmission gear display (Relocated)

Speedometer
The speedometer shows the vehicle's traveling speed.

Tachometer
The tachometer shows the engine speed, as measured by the rotational velocity of the crankshaft, in revolutions per minute (r/min).

ECA19660

NOTICE

Do not operate the engine in the tachometer red zone.

Red zone
10000 r/min and above

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

TIP

If all the fuel meter display segments flash repeatedly, have a Yamaha dealer inspect the vehicle.

Coolant temperature meter
The coolant temperature meter indicates the radiator coolant temperature. When the coolant is too hot, the top segment will flash.

TIP

If all the coolant temperature meter display segments flash repeatedly, have a Yamaha dealer inspect the vehicle.

Clock "⏲"
The clock uses a 12-hour time system.

TIP

The clock can be adjusted in the menu system.

Transmission gear display
This shows which gear the transmission is in. This model has 6 gears and a neutral position. The neutral position is indicated by "N".

TIP

If a malfunction occurs, "–" will be shown.

"ECO" indicator icon
This icon is shown when the vehicle is being operated in an environmentally friendly, fuel-efficient manner. The icon is not shown when idling.

TIP

Consider the following tips to reduce fuel consumption:
- Avoid high engine speeds during acceleration.
- Travel at a constant speed.
- Select the transmission gear that is appropriate for the vehicle speed.

Air temperature display
The air temperature is displayed from 16 °F (–9 °C) to 122 °F (50 °C) in 1 °F (1 °C) increments. The temperature displayed may vary from the actual ambient temperature.

TIP

"– – –" will be displayed if the detected temperature is higher or lower than the display range.

Coolant temperature warning icon "🌡"
This icon is shown when the coolant temperature is too high. Stop the vehicle and turn off the engine. Allow the engine to cool.

ECA10022

NOTICE

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

Oil pressure warning icon "🛢"
This icon is shown when the engine oil pressure is low. When the vehicle power is first turned on, engine oil pressure has yet to build up, therefore this icon will show until the engine has been started.

TIP

If a malfunction is detected, the oil pressure warning icon will flash repeatedly. If this occurs, have a Yamaha dealer inspect the vehicle.

ECA27240

NOTICE

Do not continue to operate the engine if the oil pressure is low.

Engine trouble warning icon "🔧"
This icon comes on or flashes if a problem is detected in the engine or other vehicle control system. If this occurs, have a Yamaha dealer inspect the vehicle.

TIP

When the vehicle is turned on, this icon should come on briefly and then go off. If it does not come on, or if it remains on, have a Yamaha dealer inspect the vehicle.

ECA26820

NOTICE

If the MIL starts flashing, reduce engine speed to prevent exhaust system damage.

TIP

The engine is sensitively monitored by the on-board diagnostic system to detect deterioration or malfunction of the emission control system. Therefore, the malfunction indicator (MIL) icon may come on or flash due to vehicle modifications, lack of maintenance, or excessive/improper use of the vehicle. To prevent this, observe these precautions:

- Do not attempt to modify the software of the engine control unit.
- Do not add any electrical accessories that interfere with engine control.
- Do not use aftermarket accessories or parts such as suspension, spark plugs, injectors, exhaust system, etc.
- Do not change the drivetrain specifications (chain, sprockets, wheels, tires, etc.).
- Do not remove or alter the O2 sensor, air induction system, or exhaust parts (catalysts or EXUP, etc.).
- Maintain the drive chain properly.
- Maintain correct tire pressure.
- Maintain proper brake pedal height to prevent rear brake from dragging.
- Do not operate the vehicle in an extreme manner. For example, repeated or excessive opening and closing of the throttle, racing, burnouts, wheelies, extended half-clutch use, etc.

High beam indicator icon ""

This icon is shown when the high beam of the headlight is on.

Turn signal indicator icons "  "/"  "

Each icon flashes when its corresponding turn signal lights are flashing.

Smartphone battery level indicator icon "  "

This icon displays the connected smartphone's current battery level.

- Icon off: No smartphone connected.
- "  ": The center bar moves up and down to indicate the battery level. When the battery level is below 11%, the icon will turn red and flash continuously.

Smartphone connectivity indicator icon "  "

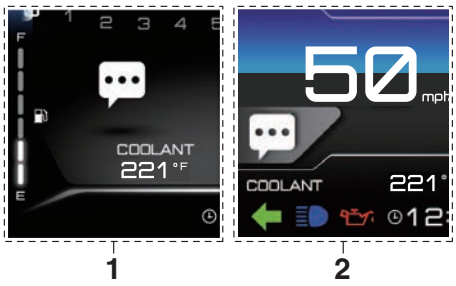
This icon comes on when a smartphone is successfully connected to the CCU.

Incoming call/message indicator icons

The incoming call indicator icon appears when the connected smartphone receives a call. It will remain on for 30 seconds.

1. Street theme
2. Touring theme

The incoming message indicator icon appears when the connected smartphone receives an SMS, E-mail or other notification. It will remain on for 10 seconds.



1. Street theme
2. Touring theme

When either the incoming call indicator or the incoming message indicator icons appear while using the Street theme, the transmission gear display will be relocated as shown:

1. Transmission gear display (Relocated)

TIP

- Only one indicator icon can be active in this location on the display at a time. The incoming call indicator icon has priority.
- Notifications must be setup for each application on the connected smartphone in advance.

Missed call indicator icon “ ”

The missed call indicator icon comes on when the connected smartphone misses a call. It will remain on until the vehicle power is turned off or until “Cancel Notification” is selected in the “Telephone” section of the menu system.

Unread message indicator icon “ ”

The unread message indicator icon comes on when the connected smartphone receives a message. It will remain on until the vehicle power is turned off or until “Cancel Notification” is selected in the “Message” section of the menu system.

Quick shifter icon (if equipped)

This icon comes on when the quick shifter is active and able to shift. When the icon is not visible, the quick shifter will not operate.

Information display

The vehicle information display can be set to show the following items:

- “ODO”: odometer
- “COOLANT”: coolant temperature
- “TRIP 1”: tripmeter 1
- “TRIP 2”: tripmeter 2
- “TRIP F”: fuel reserve tripmeter
- “INST FUEL”: current fuel consumption
- “AVG FUEL”: average fuel consumption

Rotate the “MENU” wheel switch to cycle the items.

Operate the vehicle information display as follows:

Rotate the “MENU” wheel switch to cycle which items are visible.

Short press the “MENU” wheel switch inward and the topmost (Touring theme) or leftmost (Street theme) item which is currently visible will be highlighted blue. If that item is non-resettable, the other visible item will be highlighted blue. If neither visible item is resettable, short pressing the “MENU” wheel switch inward has no effect.

Long press the “MENU” wheel switch inward and the blue-highlighted item will reset.

Short press the “MENU” wheel switch inward to deselect a blue-highlighted item.

TIP

- The “TRIP 1”, “TRIP 2”, “TRIP F”, and “AVG FUEL” items can be individually reset.
- The blue highlight will disappear after a few seconds without input from the “MENU” wheel switch.

Odometer “ODO”:

The odometer shows the total distance traveled by the vehicle.

TIP

The odometer will lock at 621370 mile (999999 km) and cannot be reset.

Coolant temperature “COOLANT”:

The coolant temperature is displayed from 104 °F (40 °C) to 242 °F (116 °C) in 1 °F (1 °C) increments.

TIP

- If the vehicle coolant temperature is below 104 °F (40 °C) the coolant temperature display will read “Low Temp”.
- If the vehicle coolant temperature is above 242 °F (116 °C) the coolant temperature display will read “High Temp”.

Tripmeters “TRIP 1” / “TRIP 2”:

“TRIP 1” and “TRIP 2” show the distance traveled since they were last reset.

TIP

“TRIP 1” and “TRIP 2” will reset to 0.0 and begin counting again after 9999.9 has been reached.

Fuel reserve tripmeter “TRIP F”:

When the fuel tank reserve level has been reached, “TRIP F” appears automatically and begins recording distance traveled from that point. After refueling and traveling some distance, “TRIP F” will disappear.

Current fuel consumption “INST FUEL”:
The current fuel consumption display can be set to “km/L”, “L/100km” or “MPG” in the menu system.

TIP

If traveling at speeds under 6mi/h (10 km/h), “– – .–” will be displayed.

Average fuel consumption “AVG FUEL”:
The average fuel consumption display can be to “km/L”, “L/100km” or “MPG” in the menu system.

TIP

After resetting the average fuel consumption display, “– –.–” will be shown until the vehicle has traveled 1 mile.

EAS33897
MENU SYSTEM

The first layer of the menu system is a pop-out that appears on the right side of the main display. All other menu screens replace the main display screen with a full-screen view. While the menu system is full-screen, the main display items are relocated/hidden as shown:

TIP

- The menu system cannot be accessed while the vehicle is in motion or if certain warning lights/ indicator icons are on. If this occurs while the menu system is already open, then the display will return to the main screen.
- If the “MENU” wheel switch is not operated for 10 seconds the menu system will close and the display will return to the main screen.

Menu system general operation:
The menu system for this vehicle is controlled with the “MENU” wheel switch on the right handlebar:

- While the main screen is displayed, long press the “MENU” wheel switch to open the menu system top layer.
- Rotate the “MENU” wheel switch to cycle/highlight different items or adjust selected item values.
- Short press the “MENU” wheel switch to open a highlighted module or select/de-select a blue-highlighted item. When an item is selected it will turn grey.
- If a menu item is selected, long press of the “MENU” wheel switch will confirm the setting and return the menu to the previous module.
- If no menu item is selected, long press the “MENU” wheel switch to exit the menu system and return to the main screen.

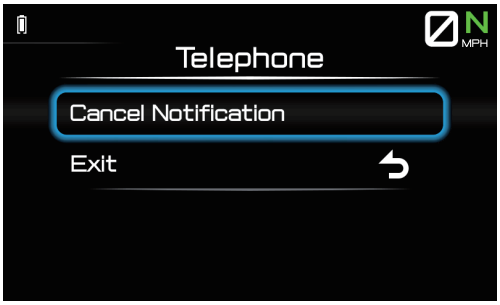
The menu system is divided into the following main modules:

“Setting”	Adjust settings related to the multi-function meter’s operation.
“Themes”	Change between display themes.
“Telephone”	Incoming/missed call settings.
“Message”	Incoming/missed notification settings.

“Themes”

This module allows you to switch between display themes. Select a theme and the display will return to the main screen in that theme.

“Telephone”



This module allows you to clear all stored call notifications. When “Cancel Notification” is selected, the incoming/ missed call icon will disappear from the main screen.

"Message"

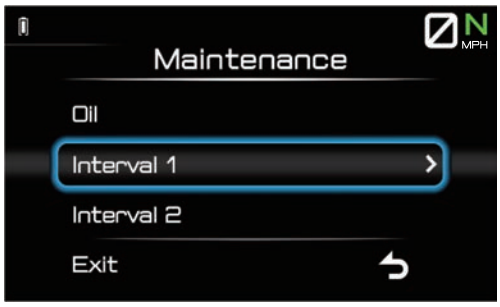
This module allows you to clear all stored message notifications. When "Cancel Notification" is selected, the message icon will disappear from the main screen.

"Setting"

The setting menu is further divided into the following modules:

"Maintenance"	Set maintenance tripmeters.
"Unit"	Change measurement units.
"Brightness"	Adjust display brightness.
"Clock"	Set clock.
"All Reset"	Reset system settings.

"Maintenance"



This module allows you to record distance traveled between engine oil changes "Oil", and two other maintenance intervals of your choice "Interval 1"/ "Interval 2". Short press the "MENU" wheel switch inward to enter the items sub-module, where the current mileage for the item can be viewed and the item can be reset.

After maintenance to one of the items has been completed, short press the "MENU" wheel switch to select it and then long press the "MENU" wheel switch to reset it.

"Unit"

This module allows you to change the measurement units. Each of the three items contain a sub-menu where the desired unit is selected.

TIP

If "mile" is selected as a speed unit, "MPG" will be automatically set as the fuel economy unit and the menu item will be grayed out.

"Brightness"

This module allows you to adjust the screen brightness between 3 different levels.

TIP

The TFT display is equipped with an ambient light sensor which is used to adjust the screen brightness automatically. Using this module to manually set the brightness cancels automatic mode. Turning the main switch “OFF”/“ON” will reset screen brightness to automatic mode.

“Clock”

This module allows you to set the 12-hour clock. The hours and minutes are set individually.

“All Reset”

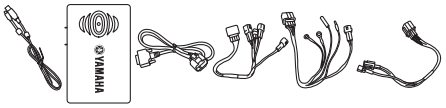
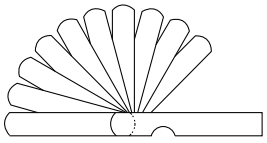
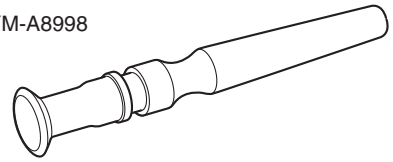
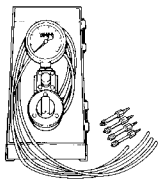
This module allows you to reset all of the following at once: tripmeters (not including maintenance tripmeters), and all measurement units.

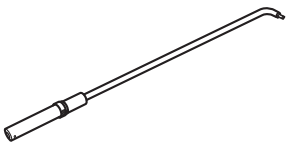
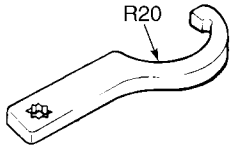
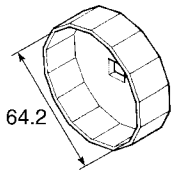
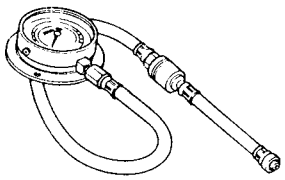
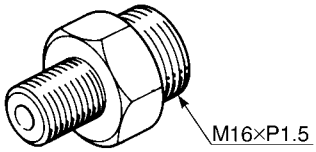
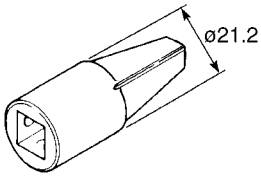
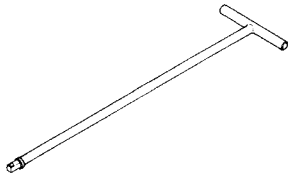
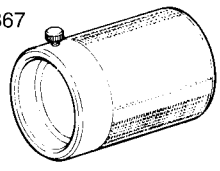
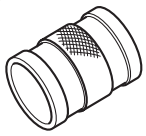
EAS20012
SPECIAL TOOLS

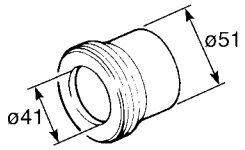
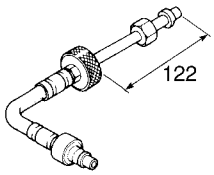
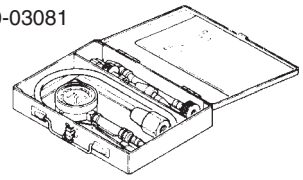
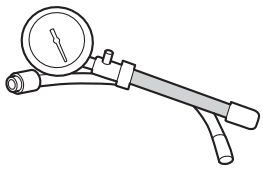
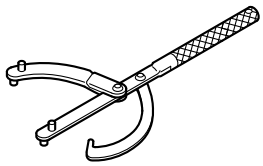
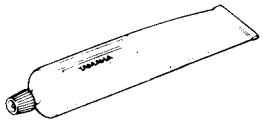
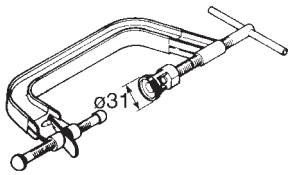
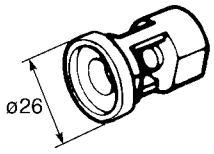
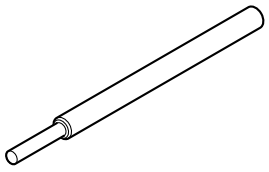
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

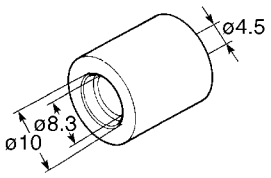
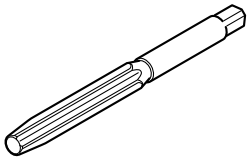
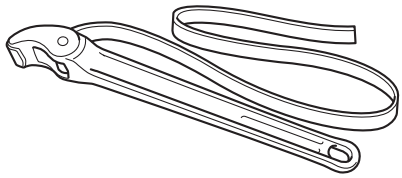
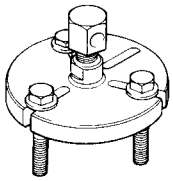
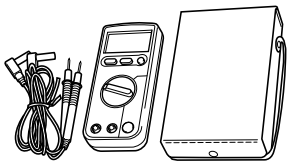
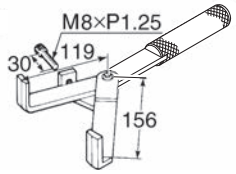
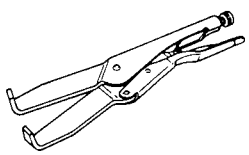
TIP

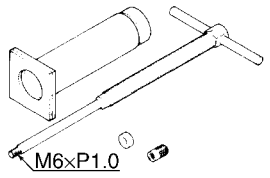
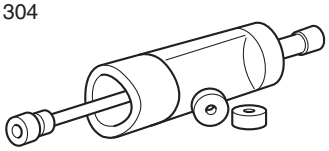
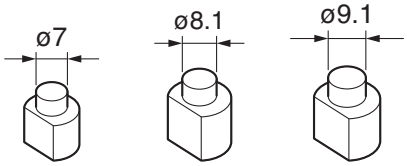
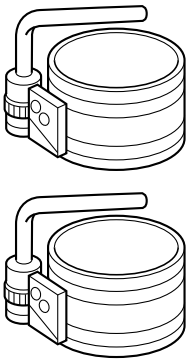
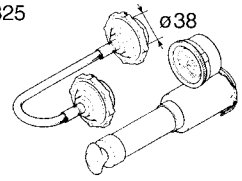
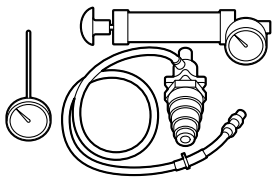
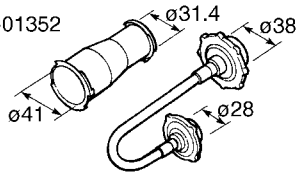
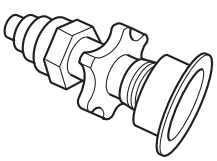
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part numbers starting with “90890-”.

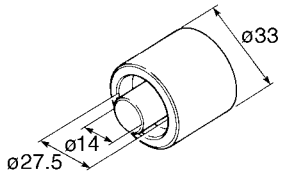
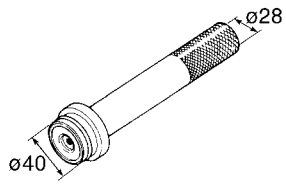
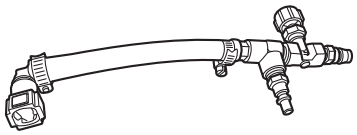
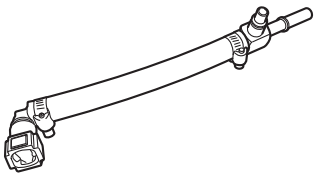
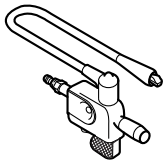
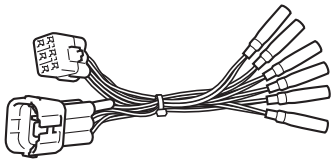
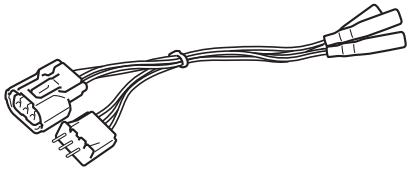
Tool name/Tool No.	Illustration	Reference pages
Yamaha diagnostic tool USB (US) 90890-03269		3-4, 3-8, 4-65, 4-66, 7-15, 7-15, 7-15, 8-40, 9-3, 9-21, 9-22
Yamaha diagnostic tool (A/I) 90890-03273		3-4, 3-8, 4-65, 4-66, 7-15, 7-15, 7-15, 8-40, 9-3, 9-21, 9-22
Thickness gauge 90890-03268 Feeler gauge set YU-26900-9		3-6, 4-25, 4-35, 5-58
Valve lapper (ø14) 90890-04101 Valve lapper (ø14) YM-A8998	90890-04101  YM-A8998 	3-7
Vacuum gauge 90890-03094 Vacuummate YU-44456	90890-03094  YU-44456 	3-9

Tool name/Tool No.	Illustration	Reference pages
Carburetor angle driver 2 90890-03173		3-9
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472		3-19, 4-85
Oil filter wrench 90890-01426 Oil filter wrench YU-38411		3-22
Pressure gauge 90890-03153 Pressure gauge YU-03153		3-23, 7-16, 7-17
Oil pressure adapter H 90890-03139		3-23
Damper rod holder (ø21.2) 90890-01460		4-77, 4-79
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-77, 4-79
Fork seal driver weight 90890-01367 Replacement hammer YM-A9409-7	90890-01367  YM-A9409-7/YM-A5142-4 	4-80, 4-80, 4-80

Tool name/Tool No.	Illustration	Reference pages
Fork seal driver attachment (ø41) 90890-01381 Replacement 41 mm YM-A5142-2		4-80, 4-80
Compression gauge extension 122mm 90890-04136 Compression gauge extension 122mm YM-04136		5-8
Compression gauge 90890-03081 Engine compression tester YU-33223	90890-03081  YU-33223 	5-8
Rotor holding tool 90890-01235 Universal magneto and rotor holder YU-01235		5-23, 5-26
Yamaha bond No. 1215 90890-85505 Three bond No. 1215®		5-30, 5-48, 5-74, 5-76
Valve spring compressor 90890-04200 Valve spring compressor YM-04019		5-38, 5-42
Valve spring compressor attachment (ø26) 90890-01243 Valve spring compressor attachment (ø26) YM-01253-1		5-38, 5-42
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-39

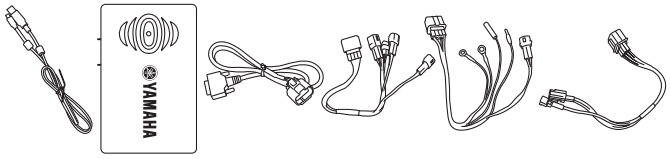
Tool name/Tool No.	Illustration	Reference pages
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117		5-39
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118		5-39
Rotor holding tool 90890-04166 Rotor holding tool YM-04166		5-46, 5-46, 5-47, 5-47
Flywheel puller 90890-01362 Heavy duty puller YU-33270-B		5-46
Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927		5-51, 8-40, 8-41, 8-42, 8-43, 8-44, 8-44, 8-45, 8-46, 8-46, 8-46, 8-47, 8-48, 8-49, 8-49, 8-50, 8-50, 8-51, 8-51, 8-51
Clutch holder 90890-04199 Universal clutch holder YM-91042	 YM-91042 	5-57, 5-60

Tool name/Tool No.	Illustration	Reference pages
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304  YU-01304 	5-80
Connecting rod big end bearing installer 90890-04193 Connecting rod big end bearing installer YM-04193	 	5-82, 5-85
Piston ring compressor 90890-05158 Piston ring compressor YM-08037		5-87
Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A	90890-01325  YU-24460-A 	6-4, 6-5
Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984	90890-01352  YU-33984 	6-4, 6-5

Tool name/Tool No.	Illustration	Reference pages
Mechanical seal installer (ø33) 90890-04132 Water pump seal installer (ø33) YM-33221-A		6-14
Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 & 50 mm YM-04058		6-14
Fuel injector pressure adapter 90890-03210 Fuel injector pressure adapter YU-03210		7-16
Fuel pressure adapter 90890-03176 Fuel pressure adapter YM-03176		7-17
Ignition checker 90890-06754 Oppama pet–4000 spark checker YM-34487		8-44
Test harness– lean angle sensor (6P) 90890-03209 Test harness– lean angle sensor (6P) YU-03209		8-45
Test harness S– pressure sensor (3P) 90890-03207 Test harness S– pressure sensor (3P) YU-03207		8-49

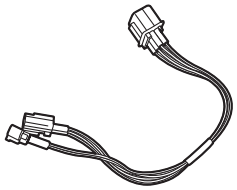
TIP

Yamaha diagnostic tool (A/I) 90890-03273
This special tool includes the YDT sub harness (6P) (90890-03266).



TIP

YDT sub harness (6P) 90890-03266
If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.



SPECIFICATIONS

EAS20013
GENERAL SPECIFICATIONS

Model	
Model	BATT (MT07P) BATU (MT07PC)
Dimensions	
Overall length	2085 mm (82.1 in)
Overall width	780 mm (30.7 in)
Overall height	1115 mm (43.9 in)
Wheelbase	1400 mm (55.1 in)
Ground clearance	140 mm (5.51 in)
Minimum turning radius	2.9 m (9.51 ft)
Weight	
Curb weight	184 kg (406 lb)
Loading	
Maximum load	171 kg (377 lb)
Riding capacity	2 person

EAS20014
ENGINE SPECIFICATIONS

Engine	
Combustion cycle	4-stroke
Cooling system	Liquid cooled
Valve train	DOHC
Displacement	689 cm³
Cylinder arrangement	Inline
Number of cylinders	2-cylinder
Bore × stroke	80.0 × 68.6 mm (3.15 × 2.70 in)
Compression ratio	11.5 : 1
Compression pressure	765–985 kPa/355 r/min (7.7–9.9 kgf/cm²/355 r/min, 108.9–140.2 psi/355 r/min)
Compression pressure (#2 cylinder)	687–884 kPa/355 r/min (6.9–8.8 kgf/cm²/355 r/min, 97.8–125.8 psi/355 r/min)
Fuel	
Recommended fuel	Unleaded gasoline (E10 acceptable)
Octane number (RON)	90
Fuel tank capacity	14 L (3.7 US gal, 3.1 Imp.gal)
Fuel reserve amount	2.7 L (0.71 US gal, 0.59 Imp.gal)
Engine oil	
Recommended brand	YAMALUBE
SAE viscosity grades	10W-40, 10W-50, 15W-40, 20W-40 or 20W-50
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Lubrication system	Wet sump
Engine oil quantity	
Oil change	2.30 L (2.43 US qt, 2.02 Imp.qt)
With oil filter removal	2.60 L (2.75 US qt, 2.29 Imp.qt)
Quantity (disassembled)	3.00 L (3.17 US qt, 2.64 Imp.qt)
Oil filter	
Oil filter type	Cartridge
Oil pump	
Oil pressure	280.0 kPa/5000 r/min (2.80 kgf/cm²/5000 r/min, 40.6 psi/5000 r/min)
Cooling system	
Coolant quantity	
Radiator (including all routes)	1.60 L (1.69 US qt, 1.41 Imp.qt)
Coolant reservoir (up to the maximum level mark)	0.25 L (0.26 US qt, 0.22 Imp.qt)
Radiator cap valve opening pressure	107.9–137.3 kPa (1.08–1.37 kgf/cm², 15.6–19.9 psi)
Cooling system leak test pressure	137.3 kPa (1.37 kgf/cm², 19.9 psi)

Thermostat	
Valve opening temperature	80.0–84.0 °C (176.00–183.20 °F)
Valve full open temperature	95.0 °C (203.00 °F)
Water 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	0.10 mm (0.0039 in)
Camshaft	
Camshaft cap inside diameter	22.000–22.021 mm (0.8661–0.8670 in)
Camshaft journal diameter	21.959–21.972 mm (0.8645–0.8650 in)
Camshaft-journal-to-camshaft-cap clearance limit	0.080 mm (0.0032 in)
Camshaft lobe dimensions	
Lobe height limit (Intake)	35.510 mm (1.3980 in)
Lobe height limit (Exhaust)	35.610 mm (1.4020 in)
Camshaft runout limit	0.030 mm (0.0012 in)
Valve, valve seat, valve guide	
Valve clearance (cold)	
Intake	0.11–0.20 mm (0.0043–0.0079 in)
Exhaust	0.24–0.30 mm (0.0094–0.0118 in)
Valve dimensions	
Valve seat contact width limit (intake)	1.6 mm (0.06 in)
Valve seat contact width limit (exhaust)	1.6 mm (0.06 in)
Valve stem diameter limit (intake)	4.445 mm (0.1750 in)
Valve stem diameter limit (exhaust)	4.430 mm (0.1744 in)
Valve guide inside diameter (intake)	4.500–4.512 mm (0.1772–0.1776 in)
Valve guide inside diameter (exhaust)	4.500–4.512 mm (0.1772–0.1776 in)
Valve-stem-to-valve-guide clearance limit (intake)	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance limit (exhaust)	0.100 mm (0.0039 in)
Valve stem runout	0.020 mm (0.0008 in)
Valve spring	
Free length limit (intake)	38.29 mm (1.51 in)
Free length limit (exhaust)	39.32 mm (1.55 in)
Cylinder	
Bore	80.000–80.010 mm (3.1496–3.1500 in)
Wear limit	80.060 mm (3.1520 in)

Piston	
Diameter	79.970–79.985 mm (3.1484–3.1490 in)
Measuring point (from piston skirt bottom)	8.0 mm (0.31 in)
Piston-to-cylinder clearance	0.015–0.040 mm (0.0006–0.0016 in)
Piston pin bore inside diameter limit	18.045 mm (0.7104 in)
Piston pin outside diameter limit	17.970 mm (0.7075 in)
Piston ring	
Top ring	
End gap limit	0.50 mm (0.0197 in)
Side clearance limit	0.115 mm (0.0045 in)
2nd ring	
End gap limit	0.80 mm (0.0315 in)
Side clearance limit	0.115 mm (0.0045 in)
Connecting rod	
Oil clearance	0.027–0.051 mm (0.0011–0.0020 in)
Bearing color code	
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green
Crankshaft	
Runout limit	0.030 mm (0.0012 in)
Journal oil clearance	0.018–0.042 mm (0.0007–0.0017 in)
Bearing color code	
Model identification color	Pink
Code -1	Purple
Code 0	White
Code 1	Blue
Code 2	Black
Code 3	Brown
Balancer	
Balancer shaft runout limit	0.030 mm (0.0012 in)
Bearing color code	
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green
Code 5	Yellow
Balancer shaft journal to balancer shaft bearing clearance	0.020–0.054 mm (0.0008–0.0021 in)
Clutch	
Clutch type	Wet, multiple-disc
Clutch lever free play	5.0–10.0 mm (0.20–0.39 in)
Friction plate 1 thickness	2.90–3.10 mm (0.114–0.122 in)

Plate quantity	2 pcs
Wear limit	2.80 mm (0.110 in)
Friction plate 2 thickness	2.92–3.08 mm (0.115–0.121 in)
Plate quantity	5 pcs
Wear limit	2.82 mm (0.111 in)
Clutch plate thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	6 pcs
Warpage limit	0.10 mm (0.004 in)
Clutch spring free length limit	47.50 mm (1.87 in)
Drivetrain	
Transmission type	Constant mesh 6-speed
Gear ratio	
Primary reduction ratio	1.925 (77/40)
1st	2.846 (37/13)
2nd	2.125 (34/16)
3rd	1.632 (31/19)
4th	1.300 (26/20)
5th	1.091 (24/22)
6th	0.964 (27/28)
Secondary reduction ratio	2.688 (43/16)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)
Final drive	Chain
Shifting mechanism	
Installed shift rod length	217.5–219.5 mm (8.56–8.64 in)
Air filter	
Air filter element	Oil-coated paper element
Fuel injector	
Resistance	12.0 Ω
Idling condition	
Engine idling speed	1250–1450 r/min
O2 feedback control	Active
Coolant temperature	85–105 °C (185–221 °F)
Difference in vacuum pressure between the cylinders	0 kPa–1.3 kPa (0 mmHg–10 mmHg, 0 inHg–0.4 inHg)
CO%	0.0–2.0 %
Fuel line pressure (at idle)	300–390 kPa (3.0–3.9 kgf/cm², 43.5–56.6 psi)
Throttle grip free play	3.0–5.0 mm (0.12–0.20 in)

EAS20015
CHASSIS SPECIFICATIONS

Chassis	
Caster angle	24.8 °
Trail	90 mm (3.5 in)
Front wheel	
Wheel type	Cast wheel
Rim size	17M/C x MT3.50
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Wheel axle bending limit	0.25 mm (0.01 in)
Rear wheel	
Wheel type	Cast wheel
Rim size	17M/C x MT5.50
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Wheel axle bending limit	0.25 mm (0.01 in)
Front tire	
Type	Tubeless
Size	120/70 ZR 17M/C(58W)
Manufacturer/model	MICHELIN/ROAD 5
Rear tire	
Type	Tubeless
Size	180/55 ZR 17M/C(73W)
Manufacturer/model	MICHELIN/ROAD 5
Tire air pressure (measured on cold tires)	
Front	225 kPa (2.25 kgf/cm², 33 psi)
Rear	250 kPa (2.50 kgf/cm², 36 psi)
Front brake	
Brake disc thickness limit	4.0 mm (0.16 in)
Brake disc runout limit (as measured on wheel)	0.10 mm (0.0039 in)
Brake pad lining thickness limit	0.5 mm (0.02 in)
Master cylinder inside diameter	15.00 mm (0.59 in)
Caliper cylinder inside diameter (Left)	30.23 mm, 27.00 mm (1.19 in, 1.06 in)
Caliper cylinder inside diameter (Right)	30.23 mm, 27.00 mm (1.19 in, 1.06 in)
Specified brake fluid	DOT 4

Rear brake	
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 limit	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	38.18 mm (1.50 in)
Specified brake fluid	DOT 4
Front suspension	
Shock absorber	Hydraulic damper
Fork spring free length limit	338.4 mm (13.33 in)
Inner tube bending limit	0.2 mm (0.01 in)
Recommended oil	Yamaha Suspension Oil G10
Quantity (left)	405.0 cm^3 (13.69 US oz, 14.28 Imp.oz)
Quantity (right)	405.0 cm^3 (13.69 US oz, 14.28 Imp.oz)
Level (left)	160 mm (6.3 in)
Level (right)	160 mm (6.3 in)
Rear suspension	
Shock absorber	Gas-hydraulic damper
Spring preload	
Unit for adjustment	Cam position
Adjustment value (Soft)	1
Adjustment value (STD)	4
Adjustment value (Hard)	7
Rebound damping	
Unit for adjustment	Turn
Adjustment value from the start position (Soft)	2.5
Adjustment value from the start position (STD)	1.5
Adjustment value from the start position (Hard)	0
Drive chain	
Size	525
Chain type	Sealed type
Number of links	108
Drive chain slack (Maintenance stand)	51.0–56.0 mm (2.01–2.20 in)
Drive chain slack (Sidestand)	51.0–56.0 mm (2.01–2.20 in)
Drive chain slack limit	58.0 mm (2.28 in)
15-link length limit	239.3 mm (9.42 in)

EAS20016
ELECTRICAL SPECIFICATIONS

Voltage	
System voltage	12 V
Ignition system	
Ignition timing (B.T.D.C.)	8.0–12.0 °/1350 r/min
Engine control unit	
Model	TBDFBH (MT07P) TBDFBJ (MT07PC)
Ignition coil	
Primary coil resistance	1.19–1.61 Ω
Secondary coil resistance	8.50–11.50 kΩ
Lean angle sensor	
Operating angle	65 °
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, 29.3 A at 5000 r/min
Rectifier/regulator	
Regulated voltage (DC)	14.3–14.7 V
Battery	
Model	YTZ10(S)
Voltage, capacity	12 V, 8.6 Ah (10 HR)
Bulb wattage	
Headlight	LED
Brake/tail light	LED
Front turn signal/position light	LED
Rear turn signal light	LED
Auxiliary light	LED
License plate light	5.0 W
Meter lighting	LED
Indicator light	
Neutral indicator light	LED
High beam indicator light	LED
Oil level warning light	LED
Turn signal indicator light	LED
Coolant temperature warning light	LED
Engine trouble warning light	LED
ABS warning light	LED

Starter motor	
Brush overall length limit	6.5 mm (0.26 in)
Mica undercut (depth)	0.70 mm (0.03 in)
Fuel sender unit	
Sender unit resistance (full)	9.0–11.0 Ω
Sender unit resistance (empty)	213.0–219.0 Ω
Solenoid	
Purge cut valve solenoid resistance	22.00–26.00 Ω (MT07PC)
Fuel injection sensor	
Crankshaft position sensor resistance	228–342 Ω
Intake air temperature sensor resistance	5400–6600 Ω at 0 °C (5400–6600 Ω at 32 °F)
Intake air temperature sensor resistance	290–390 Ω at 80 °C (290–390 Ω at 176 °F)
Intake air pressure sensor output voltage	3.59–3.67 V at 101.3 kPa (3.59–3.67 V at 1.01 kgf/cm², 3.59–3.67 V at 14.7 psi)
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	30.0 A
Headlight fuse	7.5 A
Signaling system fuse	7.5 A
Ignition fuse	7.5 A
Radiator fan motor fuse	10.0 A
ABS ECU fuse	7.5 A
Fuel injection system fuse	10.0 A
ABS motor fuse	30.0 A
ABS solenoid fuse	20.0 A
Accessory fuse	7.5 A
Terminal fuse 1	3.0 A
Backup fuse	7.5 A

EAS20017
TIGHTENING TORQUES

EAS30016
ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Exhaust pipe nut	M8	4	20 N·m (2.0 kgf·m, 15 lb·ft)	
Muffler bracket bolt	M6	4	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Muffler bracket bolt	M8	2	20 N·m (2.0 kgf·m, 15 lb·ft)	
Muffler cover bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Exhaust pipe protector bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Spark plug	M10	2	13 N·m (1.3 kgf·m, 9.6 lb·ft)	
Cylinder head cover bolt	M6	4	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Generator rotor bolt	M12	1	70 N·m (7.0 kgf·m, 52 lb·ft)	
Generator cover bolt	M6	2	12 N·m (1.2 kgf·m, 8.9 lb·ft)	
Generator cover bolt	M6	8	12 N·m (1.2 kgf·m, 8.9 lb·ft)	
Clutch boss nut	M20	1	95 N·m (9.5 kgf·m, 70 lb·ft)	Stake. 
Clutch spring bolt	M6	6	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Clutch cover bolt	M6	10	12 N·m (1.2 kgf·m, 8.9 lb·ft)	
Clutch cover bolt	M6	2	12 N·m (1.2 kgf·m, 8.9 lb·ft)	
Oil filter cartridge	M20	1	17 N·m (1.7 kgf·m, 13 lb·ft)	
Oil filter cartridge union bolt	M20	1	40 N·m (4.0 kgf·m, 30 lb·ft)	
Coolant drain bolt	M6	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Engine oil drain bolt	M14	1	43 N·m (4.3 kgf·m, 32 lb·ft)	

EAS30017
CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Front wheel axle	M16	1	65 N·m (6.5 kgf·m, 48 lb·ft)	
Front wheel axle pinch bolt	M8	1	23 N·m (2.3 kgf·m, 17 lb·ft)	
Rear wheel sprocket nut	M10	6	80 N·m (8.0 kgf·m, 59 lb·ft)	
Wheel axle nut	M18	1	105 N·m (10.5 kgf·m, 77 lb·ft)	
Rear brake caliper bolt	M8	1	22 N·m (2.2 kgf·m, 16 lb·ft)	
Brake caliper bleed screw	M8	3	5 N·m (0.5 kgf·m, 3.7 lb·ft)	
Front brake caliper bolt	M10	2	40 N·m (4.0 kgf·m, 30 lb·ft)	
Upper handlebar holder bolt	M8	4	28 N·m (2.8 kgf·m, 21 lb·ft)	
Lower handlebar holder nut	M10	2	32 N·m (3.2 kgf·m, 24 lb·ft)	
Clutch cable locknut	M8	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Lower bracket pinch bolt	M8	4	23 N·m (2.3 kgf·m, 17 lb·ft)	
Upper bracket pinch bolt (left and right)	M8	2	26 N·m (2.6 kgf·m, 19 lb·ft)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Upper bracket pinch bolt (center)	M10	1	21 N·m (2.1 kgf·m, 15 lb·ft)	
Cap nut	M25	1	See TIP.	
Drive sprocket nut	M22	1	110 N·m (11 kgf·m, 81 lb·ft)	Stake. 

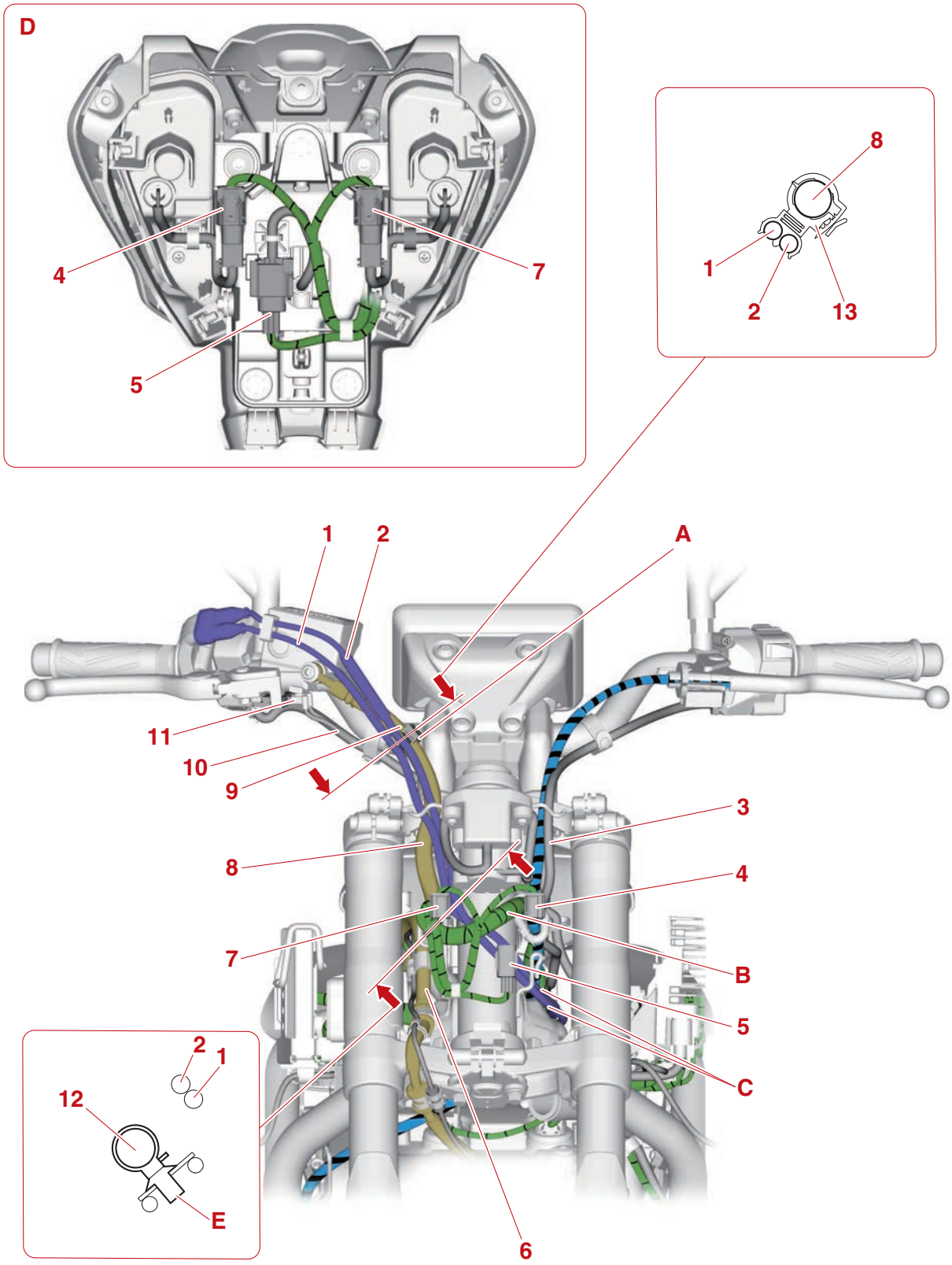
TIP

Cap nut

1. First, tighten the cap nut to approximately 52 N·m (5.2 kgf·m, 38 lb·ft) with a torque wrench, then loosen the cap nut completely.
2. Retighten the cap nut to 18 N·m (1.8 kgf·m, 13 lb·ft) with a torque wrench.

EAS20021
CABLE ROUTING

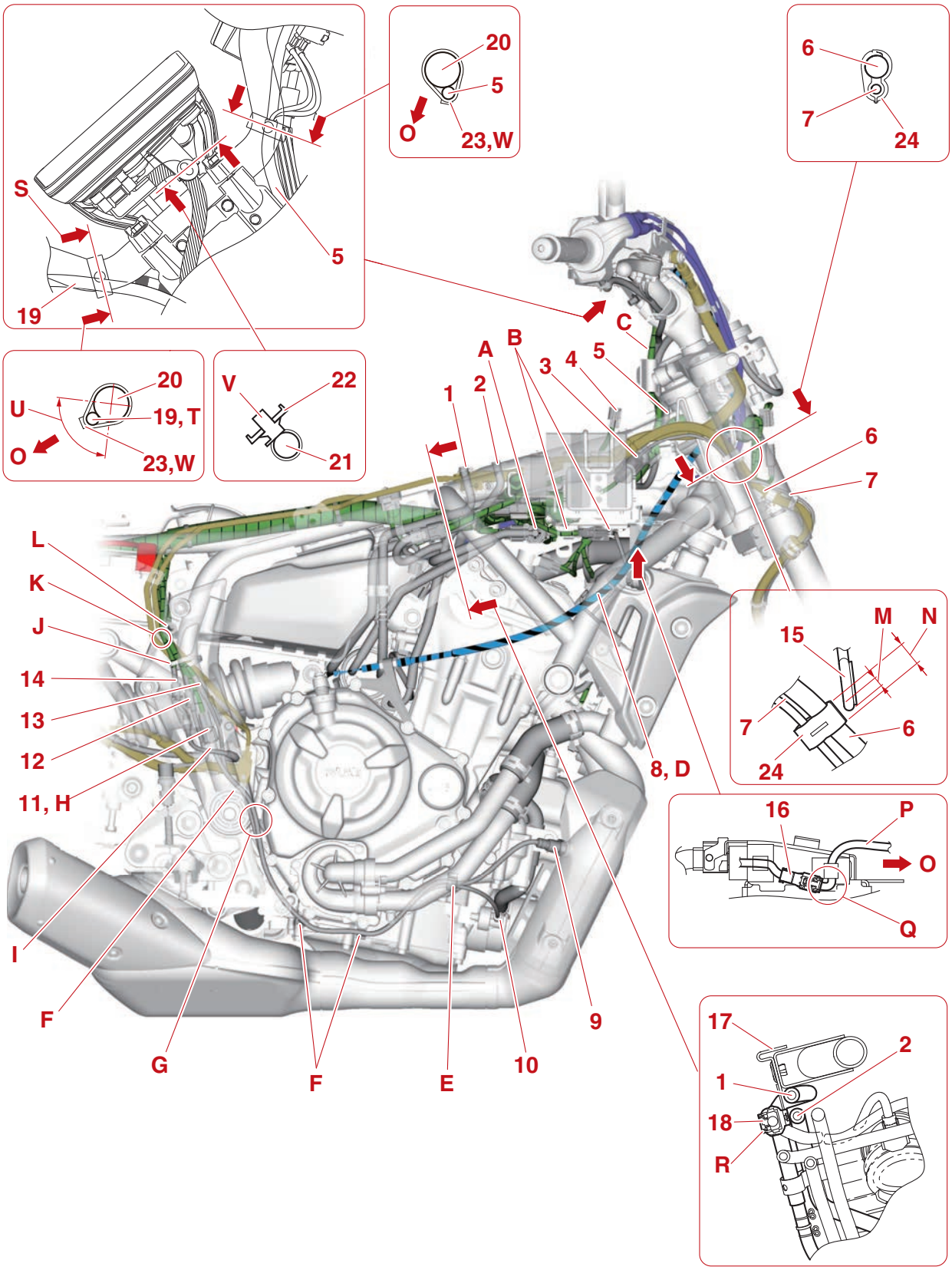
Handlebar (front view)



1. Throttle cable (decelerator cable)
2. Throttle cable (accelerator cable)
3. Handlebar switch lead (left)
4. Auxiliary light coupler (left)
5. Headlight coupler
6. Brake hose (hydraulic unit to front brake caliper (left))
7. Auxiliary light coupler (right)
8. Brake hose (front brake master cylinder to hydraulic unit)
9. Shrinkable tube
10. Handlebar switch lead (right)
11. Front brake light switch connector
12. Wire harness
13. Clamp

A. Fasten the throttle cable (decelerator cable), throttle cable (accelerator cable), and brake hose (front brake master cylinder to hydraulic unit) using a clamp. When doing so, attach the clamp to the end of the shrinkable tube of the brake hose (front brake master cylinder to hydraulic unit).
B. Route the branch of the wire harness in front of the throttle cable.
C. Route the throttle cables through the guide on the frame. Route the throttle cable (decelerator cable) over the throttle cable (accelerator cable).
D. Detailed drawing of the backside of the headlight
E. Insert the projection on the wire harness holder into the hole in the cable guide.

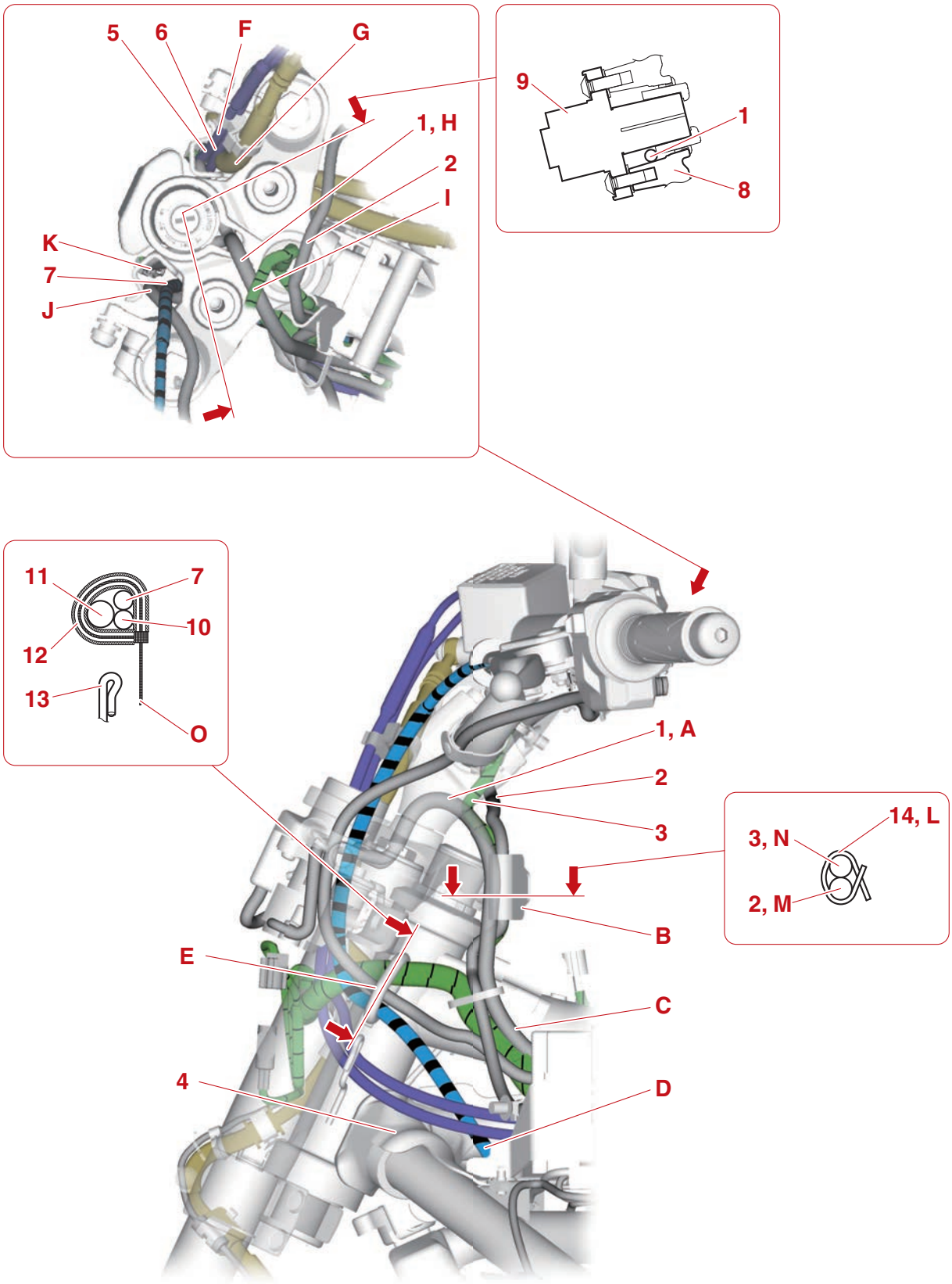
Frame and engine (right side view)



1. Fuel tank breather hose (blue paint mark)
2. Fuel tank overflow hose (white paint mark)
3. Front wheel sensor coupler
4. Intake air temperature sensor coupler
5. Handlebar switch lead (right)
6. Brake hose (hydraulic unit to front brake caliper (left))
7. Front wheel sensor lead
8. Clutch cable
9. O_2 sensor
10. Oil pressure switch
11. O_2 sensor coupler
12. Rear brake light switch coupler
13. Oil pressure switch connector
14. Rear wheel sensor coupler
15. Cable guide
16. Front turn signal/position light coupler
17. Sub-wire harness bracket
18. Sub-wire harness coupler
19. Handlebar switch lead (left)
20. Handlebar
21. Meter lead
22. Meter bracket
23. Rubber band
24. Clamp

A. Route the front turn signal light/position lead above the purge cut valve solenoid and canister purge hose. (for California only)
B. Fasten the front turn signal/position light lead with the clamp.
C. To meter
D. Route the clutch cable through the guide as shown in the illustration.
E. Route the oil pressure switch lead and O_2 sensor lead through the guide, and then fasten the leads by bending the clamp.
F. Route the oil pressure switch lead behind the O_2 sensor lead, route it through the clamps, and then fasten the lead by bending the clamps.
Route the O_2 sensor lead outside the oil pressure switch lead.
G. Make sure that the O_2 sensor lead and oil pressure switch lead are not pinched between the pivot shaft protector (right) and the engine.
H. Connect the O_2 sensor coupler, and then insert the projection on the coupler into the hole in the bracket.
I. Fasten the rear brake light switch lead and O_2 sensor lead with the clamp.
When doing so, the orientation of the clamp does not matter.
J. Fasten the rear wheel sensor lead, oil pressure switch lead, rear brake light switch lead, and O_2 sensor lead to the frame with the plastic locking tie.
Cut off the end of the plastic locking tie to 2 mm (0.08 in) or less.
Face the end of the plastic locking tie to the rear side.
K. Make sure that the wire harness is not pinched between the pivot shaft protector (right) and the frame.
L. Insert the projection on the wire harness holder into the hole in the frame from the inside of the frame.
M. Lower cable of the cable guide
N. Fasten the front wheel sensor coupler and brake hose (hydraulic unit to front brake caliper (left)) using a clamp.
When doing so, position the clamp so that the lower cable of the cable guide is within the width of the clamp.
O. Forward
P. To front turn signal/position light (right)
Q. Make sure that the front turn signal/position light lead has no slack within the range shown in the illustration.
R. Arrange the sub-wire harness coupler outside the vehicle past the sub-wire harness bracket.
S. After connecting the meter coupler, install the coupler cover completely until it contacts the meter assembly.
T. Position the handlebar switch lead (left) within the range as shown.
U. 90°
V. Insert the projection on the meter lead into the hole in the meter bracket.
W. Face the buckle of the rubber band to the forward.

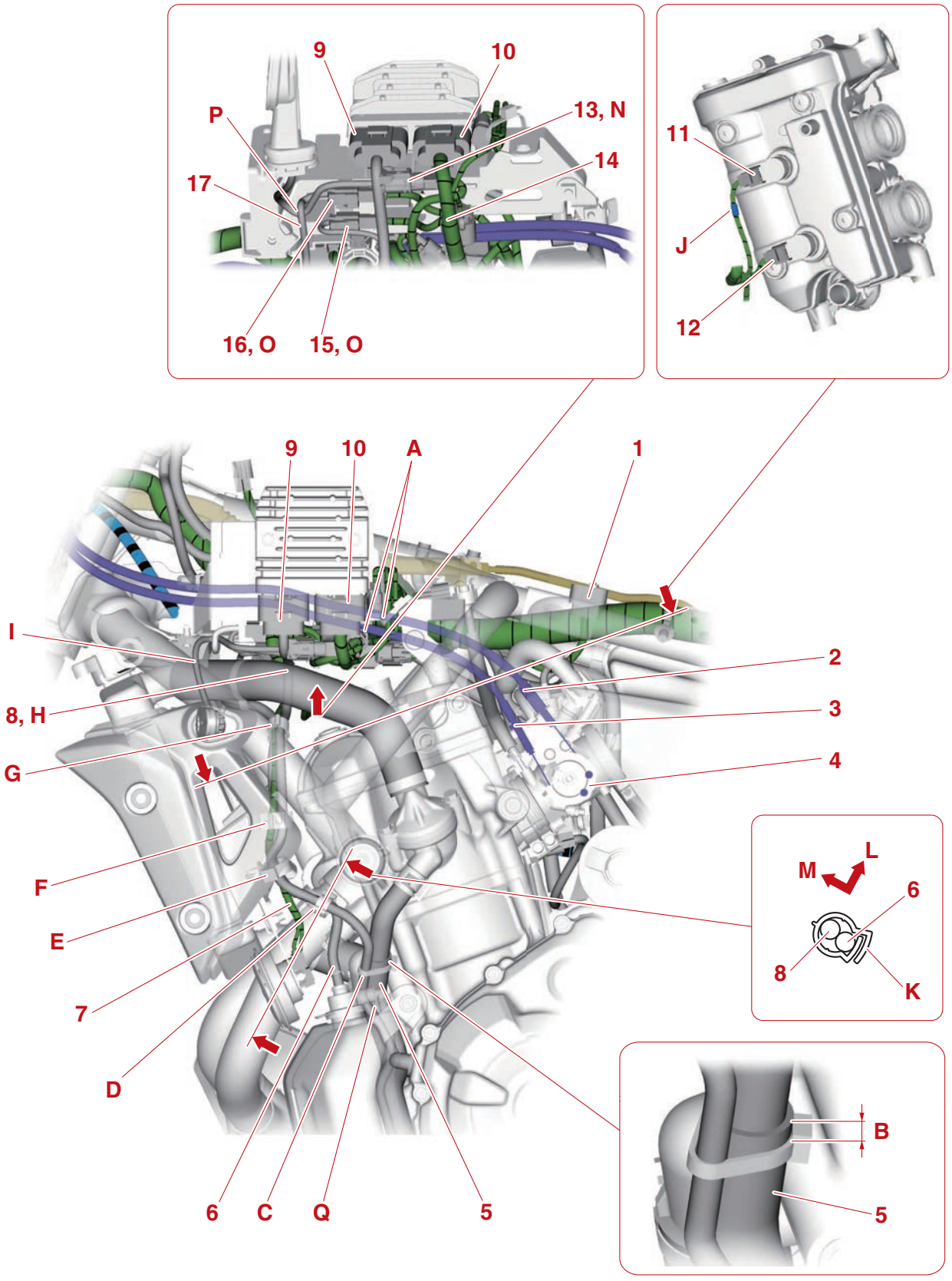
Frame (front left side view)



1. Main switch lead
2. Handlebar switch lead (right)
3. Meter lead
4. Frame cover
5. Throttle cable (accelerator cable)
6. Throttle cable (decelerator cable)
7. Clutch cable
8. Upper bracket
9. Main switch
10. Handlebar switch lead (left)
11. Wire harness
12. Rubber tube
13. Cable guide
14. Rubber band

A. Route the main switch lead under the lower handlebar holder.
B. Fasten the rubber band at the tape portion of the meter lead and handlebar switch lead (right).
C. Route the main switch lead outside the handlebar switch lead (right) and wire harness.
D. Route the clutch cable through the hole in the frame cover.
E. When securing the corresponding plastic locking tie, move the handlebar all the way to the right, and then secure the plastic locking tie while the lead to be fastened is pulled.
Align the plastic locking tie position with the center line of the cable guide.
When doing so, align the clutch cable and wire harness with the blue tape of the handlebar switch lead (left), and then fasten the clutch cable and wire harness.
F. Place the throttle cable within the area shown in the illustration.
G. Route the brake hose through the position shown.
H. Route the main switch lead through the hole in the upper bracket.
I. To meter
J. Route the handlebar switch lead (left) outside the clutch cable.
K. To main switch
L. Lead position fastened with the rubber band.
M. White tape
N. Blue tape
O. Position the end of the plastic locking tie outside the vehicle beyond the cable guide.

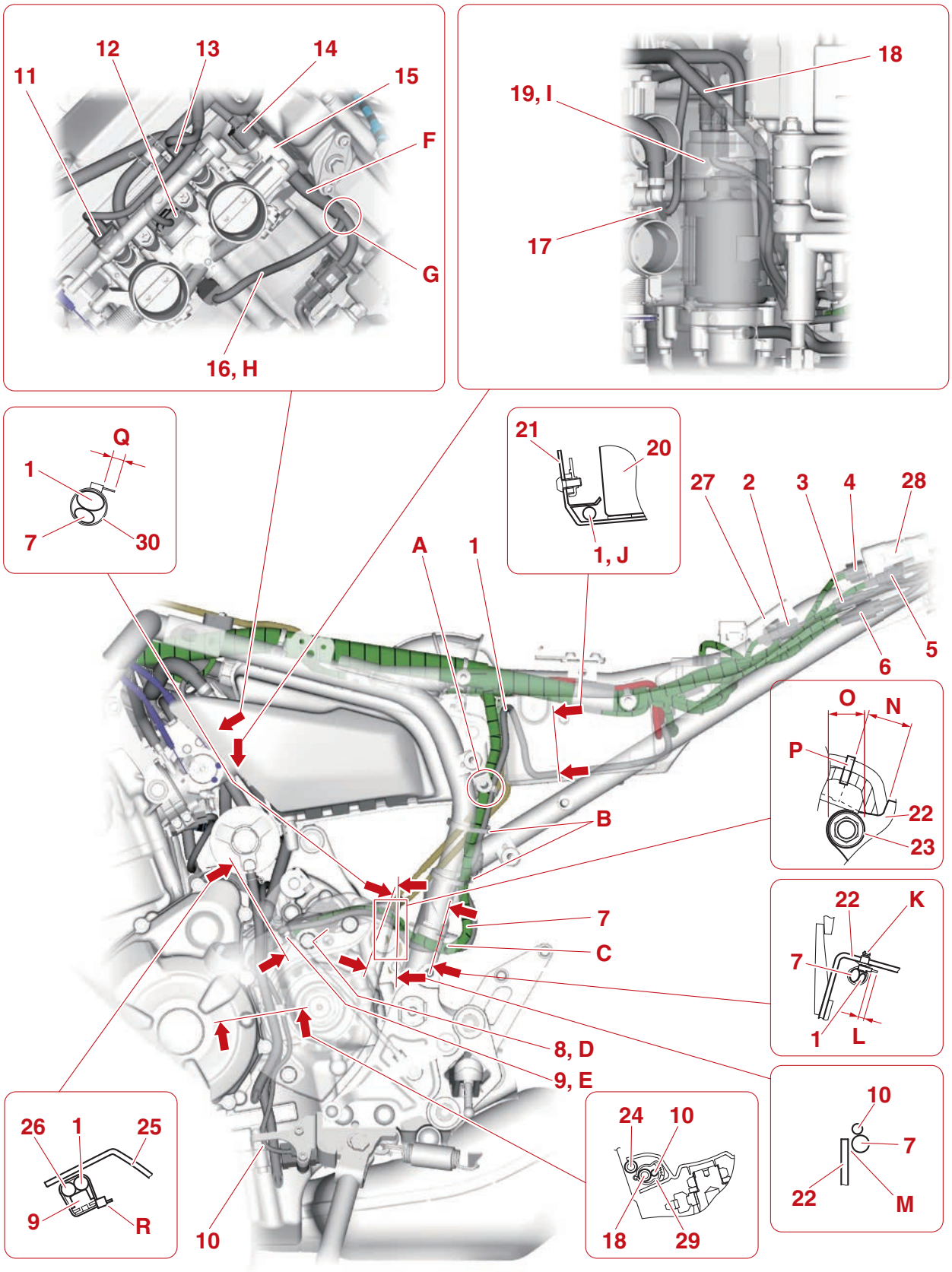
Frame and engine (front left side view)



1. Fuel pump coupler
2. Throttle cable (decelerator cable)
3. Throttle cable (accelerator cable)
4. Throttle body assembly
5. Oil cooler inlet hose
6. Coolant reservoir hose
7. Horn lead
8. Stator coil lead
9. Stator coil coupler
10. Rectifier/regulator coupler
11. Ignition coil #2 coupler
12. Ignition coil #1 coupler
13. Front turn signal/position light coupler
14. Rectifier/regulator lead
15. Crankshaft position sensor coupler
16. Radiator fan motor coupler
17. Radiator fan motor lead

A. Make sure that the throttle cables do not twist between the throttle body assembly and the cable guide of the frame.
B. 5–10 mm (0.20–0.39 in)
C. Fasten the stator coil lead to the oil cooler inlet hose with a plastic locking tie.
Make sure to route the stator coil lead to the outside of the oil cooler inlet hose.
Align the plastic locking tie with the blue tape on the stator coil lead.
Face the buckle of the plastic locking tie rearward, and then cut off the excess end of the tie to 2 mm (0.08 in) or less.
D. Fasten the stator coil lead and coolant reservoir hose with the holder at the location shown in the illustration.
Make sure that there is no slack in the stator coil lead.
E. Secure the holder by inserting the projection on the holder into the hole in the radiator fan motor bracket, and then fasten the stator coil lead, horn lead, and coolant reservoir hose with the holder.
Make sure that the coolant reservoir hose and leads do not cross between the oil cooler inlet hose and this holder.
F. Fasten the stator coil lead, horn lead, and coolant reservoir hose with the holder.
G. Fasten the stator coil lead, horn lead, and coolant reservoir hose with the holder at the location shown in the illustration.
Make sure that there is no slack in the stator coil lead, horn lead, and coolant reservoir hose.
H. Route the stator coil lead to the inside of the radiator inlet hose, and then connect the stator coil coupler to the rectifier/regulator.
I. To front turn signal/position light (left)
J. Blue tape
K. Face the catch of the holder inward.
L. Upward
M. Outward
N. Route the front turn signal/position light lead above the rectifier/regulator lead.
O. Connect the coupler, and then insert the projection on the coupler into the hole in the electrical components tray 1.
P. Route the front turn signal/position light lead above the radiator fan motor lead.
Q. Do not pinch the stator coil lead between the oil cooler inlet hose and engine.

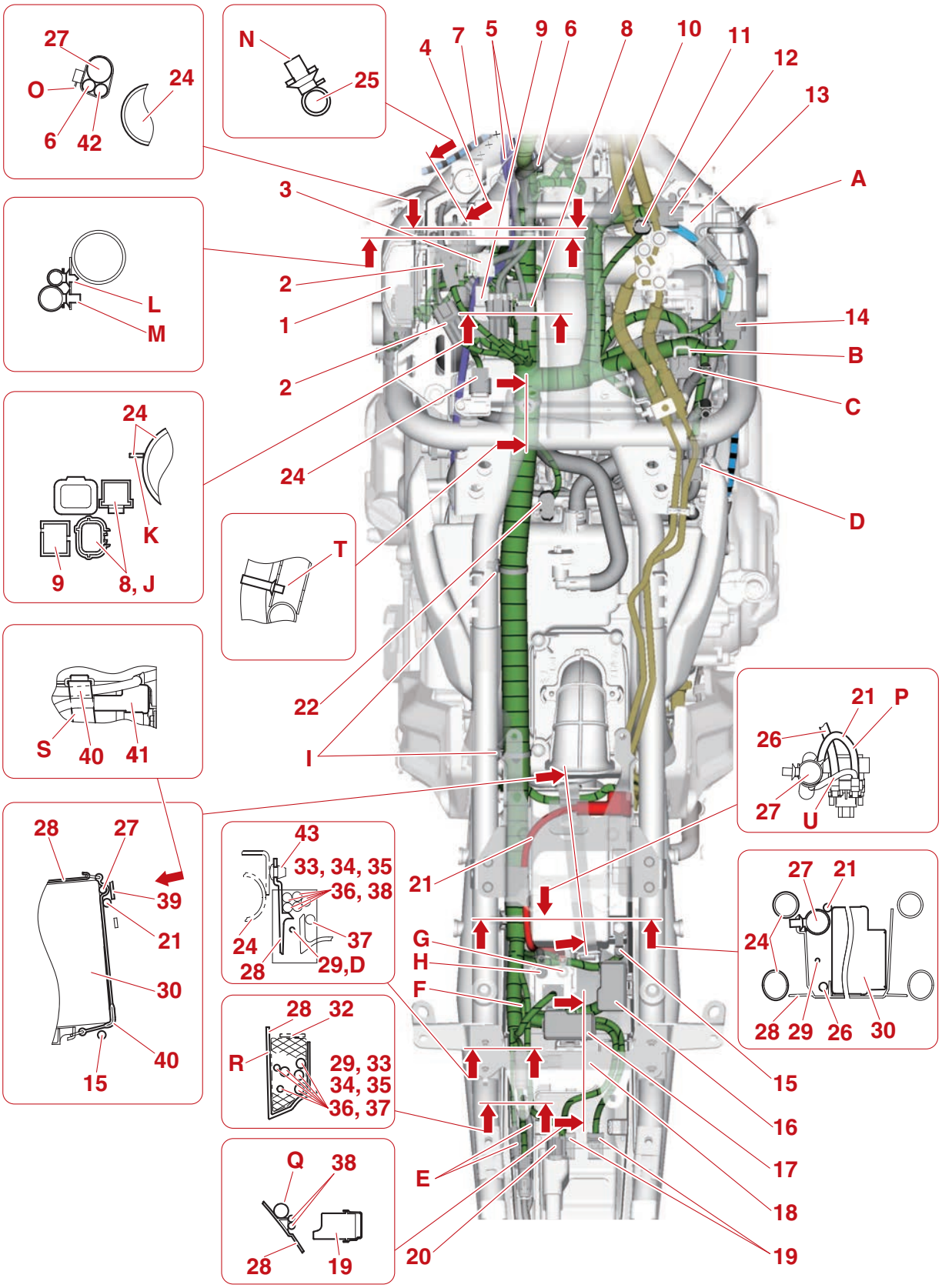
Frame and engine (rear left side view)



1. Starter motor lead
2. Rear turn signal light coupler (left)
3. License plate light coupler
4. CCU (Communication Control Unit) coupler
5. Rear turn signal light coupler (right)
6. Tail/brake light coupler
7. Engine ground lead
8. Terminal cover
9. Sidestand switch coupler
10. Sidestand switch lead
11. Injector #1 coupler
12. ISC (Idle Speed Control) unit coupler
13. Injector #2 coupler
14. Throttle position sensor coupler
15. Throttle position sensor
16. Coolant temperature sensor lead
17. Coolant temperature sensor coupler
18. Fuel tank overflow hose
19. Gear position switch coupler
20. Battery
21. Battery box
22. Frame
23. Plain washer
24. Canister breather hose (for California only)
25. Drive sprocket cover
26. Gear position switch lead
27. Lean angle sensor
28. CCU (Communication Control Unit)
29. Clamp
30. Plastic locking tie

A. Insert the projection on the engine ground lead holder into the hole in the frame from the inside of the frame.
B. Fasten the engine ground lead and starter motor lead to the frame with plastic locking ties.
Point the end of each plastic locking tie rearward, and then cut off the excess end of the tie to 2 mm (0.08 in) or less.
C. Using the holder, fasten the starter motor lead and engine ground lead at the white tape portion on the starter motor lead.
D. Cover the engine ground terminal with the terminal cover.
E. Fasten the sidestand switch coupler, starter motor lead, and gear position switch lead with the plastic locking tie. When doing so, be sure to fasten the center portion of the sidestand switch coupler.
F. Route the coolant temperature sensor lead and gear position switch lead between the throttle position sensor and the cylinder head.
G. The gear position switch lead and coolant temperature sensor lead may be positioned and routed in any order.
Make sure that the leads is not twisted.
H. Route the coolant temperature sensor lead to the front of the gear position switch lead.
I. Insert the projection on the coupler into the hole in the bracket.
J. Fit the starter motor lead between the bottom of the battery box and the rib on the battery box.
K. Insert the projection on the holder into the hole in the frame from the bottom of the frame.
L. Maximum: 5 mm (0.2 in)
Point the end of the plastic band inward.
M. Do not pinch the sidestand switch lead between the engine ground lead and the frame.
N. Route the starter motor lead and engine ground lead together in this distance.
O. Plain washer diameter
P. Place the plastic locking tie within the diameter of the plain washer.
Q. Maximum: 5 mm (0.2 in)
Point the end of the plastic band outward.
R. After fastening the starter motor lead, gear position switch lead, and sidestand switch coupler with the plastic locking tie, place them into the drive sprocket cover.
Face the end of the plastic locking tie downward, and then cut off the excess.

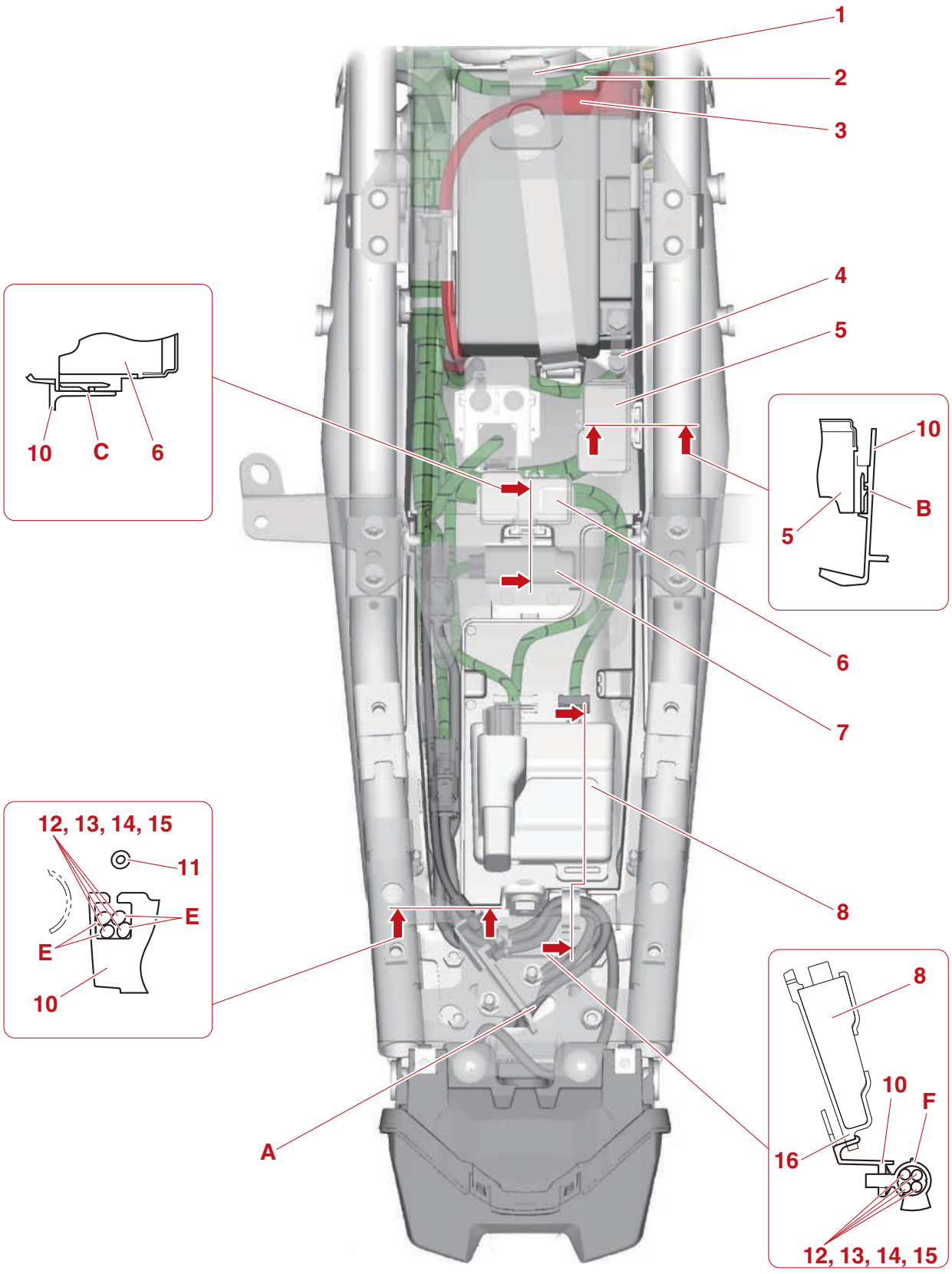
Frame (top view)



1. Rectifier/regulator
2. Handlebar switch coupler (right)
3. Radiator fan motor relay
4. Relay unit
5. Throttle cable
6. Handlebar switch lead (left)
7. Clutch cable
8. Handlebar switch coupler (left)
9. Main switch coupler
10. Front wheel sensor coupler
11. Intake air temperature sensor coupler
12. ABS ECU coupler
13. Hydraulic unit assembly
14. ECU coupler
15. Negative battery lead
16. Fuse box 1
17. Fuse box 2
18. Lean angle sensor
19. Headlight control unit coupler
20. CCU (Communication Control Unit) coupler
21. Positive battery lead
22. Fuel pump coupler
23. Intake air pressure sensor coupler
24. Frame
25. Handlebar switch lead (right)
26. Starter motor lead
27. Wire harness
28. Battery box
29. Seat lock cable
30. Battery
31. Headlight control unit lead
32. Rider seat bracket 2
33. Tail/brake light assembly lead
34. License plate light lead
35. Rear turn signal light lead (left)
36. Rear turn signal light lead (right)
37. CCU (Communication Control Unit) coupler lead
38. Lean angle sensor lead
39. Rider seat bracket 1
40. Battery band
41. Positive battery lead cover
42. Main switch lead
43. Plug

A. To front turn signal/position light (right)
B. Route the ECU lead and sub-wire harness through the cable guide.
C. Insert the projection on the sub-wire harness coupler (13 pins) to the bracket.
D. Connect the sub-wire harness coupler (7 pins), and then insert the projection on the coupler into the hole in the bracket.
E. Place the loose portion of the flasher lead under the check coupler (OBD).
F. Make sure that the fuse box 1 lead touches the rib of the battery box, and then route it.
G. To positive battery terminal
H. To starter motor
I. Insert the projection on each wire harness holder into the hole in the frame.
J. Place the handlebar switch coupler (left) inside the main switch coupler as shown. The position of coupler of the handlebar switch coupler (left) does not matter.
K. Place the handlebar switch lead (left), and handlebar switch lead (right) under the lower bracket of the frame.
L. Insert the projection on the main switch lead holder into the upper hole in the frame.
M. Insert the projection on the wire harness holder into the lower hole in the frame.
N. Insert the projection on the holder of the handlebar switch lead (right) into the hole in the fuel tank cover bracket.
O. Cut off the excess end of the plastic locking tie to 3 mm (0.12 in) or less.
Point the end of the plastic locking tie upward.
P. Insert the remaining portion of the positive battery lead into the battery box side.
Q. Make sure that the fuse box 1 lead touches the rib of the battery box, and then route it.
R. Place each lead and seat lock cable within the area of the hatching.
S. Align the side edge of the battery band with the end of the positive battery lead cover as shown in the illustration.
T. Insert the projection on the wire harness holder into the hole in the lower of the frame.
U. To Positive battery lead.

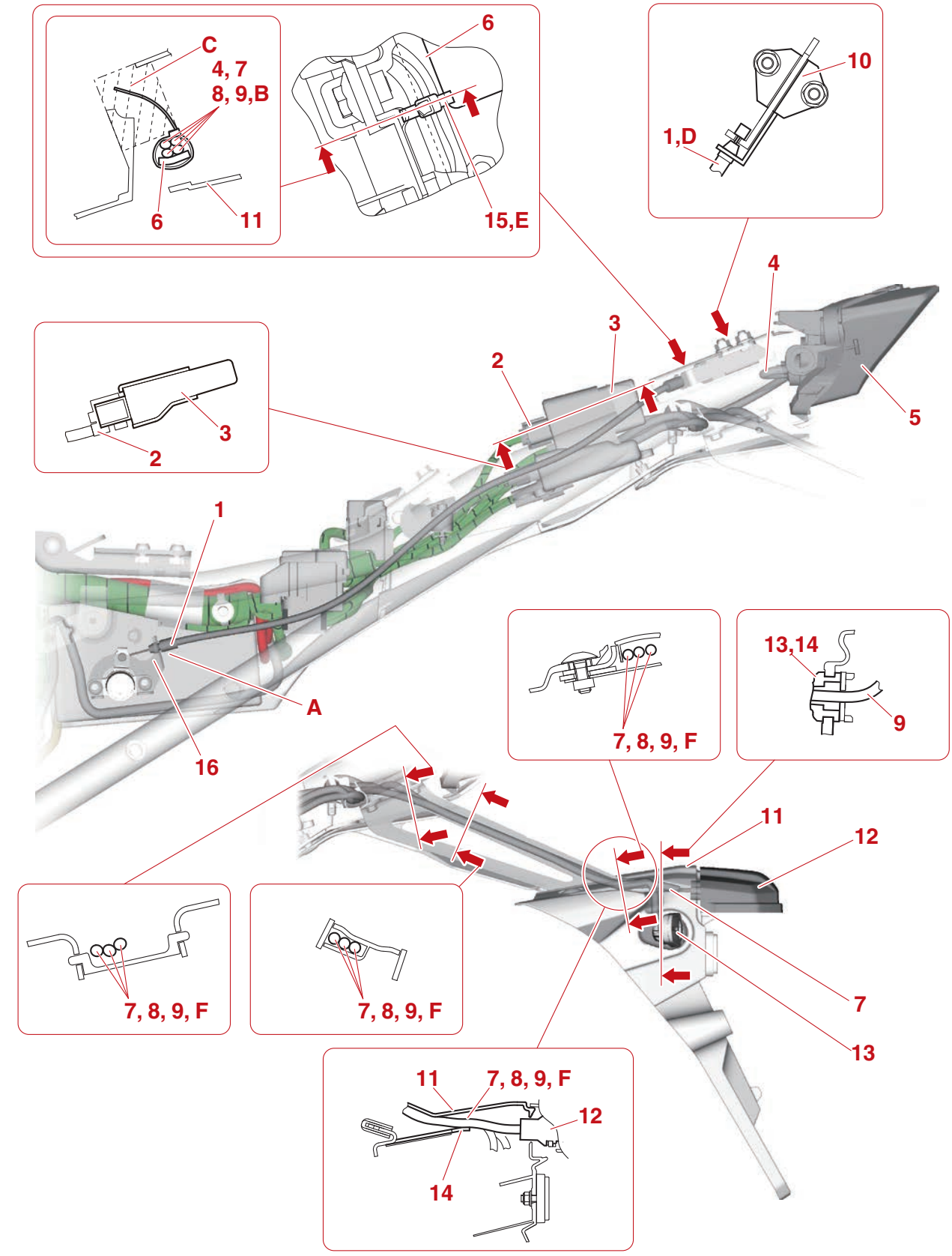
Rear fender (top view)



1. Battery band
2. Wire harness
3. Positive battery lead
4. Negative battery lead
5. Fuse box 1
6. Fuse box 2
7. Lean angle sensor
8. Headlight control unit
9. Battery
10. Battery box
11. Seat lock cable
12. Rear turn signal light lead (left)
13. Rear turn signal light lead (right)
14. License plate light lead
15. Tail/brake light assembly lead
16. Band
17. Plug

A. Route the rear turn signal light leads, and license plate light lead through the hole in the frame.
B. Install fuse box 1 completely onto the tab on the battery box.
C. Install fuse box 2 completely onto the tab on the battery box.
D. Route the seat lock cable through the guide on the battery box.
E. Route the tail/brake light assembly lead, rear turn signal light lead, and license plate light lead through the hole in the battery box, and then fasten them with the plastic locking tie.
F. Fasten the tail/brake light assembly lead, rear turn signal light leads, and license plate light lead with the holder.
The leads may be fastened in any order.

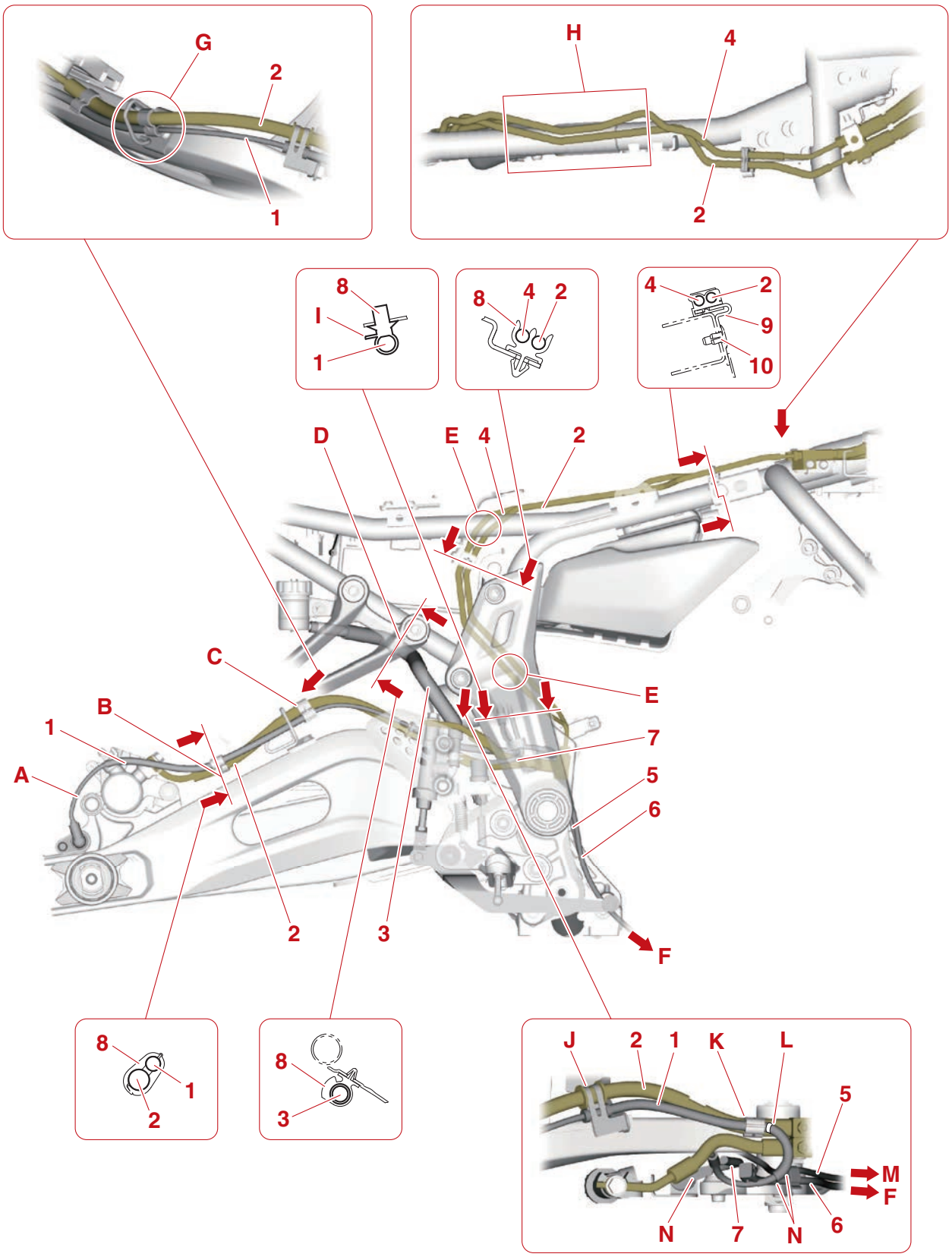
Rear fender (left side view)



1. Seat lock cable
2. CCU (Communication Control Unit) coupler
3. CCU (Communication Control Unit)
4. Tail/brake light assembly lead
5. Tail/brake light assembly
6. Frame
7. License plate light lead
8. Rear turn signal light lead (right)
9. Rear turn signal light lead (left)
10. Seat lock assembly
11. Mudguard
12. License plate light
13. Rear turn signal light (left)
14. Plate
15. Plastic locking tie
16. Seat lock key cylinder bracket

A. Insert the seat lock cable completely into the hole in the seat lock key cylinder bracket.
B. Fasten the tail/brake light assembly lead, rear turn signal light leads, and license plate light lead with a plastic locking tie. The leads may be fastened in any order. Cut off the excess end of the plastic locking tie so that it does not contact the seat lock assembly.
C. After cutting off the excess end of the plastic locking tie, position the end in this area.
D. Insert the seat lock cable completely into the hole in the seat lock assembly.
E. The leads may be routed in any order.
F. Route the rear turn signal light leads and license plate light lead between the mudguard and the plate.
The leads may be routed in any order.

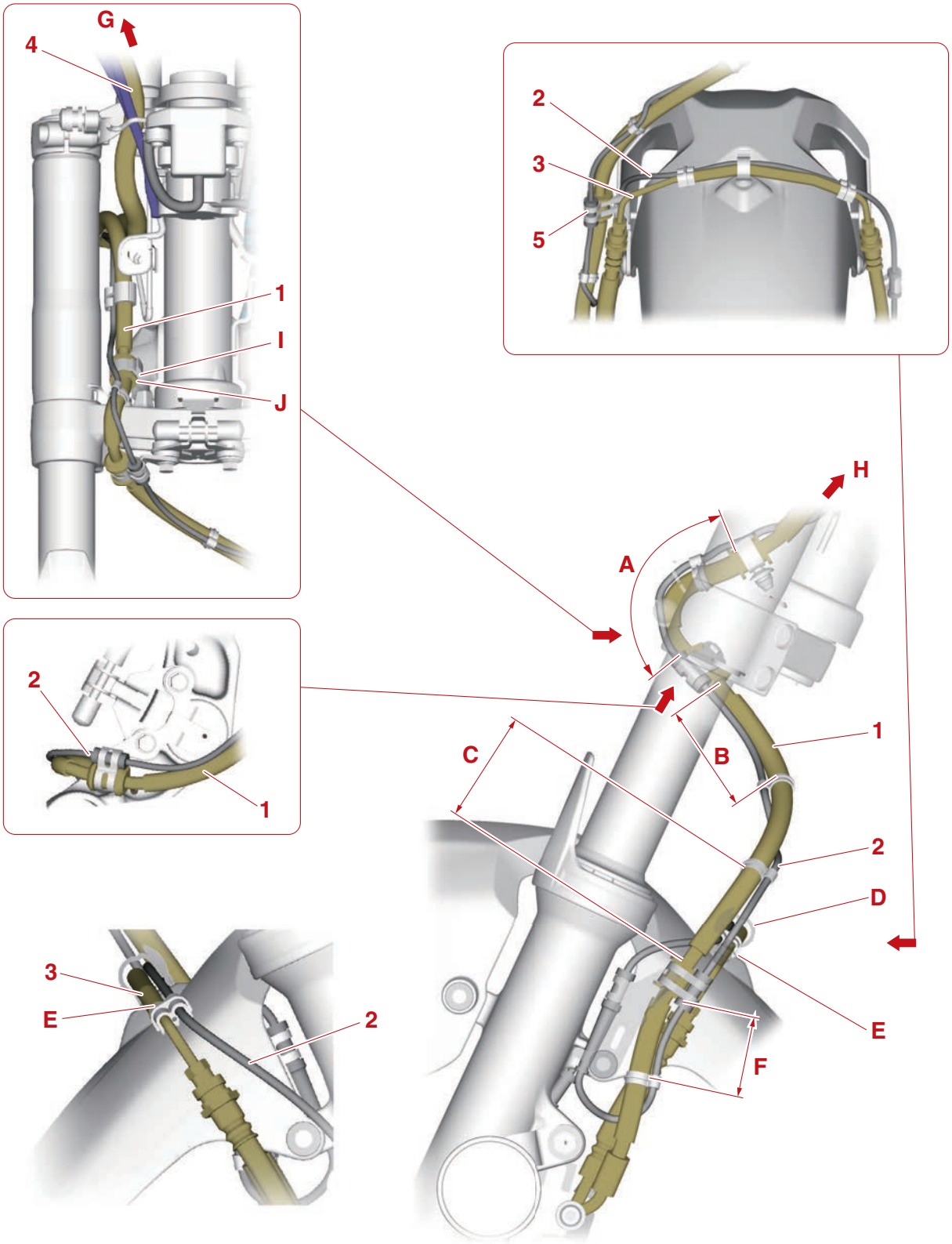
Rear brake hose (right side view)



1. Rear wheel sensor lead
2. Brake hose (hydraulic unit to rear brake caliper)
3. Rear brake fluid reservoir hose
4. Brake hose (rear brake master cylinder to hydraulic unit)
5. Oil pressure switch lead
6. O_2 sensor lead
7. Rear brake light switch lead
8. Clamp
9. Bracket
10. Quick fastener

A. Route the rear wheel sensor lead to the outside of the brake hose (hydraulic unit to rear brake caliper). Make sure that the rear wheel sensor lead is not twisted.
B. Align the holder with the pipe section of the brake hose (hydraulic unit to rear brake caliper).
C. Position the holder halfway between the guide and the end of the protective sleeve on the rear wheel sensor lead as shown in the illustration.
D. Clamp the straight-shaped portion of the rear brake fluid reservoir hose as shown.
E. Route the brake hoses to the inside of the frame.
F. To O_2 sensor
G. Route the rear wheel sensor lead and brake hose (hydraulic unit to rear brake caliper) through the guide.
H. Route the brake hoses on top of the frame.
I. Point the end of the clamp rearward, and then cut off the excess end of the tie to 5 mm (0.20 in) or less.
J. Fasten the grommets on the rear wheel sensor lead and the brake hose (hydraulic unit to rear brake caliper) with the holder.
K. Fasten the rear wheel sensor lead and brake hose (hydraulic unit to brake caliper) with the holder.
When doing so, route the rear wheel sensor lead above the brake hose (hydraulic unit to brake caliper).
Align the holder with the pipe section of the brake hose (hydraulic unit to brake caliper).
Make sure that the white tape of the rear wheel sensor lead is at the front of the holder.
L. White tape
M. To oil pressure switch
N. Route the rear brake light switch lead, O_2 sensor lead and oil pressure switch lead to the inside of the rear wheel sensor lead.

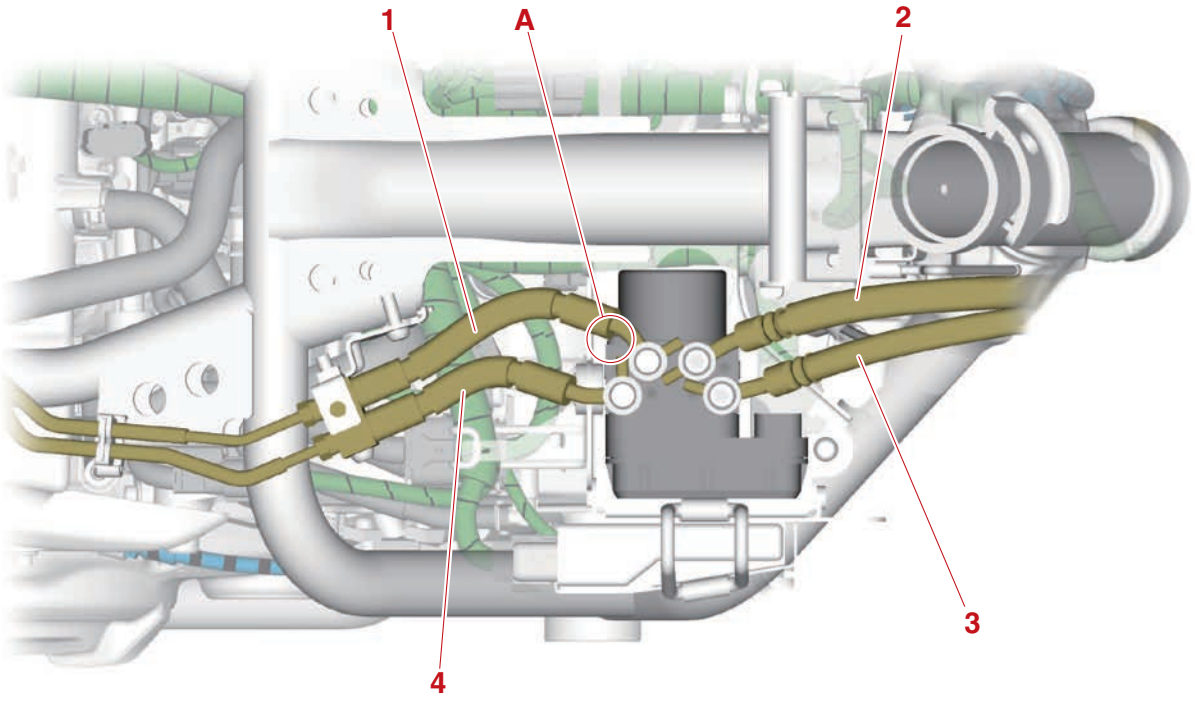
Front brake hose (left and right side view)

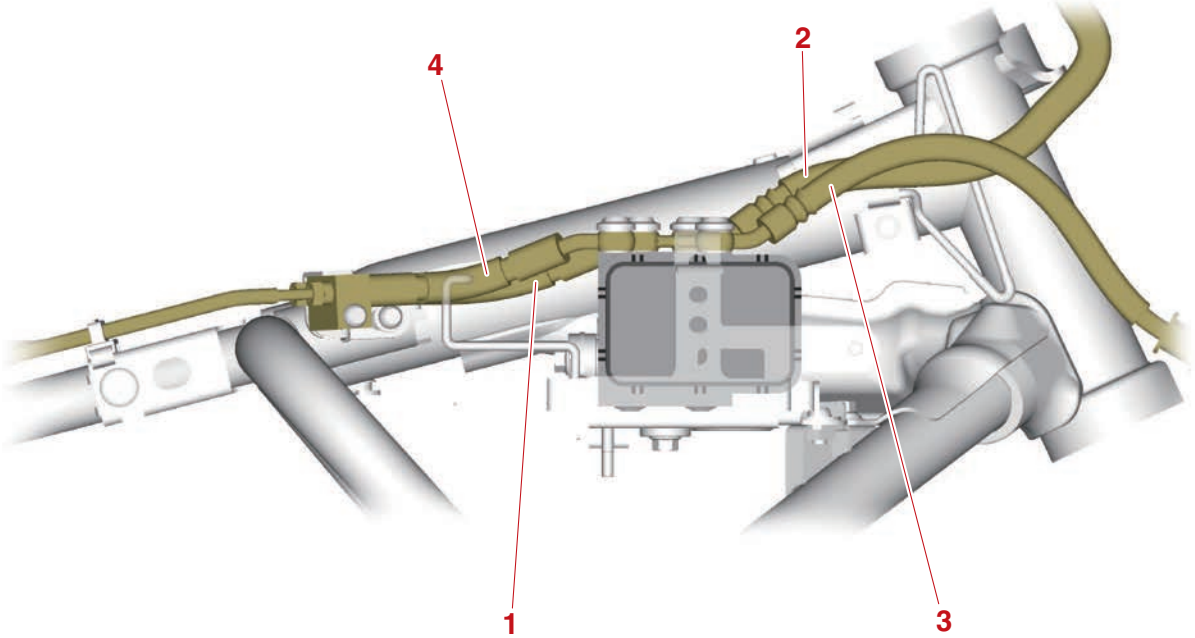


1. Brake hose (hydraulic unit to front brake caliper (left))
2. Front wheel sensor lead
3. Brake hose (front brake caliper (left) to front brake caliper (right))
4. Brake hose (front brake master cylinder to hydraulic unit)
5. Brake hose holders

A. The front wheel sensor lead should not be caught between the headlight front cover and the brake hose (hydraulic unit to front brake caliper (left)).
B. Fasten the front wheel sensor lead and brake hose (hydraulic unit to front brake caliper (left)) with the holder as shown in the illustration. Position the holder 80–100 mm (3.15–3.94 in) from the grommet on the hose and route the lead in front the hose.
C. As shown, fasten the front wheel sensor lead and brake hose (hydraulic unit to front brake caliper (left)) with the holder. Position the holder 60–80 mm (2.36–3.15 in) from the grommet on the hose, and then route the lead to the rear of the hose.
D. Face the catch of the holder forward, and then close the holder until three clicks or more are heard.
E. Make sure that the holder contacts the end of the hose protector on the brake hose.
F. Fasten the front wheel sensor lead and brake hose (hydraulic unit to front brake caliper (left)) with the holder as shown in the illustration.
Position the holder 30–50 mm (1.18–1.97 in) from the grommet on the hose and route the lead to the rear of the hose.
G. To front brake master cylinder
H. To hydraulic unit
I. Face the catch of the holder inward, and then close the holder until two clicks or more are heard.
J. With the clamp, fasten the front wheel sensor lead and brake hose at the white paint portion on the brake hose and white tape on the front wheel sensor lead.
When doing so, make sure that the front wheel sensor lead overlaps with the white paint portion of the brake hose.

Hydraulic unit assembly (top and right side view)

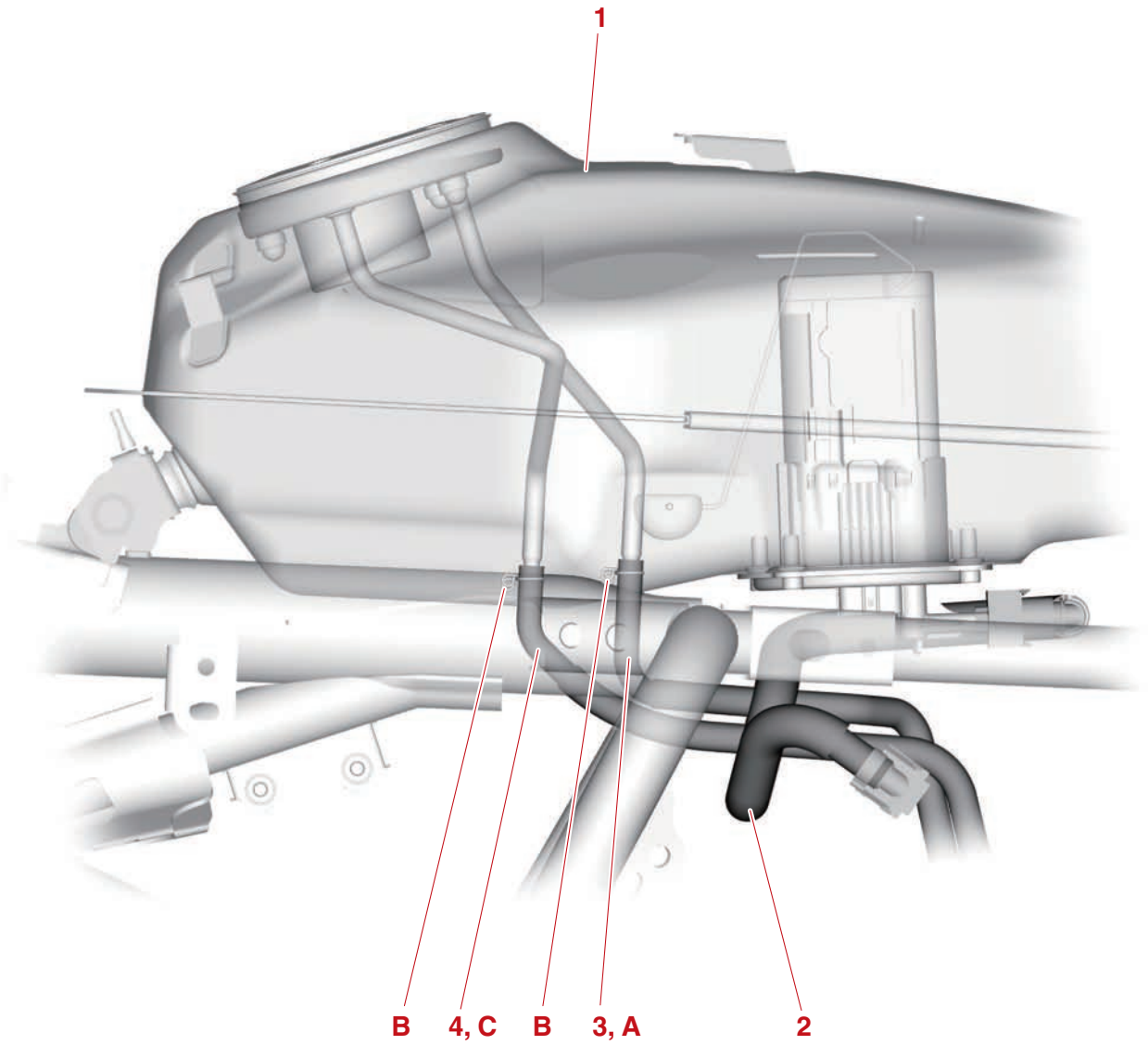




1. Brake hose (rear brake master cylinder to hydraulic unit)
2. Brake hose (front brake master cylinder to hydraulic unit)
3. Brake hose (hydraulic unit to front brake caliper (left))
4. Brake hose (hydraulic unit to rear brake caliper)

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

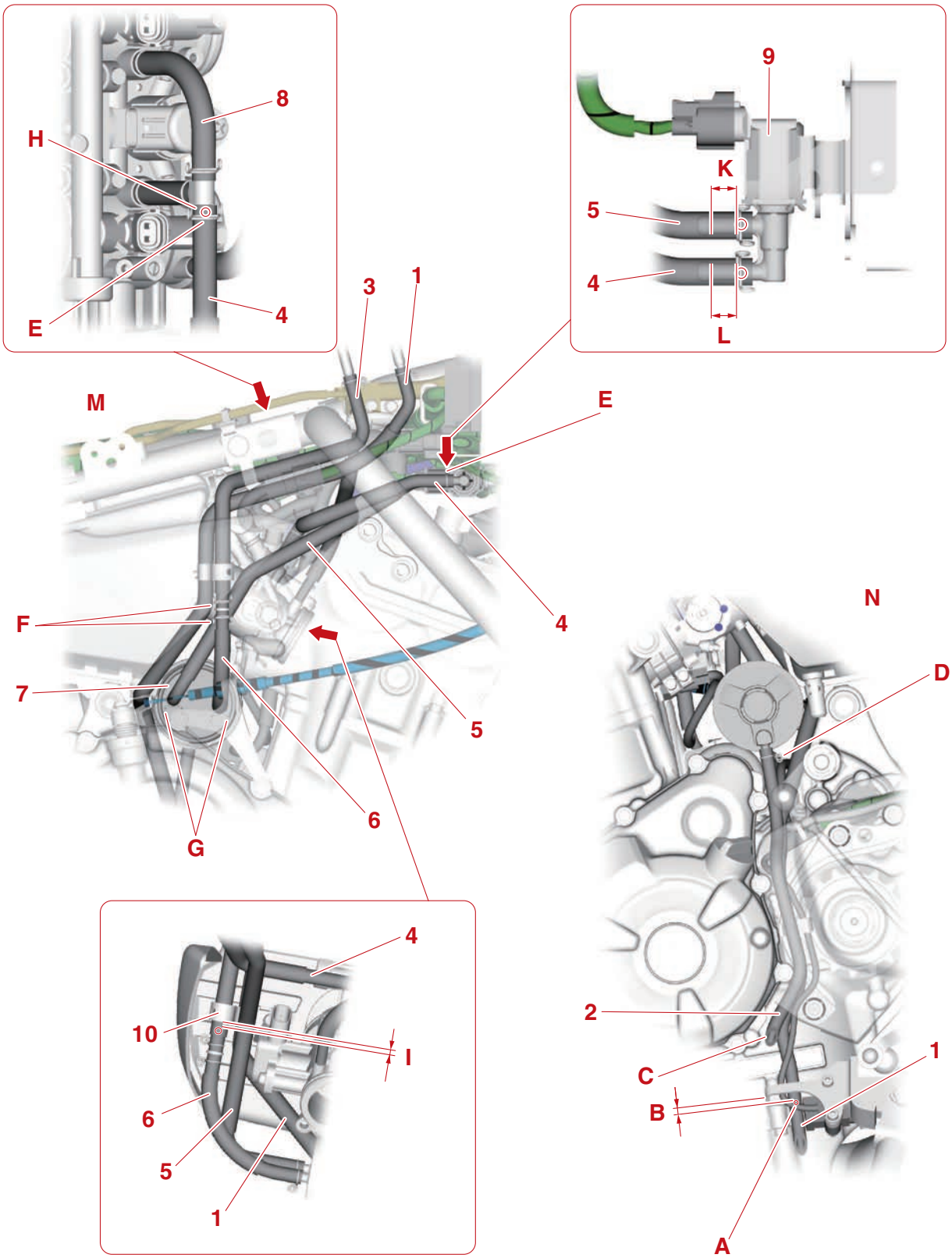
Fuel tank (left side view)



1. Fuel tank
2. Fuel hose
3. Fuel tank breather hose
4. Fuel tank overflow hose

A. Face the blue paint mark on the fuel tank breather hose to the right. Install the hose up to the wide portion of the pipe.
B. Align the ends of the hose clamp with the paint mark on the hose. Make sure not to install the hose clamp on the raised portion of the hose fitting.
Face the knob of the hose clamp to the front side of the vehicle, and make sure that the hose clamp does not contact the bottom of the fuel tank.
C. Face the white paint mark on the fuel tank overflow hose to the right. Install the hose up to the wide portion of the pipe.

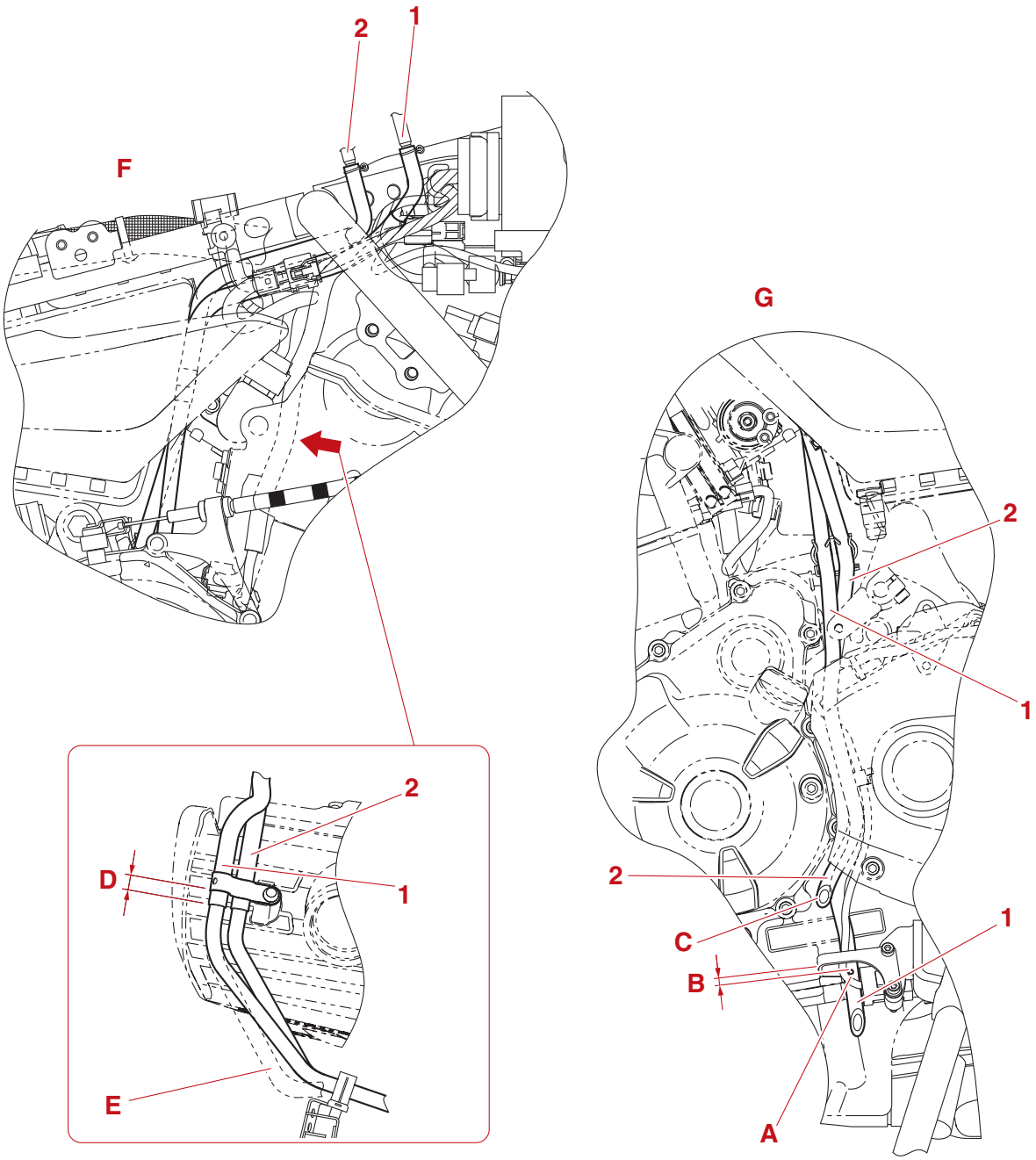
Fuel tank hose (for California)



1. Fuel tank overflow hose
2. Canister breather hose
3. Fuel tank breather hose (fuel tank to hose joint)
4. Canister purge hose (purge cut valve solenoid to hose joint)
5. Canister purge hose (canister to purge cut valve solenoid)
6. Fuel tank breather hose (hose joint to canister)
7. Canister
8. Canister purge hose (hose joint to throttle body)
9. Purge cut valve solenoid
10. Clamp

A. Blue paint mark
B. 0–10 mm (0–0.39 in)
C. The tip of the canister breather hose protrudes from the lower side of the drive sprocket cover.
Place the canister breather hose in front of the fuel tank overflow hose.
D. Point the knob of the clip to the rear side of the vehicle, making sure that it does not interfere with the canister body.
E. Point the knob of the clip upward.
F. Point the knob of the clip to the inside of the vehicle.
G. Point the knob of the clip downward.
H. Point the paint mark on the canister purge hose (purge cut valve solenoid to hose joint) upward.
I. When fastening the fuel tank breather hose with the holder, make sure that the paint mark on the hose is positioned 0–10 mm (0–0.39 in) from the holder.
J. Detailed drawing of the purge cut valve solenoid
K. Position the clip between the blue paint mark and the raised portion of the hose fitting.
L. Position the clip between the white paint mark and the raised portion of the hose fitting.

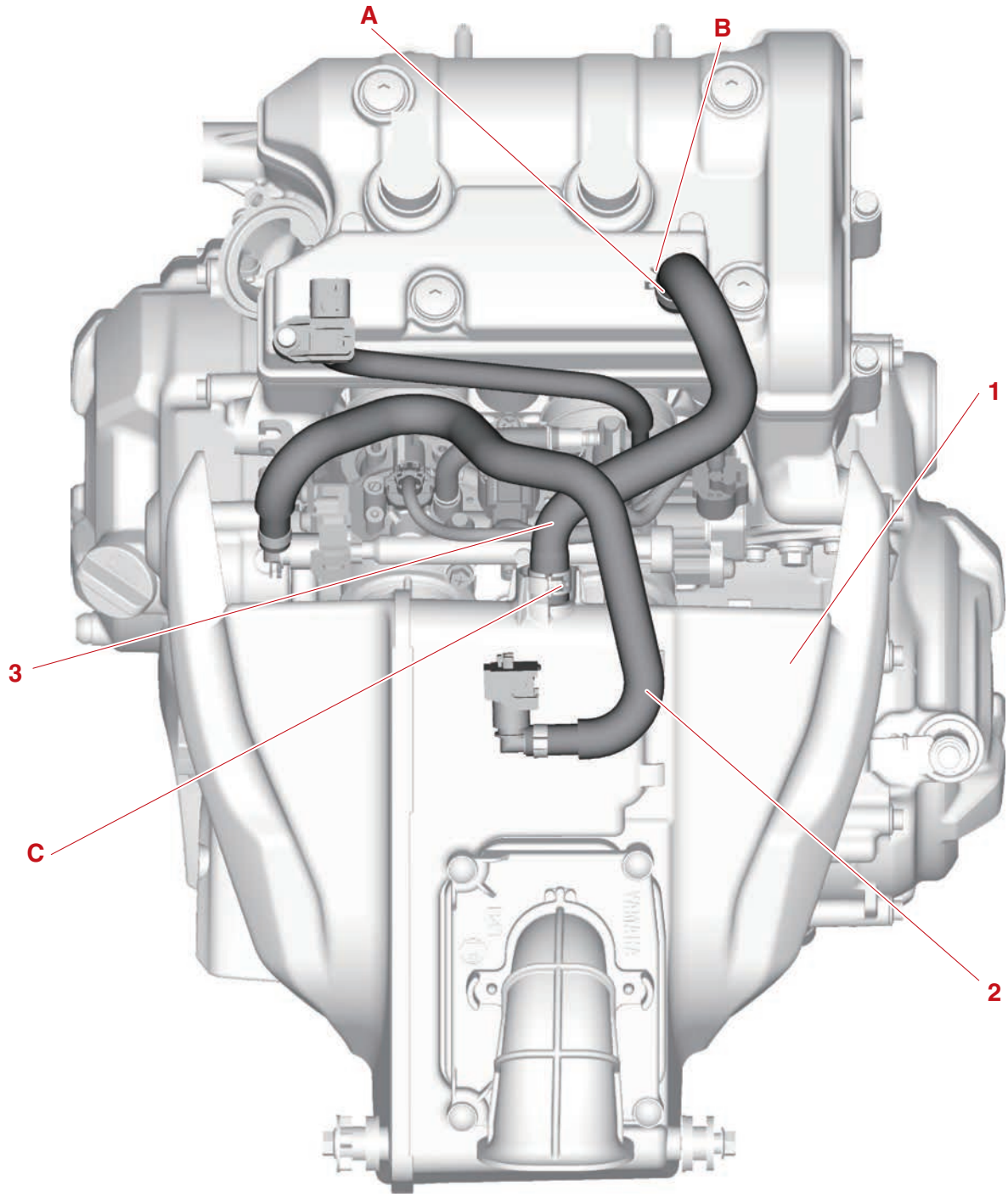
Fuel tank hose (except for California)



1. Fuel tank overflow hose
2. Fuel tank breather hose

A. Blue paint mark
B. 0–10 mm (0–0.39 in)
C. The tip of the fuel tank breather hose protrudes from the lower side of the chain case.
   Place the fuel tank breather hose in front of the fuel tank overflow hose.
D. Less than 10 mm (0.39 in). Fasten the hose protector of each hose with the holder.
E. Make sure that there is no slack in the fuel tank breather hose or fuel tank overflow hose.
F. Right side
G. Left side

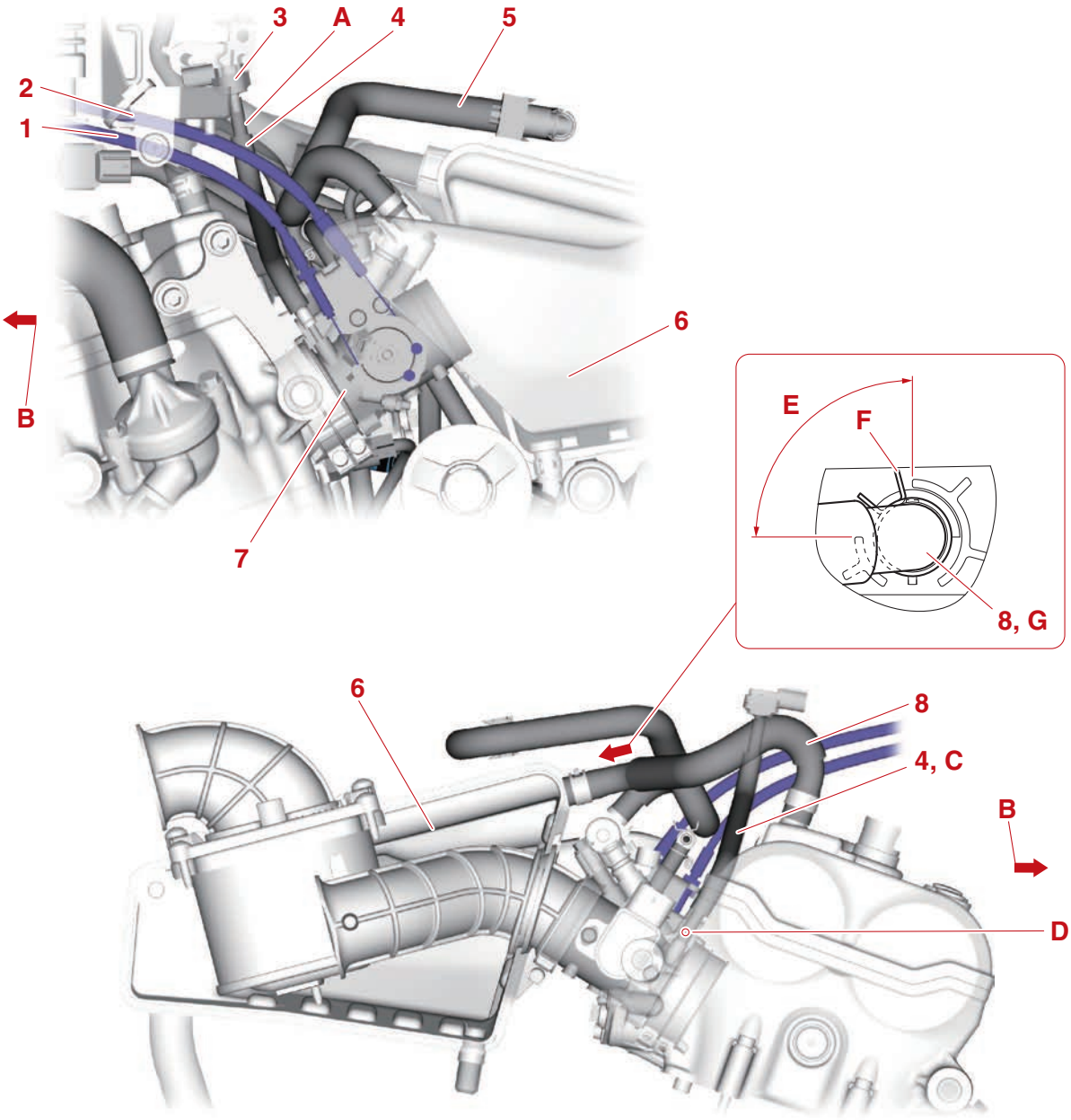
Throttle bodies (top view)



1. Air filter case
2. Fuel hose
3. Cylinder head breather hose

A. Face the yellow paint mark on the cylinder head breather hose to the left.
B. Position the hose clamp 1–4 mm (0.04–0.16 in) from the end of the hose. Point the ends of the hose clamp to the left.
C. Position the hose clamp 1–4 mm (0.04–0.16 in) from the end of the hose.

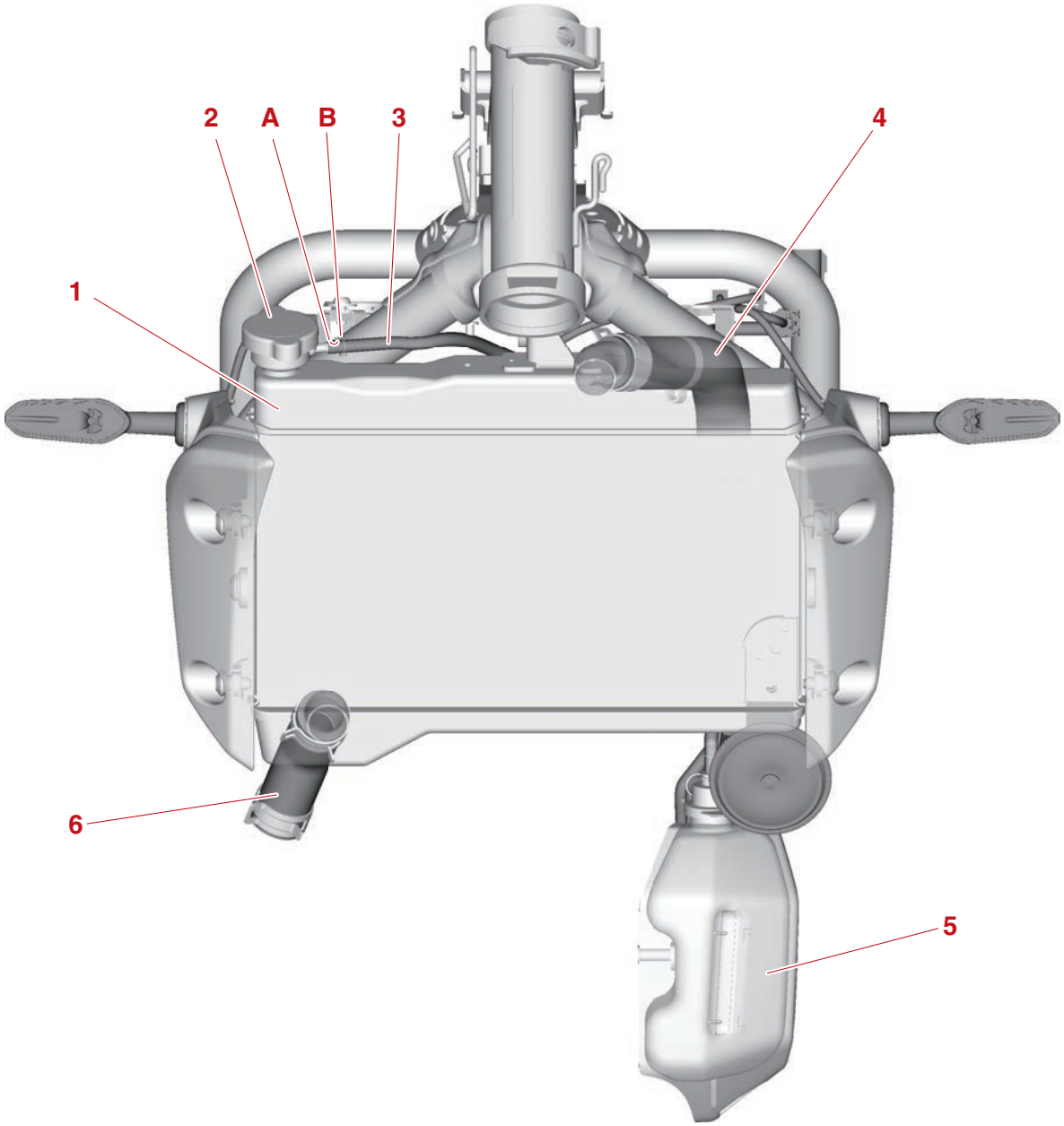
Air filter case (left and right side view)



1. Throttle cable (accelerator cable)
2. Throttle cable (decelerator cable)
3. Intake air pressure sensor
4. Intake air pressure sensor hose
5. Fuel hose
6. Air filter case
7. Throttle body assembly
8. Cylinder head breather hose

A. Install the intake air pressure sensor hose up to the bend in the hose fitting of the intake air pressure sensor.
B. Forward
C. Make sure that the hose is not twisted.
D. Face the green paint mark on the intake air pressure sensor hose toward the right side of the vehicle.
   Install the intake air pressure sensor hose on the throttle body assembly, and then make sure that the hose contacts the throttle body assembly.
E. 90°
F. Position the ends of the hose clamp within the range shown in the illustration.
G. Face the blue paint mark on the cylinder head breather hose upward. Install the cylinder head breather hose onto the air filter case, making sure that the hose contacts the case.

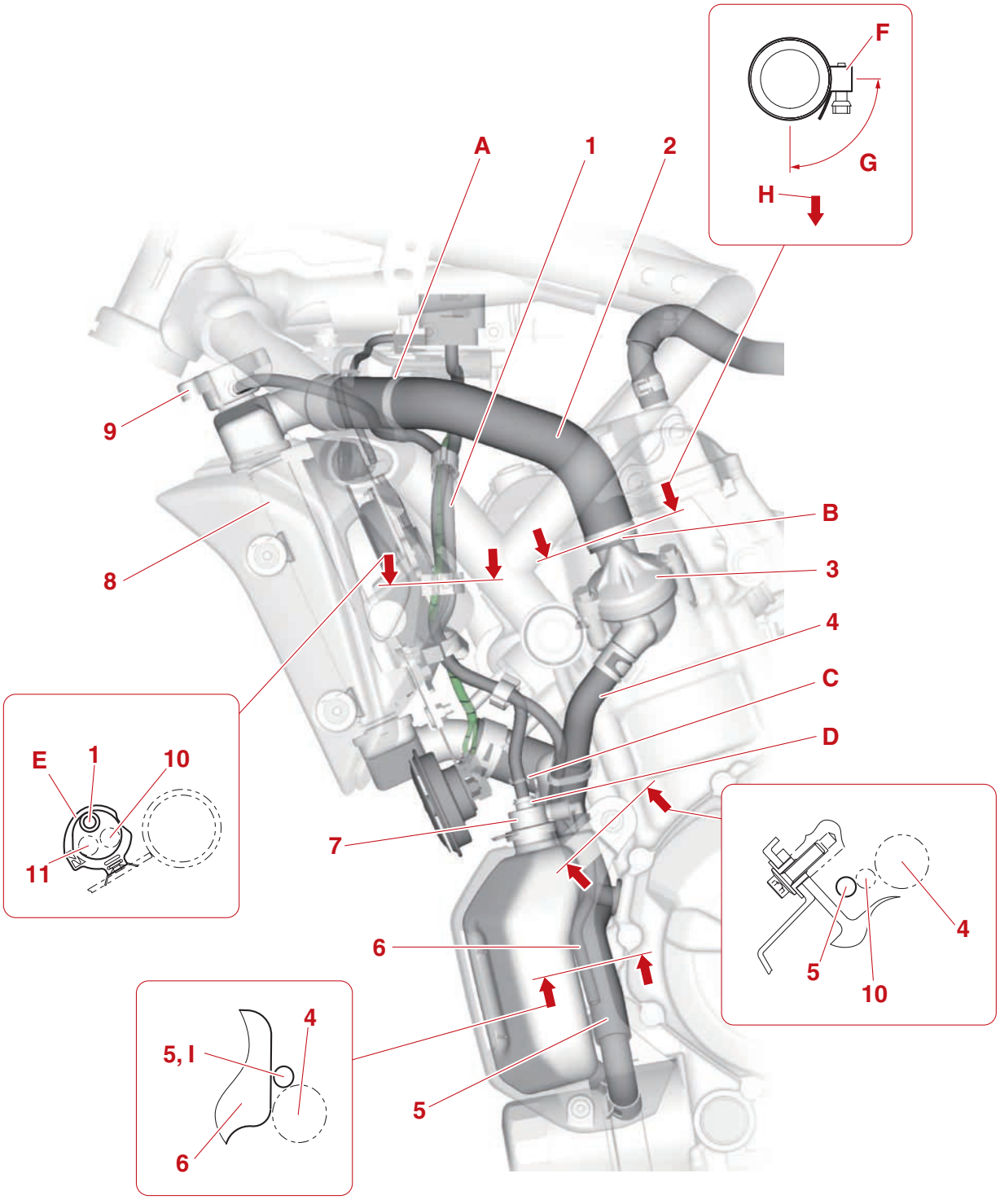
Radiator (front view)



1. Radiator
2. Radiator cap
3. Coolant reservoir hose
4. Radiator inlet hose
5. Coolant reservoir
6. Radiator outlet hose

A. Connect the end of the coolant reservoir hose that is identified by the white paint mark to the radiator.
B. Point the ends of the hose clamp toward the frame.

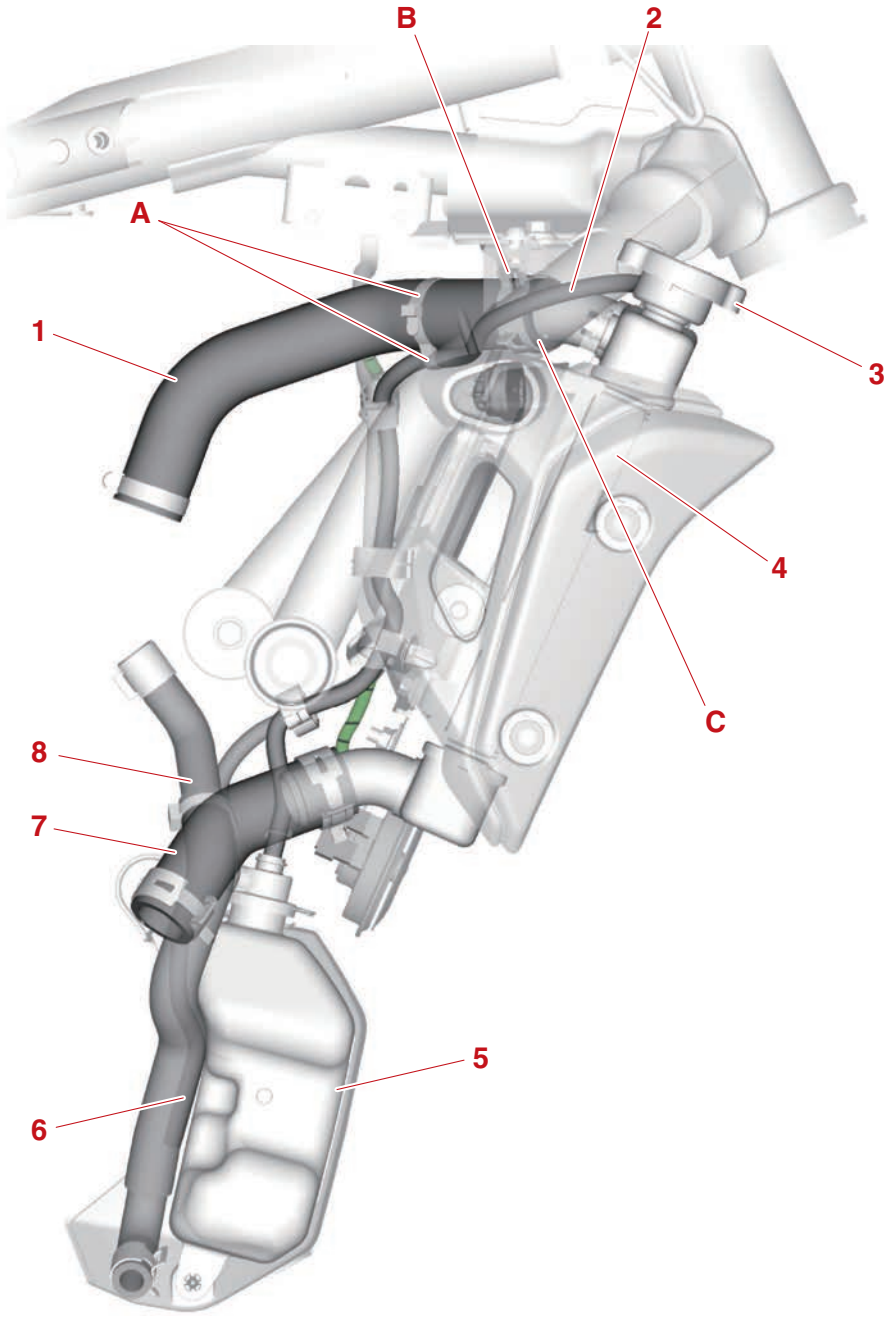
Radiator (left side view)



1. Coolant reservoir hose
2. Radiator inlet hose
3. Thermostat housing
4. Oil cooler inlet hose
5. Coolant reservoir
6. Coolant reservoir breather hose
7. Coolant reservoir cap
8. Radiator
9. Radiator cap
10. Stator coil lead
11. Horn lead

A. Fasten the coolant reservoir hose to the radiator inlet hose with the plastic locking tie.
   Position the coolant reservoir hose directly under the radiator inlet hose.
   Face the buckle of the plastic locking tie inward with the end pointing downward.
B. Align the white paint mark on the radiator inlet hose with the projection on the thermostat housing.
   Install the radiator inlet hose onto the thermostat housing, making sure that the hose contacts the projection on the housing.
C. Point the ends of the hose clamp outward.
D. Install the coolant reservoir hose onto the coolant reservoir cap, making sure that the hose contacts the cap.
E. Face the catch of the holder forward.
F. Position the clamp screw within the range shown in the illustration.
G. 90°
H. Outward
I. Route the coolant reservoir breather hose to the outside of the oil cooler inlet hose.

Radiator (right side view)



1. Radiator inlet hose
2. Coolant reservoir hose
3. Radiator cap
4. Radiator
5. Coolant reservoir
6. Coolant reservoir breather hose
7. Radiator outlet hose
8. Oil cooler inlet hose

A. Align the plastic locking tie with the white paint marks on the radiator inlet hose and coolant reservoir hose.
B. Point the ends of the hose clamp in the direction shown in the illustration. Make sure that the ends of the hose clamp do not contact the coolant reservoir hose.
C. Align the yellow paint mark on the radiator inlet hose with the projection on the radiator pipe.
Install the radiator inlet hose onto the radiator pipe, making sure that the hose contacts the projection on the pipe.

PERIODIC CHECKS AND ADJUSTMENTS

EAS20022
PERIODIC MAINTENANCE

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

EAS30614
PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM
TIP
- From 24000 mi (37000 km) or 36 months, repeat the maintenance intervals starting from 8000 mi (13000 km) or 12 months.
- Items marked with an asterisk require special tools, data and technical skills, have a Yamaha dealer perform the service.

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
1	*	Fuel line	• Check fuel hoses for cracks or damage. • Replace if necessary.		√	√	√	√	√
2	*	Spark plugs	• Check condition. • Adjust gap and clean.		√		√		√
			• Replace.			√		√	
3	*	Valve clearance	• Check and adjust valve clearance when engine is cold.	Every 26600 mi (42000 km)					
4	*	Crankcase breather system	• Check breather hose for cracks or damage. • Replace if necessary.		√	√	√	√	√
5	*	Fuel injection	• Adjust synchronization.	√	√	√	√	√	√
6	*	Exhaust system	• Check for leakage. • Tighten if necessary. • Replace gaskets if necessary.	√	√	√	√	√	√
7	*	Evaporative emission control system (for California only)	• Check control system for damage. • Replace if necessary.				√		√

EAS30615
GENERAL MAINTENANCE AND LUBRICATION CHART

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
1	*	Diagnostic system check	• Perform dynamic inspection using Yamaha diagnostic tool. • Check the DTC.	√	√	√	√	√	√
2	*	Air filter element	• Replace.	Every 24000 mi (37000 km)					
3		Air filter check hose	• Clean.	√	√	√	√	√	√
4	*	Clutch	• Check operation. • Adjust or replace cable.	√	√	√	√	√	√

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
5	*	**Front brake**	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	√	√	√	√	√	√
6	*	**Rear brake**	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	√	√	√	√	√	√
7	*	**Brake hoses**	• Check for cracks or damage. • Check for correct routing and clamping.		√	√	√	√	√
			• Replace.	Every 4 years					
8	*	**Brake fluid**	• Change.	Every 2 years					
9	*	**Wheels**	• Check runout and for damage. • Replace if necessary.		√	√	√	√	√
10	*	**Tires**	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
11	*	**Wheel bearings**	• Check bearings for smooth operation. • Replace if necessary.		√	√	√	√	√
12	*	**Swingarm pivot bearings**	• Check operation and for excessive play.		√	√	√	√	√
			• Moderately repack with lithium-soap-based grease.	Every 32000 mi (50000 km)					
13		**Drive chain**	• Check chain slack, alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 600 mi (1000 km) and after washing the motorcycle, riding in the rain or riding in wet areas					
14	*	**Steering bearings**	• Check bearing assemblies for looseness.	√	√	√	√	√	√
			• Moderately repack with lithium-soap-based grease.	Every 12000 mi (19000 km)					
15	*	**Chassis fasteners**	• Check all chassis fitting and fasteners. • Correct if necessary.		√	√	√	√	√
16		**Brake lever pivot shaft**	• Apply silicone grease lightly.		√	√	√	√	√
17		**Brake pedal pivot shaft**	• Apply lithium-soap-based grease lightly.		√	√	√	√	√
18		**Clutch lever pivot shaft**	• Apply lithium-soap-based grease lightly.		√	√	√	√	√
19		**Shift pedal pivot shaft**	• Apply lithium-soap-based grease lightly.		√	√	√	√	√
20		**Sidestand pivot**	• Check operation. • Apply molybdenum disulfide grease lightly.		√	√	√	√	√
21	*	**Sidestand switch**	• Check operation and replace if necessary.	√	√	√	√	√	√
22	*	**Front fork**	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√
23	*	**Shock absorber assembly**	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√
24	*	**Rear suspension link pivots**	• Check operation. • Correct if necessary.			√		√	

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

TIP

- Air filter
  - This model uses a disposable oil-coated paper element. This element cannot be cleaned with compressed air, doing so will only damage it.
  - Replace the air filter more frequently if you often ride in the rain or dusty conditions.
- Hydraulic brake service
  - Regularly check the brake fluid levels. Replenish as necessary.
  - 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 or sooner 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:
   - Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
2. Disconnect the coupler from the CCU (Communication Control Unit), and then connect the YDT to the coupler.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

TIP

- Yamaha diagnostic tool (A/I) (90890-03273) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

Refer to "YDT" on page 9-3.

3. Check:
   - DTC

TIP

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

DTC number is displayed → Check and repair the probable cause of the malfunction.
Refer to "SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE" on page 9-24.

4. Perform:
   - Dynamic inspection

TIP

Use the "Dynamic inspection" function of the Yamaha diagnostic tool version 3.0 and later 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:
   - Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30619
CHECKING THE FUEL LINE

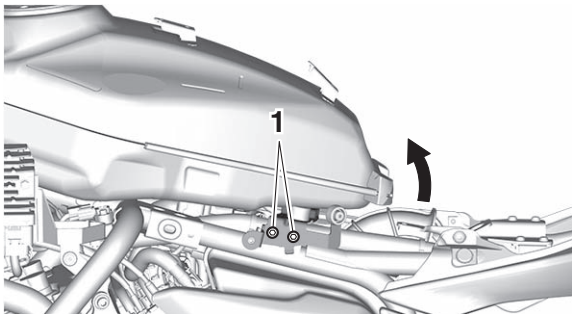
1. Remove:
   - Passenger seat
   - Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Rear fuel tank bracket bolt "1"

TIP

After removing the rear fuel tank bracket bolts, lift up the rear of the fuel tank.

ECA20070
NOTICE

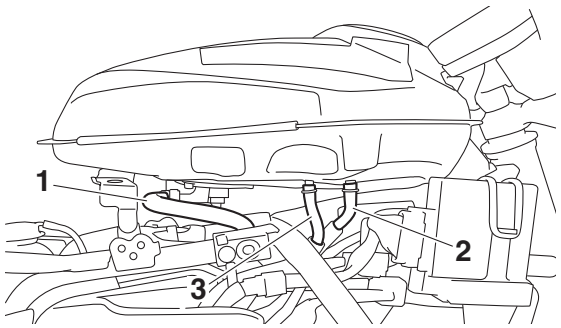
When lifting up the fuel tank, be careful not to pull the fuel tank overflow hose and fuel tank breather hose.



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

ECA16950
NOTICE

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



3. Install:
   • Rear fuel tank bracket bolt

	Rear fuel tank bracket bolt **10 N·m (1.0 kgf·m, 7.4 lb·ft)**

4. Install:
   • Fuel tank cover assembly
   Refer to "GENERAL CHASSIS (4)" on page 4-11.
   • Rider seat
   • Passenger seat
   Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30620
CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

1. Remove:
   • Passenger seat
   • Rider seat
   Refer to "GENERAL CHASSIS (1)" on page 4-1.
   • Fuel tank cover assembly
   Refer to "GENERAL CHASSIS (4)" on page 4-11.
   • Fuel tank
   Refer to "FUEL TANK" on page 7-1.
2. Remove:
   • Ignition coil
   • Spark plug

ECA13320
NOTICE

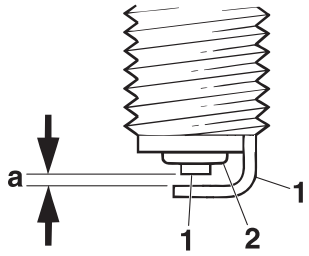
Before removing the spark plugs, blow away any dirt accumulated in the spark plug wells with compressed air to prevent it from falling into the cylinders.

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)**



G088879

7. Install:
   • Spark plug
   • Ignition coil

	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.

8. Install:
   • Fuel tank
   Refer to "FUEL TANK" on page 7-1.
   • Fuel tank cover assembly
   Refer to "GENERAL CHASSIS (4)" on page 4-11.
   • Rider seat
   • Passenger seat
   Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30622
ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

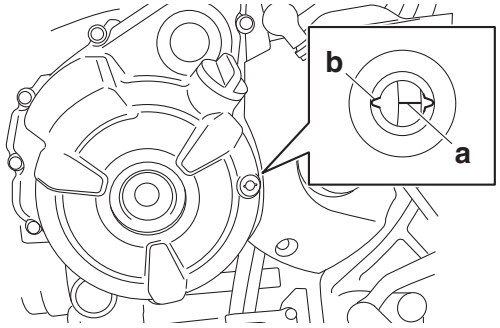
TIP

- 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. Drain:
   - Coolant
   Refer to "CHANGING THE COOLANT" on page 3-24.
2. Remove:
   - Passenger seat
   - Rider seat
   Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
   Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Radiator
   Refer to "RADIATOR" on page 6-2.
   - Clutch cable guide
   Refer to "ENGINE REMOVAL" on page 5-10.
3. Remove:
   - Ignition coil
   - Spark plug
   - Cylinder head cover
   - Cylinder head cover gasket
   Refer to "CAMSHAFTS" on page 5-19.
4. Remove:
   - Timing mark accessing bolt
   - Crankshaft end cover
5. Measure:
   - Valve clearance
   Out of specification → Adjust.

Valve clearance (cold)
Intake
0.11–0.20 mm (0.0043–0.0079 in)
Exhaust
0.24–0.30 mm (0.0094–0.0118 in)

a. Turn the crankshaft counterclockwise.
b. When piston #1 is at TDC on the compression stroke, align the TDC mark "a" on the generator rotor with the slot "b" in the generator rotor cover.



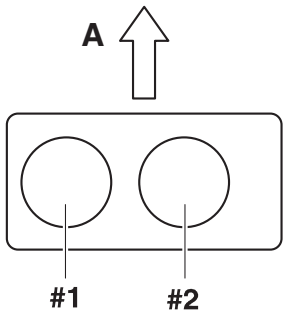
c. Measure the valve clearance with a thickness gauge.

Thickness gauge
90890-03268
Feeler gauge set
YU-26900-9

TIP

- If the valve clearance is incorrect, record the measured reading.
- Measure the valve clearance in the following sequence.

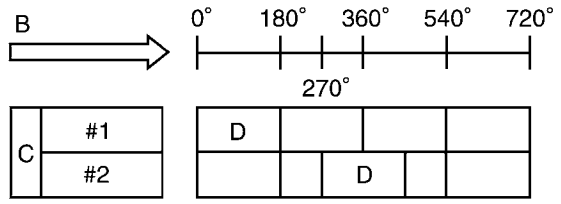
Valve clearance measuring sequence
Cylinder #1 → #2



G088881

A. Front

d. To measure the valve clearances of cylinder #2 turn the crankshaft 270° counterclockwise.



B. Degrees that the crankshaft is turned counterclockwise
C. Cylinder
D. Combustion cycle

6. Remove:
   • Camshaft

TIP

- Refer to "CHANGING THE COOLANT" on page 3-24.
- When removing the timing chain and camshafts, fasten the timing chain with a wire to retrieve it if it falls into the crankcase.

7. Adjust:
   • Valve clearance
   a. Remove the valve lifter and the valve pad with a valve lapper.

Valve lapper (ø14)
90890-04101
Valve lapper (ø14)
YM-A8998

TIP

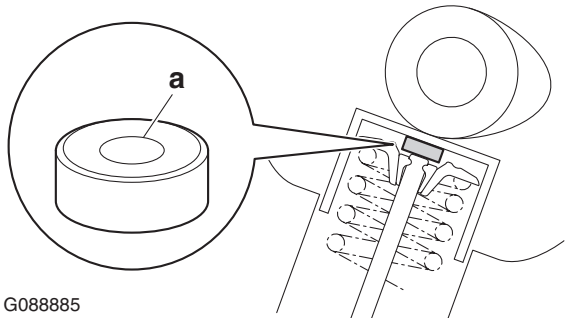
- Cover the timing chain opening with a rag to prevent the valve pad from falling into the crankcase.
- Make a note of the position of each valve lifter and valve pad so that they can be installed in the correct place.

   b. Calculate the difference between the specified valve clearance and the measured valve clearance.
      Example:
      Specified valve clearance = 0.11–0.20 mm (0.0043–0.0079 in)
      Measured valve clearance = 0.25 mm (0.0098 in)
      0.25 mm (0.0098 in) – 0.20 mm (0.0079 in) = 0.05 mm (0.0020 in)
   c. Check the thickness of the current valve pad.

TIP

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

      Example:
      If the valve pad is marked "158", the pad thickness is 1.58 mm (0.0622 in).



G088885

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

Last digit	Rounded value
0, 1, 2	0
3, 4, 5, 6	5
7, 8, 9	10

TIP

Refer to the following table for the available valve pads.

Valve pad range	No. 150–240
Valve pad thickness	1.50–2.40 mm (0.0590–0.0944 in)
Available valve pads	19 thicknesses in 0.05 mm (0.0020 in) increments

      Example:
      Valve pad number = 163
      Rounded value = 165
      New valve pad number = 165
   f. Install the new valve pad and the valve lifter.

TIP
- Lubricate the valve pad with molybdenum disulfide oil.
- Lubricate the valve lifter with engine oil.
- Install the valve lifter and the valve pad in the correct place.
- The valve lifter must turn smoothly when rotated by hand.

g. Install the exhaust and intake camshafts, timing chain and camshaft caps.

Exhaust camshaft cap bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)
Intake camshaft cap bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP
- Refer to "CAMSHAFTS" on page 5-19.
- Lubricate the camshaft lobes and camshaft journals with molybdenum disulfide oil.
- First, install the exhaust camshaft.
- Align the camshafts sprocket marks with the cylinder head edge.
- Turn the crankshaft counterclockwise several full turns to seat the parts.

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

8. 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 throttle body synchronization should be adjusted properly, the air filter element should be clean, and the engine should have adequate compression.

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

Engine idling speed
1250–1450 r/min

3. Check:
   - ISC (Idle Speed Control) learning value
     "00" or "01" → Check the intake system.
     "02" → Clean the ISC (Idle Speed Control) valve.
     Refer to "CLEANING THE ISC (IDLE SPEED CONTROL) VALVE" on page 7-12.

a. Connect the Yamaha diagnostic tool.
   Use the diagnostic code number "67".
   Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-42.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

b. Check the ISC (Idle Speed Control) leaning value.

EAS30797
SYNCHRONIZING THE THROTTLE BODIES

TIP
Before synchronizing the throttle bodies, check the following items:
- Valve clearance
- Spark plug
- Air filter element
- Throttle body joint
- Fuel hose
- Exhaust system
- Cylinder head breather hose
- Vacuum hose

Checking the throttle body synchronization

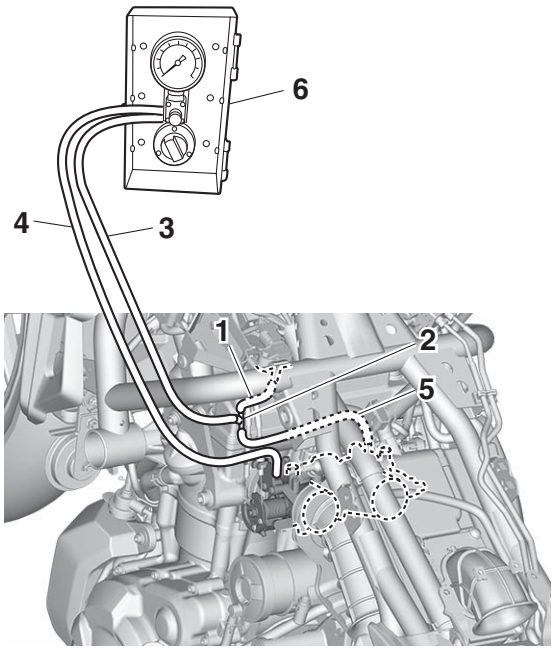
1. Stand the vehicle on a level surface.

TIP
Place the vehicle on a maintenance stand.

2. Remove:
   - Passenger seat
   - Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.

3. Disconnect:
   • Intake air pressure sensor hose
   Refer to "THROTTLE BODIES" on page 7-9.
4. Install:
   • Hose "1" (Parts No.: 5JW-24311-00)
   • 3-way joint "2" (Parts No.: 90413-05014)
   • Vacuum gauge hose #2 "3"
   • Vacuum gauge hose #1 "4"
   • Intake air pressure sensor hose "5"
   • Vacuum gauge "6"

Vacuum gauge
90890-03094
Vacuummate
YU-44456



5. Install:
   • Fuel tank
   Refer to "FUEL TANK" on page 7-1.
6. Check:
   • Throttle body synchronization
   a. Start the engine, warm it up for several minutes, and then let it run at the specified engine idling speed.

Engine idling speed
1250–1450 r/min

   b. Check the vacuum pressure.

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

If out of specification → Adjust the throttle body synchronization.

Adjusting the throttle body synchronization

1. Adjust:
   • Throttle body synchronization
   a. Start the engine, warm it up for several minutes, and then let it run at the specified engine idling speed.

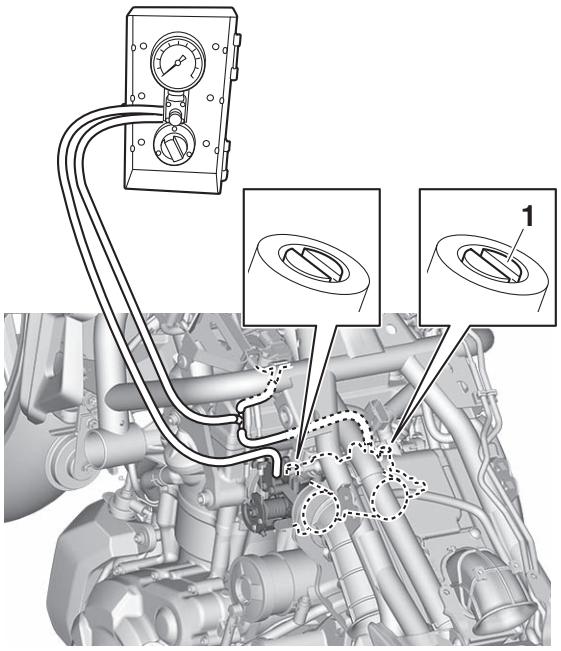
Engine idling speed
1250–1450 r/min

   b. With throttle body #1 as standard, adjust throttle body #2 using the air screw "1".

TIP

- Turn the bypass air screw using the carburetor angle driver.
- After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.
- If a bypass air screw was removed, turn the screw in fully and be sure to synchronize the throttle bodies.
- If the throttle body synchronization can not be adjusted using the bypass air screw, clean or replace the throttle bodies.
- The difference in vacuum pressure between the throttle bodies should not exceed 1.33 kPa (10 mmHg).

Carburetor angle driver 2
90890-03173



2. Stop the engine and remove the measuring equipment.
3. Connect:
   - Intake air pressure sensor hose
     Refer to "THROTTLE BODIES" on page 7-9.
4. Install:
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Rider seat
   - Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
5. Adjust:
   - Throttle grip free play
     Refer to "CHECKING THE THROTTLE GRIP OPERATION" on page 3-27.

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

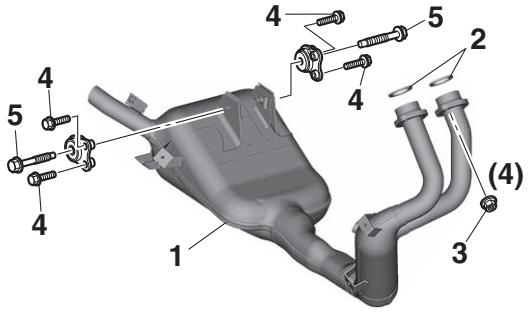
EAS30798
CHECKING THE THROTTLE BODY JOINTS

1. Remove:
   - Passenger seat
   - Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Disconnect:
   - Intake air pressure sensor hose
   - Canister purge hose (for California only)
     Refer to "THROTTLE BODIES" on page 7-9.
3. Remove:
   - Throttle body
     Refer to "THROTTLE BODIES" on page 7-9.
4. Check:
   - Throttle body joint
     Cracks/damage → Replace.
5. Install:
   - Throttle body
     Refer to "THROTTLE BODIES" on page 7-9.
6. Connect:
   - Intake air pressure sensor hose
   - Canister purge hose (for California only)
     Refer to "THROTTLE BODIES" on page 7-9.
7. Install:
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Rider seat
   - Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30062
CHECKING THE EXHAUST SYSTEM

1. Check:
   - Muffler assembly "1"
     Cracks/damage → Replace.
   - Exhaust gasket "2"
     Exhaust gas leaks → Replace.
2. Check:
   Tightening torque
   - Exhaust pipe nut "3"
   - Muffler bracket bolt "4", "5"

Exhaust pipe nut
20 N·m (2.0 kgf·m, 15 lb·ft)
Muffler bracket bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)
Muffler bracket bolt
20 N·m (2.0 kgf·m, 15 lb·ft)



EAS30626
CHECKING THE CANISTER (for California only)

1. Remove:
   - Passenger seat
   - Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Check:
   - Canister
   - Canister purge hose
   - Fuel tank breather hose
   - Canister breather hose
     Cracks/damage → Replace.
3. Install:
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Rider seat
   - Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

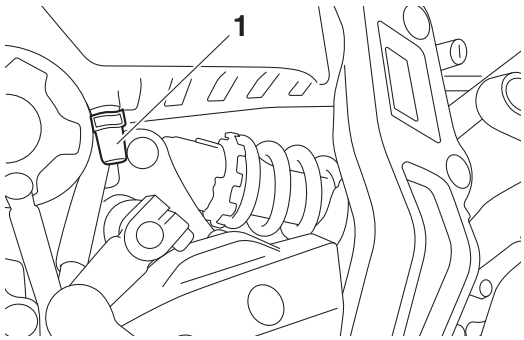
EAS33546
CHECKING THE PURGE CUT VALVE SOLENOID (for California only)

1. Remove:
   - Passenger seat
   - Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank top cover
   - Fuel tank side cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
2. Check:
   - Canister purge hose
   - Purge cut valve solenoid
     Cracks/damage → Replace.
3. Check:
   - Purge cut valve solenoid resistance
     Refer to "CHECKING THE PURGE CUT VALVE SOLENOID (for California only)" on page 8-51.
4. Install:
   - Fuel tank side cover assembly
   - Fuel tank top cover
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Rider seat
   - Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS31130
REPLACING THE AIR FILTER ELEMENT AND CLEANING THE CHECK HOSE

TIP

There is an air filter check hose "1" at the bottom of the air filter case. If dust and/or water collects in this hose, clean the air filter check hose and replace the air filter element.



1. Remove:
   - Passenger seat
   - Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Remove:
   - Air duct bracket
   - Air filter element
     Refer to "AIR FILTER" on page 7-7.

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

TIP

- Replace the air filter element every 40000 km (24000 mi) of operation.
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

4. Install:
   • Air filter element
   • Air duct bracket

Air filter element screw
1.6 N·m (0.16 kgf·m, 1.2 lb·ft)
Air duct bracket screw
1.6 N·m (0.16 kgf·m, 1.2 lb·ft)

ECA14401

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 carburetor synchronization, leading to poor engine performance and possible overheating.

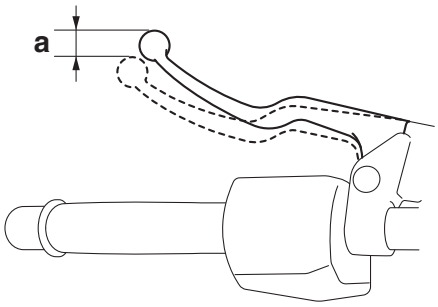
5. Install:
   • Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   • Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   • Rider seat
   • Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30629

ADJUSTING THE CLUTCH LEVER FREE PLAY

1. Check:
   • Clutch lever free play "a"
     Out of specification → Adjust.

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

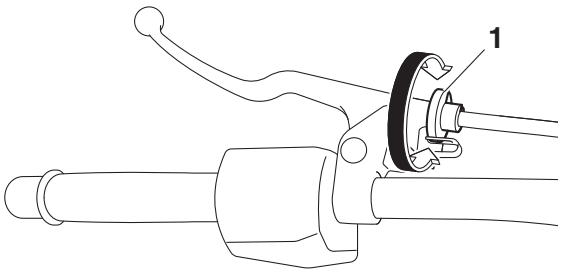


G088887

2. Adjust:
   • Clutch lever free play

Handlebar side

a. Turn the adjusting bolt "1" until the specified clutch lever free play is obtained.



G088888

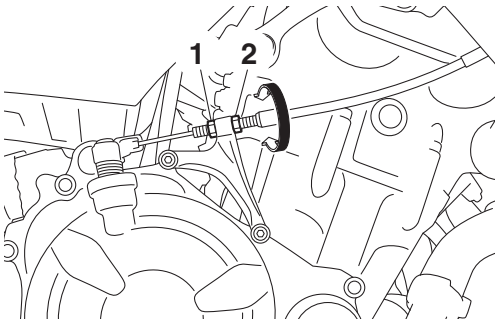
TIP

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

Engine side

a. Loosen the locknut "1".
b. Turn the adjusting nut "2" until the specified clutch lever free play is obtained.
c. Tighten the locknut "1".

Clutch cable locknut
7 N·m (0.7 kgf·m, 5.2 lb·ft)



EAS30801
CHECKING THE BRAKE OPERATION

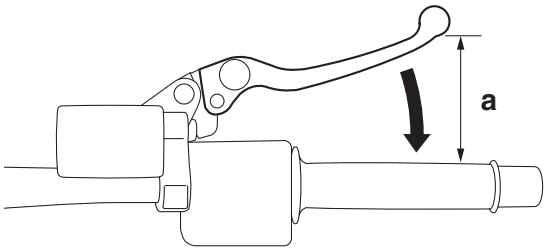
1. Check:
   • Brake operation
   Brake not working properly → Check the brake system.
   Refer to "FRONT BRAKE" on page 4-36 and "REAR BRAKE" on page 4-48.

TIP

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

EAS30630
ADJUSTING THE FRONT DISC BRAKE

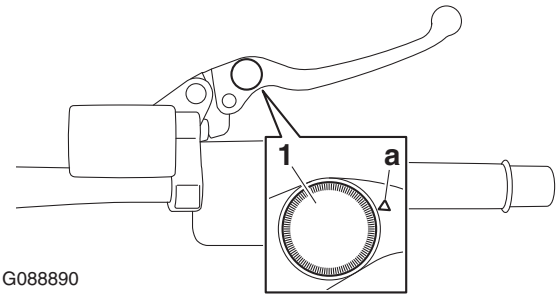
1. Adjust:
   • Brake lever position
   (distance "a" from the throttle grip to the brake lever)



G088889

TIP

- While pushing the brake lever forward, turn the adjusting dial "1" until the brake lever is in the desired position.
- Be sure to align the setting on the adjusting dial with the arrow mark "a" on the brake lever holder.



G088890

EWA17050

⚠ WARNING

- **After adjusting the brake lever position, make sure the pin on the brake lever holder is firmly inserted in the hole in the adjusting dial.**
- **A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce brake performance resulting in loss of control and possibly cause an accident. Therefore, check and if necessary, bleed the brake system.**

ECA13490

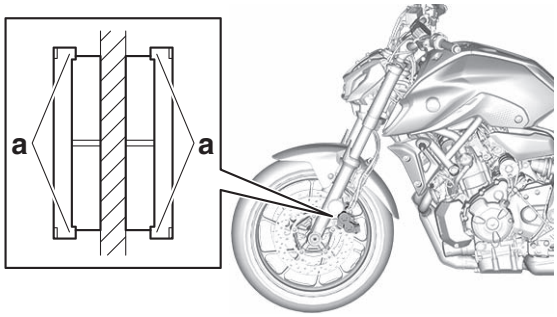
NOTICE

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

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 indicators "a" almost touch the brake disc → Replace the brake pads as a set.
   Refer to "FRONT BRAKE" on page 4-36.



EAS30631
ADJUSTING THE REAR DISC BRAKE

1. Adjust:
   • Brake pedal position
   a. Loosen the locknut "1".
   b. Turn the adjusting bolt "2" until the specified brake pedal position is obtained.

EWA18830

⚠ WARNING

After adjusting the brake pedal position, check that the end of the adjusting bolt "a" is visible through the hole "b".

c. Tighten the locknut "1" to specification.

Rear brake pedal adjusting locknut
18 N·m (1.8 kgf·m, 13 lb·ft)

EWA17030

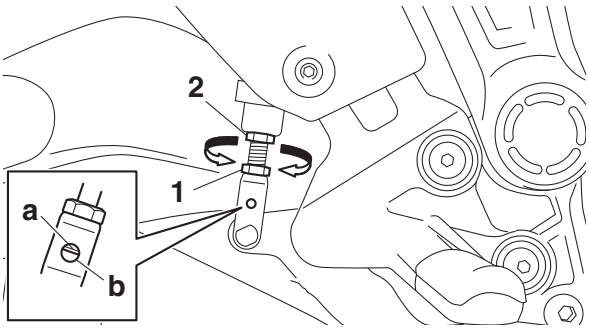
⚠ WARNING

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

ECA13510

NOTICE

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



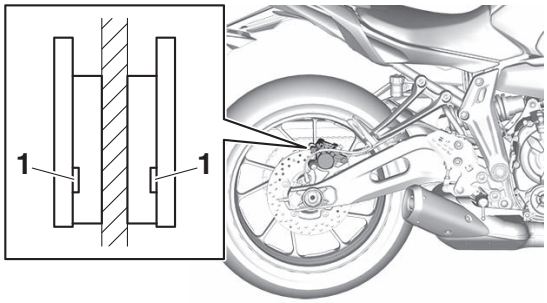
2. Adjust:
   • Rear brake light switch
   Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-26.

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 "1" almost touch the brake disc → Replace the brake pads as a set.
   Refer to "REAR BRAKE" on page 4-48.



EAS30894

CHECKING THE BRAKE HOSES

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

1. Check:
   • Brake hose
   Cracks/damage/wear → Replace.
2. Check:
   • Brake hose holder
   Loose → Tighten the holder bolts.
3. Hold the vehicle upright and apply the brake several times.
4. Check:
   • Brake hose
   Brake fluid leakage → Replace the damaged hose.
   Refer to "FRONT BRAKE" on page 4-36, "REAR BRAKE" on page 4-48 and "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-60.

EAS30893

BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)

EWA14000

⚠ WARNING

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

ECA18050

NOTICE

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

EWA16530

⚠ WARNING

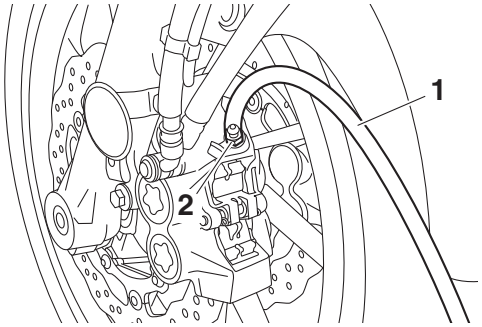
Bleed the ABS whenever:
- **the system is disassembled.**
- **a brake hose is loosened, disconnected or replaced.**
- **the brake fluid level is very low.**
- **brake operation is faulty.**

TIP

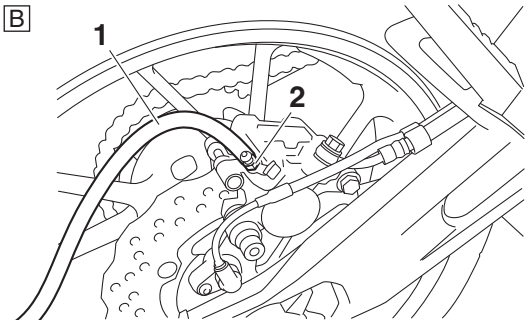
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir or brake fluid reservoir to overflow.
- When bleeding the ABS, make sure that there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the ABS, considerably lengthening 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 or brake fluid reservoir to the proper level with the specified brake fluid.
   b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
   c. Connect a clear plastic hose "1" tightly to the bleed screw "2".

A



B



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 or fully depress the brake pedal and hold it in position.
   g. Loosen the bleed screw.

TIP

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

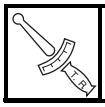
   h. Tighten the bleed screw and then release the brake lever or brake pedal.
   i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
   j. Check the operation of the hydraulic unit. Refer to "HYDRAULIC UNIT OPERATION TESTS" on page 4-64.

ECA18060

NOTICE

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

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

	**Brake caliper bleed screw** **5 N·m (0.5 kgf·m, 3.7 lb·ft)**

   m. Fill the brake master cylinder reservoir or brake fluid reservoir to the proper level with the specified brake fluid.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-15.

EWA13110

⚠ WARNING

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

EAS30632

CHECKING THE BRAKE FLUID LEVEL

1. Stand the vehicle on a level surface.

TIP

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

2. Check:
   - Brake fluid level
   Below the minimum level mark → Add the specified brake fluid to the proper level.

	**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.

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

EAS30638
CHECKING THE WHEELS
The following procedure applies to both of the wheels.
1. Check:
   - Wheel
     Damage/out-of-round → Replace.

EWA13260
WARNING
Never attempt to make any repairs to the wheel.

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

EAS30640
CHECKING THE TIRES
The following procedure applies to both of the tires.
1. Check:
   - Tire air 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)
Front
225 kPa (2.25 kgf/cm², 33 psi)
Rear
250 kPa (2.50 kgf/cm², 36 psi)
Maximum load
171 kg (377 lb)
*** Maximum load: Total weight of rider, passenger, cargo and accessories**

2. Check:
   - Tire surface
     Damage/wear → Replace the tire.

EWA13190
WARNING
It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.

Wear limit (front)
1.0 mm (0.04 in)
Wear limit (rear)
1.0 mm (0.04 in)

EWA14090
WARNING
After extensive tests, the tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved by Yamaha is used on this vehicle.

Front tire
Size
120/70 ZR 17M/C(58W)
Manufacturer/model
MICHELIN/ROAD 5

Rear tire
Size
180/55 ZR 17M/C(73W)
Manufacturer/model
MICHELIN/ROAD 5

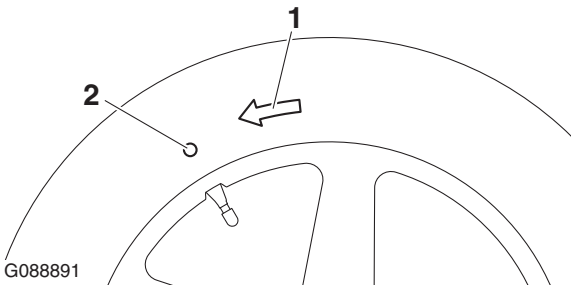
EWA13210

⚠ 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 bearing
     Refer to "CHECKING THE FRONT WHEEL" on page 4-22 and "CHECKING THE REAR WHEEL" on page 4-31.

EAS30802

CHECKING THE SWINGARM OPERATION

1. Check:
   - Swingarm operation
     Swingarm not working properly → Check the swingarm.
     Refer to "SWINGARM" on page 4-92.
2. Check:
   - Swingarm excessive play
     Refer to "SWINGARM" on page 4-92.

EAS30643

LUBRICATING THE SWINGARM PIVOT

1. Lubricate:
   - Bearing
   - Spacer
   - Oil seal
   - Pivot shaft

Recommended lubricant
Lithium-soap-based grease

Refer to "INSTALLING THE SWINGARM" on page 4-96.

EAS31923

DRIVE CHAIN SLACK

Checking the drive chain slack

EWA13120

⚠ WARNING

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

ECA13550

NOTICE

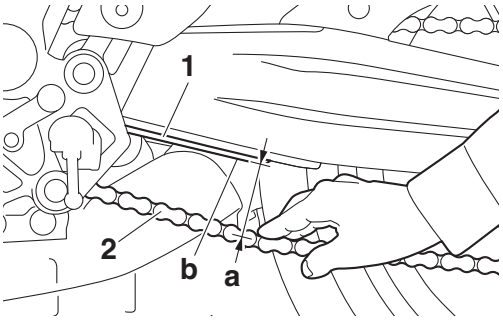
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

1. Shift the transmission into the neutral position.
2. Check:
   Drive chain slack "a"
   Out of specification → Adjust.

Drive chain slack (Maintenance stand)
51.0–56.0 mm (2.01–2.20 in)
Drive chain slack (Sidestand)
51.0–56.0 mm (2.01–2.20 in)
Drive chain slack limit
58.0 mm (2.28 in) (MT07PC)

TIP

Measure the distance (drive chain slack) "a" between the rib end "b" on the drive chain guide "1" and the center of the drive chain "2".



Adjusting the drive chain slack

EWA13120

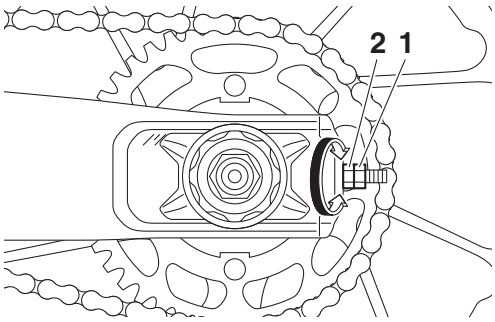
⚠ WARNING

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

1. Loosen:
   - Wheel axle nut
     Refer to "REAR WHEEL" on page 4-27.
2. Adjust:
   - Drive chain slack
   a. Loosen both of the drive chain puller locknuts "1".
   b. Turn both of the drive chain puller adjusting nuts "2" until the specified drive chain slack is obtained.

TIP

- To maintain the proper wheel alignment, adjust both sides evenly.
- There should be no clearance between the swingarm end plate and the adjusting nuts.



   c. Tighten the wheel axle nut to specification.

	Wheel axle nut **105 N·m (10.5 kgf·m, 77 lb·ft)**

   d. Tighten the drive chain puller locknuts to specification.

	Drive chain puller locknut **16 N·m (1.6 kgf·m, 12 lb·ft)**

EAS30803

LUBRICATING THE DRIVE CHAIN

The drive chain consists of many interacting parts. If the drive chain is not maintained properly, it will wear out quickly. Therefore, the drive chain should be serviced, especially when the vehicle is used in dusty areas.
This vehicle has a drive chain with small rubber O-rings between each side plate. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings. Therefore, use only kerosene to clean the drive chain. Wipe the drive chain dry and thoroughly lubricate it with engine oil or chain lubricant that is suitable for O-ring chains. Do not use any other lubricants on the drive chain since they may contain solvents that could damage the O-rings.

	Recommended lubricant **Chain lubricant suitable for O-ring chains**

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.

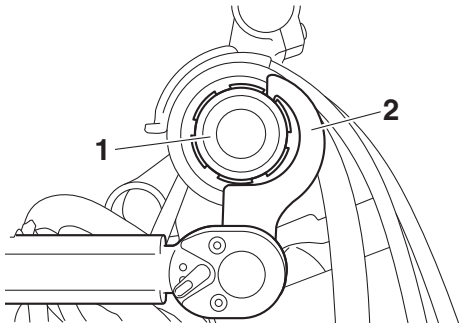
TIP

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

2. Check:
   - Steering head
     Grasp the bottom of the front fork legs and gently rock the front fork.
     Blinding/looseness → Adjust the steering head.
3. Remove:
   - Upper bracket
     Refer to "FRONT FORK" on page 4-73.
4. Adjust:
   - Steering head
   a. Loosen the cap nut "1", and then tighten it to specification with a steering nut wrench "2".

TIP

- Set the torque wrench at a right angle to the steering nut wrench.
- Move the steering to the left and right a couple of times to check that it moves smoothly.



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

	Cap nut (initial tightening torque) **52 N·m (5.2 kgf·m, 38 lb·ft)**

b. Loosen the cap nut completely, then tighten it to specification.

EWA17770

⚠ WARNING

Do not overtighten the cap nut.

	Cap nut (final tightening torque) **18 N·m (1.8 kgf·m, 13 lb·ft)**

c. 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 4-83.

5. Install:
   - Upper bracket
   Refer to "FRONT FORK" on page 4-73.

EAS30646

LUBRICATING THE STEERING HEAD

1. Lubricate:
   - Upper bearing
   - Lower bearing
   - Bearing cover
   - Lower bearing dust seal

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

EAS30647

CHECKING THE FASTENERS

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

EAS30804

LUBRICATING THE BRAKE LEVER

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

	Recommended lubricant **Silicone grease**

EAS30649

LUBRICATING THE PEDAL

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

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

EAS30805

LUBRICATING THE CLUTCH LEVER

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

	Recommended lubricant **Lithium-soap-based 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 sidestand.

	Recommended lubricant **Molybdenum disulfide grease**

EAS30652

CHECKING THE SIDESTAND SWITCH

Refer to "CHECKING THE SWITCHES" on page 8-39.

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.
   • Front fork leg
   Oil leaks between inner tube and outer tube → Replace the oil seal.
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 4-73.

EAS30808
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

Refer to "CHECKING THE REAR SHOCK ABSORBER ASSEMBLY" on page 4-89.

EAS30655
ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

EWA13120
⚠ WARNING

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

Spring preload

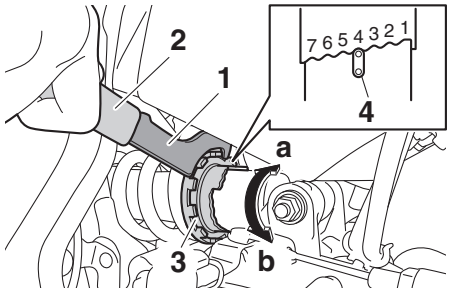
ECA13590
NOTICE

Never go beyond the maximum or minimum adjustment positions.

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

Direction "a"
Spring preload is increased (suspension is harder).
Direction "b"
Spring preload is decreased (suspension is softer).

Unit for adjustment
Cam position
Adjustment value (Soft)
1
Adjustment value (STD)
4
Adjustment value (Hard)
7



Rebound damping

ECA13590
NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
   • Rebound damping
   a. Turn the adjusting screw "1" in direction "a" or "b".

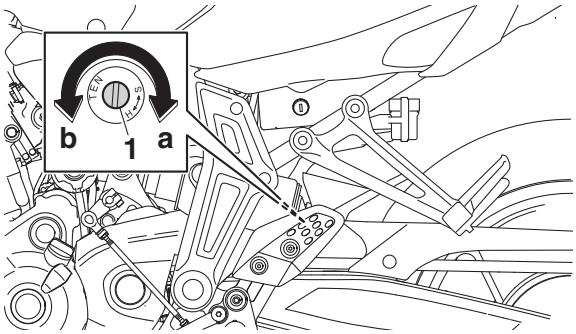
Direction "a"
Rebound damping is increased (suspension is harder).
Direction "b"
Rebound damping is decreased (suspension is softer).

Rebound damping
Minimum (soft)
2.5 turn(s) in direction "b"*
Standard
1.5 turn(s) in direction "b"*
Maximum (hard)
0 turn(s) in direction "b"*

*** With the adjusting screw fully turned in direction "a"**

TIP

To obtain a precise adjustment, it is advisable to check the actual total number of turns of the damping force adjusting mechanism. This adjustment range may not exactly match the specifications listed due to small differences in production.



EAS30809

CHECKING THE CONNECTING ARM AND RELAY ARM

Refer to “CHECKING THE RELAY ARM” on page 4-89 and “CHECKING THE CONNECTING ARM” on page 4-96.

EAS30656

CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

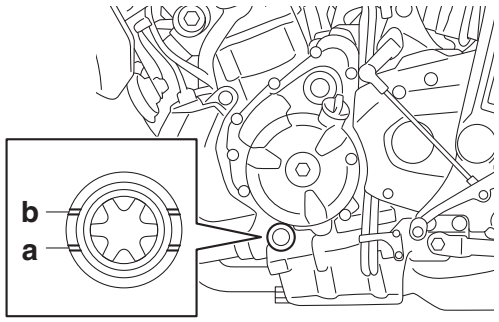
TIP

- Place the vehicle on a maintenance stand.
- 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, 10W-50, 15W-40, 20W-40 or 20W-50
Recommended engine oil grade
API service SG type or higher, JASO standard MA

ECA13361

NOTICE

- **Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use engine oils with a grade of “CD” or higher and do not use oils labeled “ENERGY CONSERVING II”.**
- **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.

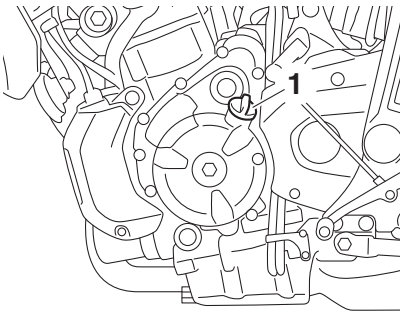
TIP

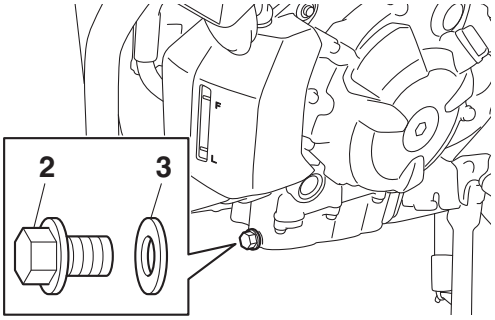
Before checking the engine oil level, wait a few minutes until the oil has settled.

EAS30657

CHANGING THE ENGINE OIL

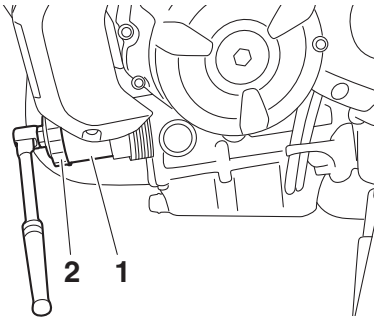
1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
   - Engine oil filler cap “1”
   - Engine oil drain bolt “2” (along with the gasket “3”)





4. Drain:
   • Engine oil
   (completely from the oil pan)
5. If the oil filter cartridge is also to be replaced, perform the following procedure.
   a. Remove the oil filter cartridge "1" with an oil filter wrench "2".

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



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

ECA25890

NOTICE

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

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

Oil filter cartridge
17 N·m (1.7 kgf·m, 13 lb·ft)

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

Engine oil drain bolt
43 N·m (4.3 kgf·m, 32 lb·ft)

7. Fill:
   • Oil pan
   (with the specified amount of the recommended engine oil)

Engine oil quantity
Quantity (disassembled)
3.00 L (3.17 US qt, 2.64 Imp.qt)
Oil change
2.30 L (2.43 US qt, 2.02 Imp.qt)
With oil filter removal
2.60 L (2.75 US qt, 2.29 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 3-21.

EAS30810

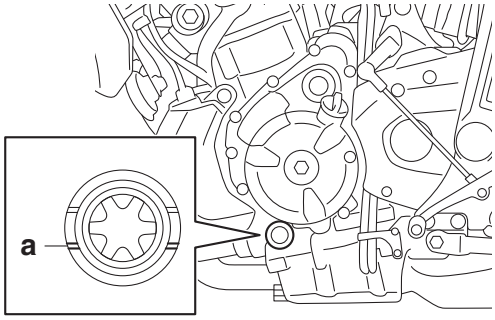
MEASURING THE ENGINE OIL PRESSURE

1. Stand the vehicle on a level surface.

TIP

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

2. Check:
   • Engine oil level
   Below the minimum level mark "a" → Add the recommended engine oil to the proper level.



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

ECA13410

NOTICE

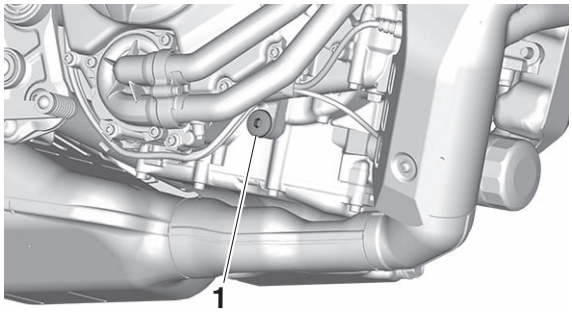
When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

4. Remove:
   - Main gallery bolt "1"

EWA12980

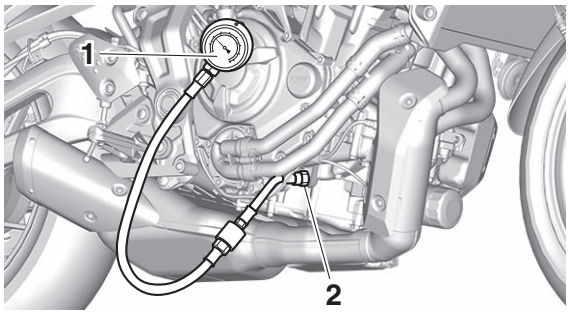
⚠ WARNING

The engine, muffler and engine oil are extremely hot.



5. Install:
   - Oil pressure gauge "1"
   - Adapter "2"

Pressure gauge
90890-03153
Pressure gauge
YU-03153
Oil pressure adapter H
90890-03139



6. Measure:
   - Engine oil pressure
     (at the following conditions)

Oil pressure
280.0 kPa/5000 r/min (2.80 kgf/cm²/5000 r/min, 40.6 psi/5000 r/min)

Out of specification → Check.

Engine oil pressure	Possible causes
Below specification	• Faulty oil pump • Clogged oil filter • Leaking oil passage • Broken or damaged oil seal
Above specification	• Leaking oil passage • Faulty oil filter • Oil viscosity too high

7. Install:
   - Main gallery bolt
   - O-ring New

Main gallery bolt
8 N·m (0.8 kgf·m, 5.9 lb·ft)

TIP

Lubricate the O-ring with a thin coat of lithium-soap-based grease.

EAS30811

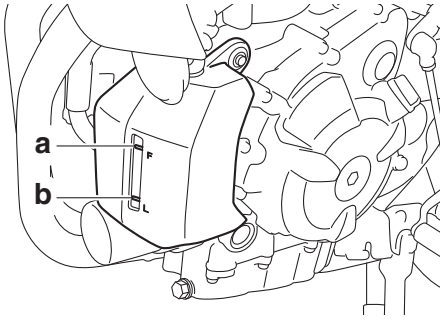
CHECKING THE COOLANT LEVEL

1. Stand the vehicle on a level surface.

TIP

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

2. Check:
   • Coolant level
   The coolant level should be between the maximum level mark “a” and minimum level mark “b”.
   Below the minimum level mark → Add the recommended coolant to the proper level.



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

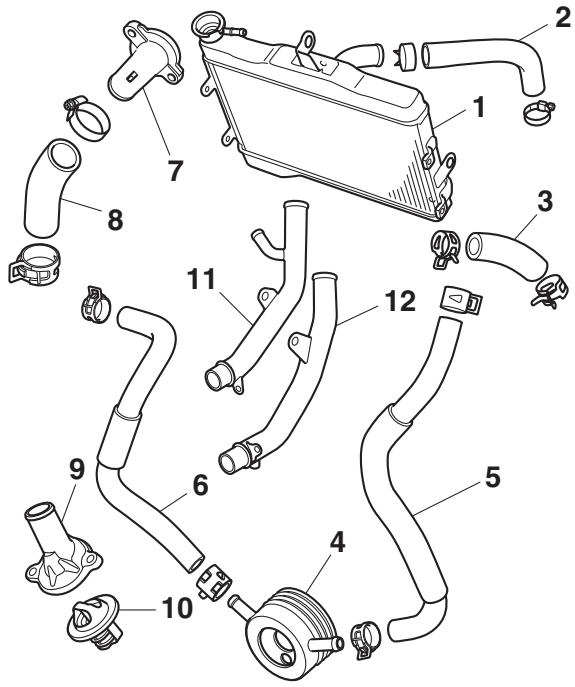
TIP

Before checking the coolant level, wait a few minutes until it settles.

EAS30812

CHECKING THE COOLING SYSTEM

1. Check:
   • Radiator “1”
   • Radiator inlet hose “2”
   • Radiator outlet hose “3”
   • Oil cooler “4”
   • Oil cooler inlet hose “5”
   • Oil cooler outlet hose “6”
   • Water jacket joint “7”
   • Water jacket joint inlet hose “8”
   • Thermostat cover “9”
   • Thermostat “10”
   • Water pump inlet pipe “11”
   • Water pump outlet pipe “12”
   Cracks/damage → Replace.
   Refer to “RADIATOR” on page 6-2, “OIL COOLER” on page 6-6, “THERMOSTAT” on page 6-9 and “WATER PUMP” on page 6-11.



EAS30813

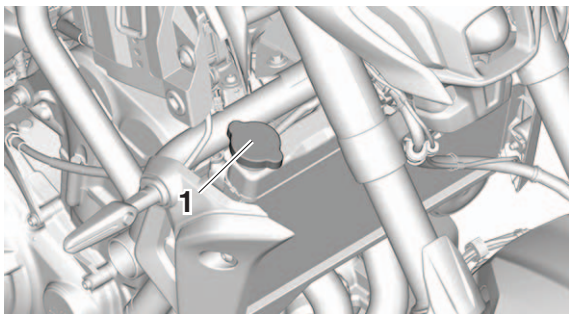
CHANGING THE COOLANT

1. Remove:
   • Fuel tank top cover
   • Fuel tank side cover assembly
   Refer to “GENERAL CHASSIS (4)” on page 4-11.
2. Remove:
   • Radiator cap “1”

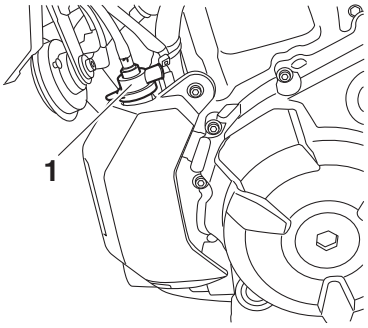
EWA13030

⚠ WARNING

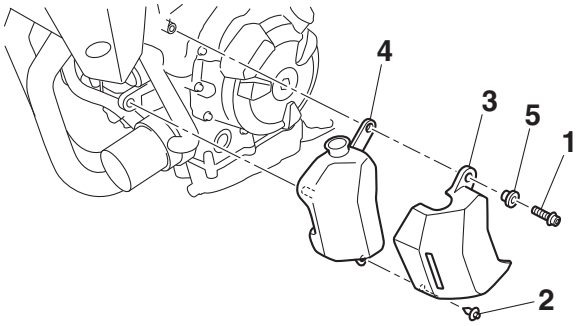
A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:
Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, press down on the radiator cap and turn it counterclockwise to remove.



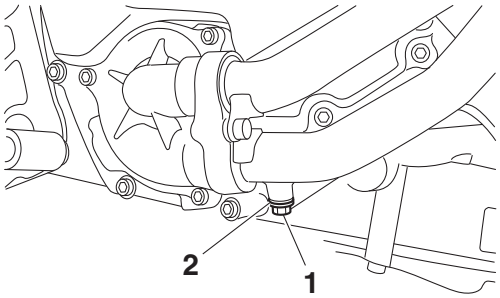
3. Remove:
   • Coolant reservoir cap “1”



4. Remove:
   • Coolant reservoir bolt “1”
   • Coolant reservoir quick fastener “2”
   • Coolant reservoir cover “3”
   • Coolant reservoir “4”
   • Collar “5”



5. Drain:
   • Coolant
   (from the coolant reservoir)
6. Remove:
   • Coolant drain bolt “1”
   • Copper washer “2”



7. Drain:
   • Coolant
   (from the engine and radiator)
8. Install:
   • Coolant drain bolt
   • Copper washer New

Coolant drain bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

9. Install:
   • Collar
   • Coolant reservoir
   • Coolant reservoir cover
   • Coolant reservoir quick fastener
   • Coolant reservoir bolt

Coolant reservoir bolt
5 N·m (0.5 kgf·m, 3.7 lb·ft)

10. Fill:
   • Cooling system
   (with the specified amount of the recommended coolant)

Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze: water)
Radiator (including all routes)
1.60 L (1.69 US qt, 1.41 Imp.qt)
Coolant reservoir (up to the maximum level mark)
0.25 L (0.26 US qt, 0.22 Imp.qt)

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

EWA13040

⚠ WARNING

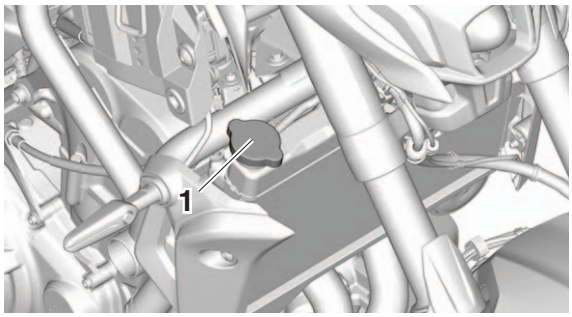
- **If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.**
- **If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.**
- **If coolant is swallowed, induce vomiting and get immediate medical attention.**

ECA13481

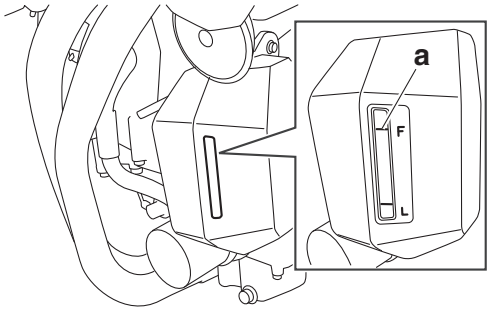
NOTICE

- **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.**

11. Install:
    - Radiator cap "1"



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



13. Install:
    - Coolant reservoir cap
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 3-23.

TIP

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

16. Install:
    - Fuel tank side cover assembly
    - Fuel tank top cover
      Refer to "GENERAL CHASSIS (4)" on page 4-11.

EAS31145

CHECKING THE FRONT BRAKE LIGHT SWITCH

Refer to "CHECKING THE SWITCHES" on page 8-39.

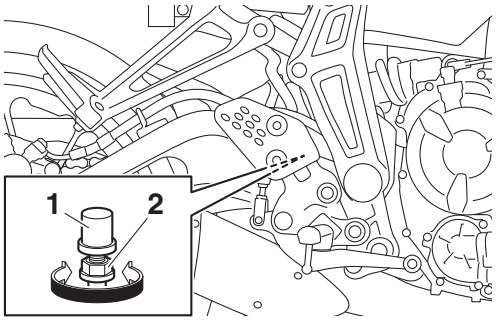
EAS30659

ADJUSTING THE REAR BRAKE LIGHT SWITCH

TIP

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

1. Check:
   - Rear brake light operation timing
     Incorrect → Adjust.
2. Adjust:
   - Rear brake light operation timing
   a. Hold the main body "1" of the rear brake light switch so that it does not rotate and turn the adjusting nut "2" until the rear brake light comes on at the proper time.



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

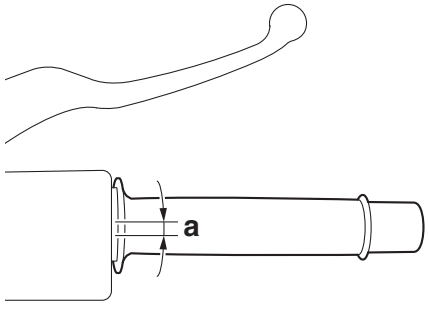
1. Check:
   • Throttle cable
   Damage/deterioration → Replace.
   • Throttle cable installation
   Incorrect → Reinstall the throttle cables.
   Refer to "HANDLEBAR" on page 4-68.
2. Check:
   • Throttle grip movement
   Rough movement → Lubricate or replace the defective part(s).

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)

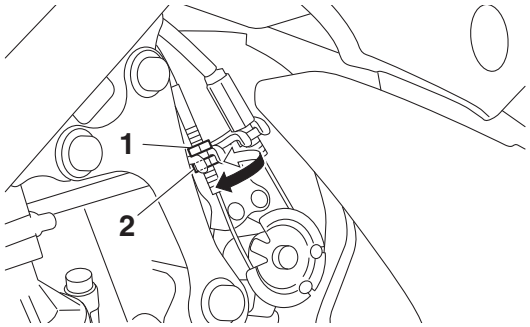


4. Adjust:
   • Throttle grip free play

TIP
Prior to adjusting the throttle grip free play, throttle body synchronization should be adjusted properly.

Throttle body side
a. Loosen the locknut "1" on the accelerator cable.
b. Turn the adjusting nut "2" until the specified throttle grip free play is obtained.
c. Tighten the locknut.

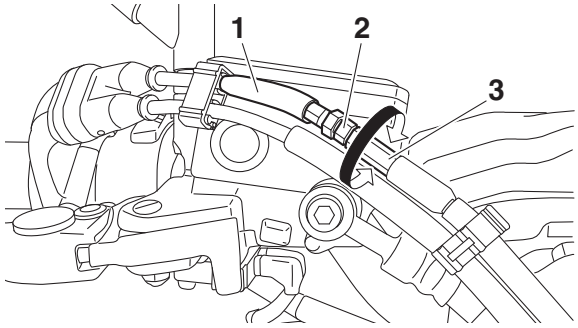
Throttle cable locknut (throttle body side)
4.5 N·m (0.45 kgf·m, 3.3 lb·ft)



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

Handlebar side

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 locknut (handlebar side)
4.3 N·m (0.43 kgf·m, 3.2 lb·ft)

e. Slide the rubber cover to its original position.

TIP

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

EAS30816
CHECKING AND CHARGING THE BATTERY

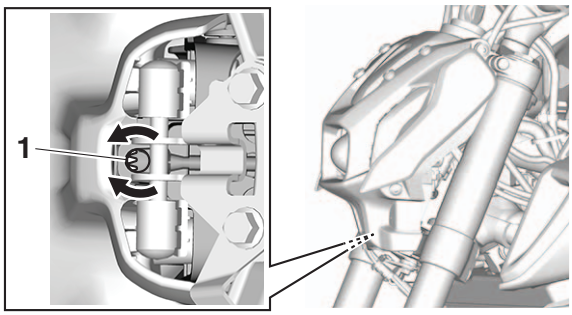
Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.

EAS30662
CHECKING THE FUSES

Refer to "CHECKING THE FUSES" on page 8-40.

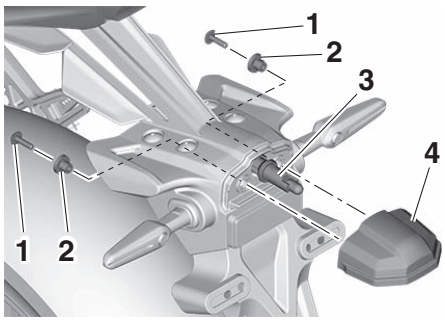
EAS30664
ADJUSTING THE HEADLIGHT BEAM

1. Adjust:
   • Headlight beam (vertically)
   a. Turn the adjusting bolt "1".

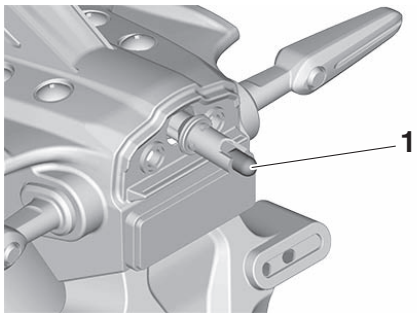


EAS31831
REPLACING THE LICENSE PLATE LIGHT BULB

1. Remove:
   • Bolt "1"
   • Collar "2"
   • License plate light bulb socket "3"
   • License plate light unit "4"



2. Remove:
   • License plate light bulb "1"



3. Install:
   • License plate light bulb New
4. Install:
   • License plate light unit
   • License plate light bulb socket
   • Collar
   • Bolt

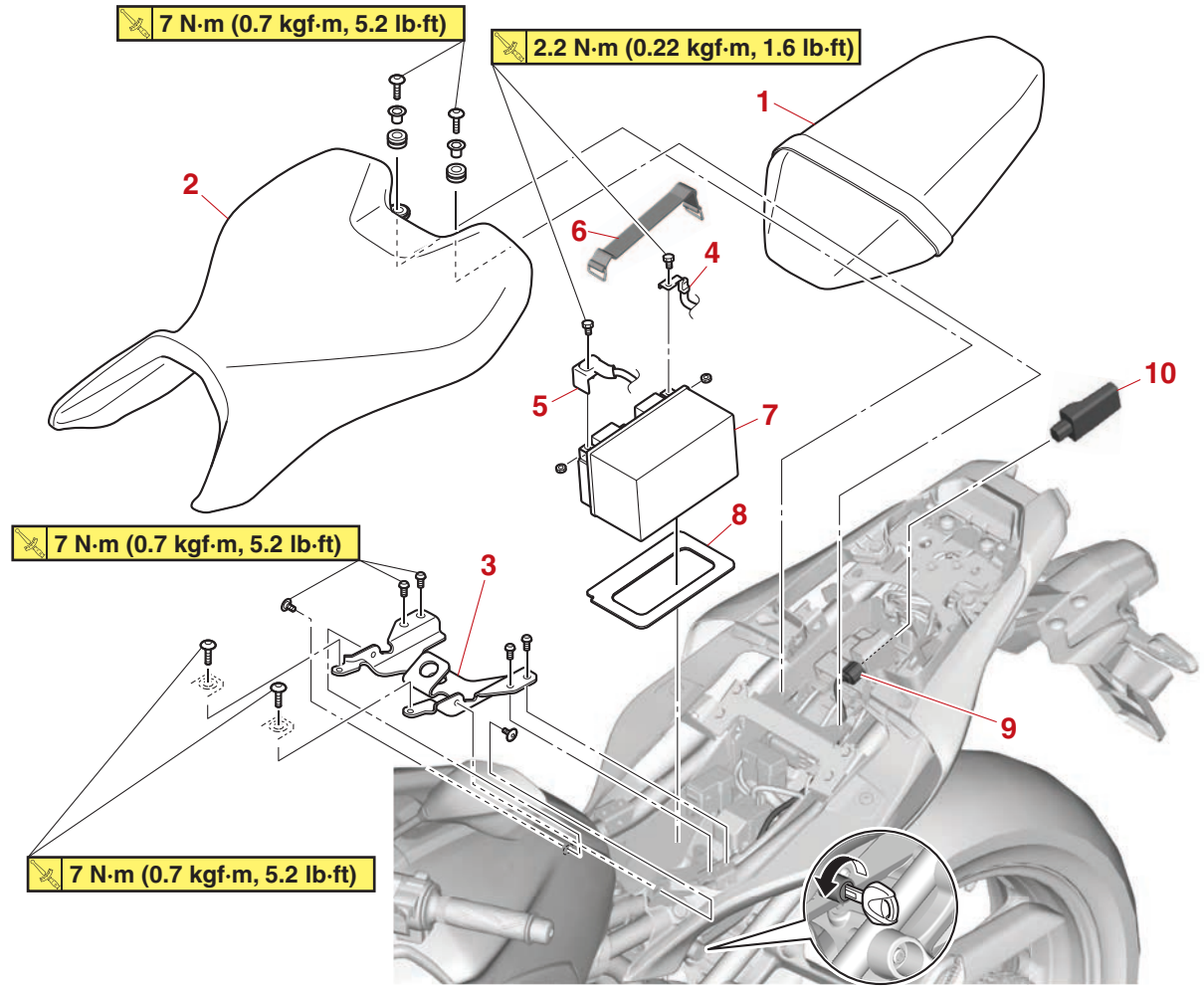
License plate light unit bolt
3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

CHASSIS

EAS20026

GENERAL CHASSIS (1)

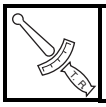
Removing the seats and battery



Order	Job/Parts to remove	Q'ty	Remarks
1	Passenger seat	1	
2	Rider seat	1	
3	Rider seat bracket 1	1	
4	Negative battery lead	1	Disconnect.
5	Positive battery lead	1	Disconnect.
6	Battery band	1	
7	Battery	1	
8	Battery seat	1	
9	CCU (Communication Control Unit) coupler	1	Disconnect.
10	CCU (Communication Control Unit)	1	

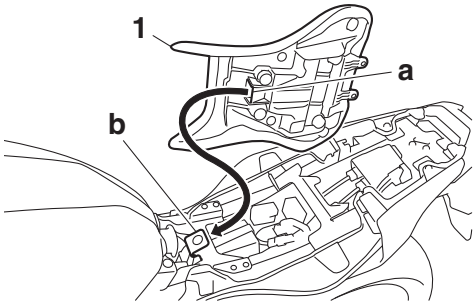
EAS31125
INSTALLING THE RIDER SEAT

1. Install:
   • Rider seat “1”

	**Rider seat bolt** **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

TIP

Fit the slot “a” in the rider seat onto the projection “b” on the rider seat bracket 1 as shown, and then place the seat in the original position.

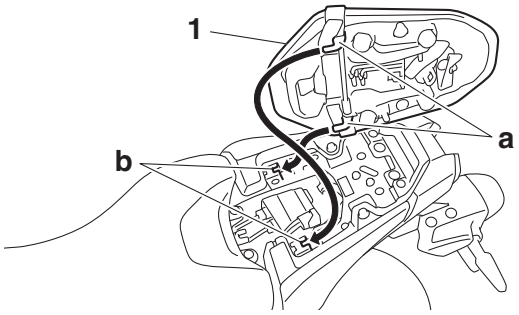


EAS31126
INSTALLING THE PASSENGER SEAT

1. Install:
   • Passenger seat “1”

TIP

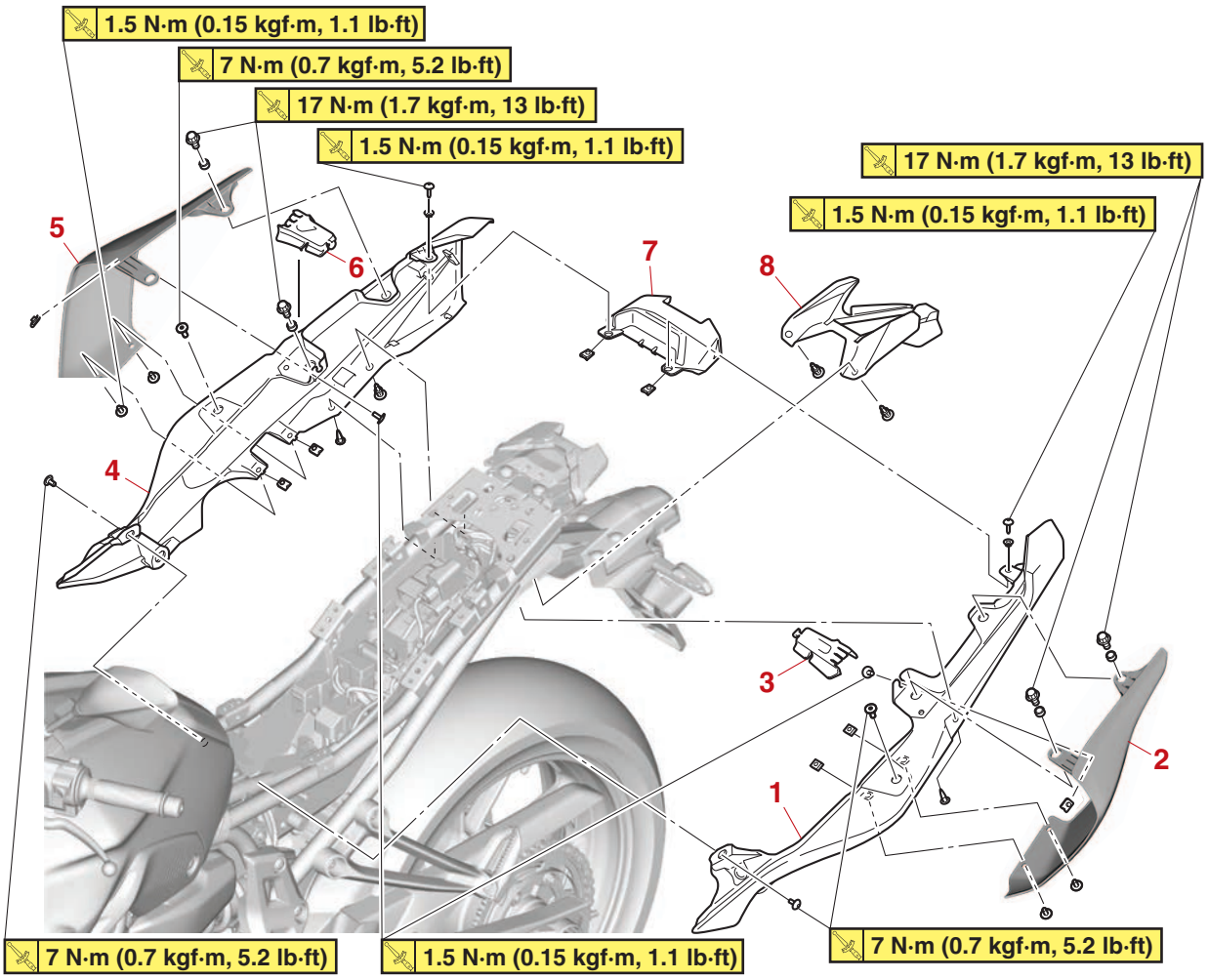
Insert the projections “a” on the front of the passenger seat into the grooves “b” as shown, and then push the rear of the seat down to lock it in place.



EAS20155

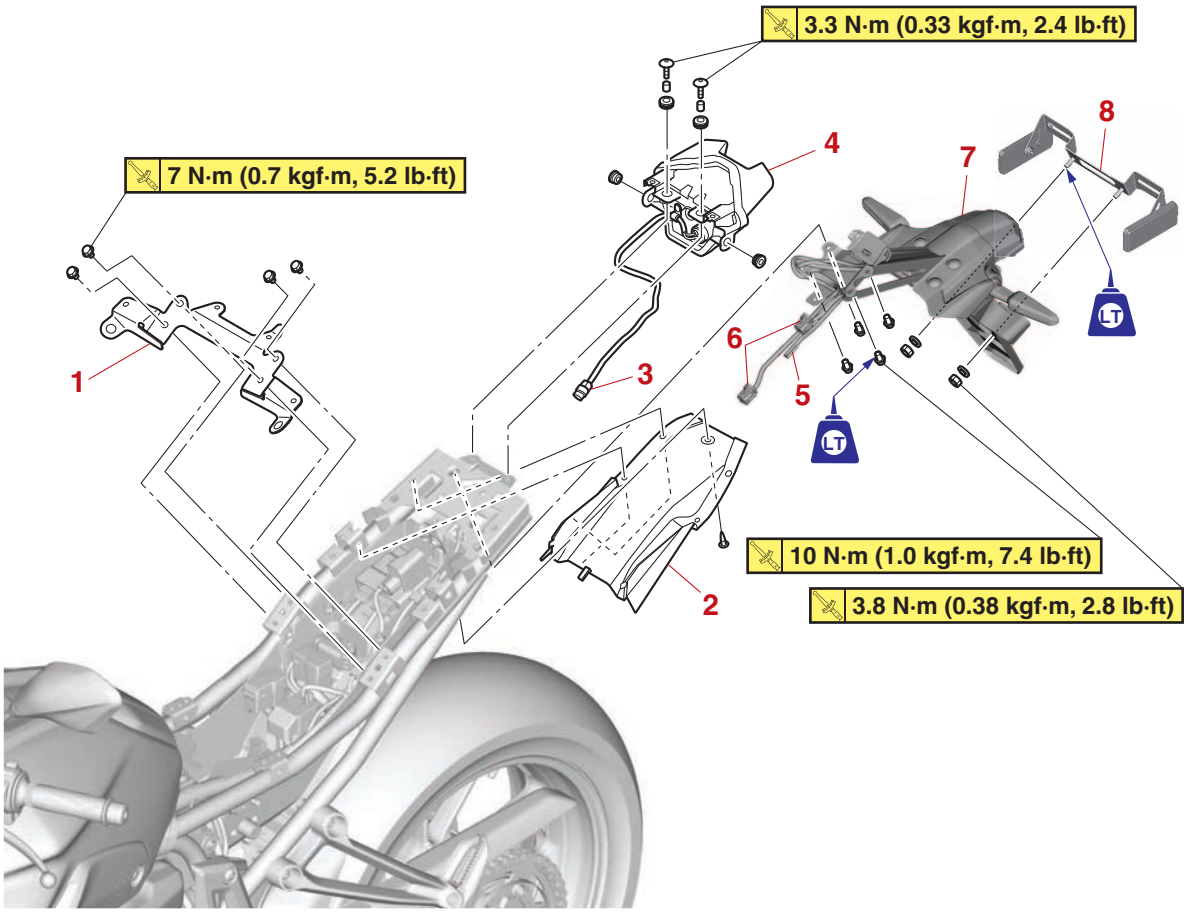
GENERAL CHASSIS (2)

Removing the covers



Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
1	Rear side cover (left)	1	
2	Lining cover (left)	1	
3	Rubber cover (left)	1	
4	Rear side cover (right)	1	
5	Lining cover (right)	1	
6	Rubber cover (right)	1	
7	Upper tail cover	1	
8	Lower tail cover	1	

Removing the tail/brake light assembly, and mudguard

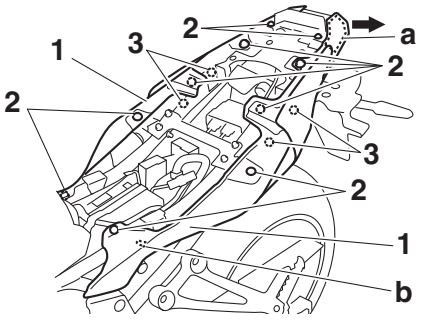


Order	Job/Parts to remove	Q'ty	Remarks
1	Rider seat bracket 2	1	
2	Lower fender cover	1	
3	Tail/brake light coupler	1	Disconnect.
4	Tail/brake light assembly	1	
5	License plate light coupler	1	Disconnect.
6	Rear turn signal light coupler	1	Disconnect.
7	Mudguard assembly	1	
8	Reflector bracket	1	

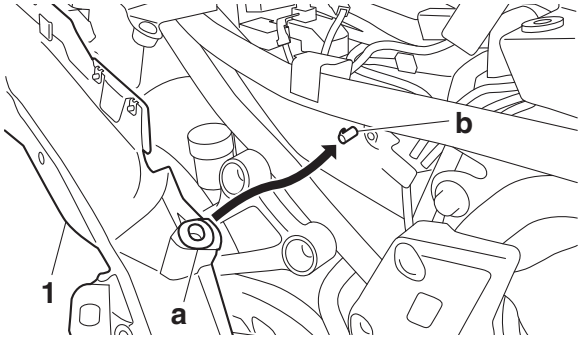
EAS31098
REMOVING THE REAR SIDE COVERS
The following procedure applies to both of the rear side covers.
1. Remove:
 • Rear side cover “1”
  a. Remove the rear side cover bolts “2” and quick fasteners “3”.
  b. Pull the rear side cover off at the areas “a” shown.

TIP
Remove the rear side cover from the rear end first.

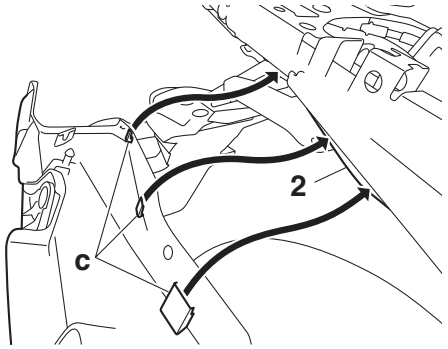
  c. Separate the rear side cover by disengaging it from the projection “b”.



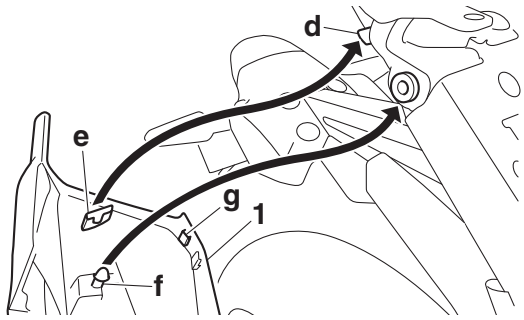
EAS31099
INSTALLING THE REAR SIDE COVERS
The following procedure applies to both of the rear side covers.
1. Install:
 • Rear side cover “1”
  a. Fit the grommet “a” on the rear side cover onto the projection “b”.



  b. Insert the edge of lower fender cover “2” between the outer wall and the projections “c” on the rear side cover.

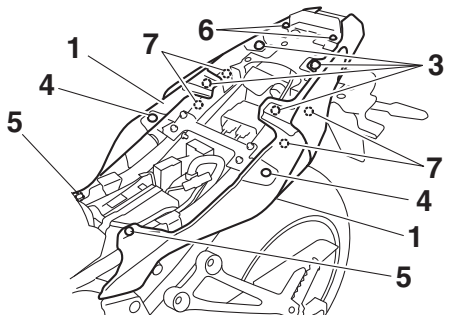


  c. Insert the projection “d” on the tail light lens into the slot “e” in the rear side cover, and then align the projection “f” and tab “g” on the tail light lens with the corresponding projection and slot on the rear side cover. Then, install the rear side cover.

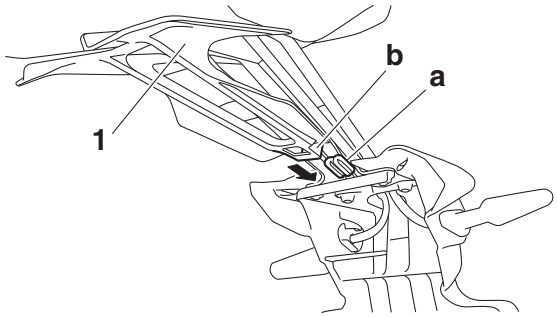


  d. Install the rear side cover bolts “3”, rear side cover bolts “4”, rear side cover bolts “5”, rear side cover screws “6”, and quick fasteners “7”, and then tighten them to specification.

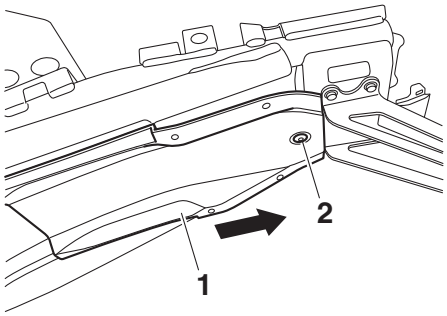
	**Rear side cover bolt (M8 × 16 mm)** **17 N·m (1.7 kgf·m, 13 lb·ft)** **Rear side cover bolt (M6 × 15 mm)** **7 N·m (0.7 kgf·m, 5.2 lb·ft)** **Rear side cover bolt (M5 × 12 mm)** **7 N·m (0.7 kgf·m, 5.2 lb·ft)** **Rear side cover screw (M5 × 16 mm)** **1.5 N·m (0.15 kgf·m, 1.1 lb·ft)**



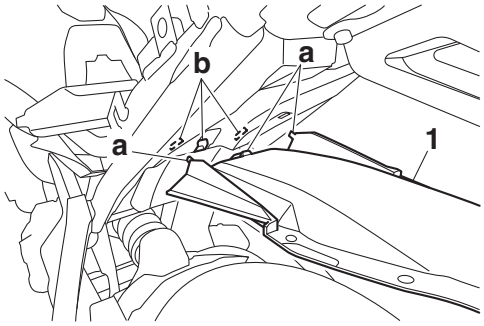
EAS31127
INSTALLING THE LOWER TAIL COVER
1. Install:
   • Lower tail cover “1”
   a. Fit the projection “a” on the tail/brake light assembly into the hole “b” in the lower tail cover.
   b. Install the quick fastener.



EAS31100
REMOVING THE LOWER FENDER COVER
1. Remove:
   • Lower fender cover “1”
   a. Remove the quick fastener “2”.
   b. Slide the lower fender cover rearward and remove it.



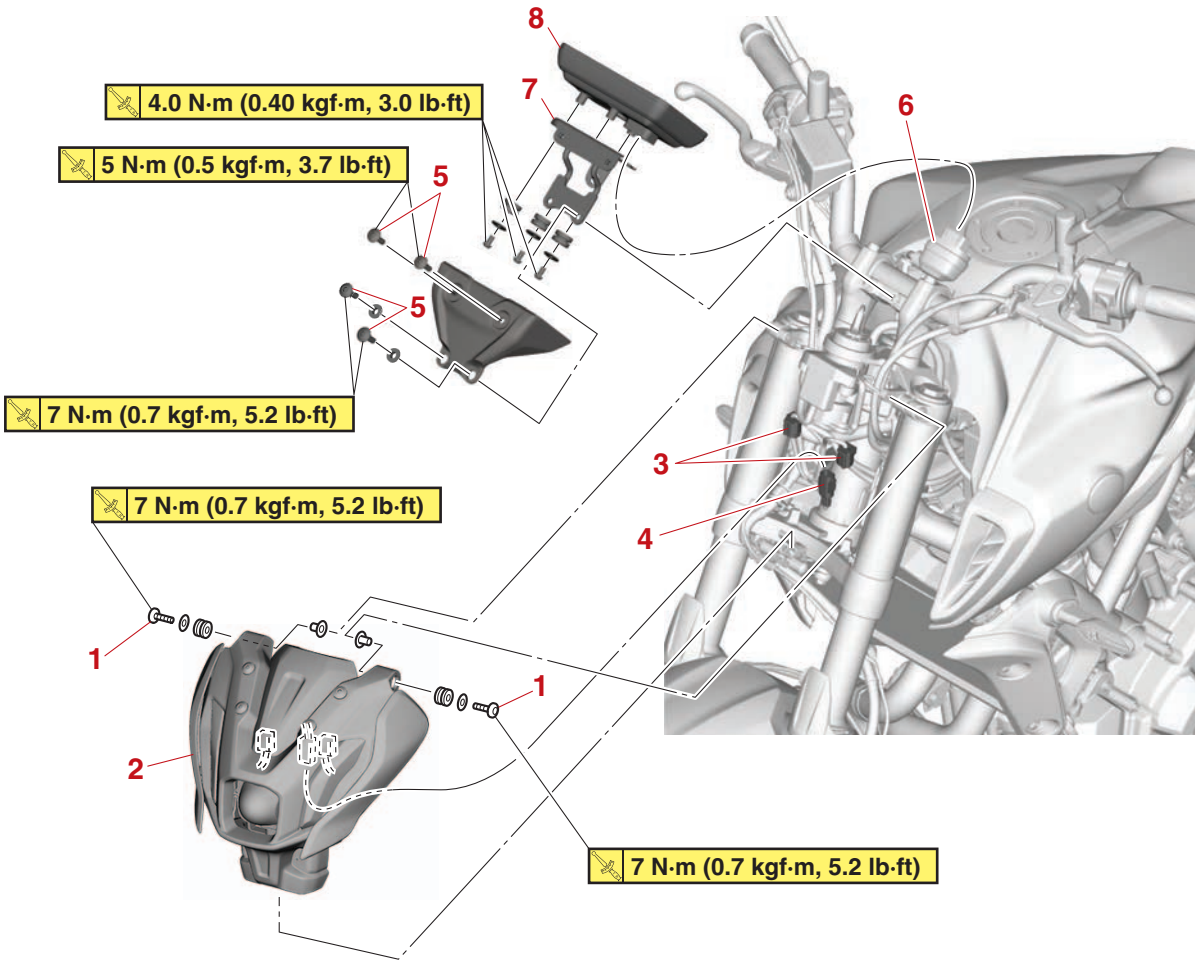
EAS31101
INSTALLING THE LOWER FENDER COVER
1. Install:
   • Lower fender cover “1”
   a. Fit the projections “a” on the lower fender cover into the holes “b” in the battery box.
   b. Install the quick fastener.



EAS20156

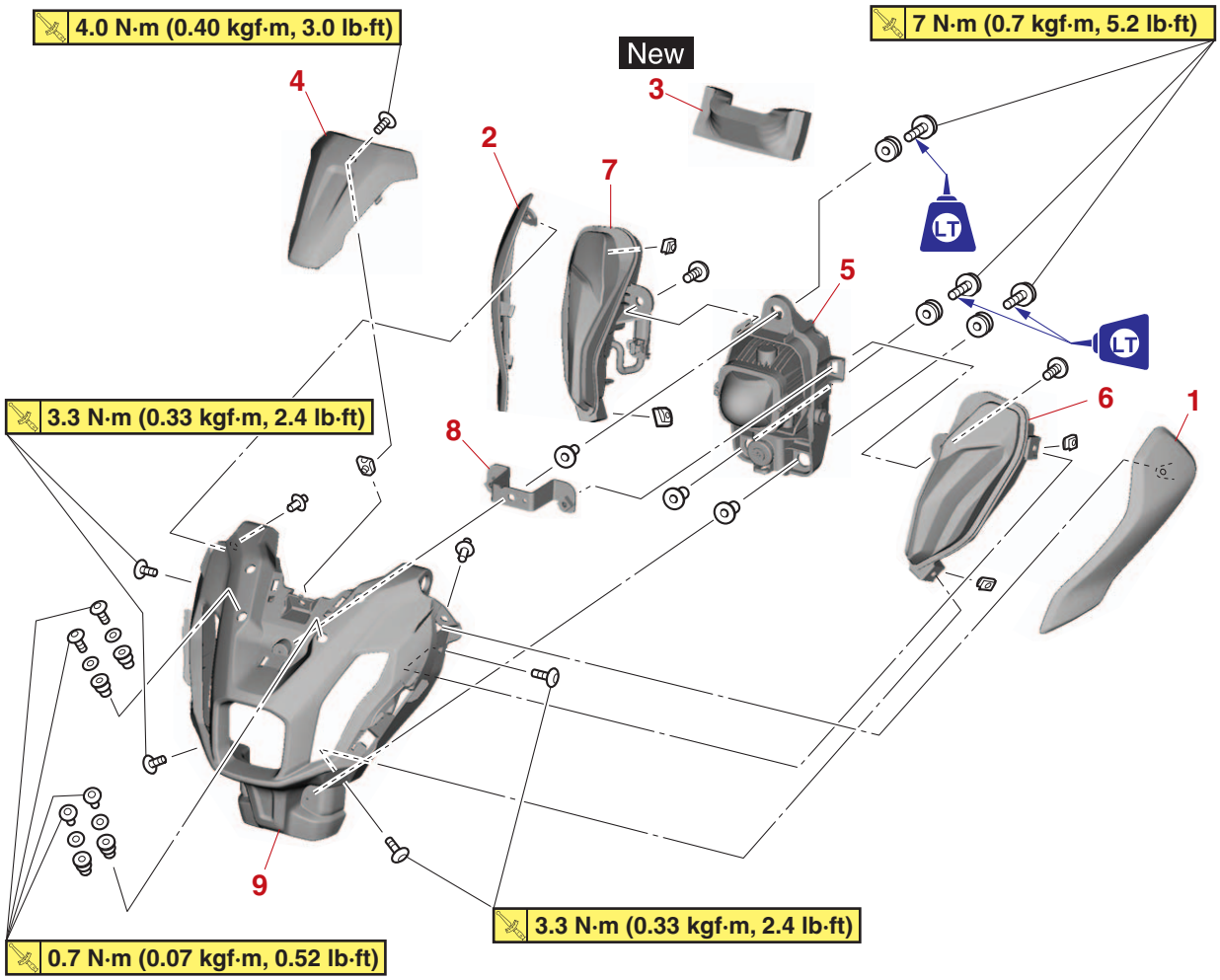
GENERAL CHASSIS (3)

Removing the headlight assembly and meter assembly



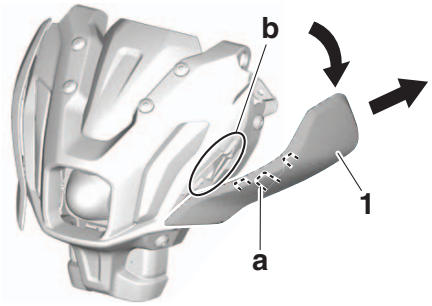
Order	Job/Parts to remove	Q'ty	Remarks
1	Headlight assembly bolt	2	
2	Headlight assembly	1	
3	Auxiliary light coupler	2	Disconnect.
4	Headlight coupler	1	Disconnect.
5	Meter assembly bracket bolt	4	
6	Meter assembly coupler	1	Disconnect.
7	Meter assembly bracket	1	
8	Meter assembly	1	

Disassembling the headlight assembly

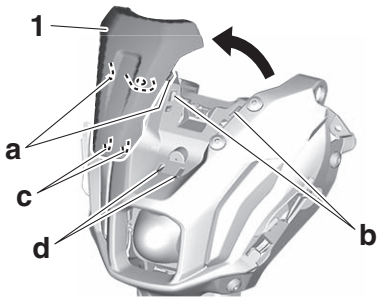


Order	Job/Parts to remove	Q'ty	Remarks
1	Headlight side cover (left)	1	
2	Headlight side cover (right)	1	
3	Damper	1	
4	Headlight center cover	1	
5	Headlight	1	
6	Auxiliary light (left)	1	
7	Auxiliary light (right)	1	
8	Headlight bracket	1	
9	Headlight front cover	1	

EAS33512
REMOVING THE HEADLIGHT SIDE COVERS
The following procedure applies to each headlight side cover.
1. Remove:
 • Headlight side cover “1”
  a. Remove the quick fastener.
  b. Slide the side cover downwards, and then remove the projection “a” on the side cover from the hole “b” in the headlight front cover.
  c. Remove the side cover by sliding it rearward.

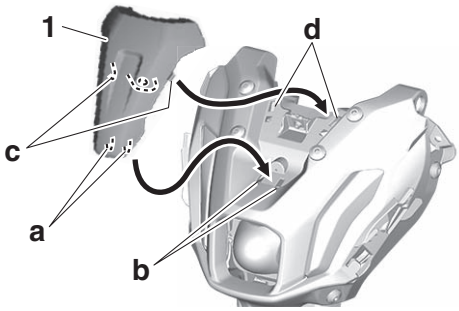


EAS32696
REMOVING THE HEADLIGHT CENTER COVER
1. Remove:
 • Headlight center cover “1”
  a. Remove the headlight center cover bolt.
  b. Disengage the projections “a” on the headlight center cover from the holes “b” in the headlight front cover.
  c. Disengage the projections “c” on the panel from the holes “d” in the cover.



EAS32697
INSTALLING THE HEADLIGHT CENTER COVER
1. Install:
 • Headlight center cover “1”
  a. Insert the projections “a” on the headlight center cover into the holes “b” in the headlight front cover.
  b. Insert the projections “c” on the panel into the holes “d” in the cover.
  c. Install the headlight center cover bolt.

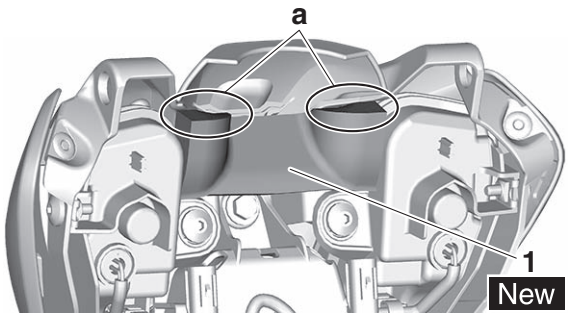
	Headlight center cover bolt 4.0 N·m (0.40 kgf·m, 3.0 lb·ft)



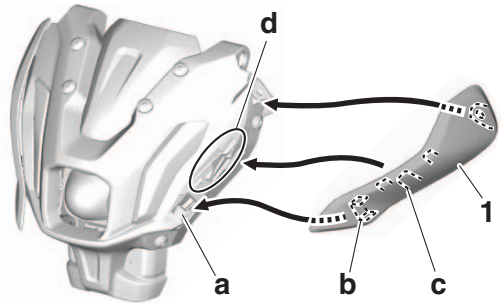
EAS33514
INSTALLING THE DAMPER
1. Install:
 • Damper “1” New

TIP

Affix the damper plate under the end “a” of the headlight front cover.



EAS33513
INSTALLING THE HEADLIGHT SIDE COVERS
The following procedure applies to each headlight side cover.
1. Install:
 • Headlight side cover “1”
  a. Insert the projection “a” on the headlight front cover into the hole “b” in the side cover.
  b. Insert the projection “c” on the side cover into the hole “d” in the headlight front cover.
  c. Install the quick fastener.



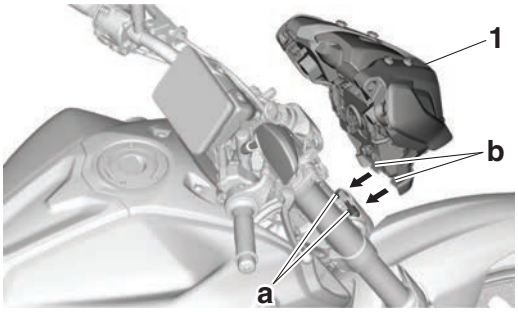
EAS31128
INSTALLING THE HEADLIGHT ASSEMBLY

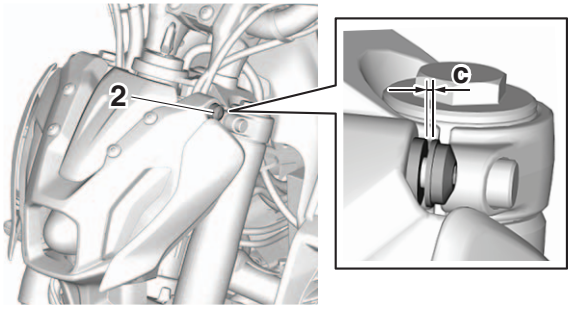
1. Install:
   - Headlight assembly “1”
   - Headlight assembly bolt “2”

	Headlight assembly bolt **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

TIP

- Fit the projections “a” on the headlight bracket into the holes “b” in the headlight assembly.
- When the headlight assembly bolts are tightened to specification, there may be gaps “c” between the washers and the grommets as shown in the illustration.

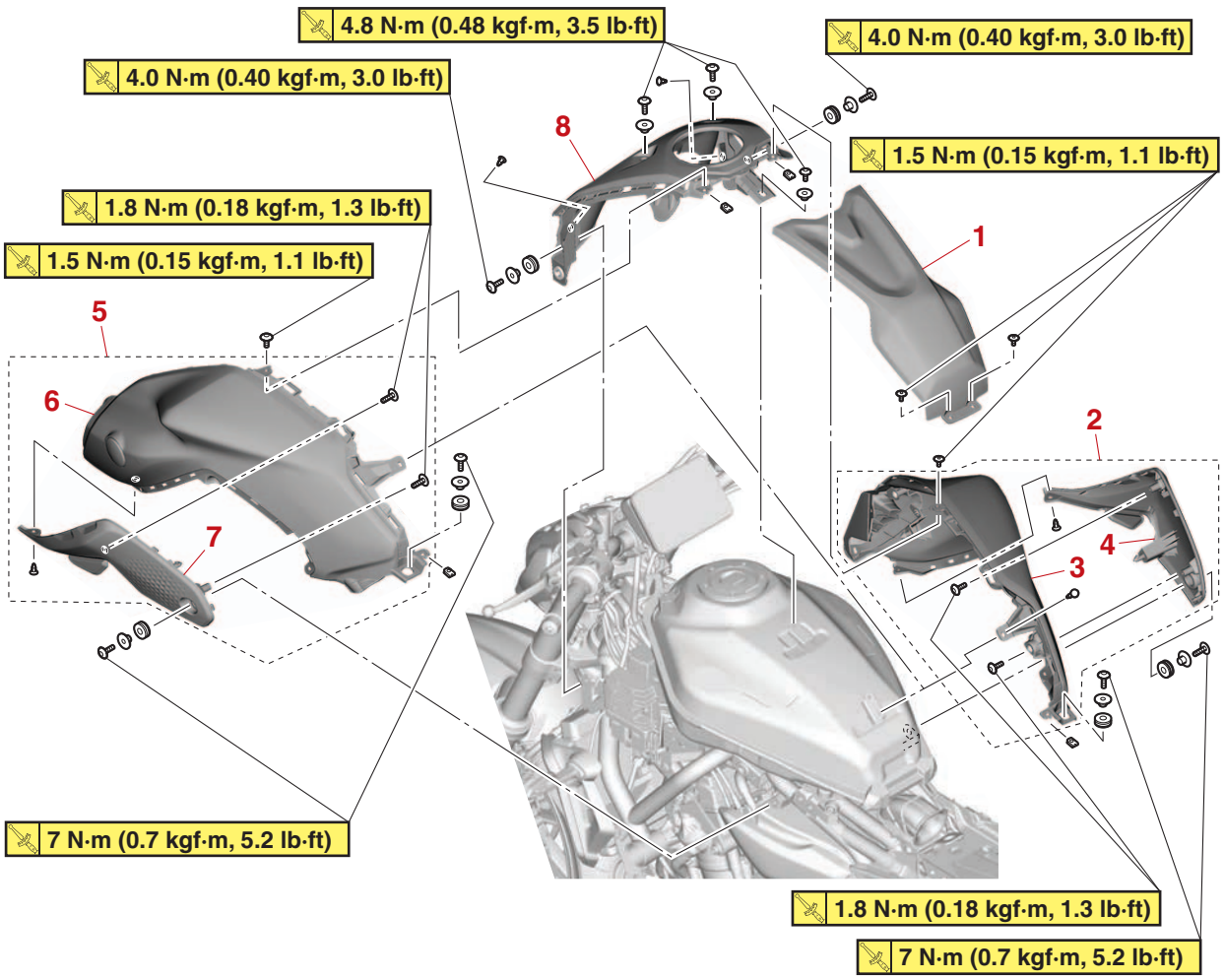




EAS20157

GENERAL CHASSIS (4)

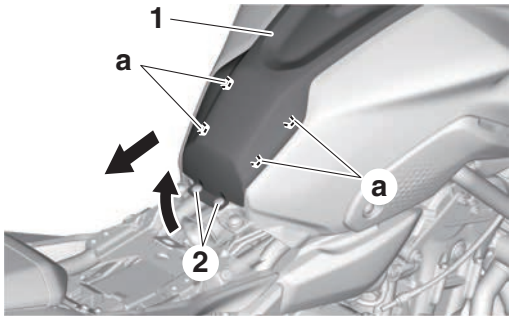
Removing the fuel tank covers



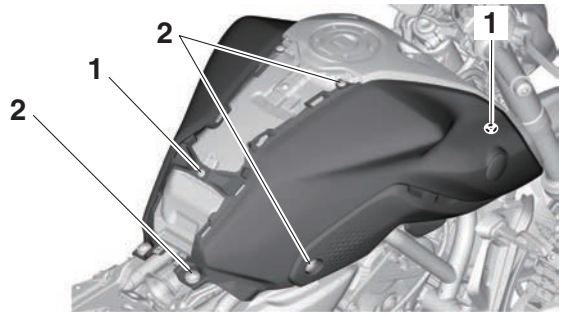
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
1	Fuel tank top cover	1	
2	Fuel tank side cover assembly (right)	1	
3	Air scoop assembly (right)	1	
4	Fuel tank side cover (right)	1	
5	Fuel tank side cover assembly (left)	1	
6	Air scoop assembly (left)	1	
7	Fuel tank side cover (left)	1	
8	Fuel tank front cover	1	

EAS33515
REMOVING THE FUEL TANK TOP COVER AND FUEL TANK SIDE COVER ASSEMBLIES

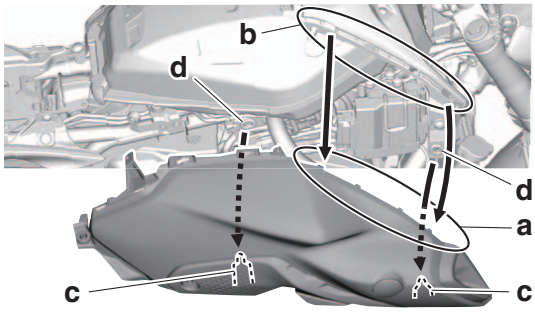
1. Remove:
   • Fuel tank top cover “1”
   a. Remove the fuel tank top cover bolts “2”.
   b. Lift up the fuel top cover upwards, and then disengage the projections “a” on the fuel tank top cover from the hole in the fuel tank side cover.
   c. Remove the fuel tank top cover by sliding the fuel tank top cover rearward.



2. Remove:
   • Fuel tank side cover assembly
   The following procedure applies to each fuel tank side cover assembly.
   a. Remove the quick fasteners “1” and bolts “2”.

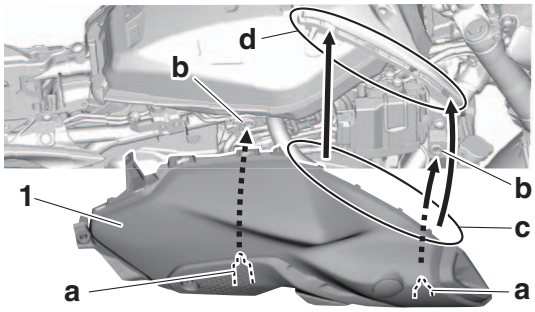


   b. Disengage the projection “a” of the fuel tank side cover assembly from the hole “b” in the fuel tank top cover.
   c. Disengage the projections “c” of the fuel tank side cover assembly from the grommets “d”.



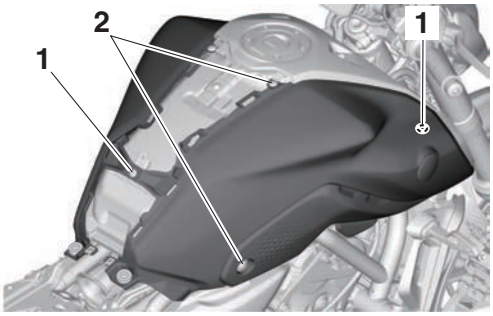
EAS33516
INSTALLING THE FUEL TANK SIDE COVER ASSEMBLIES AND FUEL TANK TOP COVER

1. Install:
   • Fuel tank side cover assembly “1”
   The following procedure applies to each fuel tank side cover assembly.
   a. Insert the projections “a” of the fuel tank side cover assembly into the grommets “b”.
   b. Insert the projection “c” of the fuel tank side cover assembly into the hole “d” in the fuel tank top cover.



   c. Install the quick fasteners “1” and bolts “2”.

Side cover assembly bolt (side)
7 N·m (0.7 kgf·m, 5.2 lb·ft)
Side cover assembly bolt (upper)
1.5 N·m (0.15 kgf·m, 1.1 lb·ft)

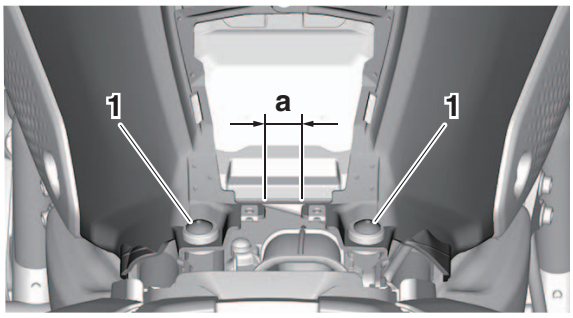


   d. Measure the clearance “a” between the fuel tank side cover assembly (right) and fuel tank side cover assembly (left), and then adjust the clearance to the specification.

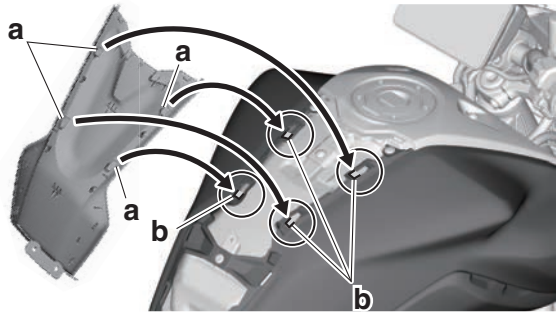
Clearance “a” (between the fuel tank side cover assembly (right) and fuel tank side cover assembly (left))
23.4–24.4 mm (0.92–0.96 in)

e. Install the bolt “1” with the clearance “a” set to the specification.

Fuel tank side cover assembly bolt “1”
7 N·m (0.7 kgf·m, 5.2 lb·ft)



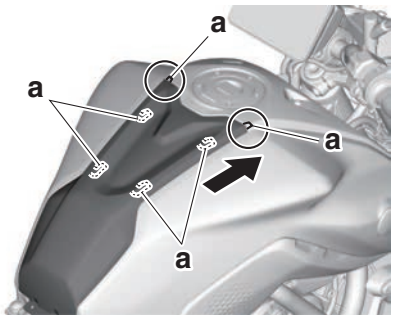
2. Install:
• Fuel tank top cover
a. Insert the projections “a” on the fuel tank top cover into the holes “b” in the fuel tank side cover assembly.



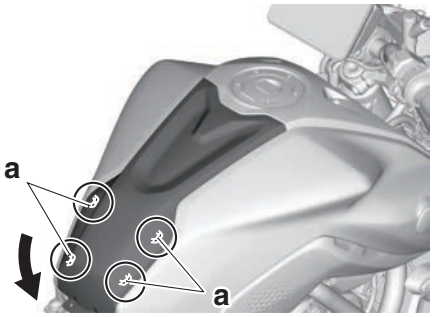
b. Slide the fuel tank top cover toward the front side, and then insert the projections “a” on the fuel tank top cover into both the holes in the fuel tank front cover and the holes in the fuel tank side cover assembly.

TIP

- When sliding the fuel tank top cover, do so while pushing the whole cover against the vehicle so that the projections “a” can be securely inserted.
- Check that the projections “a” on the fuel tank top cover is securely inserted and that the fuel tank top cover does not float.



c. Insert the projections “a” on the fuel tank top cover into the holes in the fuel tank side cover assembly.



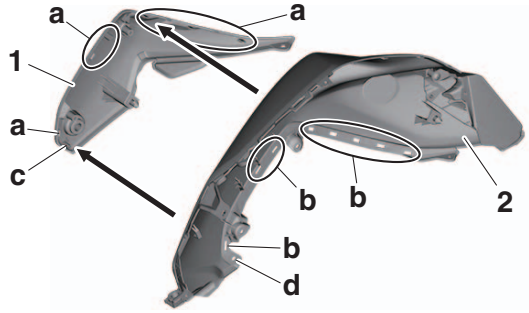
d. Install the fuel tank top cover bolt.

Fuel tank top cover bolt
1.5 N·m (0.15 kgf·m, 1.1 lb·ft)

EAS33517
DISASSEMBLING THE FUEL TANK SIDE COVER

The following procedure applies to each fuel tank side cover assembly.

1. Remove:
• Fuel tank side cover “1”
(from air scoop assembly “2”)
a. Remove the fuel tank side cover screw.
b. Disengage the projections “a” on the fuel tank side cover from the holes “b” in the air scoop assembly.
c. Disengage the projection “c” on the fuel tank side cover from the hole “d” in the air scoop assembly.

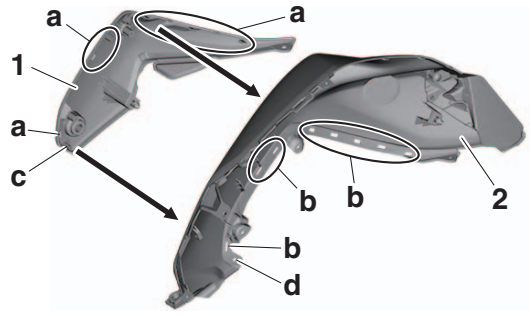


EAS33518
ASSEMBLING THE FUEL TANK SIDE COVER

The following procedure applies to each fuel tank side cover assembly.

1. Install:
   - Fuel tank side cover “1”
     (onto air scoop assembly “2”)
   a. Align the projections “a” on the fuel tank side cover with the holes “b” in the air scoop assembly.
   b. Insert the projection “c” on the fuel tank side cover into the hole “d” in the air scoop assembly.
   c. Install the fuel tank side cover screw.

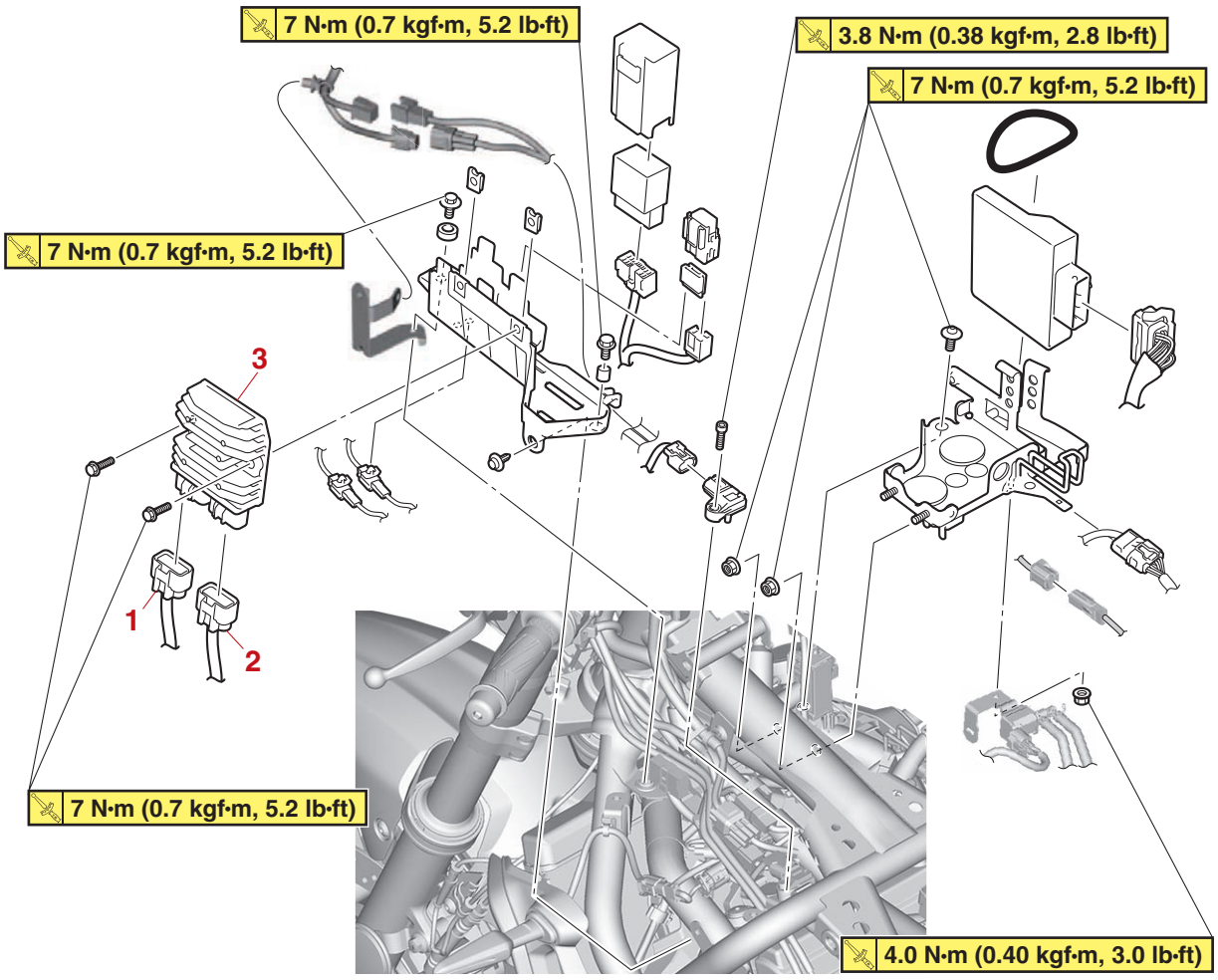
	Fuel tank side cover screw **1.8 N·m (0.18 kgf·m, 1.3 lb·ft)**



EAS20158

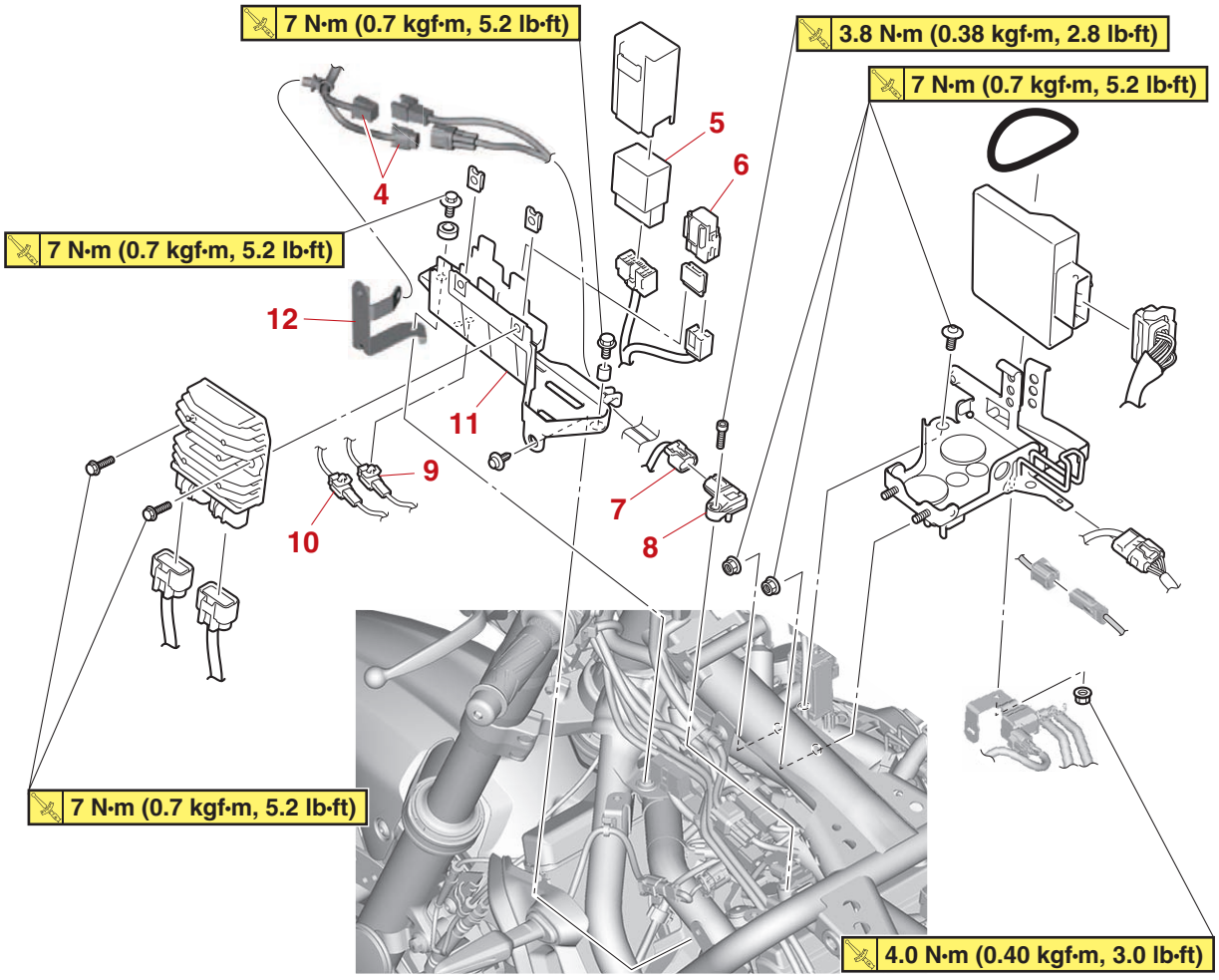
GENERAL CHASSIS (5)

Removing the electrical components tray



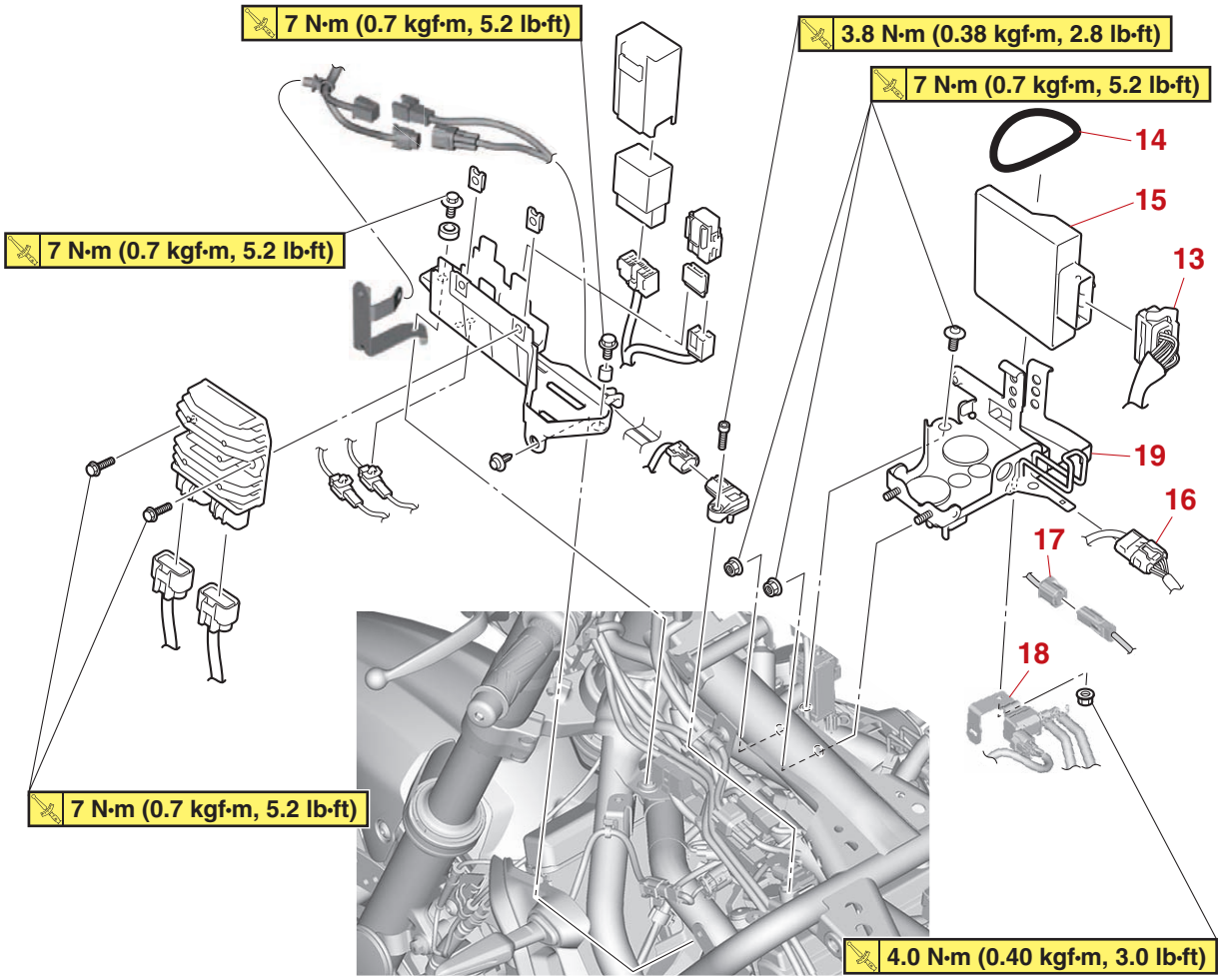
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Hydraulic unit assembly		Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-60.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Stator coil coupler	1	Disconnect.
2	Rectifier/regulator coupler	1	Disconnect.
3	Rectifier/regulator	1	

Removing the electrical components tray



Order	Job/Parts to remove	Q'ty	Remarks
4	Handlebar switch coupler (right)	2	Disconnect.
5	Relay unit	1	
6	Radiator fan motor relay	1	
7	Intake air pressure sensor coupler	1	Disconnect.
8	Intake air pressure sensor	1	
9	Crankshaft position sensor coupler	1	
10	Radiator fan motor coupler	1	
11	Electrical components tray 1	1	
12	Fuel tank cover bracket	1	

Removing the electrical components tray

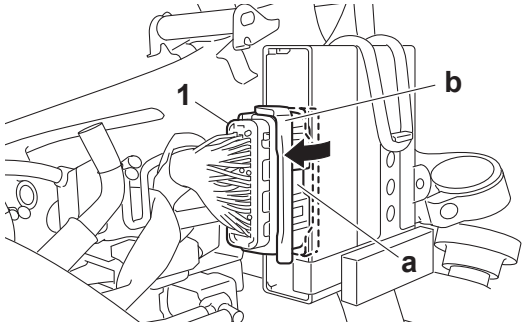


Order	Job/Parts to remove	Q'ty	Remarks
13	ECU coupler	1	Disconnect.
14	Band	1	
15	ECU (Engine Control Unit)	1	
16	Sub-wire harness coupler	1	
17	Front turn signal light coupler (right)	1	Disconnect.
18	Electrical components tray bracket	1	For California only.
19	Electrical components tray 2	1	

EAS31108
REMOVING THE ECU (Engine Control Unit)
1. Disconnect:
   • ECU coupler “1”

TIP

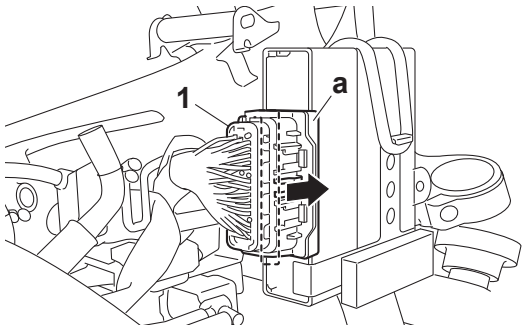
While pushing the portion “a” of the ECU coupler, move the lock lever “b” in the direction of the arrow shown to disconnect the coupler.



EAS31109
INSTALLING THE ECU (Engine Control Unit)
1. Connect:
   • ECU coupler “1”

TIP

Connect the ECU coupler, and then push the lock lever “a” of the coupler in the direction of the arrow shown.

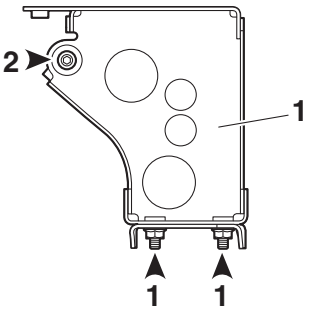


EAS31129
INSTALLING THE ELECTRICAL COMPONENTS TRAYS
1. Install:
   • Electrical components tray 2 “1”

Electrical components tray 2 nut
7 N·m (0.7 kgf·m, 5.2 lb·ft)
Electrical components tray 2 bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP

Tighten the electrical components tray 2 nuts and bolt in the proper tightening sequence as shown.

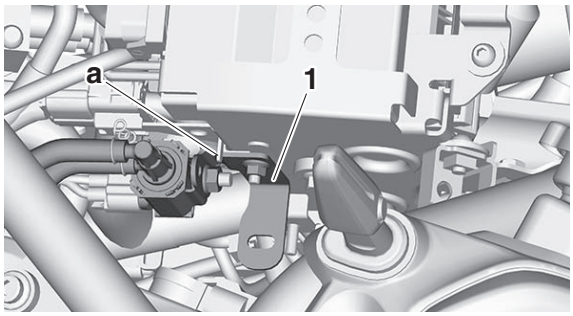


2. Install:
   • Electrical components tray bracket “1” (for California only)

Electrical components tray bracket nut
4.0 N·m (0.40 kgf·m, 3.0 lb·ft)

TIP

When installing the electrical components tray bracket, make sure that the bracket has contact with the stopper “a” of the electrical components tray 2, and then install it.

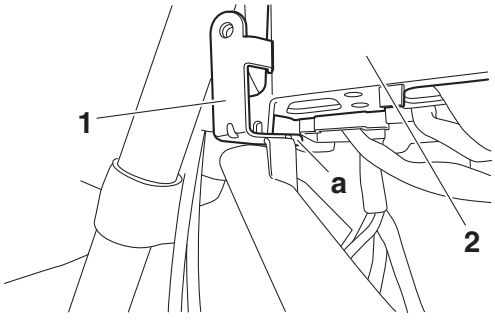


3. Install:
   • Fuel tank cover bracket “1”
   • Electrical components tray 1 “2”

Electrical components tray 1 bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP

Make sure that the projection “a” on the fuel tank cover bracket contacts the frame.

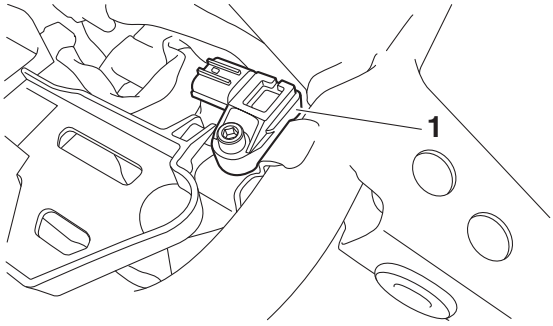


4. Install:
   • Intake air pressure sensor “1”

	Intake air pressure sensor bolt **3.8 N·m (0.38 kgf·m, 2.8 lb·ft)**

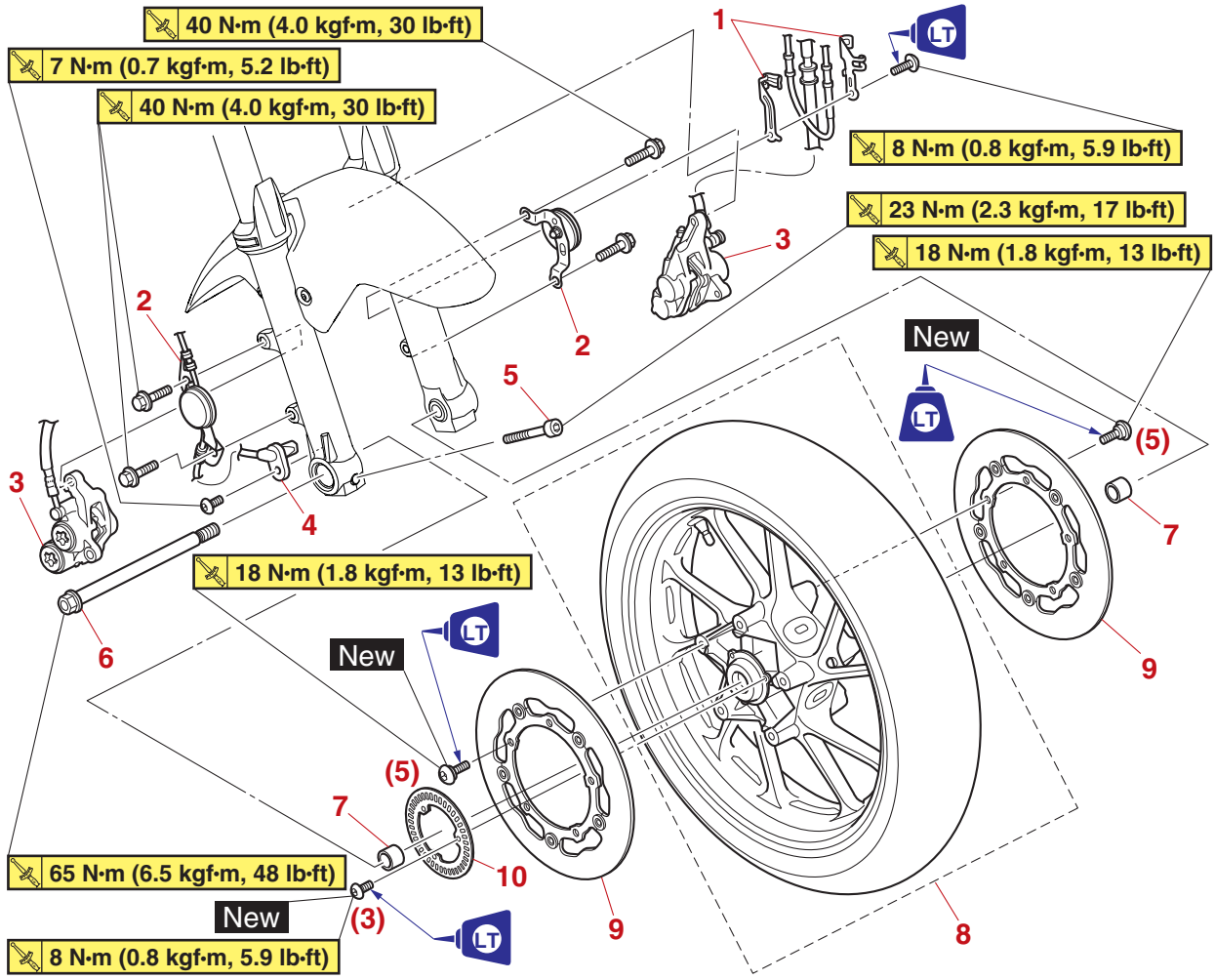
TIP

Make sure that the intake air pressure sensor contacts the frame.



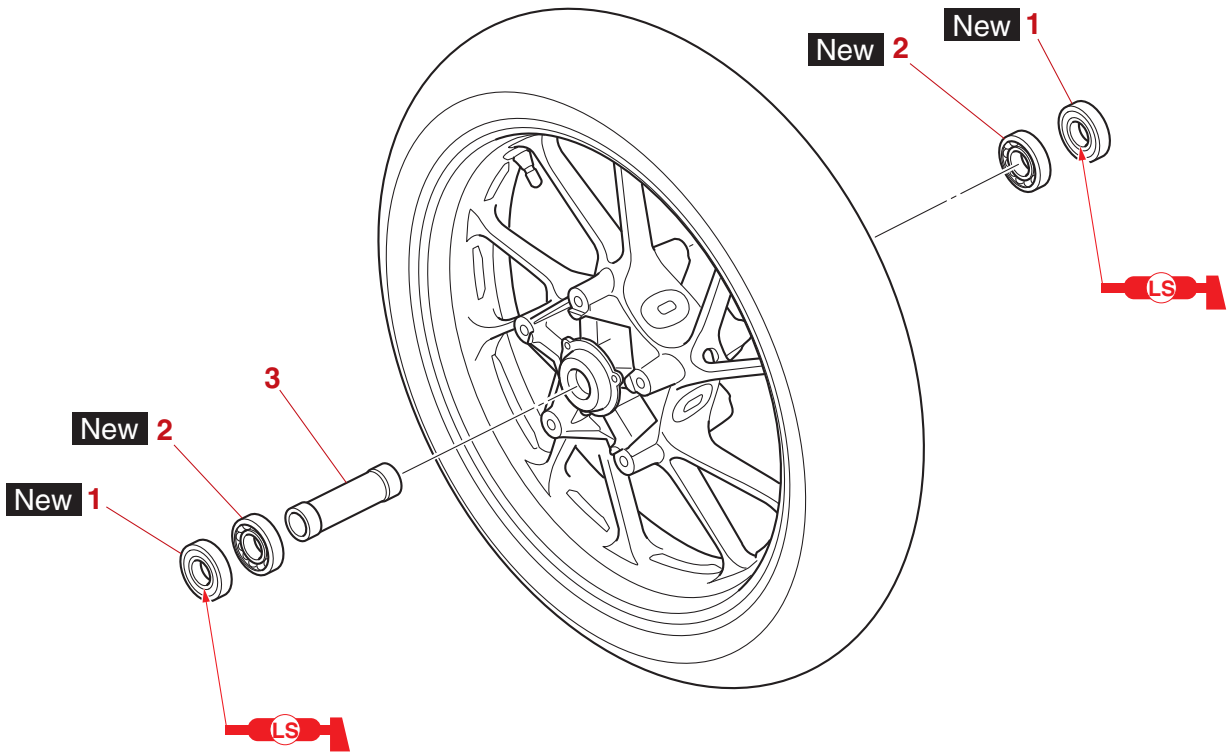
EAS20028
FRONT WHEEL

Removing the front wheel and brake discs



Order	Job/Parts to remove	Q'ty	Remarks
1	Front brake hose/lead holder	2	
2	Front reflector bracket	2	
3	Front brake caliper	2	
4	Front wheel sensor	1	
5	Wheel axle pinch bolt	1	Loosen.
6	Front wheel axle	1	
7	Collar	2	
8	Front wheel	1	
9	Front brake disc	2	
10	Front wheel sensor rotor	1	

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	2	
2	Wheel bearing	2	
3	Spacer	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 hose/lead holder
   - Front reflector bracket
   - Front brake caliper
   - Front wheel sensor

ECA20990
NOTICE

- **Do not apply the brake lever when removing the brake calipers.**
- **Be sure not to contact the sensor electrode to any metal part when removing the front wheel sensor from the outer tube.**

3. Elevate:
   - Front wheel

TIP

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

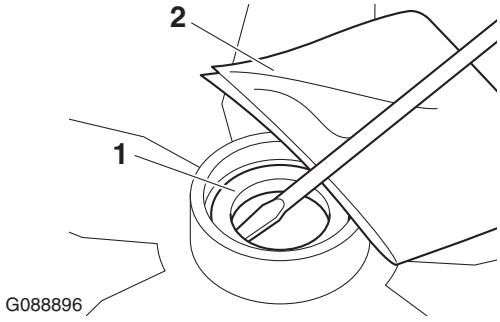
EAS30146
DISASSEMBLING THE FRONT WHEEL

1. Remove:
   - Oil seal
   - Wheel bearing

   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.



G088896

   c. Remove the wheel bearings with a general bearing puller.

EAS30147
CHECKING THE FRONT WHEEL

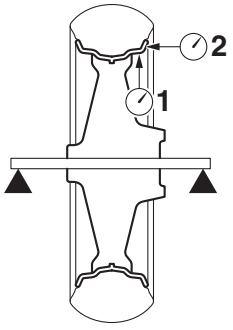
1. Check:
   - Wheel axle
     Roll the wheel axle on a flat surface.
     Bends → Replace.

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 3-16 and “CHECKING THE WHEELS” on page 3-16.
3. Measure:
   - Radial wheel runout “1”
   - Lateral wheel runout “2”
     Over the specified limits → Replace.

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



G088897

4. Check:
   • Wheel bearing
     Front wheel turns roughly or is loose → Replace the wheel bearings.
   • Oil seal
     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
     Cracks/bends/distortion → Replace.
     Iron powder/dust → Clean.
2. Check:
   • Front wheel sensor rotor
     Cracks/damage/scratches → Replace the front wheel sensor rotor.
     Iron powder/dust/solvent → Clean.

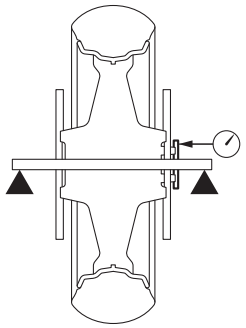
TIP
• The wheel sensor rotor is installed on the inner side of the wheel hub.
• When cleaning the wheel sensor rotor, be careful not to damage the surface of the sensor rotor.

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

Wheel sensor rotor deflection limit
0.25 mm (0.0098 in)

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

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



G088902

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

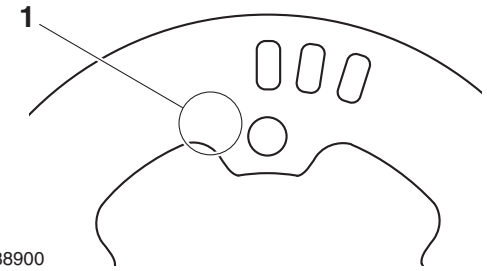
Front wheel sensor rotor bolt
8 N·m (0.8 kgf·m, 5.9 lb·ft)
LOCTITE®

ECA18100
NOTICE

Replace the wheel sensor rotor bolts with new ones.

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

TIP
Install the wheel sensor rotor with the stamped mark “1” facing outward.



G088900

EAS30151
ASSEMBLING THE FRONT WHEEL

1. Install:
   - Wheel bearing New
   - Oil seal New

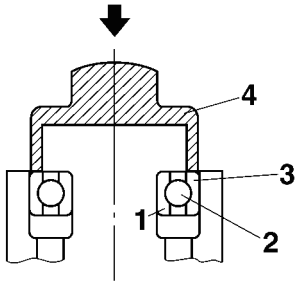
   a. Install the new wheel bearing (right side).

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.

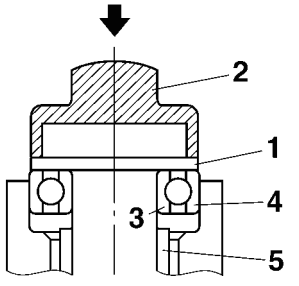


G088898

   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".



G088899

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 (DISC BRAKE)

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

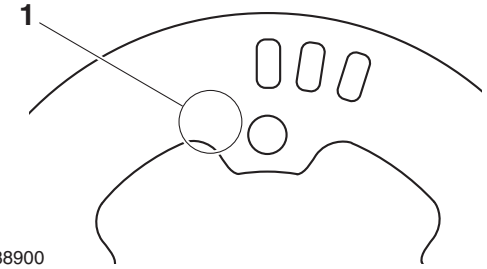
	**Front wheel sensor rotor bolt** **8 N·m (0.8 kgf·m, 5.9 lb·ft)** **LOCTITE®** **Front brake disc bolt** **18 N·m (1.8 kgf·m, 13 lb·ft)** **LOCTITE®**

ECA21011
NOTICE

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

TIP

- Install the wheel sensor rotor with the stamped mark "1" facing outward.
- Tighten the brake disc bolts in stages and in a crisscross pattern.



G088900

2. Check:
   - Front brake disc

   Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-42.

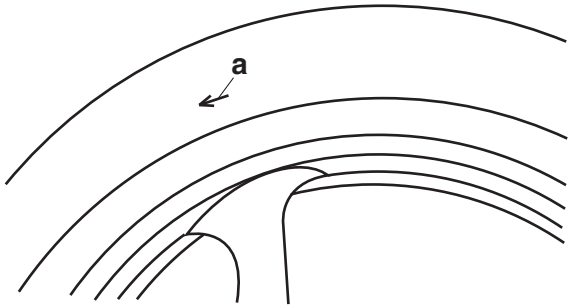
3. Lubricate:
   • Oil seal lip

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

4. Install:
   • Collar
   • Front wheel
   • Front wheel axle

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
   • Front wheel axle pinch bolt

	Front wheel axle **65 N·m (6.5 kgf·m, 48 lb·ft)** **Front wheel axle pinch bolt** **23 N·m (2.3 kgf·m, 17 lb·ft)**

ECA19760

NOTICE

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

TIP

First, tighten the wheel axle, then the wheel axle pinch bolt.

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.

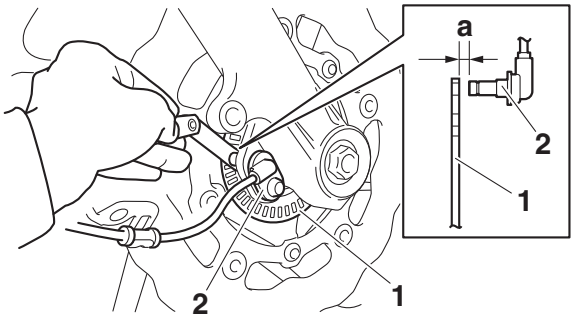
7. Measure:
   • Distance “a”
   (between the front wheel sensor rotor “1” and front wheel sensor “2”)
   Out of specification → Check the wheel bearing for looseness, and the front wheel sensor and sensor rotor installation conditions (warpage caused by overtorque, wrong installation direction, rotor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

	Distance “a” (between the front wheel sensor rotor and front wheel sensor) **1.1–1.9 mm (0.04–0.07 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 **90890-03268** **Feeler gauge set** **YU-26900-9**



8. Install:
   - Front reflector bracket
   - Front brake caliper
   - Front brake hose/lead holder “1”

	**Front brake caliper bolt** **40 N·m (4.0 kgf·m, 30 lb·ft)** **Front brake hose/lead holder bolt** **8 N·m (0.8 kgf·m, 5.9 lb·ft)**

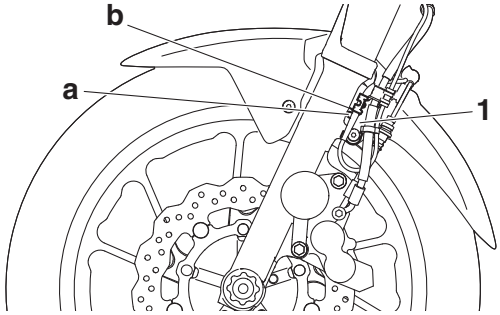
EWA13500

⚠ WARNING

Make sure the brake hose is routed properly.

TIP

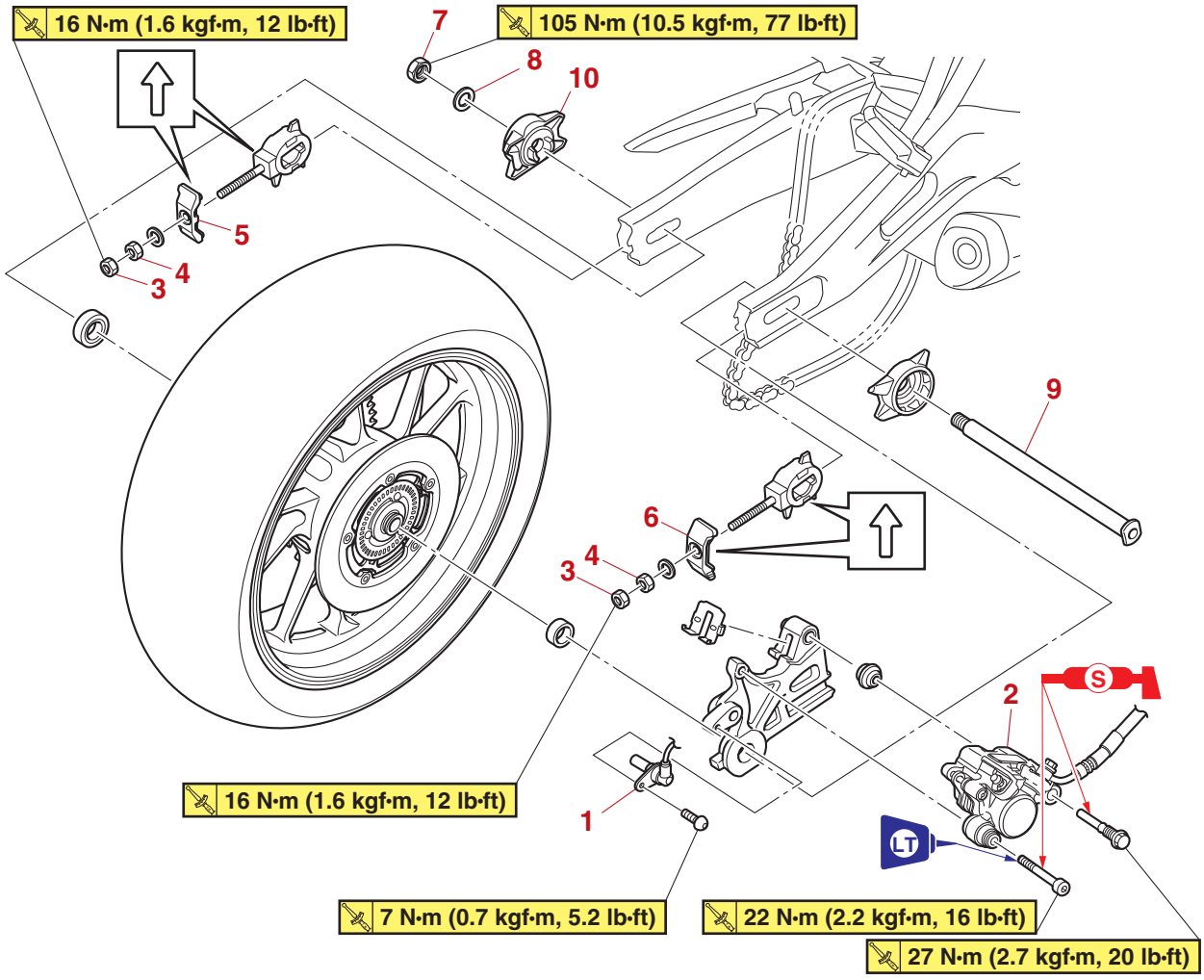
Install the front brake hose/lead holder so that the projection “a” on the holder contacts the stopper “b” on the front fork.



EAS20029

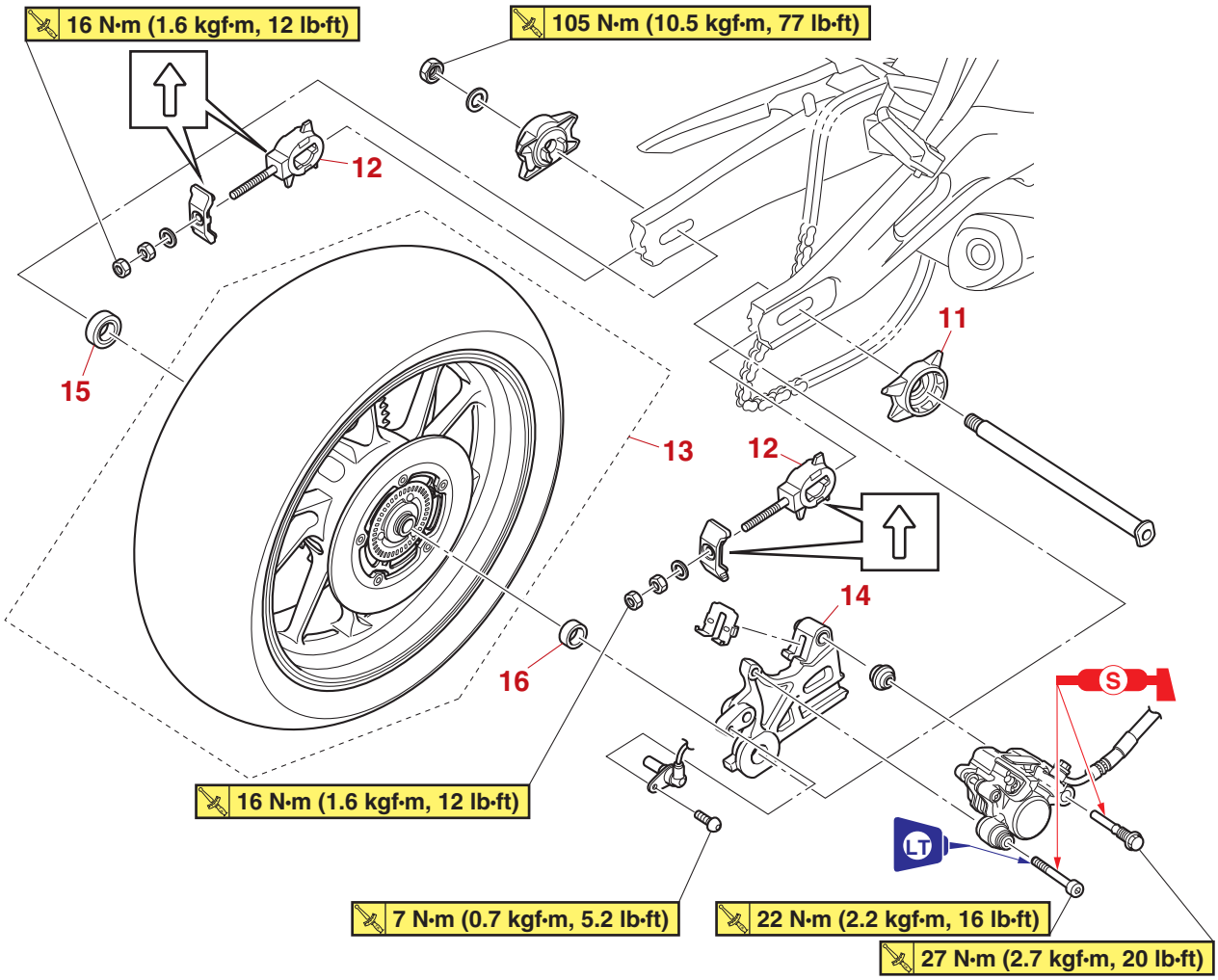
REAR WHEEL

Removing the rear wheel



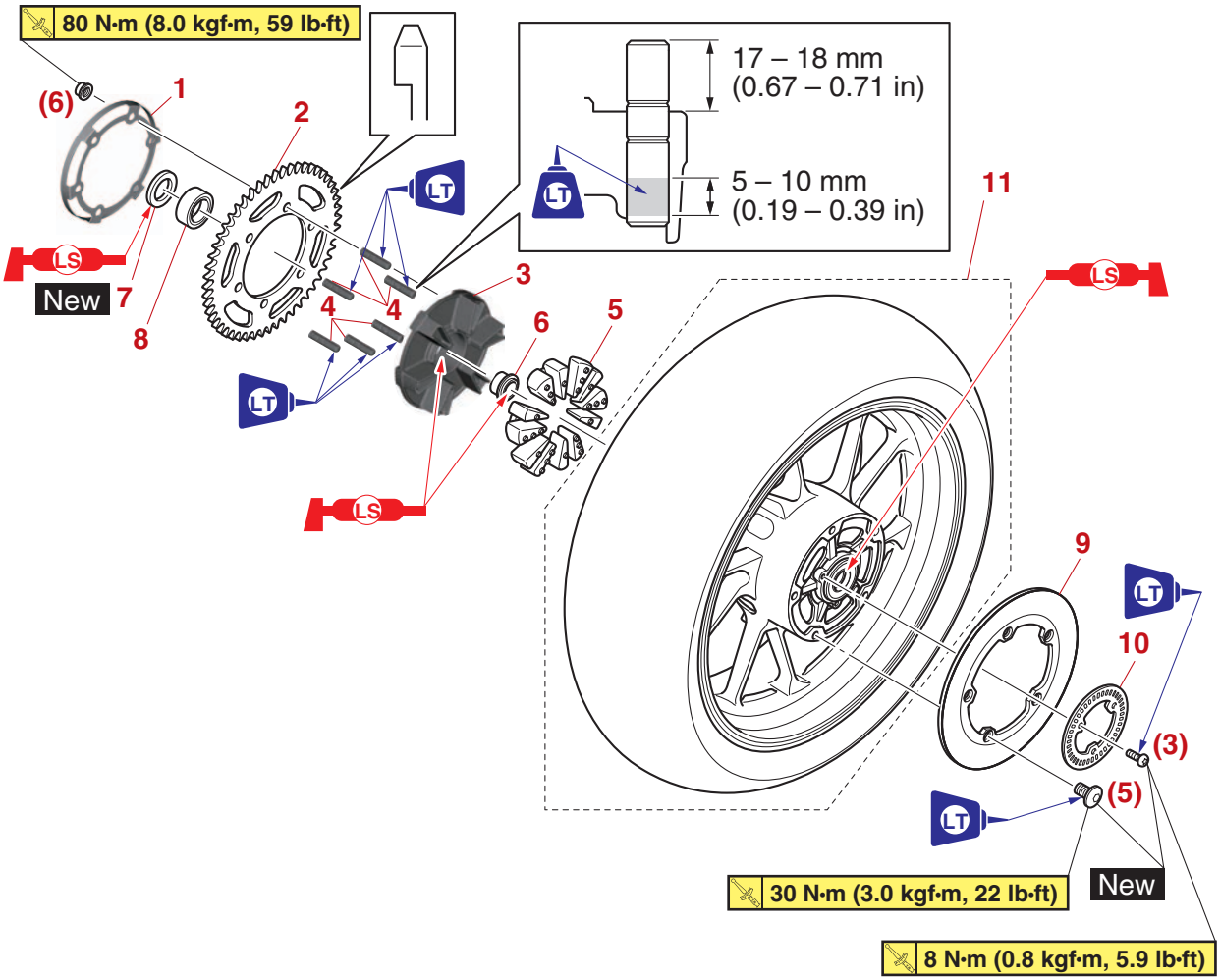
Order	Job/Parts to remove	Q'ty	Remarks
1	Rear wheel sensor	1	
2	Rear brake caliper	1	
3	Drive chain puller locknut	2	Loosen.
4	Drive chain adjusting nut	2	Loosen.
5	Swingarm end plate (left)	1	
6	Swingarm end plate (right)	1	
7	Wheel axle nut	1	
8	Washer	1	
9	Rear wheel axle	1	
10	Drive chain slack adjusting plate (left)	1	

Removing the rear wheel



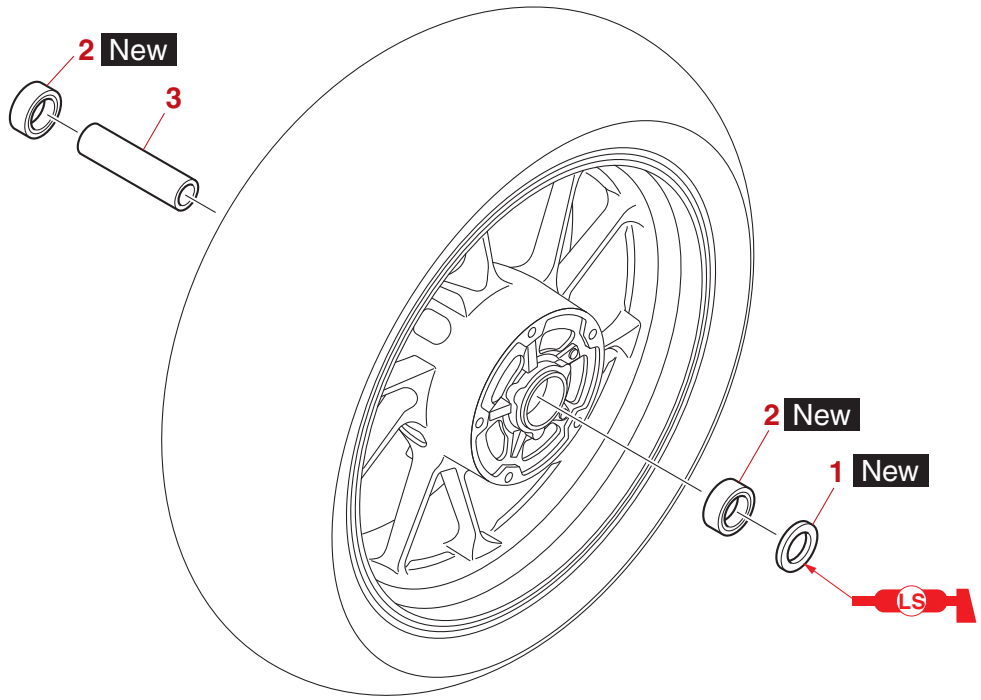
Order	Job/Parts to remove	Q'ty	Remarks
11	Drive chain slack adjusting plate (right)	1	
12	Chain puller	2	
13	Rear wheel	1	
14	Brake caliper bracket	1	
15	Collar (left)	1	
16	Collar (right)	1	

Removing the rear brake disc and rear wheel sprocket



Order	Job/Parts to remove	Q'ty	Remarks
1	Bracket	1	
2	Rear wheel sprocket	1	
3	Rear wheel drive hub	1	
4	Rear wheel drive hub stud bolt	6	
5	Rear wheel drive hub damper	6	
6	Collar	1	
7	Oil seal	1	
8	Bearing	1	
9	Rear brake disc	1	
10	Rear wheel sensor rotor	1	
11	Rear wheel	1	

Disassembling the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	1	
2	Wheel bearing	2	
3	Spacer	1	

EAS30156
REMOVING THE REAR WHEEL (DISC BRAKE)

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

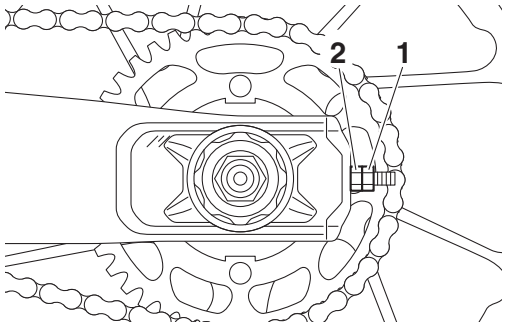
Place the vehicle on a maintenance stand so that the rear wheel is elevated.

2. Remove:
   - Rear wheel sensor
   - Rear brake caliper

ECA21040
NOTICE

- **Do not depress the brake pedal when removing the brake caliper.**
- **Be sure not to contact the sensor electrode to any metal part when removing the rear wheel sensor from the rear brake caliper bracket.**

3. Loosen:
   - Chain puller locknut “1”
   - Drive chain adjusting nut “2”



4. Remove:
   - Wheel axle nut
   - Washer
   - Rear wheel axle
   - Drive chain slack adjusting plate
   - Rear wheel

TIP

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

EAS30158
DISASSEMBLING THE REAR WHEEL

1. Remove:
   - Oil seal
   - Wheel bearing
   Refer to “DISASSEMBLING THE FRONT WHEEL” on page 4-22.

EAS30159
CHECKING THE REAR WHEEL

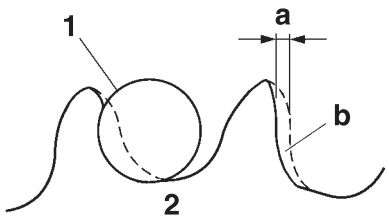
1. Check:
   - Rear wheel axle
   - Wheel bearing
   - Oil seal
   Refer to “CHECKING THE FRONT WHEEL” on page 4-22.
2. Check:
   - Tire
   - Rear wheel
   Damage/wear → Replace.
   Refer to “CHECKING THE TIRES” on page 3-16 and “CHECKING THE WHEELS” on page 3-16.
3. Measure:
   - Radial wheel runout
   - Lateral wheel runout
   Refer to “CHECKING THE FRONT WHEEL” on page 4-22.

EAS30160
CHECKING THE REAR WHEEL DRIVE HUB

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

EAS30161
CHECKING AND REPLACING THE REAR WHEEL SPROCKET

1. Check:
   • Rear wheel sprocket
   More than 1/4 tooth "a" wear → Replace the drive sprocket, the rear wheel sprocket and the drive chain as a set.
   Bent teeth → Replace the drive sprocket, the rear wheel sprocket and the drive chain as a set.

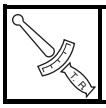


G088904

b. Correct

1. Drive chain roller
2. Rear wheel sprocket

2. Replace:
   • Rear wheel sprocket
   a. Remove the rear wheel sprocket nuts, bracket, and the rear wheel sprocket.
   b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
   c. Install a new rear wheel sprocket.

	**Rear wheel sprocket nut** **80 N·m (8.0 kgf·m, 59 lb·ft)**

TIP

- Install the rear wheel sprocket so that the stepped side of the sprocket faces away from the hub.
- Tighten the rear wheel sprocket nuts in stages and in a crisscross pattern.

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 4-23.
2. Check:
   • Rear wheel sensor rotor
   Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-23.
3. Measure:
   • Wheel sensor rotor deflection
   Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-23.

	**Wheel sensor rotor deflection limit** **0.25 mm (0.0098 in)**

EAS30163
ASSEMBLING THE REAR WHEEL

ECA21050

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.**

1. Install:
   • Wheel bearing New
   • Oil seal New
   Refer to "ASSEMBLING THE FRONT WHEEL" on page 4-24.

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 and rear wheel drive hub installed.

1. Adjust:
   - Rear wheel static balance
     Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-24.

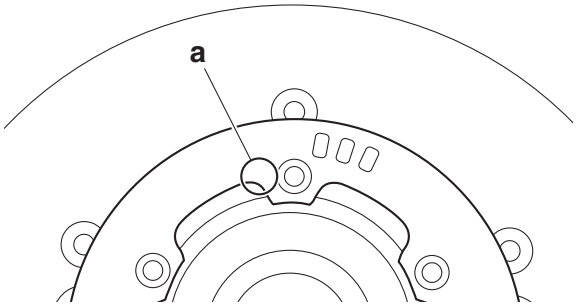
EAS30165
INSTALLING THE REAR WHEEL (REAR BRAKE DISC)

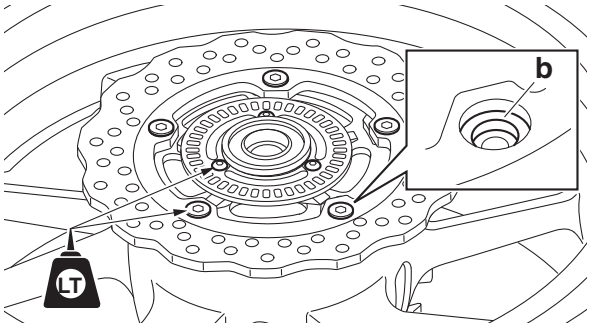
1. Install:
   - Rear brake disc
   - Rear wheel sensor rotor

Rear wheel sensor rotor bolt
8 N·m (0.8 kgf·m, 5.9 lb·ft)
LOCTITE®
Rear brake disc bolt
30 N·m (3.0 kgf·m, 22 lb·ft)
LOCTITE®

ECA21011
NOTICE
- **Do not drop the wheel sensor rotor or subject it to shocks.**
- **If any solvent gets on the wheel sensor rotor, wipe it off immediately.**
- **Replace the brake disc bolts and wheel sensor rotor bolts with new ones.**

TIP
- Install the wheel sensor rotor with the stamped mark "a" facing outward.
- Install the brake disc so that the recessed portions of the bolt holes "b" face away from the hub.
- Tighten the brake disc bolts in stages and in a crisscross pattern.



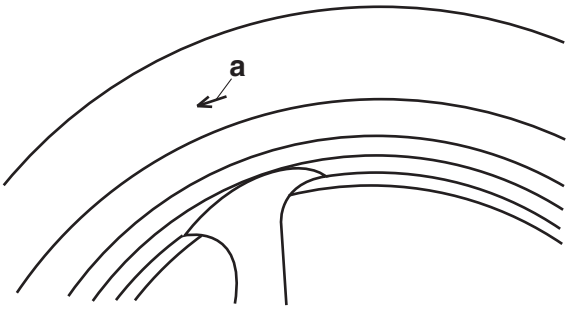


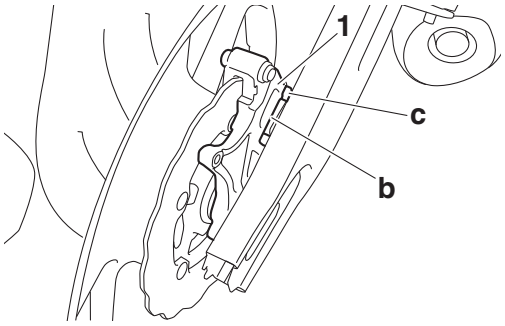
2. Install:
   - Rear wheel sprocket
     Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-32.
3. Check:
   - Rear brake disc
     Refer to "CHECKING THE REAR BRAKE DISC" on page 4-54.
4. Lubricate:
   - Oil seal lip

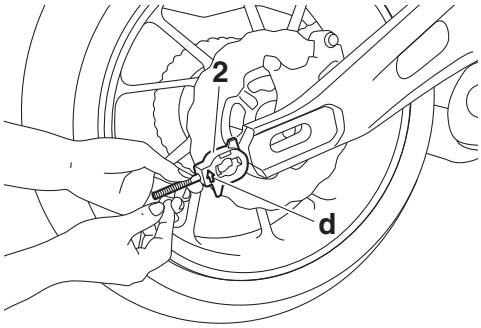
Recommended lubricant
Lithium-soap-based grease

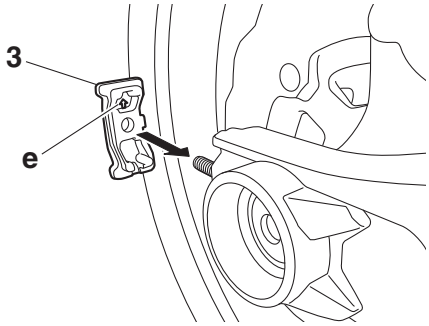
5. Install:
   - Collar (right)
   - Collar (left)
   - Brake caliper bracket "1"
   - Rear wheel
   - Chain puller "2"
   - Drive chain slack adjusting plate
   - Rear wheel axle
   - Washer
   - Wheel axle nut
   - Swingarm end plate "3"

TIP
- Install the rear wheel with the mark "a" on the rear tire pointing in the direction of wheel rotation.
- Align the projection "b" on the swingarm with the slot "c" in the brake caliper bracket.
- Make sure that the arrow mark "d" on each chain puller points upward.
- Make sure that the arrow mark "e" on each swingarm end plate points upward.

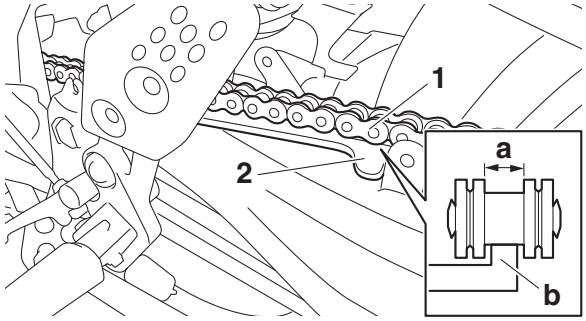








6. Install:
   - Rear brake caliper
   - Rear brake caliper retaining bolt
   - Rear brake caliper bolt
7. Fit the space “a” between the side plates of the drive chain “1” onto the rib “b” on the drive chain guide “2”.



8. Adjust:
   - Drive chain slack
     Refer to “DRIVE CHAIN SLACK” on page 3-17.

Drive chain slack (Maintenance stand)
51.0–56.0 mm (2.01–2.20 in)
Drive chain slack (Sidestand)
51.0–56.0 mm (2.01–2.20 in)
Drive chain slack limit
58.0 mm (2.28 in) (MT07PC)

9. Tighten:
   - Wheel axle nut
   - Rear brake caliper retaining bolt
   - Rear brake caliper bolt

Wheel axle nut
105 N·m (10.5 kgf·m, 77 lb·ft)
Rear brake caliper retaining bolt
27 N·m (2.7 kgf·m, 20 lb·ft)
Rear brake caliper bolt
22 N·m (2.2 kgf·m, 16 lb·ft)
LOCTITE®

EWA13500
WARNING
Make sure the brake hose is routed properly.

10. Install:
    - Rear wheel sensor

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

ECA21080
NOTICE
Make sure there are no foreign materials in the rear wheel sensor rotor and rear wheel sensor. Foreign materials cause damage to the rear wheel sensor rotor and rear wheel sensor.

TIP

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

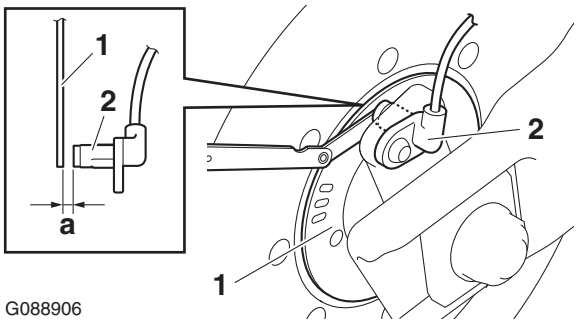
11. Measure:
    - Distance "a"
      (between the rear wheel sensor rotor "1" and rear wheel sensor "2")
      Out of specification → Check the wheel bearing for looseness, and the rear wheel sensor and sensor rotor installation conditions (warpage caused by overtorque, wrong installation direction,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

Distance "a" (between the rear wheel sensor rotor and rear wheel sensor)
0.7–1.5 mm (0.03–0.06 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 with the thickness gauge installed. This may damage the rear wheel sensor rotor and the rear wheel sensor.

Thickness gauge
90890-03268
Feeler gauge set
YU-26900-9



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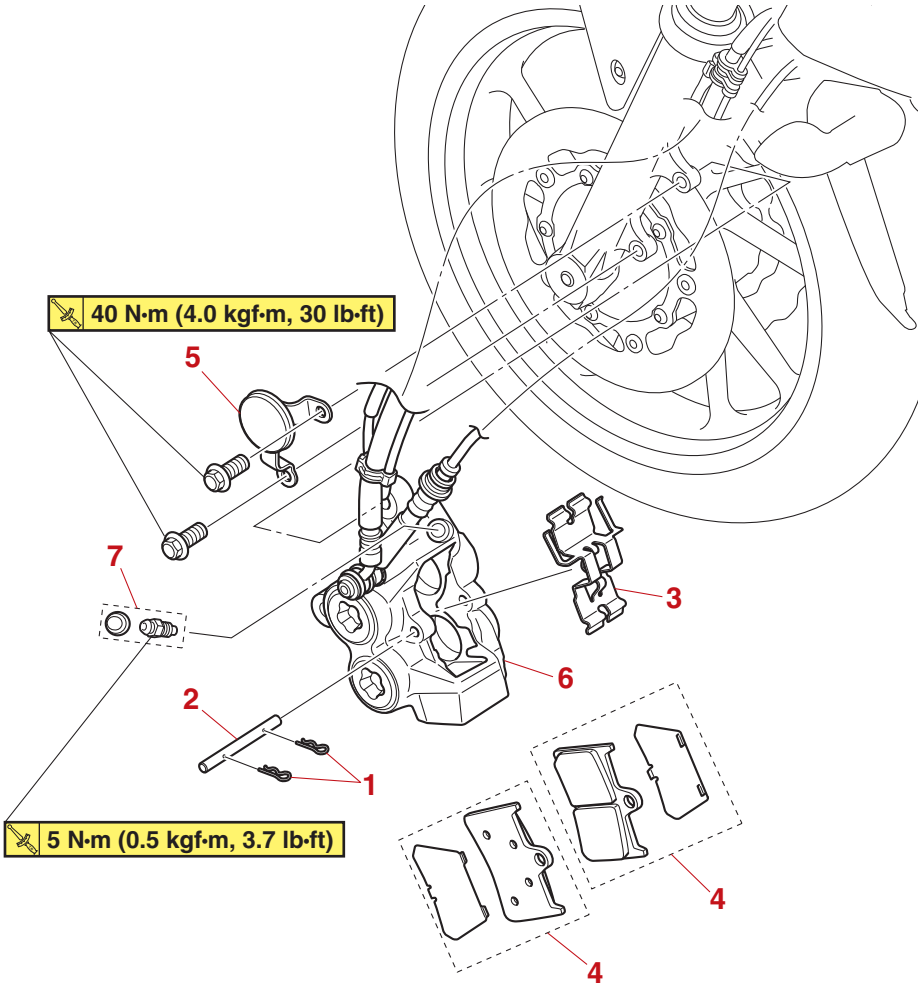
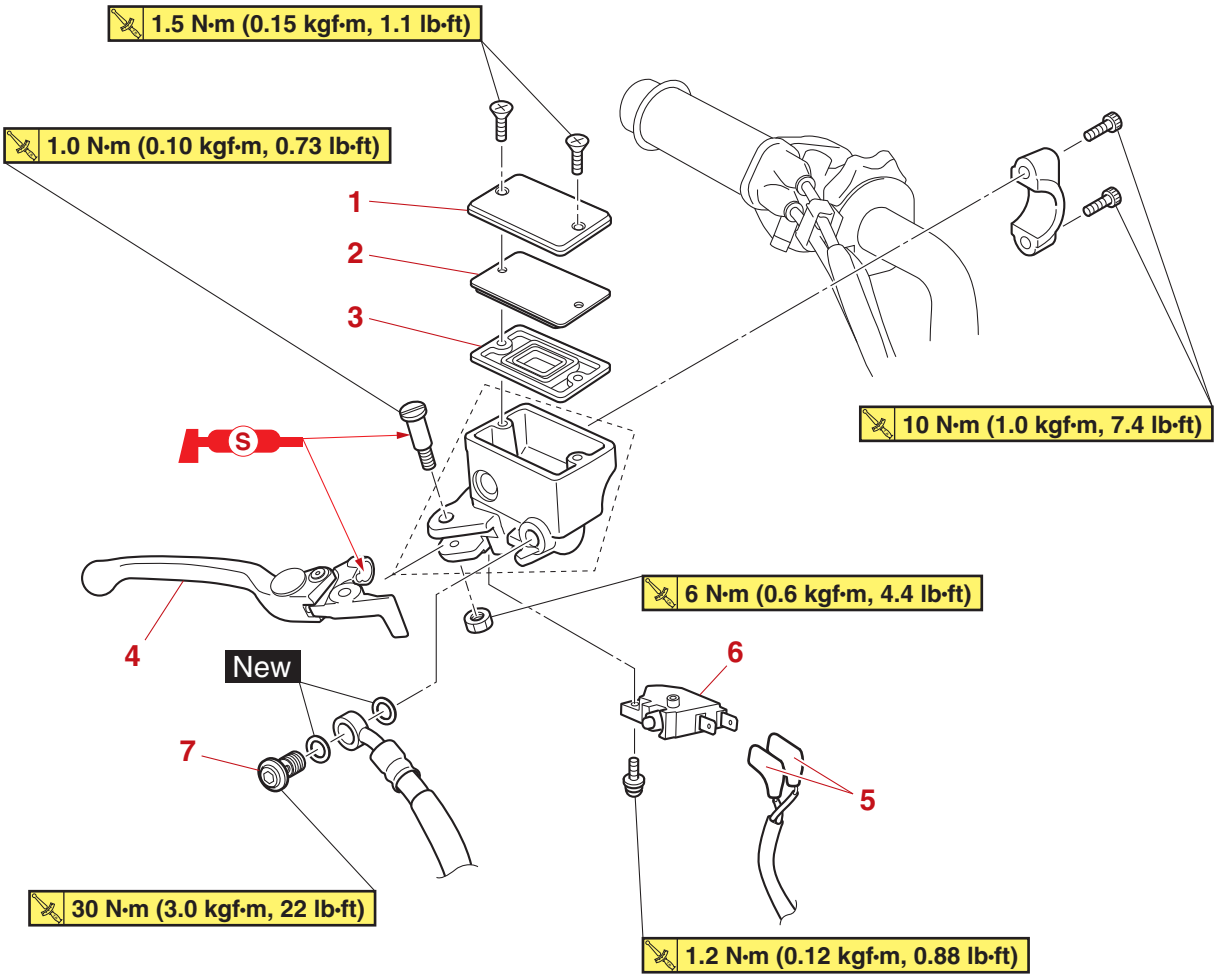
EAS20030
FRONT BRAKE

Removing the front brake pads



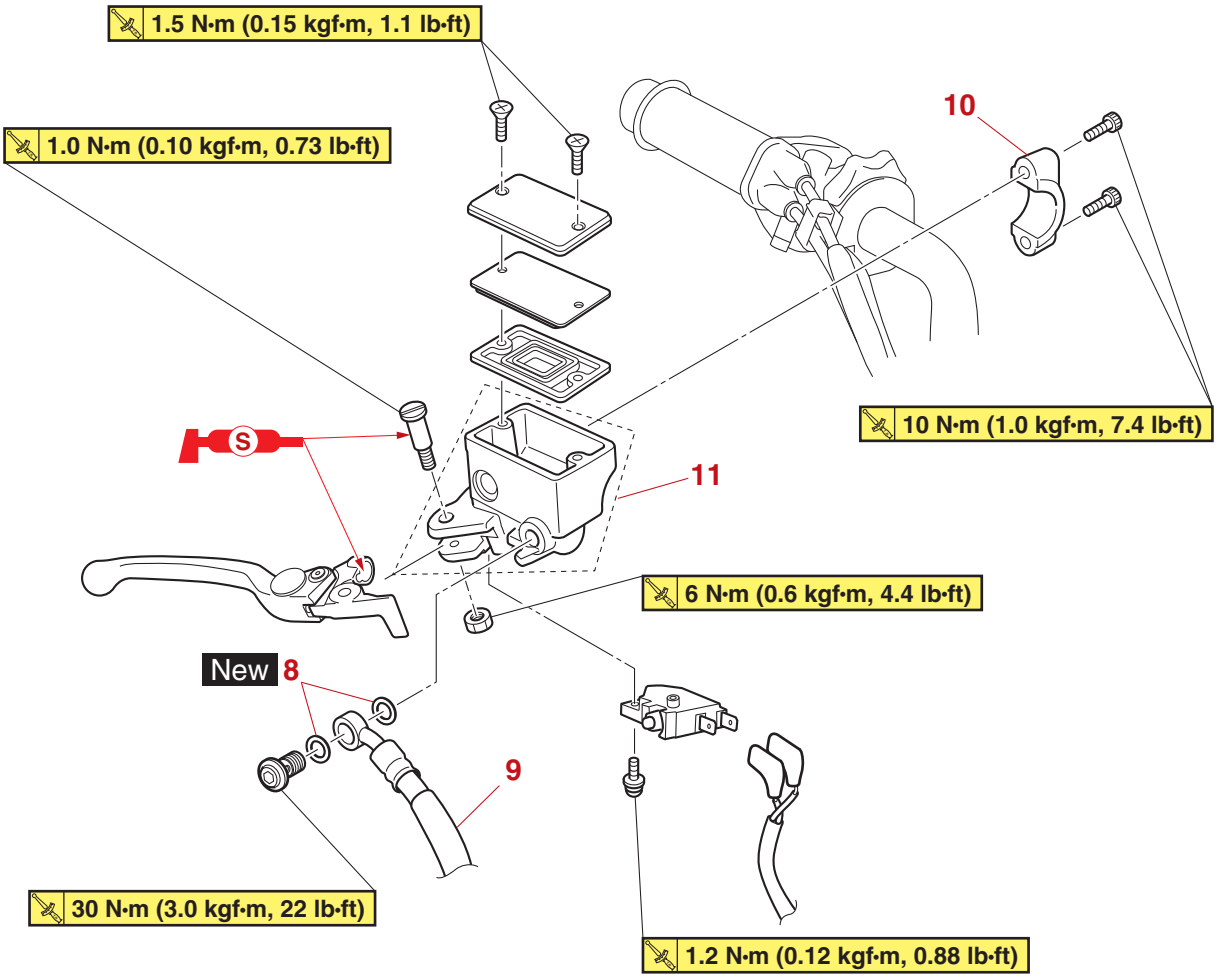
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad spring	1	
4	Brake pad	2	
5	Front reflector bracket	1	
6	Front brake caliper	1	
7	Brake caliper bleed screw	1	

Removing the front brake master cylinder



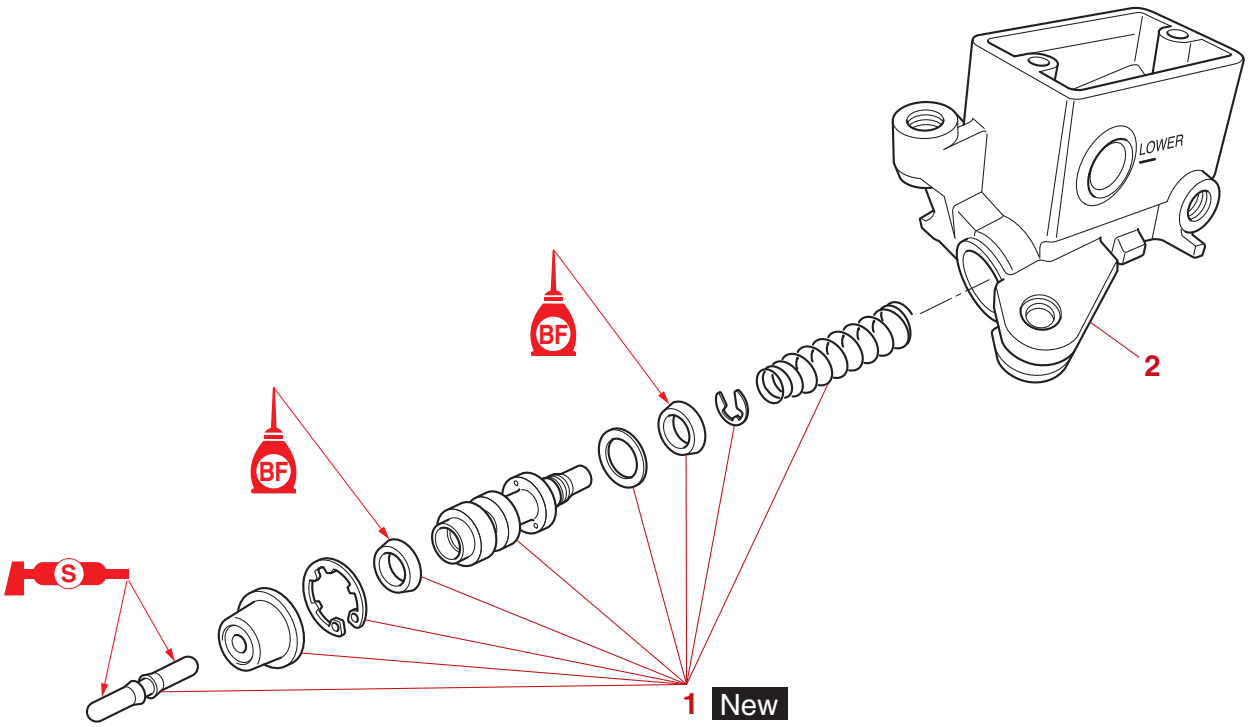
Order	Job/Parts to remove	Q'ty	Remarks
	Rearview mirror (right)		Refer to "HANDLEBAR" on page 4-68.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.
1	Brake master cylinder reservoir cap	1	
2	Brake master cylinder reservoir diaphragm holder	1	
3	Brake master cylinder reservoir diaphragm	1	
4	Brake lever	1	
5	Front brake light switch connector	2	Disconnect.
6	Front brake light switch	1	
7	Front brake hose union bolt	1	

Removing the front brake master cylinder



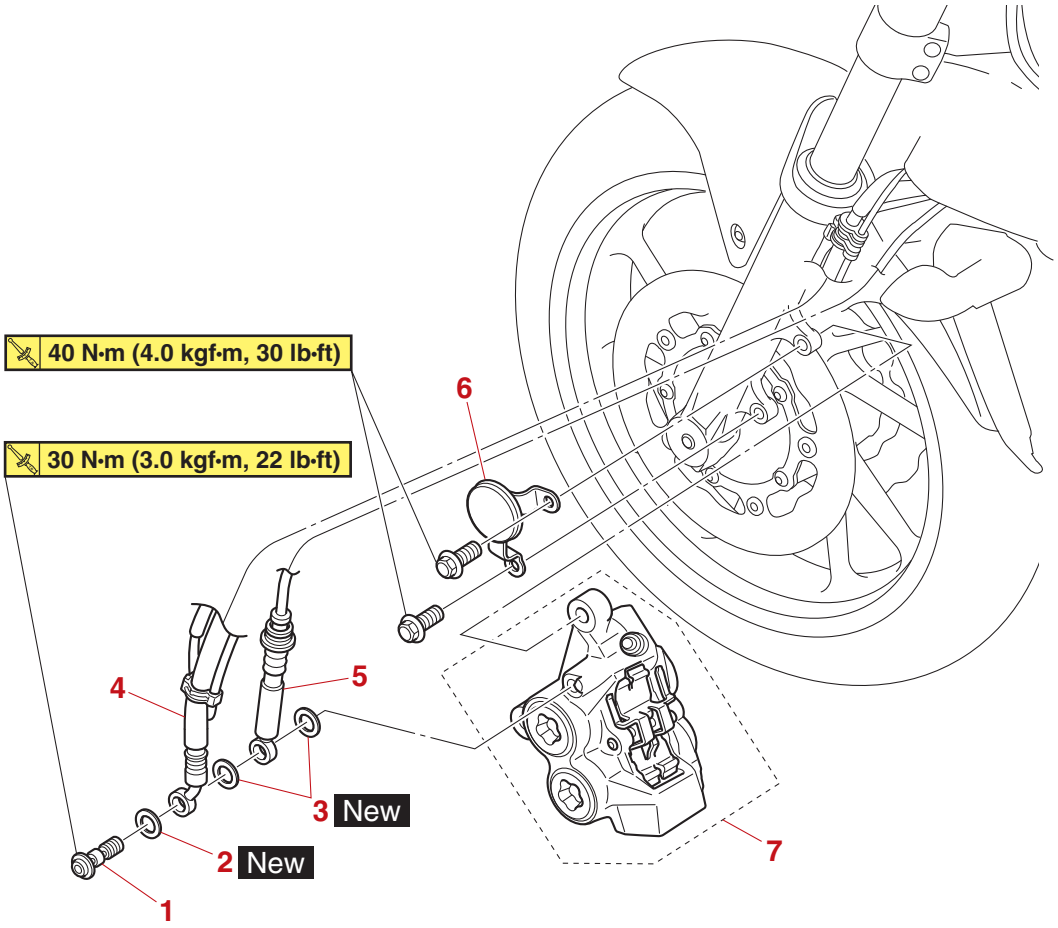
Order	Job/Parts to remove	Q'ty	Remarks
8	Brake hose gasket	2	
9	Brake hose (front brake master cylinder to hydraulic unit)	1	
10	Front brake master cylinder holder	1	
11	Front brake master cylinder assembly	1	

Disassembling the front brake master cylinder



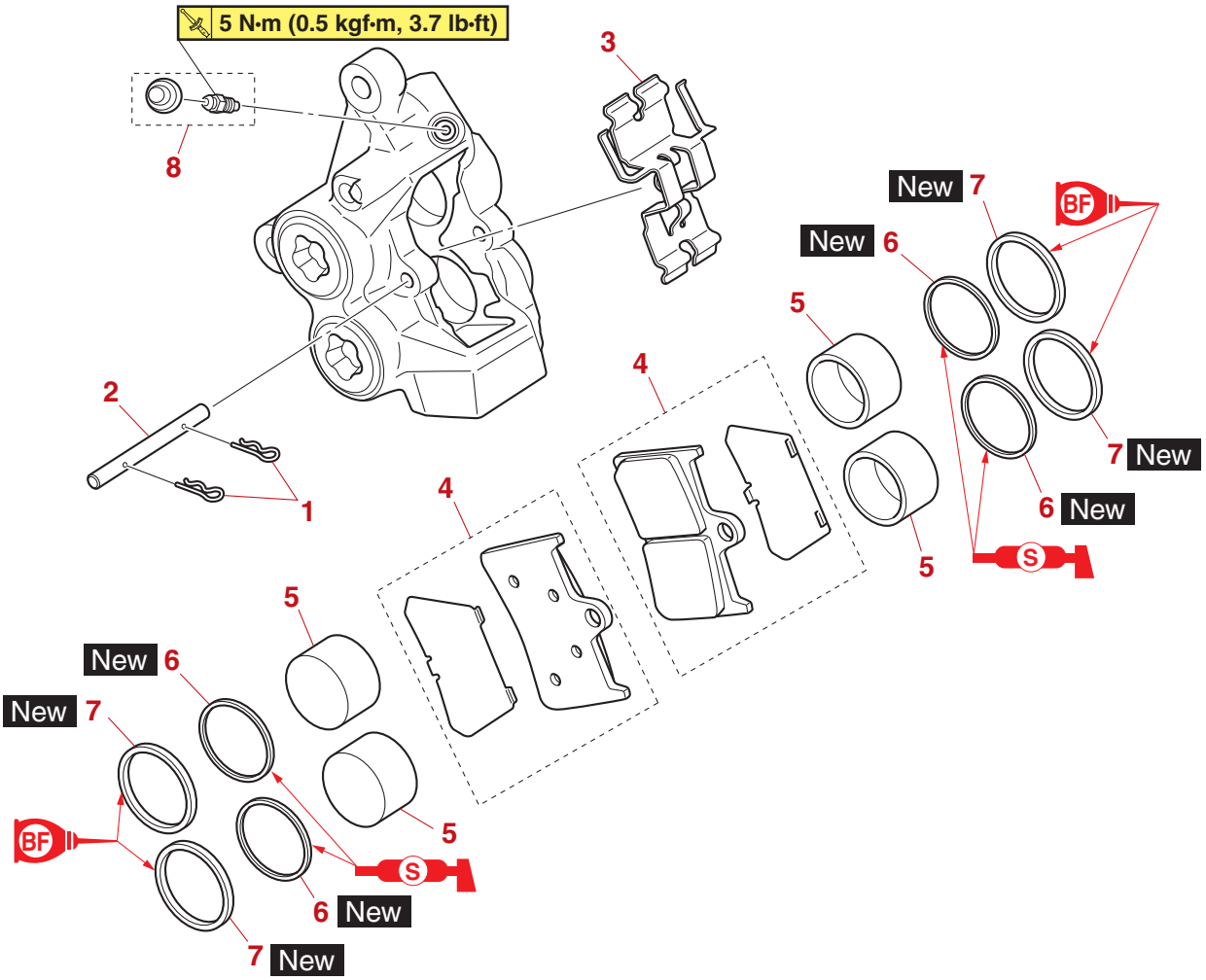
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Brake master cylinder body	1	

Removing the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.
1	Front brake hose union bolt	1	
2	Brake hose gasket	1	Left side only.
3	Brake hose gasket	2	
4	Brake hose (hydraulic unit to front brake caliper (left))	1	Left side only.
5	Brake hose (front brake caliper (left) to front brake caliper (right))	1	
6	Front reflector bracket	1	
7	Front brake caliper	1	

Disassembling the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad spring	1	
4	Brake pad	2	
5	Brake caliper piston	4	
6	Brake caliper piston dust seal	4	
7	Brake caliper piston seal	4	
8	Brake caliper bleed screw	1	

EAS30168
INTRODUCTION
EWA14101
⚠ WARNING

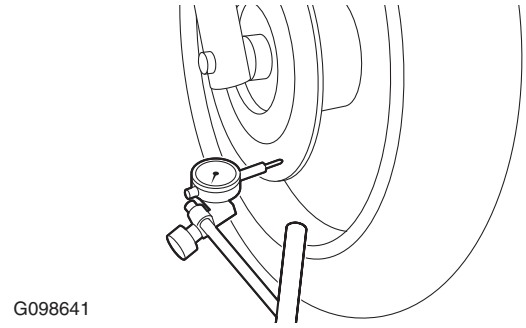
Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:
- **Never disassemble brake components unless absolutely necessary.**
- **If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, 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 DISCS
The following procedure applies to both brake discs.
1. Check:
   - Front brake disc
     Damage/galling → Replace.
2. Measure:
   - Brake disc deflection
     Out of specification → Replace the brake disc.

Brake disc runout limit (as measured on wheel)
0.10 mm (0.0039 in)

   a. Place the vehicle on a maintenance stand so that the front wheel is elevated.
   b. Remove the brake caliper.
   c. Hold the dial gauge at a right angle against the brake disc surface.
   d. Measure the deflection 1.5 mm (0.06 in) below the edge of the brake disc.


G098641

3. 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)

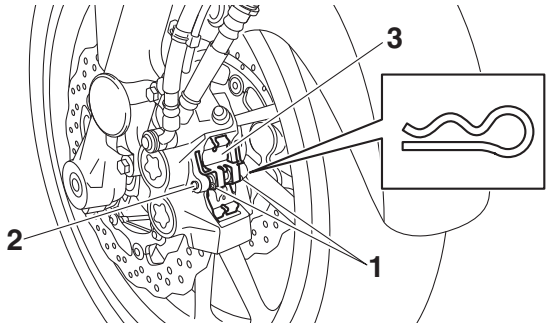
4. Replace:
   - Brake disc
     Refer to “FRONT WHEEL” on page 4-20.

EAS30170
REPLACING THE FRONT BRAKE PADS
The following procedure applies to both brake calipers.

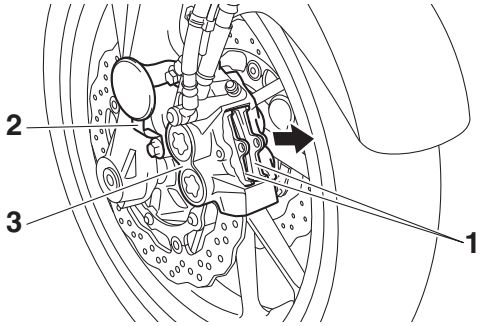
TIP

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

1. Remove:
   - Brake pad clip “1”
   - Brake pad pin “2”
   - Brake pad spring “3”

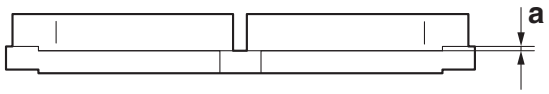


2. Remove:
   - Brake pad “1”
   - Front reflector bracket “2”
   - Front brake caliper “3”



3. Measure:
   • Brake pad wear limit “a”
   Out of specification → Replace the brake pads as a set.

	Brake pad lining thickness limit 0.5 mm (0.02 in)

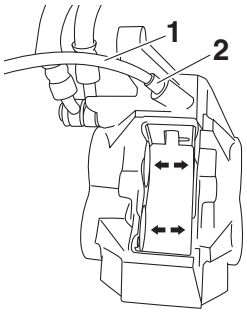


4. Install:
   • Brake pad
   • Brake pad spring

TIP

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

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



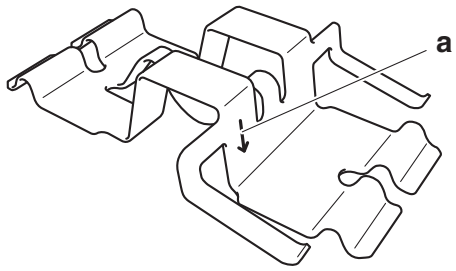
   c. Tighten the bleed screw.

	Brake caliper bleed screw 5 N·m (0.5 kgf·m, 3.7 lb·ft)

   d. Install the new brake pads and a new brake pad spring.

TIP

The arrow mark “a” on the brake pad spring must point in the direction of disc rotation.



5. Install:
   • Brake pad pin
   • Brake pad clip
   • Front reflector bracket
   • Front brake caliper

	Front brake caliper bolt 40 N·m (4.0 kgf·m, 30 lb·ft)

6. Check:
   • Brake fluid level
   Below the minimum level mark → Add the specified brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-15.
7. Check:
   • Brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-14.

EAS30724

REMOVING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

TIP

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

1. Remove:
   • Brake hose union bolt
   • Brake hose gasket
   • Brake hose (hydraulic unit to front brake caliper (left))
   • Brake hose (front brake caliper (left) to front brake caliper (right))

TIP

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

EAS30172

DISASSEMBLING THE FRONT BRAKE CALIPERS

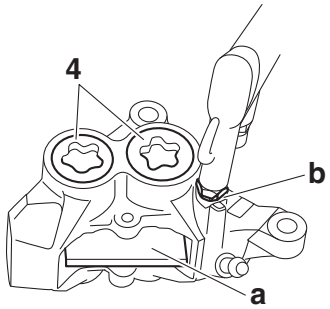
The following procedure applies to both of the brake calipers.

1. Remove:
   • Brake caliper piston
   • Brake caliper piston dust seal
   • Brake caliper piston seal
   a. Secure the right side brake caliper pistons with a piece of wood “a”.
   b. Blow compressed air into the brake hose joint opening “b” to force out the left side pistons from the brake caliper.

EWA17060

WARNING

• Never try to pry out the brake caliper pistons.
• Do not loosen the bolts “4”.



   c. Remove the brake caliper piston dust seals and brake caliper piston seals.
   d. Repeat the previous steps to force out the right side pistons from the brake caliper.

EAS30173

CHECKING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

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

1. Check:
   • Brake caliper piston
   Rust/scratches/wear → Replace the brake caliper pistons.
   • Brake caliper cylinder
   Scratches/wear → Replace the brake caliper assembly.
   • Brake caliper body
   Cracks/damage → Replace the brake caliper assembly.
   • Brake fluid delivery passage (brake caliper body)
   Obstruction → Blow out with compressed air.

EWA13611

WARNING

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

EAS30174

ASSEMBLING THE FRONT BRAKE CALIPERS

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**

EAS30175
INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

1. Install:
   - Front brake caliper “1”
   - Front reflector bracket “2”
   - Brake hose gasket “3” New
   - Brake hose (hydraulic unit to front brake caliper (left)) “4”
   - Brake hose (front brake caliper (left) to front brake caliper (right)) “5”
   - Brake hose union bolt “6”

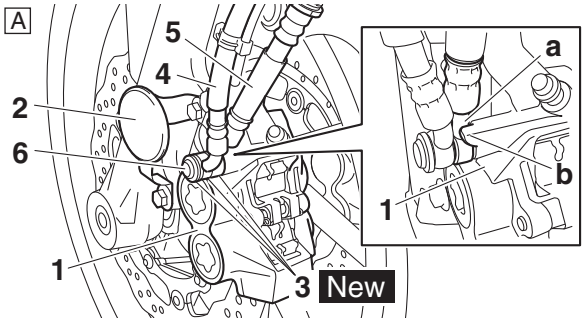
Front brake caliper bolt
40 N·m (4.0 kgf·m, 30 lb·ft)
Front brake hose union bolt
30 N·m (3.0 kgf·m, 22 lb·ft)

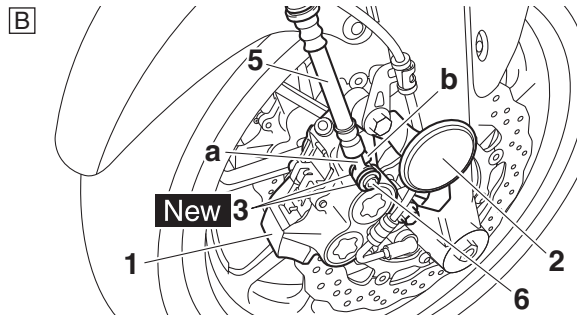
EWA13531
WARNING

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

ECA20851
NOTICE

- **When installing the brake hose onto the brake caliper “1”, make sure the brake pipe “a” touches the projection “b” on the brake caliper.**
- **There should be 0.5–1.5 mm (0.020–0.059 in) of clearance between the brake pipes. (Left side only)**





A. Left side
B. Right side

2. Install:
   - Brake pad
   - Brake pad spring
   - Brake pad pin
   - Brake pad clip

   Refer to “REPLACING THE FRONT BRAKE PADS” on page 4-42.
3. Fill:
   - Brake master cylinder reservoir (with the specified amount of the specified brake fluid)

Specified brake fluid
DOT 4

EWA13090
WARNING

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

ECA13540
NOTICE

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

4. Bleed:
   - Brake system

   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-14.
5. Check:
   - Brake fluid level

   Below the minimum level mark → Add the specified brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-15.
6. Check:
   - Brake lever operation

   Soft or spongy feeling → Bleed the brake system.
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-14.

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. Disconnect:
   - Brake light switch connector (from the front brake light switch)
2. Remove:
   - Brake hose union bolt
   - Brake hose gasket
   - Brake hose (front brake master cylinder to hydraulic unit)

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 passage (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
   - Brake master cylinder reservoir diaphragm holder
     Cracks/damage → Replace.
   - Brake master cylinder reservoir diaphragm
     Damage/wear → Replace.
4. Check:
   - 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

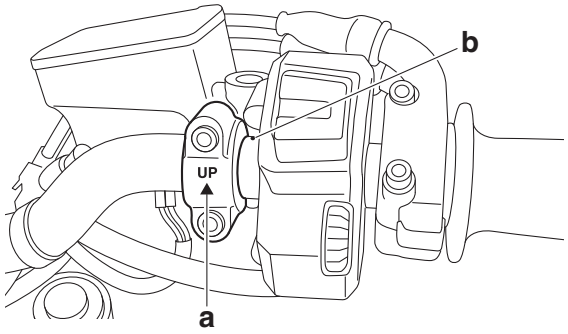
EAS30182
INSTALLING THE FRONT BRAKE MASTER CYLINDER

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

Front brake master cylinder holder bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

- Install the front brake master cylinder holder with the “UP” mark “a” facing up.
- Align the extension of division surface of the between master cylinder assembly and brake master cylinder holder with the punch mark “b” on the handlebar.
- First, tighten the upper bolt, then the lower bolt.
- There should be 12–14 mm (0.47–0.55 in) for clearance between the handlebar switch (right) and the front brake master cylinder holder. Also, the punch mark should be seen.



2. Install:
   - Brake hose (front brake master cylinder to hydraulic unit)
   - Brake hose gasket New
   - Brake hose union bolt

Front brake hose union bolt
30 N·m (3.0 kgf·m, 22 lb·ft)

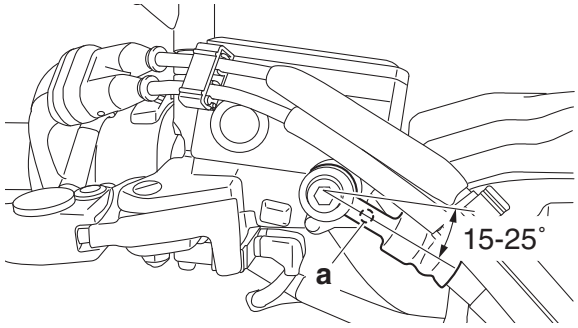
EWA13531

WARNING

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

TIP

- Install the brake pipe so that paint mark "a" on the pipe faces to the rear of the vehicle.
- Attach the brake hose so that its angle is 15° to 25° against the straight line in parallel with the ceiling plane of the master cylinder.
- While holding the brake hose, tighten the union bolt as shown.
- 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

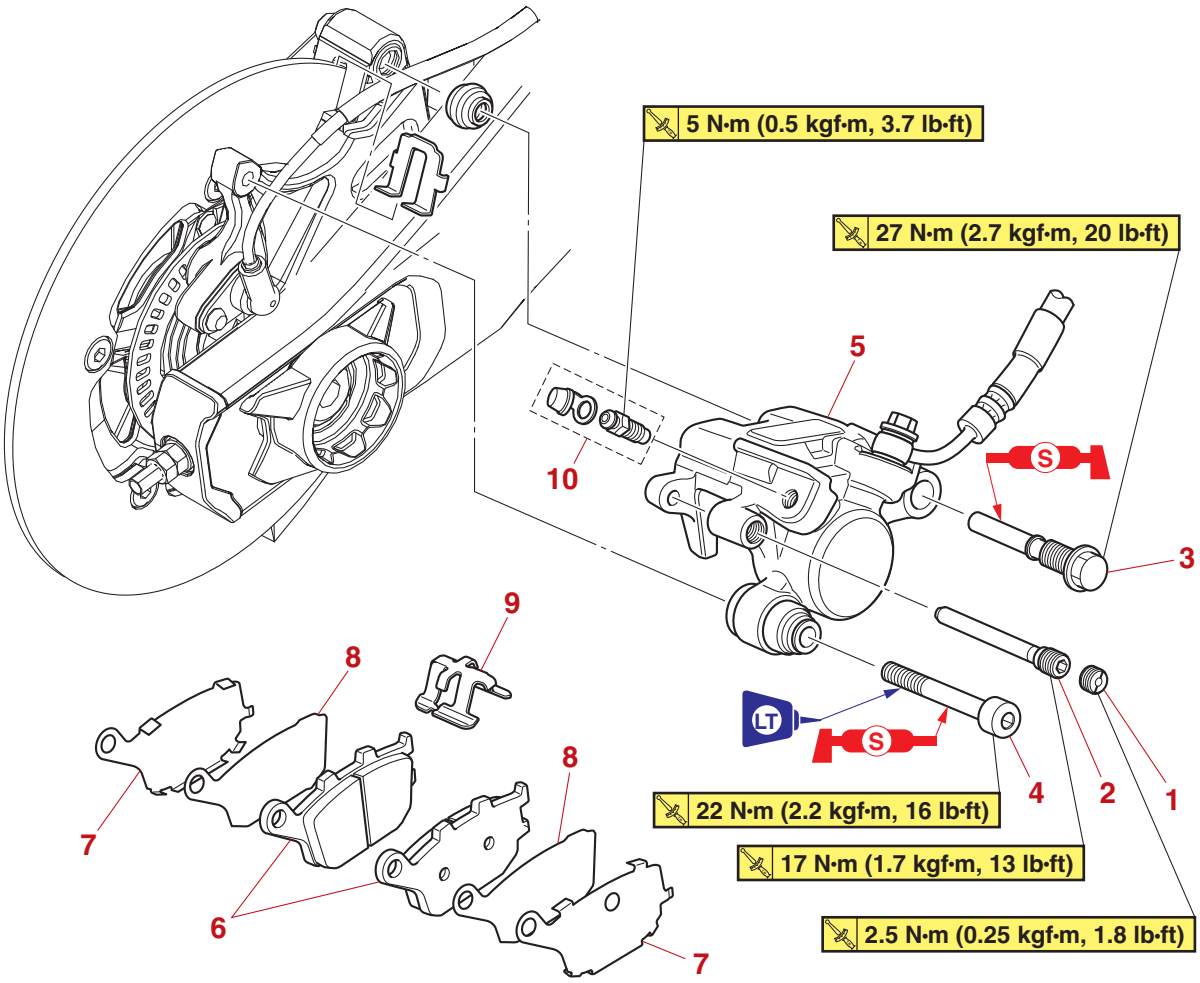
NOTICE

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 3-14.
5. Check:
   - Brake fluid level
     Below the minimum level mark → Add the specified brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-15.
6. Check:
   - Brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.

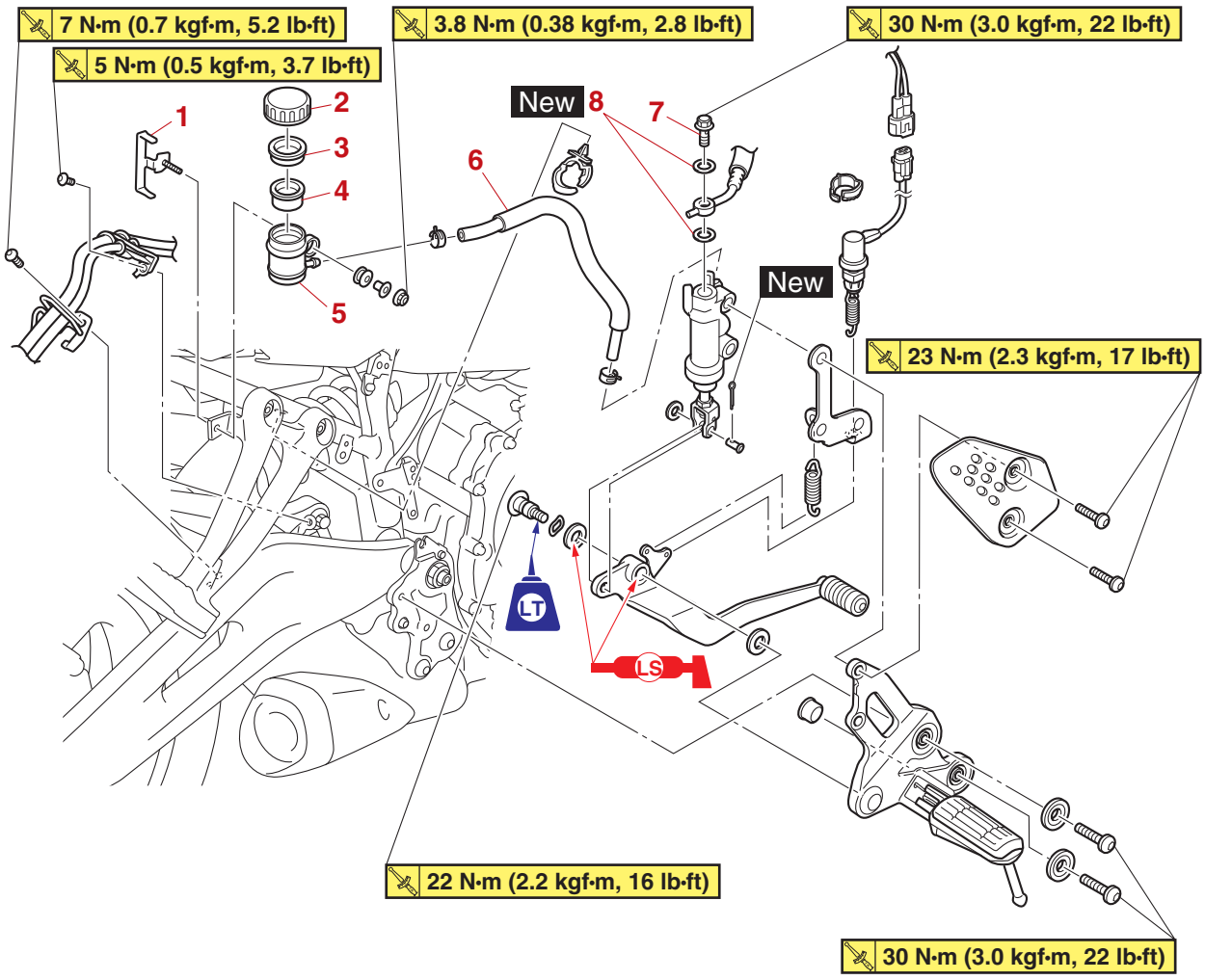
EAS20031
REAR BRAKE

Removing the rear brake pads



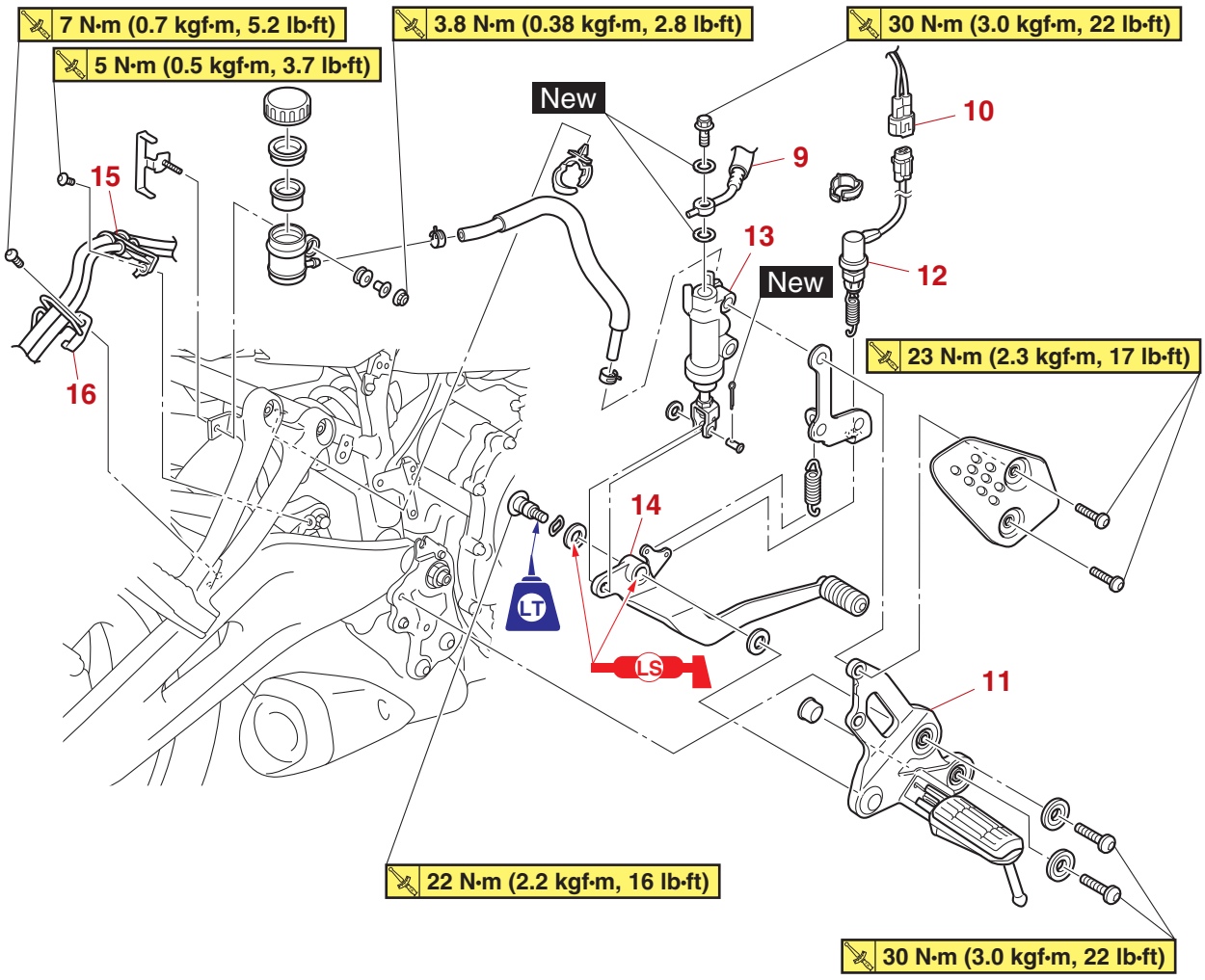
Order	Job/Parts to remove	Q'ty	Remarks
1	Screw plug	1	
2	Brake pad retaining bolt	1	
3	Rear brake caliper retaining bolt	1	
4	Rear brake caliper bolt	1	
5	Rear brake caliper	1	
6	Brake pad	2	
7	Brake pad shim	2	
8	Brake pad insulator	2	
9	Brake pad spring	1	
10	Brake caliper bleed screw	1	

Removing the rear brake master cylinder



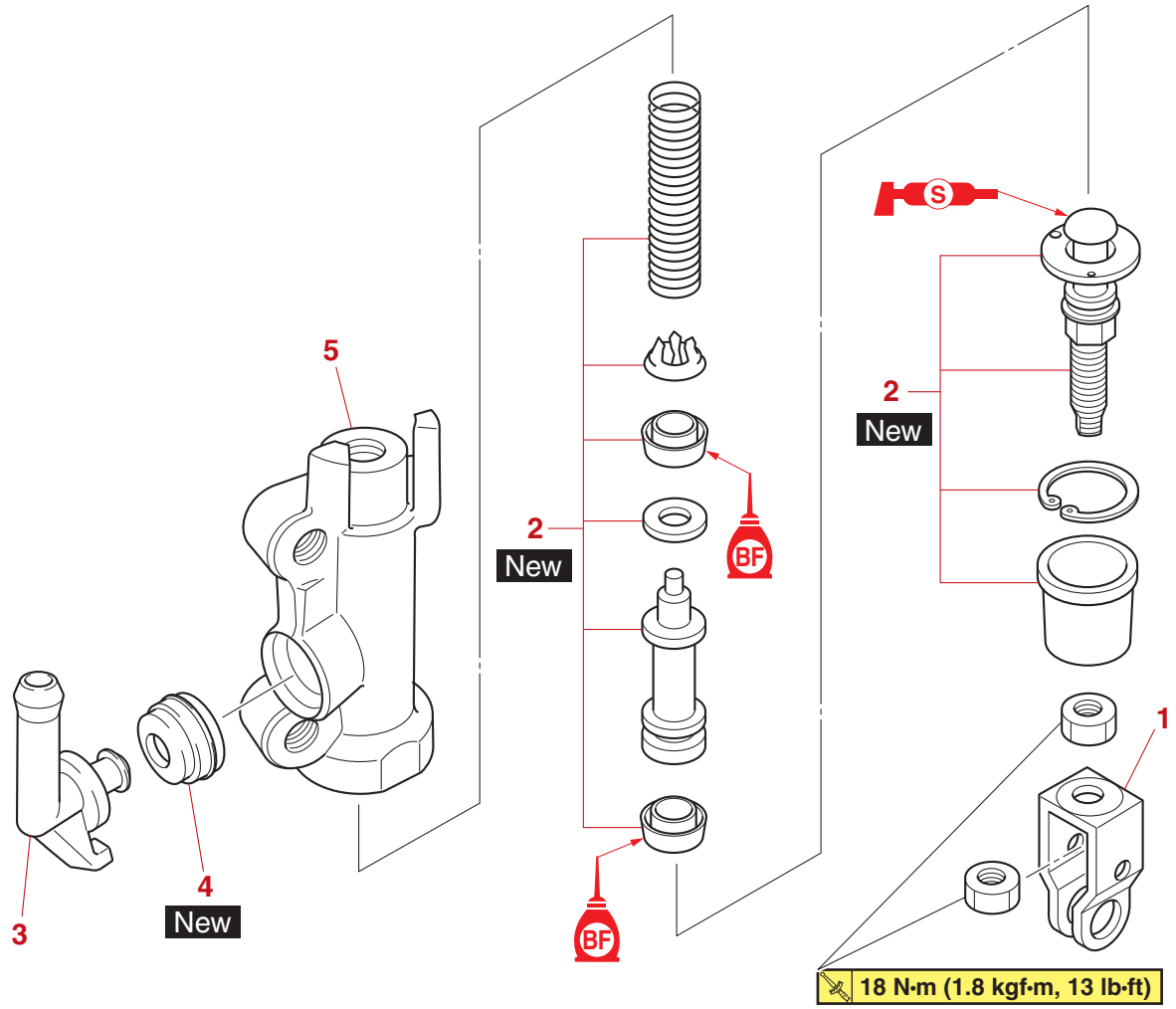
Order	Job/Parts to remove	Q'ty	Remarks
	Pivot shaft protector (right)		Refer to "SWINGARM" on page 4-92.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.
1	Brake fluid reservoir holder	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Rear brake hose union bolt	1	
8	Brake hose gasket	2	

Removing the rear brake master cylinder



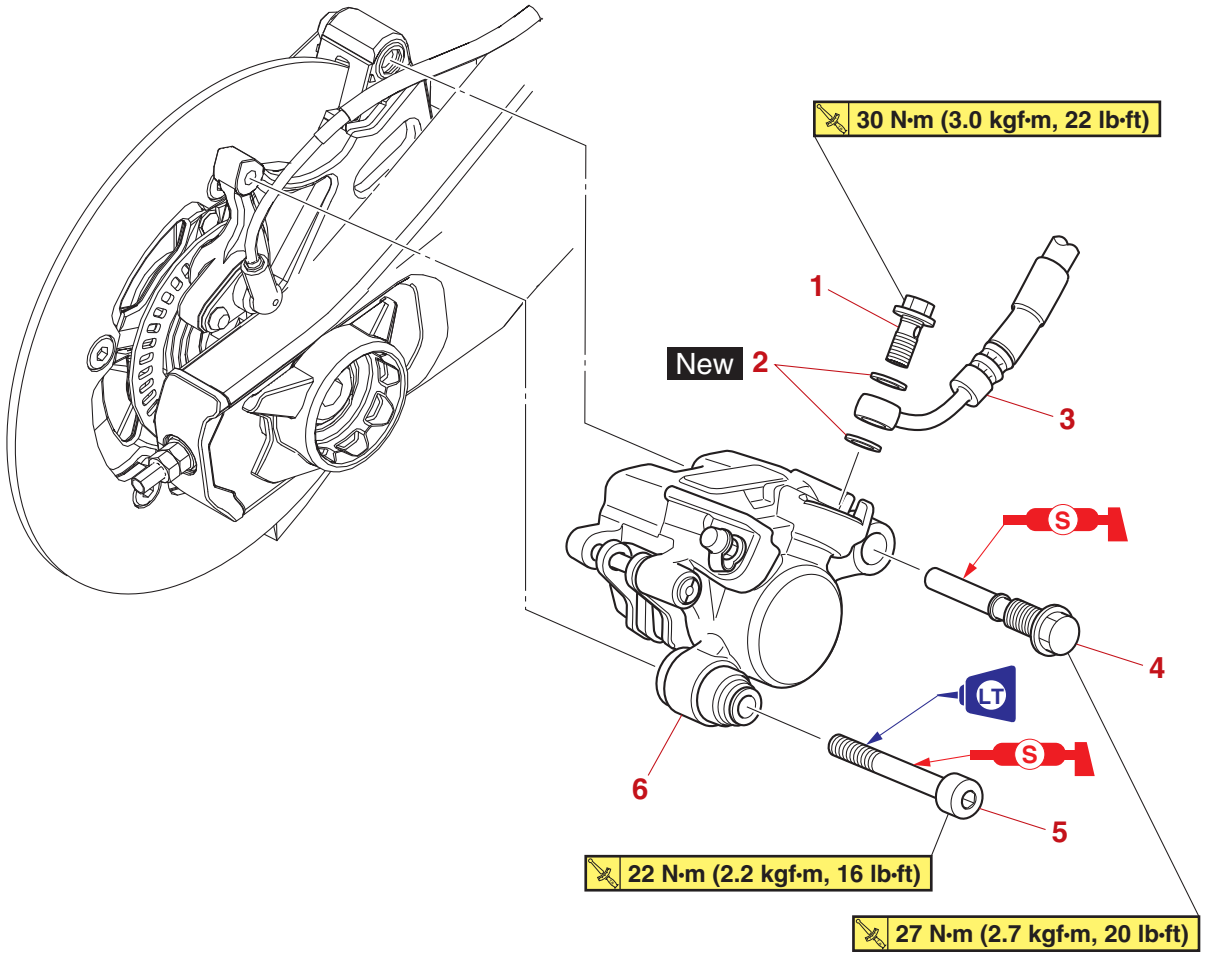
Order	Job/Parts to remove	Q'ty	Remarks
9	Brake hose (rear brake master cylinder to hydraulic unit)	1	Disconnect.
10	Rear brake light switch coupler	1	Disconnect.
11	Footrest assembly (right)	1	
12	Rear brake light switch	1	
13	Rear brake master cylinder	1	
14	Brake pedal	1	
15	Rear brake hose/lead holder	1	
16	Rear brake hose/lead guide	1	

Disassembling the rear brake master cylinder



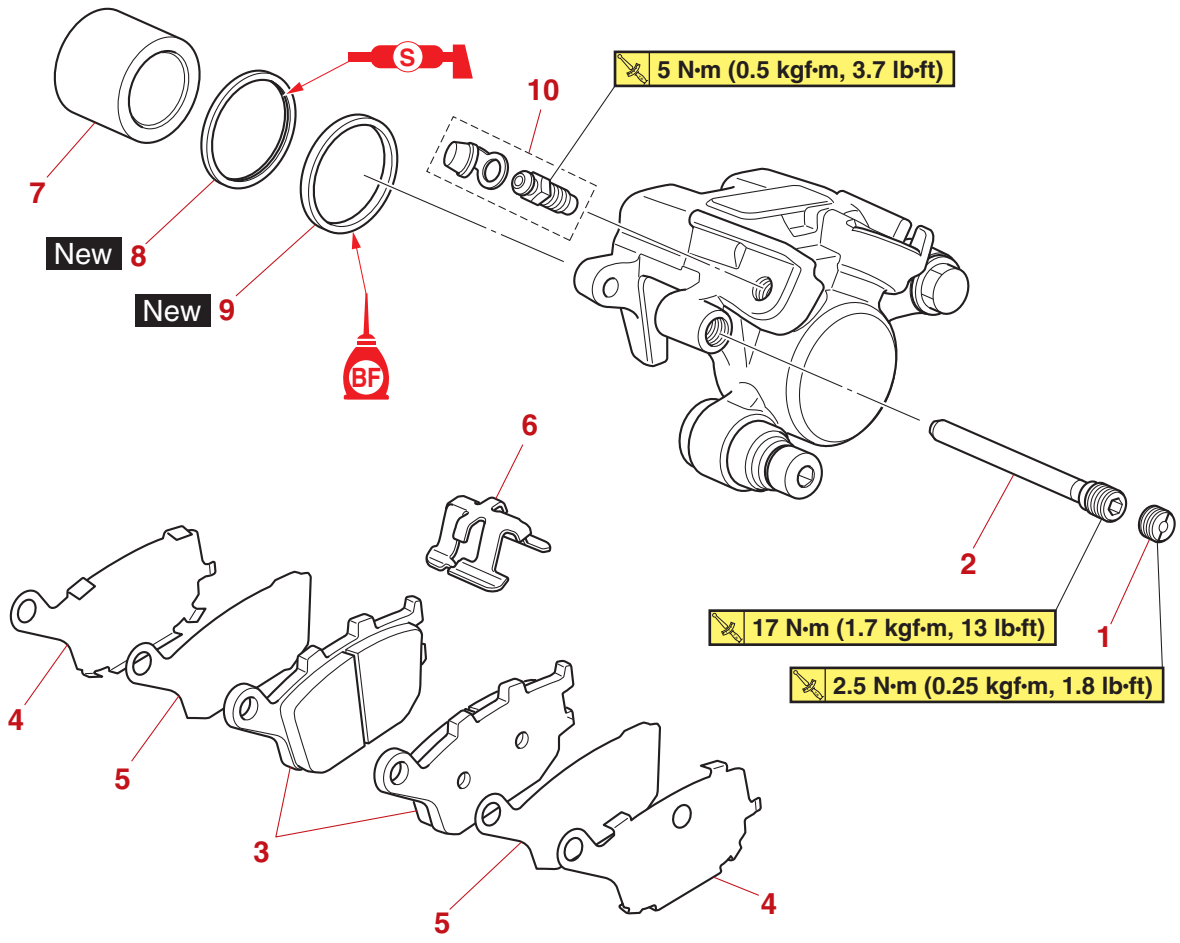
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder yoke	1	
2	Brake master cylinder kit	1	
3	Hose joint	1	
4	Bushing	1	
5	Brake master cylinder body	1	

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 3-14.
1	Rear brake hose union bolt	1	
2	Brake hose gasket	2	
3	Brake hose (hydraulic unit to rear brake caliper)	1	
4	Rear brake caliper retaining bolt	1	
5	Rear brake caliper bolt	1	
6	Rear brake caliper	1	

Disassembling the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
1	Screw plug	1	
2	Brake pad retaining bolt	1	
3	Brake pad	2	
4	Brake pad shim	2	
5	Brake pad insulator	2	
6	Brake pad spring	1	
7	Brake caliper piston	1	
8	Brake caliper piston dust seal	1	
9	Brake caliper piston seal	1	
10	Brake caliper bleed screw	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 4-27.
2. Check:
   - Rear brake disc
     Damage/galling → Replace.
3. Measure:
   - Brake disc deflection
     Out of specification → Replace the brake disc.
     Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-42.

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 DISCS" on page 4-42.

Brake disc thickness limit
4.5 mm (0.18 in)

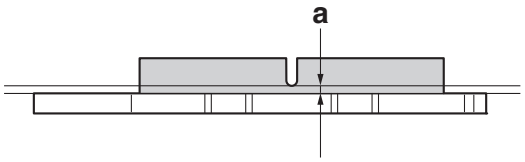
5. Replace:
   - Brake disc
     Refer to "REAR WHEEL" on page 4-27.
6. Install:
   - Rear wheel
     Refer to "REAR WHEEL" on page 4-27.

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 limit
1.0 mm (0.04 in)

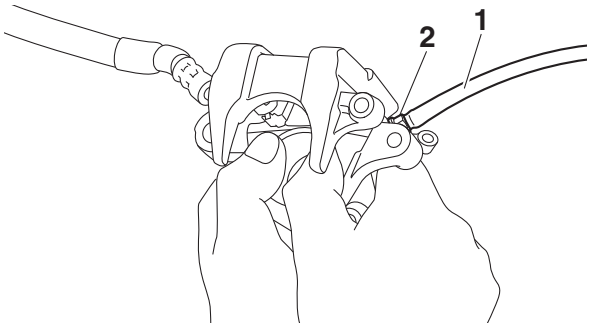


2. Install:
   - Brake pad insulator
     (onto the brake pads)
   - Brake pad shim
     (onto the brake pads)
   - Brake pad spring
     (into the rear brake caliper)
   - Brake pad

TIP

Always install new brake pads, brake pad insulators, brake pad shims, and 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
5 N·m (0.5 kgf·m, 3.7 lb·ft)

d. Install the brake pad insulators and brake pad shims onto each brake pads.

ECA18210

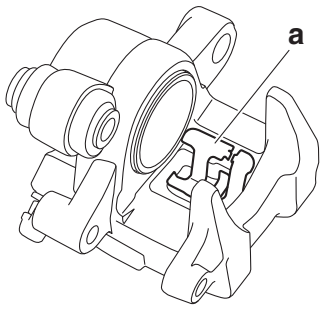
NOTICE

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

e. Install the brake pads and brake pad spring.

TIP

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



3. Lubricate:
   - Rear brake caliper bolt
   - Rear brake caliper retaining bolt

Recommended lubricant
Silicone grease

ECA18210

NOTICE

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

4. Install:
   - Rear brake caliper
   - Rear brake caliper bolt
   - Rear brake caliper retaining bolt
   - Brake pad retaining bolt
   - Screw plug

Rear brake caliper bolt
22 N·m (2.2 kgf·m, 16 lb·ft)
LOCTITE®
Rear brake caliper retaining bolt
27 N·m (2.7 kgf·m, 20 lb·ft)
Brake pad retaining bolt
17 N·m (1.7 kgf·m, 13 lb·ft)
Screw plug
2.5 N·m (0.25 kgf·m, 1.8 lb·ft)

5. Check:
   - Brake fluid level
     Below the minimum level mark → Add the specified brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-15.
6. Check:
   - Brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.

EAS30186

REMOVING THE REAR BRAKE CALIPER

TIP

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

1. Remove:
   - Rear brake hose union bolt
   - Brake hose gasket
   - Brake hose (hydraulic unit to rear brake caliper)

TIP

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

EAS30187

DISASSEMBLING THE REAR BRAKE CALIPER

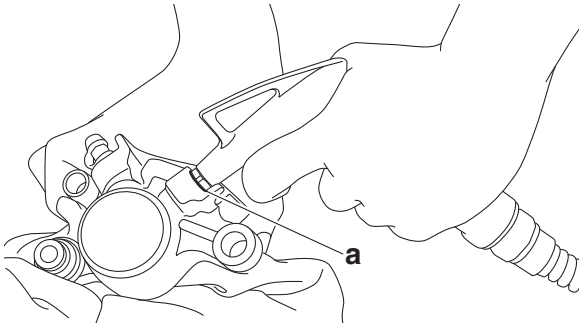
1. Remove:
   - Brake caliper piston
   - Brake caliper piston dust seal
   - Brake caliper piston seal

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

EWA13550

⚠ WARNING

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



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

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 hoses	Every four years
Brake fluid	Every two years and whenever the brake is disassembled

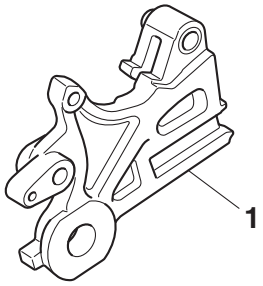
1. Check:
   • Brake caliper piston
   Rust/scratches/wear → Replace the brake caliper piston.
   • Brake caliper cylinder
   Scratches/wear → Replace the brake caliper assembly.
   • Brake caliper body
   Cracks/damage → Replace the brake caliper assembly.
   • Brake fluid delivery passage (brake caliper 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:
   • Rear brake caliper bracket "1"
   Cracks/damage → Replace.
   Refer to "REAR WHEEL" on page 4-27.



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.

Specified brake fluid
DOT 4

EAS30190

INSTALLING THE REAR BRAKE CALIPER

1. Install:
   • Rear brake caliper (temporarily)
   • Brake hose gasket New
   • Brake hose (hydraulic unit to rear brake caliper)
   • Rear brake hose union bolt

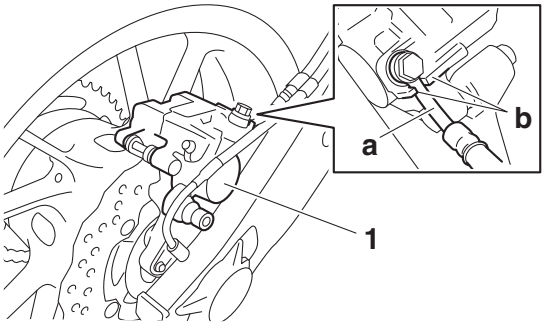
Rear brake hose union bolt
30 N·m (3.0 kgf·m, 22 lb·ft)

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 insulator
     (onto the brake pads)
   • Brake pad shim
     (onto the brake pads)
   • Brake pad spring
     (into the rear brake caliper)
   • Brake pad
   • Rear brake caliper
     Refer to "REPLACING THE REAR BRAKE PADS" on page 4-54.

Rear brake caliper bolt
22 N·m (2.2 kgf·m, 16 lb·ft)
LOCTITE®
Rear brake caliper retaining bolt
27 N·m (2.7 kgf·m, 20 lb·ft)
Brake pad retaining bolt
17 N·m (1.7 kgf·m, 13 lb·ft)
Screw plug
2.5 N·m (0.25 kgf·m, 1.8 lb·ft)

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

Specified brake fluid
DOT 4

EWA13090
⚠ WARNING

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

ECA13540
NOTICE

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

5. Bleed:
   • Brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.
6. Check:
   • Brake fluid level
     Below the minimum level mark → Add the specified brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-15.
7. Check:
   • Brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.

EAS30193
REMOVING THE REAR BRAKE MASTER CYLINDER

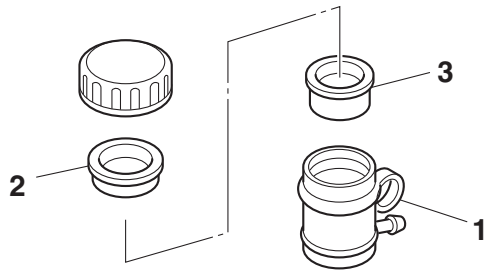
1. Remove:
   • Brake hose union bolt
   • Brake hose gasket
   • Brake hose (rear brake master cylinder to hydraulic unit)

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



4. Check:
   - Brake hose
   - Brake fluid reservoir hose
     Cracks/damage → 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

1. Install:
   - Brake master cylinder kit New

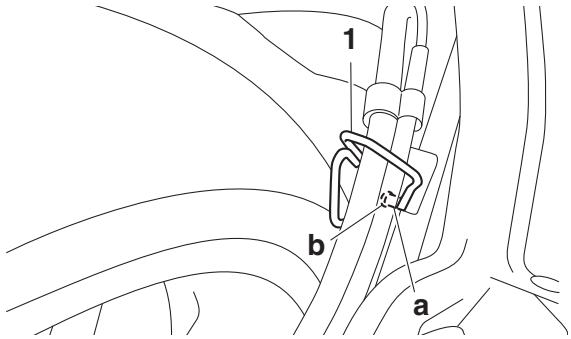
EAS30196
INSTALLING THE REAR BRAKE MASTER CYLINDER

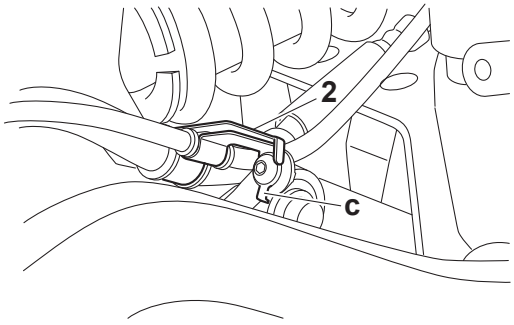
1. Install:
   - Rear brake hose/lead guide "1"
   - Rear brake hose/lead holder "2"

TIP

- Fit the projection "a" on the rear brake hose/lead guide into the hole "b" in the swingarm.
- Make sure that the projection "c" on the rear brake hose/lead holder contacts the swingarm.

Rear brake hose/lead guide bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)
Rear brake hose/lead holder bolt
5 N·m (0.5 kgf·m, 3.7 lb·ft)





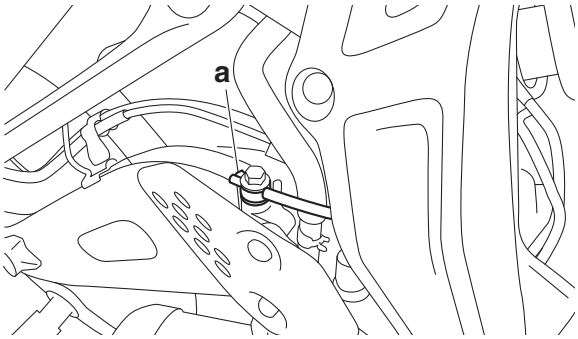
2. Install:
   - Brake hose gasket New
   - Brake hose (rear brake master cylinder to hydraulic unit)
   - Brake hose union bolt
   - Brake fluid reservoir hose

Rear brake hose union bolt
30 N·m (3.0 kgf·m, 22 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.



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

Specified brake fluid
DOT 4

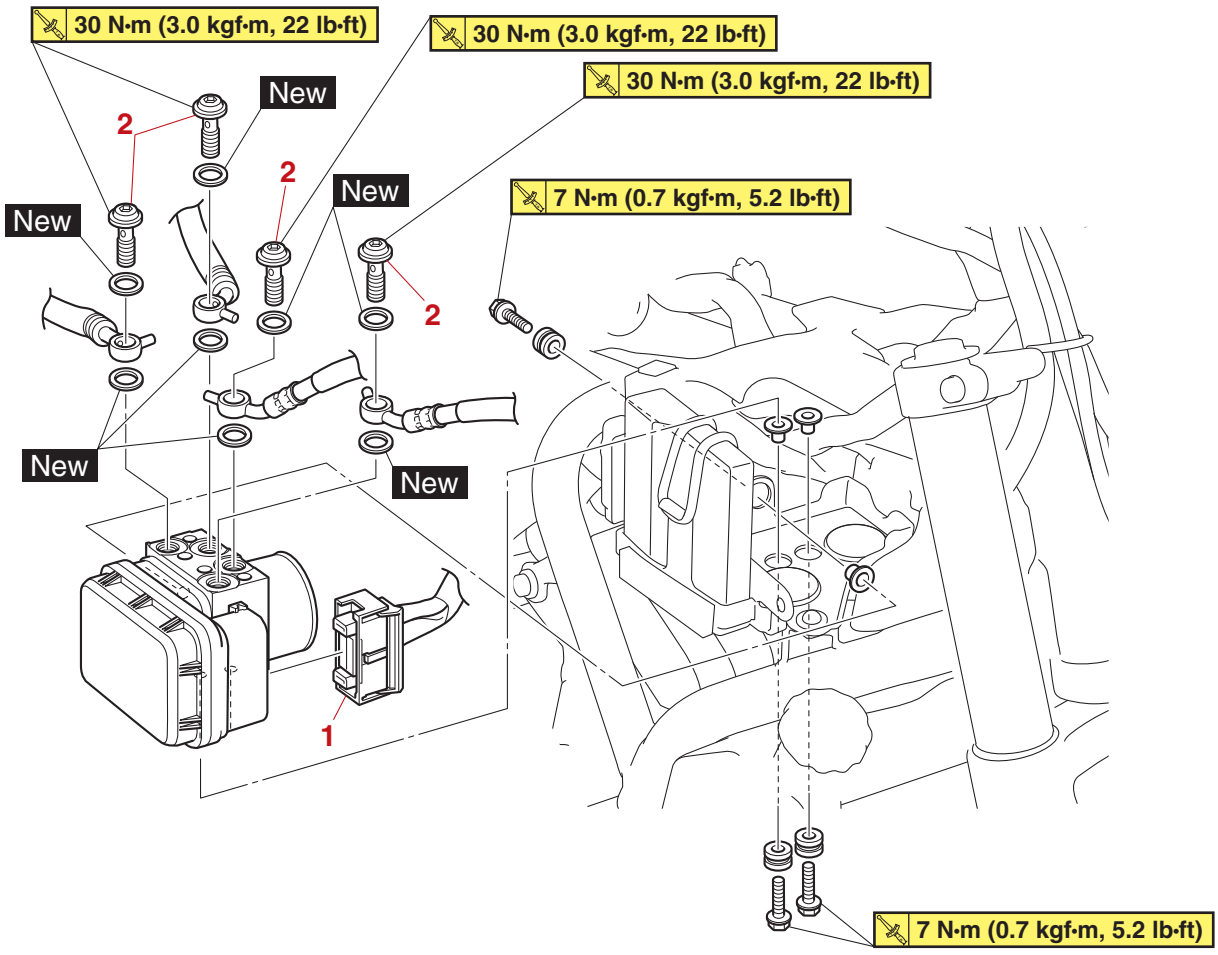
EWA13090
WARNING
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

ECA13540
NOTICE
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:
   • Brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.
5. Check:
   • Brake fluid level
   Below the minimum level mark → Add the specified brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-15.
6. Adjust:
   • Brake pedal position
   Refer to "ADJUSTING THE REAR DISC BRAKE" on page 3-13.
7. Adjust:
   • Rear brake light operation timing
   Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-26.

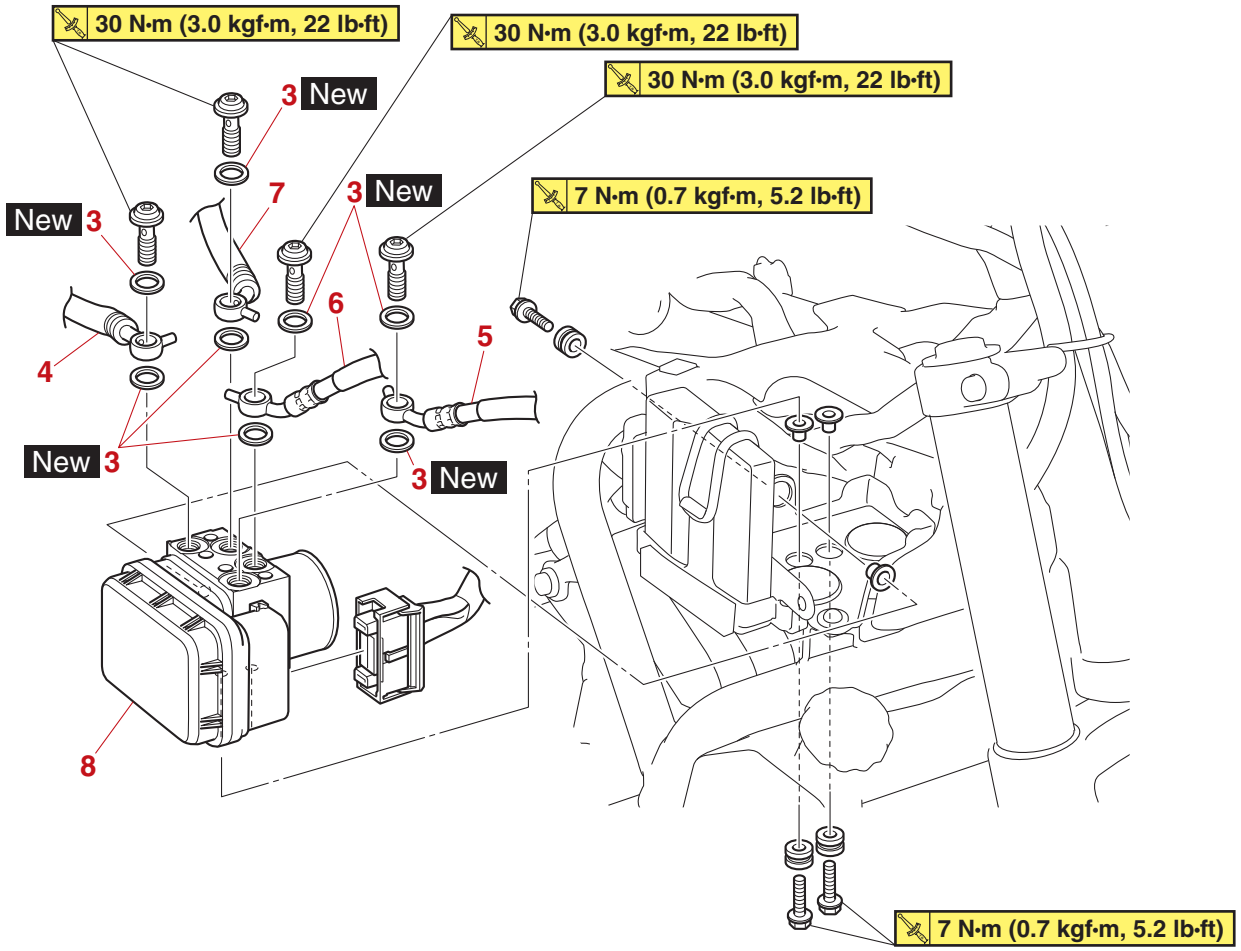
EAS20032
ABS (ANTI-LOCK BRAKE SYSTEM)

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 3-14.
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	ABS ECU coupler	1	Disconnect.
2	Brake hose union bolt	4	

Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
3	Brake hose gasket	8	
4	Brake hose (hydraulic unit to rear brake caliper)	1	Disconnect.
5	Brake hose (hydraulic unit to front brake caliper (left))	1	Disconnect.
6	Brake hose (front brake master cylinder to hydraulic unit)	1	Disconnect.
7	Brake hose (rear brake master cylinder to hydraulic unit)	1	Disconnect.
8	Hydraulic unit assembly	1	

EAS31036
REMOVING THE HYDRAULIC UNIT ASSEMBLY

ECA21091
NOTICE

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

EWA13930
WARNING

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

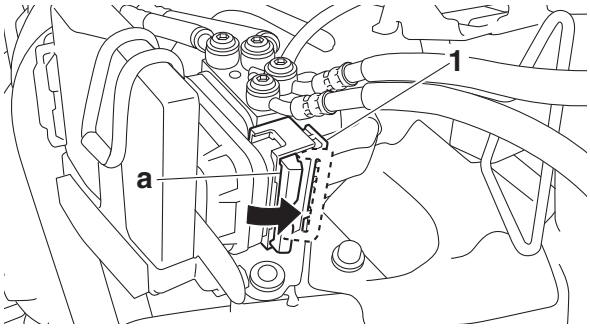
ECA18241
NOTICE

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

1. Disconnect:
   - ABS ECU coupler "1"

TIP

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



2. Remove:
   - Brake hose

TIP

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

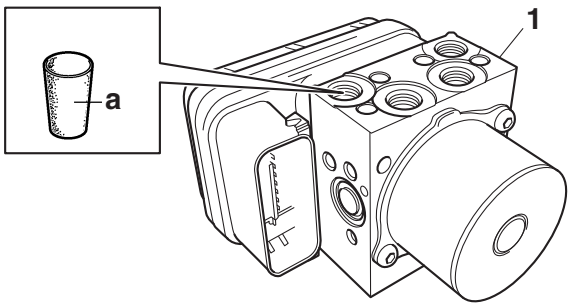
ECA14530
NOTICE

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

3. Remove:
   - Hydraulic unit assembly "1"

TIP

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

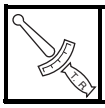


EAS31037
CHECKING THE HYDRAULIC UNIT ASSEMBLY

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.

EAS31039
INSTALLING THE HYDRAULIC UNIT ASSEMBLY

1. Install:
   - Hydraulic unit assembly

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

TIP

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

ECA21110

NOTICE

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

2. Remove:
   - Rubber plug or bolt (M10 × 1.25)
3. Install:
   - Brake hose (rear brake master cylinder to hydraulic unit) "1"
   - Brake hose (front brake master cylinder to hydraulic unit) "2"
   - Brake hose (hydraulic unit to front brake caliper (left)) "3"
   - Brake hose (hydraulic unit to rear brake caliper) "4"

Front brake hose union bolt
30 N·m (3.0 kgf·m, 22 lb·ft)
Rear brake hose union bolt
30 N·m (3.0 kgf·m, 22 lb·ft)

ECA21121

NOTICE

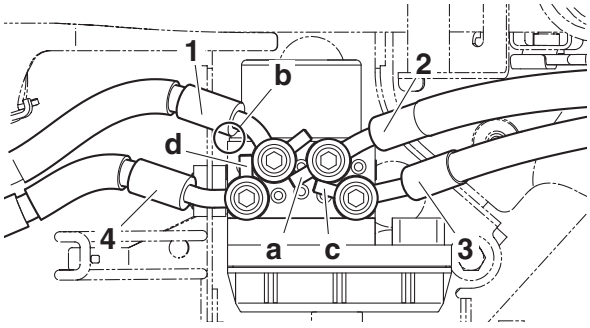
If the brake hose union bolt does not turn easily, replace the hydraulic unit assembly, brake hoses, and related parts as a set.

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

TIP

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

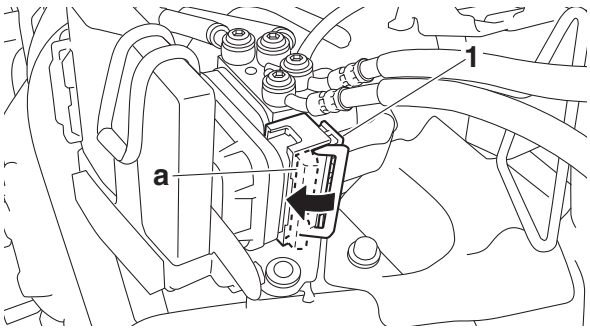
d. Position the brake hose (hydraulic unit to front brake caliper (left)) "3" so that its projection "c" contacts the brake hose (front brake master cylinder to hydraulic unit) "2", and then temporarily tighten the union bolt for the brake hose (hydraulic unit to front brake caliper (left)).
e. Position the brake hose (hydraulic unit to rear brake caliper) "4" so that its projection "d" contacts the brake hose (rear brake master cylinder to hydraulic unit) "1", and then temporarily tighten the union bolt for the brake hose (hydraulic unit to rear brake caliper).
f. Tighten the brake hose union bolts to specification.

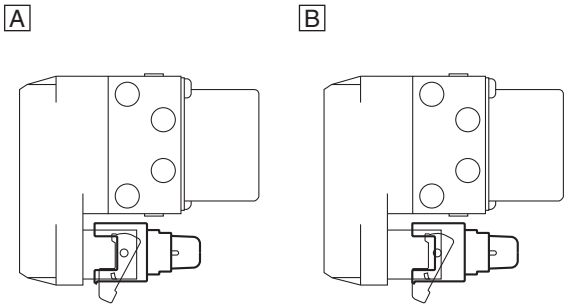


4. Connect:
   - ABS ECU coupler "1"

TIP

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





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

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

Specified brake fluid
DOT 4

EWA13090
WARNING
- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

ECA13540
NOTICE
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

6. Bleed:
   • Brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.
7. Check the operation of the hydraulic unit according to the brake lever and the brake pedal response. (Refer to "HYDRAULIC UNIT OPERATION TESTS" on page 4-64.)

ECA14770
NOTICE
Always check the operation of the hydraulic unit according to the brake lever and the brake pedal response.

8. Delete all of the DTC. (Refer to "[B-3] DELETING THE DTC" on page 9-22.)
9. Perform a trial run. (Refer to "CHECKING THE ABS WARNING LIGHT" on page 4-67.)

EAS31040
HYDRAULIC UNIT OPERATION TESTS

The reaction-force pulsating action generated in the brake lever and brake pedal when the ABS is activated can be tested when the vehicle is stopped.
The hydraulic unit operation can be tested using the following two methods.
- Brake line routing confirmation: this test checks the function of the ABS after the system was disassembled, adjusted, or serviced.
- ABS reaction-force confirmation: this test generates the same reaction-force pulsating action that is generated in the brake lever and brake pedal when the ABS is activated.

Brake line routing confirmation

EWA13120
WARNING
Securely support the vehicle so that there is no danger of it falling over.

TIP
- For the brake line routing confirmation, use the diagnosis of function 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 maintenance stand.
2. Turn the main switch to "OFF".
3. Remove:
   • Passenger seat
   • Rider seat
   • Rider seat bracket 1
   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.

5. Disconnect the coupler from the CCU (Communication Control Unit), and then connect the YDT to the coupler.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

TIP

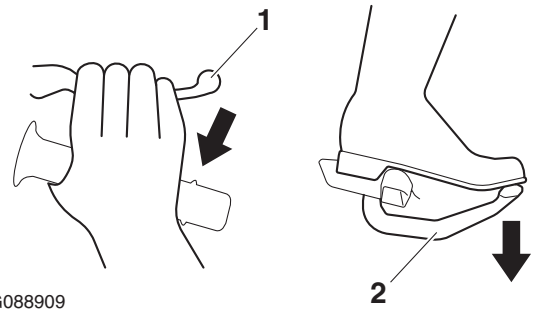
- Yamaha diagnostic tool (A/I) (90890-03273) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

Refer to “YDT” on page 9-3.

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

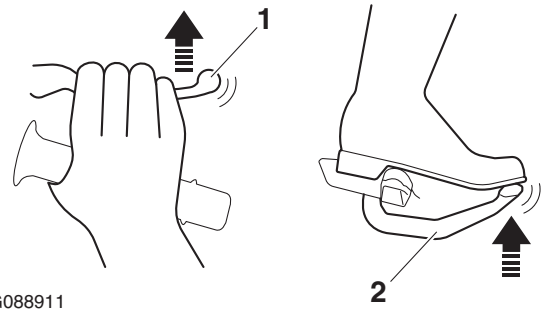
TIP

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



G088909

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



G088911

TIP

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

ECA18280

NOTICE

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

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

ABS reaction-force confirmation

EWA13120

⚠ WARNING

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

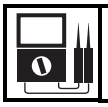
TIP

- For the ABS reaction-force confirmation, use the diagnosis of function 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 maintenance stand.
2. Turn the main switch to "OFF".
3. Remove:
   - Passenger seat
   - Rider seat

   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. Disconnect the coupler from the CCU (Communication Control Unit), and then connect the YDT to the coupler.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

TIP

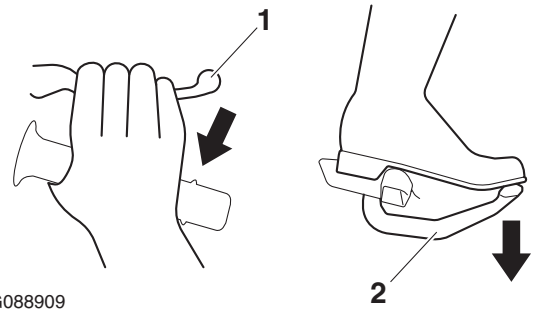
- Yamaha diagnostic tool (A/I) (90890-03273) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

Refer to "YDT" on page 9-3.

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

TIP

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

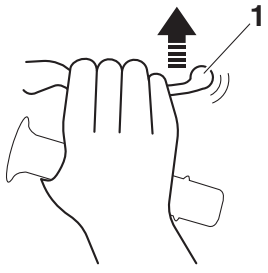


G088909

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

TIP

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

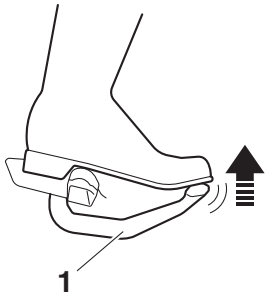


G088913

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

TIP

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



G088914

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

TIP

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

ECA18280

NOTICE

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

12. Turn the main switch to "OFF".
13. Disconnect the YDT from the coupler, and then connect the coupler to the CCU (Communication Control Unit).
14. Turn the main switch to "ON".
15. Set the start/engine stop switch to "◯".
16. Check for brake fluid leakage around the hydraulic unit.
    Brake fluid leakage → Replace the hydraulic unit, brake hoses, and related parts as a set.
17. If the operation of the hydraulic unit is normal, delete all of the DTC.

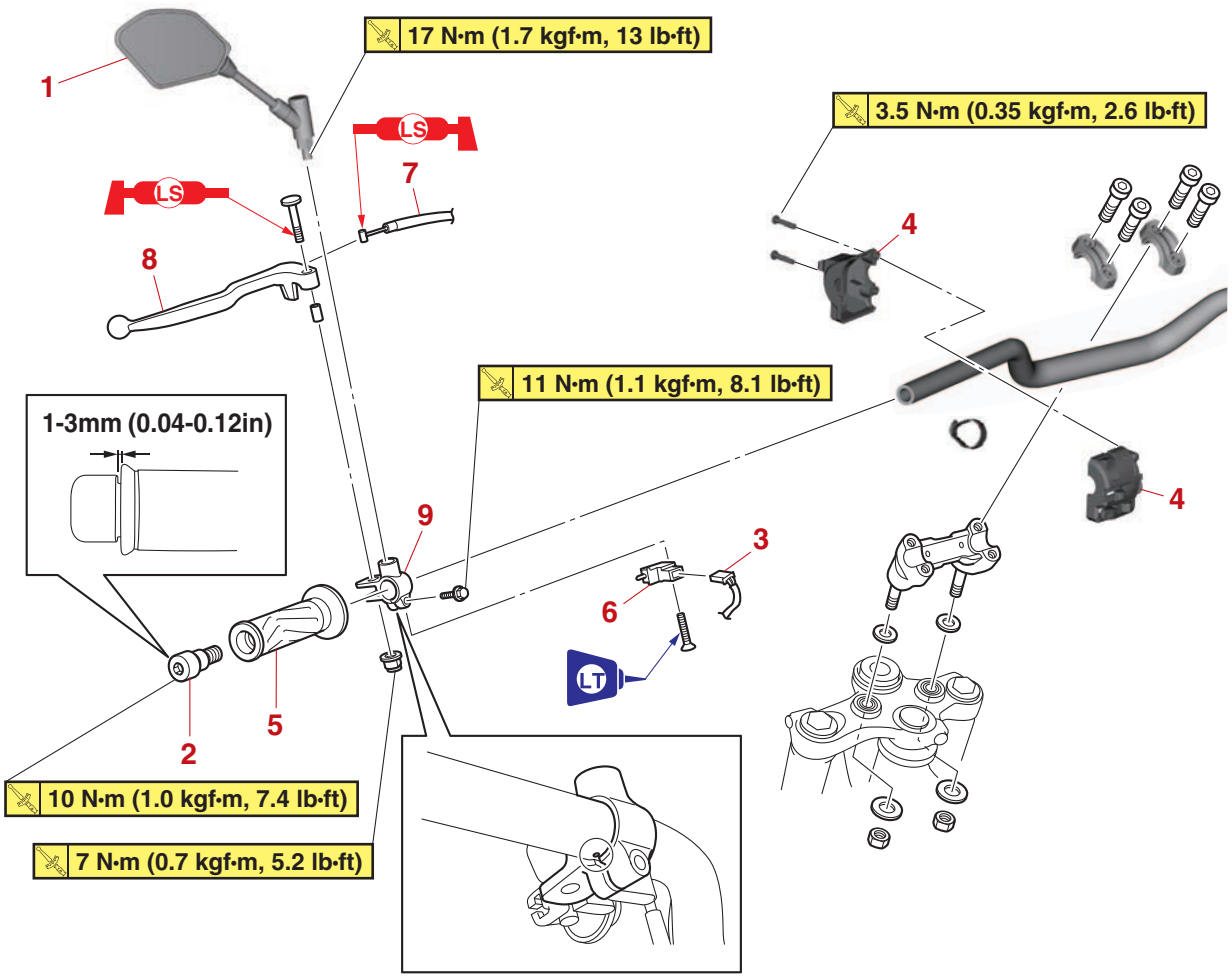
EAS31041

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 (6.2 mph) or performing a trial run.

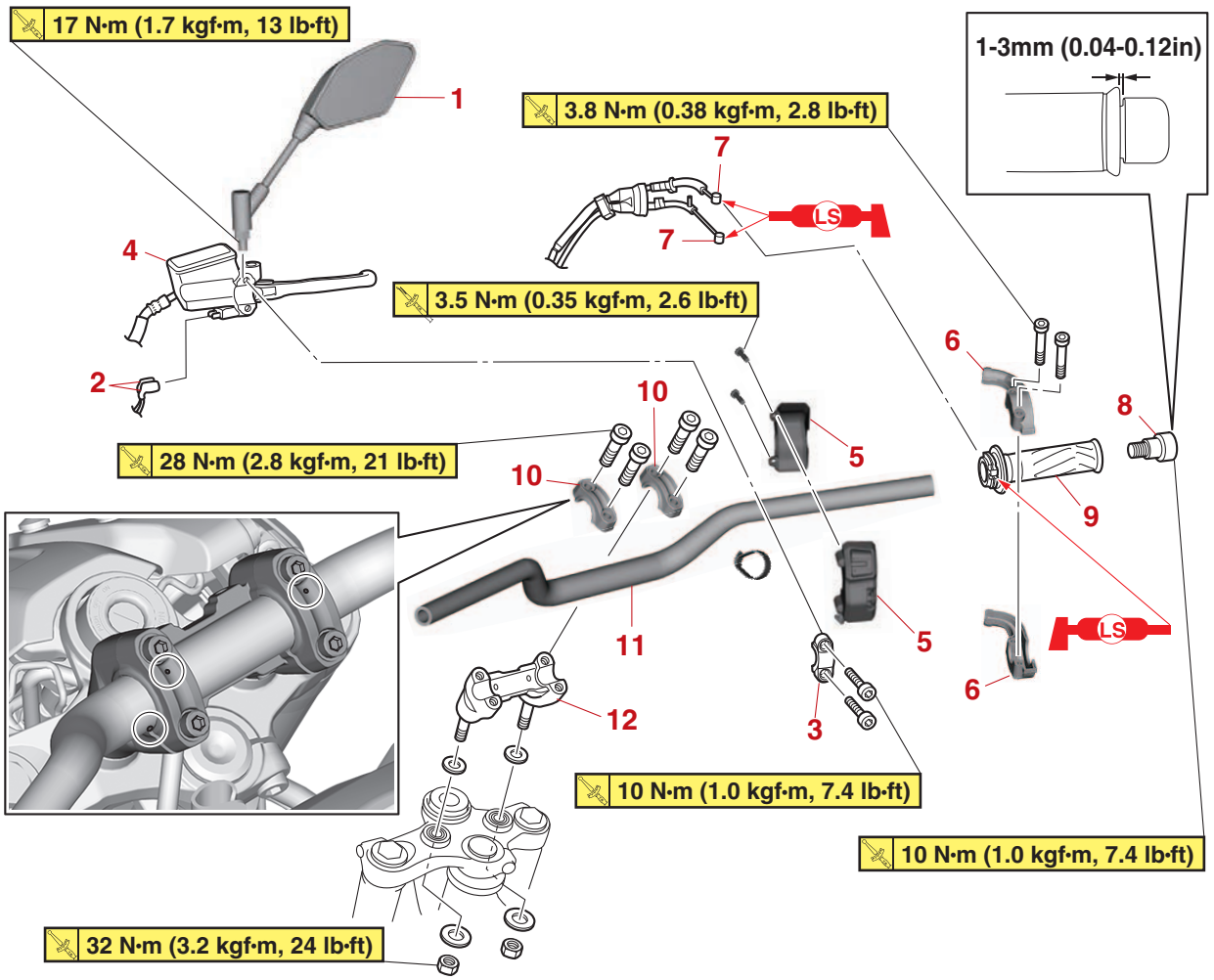
EAS20033
HANDLEBAR

Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
	Meter assembly bracket		Refer to "GENERAL CHASSIS (3)" on page 4-7.
1	Rearview mirror (left)	1	
2	Grip end	1	
3	Clutch switch coupler	1	Disconnect.
4	Handlebar switch (left)	1	
5	Handlebar grip	1	
6	Clutch switch	1	
7	Clutch cable	1	Disconnect.
8	Clutch lever	1	
9	Clutch lever holder	1	

Removing the handlebar



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

EAS30203
REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

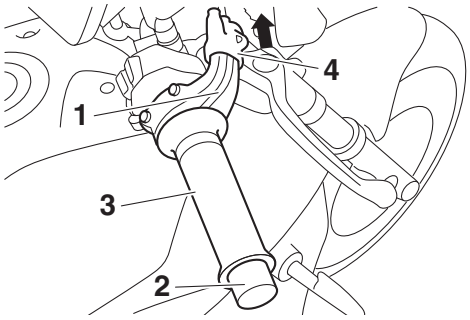
EWA13120
⚠ WARNING

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

2. Remove:
   - Throttle cable housing “1”
   - Grip end (right) “2”
   - Throttle grip “3”

TIP

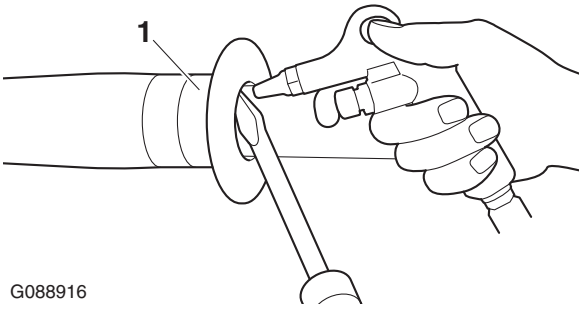
While removing the throttle cable housing, pull back the rubber cover “4”.



3. Remove:
   - Handlebar grip “1”

TIP

Blow compressed air between the left 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

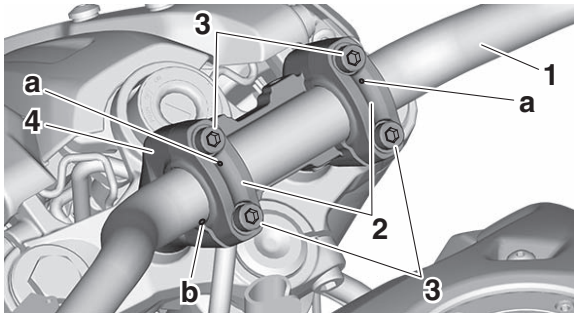
Securely support the vehicle so that there is no danger of it falling over.

2. Install:
   - Lower handlebar holder
   - Handlebar “1”
   - Upper handlebar holder “2”
   - Upper handlebar holder bolt “3” (temporarily)

	Lower handlebar holder nut 32 N·m (3.2 kgf·m, 24 lb·ft)

TIP

- The upper handlebar holders should be installed with the punch marks “a” facing forward.
- Align the punch mark “b” on the handlebar with the left side upper surface of the lower handlebar holder “4”.



3. Tighten:
   - Upper handlebar holder bolt

	Upper handlebar holder bolt 28 N·m (2.8 kgf·m, 21 lb·ft)

ECA18300
NOTICE

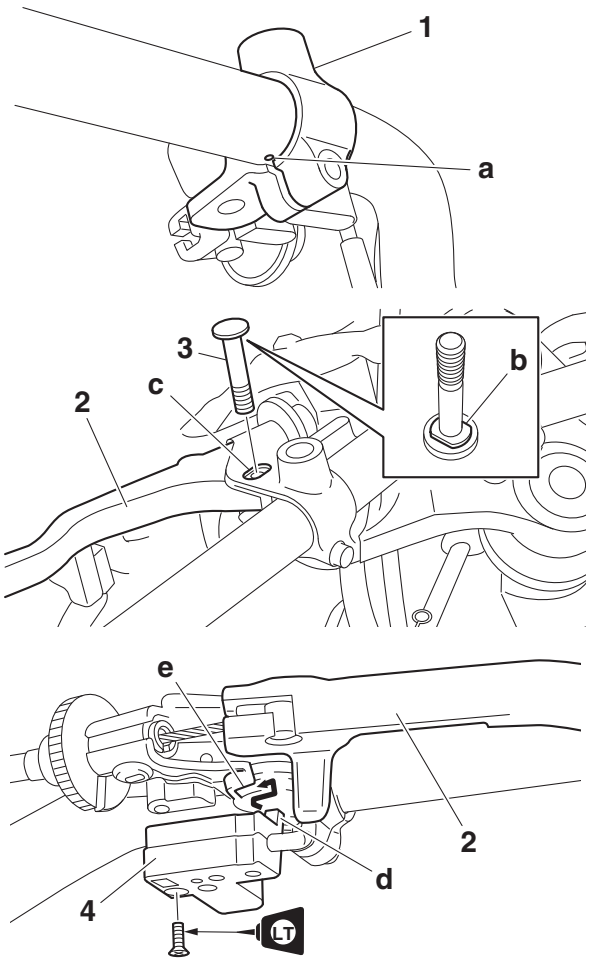
First, tighten the bolts on the front side of the handlebar holder, and then on the rear side.

4. Install:
   - Clutch lever holder “1”
   - Clutch lever “2”
   - Clutch lever pivot bolt “3”
   - Clutch cable
   - Clutch switch “4”

	Clutch lever holder pinch bolt **11 N·m (1.1 kgf·m, 8.1 lb·ft)** **Clutch lever pivot nut** **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

TIP

- Align the center of slit on the clutch lever holder with the punch mark “a” on the handlebar.
- Fit the projection “b” on the bottom of the bolt head into the slot “c” in the bolt hole in the clutch lever holder.
- While squeezing the clutch lever, fit the projection “d” on the clutch switch into the slot “e” in the clutch lever holder.



5. Install:
   - Handlebar grip
   - Grip end (left) “1”

	Grip end **10 N·m (1.0 kgf·m, 7.4 lb·ft)**

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

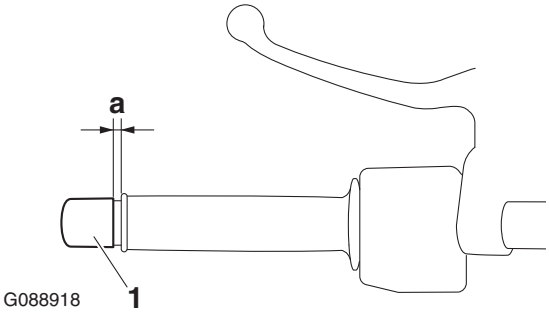
EWA13700

⚠ WARNING

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

TIP

There should be 1–3 mm (0.04–0.12 in) of clearance “a” between the handlebar grip and the grip end.

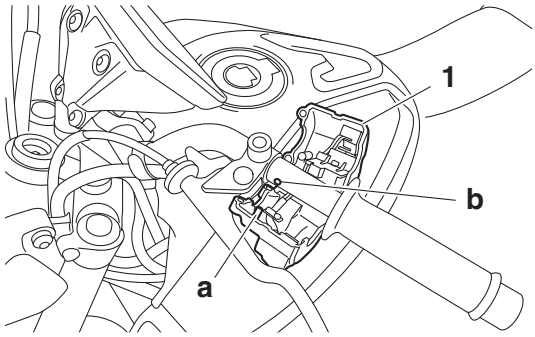


6. Install:
   - Handlebar switch (left) “1”

	Handlebar switch screw (left) **3.5 N·m (0.35 kgf·m, 2.6 lb·ft)**

TIP

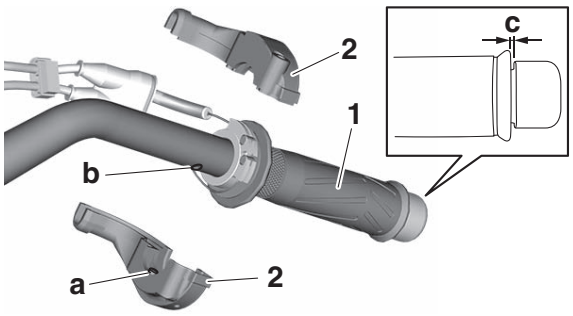
Align the projection “a” on the handlebar switch (left) with the hole “b” in the handlebar.



7. Install:
   - Throttle grip “1”
   - Throttle cable
   - Grip end (right)
   - Throttle cable housing “2”

Grip end
10 N·m (1.0 kgf·m, 7.4 lb·ft)
Throttle cable housing bolt
3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

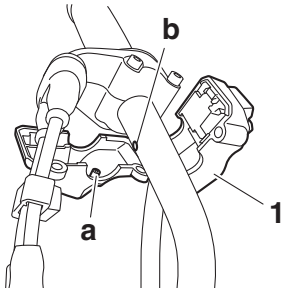
TIP
- Align the projection "a" on the throttle cable housing with the hole "b" in the handlebar.
- There should be 1–3 mm (0.04–0.12 in) of clearance "c" between the throttle grip and the grip end.



8. Install:
   - Handlebar switch (right) "1"

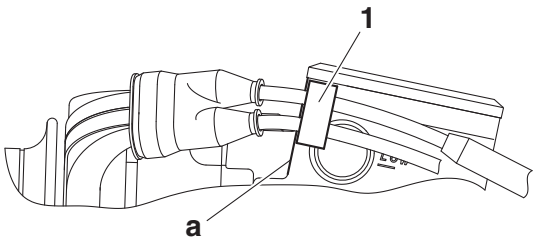
Handlebar switch screw (right)
3.5 N·m (0.35 kgf·m, 2.6 lb·ft)

TIP
Align the projection "a" on the handlebar switch (right) with the hole "b" in the handlebar.



9. Install:
   - Throttle cable holder "1"

TIP
Align the throttle cable holder with the edge "a" of the front brake master cylinder.



10. Install:
    - Front brake master cylinder assembly
      Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER" on page 4-46.
11. Adjust:
    - Throttle grip free play
      Refer to "CHECKING THE THROTTLE GRIP OPERATION" on page 3-27.

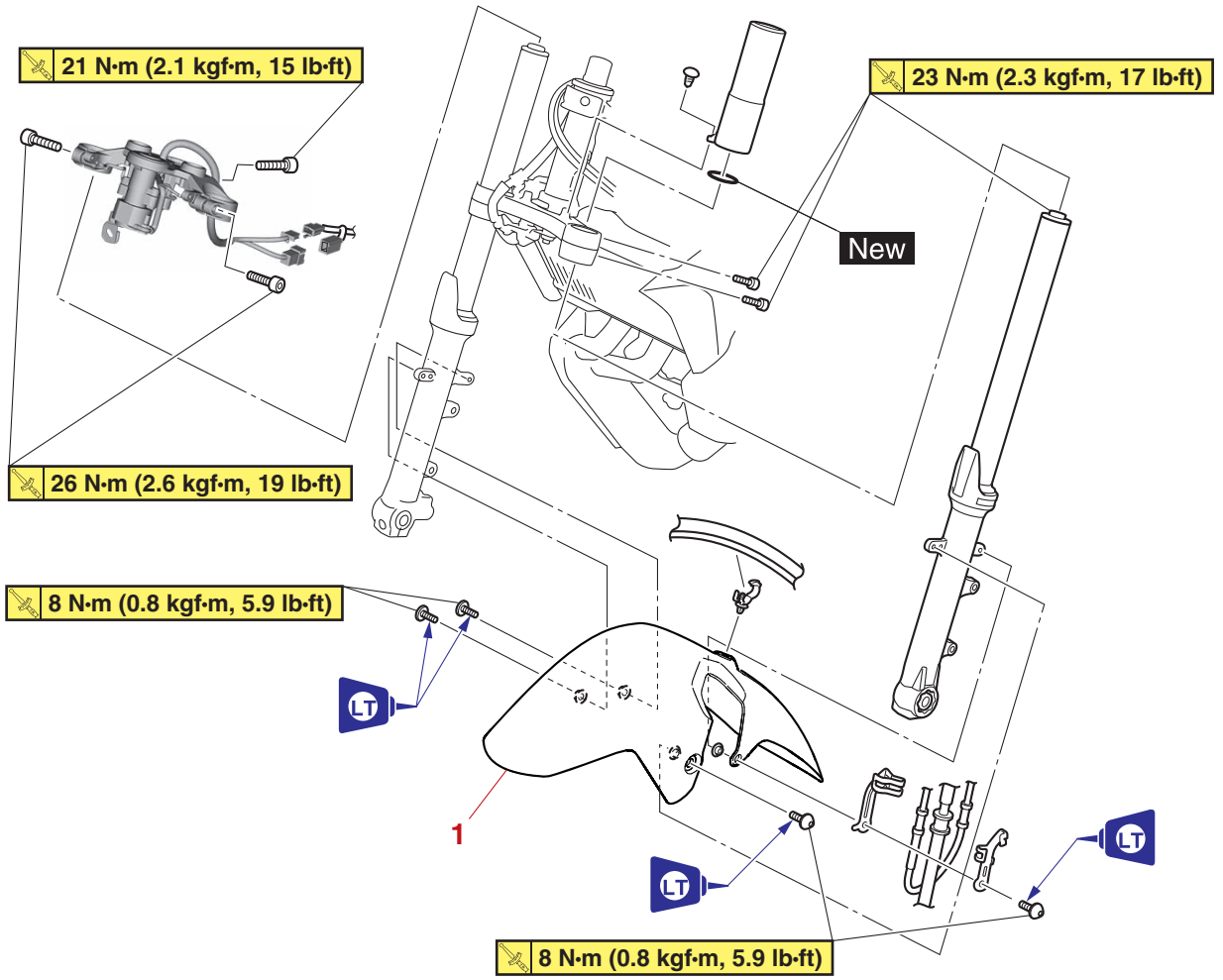
Throttle grip free play
3.0–5.0 mm (0.12–0.20 in)

12. Adjust:
    - Clutch lever free play
      Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-12.

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

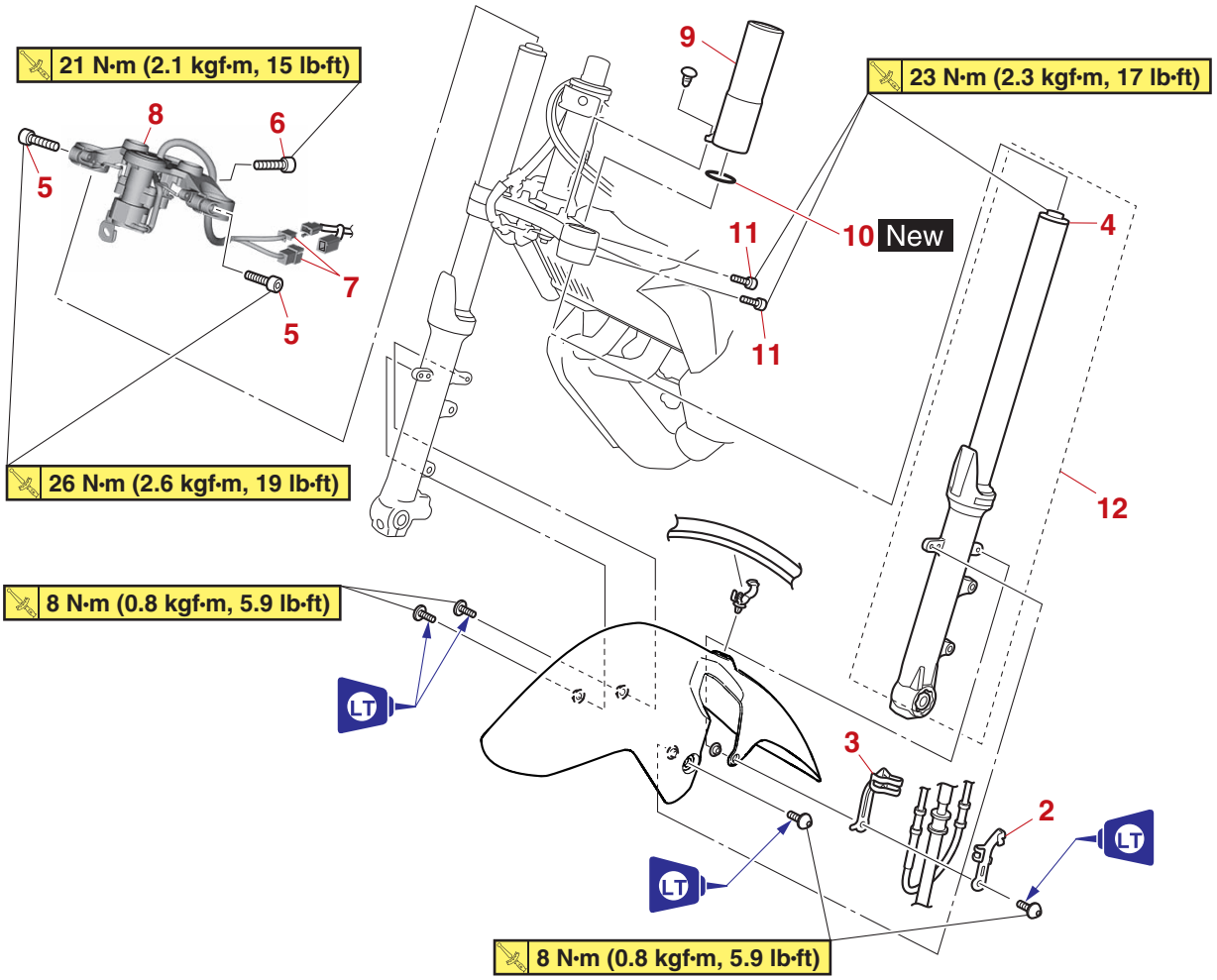
EAS20034
FRONT FORK

Removing the front fork legs



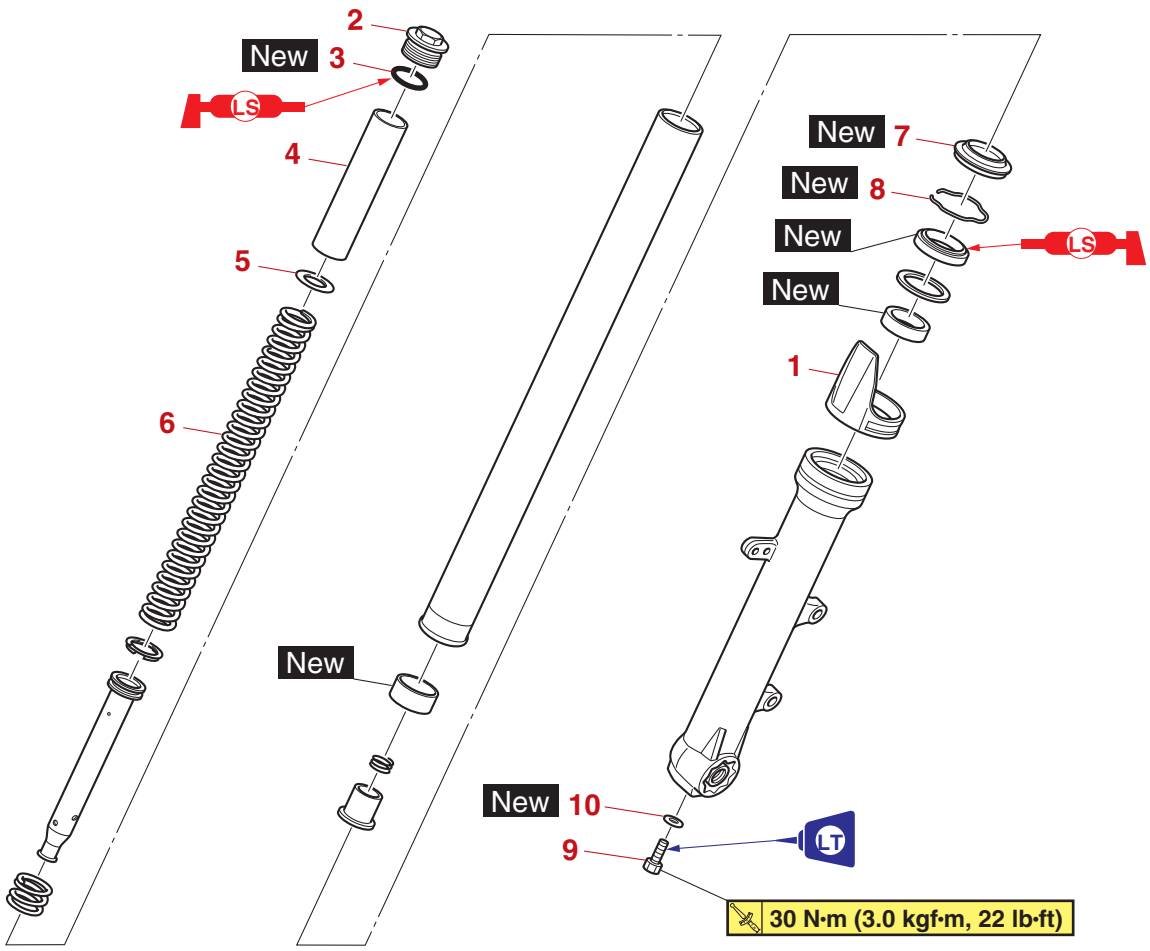
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Headlight assembly/Meter assembly bracket		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Passenger seat/Rider seat		Refer to "HANDLEBAR" on page 4-68.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Front wheel		Refer to "FRONT WHEEL" on page 4-20.
	Front brake caliper		Refer to "FRONT BRAKE" on page 4-36.
1	Front fender	1	

Removing the front fork legs



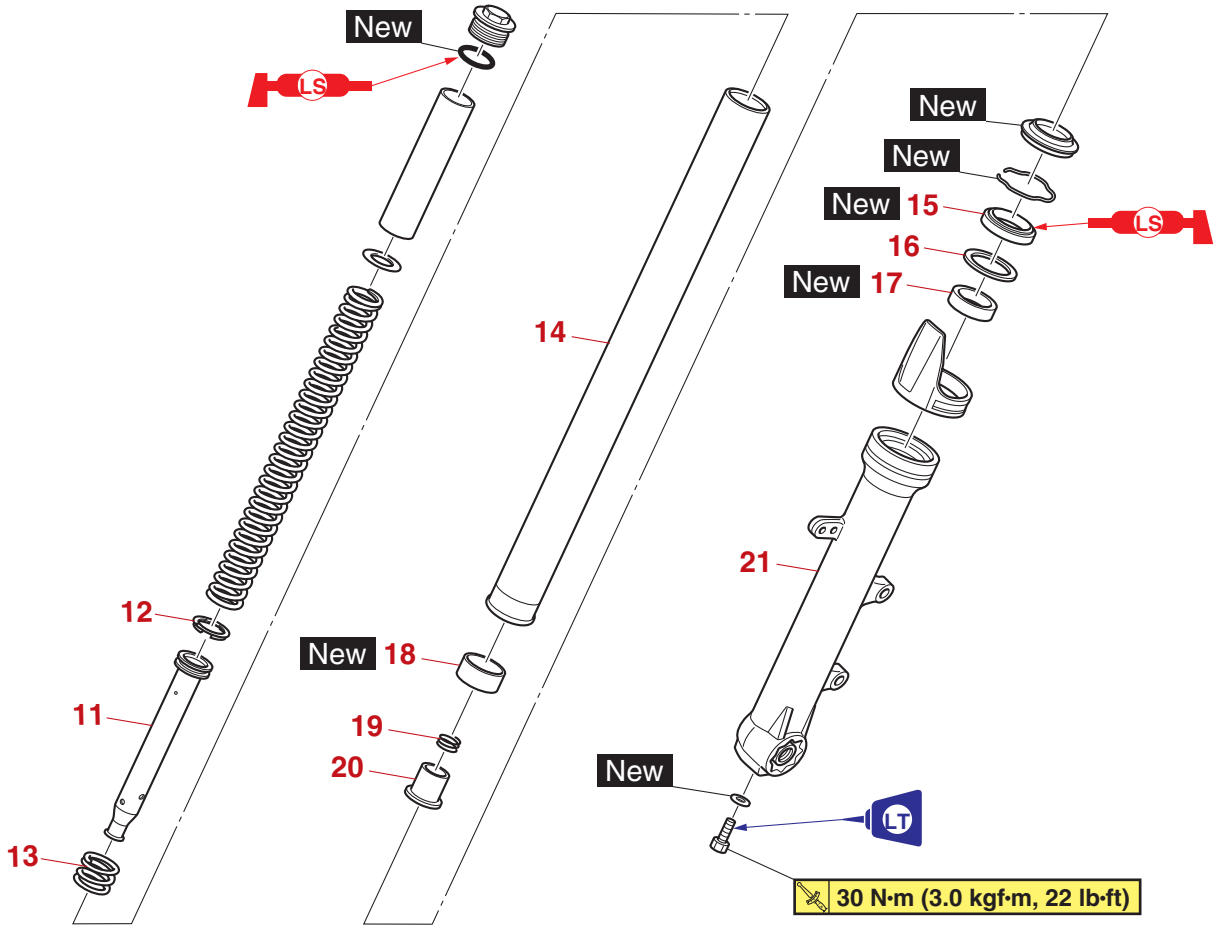
Order	Job/Parts to remove	Q'ty	Remarks
2	Brake hose holder	1	
3	Brake hose holder	1	
4	Front fork cap bolt	1	Loosen.
5	Upper bracket pinch bolt (left and right)	2	Loosen.
6	Upper bracket pinch bolt (center)	1	Loosen.
7	Main switch coupler	2	Disconnect.
8	Upper bracket	1	
9	Front fork cover	1	
10	O-ring	1	
11	Lower bracket pinch bolt	2	
12	Front fork leg	1	

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	Protector	1	
2	Front fork cap bolt	1	
3	O-ring	1	
4	Spacer	1	
5	Spring seat	1	
6	Fork spring	1	
7	Dust seal	1	
8	Oil seal clip	1	
9	Front fork damper rod bolt	1	
10	Copper washer	1	

Disassembling the front fork legs



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

EAS30206
REMOVING THE FRONT FORK LEGS

The following procedure applies to both of the front fender side covers and front fork legs.

1. Remove:
   • Front fender
2. Stand the vehicle on a level surface.

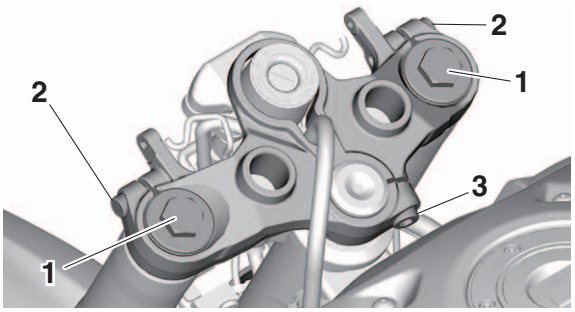
EWA13120
⚠ WARNING

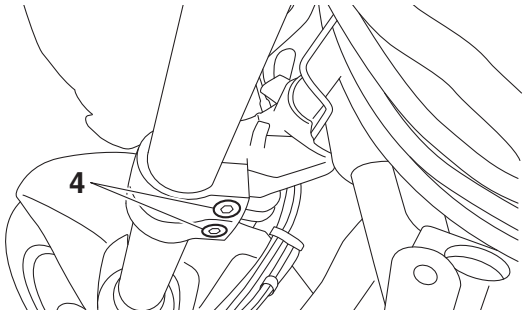
Securely support the vehicle so that there is no danger of it falling over.

TIP

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

3. Loosen:
   • Front fork cap bolt “1”
   • Upper bracket pinch bolt (left and right) “2”
   • Upper bracket pinch bolt (center) “3”
   • Lower bracket pinch bolt “4”





EWA13640
⚠ WARNING

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

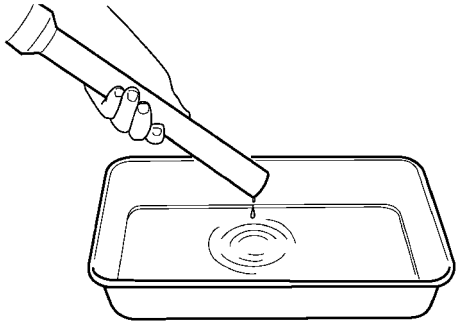
EAS30207
DISASSEMBLING THE FRONT FORK LEGS

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

1. Drain:
   • Fork oil

TIP

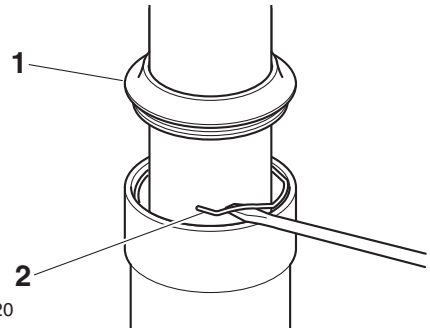
Stroke the outer tube several times while draining the fork oil.



2. Remove:
   • Dust seal “1”
   • Oil seal clip “2”
   (with a flathead screwdriver)

ECA14180
NOTICE

Do not scratch the inner tube.



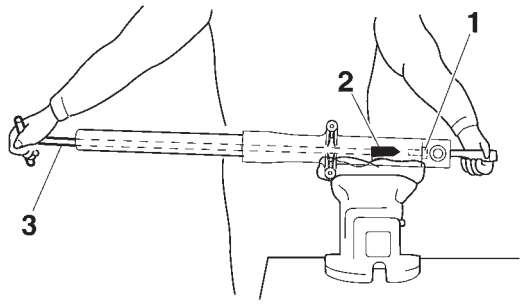
G088920

3. Remove:
   • Front fork damper rod bolt “1”
   • Copper washer

TIP

While holding the damper rod with the damper rod holder “2” and T-handle “3”, loosen the front fork damper rod bolt.

Damper rod holder (ø21.2)
90890-01460
T-handle
90890-01326
T-handle 3/8" drive 60 cm long
YM-01326

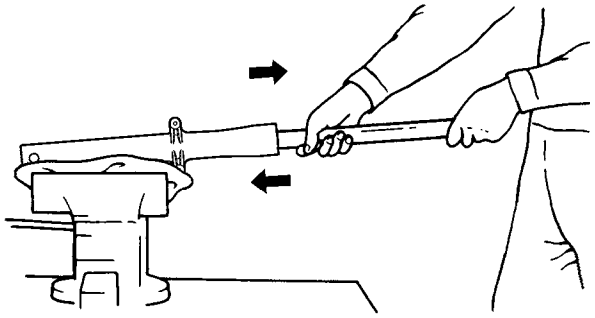


4. Remove:
   • Inner tube
   a. Hold the front fork leg horizontally.
   b. Securely clamp the brake caliper bracket in a vise with soft jaws.
   c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

ECA14190

NOTICE

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



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.

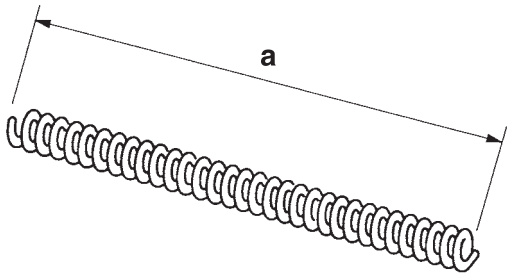
EWA13650

⚠ 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 limit
338.4 mm (13.33 in)



G088921

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

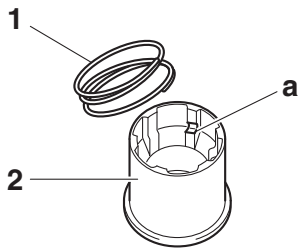
- When assembling the front fork leg, be sure to replace the following parts:
  – Inner tube bushing
  – Outer tube bushing
  – Oil seal
  – Oil seal clip
  – Dust seal
  – O-ring
- Before assembling the front fork leg, make sure all of the components are clean.

1. Install:
   - Oil flow stopper spring “1”
   - Oil flow stopper “2”
   - Damper rod ring “3”
   - Damper rod “4”
   - Rebound spring
   - Inner tube bushing “5” New

   a. Install the oil flow stopper spring into the oil flow stopper.

TIP

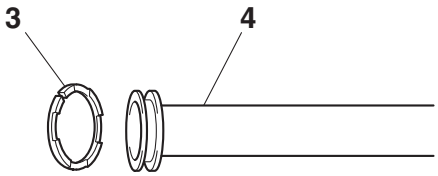
Make sure that the oil flow stopper spring is installed securely into the grooves “a” in the oil flow stopper.



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

TIP

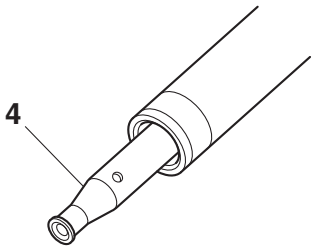
Fit the damper rod ring into the damper rod groove so that the side of the ring with the projections is facing in the direction shown in the illustration.



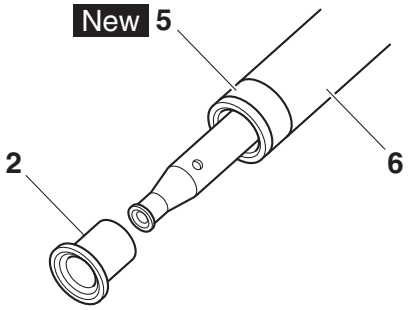
   c. Install the damper rod and rebound spring to the inner tube.

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 and inner tube bushing onto the inner tube “6”.



2. Lubricate:
   - Inner tube’s outer surface

	Recommended oil **Yamaha Suspension Oil G10**

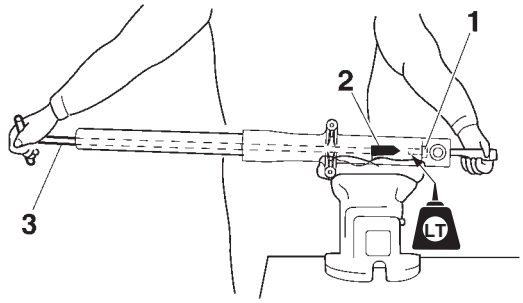
3. Install:
   - Inner tube
     (in the outer tube)
4. Install:
   - Copper washer New
   - Front fork damper rod bolt
5. Tighten:
   - Front fork damper rod bolt “1”

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

TIP

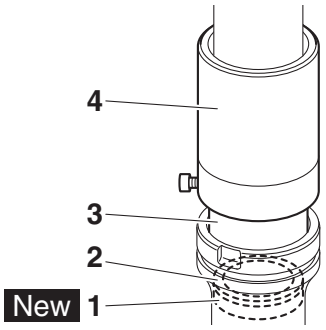
While holding the damper rod assembly with the damper rod holder “2” and T-handle “3”, tighten the front fork damper rod bolt.

	Damper rod holder (ø21.2) **90890-01460** **T-handle** **90890-01326** **T-handle 3/8" drive 60 cm long** **YM-01326**



6. 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
90890-01367
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø41)
90890-01381
Replacement 41 mm
YM-A5142-2



7. Install:
   - Oil seal “1” New
     (with the fork seal driver attachment “2” and fork seal driver weight “3”)

ECA14220

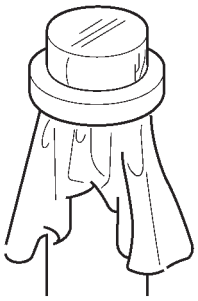
NOTICE

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

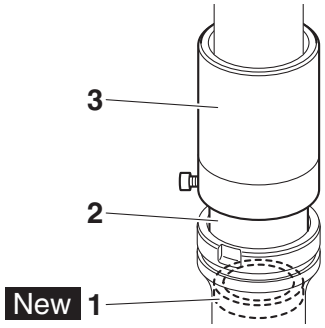
TIP

- 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.

Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7
Fork seal driver attachment (ø41)
90890-01381
Replacement 41 mm
YM-A5142-2



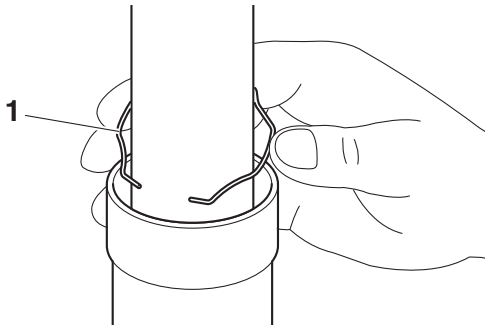
G088922



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

TIP

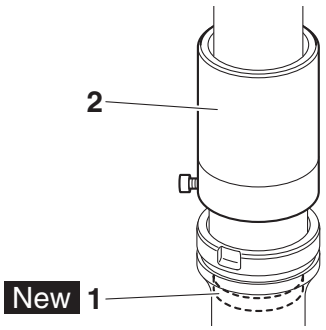
Adjust the oil seal clip so that it fits into the outer tube’s groove.



G088925

9. Install:
   - Dust seal “1” New
     (with the fork seal driver weight “2”)

Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7



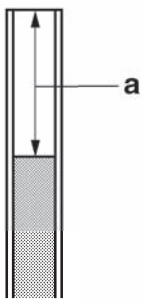
10.Fill:
- Front fork leg
  (with the specified amount of the recommended fork oil)

Quantity (left)
405.0 cm³ (13.69 US oz, 14.28 Imp.oz)
Quantity (right)
405.0 cm³ (13.69 US oz, 14.28 Imp.oz)
Recommended oil
Yamaha Suspension Oil G10

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

Level (left)
160 mm (6.3 in)
Level (right)
160 mm (6.3 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.



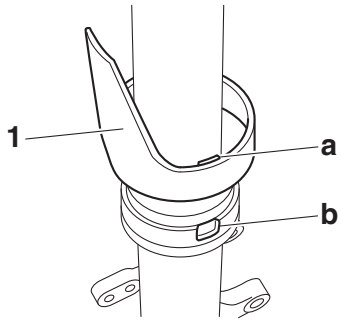
G088928

12.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.
- Temporarily tighten the front fork cap bolt.
- Tighten the front fork cap bolt to the specified torque, when installing the front fork with upper bracket.

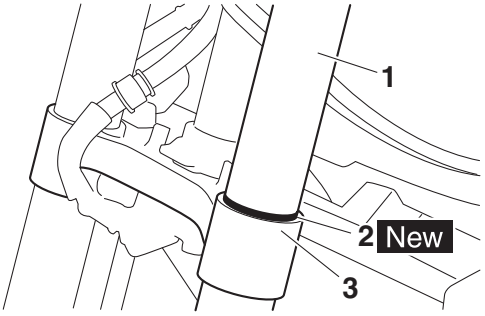
13.Install:
- Protector “1”

TIP
Align the projection “a” on the protector with the slot “b” in the outer tube.



EAS30210
INSTALLING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.
1. Install:
   - Front fork leg “1”
     Temporarily tighten the lower bracket pinch bolts.
   - O-ring “2” New

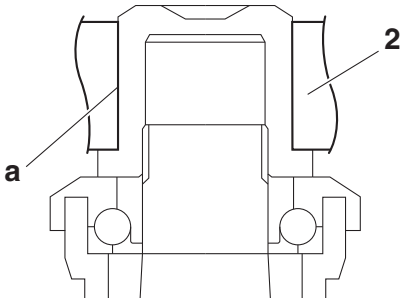
TIP
Make sure that the O-ring contacts the top of the lower bracket “3”.

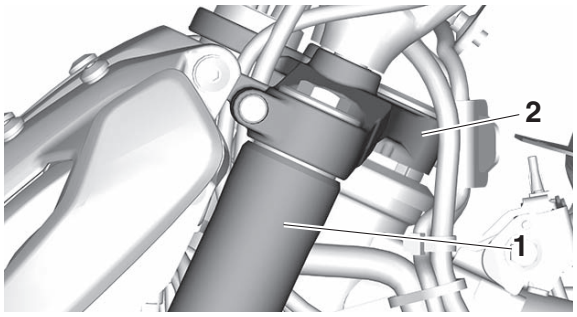


2. Install:
   • Front fork cover “1”
   • Upper bracket “2”

TIP

- Before installing the upper bracket, remove any grease from the outer surface “a” of the cap nut.
- Make sure the inner tube end is flush with the top of the upper bracket.





3. Tighten:
   • Lower bracket pinch bolt
   • Upper bracket pinch bolt (center)
   • Upper bracket pinch bolt (left and right)
   • Front fork cap bolt

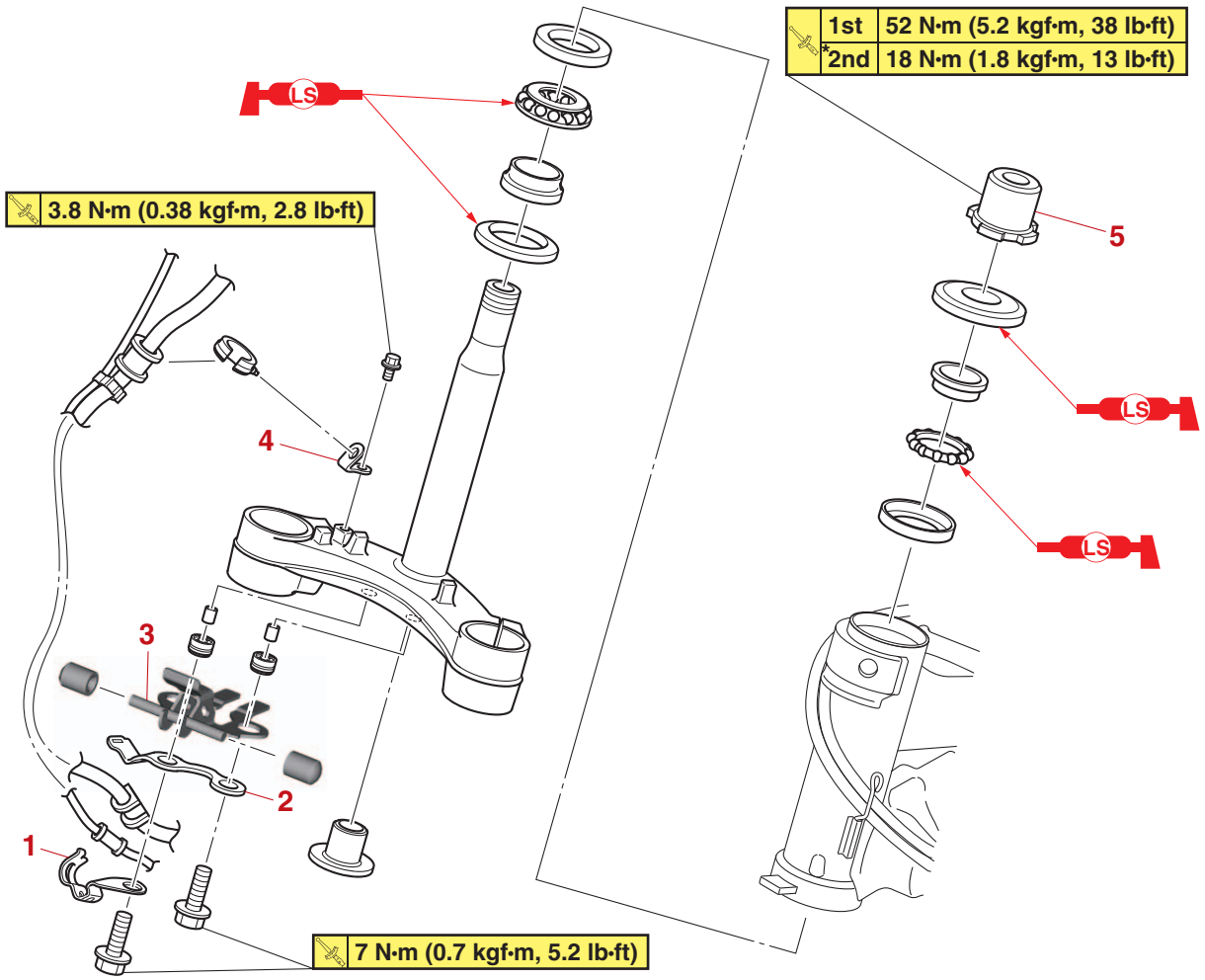
Lower bracket pinch bolt
23 N·m (2.3 kgf·m, 17 lb·ft)
Upper bracket pinch bolt (center)
21 N·m (2.1 kgf·m, 15 lb·ft)
Upper bracket pinch bolt (left and right)
26 N·m (2.6 kgf·m, 19 lb·ft)
Front fork cap bolt
23 N·m (2.3 kgf·m, 17 lb·ft)

4. Install:
   • Front fender

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

EAS20035
STEERING HEAD

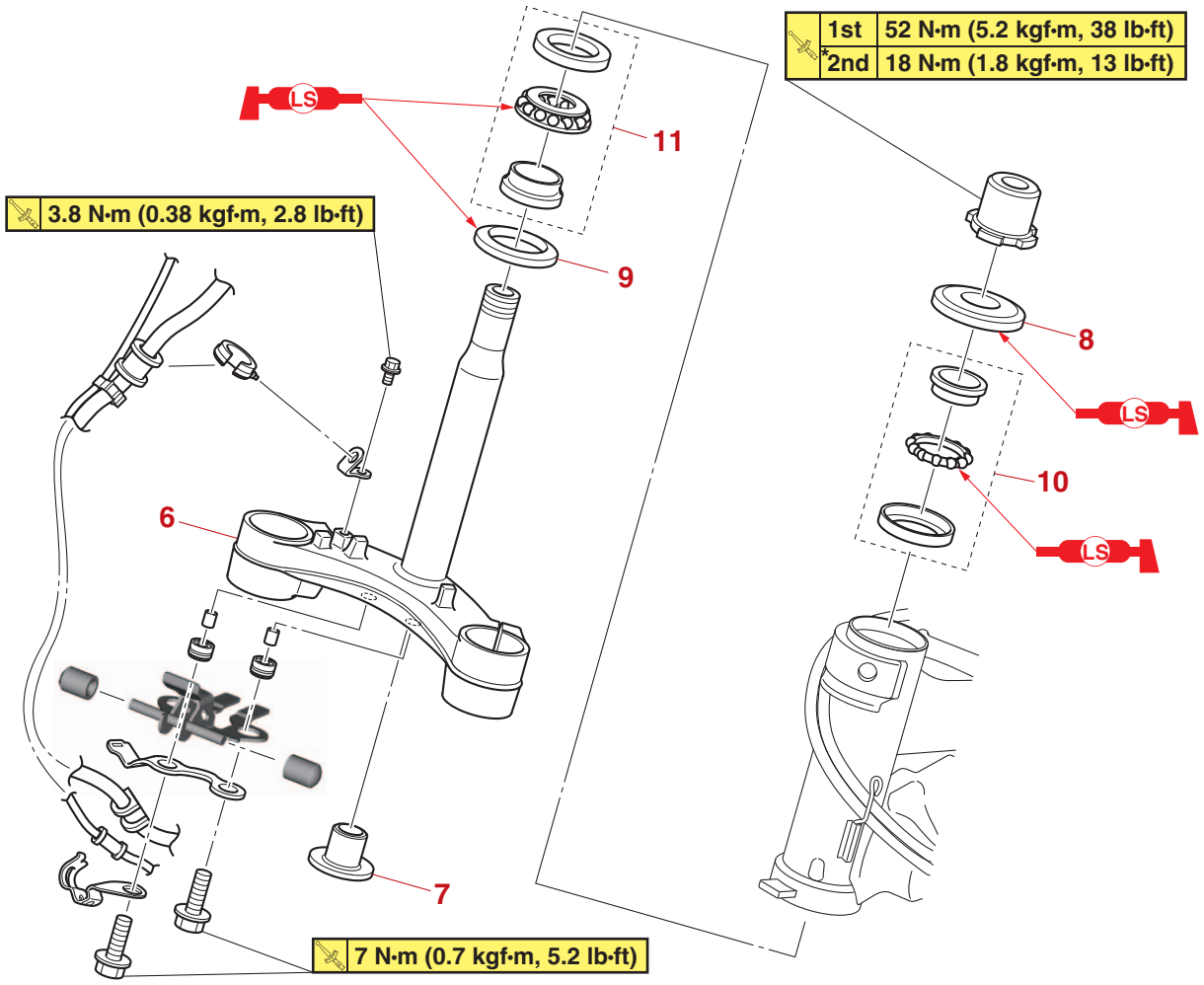
Removing the lower bracket



*** Loosen the cap nut completely, and then tighten it to specification.**

Order	Job/Parts to remove	Q'ty	Remarks
	Headlight assembly		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Handlebar		Refer to "HANDLEBAR" on page 4-68.
	Front fork legs		Refer to "FRONT FORK" on page 4-73.
1	Front brake hose lower holder	1	
2	Front brake hose upper holder	1	
3	Headlight bracket	1	
4	Front brake hose holder bracket	1	
5	Cap nut	1	

Removing the lower bracket



*** Loosen the cap nut completely, and then tighten it to specification.**

Order	Job/Parts to remove	Q'ty	Remarks
6	Lower bracket	1	
7	Lower bracket cap	1	
8	Bearing cover	1	
9	Lower bearing dust seal	1	
10	Upper bearing	1	
11	Lower bearing	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:
   - Cap nut “1”
   - Lower bracket

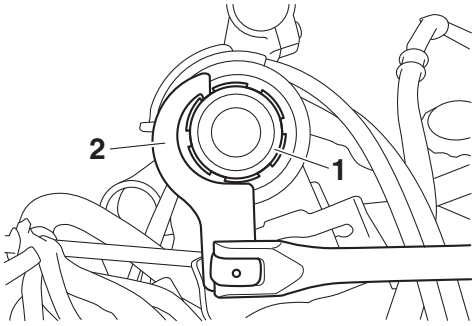
EWA13730
⚠ WARNING

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

TIP

Remove the cap 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:
   - Bearing
   - Bearing race

Recommended cleaning solvent
Kerosene

2. Check:
   - Bearing
   - Bearing race
     Damage/pitting → Replace the bearings and bearing races as a set.
3. Replace:
   - Bearing
   - Bearing race

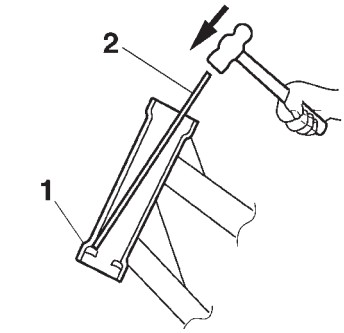
a. Remove the bearing races from the steering head pipe “1” with a long rod “2” and hammer.
b. Remove the bearing race “3” from the lower bracket with a floor chisel “4” and hammer.
c. Install a new dust seal and new bearing races.

ECA14270
NOTICE

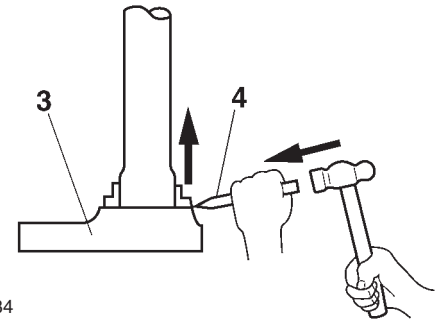
If the bearing race is not installed properly, the steering head pipe could be damaged.

TIP

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



G088933



G088934

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

EAS30216
INSTALLING THE STEERING HEAD

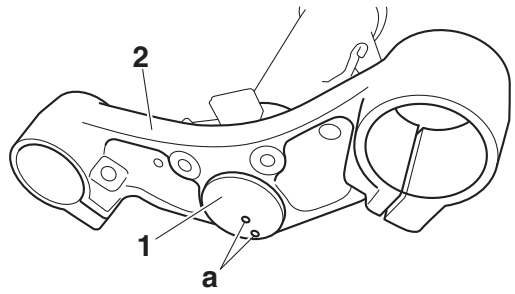
1. Lubricate:
   - Upper bearing
   - Lower bearing

Recommended lubricant
Lithium-soap-based grease

2. Install:
   - Lower bracket cap “1”
     (onto the lower bracket “2”)

TIP

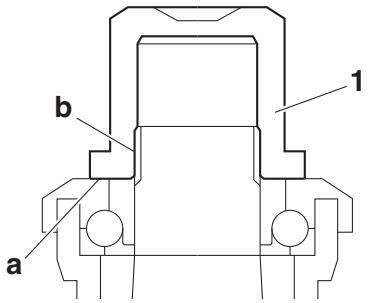
Face the holes “a” in the lower bracket cap rearward.



3. Install:
   - Lower bracket
   - Cap nut “1”
     Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” on page 3-18.

TIP

Before installing the cap nut, remove any grease from the contact surfaces “a” between the cap nut and the bearing cover and from the threads “b” of the lower bracket and cap nut.

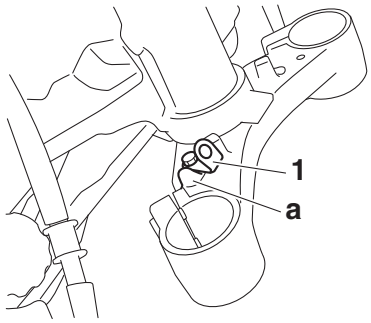


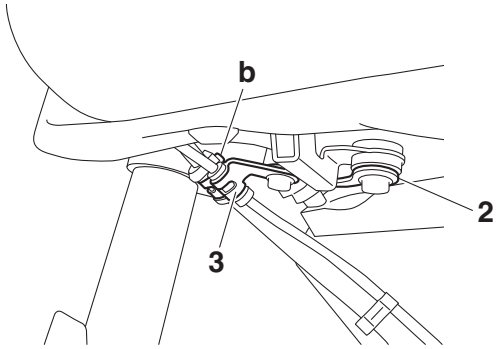
4. Install:
   - Front brake hose holder bracket “1”
   - Headlight bracket
   - Front brake hose upper holder “2”
   - Front brake hose lower holder “3”

	Front brake hose holder bracket bolt **3.8 N·m (0.38 kgf·m, 2.8 lb·ft)** **Front brake hose lower holder bolt** **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

TIP

- Make sure that the front brake hose holder bracket contacts the projection “a” on the lower bracket.
- Make sure that the projection “b” on the front brake hose lower holder fits into the hole in the front brake hose upper holder.

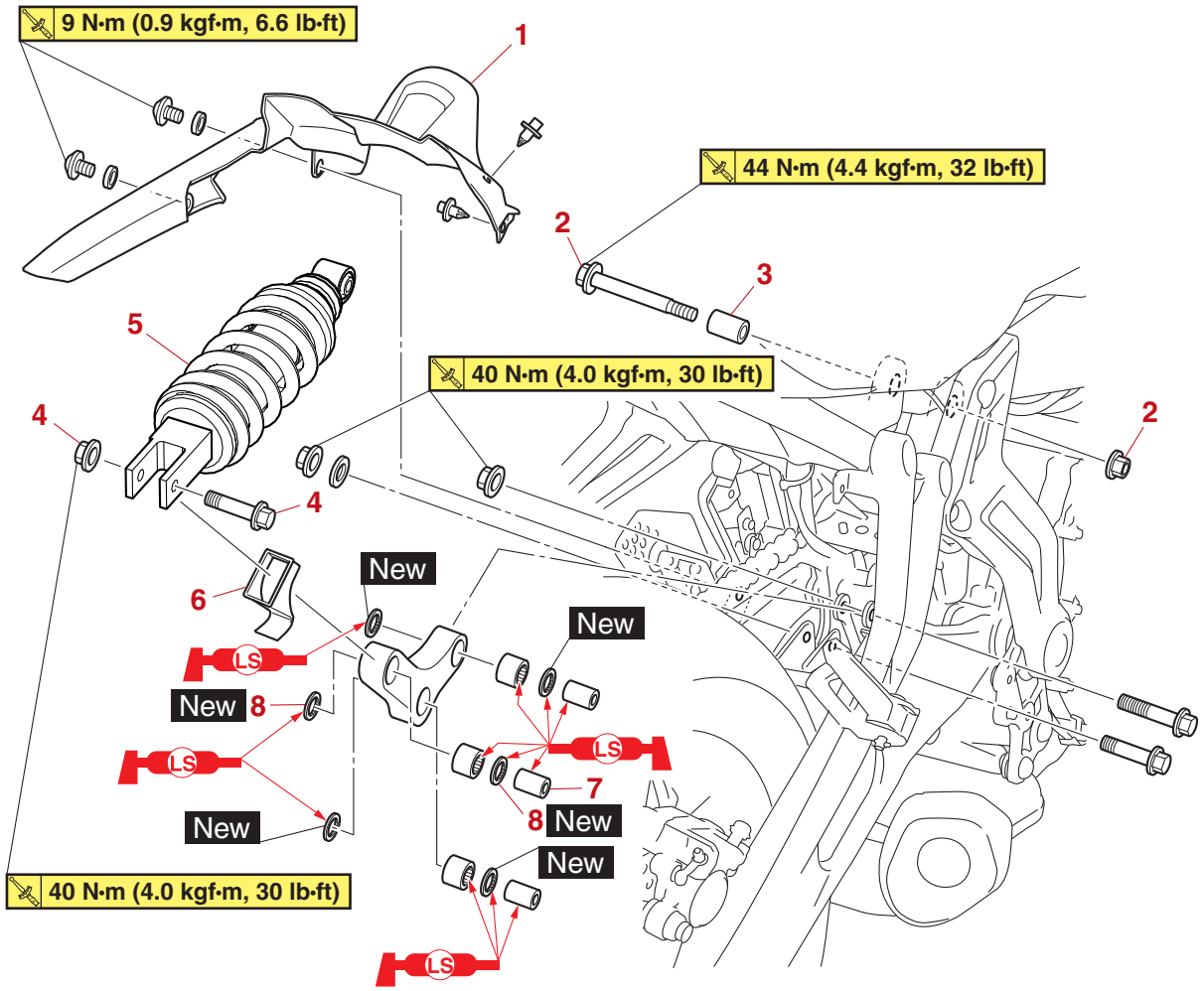




EAS20036

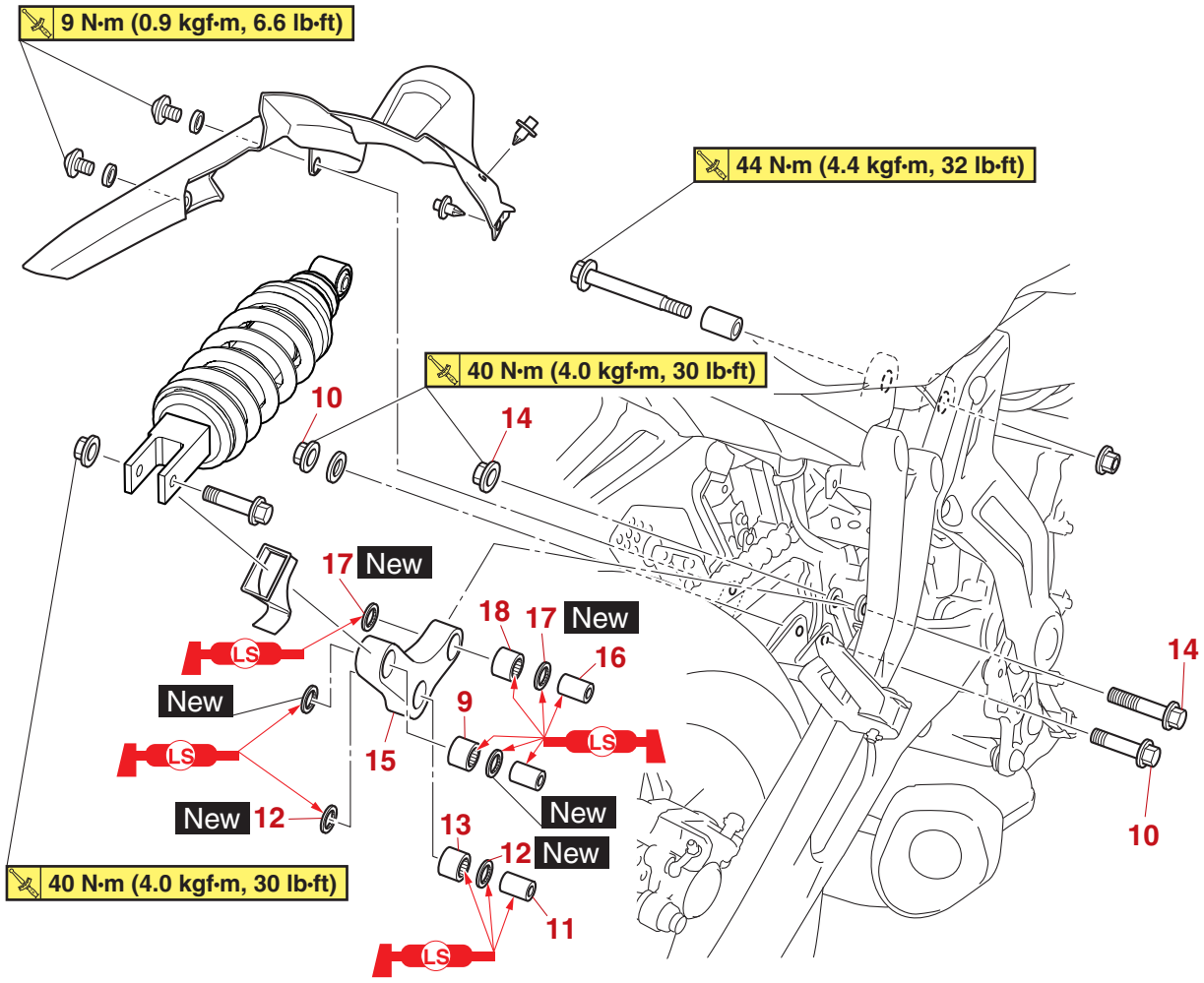
REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Drive chain guard	1	
2	Rear shock absorber assembly nut/Bolt (front side)	1/1	
3	Spacer	1	
4	Rear shock absorber assembly nut/Bolt (rear side)	1/1	
5	Rear shock absorber assembly	1	
6	Relay arm rubber cover	1	
7	Spacer	1	
8	Oil seal	2	

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
9	Bearing	1	
10	Relay arm nut/Bolt	1/1	
11	Spacer	1	
12	Oil seal	2	
13	Bearing	1	
14	Connecting arm nut/Bolt (relay arm side)	1/1	
15	Relay arm	1	
16	Spacer	1	
17	Oil seal	2	
18	Bearing	1	

EAS30826
HANDLING THE REAR SHOCK ABSORBER

EWA13740
⚠ WARNING

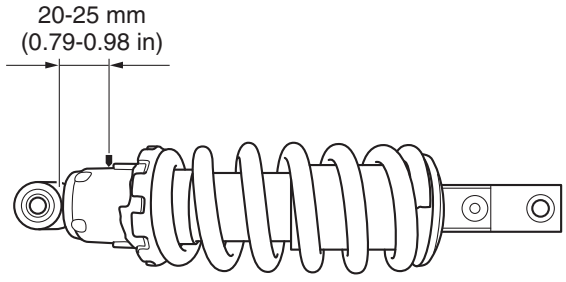
This rear shock absorber contains highly compressed nitrogen gas. Before handling the rear shock absorber, read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear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

EAS30729
DISPOSING OF A REAR SHOCK ABSORBER

1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3 mm (0.08–0.12 in) hole through the rear shock absorber at a point 20–25 mm (0.79–0.98 in) from its end as shown.

EWA13760
⚠ WARNING

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



EAS30219
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

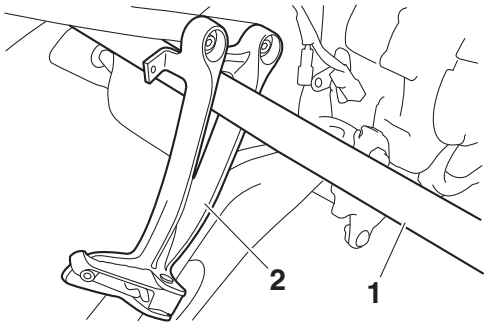
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

TIP

Pass a suitable rod “1” through the holes in the brackets of the passenger footrests “2” and secure the rod to support the vehicle. Before securing the rod, move the brake fluid reservoir hose to a place where the brake fluid reservoir hose does not contact the rod.



EAS30220
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

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

EAS31112
CHECKING THE RELAY ARM

1. Check:
   - Relay arm
     Damage/wear → Replace.
2. Check:
   - Bearing
   - Oil seal
     Damage/pitting → Replace.
3. Check:
   - Collar
     Damage/scratches → Replace.

EAS30222
INSTALLING THE RELAY ARM

1. Lubricate:
   - Spacer
   - Bearing
   - Oil seal

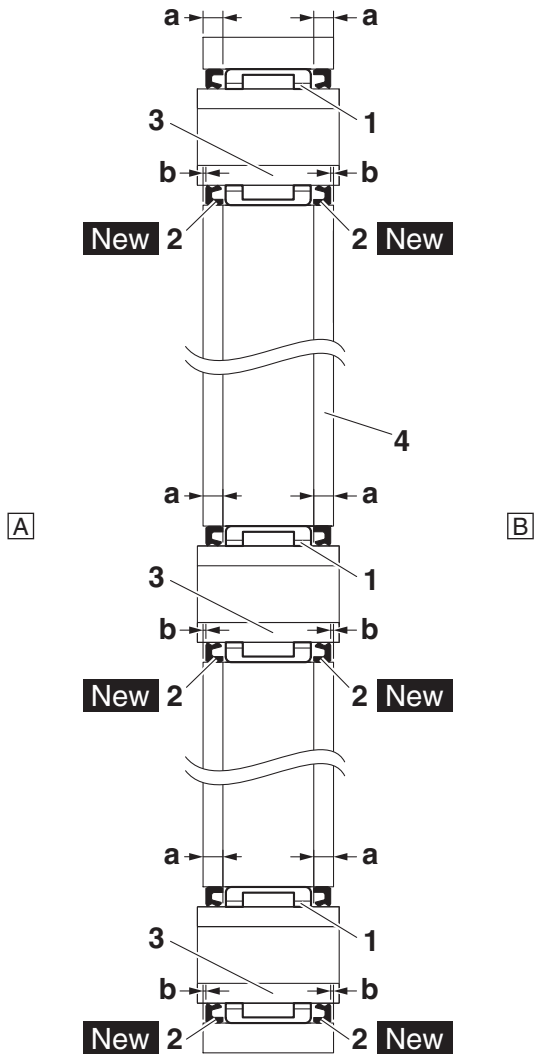
Recommended lubricant
Lithium-soap-based grease

2. Install:
   - Bearing “1”
   - Oil seal “2” New
   - Spacer “3”
     (to the relay arm “4”)

Installed depth “a”
4.0 mm (0.16 in)
Installed depth “b”
More than 0.3 mm (0.01 in)

TIP

When installing the oil seals to the relay arm, face the character stamps of the oil seals outside.

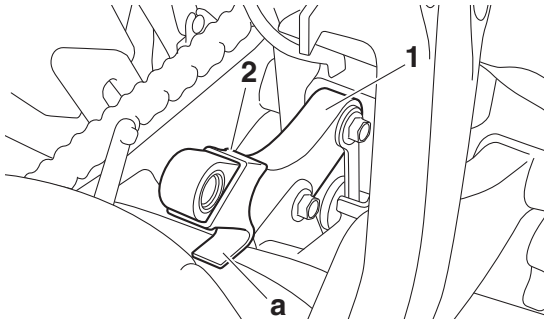


A. Left side
B. Right side

3. Install:
   - Relay arm “1”
   - Relay arm rubber cover “2”
     (to the relay arm)

TIP

Make sure that the portion “a” of the relay arm rubber cover is positioned on top of the swingarm.



4. Tighten:
   - Connecting arm nut
   - Relay arm nut

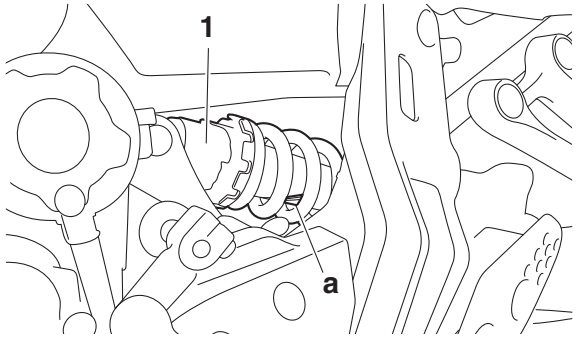
Connecting arm nut (relay arm side)
40 N·m (4.0 kgf·m, 30 lb·ft)
Relay arm nut
40 N·m (4.0 kgf·m, 30 lb·ft)

EAS30225
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Install:
   - Rear shock absorber assembly “1”

TIP

Make sure that the label “a” on the rear shock absorber assembly faces down.

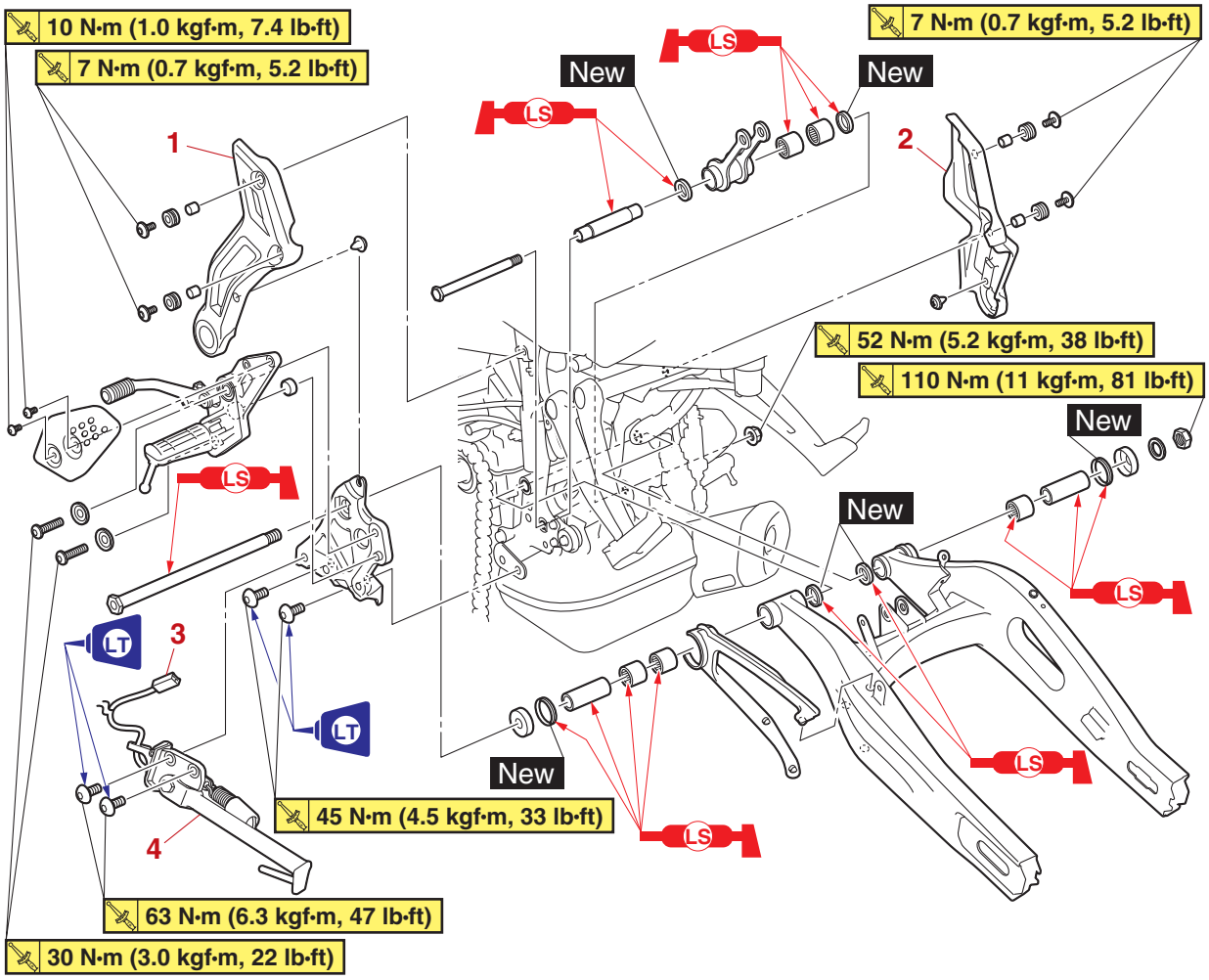


2. Tighten:
   - Rear shock absorber assembly bolt (front side)
   - Rear shock absorber nut (rear side)

Rear shock absorber assembly bolt (front side)
44 N·m (4.4 kgf·m, 32 lb·ft)
Rear shock absorber assembly nut (rear side)
40 N·m (4.0 kgf·m, 30 lb·ft)

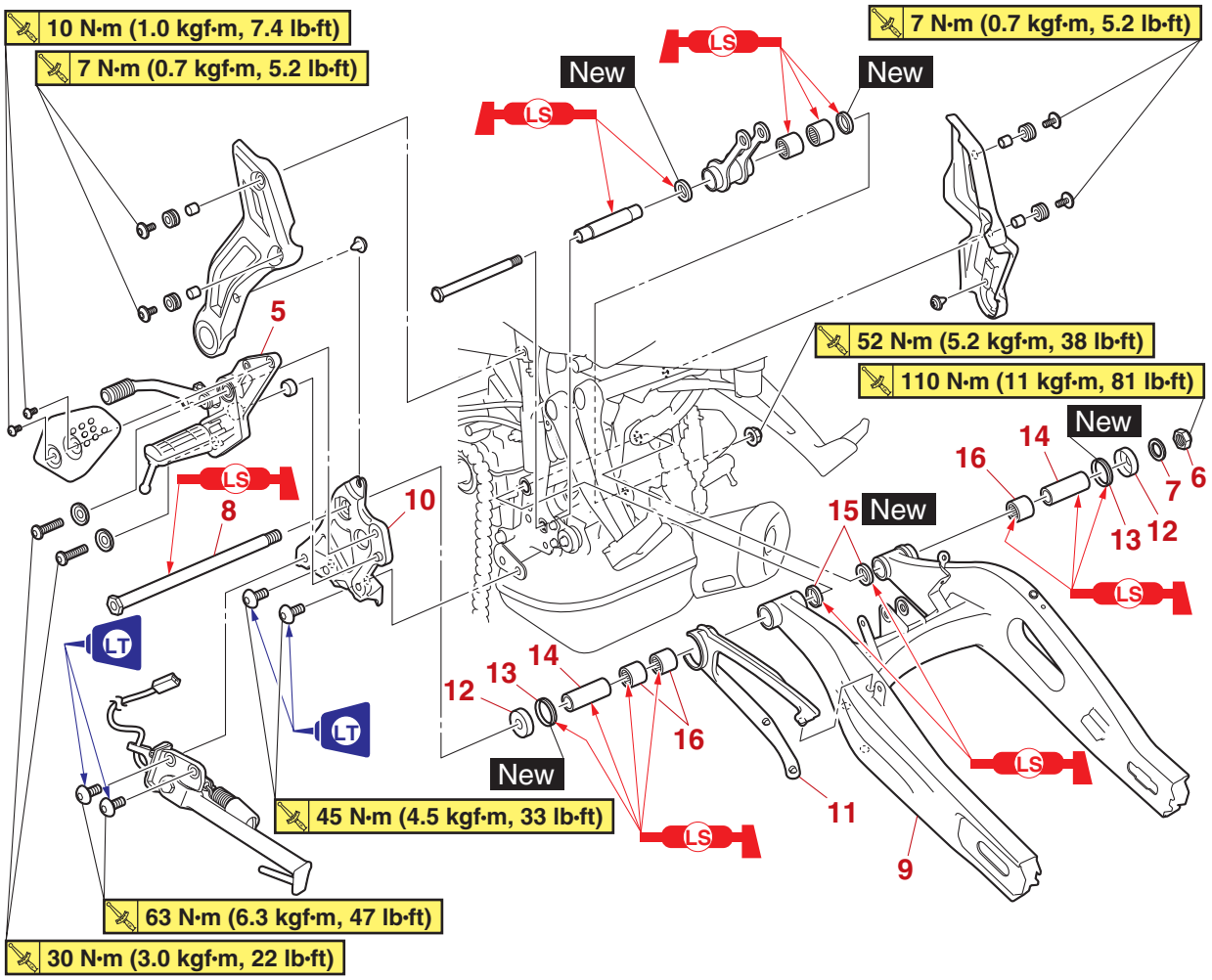
EAS20037
SWINGARM

Removing the swingarm



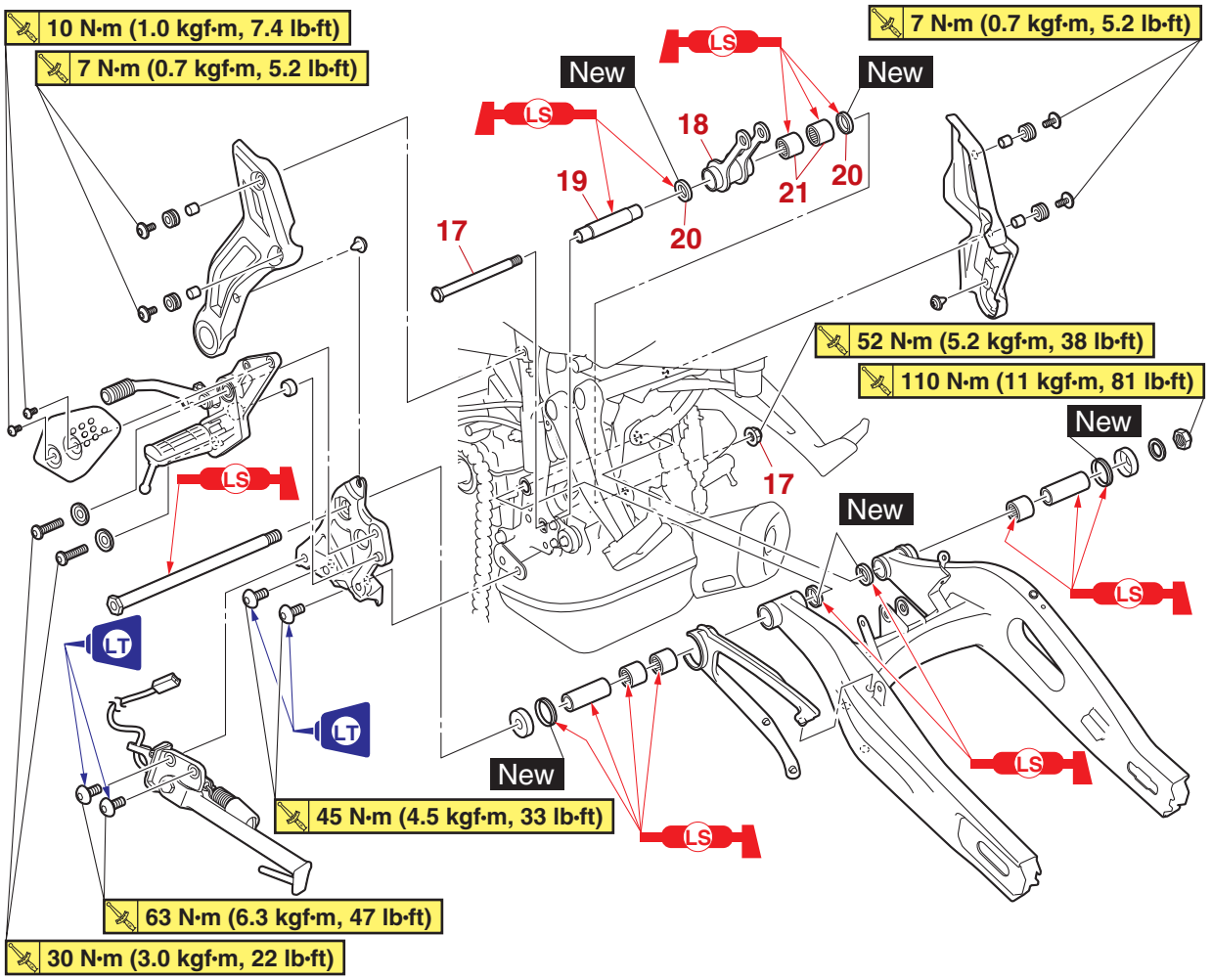
Order	Job/Parts to remove	Q'ty	Remarks
	Rear brake caliper/Rear brake hose guide/Rear brake hose holder		Refer to "REAR BRAKE" on page 4-48.
	Rear wheel		Refer to "REAR WHEEL" on page 4-27.
	Relay arm		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-87.
	Drive sprocket cover		Refer to "CHAIN DRIVE" on page 4-98.
1	Pivot shaft protector (left)	1	
2	Pivot shaft protector (right)	1	
3	Sidestand switch coupler	1	Disconnect.
4	Sidestand	1	

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
5	Footrest assembly (left)	1	
6	Pivot shaft nut	1	
7	Washer	1	
8	Pivot shaft	1	
9	Swingarm	1	
10	Footrest bracket (left)	1	
11	Drive chain guide	1	
12	Dust cover	2	
13	Oil seal	2	
14	Spacer	2	
15	Oil seal	2	
16	Bearing	3	

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
17	Connecting arm nut/Bolt (frame side)	1/1	
18	Connecting arm	1	
19	Spacer	1	
20	Oil seal	2	
21	Bearing	2	

EAS30226
REMOVING THE SWINGARM

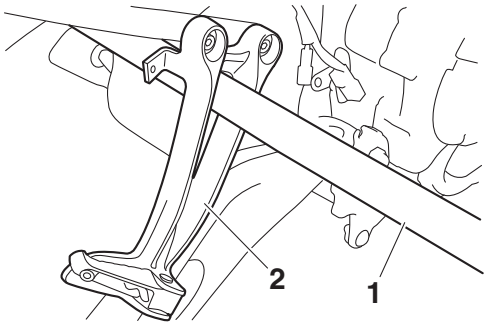
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

TIP

Pass a suitable rod "1" through the holes in the brackets of the passenger footrests "2" and secure the rod to support the vehicle. Before securing the rod, move the brake fluid reservoir hose to a place where the brake fluid reservoir hose does not contact the rod.

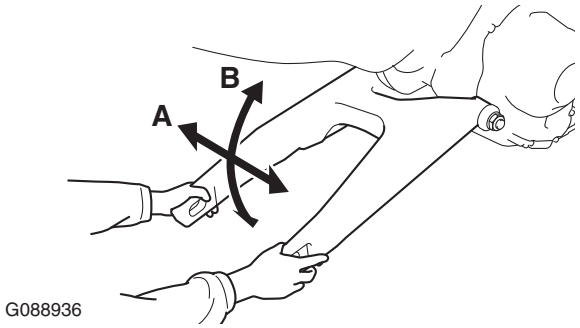


2. Measure:
   - Swingarm side play
   - Swingarm vertical movement

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

	Pivot shaft nut **110 N·m (11 kgf·m, 81 lb·ft)**

   b. Check the swingarm side play "A" by moving the swingarm from side to side.
      If the swingarm has side-to-side play, check the collars, bearings, and dust covers.
   c. Check the swingarm vertical movement "B" by moving the swingarm up and down.
      If the swingarm vertical movement is not smooth or if there is binding, check the pivot shaft, collars, bearings, and dust covers.



3. Remove:
   - Swingarm

EAS30227
CHECKING THE SWINGARM

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

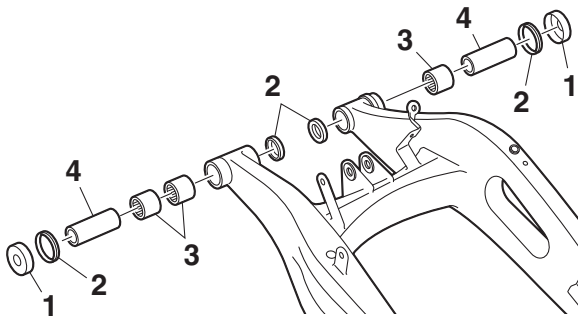
EWA13770
⚠ WARNING

Do not attempt to straighten a bent pivot shaft.

3. Wash:
   - Pivot shaft
   - Dust cover
   - Collar
   - Bearing
   - Washer

	Recommended cleaning solvent **Kerosene**

4. Check:
   - Dust cover "1"
   - Oil seal "2"
     Damage/wear → Replace.
   - Bearing "3"
     Damage/pitting → Replace.
   - Collar "4"
     Damage/scratches → Replace.



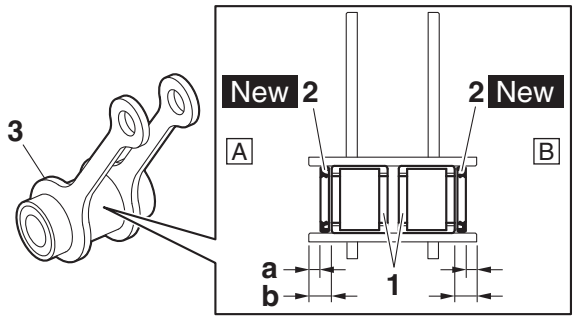
EAS31113
CHECKING THE CONNECTING ARM
1. Check:
   • Connecting arm
   Damage/wear → Replace.
2. Check:
   • Bearing
   • Oil seal
   Damage/pitting → Replace.
3. Check:
   • Collar
   Damage/scratches → Replace.

EAS31114
INSTALLING THE CONNECTING ARM
1. Lubricate:
   • Spacer
   • Bearing

Recommended lubricant
Lithium-soap-based grease

2. Install:
   • Bearing “1”
   • Oil seal “2” New
   (to the connecting arm “3”)

TIP
When installing the oil seals to the connecting arm, face the character stamp of the oil seals outside.



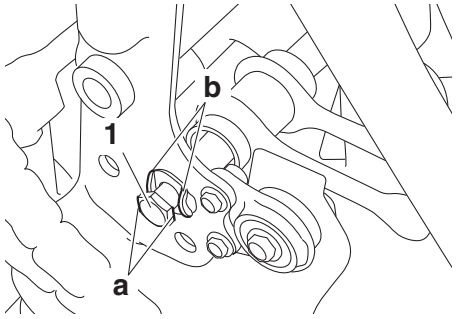
A. Left side
B. Right side

Installed depth “a”
3.5–4.5 mm (0.14–0.18 in)
Installed depth “b”
8.0–9.0 mm (0.31–0.35 in)

3. Install:
   • Spacer
   • Connecting arm
   • Connecting arm bolt “1”
   • Connecting arm nut

Connecting arm nut (frame side)
52 N·m (5.2 kgf·m, 38 lb·ft)

TIP
Align two flat sides “a” of the connecting arm bolt with the projections “b” on the frame.



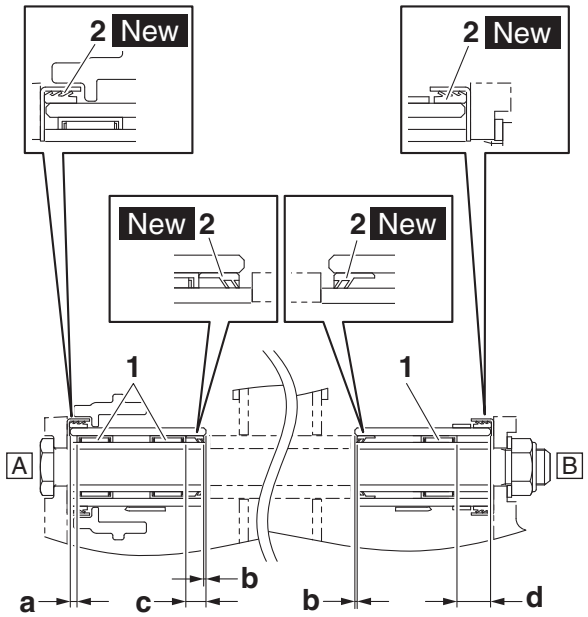
EAS30228
INSTALLING THE SWINGARM
1. Lubricate:
   • Spacer
   • Pivot shaft
   • Bearing
   • Oil seal

Recommended lubricant
Lithium-soap-based grease

2. Install:
   • Bearing “1”
   • Oil seal “2” New
   (to the swingarm)

Installed depth “a”
3.0 mm (0.12 in)
Installed depth “b”
1.0 mm (0.04 in)
Installed depth “c”
9.0 mm (0.35 in)
Installed depth “d”
15 mm (0.59 in)

TIP
Install the oil seals to the swingarm so that they are facing in the directions shown in the illustration.



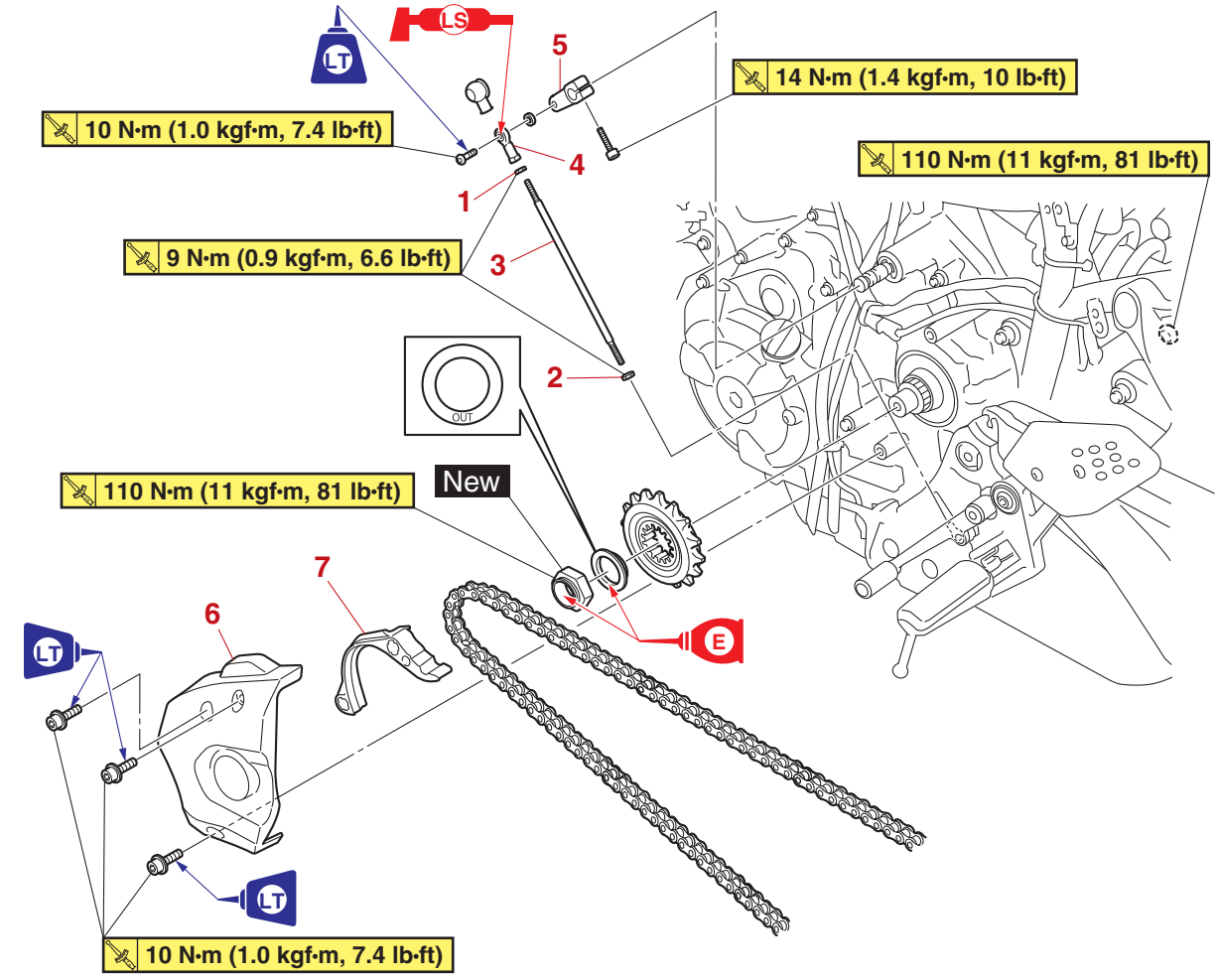
A. Left side
B. Right side

3. Adjust:
   • Drive chain slack
   Refer to “DRIVE CHAIN SLACK” on page 3-17.

Drive chain slack (Maintenance stand)
51.0–56.0 mm (2.01–2.20 in)
Drive chain slack (Sidestand)
51.0–56.0 mm (2.01–2.20 in)
Drive chain slack limit
58.0 mm (2.28 in) (MT07PC)

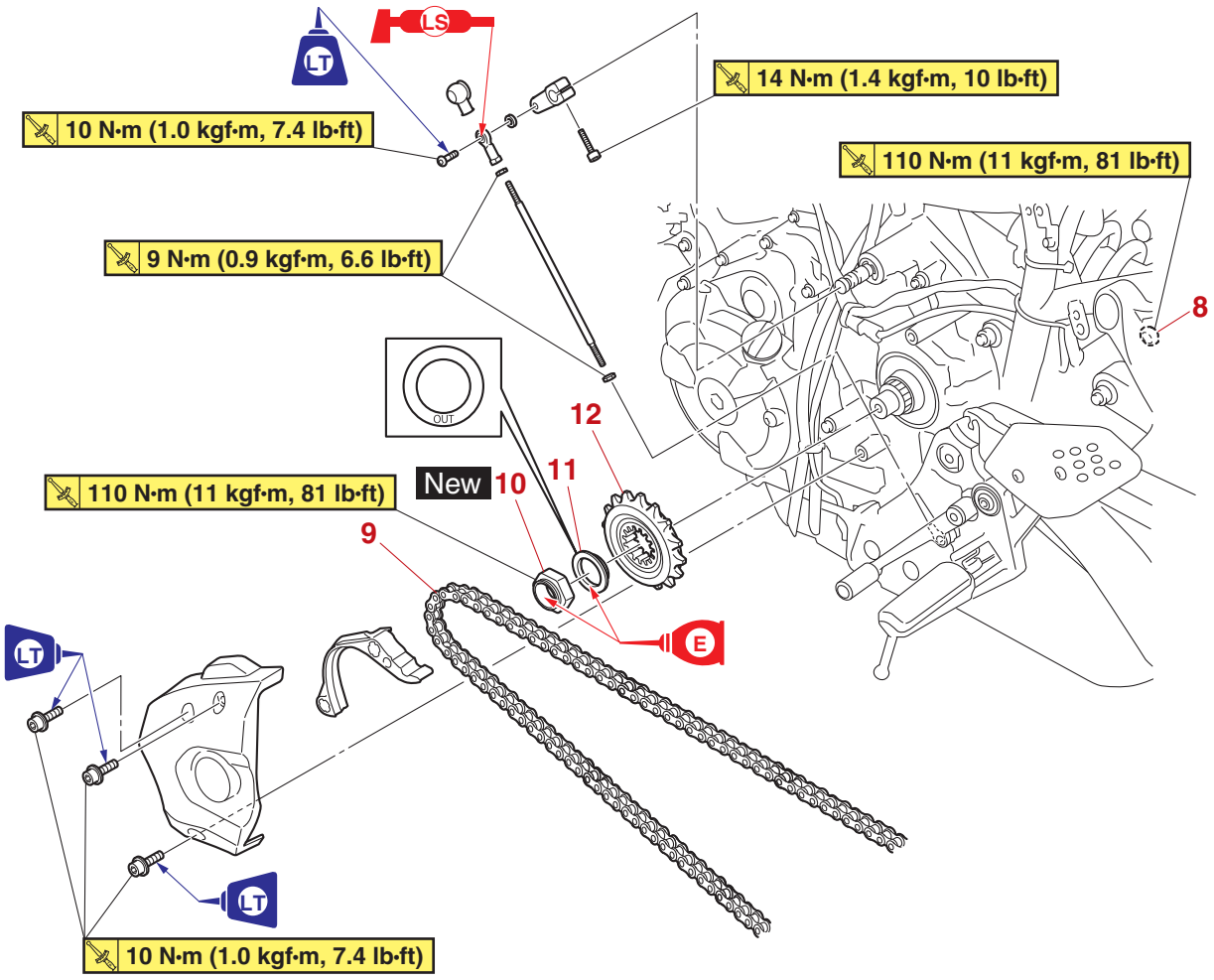
EAS20038
CHAIN DRIVE

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Drive chain guard		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-87.
	Pivot shaft protectors/sidestand		Refer to "SWINGARM" on page 4-92.
1	Shift rod locknut (shift arm side)	1	
2	Shift rod locknut (shift pedal side)	1	Left-hand threads
3	Shift rod	1	
4	Shift rod joint	1	
5	Shift arm	1	
6	Drive sprocket cover	1	
7	Drive chain guide	1	

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
8	Pivot shaft nut	1	Loosen.
9	Drive chain	1	
10	Drive sprocket nut	1	
11	Washer	1	
12	Drive sprocket	1	

EAS30229
REMOVING THE DRIVE CHAIN
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 maintenance stand so that the rear wheel is elevated.

2. Remove:
   • Drive chain “1”

TIP

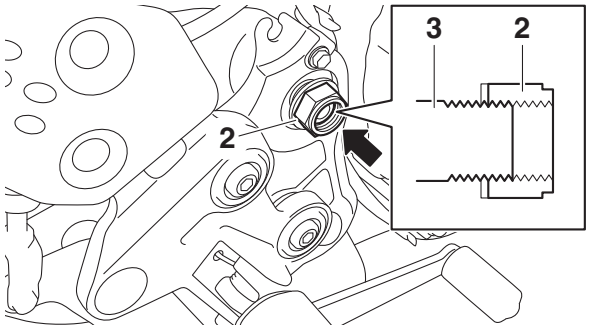
Push the rear wheel forward and remove the drive chain from the rear wheel sprocket. Refer to “DRIVE CHAIN SLACK” on page 3-17.

   a. Loosen the pivot shaft nut “2” so that the engaged thread length on the pivot shaft “3” is 3–4 ridges.

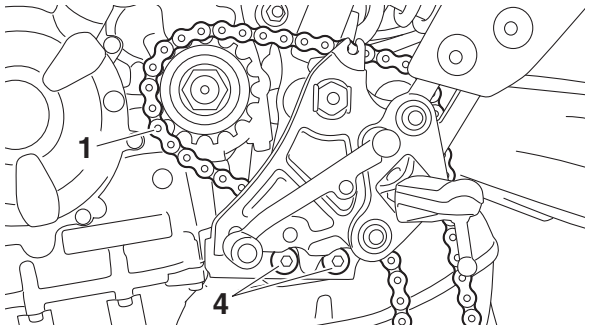
ECA21200
NOTICE

Make sure that the pivot shaft nut does not come off the pivot shaft.

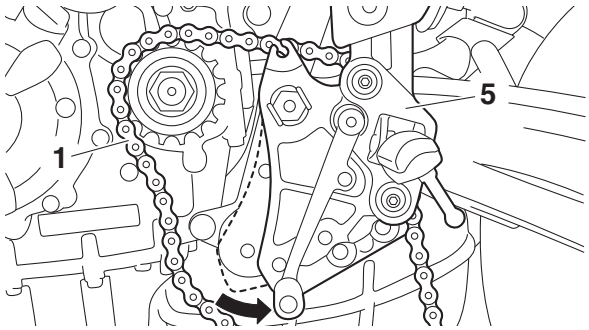
   b. Tap the pivot shaft nut to push the pivot shaft to the left.



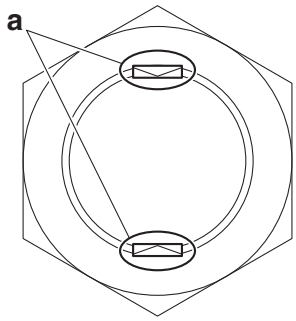
   c. Remove the footrest bracket bolts “4”.



   d. Move the footrest bracket “5” rearward, and then remove the drive chain.



EAS31115
REMOVING THE DRIVE SPROCKET
1. Straighten the drive sprocket nut ribs “a”.



2. Loosen:
   • Drive sprocket nut

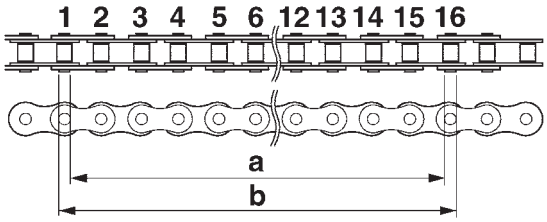
TIP

Loosen the drive sprocket nut while pressing the brake pedal.

EAS30230
CHECKING THE DRIVE CHAIN
1. Measure:
   • 15-link section “c” of the drive chain
   Out of specification → Replace the drive chain.

	15-link length limit **239.3 mm (9.42 in)**

   a. Measure the length “a” between the inner sides of the pins and the length “b” between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.

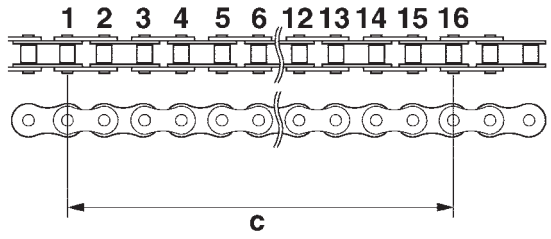


G088937

b. Calculate the length “c” of the 15-link section of the drive chain using the following formula.
Drive chain 15-link section length “c” = (length “a” between pin inner sides + length “b” between pin outer sides)/2

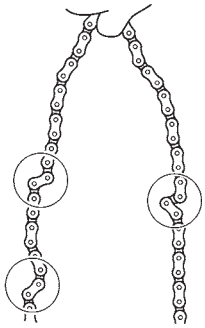
TIP

- When measuring a 15-link section of the drive chain, make sure that the drive chain is taut.
- Perform this procedure 2–3 times, at a different location each time.



G088938

2. Check:
   - Drive chain
     Stiffness → Clean and lubricate or replace.



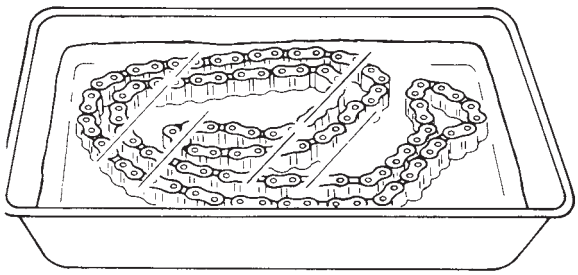
G088939

3. Clean:
   - Drive chain
     a. Wipe the drive chain with a clean cloth.
     b. Put the drive chain in kerosene and remove any remaining dirt.
     c. Remove the drive chain from the kerosene and completely dry it.

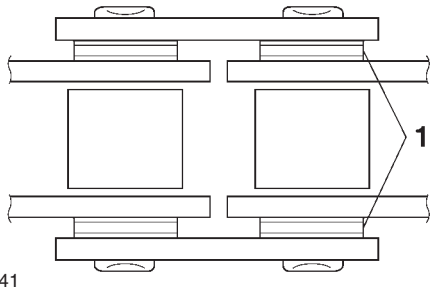
ECA14290

NOTICE

- **This motorcycle has a drive chain with small rubber O-rings “1” between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzine), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water into the drive chain’s internals, and solvents will deteriorate the O-rings. A coarse brush can also damage the O-rings. Therefore, use only kerosene to clean the drive chain.**
- **Do not soak the drive chain in kerosene for more than ten minutes, otherwise the O-rings can be damaged.**

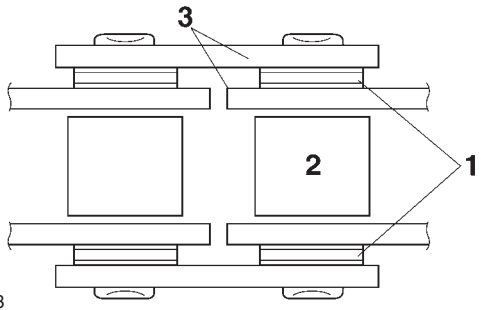


G088940



G088941

4. Check:
   - O-ring “1”
     Damage → Replace the drive chain.
   - Drive chain roller “2”
     Damage/wear → Replace the drive chain.
   - Drive chain side plate “3”
     Damage/wear/cracks → Replace the drive chain.



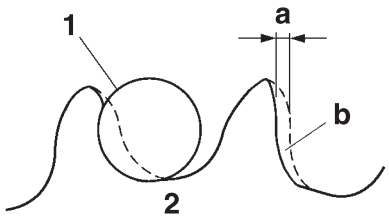
G088943

5. Lubricate:
   • Drive chain

Recommended lubricant
Chain lubricant suitable for O-ring chains

EAS30231
CHECKING THE DRIVE SPROCKET

1. Check:
   • Drive sprocket
   More than 1/4 tooth "a" wear → Replace the drive chain sprocket, drive chain, and rear wheel sprocket as a set.
   Bent teeth → Replace the drive chain sprocket, drive chain, and rear wheel sprocket as a set.



G088904

b. Correct

1. Drive chain roller
2. Drive sprocket

EAS30232
CHECKING THE REAR WHEEL SPROCKET

Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-32.

EAS30233
CHECKING THE REAR WHEEL DRIVE HUB

Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-31.

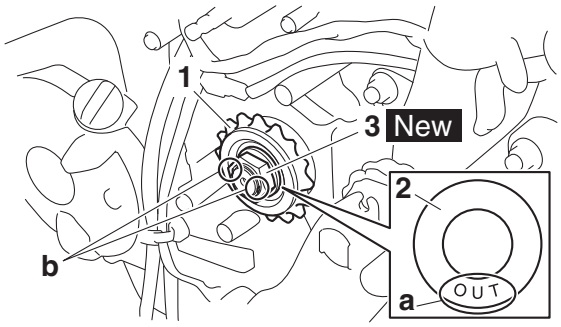
EAS31116
INSTALLING THE DRIVE SPROCKET

1. Install:
   • Drive sprocket "1"
   • Washer "2"
   • Drive sprocket nut "3" New

Drive sprocket nut
110 N·m (11 kgf·m, 81 lb·ft)

TIP

- While applying the rear brake, tighten the drive sprocket nut.
- Install washer with the "OUT" mark "a" facing out.
- Stake the drive sprocket nut at cutouts "b" in the drive axle.

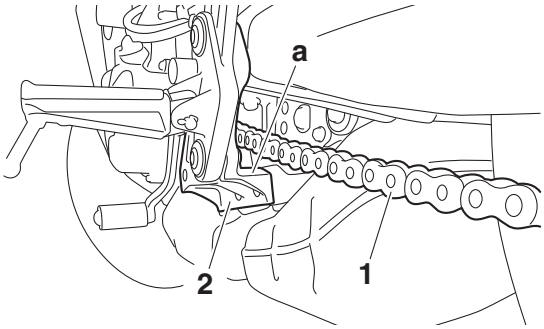


EAS30234
INSTALLING THE DRIVE CHAIN

1. Install:
   • Drive chain "1"

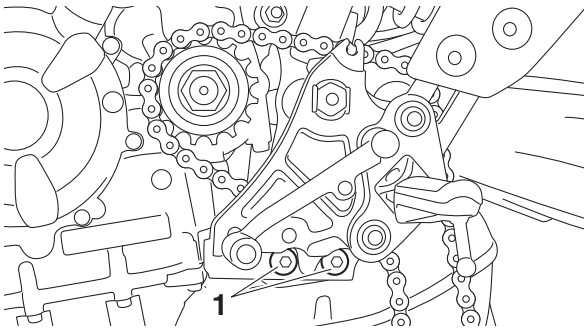
TIP

Make sure that the drive chain is positioned above the portion "a" of the footrest bracket "2".



2. Tighten:
   • Footrest bracket bolt "1"

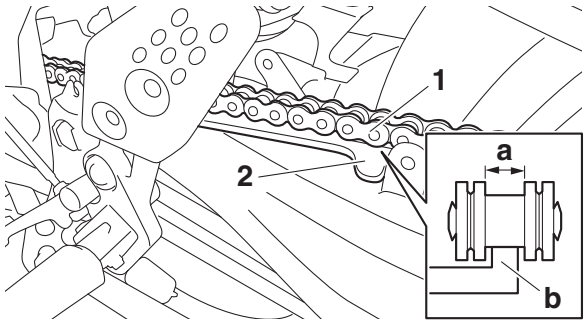
Footrest bracket bolt
45 N·m (4.5 kgf·m, 33 lb·ft)
LOCTITE®



3. Lubricate:
   • Drive chain

Recommended lubricant
Chain lubricant suitable for O-ring chains

4. Fit the space “a” between the side plates of the drive chain “1” onto the rib “b” on the drive chain guide “2”.

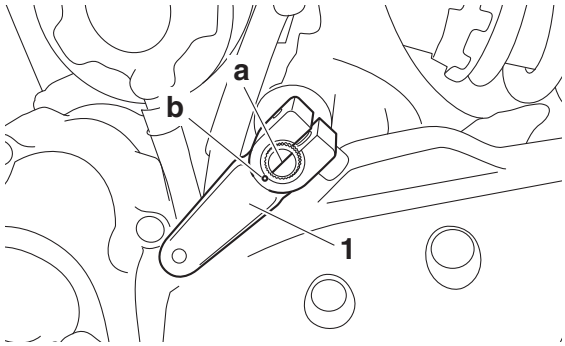


5. Install:
   • Shift arm “1”
   • Shift rod joint
   • Shift rod
   • Shift rod locknut

TIP

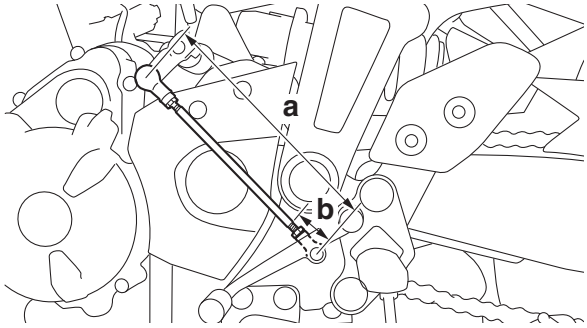
Before installing, make sure to align the mark “a” of the shift shaft with the punch mark “b” of the shift arm.

Shift arm pinch bolt
14 N·m (1.4 kgf·m, 10 lb·ft)



6. Measure:
   • Installed shift rod length “a” and “b”
   Incorrect → Adjust.

Installed shift rod length
217.5–219.5 mm (8.56–8.64 in)
Installed length “b”
35.0–36.0 mm (1.38–1.42 in)

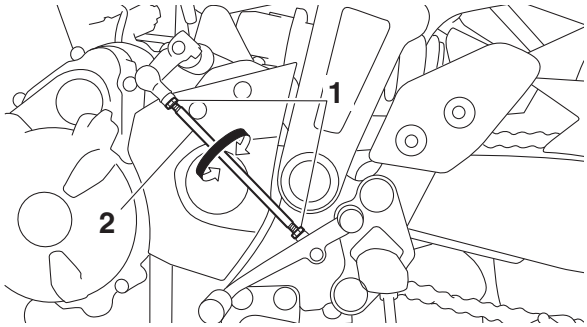


7. Adjust:
   • Installed shift rod length
   a. Loosen both locknuts “1”.

TIP

The shift rod locknut (shift pedal side) has left-hand threads.

   b. Turn the shift rod “2” to obtain the correct shift pedal position.



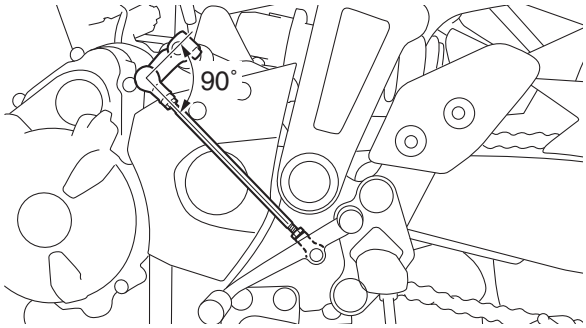
   c. Tighten both locknuts.

TIP

The shift rod locknut (shift pedal side) has left-hand threads.

Shift rod locknut (shift arm side)
9 N·m (0.9 kgf·m, 6.6 lb·ft)
Shift rod locknut (shift pedal side)
9 N·m (0.9 kgf·m, 6.6 lb·ft)
Left-hand threads

d. Make sure the installed shift rod length is within specification. Make sure that the installed shift rod length is within specification and that the angle between the shift arm and the shift rod is 90°.



8. Adjust:
   • Drive chain slack
   Refer to “DRIVE CHAIN SLACK” on page 3-17.

Drive chain slack (Maintenance stand)
51.0–56.0 mm (2.01–2.20 in)
Drive chain slack (Sidestand)
51.0–56.0 mm (2.01–2.20 in)
Drive chain slack limit
58.0 mm (2.28 in) (MT07PC)

ECA13550

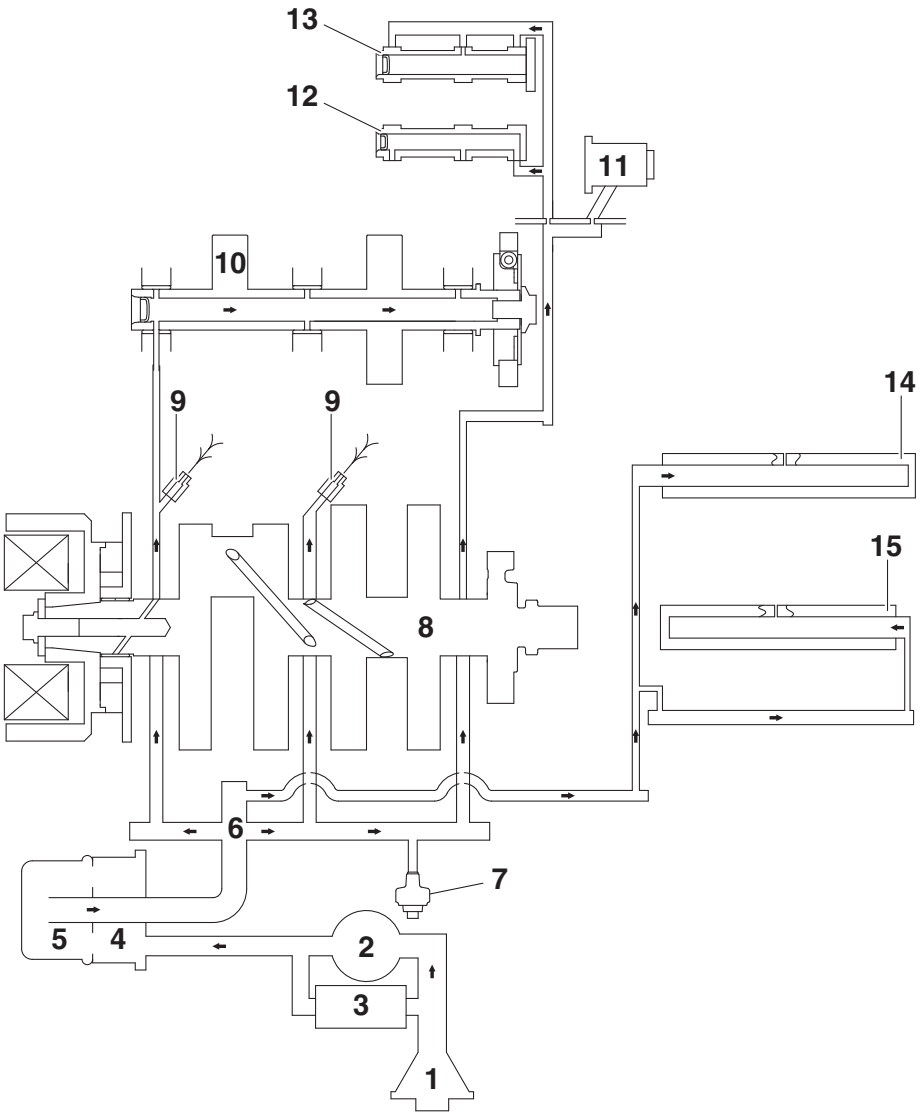
NOTICE

A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

ENGINE

EAS20298
LUBRICATION SYSTEM CHART AND DIAGRAMS

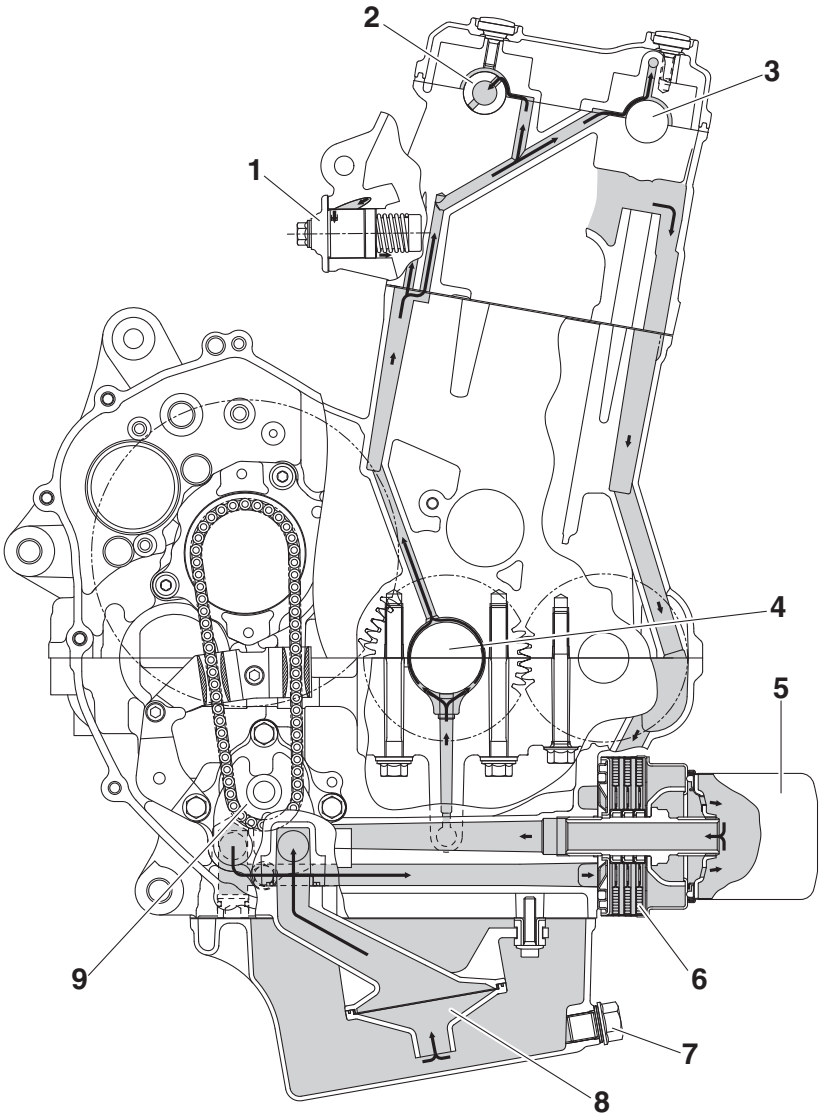
EAS32362
ENGINE OIL LUBRICATION CHART



1. Oil strainer
2. Oil pump
3. Relief valve
4. Oil cooler
5. Oil filter cartridge
6. Main gallery
7. Oil pressure switch
8. Crankshaft
9. Oil nozzle
10. Balancer shaft assembly
11. Timing chain tensioner
12. Intake camshaft
13. Exhaust camshaft
14. Main axle
15. Drive axle

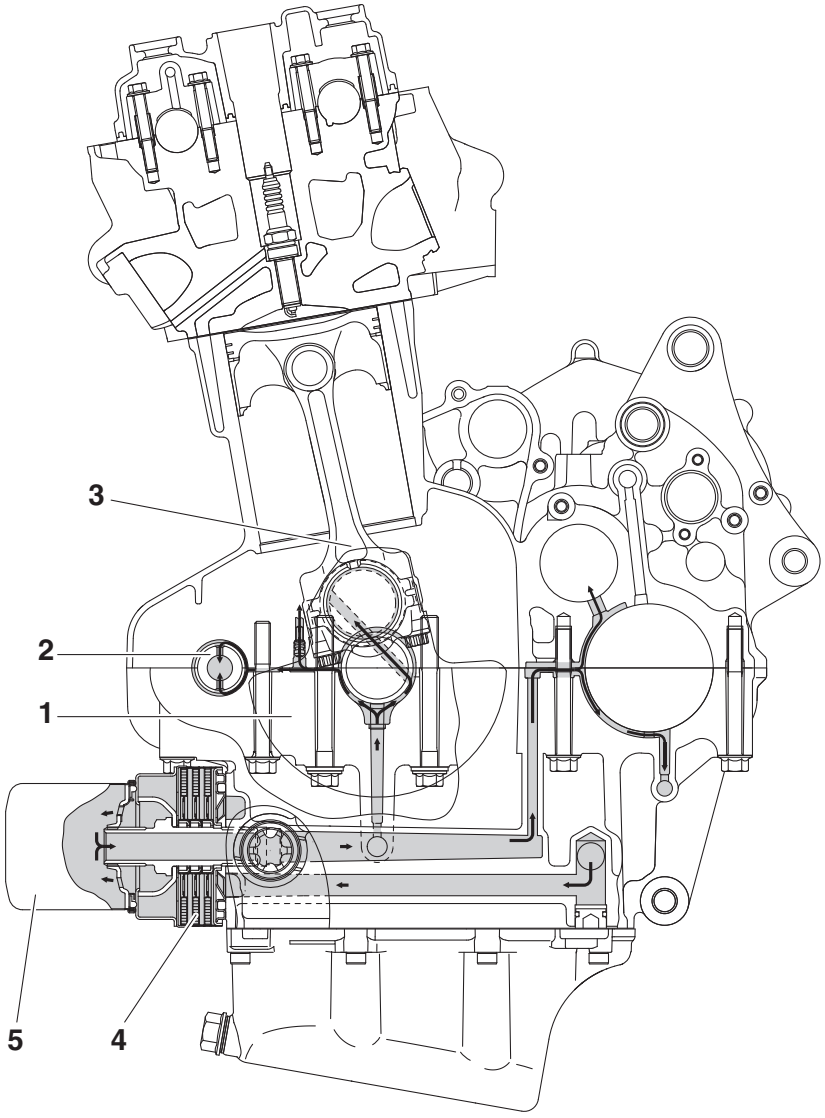
EAS32363
LUBRICATION DIAGRAMS

Crankcase, cylinder, and cylinder head (right side view)



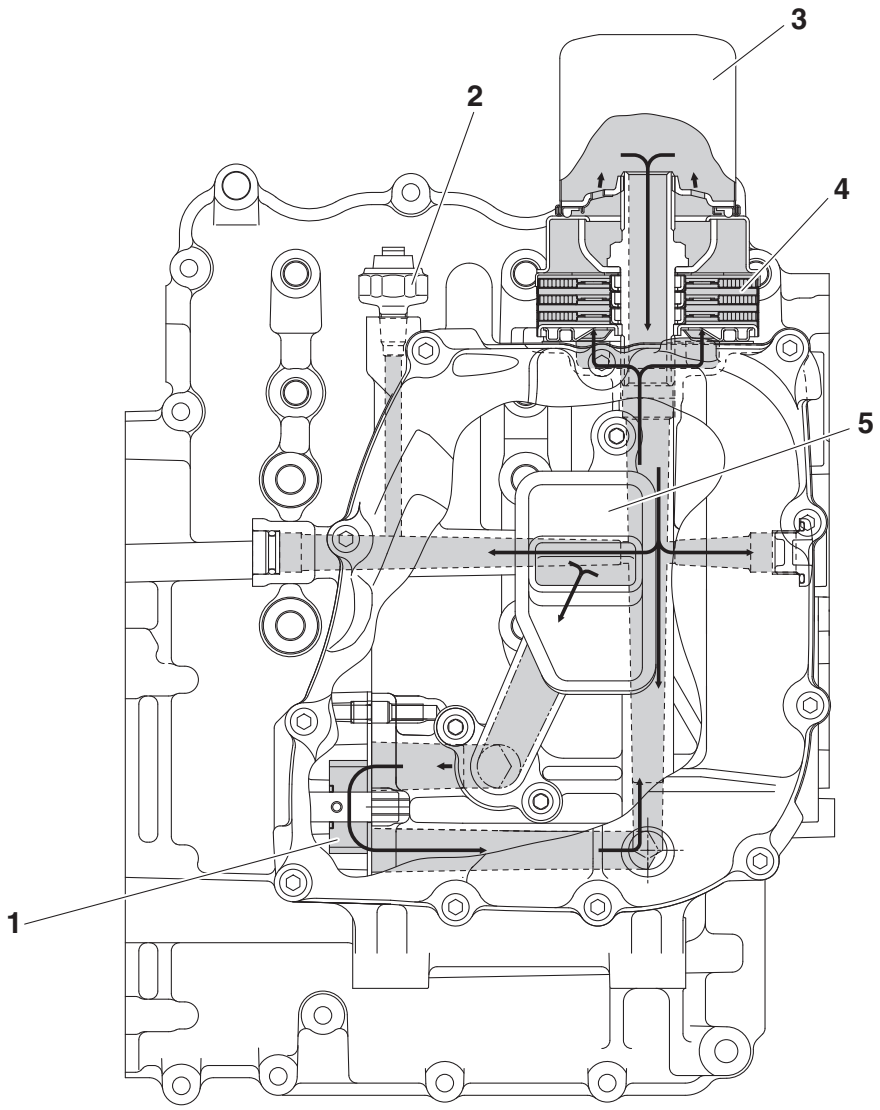
1. Timing chain tensioner
2. Intake camshaft
3. Exhaust camshaft
4. Crankshaft
5. Oil filter cartridge
6. Oil cooler
7. Oil drain bolt
8. Oil strainer
9. Oil pump

Crankcase and cylinder (left side view)



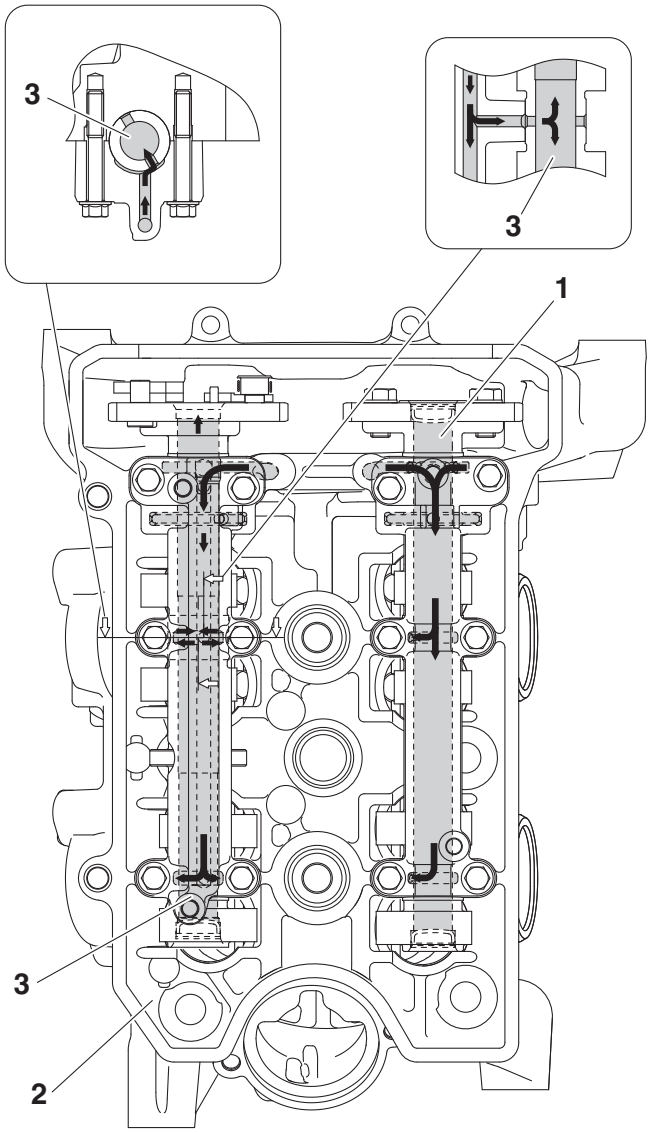
1. Crankshaft
2. Balancer shaft assembly
3. Connecting rod
4. Oil cooler
5. Oil filter cartridge

Oil pump (bottom view)



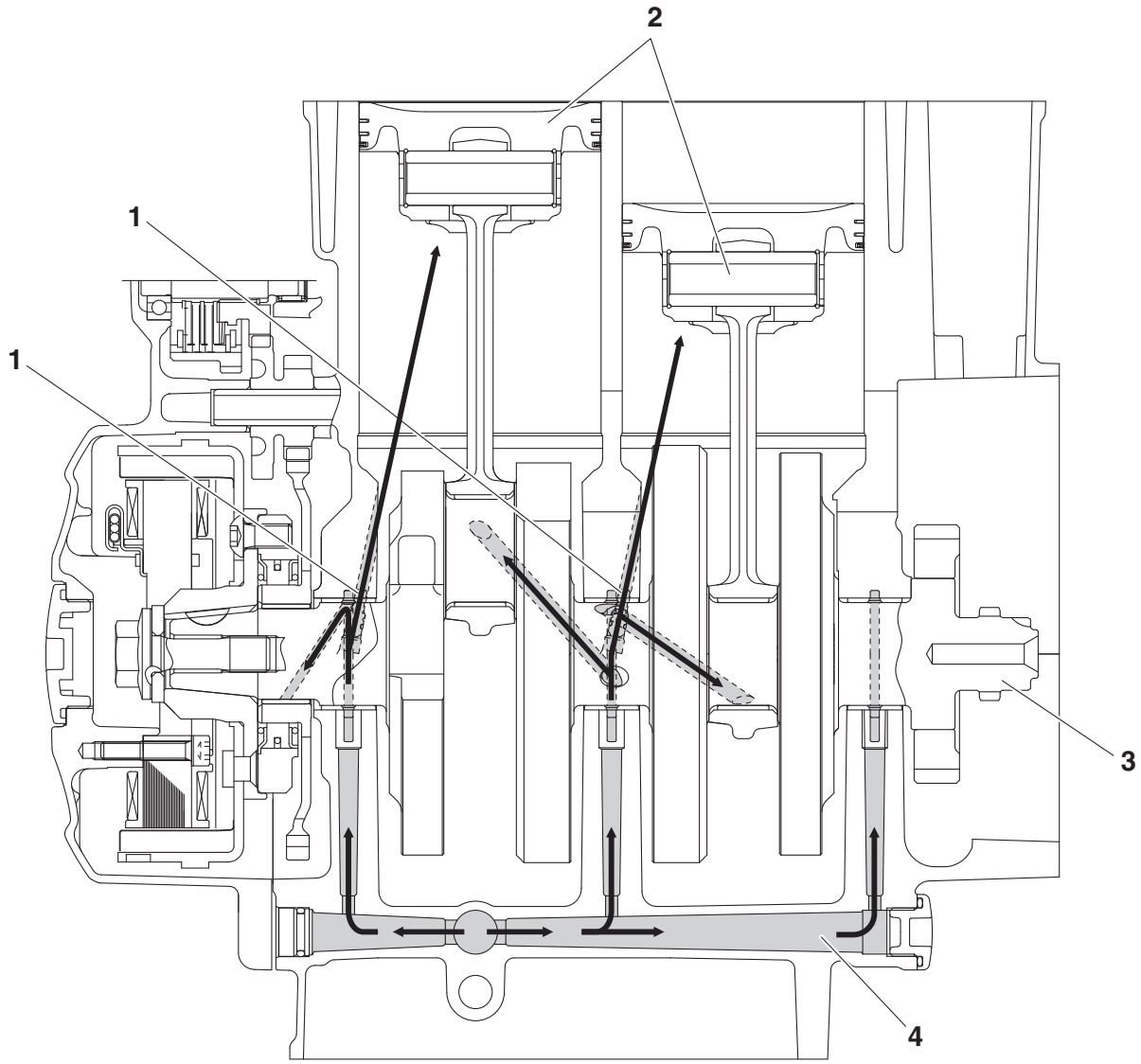
1. Oil pump
2. Oil pressure switch
3. Oil filter cartridge
4. Oil cooler
5. Oil strainer

Camshaft (top view)



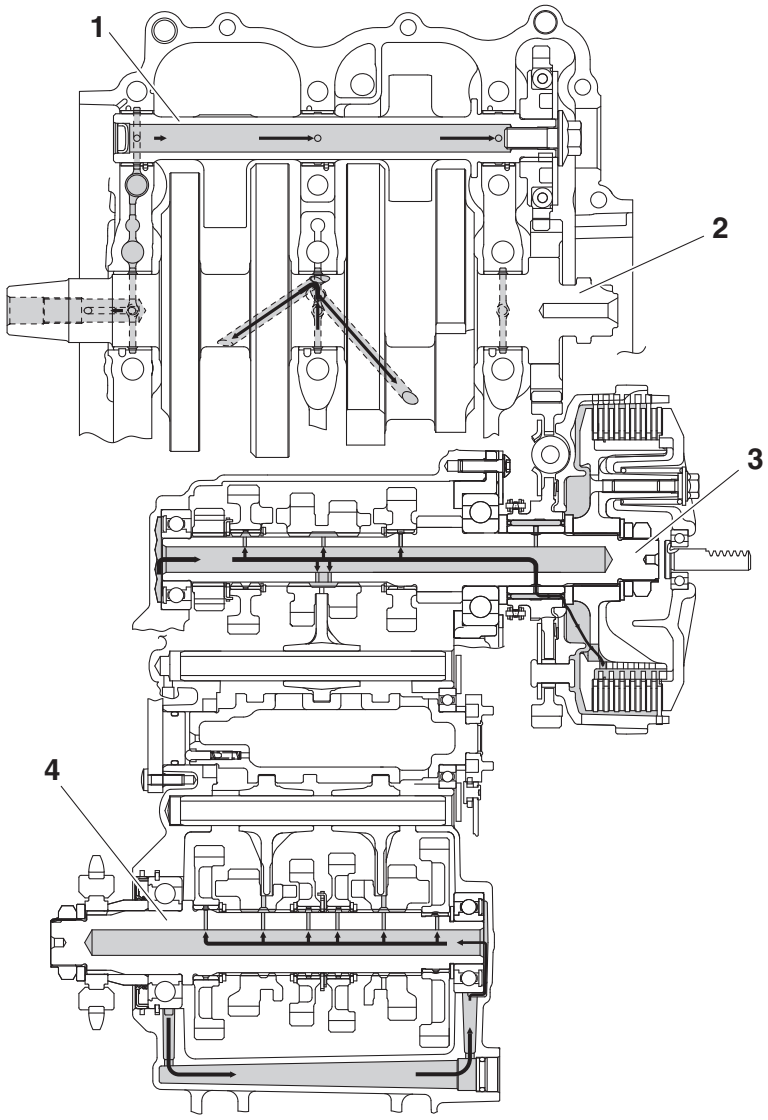
1. Intake camshaft
2. Cylinder head
3. Exhaust camshaft

Crankshaft (front view)



1. Oil nozzle
2. Piston
3. Crankshaft
4. Main gallery

Crankshaft and transmission (top view)



1. Balancer shaft assembly
2. Crankshaft
3. Main axle
4. Drive axle

EAS20041
ENGINE INSPECTION

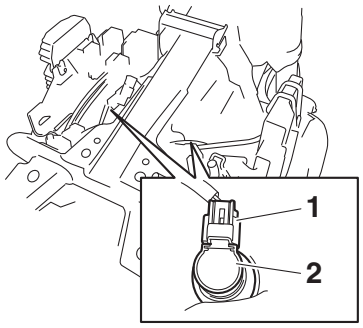
EAS30249
MEASURE THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

TIP

Insufficient compression pressure will result in a loss of performance.

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
     Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-6.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
   - Passenger seat
   - Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
4. Disconnect:
   - Ignition coil coupler "1"
5. Remove:
   - Ignition coil "2"



6. Remove:
   - Spark plug

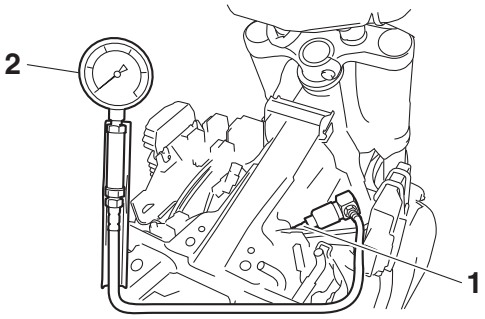
ECA13340

NOTICE

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

7. Install:
   - Extension "1"
   - Compression gauge "2"

Compression gauge extension 122mm
90890-04136
Compression gauge extension 122mm
YM-04136
Compression gauge
90890-03081
Engine compression tester
YU-33223



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

TIP

Due to the engine characteristics, the compression pressure is different for cylinder #1 and cylinder #2.

Compression pressure
765–985 kPa/355 r/min (7.7–9.9 kgf/cm²/355 r/min, 108.9–140.2 psi/355 r/min)
Compression pressure (#2 cylinder)
687–884 kPa/355 r/min (6.9–8.8 kgf/cm²/355 r/min, 97.8–125.8 psi/355 r/min)

   a. Turn the main switch to "ON".
   b. With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

EWA12940

⚠ WARNING

To prevent sparking, ground all spark plug leads before cranking the engine.

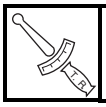
TIP

The difference in compression pressure between cylinders should not exceed 100 kPa (1 kgf/cm², 14 psi).

c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces and piston crown for carbon deposits.
   Carbon deposits → Eliminate.
d. 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	Pistons, valves, cylinder head gasket or piston ring(s) possibly defective → Repair.

9. Install:
   • Spark plug
   • Ignition coil



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

10. Connect:
    • Ignition coil coupler
11. Install:
    • Fuel tank
      Refer to "FUEL TANK" on page 7-1.
    • Fuel tank cover assembly
      Refer to "GENERAL CHASSIS (4)" on page 4-11.
    • Rider seat
    • Passenger seat
      Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS31133

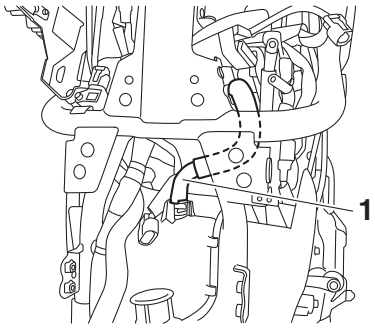
CHECKING THE CYLINDER HEAD BREATHER HOSE

1. Remove:
   • Passenger seat
   • Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   • Air scoop (left)
   • Air scoop (right)
   • Fuel tank center cover (fuel tank side covers)
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   • Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Check:
   • Cylinder head breather hose "1"
     Cracks/damage → Replace.
     Loose connection → Connect properly.

ECA14920

NOTICE

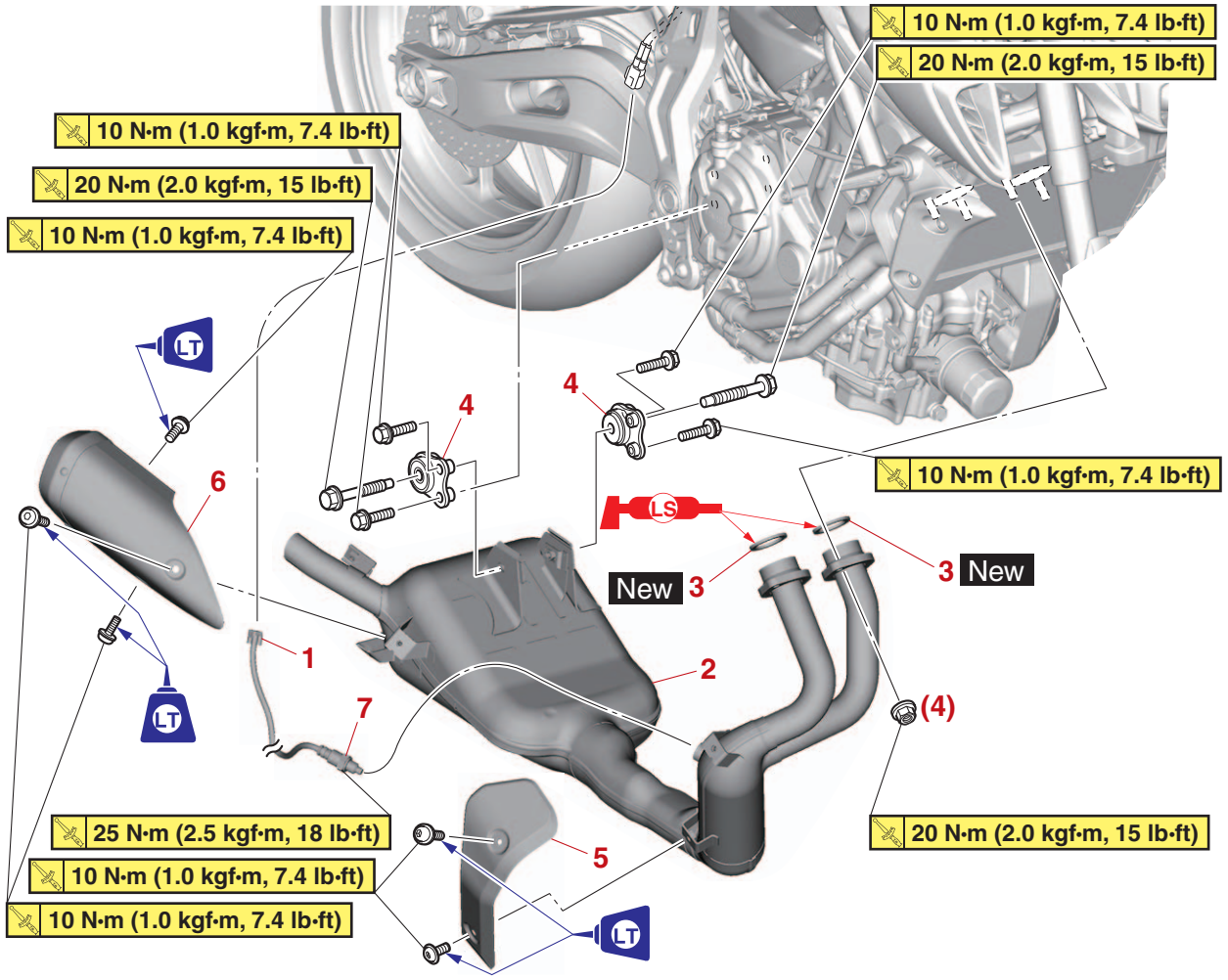
Make sure the cylinder head breather hose is routed correctly.



3. Install:
   • Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   • Fuel tank center cover (fuel tank side covers)
   • Air scoop (right)
   • Air scoop (left)
     Refer to "GENERAL CHASSIS (4)" on page 4-11.
   • Rider seat
   • Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

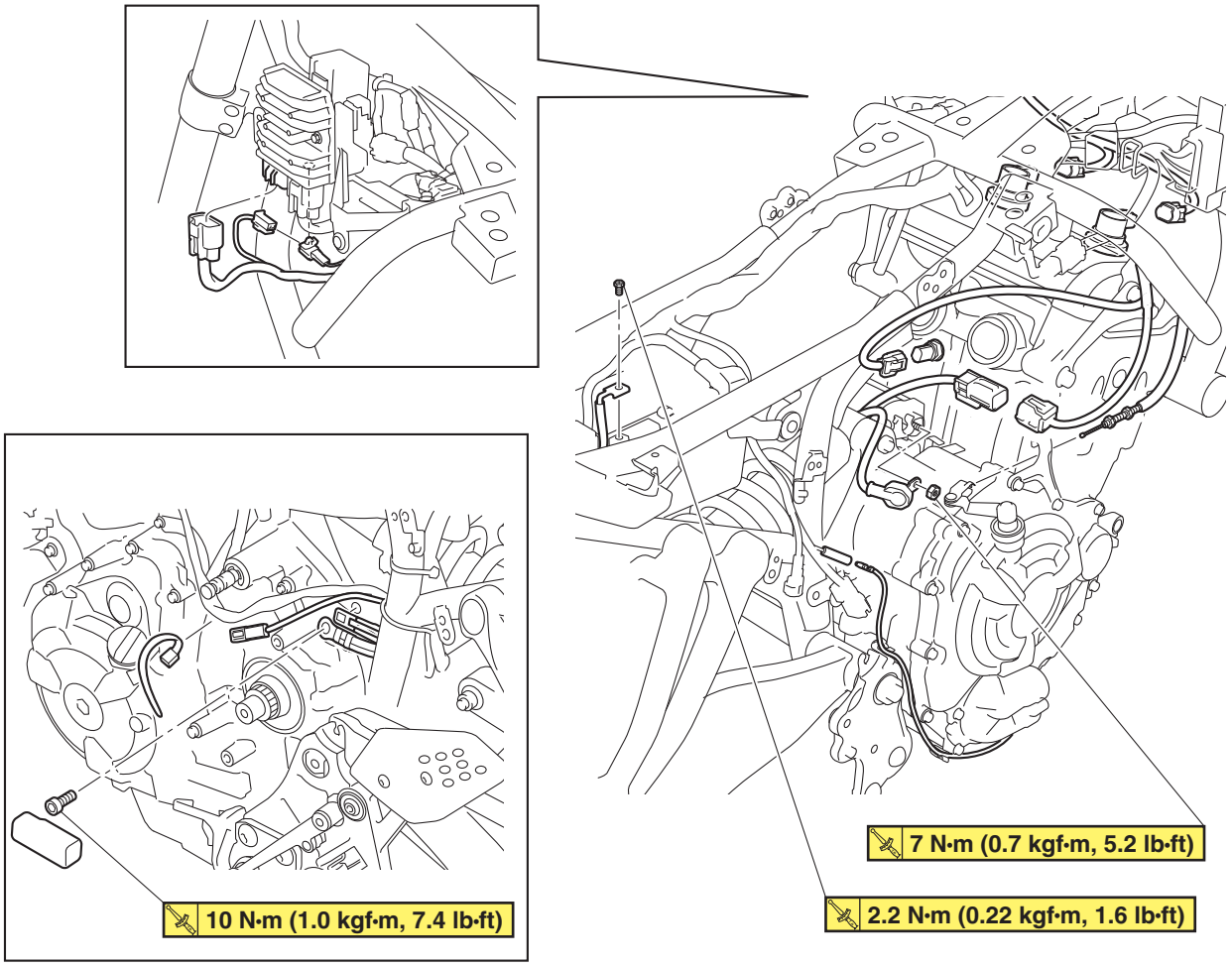
EAS20042
ENGINE REMOVAL

Removing the muffler and exhaust pipe



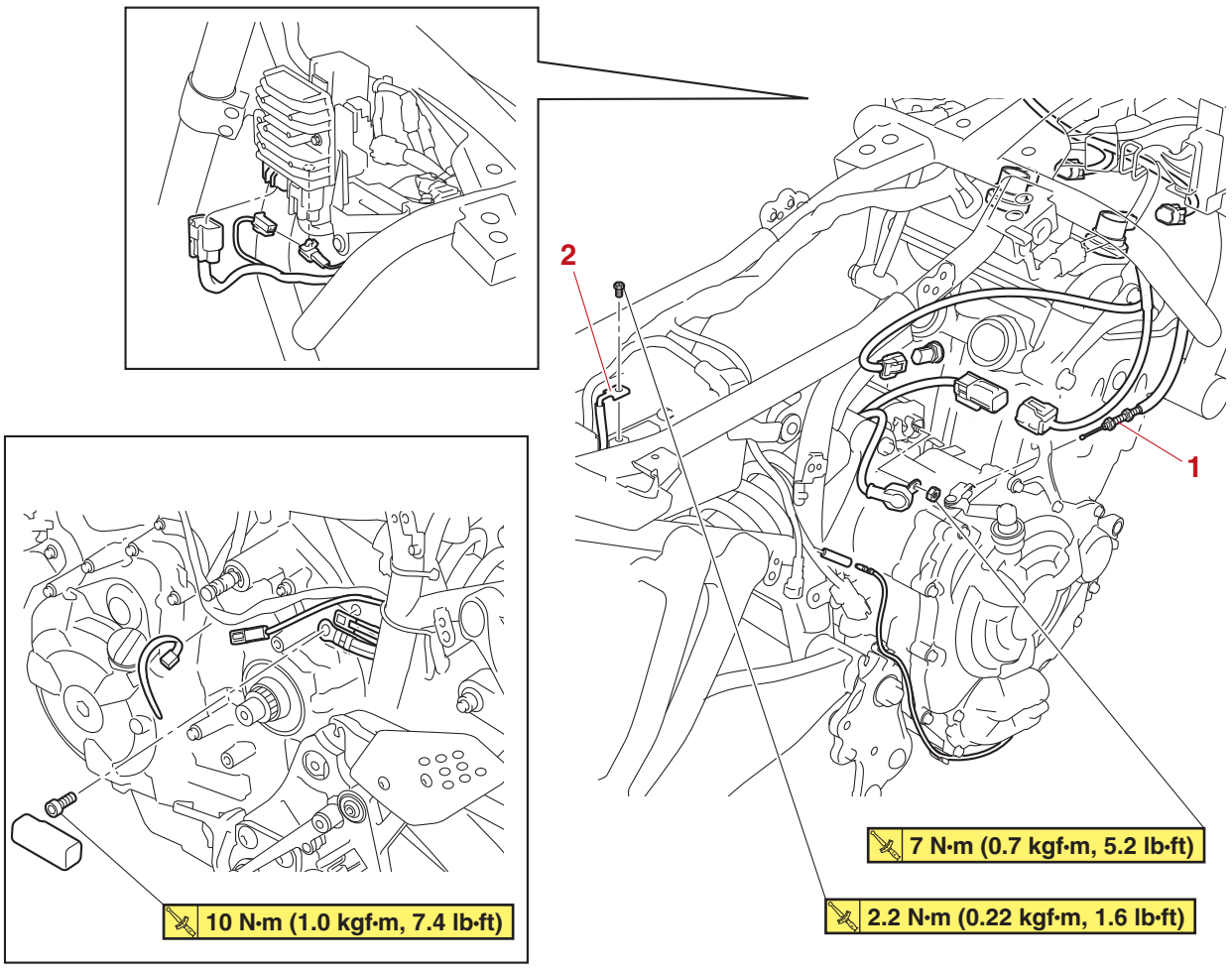
Order	Job/Parts to remove	Q'ty	Remarks
	Pivot shaft protector (right)		Refer to "SWINGARM" on page 4-92.
	Footrest assembly (right)		Refer to "REAR BRAKE" on page 4-48.
1	O_2 sensor coupler	1	Disconnect.
2	Muffler assembly	1	
3	Exhaust gasket	2	
4	Muffler bracket	2	
5	Exhaust pipe protector	1	
6	Muffler cover	1	
7	O_2 sensor	1	Remove the O_2 sensor only when necessary.

Disconnecting the leads and hoses



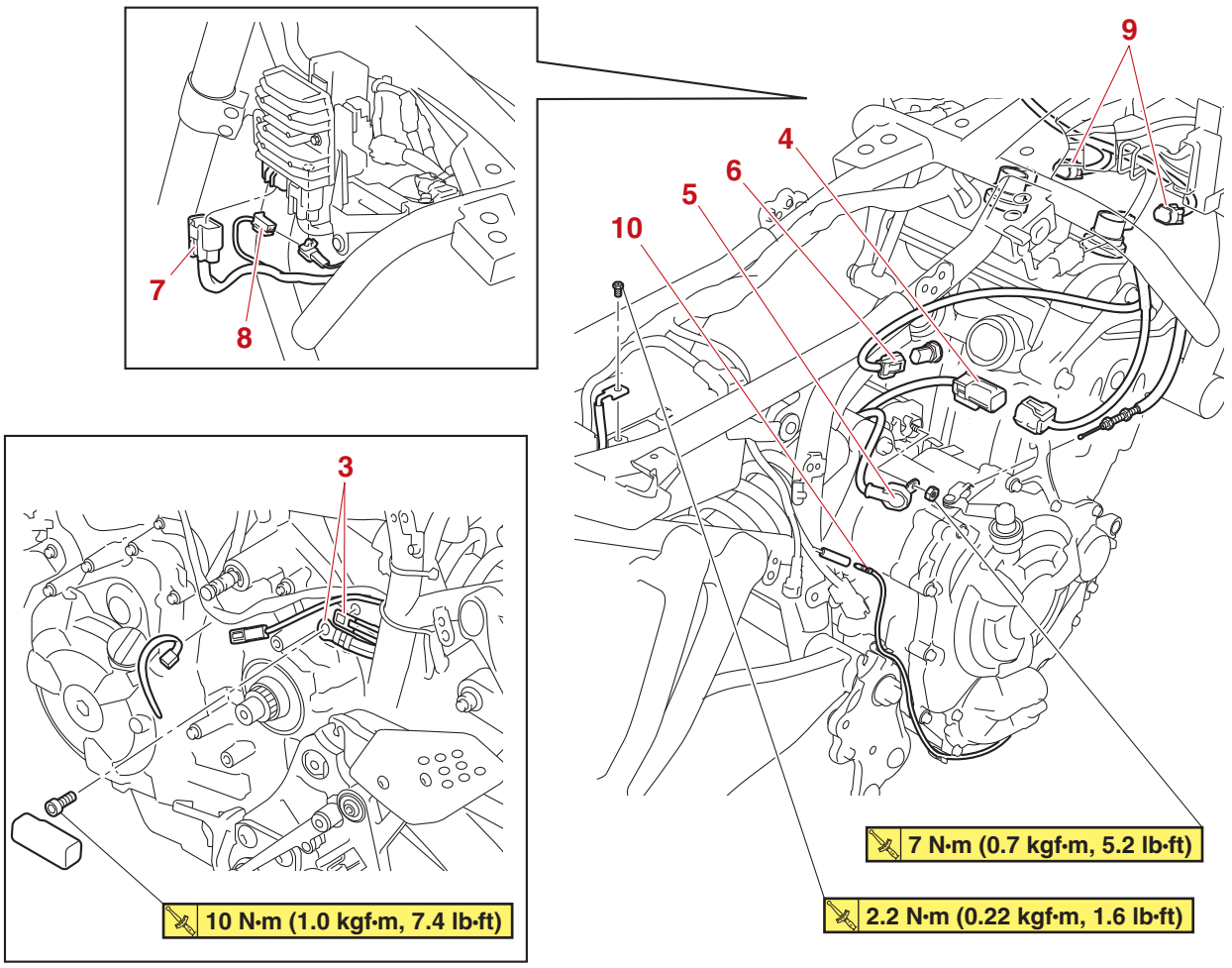
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Pivot shaft protectors/Sidestand/Footrest assembly (left)		Refer to "SWINGARM" on page 4-92.
	Brake fluid reservoir/Footrest assembly (right)		Refer to "REAR BRAKE" on page 4-48.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Canister/Purge cut valve solenoid		For California only. Refer to "FUEL TANK" on page 7-1.
	Air duct bracket		Refer to "AIR FILTER" on page 7-7.
	Throttle bodies/Air filter case/Cylinder head breather hose		Refer to "THROTTLE BODIES" on page 7-9.

Disconnecting the leads and hoses



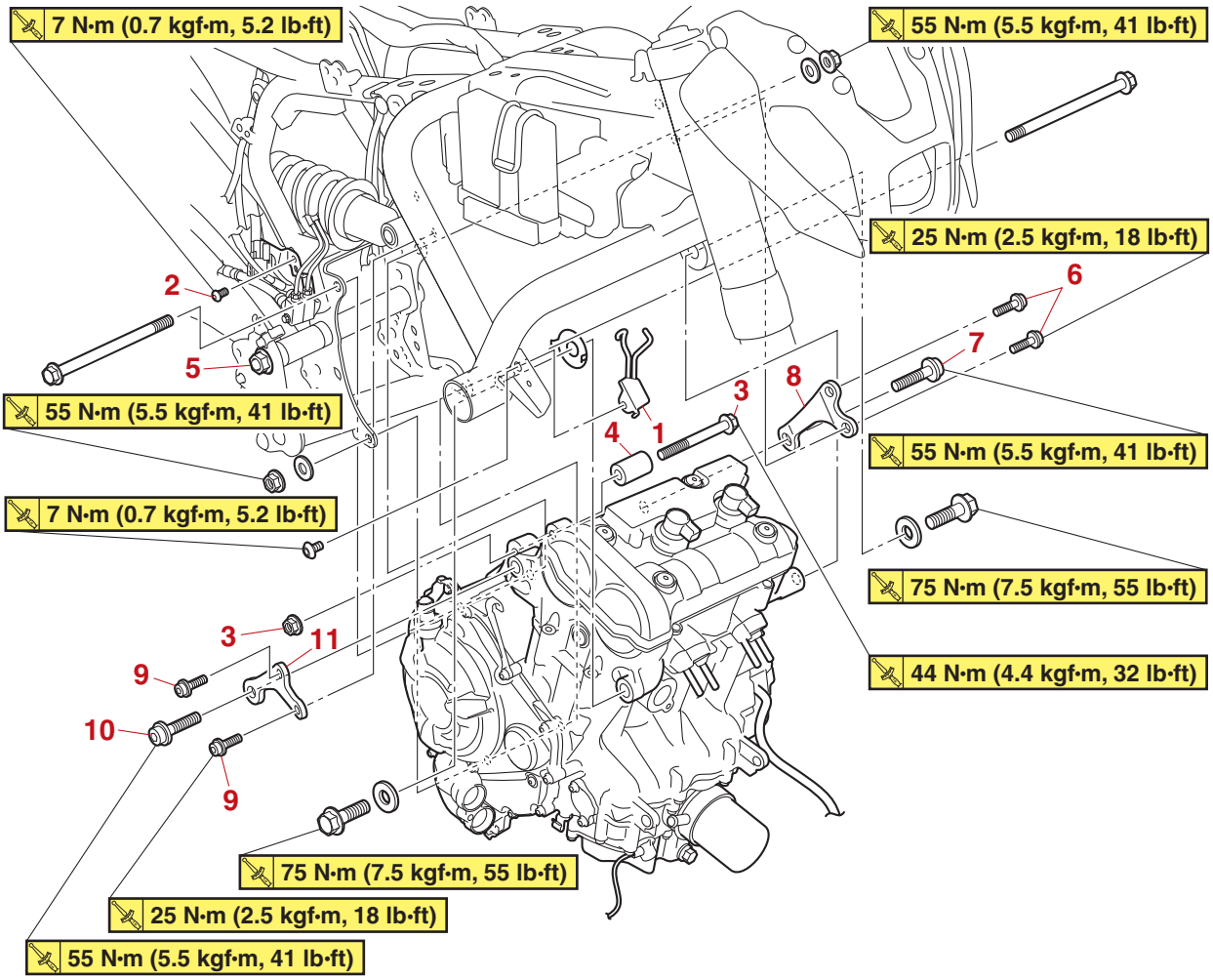
Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-24.
	Radiator/Coolant reservoir		Refer to "RADIATOR" on page 6-2.
	Oil cooler outlet hose/Oil cooler inlet hose		Refer to "OIL COOLER" on page 6-6.
	Water pump inlet pipe/Water pump outlet pipe		Refer to "WATER PUMP" on page 6-11.
	Drive chain/Drive sprocket		Refer to "CHAIN DRIVE" on page 4-98.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
1	Clutch cable	1	Disconnect.
2	Negative battery lead	1	Disconnect.

Disconnecting the leads and hoses



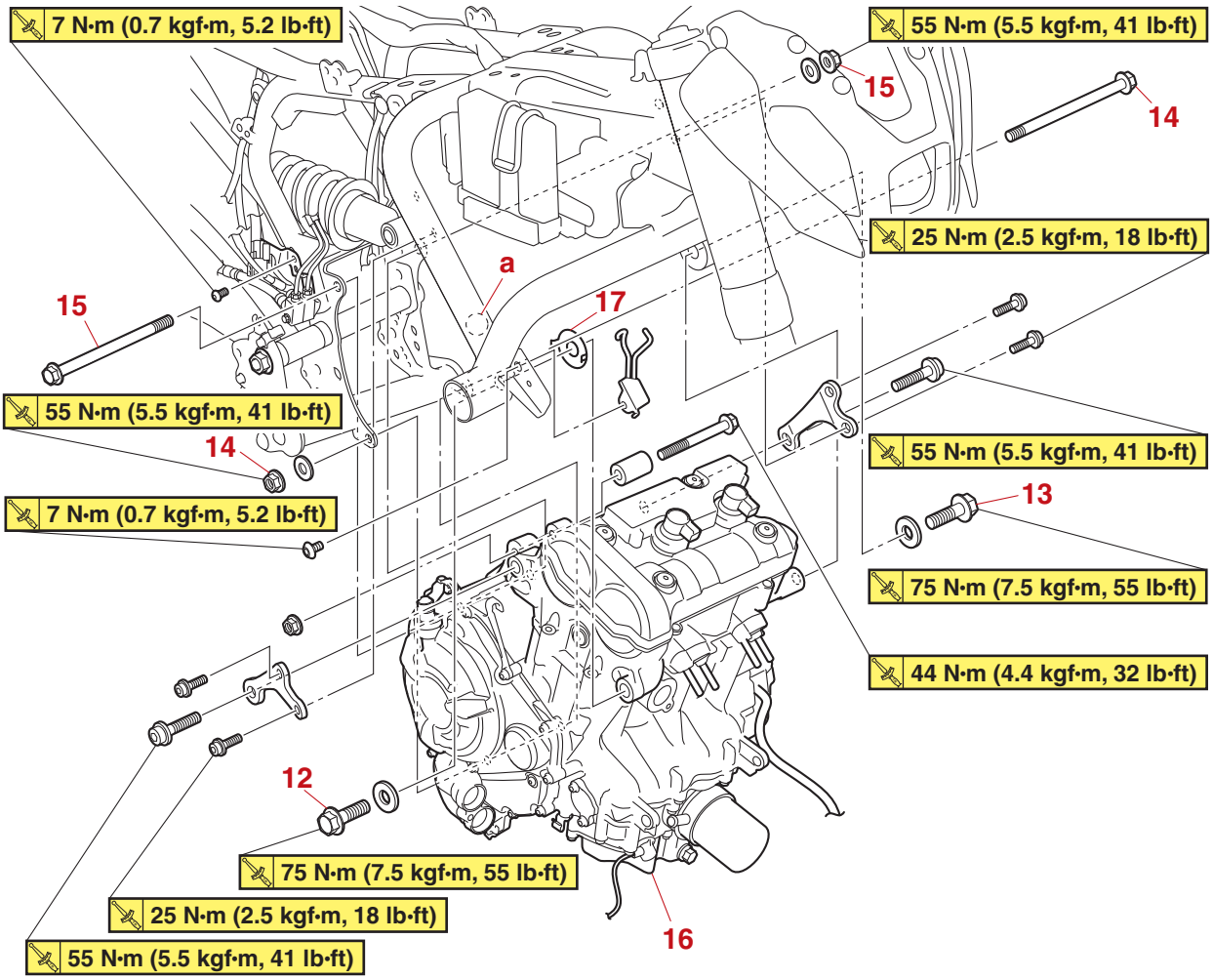
Order	Job/Parts to remove	Q'ty	Remarks
3	Engine ground lead	2	Disconnect.
4	Gear position switch coupler	1	Disconnect.
5	Starter motor lead	1	Disconnect.
6	Coolant temperature sensor coupler	1	Disconnect.
7	Stator coil coupler	1	Disconnect.
8	Crankshaft position sensor coupler	1	Disconnect.
9	Ignition coil coupler	2	Disconnect.
10	Oil pressure switch connector	1	Disconnect.

Removing the engine



Order	Job/Parts to remove	Q'ty	Remarks
1	Clutch cable guide	1	
2	Rear brake hose joint bracket bolt	1	
3	Rear shock absorber assembly bolt/Nut (front side)	1/1	
4	Spacer	1	
5	Pivot shaft nut	1	Loosen.
6	Engine bracket bolt (left)	2	
7	Engine mounting bolt (left upper side)	1	
8	Engine bracket (left)	1	
9	Engine bracket bolt (right)	2	
10	Engine mounting bolt (right upper side)	1	
11	Engine bracket (right)	1	

Removing the engine

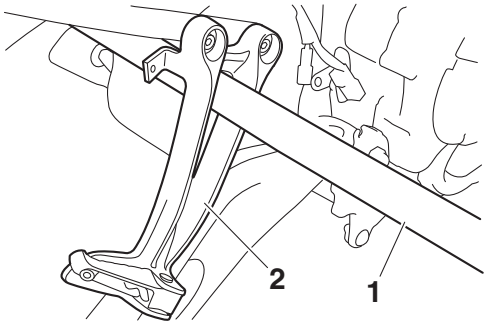


Order	Job/Parts to remove	Q'ty	Remarks
12	Engine mounting bolt (right front side)	1	
13	Engine mounting bolt (left front side)	1	
14	Engine mounting bolt/Nut (rear lower side)	1/1	
15	Engine mounting bolt/Nut (rear upper side)	1/1	
16	Engine	1	
17	Plate	1	Install the plate only for frames that have a stamped "1" mark at the location "a".

EAS30250
REMOVING THE ENGINE

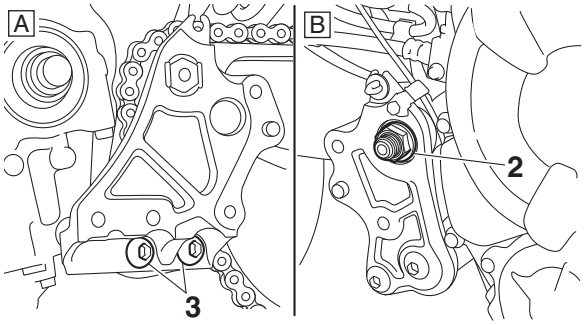
TIP

Pass a suitable rod “1” through the holes in the brackets of the passenger footrests “2” and secure the rod to support the vehicle.



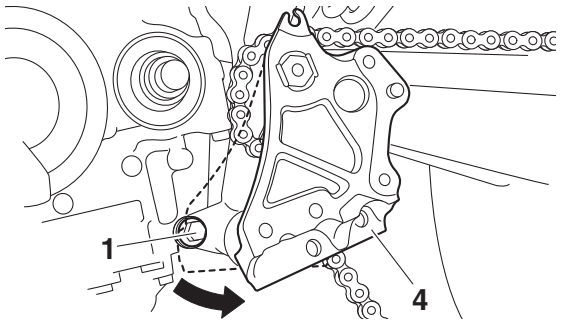
1. Remove:
   - Engine mounting bolt (rear lower side) “1”

   a. Loosen the pivot shaft nut “2”, and then remove the footrest bracket bolts “3”.



A. Left side
B. Right side

   b. Move the footrest bracket “4” rearward, and then loosen the engine mounting bolt (rear lower side).



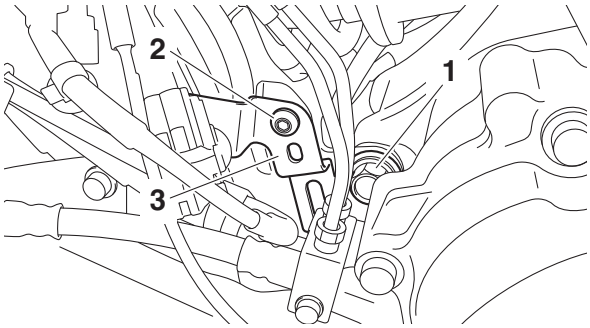
2. Remove:
   - Engine mounting bolt (rear upper side) “1”

   a. Remove the rear brake hose joint bracket bolt “2”.
   b. Move the rear brake hose joint bracket “3” slightly rearward, and then remove the engine mounting bolt (rear upper side).

ECA21181

NOTICE

Do not move the rear brake hose joint bracket more than necessary. Otherwise, the brake hoses could bend and break.

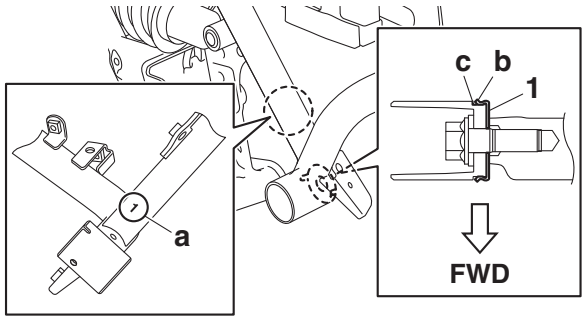


EAS30251
INSTALLING THE ENGINE

1. Install:
   (for models with a stamped “1” mark on the frame)
   - Plate “1”

TIP

- Install the plate only for frames that have a stamped “1” mark at the location “a”.
- Fit the projections “b” on the plate into the slots “c” in the frame.



2. Install:
   - Engine “2”
3. Install:
   - Engine mounting bolt (rear upper side) “3”
   - Engine mounting nut (rear upper side) “4”
   - Engine mounting bolt (rear lower side) “5”
   - Engine mounting nut (rear lower side) “6”
   - Engine mounting bolt (left front side) “7”
   - Engine mounting bolt (right front side) “8”
   - Engine mounting bolt (right upper side) “9”
   - Engine bracket bolt (right) “10”
   - Engine bracket (right) “11”

TIP

Temporarily tighten the bolts and nuts.

4. Tighten:
   - Engine mounting nut (rear upper side) “4”
   - Engine mounting nut (rear lower side) “6”
   - Engine mounting bolt (left front side) “7”

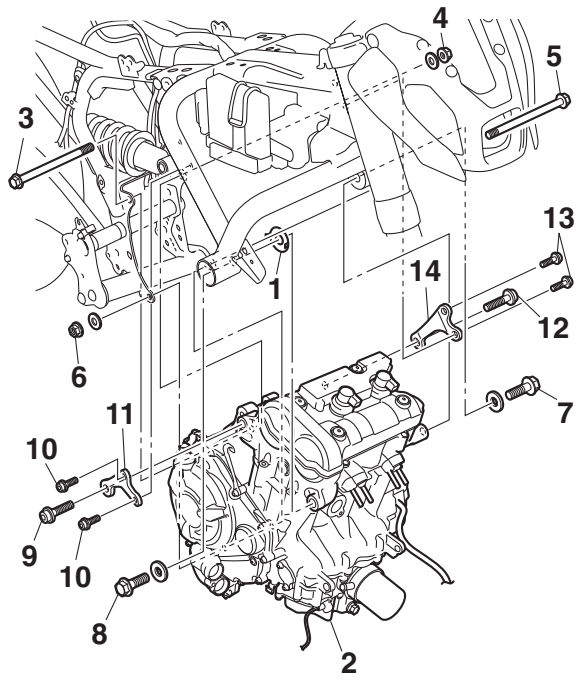
Engine mounting nut (rear upper side)
55 N·m (5.5 kgf·m, 41 lb·ft)
Engine mounting nut (rear lower side)
55 N·m (5.5 kgf·m, 41 lb·ft)
Engine mounting bolt (left front side)
75 N·m (7.5 kgf·m, 55 lb·ft)

5. Install:
   - Engine mounting bolt (left upper side) “12”
   - Engine bracket bolt (left) “13”
   - Engine bracket (left) “14”

TIP
Temporarily tighten the bolts.

6. Tighten:
   - Engine mounting bolt (left upper side) “12”
   - Engine mounting bolt (right front side) “8”
   - Engine mounting bolt (right upper side) “9”
   - Engine bracket bolt (right) “10”
   - Engine bracket bolt (left) “13”

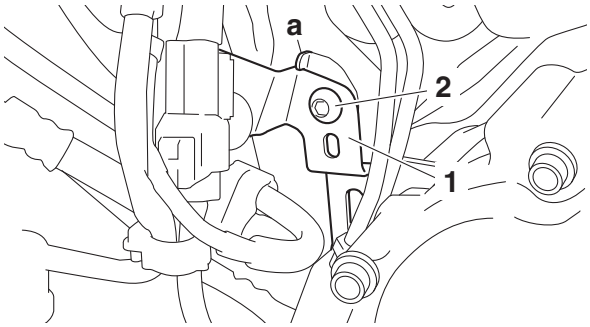
Engine mounting bolt (left upper side)
55 N·m (5.5 kgf·m, 41 lb·ft)
Engine mounting bolt (right front side)
75 N·m (7.5 kgf·m, 55 lb·ft)
Engine mounting bolt (right upper side)
55 N·m (5.5 kgf·m, 41 lb·ft)
Engine bracket bolt (right)
25 N·m (2.5 kgf·m, 18 lb·ft)
Engine bracket bolt (left)
25 N·m (2.5 kgf·m, 18 lb·ft)



7. Install:
   - Rear brake hose joint bracket “1”
   - Rear brake hose joint bracket bolt “2”

Rear brake hose joint bracket bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

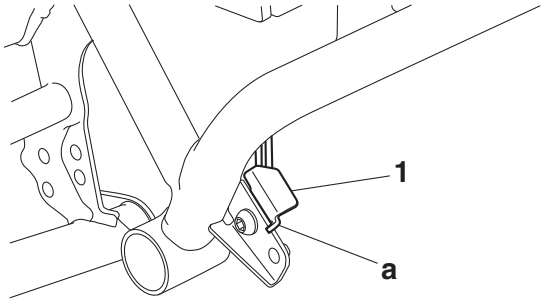
TIP
Make sure that the rear brake hose joint bracket contacts the projection “a” on the frame.



8. Install:
   - Clutch cable guide “1”

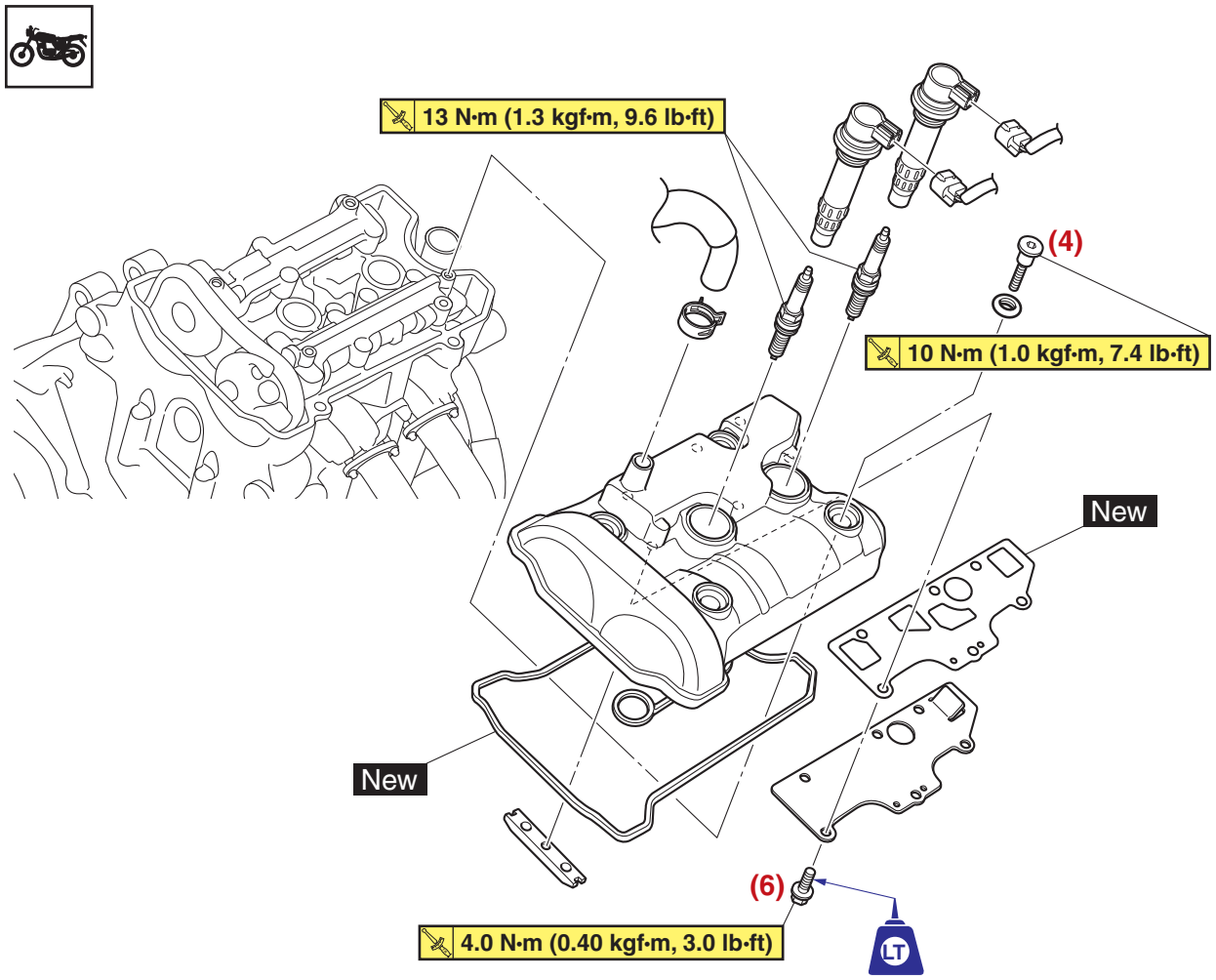
Clutch cable guide bolt
7 N·m (0.7 kgf·m, 5.2 lb·ft)

TIP
Make sure that the projection “a” on the clutch cable guide contacts the frame.


1
a

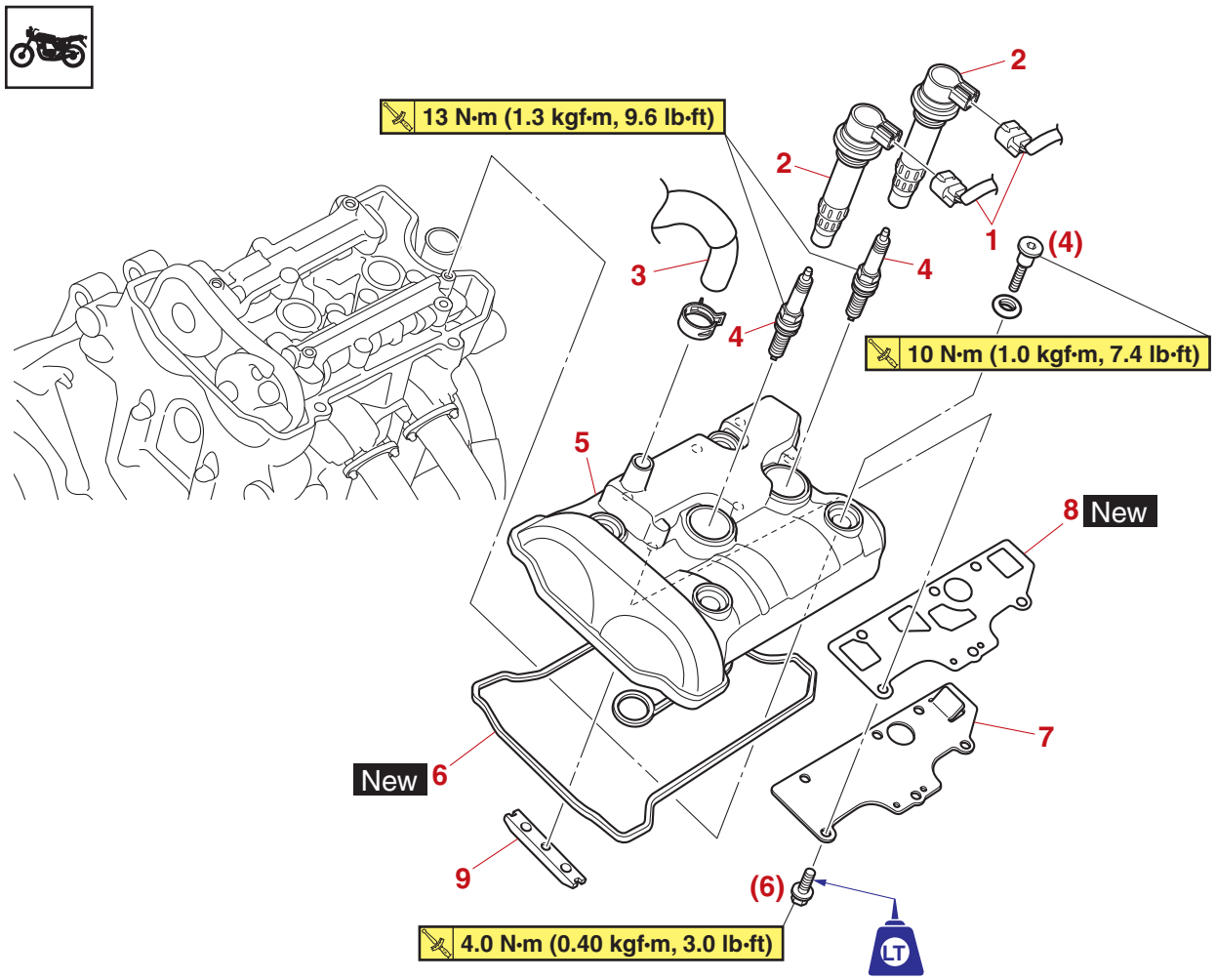
EAS20043
CAMSHAFTS

Removing the cylinder head cover



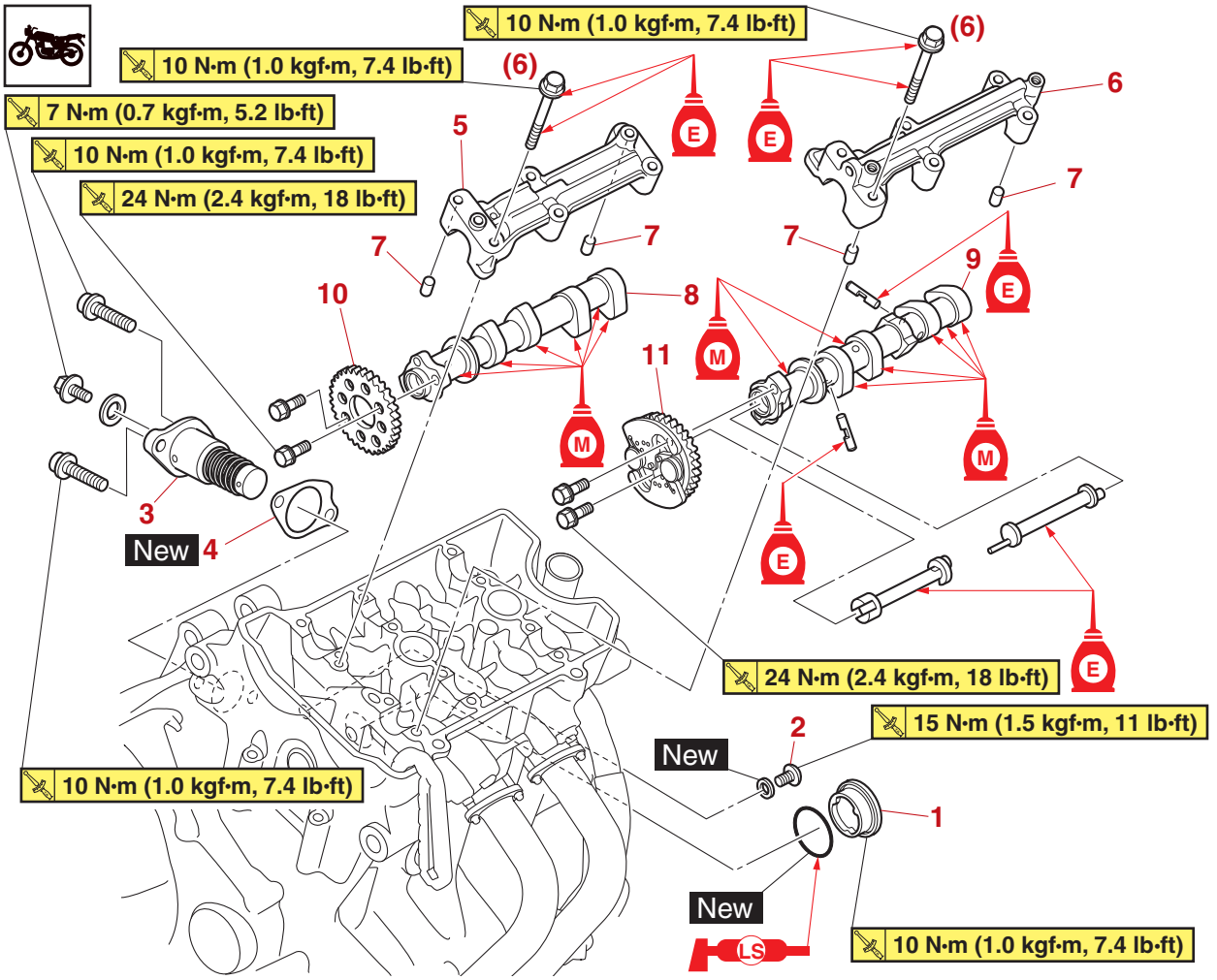
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank top cover/Fuel tank side cover assembly (right)/Fuel tank side cover assembly (left)		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Electrical components tray bracket		For California only. Refer to "GENERAL CHASSIS (5)" on page 4-15.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-24.
	Radiator inlet hose/Radiator		Refer to "RADIATOR" on page 6-2.
	Clutch cable guide		Refer to "ENGINE REMOVAL" on page 5-10.

Removing the cylinder head cover



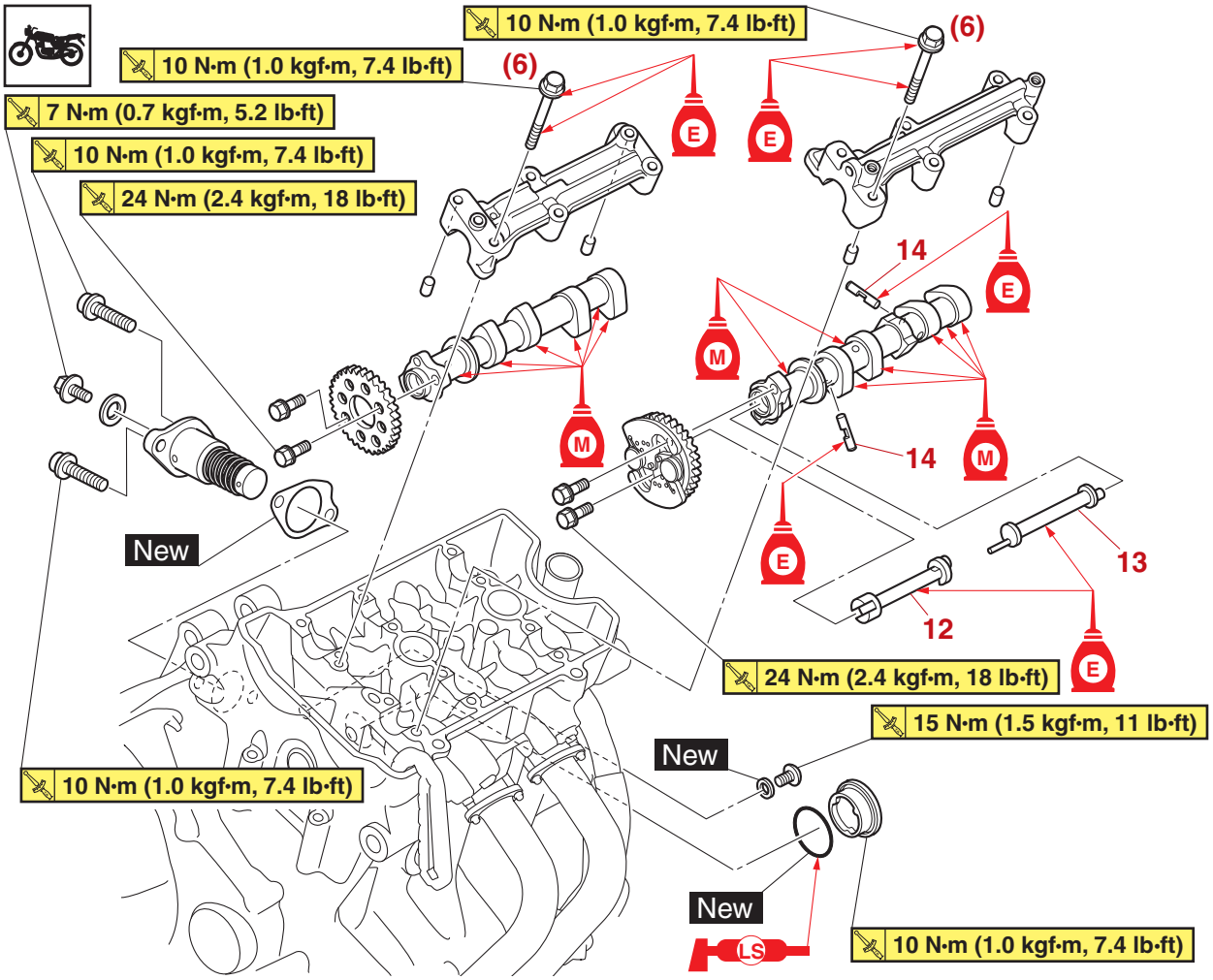
Order	Job/Parts to remove	Q'ty	Remarks
1	Ignition coil coupler	2	Disconnect.
2	Ignition coil	2	
3	Cylinder head breather hose	1	Disconnect.
4	Spark plug	2	
5	Cylinder head cover	1	
6	Cylinder head cover gasket	1	
7	Breather plate	1	
8	Breather plate gasket	1	
9	Timing chain guide (upper side)	1	

Removing the camshafts



Order	Job/Parts to remove	Q'ty	Remarks
1	Crankshaft end cover	1	
2	Timing mark accessing bolt	1	
3	Timing chain tensioner	1	
4	Timing chain tensioner gasket	1	
5	Intake camshaft cap	1	
6	Exhaust camshaft cap	1	
7	Dowel pin	4	
8	Intake camshaft	1	
9	Exhaust camshaft	1	
10	Intake camshaft sprocket	1	
11	Exhaust camshaft sprocket	1	

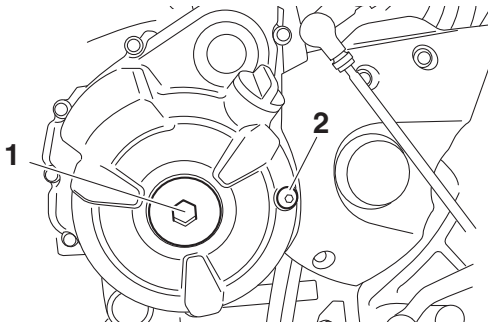
Removing the camshafts



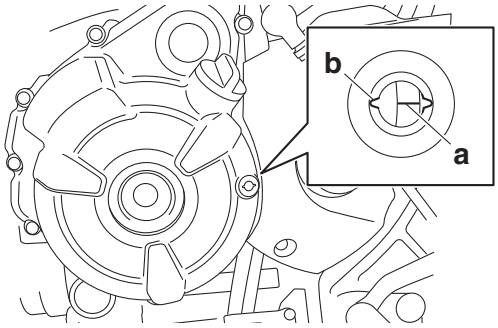
Order	Job/Parts to remove	Q'ty	Remarks
12	Decompressor lever #2	1	
13	Decompressor lever #1	1	
14	Decompressor lever pin	2	

EAS30256
REMOVING THE CAMSHAFTS

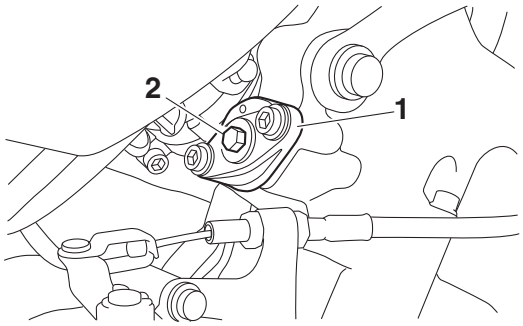
1. Remove:
   • Crankshaft end cover “1”
   • Timing mark accessing bolt “2”



2. Align:
   • Mark “a” on the generator rotor (with the slot “b” in the generator rotor cover)
   a. Turn the crankshaft counterclockwise.
   b. When piston #1 is at TDC on the exhaust stroke, align the TDC mark “a” on the generator rotor with the slot “b” in the generator rotor cover.



3. Remove:
   • Timing chain tensioner “1”
   • Timing chain tensioner gasket
   a. Insert the hexagon wrench “2” (part No.: 1WS-12228-00) into the timing chain tensioner.
   b. Remove the timing chain tensioner.



4. Remove:
   • Intake camshaft cap
   • Exhaust camshaft cap

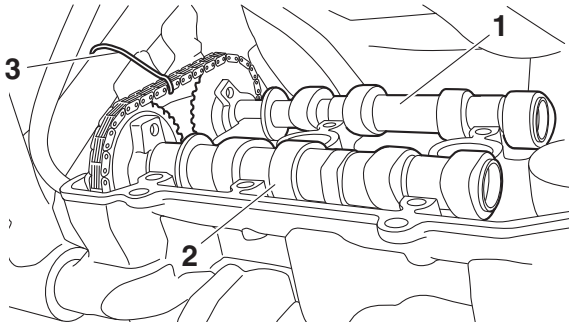
ECA13720
NOTICE

To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a criss-cross pattern, working from the outside in.

5. Remove:
   • Intake camshaft “1”
   • Exhaust camshaft “2”

TIP

To prevent the timing chain from falling into the crankcase, fasten it with a wire “3”.

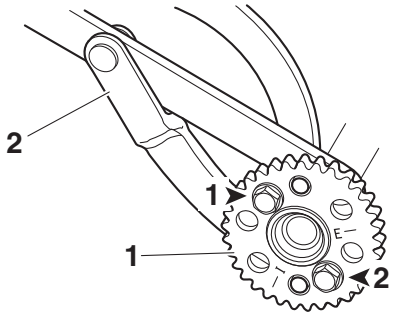


6. Remove:
   • Intake camshaft sprocket “1”

TIP

While holding the intake camshaft sprocket with the rotor holding tool “2”, loosen the intake camshaft sprocket bolts.

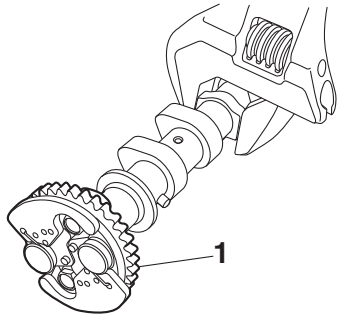
Rotor holding tool
90890-01235
Universal magneto and rotor holder
YU-01235



7. Remove:
   • Exhaust camshaft sprocket “1”

TIP

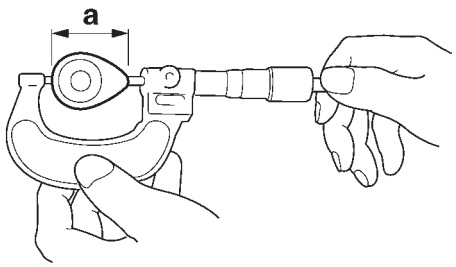
While holding the exhaust camshaft with a suitable tool, loosen the exhaust camshaft sprocket bolts.



EAS30257
CHECKING THE CAMSHAFTS

1. Check:
   • Camshaft lobe
   Blue discoloration/pitting/scratches → Replace the camshaft.
2. Measure:
   • Camshaft lobe dimension “a”
   Out of specification → Replace the camshaft.

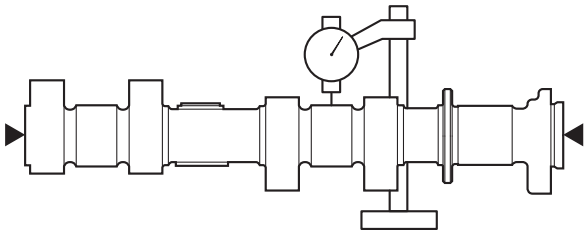
Camshaft lobe dimensions
Lobe height limit (Intake)
35.510 mm (1.3980 in)
Lobe height limit (Exhaust)
35.610 mm (1.4020 in)



G088946

3. Measure:
   • Camshaft runout
   Out of specification → Replace.

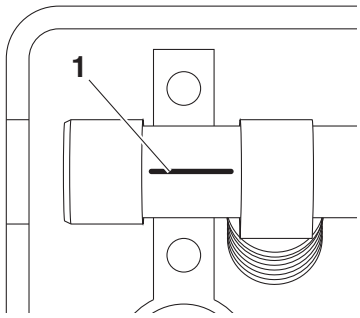
Camshaft runout limit
0.030 mm (0.0012 in)



4. Measure:
   • Camshaft-journal-to-camshaft-cap clearance
   Out of specification → Measure the camshaft journal diameter.

Camshaft-journal-to-camshaft-cap clearance limit
0.080 mm (0.0032 in)

a. Install the camshafts into the cylinder head (without the camshaft caps).
b. Position a strip of Plastigauge® “1” onto the camshaft journal as shown.



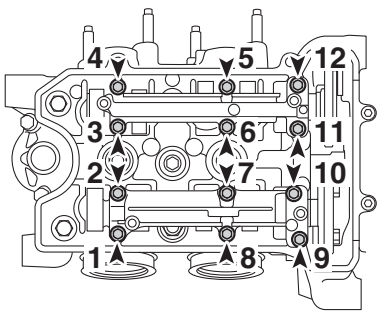
G088947

c. Install the dowel pins and camshaft caps.

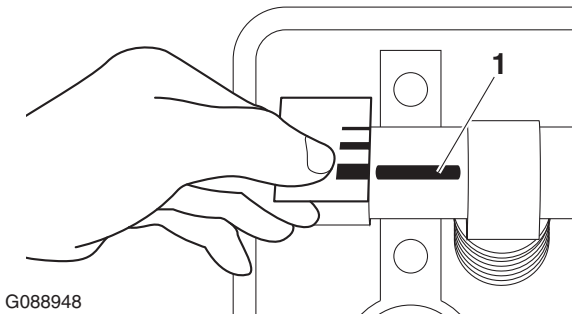
ECA13730
NOTICE
The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft caps, and camshafts will result.

TIP
- Tighten the camshaft cap bolts in the tightening sequence as shown.
- Do not turn the camshaft when measuring the camshaft journal-to-camshaft cap clearance with the Plastigauge®.

Exhaust camshaft cap bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)
Intake camshaft cap bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

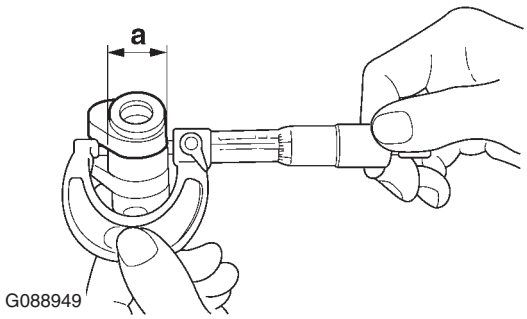


d. Remove the camshaft caps, and then measure the width of the Plastigauge® “1”.



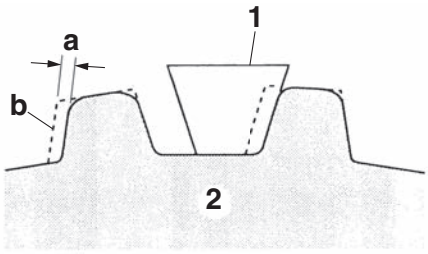
5. Measure:
   • Camshaft journal diameter "a"
   Out of specification → Replace the camshaft.
   Within specification → Replace the cylinder head and camshaft caps as a set.

Camshaft journal diameter
21.959–21.972 mm (0.8645–0.8650 in)



EAS30936
CHECKING THE CAMSHAFT SPROCKETS

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



a. 1/4 tooth
b. Correct

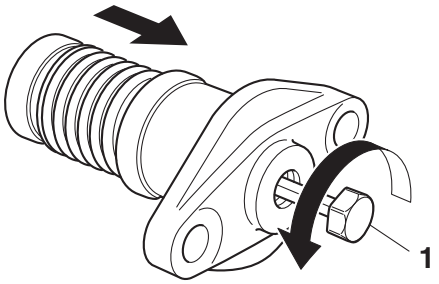
1. Timing chain
2. Camshaft sprocket

EAS30266
CHECKING THE TIMING CHAIN TENSIONER

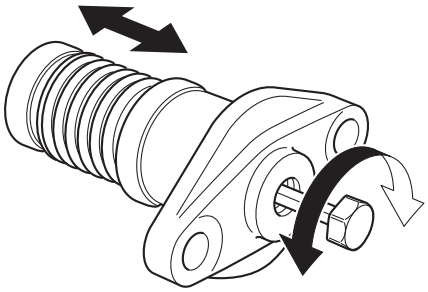
1. Check:
   • Timing chain tensioner
   Cracks/damage/rough movement → Replace.
   a. Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.

TIP

While pressing the timing chain tensioner rod, wind it counterclockwise with a hexagon wrench "1" (Parts No.: 1WS-12228-00) until it stops.



   b. Make sure that the timing chain tensioner rod moves in and out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

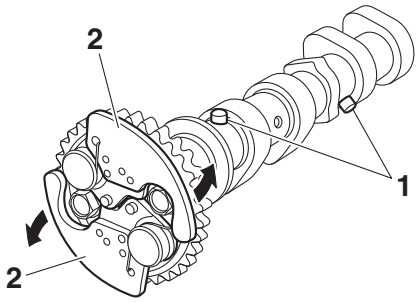


EAS30267
CHECKING THE DECOMPRESSION SYSTEM

1. Check:
   • Decompression system

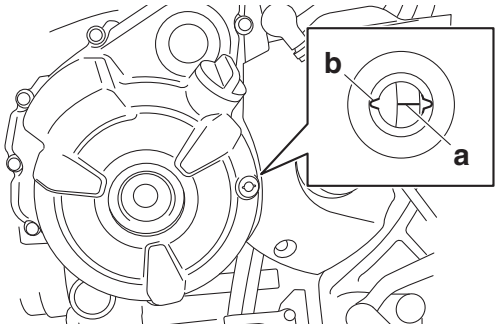
TIP

• Check that the decompressor lever pins "1" projects from the camshaft.
• Check that the decompressor cams "2" and decompressor lever pins "1" moves smoothly.



EAS30269
INSTALLING THE CAMSHAFTS

1. Align:
   - Mark “a” on the generator rotor (with the slot “b” in the generator rotor cover)
   a. Turn the crankshaft counterclockwise.
   b. When piston #1 is at TDC, align the TDC mark “a” on the generator rotor with the slot “b” in the generator rotor cover.



2. Install:
   - Intake camshaft sprocket “1”

	Intake camshaft sprocket bolt 24 N·m (2.4 kgf·m, 18 lb·ft)

ECA19980

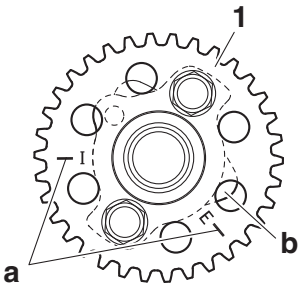
NOTICE

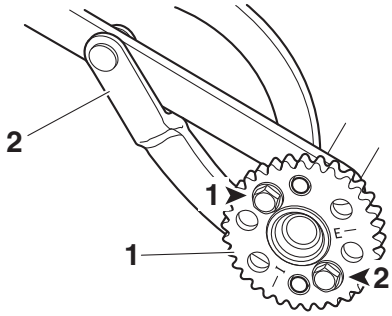
Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

TIP

- Make sure that the marks “a” on the intake camshaft sprocket are aligned with cam lobe #1 “b” as shown in the illustration.
- While holding the intake camshaft sprocket with the rotor holding tool “2”, tighten the intake camshaft sprocket bolts in the proper tightening sequence as shown.

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

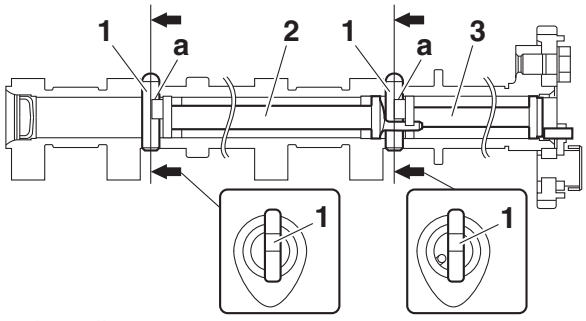




3. Install:
   - Decompressor lever pin “1”
   - Decompressor lever #1 “2”
   - Decompressor lever #2 “3”

TIP

- Face the cutout “a” in each decompressor lever pin toward the exhaust camshaft sprocket.
- Install the decompressor lever pins, decompressor lever #1, and decompressor lever #2 into the exhaust camshaft as shown in the illustration.



4. Install:
   - Exhaust camshaft sprocket “1”

	Exhaust camshaft sprocket bolt 24 N·m (2.4 kgf·m, 18 lb·ft)

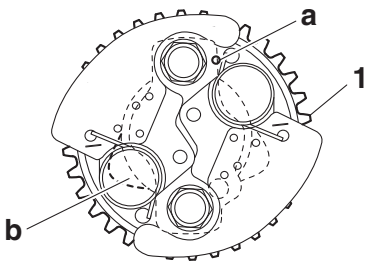
ECA19980

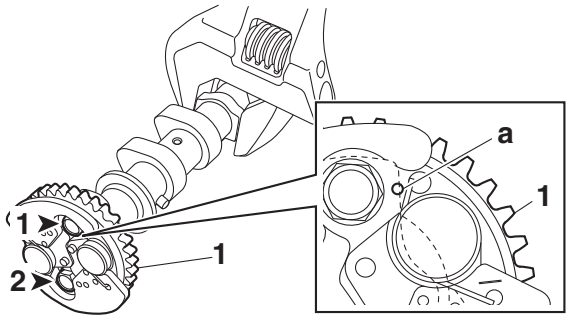
NOTICE

Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

TIP

- Make sure that the mark “a” on the exhaust camshaft sprocket is aligned with cam lobe #1 “b” as shown in the illustration.
- While holding the exhaust camshaft with a suitable tool, tighten the exhaust camshaft sprocket bolts.
- Tighten the camshaft sprocket bolts in the tightening sequence as shown.





5. Install:
   - Timing chain “1”
     (onto the exhaust camshaft sprocket “2”)
   - Exhaust camshaft
   - Exhaust camshaft cap

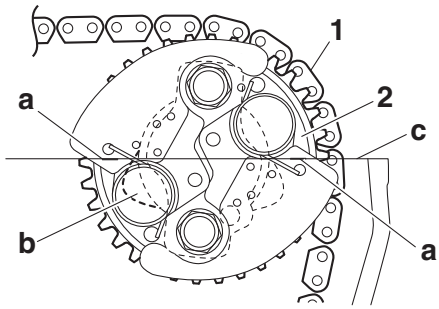
ECA20930

NOTICE

- **Lubricate the camshaft cap bolts with the engine oil.**
- **The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft caps, and camshafts will result.**
- **Do not turn the crankshaft when installing the camshaft to avoid damage or improper valve timing.**

TIP

- When installing the timing chain, start with the exhaust camshaft and be sure to keep the timing chain as tight as possible on the exhaust side.
- Make sure that the match marks “a” on the exhaust camshaft sprocket and cam lobe #1 “b” are aligned with the cylinder head edge “c” as shown in the illustration.
- Temporarily tighten the exhaust camshaft cap bolts.



6. Install:
   - Timing chain “1”
     (onto the intake camshaft sprocket “2”)
   - Intake camshaft
   - Intake camshaft cap

ECA20930

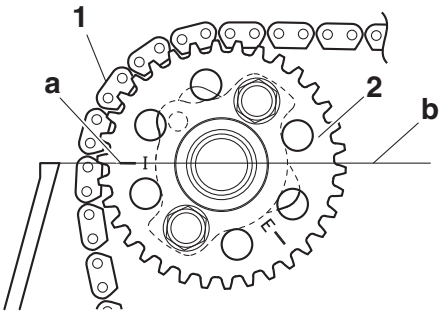
NOTICE

- **Lubricate the camshaft cap bolts with the engine oil.**
- **The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft caps, and camshafts will result.**
- **Do not turn the crankshaft when installing the camshaft to avoid damage or improper valve timing.**

a. Install the timing chain onto intake camshaft sprocket, and then install the intake camshaft onto the cylinder head.

TIP

Make sure the match mark “a” on the intake camshaft sprocket is aligned with the cylinder head edge “b”.



b. Temporarily tighten the intake camshaft cap bolts.

7. Tighten:
   - Exhaust camshaft cap bolt
   - Intake camshaft cap bolt

ECA13730

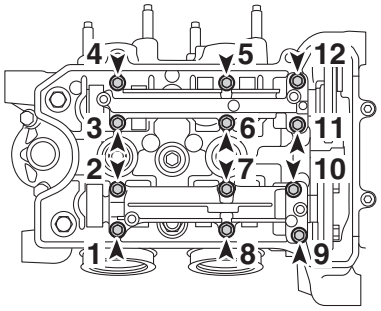
NOTICE

The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft caps, and camshafts will result.

TIP

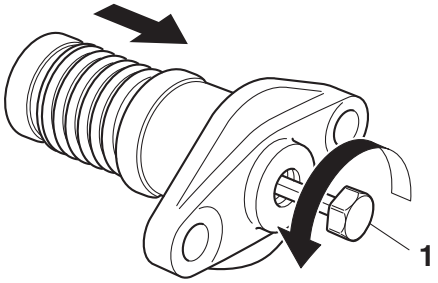
Tighten the camshaft cap bolts in the tightening sequence as shown.

Exhaust camshaft cap bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)
Intake camshaft cap bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

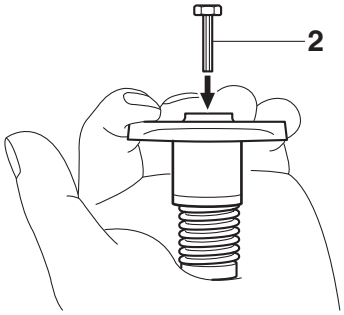


8. Install:
   - Timing chain tensioner
   - Timing chain tensioner gasket New

a. While lightly pressing the timing chain tensioner rod by hand, turn the timing chain tensioner rod fully counterclockwise with a hexagon wrench "1".



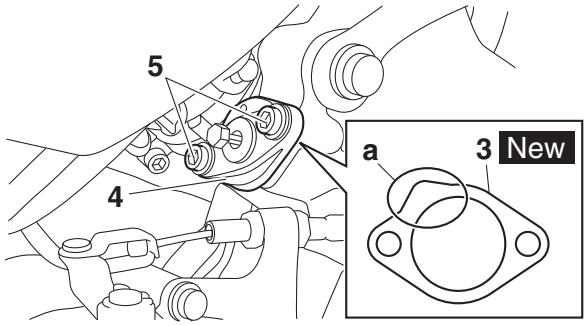
b. Keep pressing the timing chain tensioner rod by hand, remove the hexagon wrench, and then insert the hexagon wrench "2" (Parts No.: 1WS-12228-00) into the timing chain tensioner rod.



c. Install a new timing chain tensioner gasket "3", the timing chain tensioner "4", and the timing chain tensioner bolts "5" on the cylinder block.

TIP

Be sure to install the timing chain tensioner gasket so that the portion "a" of the gasket is protruding from the upper inner side of the timing chain tensioner.



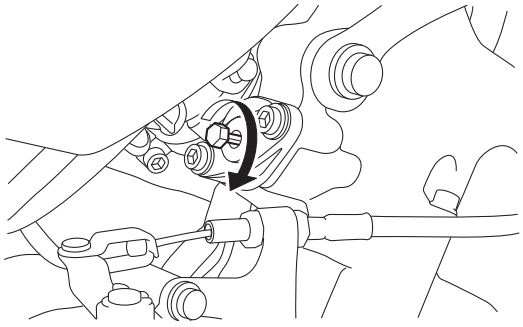
d. Tighten the timing chain tensioner bolts to specification.

Timing chain tensioner bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

e. Screw the hexagon wrench by hand until the timing chain tensioner rod touches the timing chain guide, and then tighten 1/4 turn by tool.

TIP

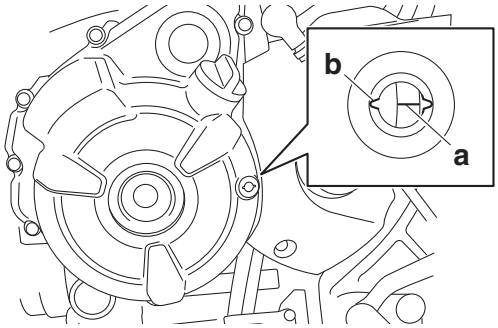
The timing chain tensioner rod is extended by turning the hexagon wrench clockwise.

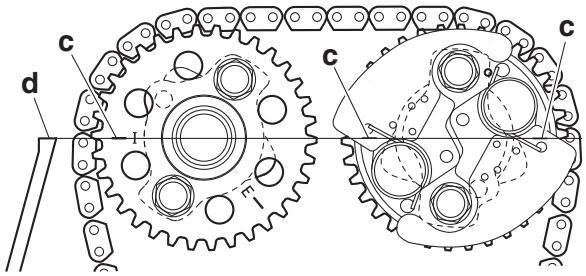


f. Remove the hexagon wrench.
g. Install the timing chain tensioner cap bolt and gasket, and then tighten the timing chain tensioner cap bolt to specification.

	Timing chain tensioner cap bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft)

9. Turn:
   • Crankshaft
   (several turns counterclockwise)
10. Check:
   • Mark "a"
   Make sure the mark "a" on the generator rotor is aligned with the slot "b" in the generator rotor cover.
   • Camshaft sprocket match mark
   Make sure the match marks "c" on the camshaft sprockets are aligned with the cylinder head mating surface "d".
   Out of alignment → Adjust.
   Refer to the installation steps above.



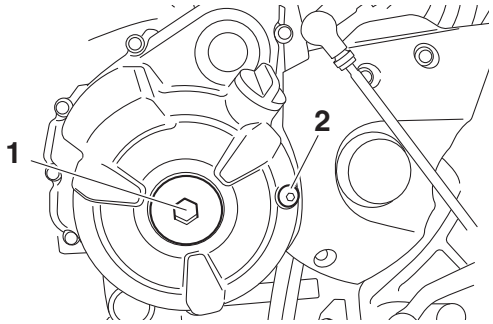


11. Measure:
   • Valve clearance
   Out of specification → Adjust.
   Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-6.
12. Install:
   • Timing mark accessing bolt "1"

	Timing mark accessing bolt 15 N·m (1.5 kgf·m, 11 lb·ft)

   • Crankshaft end cover "2"

	Crankshaft end cover 10 N·m (1.0 kgf·m, 7.4 lb·ft)



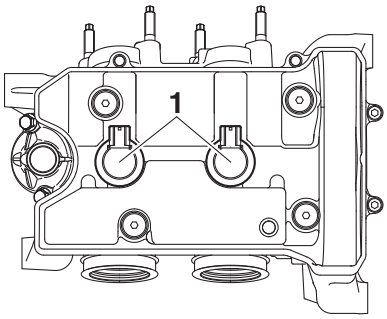
EAS30274
INSTALLING THE CYLINDER HEAD COVER

1. Install:
   • Timing chain guide (top side)
   • Cylinder head cover gasket "1" New
   (to the cylinder head cover)
   • Cylinder head cover "2"

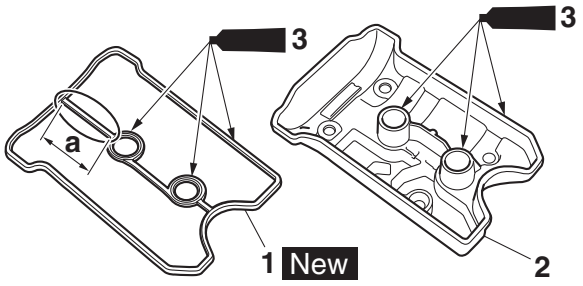
	Cylinder head cover bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

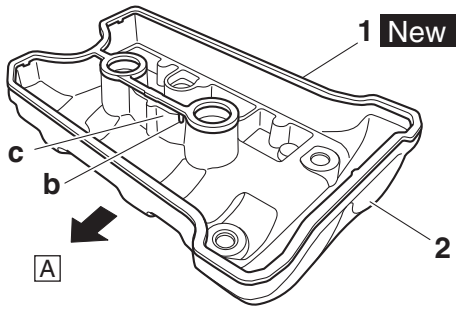
TIP

- Apply Three bond No. 1215® “3” onto the mating surfaces of the cylinder head cover gasket and cylinder head.
- After installing the cylinder head cover gasket “1” to the cylinder head cover, cut off the “a” section.
- Make sure that the projection “b” on the cylinder head cover gasket is positioned on the exhaust side of the rib “c” on the cylinder head cover.



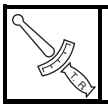
Yamaha bond No. 1215
90890-85505
Three bond No. 1215®





A. Exhaust side

2. Install:
   - Spark plug
   - Ignition coil “1”



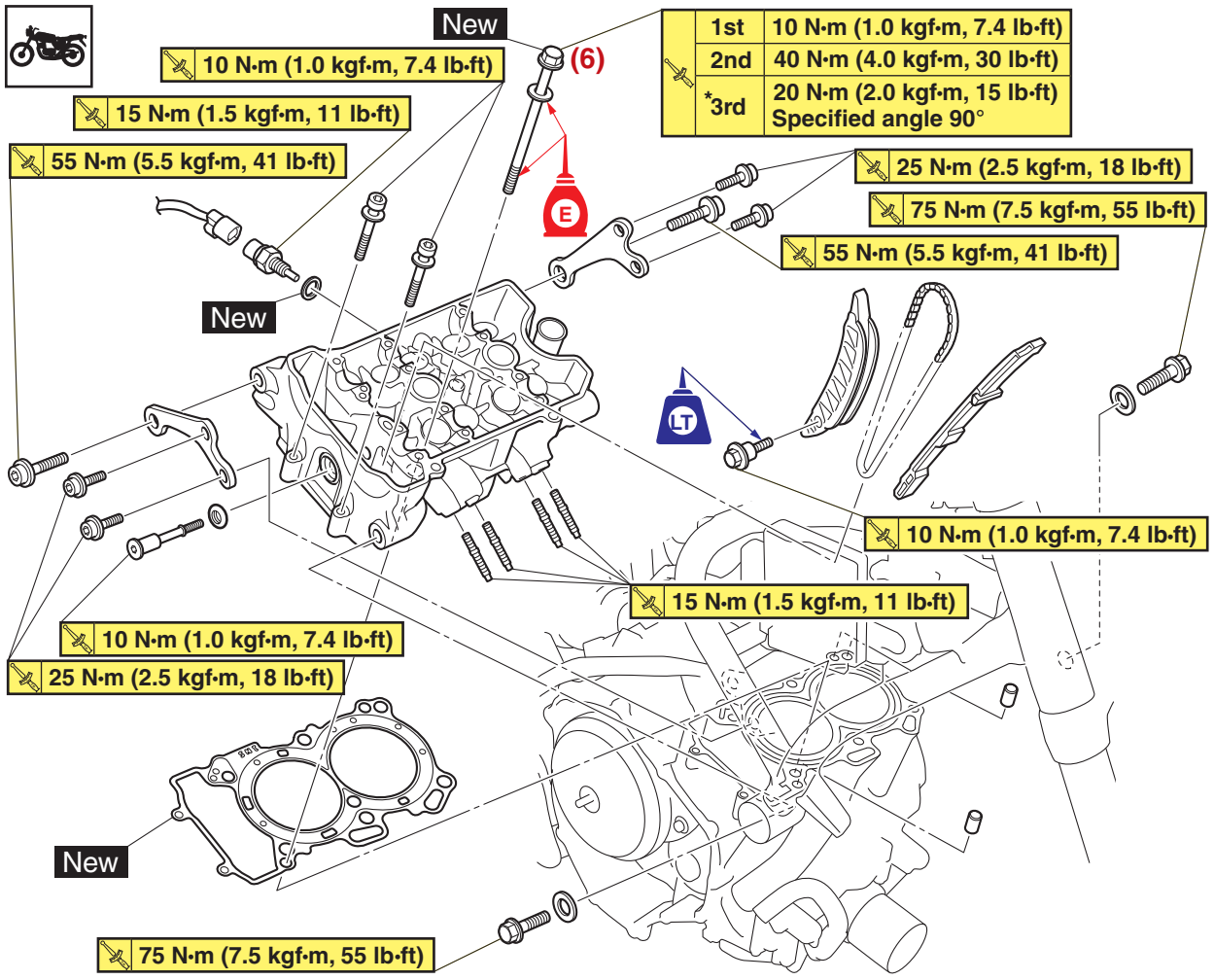
Spark plug
13 N·m (1.3 kgf·m, 9.6 lb·ft)

TIP

Install the ignition coils “1” in the direction shown in the illustration.

EAS20044
CYLINDER HEAD

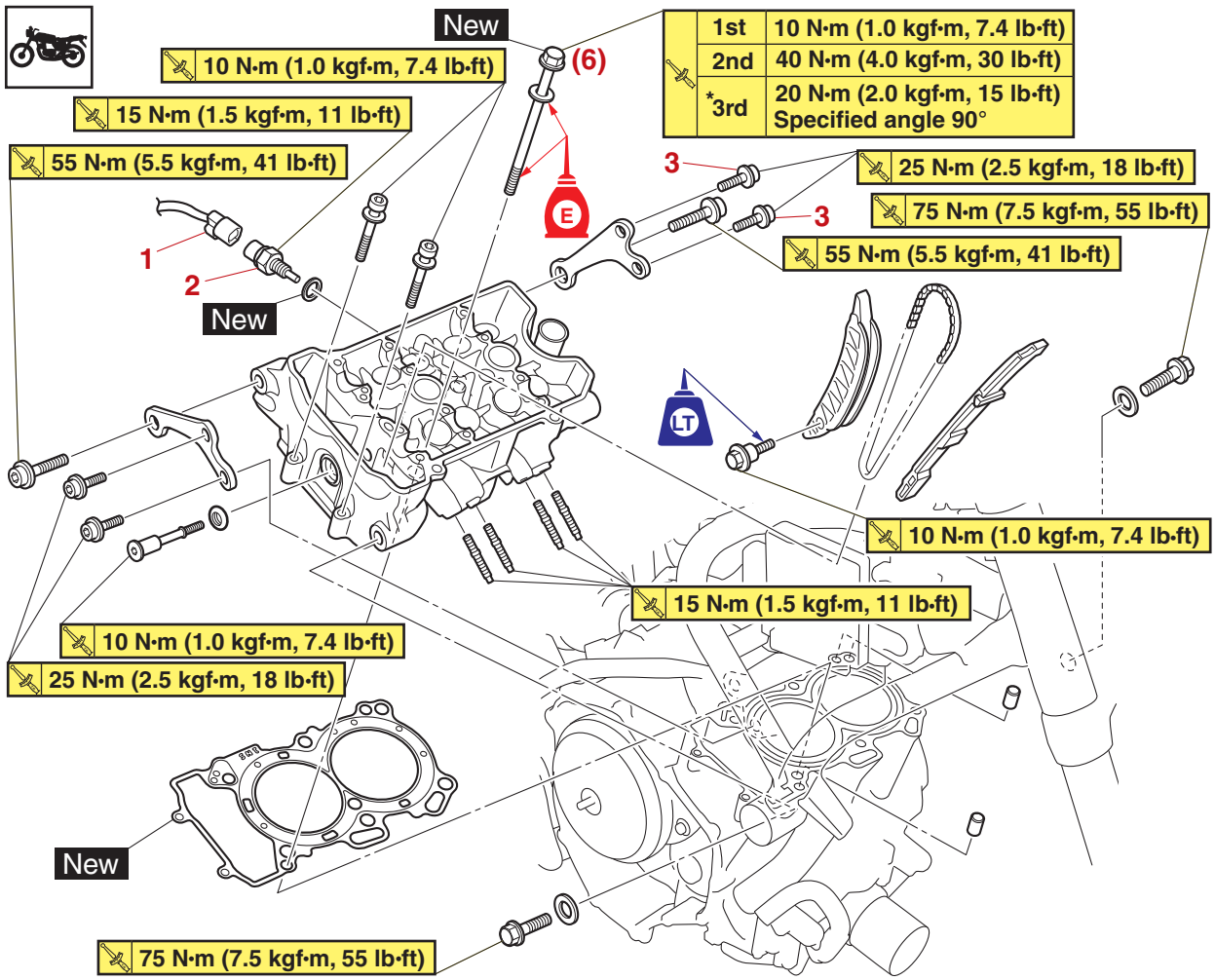
Removing the cylinder head



*** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.**

Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air duct bracket		Refer to "AIR FILTER" on page 7-7.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-9.
	Footrest assembly (right)		Refer to "REAR BRAKE" on page 4-48.

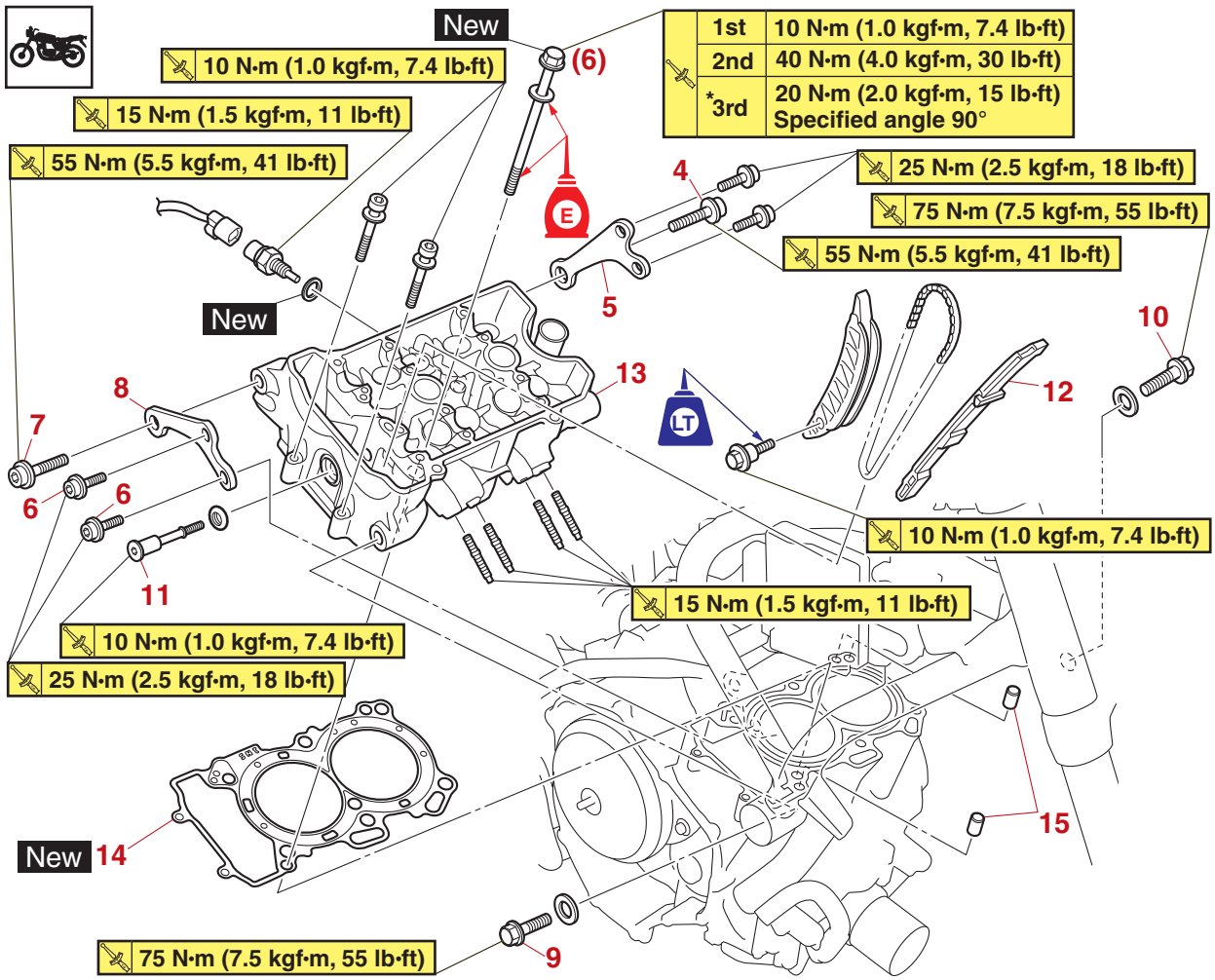
Removing the cylinder head



*** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.**

Order	Job/Parts to remove	Q'ty	Remarks
	Muffler assembly		Refer to "ENGINE REMOVAL" on page 5-10.
	Oil cooler inlet hose		Disconnect. Refer to "OIL COOLER" on page 6-6.
	Radiator		Refer to "RADIATOR" on page 6-2.
	Cylinder head cover/Intake camshaft/Exhaust camshaft		Refer to "CAMSHAFTS" on page 5-19.
	Clutch cover		Refer to "CLUTCH" on page 5-53.
	Thermostat		Refer to "THERMOSTAT" on page 6-9.
1	Coolant temperature sensor coupler	1	Disconnect.
2	Coolant temperature sensor	1	
3	Engine bracket bolt (left)	2	

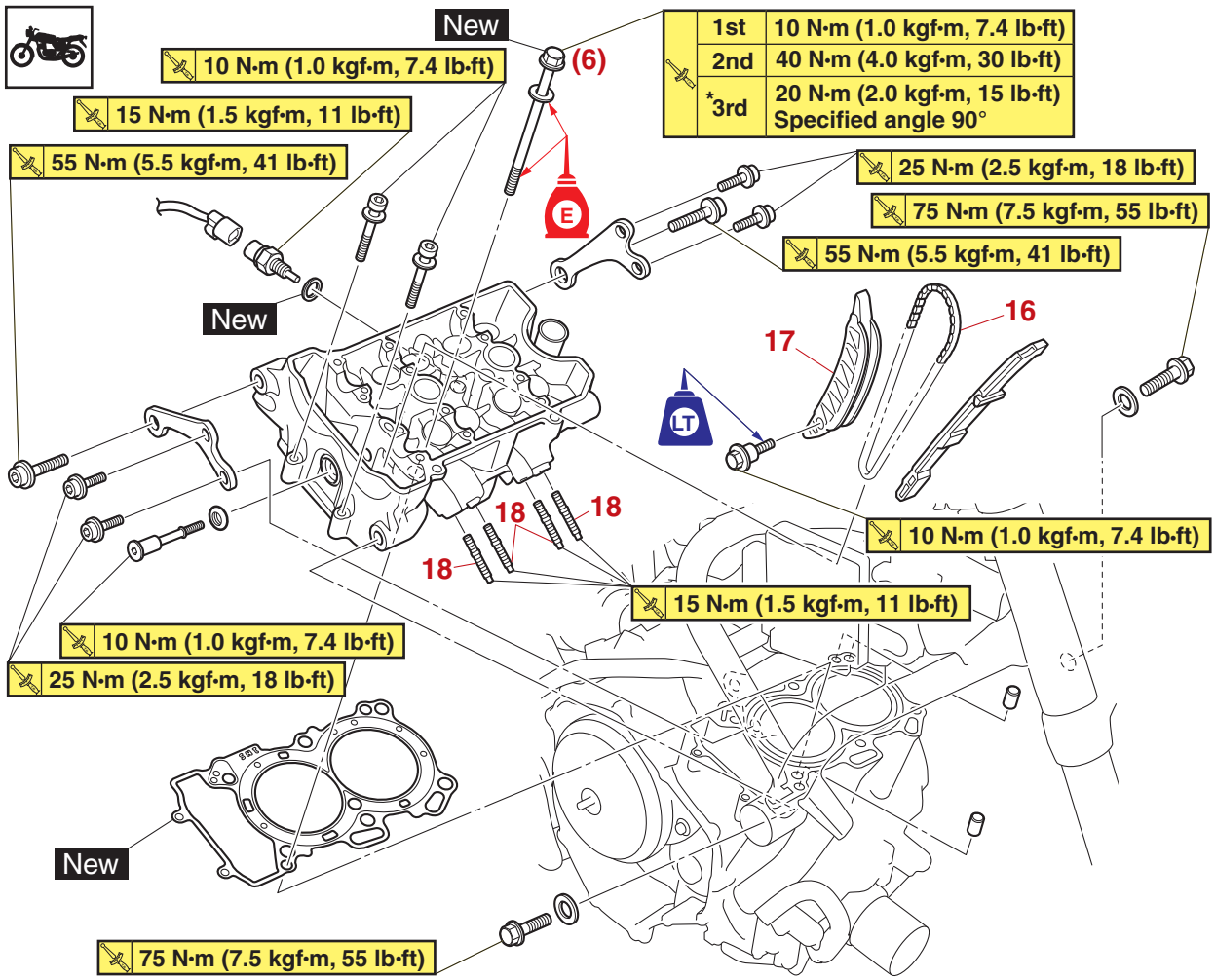
Removing the cylinder head



*** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.**

Order	Job/Parts to remove	Q'ty	Remarks
4	Engine mounting bolt (left upper side)	1	
5	Engine bracket (left)	1	
6	Engine bracket bolt (right)	2	
7	Engine mounting bolt (right upper side)	1	
8	Engine bracket (right)	1	
9	Engine mounting bolt (right front side)	1	
10	Engine mounting bolt (left front side)	1	
11	Timing chain bolt (right side of cylinder head)	1	
12	Timing chain guide (exhaust side)	1	
13	Cylinder head	1	
14	Cylinder head gasket	1	
15	Dowel pin	2	

Removing the cylinder head



*** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.**

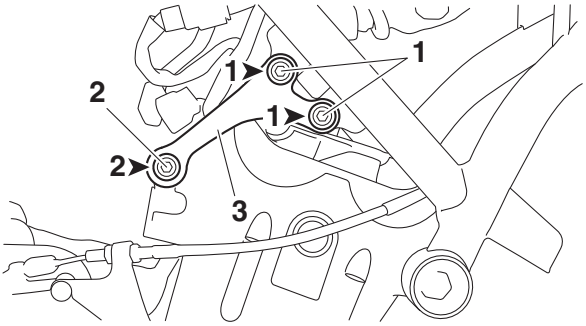
Order	Job/Parts to remove	Q'ty	Remarks
16	Timing chain	1	
17	Timing chain guide (intake side)	1	
18	Stud bolt	4	

EAS30276
REMOVING THE CYLINDER HEAD

1. Remove:
   The following procedure applies to both of the engine bracket.
   - Engine bracket bolt “1”
   - Engine mounting bolt “2”
   - Engine bracket “3”

TIP

- Place a suitable stand under the engine.
- Loosen the bolts in the proper sequence as shown.

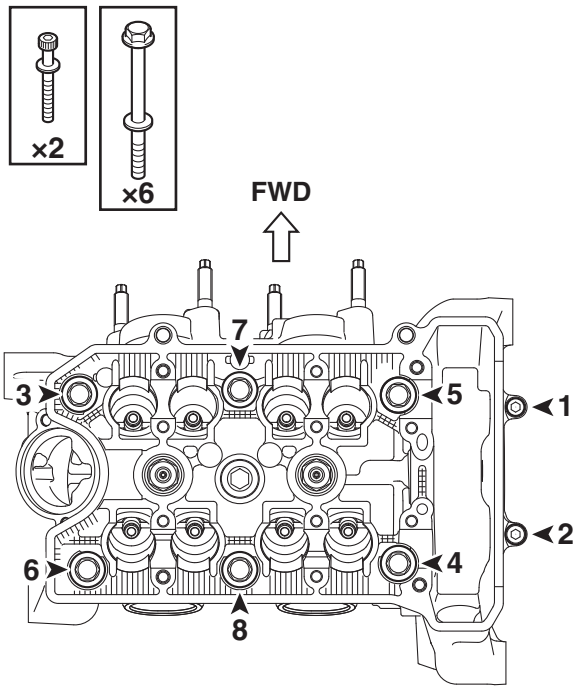


2. Remove:
   - Cylinder head bolt (M6) (×2)
   - Cylinder head bolt (M10) (×6)

TIP

- Loosen the bolts in the proper sequence as shown.
- Loosen each bolt 1/2 of a turn at a time. After all of the bolts are fully loosened, remove them.

  - M6 × 45 mm: “1”, “2”
  - M10 × 100 mm: “3”–“8”



EAS30278
CHECKING THE TIMING CHAIN GUIDES

1. Check:
   - Timing chain guide (exhaust side)
   - Timing chain guide (intake side)
     Damage/wear → Replace.

EAS30277
CHECKING THE CYLINDER HEAD

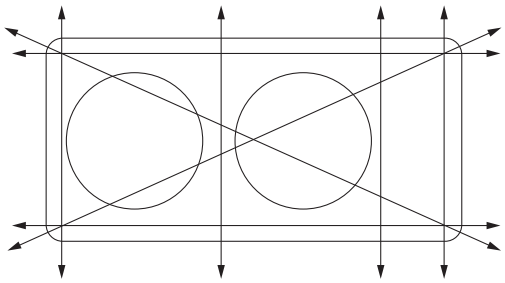
1. Eliminate:
   - Combustion chamber carbon deposit (with a rounded scraper)

TIP

Do not use a sharp instrument to avoid damaging or scratching:
- Spark plug bore threads
- Valve seats

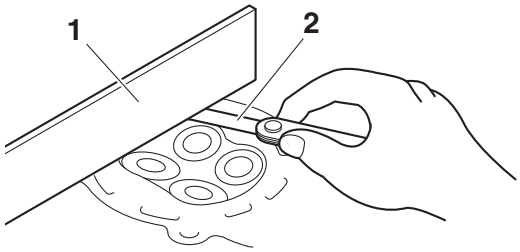
2. Check:
   - Cylinder head
     Damage/scratches → Replace.
   - Cylinder head water jacket
     Mineral deposits/rust → Eliminate.
3. Measure:
   - Cylinder head warpage
     Out of specification → Resurface the cylinder head.

	Warpage limit **0.10 mm (0.0039 in)**



G088954

a. Place a straightedge “1” and a thickness gauge “2” across the cylinder head.



G088957

b. Measure the warpage.
c. If the limit is exceeded, resurface the cylinder head as follows.
d. Place a 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.

EAS30282

INSTALLING THE CYLINDER HEAD

1. Install:
   - Cylinder head
   - Cylinder head bolt (M10) (×6) New
   - Cylinder head bolt (M6) (×2)

TIP

- Pass the timing chain through the timing chain cavity.
- Lubricate the cylinder head bolt (M10) threads and mating surface with engine oil.

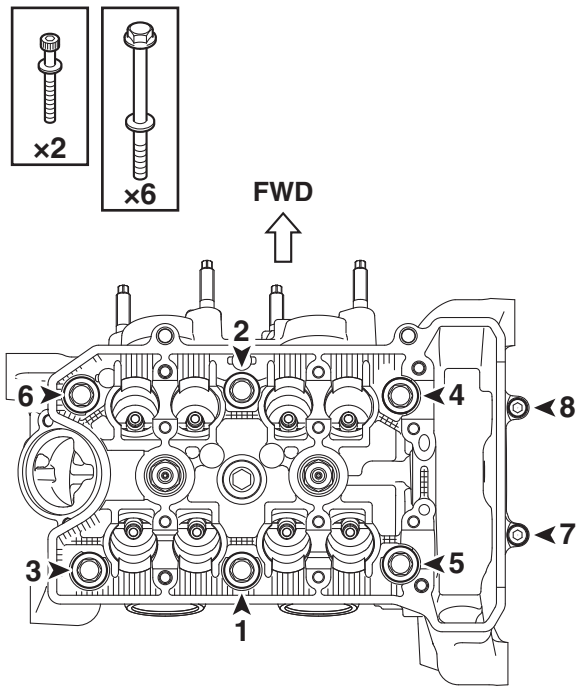
2. Tighten:
   - Cylinder head bolt “1”–“6”
   - Cylinder head bolt “7”, “8”

Cylinder head bolt (“1”–“6”)
1st: 10 N·m (1.0 kgf·m, 7.4 lb·ft)
2nd: 40 N·m (4.0 kgf·m, 30 lb·ft)
***3rd: 20 N·m (2.0 kgf·m, 15 lb·ft)**
Specified angle 90°
Cylinder head bolt (“7”, “8”)
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.

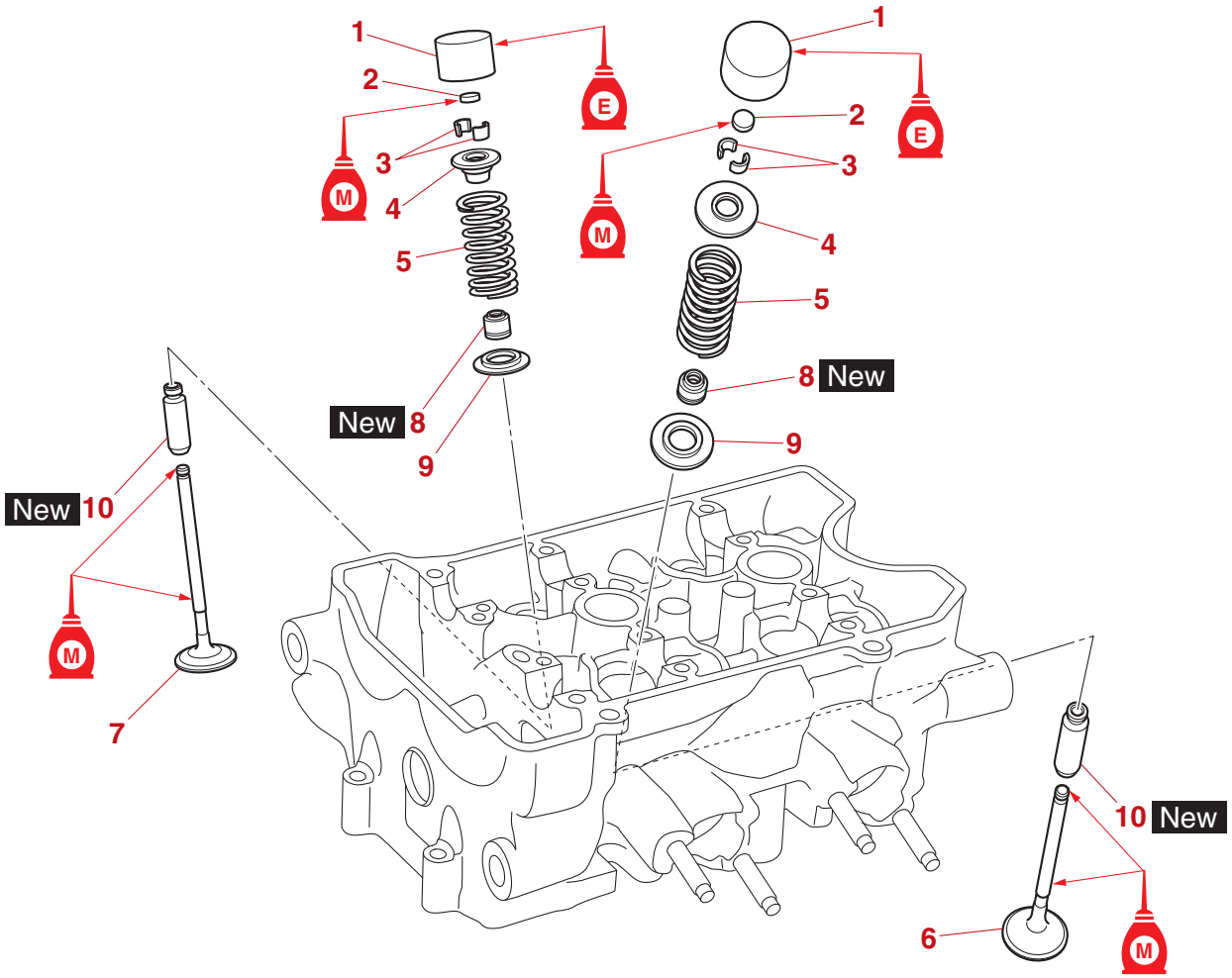
TIP

Tighten the cylinder head bolts in the tightening sequence as shown and torque them in 4 stages.



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 5-31.
1	Valve lifter	8	
2	Valve pad	8	
3	Valve cotter	16	
4	Valve spring retainer	8	
5	Valve spring	8	
6	Exhaust valve	4	
7	Intake valve	4	
8	Valve stem seal	8	
9	Valve spring seat	8	
10	Valve guide	8	

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. Remove:
   - Valve lifter
   - Valve pad

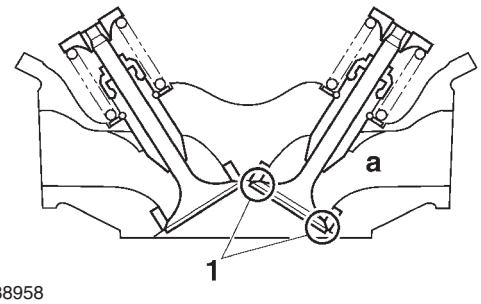
TIP

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

2. 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 5-40.
   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".



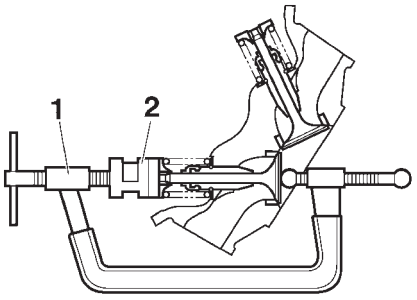
G088958

3. Remove:
   - Valve cotter

TIP

Remove the valve cotters by compressing the valve spring with the valve spring compressor "1" and the valve spring compressor attachment "2".

Valve spring compressor
90890-04200
Valve spring compressor
YM-04019
Valve spring compressor attachment (ø26)
90890-01243
Valve spring compressor attachment (ø26)
YM-01253-1



G088959

4. Remove:
   - Valve spring retainer
   - Valve spring
   - Valve
   - Valve stem seal
   - Valve spring seat

TIP

Identify the position of each part very carefully so that it can be reinstalled in its original place.

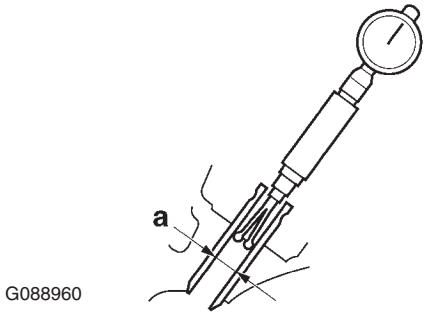
EAS30284
CHECKING THE VALVES AND VALVE GUIDES

The following procedure applies to all of the valves and valve guides.

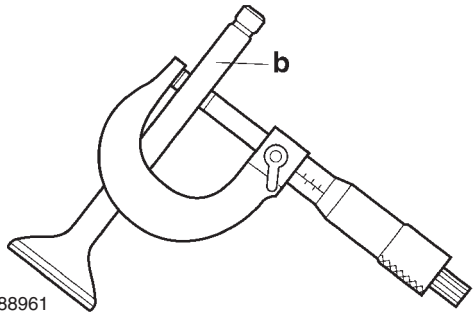
1. Measure:
   - Valve-stem-to-valve-guide clearance
     Out of specification → Replace the valve guide.

Valve-stem-to-valve-guide clearance =
Valve guide inside diameter "a" –
Valve stem diameter "b"

Valve-stem-to-valve-guide clearance limit (intake)
0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance limit (exhaust)
0.100 mm (0.0039 in)



G088960



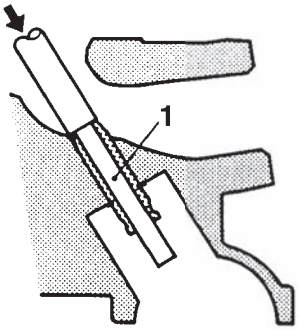
G088961

2. Replace:
   • Valve guide

TIP

To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100 °C (212 °F) in an oven.

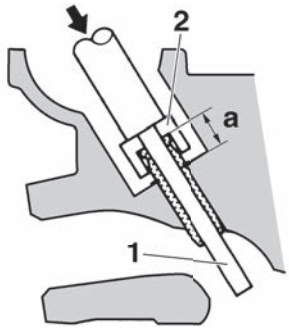
a. Remove the valve guide with the valve guide remover "1".



G088962

b. Install the new valve guide with the valve guide installer "2" and valve guide remover "1".

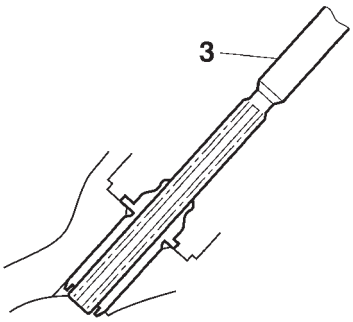
	Valve guide position **14.8–15.2 mm (0.58–0.60 in)**



G088963

a. Valve guide position

c. After installing the valve guide, bore the valve guide with the valve guide reamer "3" to obtain the proper valve-stem-to-valve-guide clearance.



G088964

TIP

After replacing the valve guide, reface the valve seat.

	Valve guide remover (ø4.5) **90890-04116** **Valve guide remover (4.5 mm)** **YM-04116** **Valve guide installer (ø4.5)** **90890-04117** **Valve guide installer (4.5 mm)** **YM-04117** **Valve guide reamer (ø4.5)** **90890-04118** **Valve guide reamer (4.5 mm)** **YM-04118**

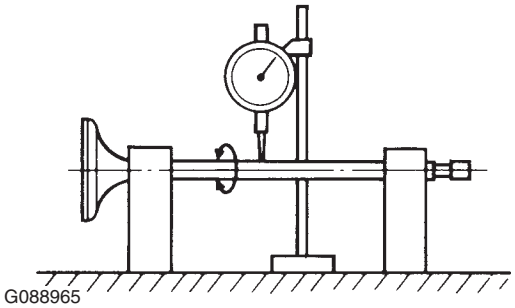
3. Eliminate:
   • Carbon deposit
   (from the valve face and valve seat)
4. Check:
   • Valve face
   Pitting/wear → Grind the valve face.
   • Valve stem end
   Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.

5. Measure:
   • Valve 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
0.020 mm (0.0008 in)


G088965

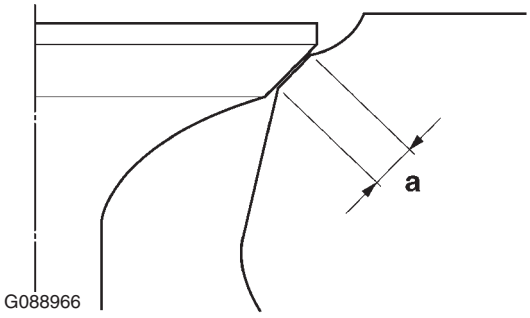
EAS30285

CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.

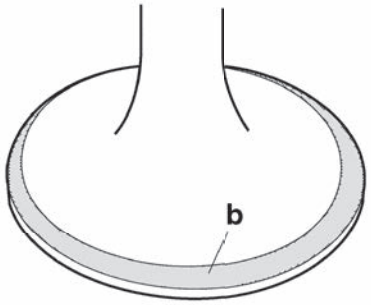
1. Eliminate:
   • Carbon deposit
   (from the valve face and valve seat)
2. Check:
   • Valve seat
   Pitting/wear → Replace the cylinder head.
3. Measure:
   • Valve seat width "a"
   Out of specification → Replace the cylinder head.

Valve seat contact width limit (intake)
1.6 mm (0.06 in)
Valve seat contact width limit (exhaust)
1.6 mm (0.06 in)



G088966

a. Apply blue layout fluid "b" onto the valve face.



G088967

b. Install the valve into the cylinder head.
c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
d. Measure the valve seat width.

TIP

Where the valve seat and valve face contacted one another, the blueing will have been removed.

4. Lap:
   • Valve face
   • Valve seat

TIP

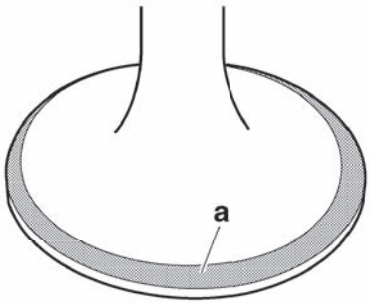
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

a. Apply a coarse lapping compound "a" to the valve face.

ECA13790

NOTICE

Do not let the lapping compound enter the gap between the valve stem and the valve guide.



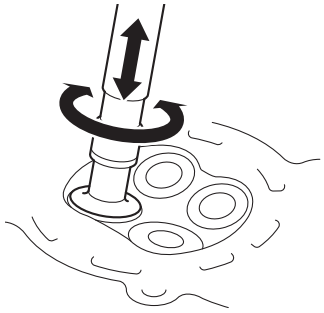
G088968

b. Apply molybdenum disulfide oil onto the valve stem.
c. Install the valve into the cylinder head.

d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

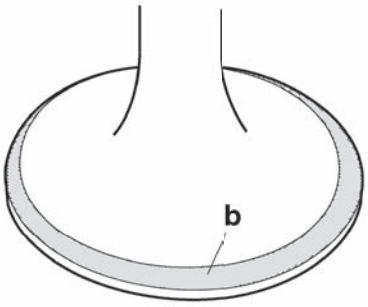
TIP

For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



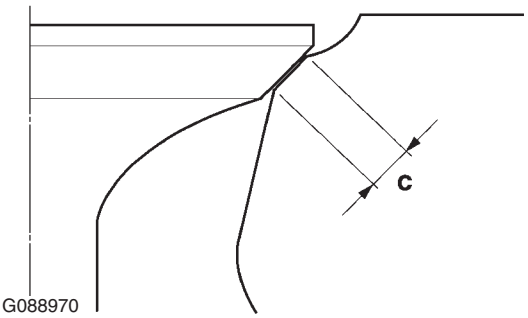
G088969

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.



G088967

h. Install the valve into the cylinder head.
i. Press the valve through the valve guide and onto the valve seat to make a clear impression.
j. Measure the valve seat width "c" again. If the valve seat width is out of specification, reface and lap the valve seat.



G088970

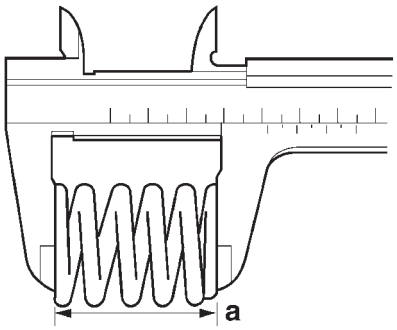
EAS30286

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 limit (intake)
38.29 mm (1.51 in)
Free length limit (exhaust)
39.32 mm (1.55 in)



G088971

EAS30287

CHECKING THE VALVE LIFTERS

The following procedure applies to all of the valve lifters.

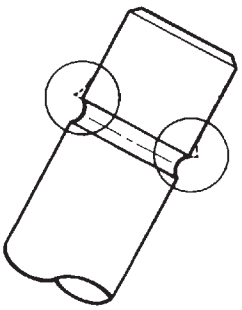
1. Check:
   • Valve lifter
   Damage/scratches → Replace the valve lifters and cylinder head.

EAS30288

INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

1. Deburr:
   • Valve stem
   (with an oil stone)



G088972

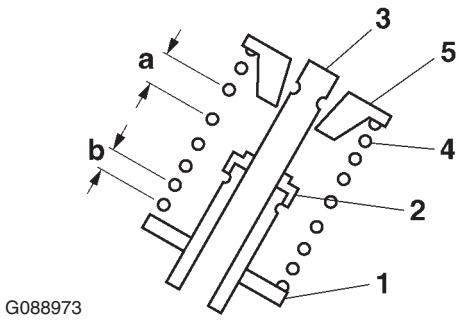
2. Lubricate:
   • Valve stem
   • Valve stem end
   (with the recommended lubricant)

Recommended lubricant
Molybdenum disulfide oil

3. Install:
   - Valve spring seat “1” (into the cylinder head)
   - Valve stem seal “2” New
   - Valve “3”
   - Valve spring “4”
   - Valve spring retainer “5”

TIP

- Make sure each valve is installed in its original place.
- Install the valve springs with the larger pitch “a” facing up.



G088973

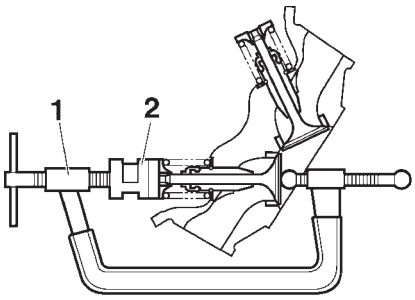
b. Smaller pitch

4. Install:
   - Valve cotter

TIP

Install the valve cotters by compressing the valve spring with the valve spring compressor “1” and the valve spring compressor attachment “2”.

Valve spring compressor
90890-04200
Valve spring compressor
YM-04019
Valve spring compressor attachment (ø26)
90890-01243
Valve spring compressor attachment (ø26)
YM-01253-1



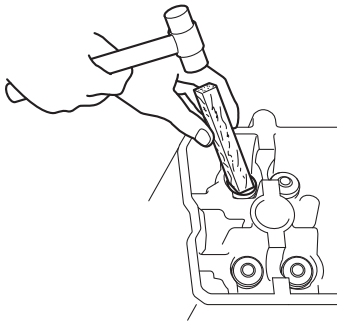
G088959

5. 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.



G088975

6. Lubricate:
   - Valve lifter (with the recommended lubricant)

Recommended lubricant
Engine oil

7. Install:
   - Valve pad
   - Valve lifter

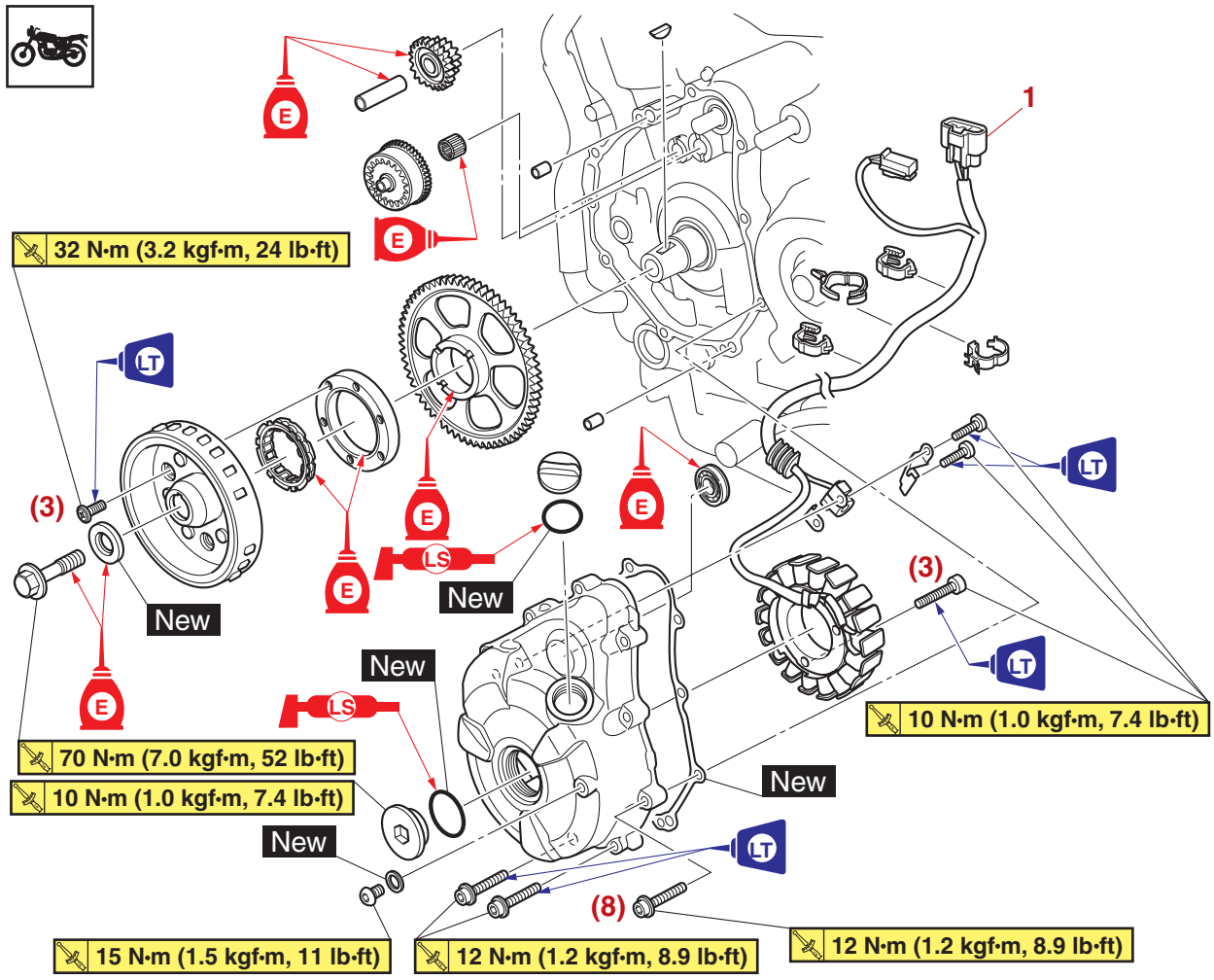
TIP

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

EAS20140

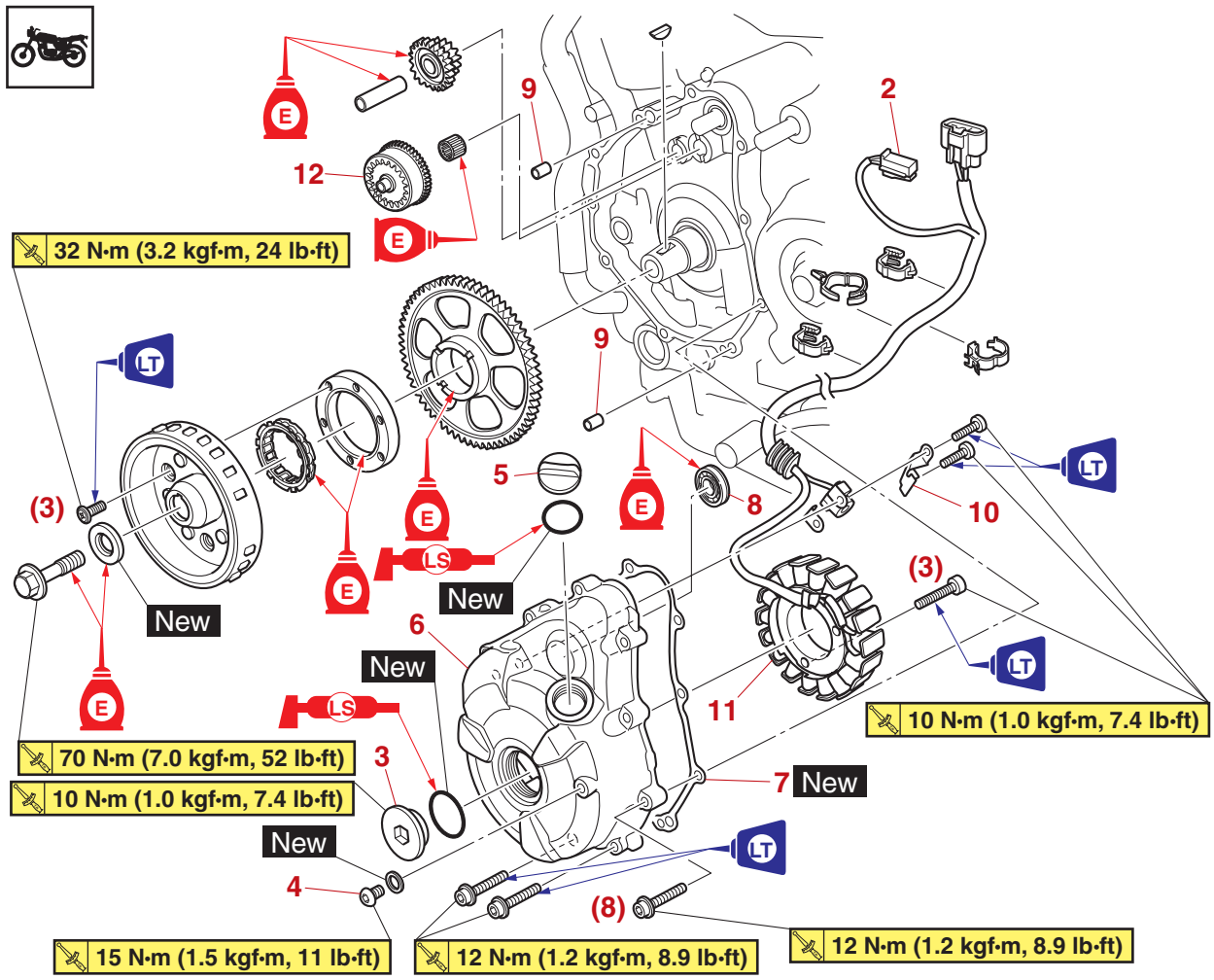
GENERATOR AND STARTER CLUTCH

Removing the stator coil, generator rotor and starter clutch



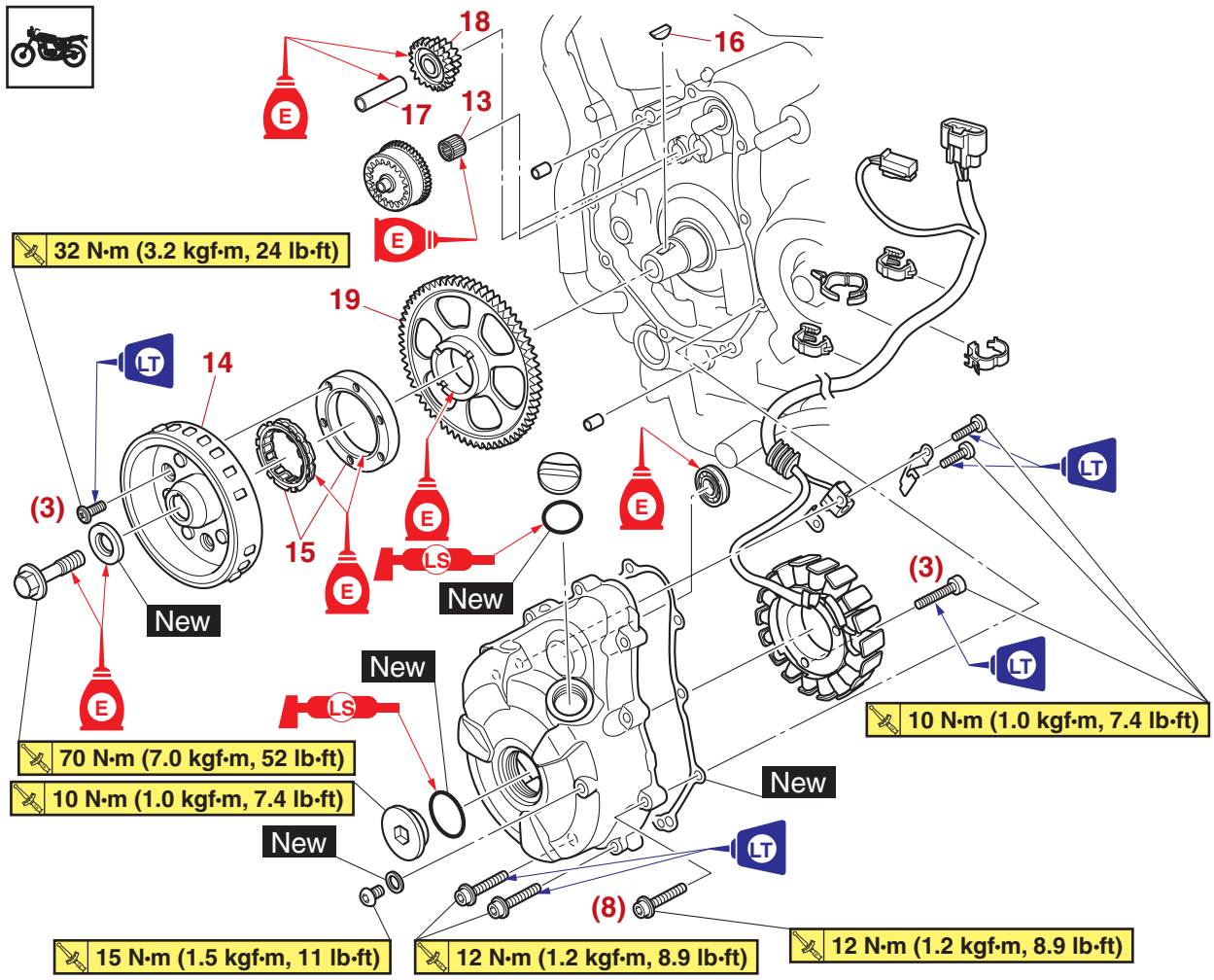
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank top cover/Fuel tank side cover assembly (right)/Fuel tank side cover assembly (left)		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Drive sprocket cover		Refer to "CHAIN DRIVE" on page 4-98.
	Coolant reservoir		Refer to "RADIATOR" on page 6-2.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
1	Stator coil coupler	1	Disconnect.

Removing the stator coil, generator rotor and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
2	Crankshaft position sensor coupler	1	Disconnect.
3	Crankshaft end cover	1	
4	Timing mark accessing bolt	1	
5	Oil filler cap	1	
6	Generator cover	1	
7	Generator cover gasket	1	
8	Bearing	1	
9	Dowel pin	2	
10	Stator coil lead holder	1	
11	Stator coil assembly (Stator coil/Crankshaft position sensor)	1	
12	Torque limiter	1	

Removing the stator coil, generator rotor and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
13	Bearing	1	
14	Generator rotor	1	
15	Starter clutch	1	
16	Woodruff key	1	
17	Starter clutch idle gear shaft	1	
18	Starter clutch idle gear	1	
19	Starter clutch gear	1	

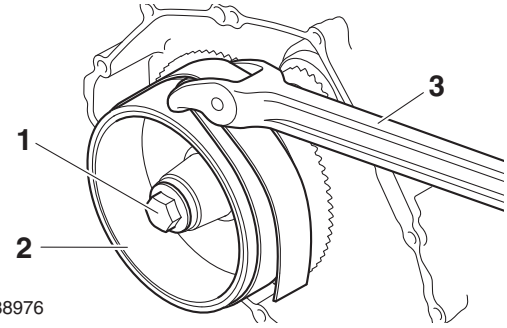
EAS30867
REMOVING THE GENERATOR

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



G088976

2. Remove:
   • Generator rotor “1”
   (with the flywheel puller “2”)
   • Woodruff key

ECA13880

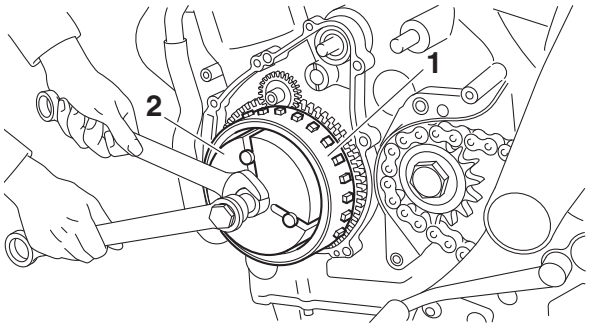
NOTICE

To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set center bolt and the crankshaft.

TIP

- Install the flywheel puller bolts to the threaded holes of the starter clutch.
- Make sure the flywheel puller is centered over the generator rotor.

Flywheel puller
90890-01362
Heavy duty puller
YU-33270-B



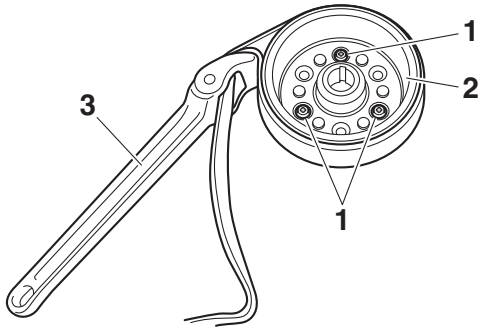
EAS30868
REMOVING THE STARTER CLUTCH

1. Remove:
   • Starter clutch bolt “1”
   • Starter clutch

TIP

While holding the generator rotor “2” with the rotor holding tool “3”, loosen the starter clutch bolts.

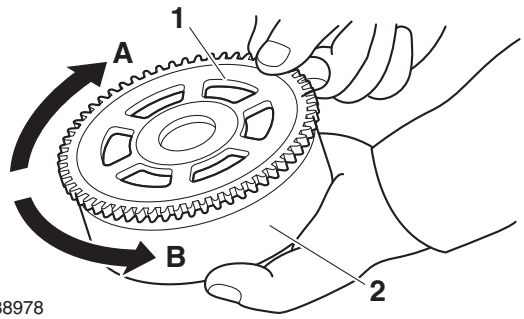
Rotor holding tool
90890-04166
Rotor holding tool
YM-04166



EAS30869
CHECKING THE STARTER CLUTCH

1. Check:
   • Starter clutch roller
   Damage/wear → Replace.
2. Check:
   • Starter clutch idle gear
   • Starter clutch gear
   Burrs/chips/roughness/wear → Replace the defective part(s).
3. Check:
   • Starter clutch gear contact surface
   Damage/pitting/wear → Replace the starter clutch gear.
4. Check:
   • Starter clutch operation

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



G088978

EAS30870
CHECKING THE TORQUE LIMITER

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

TIP

Do not disassemble the torque limiter.

EAS30871
INSTALLING THE STARTER CLUTCH

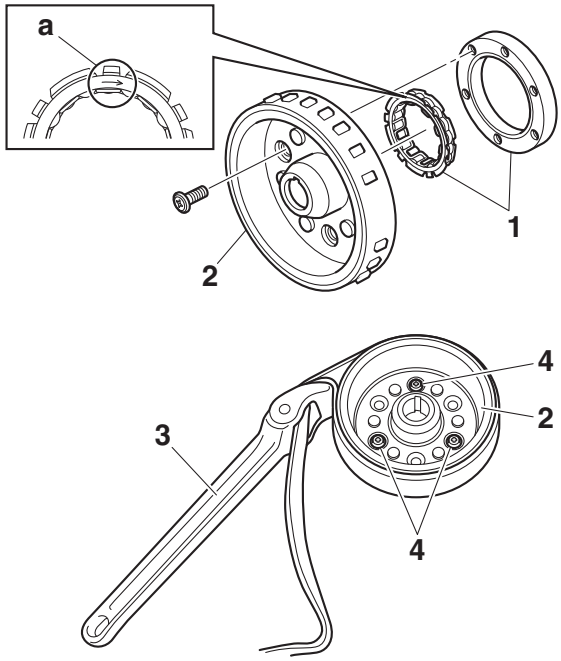
1. Install:
   • Starter clutch "1"

Starter clutch bolt
32 N·m (3.2 kgf·m, 24 lb·ft)
LOCTITE®

TIP

- Install the starter clutch so that the side of the starter clutch roller assembly with the arrow mark "a" is toward the generator rotor "2".
- 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:
   • Woodruff key
   • Generator rotor
   • Washer New
   • Generator rotor bolt

TIP

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

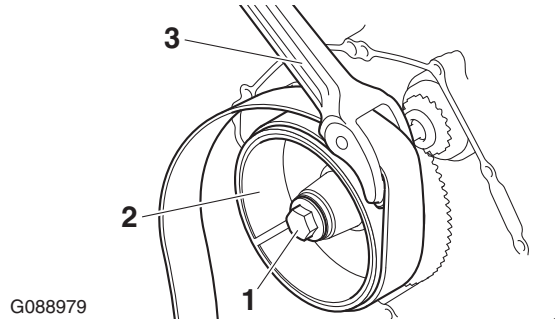
2. Tighten:
   • Generator rotor bolt "1"

Generator rotor bolt
70 N·m (7.0 kgf·m, 52 lb·ft)

TIP

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

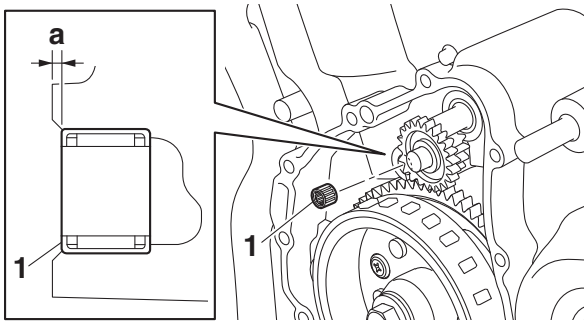
Rotor holding tool
90890-04166
Rotor holding tool
YM-04166



3. Install:
   • Bearing “1”

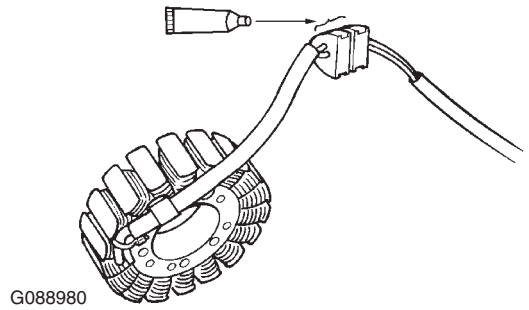
TIP

Make sure that the bearing does not protrude past the surface “a” of the cylinder.



4. Apply:
   • Sealant
   (onto the stator coil lead grommet)

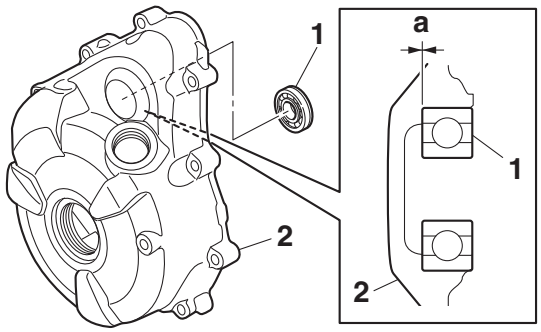
	Yamaha bond No. 1215 **90890-85505** **Three bond No. 1215®**



5. Install:
   • Bearing “1”

TIP

Make sure that the bearing contacts the surface “a” of the generator cover “2”.

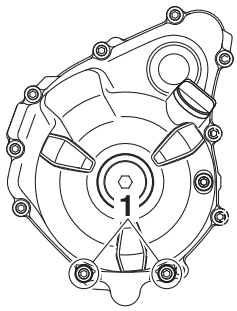


6. Install:
   • Generator cover gasket New
   • Generator cover

	Generator cover bolt **12 N·m (1.2 kgf·m, 8.9 lb·ft)** **LOCTITE®** **Generator cover bolt** **12 N·m (1.2 kgf·m, 8.9 lb·ft)**

TIP

- Tighten the generator cover bolts in stages and in a crisscross pattern.
- Apply LOCTITE® to the threads of only the generator cover bolts “1” shown in the illustration.



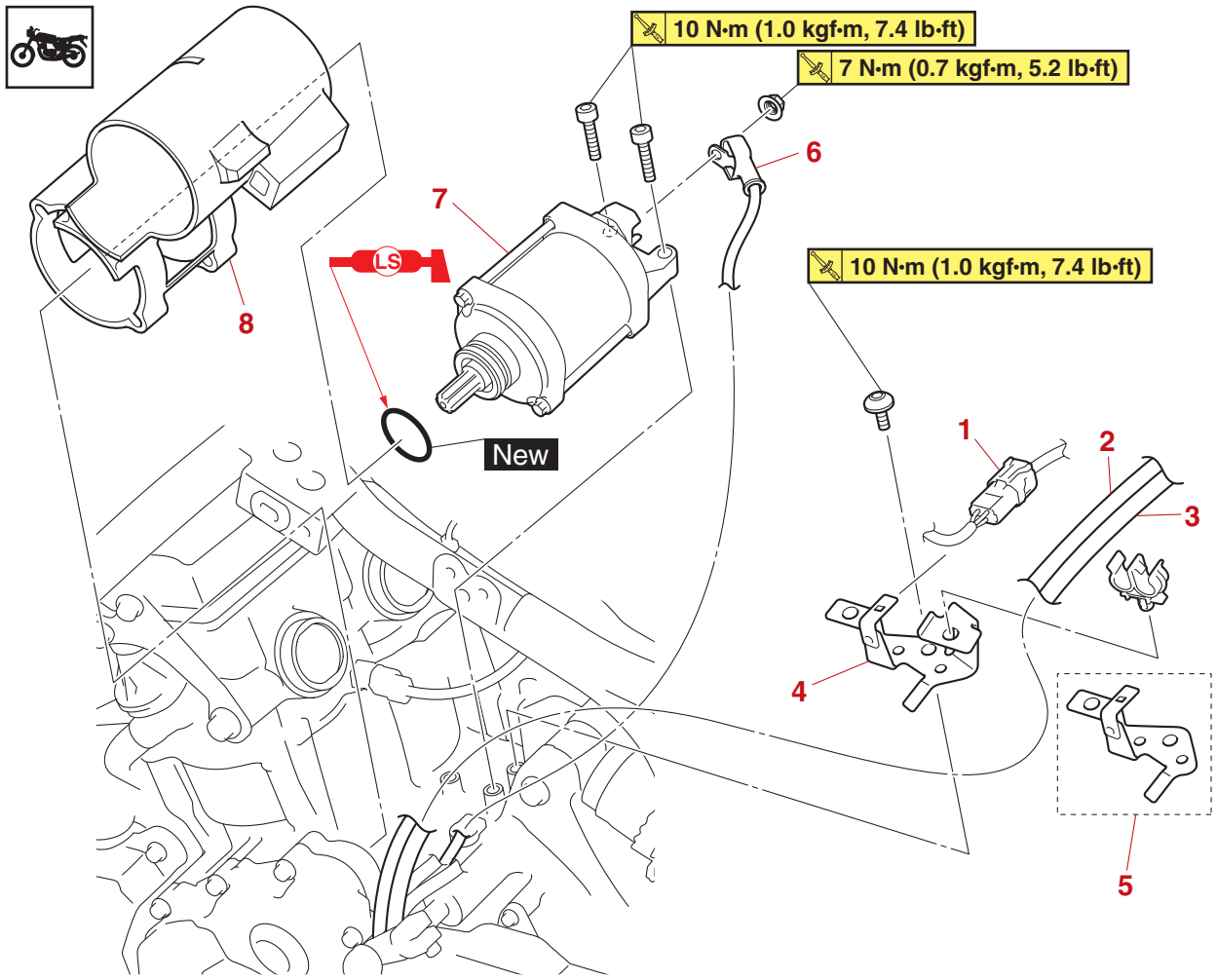
7. Connect:
   • Stator coil coupler
   • Crankshaft position sensor coupler

TIP

To route the stator coil lead, refer to “CABLE ROUTING” on page 2-13.

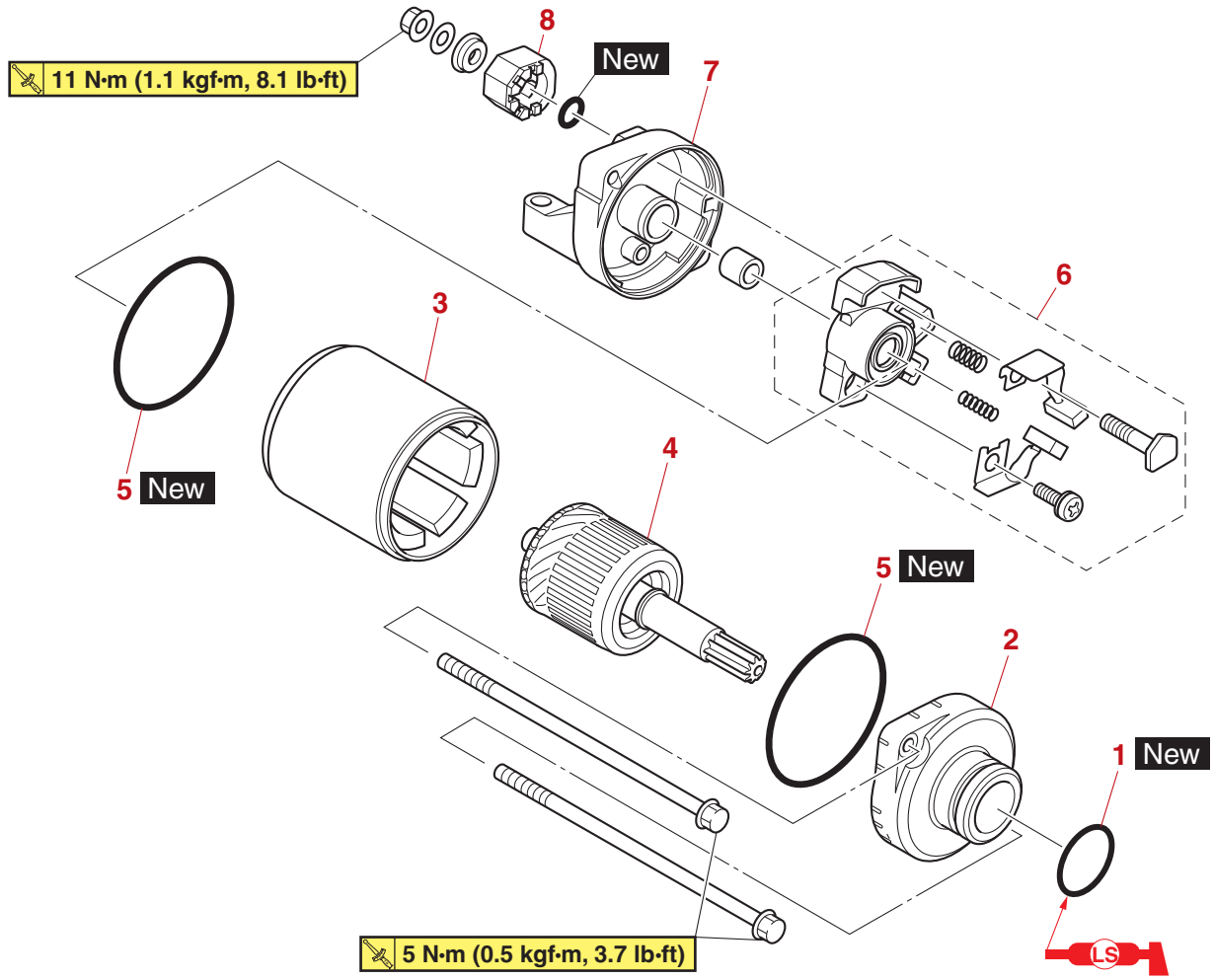
EAS20052
ELECTRIC STARTER

Removing the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Canister/Purge cut valve solenoid		For California only. Refer to "FUEL TANK" on page 7-1.
	Pivot shaft protectors		Refer to "SWINGARM" on page 4-92.
	Air duct bracket		Refer to "AIR FILTER" on page 7-7.
	Throttle bodies/Air filter case		Refer to "THROTTLE BODIES" on page 7-9.
1	Gear position switch coupler	1	
2	Fuel tank overflow hose	1	Except for California.
3	Fuel tank breather hose	1	Except for California.
4	Coupler and hose bracket	1	Except for California.
5	Coupler bracket	1	For California only.
6	Starter motor lead	1	Disconnect.
7	Starter motor	1	
8	Canister holder	1	For California only.

Disassembling the starter motor



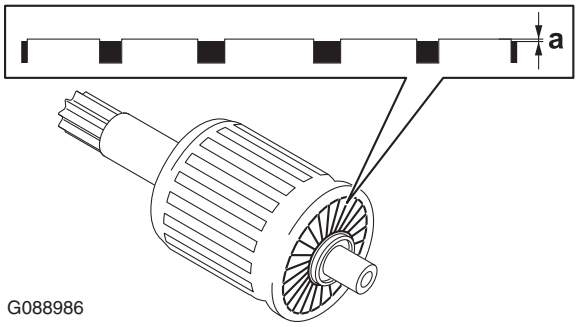
Order	Job/Parts to remove	Q'ty	Remarks
1	O-ring	1	
2	Starter motor front cover	1	
3	Starter motor yoke	1	
4	Armature assembly	1	
5	Gasket	2	
6	Brush holder set	1	
7	Starter motor rear cover	1	
8	Lead guide	1	

EAS30325
CHECKING THE STARTER MOTOR

1. Check:
   • Commutator
   Dirt → Clean with 600 grit sandpaper.
2. Measure:
   • Mica undercut “a”
   Out of specification → Cut the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

Mica undercut (depth)
0.70 mm (0.03 in)

TIP
The mica of the commutator must be undercut to ensure proper operation of the commutator.

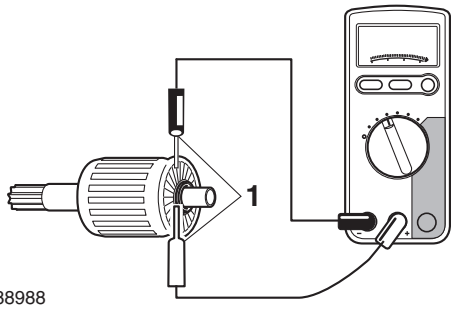


G088986

3. Measure:
   • Armature assembly resistance “1”
   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

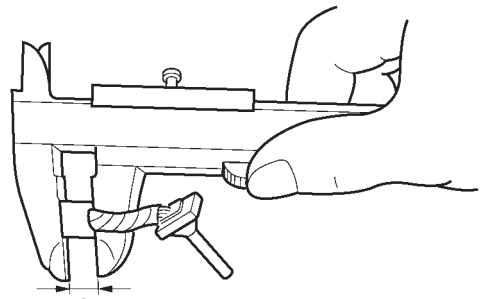
   b. If there is no continuity, replace the starter motor.



G088988

4. Measure:
   • Brush length “a”
   Out of specification → Replace the brush holder set.

Brush overall length limit
6.5 mm (0.26 in)

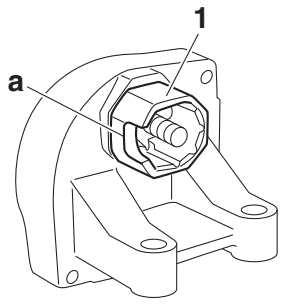

G088989 **a**

5. Check:
   • Gear teeth
   Damage/wear → Replace the starter motor.
6. Check:
   • Bearing
   • Oil seal
   Damage/wear → Replace the starter motor front cover.

EAS30326
ASSEMBLING THE STARTER MOTOR

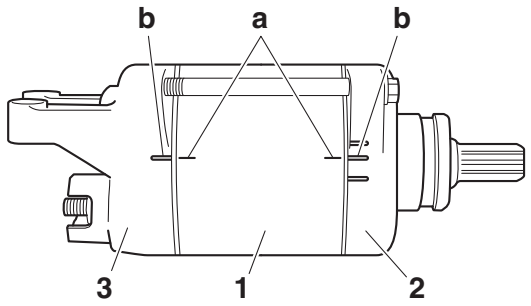
1. Install:
   • Lead guide “1”

TIP
Make sure that the slot “a” in the lead guide is facing in the direction shown in the illustration.



2. Install:
   • Starter motor yoke “1”
   • Starter motor front cover “2”
   • Starter motor rear cover “3”

TIP
Align the match marks “a” on the starter motor yoke with the match marks “b” on the front cover and rear covers.

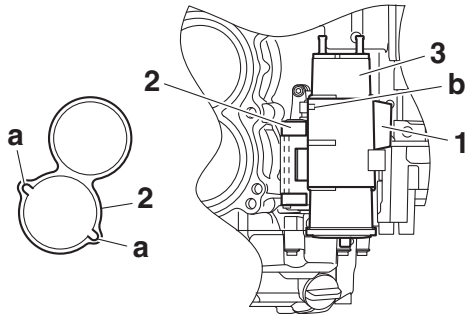


EAS30327
INSTALLING THE STARTER MOTOR

1. Install:
   - Canister holder “1” (for California only)
   - Starter motor “2”
   - Canister “3” (for California only)

TIP

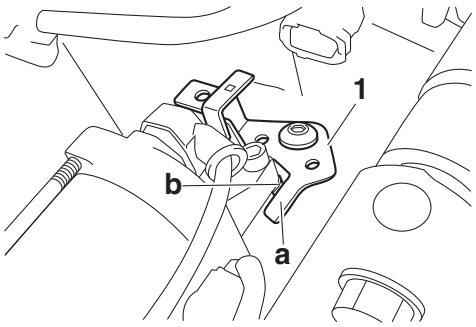
- Pass the starter motor front cover bolts through the slots “a” in the canister holder to secure it.
- Install the canister holder with the stamped mark “2RC” “b” facing forward.



2. Install:
   - Coupler bracket “1”

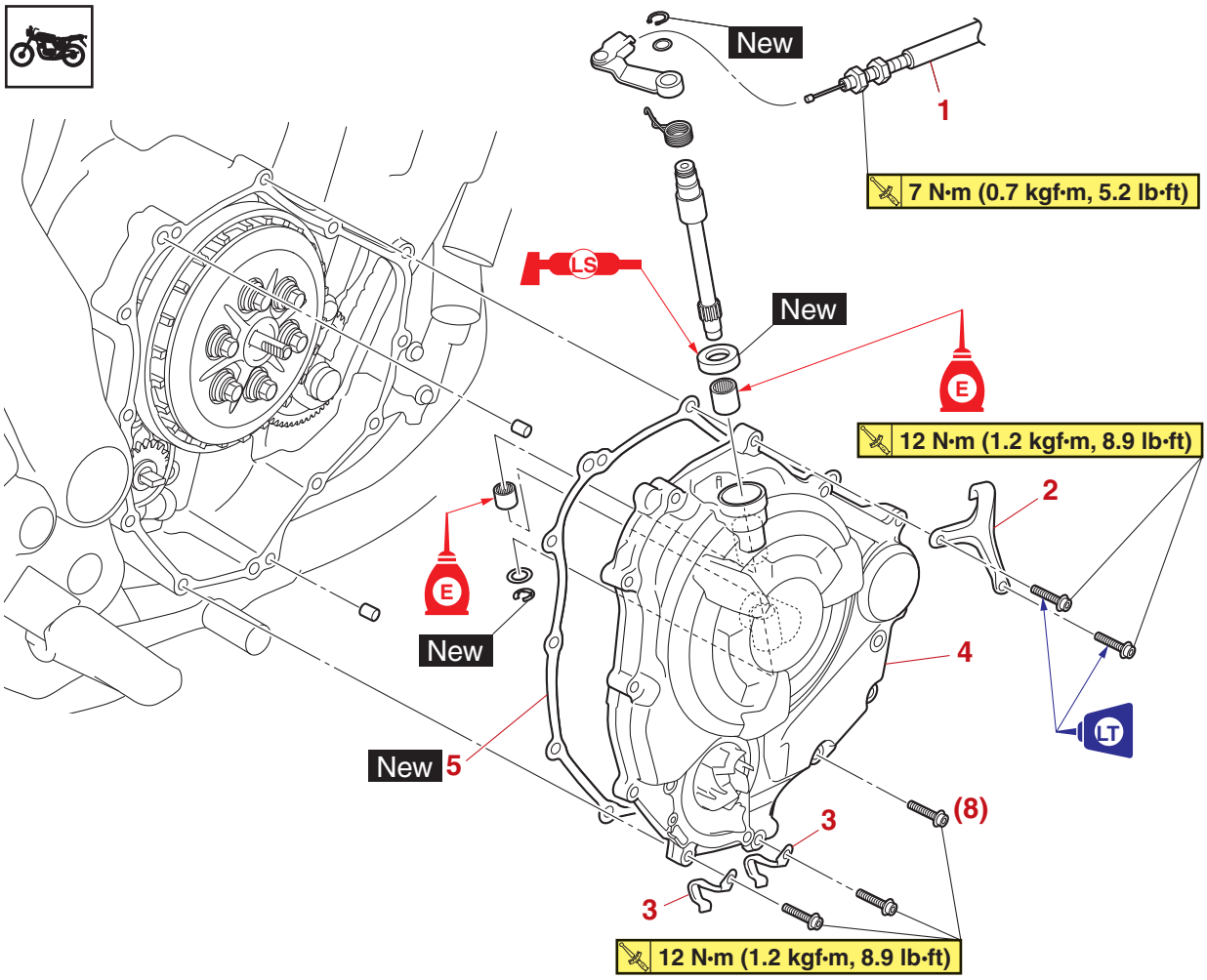
TIP

Make sure that the tab “a” on the coupler bracket contacts the projection “b” on the cylinder block.



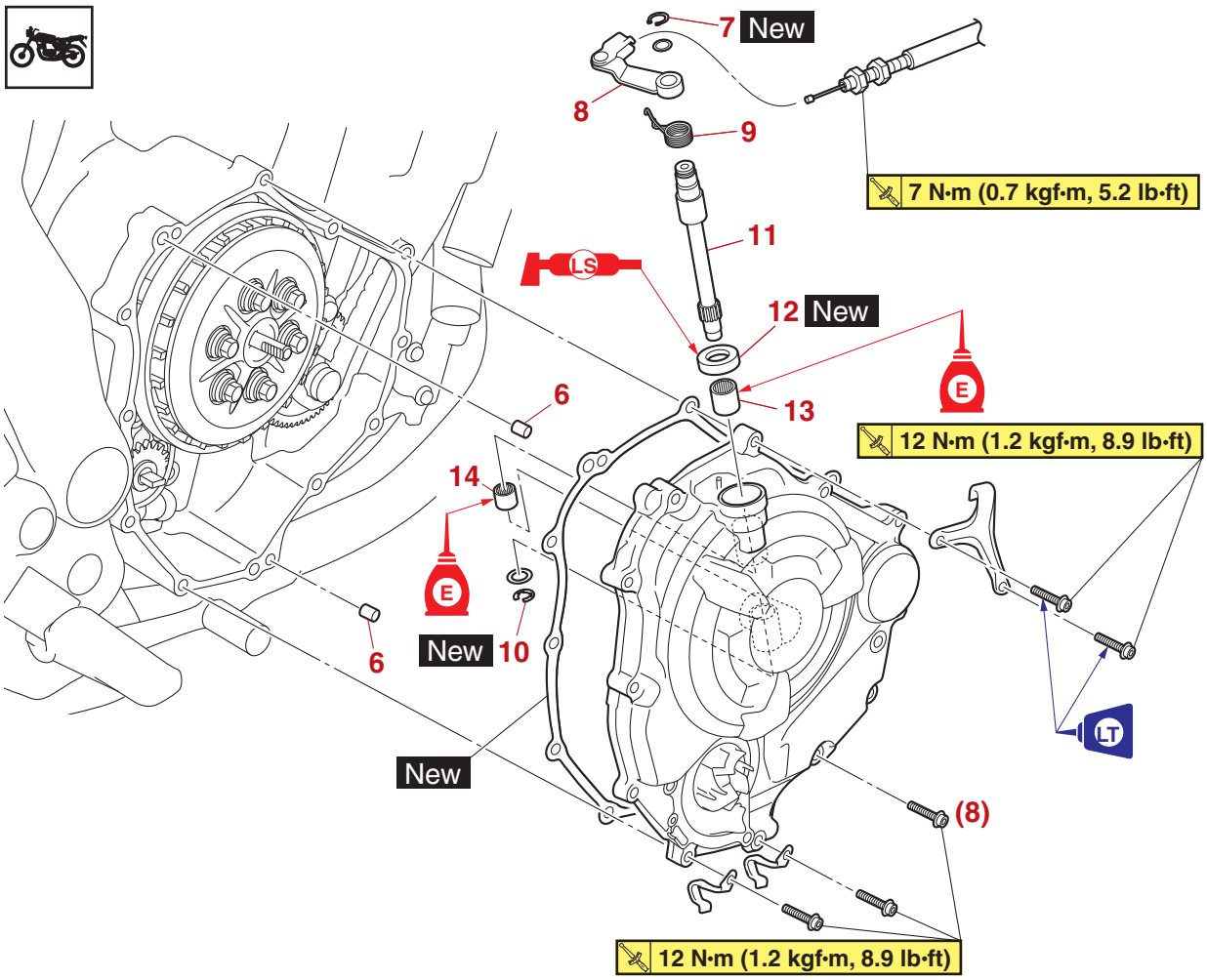
EAS20055
CLUTCH

Removing the clutch cover and pull lever shaft



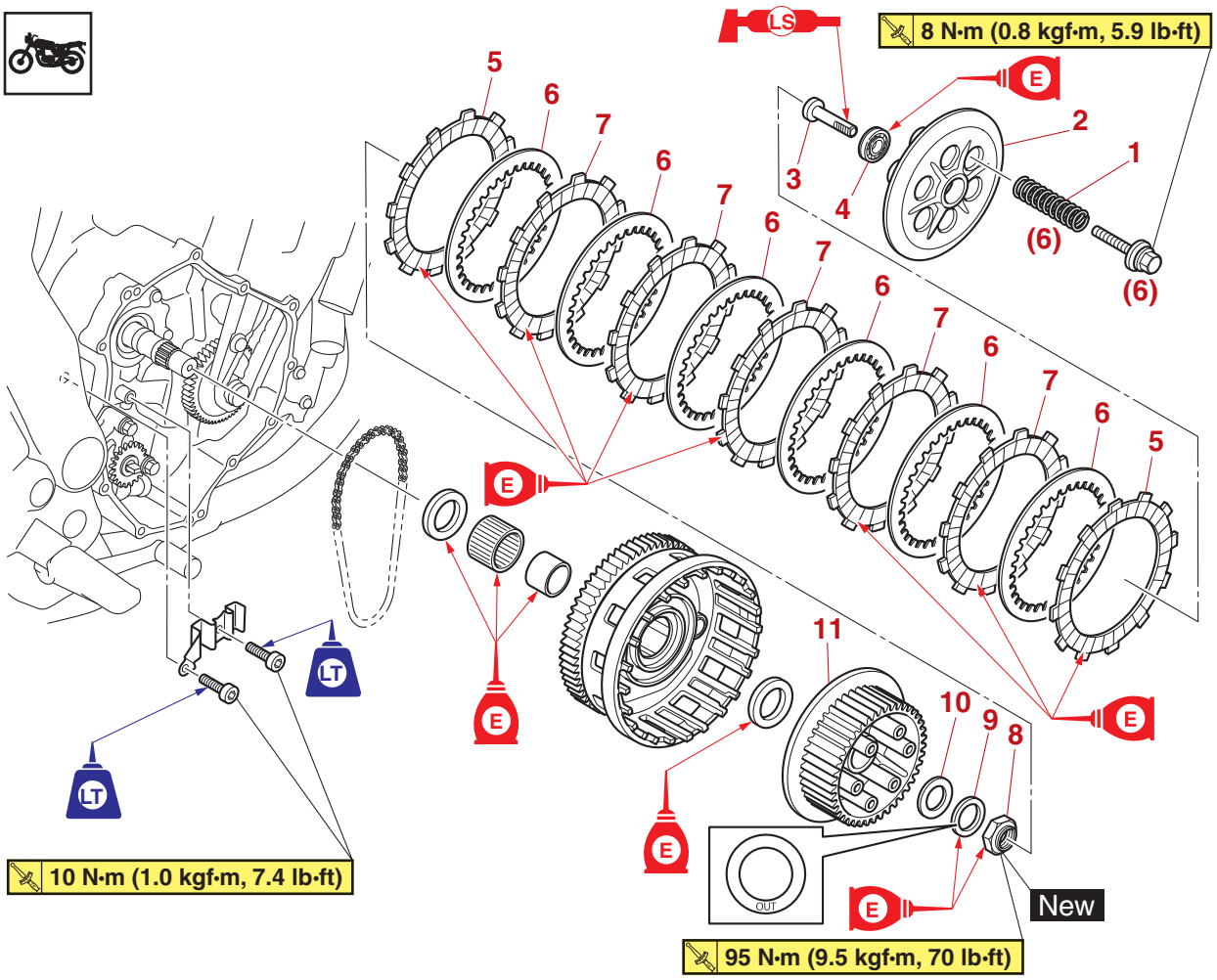
Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
	Water pump housing		Refer to "WATER PUMP" on page 6-11.
1	Clutch cable	1	Disconnect.
2	Clutch cable holder	1	
3	Holder (O_2 sensor lead and oil pressure switch lead)	2	
4	Clutch cover	1	
5	Clutch cover gasket	1	

Removing the clutch cover and pull lever shaft



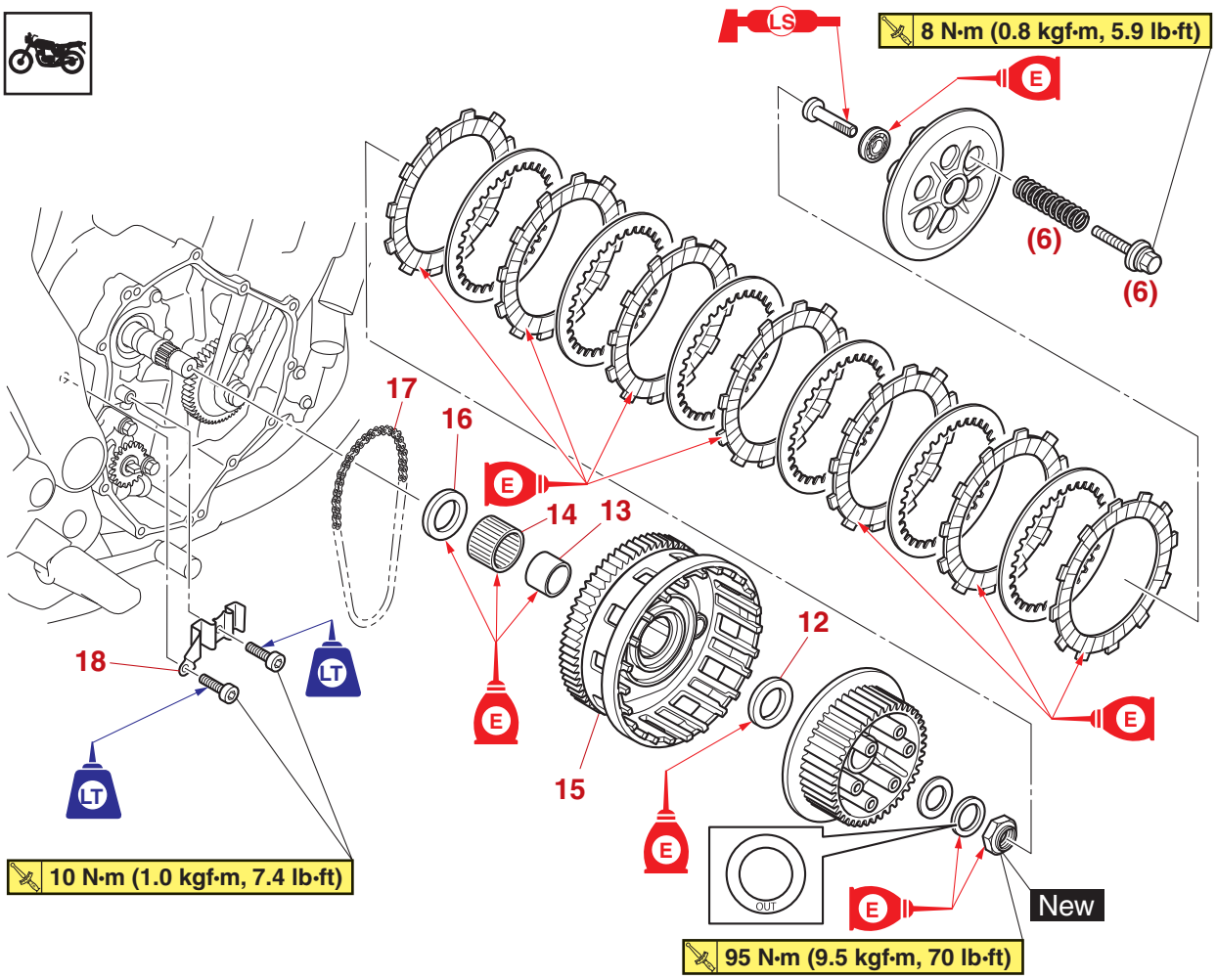
Order	Job/Parts to remove	Q'ty	Remarks
6	Dowel pin	2	
7	Circlip	1	
8	Pull lever	1	
9	Pull lever spring	1	
10	Circlip	1	
11	Pull lever shaft	1	
12	Oil seal	1	
13	Bearing	1	
14	Bearing	1	

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
1	Clutch spring	6	
2	Pressure plate	1	
3	Pull rod	1	
4	Bearing	1	
5	Friction plate 1	2	
6	Clutch plate	6	
7	Friction plate 2	5	Identification color (purple)
8	Clutch boss nut	1	
9	Conical spring washer	1	
10	Washer	1	
11	Clutch boss	1	

Removing the clutch



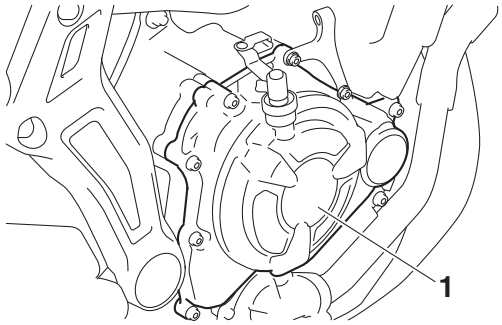
Order	Job/Parts to remove	Q'ty	Remarks
12	Thrust plate	1	
13	Spacer	1	
14	Bearing	1	
15	Clutch housing	1	
16	Thrust plate	1	
17	Oil pump drive chain	1	
18	Oil pump drive chain guide	1	

EAS30346
REMOVING THE CLUTCH

1. Remove:
   • Clutch cover “1”
   • Gasket

TIP

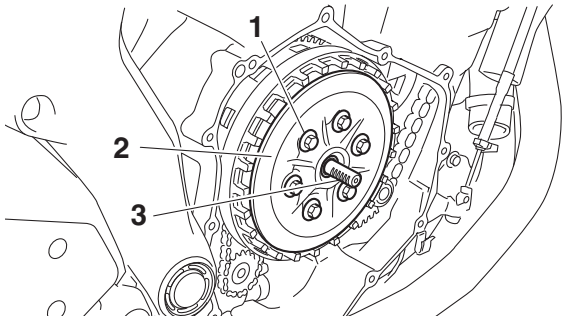
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



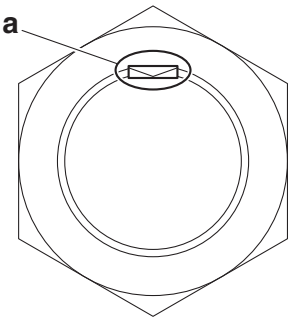
2. Remove:
   • Clutch spring bolt “1”
   • Clutch spring
   • Pressure plate “2”
   • Pull rod “3”

TIP

Loosen the clutch spring bolts in stages and in a crisscross pattern.



3. Remove:
   • Friction plate 1
   • Clutch plate
   • Friction plate 2
4. Straighten the clutch boss nut rib “a”.



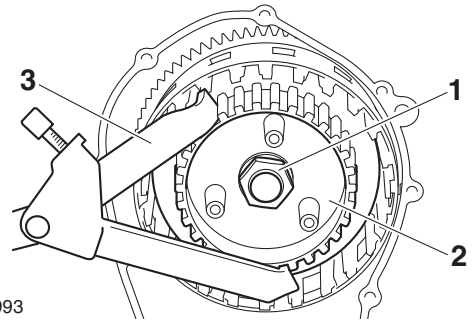
G088991

5. Loosen:
   • Clutch boss nut “1”

TIP

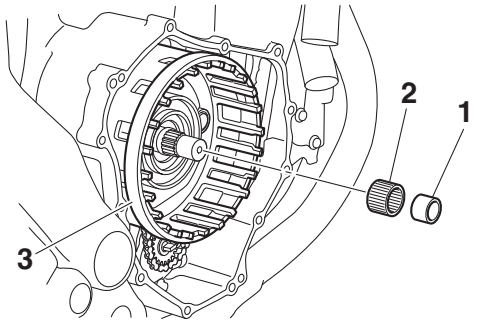
While holding the clutch boss “2” with the universal clutch holder “3”, loosen the clutch boss nut.

Clutch holder
90890-04199
Universal clutch holder
YM-91042

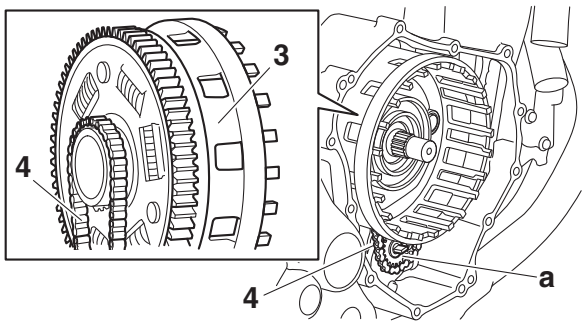


G088993

6. Remove:
   • Spacer “1”
   • Bearing “2”
   • Clutch housing “3”
   a. Remove the spacer and bearing.



   b. Remove the oil pump drive chain “4” from the oil pump driven sprocket “a”, and then remove the clutch housing.



EAS30348
CHECKING THE FRICTION PLATES

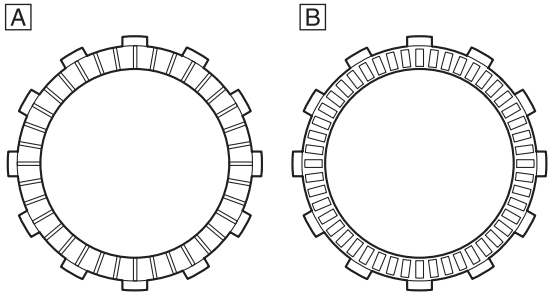
The following procedure applies to all of the friction plates.

1. Check:
   - Friction plate
     Damage/wear → Replace the friction plates as a set.
2. Measure:
   - Friction plate thickness
     Out of specification → Replace the friction plates as a set.

TIP

Measure the friction plate at four places.

Friction plate thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.110 in)
Friction plate thickness
2.92–3.08 mm (0.115–0.121 in)
Wear limit
2.82 mm (0.111 in)



A. Friction plate 1
B. Friction plate 2

EAS30349
CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

1. Check:
   - Clutch plate
     Damage → Replace the clutch plates as a set.
2. Measure:
   - Clutch plate warpage
     (with a surface plate and thickness gauge)
     Out of specification → Replace the clutch plates as a set.

Thickness gauge
90890-03268
Feeler gauge set
YU-26900-9

Warpage limit
0.10 mm (0.004 in)

EAS30351
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

1. Check:
   - Clutch spring
     Damage → Replace the clutch springs as a set.
2. Measure:
   - Clutch spring free length
     Out of specification → Replace the clutch springs as a set.

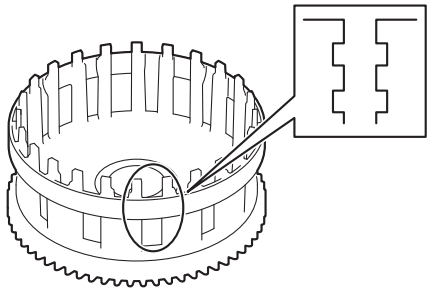
Clutch spring free length limit
47.50 mm (1.87 in)

EAS30352
CHECKING THE CLUTCH HOUSING

1. Check:
   - Clutch housing dog
     Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

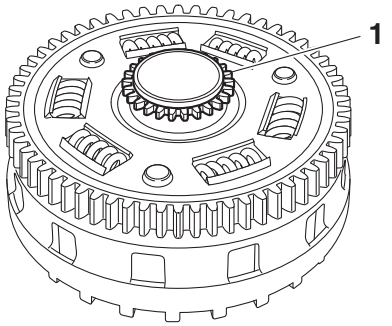
TIP

Pitting on the clutch housing dogs will cause erratic clutch operation.



G088994

2. Check:
   - Oil pump drive sprocket “1”
     Cracks/damage/wear → Replace.



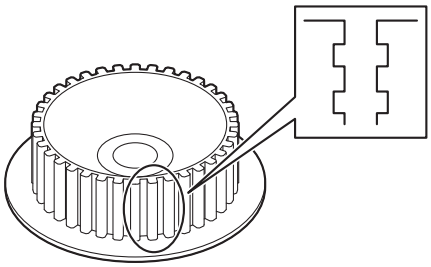
3. Check:
   • Bearing
   Damage/wear → Replace the bearing and clutch housing.

EAS30353
CHECKING THE CLUTCH BOSS

1. Check:
   • Clutch boss spline
   Damage/pitting/wear → Replace the clutch boss.

TIP

Pitting on the clutch boss splines will cause erratic clutch operation.



G088995

EAS30354
CHECKING THE PRESSURE PLATE

1. Check:
   • Pressure plate
   Cracks/damage → Replace.
   • Bearing
   Damage/wear → Replace.

EAS30356
CHECKING THE PRIMARY DRIVE GEAR

1. Check:
   • Primary drive gear
   Damage/wear → Replace the crankshaft and clutch housing as a set.
   Excessive noise during operation → Replace the crankshaft and clutch housing as a set.

EAS30357
CHECKING THE PRIMARY DRIVEN GEAR

1. Check:
   • Primary driven gear
   Damage/wear → Replace the clutch housing and crankshaft as a set.
   Excessive noise during operation → Replace the clutch housing and crankshaft as a set.

EAS30358
CHECKING THE PULL LEVER SHAFT AND PULL ROD

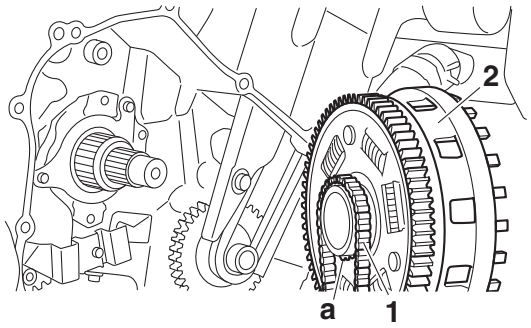
1. Check:
   • Pull lever shaft pinion gear teeth
   • Pull rod teeth
   Damage/wear → Replace the pull rod and pull lever shaft as a set.
2. Check:
   • Pull rod bearing
   Damage/wear → Replace.

EAS30363
INSTALLING THE CLUTCH

1. Install:
   • Oil pump drive chain “1”
   • Thrust plate
   • Clutch housing “2”
   • Bearing
   • Spacer

TIP

Install the oil pump drive chain onto the oil pump drive sprocket “a”.



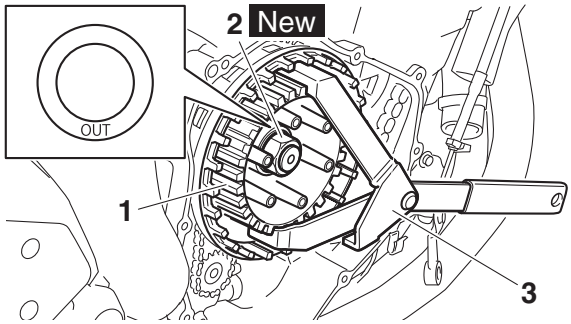
2. Install:
   • Thrust plate
   • Clutch boss “1”
   • Washer
   • Conical spring washer
   • Clutch boss nut “2” New

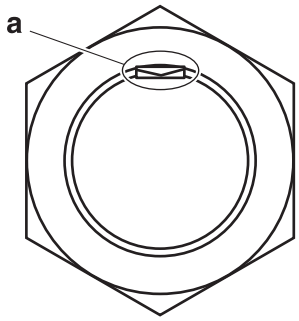
	Clutch boss nut **95 N·m (9.5 kgf·m, 70 lb·ft)**

TIP

- Lubricate the conical spring washer and clutch boss nut threads with engine oil.
- Install the washer on the main axle with the "OUT" mark facing away from the vehicle.
- While holding the clutch boss "1" with the universal clutch holder "3", tighten the clutch boss nut.
- Stake the clutch boss nut at a cutout "a" in the main axle.

Clutch holder
90890-04199
Universal clutch holder
YM-91042

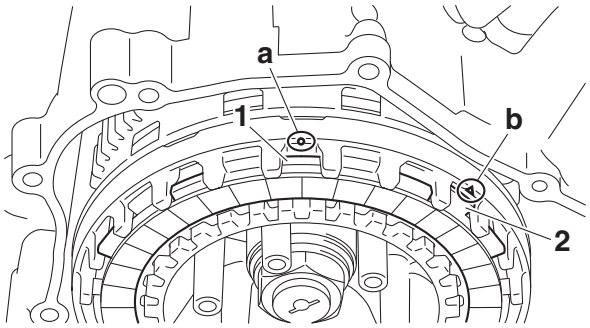




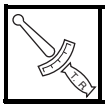
3. Install:
   - Friction plate 1 "1"
   - Friction plate 2 "2"

TIP

- First, install a friction plate, and then alternate between a clutch plate and a friction plate.
- Align a projection on friction plate 1 with the punch mark "a" on the clutch housing and align a projection on friction plate 2 with the "△" mark "b" on the housing.



4. Install:
   - Bearing
   - Pull rod
   - Pressure plate
   - Clutch spring
   - Clutch spring bolt



Clutch spring bolt
8 N·m (0.8 kgf·m, 5.9 lb·ft)

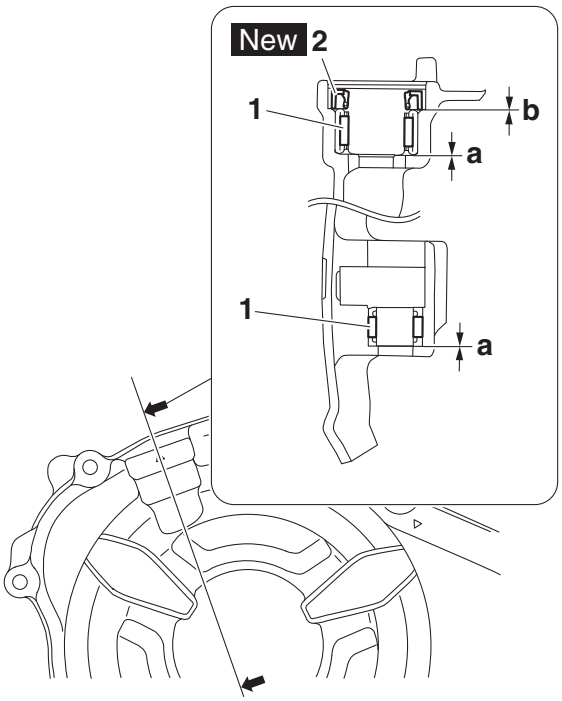
TIP

- Apply lithium-soap-based grease onto the pull rod.
- Tighten the clutch spring bolts in stages and in a crisscross pattern.

5. Install:
   - Bearing "1"
   - Oil seal "2" New
     (to the clutch cover)

TIP

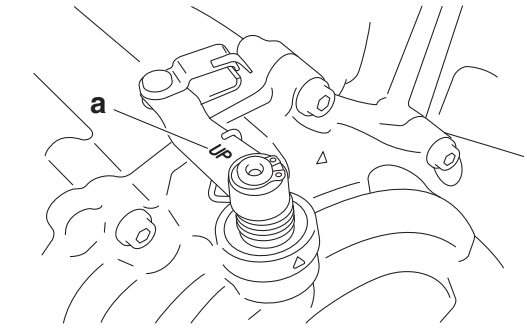
- Lubricate the bearings with engine oil and lubricate the oil seal with lithium-soap-based grease.
- Install the bearings until they contact the surfaces "a" and install the oil seal until it contacts the surface "b" as shown in the illustration.

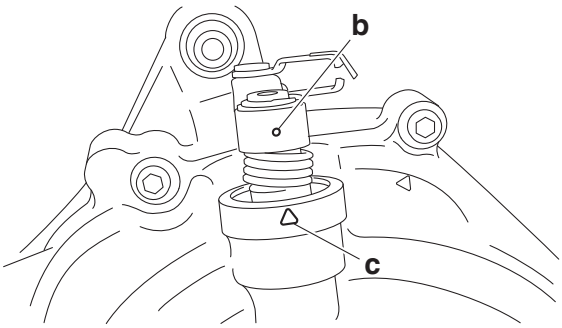


6. Install:
   • Pull lever

TIP

- Install the pull lever with the "UP" mark "a" facing toward upper side.
- When installing the pull lever, push the pull lever and check that the punch mark "b" on the pull lever aligns with the mark "c" on the clutch cover.



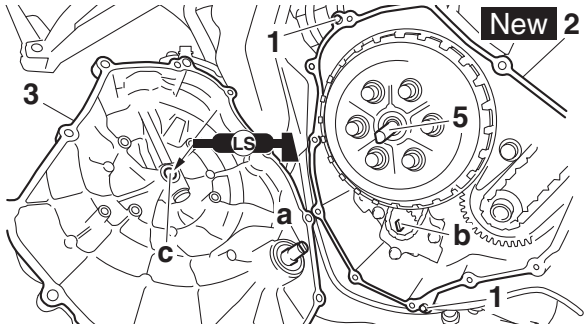


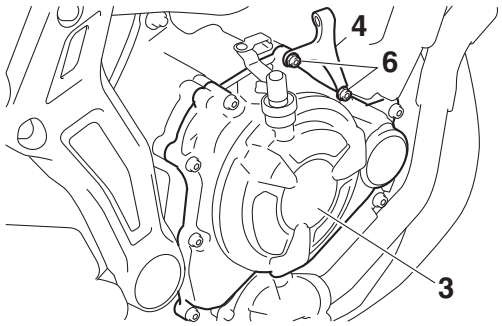
7. Install:
   • Dowel pin "1"
   • Clutch cover gasket "2" New
   • Clutch cover "3"
   • Clutch cable holder "4"

Clutch cover bolt
12 N·m (1.2 kgf·m, 8.9 lb·ft)
Clutch cable holder bolt
12 N·m (1.2 kgf·m, 8.9 lb·ft)
LOCTITE®

TIP

- Align the slit "a" in the impeller shaft with the projection "b" on the oil pump driven sprocket.
- Face the serrations on the clutch pull rod "5" rearward and align the rod with the hole "c" in the clutch cover.
- Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.
- Apply locking agent (LOCTITE®) to the threads of only the clutch cable holder bolts "6" shown in the illustration.
- Tighten the bolts in stages and in a crisscross pattern.

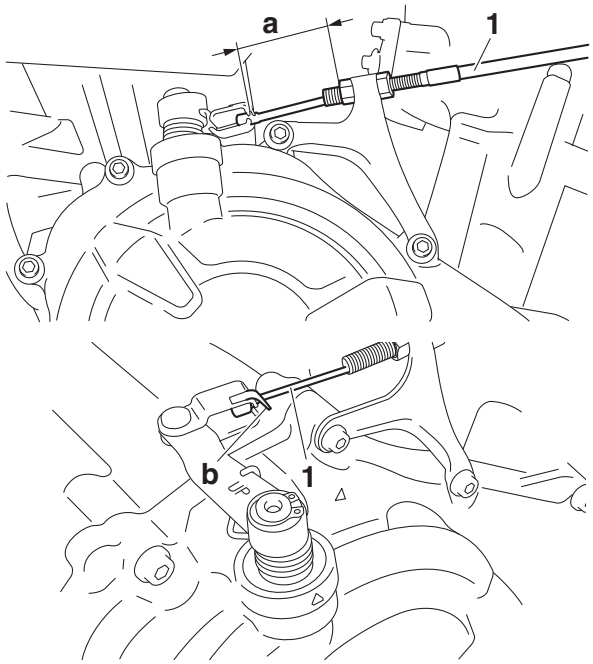




8. Connect:
   • Clutch cable “1”

TIP

- Install the clutch cable so that the clutch cable length “a” is 51.6–62.2 mm (2.03–2.45 in) as shown in the illustration. In addition, make sure that the vehicle is positioned upright when measuring the clutch cable length.
- After installing the clutch cable, bend the projection “b” on the pull lever.

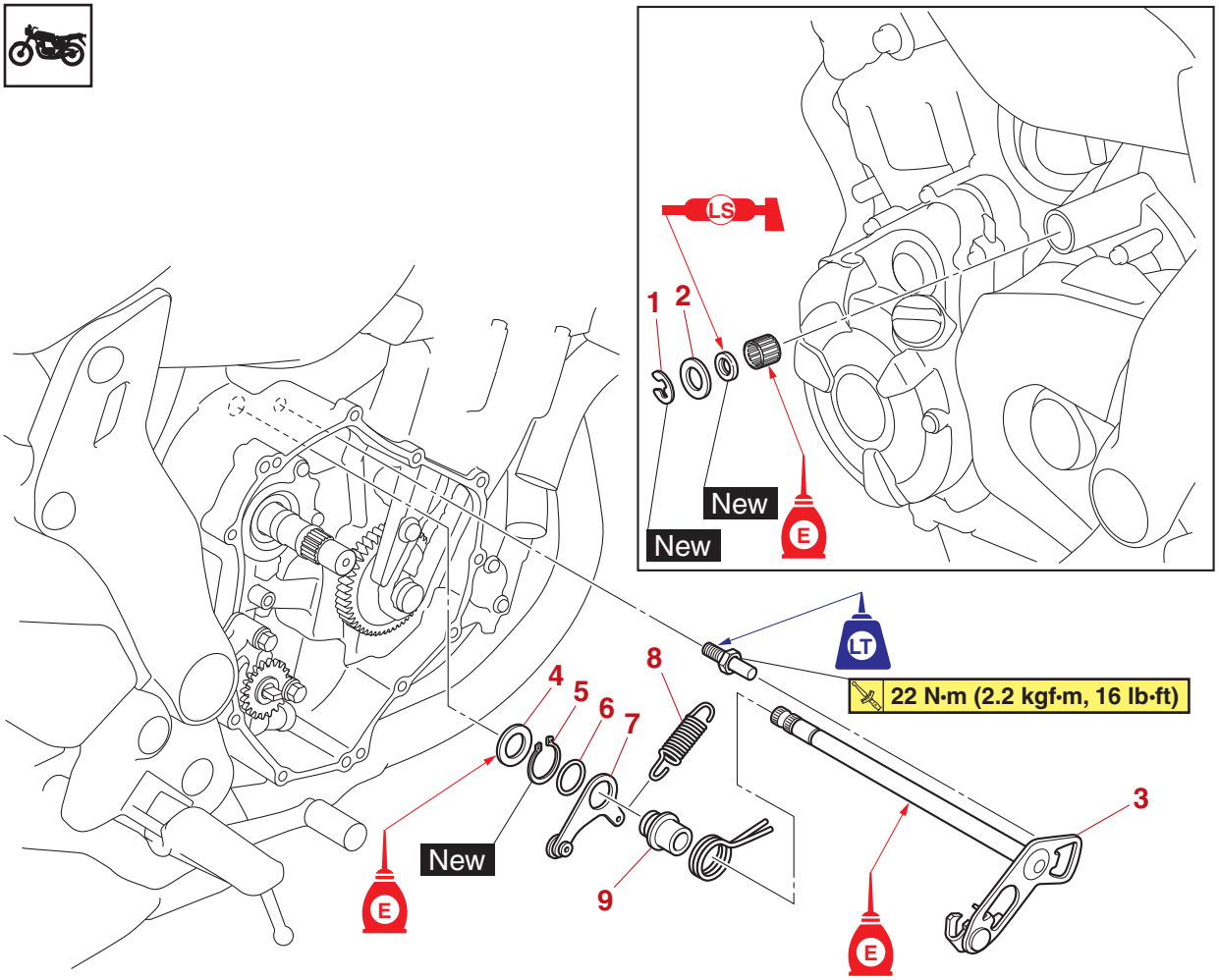


9. Adjust:
   • Clutch lever free play
   Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-12.

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

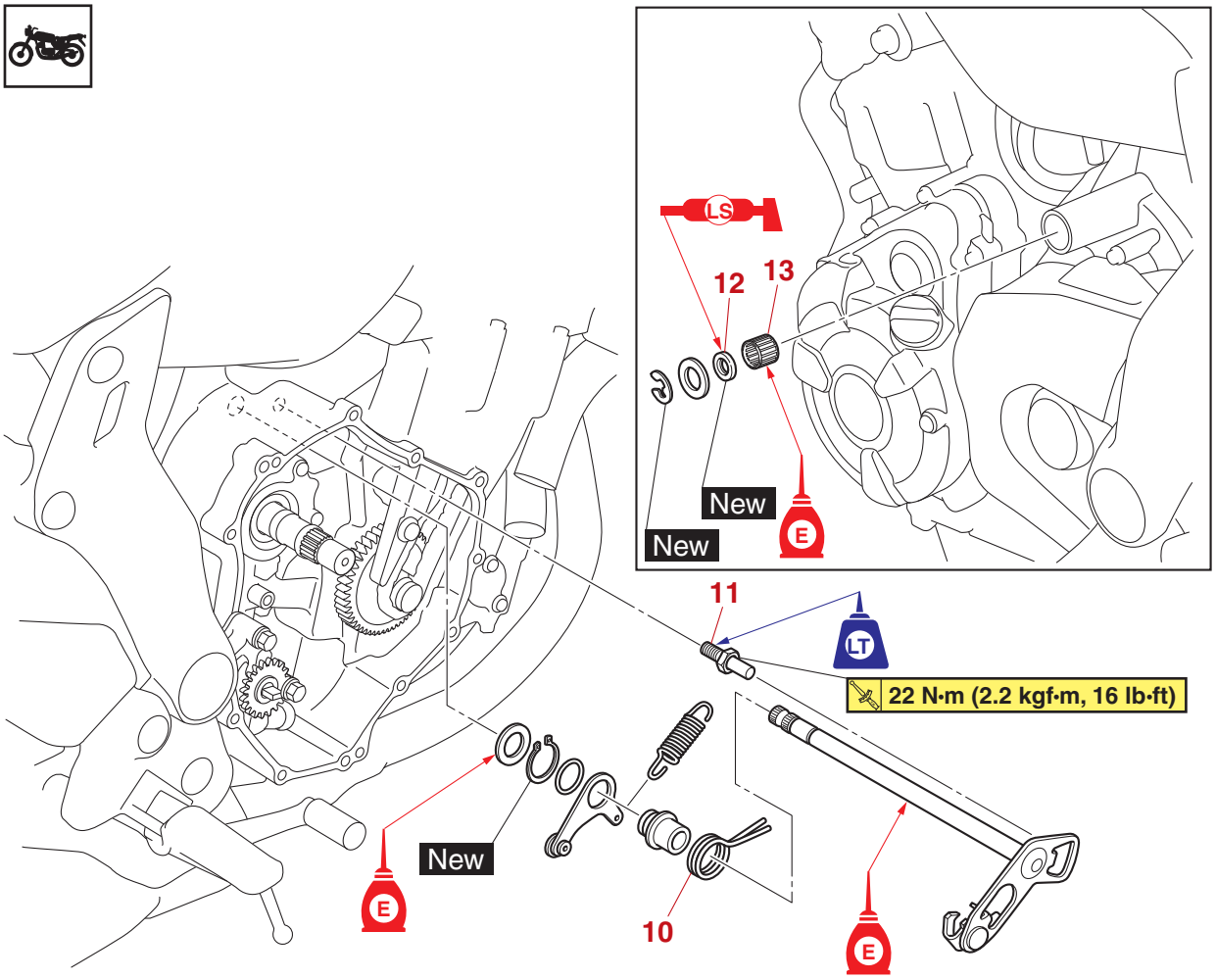
EAS20057
SHIFT SHAFT

Removing the shift shaft and stopper lever



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch housing		Refer to "CLUTCH" on page 5-53.
1	Circlip	1	
2	Washer	1	
3	Shift shaft	1	
4	Washer	1	
5	Circlip	1	
6	Washer	1	
7	Stopper lever	1	
8	Stopper lever spring	1	
9	Collar	1	

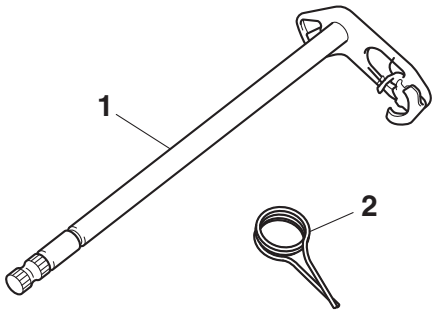
Removing the shift shaft and stopper lever



Order	Job/Parts to remove	Q'ty	Remarks
10	Shift shaft spring	1	
11	Shift shaft spring stopper	1	
12	Oil seal	1	
13	Bearing	1	

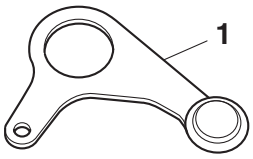
EAS30377
CHECKING THE SHIFT SHAFT

1. Check:
   - Shift shaft “1”
     Bends/damage/wear → Replace.
   - Shift shaft spring “2”
   - Collar
     Damage/wear → Replace.



EAS30378
CHECKING THE STOPPER LEVER

1. Check:
   - Stopper lever “1”
     Bends/damage → Replace.
     Roller turns roughly → Replace the stopper lever.



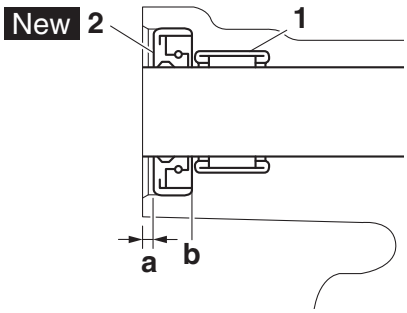
EAS30381
INSTALLING THE SHIFT SHAFT

1. Install:
   - Bearing “1”
   - Oil seal “2” New

	Install depth “a” **0.6–1.1 mm (0.02–0.04 in)**

TIP

- Apply engine oil onto the bearing.
- Make sure that the bearing does not protrude past the line “b” shown in the illustration.
- Lubricate the oil seal lips with lithium-soap-based grease.

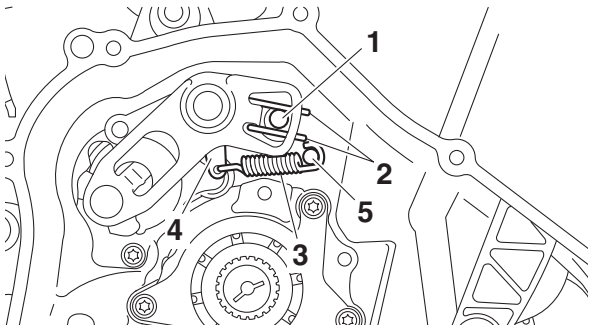


2. Install:
   - Shift shaft spring stopper
   - Washer
   - Shift shaft assembly
   - Stopper lever spring

	Shift shaft spring stopper **22 N·m (2.2 kgf·m, 16 lb·ft)** **LOCTITE®**

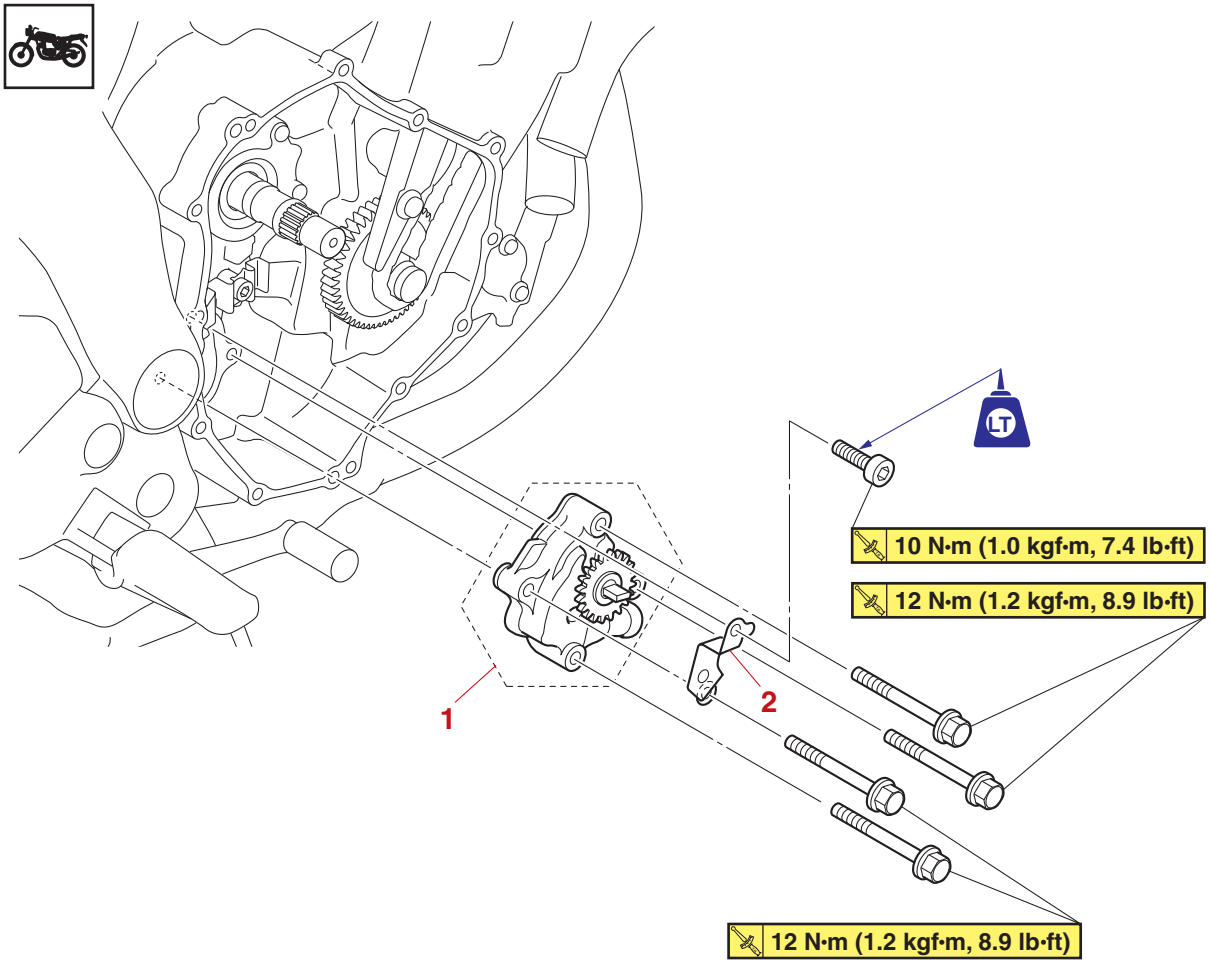
TIP

- Hook the end of the shift shaft spring “2” onto the shift shaft spring stopper “1”.
- Hook the ends of the stopper lever spring “3” onto the stopper lever “4” and the stopper lever spring hook “5”.
- Mesh the stopper lever with the shift drum segment assembly.



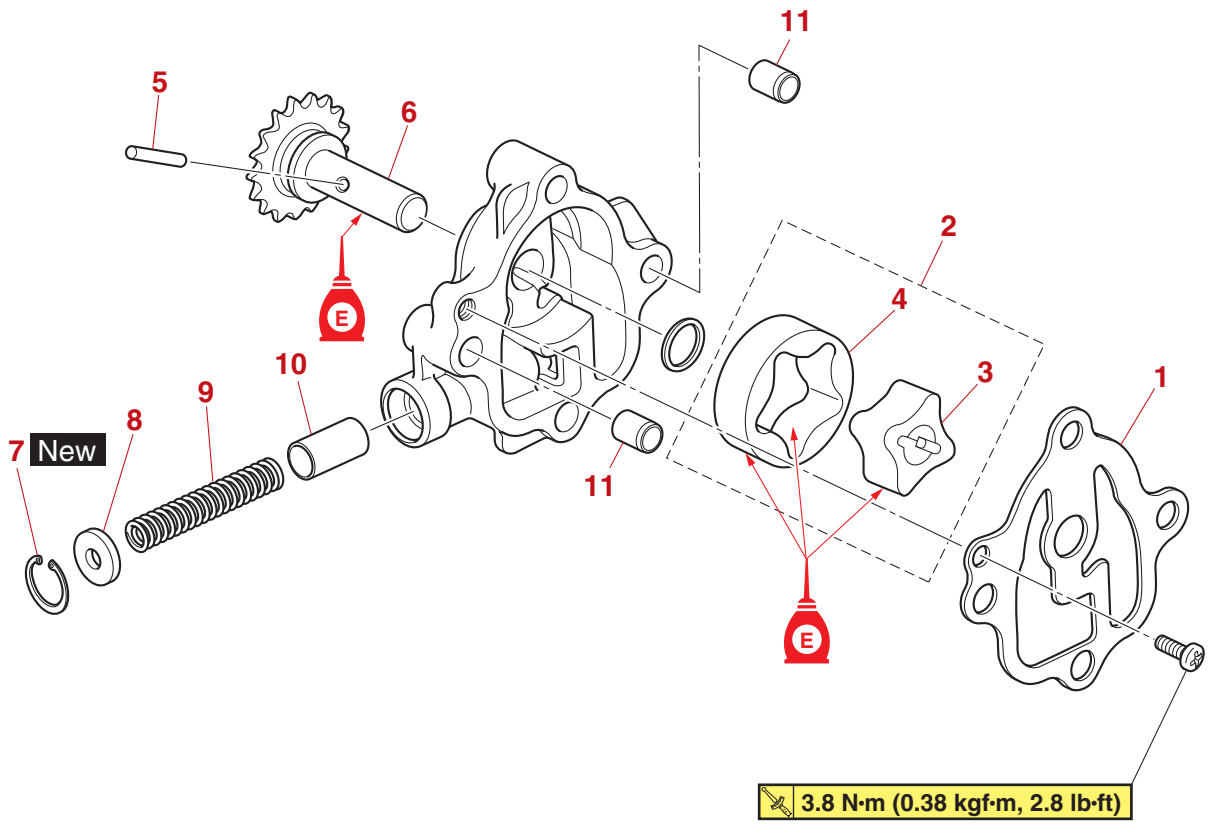
EAS20054
OIL PUMP

Removing the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch housing		Refer to "CLUTCH" on page 5-53.
1	Oil pump assembly	1	
2	Holder	1	

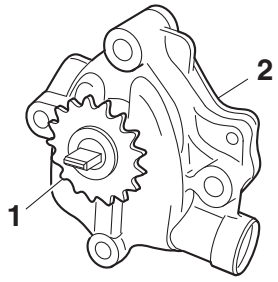
Disassembling the oil pump



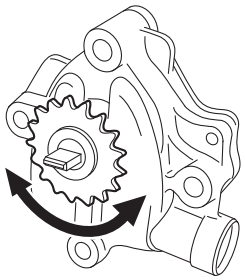
Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump cover	1	
2	Oil pump rotor assembly	1	
3	Oil pump inner rotor	1	
4	Oil pump outer rotor	1	
5	Pin	1	
6	Oil pump driven sprocket	1	
7	Circlip	1	Hold down the washer when removing the circlip.
8	Washer	1	
9	Spring	1	
10	Relief valve	1	
11	Dowel pin	2	

EAS30336
CHECKING THE SPROCKET AND CHAIN
1. Check:
   - Oil pump drive sprocket
     Refer to "CHECKING THE CLUTCH HOUSING" on page 5-58.
   - Oil pump driven sprocket
     Refer to "CHECKING THE OIL PUMP" on page 5-68.
2. Check:
   - Oil pump drive chain
     Damage/stiffness → Replace the oil pump drive chain, oil pump drive sprocket (clutch housing), and oil pump driven sprocket as a set.

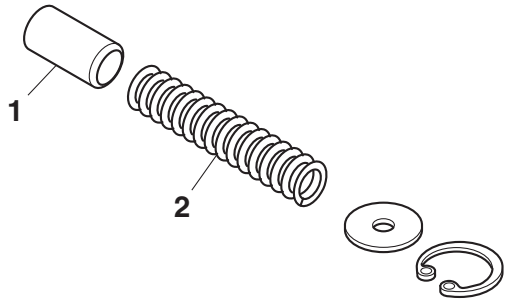
EAS30337
CHECKING THE OIL PUMP
1. Check:
   - Oil pump driven sprocket "1"
   - Oil pump housing "2"
     Cracks/damage/wear → Replace the oil pump assembly.



2. Check:
   - Oil pump operation
     Rough movement → Repeat step (1) or replace the oil pump assembly.



EAS30338
CHECKING THE RELIEF VALVE
1. Check:
   - Relief valve "1"
   - Spring "2"
     Damage/wear → Replace the oil pump assembly.



EAS30342
ASSEMBLING THE OIL PUMP
1. Lubricate:
   - Inner rotor
   - Outer rotor
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

2. Lubricate:
   - Oil pump driven sprocket
     (with the recommended lubricant)

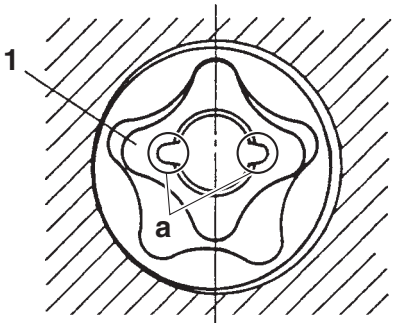
	Recommended lubricant **Engine oil**

3. Install:
   - Oil pump driven sprocket
   - Pin
   - Outer rotor
   - Inner rotor
   - Oil pump cover
   - Oil pump cover screw

	Oil pump cover screw **3.8 N·m (0.38 kgf·m, 2.8 lb·ft)**

TIP

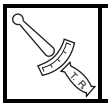
Align the pin in the oil pump shaft with the grooves "a" in the inner rotor "1".



4. Check:
   • Oil pump operation
   Refer to “CHECKING THE OIL PUMP” on page 5-68.

EAS30343
INSTALLING THE OIL PUMP

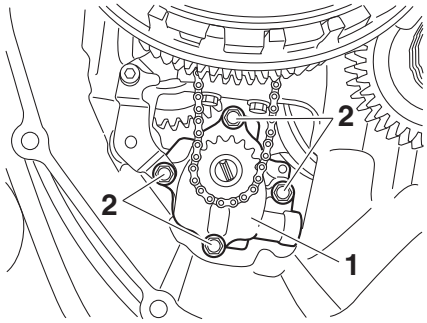
1. Install:
   • Oil pump “1”
   • Oil pump bolt “2”

	**Oil pump bolt** **12 N·m (1.2 kgf·m, 8.9 lb·ft)**

ECA20940

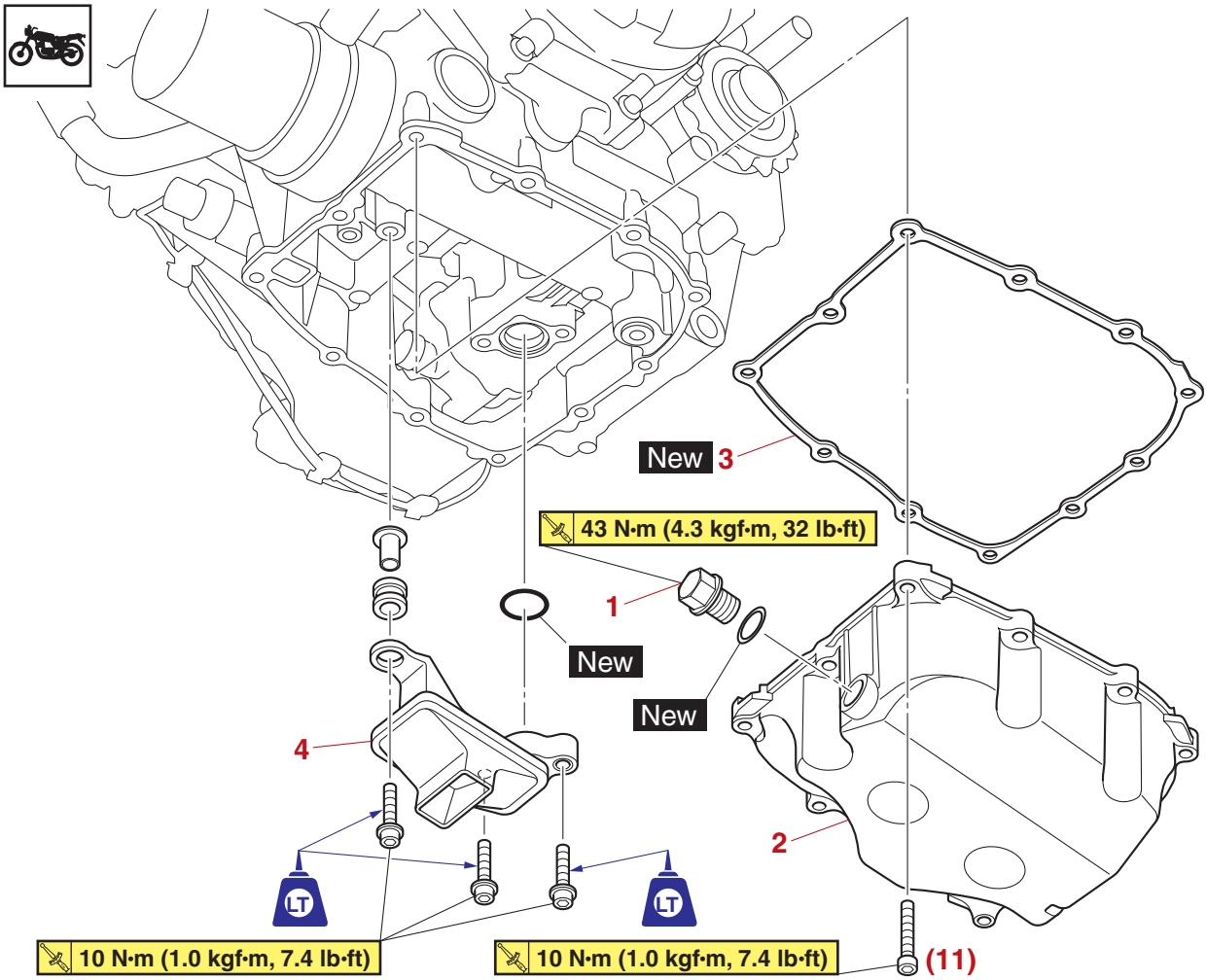
NOTICE

After installing the oil pump drive chain and driven sprocket, make sure the oil pump turns smoothly.



EAS20177
OIL PAN

Removing the oil pan



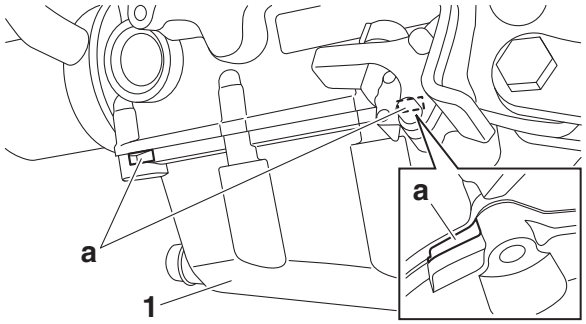
Order	Job/Parts to remove	Q'ty	Remarks
	Pivot shaft protector (right)		Refer to "SWINGARM" on page 4-92.
	Footrest assembly (right)		Refer to "REAR BRAKE" on page 4-48.
	Muffler assembly		Refer to "ENGINE REMOVAL" on page 5-10.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
1	Engine oil drain bolt	1	
2	Oil pan	1	
3	Oil pan gasket	1	
4	Oil strainer	1	

EAS31068
REMOVING THE OIL PAN

1. Remove:
   - Oil pan “1”
   - Oil pan gasket

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.
- Insert a flat-head screwdriver into the slots “a” in the oil pan to remove the oil pan.

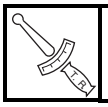


EAS31069
CHECKING THE OIL STRAINER

1. Check:
   - Oil strainer
     Damage → Replace.
     Contaminants → Clean with solvent.

EAS31070
INSTALLING THE OIL PAN

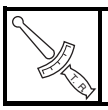
1. Install:
   - Oil pan gasket New
   - Oil pan

	**Oil pan bolt** **10 N·m (1.0 kgf·m, 7.4 lb·ft)**

TIP

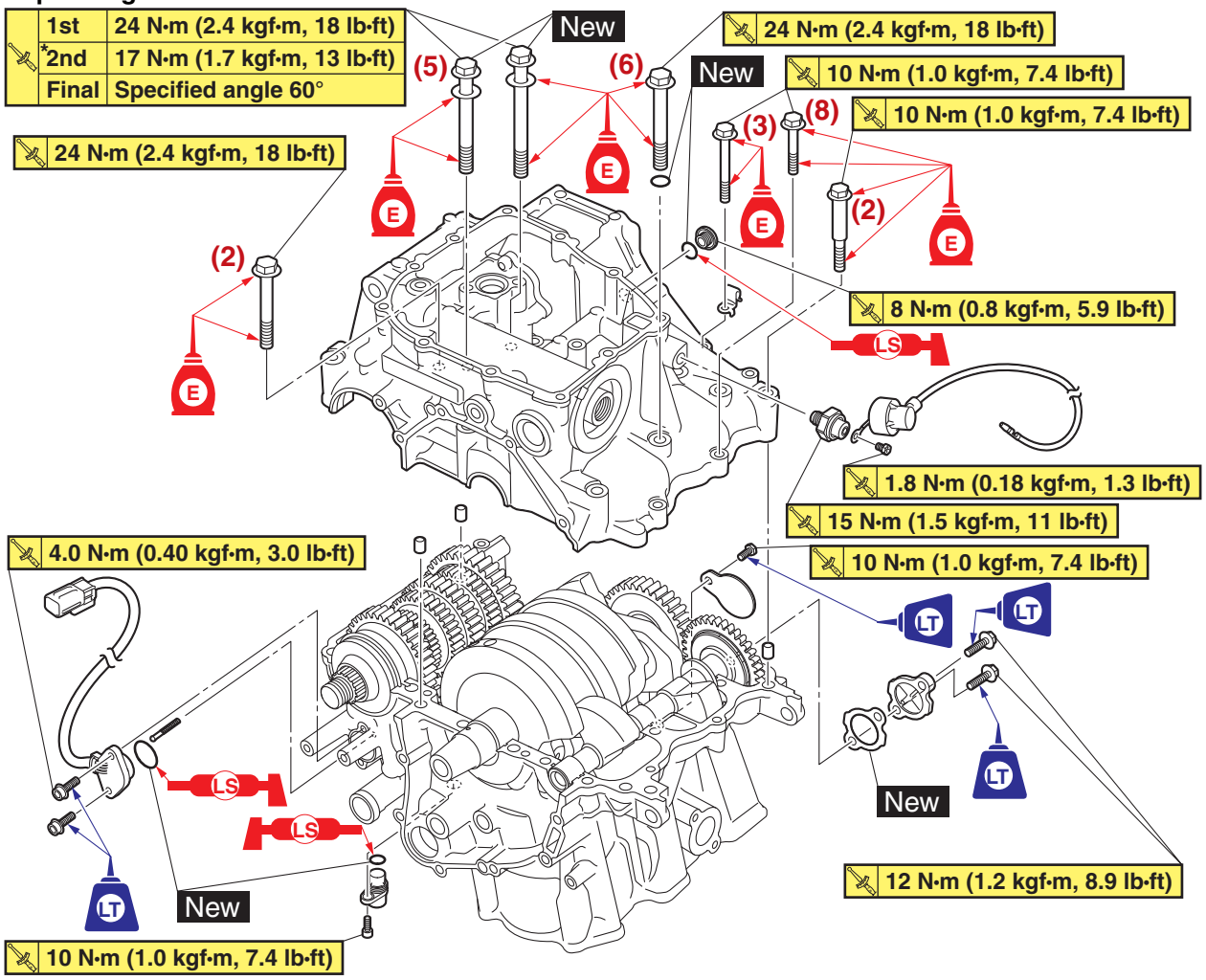
Tighten the oil pan bolts in stages and in a crisscross pattern.

2. Install:
   - Gasket New
   - Engine oil drain bolt

	**Engine oil drain bolt** **43 N·m (4.3 kgf·m, 32 lb·ft)**

EAS20059
CRANKCASE

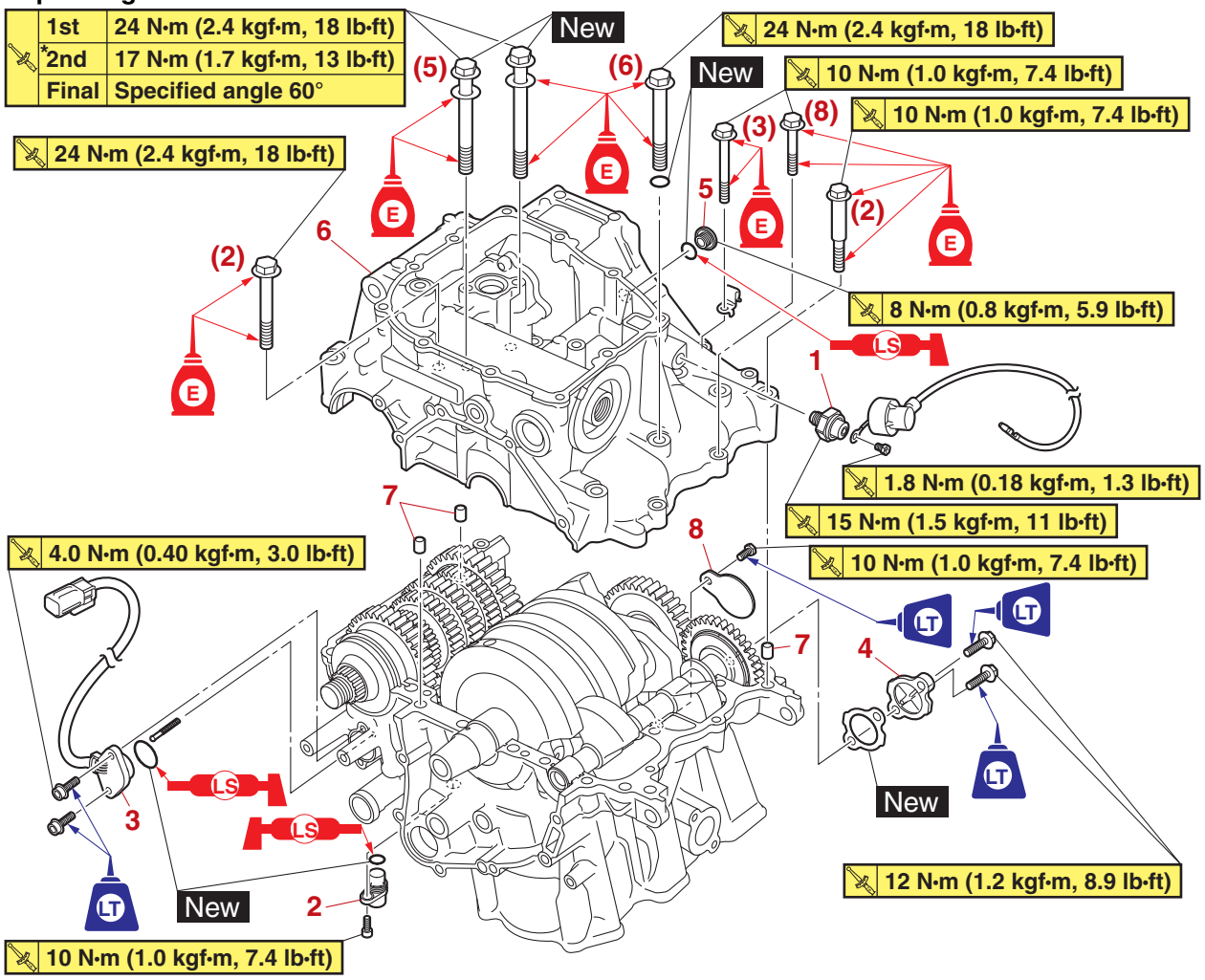
Separating the crankcase



*** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.**

Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-10.
	Cylinder head cover		Refer to "CAMSHAFTS" on page 5-19.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-31.
	Starter clutch		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-43.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-49.
	Clutch housing		Refer to "CLUTCH" on page 5-53.
	Oil strainer		Refer to "OIL PAN" on page 5-70.

Separating the crankcase



*** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.**

Order	Job/Parts to remove	Q'ty	Remarks
	Oil cooler		Refer to "OIL COOLER" on page 6-6.
	Drive sprocket		Refer to "CHAIN DRIVE" on page 4-98.
1	Oil pressure switch	1	
2	Cylinder plug	1	
3	Gear position switch	1	
4	Balancer shaft access cover	1	
5	Main gallery bolt	1	
6	Crankcase	1	
7	Dowel pin	3	
8	Blind plate	1	

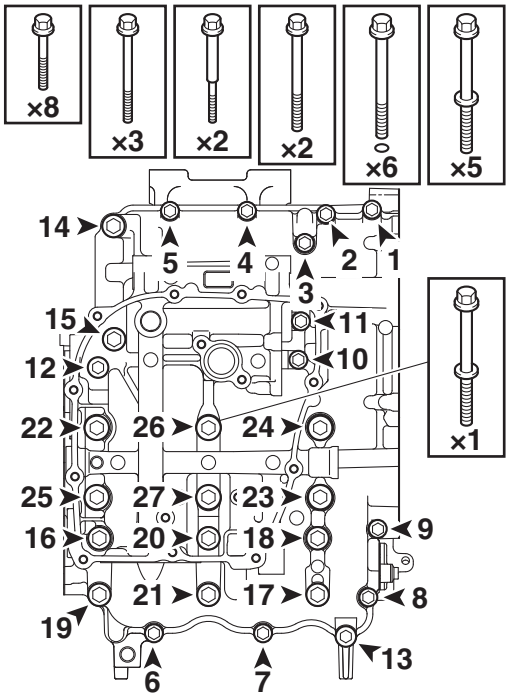
EAS30389
DISASSEMBLING THE CRANKCASE

1. Place the engine upside down.
2. Remove:
   • Crankcase bolt (×27)

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.
- Loosen the bolts "1"–"11" in any loosening sequence.
- Loosen the bolts "12"–"27" in the proper sequence as shown.
- The numbers embossed "1"–"16" on the crankcase indicate the crankcase tightening sequence.

- M6 × 40 mm bolt (×8): "1", "2", "4"–"7", "10", "11"
- M6 × 60 mm bolt (×3): "3", "8", "9"
- M6 × 65 mm bolt (×2): "12", "13"
- M8 × 65 mm bolt (×2): "14", "15"
- M8 × 70 mm bolt (×6) (bolts with O-rings): "16"– "21"
- M9 × 80 mm bolt (×5) (bolts with washers): "22"–"25", "27"
- M9 × 90 mm bolt (×1) (bolt with washer): "26"



3. Remove:
   • Crankcase
   • Dowel pin

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 passage
   Obstruction → Blow out with compressed air.

EAS30397
ASSEMBLING THE CRANKCASE

1. Lubricate:
   • Crankshaft journal bearing inner surface (with the recommended lubricant)

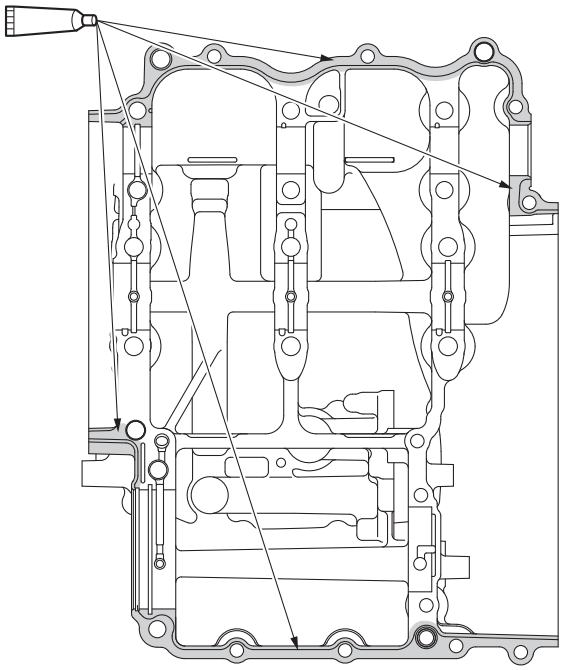
	Recommended lubricant **Engine oil**

2. Apply:
   • Sealant
   (onto the crankcase mating surfaces)

	Yamaha bond No. 1215 **90890-85505** **Three bond No. 1215®**

ECA20880
NOTICE

Do not allow any sealant to come into contact with the oil gallery, crankshaft journal bearings, or balancer shaft journal bearings.

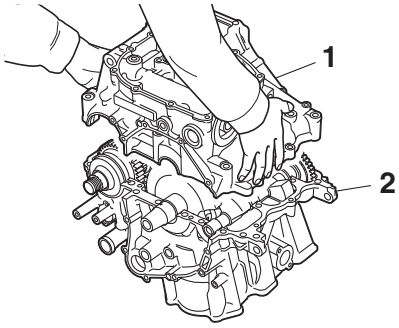


3. Install:
   • Dowel pin
4. Set the shift drum assembly and transmission gears in the neutral position.
5. Install:
   • Crankcase "1"
   (onto the cylinder "2")

ECA13980

NOTICE

Before tightening the crankcase bolts, make sure the transmission gears shift correctly when the shift drum assembly is turned by hand.

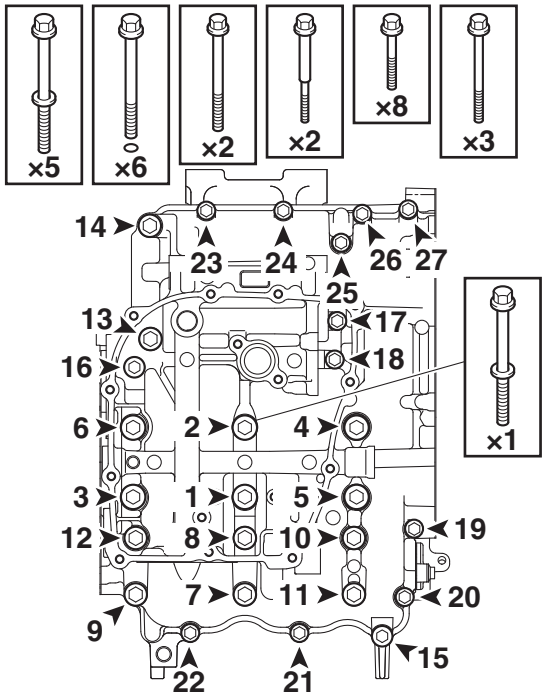


6. Install:
   • Crankcase bolt (×27)

TIP

- Tighten the bolts "1"–"16" in the order of the embossed numbers on the crankcase.
- Lubricate the bolts "1"–"6" threads, mating surfaces and washers with engine oil.
- Lubricate the bolts "7"–"12" threads, mating surfaces and O-rings with engine oil.
- Lubricate the bolts "13"–"27" threads and mating surfaces with engine oil.

• M9 × 80 mm bolt (×5) (bolts with washers): "1", "3"–"6" New
• M9 × 90 mm bolt (×1) (bolt with washer): "2" New
• M8 × 70 mm bolt (×6) (bolts with new O-rings): "7"–"12"
• M8 × 65 mm bolt (×2): "13", "14"
• M6 × 65 mm bolt (×2): "15", "16"
• M6 × 40 mm bolt (×8): "17", "18", "21"–"24", "26", "27"
• M6 × 60 mm bolt (×3): "19", "20", "25"



7. Tighten:
   • Crankcase bolt "1"–"6"

Crankcase bolts (bolts with washers) "1"–"6"
1st: 24 N·m (2.4 kgf·m, 18 lb·ft)
***2nd: 17 N·m (1.7 kgf·m, 13 lb·ft)**
Final: specified angle 60°

* Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.

EWA16610

⚠ WARNING

If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

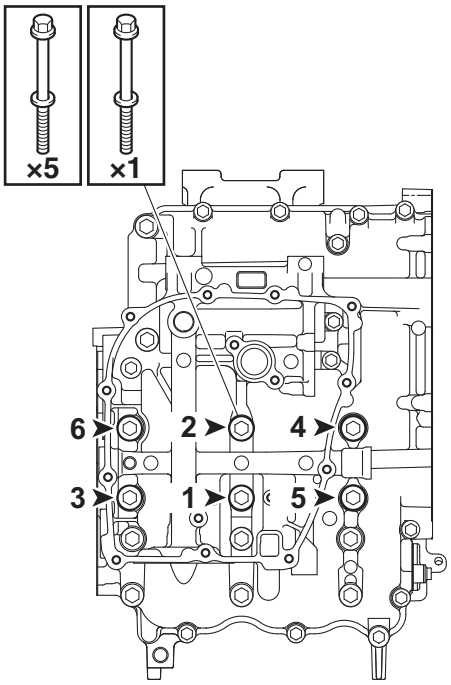
ECA20890

NOTICE

Do not use a torque wrench to tighten the bolt to the specified angle.

TIP

Tighten the bolts in the tightening sequence cast on the crankcase.

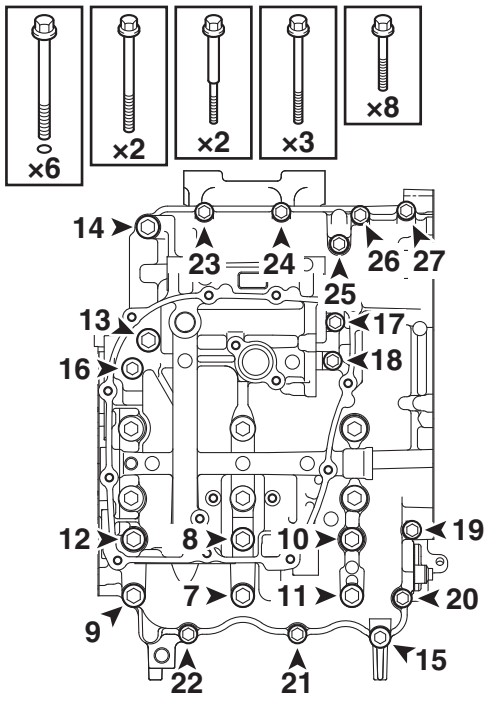


8. Tighten:
   • Crankcase bolt “7”–“27”

Crankcase bolts “7”–“14”
24 N·m (2.4 kgf·m, 18 lb·ft)
Crankcase bolts “15”–“27”
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

- Tighten the bolts “7”–“16” in the tightening sequence cast on the crankcase.
- Tighten the bolts “17”–“27” in any tightening sequence using a crisscross pattern.



EAS31071

INSTALLING THE OIL PRESSURE SWITCH

1. Install:
   • Oil pressure switch “1”
   • Oil pressure switch lead “2”

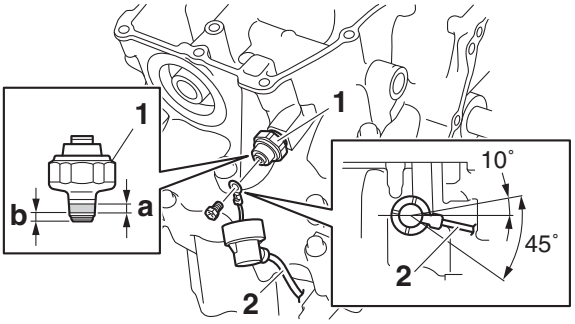
Oil pressure switch
15 N·m (1.5 kgf·m, 11 lb·ft)
Oil pressure switch lead bolt
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

2. Apply:
   • Sealant
   (onto the oil pressure switch threads)

Yamaha bond No. 1215
90890-85505
Three bond No. 1215®

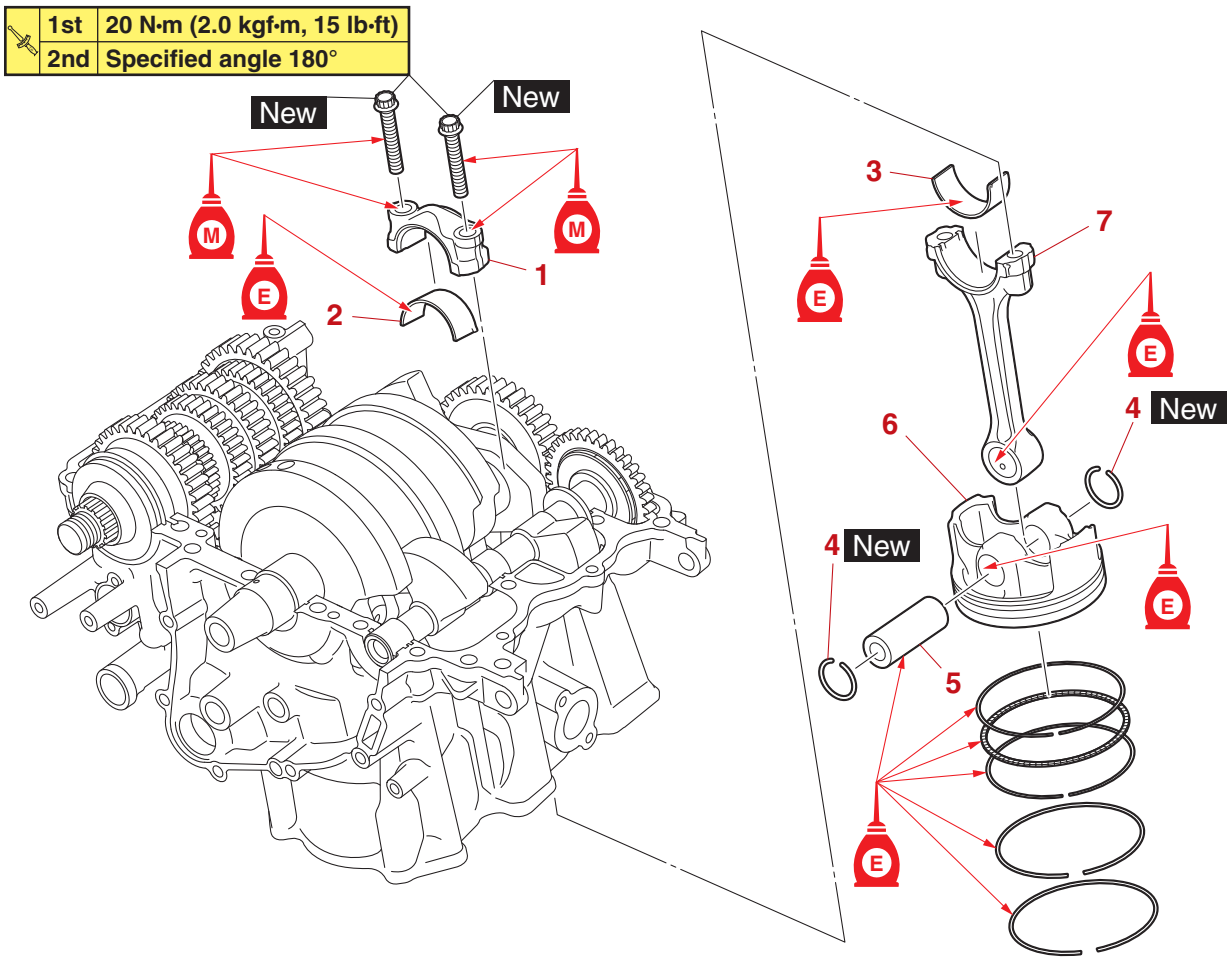
TIP

- Apply Three bond No. 1215® to the threads “a” of the oil pressure switch. However, do not apply Three bond No. 1215® to the portion “b” of the oil pressure switch.
- Install the oil pressure switch lead so that it is routed within the range shown in the illustration.


1
b
a
1
10˚
45˚
2
2

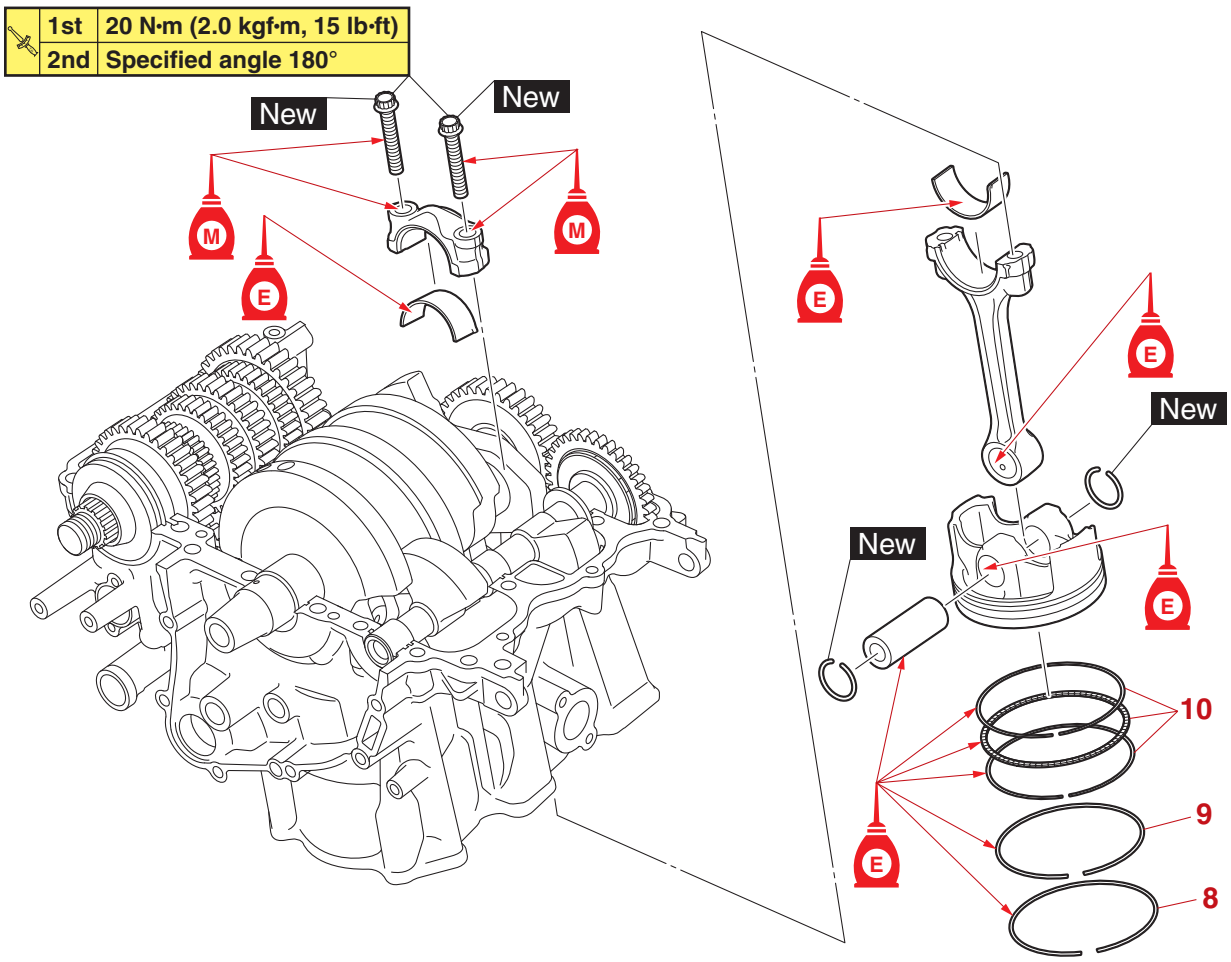
EAS20132
CONNECTING RODS AND PISTONS

Removing the connecting rods and pistons



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to all of the connecting rods and pistons.
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-72.
1	Connecting rod cap	1	
2	Big end lower bearing	1	
3	Big end upper bearing	1	
4	Piston pin clip	2	
5	Piston pin	1	
6	Piston	1	
7	Connecting rod	1	

Removing the connecting rods and pistons



Order	Job/Parts to remove	Q'ty	Remarks
8	Top ring	1	
9	2nd ring	1	
10	Oil ring	1	

EAS30745
REMOVING THE CONNECTING RODS AND PISTONS

The following procedure applies to all of the connecting rods and pistons.

1. Remove:
   - Connecting rod cap
   - Connecting rod
   - Big end bearing

TIP

- Identify the position of each connecting rod cap so that it can be reinstalled in its original place.
- After removing the connecting rods and connecting rod caps, care should be taken not to damage the mating surfaces of the connecting rods and connecting rod caps.

2. Remove:
   - Piston pin clip
   - Piston pin "1"
   - Piston "2"
   - Connecting rod

ECA13810

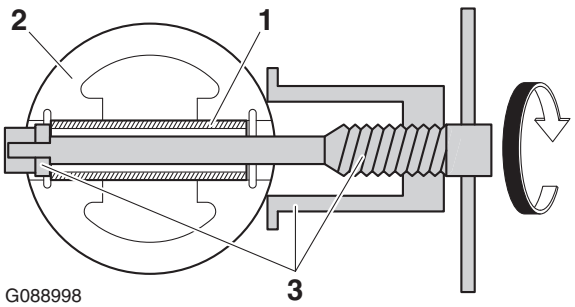
NOTICE

Do not use a hammer to drive the piston pin out.

TIP

- For reference during installation, put identification marks on the piston crown.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are debarred and the piston pin is still difficult to remove, remove it with the piston pin puller set "3".

Piston pin puller set
90890-01304
Piston pin puller
YU-01304

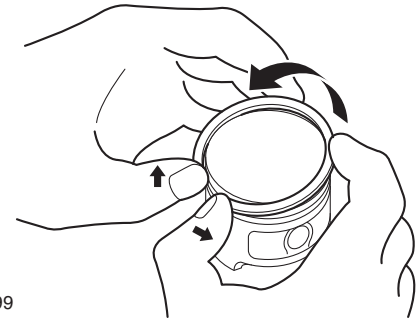


G088998

3. 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.



G088999

EAS30747
CHECKING THE CYLINDER AND PISTON

The following procedure applies to all of the cylinders and pistons.

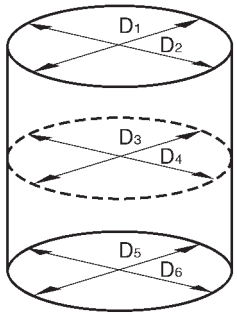
1. Check:
   - Piston wall
   - Cylinder wall
     Vertical scratches → Replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
   - Piston-to-cylinder clearance
   a. Measure cylinder bore with the cylinder bore gauge.

TIP

Measure cylinder bore by taking side-to-side and front-to-back measurements of the cylinder.

Bore
80.000–80.010 mm (3.1496–3.1500 in)
Wear limit
80.060 mm (3.1520 in)

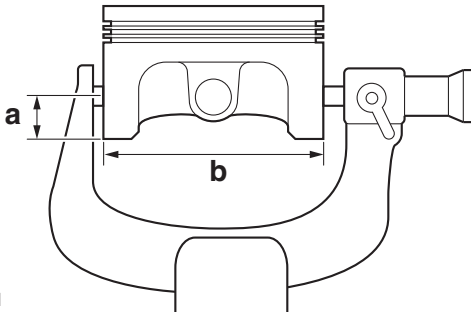
Cylinder bore = maximum of D_1, D_2, D_3, D_4, D_5, D_6



G089000

b. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.
c. Measure piston skirt diameter “b” with the micrometer.

Diameter
79.970–79.985 mm (3.1484–3.1490 in)



G089001

a. 8.0 mm (0.31 in) from the bottom edge of the piston

d. If out of specification, replace the piston and piston rings as a set.
e. Calculate the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance =
Cylinder bore – Piston skirt diameter

f. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.

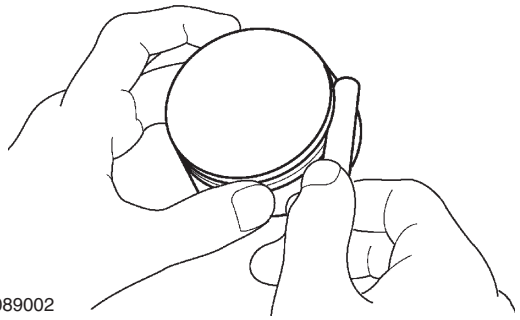
EAS30748
CHECKING THE PISTON RINGS

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.

Top ring
Side clearance limit
0.115 mm (0.0045 in)
2nd ring
Side clearance limit
0.115 mm (0.0045 in)


G089002

2. Install:
   • Piston ring
   (into the cylinder)

TIP

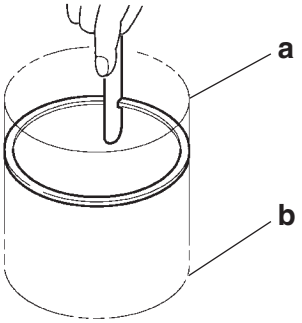
Use the piston crown to level the piston ring near bottom of cylinder “a”, where cylinder wear is lowest.

3. Measure:
   • Piston ring end gap
   Out of specification → Replace the piston ring.

TIP

The oil ring expander spacer’s end gap cannot be measured. If the oil ring rail’s gap is excessive, replace the oil ring as a set.

Top ring
End gap limit
0.50 mm (0.0197 in)
2nd ring
End gap limit
0.80 mm (0.0315 in)

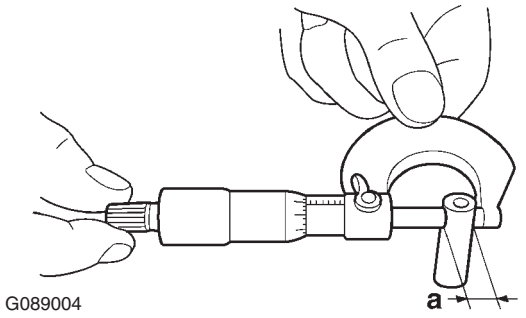


G089003

a. Bottom of cylinder
b. Top of cylinder

EAS30749
CHECKING THE PISTON PIN
The following procedure applies to all of the piston pins.
1. Check:
   • Piston pin
   Blue discoloration/grooves → Replace the piston pin, and then check the lubrication system.
2. Measure:
   • Piston pin outside diameter “a”
   Out of specification → Replace the piston pin.

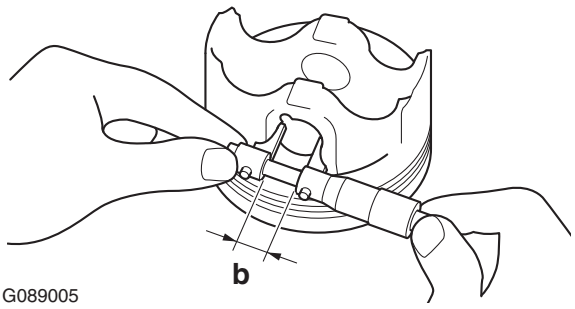
Piston pin outside diameter limit
17.970 mm (0.7075 in)



G089004

3. Measure:
   • Piston pin bore inside diameter “b”
   Out of specification → Replace the piston.

Piston pin bore inside diameter limit
18.045 mm (0.7104 in)



G089005

EAS30750
CHECKING THE CONNECTING RODS
1. Measure:
   • Crankshaft-pin-to-big-end-bearing clearance
   Out of specification → Replace the big end bearings.

Oil clearance
0.027–0.051 mm (0.0011–0.0020 in)

The following procedure applies to all of the connecting rods.

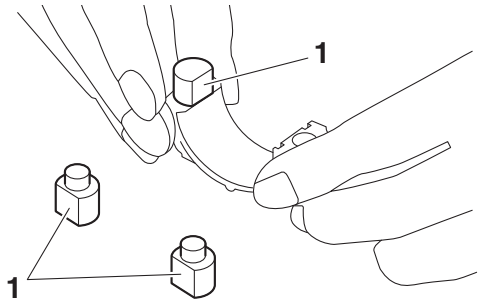
ECA13930
NOTICE

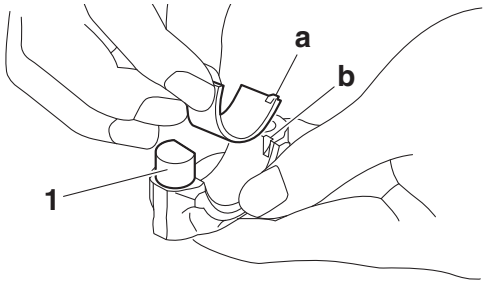
Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft-pin-to-big-end-bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.

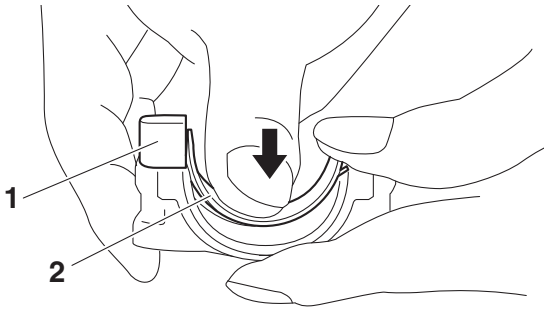
a. Clean the big end bearings, crankshaft pins, and the inside of the connecting rods halves.
b. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap with the connecting rod big end bearing installer “1”.

TIP
- From the 3 types, choose the connecting rod big end bearing installer “1” that fits exactly, and install it to the connecting rod and connecting rod cap as shown in the illustration.
- Align the projections “a” on the big end bearings with the notches “b” in the connecting rod and connecting rod cap.
- Push the big end bearing “2” down and install it to the connecting rod and connecting rod cap.

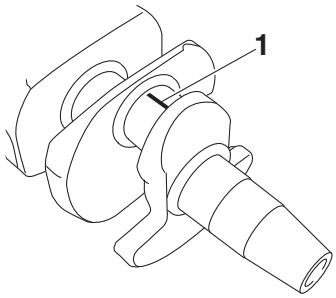
Connecting rod big end bearing installer
90890-04193
Connecting rod big end bearing installer
YM-04193







c. Put a piece of Plastigauge® “1” on the crankshaft pin.



G089008

d. Assemble the connecting rod halves.

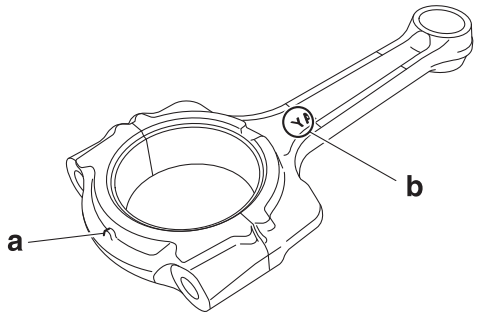
ECA18390

NOTICE

Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts.

TIP

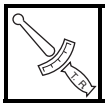
- Clean the connecting rod bolts and lubricate the bolt threads and seats with molybdenum disulfide oil.
- Make sure that the projection “a” on the connecting rod cap faces the same direction as the “Y” mark “b” on the connecting rod.
- After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.



TIP

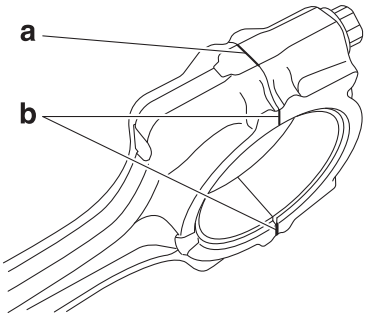
Install by carrying out the following procedures in order to assemble in the most suitable condition.

e. Tighten the connecting rod bolt while checking that the sections shown “a” and “b” are flush with each other by touching the surface.

	**Connecting rod bolt** **30 N·m (3.0 kgf·m, 22 lb·ft)**

TIP

To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.

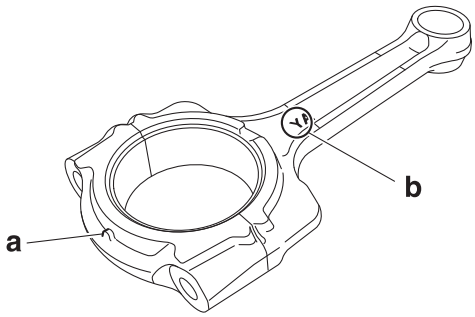


a. Side machined face
b. Thrusting faces

f. Loosen the connecting rod bolts, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

TIP

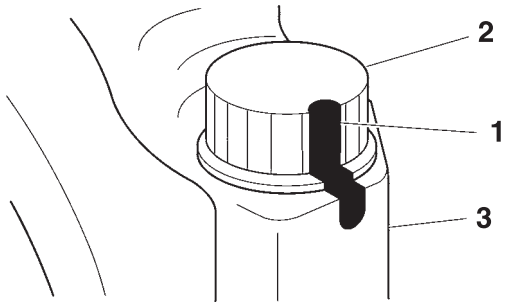
- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Make sure that the projection "a" on the connecting rod cap faces the same direction as the "Y" mark "b" on the connecting rod.
- Make sure the "Y" marks "b" on the connecting rods face towards the left side of the crankshaft.



g. Tighten the connecting rod bolts with a torque wrench.

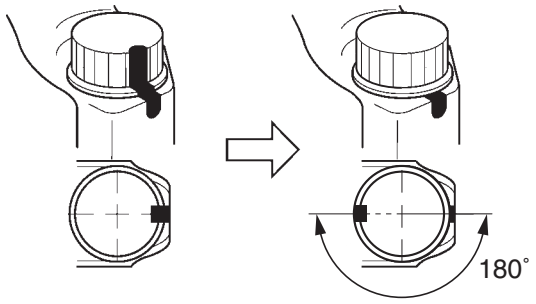
	Connecting rod bolt (1st) **20 N·m (2.0 kgf·m, 15 lb·ft)**

h. Put a mark "1" on the corner of the connecting rod bolt "2" and the connecting rod cap "3".



i. Tighten the connecting rod bolts further to reach the specified angle 175°–185°.

	Connecting rod bolt (final) **Specified angle 180°**



EWA16610

⚠ WARNING

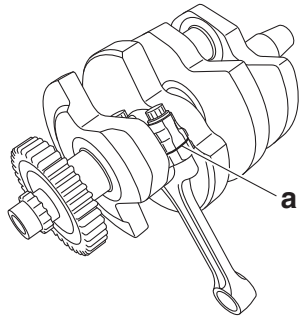
If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

ECA20890

NOTICE

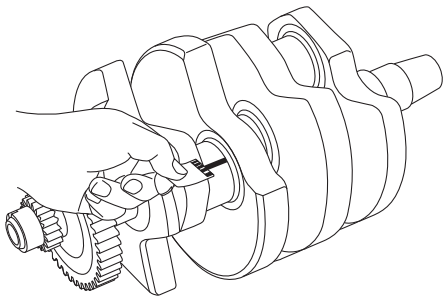
Do not use a torque wrench to tighten the bolt to the specified angle.

j. After the installation, check that the section shown "a" is flush with each other by touching the surface.



k. Remove the connecting rod and big end bearings.

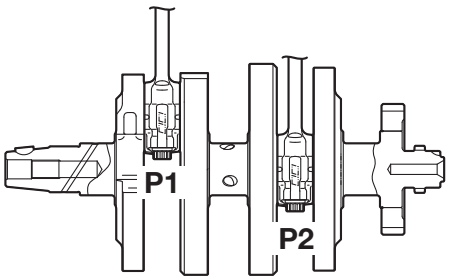
l. Measure the compressed Plastigauge® width on the crankshaft pin. If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



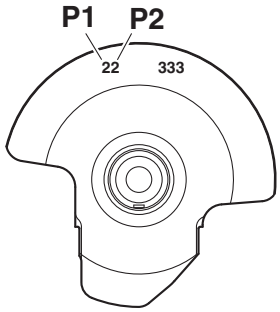
2. Select:
   - Big end bearing (P_1–P_2)

TIP

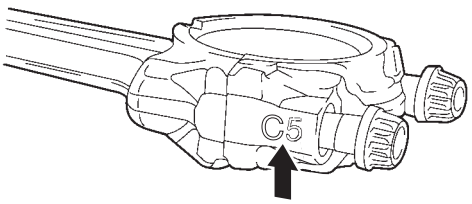
- The numbers “A” stamped into the crankshaft web and the numbers “B” on the connecting rods are used to determine the replacement big end bearings sizes.
- “P_1”–“P_2” refer to the bearings shown in the crankshaft illustration.



A



B



For example, if the connecting rod “P_1” and the crankshaft web “P_1” numbers are 5 and 2 respectively, then the bearing size for “P_1” is:

“P_1” (connecting rod) – “P_1” (crankshaft web) = 5 – 2 = 3 (brown)

Bearing color code
Code 1
Blue
Code 2
Black
Code 3
Brown
Code 4
Green

EAS30751
INSTALLING THE CONNECTING ROD AND PISTON

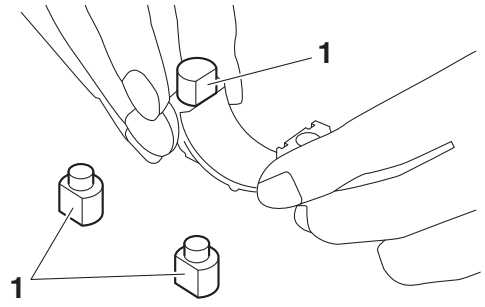
The following procedure applies to all of the connecting rods and pistons.

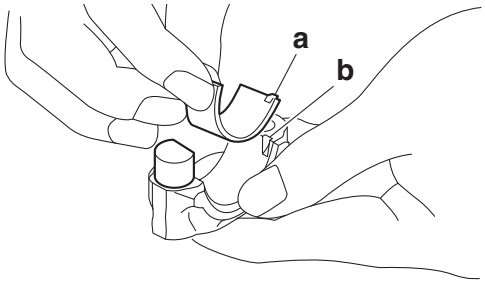
1. Install:
   - Big end bearing
   - Connecting rod cap
     (onto the connecting rod)

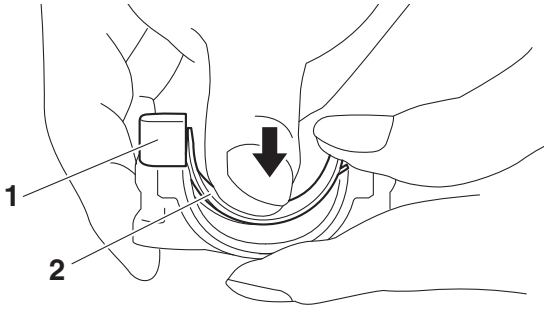
TIP

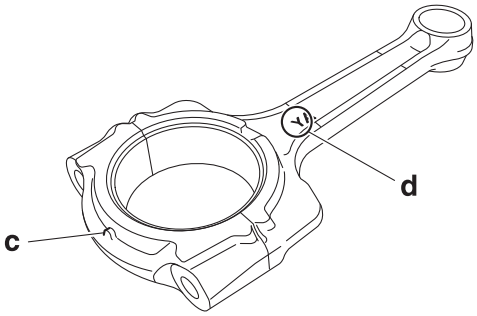
- Clean the big end bearings, crankshaft pins, and the inside of the connecting rods halves.
- Be sure to reinstall each big end bearing in its original place.
- From the 3 types, choose the connecting rod big end bearing installer “1” that fits exactly, and install it to the connecting rod and connecting rod cap as shown in the illustration.
- Align the projections “a” on the big end bearings with the notches “b” in the connecting rods and connecting rod caps.
- Push the big end bearing “2” down and install it to the connecting rod and connecting rod cap.
- Make sure that the projection “c” on the connecting rod cap faces the same direction as the “Y” mark “d” on the connecting rod.

Connecting rod big end bearing installer
90890-04193
Connecting rod big end bearing installer
YM-04193









2. Tighten:
   - Connecting rod bolt New

ECA18390

NOTICE

Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts.

TIP

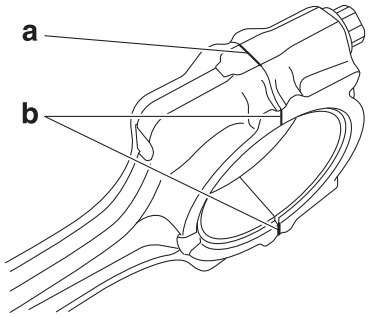
Install by carrying out the following procedures in order to assemble in the most suitable condition.

a. Replace the connecting rod bolts with new ones.
b. Clean the connecting rod bolts and lubricate the bolt threads and seats with molybdenum disulfide oil.
c. After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.
d. Tighten the connecting rod bolt while checking that the sections shown “a” and “b” are flush with each other by touching the surface.

	Connecting rod bolt **30 N·m (3.0 kgf·m, 22 lb·ft)**

TIP

To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.



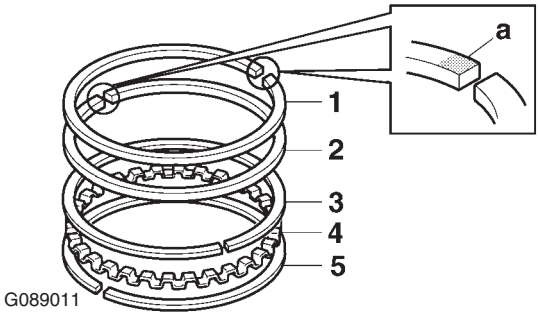
a. Side machined face
b. Thrusting faces

e. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

3. Install:
   - Top ring “1”
   - 2nd ring “2”
   - Upper oil ring rail “3”
   - Oil ring expander “4”
   - Lower oil ring rail “5”

TIP

Be sure to install the piston rings so that the manufacturer’s marks “a” face up.

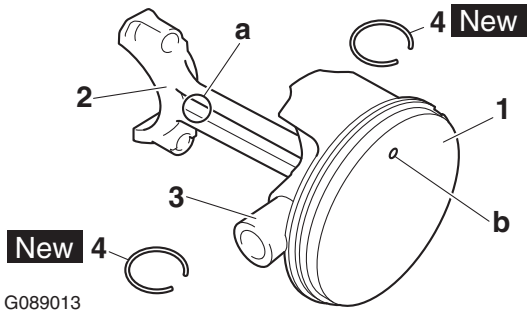


G089011

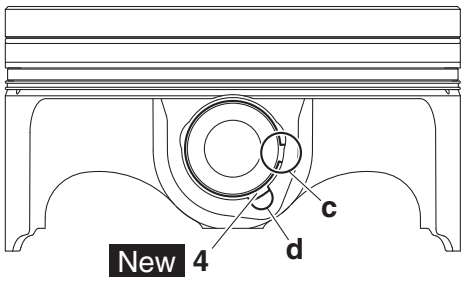
4. Install:
   • Piston "1"
   (onto the respective connecting rod "2")
   • Piston pin "3"
   • Piston pin clip "4" New

TIP

- Apply engine oil onto the piston pin.
- Make sure that the "Y" mark "a" on the connecting rod faces left when the punch mark "b" on the piston is pointing up as shown.
- When installing a piston pin clip, make sure that the clip ends "c" are positioned away from the cutout "d" in the piston as shown in the illustration.
- Reinstall each piston into its original cylinder.



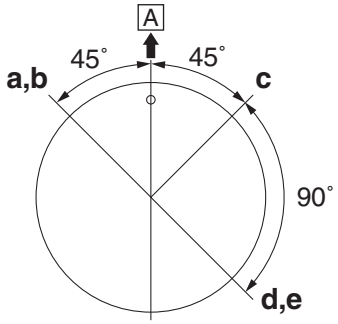
G089013



5. Lubricate:
   • Piston
   • Piston ring
   • Cylinder
   (with the recommended lubricant)

Recommended lubricant
Engine oil

6. Offset:
   • Piston ring end gap



a. 2nd ring
b. Lower oil ring rail
c. Upper oil ring rail
d. Top ring
e. Oil ring expander

A. Exhaust side

7. Lubricate:
   • Crankshaft pin
   • Connecting rod big end bearing inner surface
   (with the recommended lubricant)

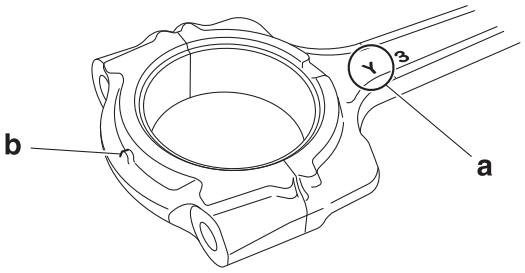
Recommended lubricant
Engine oil

8. Install:
   • Connecting rod assembly "1"
   (into the cylinder and onto the crankshaft pin)
   • Connecting rod cap
   (onto the connecting rod)

TIP

- While compressing the piston ring with piston ring compressor "2", install the connecting rod assembly into the cylinder with the other hand.
- Make sure the "Y" marks "a" on the connecting rods face towards the left side of the crankshaft.
- Make sure that the projection "b" on the connecting rod cap faces the same direction as the "Y" mark "a" on the connecting rod.
- Apply molybdenum disulfide oil to the threads and seats of the connecting rod bolt.

Piston ring compressor
90890-05158
Piston ring compressor
YM-08037



9. Tighten:
   • Connecting rod bolt

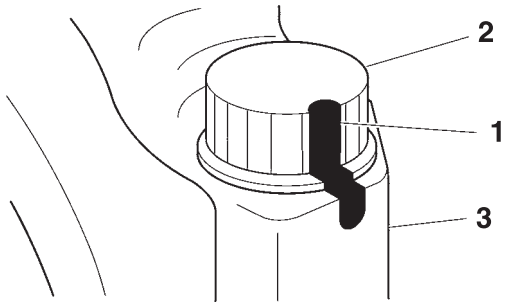
TIP

Tighten the connecting rod bolts using the following procedure.

a. Tighten the connecting rod bolts with a torque wrench.

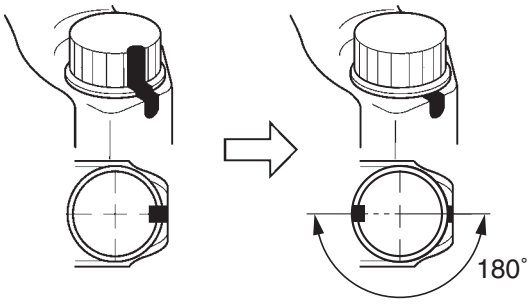
	Connecting rod bolt (1st) **20 N·m (2.0 kgf·m, 15 lb·ft)**

b. Put a mark “1” on the corner of the connecting rod bolt “2” and the connecting rod cap “3”.



c. Tighten the connecting rod bolts further to reach the specified angle 175°–185°.

	Connecting rod bolt (final) **Specified angle 180°**



EWA16610

⚠ WARNING

If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

ECA20890

NOTICE

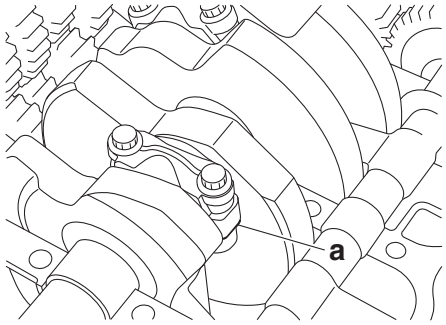
Do not use a torque wrench to tighten the bolt to the specified angle.

d. After the installation, check that the section shown “a” is flush with each other by touching the surface.

EWA17120

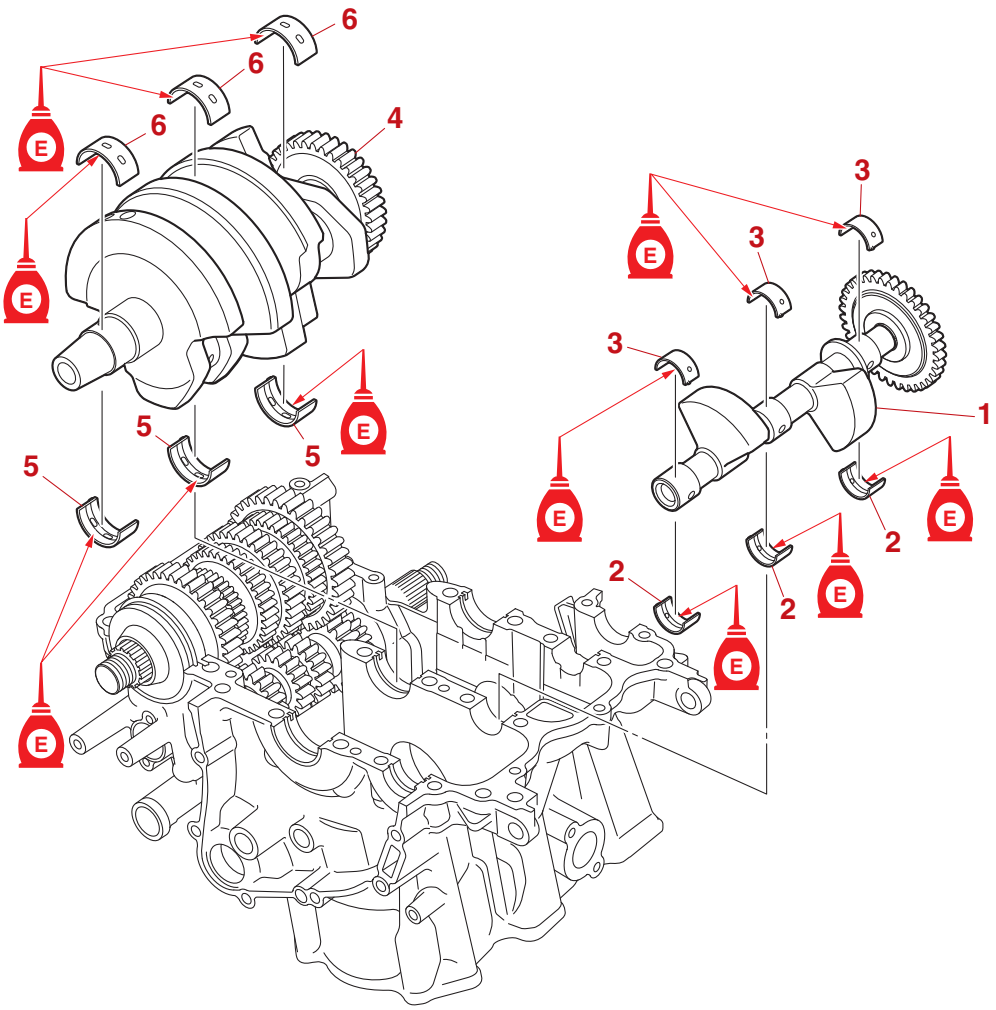
⚠ WARNING

If the connecting rod and cap are not flush with each other, remove the connecting rod bolts and big end bearing and restart from step (1). In this case, make sure to replace the connecting rod bolts.



EAS20178
CRANKSHAFT AND BALANCER SHAFT

Removing the crankshaft and balancer shaft



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Refer to "CRANKCASE" on page 5-72.
	Connecting rod		Refer to "CONNECTING RODS AND PISTONS" on page 5-78.
1	Balancer shaft assembly	1	
2	Balancer shaft journal lower bearing	3	
3	Balancer shaft journal upper bearing	3	
4	Crankshaft assembly	1	
5	Crankshaft journal lower bearing	3	
6	Crankshaft journal upper bearing	3	

EAS31072
REMOVING THE BALANCER SHAFT JOURNAL BEARINGS

1. Remove:
   - Balancer shaft journal lower bearing (from the crankcase)
   - Balancer shaft journal upper bearing (from the cylinder)

TIP

Identify the position of each balancer shaft journal bearing so that it can be reinstalled in its original place.

EAS31074
REMOVING THE CRANKSHAFT JOURNAL BEARINGS

1. Remove:
   - Crankshaft journal lower bearing (from the crankcase)
   - Crankshaft journal upper bearing (from the cylinder)

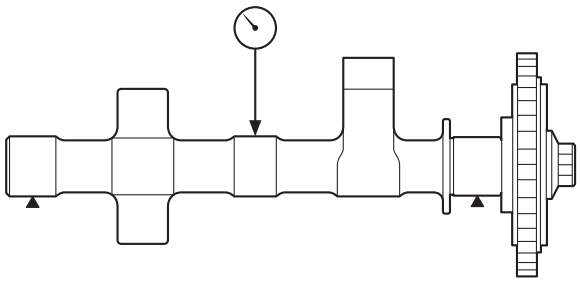
TIP

Identify the position of each crankshaft journal bearing so that it can be reinstalled in its original place.

EAS31142
CHECKING THE BALANCER SHAFT ASSEMBLY

1. Check:
   - Balancer driven gear
     Damage/wear → Replace the balancer drive gear and balancer shaft assembly as a set.
     Excessive noise during operation → Replace the balancer drive gear and balancer shaft assembly as a set.
2. Measure:
   - Balancer shaft runout
     Out of specification → Replace the balancer shaft assembly.

Balancer shaft runout limit
**** mm (** in)**



3. Check:
   - Balancer shaft assembly
     Cracks/damage/wear → Replace the balancer shaft assembly and journal bearings.
     Dirt → Clean.
   - Bearing
     Damage/wear → Replace.
4. Measure:
   - Balancer shaft-journal-to-balancer shaft-journal-bearing clearance
     Out of specification → Replace the balancer shaft journal bearings.

Balancer shaft journal to balancer shaft bearing clearance
0.020–0.054 mm (0.0008–0.0021 in)

ECA18400

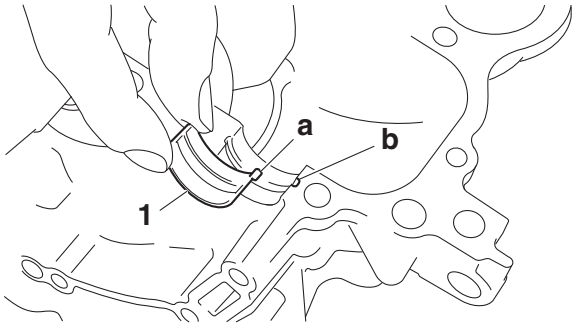
NOTICE

Do not interchange the balancer shaft journal bearings. To obtain the correct balancer shaft-journal-to-balancer shaft-journal-bearing clearance and prevent engine damage, the balancer shaft journal bearings must be installed in their original positions.

a. Clean the balancer shaft journal bearings, balancer shaft journals, and bearing portions of the crankcase and cylinder.
b. Install the balancer shaft journal upper bearings “1” and the balancer shaft assembly into the cylinder.

TIP

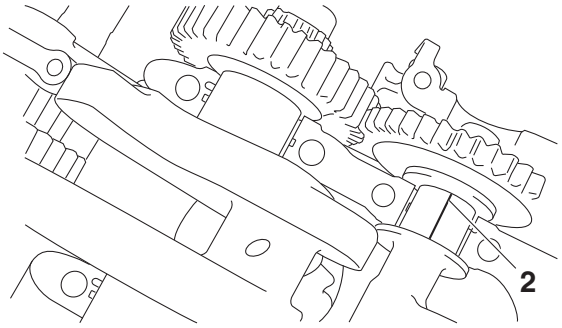
Align the projections “a” on the balancer shaft journal upper bearings with the notches “b” in the cylinder.



c. Put a piece of Plastigauge® “2” on each balancer shaft journal.

TIP

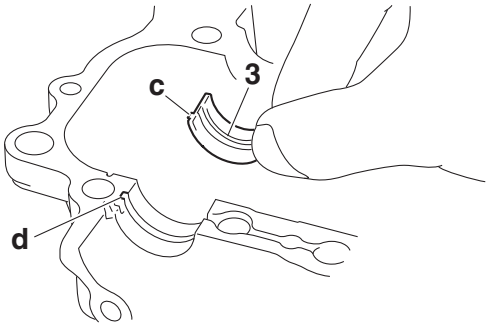
Do not put the Plastigauge® over the oil hole in the balancer shaft journal.



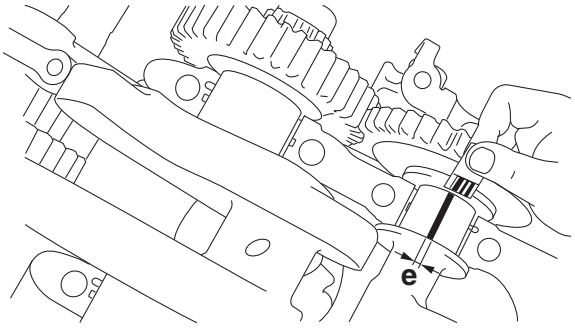
d. Install the balancer shaft journal lower bearings "3" into the crankcase and assemble the crankcase and cylinder.

TIP

- Align the projections "c" of the balancer shaft journal lower bearings with the notches "d" in the crankcase.
- Do not move the balancer shaft until the clearance measurement has been completed.



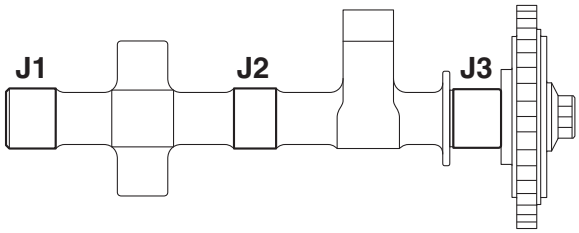
e. Tighten the bolts to specification in the tightening sequence cast on the crankcase. Refer to "CRANKCASE" on page 5-72.
f. Remove the crankcase and the balancer shaft journal lower bearings.
g. Measure the compressed Plastigauge® width "e" on each balancer shaft journal. If the balancer shaft-journal-to-balancer shaft-journal-bearing clearance is out of specification, select replacement balancer shaft journal bearings.

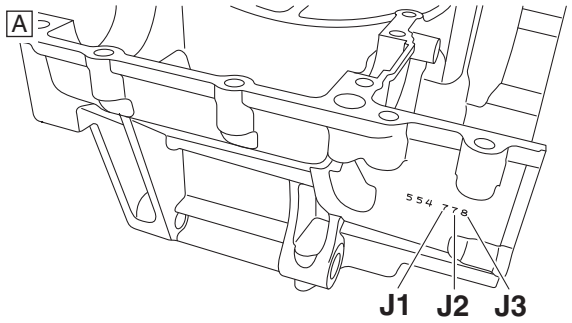


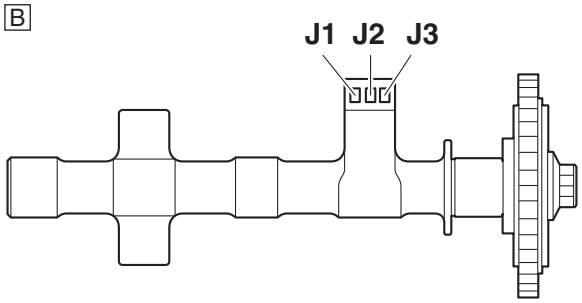
5. Select:
   - Balancer shaft journal bearing (J_1–J_3)

TIP

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







For example, if the crankcase "J_1" and balancer shaft web "J_1" numbers are 6 and 5 respectively, then the bearing size for "J_1" is:

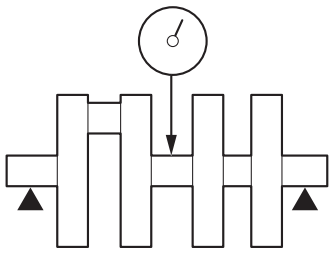
"J_1" (crankcase) – "J_1" (balancer shaft web) = 6 – 5 = 1 (blue)

Bearing color code
Code 1
Blue
Code 2
Black
Code 3
Brown
Code 4
Green
Code 5
Yellow

EAS31075
CHECKING THE CRANKSHAFT

1. Check:
   - Balancer drive gear
     Damage/wear → Replace the balancer drive gear and balancer shaft assembly as a set.
     Excessive noise during operation → Replace the balancer drive gear and balancer shaft assembly as a set.
2. Measure:
   - Crankshaft runout
     Out of specification → Replace the crankshaft.

Runout limit
0.030 mm (0.0012 in)



G089016

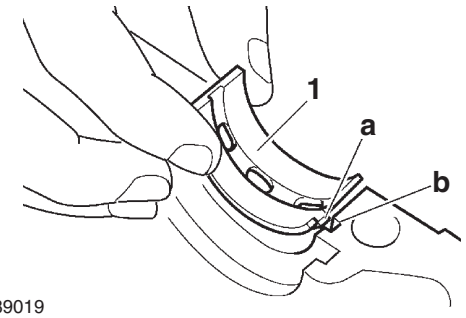
3. Check:
   - Crankshaft journal surface
   - Crankshaft pin surface
   - Bearing surface
     Scratches/wear → Replace the crankshaft.
4. Measure:
   - Crankshaft-journal-to-crankshaft-journal-bearing clearance
     Out of specification → Replace the crankshaft journal bearings.

Journal oil clearance
0.018–0.042 mm (0.0007–0.0017 in)

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 cylinder and crankcase.
b. Install the crankshaft journal upper bearings “1” and the crankshaft into the cylinder.

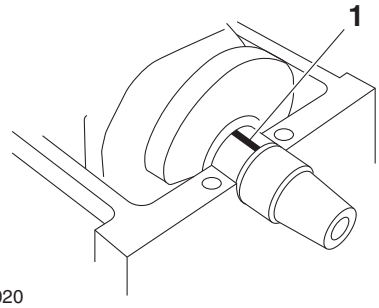
TIP
Align the projections “a” on the crankshaft journal upper bearings with the notches “b” in the cylinder.



G089019

c. Put a piece of Plastigauge® “1” on each crankshaft journal.

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

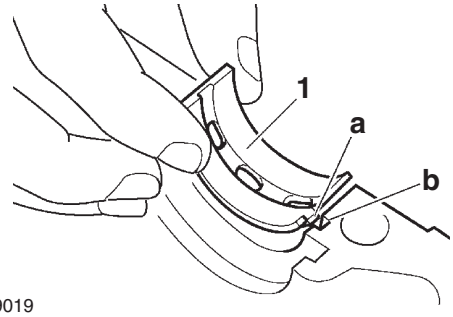


G089020

d. Install the crankshaft journal lower bearings “1” into the crankcase and assemble the crankcase and cylinder.

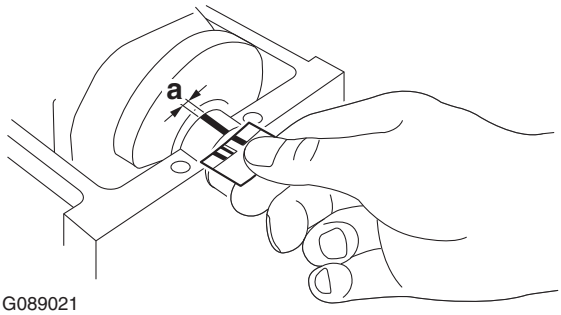
TIP

- Align the projections "a" of the crankshaft journal lower bearings with the notches "b" in the crankcase.
- Do not move the crankshaft until the clearance measurement has been completed.



G089019

e. Tighten the bolts to specification in the tightening sequence cast on the crankcase. Refer to "CRANKCASE" on page 5-72.
f. Remove the crankcase and the crankshaft journal lower bearings.
g. Measure the compressed Plastigauge® width "a" on each crankshaft journal.
If the crankshaft-journal-to-crankshaft-journal-bearing clearance is out of specification, select replacement crankshaft journal bearings.

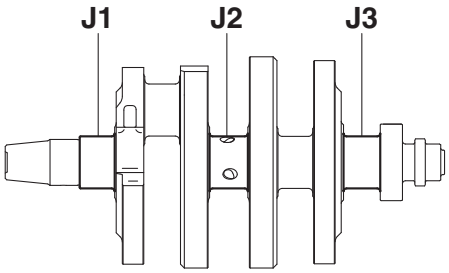


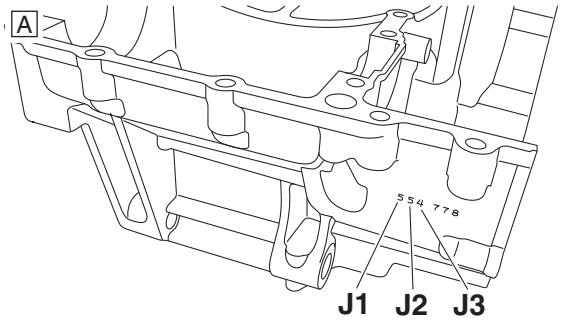
G089021

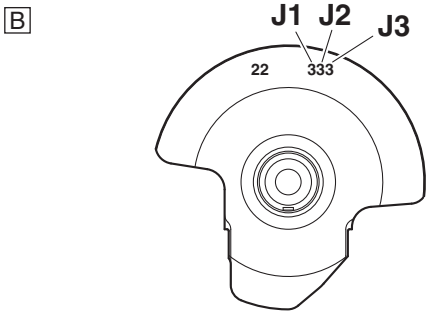
5. Select:
   - Crankshaft journal bearing (J_1–J_3)

TIP

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







For example, if the crankcase "J_1" and crankshaft web "J_1" numbers are 5 and 3 respectively, then the bearing size for "J_1" is:

"J_1" (crankcase) – "J_1" (crankshaft web) – 2 = 5 – 3 – 2 = 0 (white–pink)

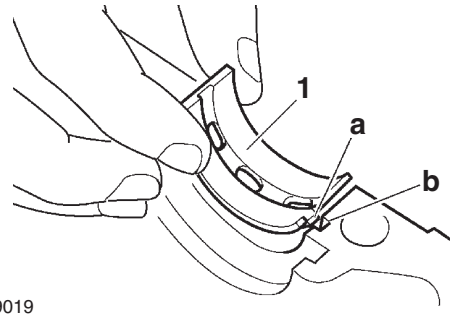
Bearing color code
Model identification color
Pink
Code -1
Purple
Code 0
White
Code 1
Blue
Code 2
Black
Code 3
Brown

EAS31077
INSTALLING THE CRANKSHAFT

1. Install:
   - Crankshaft journal upper bearing (into the upper crankcase)
   - Crankshaft journal lower bearing (into the lower crankcase)

TIP

- Align the projections “a” on the crankshaft journal bearings “1” with the notches “b” in the crankcase.
- Be sure to install each crankshaft journal bearing in its original place.



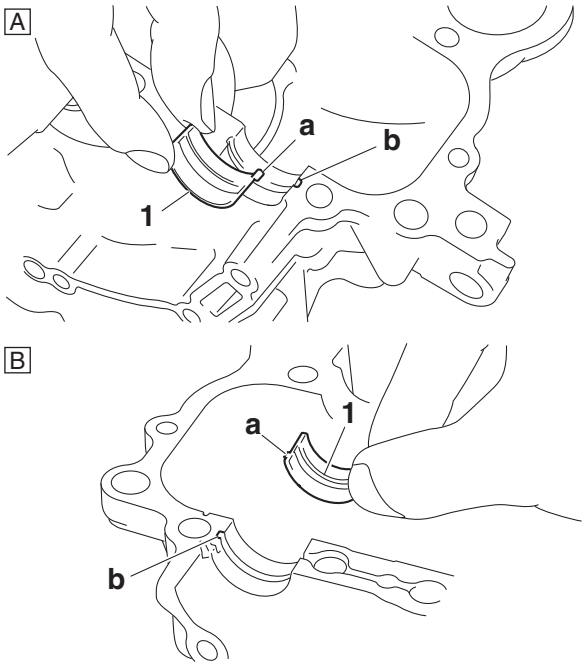
G089019

EAS31078
INSTALLING THE BALANCER SHAFT ASSEMBLY

1. Install:
   - Balancer shaft journal upper bearing (into the upper crankcase)
   - Balancer shaft journal lower bearing (into the lower crankcase)

TIP

- Align the projections “a” on the balancer shaft journal bearings “1” with the notches “b” in the crankcase.
- Be sure to install each balancer shaft journal bearing in its original place.

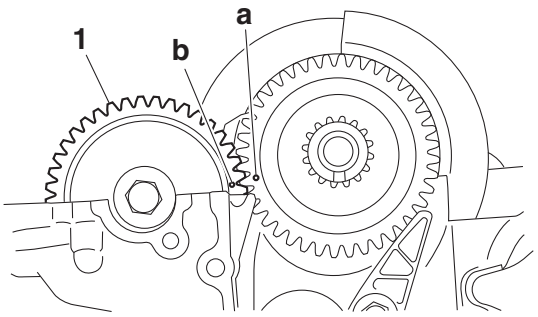


A. Upper crankcase
B. Lower crankcase

2. Install:
   - Balancer shaft “1”

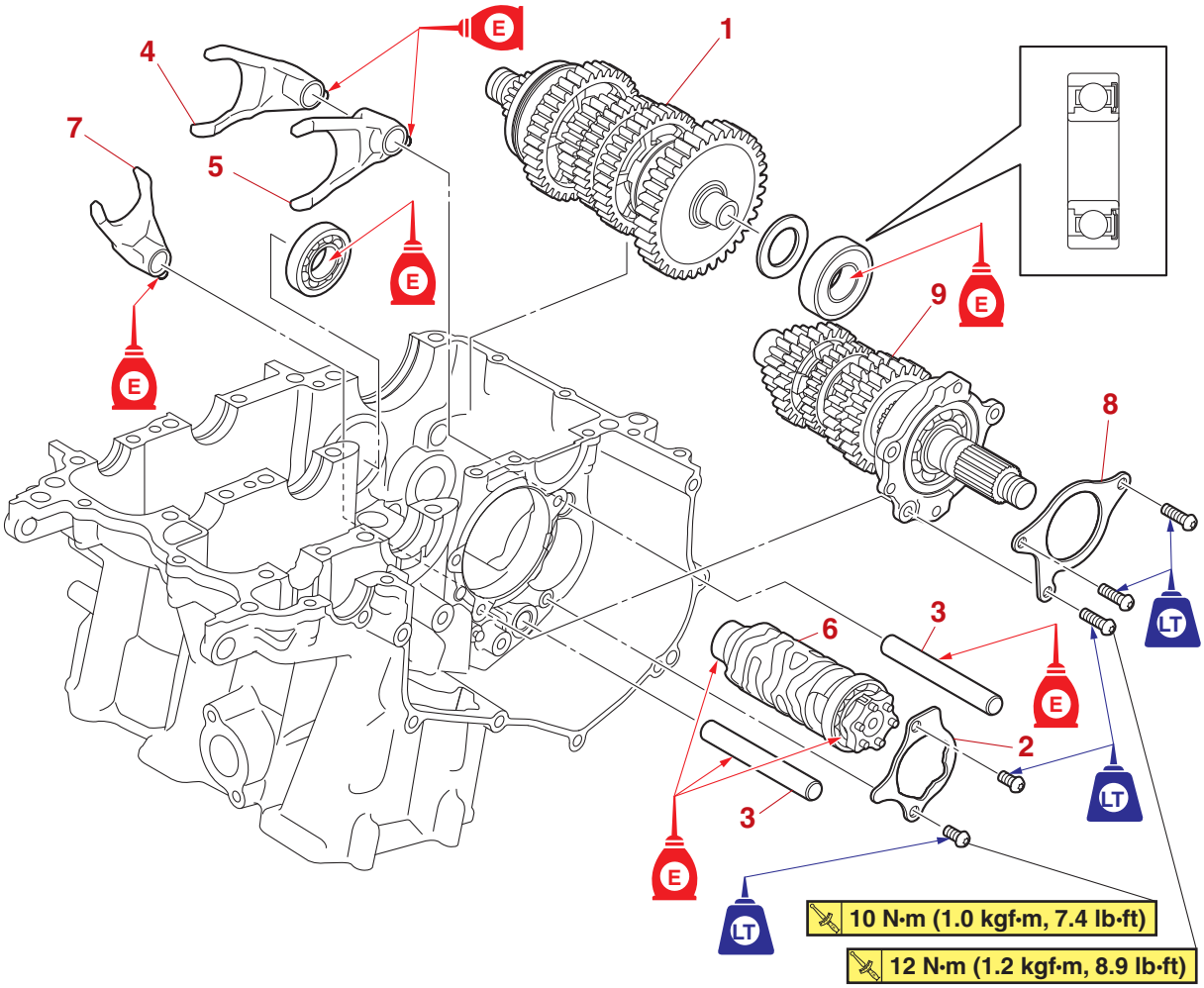
TIP

Align the punch mark “a” in the balancer drive gear with the punch mark “b” in the balancer driven gear.



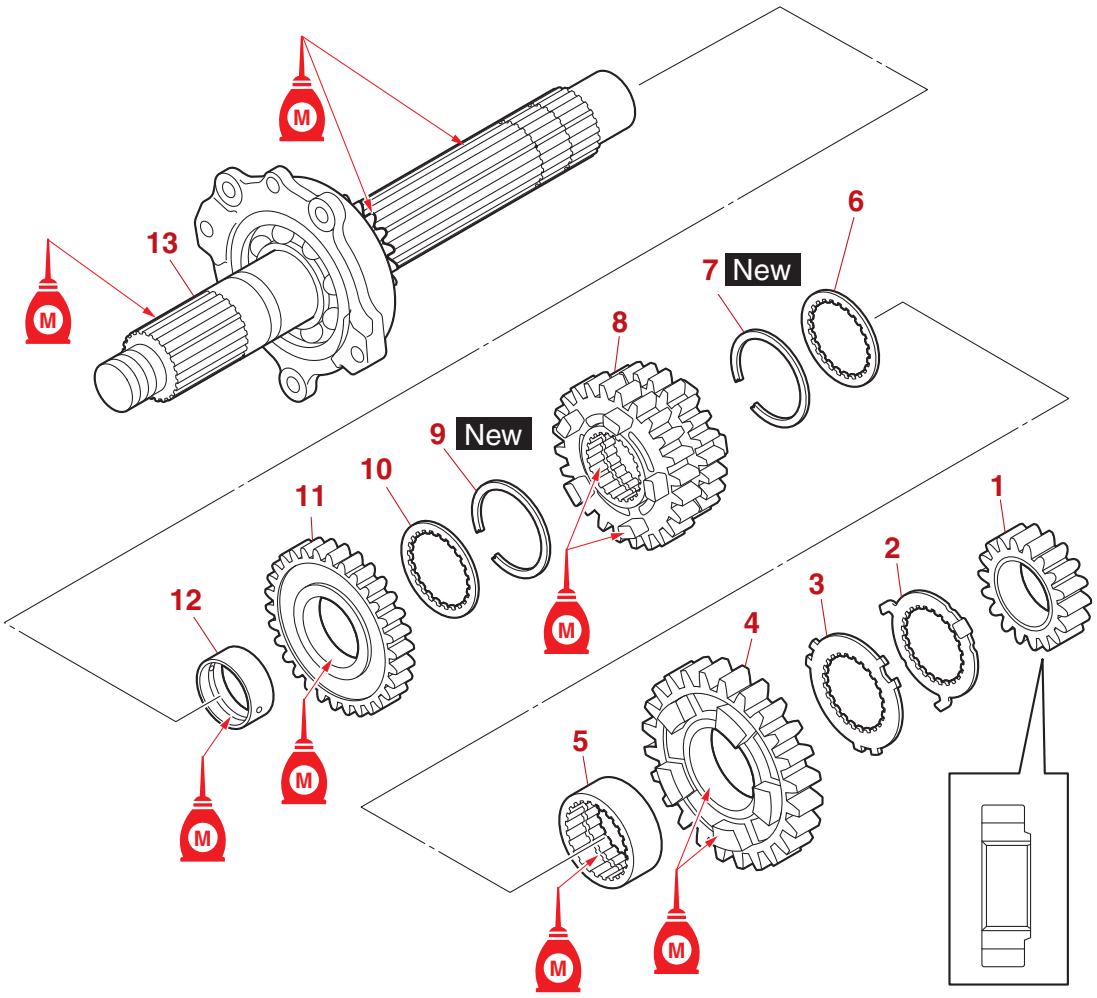
EAS20062
TRANSMISSION

Removing the transmission, shift drum assembly, and shift forks



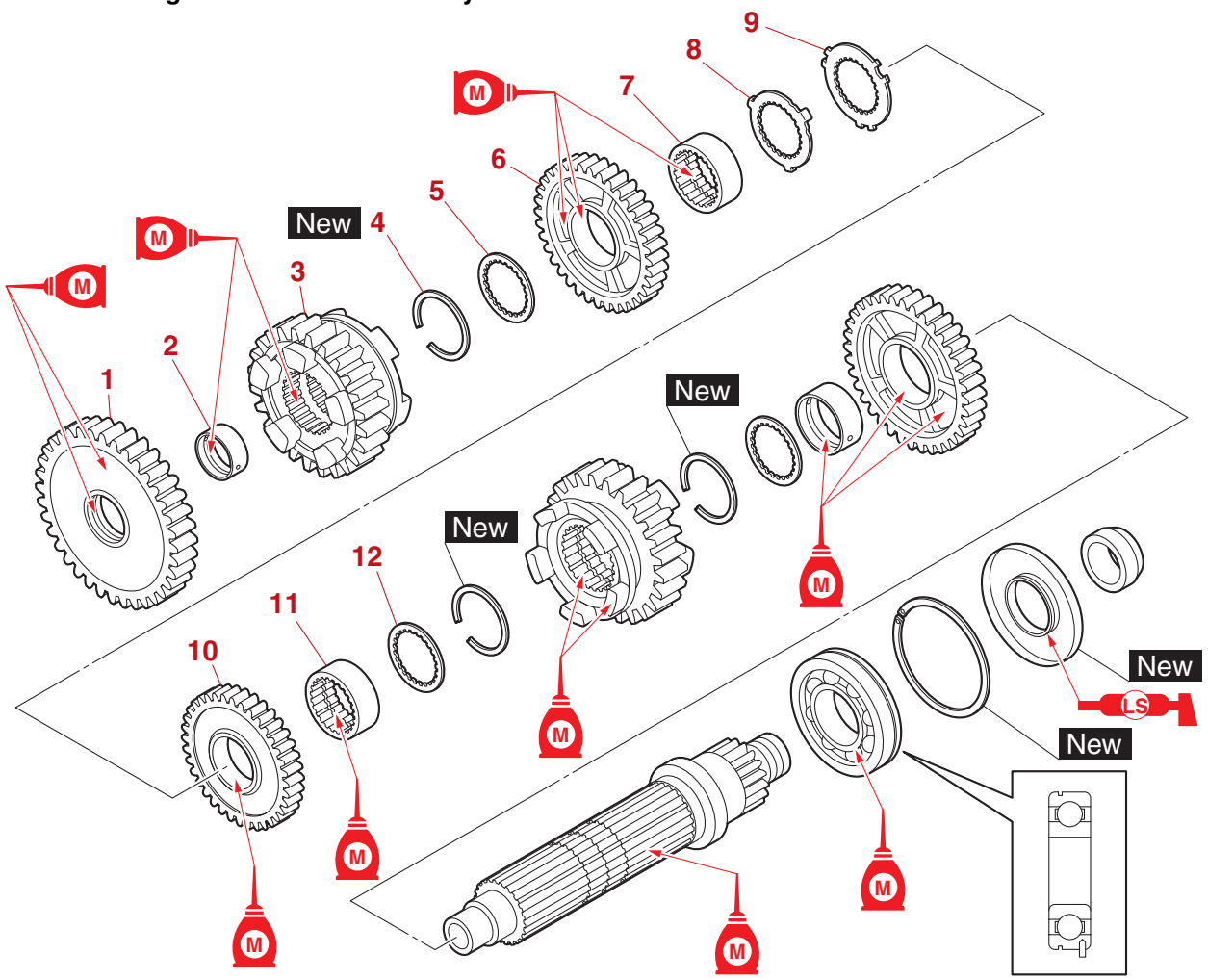
Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Refer to "CRANKCASE" on page 5-72.
1	Drive axle assembly	1	
2	Shift drum retainer	1	
3	Shift fork guide bar	2	
4	Shift fork "L"	1	
5	Shift fork "R"	1	
6	Shift drum assembly	1	
7	Shift fork "C"	1	
8	Bearing retainer	1	
9	Main axle assembly	1	

Disassembling the main axle assembly



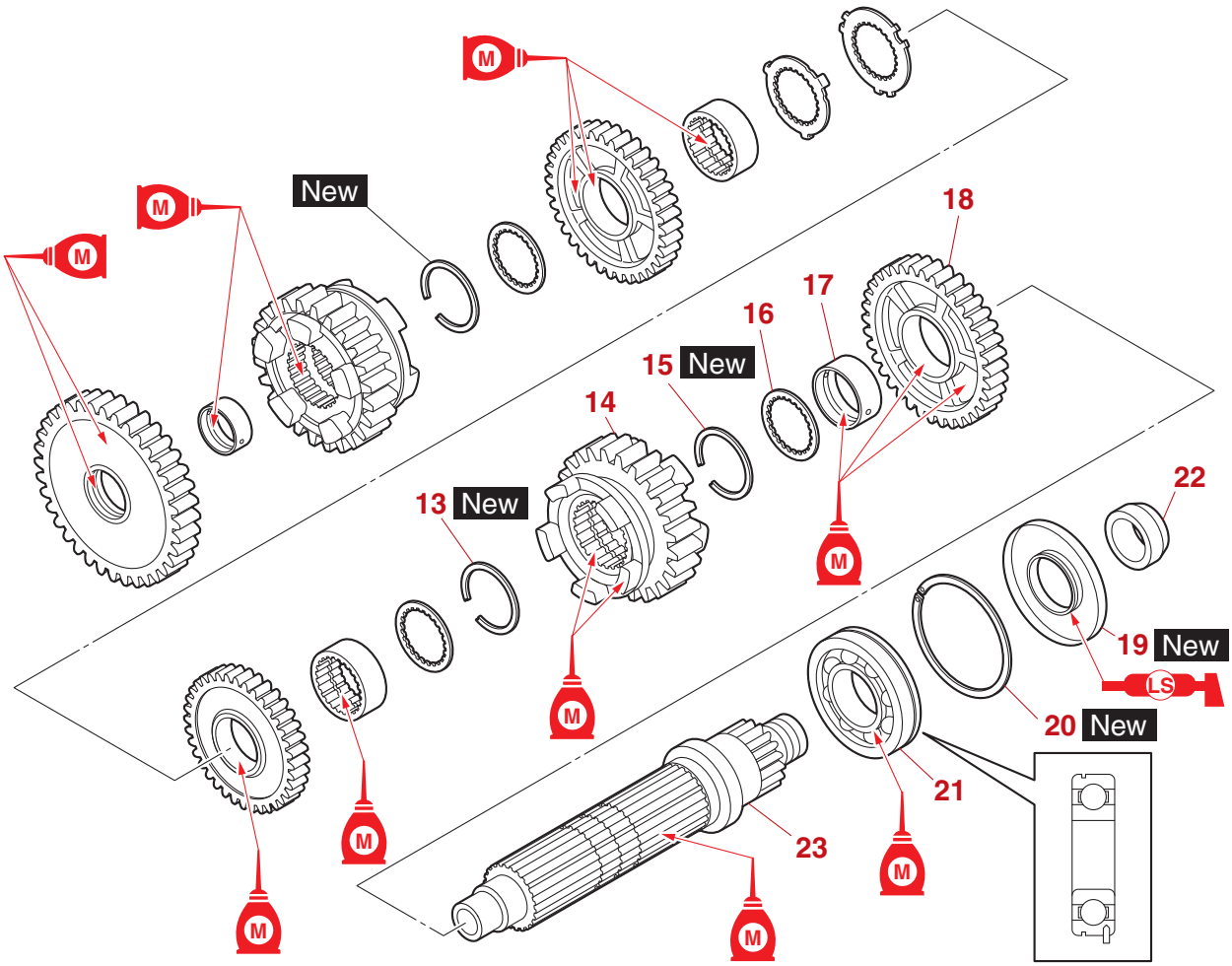
Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	
2	Toothed lock washer	1	
3	Toothed lock washer retainer	1	
4	6th pinion gear	1	
5	Collar	1	
6	Washer	1	
7	Circlip	1	
8	3rd pinion gear	1	
9	Circlip	1	
10	Washer	1	
11	5th pinion gear	1	
12	Collar	1	
13	Main axle	1	

Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	1st wheel gear	1	
2	Collar	1	
3	5th wheel gear	1	
4	Circlip	1	
5	Washer	1	
6	3rd wheel gear	1	
7	Collar	1	
8	Toothed lock washer	1	
9	Toothed lock washer retainer	1	
10	4th wheel gear	1	
11	Collar	1	
12	Washer	1	

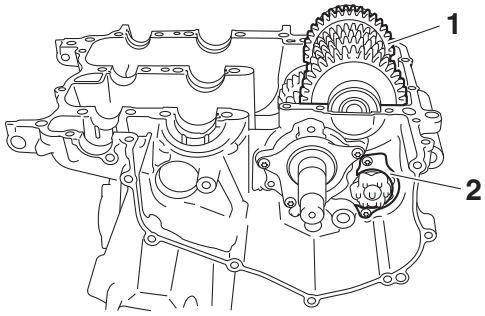
Disassembling the drive axle assembly



Order	Job/Parts to remove	Q'ty	Remarks
13	Circlip	1	
14	6th wheel gear	1	
15	Circlip	1	
16	Washer	1	
17	Collar	1	
18	2nd wheel gear	1	
19	Oil seal	1	
20	Circlip	1	
21	Bearing	1	
22	Collar	1	
23	Drive axle	1	

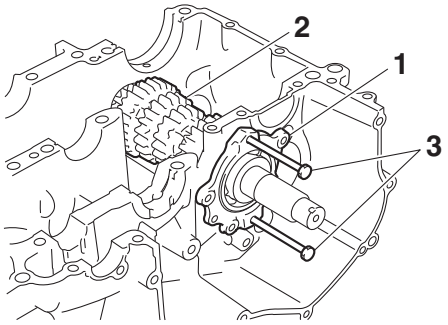
EAS30430
REMOVING THE TRANSMISSION

1. Remove:
   - Drive axle assembly “1”
   - Shift drum retainer “2”
   - Shift fork guide bar
   - Shift fork “L” and “R”
   - Shift drum assembly
   - Shift fork “C”



2. Remove:
   - Bearing retainer
   - Main axle assembly bearing housing “1”
   - Main axle assembly “2”

   a. Insert two bolts “3” of the proper size, as shown in the illustration, into the main axle assembly bearing housing.

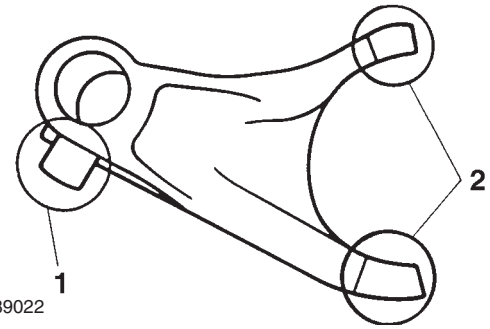


   b. Tighten the bolts until they contact the crankcase surface.
   c. Continue tightening the bolts until the main axle assembly comes free from the cylinder.

EAS30431
CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

1. Check:
   - Shift fork cam follower “1”
   - Shift fork pawl “2”
     Bends/damage/scoring/wear → Replace the shift fork.



G089022

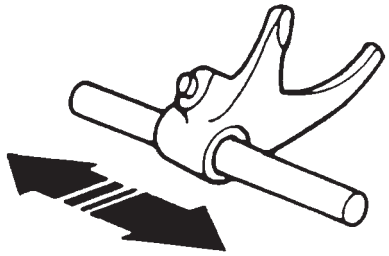
2. Check:
   - Shift fork guide bar
     Roll the shift fork guide bar on a flat surface.
     Bends → Replace.

EWA12840

⚠ WARNING

Do not attempt to straighten a bent shift fork guide bar.

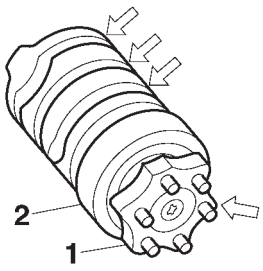
3. Check:
   - Shift fork movement
     (along the shift fork guide bar)
     Rough movement → Replace the shift forks and shift fork guide bar as a set.



G089023

EAS30432
CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:
   - Shift drum groove
     Damage/scratches/wear → Replace the shift drum assembly.
   - Shift drum segment “1”
     Damage/wear → Replace the shift drum assembly.
   - Shift drum bearing “2”
     Damage/pitting → Replace the shift drum assembly.

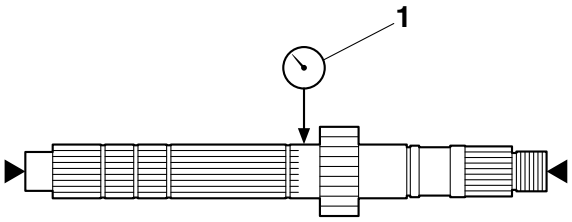


G089024

EAS30433
CHECKING THE TRANSMISSION

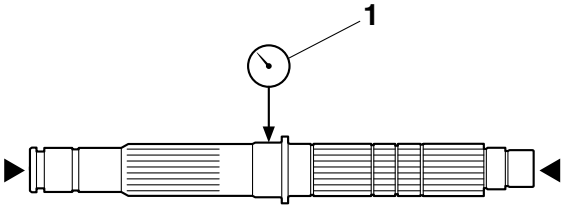
1. Measure:
   • Main axle runout
   (with a centering device and dial gauge “1”)
   Out of specification → Replace the main axle.

	Main axle runout limit **0.08 mm (0.0032 in)**

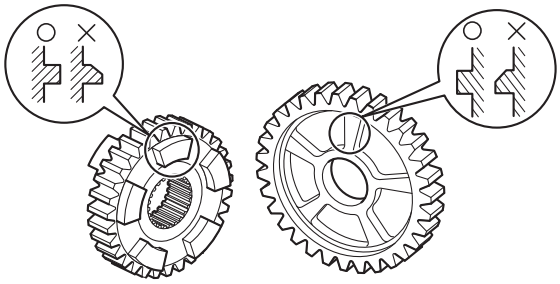


2. Measure:
   • Drive axle runout
   (with a centering device and dial gauge “1”)
   Out of specification → Replace the drive axle.

	Drive axle runout limit **0.08 mm (0.0032 in)**



3. Check:
   • Transmission gear
   Blue discoloration/pitting/wear → Replace the defective gear(s).
   • Transmission gear dog
   Cracks/damage/rounded edges → Replace the defective gear(s).



G089025

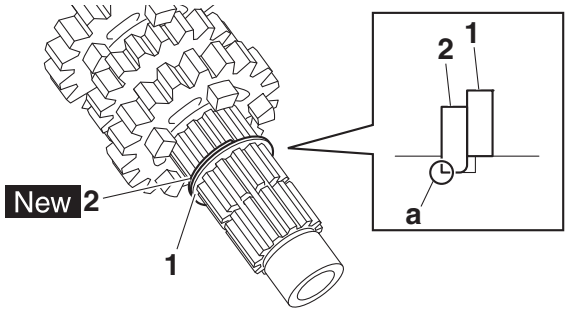
4. Check:
   • Transmission gear engagement
   (each pinion gear to its respective wheel gear)
   Incorrect → Reassemble the transmission axle assemblies.
5. Check:
   • Transmission gear movement
   Rough movement → Replace the defective part(s).
6. Check:
   • Circlip
   Bends/damage/looseness → Replace.

EAS30435
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

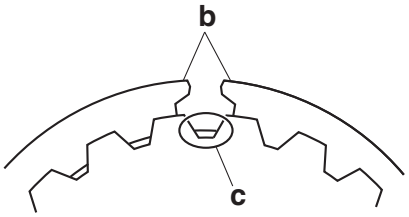
1. Install:
   • Toothed washer “1”
   • Circlip “2” New

TIP

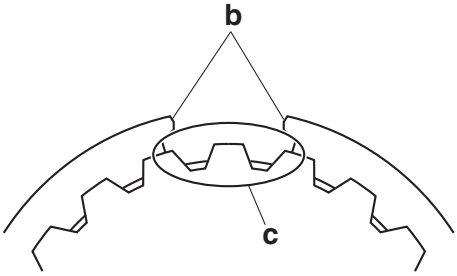
- Be sure the circlip sharp-edged corner “a” is positioned opposite side to the toothed washer and gear.
- Align the opening between the ends “b” of the circlip with a groove “c” in the axle.



A



B

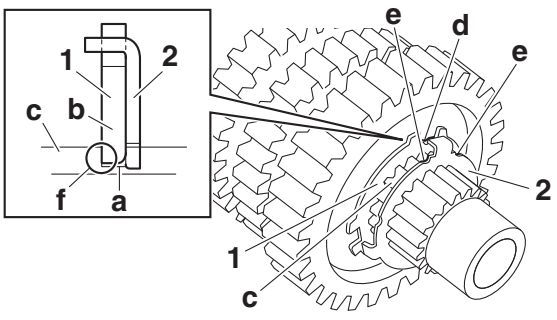


A. Main axle
B. Drive axle

2. Install:
   • Toothed lock washer retainer “1”
   • Toothed lock washer “2”

TIP

- With the toothed lock washer retainer in the groove “a” in the axle, align the projection “b” on the retainer with an axle spline “c”, and then install the toothed lock washer.
- Be sure to align the projection on the toothed lock washer that is between the alignment marks “e” with the alignment mark “d” on the retainer.
- Be sure the toothed lock washer retainer sharp-edged corner “f” is positioned opposite side to the toothed lock washer.



EAS30438

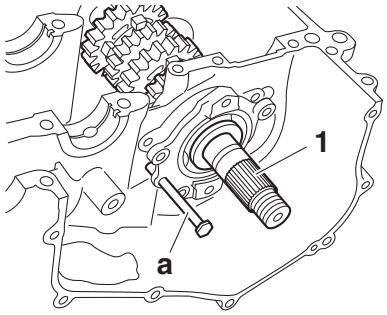
INSTALLING THE TRANSMISSION

1. Install:
   • Main axle assembly “1”
   • Bearing retainer

Bearing retainer bolt
12 N·m (1.2 kgf·m, 8.9 lb·ft)
LOCTITE®

TIP

Use a suitable pin “a” to position the bearing housing, and then install the housing until it contacts the cylinder.



2. Install:
   • Shift fork “C”
   • Shift drum assembly
   • Shift fork guide bar

TIP

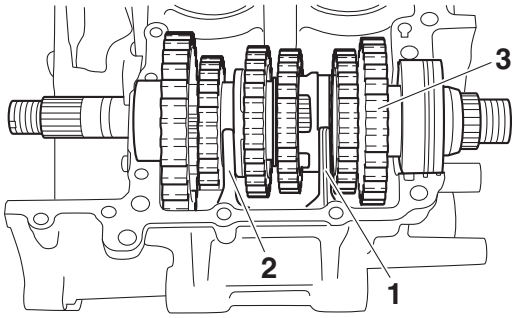
- The embossed marks on the shift forks should face towards the right side of the engine.
- Install shift fork “C” into the groove in the 3rd pinion gear on the main axle.

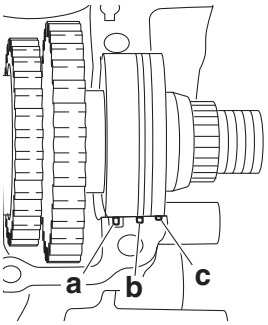
3. Install:
   • Shift fork “L” “1”
   • Shift fork “R” “2”
   • Shift fork guide bar
   • Shift drum retainer
   • Drive axle assembly “3”

Shift drum retainer bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)
LOCTITE®

TIP

- Install shift fork “L” into the groove in the 6th wheel gear and shift fork “R” into the groove in the 5th wheel gear on the drive axle.
- Make sure that the projection “a” on the drive axle assembly is inserted into the slot in the cylinder.
- Make sure that the drive axle bearing circlip “b” and flange “c” of the oil seal are inserted into the grooves in the cylinder.





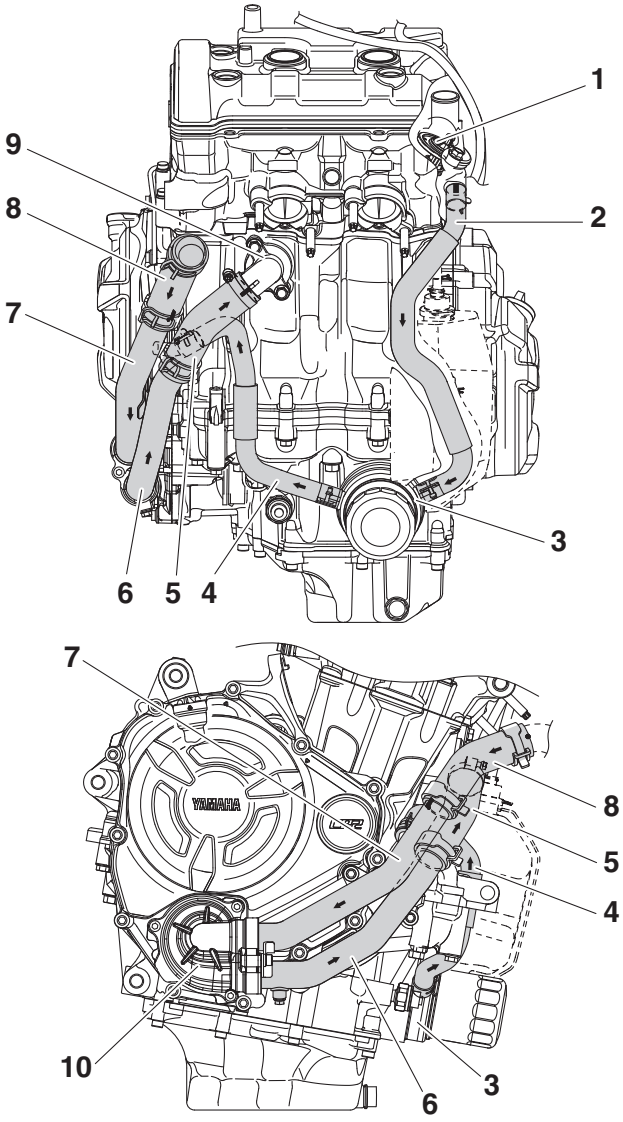
4. Check:
   • Transmission
     Rough movement → Repair.

TIP

Oil each gear, shaft, and bearing thoroughly.

COOLING SYSTEM

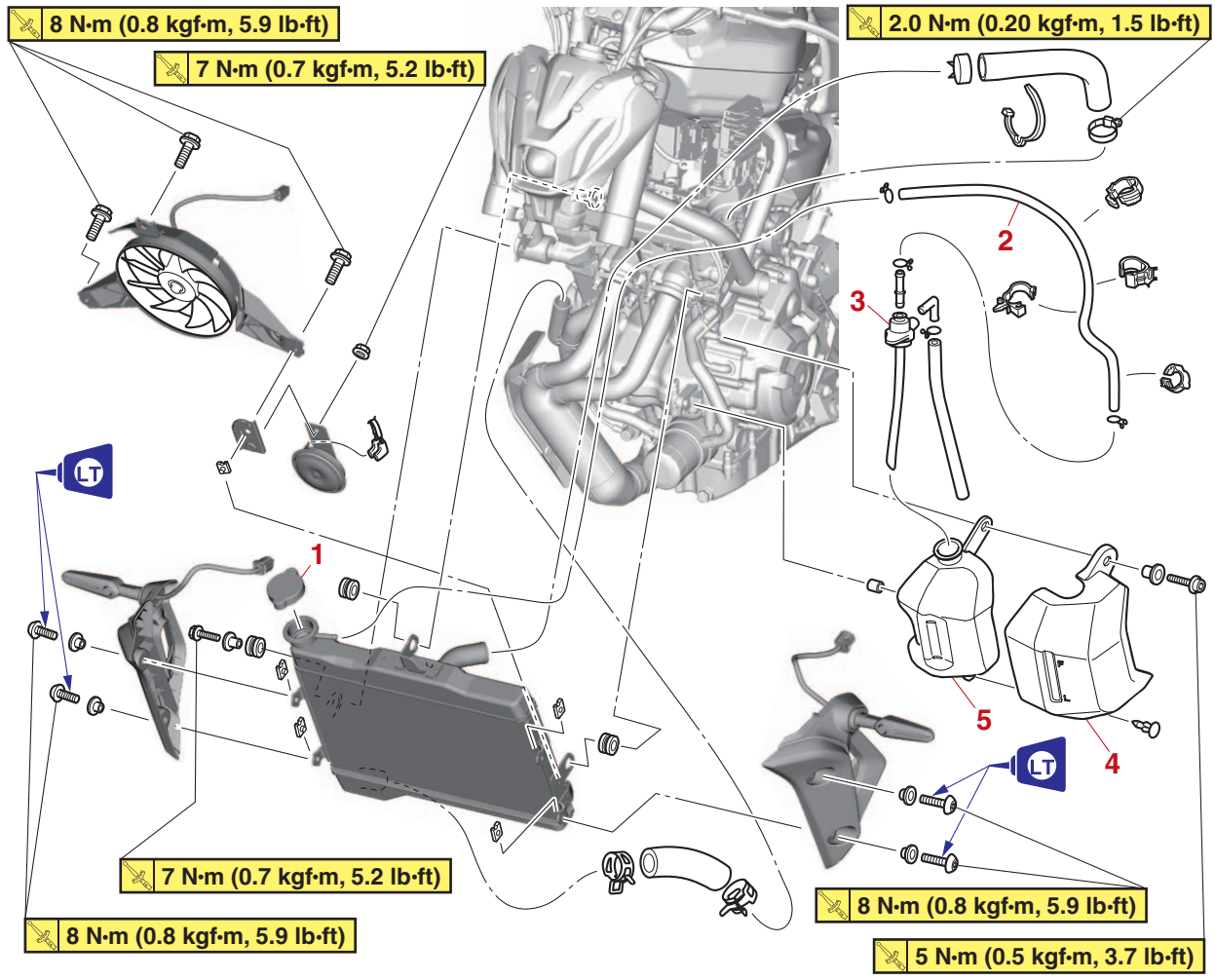
EAS20299
COOLING SYSTEM DIAGRAMS



1. Thermostat
2. Oil cooler inlet hose
3. Oil cooler
4. Oil cooler outlet hose
5. Water jacket joint inlet hose
6. Water pump outlet pipe
7. Water pump inlet pipe
8. Radiator outlet hose
9. Water jacket joint
10. Water pump

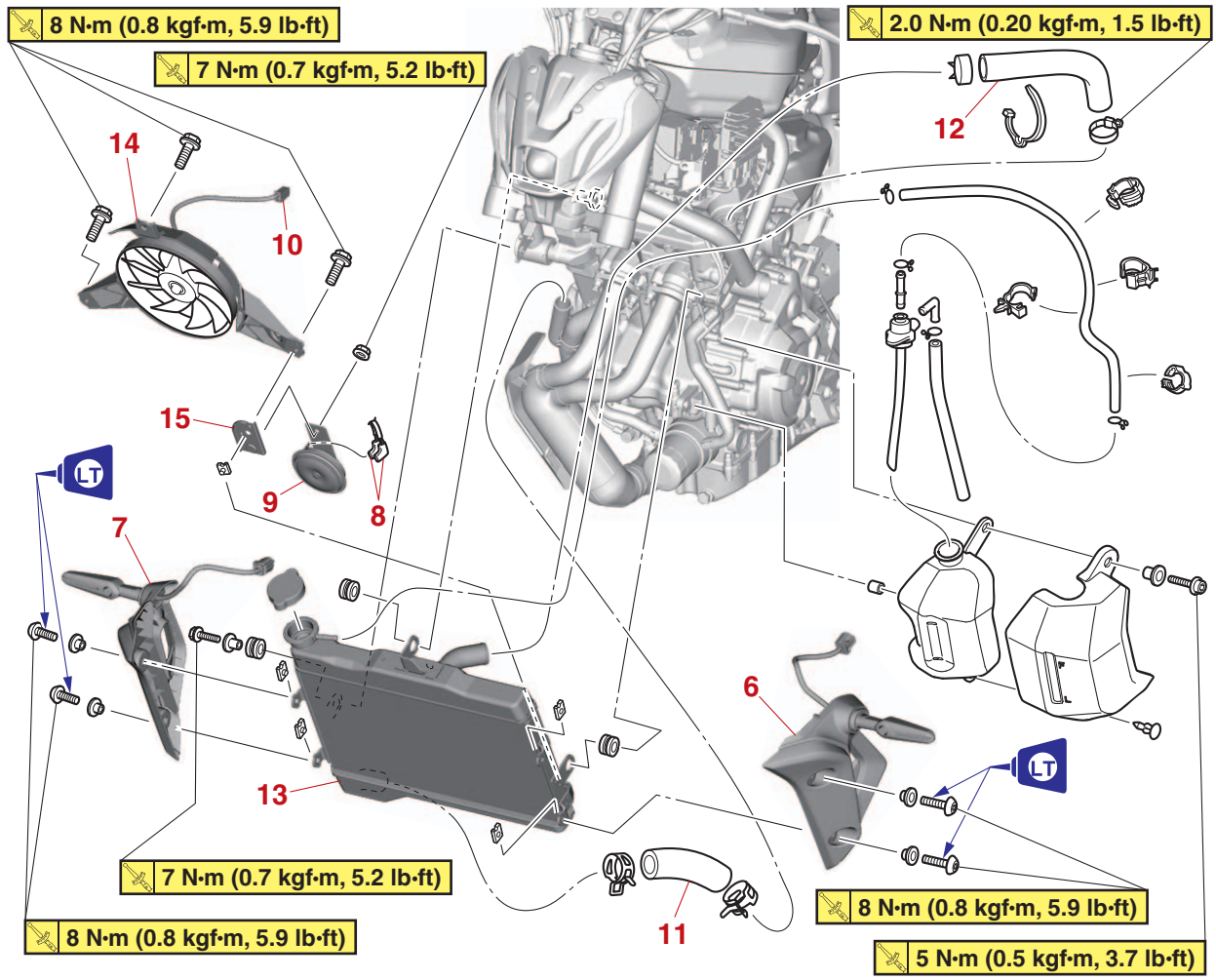
EAS20063
RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-24.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
1	Radiator cap	1	
2	Coolant reservoir hose	1	
3	Coolant reservoir cap	1	
4	Coolant reservoir cover	1	
5	Coolant reservoir	1	

Removing the radiator



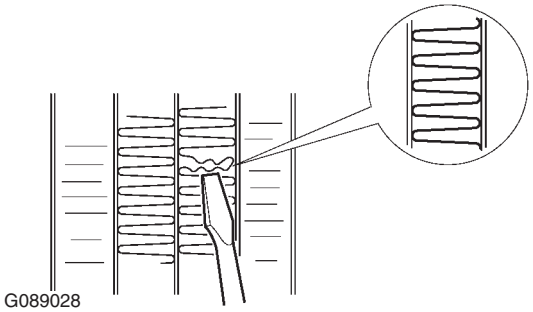
Order	Job/Parts to remove	Q'ty	Remarks
6	Radiator side cover (left)	1	
7	Radiator side cover (right)	1	
8	Horn connector	2	Disconnect.
9	Horn	1	
10	Radiator fan motor coupler	1	Disconnect.
11	Radiator outlet hose	1	
12	Radiator inlet hose	1	
13	Radiator	1	
14	Radiator fan	1	
15	Radiator bracket	1	

EAS30439
CHECKING THE RADIATOR

1. Check:
   - Radiator fin
     Obstruction → Clean.
     Apply compressed air to the rear of the radiator.
     Damage → Repair or replace.

TIP

Straighten any flattened fins with a thin, flat-head screwdriver.



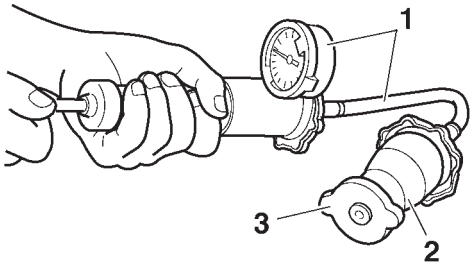
G089028

2. Check:
   - Radiator hose
     Cracks/damage → Replace.
   - Radiator pipe
     Cracks/damage → Replace the radiator.
3. Measure:
   - Radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.

Radiator cap valve opening pressure
107.9–137.3 kPa (1.08–1.37 kgf/cm², 15.6–19.9 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
90890-01352
Pressure tester adapter
YU-33984



G089029

b. Apply the specified pressure, and then make sure that there is no drop in pressure for 10 seconds.

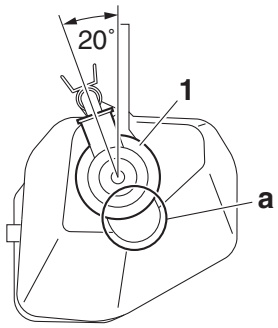
4. Check:
   - Radiator fan
     Damage → Replace.
     Malfunction → Check and repair.
     Refer to "COOLING SYSTEM" on page 8-29.

EAS30440
INSTALLING THE RADIATOR

1. Install:
   - Coolant reservoir cap "1"

TIP

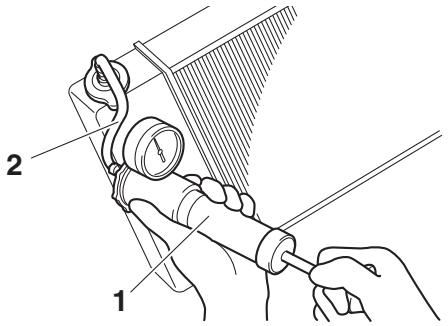
Point the tab "a" on the coolant reservoir cap in the direction shown in the illustration.



2. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT" on page 3-24.
3. 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.

Radiator cap tester
90890-01325
Mityvac cooling system tester kit
YU-24460-A
Radiator cap tester adapter
90890-01352
Pressure tester adapter
YU-33984



G089031

b. Apply 137.3 kPa (1.37 kgf/cm², 19.9 psi) of pressure.

Test pressure value
137.3 kPa (1.37 kgf/cm², 19.9 psi)

ECA24270

NOTICE

- **Do not apply such a high pressure as exceeds the test pressure.**
- **Make sure that a checkup after the cylinder head gasket is replaced is made after 3 minutes of warm-up.**
- **Make sure that coolant is filled up to the upper level beforehand.**

4. Check:
   - Pressure value
     No stay for 5 to 10 seconds at the test pressure value → Correct.
   - Radiator
   - Radiator hose connections
     Coolant leaks → Correct or replace.
   - Radiator hoses
     Bulges → Replace.

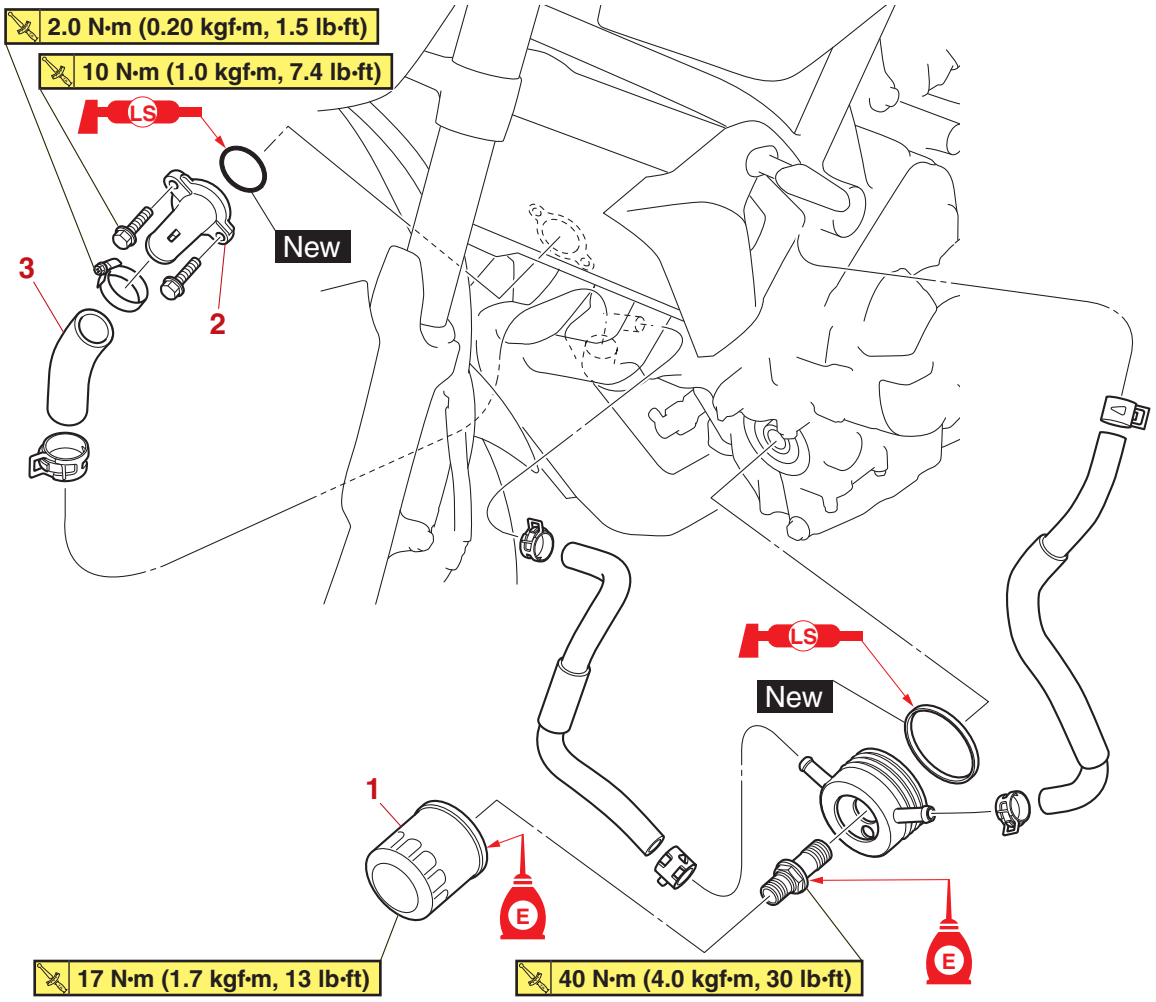
EWA19090

⚠ WARNING

When the radiator cap tester is removed, coolant will spout; therefore, cover it with a cloth beforehand.

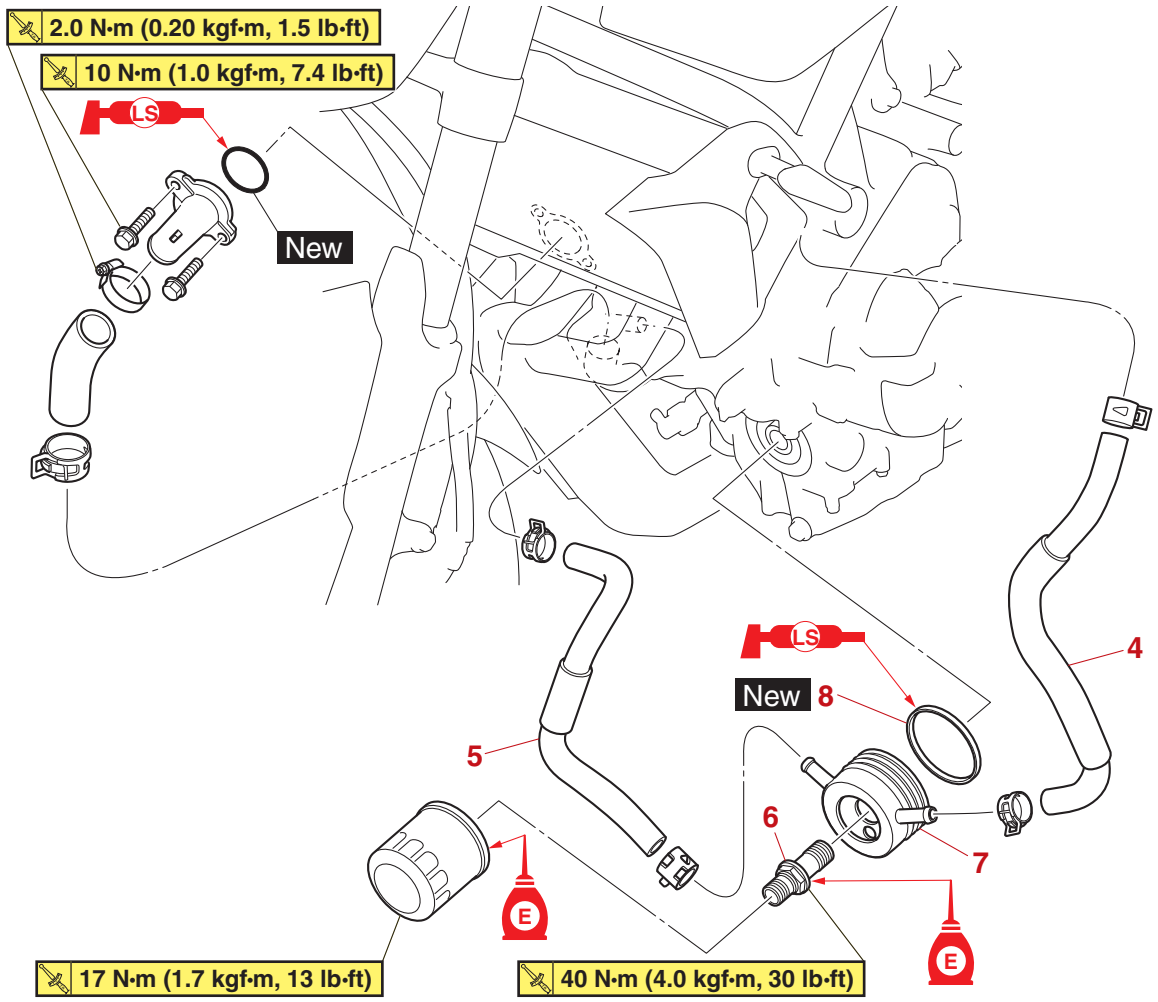
EAS20064
OIL COOLER

Removing the oil cooler



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-24.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
	Coolant reservoir		Refer to "RADIATOR" on page 6-2.
1	Oil filter cartridge	1	
2	Water jacket joint	1	
3	Water jacket joint inlet hose	1	

Removing the oil cooler



Order	Job/Parts to remove	Q'ty	Remarks
4	Oil cooler inlet hose	1	
5	Oil cooler outlet hose	1	
6	Oil filter cartridge union bolt	1	
7	Oil cooler	1	
8	Gasket	1	

EAS30441
CHECKING THE OIL COOLER

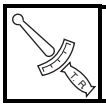
1. Check:
   - Oil cooler
     Cracks/damage → Replace.
2. Check:
   - Oil cooler inlet hose
   - Oil cooler outlet hose
   - Water pump outlet hose
     Cracks/damage → Replace.

EAS31123
CHECKING THE WATER JACKET JOINT

1. Check:
   - Water jacket joint
     Mineral deposits/rust → Eliminate.

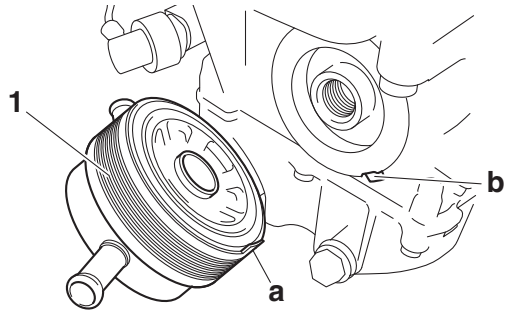
EAS30442
INSTALLING THE OIL COOLER

1. Clean:
   - Mating surfaces of the oil cooler and the crankcase
     (with a cloth dampened with lacquer thinner)
2. Install:
   - Gasket New
   - Oil cooler "1"
   - Oil filter cartridge union bolt

	**Oil filter cartridge union bolt** **40 N·m (4.0 kgf·m, 30 lb·ft)**

TIP

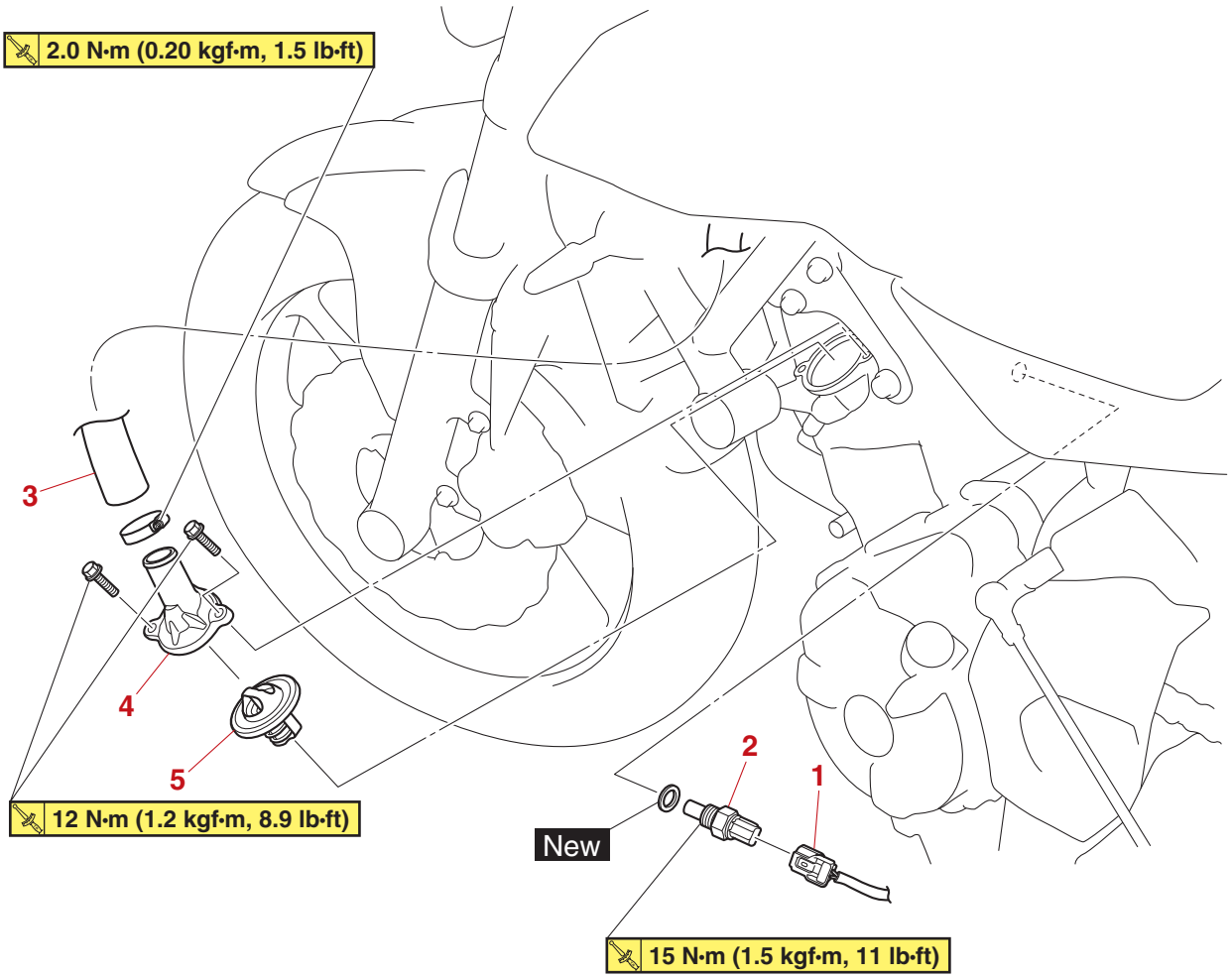
- Before installing the oil cooler, apply engine oil lightly to the oil filter cartridge union bolt.
- Align the projection "a" on the oil cooler with the slot "b" in the crankcase.



3. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT" on page 3-24.
   - Crankcase
     (with the specified amount of the recommended engine oil)
     Refer to "CHANGING THE ENGINE OIL" 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.

EAS20065
THERMOSTAT

Removing the thermostat



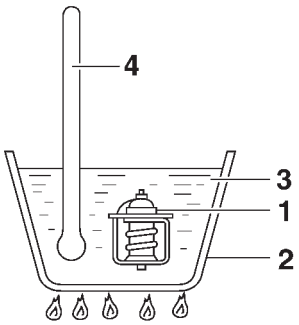
Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-24.
	Passenger seat/Rider seat		For California only. Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		For California only. Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank/Canister		For California only. Refer to "FUEL TANK" on page 7-1.
1	Coolant temperature sensor coupler	1	Disconnect.
2	Coolant temperature sensor	1	
3	Radiator inlet hose	1	Disconnect.
4	Thermostat cover	1	
5	Thermostat	1	

EAS30443
CHECKING THE THERMOSTAT

1. Check:
   • Thermostat
   When the water temperature in the specified value, the thermostat does not fully open. → Replace.

	Valve full open temperature 95.0 °C (203.00 °F)

   a. Suspend the thermostat "1" in a container "2" filled with water.
   b. Slowly heat the water "3".
   c. Place a thermometer "4" in the water.
   d. While stirring the water, observe the thermostat and thermometer's indicated temperature.



G089032

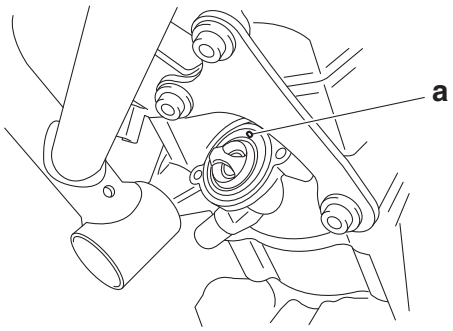
TIP
If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

2. Check:
   • Thermostat cover
   Cracks/damage → Replace.

EAS30939
INSTALLING THE THERMOSTAT

1. Install:
   • Thermostat

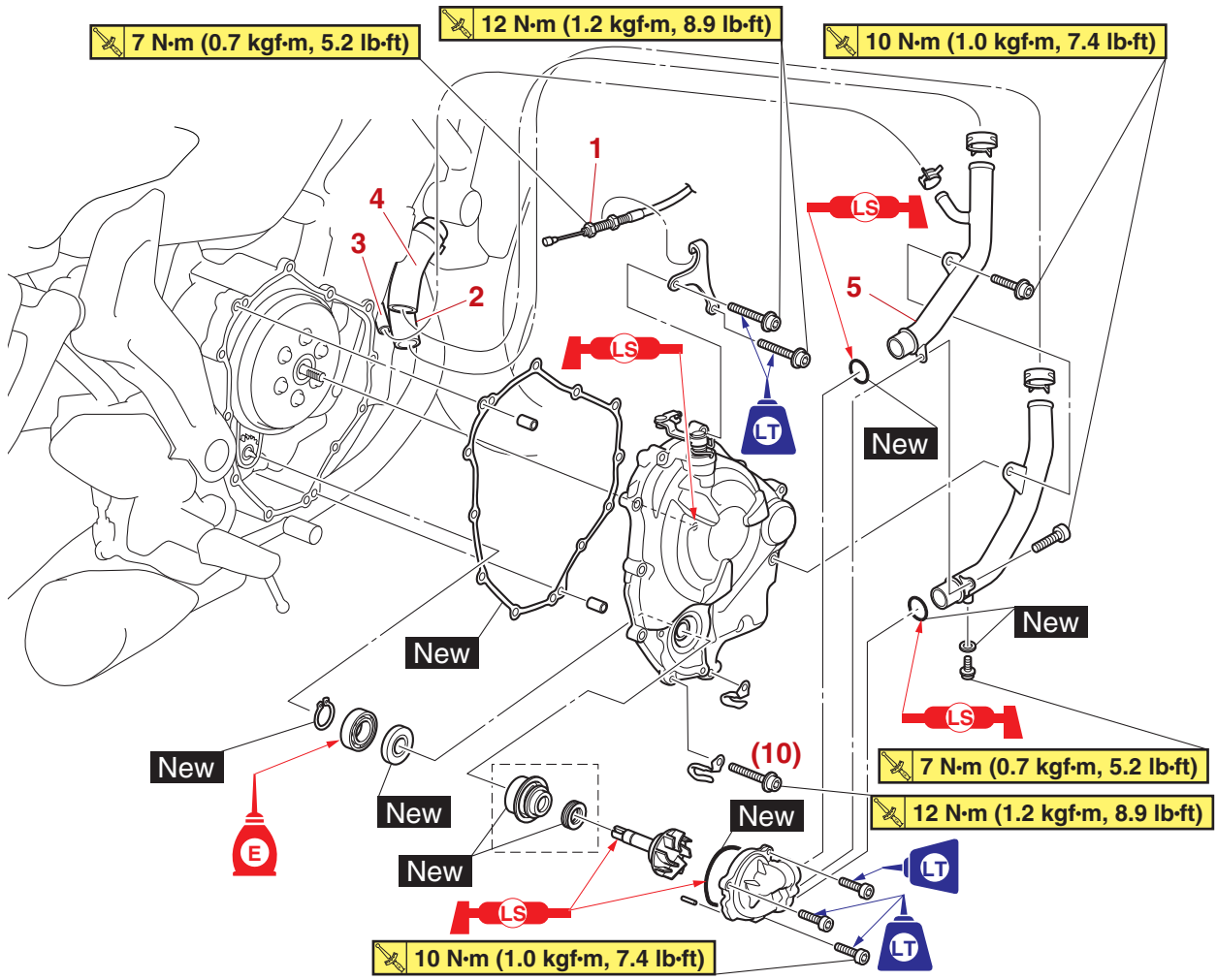
TIP
Install the thermostat with its breather valve "a" facing inward.



2. Fill:
   • Cooling system
   (with the specified amount of the recommended coolant)
   Refer to "CHANGING THE COOLANT" on page 3-24.
3. Check:
   • Cooling system
   Leaks → Repair or replace any faulty part.
4. Measure:
   • Radiator cap opening pressure
   Below the specified pressure → Replace the radiator cap.
   Refer to "CHECKING THE RADIATOR" on page 6-4.

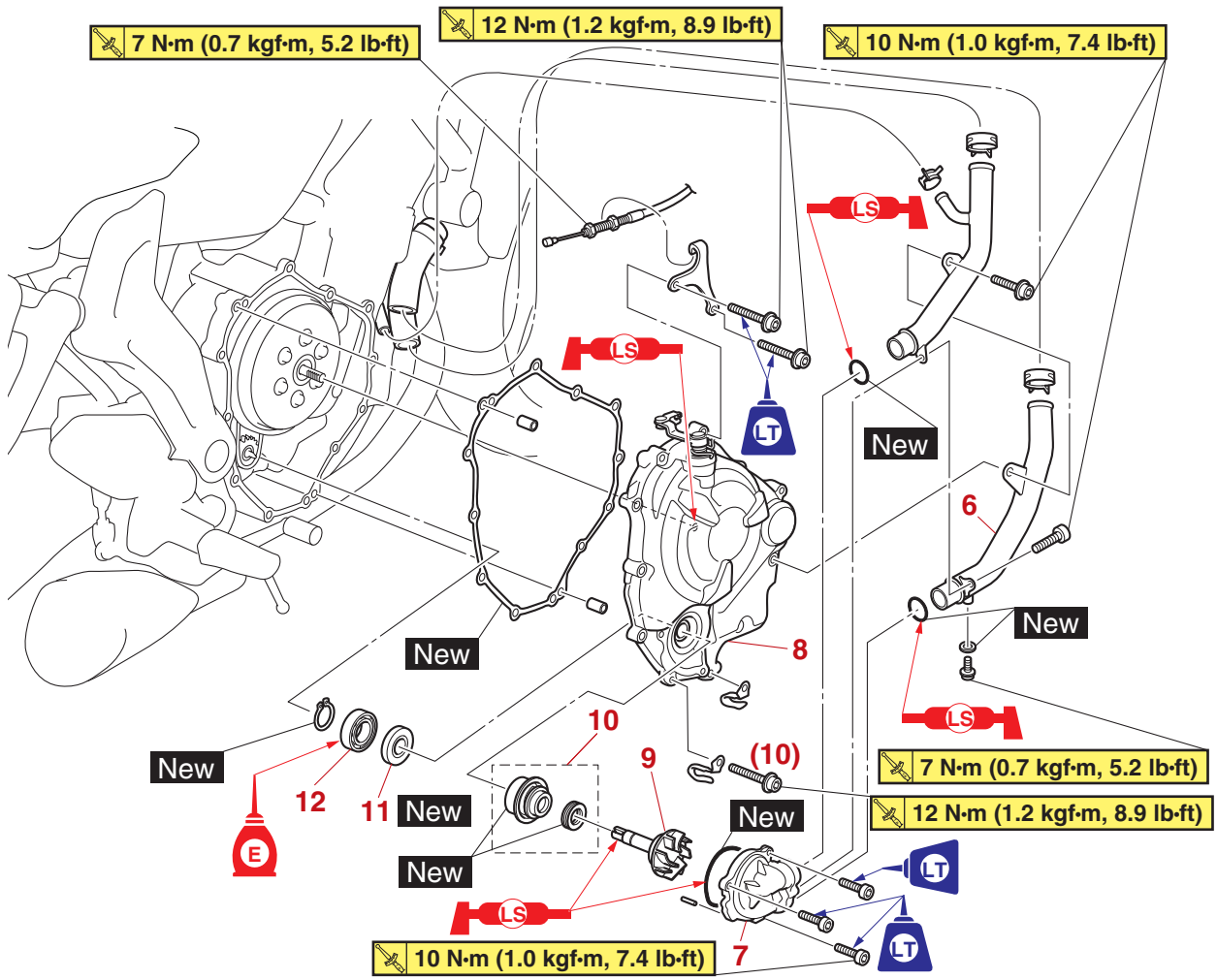
EAS20066
WATER PUMP

Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-24.
	Engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-21.
1	Clutch cable	1	Disconnect.
2	Water pump outlet hose	1	Disconnect.
3	Oil cooler outlet hose	1	Disconnect.
4	Radiator outlet hose	1	Disconnect.
5	Water pump inlet pipe	1	

Removing the water pump



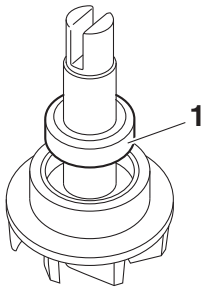
Order	Job/Parts to remove	Q'ty	Remarks
6	Water pump outlet pipe	1	
7	Water pump housing	1	
8	Clutch cover	1	
9	Impeller shaft	1	
10	Water pump seal assembly	1	
11	Oil seal	1	
12	Bearing	1	

EAS30446
DISASSEMBLING THE WATER PUMP

1. Remove:
   • Mechanical seal (impeller side) “1”
   (from the impeller, with a thin, flat-head screwdriver)

TIP

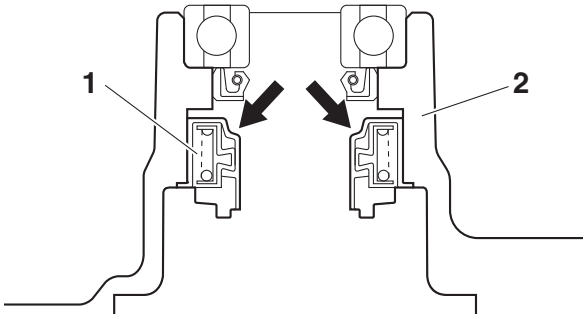
Do not scratch the impeller shaft.



2. Remove:
   • Mechanical seal (housing side) “1”

TIP

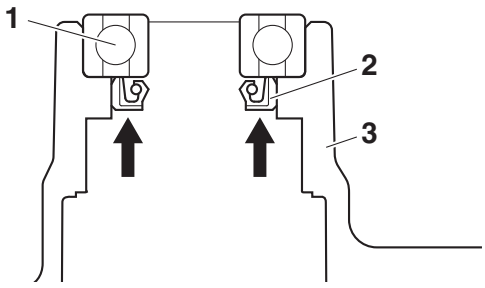
Remove the mechanical seal (housing side) from the inside of the clutch cover “2”.



3. Remove:
   • Bearing “1”
   • Oil seal “2”

TIP

Remove the bearing and oil seal from the outside of the clutch cover “3”.



EAS30447
CHECKING THE WATER PUMP

1. Check:
   • Water pump housing
   • Clutch cover
   • Impeller shaft
   Cracks/damage/wear → Replace.
2. Check:
   • Bearing
   Rough movement → Replace.
3. Check:
   • Water pump outlet pipe
   • Water pump inlet pipe
   Cracks/damage/wear → Replace.

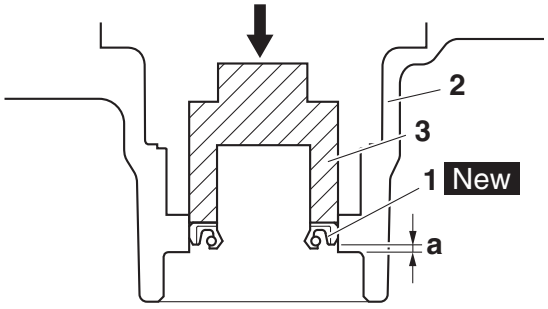
EAS30448
ASSEMBLING THE WATER PUMP

1. Install:
   • Oil seal “1” New
   • Bearing
   (into the clutch cover “2”)

TIP

Install the oil seal with a socket “3” that matches its outside diameter.

Installed depth of oil seal “a”
0.5–1.3 mm (0.02–0.05 in)



2. Install:
   • Mechanical seal (housing side) “1” New
   (into the clutch cover “2”)

ECA20330

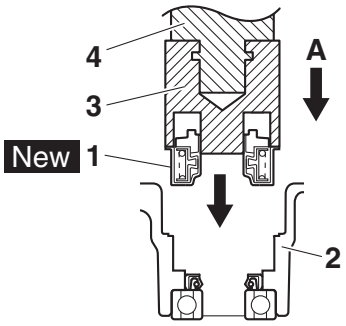
NOTICE

Never lubricate the mechanical seal (housing side) surface with oil or grease.

TIP

Use the special tools and a press to press the mechanical seal (housing side) straight in until it touches the clutch cover.

Mechanical seal installer (ø33)
90890-04132
Water pump seal installer (ø33)
YM-33221-A
Middle driven shaft bearing driver
90890-04058
Middle drive bearing installer 40 & 50 mm
YM-04058

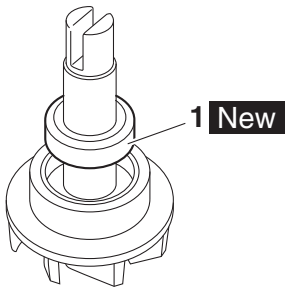


3. Mechanical seal installer
4. Middle driven shaft bearing driver
A. Push down

3. Install:
   • Mechanical seal (impeller side) "1" New

TIP

Before installing the mechanical seal (impeller side), apply tap water or coolant onto its outer surface.



4. Measure:
   • Mechanical seal (impeller side)
   Out of specification → Repeat steps (3) and (4).

ECA14090

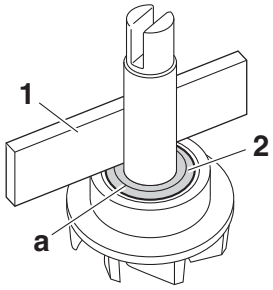
NOTICE

Make sure the rubber damper and rubber damper holder are flush with the impeller.

TIP

If the surface "a" of the mechanical seal (impeller side) that contacts the mechanical seal (housing side) is dirty, clean it.

Mechanical seal (impeller side)
0.15 mm (0.006 in)

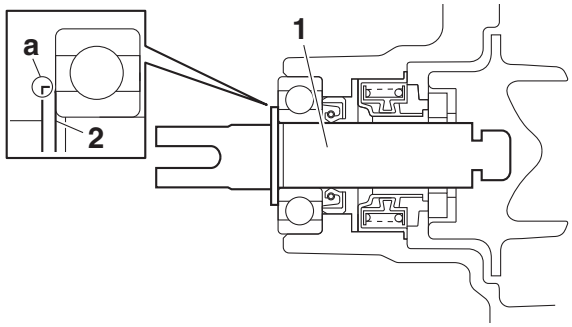


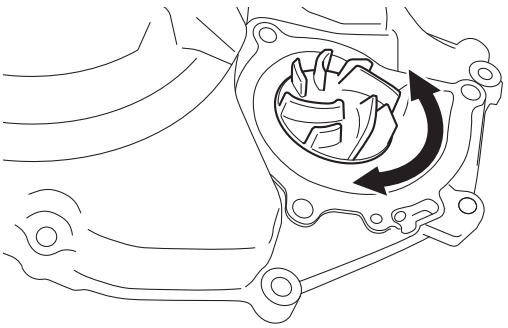
1. Straightedge
2. Impeller

5. Install:
   • Impeller shaft "1"
   • Circlip "2"

TIP

- Be sure the circlip sharp-edged corner "a" is positioned opposite side to the bearing.
- After installation, check that the impeller shaft rotates smoothly.





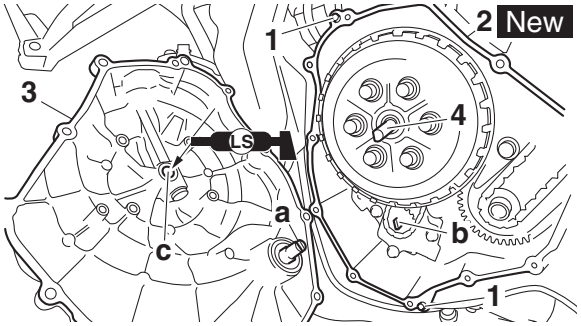
EAS31117
INSTALLING THE CLUTCH COVER

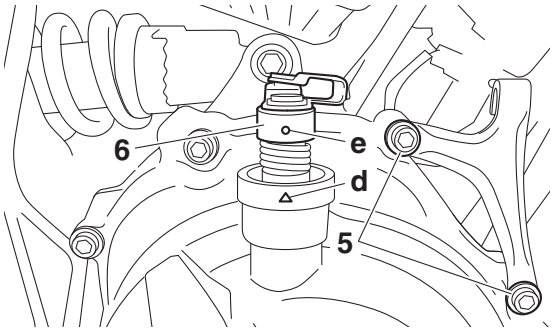
1. Install:
   - Dowel pin “1”
   - Clutch cover gasket “2” New
   - Clutch cover “3”

	**Clutch cover bolt** **12 N·m (1.2 kgf·m, 8.9 lb·ft)** **Clutch cable holder bolt** **12 N·m (1.2 kgf·m, 8.9 lb·ft)** **LOCTITE®**

TIP

- Align the slit “a” in the impeller shaft with the projection “b” on the oil pump driven sprocket.
- Face the serrations on the clutch pull rod “4” rearward and align the rod with the hole “c” in the clutch cover.
- Apply looking agent (LOCTITE®) to the threads of only the clutch cable holder bolts “5”.
- Tighten the bolts in stages and in a crisscross pattern.
- After installing the clutch cover, make sure that the alignment mark “d” on the clutch cover is aligned with the punch mark “e” on the pull lever “6”.



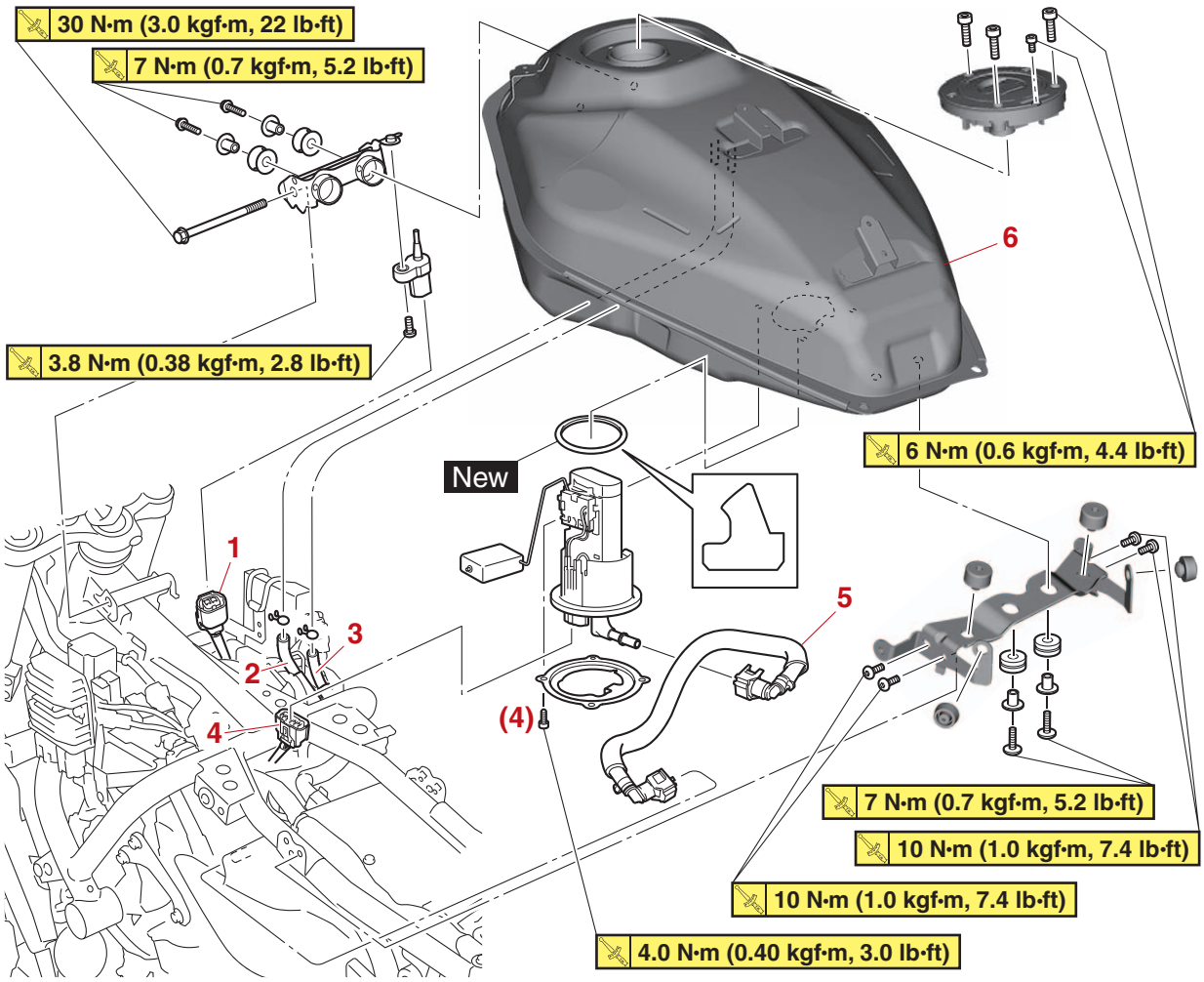


2. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” on page 3-24.
3. Check:
   - Cooling system
     Leaks → Repair or replace the faulty part.
4. Measure:
   - Radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to “CHECKING THE RADIATOR” on page 6-4.
5. Adjust:
   - Clutch lever free play
     Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-12.

FUEL SYSTEM

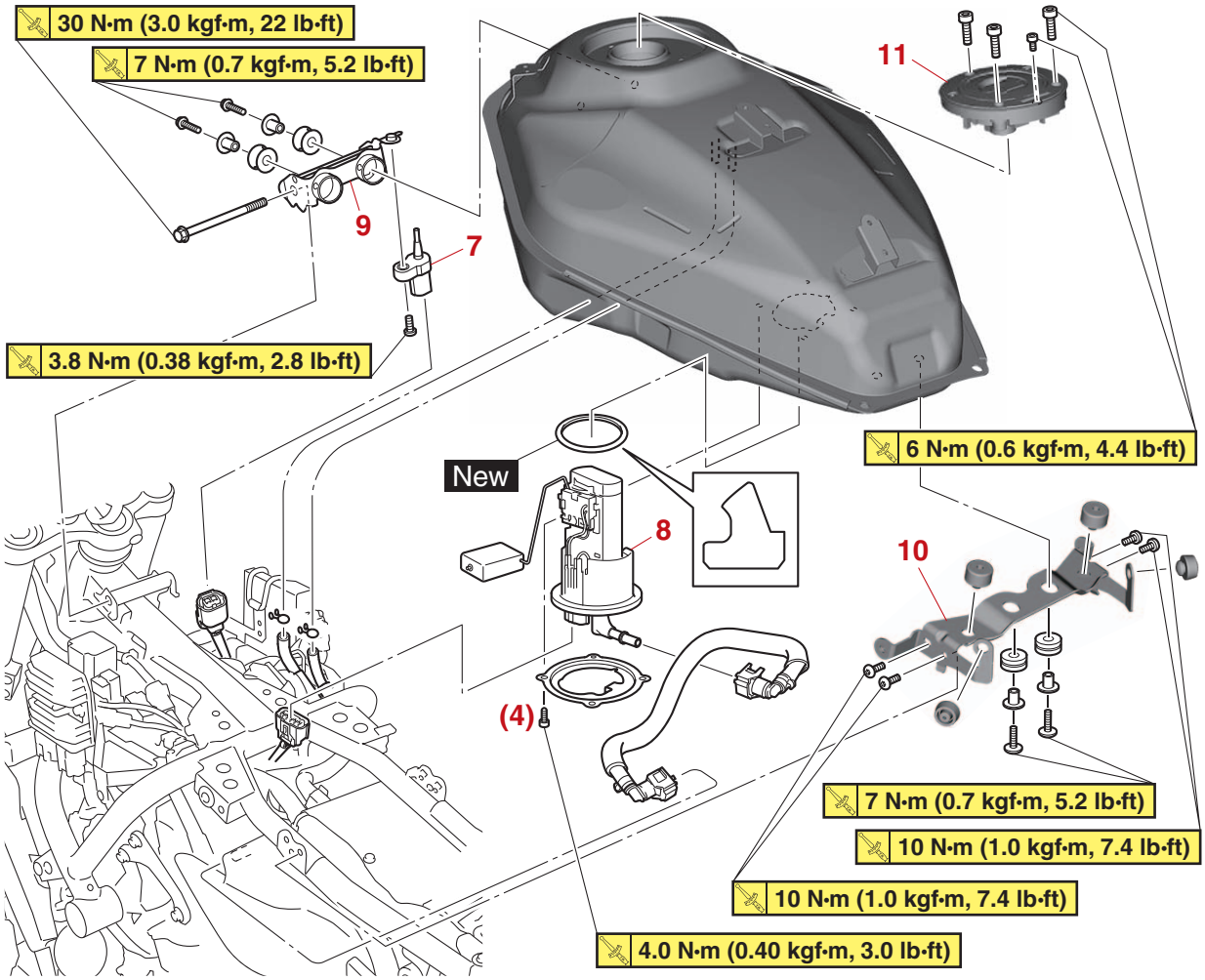
EAS20067
FUEL TANK

Removing the fuel tank and fuel pump



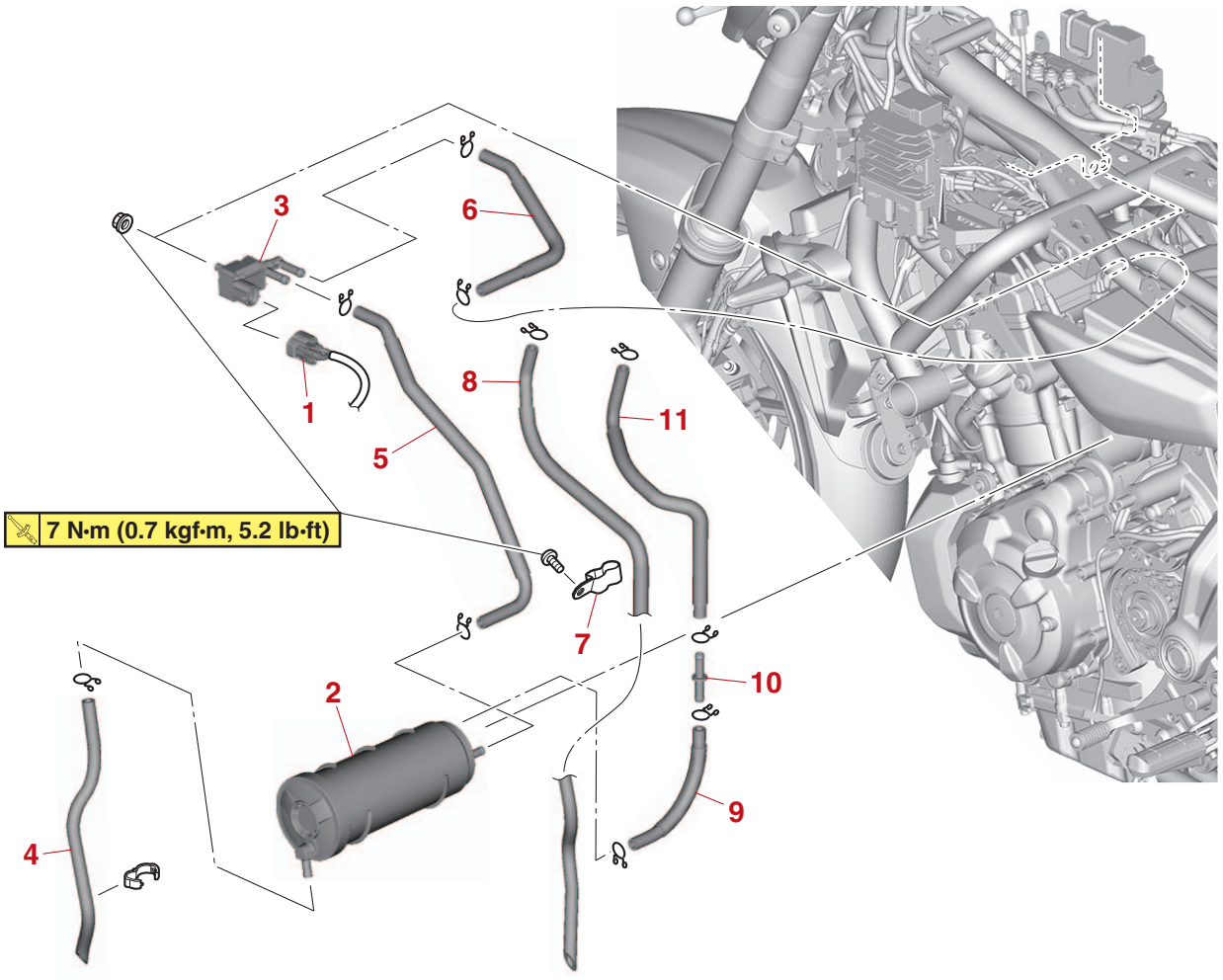
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
1	Air temperature sensor coupler	1	Disconnect.
2	Fuel tank overflow hose	1	Disconnect.
3	Fuel tank breather hose	1	Disconnect.
4	Fuel pump coupler	1	Disconnect.
5	Fuel hose	1	
6	Fuel tank	1	

Removing the fuel tank and fuel pump



Order	Job/Parts to remove	Q'ty	Remarks
7	Intake air temperature sensor	1	
8	Fuel pump	1	
9	Front fuel tank bracket	1	
10	Rear fuel tank bracket	1	
11	Fuel tank cap	1	

Removing the canister (for California only)



Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Purge cut valve solenoid coupler	1	Disconnect.
2	Canister	1	
3	Purge cut valve solenoid	1	
4	Canister breather hose	1	
5	Canister purge hose (canister to purge cut valve solenoid)	1	
6	Canister purge hose (purge cut valve solenoid to hose joint)	1	
7	Fuel tank breather hose and fuel tank overflow hose clamp	1	
8	Fuel tank overflow hose	1	
9	Fuel tank breather hose (hose joint to canister)	1	
10	Hose joint	1	
11	Fuel tank breather hose (fuel tank to hose joint)	1	

EAS30450
REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
   • Fuel hose

EWA17320
⚠ WARNING

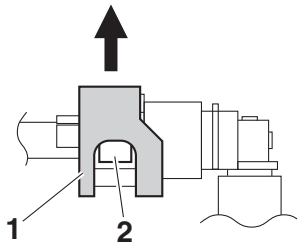
Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

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 rail and 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.



G089038

3. Remove:
   • Fuel tank

TIP

Do not set the fuel tank down on the installation surface of the fuel pump. Be sure to lean the fuel tank against a wall or the like.

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.**

EAS30454
CHECKING THE FUEL PUMP BODY

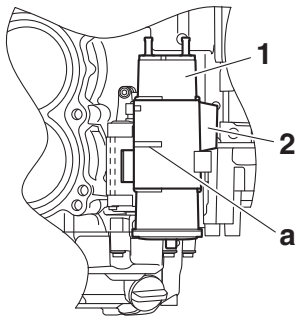
1. Check:
   • Fuel pump body
   Obstruction → Clean.
   Cracks/damage → Replace fuel pump assembly.

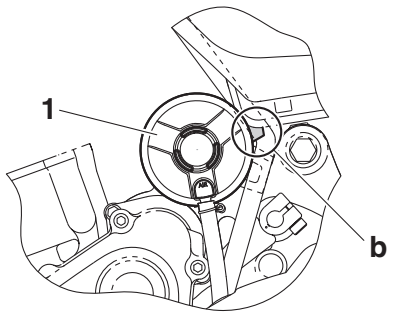
EAS31330
INSTALLING THE CANISTER (for California only)

1. Install:
   • Canister "1"
   (into the canister holder "2")

TIP

- Fit the projection on the canister into the slot "a" in the canister holder.
- After installing the canister, make sure that the projection "b" on the canister holder contacts the air filter case.





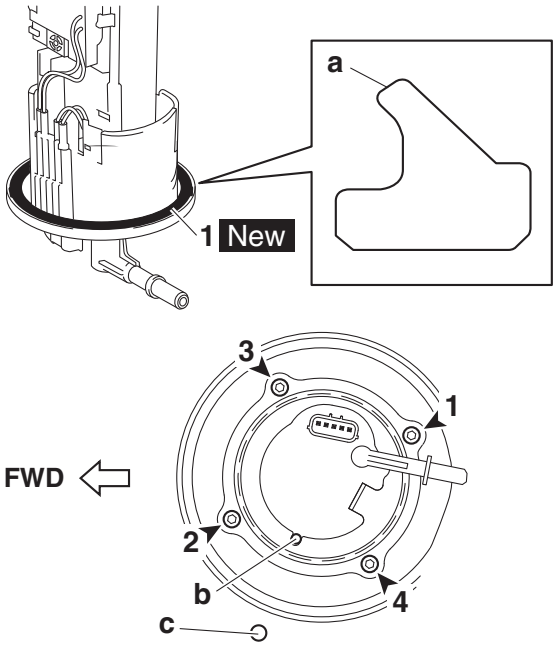
EAS30456
INSTALLING THE FUEL PUMP

1. Install:
   - Fuel pump gasket “1” New
   - Fuel pump
   - Fuel pump bracket

	Fuel pump 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.
- The gasket lip “a” shall face toward the fuel tank.
- Align the projection “b” on the fuel pump with the punch mark “c” on the fuel tank.
- Align the slot in the fuel pump bracket with the projection “b” on the fuel pump.
- Tighten the fuel pump bolts in the proper tightening sequence as shown.



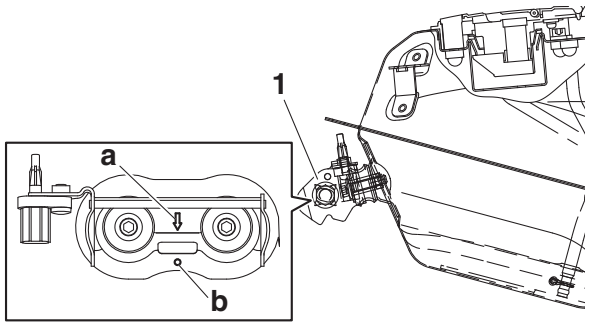
EAS31081
INSTALLING THE FUEL TANK BRACKET

1. Install:
   - Grommet
   - Collar
   - Front fuel tank bracket “1”

	Fuel tank bolt (front side) **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

TIP

Make sure that the arrow mark “a” on the front fuel tank bracket points toward the hole “b” in the fuel tank.

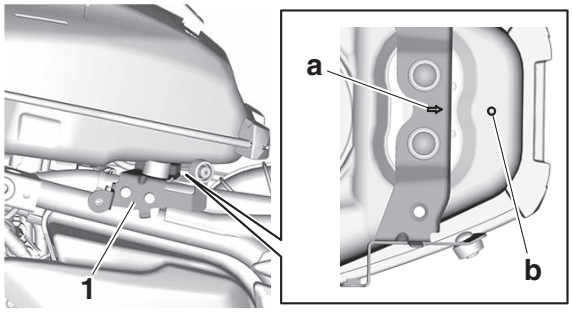


2. Install:
   - Grommet
   - Collar
   - Rear fuel tank bracket “1”

	Fuel tank bolt (rear side) **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

TIP

Make sure that the arrow mark “a” on the rear fuel tank bracket points toward the punch mark “b” on the fuel tank.



EAS30457
INSTALLING THE FUEL TANK

1. Tighten:
   - Front fuel tank bracket bolt (temporarily)

TIP

Temporarily tighten the front fuel tank bracket bolt.

2. Install:
   - Fuel hose

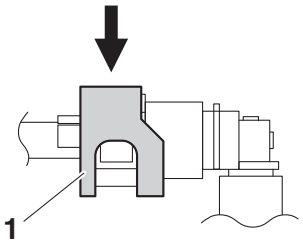
ECA18420

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.

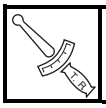
TIP

- Install the fuel hose securely onto the fuel rail and 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.

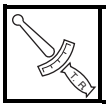


G089039

3. Connect:
   - Fuel pump coupler
   - Fuel tank breather hose
   - Fuel tank overflow hose
   - Intake air temperature sensor coupler
4. Tighten:
   - Rear fuel tank bracket bolt

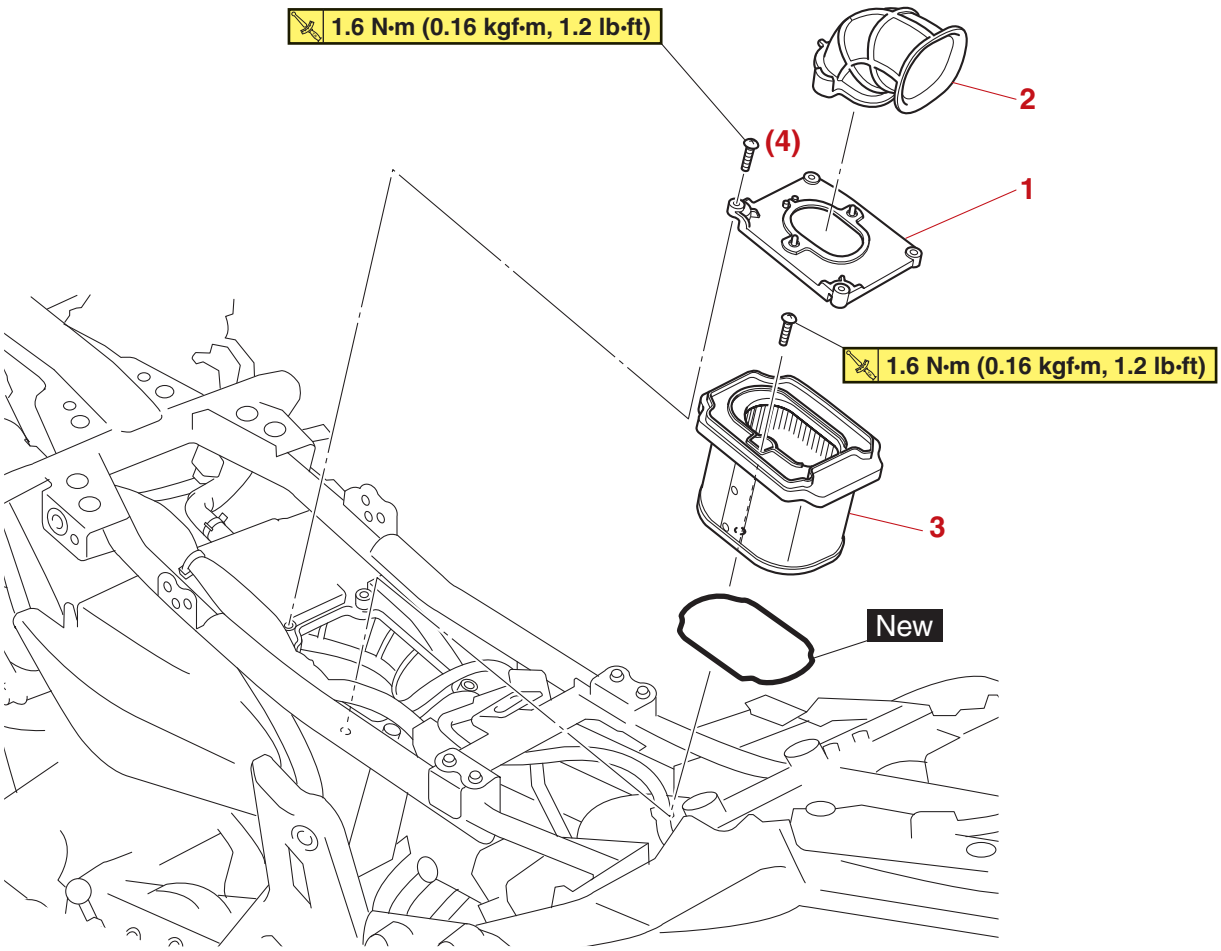
	**Rear fuel tank bracket bolt** **10 N·m (1.0 kgf·m, 7.4 lb·ft)**

5. Tighten:
   - Front fuel tank bracket bolt

	**Front fuel tank bracket bolt** **30 N·m (3.0 kgf·m, 22 lb·ft)**

EAS20198
AIR FILTER

Removing the air filter element



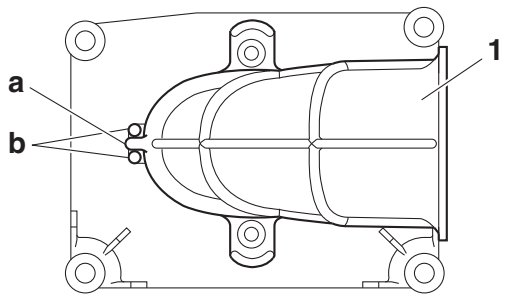
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Air duct bracket	1	
2	Air duct	1	
3	Air filter element	1	

EAS33520
INSTALLING THE AIR DUCT

1. Install:
   • Air duct “1”

TIP

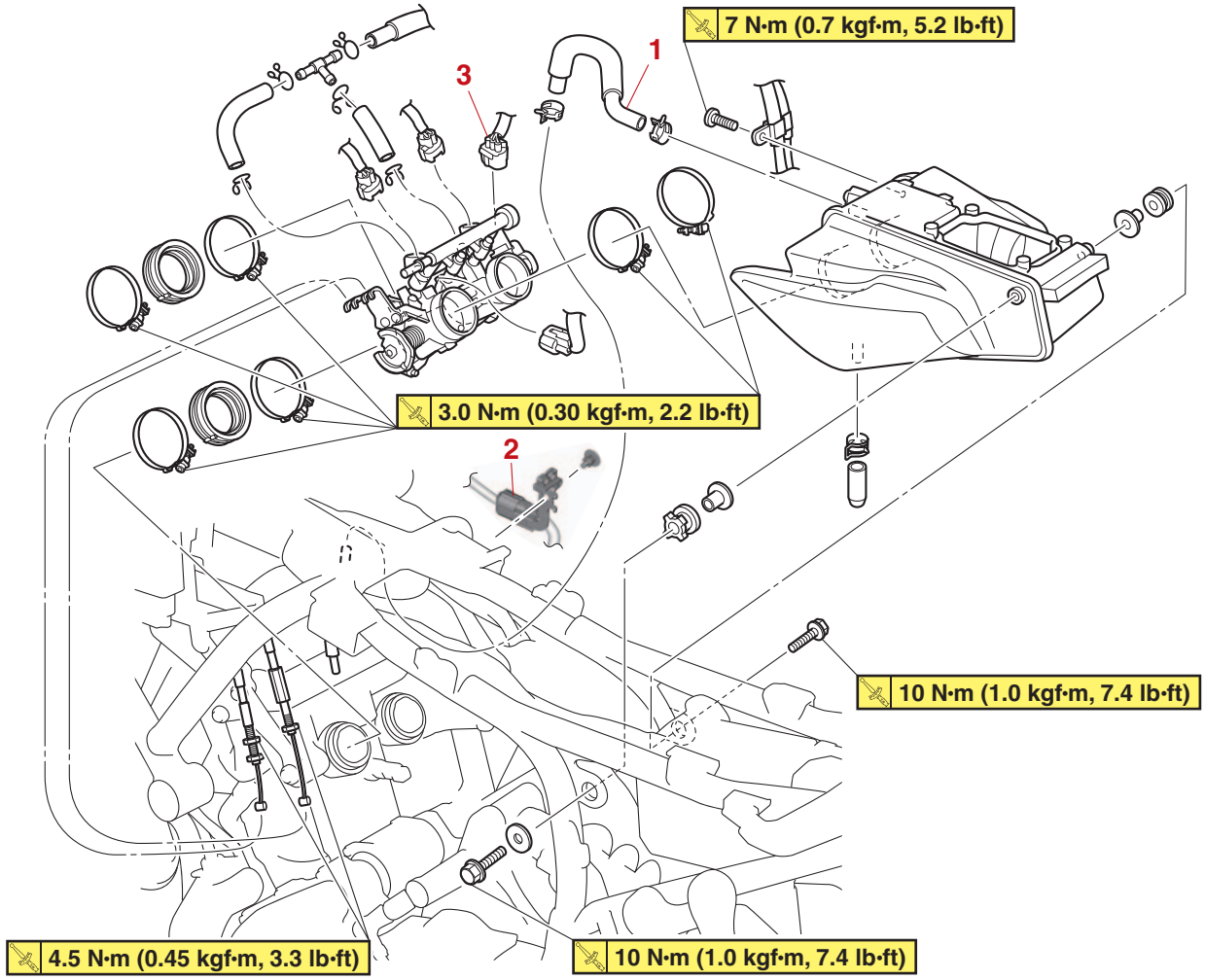
Align the tab “a” on the air duct between the projections “b” on the air duct bracket.



EAS20070

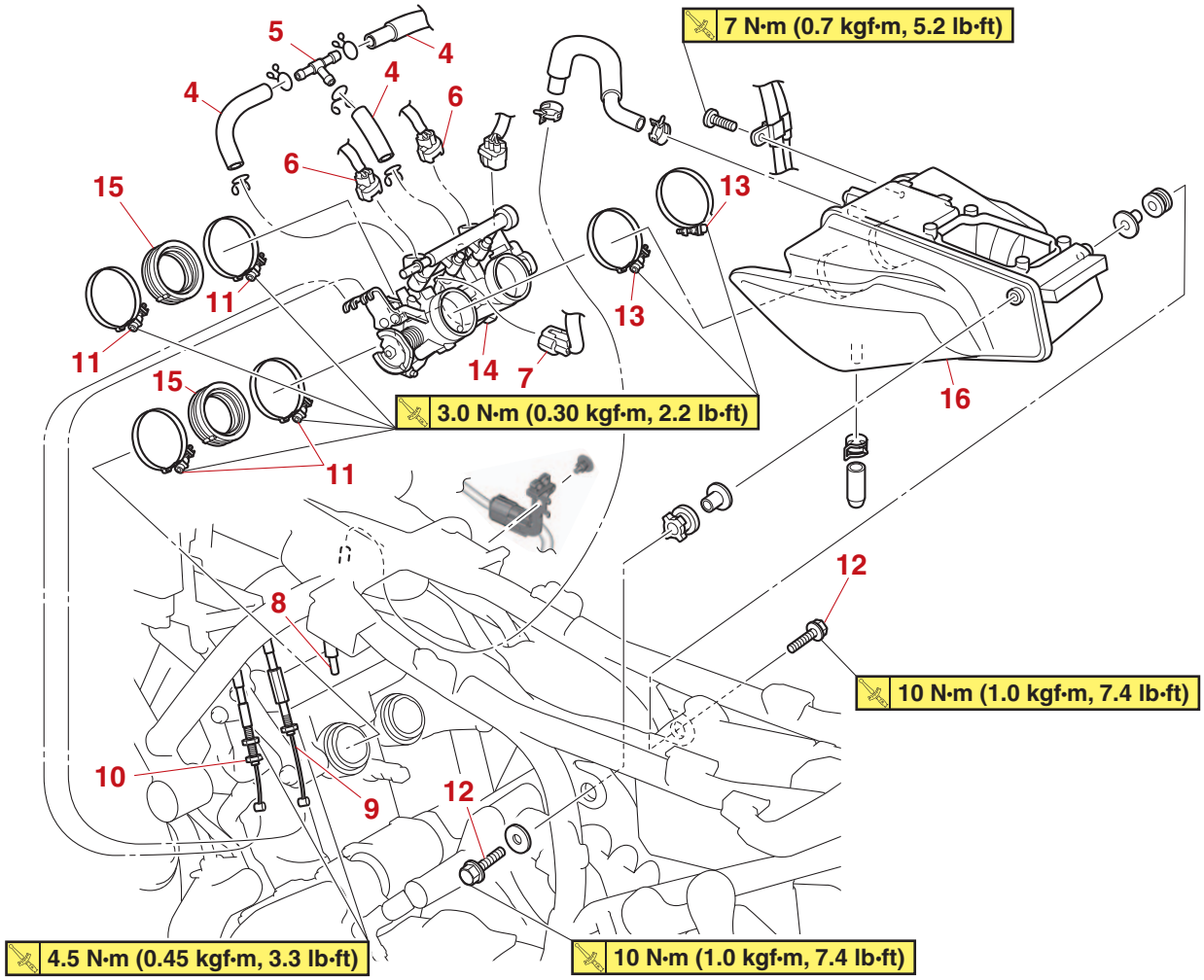
THROTTLE BODIES

Removing the air filter case and throttle bodies



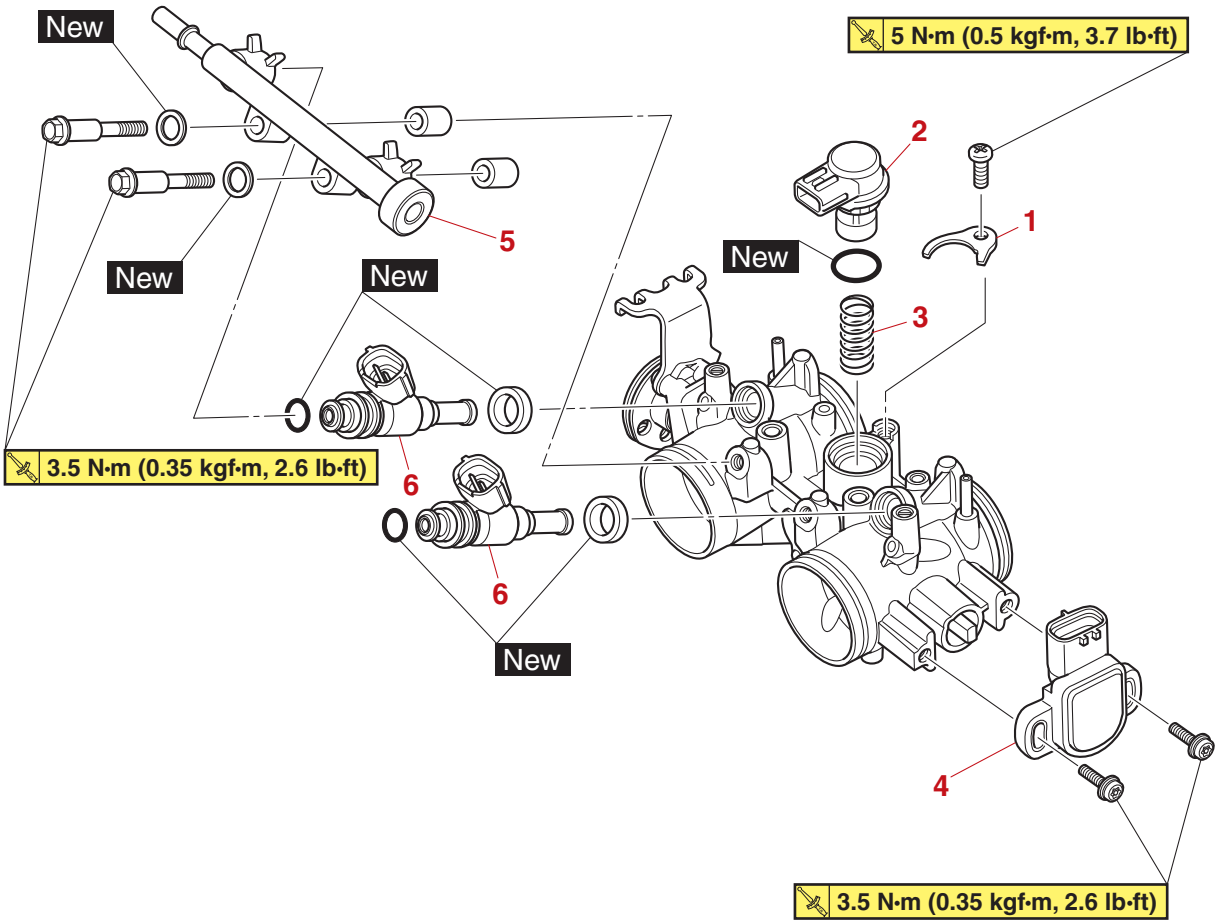
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Canister		For California only. Refer to "FUEL TANK" on page 7-1.
	Air duct bracket		Refer to "AIR FILTER" on page 7-7.
	Pivot shaft protector (left/right)		Refer to "SWINGARM" on page 4-92.
1	Cylinder head breather hose	1	
2	Sub-wire harness bracket	1	
3	Throttle position sensor coupler	1	Disconnect.

Removing the air filter case and throttle bodies



Order	Job/Parts to remove	Q'ty	Remarks
4	Canister purge hose	3	For California only.
5	Hose joint	1	For California only.
6	Injector coupler	2	Disconnect.
7	ISC (Idle Speed Control) unit coupler	1	Disconnect.
8	Intake air pressure sensor hose	1	Disconnect.
9	Throttle cable (decelerator cable)	1	Disconnect.
10	Throttle cable (accelerator cable)	1	Disconnect.
11	Throttle body joint clamp screw	4	Loosen.
12	Air filter case bolt	2	
13	Air filter case joint clamp screw	2	Loosen.
14	Throttle body	1	
15	Throttle body joint	2	
16	Air filter case	1	

Removing the fuel injectors



Order	Job/Parts to remove	Q'ty	Remarks
1	ISC (Idle Speed Control) valve plate	1	
2	ISC (Idle Speed Control) valve	1	
3	Spring	1	
4	Throttle position sensor	1	
5	Fuel rail	1	
6	Fuel injector	2	

EAS30475
CHECKING THE INJECTORS (BEFORE REMOVING)

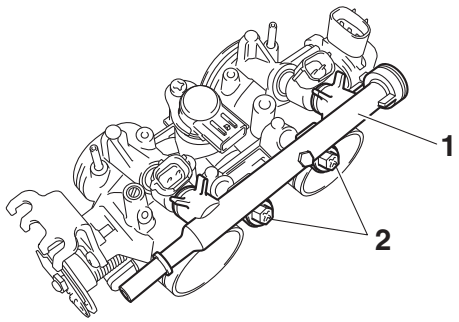
1. Check:
   • Injector
   Use the diagnostic code numbers “36–37”.
   Refer to “DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE” on page 9-45.

EAS30476
REMOVING THE INJECTORS

EWA17330
⚠ WARNING

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

1. Remove:
   • Fuel rail “1”
   a. Remove the fuel rail bolts “2” as shown.



EAS30477
CHECKING THE INJECTORS

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 INJECTORS” on page 8-50.

EAS30479
CHECKING THE THROTTLE BODIES

TIP

Before checking the throttle bodies, check the following items:
• Valve clearance
• Spark plug
• Air filter element
• Throttle body joint
• Fuel hose
• Exhaust system
• Cylinder head breather hose
• Vacuum hose

EWA17850
⚠ WARNING

If the throttle bodies are subjected to strong shocks or dropped during checking, replace them.

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

EAS31143
CLEANING THE ISC (IDLE SPEED CONTROL) VALVE

1. Remove the throttle bodies from the vehicle.

TIP

Before removing the throttle bodies, disconnect the throttle cables and couplers.

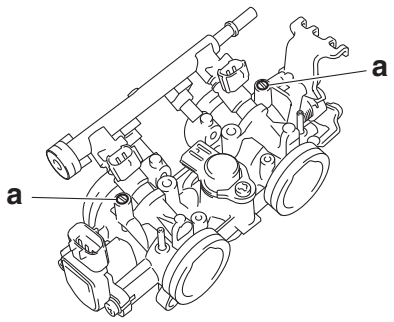
Cleaning the throttle bodies

1. Clean:
   • Throttle body

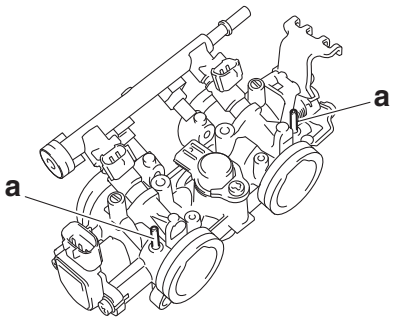
ECA20910

NOTICE

• Observe the following precautions; otherwise, the throttle bodies may not operate properly.
• Do not open the throttle valves quickly.
• Do not subject the throttle bodies to excessive force.
• Wash the throttle bodies in a petroleum-based solvent.
• Do not use any caustic carburetor cleaning solution.
• Do not apply cleaning solvent directly to any plastic parts, sensors, or seals.
• Do not directly push the throttle valves to open them.
• Do not turn the bypass air screws "a"; otherwise, the throttle body synchronization will be affected.



a. Place the throttle bodies on a flat surface with the air filter case side facing up.
b. Install the caps (895-14169-00) onto the hose fittings "a".



c. Push the lever in the direction shown in the illustration to hold the throttle valves in the open position.

EWA16680

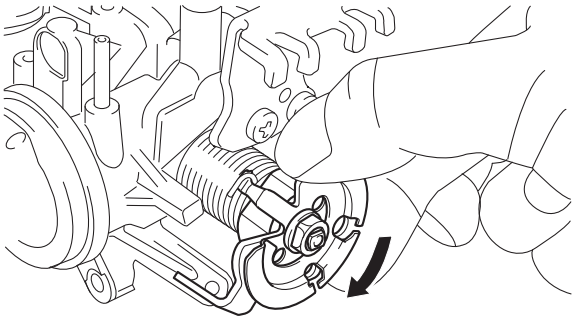
⚠ WARNING

When cleaning the throttle bodies, be careful not to injure yourself on the throttle valves or other components of the throttle bodies.

ECA21190

NOTICE

• Do not use tools to open the throttle valves or to keep them in the open position.
• Do not open the throttle valves quickly.



d. Apply a petroleum-based solvent to the throttle valves and the inside of the throttle bodies to remove any carbon deposits.

TIP

- Do not allow any petroleum-based solvent to enter the opening for the injectors.
- Do not apply any petroleum-based solvent to the portions of the throttle valve shafts between the throttle bodies.

e. Remove the carbon deposits from the inside of each throttle body in a downward direction, from the air filter case side of the throttle body to the engine side.

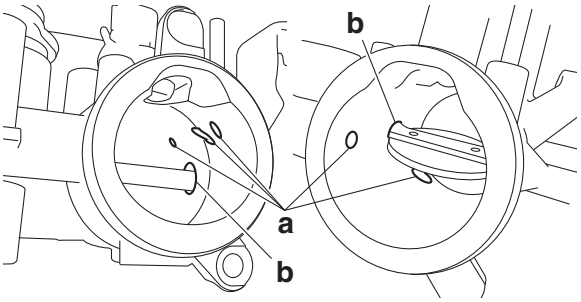
ECA18470

NOTICE

• Do not use a tool, such as a wire brush, to remove the carbon deposits; otherwise, the inside of the throttle bodies may be damaged.
• Do not allow carbon deposits or other foreign materials to enter any of the passages in each throttle body or in the space between the throttle valve shaft and the throttle body.

f. After removing the carbon deposits, clean the inside of the throttle bodies with a petroleum-based solvent, and then dry the throttle bodies using compressed air.

g. Make sure that there are no carbon deposits or other foreign materials in any of the passages “a” in each throttle body or in the space “b” between the throttle valve shaft and the throttle body.



Cleaning the ISC (Idle Speed Control) valve

1. Remove:
   - ISC (Idle Speed Control) valve plate
   - ISC (Idle Speed Control) valve
   - O-ring
2. Clean:
   - ISC (Idle Speed Control) valve “1”

	Recommended cleaning agent: Yamaha oil & brake cleaner

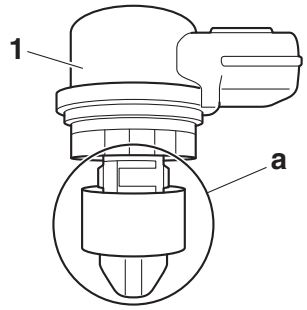
ECA21230

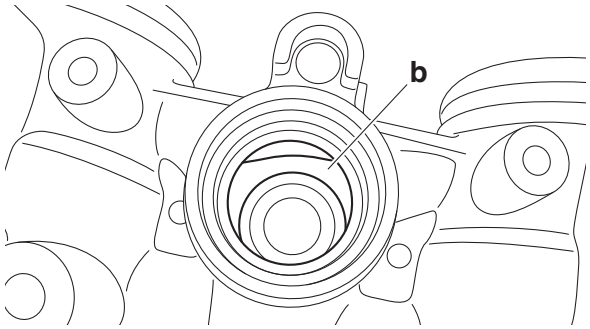
NOTICE

- **Be sure to use the recommended cleaning agent.**
- **Do not spray the cleaning agent directly onto the ISC valve or throttle bodies 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 those indicated in the illustrations. If the cleaning agent attaches to the ISC valve or enters the throttle bodies, thoroughly wipe it off.**

TIP

Clean the area “a” of the ISC valve and the ISC valve installation hole “b” in the throttle bodies.



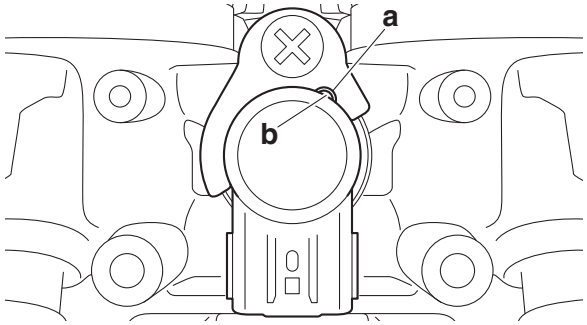


3. Install:
   - O-ring New
   - ISC (Idle Speed Control) valve
   - ISC (Idle Speed Control) valve plate

	ISC (Idle Speed Control) valve plate screw 5 N·m (0.5 kgf·m, 3.7 lb·ft)

TIP

Align the slot “a” in the ISC valve plate with the projection “b” on the ISC valve.



Resetting the ISC (Idle Speed Control) learning values

1. Install:
   • Throttle body
2. Reset:
   • ISC (Idle Speed Control) learning values
   Use the diagnostic code number “67”.
   Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-42.
3. Reset:
   • O_2 feedback learning value
   Use the diagnostic code number “87”.
   Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-42.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

4. Adjust:
   • Throttle bodies synchronizing
   Out of specification → Replace the throttle bodies.
   Refer to “SYNCHRONIZING THE THROTTLE BODIES” on page 3-8.

EAS31160
REPLACING THE THROTTLE BODIES

1. Remove the throttle bodies from the vehicle.
2. Install a new throttle bodies to the vehicle.
3. Reset:
   • ISC (Idle Speed Control) learning values
   Use the diagnostic code number “67”.
   Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-42.

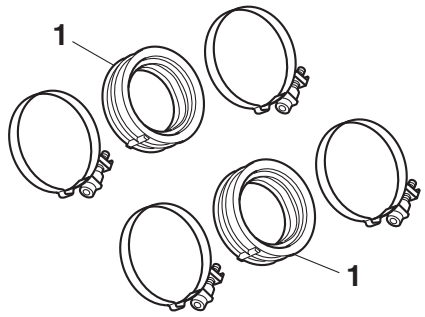
Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

4. Reset:
   • O_2 feedback learning value
   Use the diagnostic code number “87”.
   Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-42.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

EAS30792
CHECKING THE THROTTLE BODY JOINTS

1. Check:
   • Throttle body joint “1”
   Cracks/damage → Replace.



EAS30485
ADJUSTING THE THROTTLE POSITION SENSOR

EWA16690

⚠ WARNING

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

1. Check:
   • Throttle position sensor
   Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 8-48.
2. Adjust:
   • Throttle position sensor angle
   a. Temporary tighten the throttle position sensor screws.
   b. Check that the throttle valves are fully closed.
   c. Connect the throttle position sensor to the wire harness.
   d. Disconnect the coupler from the CCU (Communication Control Unit), and then connect the YDT to the coupler.

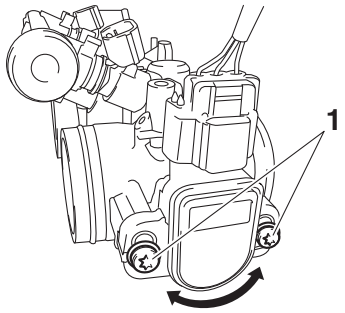
TIP

For information about using the Yamaha diagnostic tool, refer to the operation manual that is included with the tool.

   Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-42.
   e. Diagnostic code number “01” is selected.
   f. Adjust the position of the throttle position sensor angle so that 11–21 can appear in the Yamaha diagnostic tool screen.

g. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws “1”.

	Throttle position sensor screw 3.5 N·m (0.35 kgf·m, 2.6 lb·ft)



EAS31124
INSTALLING THE FUEL INJECTORS

ECA20000
NOTICE

• Always use new O-rings.
• When checking the injectors, do not allow any foreign material to enter or adhere to the injectors, fuel rail, or O-rings.
• Be careful not to twist or pinch the O-rings when installing the injectors.
• If an injector is subject to strong shocks or excessive force, replace it.
• If installing the original fuel rail and screws, remove the white paint marks using a cleaning solvent. Otherwise, paint chips on the screw seats could prevent the screws from being tightened to the specified torque.

1. Install new seals onto the end of each injector.
2. Install the fuel injectors to the fuel rail.

	Fuel rail bolt 3.5 N·m (0.35 kgf·m, 2.6 lb·ft)

3. Install the fuel injector assemblies to the throttle bodies.
4. Check the injector pressure after the fuel injectors are installed to the throttle bodies. Refer to “CHECKING THE INJECTOR PRESSURE” on page 7-16.

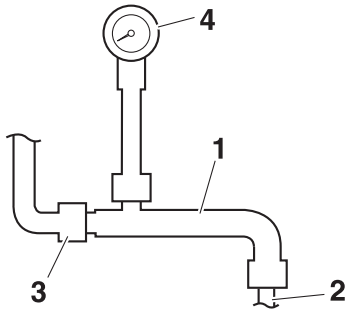
EAS30481
CHECKING THE INJECTOR PRESSURE

TIP

- After installing the fuel injectors, perform the following steps to check the injector pressure.
- Do not allow any foreign materials to enter the fuel lines.

1. Check:
   - Injector pressure
   a. Connect the fuel injector pressure adapter “1” to the fuel rail “2”, and then connect an air compressor “3” to the adapter.
   b. Connect the pressure gauge “4” to the fuel injector pressure adapter “1”.

	Pressure gauge 90890-03153 **Pressure gauge YU-03153** **Fuel injector pressure adapter 90890-03210** **Fuel injector pressure adapter YU-03210**



G089041

   c. Close the valve on the fuel injector pressure adapter.
   d. Apply air pressure with the air compressor.
   e. Open the valve on the fuel injector pressure adapter until the specified pressure is reached.

	Specific air pressure 490 kPa (4.9 kgf/cm^2, 69.7 psi)

ECA18440
NOTICE

Never exceed the specified air pressure or damage could occur.

   f. Close the valve on the fuel injector pressure adapter.

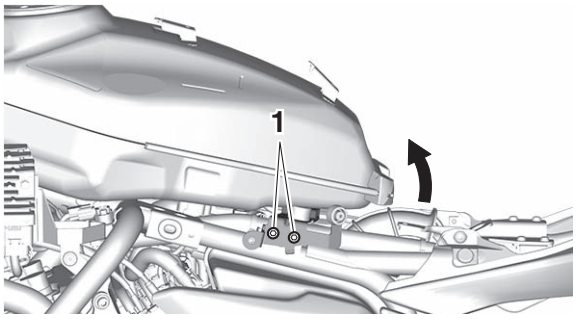
g. Check that the specified air pressure is held for about one minute.
Pressure drops → Check the pressure gauge and adapter.
Check the seals and O-rings, and then reinstall.
Replace the fuel injectors.

EAS30482
CHECKING THE FUEL PRESSURE

1. Remove:
   - Passenger seat
   - Rider seat
   Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
   Refer to "GENERAL CHASSIS (4)" on page 4-11.
2. Check:
   - Fuel pressure

a. Remove the rear fuel tank bracket bolts "1" and hold up the fuel tank.

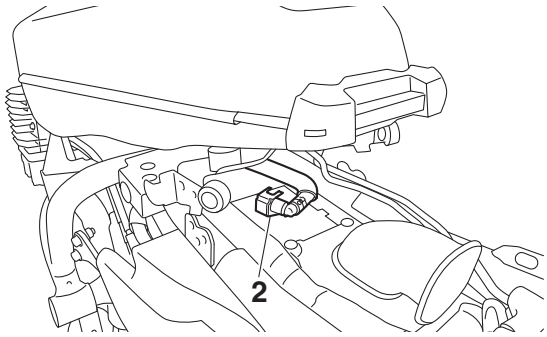
ECA20070
NOTICE
When lifting up the fuel tank, be careful not to pull the fuel tank overflow hose and fuel tank breather hose.



b. Disconnect the fuel hose "2" from the fuel tank.

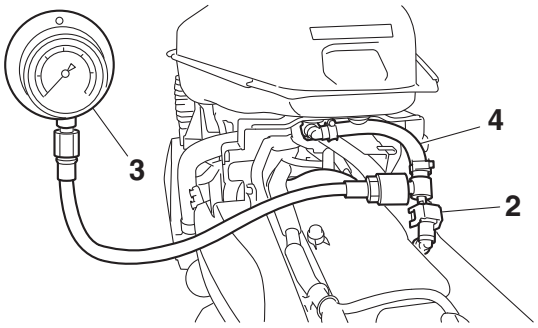
EWA16640
⚠ WARNING
Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

ECA20010
NOTICE
Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.



c. Connect the pressure gauge "3" and adapter "4" to the fuel hose "2".

Pressure gauge
90890-03153
Pressure gauge
YU-03153
Fuel pressure adapter
90890-03176
Fuel pressure adapter
YM-03176



d. Start the engine.
e. Measure the fuel pressure.

Fuel line pressure (at idle)
300–390 kPa (3.0–3.9 kgf/cm², 43.5–56.6 psi)

Faulty → Replace the fuel pump.

3. Install:
   - Fuel tank

Rear fuel tank bracket bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

Refer to "FUEL TANK" on page 7-1.
   - Fuel tank cover assembly
   Refer to "GENERAL CHASSIS (4)" on page 4-11.
   - Rider seat
   - Passenger seat
   Refer to "GENERAL CHASSIS (1)" on page 4-1.

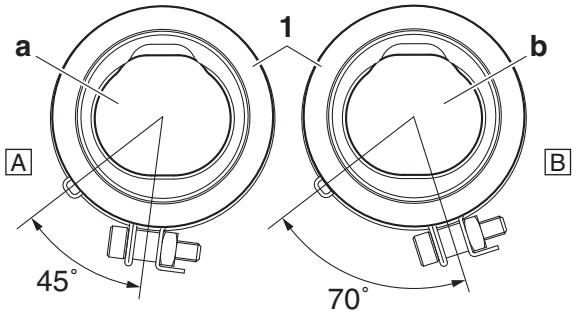
EAS30937
INSTALLING THE THROTTLE BODY JOINTS

1. Install:
   • Throttle body joint “1”

	Throttle body joint clamp screw 3.0 N·m (0.30 kgf·m, 2.2 lb·ft)

TIP

Be sure to install the throttle body joints “1” as shown in the illustration.



a. #1 cylinder
b. #2 cylinder

A. Left
B. Right

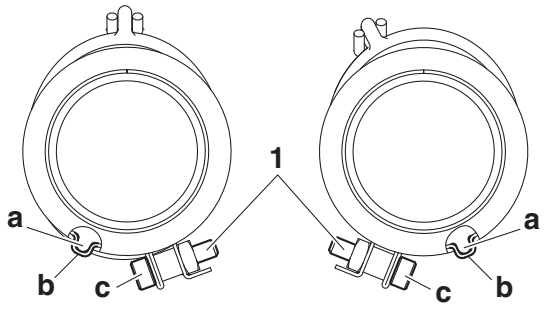
EAS31092
INSTALLING THE AIR FILTER CASE

1. Install:
   • Air filter case joint clamp “1”

	Air filter case joint clamp screw 3.0 N·m (0.30 kgf·m, 2.2 lb·ft)

TIP

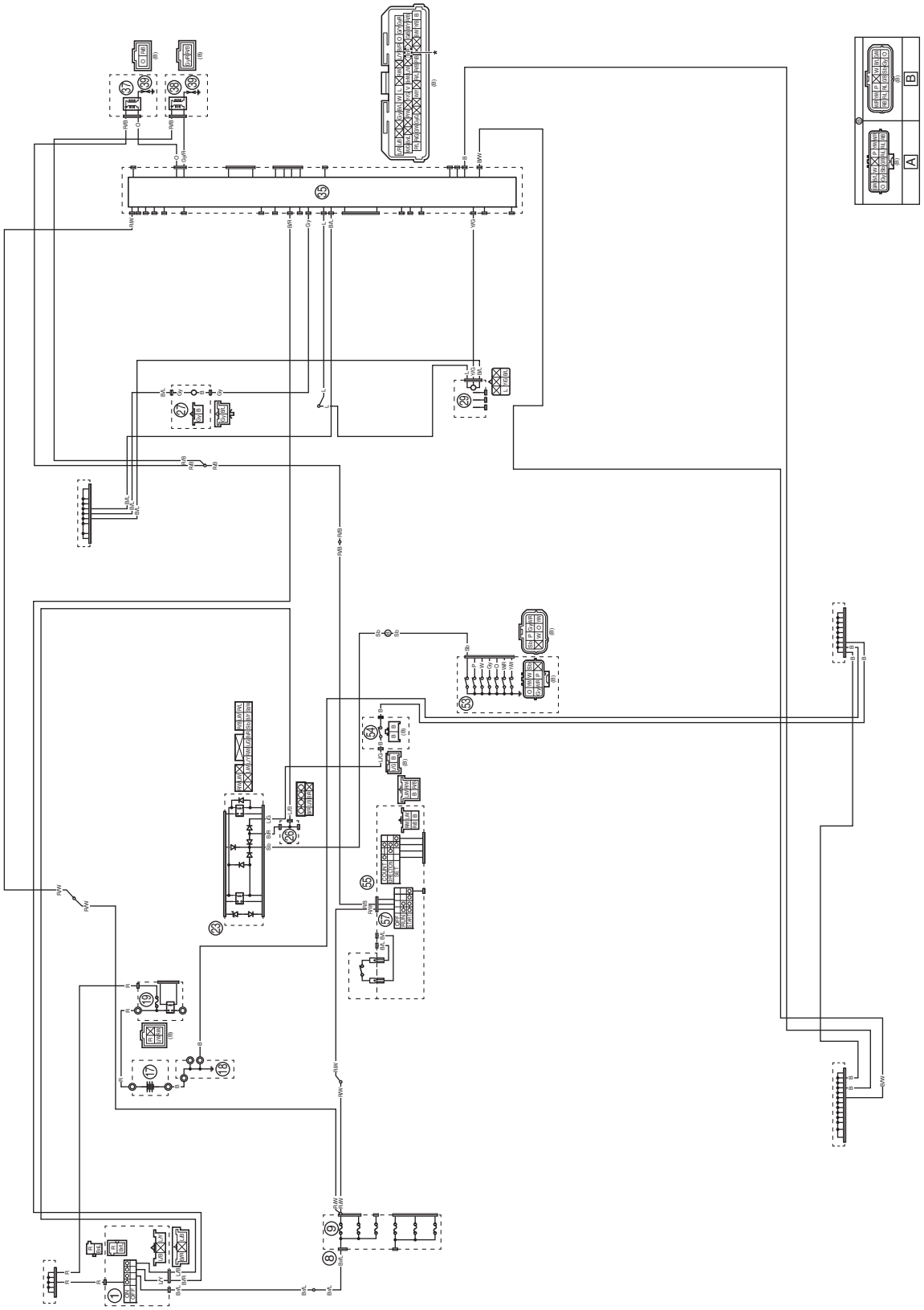
- Align the projections “a” on the air filter case joint with the slots “b” in the air filter case joint clamp.
- Face the screw heads “c” of the air filter case joint clamp outward.



ELECTRICAL SYSTEM

EAS20072
IGNITION SYSTEM

EAS30490
CIRCUIT DIAGRAM



1. Main switch
8. Fuse box 1
9. Ignition fuse
17. Battery
18. Engine ground
19. Main fuse
23. Relay unit
26. Joint coupler
27. Crankshaft position sensor
29. Lean angle sensor
35. ECU (Engine Control Unit)
37. Ignition coil #1
38. Ignition coil #2
39. Spark plug
53. Gear position switch
54. Sidestand switch
55. Handlebar switch (right)
57. Start/engine stop switch

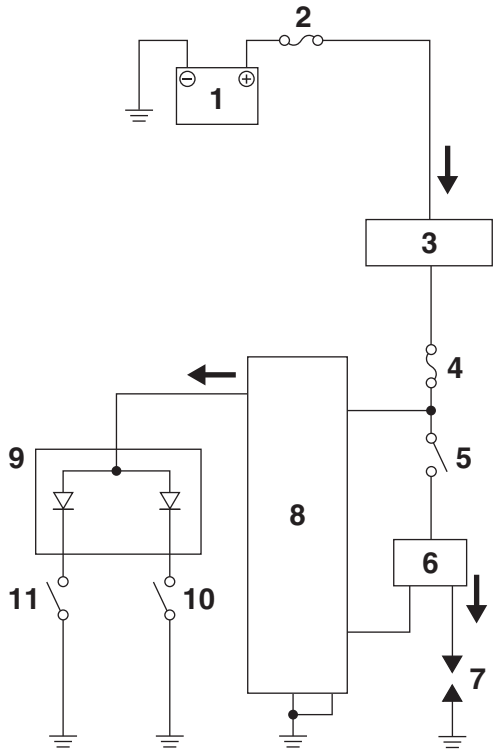
*. For California: Br/R
Except for California: blank

A. Wire harness
B. Sub-wire harness (throttle position sensor, coolant temperature sensor, fuel injector #1, fuel injector #2, ISC (Idle Speed Control) unit, gear position switch)

EAS30491
ENGINE STOPPING DUE TO SIDESTAND OPERATION

When the engine is running and the transmission is in gear, the engine will stop if the sidestand is moved down. This is because the electric current from the ECU does not flow to the ignition coils or fuel injectors when the gear position switch (neutral circuit) or sidestand switch is open. However, the engine continues to run under the following conditions:

- The transmission is in gear (the neutral circuit of the gear position switch is open) and the sidestand is up (the sidestand switch circuit is closed).
- The transmission is in neutral (the neutral circuit of the gear position switch is closed) and the sidestand is down (the sidestand switch circuit is open).



1. Battery
2. Main fuse
3. Main switch
4. Ignition fuse
5. Start/engine stop switch
6. Ignition coil
7. Spark plug
8. ECU (Engine Control Unit)
9. Relay unit (diode)
10. Sidestand switch
11. Gear position switch

EAS30492
TROUBLESHOOTING

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

TIP

• Before troubleshooting, remove the following part(s):
1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank cover assembly
4. Fuel tank
5. Drive sprocket cover

1. Check the fuses. (Ignition and main) Refer to “CHECKING THE FUSES” on page 8-40.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the spark plugs. Refer to “CHECKING THE SPARK PLUGS” on page 3-5.	NG→	Re-gap or replace the spark plug(s).
OK↓		
4. Check the ignition spark gap. Refer to “CHECKING THE IGNITION SPARK GAP” on page 8-44.	OK→	Ignition system is OK.
NG↓		
5. Check the ignition coils. Refer to “CHECKING THE IGNITION COILS” on page 8-43.	NG→	Replace the ignition coil(s).
OK↓		
6. Check the crankshaft position sensor. Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” on page 8-44.	NG→	Replace the stator coil assembly.
OK↓		
7. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the main switch.
OK↓		

8. Check the start/engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-39.
NG→ • The start/engine stop switch is faulty. • Replace the handlebar switch (right).

OK↓

9. Check the gear position switch. Refer to "CHECKING THE GEAR POSITION SWITCH" on page 8-49.
NG→ Replace the gear position switch.

OK↓

10. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-39.
NG→ Replace the sidestand switch.

OK↓

11. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-42.
NG→ Replace the relay unit.

OK↓

12. Check the lean angle sensor. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-45.
NG→ Replace the lean angle sensor.

OK↓

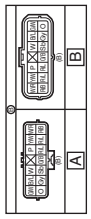
13. Check the entire ignition system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.
NG→ Properly connect or replace the wiring harness.

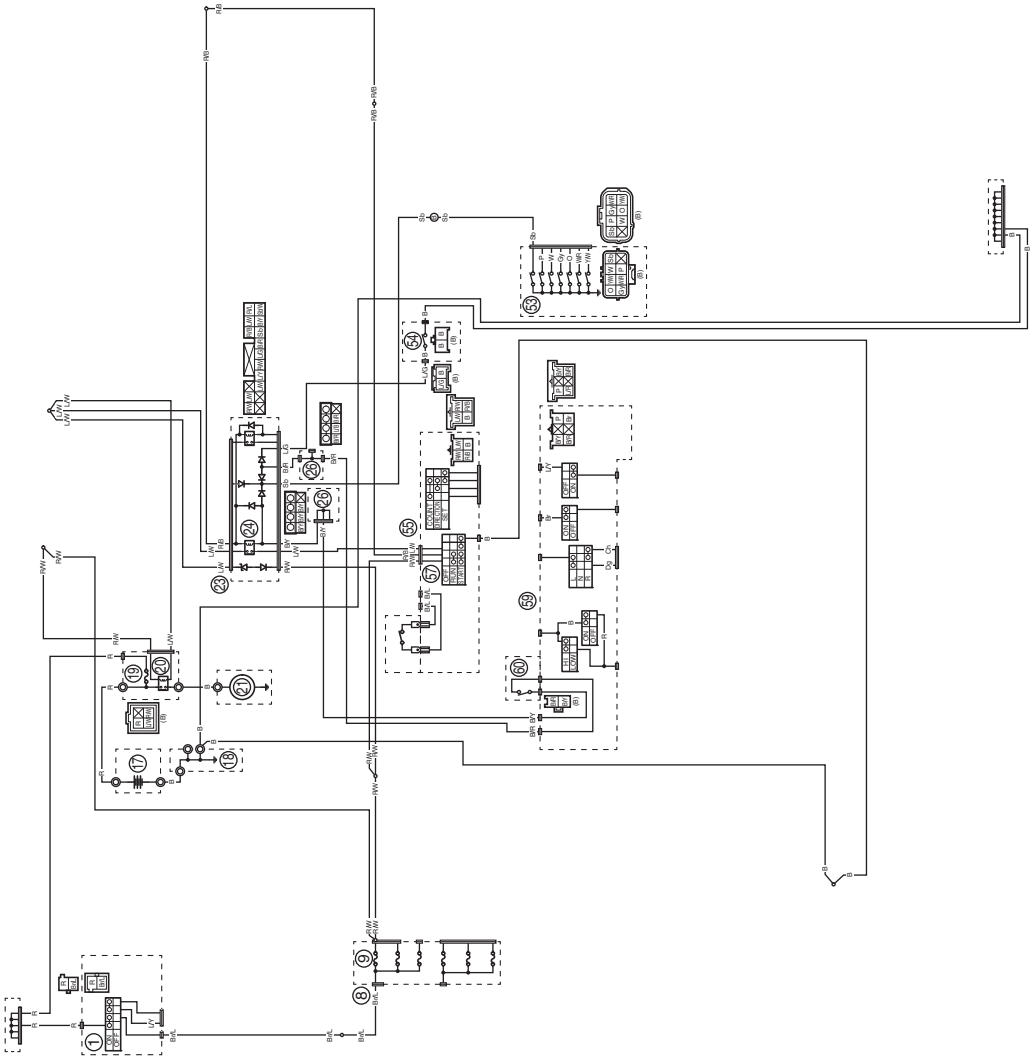
OK↓

Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-40.

EAS20073
ELECTRIC STARTING SYSTEM

EAS30493
CIRCUIT DIAGRAM





1. Main switch
8. Fuse box 1
9. Ignition fuse
17. Battery
18. Engine ground
19. Main fuse
20. Starter relay
21. Starter motor
23. Relay unit
24. Starting circuit cut-off relay
26. Joint coupler
53. Gear position switch
54. Sidestand switch
55. Handlebar switch (right)
57. Start/engine stop switch
59. Handlebar switch (left)
60. Clutch switch

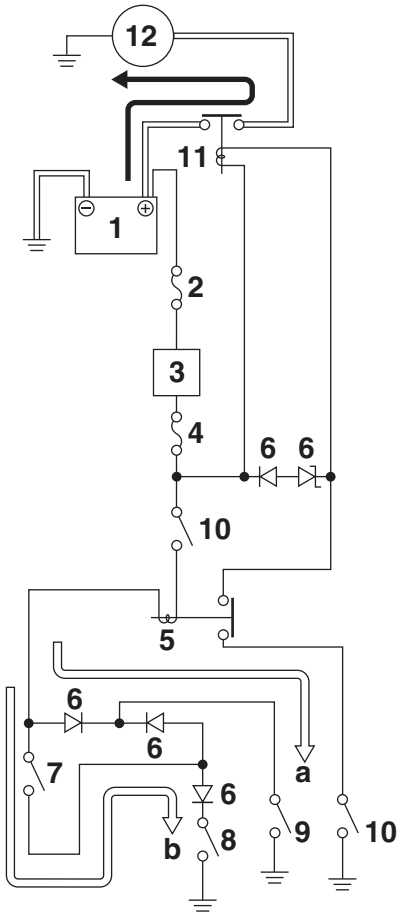
A. Wire harness
B. Sub-wire harness (throttle position sensor, coolant temperature sensor, fuel injector #1, fuel injector #2, ISC (Idle Speed Control) unit, gear position switch)

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 transmission is in neutral (the neutral circuit of the gear position switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

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



a. WHEN THE TRANSMISSION IS IN NEUTRAL
b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR

1. Battery
2. Main fuse
3. Main switch
4. Ignition fuse
5. Starting circuit cut-off relay
6. Relay unit (diode)
7. Clutch switch
8. Sidestand switch
9. Gear position switch
10. Start/engine stop switch
11. Starter relay
12. Starter motor

EAS30495
TROUBLESHOOTING

The starter motor fails to turn.

TIP

• Before troubleshooting, remove the following part(s):
1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank cover assembly
4. Fuel tank
5. Canister (for California only)
6. Pivot shaft protectors
7. Throttle body/Air filter case
8. Drive sprocket cover

1. Check the fuses. (Ignition and main) Refer to “CHECKING THE FUSES” on page 8-40.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.	NG→	• 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 8-45.	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 5-51.	NG→	Repair or replace the starter motor.
OK↓		
5. Check the relay unit (starting circuit cut-off relay). Refer to “CHECKING THE RELAYS” on page 8-41.	NG→	Replace the relay unit.
OK↓		
6. Check the relay unit (diode). Refer to “CHECKING THE RELAY UNIT (DIODE)” on page 8-42.	NG→	Replace the relay unit.
OK↓		
7. Check the starter relay. Refer to “CHECKING THE RELAYS” on page 8-41.	NG→	Replace the starter relay.

OK↓

8. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the main switch.

OK↓

9. Check the gear position switch. Refer to “CHECKING THE GEAR POSITION SWITCH” on page 8-49.	NG→	Replace the gear position switch.

OK↓

10. Check the sidestand switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the sidestand switch.

OK↓

11. Check the clutch switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the clutch switch.

OK↓

12. Check the start/engine stop switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	• The start/engine stop switch is faulty. • Replace the handlebar switch (right).

OK↓

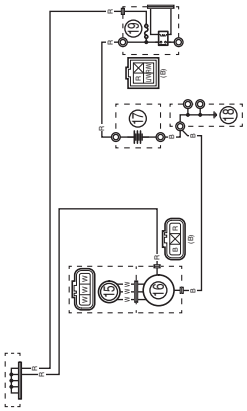
13. Check the entire starting system wiring. Refer to “CIRCUIT DIAGRAM” on page 8-7.	NG→	Properly connect or replace the wiring harness.

OK↓

The starting system circuit is OK.

EAS20074
CHARGING SYSTEM

EAS30496
CIRCUIT DIAGRAM



15. AC magneto
16. Rectifier/regulator
17. Battery
18. Engine ground
19. Main fuse

EAS30497
TROUBLESHOOTING

The battery is not being charged.

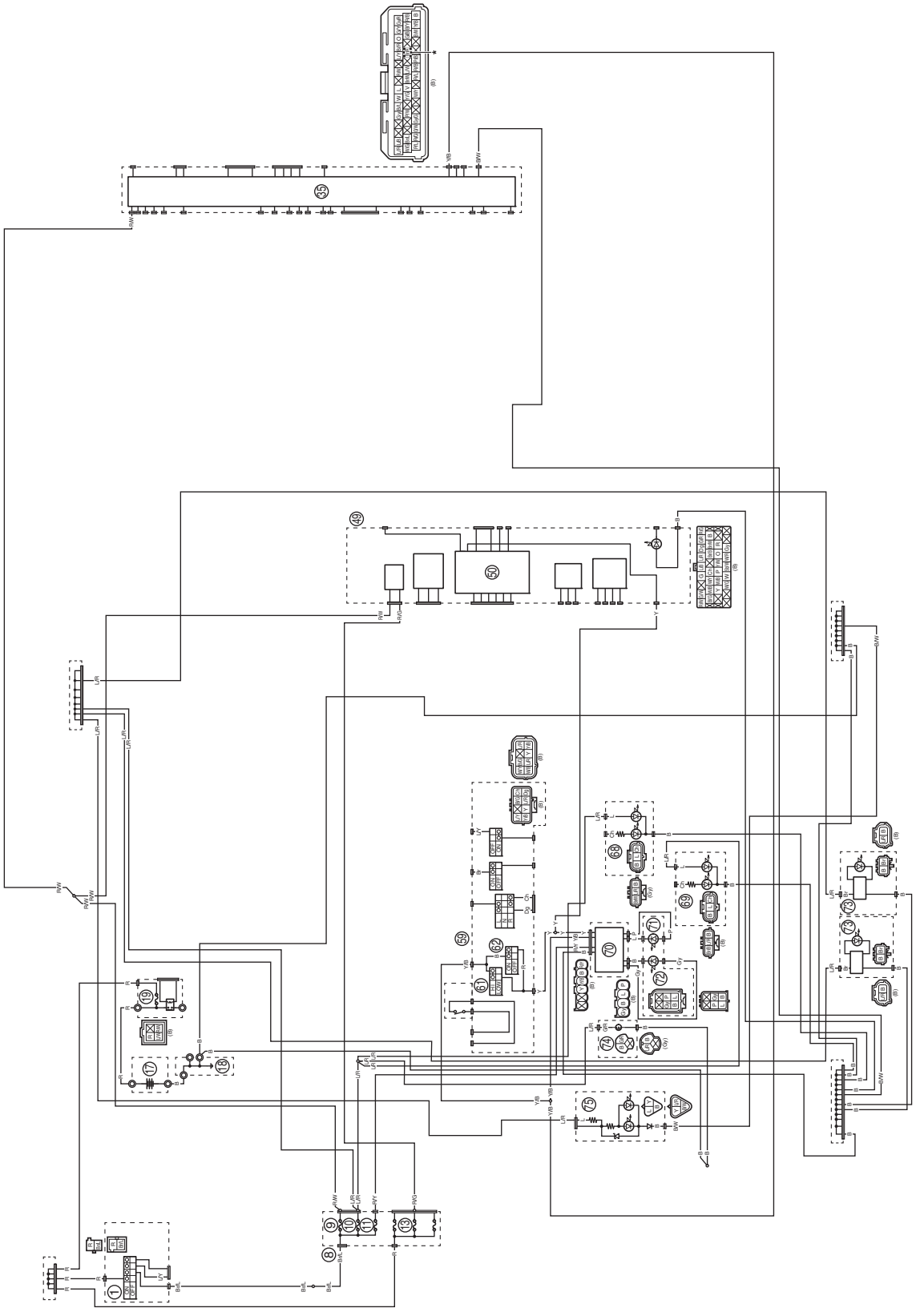
TIP

• Before troubleshooting, remove the following part(s):
1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank top cover
4. Fuel tank side cover assembly (left)

1. Check the fuse. (Main) Refer to “CHECKING THE FUSES” on page 8-40.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to “CHECKING THE STATOR COIL” on page 8-45.	NG→	Replace the stator coil assembly.
OK↓		
4. Check the rectifier/regulator. Refer to “CHECKING THE RECTIFIER/REGULATOR” on page 8-46.	NG→	Replace the rectifier/regulator.
OK↓		
5. Check the entire charging system wiring. Refer to “CIRCUIT DIAGRAM” on page 8-13.	NG→	Properly connect or replace the wiring harness.
OK↓		
The charging system circuit is OK.		

EAS20075
LIGHTING SYSTEM

EAS30498
CIRCUIT DIAGRAM



1. Main switch
8. Fuse box 1
9. Ignition fuse
10. Signaling system fuse
11. Headlight fuse
13. Backup fuse
17. Battery
18. Engine ground
19. Main fuse
35. ECU (Engine Control Unit)
49. Meter assembly
50. Multi-function meter
59. Handlebar switch (left)
61. Dimmer switch
62. Pass switch
68. Front turn signal/position light (right)
69. Front turn signal/position light (left)
70. Headlight control unit
71. Headlight (low beam)
72. Headlight (high beam)
73. Auxiliary light
74. License plate light
75. Tail/brake light

*. For California: Br/R
Except for California: blank

EAS30499
TROUBLESHOOTING

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

TIP

• Before troubleshooting, remove the following part(s):
1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank cover assembly
4. Fuel tank

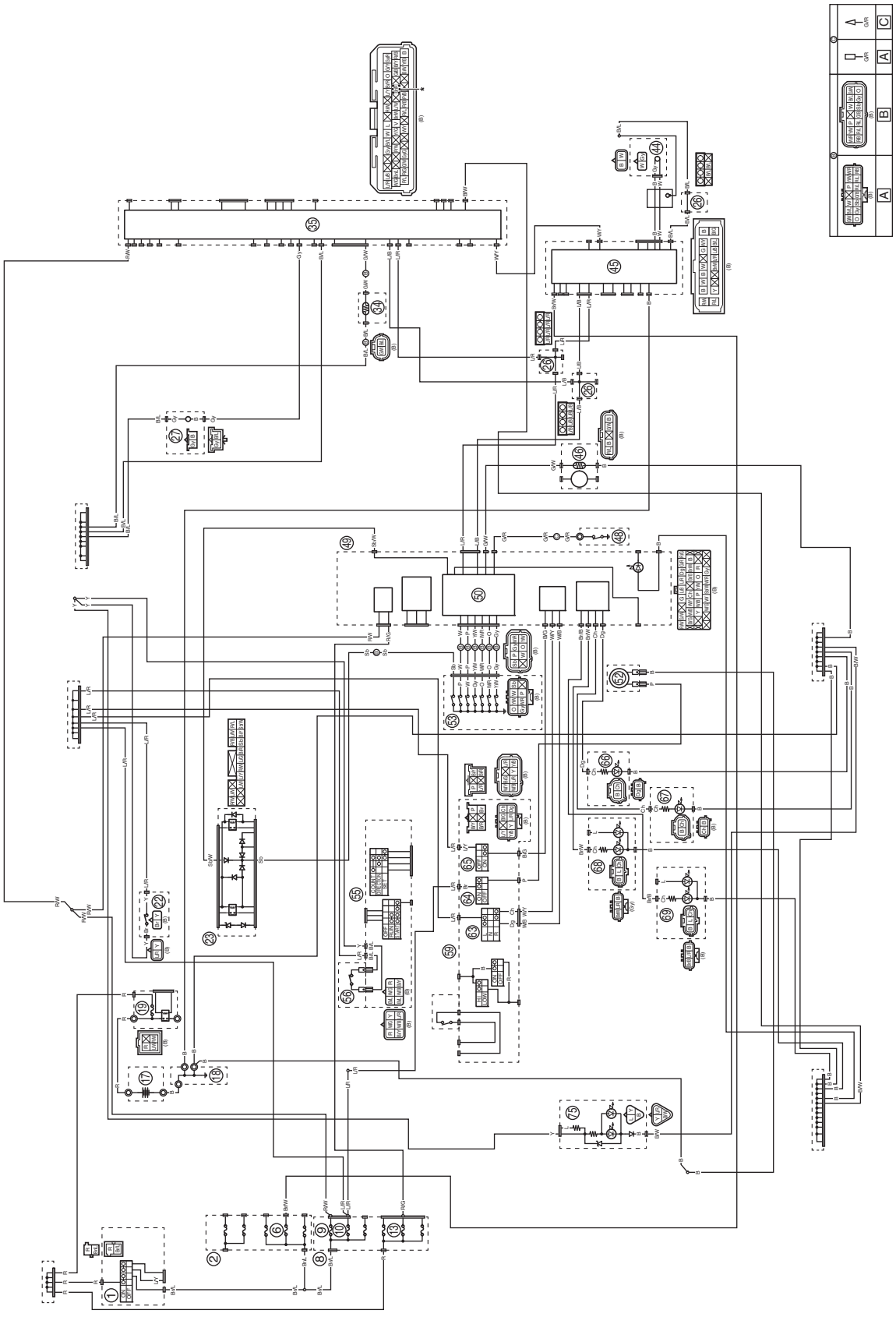
1. Check the license plate light bulb and license plate light bulb socket condition. Refer to “CHECKING THE BULBS AND BULB SOCKETS” in “BASIC INFORMATION” (separate volume).	NG→	Replace the bulb and bulb socket.
OK↓		
2. Check the fuses. (Ignition, signaling system, headlight, backup and main) Refer to “CHECKING THE FUSES” on page 8-40.	NG→	Replace the fuse(s).
OK↓		
3. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
4. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the main switch.
OK↓		
5. Check the dimmer switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	• The dimmer switch is faulty. • Replace the handlebar switch (left).
OK↓		
6. Check the pass switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	• The pass switch is faulty. • Replace the handlebar switch (left).
OK↓		
7. Check the entire lighting system wiring. Refer to “CIRCUIT DIAGRAM” on page 8-17.	NG→	Properly connect or replace the wiring harness.

OK↓

Replace the ECU, meter assembly, front turn signal/position light(s), auxiliary light(s), headlight or tail/brake light. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

EAS20076
SIGNALING SYSTEM

EAS30500
CIRCUIT DIAGRAM



1. Main switch
2. Fuse box 2
6. ABS ECU fuse
8. Fuse box 1
9. Ignition fuse
10. Signaling system fuse
13. Backup fuse
17. Battery
18. Engine ground
19. Main fuse
22. Rear brake light switch
23. Relay unit
26. Joint coupler
27. Crankshaft position sensor
34. Coolant temperature sensor
35. ECU (Engine Control Unit)
44. Rear wheel sensor
45. ABS ECU
46. Fuel sender
48. Oil pressure switch
49. Meter assembly
50. Multi-function meter
52. Horn
53. Gear position switch
55. Handlebar switch (right)
56. Front brake light switch
59. Handlebar switch (left)
63. Turn signal switch
64. Horn switch
65. Hazard switch
66. Rear turn signal light (right)
67. Rear turn signal light (left)
68. Front turn signal/position light (right)
69. Front turn signal/position light (left)
75. Tail/brake light

*. For California: Br/R
Except for California: blank

A. Wire harness
B. Sub-wire harness (throttle position sensor, coolant temperature sensor, fuel injector #1, fuel injector #2, ISC (Idle Speed Control) unit, gear position switch)
C. Sub-wire harness (oil pressure switch)

EAS30501
TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or an indicator light.
- The horn fails to sound.
- The fuel meter fails to come on.
- The speedometer fails to operate.
- The tachometer fails to operate.

TIP

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

1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank cover assembly
4. Fuel tank
5. Drive sprocket cover
6. Pivot shaft protector (right)

1. Check the fuses. (ABS ECU, ignition, signaling system, backup, and main) Refer to "CHECKING THE FUSES" on page 8-40.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the main switch.
OK↓		
4. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.	NG→	Properly connect or replace the wiring harness.
OK↓		
Check the condition of each of the signaling system circuits. Refer to "Checking the signaling system".		

Checking the signaling system

The horn fails to sound.

1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	• The horn switch is faulty. • Replace the handlebar switch (left).
OK↓		

2. Check the entire signaling system wiring. Refer to “CIRCUIT DIAGRAM” on page 8-21.	NG→	Properly connect or replace the wiring harness.

OK↓

Replace the horn.

The brake light fails to come on.

1. Check the front brake light switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the front brake light switch.

OK↓

2. Check the rear brake light switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the rear brake light switch.

OK↓

3. Check the entire signaling system wiring. Refer to “CIRCUIT DIAGRAM” on page 8-21.	NG→	Properly connect or replace the wiring harness.

OK↓

Replace the tail/brake light.

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

1. Check the turn signal switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	• The turn signal switch is faulty. • Replace the handlebar switch (left).

OK↓

2. Check the hazard switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	• The hazard switch is faulty. • Replace the handlebar switch (left).

OK↓

3. Check the entire signaling system wiring. Refer to “CIRCUIT DIAGRAM” on page 8-21.	NG→	Properly connect or replace the wiring harness.

OK↓

Replace the turn signal/position light or meter assembly.

The neutral indicator light fails to come on.

1. Check the gear position switch. Refer to "CHECKING THE GEAR POSITION SWITCH" on page 8-49.
   NG→ Replace the gear position switch.
   OK↓
2. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-42.
   NG→ Replace the relay unit.
   OK↓
3. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.
   NG→ Properly connect or replace the wiring harness.
   OK↓

Replace the meter assembly.

The oil pressure warning light fails to come on when the main switch is set to "ON".

1. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.
   NG→ Properly connect or replace the wiring harness.
   OK↓
2. Disconnect the oil pressure switch lead from the oil pressure switch, and then check whether the oil pressure warning light comes on when the lead is connected to the engine ground.
   NG→ Replace the meter assembly.
   OK↓

Replace the oil pressure switch.

The oil pressure warning light remains on after the engine is started.

1. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.
   NG→ Properly connect or replace the wiring harness.
   OK↓
2. Measure the engine oil pressure. Refer to "MEASURING THE ENGINE OIL PRESSURE" on page 3-22.
   NG→ Check the engine oil leakage, oil viscosity, oil seal, oil filter, or oil pump.

OK↓

Replace the oil pressure switch.

The fuel meter fail to come on.

1. Check the fuel sender.
   Refer to “CHECKING THE FUEL SENDER” on page 8-46.

NG→ Replace the fuel pump.

OK↓

2. Check the entire signaling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 8-21.

NG→ Properly connect or replace the wiring harness.

OK↓

Replace the meter assembly.

The coolant temperature meter, coolant temperature warning light, or both fails to come on.

1. Check the coolant temperature sensor.
   Refer to “CHECKING THE COOLANT TEMPERATURE SENSOR” on page 8-47.

NG→ Replace the coolant temperature sensor.

OK↓

2. Check the entire signaling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 8-21.

NG→ Properly connect or replace the wiring harness.

OK↓

Replace the ECU or meter assembly.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

The speedometer fails to operate.

1. Check the rear wheel sensor.
   Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

NG→ Replace the rear wheel sensor.

OK↓

2. Check the entire rear wheel sensor wiring.
   Refer to TIP.

NG→ Properly connect or replace the wiring harness.

OK↓

Replace the ECU, ABS ECU, or meter assembly. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

TIP

Replace the wire harness if there is an open or short circuit.
- Between rear wheel sensor coupler and ABS ECU coupler.
  (white–white)
  (black–black)
- Between ABS ECU coupler and joint coupler.
  (blue/black–blue/black)
  (blue/red–blue/red)
- Between joint coupler and ECU coupler.
  (blue/black–blue/black)
  (blue/red–blue/red)
- Between joint coupler and meter assembly coupler.
  (blue/black–blue/black)
  (blue/red–blue/red)

The tachometer fails to operate.

1. Check the crankshaft position sensor.
   Refer to “CHECKING THE CRANKSHAFT POSITION SENSOR” on page 8-44.

NG→ Replace the stator coil assembly.

OK↓

2. Check the entire signaling system wiring.
   Refer to “CIRCUIT DIAGRAM” on page 8-21.

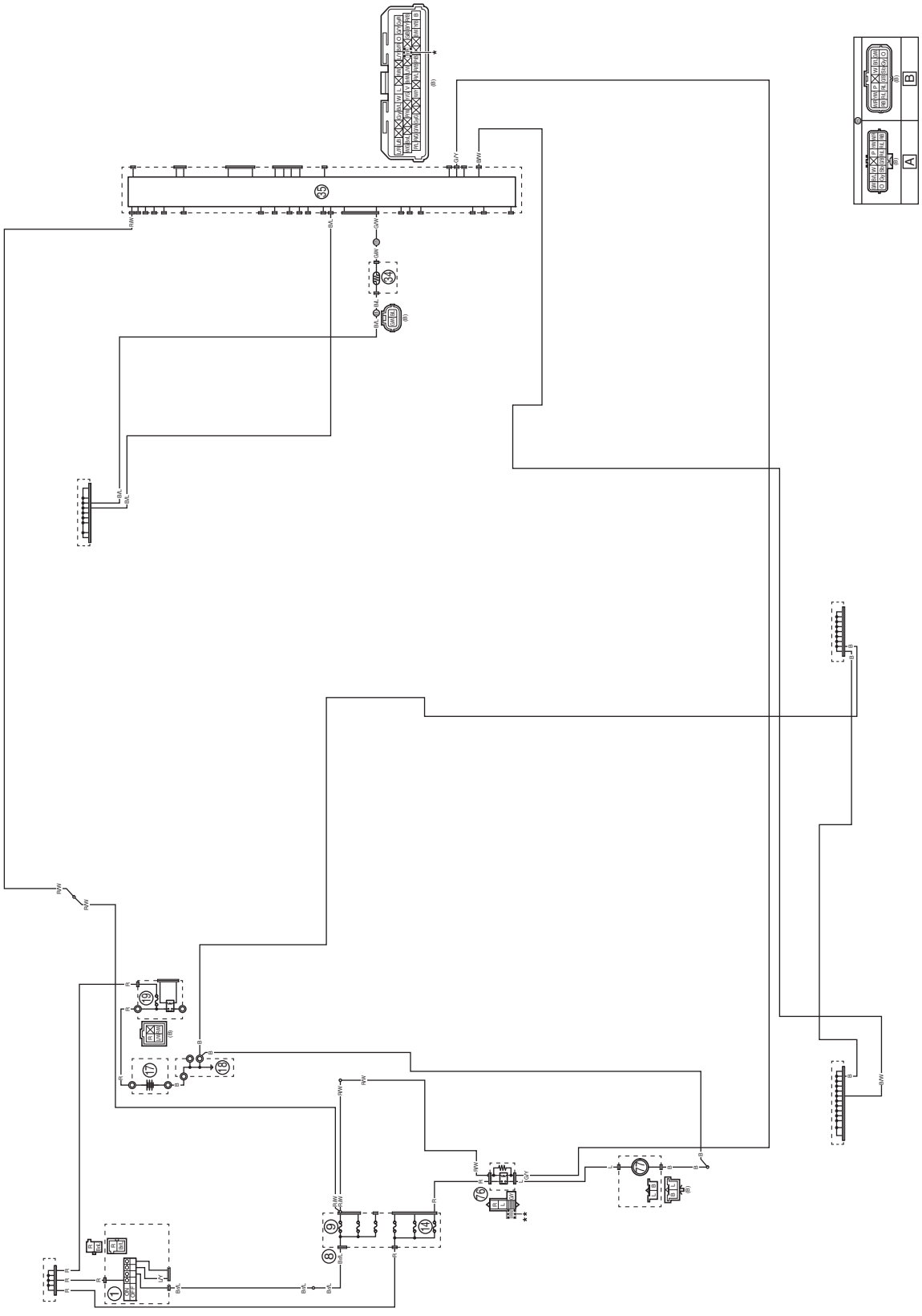
NG→ Properly connect or replace the wire harness.

OK↓

Replace the meter assembly or ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

EAS20077
COOLING SYSTEM

EAS30502
CIRCUIT DIAGRAM



1. Main switch
8. Fuse box 1
9. Ignition fuse
14. Radiator fan motor fuse
17. Battery
18. Engine ground
19. Main fuse
34. Coolant temperature sensor
35. ECU (Engine Control Unit)
76. Radiator fan motor relay
77. Radiator fan motor

*. For California: Br/R
Except for California: blank

**. For California: B/R, R/W
Except for California: R/W

A. Wire harness
B. Sub-wire harness (throttle position sensor, coolant temperature sensor, fuel injector #1, fuel injector #2, ISC (Idle Speed Control) unit, gear position switch)

EAS30503
TROUBLESHOOTING

The radiator fan motor fails to turn.

TIP

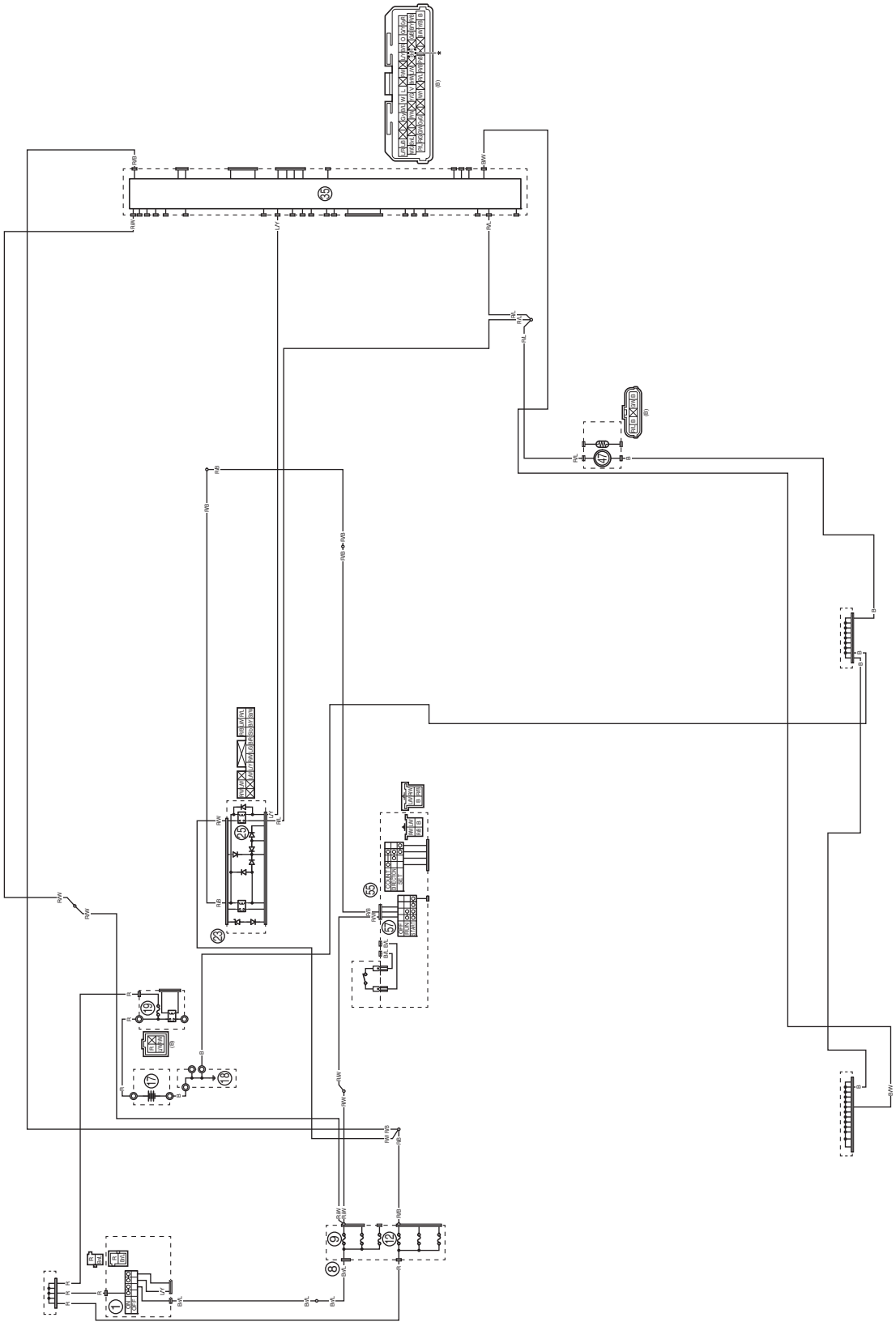
• Before troubleshooting, remove the following part(s):
1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank cover assembly
4. Fuel tank

1. Check the fuses. (Ignition, radiator fan motor, and main) Refer to “CHECKING THE FUSES” on page 8-40.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the main switch.
OK↓		
4. Check the radiator fan motor. Refer to “CHECKING THE RADIATOR FAN MOTOR” on page 8-47.	NG→	Replace the radiator fan motor.
OK↓		
5. Check the radiator fan motor relay. Refer to “CHECKING THE RELAYS” on page 8-41.	NG→	Replace the radiator fan motor relay.
OK↓		
6. Check the coolant temperature sensor. Refer to “CHECKING THE COOLANT TEMPERATURE SENSOR” on page 8-47.	NG→	Replace the coolant temperature sensor.
OK↓		
7. Check the entire cooling system wiring. Refer to “CIRCUIT DIAGRAM” on page 8-29.	NG→	Properly connect or replace the wiring harness.
OK↓		

Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

EAS20081
FUEL PUMP SYSTEM

EAS30513
CIRCUIT DIAGRAM



1. Main switch
8. Fuse box 1
9. Ignition fuse
12. Fuel injection system fuse
17. Battery
18. Engine ground
19. Main fuse
23. Relay unit
25. Fuel pump relay
35. ECU (Engine Control Unit)
47. Fuel pump
55. Handlebar switch (right)
57. Start/engine stop switch

*. For California: Br/R
Except for California: blank

EAS30514
TROUBLESHOOTING

If the fuel pump fails to operate.

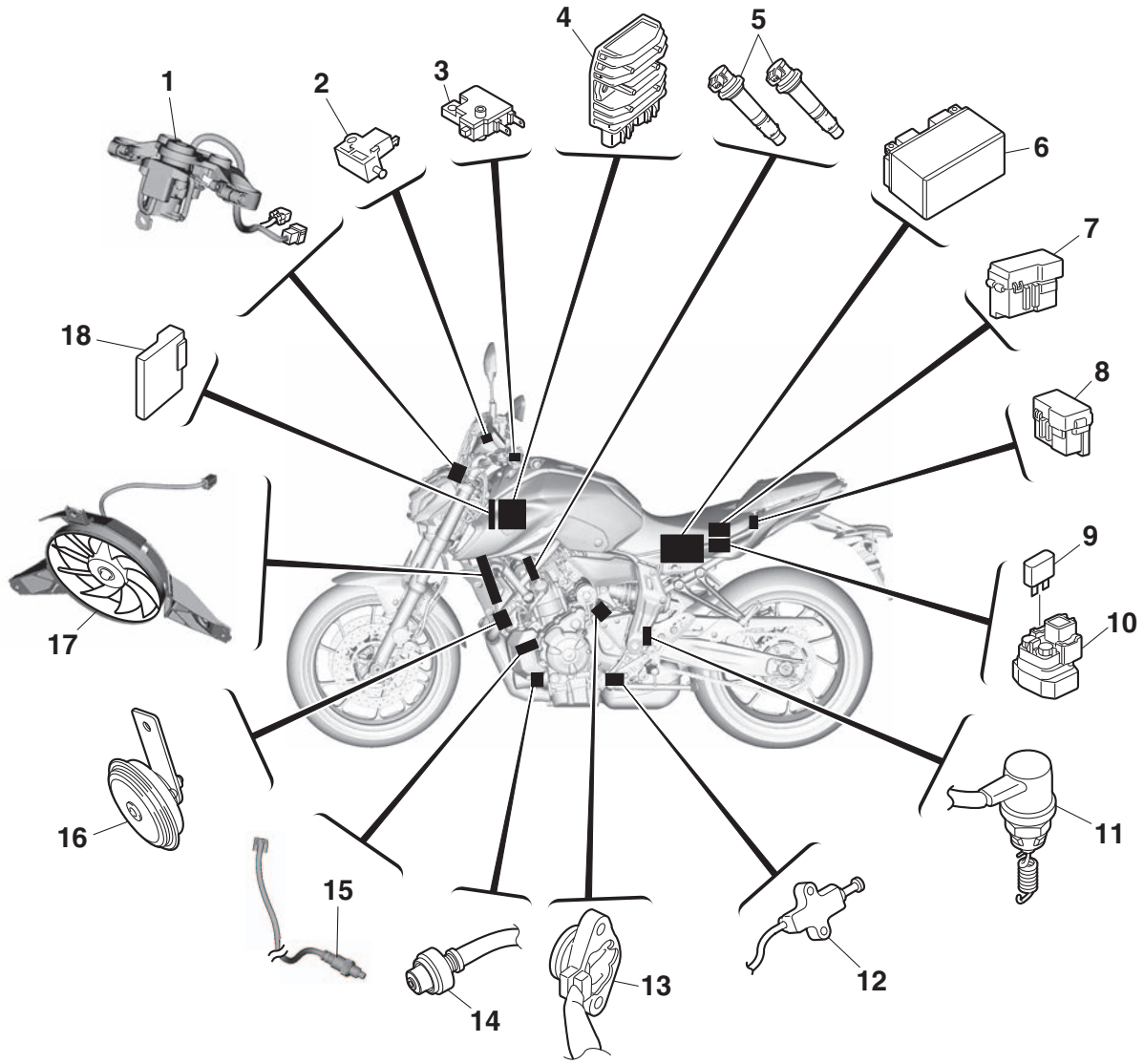
TIP

• Before troubleshooting, remove the following part(s):
1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank cover assembly
4. Fuel tank

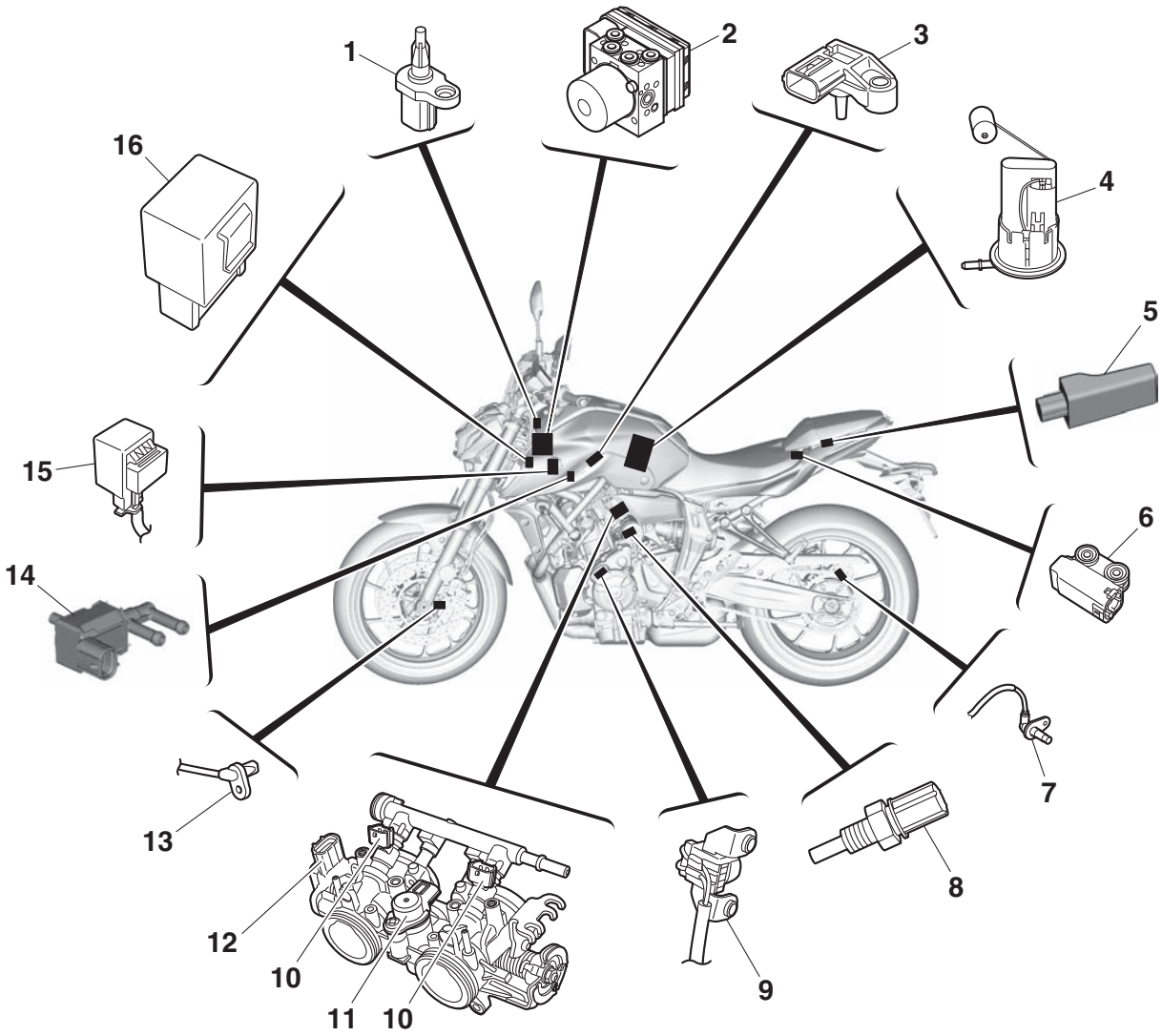
1. Check the fuses. (Ignition, fuel injection system and main) Refer to “CHECKING THE FUSES” on page 8-40.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	Replace the main switch.
OK↓		
4. Check the start/engine stop switch. Refer to “CHECKING THE SWITCHES” on page 8-39.	NG→	• The start/engine stop switch is faulty. • Replace the handlebar switch (right).
OK↓		
5. Check the relay unit (fuel pump relay). Refer to “CHECKING THE RELAYS” on page 8-41.	NG→	Replace the relay unit.
OK↓		
6. Check the fuel pump. Refer to “CHECKING THE FUEL PUMP BODY” on page 7-4.	NG→	Replace the fuel pump.
OK↓		
7. Check the entire fuel pump system wiring. Refer to “CIRCUIT DIAGRAM” on page 8-33.	NG→	Properly connect or replace the wiring harness.
OK↓		

Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

EAS20089
ELECTRICAL COMPONENTS



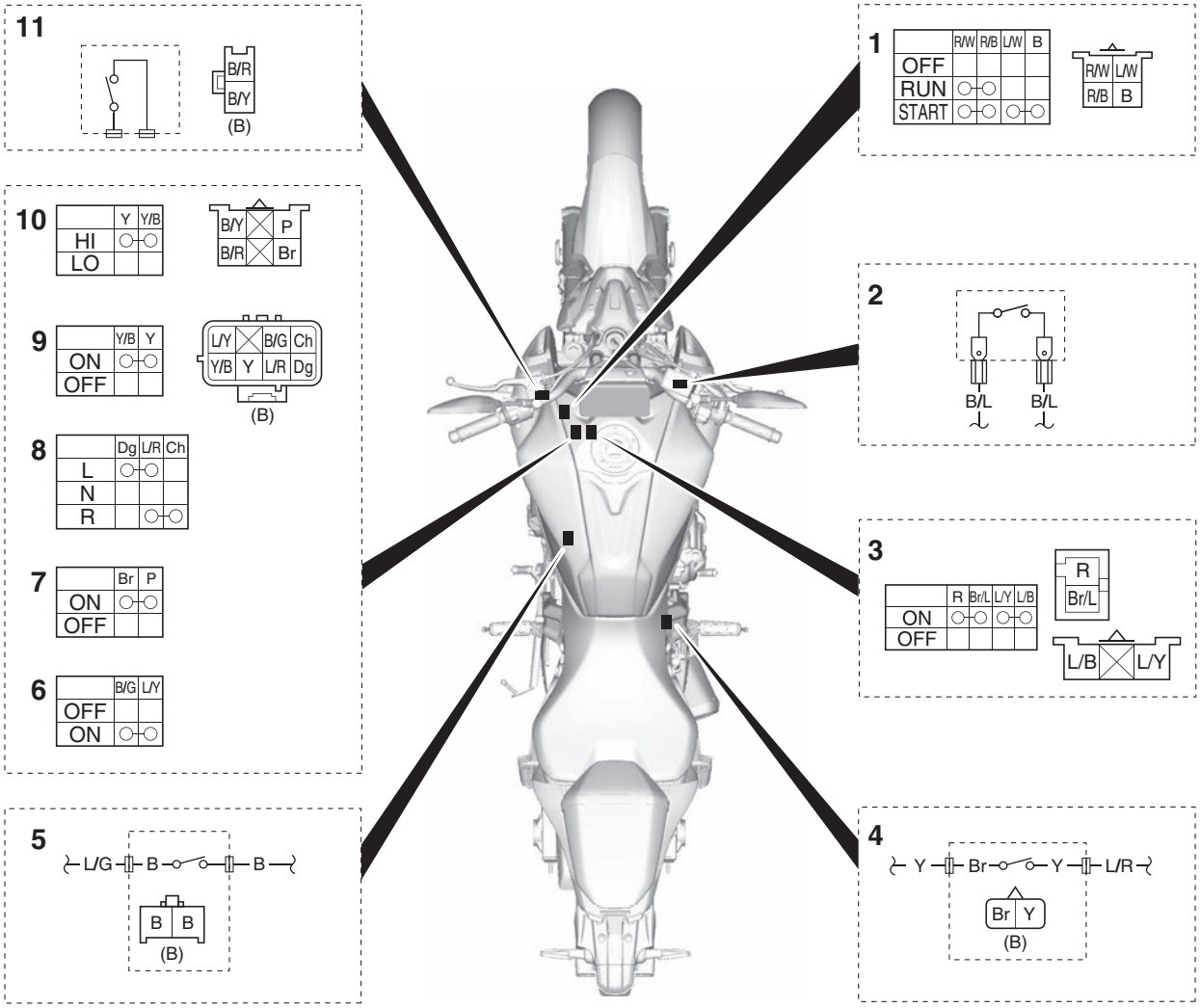
1. Main switch
2. Front brake light switch
3. Clutch switch
4. Rectifier/regulator
5. Ignition coil
6. Battery
7. Fuse box 1
8. Fuse box 2
9. Main fuse
10. Starter relay
11. Rear brake light switch
12. Sidestand switch
13. Gear position switch
14. Oil pressure switch
15. O_2 sensor
16. Horn
17. Radiator fan motor
18. ECU (Engine Control Unit)



1. Intake air temperature sensor
2. Hydraulic unit assembly
3. Intake air pressure sensor
4. Fuel pump
5. CCU (Communication Control Unit)
6. Lean angle sensor
7. Rear wheel sensor
8. Coolant temperature sensor
9. Crankshaft position sensor
10. Fuel injector
11. ISC (Idle Speed Control) unit
12. Throttle position sensor
13. Front wheel sensor
14. Purge cut valve solenoid (for California only)
15. Radiator fan motor relay
16. Relay unit

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. Start/engine stop switch
2. Front brake light switch
3. Main switch
4. Rear brake light switch
5. Sidestand switch
6. Hazard switch
7. Horn switch
8. Turn signal switch
9. Pass switch
10. Dimmer switch
11. Clutch switch

EAS30551
CHECKING THE FUSES

The following procedure applies to all of the fuses.

ECA13680
NOTICE

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

1. Remove:
   - Passenger seat
   - Rider seat

   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 there is no continuity, replace the fuse.
3. Replace:
   - Blown fuse

   a. Set the main switch to "OFF".
   b. Install a new fuse of the correct amperage rating.
   c. Set on the switches to verify if the electrical circuit is operational.
   d. If the fuse immediately blows again, check the electrical circuit.

Fuses	Amperage rating	Q'ty
Main	30 A	1
ABS motor	30 A	1
ABS solenoid	20 A	1
Headlight	7.5 A	1
Signaling system	7.5 A	1
Ignition	7.5 A	1
Fuel injection system	10 A	1
Radiator fan motor	10 A	1
ABS ECU	7.5 A	1
Backup	7.5 A	1
Terminal 1	3.0 A	1
Accessory	7.5 A	1
Spare	30 A	1
Spare	20 A	1
Spare	10 A	1
Spare	7.5 A	1
Spare	3.0 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:
   - Rider seat
   - Passenger seat

   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). Refer to "REMOVING THE ECU (Engine Control Unit)" on page 4-18.
3. Clean the ISC (Idle Speed Control). Refer to "CLEANING THE ISC (IDLE SPEED CONTROL) VALVE" on page 7-12.
4. Reset:
   - O_2 feedback learning value

   Use the diagnostic code number "87". Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-42.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

5. Check:
   - Engine idling speed

   Start the engine, warm it up, and then measure the engine idling speed.

Engine idling speed
1250–1450 r/min

EAS30552
CHECKING AND CHARGING THE BATTERY

TIP

Refer to “CHECKING AND CHARGING THE BATTERY” in “BASIC INFORMATION” (separate volume).

1. Remove:
   - Passenger seat
   - Rider seat
   - Rider seat bracket 1
   - Battery band
   Refer to “GENERAL CHASSIS (1)” on page 4-1.
2. Disconnect:
   - Battery lead
   (from the battery terminals)

ECA13700

NOTICE

First, disconnect the negative battery lead, and then the positive battery lead.

3. Remove:
   - Battery
   Refer to “GENERAL CHASSIS (1)” on page 4-1.
4. Check:
   - Battery charge
5. Install:
   - Battery
   Refer to “GENERAL CHASSIS (1)” on page 4-1.
6. Connect:
   - Battery lead
   (to the battery terminals)

ECA26980

NOTICE

First, connect the positive battery lead, and then the negative battery lead.

7. Check:
   - Battery terminal
   Dirt → Clean with a wire brush.
   Loose connection → Connect properly.
8. Lubricate:
   - Battery terminal

Recommended lubricant
Dielectric grease

9. Install:
   - Battery band
   - Rider seat bracket 1
   - Rider seat
   - Passenger seat
   Refer to “GENERAL CHASSIS (1)” on page 4-1.

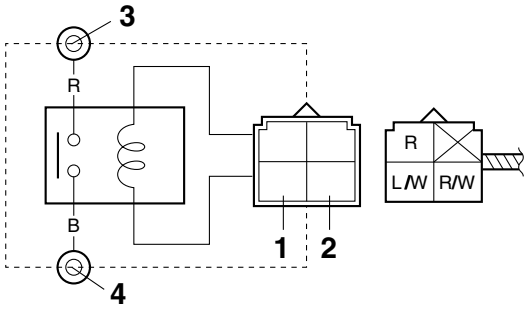
EAS30553
CHECKING THE RELAYS

Check each relay 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 tachometer
YU-A1927

1. Disconnect the relay from the wire harness.
2. Connect the digital circuit tester and battery (12 V) to the relay terminal as shown.
   Check the relay operation.
   Out of specification → Replace.

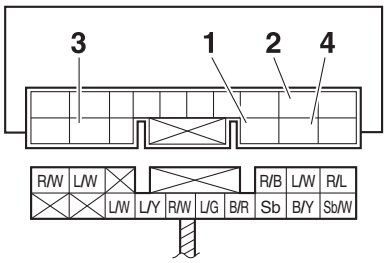
Starter relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Relay operation
Continuity
(between “3” and “4”)

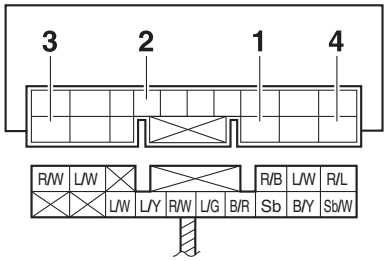
Relay unit (starting circuit cut-off relay)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
(between "3" and "4")

Relay unit (fuel pump relay)

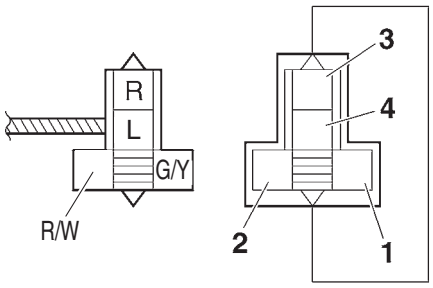


1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

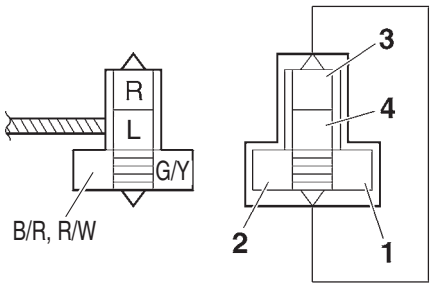
Result
Continuity
(between "3" and "4")

Radiator fan motor relay

A



B



A. Except for California
B. For California

1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

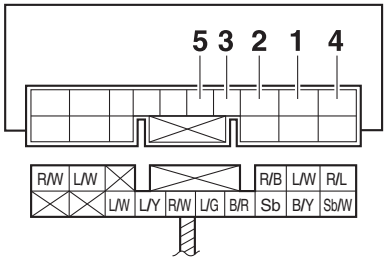
Result
Continuity
(between "3" and "4")

EAS30795
CHECKING THE RELAY UNIT (DIODE)

1. Check:
   • Relay unit (diode)
   Out of specification → Replace.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

Continuity
Positive tester probe
black/yellow “1”
Negative tester probe
sky blue “2”
No continuity
Positive tester probe
sky blue “2”
Negative tester probe
black/yellow “1”
Continuity
Positive tester probe
black/red “3”
Negative tester probe
sky blue “2”
No continuity
Positive tester probe
sky blue “2”
Negative tester probe
black/red “3”
Continuity
Positive tester probe
sky blue/white “4”
Negative tester probe
sky blue “2”
No continuity
Positive tester probe
sky blue “2”
Negative tester probe
sky blue/white “4”
Continuity
Positive tester probe
black/red “3”
Negative tester probe
blue/green “5”
No continuity
Positive tester probe
blue/green “5”
Negative tester probe
black/red “3”



a. Disconnect the relay unit coupler from the wire harness.
b. Connect the digital circuit tester to the relay unit terminal as shown.
c. Check the relay unit (diode) for continuity.
d. Check the relay unit (diode) for no continuity.

EAS30558
CHECKING THE IGNITION COILS

The following procedure applies to all of the ignition coils.

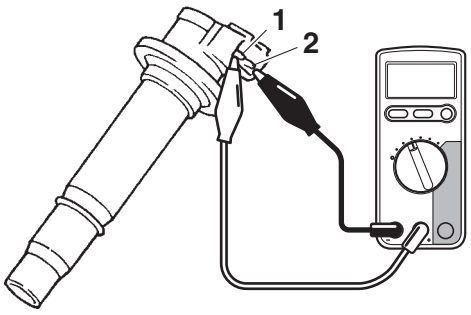
1. Check:
   • Primary coil resistance
   Out of specification → Replace.

Primary coil resistance
1.19–1.61 Ω

a. Disconnect the ignition coil coupler from the ignition coil.
b. 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
Ignition coil terminal “1”
• Negative tester probe
Ignition coil terminal “2”



G089046

c. Measure the primary coil resistance.

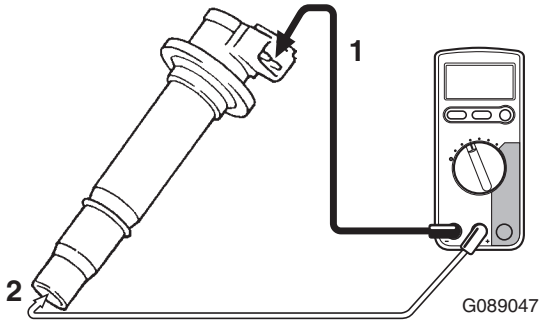
2. Check:
   • Secondary coil resistance
   Out of specification → Replace.

Secondary coil resistance
8.50–11.50 kΩ

a. Connect the digital circuit tester to the ignition coil as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Negative tester probe
  Ignition coil terminal "1"
- Positive tester probe
  Spark plug terminal "2"



b. Measure the secondary coil resistance.

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 8-4.

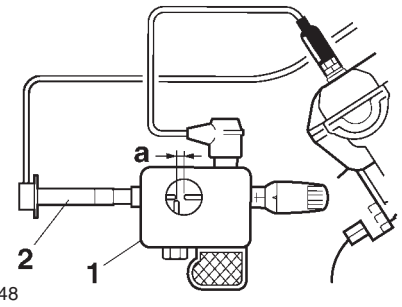
Minimum ignition spark gap
6.0 mm (0.24 in)

TIP

If the ignition spark gap is within specification, the ignition system circuit is operating normally.

a. Remove the ignition coil 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 pushing the "(≋)" side of the start/engine stop switch and gradually increase the spark gap until a misfire occurs.

EAS30560
CHECKING THE CRANKSHAFT POSITION SENSOR

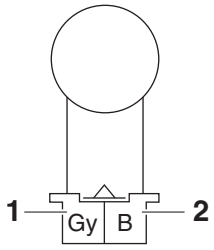
1. Disconnect:
   - Crankshaft position sensor coupler (from the wire harness)
2. Check:
   - Crankshaft position sensor resistance
     Out of specification → Replace the stator coil assembly.

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
  Gray "1"
- Negative tester probe
  Black "2"



b. Measure the crankshaft position sensor resistance.

EAS30561
CHECKING THE LEAN ANGLE SENSOR

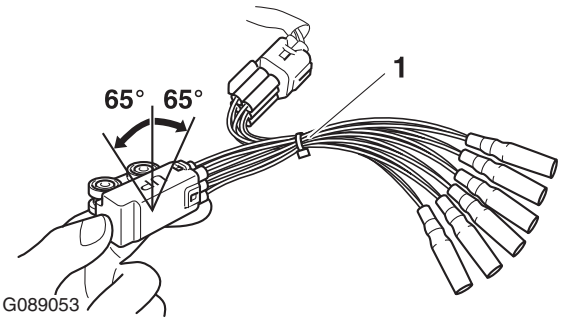
1. Remove:
   • Lean angle sensor
   (from the battery box)
2. Check:
   • Lean angle sensor output voltage
   Out of specification → Replace.

Operating angle
65 °
Output voltage up to operating angle
0.4–1.4 V
Output voltage over operating angle
3.7–4.4 V

a. Connect the test harness– lean angle sensor (6P) "1" to the lean angle sensor and wire harness as shown.
b. Connect the digital circuit tester to the test harness– lean angle sensor (6P).

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927
Test harness– lean angle sensor (6P)
90890-03209
Test harness– lean angle sensor (6P)
YU-03209

• Positive tester probe
Yellow/green (wire harness color)
• Negative tester probe
Black/blue (wire harness color)



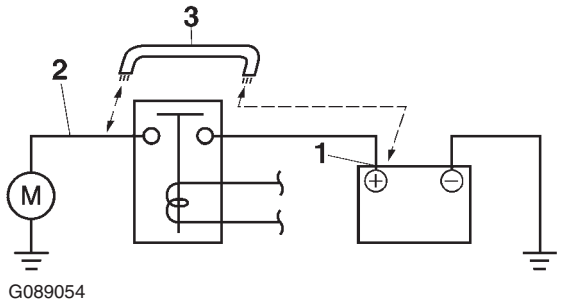
c. Set the main switch to "ON".
d. Turn the lean angle sensor to 65°.
e. Measure the lean angle sensor output voltage.

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 8-10.

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 rectifier/regulator)

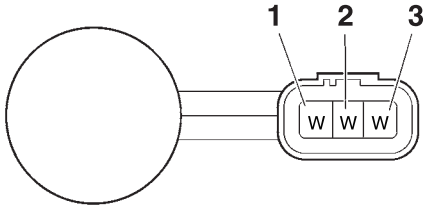
2. Check:
   • Stator coil
   a. Connect the digital circuit tester to the stator coil coupler as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

• Positive tester probe
White “1”
• Negative tester probe
White “2”

• Positive tester probe
White “1”
• Negative tester probe
White “3”

• Positive tester probe
White “2”
• Negative tester probe
White “3”



   b. Check the stator coil continuity.
   c. If there is no continuity, replace the stator coil assembly.

EAS30680
CHECKING THE RECTIFIER/REGULATOR
1. Check:
   • Charging voltage
   Out of specification → Replace the rectifier/regulator.

Charging voltage
14 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
• Negative tester probe
Negative battery terminal

   b. Start the engine and let it run at approximately 5000 r/min.
   c. Measure the charging voltage.

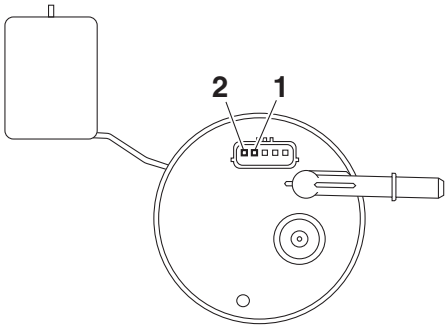
EAS30573
CHECKING THE FUEL SENDER
1. Disconnect:
   • Fuel pump coupler
   (from the fuel pump)
2. Remove:
   • Fuel tank
3. Remove:
   • Fuel pump
   (from the fuel tank)
4. Check:
   • Fuel sender resistance
   Out of specification → Replace the fuel pump.

Sender unit resistance (full)
9.0–11.0 Ω
Sender unit resistance (empty)
213.0–219.0 Ω

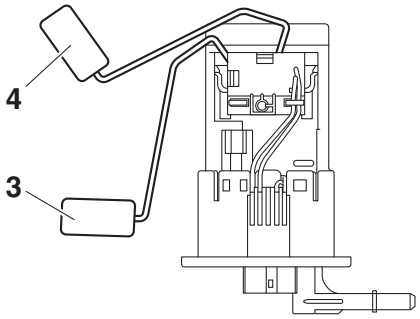
   a. Connect the digital circuit tester to the fuel sender terminals as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

• Positive tester probe
Fuel pump terminal “1”
• Negative tester probe
Fuel pump terminal “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.

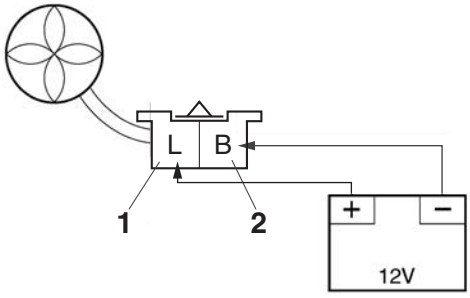
1. Check:
   - Fuel meter “1”
     (Turn the main switch to “ON”.)
     Fuel meter comes on for a few seconds, then goes off → Fuel meter is OK.
     Fuel meter does not come on → Replace the meter assembly.
     Fuel meter flashes repeatedly → Replace the fuel pump.

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 5-31.

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)

a. Connect the digital circuit tester to the coolant temperature sensor as shown.

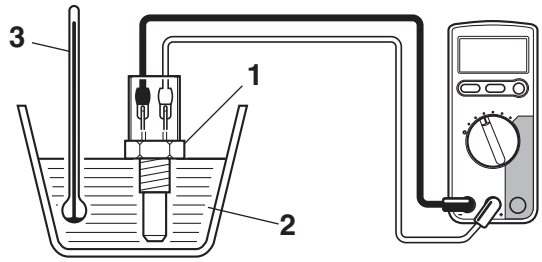
Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

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

TIP

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

c. Place a thermometer “3” in the coolant.



G089056

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)

EAS30581

CHECKING THE THROTTLE POSITION SENSOR

1. Remove:
   • Throttle position sensor (from the throttle body)

EWA16690

⚠ WARNING

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

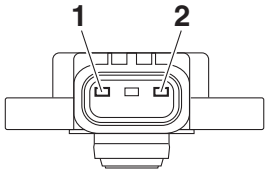
2. Check:
   • Throttle position sensor maximum resistance
     Out of specification → Replace the throttle position sensor.

	Resistance 2.64–6.16 kΩ

a. Connect the digital circuit tester to the throttle position sensor as shown.

	Digital circuit tester (CD732) 90890-03243 **Model 88 Multimeter with tachometer YU-A1927**

• Positive tester probe Sensor terminal “1” • Negative tester probe Sensor terminal “2”



b. Check the throttle position sensor maximum resistance.

3. Install:
   • Throttle position sensor

TIP

When installing the throttle position sensor, adjust its angle properly. Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-15.

EAS30593

CHECKING THE INTAKE AIR PRESSURE SENSOR

1. Check:
   • Intake air pressure sensor output voltage
     Out of specification → Replace.

	Intake air pressure sensor output voltage 3.59–3.67 V at 101.3 kPa (3.59–3.67 V at 1.01 kgf/cm², 3.59–3.67 V at 14.7 psi)

a. Connect the test harness S– pressure sensor (3P) “1” to the intake air pressure sensor and wire harness as shown.

ECA20920

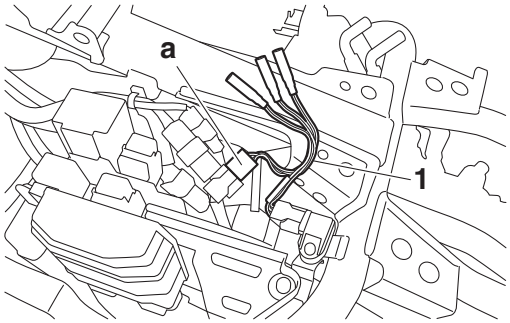
NOTICE

Pay attention to the installing direction of the test harness S– pressure sensor (3P) coupler.

b. Connect the digital circuit tester to the test harness S– pressure sensor (3P) “a”.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927
Test harness S– pressure sensor (3P)
90890-03207
Test harness S– pressure sensor (3P)
YU-03207

- Positive tester probe
  Pink/white (wire harness color)
- Negative tester probe
  Black/blue (wire harness color)



c. Set the main switch to “ON”.
d. Measure the intake air pressure sensor output voltage.

EAS30594
CHECKING THE INTAKE AIR TEMPERATURE SENSOR

1. Remove:
   - Intake air temperature sensor

EWA14110
⚠ WARNING
- **Handle the intake air temperature sensor with special care.**
- **Never subject the intake air temperature sensor to strong shocks. If the intake air temperature sensor is dropped, replace it.**

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

Intake air temperature sensor resistance
290–390 Ω at 80 °C (290–390 Ω at 176 °F)

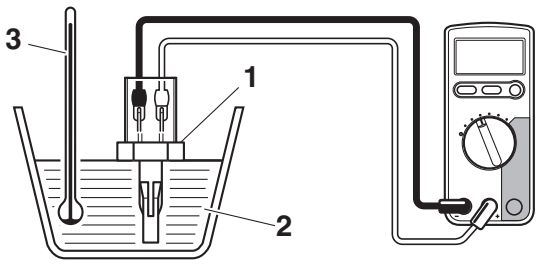
a. Connect the digital circuit tester to the intake air temperature sensor terminal as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

b. Immerse the intake air temperature sensor “1” in a container filled with water “2”.

TIP
Make sure that the intake air temperature sensor terminals do not get wet.

c. Place a thermometer “3” in the water.



G089057

d. Slowly heat the water, then let it cool down to the specified temperature.
e. Measure the intake air temperature sensor resistance.

3. Install:
   - Intake air temperature sensor

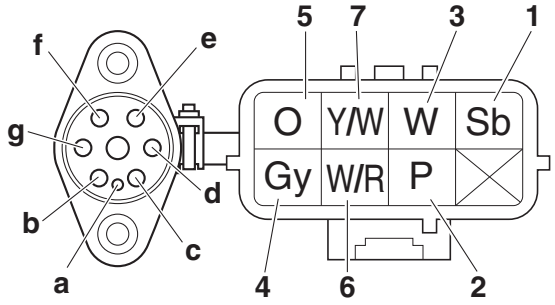
Intake air temperature sensor bolt
3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

EAS31088
CHECKING THE GEAR POSITION SWITCH

1. Remove:
   - Drive sprocket cover
     Refer to “CHAIN DRIVE” on page 4-98.
   - Gear position switch
     Refer to “CRANKCASE” on page 5-72.
2. Check:
   - Gear position switch
     Out of specification → Replace the gear position switch.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

Result
Neutral position
Continuity
Positive tester probe
sky blue “1”
Negative tester probe
Switch terminal “a”
1st position
Continuity
Positive tester probe
pink “2”
Negative tester probe
Switch terminal “b”
2nd position
Continuity
Positive tester probe
white “3”
Negative tester probe
Switch terminal “c”
3rd position
Continuity
Positive tester probe
gray “4”
Negative tester probe
Switch terminal “d”
4th position
Continuity
Positive tester probe
orange “5”
Negative tester probe
Switch terminal “e”
5th position
Continuity
Positive tester probe
white/red “6”
Negative tester probe
Switch terminal “f”
6th position
Continuity
Positive tester probe
yellow/white “7”
Negative tester probe
Switch terminal “g”



EAS30681
CHECKING THE FUEL INJECTORS

The following procedure applies to all of the fuel injectors.

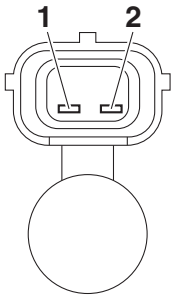
1. Remove:
   - Fuel injector
     Refer to “THROTTLE BODIES” on page 7-9.
2. Check:
   - Fuel injector resistance
     Out of specification → Replace the fuel injector.

Resistance
12.0 Ω at 20 °C (12.0 Ω at 68 °F)

a. Disconnect the fuel injector coupler from the fuel injector.
b. Connect the digital circuit tester to the fuel injector coupler as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe
  Fuel injector terminal “1”
- Negative tester probe
  Fuel injector terminal “2”



c. Measure the fuel injector resistance.

EAS32604
CHECKING THE PURGE CUT VALVE SOLENOID (for California only)

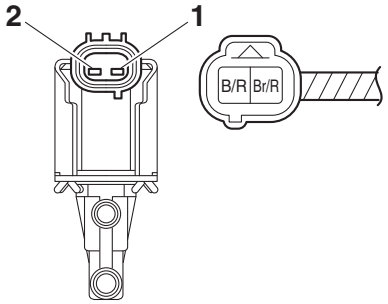
1. Check:
   • Purge cut valve solenoid resistance
   Out of specification → Replace.

Purge cut valve solenoid resistance
22.00–26.00 Ω (MT07PC)

a. Disconnect the purge cut valve solenoid coupler from the purge cut valve solenoid.
b. Connect the digital circuit tester to the purge cut valve solenoid terminal as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

• Positive tester probe
Purge cut valve solenoid terminal "1"
• Negative tester probe
Purge cut valve solenoid terminal "2"



c. Measure the purge cut valve solenoid resistance.

EAS31673
CHECKING THE WHEEL SWITCH

1. Check:
   • Wheel switch "1" output voltage
   Out of specification → Replace the right handlebar switch.

a. Connect the digital circuit tester (DC V) to the handlebar switch coupler (right) as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

• Positive tester probe
white/green "2"
• Negative tester probe
black/yellow "3"

b. Turn the main switch to "ON".
c. When turning the wheel switch in direction "a" and "b", check that the output voltage is within the specified values.

Output voltage reading cycle
More than 5 V to less than 0.5 V then back to more than 5 V to less than 0.5 V

d. Connect the digital circuit tester (DC V) to the handlebar switch coupler (right) as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

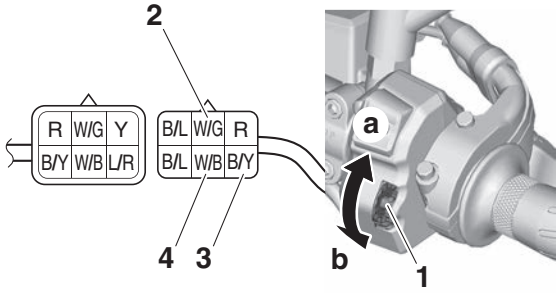
• Positive tester probe
white/black "4"
• Negative tester probe
black/yellow "3"

e. When turning the wheel switch in direction "a", check that the output voltage is within the specified values.

Output voltage
More than 5 V

f. When turning the wheel switch in direction "b", check that the output voltage is within the specified values.

Output voltage
Less than 0.5 V



SELF DIAGNOSTIC

EAS20437
SELF-DIAGNOSTIC FUNCTION

EAS33142
GLOSSARY

Word	Description
MIL (Malfunction indicator light)	MIL is an indicator light that comes on when a control unit determines a malfunction.
DTC (Diagnostic trouble code)	DTC is a code that is saved within a control unit's memory when the control unit determines a malfunction.
Current malfunction	A DTC for an unrecovered, current malfunction.
Recovered malfunction	A DTC for a previously determined but now recovered malfunction.
OBD (On-board diagnostics)	Self-diagnostic system is equipped in a control unit for the emission control system.
GST (Generic scan tool)	Generic diagnostic tool that complies with OBD standards.
YDT (Yamaha diagnostic tool)	Diagnostic tool developed especially for Yamaha vehicles.

EAS32858
OUTLINE
The control unit is equipped with a self-diagnostic function in order to ensure that the system is operating normally. If this function detects a malfunction in the system, it immediately operates the system under substitute characteristics and illuminates the warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a DTC is stored in the memory of the control unit.

EAS32859
CHECKING THE WARNING LIGHT
The warning light comes on after the main switch has been set to "ON". Refer to the following table for lighting up time.
If the warning light still comes on, refer to a check item of a troubleshooting of each system, check and repair it. If the warning light does not come on, the warning light (LED) may be defective.

TIP

- This engine equips self-diagnostic function. It's controlled delicately for detecting defective and malfunction of the exhaust emission control system. Therefore, the vehicle modifying, poor maintenance, and improper using of the vehicle may also become the cause of the MIL come on. These events may cause the occurrence of the warning light coming on without malfunction.
- Reprogramming of the ECU software.
- Using the electrical accessory which may affect the ECU.
- Using the incorrect specification of spark plug and fuel injector. Using the third party accessories such as suspension and exhaust system.
- Change of specifications of drive chain, sprocket, wheel and tire.
- Removing or modifying the O_2 sensor, the exhaust system part (catalyst, etc.).
- Poor maintenance of the drive chain and tire air pressure.
- Incorrect brake pedal height, rear brake dragging.
- Excessive opening and closing of the throttle grip, frequently used of burnout, wheelie and half clutch.
- Air mixture by fuel supply badness.

System	Lighting up warning light	Lighting time
FUEL INJECTION SYSTEM	MIL "1"	2.0 seconds
ABS (Anti-lock Brake System)	ABS warning light "2"	*1

TIP

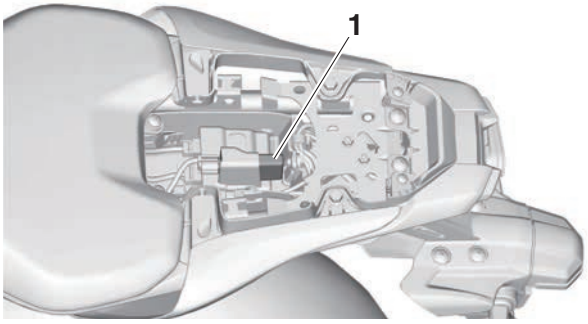
*1: The ABS warning light goes off when the vehicle is judged to normal with running.

EAS32806
YDT
This model uses the YDT to identify malfunctions.
For information about using the YDT, refer to the operation manual that is included with the tool.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

TIP
- Yamaha diagnostic tool (A/I) (90890-03273) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.
- A GST can also be used to identify malfunctions.

Connecting the YDT
Disconnect the coupler from the CCU (Communication Control Unit) “1”, and then connect the YDT to the coupler.



EAS32864
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
- Fuel injector #1
- Fuel injector #2
- Ignition coil #1
- Ignition coil #2
- Throttle position sensor
- Intake air pressure sensor
- Coolant temperature sensor
- Lean angle sensor
- Shift sensor (OPTION)
- Purge cut valve solenoid (for California only)
- Intake air temperature sensor
- O_2 sensor
- Hydraulic unit assembly (ABS ECU)
- Relay unit
- Starter relay
- Radiator fan motor relay
- Meter assembly
- ISC (Idle Speed Control) unit
- CCU (Communication Control Unit)
- Main switch

EAS32918
PARTS CONNECTED TO THE ABS ECU

The following parts are connected to the hydraulic unit assembly (ABS ECU).
When checking for a power short circuit, the couplers must be disconnected from all of the following parts beforehand.

- Meter assembly
- ECU (Engine Control Unit)
- Front wheel sensor
- Rear wheel sensor
- Handlebar switch (right)
- Front brake light switch
- Rear brake light switch
- Tail/brake light
- CCU (Communication Control Unit)

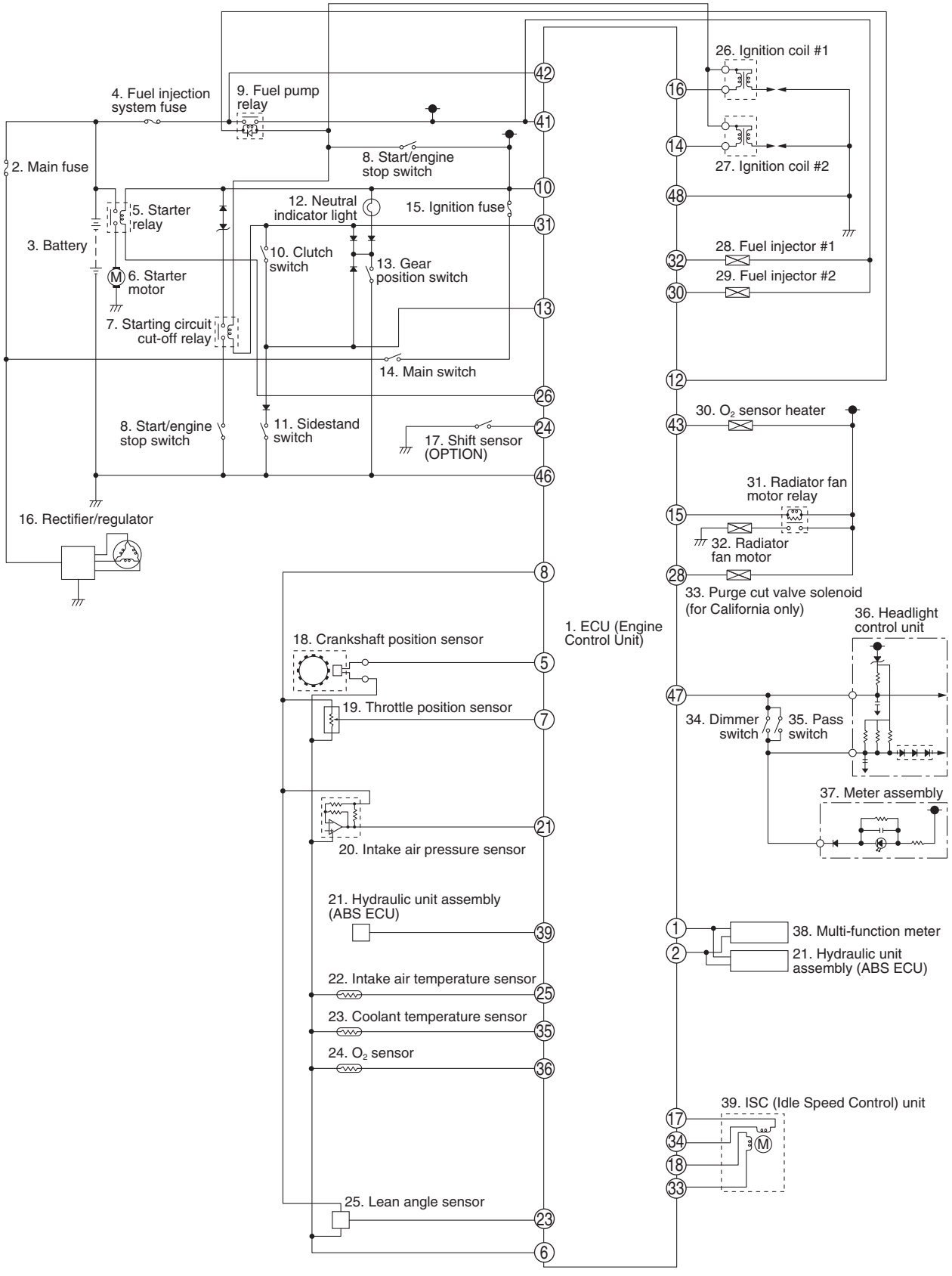
EAS33137
PRECAUTIONS FOR ROAD TEST

EWA20860
⚠ WARNING

When test riding the vehicle, always comply with local traffic regulations.

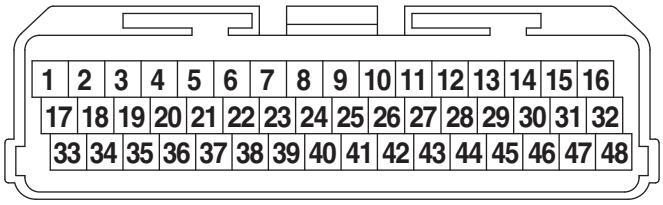
EAS20387
SYSTEM DIAGRAM

EAS32920
ECU CIRCUIT DIAGRAM



1. ECU (Engine Control Unit)
2. Main fuse
3. Battery
4. Fuel injection system fuse
5. Starter relay
6. Starter motor
7. Starting circuit cut-off relay
8. Start/engine stop switch
9. Fuel pump relay
10. Clutch switch
11. Sidestand switch
12. Neutral indicator light
13. Gear position switch
14. Main switch
15. Ignition fuse
16. Rectifier/regulator
17. Shift sensor (OPTION)
18. Crankshaft position sensor
19. Throttle position sensor
20. Intake air pressure sensor
21. Hydraulic unit assembly (ABS ECU)
22. Intake air temperature sensor
23. Coolant temperature sensor
24. O_2 sensor
25. Lean angle sensor
26. Ignition coil #1
27. Ignition coil #2
28. Fuel injector #1
29. Fuel injector #2
30. O_2 sensor heater
31. Radiator fan motor relay
32. Radiator fan motor
33. Purge cut valve solenoid (for California only)
34. Dimmer switch
35. Pass switch
36. Headlight control unit
37. Meter assembly
38. Multi-function meter
39. ISC (Idle Speed Control) unit

EAS33369
ECU COUPLER LAYOUT



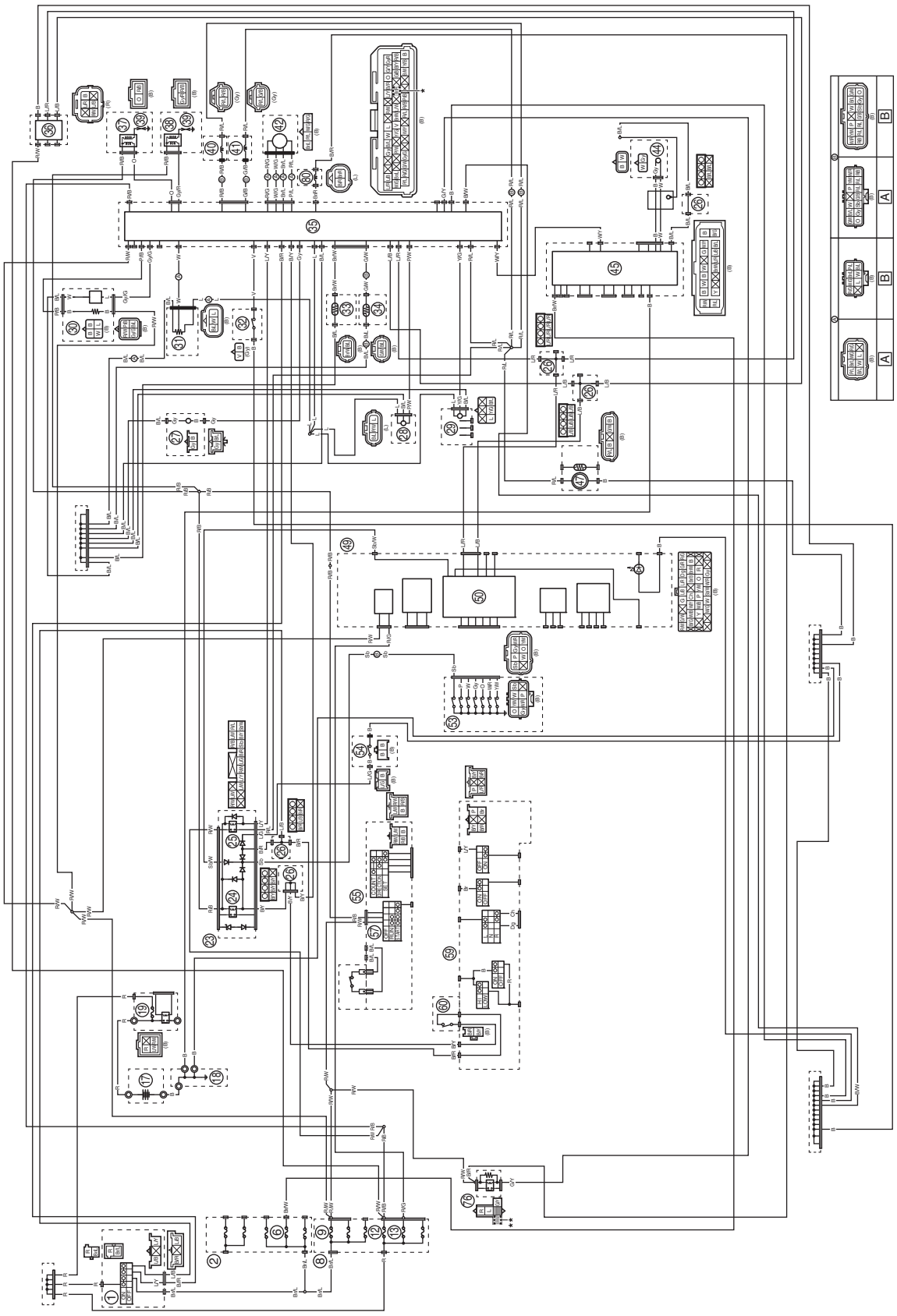
No.	Connected parts	Wire harness color
1	CAN communication circuit	L/R
2	CAN communication circuit	L/B
3	—	—
4	—	—
5	Crankshaft position sensor	Gy
6	O_2 sensor, throttle position sensor, intake air temperature sensor, coolant temperature sensor, intake air pressure sensor, lean angle sensor, crankshaft position sensor	B/L
7	Throttle position sensor	W
8	Throttle position sensor, intake air pressure sensor, lean angle sensor	L
9	—	—
10	Ignition fuse	R/W
11	—	—
12	Fuel pump relay	L/Y
13	Relay unit (diode), clutch switch, sidestand switch, gear position switch	B/R
14	Ignition coil #2	Gy/R
15	Radiator fan motor relay	G/Y
16	Ignition coil #1	O

No.	Connected parts	Wire harness color
17	ISC (Idle Speed Control) unit	W/G
18	ISC (Idle Speed Control) unit	Br/L
19	—	—
20	—	—
21	Intake air pressure sensor	P/W
22	—	—
23	Lean angle sensor	Y/G
24	Shift sensor (OPTION)	V
25	Intake air temperature sensor	Br/W
26	Relay unit, starting circuit cut-off relay, starter relay	L/W
27	—	—
28	Purge cut valve solenoid (for California only)	Br/R
29	—	—
30	Fuel injector #2	G/B
31	Relay unit (diode), starting circuit cut-off relay, gear position switch, clutch switch	B/Y
32	Fuel injector #1	R/B
33	ISC (Idle Speed Control) unit	P/L
34	ISC (Idle Speed Control) unit	R/G
35	Coolant temperature sensor	G/W

No.	Connected parts	Wire harness color
36	O_2 sensor	Gy/G
37	—	—
38	—	—
39	Hydraulic unit assembly (ABS ECU)	W/Y
40	—	—
41	Fuel injector #1, fuel injector #2, fuel pump relay, fuel pump	R/L
42	Fuel injection system fuse	R/B
43	O_2 sensor heater	P/B
44	—	—
45	—	—
46	Engine ground	B/W
47	Headlight control unit, dimmer switch, pass switch	Y/B
48	Engine ground	B

EAS20440
FUEL INJECTION SYSTEM

EAS32871
CIRCUIT DIAGRAM



1. Main switch
2. Fuse box 2
6. ABS ECU fuse
8. Fuse box 1
9. Ignition fuse
12. Fuel injection system fuse
13. Backup fuse
17. Battery
18. Engine ground
19. Main fuse
23. Relay unit
24. Starting circuit cut-off relay
25. Fuel pump relay
26. Joint coupler
27. Crankshaft position sensor
28. Intake air pressure sensor
29. Lean angle sensor
30. O_2 sensor
31. Throttle position sensor
32. Shift sensor (OPTION)
33. Intake air temperature sensor
34. Coolant temperature sensor
35. ECU (Engine Control Unit)
36. CCU (Communication Control Unit)
37. Ignition coil #1
38. Ignition coil #2
39. Spark plug
40. Fuel injector #1
41. Fuel injector #2
42. ISC (Idle Speed Control) unit
44. Rear wheel sensor
45. ABS ECU
47. Fuel pump
49. Meter assembly
50. Multi-function meter
53. Gear position switch
54. Sidestand switch
55. Handlebar switch (right)
57. Start/engine stop switch
59. Handlebar switch (left)
60. Clutch switch
76. Radiator fan motor relay
80. Purge cut valve solenoid (for California only)

*. For California: Br/R
Except for California: blank

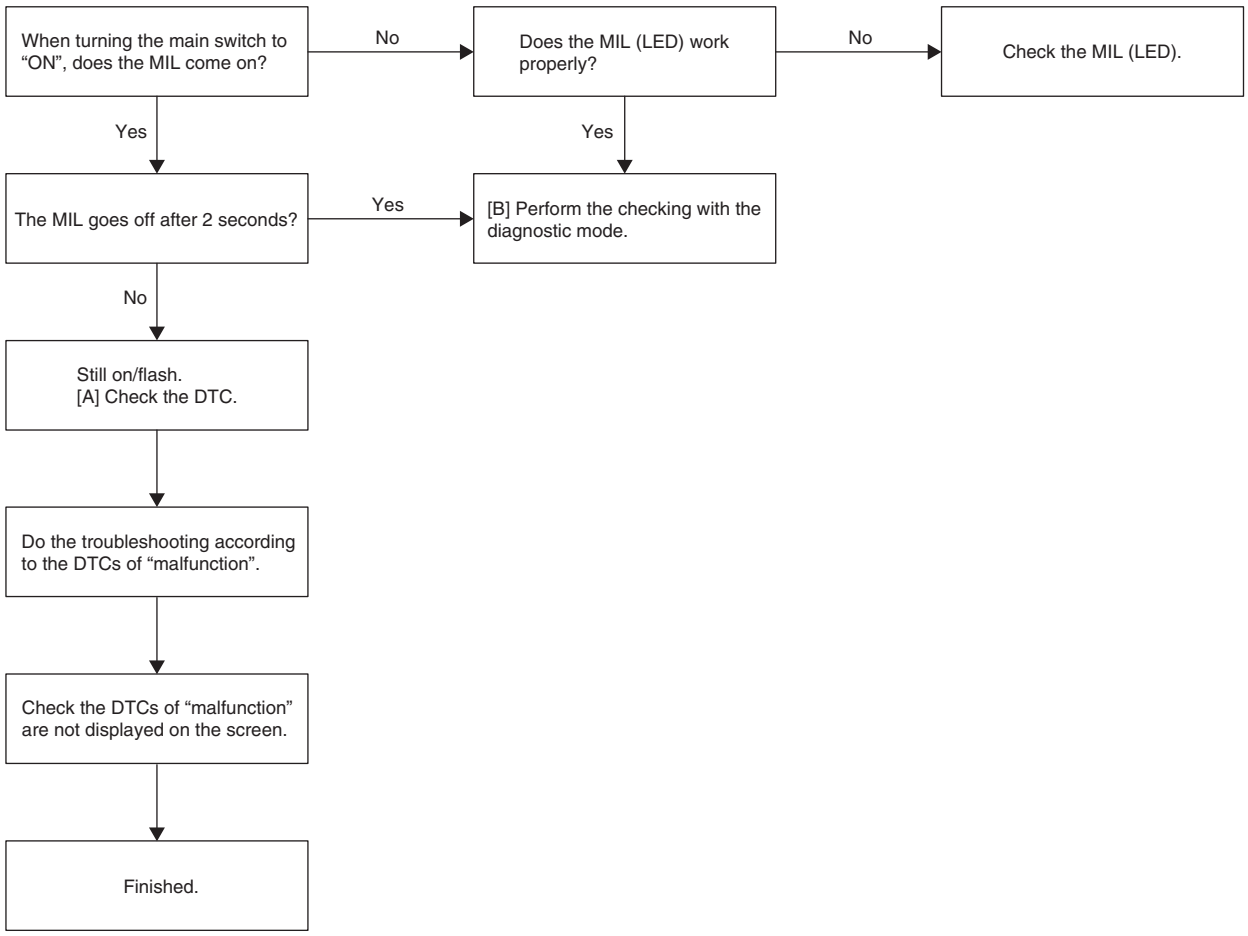
**. For California: B/R, R/W
Except for California: R/W

A. Wire harness
B. Sub-wire harness (throttle position sensor, coolant temperature sensor, fuel injector #1, fuel injector #2, ISC (Idle Speed Control) unit, gear position switch)

EAS32917

BASIC PROCESS FOR TROUBLESHOOTING

This section describes the basic process about fuel injection system troubleshooting.
But because a work procedure varies depending to symptom and DTC, check and repair it according to applicable troubleshooting.



EAS33147
[A] THE MIL COMES ON/FLASHES AND ENGINE OPERATION IS NOT NORMAL

1. Check the DTC of “malfunction” using the YDT.
2. Check and repair the malfunction according to applicable DTC troubleshooting.
3. Turn the main switch from “OFF” to “ON”, and then check the DTC of “malfunction” is not displayed.

TIP

- If another DTC is displayed, repeat steps (1) to (3) until no DTC is displayed.
- Turning the main switch to “OFF” will not erase the malfunction history.

EAS33148
[B] THE MIL DOES NOT COME ON, BUT THE ENGINE OPERATION IS NOT NORMAL

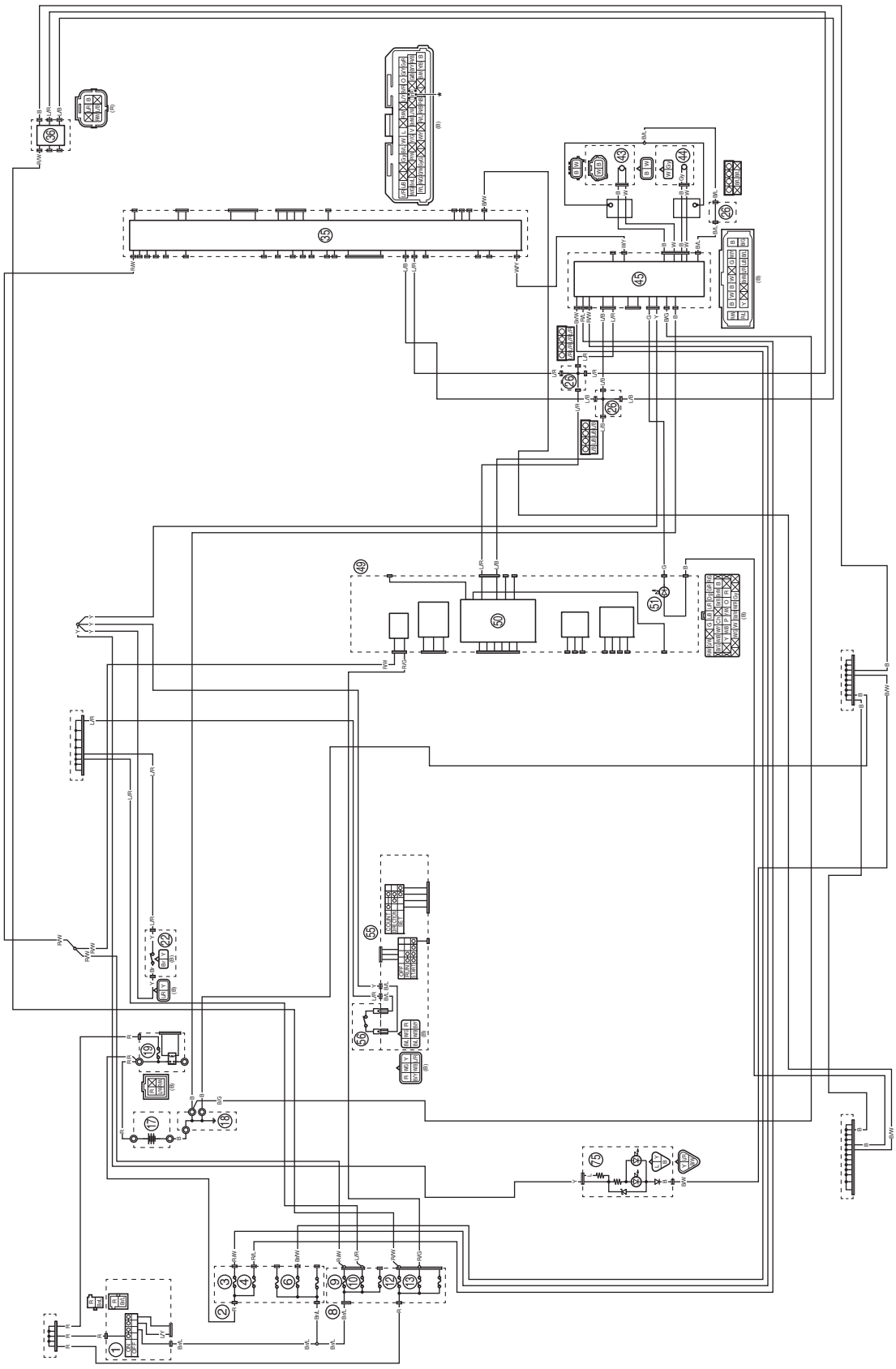
1. Monitor the operation of these sensors and actuators by using the YDT in the diagnostic mode. Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-42 and “DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE” on page 9-45.

01: Throttle position sensor signal (throttle angle) 30: Cylinder-#1 ignition coil 31: Cylinder-#2 ignition coil 36: Fuel injector #1 37: Fuel injector #2

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.

EAS20443
ABS (Anti-lock Brake System)

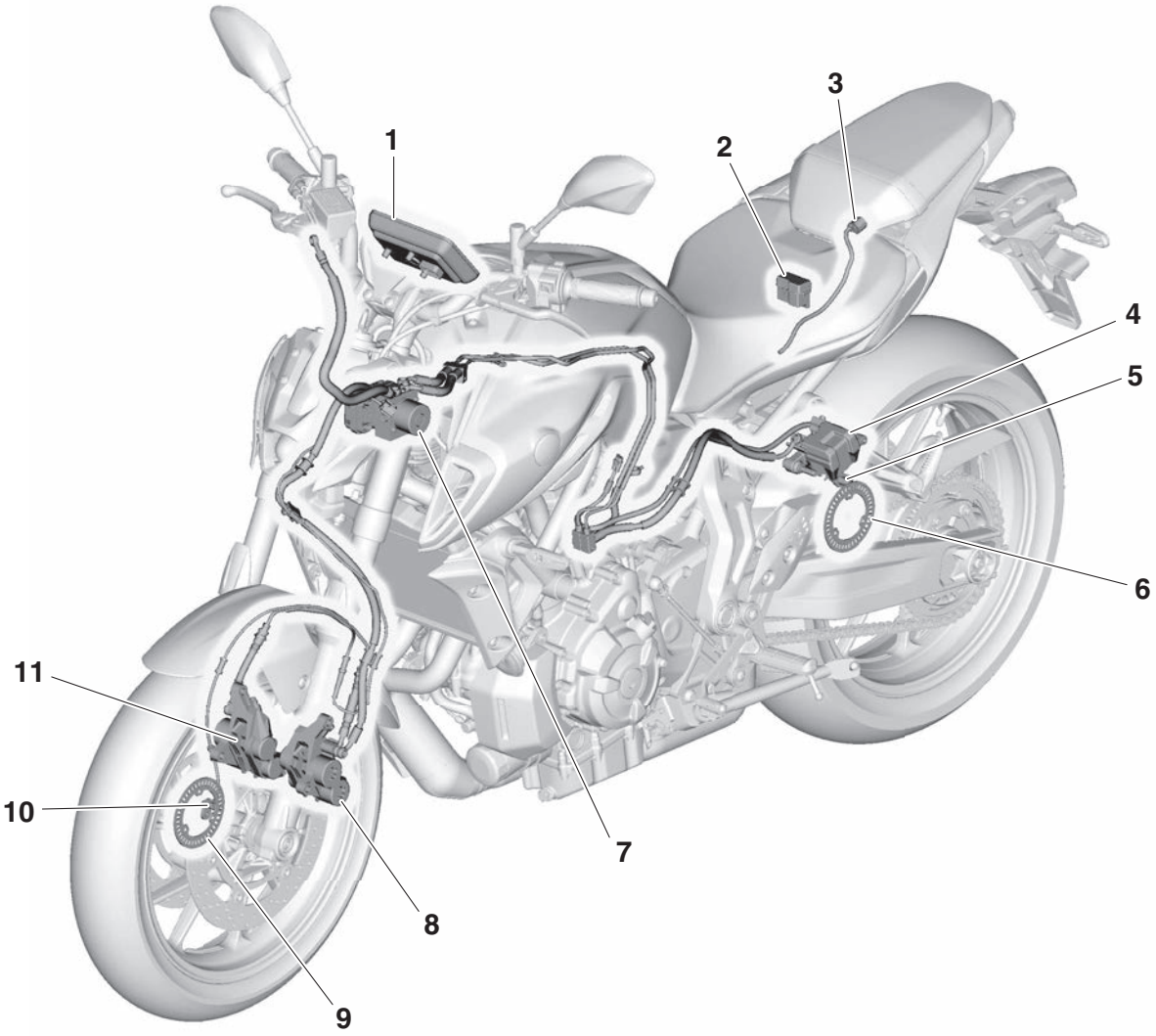
EAS32890
CIRCUIT DIAGRAM



1. Main switch
2. Fuse box 2
3. ABS solenoid fuse
4. ABS motor fuse
6. ABS ECU fuse
8. Fuse box 1
9. Ignition fuse
10. Signaling system fuse
12. Fuel injection system fuse
13. Backup fuse
17. Battery
18. Engine ground
19. Main fuse
22. Rear brake light switch
35. ECU (Engine Control Unit)
36. CCU (Communication Control Unit)
43. Front wheel sensor
44. Rear wheel sensor
45. ABS ECU
49. Meter assembly
50. Multi-function meter
51. ABS warning light
55. Handlebar switch (right)
56. Front brake light switch
75. Tail/brake light

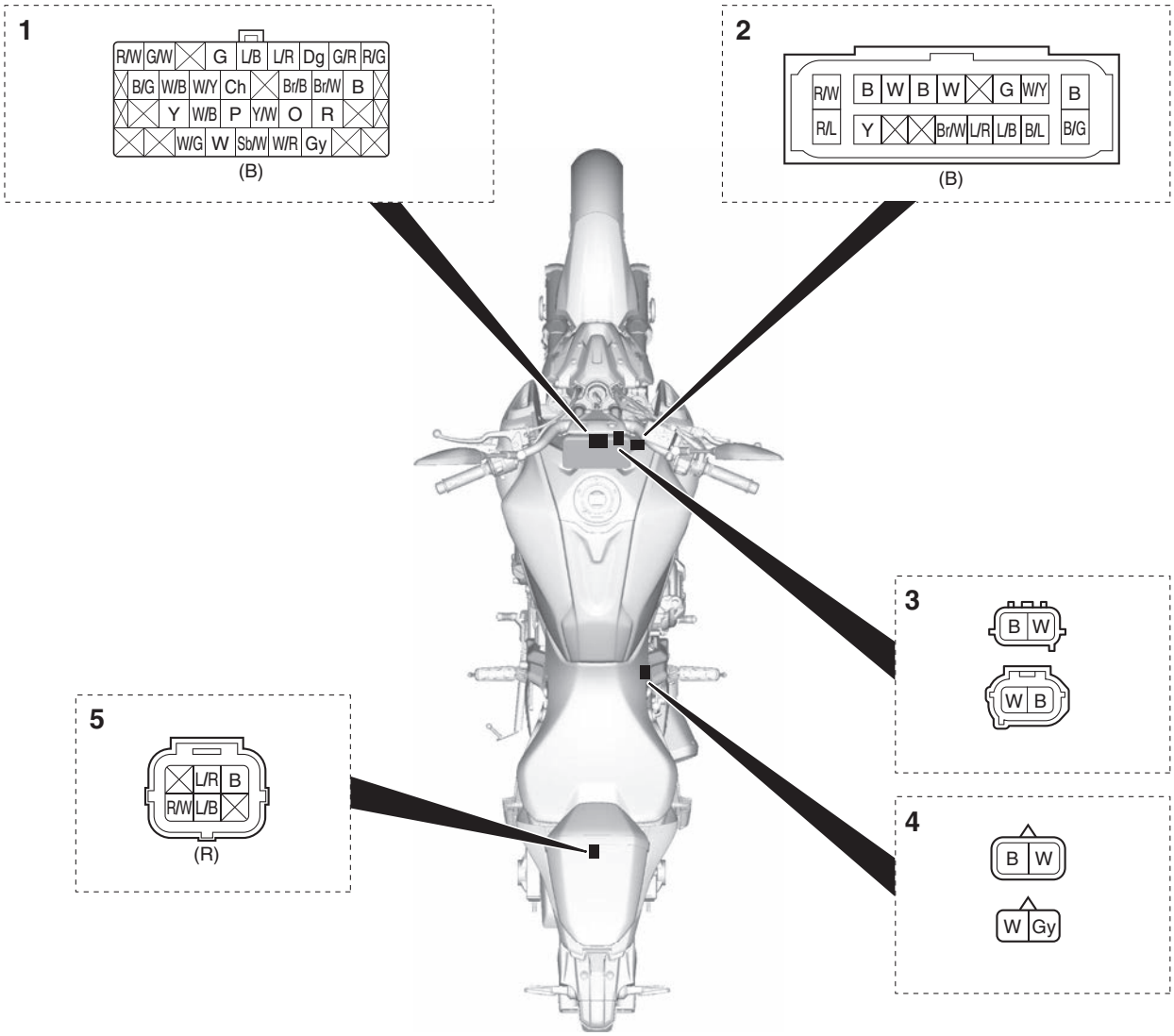
*. For California: Br/R
Except for California: blank

EAS32891
ABS COMPONENTS CHART



1. ABS warning light
2. Fuse box 2 (ABS motor fuse, ABS solenoid fuse, and ABS ECU fuse)
3. CCU (Communication Control Unit) coupler
4. Rear brake caliper
5. Rear wheel sensor
6. Rear wheel sensor rotor
7. ABS ECU
8. Front brake caliper (left)
9. Front wheel sensor rotor
10. Front wheel sensor
11. Front brake caliper (right)

EAS32892
ABS COUPLER LOCATION CHART



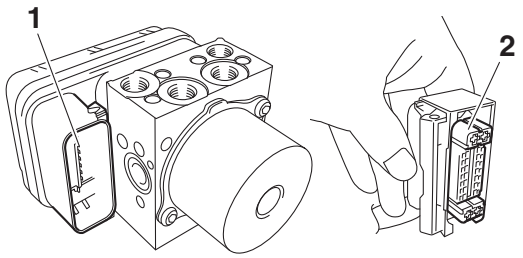
1. Meter assembly coupler
2. ABS ECU coupler
3. Front wheel sensor coupler
4. Rear wheel sensor coupler
5. CCU (Communication Control Unit) coupler

EAS32893
MAINTENANCE OF THE ABS ECU

Checking the ABS ECU
1. Check:
   - Terminals “1” of the hydraulic unit assembly (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.



EAS33284
ABS TROUBLESHOOTING OUTLINE

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 9-22.

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 9-18.

Self-diagnosis with 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 YDT when the ABS ECU has entered the self-diagnosis mode.

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 under the fuel tank, and if the brake lever or brake pedal are even slightly applied, a vibration can be felt at the lever and pedal, but these do not indicate a malfunction.

Special precautions for handling and servicing a vehicle equipped with ABS

ECA17620

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 DTC when the service is finished. (This is because the past DTC will be displayed again if another malfunction occurs.)

EAS32895

BASIC INSTRUCTIONS FOR TROUBLESHOOTING

1. Check the DTC of “malfunction” using the YDT.
2. Check and repair the malfunction according to applicable DTC troubleshooting.
3. Turn the main switch from “OFF” to “ON”, and then check the DTC of “malfunction” is not displayed.

TIP

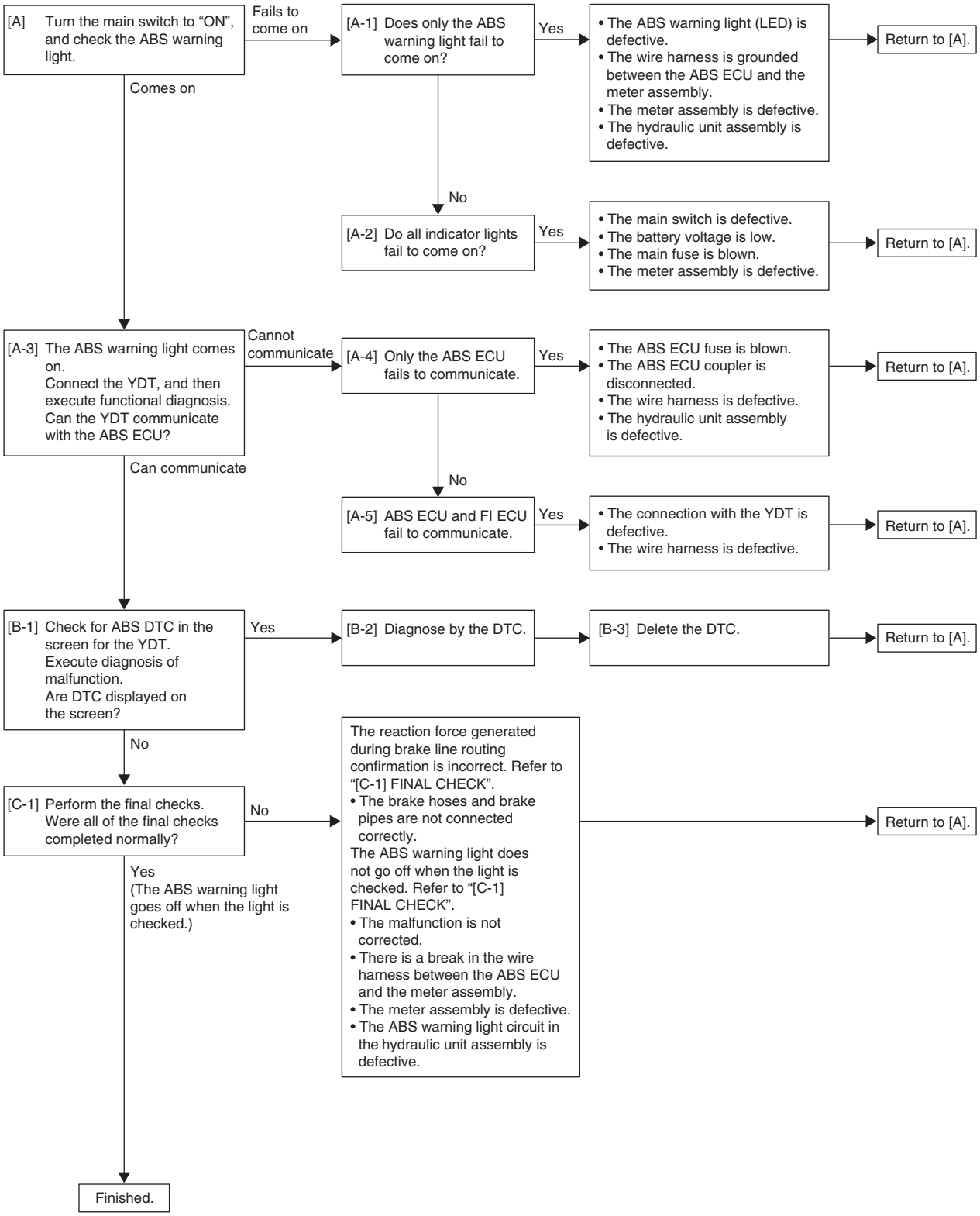
- If another DTC is displayed, repeat steps (1) to (3) until no DTC is displayed.
- Turning the main switch to “OFF” will not erase the malfunction history.

4. Do the final check.

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] Turn the main switch to "ON", and check the ABS warning light.
Fails to come on
[A-1] Does only the ABS warning light fail to come on?
Yes
• The ABS warning light (LED) is defective.
• The wire harness is grounded between the ABS ECU and the meter assembly.
• The meter assembly is defective.
• The hydraulic unit assembly is defective.
Return to [A].
No
[A-2] Do all indicator lights fail to come on?
Yes
• The main switch is defective.
• The battery voltage is low.
• The main fuse is blown.
• The meter assembly is defective.
Return to [A].
Comes on
[A-3] The ABS warning light comes on.
Connect the YDT, and then execute functional diagnosis.
Can the YDT communicate with the ABS ECU?
Cannot communicate
[A-4] Only the ABS ECU fails to communicate.
Yes
• The ABS ECU fuse is blown.
• The ABS ECU coupler is disconnected.
• The wire harness is defective.
• The hydraulic unit assembly is defective.
Return to [A].
No
[A-5] ABS ECU and FI ECU fail to communicate.
Yes
• The connection with the YDT is defective.
• The wire harness is defective.
Return to [A].
Can communicate
[B-1] Check for ABS DTC in the screen for the YDT.
Execute diagnosis of malfunction.
Are DTC displayed on the screen?
Yes
[B-2] Diagnose by the DTC.
[B-3] Delete the DTC.
Return to [A].
No
[C-1] Perform the final checks.
Were all of the final checks completed normally?
No
The reaction force generated during brake line routing confirmation is incorrect. Refer to "[C-1] FINAL CHECK".
• The brake hoses and brake pipes are not connected correctly.
The ABS warning light does not go off when the light is checked. Refer to "[C-1] FINAL CHECK".
• The malfunction is not corrected.
• There is a break in the wire harness between the ABS ECU and the meter assembly.
• The meter assembly is defective.
• The ABS warning light circuit in the hydraulic unit assembly is defective.
Return to [A].
Yes
(The ABS warning light goes off when the light is checked.)
Finished.

EAS32897
[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]

EAS32898
[A-1] ONLY THE ABS WARNING LIGHT FAILS TO COME ON
1. Check for a short circuit to the ground between the green terminal of the ABS ECU coupler and green 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.

EAS32899
[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 8-39.
   • 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 8-41.
   • 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 8-40.
   • If the main fuse is blown, replace the fuse.
4. Circuit
   • Check the meter assembly circuit.
   Refer to “CIRCUIT DIAGRAM” on page 9-13.
   • If the meter assembly circuit is open, replace the wire harness.

EAS32900
[A-3] THE ABS WARNING LIGHT COMES ON
Connect the YDT to the CCU (Communication Control Unit) coupler and execute functional diagnosis. (For information about how to execute functional diagnosis, refer to the operation manual that is included with the tool.)
Check that communication with the ABS ECU is possible.
• Only the ABS ECU fails to communicate. [A-4]
• ABS ECU and FI ECU fail to communicate. [A-5]
• Communication is possible with the ABS ECU. [B-1] (The ABS is displayed on the select unit screen.)

EAS32901
[A-4] ONLY THE ABS ECU FAILS TO COMMUNICATE
1. ABS ECU fuse
   • Check the ABS ECU fuse for continuity.
   Refer to “CHECKING THE FUSES” on page 8-40.
   • If the ABS ECU fuse is blown, replace the fuse.

2. ABS ECU coupler
   • Check that the ABS ECU coupler is connected properly.
   For information about connecting the ABS ECU coupler properly, refer to “INSTALLING THE HYDRAULIC UNIT ASSEMBLY” on page 4-62.
3. Wire harness
   • Open circuit between the main switch and the ABS ECU, or between the ABS ECU and the ground.
   Check for continuity between brown/blue terminal of the main switch coupler and brown/white terminal of the ABS ECU coupler.
   Check for continuity between black/green 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 CCU (Communication Control Unit) coupler.
   Check for continuity between blue/red terminal of the ABS ECU coupler and blue/red terminal of the CCU (Communication Control Unit) coupler. (CANH)
   Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the CCU (Communication Control Unit) coupler. (CANL)
4. ABS ECU malfunction
   Replace the hydraulic unit assembly.

EAS32902
[A-5] ABS ECU AND FI ECU FAIL TO COMMUNICATE
1. YDT
   Check that the YDT is properly connected.
2. Wire harness
   • Open circuit in the wire harness between the ABS ECU coupler and the CCU (Communication Control Unit) coupler.
   Check for continuity between blue/white terminal of the ABS ECU coupler and blue/red terminal of the CCU (Communication Control Unit) coupler. (CANH)
   Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the CCU (Communication Control Unit) coupler. (CANL)

EAS32903
[B-1] MALFUNCTION ARE CURRENTLY DETECTED
When the YDT is connected to the CCU (Communication Control Unit) coupler, the DTC will be displayed on the computer screen.
• A DTC is displayed. [B-2]
• A DTC is not displayed. [C-1]

EAS32904
[B-2] DIAGNOSIS USING THE DTC
This model uses the YDT to identify malfunctions.
For information about using the YDT, refer to the operation manual that is included with the tool.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

TIP
• Yamaha diagnostic tool (A/I) (90890-03273) includes YDT sub harness (6P) (90890-03266).
• If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

Refer to “YDT” on page 9-3.

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

TIP

Do the final check after terminating the connection with the YDT and turning the main switch off. [C-1]

EAS33339
[B-3] DELETING THE DTC

To delete the DTCs, use the YDT. For information about deleting the DTCs, refer to the operation manual of the YDT.
Check that all the displayed DTCs are deleted.

Yamaha diagnostic tool USB (US)
90890-03269
Yamaha diagnostic tool (A/I)
90890-03273

TIP

- Yamaha diagnostic tool (A/I) (90890-03273) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

Refer to “YDT” on page 9-3.

EAS32905
[C-1] FINAL CHECK

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.

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 the rear brake master cylinder reservoir.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-15.
2. Check the wheel sensors for proper installation.
   Refer to “INSTALLING THE FRONT WHEEL (DISC BRAKE)” on page 4-24 and “INSTALLING THE REAR WHEEL (REAR BRAKE DISC)” on page 4-33.
3. Perform brake line routing confirmation.
   Refer to “HYDRAULIC UNIT OPERATION TESTS” on page 4-64.
   If it does not have reaction-force properly, the brake hose is not properly routed or connected.
4. Delete the DTCs.
   Refer to “[B-3] DELETING THE DTC” on page 9-22.

5. Checking the ABS warning light.
   Confirm the ABS warning light go off.
   If the ABS warning light does not come on or does not go off, refer to “[A] CHECKING THE ABS WARNING LIGHT” on page 9-20.
   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 green terminal of the ABS ECU coupler and green terminal of the meter assembly coupler.
   - Malfunction in the meter assembly circuit.
   - Malfunction in the ABS warning light circuit in the hydraulic unit assembly.

EAS20551
SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS33149
DTC TABLE

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
“11, 25_ABS”	Front wheel sensor (intermittent pulses or no pulses)	—	—	—
“12_ABS”	Rear wheel sensor (intermittent pulses or no pulses)	—	—	—
“13, 26_ABS”	Front wheel sensor (abnormal pulse period)	—	—	—
“14, 27_ABS”	Rear wheel sensor (abnormal pulse period)	—	—	—
“15_ABS”	Front wheel sensor (open or short circuit)	—	—	—
“16_ABS”	Rear wheel sensor (open or short circuit)	—	—	—
“17, 45_ABS”	Front wheel sensor (missing pulses)	—	—	—
“18, 46_ABS”	Rear wheel sensor (missing pulses)	—	—	—
“21_ABS”	Hydraulic unit assembly (defective solenoid drive circuit)	—	—	—
“24_ABS”	Brake light switch or tail/brake light	—	—	—
“30_EVENT”	Overturn is detected.	Unable	Unable	08
“31_ABS”	Hydraulic unit assembly (defective ABS solenoid power circuit)	—	—	—
“32_ABS”	Hydraulic unit assembly (short circuit in ABS solenoid power supply circuit)	—	—	—
“33_ABS”	Hydraulic unit assembly (abnormal ABS motor power supply)	—	—	—
“34_ABS”	Hydraulic unit assembly (short circuit in ABS motor power supply circuit)	—	—	—
“41_ABS”	Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	—	—	—
“42, 47_ABS”	Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	—	—	—
“43_ABS”	Front wheel sensor (missing pulses)	—	—	—
“44_ABS”	Rear wheel sensor (missing pulses)	—	—	—
“51, 52_ABS”	[51_ABS] Vehicle system power supply (voltage of ABS ECU power supply is high) [52_ABS] Vehicle system power supply (voltage of wheel sensor power supply is high)	—	—	—

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
“53_ABS”	Vehicle system power supply (voltage of ABS ECU power supply is low)	—	—	—
“54_ABS”	Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)	—	—	—
“55_ABS”	Hydraulic unit assembly (defective ABS ECU)	—	—	—
“56_ABS”	Hydraulic unit assembly (abnormal internal power supply)	—	—	—
“63_ABS”	Front wheel sensor power supply (voltage of power supply is low)	—	—	—
“64_ABS”	Rear wheel sensor power supply (voltage of power supply is low)	—	—	—
“70_EVENT”	Engine forcibly stops when the vehicle is left idling for a long period.	Unable	Unable	—
“P0030”	O_2 sensor heater: defective heater or heater driver ON/OFF command and error signal is mismatching.	Able	Able	—
“P00D1, P2195”	[P00D1] O_2 sensor: heater performance is deteriorated and normal signal is not received from the O_2 sensor while driving the O_2 sensor. [P2195] O_2 sensor: open circuit is detected. Normal signal is not received from the O_2 sensor.	Able	Able	—
“P0107, P0108”	[P0107] Intake air pressure sensor: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor. [P0108] Intake air pressure sensor: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor.	Able	Able	04
“P0112, P0113”	[P0112] Intake air temperature sensor: short to ground circuit is detected. Normal signal is not received from the intake air temperature sensor. [P0113] Intake air temperature sensor: open or short to power circuit is detected. Normal signal is not received from the intake air temperature sensor.	Able	Able	05
“P0117, P0118”	[P0117] Coolant temperature sensor: short to ground circuit is detected. [P0118] Coolant temperature sensor: open or short to power circuit is detected.	Able	Able	06

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"P0122, P0123"	[P0122] Throttle position sensor: open or short to ground circuit is detected. Normal signal is not received from the throttle position sensor. [P0123] Throttle position sensor: short to power circuit is detected. Normal signal is not received from the throttle position sensor.	Able/Depends on the situation	Able/Depends on the situation	01
"P0132"	O_2 sensor: short to power circuit is detected.	Able	Able	—
"P0201"	Fuel injector #1: malfunction in fuel injector #1. Normal signal is not received from the fuel injector #1.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)	36
"P0202"	Fuel injector #2: malfunction in fuel injector #2. Normal signal is not received from the fuel injector #2.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)	37
"P0335"	Crankshaft position sensor: normal signals are not received from the crankshaft position sensor.	Unable	Unable	—
"P0351"	Cylinder-#1 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#1 ignition coil. Normal signal is not received from the ignition circuit.	Unable	Unable	30
"P0352"	Cylinder-#2 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#2 ignition coil. Normal signal is not received from the ignition circuit.	Unable	Unable	31
"P0458"*	Purge cut valve solenoid: open circuit is detected. Purge cut valve solenoid is not operated.	Able	Able	46
"P0480"	Radiator fan motor relay: open or short circuit is detected. Normal signal is not received from the radiator fan motor relay.	Able	Able	51
"P0507"	Engine idling speed is too high.	Able	Able	54
"P0511"	ISC (Idle Speed Control) valve: ISC valve is not operated.	Able	Able	54
"P0560, P0563"	[P0560] Charging voltage regulator is abnormal. (Discharged condition) [P0563] Charging voltage regulator is abnormal. (Overcharged condition)	Able	Able	—
"P0601"	Internal malfunction in ECU. (When this malfunction is detected in the ECU, the DTC might not appear on the tool display.)	Unable	Unable	—

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
“P062F”	EEPROM DTC: an error is detected while reading or writing on EEPROM.	Depends on the situation of EEPROM failure	Depends on the situation of EEPROM failure	60
“P0657”	Fuel system voltage: normal voltage is not supplied to the fuel injector and fuel pump.	Able	Able	09, 50
“P1500”	Rear wheel sensor: normal signals are not received from the rear wheel sensor. Gear position switch: open or short circuit is detected. Clutch switch: open or short circuit is detected.	Able	Able	07, 21
“P1601”	Sidestand switch: open or short circuit of the black/red lead of the ECU is detected. Normal signal is not received from the sidestand switch.	Unable	Unable	20
“P1602”	Malfunction in ECU internal circuit (malfunction of ECU power cut-off function).	Depends on the situation	Depends on the situation	—
“P1604, P1605”	[P1604] Lean angle sensor: short to ground circuit is detected. [P1605] Lean angle sensor: open or short to power circuit is detected. Normal signal is not received from the lean angle sensor.	Unable	Unable	08
“U0155 or Err”	Multi-function meter: signals cannot be transmitted between the ECU and the multi-function meter.	Able	Able	—

*“P0458” is indicated for California only.

EAS33028
SELF-DIAGNOSTIC FUNCTION TABLE (FOR FUEL INJECTION SYSTEM)

TIP

For details of the DTC, refer to “BASIC PROCESS FOR TROUBLESHOOTING” on page 9-11.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
30_EVENT	Overturn is detected.	• The vehicle has overturned. • Installed condition of lean angle sensor. • Defective lean angle sensor. • Malfunction in ECU.	—	—
70_EVENT	Engine forcibly stops when the vehicle is left idling for a long period.	• Allow to idle for a long period of time. • Malfunction in ECU.	—	—
P0030	O_2 sensor heater: defective heater or heater driver ON/OFF command and error signal is mismatching.	• Open or short circuit in wire harness. • Disconnected coupler. • Defective O_2 sensor heater driver (Malfunction in ECU). • Broken or disconnected lead in O_2 sensor heater.	(When the O_2 sensor does not operate because the exhaust temperature is low.) Increased exhaust emissions. Fuel learning cannot be carried out.	Display only (If the O_2 sensor does not operate, O_2 feedback is not carried out.)
P00D1	O_2 sensor: heater performance is deteriorated and normal signal is not received from the O_2 sensor while driving the O_2 sensor.	• Improperly installed O_2 sensor. • Defective coupler between O_2 sensor and ECU. • Open or short circuit in wire harness between O_2 sensor and ECU. • Incorrect fuel pressure. • Defective O_2 sensor. • Malfunction in ECU.	Increased exhaust emissions.	O_2 feedback is not carried out. O_2 learning is not carried out.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0107 P0108	[P0107] Intake air pressure sensor: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor. [P0108] Intake air pressure sensor: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor.	[P0107] Low voltage of the intake air pressure sensor circuit (0.5 V or less) [P0108] High voltage of the intake air pressure sensor circuit (4.8 V or more) • Defective coupler between intake air pressure sensor and ECU. • Open or short circuit in wire harness between intake air pressure sensor and ECU. • Defective intake air pressure sensor. • Malfunction in ECU.	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]. α–N is fixed. Fuel is not cut off due to the intake air pressure difference. Intake air pressure is fixed to 101.3 [kPa]. O_2 feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.
P0112 P0113	[P0112] Intake air temperature sensor: short to ground circuit is detected. Normal signal is not received from the intake air temperature sensor. [P0113] Intake air temperature sensor: open or short to power circuit is detected. Normal signal is not received from the intake air temperature sensor.	[P0112] Low voltage of the intake air temperature sensor circuit (0.1 V or less) [P0113] High voltage of the intake air temperature sensor circuit (4.8 V or more) • Defective coupler between intake air temperature sensor and ECU. • Open or short circuit in wire harness between intake air temperature sensor and ECU. • Improperly installed intake air temperature sensor. • 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 sensor heater driving is not carried out. O_2 feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0117 P0118	[P0117] Coolant temperature sensor: short to ground circuit is detected. [P0118] Coolant temperature sensor: open or short to power circuit is detected.	[P0117] Low voltage of the coolant temperature sensor circuit (0.1 V or less) [P0118] High voltage of the coolant temperature sensor circuit (4.9 V or more) • 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.	The radiator fan motor relay is on only when the vehicle is traveling at low speeds. O_2 feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out. The coolant temperature is fixed to 60 [°C].
P0122 P0123	[P0122] Throttle position sensor: open or short to ground circuit is detected. Normal signal is not received from the throttle position sensor. [P0123] Throttle position sensor: short to power circuit is detected. Normal signal is not 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) • Defective coupler between throttle position sensor and ECU. • Open or short circuit in wire harness between throttle position sensor and ECU. • Improperly installed throttle position sensor. • 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. Vehicle cannot be driven.	Change in the throttle opening value is 0 (transient control is not carried out). D–j is fixed. Throttle opening is fixed to 125[°]. Atmospheric pressure is fixed to 101.3 [kPa]. O_2 feedback is not carried out. Fuel is not cut off due to the throttle opening. Output is restricted. ISC feedback is not carried out. ISC learning is not carried out.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0132	O_2 sensor: short to power circuit is detected.	High voltage of the O_2 sensor circuit (4.8 V or more) • Improperly installed O_2 sensor. • Defective coupler between O_2 sensor and ECU. • Open or short circuit in wire harness between O_2 sensor and ECU. • Incorrect fuel pressure. • Defective O_2 sensor. • Malfunction in ECU.	Increased exhaust emissions.	O_2 feedback is not carried out. O_2 feedback learning is not carried out.
P0201 P0202	[P0201] Fuel injector #1: malfunction in fuel injector #1. Normal signal is not received from the fuel injector #1. [P0202] Fuel injector #2: malfunction in fuel injector #2. Normal signal is not received from the fuel injector #2.	• 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. 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.
P0335	Crankshaft position sensor: normal signals are not received from the crankshaft position sensor.	• 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. • Malfunction in generator rotor. • Defective crankshaft position sensor. • Malfunction in ECU.	Engine cannot be started.	Does not operate. ISC feedback is not carried out. ISC learning is not carried out.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0351 P0352	[P0351] Cylinder-#1 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#1 ignition coil. Normal signal is not received from the ignition circuit. [P0352] Cylinder-#2 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#2 ignition coil. Normal signal is not received from the ignition circuit.	• 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. Engine idling speed is unstable. Increased exhaust emissions.	Injection to the applicable cylinder group is cut off. O_2 feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.
P0458*	Purge cut valve solenoid: open circuit is detected. Purge cut valve solenoid is not operated.	• Open or short circuit in wire harness. • Defective purge cut valve solenoid. • Malfunction in ECU.	Vapor gas cannot be purged from canister.	Closing side on purge cut valve solenoid is fixed.
P0480	Radiator fan motor relay: open or short circuit is detected. Normal signal is not received from the radiator fan motor relay.	• Open or short circuit in wire harness. • Disconnected coupler. • Defective radiator fan motor relay. • Defective radiator fan motor relay controller (Malfunction in ECU).	Engine is difficult to start. Loss of engine power. Engine overheats. Increased exhaust emissions.	Radiator fan motor relay is off all the time. O_2 feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0507	Engine idling speed is too high.	• Defective rear wheel sensor. • Defective coupler between ISC unit and ECU. • Open or short circuit in wire harness between ISC unit and ECU. • Improperly installed ISC unit. • Disconnected ISC unit hose or air sucking 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.	ISC learning is not carried out.
P0511	ISC (Idle Speed Control) valve: ISC valve is not operated.	• Defective coupler between ISC unit and ECU. • Open or short circuit in wire harness between ISC unit and ECU. • Defective ISC stepping motor. • Malfunction in ECU.	Engine is difficult to start. Engine idling speed is unstable. Engine idling speed is high.	Power is not supplied to the ISC unit. ISC learning is not carried out.
P0560	Charging voltage regulator is abnormal. (Discharged condition)	• Battery discharging (broken or disconnected lead in charging system). • Battery 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.
P0563	Charging voltage regulator is abnormal. (Overcharged condition)	• Battery overcharging (defective rectifier/regulator). • Battery overcharging (broken or disconnected lead in rectifier/regulator wire harness).	Engine is difficult to start. Increased exhaust emissions. Battery performance has deteriorated or battery is defective.	O_2 feedback is not carried out.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0601	Internal malfunction in ECU. (When this malfunction is detected in the ECU, the DTC might not appear on the tool display.)	• Malfunction in ECU.	Engine cannot be started.	Engine cannot be started.
P062F	EEPROM DTC: an error is detected while reading or writing on EEPROM.	• CO adjustment value is not properly written. • ISC learning value is not properly written. • O_2 feedback learning value is not properly written. • OBD memory value is not properly written. • Malfunction in ECU.	Increased exhaust emissions. Engine cannot be started or is difficult to start. Engine idling speed is unstable. OBD memory value is not correct.	CO adjustment value for the faulty cylinder = 0 (default value) ISC learning values = Default values. OBD memory value is initialized. Initialization of O_2 feedback learning value.
P0657	Fuel system voltage: normal voltage is not supplied to the fuel injector and fuel pump.	• Open or short circuit in wire harness between relay unit and ECU. • Open circuit in wire harness between battery and ECU. • Defective relay unit. • Malfunction in ECU.	Engine is difficult to start. Increased exhaust emissions.	Monitor voltage = 12 [V] O_2 feedback is not carried out.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P1500	• Rear wheel sensor: normal signals are not received from the rear wheel sensor. • gear position switch: open or short circuit is detected. • Clutch switch: open or short circuit is detected.	• Open or short circuit in wire harness between rear wheel sensor and ECU. • Open or short circuit in wire harness between ABS unit and ECU. • Open or short circuit in wire harness between gear position switch and ECU. • Open or short circuit in wire harness between clutch switch and ECU. • Defective rear wheel sensor. • Defective gear position switch. • Defective clutch switch. • Improper adjustment of clutch lever. • Malfunction in ECU.	Vehicle speed is not displayed on the meter. Indication of the neutral indicator light is incorrect. Engine idling speed is unstable.	Vehicle speed displayed on the meter = 0 [km/h] O_2 feedback is not carried out. Fuel cut-off control when the rear wheel sensor or gear position switch malfunctions is carried out. ISC feedback is not carried out. ISC learning is not carried out.
P1601	Sidestand switch: open or short circuit of the black/red lead of the ECU is detected. Normal signal is not received from the sidestand switch.	• Defective coupler between relay unit and ECU. • Open or short circuit in wire harness between relay unit and ECU. • Defective coupler between sidestand switch and relay unit. • Open or short circuit in wire harness between sidestand switch and relay unit. • Defective sidestand switch. • Malfunction in ECU.	Engine cannot be started.	Engine is forcefully stopped (the injector output is stopped).

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P1602	Malfunction in ECU internal circuit (malfunction of ECU power cut-off function).	• Open or short circuit in wire harness between ECU and battery. • Open or short circuit in wire harness between ECU and main switch. • Blown fuel injection system fuse. • Malfunction in ECU.	Engine idling speed is unstable. Engine idling speed is high. Increased exhaust emissions. Engine is difficult to start.	O_2 feedback learning is not carried out. O_2 feedback learning value is not written.
P1604 P1605	[P1604] Lean angle sensor: short to ground circuit is detected. [P1605] Lean angle sensor: open or short to power circuit is detected. Normal signal is not received from the lean angle sensor.	[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) • 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 cannot be started.
P2195	O_2 sensor: open circuit is detected. Normal signal is not received from the O_2 sensor.	• Signal voltage is 0.18–0.49 V. • Improperly installed O_2 sensor. • Defective coupler between O_2 sensor and ECU. • Open or short circuit in wire harness between O_2 sensor and ECU. • Incorrect fuel pressure. • Defective O_2 sensor. • Malfunction in ECU.	Increased exhaust emissions.	O_2 feedback is not carried out. O_2 feedback learning is not carried out.

*"P0458" is indicated for California only.

EAS33286
SELF-DIAGNOSTIC FUNCTION TABLE (FOR ABS (Anti-lock Brake System))

TIP

For details of the DTC, refer to “BASIC INSTRUCTIONS FOR TROUBLESHOOTING” on page 9-18.

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

DTC	Item	Symptom	Check point
15	Front wheel sensor (open or short circuit)	Open or short circuit is detected in the front wheel sensor.	• Defective coupler between the front wheel sensor and the hydraulic unit assembly • Open or short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly • Defective front wheel sensor or hydraulic unit assembly
16	Rear wheel sensor (open or short circuit)	Open or short circuit is detected in the rear wheel sensor.	• Defective coupler between the rear wheel sensor and the hydraulic unit assembly • Open or short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly • Defective rear wheel sensor or hydraulic unit assembly
17* 45*	Front wheel sensor (missing pulses)	Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	• Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
18* 46*	Rear wheel sensor (missing pulses)	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	• Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
21	Hydraulic unit assembly (defective solenoid drive circuit)	Solenoid drive circuit in the hydraulic unit assembly is open or short circuited.	• Defective hydraulic unit assembly

DTC	Item	Symptom	Check point
24	Brake light switch or tail/ brake light	Brake light signal is not received properly while the vehicle is traveling. (Brake light circuit, or front or rear brake light switch circuit)	• Defective signaling system (tail/brake light or brake light switch) • Defective coupler between the signaling system (tail/brake light or brake light switch) and the hydraulic unit assembly • Open or short circuit in the wire harness between the signaling system (tail/brake light or brake light switch) and the hydraulic unit assembly • Defective hydraulic unit assembly
31	Hydraulic unit assembly (defective ABS solenoid power circuit)	Power is not supplied to the solenoid circuit in the hydraulic unit assembly.	• Blown ABS solenoid fuse • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective hydraulic unit assembly
32	Hydraulic unit assembly (short circuit in ABS solenoid power supply circuit)	Short circuit is detected in the solenoid power supply circuit in the hydraulic unit assembly.	• Defective hydraulic unit assembly
33	Hydraulic unit assembly (abnormal ABS motor power supply)	Power is not supplied to the motor circuit in the hydraulic unit assembly.	• Blown ABS motor fuse • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective hydraulic unit assembly
34	Hydraulic unit assembly (short circuit in ABS motor power supply circuit)	Short circuit is detected in the motor power supply circuit in the hydraulic unit assembly.	• Defective hydraulic unit assembly

DTC	Item	Symptom	Check point
41	Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	• Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. • Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.	• Incorrect installation of the front wheel sensor • Incorrect rotation of the front wheel • Front brake dragging • Defective hydraulic unit assembly
42 47	Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	• Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. (for DTC 42) • Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure.	• Incorrect installation of the rear wheel sensor (for DTC 42) • Incorrect rotation of the rear wheel • Rear brake dragging • Defective hydraulic unit assembly
43	Front wheel sensor (missing pulses)	Front wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	• Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
44	Rear wheel sensor (missing pulses)	Rear wheel sensor signal is not received properly. (Missing pulses are detected in the signal while the vehicle is traveling.)	• Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
51 52	• [51_ABS] Vehicle system power supply (voltage of ABS ECU power supply is high) • [52_ABS] Vehicle system power supply (voltage of wheel sensor power supply is high)	• Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too high. (for DTC 51) • Power voltage supplied to the wheel sensor is too high. (for DTC 52)	• Defective battery • Disconnected battery terminal • Defective charging system

DTC	Item	Symptom	Check point
53	Vehicle system power supply (voltage of ABS ECU power supply is low)	Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too low.	• Defective battery • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective charging system
54	Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)	Abnormality is detected in the solenoid or motor power supply circuit in the hydraulic unit assembly.	• Defective battery • Defective coupler between the battery and the hydraulic unit assembly • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly • Defective charging system • Defective hydraulic unit assembly
55	Hydraulic unit assembly (defective ABS ECU)	Abnormal data is detected in the hydraulic unit assembly.	• Defective hydraulic unit assembly
56	Hydraulic unit assembly (abnormal internal power supply)	Abnormality is detected in the power supply circuit in the hydraulic unit assembly.	• Defective hydraulic unit assembly
63	Front wheel sensor power supply (voltage of power supply is low)	Power voltage supplied from the ABS ECU to the front wheel sensor is too low.	• Short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly • Defective front wheel sensor • Defective hydraulic unit assembly
64	Rear wheel sensor power supply (voltage of power supply is low)	Power voltage supplied from the ABS ECU to the rear wheel sensor is too low.	• Short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly • Defective rear wheel sensor • Defective hydraulic unit assembly

* The DTC number varies according to the vehicle conditions.

EAS33030
COMMUNICATION ERROR WITH THE METER

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
U0155 (YDT) Err (multi-function meter display)	CAN communication error (with the meter)	Communication between the ECU and the meter is not possible • Defective meter coupler and ECU coupler • Open or short circuit in the wire harness between the meter and the ECU • Defective meter • Defective ECU	Defective meter display.	MAP changeover: State is fixed. Meter switch input: OFF is fixed. Grip warmer (OPTION) output: OFF is fixed.

EAS33031
DIAGNOSTIC CODE: SENSOR OPERATION TABLE

Code	Item	Tool display	Procedure
01	Throttle position sensor signal	Displays the throttle valve opening angle.	
	• Fully closed position	11–21 [deg.]	Check the fully closed throttle valves.
	• Fully opened position	96–106 [deg.]	Check the fully opened throttle valves.
04	Intake air pressure	Displays the intake air pressure. When engine is stopped: atmospheric pressure at the current altitude and weather conditions are indicated. At sea level: Approx.101 kPa At above sea level (3000 m): Approx. 70 kPa	Check the intake air pressure when starting the engine. (If the displaying value changes, the performance is OK.)
05	Intake air temperature	Displays the intake air temperature. -30 to 120°C (-22 to 248°F) When engine is cold: displays the closer air temperature to around the air temperature sensor. When engine is hot: displays the air temperature +approx. 20°C (68°F).	Compare the actually measured air temperature with the tool displayed value.

Code	Item	Tool display	Procedure
06	Coolant temperature	Displays the coolant temperature. -30 to 120°C (-22 to 248°F) When engine is cold: displays the closer air temperature to around the coolant temperature sensor. When engine is hot: displays the current coolant temperature.	Compare the actually measured coolant temperature with the tool displayed value.
07	Rear wheel vehicle speed pulses	Displays the rear wheel speed pulse 0–999 [pulse]	Check that the number increases when the rear wheel is rotated several turns and the number is cumulative. At the wheel stopped: the displayed value is constant value.
08	Lean angle sensor • Upright • Overturned	Displays the lean angle sensor output voltage 0.4–1.4 [V] 3.7–4.4 [V]	Remove the lean angle sensor and incline it more than 45 degrees.
09	Fuel system voltage (battery voltage)	Displays the fuel system voltage Approx. 12.0 [V]	Set the start/engine stop switch to "○", and then compare the actually measured battery voltage with the tool displayed value. (If the actually measured battery voltage is low, recharge the battery.)
20	Sidestand switch • Sidestand retracted • Sidestand extended	 ON OFF	Check the sidestand switch condition. (with the transmission in gear).
21	Gear position switch and clutch switch • Transmission is in neutral • Transmission is in gear or the clutch lever released • Clutch lever is squeezed with the transmission in gear and when the sidestand is retracted • Clutch lever is squeezed with the transmission in gear and when the sidestand is extended	 ON OFF ON OFF	Operate the transmission, clutch lever, and sidestand.

Code	Item	Tool display	Procedure
60	EEPROM DTC display • No history • History exists	 00 • Malfunction is not detected (If the DTC P062F is indicated, the ECU is defective.) 01–02 (#1 and #2 CO adjustment value) • (If more than one cylinder is defective, the display alternates every two seconds to show all the detected cylinder numbers. When all cylinder numbers are shown, the display repeats the same process.) Except 00-02 (EEPROM data error for corresponding learning/memory 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, set the start/engine stop switch from "⊗" to "◯" 3 times within 5 seconds.
70	Programmed unit version number	Displays the version number. 0–254 [-]	—
87	O_2 feedback learning data erasure	00 O_2 feedback learning data has been erased. 01 O_2 feedback learning data has not been erased.	To erase the O_2 feedback learning data, set the start/engine stop switch from "⊗" to "◯" 3 times within 5 seconds.

EAS33032
DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE

Code	Item	Actuation	Procedure
30	Cylinder-#1 ignition coil	Actuates the cylinder-#1 ignition coil five times at one-second intervals. The “check” indicator on the YDT screen comes on each time the ignition coil is actuated.	Connect the ignition checker and check that the sparking performance.
31	Cylinder-#2 ignition coil	Actuates the cylinder-#2 ignition coil five times at one-second intervals. The “check” indicator on the YDT screen comes on each time the ignition coil is actuated.	Connect the ignition checker and check that the sparking performance.
36	Fuel injector #1	Actuates the fuel injector #1 five times at one-second intervals. The “check” indicator on the YDT screen comes on each time the fuel injector is actuated.	Disconnect the fuel pump coupler before doing this procedure. Check that fuel injector #1 is actuated five times by listening for the operating sound.
37	Fuel injector #2	Actuates the fuel injector #2 five times at one-second intervals. The “check” indicator on the YDT screen comes on each time the fuel injector is actuated.	Disconnect the fuel pump coupler before doing this procedure. Check that fuel injector #2 is actuated five times by listening for the operating sound.
46*	Purge cut valve solenoid	Actuates the purge cut valve solenoid five times at one-second intervals. The “check” indicator on the YDT screen comes on each time the purge cut valve solenoid is actuated.	Check that the purge cut valve solenoid is actuated five times by listening for the operating sound.
50	Relay unit	Actuates the relay unit five times at one-second intervals. The “check” indicator on the YDT screen comes on each time the relay is actuated.	Check that the relay unit is actuated five times by listening for the operating sound.
51	Radiator fan motor relay	Actuates the radiator fan motor relay five times at five-second intervals. The “check” indicator on the YDT 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.

Code	Item	Actuation	Procedure
52	Headlight relay	Actuates the headlight five times at five-second intervals. The “check” indicator on the YDT screen comes on each time the headlight relay is actuated.	Check that the headlight relay is actuated five times by listening for the operating sound.
54	ISC valve	Fully closes the ISC valve, and then opens the valve. This operation is performed 3 times and takes about 6 seconds each time. The “check” indicator on the YDT screen comes on during the operation.	Check that the ISC unit is actuated three times by listening for the operating sound.

*46 is indicated for California only.

EAS20707
EVENT CODE TABLE

TIP

The event code numbers listed below cannot be displayed on the meter. To display the event code numbers, use the YDT.

No.	Item	Symptom	Possible causes	Note
192	Intake air pressure sensor	Momentary abnormality is detected in the intake air pressure sensor	Same as for DTC numbers P0107 and P0108	Perform the inspection items listed for DTC numbers P0107 and P0108.
193	Throttle position sensor	Momentary abnormality is detected in the throttle position sensor	Same as for DTC numbers P0122 and P0123	Perform the inspection items listed for DTC numbers P0122 and P0123.
195	Sidestand switch	Momentary abnormality is detected in the ECU (blue/yellow) input line	Same as for DTC number P1601	Perform the inspection items listed for DTC number P1601.
196	Coolant temperature sensor	Momentary abnormality is detected a in the coolant temperature sensor	Same as for DTC numbers P0117 and P0118	Perform the inspection items listed for DTC numbers P0117 and P0118.
197	Intake air temperature sensor	Momentary abnormality is detected in the intake air temperature sensor	Same as for DTC numbers P0112 and P0113	Perform the inspection items listed for DTC numbers P0112 and P0113.
203	Lean angle sensor	Momentary abnormality is detected in lean angle sensor	Same as for DTC numbers P1604 and P1605	Perform the inspection items listed for DTC numbers P1604 and P1605.
240	O_2 sensor (Stuck at the upper limit for adjustment)	During O_2 feedback, the adjustment is maintained at the upper limit	• Open or short circuit in the wire harness between the sensor and ECU • Drop in fuel pressure • Clogged fuel injector • Fault in sensor • Malfunction in ECU • Malfunction in the fuel injection system	• If a DTC is occurring, respond to that first. * Rarely, Code 240 occurs even when the system is functioning properly.
241	O_2 sensor (Stuck at the lower limit for adjustment)	During O_2 feedback, the adjustment is maintained at the lower limit	• Open or short circuit in the wire harness between the sensor and ECU • Drop in fuel pressure • Clogged fuel injector • Fault in sensor • Malfunction in ECU • Malfunction in the fuel injection system	• If a DTC is occurring, respond to that first. * Rarely, Code 241 occurs even when the system is functioning properly.

No.	Item	Symptom	Possible causes	Note
242	ISC (Stuck at the upper limit for adjustment)	During idling, the adjustment is maintained at the upper limit	Idling engine speed is slow • Clogged throttle body • Poorly adjusted throttle cable • Poorly adjusted clutch cable • Malfunction in the fuel injection system • Dirty or worn spark plug • Malfunction in the battery • Malfunction in ECU	• Implement diagnosis mode 67, and check the ISC maintenance request. • If a DTC is occurring, respond to that first. * Rarely, Code 242 occurs even when the system is functioning properly.
243	ISC (Stuck at the lower limit for adjustment)	During idling, the adjustment is maintained at the lower limit	Idling engine speed is fast • Poorly adjusted throttle cable • Poorly adjusted clutch cable • Malfunction in the fuel injection system • Dirty or worn spark plug • Malfunction in the battery • Malfunction in ECU	• If a DTC is occurring, respond to that first. * Rarely, Code 243 occurs even when the system is functioning properly.
244	Engine start failure or inability	Detecting the engine starting failure or inability	• No gasoline • Malfunction in the fuel injection system • Dirty or worn spark plug • Malfunction in the battery • Malfunction in ECU	• If a DTC is occurring, respond to that first. * Rarely, Code 244 occurs even when the system is functioning properly.
245	Engine stop	Engine stop is detected	• No gasoline • Poorly adjusted clutch cable • Malfunction in the fuel injection system • Dirty or worn spark plug • Malfunction in the battery • Malfunction in ECU	• If a DTC is occurring, respond to that first. * Rarely, Code 245 occurs even when the system is functioning properly.

EAS20552
30_EVENT

EAS33033
TROUBLESHOOTING
Item
Overturn is detected.

Procedure
1. The vehicle has overturned.
   • Raise the overturned vehicle vertically and check again.
   • Turn the main switch to “ON”, then to “OFF”, and then back to “ON”.

   Is the MIL on?
   YES
   → Go to step 2.
   NO
   → Service is completed.

2. Installed condition of lean angle sensor.
   • Check the installed direction and condition of the sensor.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   a. Fix the lean angle sensor installation condition.
   b. Turn the main switch to “ON”, then to “OFF”, and then back to “ON”.

      Is the MIL on?
      YES
      → Go to step 3.
      NO
      → Service is completed.

3. Defective lean angle sensor.
   • Execute the diagnostic mode. (Code 08)
   • Check that 0.4–1.4 V is displayed when the vehicle is vertical and that the displayed value increases as the vehicle continues to incline.

   Is check result OK?
   YES
   → Go to step 4.
   NO
   a. Replace the lean angle sensor.
   b. Turn the main switch to “ON”, then to “OFF”, and then back to “ON”.

      Is the MIL on?
      YES
      → Go to step 4.
      NO
      → Service is completed.

4. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

EAS20554
70_EVENT

EAS33034
TROUBLESHOOTING
Item
Engine forcibly stops when the vehicle is left idling for a long period.

Procedure
TIP

If another DTC is displayed at the same time, check the other DTC first and repair it.

1. Allow to idle for a long period.
   - Turn the main switch to “OFF”.
   - Check whether it is possible to start the engine.

   Can the engine starting?
   YES
   → Service is completed.
   NO
   → Go to step 2.
2. Malfunction in ECU.
   - Replace the ECU, and complete the service.
     Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

EAS20397
P0030

EAS33134
TROUBLESHOOTING

Item

O_2 sensor heater: defective heater or heater driver ON/OFF command and error signal is mismatching.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If the DTC P0030 is detected at the same time, perform the check and service for DTC listed below first.
- P0112, P0113, P0122, P0123

1. 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).

Is the coupler condition normal?

YES

→ Go to step 2.

NO

a. Connect the coupler securely or replace the wire harness.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

NO

→ Start the engine, and then check the DTC.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 2.

TIP

For this check, also set the start/engine stop switch to "◯".

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).

Is the coupler condition normal?

YES

→ Go to step 3.

NO

a. Connect the coupler securely or replace the wire harness.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

NO

→ Start the engine, and then check the DTC.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

NO

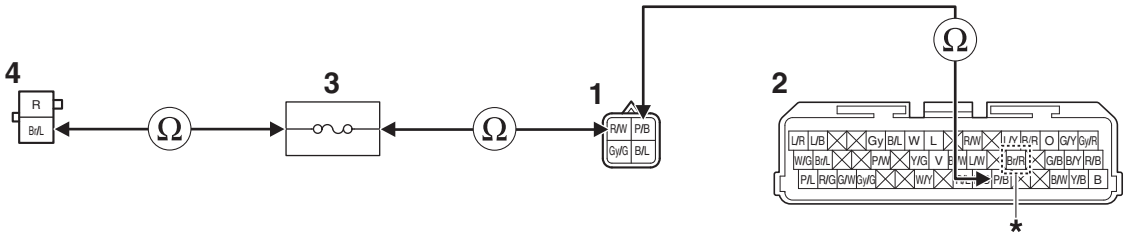
→ Go to step 3.

TIP

For this check, also set the start/engine stop switch to "○".

3. Wire harness continuity.
   - Disconnect the O_2 sensor coupler "1", ECU coupler "2", ignition fuse "3" and main switch coupler "4".
   - Open circuit check

Between O_2 sensor coupler "1" and ECU coupler "2"	pink/black–pink/black
Between O_2 sensor coupler "1" and ignition fuse "3" holder	red/white–red/white
Between main switch coupler "4" and ignition fuse "3" holder	brown/blue–brown/blue



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Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

NO

→ Start the engine, and then check the DTC.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to "Short circuit check".

TIP

For this check, also set the start/engine stop switch to "◯".

- Short circuit check

TIP

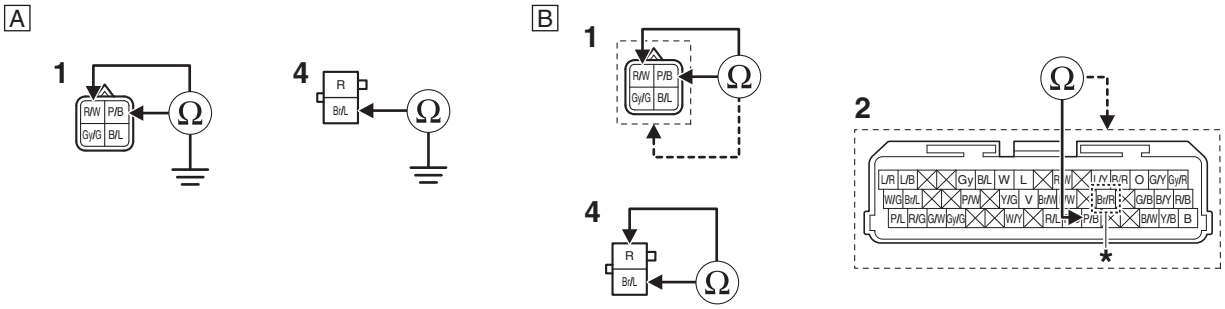
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between O_2 sensor coupler "1" and ground	red/white–ground pink/black–ground
Between main switch coupler "4" and ground	brown/blue–ground

Lines short circuit check "B"

O_2 sensor coupler "1"	red/white–any other coupler terminal pink/black–any other coupler terminal
ECU coupler "2"	pink/black–any other coupler terminal
Main switch coupler "4"	brown/blue–red



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Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

NO

→ Start the engine, and then check the DTC.

Is it in the "Recovered" condition?
YES
→ Go to step 6, and complete the service.
NO
→ Go to step 4.

TIP
For this check, also set the start/engine stop switch to "◯".

4. Defective O_2 sensor.
   • Replace the O_2 sensor.
   Refer to "ENGINE REMOVAL" on page 5-10.
   • Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?
YES
→ Go to step 6, and complete the service.
NO
→ Start the engine, and then check the DTC.

Is it in the "Recovered" condition?
YES
→ Go to step 6, and complete the service.
NO
→ Go to step 5.

TIP
For this check, also set the start/engine stop switch to "◯".

5. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-40.
6. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of "Recovered" using the YDT, and then delete the DTC.

EAS20660
P00D1, P2195

EAS33115
TROUBLESHOOTING

Item

- [P00D1] O_2 sensor: heater performance is deteriorated and normal signal is not received from the O_2 sensor while driving the O_2 sensor.
- [P2195] O_2 sensor: open circuit is detected. Normal signal is not received from the O_2 sensor.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If the DTC P0657, P2195 and P0030 are detected at the same time, perform the check and service for DTC listed below first.

- P0657
- P0030

1. Installed condition of O_2 sensor.
   - Check for looseness or pinching.

Is check result OK?

YES

→ Go to step 2.

NO

a. Reinstall or replace the O_2 sensor.
   Refer to “ENGINE REMOVAL” on page 5-10.
b. Start the engine and let it idle for approximately 1 minute.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 3.

NO

a. Connect the coupler securely or replace the wire harness.
b. Start the engine and let it idle for approximately 1 minute.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Start the engine and let it idle for approximately 1 minute.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

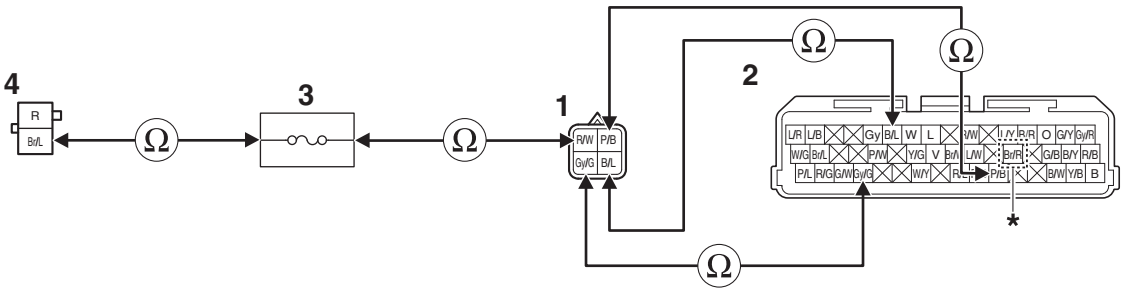
→ Go to step 8, and complete the service.

NO

→ Go to step 4.

4. Wire harness continuity.
   - Disconnect the O_2 sensor coupler "1", ECU coupler "2", ignition fuse "3" and main switch coupler "4".
   - Open circuit check

Between O_2 sensor coupler "1" and ECU coupler "2"	gray/green–gray/green pink/black–pink/black black/blue–black/blue
Between O_2 sensor coupler "1" and ignition fuse "3" holder	red/white–red/white
Between main switch coupler "4" and ignition fuse "3" holder	brown/blue–brown/blue



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Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Start the engine and let it idle for approximately 1 minute.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

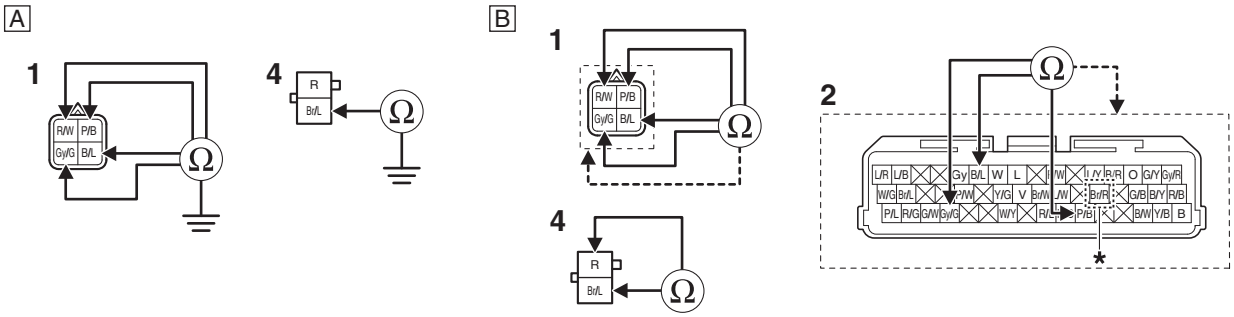
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between O_2 sensor coupler "1" and ground	gray/green–ground pink/black–ground black/blue–ground red/white–ground
Between main switch coupler "4" and ground	brown/blue–ground

Lines short circuit check "B"

O_2 sensor coupler "1"	gray/green–any other coupler terminal pink/black–any other coupler terminal black/blue–any other coupler terminal red/white–any other coupler terminal
ECU coupler "2"	gray/green–any other coupler terminal pink/black–any other coupler terminal black/blue–any other coupler terminal
Main switch coupler "4"	brown/blue–red



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Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

a. Replace the wire harness.
b. Start the engine and let it idle for approximately 1 minute.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 5.

5. Check fuel pressure.
   • Check the fuel pressure.
   Refer to "CHECKING THE FUEL PRESSURE" on page 7-17.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the fuel pump.
   Refer to "REMOVING THE FUEL PUMP" on page 7-4.
b. Start the engine and let it idle for approximately 1 minute.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 6.

6. Defective O_2 sensor.
   • Replace the O_2 sensor.
   Refer to "ENGINE REMOVAL" on page 5-10.
   • Start the engine and let it idle for approximately 1 minute.
   • Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 7.

7. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-40.
8. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of "Recovered" using the YDT, and then delete the DTC.

EAS20567
P0107, P0108

EAS33047
TROUBLESHOOTING

Item

- [P0107] Intake air pressure sensor: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor.
- [P0108] Intake air pressure sensor: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Connection of intake air pressure 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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 3.

3. Wire harness continuity.
   - Disconnect the intake air pressure sensor coupler “1” and ECU coupler “2”.

Is DTC P0107 displayed?

YES

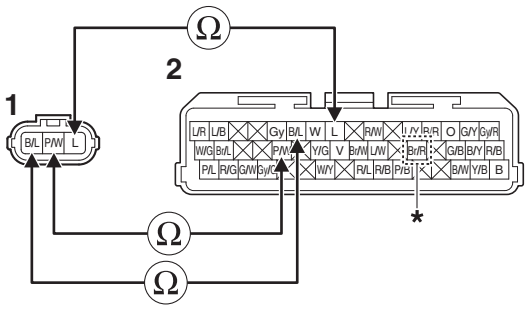
→ Go to “Short circuit check”.

NO

→ Go to “Open circuit check”.

• Open circuit check

Between intake air pressure sensor coupler “1” and ECU coupler “2”	[P0108] blue–blue [P0108] pink/white–pink/white [P0108] black/blue–black/blue



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

• Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

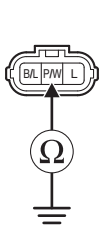
Ground short circuit check “A”

Between intake air pressure sensor coupler “1” and ground	[P0107] pink/white–ground

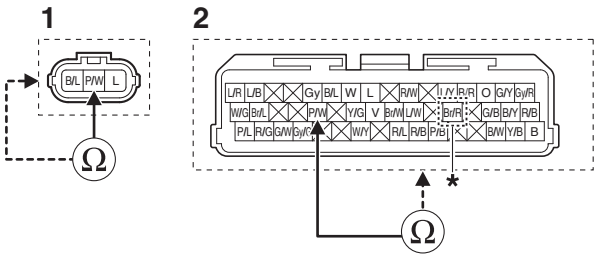
Lines short circuit check “B”

Intake air pressure sensor coupler “1”	[P0108] pink/white–any other coupler terminal
ECU coupler “2”	[P0108] pink/white–any other coupler terminal

A



B



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Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Installed condition of intake air pressure sensor.
   • Check for looseness or pinching.
   Refer to “GENERAL CHASSIS (5)” on page 4-15.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or replace the intake air pressure sensor.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective intake air pressure sensor.
   • Execute the diagnostic mode. (Code 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), approx. 3.64 V
1000 m (3300 ft) above sea level	Approx. 90 kPa (675.1 mmHg, 26.6 inHg), approx. 3.30 V
2000 m (6700 ft) above sea level	Approx. 80 kPa (600.0 mmHg, 23.6 inHg), approx. 3.00 V
3000 m (9800 ft) above sea level	Approx. 70 kPa (525.0 mmHg, 20.7 inHg), approx. 2.70 V

• When engine is cranking: Make sure that the indication value changes.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the intake air pressure sensor.
Refer to “GENERAL CHASSIS (5)” on page 4-15.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
• Replace the ECU, and complete the service.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
• Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20568
P0112, P0113

EAS33048
TROUBLESHOOTING

Item

- [P0112] Intake air temperature sensor: short to ground circuit is detected. Normal signal is not received from the intake air temperature sensor.
- [P0113] Intake air temperature sensor: open or short to power circuit is detected. Normal signal is not received from the intake air temperature sensor.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

Perform this procedure when the engine is cold.

1. Connection of intake air 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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

      Is it in the “Recovered” condition?

      YES

      → Go to step 7, and complete the service.

      NO

      → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

      Is it in the “Recovered” condition?

      YES

      → Go to step 7, and complete the service.

      NO

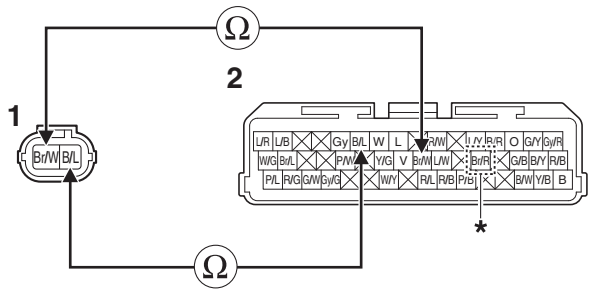
      → Go to step 3.

3. Wire harness continuity.
   • Disconnect the intake air temperature sensor coupler “1” and ECU coupler “2”.

Is DTC P0112 displayed?
YES
→ Go to “Short circuit check”.
NO
→ Go to “Open circuit check”.

• Open circuit check

Between intake air temperature sensor coupler “1” and ECU coupler “2”	[P0113] brown/white–brown/white [P0113] black/blue–black/blue



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Is resistance 0 Ω?
YES
→ Go to “Short circuit check”.
NO
a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?
YES
→ Go to step 7, and complete the service.
NO
→ Go to “Short circuit check”.

• Short circuit check

TIP
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

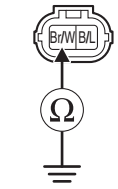
Ground short circuit check “A”

Between intake air temperature sensor coupler “1” and ground	[P0112] brown/white–ground

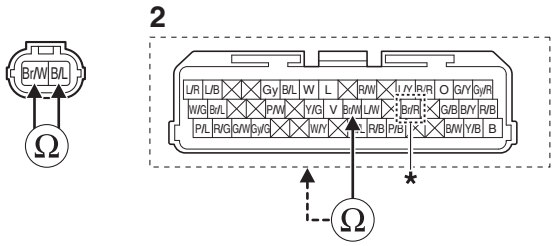
Lines short circuit check “B”

Intake air temperature sensor coupler “1”	[P0113] brown/white–black/blue
ECU coupler “2”	[P0113] brown/white–any other coupler terminal

A



B



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Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Installed condition of intake air temperature sensor.
   • Check for looseness or pinching.
   Refer to “FUEL TANK” on page 7-1.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or replace the intake air temperature sensor.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective intake air temperature sensor.
   • Execute the diagnostic mode. (Code 05)
   • When engine is cold: Displayed temperature is close to the ambient temperature.
   • The displayed temperature is not close to the ambient temperature → Check the intake air temperature sensor.
   Refer to “CHECKING THE INTAKE AIR TEMPERATURE SENSOR” on page 8-49.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the intake air temperature sensor.
   Refer to “FUEL TANK” on page 7-1.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20569
P0117, P0118

EAS33049
TROUBLESHOOTING

Item

• [P0117] Coolant temperature sensor: short to ground circuit is detected.
• [P0118] Coolant temperature sensor: open or short to power circuit is detected.

Fail-safe system

• Able to start engine
• Able to drive vehicle

Procedure

TIP

Perform this procedure when the engine is cold.

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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the sub-wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

      Is it in the “Recovered” condition?

      YES

      → Go to step 8, and complete the service.

      NO

      → Go to step 2.

2. Connection of wire harness coupler and sub-wire harness 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness and/or sub-wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

      Is it in the “Recovered” condition?

      YES

      → Go to step 8, and complete the service.

      NO

      → Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 4.

4. Wire harness continuity.
   • Disconnect the coolant temperature sensor coupler “1”, sub-wire harness coupler “2”, wire harness coupler “3” and ECU coupler “4”.

Is DTC P0117 displayed?

YES

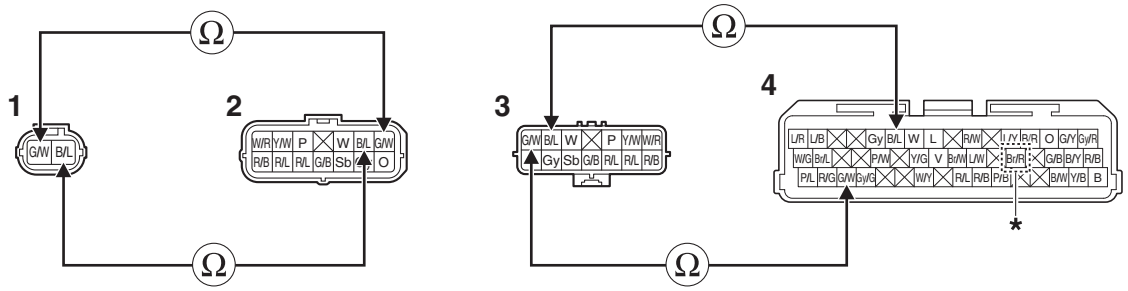
→ Go to “Short circuit check”.

NO

→ Go to “Open circuit check”.

• Open circuit check

Between coolant temperature sensor coupler “1” and sub-wire harness coupler “2”	[P0118] green/white–green/white [P0118] black/blue–black/blue
Between wire harness coupler “3” and ECU coupler “4”	[P0118] green/white–green/white [P0118] black/blue–black/blue



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to "Short circuit check".

- Short circuit check

TIP

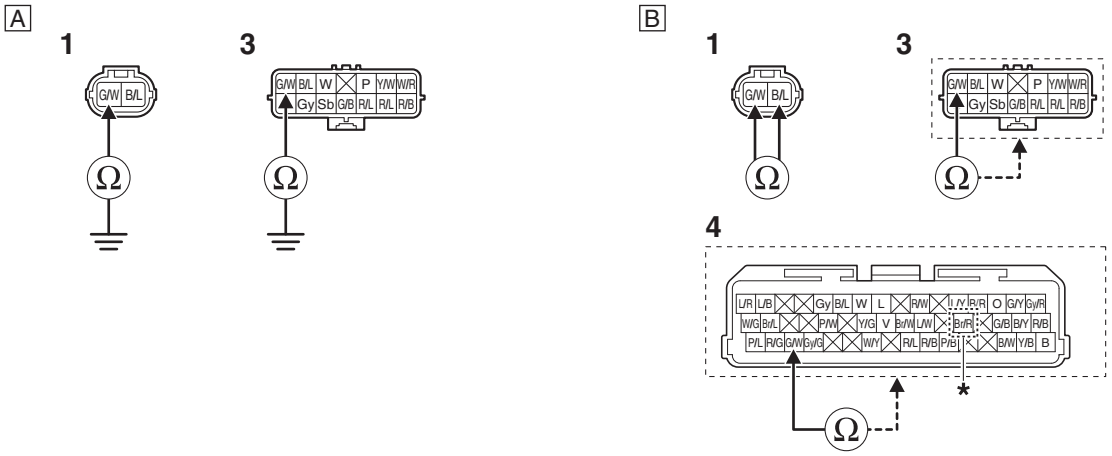
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between coolant temperature sensor coupler "1" and ground	[P0117] green/white–ground
Between wire harness coupler "3" and ground	[P0117] green/white–ground

Lines short circuit check "B"

Coolant temperature sensor coupler "1"	[P0118] green/white–black/blue
Wire harness coupler "3"	[P0118] green/white–any other coupler terminal
ECU coupler "4"	[P0118] green/white–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 5.

5. Installed condition of coolant temperature sensor.
   • Check for looseness or pinching.
   Refer to “CYLINDER HEAD” on page 5-31.

Is check result OK?

YES

→ Go to step 6.

NO

a. Reinstall or replace the coolant temperature sensor.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 6.

6. Defective coolant temperature sensor.
   • Execute the diagnostic mode. (Code 06)
   • When engine is cold: Displayed temperature is close to the ambient temperature.
   • The displayed temperature is not close to the ambient temperature → Check the coolant temperature sensor.
   Refer to “CHECKING THE COOLANT TEMPERATURE SENSOR” on page 8-47.

Is check result OK?

YES

→ Go to step 7.

NO

a. Replace the coolant temperature sensor.
   Refer to “CYLINDER HEAD” on page 5-31.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 7.

7. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
8. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20757
P0122, P0123

EAS33050
TROUBLESHOOTING

Item

- [P0122] Throttle position sensor: open or short to ground circuit is detected. Normal signal is not received from the throttle position sensor.
- [P0123] Throttle position sensor: short to power circuit is detected. Normal signal is not received from the throttle position sensor.

Fail-safe system

- Able to start engine (depends on the situation)
- Able to drive vehicle (depends on the situation)

Procedure

1. Connection of throttle 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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the sub-wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 9, and complete the service.

   NO

   → Go to step 2.

2. Connection of wire harness coupler and sub-wire harness 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness and/or sub-wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 9, and complete the service.

   NO

   → Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

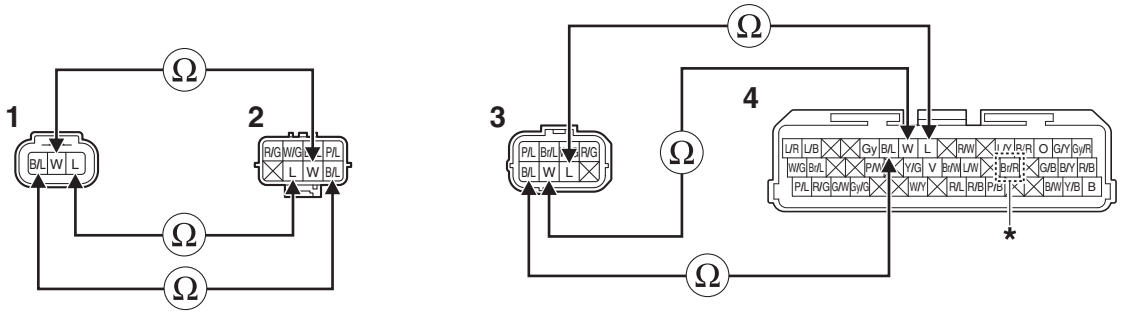
→ Go to step 9, and complete the service.

NO

→ Go to step 4.

4. Wire harness continuity.
   - Disconnect the throttle position sensor coupler “1”, sub-wire harness coupler “2”, wire harness coupler “3” and ECU coupler “4”.
   - Open circuit check

Between throttle position sensor coupler “1” and sub-wire harness coupler “2”	[P0123] black/blue–black/blue [P0122] white–white [P0122] blue–blue
Between wire harness coupler “3” and ECU coupler “4”	[P0123] black/blue–black/blue [P0122] white–white [P0122] blue–blue



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 9, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

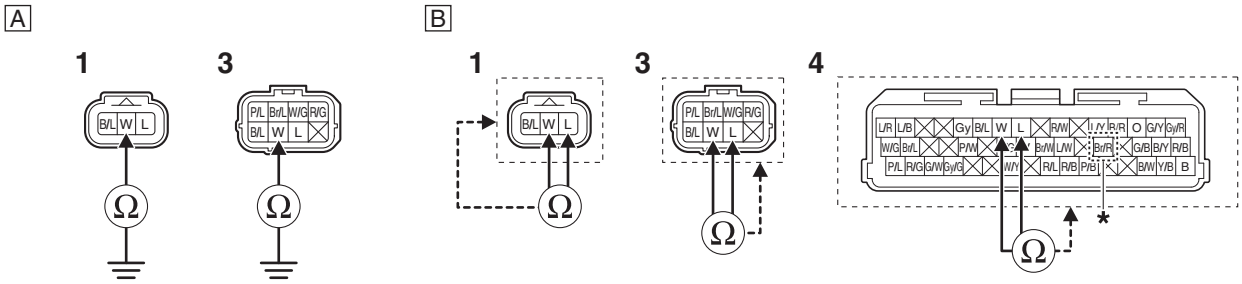
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between throttle position sensor coupler “1” and ground	[P0122] white–ground
Between wire harness coupler “3” and ground	[P0122] white–ground

Lines short circuit check “B”

Throttle position sensor coupler “1”	[P0123] white–any other coupler terminal [P0123] blue–any other coupler terminal
Wire harness coupler “3”	[P0123] white–any other coupler terminal [P0123] blue–any other coupler terminal
ECU coupler “4”	[P0123] white–any other coupler terminal [P0123] blue–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 9, and complete the service.

NO

→ Go to step 5.

5. Installed condition of throttle position sensor.
   • Check for looseness or pinching.
   Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-15.

Is check result OK?

YES

→ Go to step 6.

NO

a. Reinstall or adjust the throttle position sensor.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 9, and complete the service.

NO

→ Go to step 6.

6. Throttle position sensor resistance.
   - Measure the throttle position sensor resistance.
     Refer to "CHECKING THE THROTTLE POSITION SENSOR" on page 8-48.

Is check result OK?

YES

→ Go to step 7.

NO

a. Replace the throttle position sensor.
   Refer to "THROTTLE BODIES" on page 7-9.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 9, and complete the service.

NO

→ Go to step 7.

7. Defective throttle position sensor.
   - Check throttle position sensor signal.
   - Execute the diagnostic mode. (Code 01)

When the throttle valves are fully closed	11–21
When throttle valves are fully open	96–106

Is check result OK?

YES

→ Go to step 8.

NO

a. Replace the throttle position sensor.
   Refer to "THROTTLE BODIES" on page 7-9.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 9, and complete the service.

NO

→ Go to step 8.

8. Malfunction in ECU.
   - Replace the ECU, and complete the service.
     Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-40.
9. Delete the DTC and check that the MIL goes off.
   - Confirm that the DTC has a condition of "Recovered" using the YDT, and then delete the DTC.

EAS20571
P0132

EAS33051
TROUBLESHOOTING

Item

O_2 sensor: short to power circuit is detected.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Installed condition of O_2 sensor.
   - Check for looseness or pinching.
     Refer to “ENGINE REMOVAL” on page 5-10.

   Is check result OK?

   YES

   → Go to step 2.

   NO

   a. Reinstall or replace the O_2 sensor.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

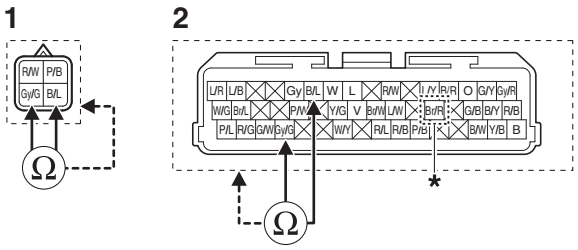
4. Wire harness continuity.
   - Disconnect the O_2 sensor coupler “1” and ECU coupler “2”.
   - Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Lines short circuit check

O_2 sensor coupler “1”	black/blue–any other coupler terminal gray/green–any other coupler terminal
ECU coupler “2”	black/blue–any other coupler terminal gray/green–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective O_2 sensor.
   • Check the O_2 sensor.
   Refer to “ENGINE REMOVAL” on page 5-10.

Is check result?
YES
→ Go to step 6.
NO
a. Replace the O_2 sensor.
   Refer to “ENGINE REMOVAL” on page 5-10.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?
YES
→ Go to step 7, and complete the service.
NO
→ Go to step 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20574
P0201

EAS33054
TROUBLESHOOTING
Item
Fuel injector #1: malfunction in fuel injector #1. Normal signal is not received from the fuel injector #1.
Fail-safe system
- Unable to start engine (depending on the number of faulty cylinders)
- Unable to drive vehicle (depending on the number of faulty cylinders)

Procedure
1. Connection of fuel injector #1 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).

   Is the coupler condition normal?
   YES
   → Go to step 2.
   NO
   a. Connect the coupler securely or replace the sub-wire harness.
   b. Execute the diagnostic mode. (Code 36)

      Is it hear operating sound?
      YES
      → Go to step 7.
      NO
      → Go to step 2.

2. Defective fuel injector #1.
   - Measure the fuel injector resistance.
     Refer to “CHECKING THE FUEL INJECTORS” on page 8-50.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   a. Replace the fuel injector #1.
      Refer to “THROTTLE BODIES” on page 7-9.
   b. Execute the diagnostic mode. (Code 36)

      Is it hear operating sound?
      YES
      → Go to step 7.
      NO
      → Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Execute the diagnostic mode. (Code 36)

Is it hear operating sound?

YES

→ Go to step 7.

NO

→ Go to step 4.

4. Connection of wire harness coupler and sub-wire harness 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).

Is the coupler condition normal?

YES

→ Go to step 5.

NO

a. Connect the coupler securely or replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 36)

Is it in the "Recovered" condition?

YES

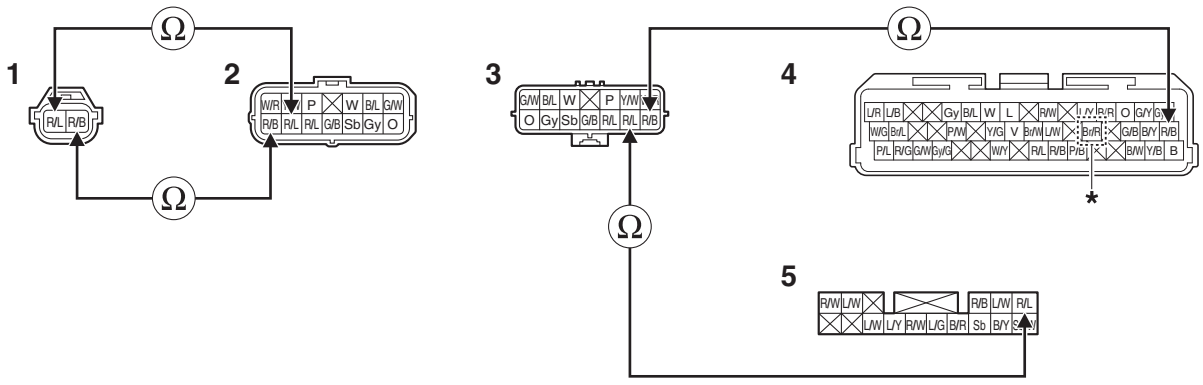
→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Wire harness continuity.
   - Disconnect the fuel injector #1 coupler "1", sub-wire harness coupler "2", wire harness coupler "3", ECU coupler "4" and relay unit coupler "5"
   - Open circuit check

Between fuel injector #1 coupler "1" and sub-wire harness coupler "2"	red/black–red/black red/blue–red/blue
Between wire harness coupler "3" and relay unit coupler "5"	red/blue–red/blue
Between wire harness coupler "3" and ECU coupler "4"	red/black–red/black



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 36)

Is it hear operating sound?

YES

→ Go to step 7.

NO

→ Go to “Short circuit check”.

• Short circuit check

TIP

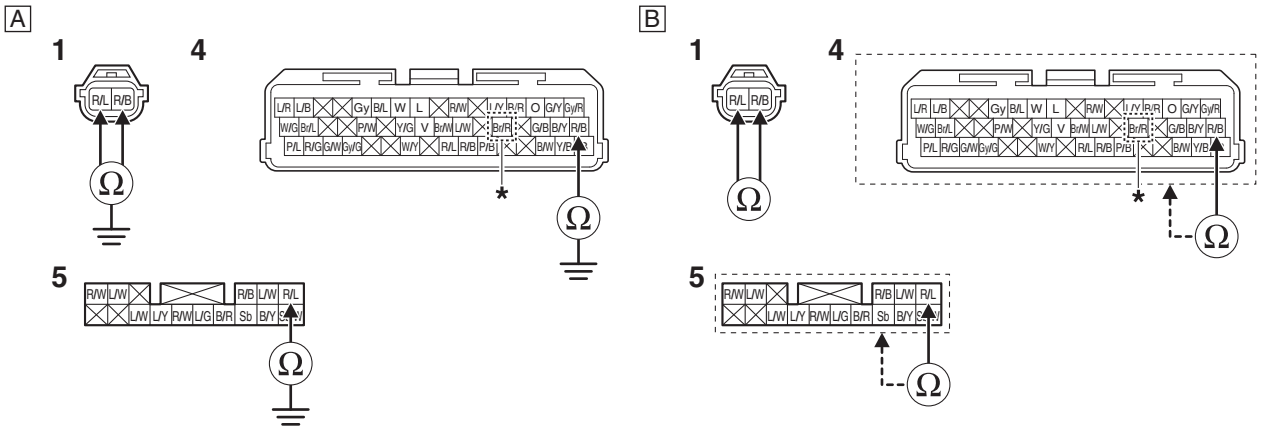
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between fuel injector #1 coupler “1” and ground	red/black–ground red/blue–ground
Between ECU coupler “4” and ground	red/black–ground
Between relay unit coupler “5” and ground	red/blue–ground

Lines short circuit check “B”

Fuel injector #1 coupler “1”	red/black–red/blue
ECU coupler “4”	red/black–any other coupler terminal
Relay unit coupler “5”	red/blue–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 6.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 36)

Is it hear operating sound?

YES

→ Go to step 7.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Start the engine and let it idle for approximately 5 seconds.
   • Confirm that the DTC has a condition of “Recovered” using the malfunction mode of the YDT, and then delete the DTC.

EAS20575
P0202

EAS33055
TROUBLESHOOTING
Item
Fuel injector #2: malfunction in fuel injector #2. Normal signal is not received from the fuel injector #2.
Fail-safe system
- Unable to start engine (depending on the number of faulty cylinders)
- Unable to drive vehicle (depending on the number of faulty cylinders)

Procedure
1. Connection of fuel injector #2 coupler.
   - Check the locking condition of the coupler.
   - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?
YES
→ Go to step 2.
NO
a. Connect the coupler securely or replace the sub-wire harness.
b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?
YES
→ Go to step 7.
NO
→ Go to step 2.

2. Defective fuel injector #2.
   - Measure the fuel injector resistance.
     Refer to “CHECKING THE FUEL INJECTORS” on page 8-50.

Is check result OK?
YES
→ Go to step 3.
NO
a. Replace the fuel injector #2.
   Refer to “THROTTLE BODIES” on page 7-9.
b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?
YES
→ Go to step 7.
NO
→ Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?

YES

→ Go to step 7.

NO

→ Go to step 4.

4. Connection of wire harness coupler and sub-wire harness 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).

Is the coupler condition normal?

YES

→ Go to step 5.

NO

a. Connect the coupler securely or replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 37)

Is it in the "Recovered" condition?

YES

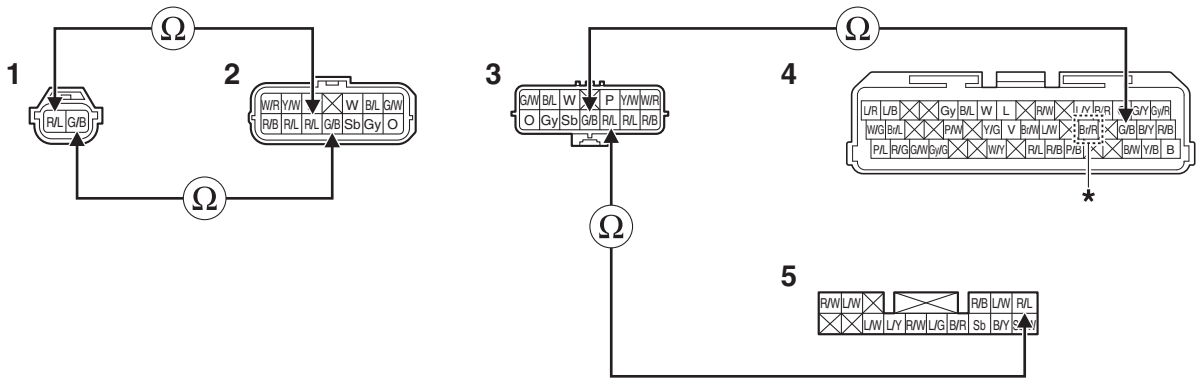
→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Wire harness continuity.
   - Disconnect the fuel injector #2 coupler "1", sub-wire harness coupler "2", wire harness coupler "3", ECU coupler "4" and relay unit coupler "5"
   - Open circuit check

Between fuel injector #2 coupler "1" and sub-wire harness coupler "2"	green/black–green/black red/blue–red/blue
Between wire harness coupler "3" and relay unit coupler "5"	red/blue–red/blue
Between wire harness coupler "3" and ECU coupler "4"	green/black–green/black



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Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?

YES

→ Go to step 7.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

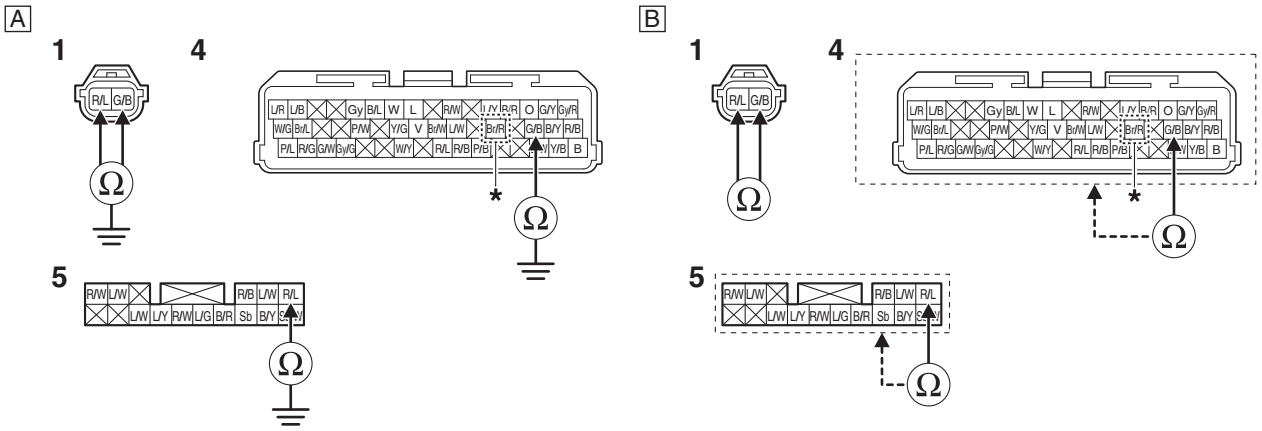
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between fuel injector #2 coupler "1" and ground	green/black–ground red/blue–ground
Between ECU coupler "4" and ground	green/black–ground
Between relay unit coupler "5" and ground	red/blue–ground

Lines short circuit check "B"

Fuel injector #2 coupler "1"	green/black–red/blue
ECU coupler "4"	green/black–any other coupler terminal
Relay unit coupler "5"	red/blue–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 6.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?

YES

→ Go to step 7.

NO

→ Go to step 6.

6. Malfunction in ECU.
   - Replace the ECU, and complete the service.
     Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   - Start the engine and let it idle for approximately 5 seconds.
   - Confirm that the DTC has a condition of “Recovered” using the malfunction mode of the YDT, and then delete the DTC.

EAS20578
P0335

EAS33058
TROUBLESHOOTING
Item
Crankshaft position sensor: normal signals are not received from the crankshaft position sensor.
Fail-safe system
- Unable to start engine
- Unable to drive vehicle

Procedure
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).

Is the coupler condition normal?
YES
→ Go to step 2.
NO
a. Connect the coupler securely or replace the wire harness.
b. Crank the engine, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?
YES
→ Go to step 7, and complete the service.
NO
→ Go to step 2.

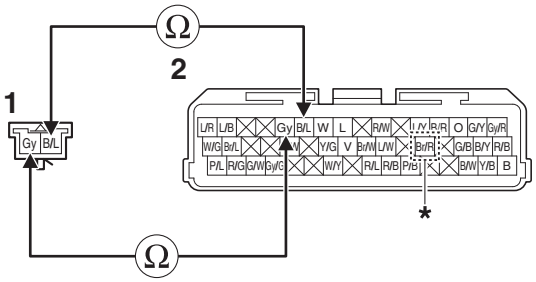
2. Connection of wire harness ECU coupler.
   - Check the locking condition of the coupler.
   - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?
YES
→ Go to step 3.
NO
a. Connect the coupler securely or replace the wire harness.
b. Crank the engine, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?
YES
→ Go to step 7, and complete the service.
NO
→ Go to step 3.

3. Wire harness continuity.
   - Disconnect the crankshaft position sensor coupler "1" and ECU coupler "2".
   - Open circuit check

Between crankshaft position sensor coupler "1" and ECU coupler "2"	black/blue–black/blue gray–gray



*. For California: Br/R Except for California: blank

Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness.
b. Crank the engine, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

• Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

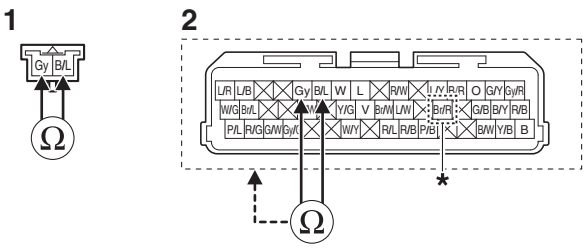
Between crankshaft position sensor coupler “1” and ground	gray–ground

Lines short circuit check “B”

Crankshaft position sensor coupler “1”	black/blue–gray
ECU coupler “2”	black/blue–any other coupler terminal gray–any other coupler terminal

A

B



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Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Crank the engine, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Installed condition of crankshaft position sensor.
   • Check for looseness or pinching.
   Refer to "GENERATOR AND STARTER CLUTCH" on page 5-43.
   • Check the gap (0.85 mm (0.03 in)) between the crankshaft position sensor and the generator rotor.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or replace the stator coil assembly.
b. Crank the engine, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective crankshaft position sensor.
   • Check the crankshaft position sensor.
   Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-44.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the stator coil assembly.
   Refer to "GENERATOR AND STARTER CLUTCH" on page 5-43.
b. Crank the engine, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of "Recovered" using the YDT, and then delete the DTC.

EAS20580
P0351

EAS33060
TROUBLESHOOTING

Item

Cylinder-#1 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#1 ignition coil. Normal signal is not received from the ignition circuit.

Fail-safe system

- Unable to start engine
- Unable to drive vehicle

Procedure

1. Connection of cylinder-#1 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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Start the engine and let it idle for approximately 5 seconds.
   c. Check the DTC using the malfunction mode of the YDT.

   Is it in the "Recovered" condition?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Start the engine and let it idle for approximately 5 seconds.
   c. Check the DTC using the malfunction mode of the YDT.

   Is it in the "Recovered" condition?

   YES

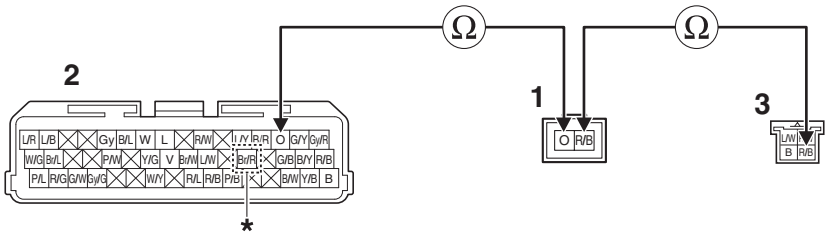
   → Go to step 7, and complete the service.

   NO

   → Go to step 3.

3. Wire harness continuity.
   - Disconnect the cylinder-#1 ignition coil coupler "1", ECU coupler "2" and handlebar switch coupler (right) "3".
   - Open circuit check

Between cylinder-#1 ignition coil coupler "1" and ECU coupler "2"	orange–orange
Between cylinder-#1 ignition coil coupler "1" and handlebar switch coupler (right) "3"	red/black–red/black



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Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

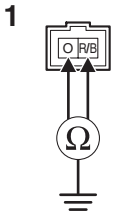
Ground short circuit check "A"

Between cylinder-#1 ignition coil coupler "1" and ground	orange–ground red/black–ground

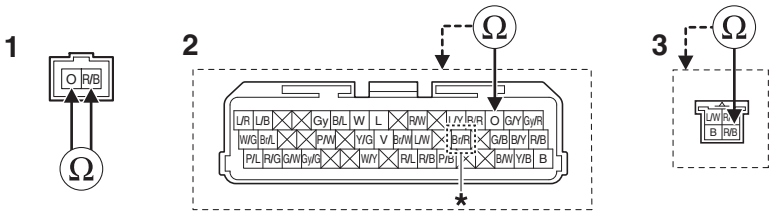
Lines short circuit check "B"

Cylinder-#1 ignition coil coupler "1"	orange–red/black
ECU coupler "2"	orange–any other coupler terminal
Handlebar switch coupler (right) "3"	red/black–any other coupler terminal

A



B



*. For California: Br/R Except for California: blank

Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Installed condition of cylinder-#1 ignition coil.
   • Check for looseness or pinching.
   Refer to "CAMSHAFTS" on page 5-19.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or replace the ignition coil.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective cylinder-#1 ignition coil.
   • Measure the primary coil resistance of the cylinder-#1 ignition coil.
   Refer to "CHECKING THE IGNITION COILS" on page 8-43.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the cylinder-#1 ignition coil.
   Refer to “CAMSHAFTS” on page 5-19.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Execute the diagnostic mode. (Code 30)
   • Confirm that spark plug does not sparking.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20581
P0352

EAS33061
TROUBLESHOOTING

Item

Cylinder-#2 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#2 ignition coil. Normal signal is not received from the ignition circuit.

Fail-safe system

- Unable to start engine
- Unable to drive vehicle

Procedure

1. Connection of cylinder-#2 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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Start the engine and let it idle for approximately 5 seconds.
   c. Check the DTC using the malfunction mode of the YDT.

   Is it in the "Recovered" condition?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Start the engine and let it idle for approximately 5 seconds.
   c. Check the DTC using the malfunction mode of the YDT.

   Is it in the "Recovered" condition?

   YES

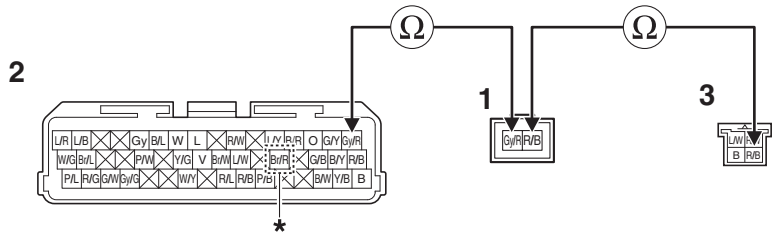
   → Go to step 7, and complete the service.

   NO

   → Go to step 3.

3. Wire harness continuity.
   - Disconnect the cylinder-#2 ignition coil coupler "1", ECU coupler "2" and handlebar switch coupler (right) "3".
   - Open circuit check

Between cylinder-#2 ignition coil coupler "1" and ECU coupler "2"	gray/red–gray/red
Between cylinder-#2 ignition coil coupler "1" and handlebar switch coupler (right) "3"	red/black–red/black



*. For California: Br/R Except for California: blank

Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

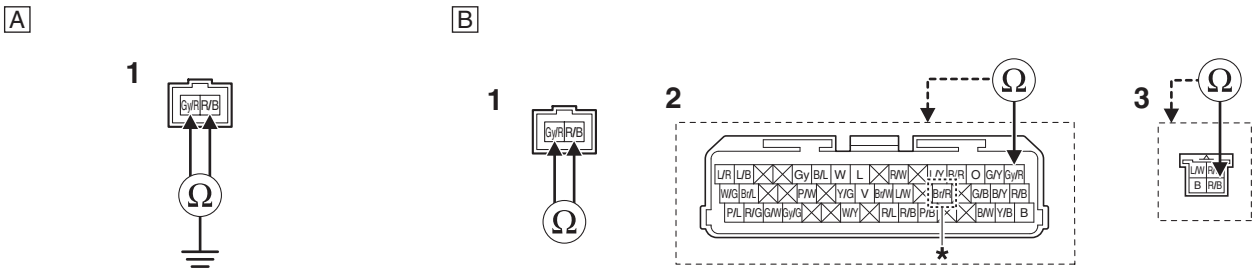
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between cylinder-#2 ignition coil coupler "1" and ground	gray/red–ground red/black–ground

Lines short circuit check "B"

Cylinder-#2 ignition coil coupler "1"	gray/red–red/black
ECU coupler "2"	gray/red–any other coupler terminal
Handlebar switch coupler (right) "3"	red/black–any other coupler terminal



*. For California: Br/R Except for California: blank

Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Installed condition of cylinder-#2 ignition coil.
   • Check for looseness or pinching.
   Refer to "CAMSHAFTS" on page 5-19.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or replace the ignition coil.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective cylinder-#2 ignition coil.
   • Measure the primary coil resistance of the cylinder-#2 ignition coil.
   Refer to "CHECKING THE IGNITION COILS" on page 8-43.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the cylinder-#2 ignition coil.
   Refer to “CAMSHAFTS” on page 5-19.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Execute the diagnostic mode. (Code 31)
   • Confirm that spark plug does not sparking.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20785
P0458

TIP

"P0458" is indicated for California only.

EAS33528
TROUBLESHOOTING

Item

Purge cut valve solenoid: open circuit is detected. Purge cut valve solenoid is not operated.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Connection of purge cut valve solenoid 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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

   Is it in the "Recovered" condition?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

   Is it in the "Recovered" condition?

   YES

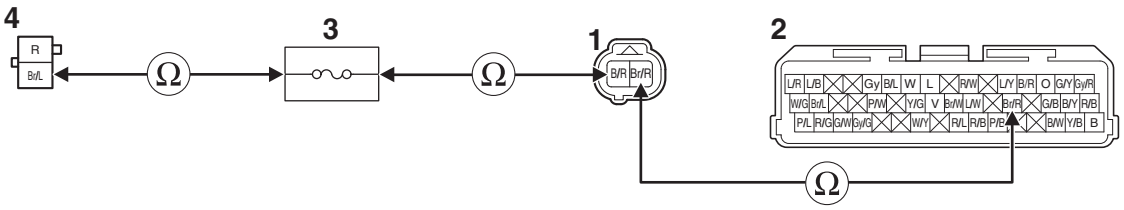
   → Go to step 7, and complete the service.

   NO

   → Go to step 3.

3. Wire harness continuity.
   - Disconnect the purge cut valve solenoid coupler "1", ECU coupler "2", ignition fuse "3" and main switch coupler "4".
   - Open circuit check

Between purge cut valve solenoid coupler “1” and ECU coupler “2”	brown/red–brown/red
Between purge cut valve solenoid coupler “1” and ignition fuse “3” holder	black/red–red/white
Between main switch coupler “4” and ignition fuse “3” holder	brown/blue–brown/blue



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

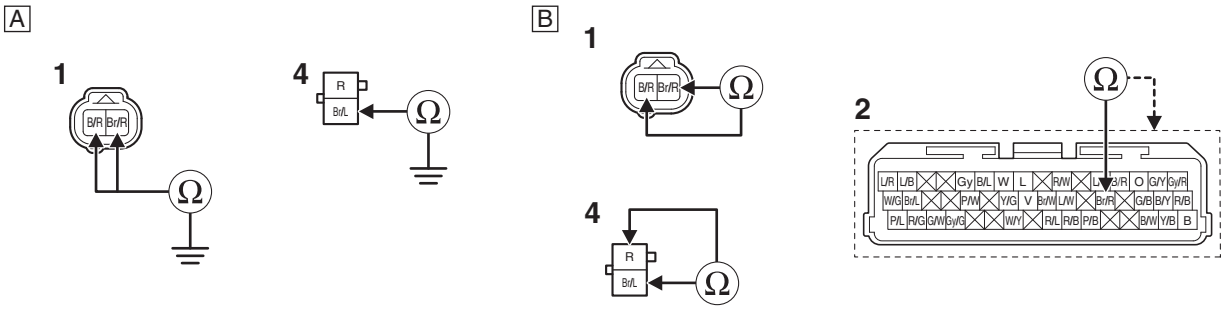
Disconnect the ECU related connectors before checking.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

Ground short circuit check “A”

Between purge cut valve solenoid coupler “1” and ground	brown/red–ground black/red–ground
Between main switch coupler “4” and ground	brown/blue–ground

Lines short circuit check “B”

Purge cut valve solenoid coupler “1”	brown/red–black/red
ECU coupler “2”	brown/red–any other coupler terminal
Main switch coupler “4”	brown/blue–red



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Installed condition of purge cut valve solenoid.
   • Check for looseness or pinching.
   Refer to "FUEL TANK" on page 7-1.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or replace the purge cut valve solenoid.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective purge cut valve solenoid.
   • Execute the diagnostic mode. (Code 46)

Is it hear operating sound?

YES

→ Go to step 7, and complete the service.

NO

a. Replace the purge cut valve solenoid.
   Refer to "FUEL TANK" on page 7-1.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
   - Replace the ECU, and complete the service.
     Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   - Confirm that the DTC has a condition of "Recovered" using the malfunction mode of the YDT, and then delete the DTC.

EAS20585
P0480

EAS33065
TROUBLESHOOTING

Item

Radiator fan motor relay: open or short circuit is detected. Normal signal is not received from the radiator fan motor relay.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 6, and complete the service.

   NO

   → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

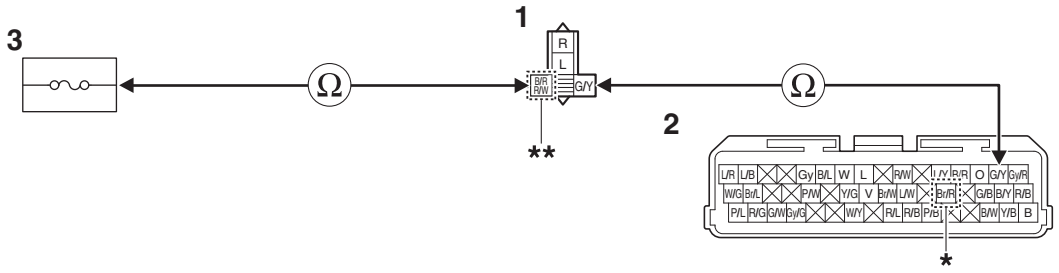
   → Go to step 6, and complete the service.

   NO

   → Go to step 3.

3. Wire harness continuity.
   - Disconnect the radiator fan motor relay coupler “1”, ECU coupler “2” and ignition fuse “3”.
   - Open circuit check

Between radiator fan motor relay coupler “1” and ignition fuse “3” holder	black/red, red/white–red/white (for California) red/white–red/white (except for California)
Between radiator fan motor relay coupler “1” and ECU coupler “2”	green/yellow–green/yellow



*. For California: Br/R Except for California: blank
**. For California: B/R, R/W Except for California: R/W

Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to “Short circuit check”.

• Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

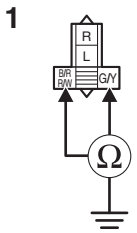
Ground short circuit check “A”

Between radiator fan motor relay coupler “1” and ground	green/yellow–ground black/red, red/white–ground (for California) red/white–ground (except for California)

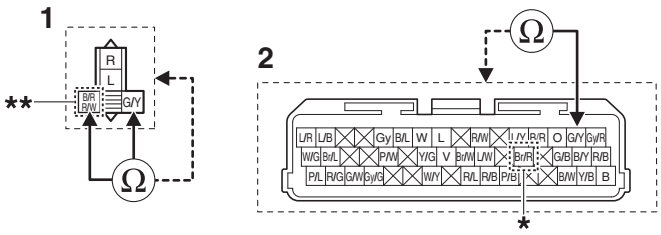
Lines short circuit check “B”

Radiator fan motor relay coupler “1”	green/yellow–any other coupler terminal black/red, red/white–any other coupler terminal (for California) red/white–any other coupler terminal (except for California)
ECU coupler “2”	green/yellow–any other coupler terminal

A



B



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Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 4.

4. Defective radiator fan motor relay.
   • Replace the radiator fan motor relay.
   Refer to “GENERAL CHASSIS (5)” on page 4-15.
   • Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 5.

5. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
6. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20589
P0507

EAS33069
TROUBLESHOOTING

Item

Engine idling speed is too high.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

- Do not remove the ISC (Idle Speed Control) valve.
- If the DTCs P0507 and P0560 are detected at the same time, perform the checked service for DTC listed below first.
  - P0560
- If the DTCs P0507 and P1500 are detected at the same time, perform the checked service for DTC listed below first.
  - P1500

1. Locate the malfunction.
   - Execute the diagnostic mode. (Code 54)
   - Fully closes the ISC (Idle Speed Control) valve, and then fully opens the valve. This operation takes approximately 6 seconds.

   Is the ISC operating sound heard?

   YES

   → Go to step 2.

   NO

   → Go to step 7.

2. Incorrect rear wheel sensor signal.
   - Check the rear wheel sensor.
   - Execute the diagnostic mode. (Code 07)
   - Rear wheel stop: The pulse integrated value should be constant.
   - Rotate the rear wheel by hand and check that the indicated value increases.

   Is check result OK?

   YES

   a. Start the engine and let it idle for approximately 10 seconds.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 6, and complete the service.

   NO

   → Go to step 3.

   NO

   → Go to DTC P1500.
   Refer to “P1500” on page 9-122.

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 3-27.

Is check result OK?

YES

→ Check the throttle body assembly.
Refer to “CHECKING THE THROTTLE BODIES” on page 7-12.

a. Replace the throttle body assembly.
   Refer to “THROTTLE BODIES” on page 7-9.
b. Start the engine and let it idle for approximately 10 seconds.
c. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 4.

NO

a. Replace the throttle cables.
   Refer to “HANDLEBAR” on page 4-68.
b. Start the engine and let it idle for approximately 10 seconds.
c. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 4.

4. ISC (Idle Speed Control) valve is not moving correctly.
   • Replace the ISC (Idle Speed Control) valve.
   Refer to “CLEANING THE ISC (IDLE SPEED CONTROL) VALVE” on page 7-12.

Is check result OK?

YES

→ Go to step 5.

NO

a. Replace the ISC (Idle Speed Control) unit.
   Refer to “THROTTLE BODIES” on page 7-9.
b. Start the engine and let it idle for approximately 10 seconds.
c. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 5.

5. Malfunction in ECU.
   • Replace the ECU.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
6. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.
7. 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).

Is the coupler condition normal?

YES

→ Go to step 8.

NO

a. Connect the coupler securely or replace the sub-wire harness.
b. Execute the diagnostic mode. (Code 54)

Is the ISC operating sound heard?

YES

→ Go to step 14, and complete the service.

NO

→ Go to step 8.

8. Connection of wire harness coupler and sub-wire harness 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).

Is the coupler condition normal?

YES

→ Go to step 9.

NO

a. Connect the coupler securely or replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 54)

Is the ISC operating sound heard?

YES

→ Go to step 14, and complete the service.

NO

→ Go to step 9.

9. 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).

Is the coupler condition normal?

YES

→ Go to step 10.

NO

a. Connect the coupler securely or replace the wire harness.
b. Execute the diagnostic mode. (Code 54)

Is the ISC operating sound heard?

YES

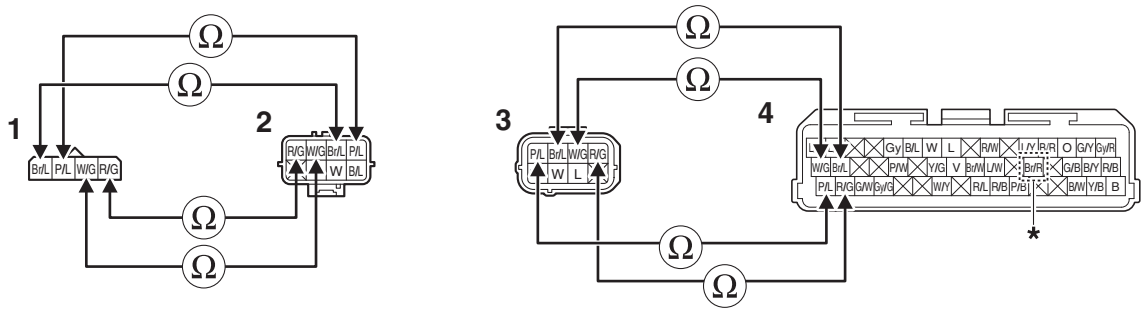
→ Go to step 14, and complete the service.

NO

→ Go to step 10.

10. Wire harness continuity.
    - Disconnect the ISC (Idle Speed Control) unit coupler “1”, sub-wire harness coupler “2”, wire harness coupler “3” and ECU coupler “4”.
    - Open circuit check

Between ISC (Idle Speed Control) unit coupler "1" and sub-wire harness coupler "2"	red/green–red/green white/green–white/green brown/blue–brown/blue pink/blue–pink/blue
Between the wire harness coupler "3" and ECU coupler "4"	red/green–red/green white/green–white/green brown/blue–brown/blue pink/blue–pink/blue



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Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 54)

Is the ISC operating sound heard?

YES

→ Go to step 14, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

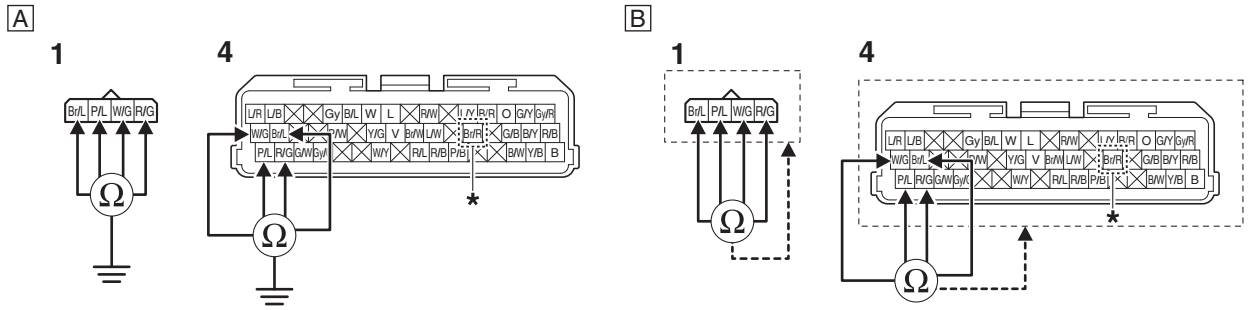
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between ISC (Idle Speed Control) unit coupler "1" and ground	red/green–ground white/green–ground brown/blue–ground pink/blue–ground
Between ECU coupler "4" and ground	red/green–ground white/green–ground brown/blue–ground pink/blue–ground

Lines short circuit check “B”

ISC (Idle Speed Control) unit coupler “1”	red/green–any other coupler terminal white/green–any other coupler terminal brown/blue–any other coupler terminal pink/blue–any other coupler terminal
ECU coupler “4”	red/green–any other coupler terminal white/green–any other coupler terminal brown/blue–any other coupler terminal pink/blue–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 11.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 54)

Is the ISC operating sound heard?

YES

→ Go to step 14, and complete the service.

NO

→ Go to step 11.

11. Installed condition of ISC (Idle Speed Control) unit.
Refer to “THROTTLE BODIES” on page 7-9.
- Improperly installed ISC (Idle Speed Control) unit.
- Check the intake air passages for air leaks.
Refer to “CHECKING THE THROTTLE BODIES” on page 7-12.

Is check result OK?

YES

→ Go to step 12.

NO

a. Reinstall or replace the ISC (Idle Speed Control) unit.
b. Execute the diagnostic mode. (Code 54)

Is the ISC operating sound heard?

YES

→ Go to step 14, and complete the service.

NO

→ Go to step 12.

12.ISC (Idle Speed Control) valve is not moving correctly.
- Check the ISC (Idle Speed Control) valve.
  Refer to “CLEANING THE ISC (IDLE SPEED CONTROL) VALVE” on page 7-12.

Is check result OK?

YES

→ Go to step 13.

NO

a. Replace the ISC (Idle Speed Control) unit.
   Refer to “THROTTLE BODIES” on page 7-9.
b. Execute the diagnostic mode. (Code 54)

Is the ISC operating sound heard?

YES

→ Go to step 14, and complete the service.

NO

→ Go to step 13.

13.Malfunction in ECU.
- Replace the ECU.
  Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

14.Delete the DTC and check that the MIL goes off.
- Start the engine and let it idle for approximately 10 seconds.
- Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20590
P0511

EAS33070
TROUBLESHOOTING

Item

ISC (Idle Speed Control) valve: ISC valve does not operate.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

Do not remove the ISC valve from the throttle body.

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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the sub-wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 2.

2. Connection of wire harness coupler and sub-wire harness 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness and/or sub-wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

   Is check result OK?

   YES

   → Go to step 7, and complete the service.

   NO

   → Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

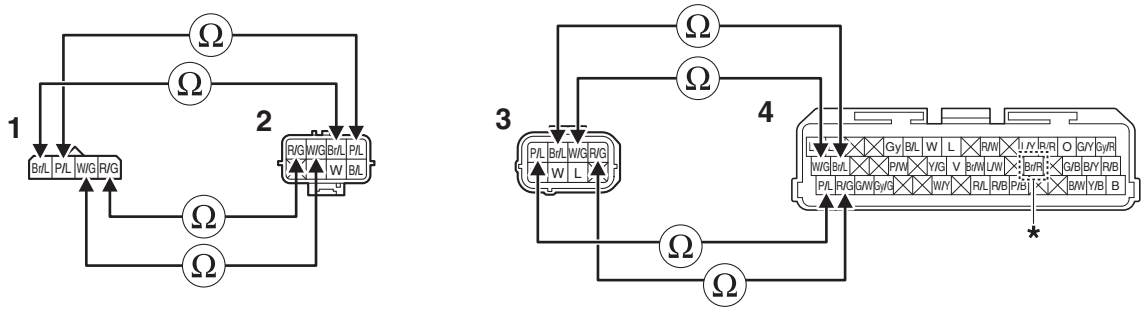
→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Wire harness continuity.
   - Disconnect the ISC (Idle Speed Control) unit coupler “1” sub-wire harness coupler “2”, wire harness coupler “3” and ECU coupler “4”.
   - Open circuit check

Between ISC (Idle Speed Control) unit coupler “1” and sub-wire harness coupler “2”	red/green–red/green white/green–white/green brown/blue–brown/blue pink/blue–pink/blue
Between the wire harness coupler “3” and ECU coupler “4”	red/green–red/green white/green–white/green brown/blue–brown/blue pink/blue–pink/blue



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

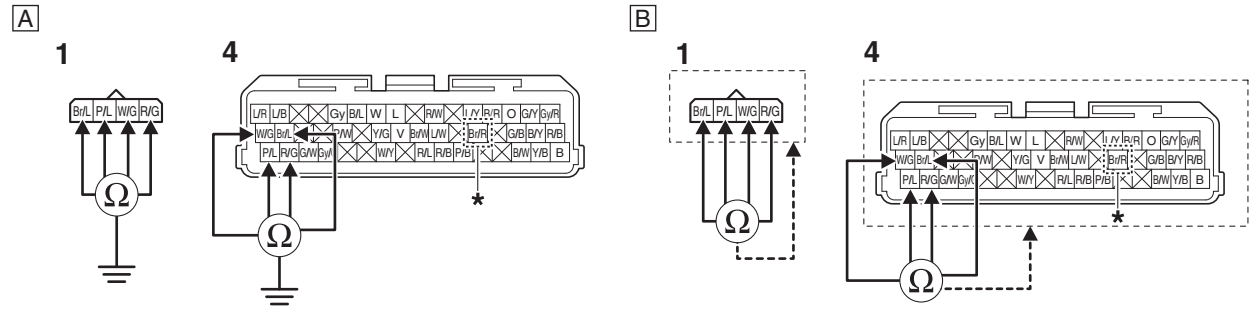
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between ISC (Idle Speed Control) unit coupler “1” and ground	red/green–ground white/green–ground brown/blue–ground pink/blue–ground
Between ECU coupler “4” and ground	red/green–ground white/green–ground brown/blue–ground pink/blue–ground

Lines short circuit check “B”

ISC (Idle Speed Control) unit coupler “1”	red/green–any other coupler terminal white/green–any other coupler terminal brown/blue–any other coupler terminal pink/blue–any other coupler terminal
ECU coupler “4”	red/green–any other coupler terminal white/green–any other coupler terminal brown/blue–any other coupler terminal pink/blue–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Faulty ISC valve operation.
   • Execute the diagnostic mode. (Code 54)

Is the ISC operating sound heard?

YES

→ Go to step 6.

NO

a. Replace the ISC valve.
   Refer to “THROTTLE BODIES” on page 7-9.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20434
P0560, P0563

EAS33304
TROUBLESHOOTING

Item

- [P0560] Battery charging voltage is abnormal. (Discharged condition)
- [P0563] Battery charging voltage is abnormal. (Overcharged condition)

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If the following DTCs are detected at the same time, perform the check and service for DTC listed below first.

- P0335

1. Malfunction in charging system.
   - Check the charging system.
     Refer to "CHARGING SYSTEM" on page 8-13.

Is check result OK?

YES

a. Start the engine and let it idle for approximately 5 seconds.
b. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 2, and complete the service.

NO

→ Repeat step 1.

NO

a. Defective rectifier/regulator or AC magneto → Replace.
b. Defective connection in the charging system circuit → Properly connect or replace the wire harness.
c. Start the engine and let it idle for approximately 5 seconds.
d. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 2, and complete the service.

NO

→ Repeat step 1.

2. Delete the DTC and check that the MIL goes off.
   - Confirm that the DTC has a condition of "Recovered" using the YDT, and then delete the DTC.

EAS20676
P0601

EAS33305
TROUBLESHOOTING

Item

Internal malfunction in ECU. (When this malfunction is detected in the ECU, the DTC might not appear on the tool display.)

Fail-safe system

- Unable to start engine
- Unable to drive vehicle

Procedure

1. Malfunction in ECU.
   - Replace the ECU.
     Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
   - Turn the main switch to “ON”.
   - Check that the MIL does not come on.

EAS20598
P062F

EAS33078
TROUBLESHOOTING

Item

EEPROM DTC: an error is detected while reading or writing on EEPROM.

Fail-safe system

- Able/Unable to start engine (depends on the situation)
- Able/Unable to drive vehicle (depends on the situation)

Procedure

1. Locate the malfunction.
   - Execute the diagnostic mode (Code 60)
2. Malfunction in ECU.
   - Replace the ECU, and complete the service.
     Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
3. Delete the DTC and check that the MIL goes off.
   - Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20601
P0657

EAS33081
TROUBLESHOOTING

Item

Fuel system voltage: normal voltage is not supplied to the fuel injector and fuel pump.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If the following DTCs are detected at the same time, perform the check and service for DTC listed below first.

- P0335

1. Connection of relay 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).

Is the coupler condition normal?

YES

→ Go to step 2.

NO

a. Connect the coupler securely or replace the wire harness.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 3.

NO

a. Connect the coupler securely or replace the wire harness.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

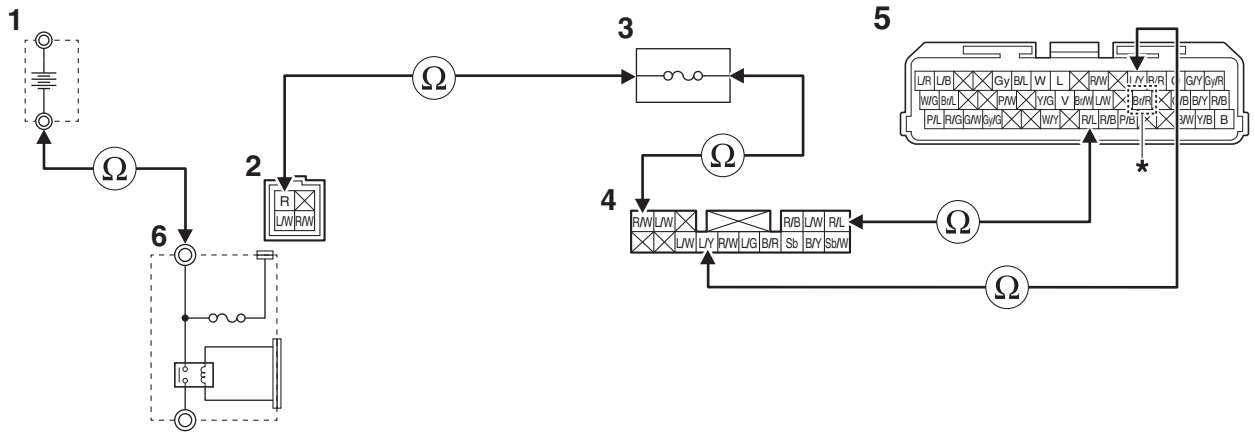
→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Wire harness continuity.
   - Disconnect the battery terminal “1”, starter relay coupler “2”, fuel injection system fuse “3”, relay unit coupler “4” and ECU coupler “5”.
   - Open circuit check

Between battery terminal “1” and starter relay terminal “6”	red–red
Between starter relay coupler “2” and fuel injection system fuse “3” holder	red–red
Between fuel injection system fuse “3” holder and relay unit coupler “4”	red/black–red/white
Between relay unit coupler “4” and ECU coupler “5”	red/blue–red/blue blue/yellow–blue/yellow



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

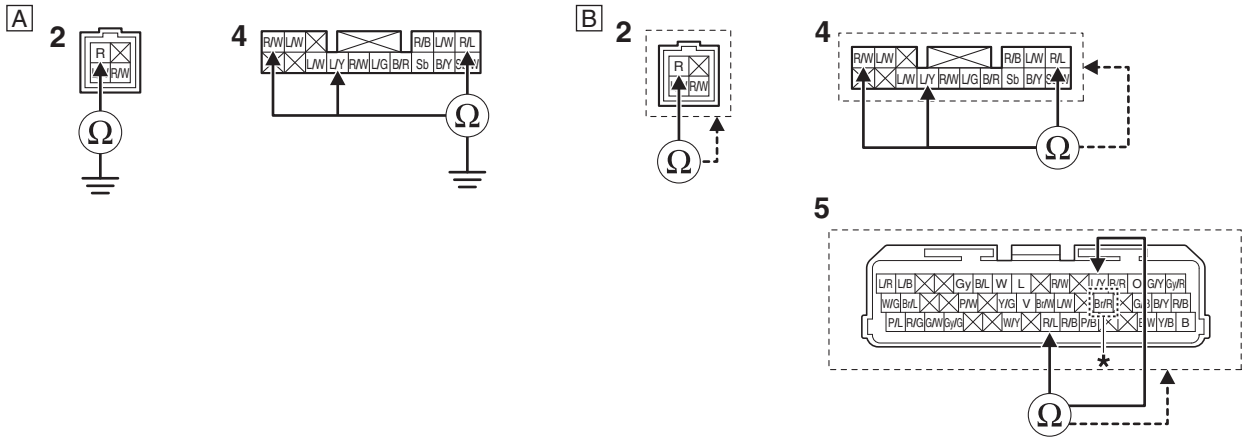
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between starter relay coupler “2” and ground	red–ground
Between relay unit coupler “4” and ground	red/white–ground red/blue–ground blue/yellow–ground

Lines short circuit check “B”

Starter relay coupler “2”	red–any other coupler terminal
Relay unit coupler “4”	red/white–any other coupler terminal red/blue–any other coupler terminal blue/yellow–any other coupler terminal
ECU coupler “5”	red/blue–any other coupler terminal blue/yellow–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Defective relay unit.
   - Execute the diagnostic mode. (Code 50)
   - Check the operating sound of the relay.

Is it hear operating sound?

YES

→ Go to step 5.

NO

a. Replace the relay unit.
   Refer to “GENERAL CHASSIS (5)” on page 4-15.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective relay unit.
   • Execute the diagnostic mode. (Code 09)

Is the fuel system voltage less than 3 V?

YES

a. Replace the relay unit.
   Refer to “GENERAL CHASSIS (5)” on page 4-15.
b. Start the engine and let it idle for approximately 5 seconds.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20764
P1500

EAS33303
TROUBLESHOOTING
Item
- Rear wheel sensor: normal signals are not received from the rear wheel sensor.
- Gear position switch: open or short circuit is detected.
- Clutch switch: open or short circuit is detected.

Fail-safe system
- Able to start engine
- Able to drive vehicle

Procedure
1. Locate the malfunction.
   - DTC P1500 detected.
   a. Execute the diagnostic mode. (Code 07)
   b. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?
YES
→ Go to step c.
NO
→ Go to step 2.

TIP
Perform the procedure from step 2 to step 7 and step 22.

c. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is check result OK?
YES
→ Go to step d.
NO
→ Go to step 8.

TIP
Perform the procedure from step 8 to step 15 and step 22.

d. Execute the diagnostic mode. (Code 21)

When the transmission is in gear with the clutch lever squeezed and the sidestand retracted	ON

Is check result OK?
YES
→ Go to step 22, and complete the service.
NO
→ Go to step 16.

TIP

Perform the procedure from step 16 to step 22.

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).

Is the coupler condition normal?

YES

→ Go to step 3.

NO

a. Connect the coupler securely or replace the wire harness.
b. Execute the diagnostic mode. (Code 07)
c. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 3.

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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Execute the diagnostic mode. (Code 07)
c. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 4.

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).

Is the coupler condition normal?

YES

→ Go to step 5.

NO

a. Connect the coupler securely or replace the wire harness.
b. Execute the diagnostic mode. (Code 07)
c. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

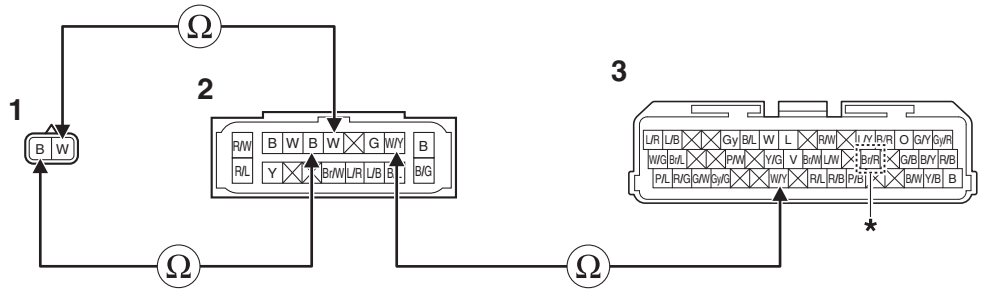
→ Go to step 22, and complete the service.

NO

→ Go to step 5.

5. Wire harness continuity.
   - Disconnect the rear wheel sensor coupler “1”, ABS ECU coupler “2” and ECU coupler “3”.
   - Open circuit check

Between rear wheel sensor coupler “1” and ABS ECU coupler “2”	black–black white–white
Between ABS ECU coupler “2” and ECU coupler “3”	white/yellow–white/yellow



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness.
b. Execute the diagnostic mode. (Code 07)
c. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 22, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

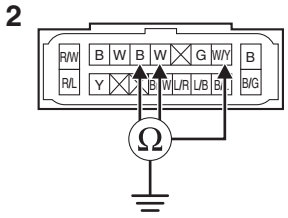
Ground short circuit check “A”

Between ABS ECU coupler “2” and ground	black–ground white–ground white/yellow–ground

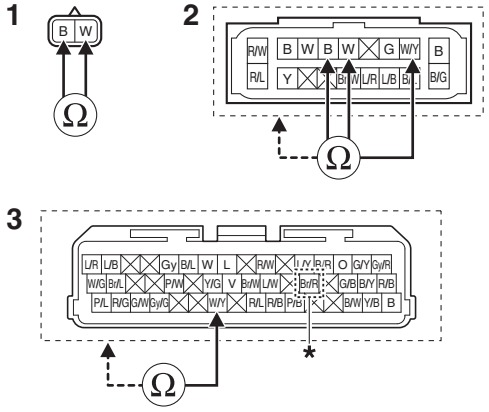
Lines short circuit check “B”

Rear wheel sensor coupler “1”	black–white
ABS ECU coupler “2”	black–any other coupler terminal white–any other coupler terminal white/yellow–any other coupler terminal
ECU coupler “3”	white/yellow–any other coupler terminal

A



B



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Is resistance ∞ Ω?

YES

→ Go to step 6.

NO

a. Replace the wire harness.
b. Execute the diagnostic mode. (Code 07)
c. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
- Replace the ECU.
  Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
- Execute the diagnostic mode. (Code 07)
- Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 7.

7. Malfunction in ABS ECU.
   • Replace the ABS ECU.
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.
   • Go to step 22, and complete the service.
8. Connection of gear position 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).

Is the coupler condition normal?

YES

→ Go to step 9.

NO

a. Connect the coupler securely or replace the sub-wire harness.
b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 9.

9. Connection of wire harness coupler and sub-wire harness 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).

Is the coupler condition normal?

YES

→ Go to step 10.

NO

a. Connect the coupler securely or replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 10.

10. 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).

Is the coupler condition normal?

YES

→ Go to step 11.

NO

a. Connect the coupler securely or replace the wire harness.
b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 22, and complete the service.

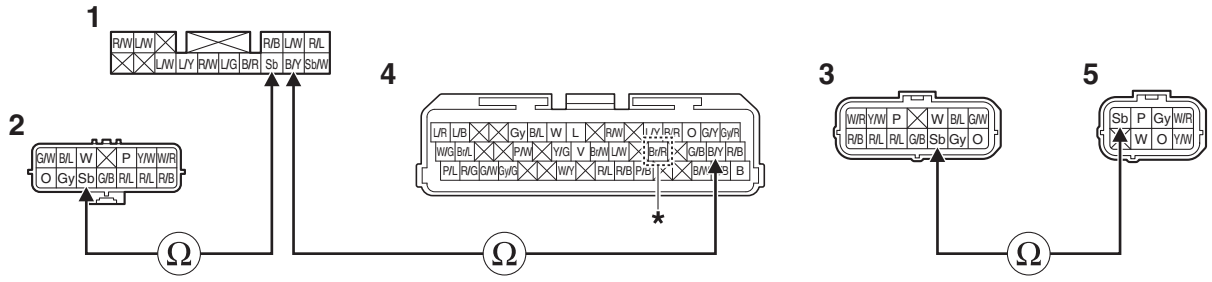
NO

→ Go to step 11.

11.Wire harness continuity.

- Disconnect the relay unit coupler “1”, wire harness coupler “2”, sub-wire harness coupler “3”, ECU coupler “4” and gear position switch coupler “5”.
- Open circuit check

Between relay unit coupler “1” and ECU coupler “4”	black/yellow–black/yellow
Between relay unit coupler “1” and wire harness coupler “2”	sky blue–sky blue
Between sub-wire harness coupler “3” to gear position switch coupler “5”	sky blue–sky blue



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

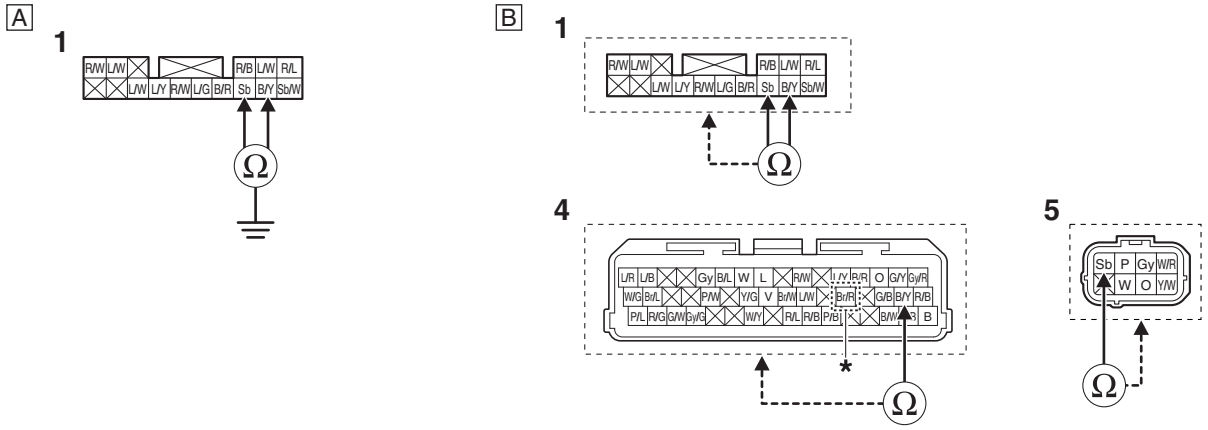
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between relay unit coupler "1" and ground	black/yellow–ground sky blue–ground

Lines short circuit check "B"

Relay unit coupler "1"	black/yellow–any other coupler terminal sky blue–any other coupler terminal
ECU coupler "4"	black/yellow–any other coupler terminal
Gear position switch coupler "5"	sky blue–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 12.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 12.

12. Defective relay unit (diode).
- Check the relay unit (diode).
  Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-42.

Is check result OK?

YES

→ Go to step 13.

NO

a. Replace the relay unit.
   Refer to "GENERAL CHASSIS (5)" on page 4-15.
b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 13.

13. Defective gear position switch.
- Check the gear position switch.
  Refer to "CHECKING THE GEAR POSITION SWITCH" on page 8-49.

Is check result OK?

YES

→ Go to step 14.

NO

a. Replace the gear position switch.
   Refer to "CRANKCASE" on page 5-72.
b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 14.

14. Faulty shift drum (neutral detection area).
- Check the shift drum.
  Refer to "CHECKING THE SHIFT DRUM ASSEMBLY" on page 5-99.

Is check result OK?

YES

→ Go to step 15.

NO

a. Replace the shift drum.
   Refer to “TRANSMISSION” on page 5-95.
b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 15.

15. Malfunction in ECU.
- Replace the ECU, and complete the service.
  Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.

16. Clutch lever adjustment.
  Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-12.
- Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 17.

17. Connection of handlebar switch coupler (left) and clutch 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).

Is the coupler condition normal?

YES

→ Go to step 18.

NO

a. Connect the coupler securely or replace the handlebar switch (left).
b. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 18.

18.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).

Is the coupler condition normal?

YES

→ Go to step 19.

NO

a. Connect the coupler securely or replace the wire harness.
b. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 22, and complete the service.

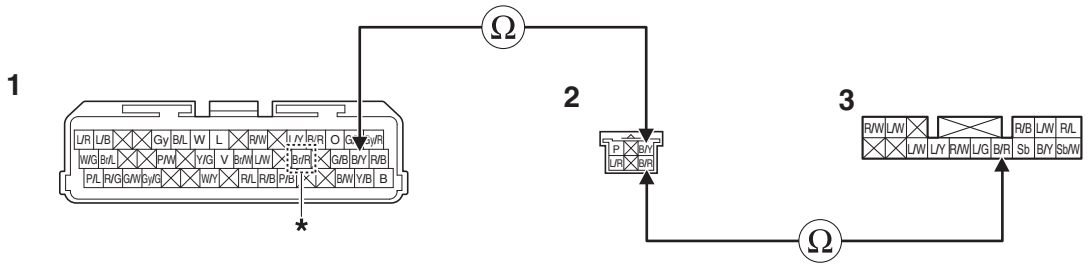
NO

→ Go to step 19.

19.Wire harness continuity.

- Disconnect the ECU coupler “1”, handlebar switch coupler (left) “2” and relay unit coupler “3”.
- Open circuit check

Between ECU coupler “1” and handlebar switch coupler (left) “2”	black/yellow–black/yellow
Between handlebar switch coupler (left) “2” and relay unit coupler “3”	black/red–black/red



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Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

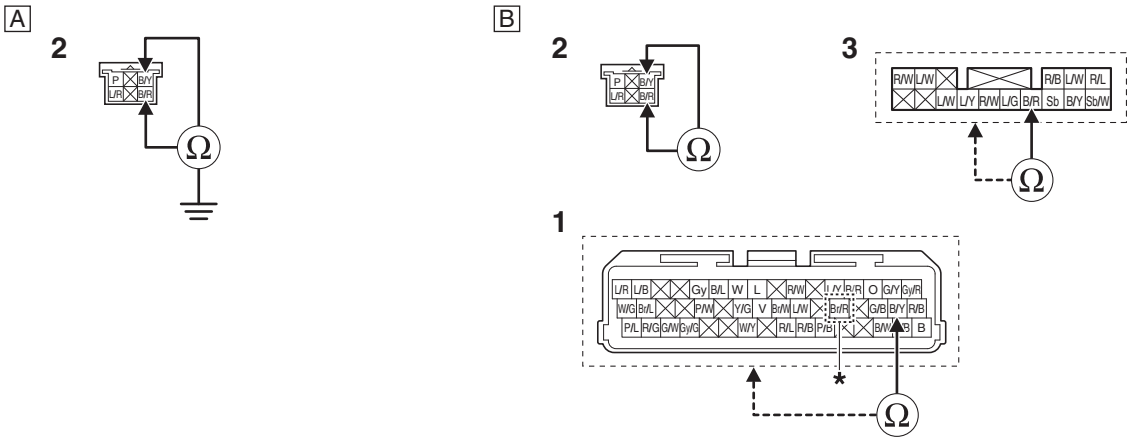
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between handlebar switch coupler (left) "2" and ground	black/yellow–ground black/red–ground

Lines short circuit check "B"

Handlebar switch coupler (left) "2"	black/yellow–black/red
Relay unit coupler "3"	black/red–any other coupler terminal
ECU coupler "1"	black/yellow–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 20.

NO

a. Replace the wire harness.
b. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 20.

20. Defective clutch switch.
- Check the clutch switch.
  Refer to “CHECKING THE SWITCHES” on page 8-39.

Is check result OK?

YES

→ Go to step 21.

NO

a. Replace the clutch switch.
   Refer to “HANDLEBAR” on page 4-68.
b. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 22, and complete the service.

NO

→ Go to step 21.

21. Malfunction in ECU.
    - Replace the ECU, and complete the service.
      Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
22. Delete the DTC and check that the MIL goes off.
    - Turn the main switch to “ON”, and then rotate the rear wheel by hand.
    - Start the engine, and input the vehicle speed signals by operating the vehicle at 20 to 30 km/h (12 to 19 mph).
    - Confirm that the DTC has a condition of “Recovered” using the malfunction mode of the YDT, and then delete the DTC. Delete this DTC even if it has a condition of “Detected”.

EAS20614
P1601

EAS33094
TROUBLESHOOTING
Item
Sidestand switch: open or short circuit of the black/red lead of the ECU is detected. Normal signal is not received from the sidestand switch.
Fail-safe system
- Unable to start engine
- Unable to drive vehicle

Procedure
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).

   Is the coupler condition normal?
   YES
   → Go to step 2.
   NO
   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then extend and retract the sidestand.
   c. Check the DTC using the malfunction mode of the YDT.

      Is it in the “Recovered” condition?
      YES
      → Go to step 7, and complete the service.
      NO
      → Go to step 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).

   Is the coupler condition normal?
   YES
   → Go to step 3.
   NO
   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then extend and retract the sidestand.
   c. Check the DTC using the malfunction mode of the YDT.

      Is it in the “Recovered” condition?
      YES
      → Go to step 7, and complete the service.
      NO
      → Go to step 3.
3. Connection of relay 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Turn the main switch to "ON", and then extend and retract the sidestand.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

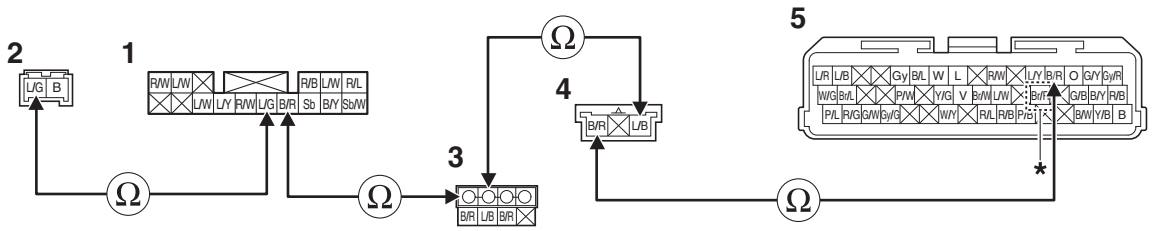
→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Wire harness continuity.
   - Disconnect the relay unit coupler "1", sidestand switch coupler "2", joint coupler "3" cap, main switch coupler "4" and ECU coupler "5".
   - Open circuit check

Between relay unit coupler "1" and sidestand switch coupler "2"	blue/green–blue/green
Between relay unit coupler "1" and joint coupler "3"	black/red–black/red
Between joint coupler "3" and main switch coupler "4"	blue/black–blue/black
Between main switch coupler "4" and ECU coupler "5"	black/red–black/red



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Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Turn the main switch to "ON", and then extend and retract the sidestand.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

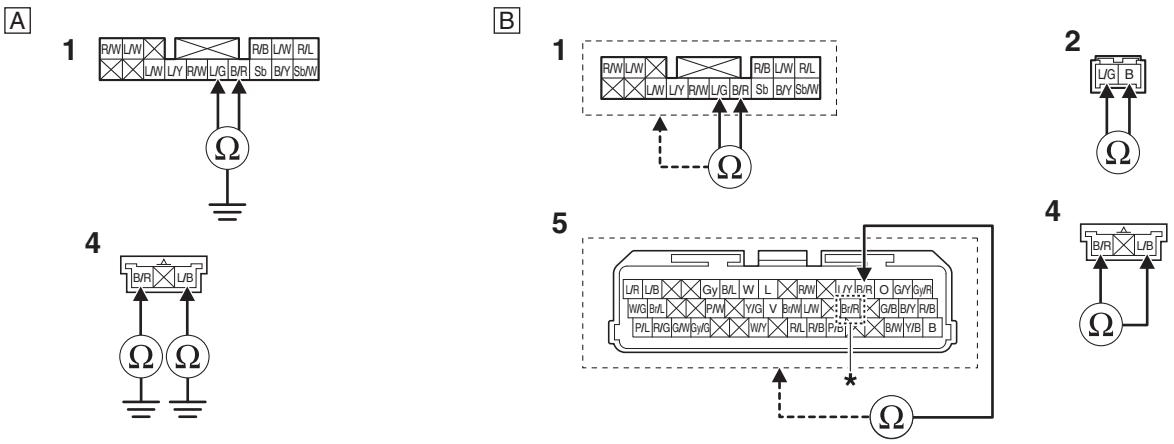
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between relay unit coupler “1” and ground	black/red–ground blue/green–ground
Between main switch coupler “4” and ground	black/red–ground blue/black–ground

Lines short circuit check “B”

Relay unit coupler “1”	black/red–any other coupler terminal blue/green–any other coupler terminal
ECU coupler “5”	black/red–any other coupler terminal
Sidestand switch coupler “2”	blue/green–black
Main switch coupler “4”	black/red–blue/black



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Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then extend and retract the sidestand.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective sidestand switch.
   • Execute the diagnostic mode. (Code 20)
   • Shift the transmission into gear.

Sidestand retracted	ON
Sidestand extended	OFF

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the sidestand switch.
   Refer to “SWINGARM” on page 4-92.
b. Turn the main switch to “ON”, and then extend and retract the sidestand.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20615
P1602

EAS33095
TROUBLESHOOTING

Item

Malfunction in ECU internal circuit (malfunction of ECU power cut-off function).

Fail-safe system

- Able/Unable to start engine (depends on the situation)
- Able/Unable to drive vehicle (depends on the situation)

Procedure

1. Installed condition of battery leads.
   - Check the installed condition of the battery and battery leads (loose bolts).

   Is check result OK?

   YES

   → Go to step 2.

   NO

   a. Reinstall or replace the battery leads.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

      Is it in the “Recovered” condition?

      YES

      → Go to step 7, and complete the service.

      NO

      → Go to step 2.

2. Connection of starter 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

      Is it in the “Recovered” condition?

      YES

      → Go to step 7, and complete the service.

      NO

      → Go to step 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).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

a. Connect the coupler securely or replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Check the fuel injection system fuse.

Is check result OK?

YES

→ Go to step 5.

NO

a. Replace the fuse.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

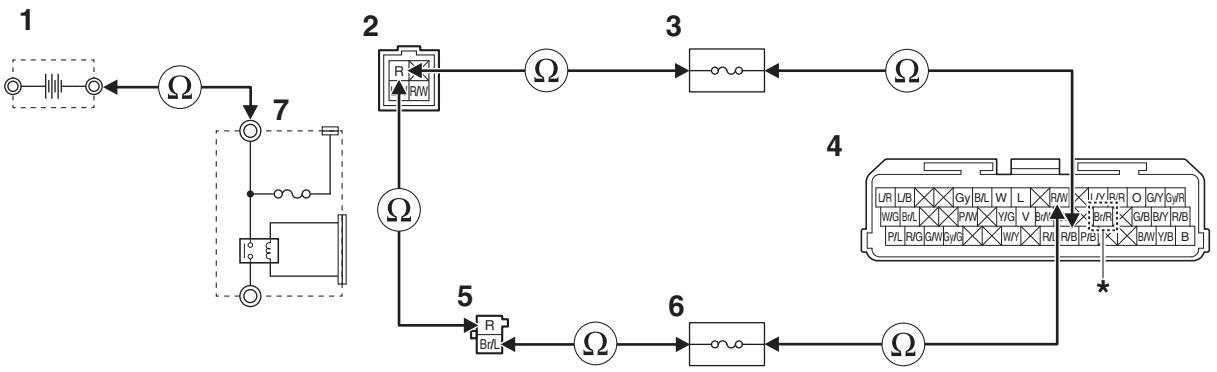
→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Wire harness continuity.
   - Disconnect the battery terminal “1”, starter relay coupler “2”, fuel injection system fuse “3”, ECU coupler “4”, main switch coupler “5” and ignition fuse “6”.
   - Open circuit check

Between battery terminal “1” and starter relay terminal “7”	red–red
Between starter relay coupler “2” and fuel injection system fuse “3” holder	red–red
Between starter relay coupler “2” and main switch coupler “5”	red–red
Between fuel injection system fuse “3” holder and ECU coupler “4”	red/black–red/black
Between main switch coupler “5” and ignition fuse “6” holder	brown/blue–brown/blue
Between ignition fuse “6” holder and ECU coupler “4”	red/white–red/white



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Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

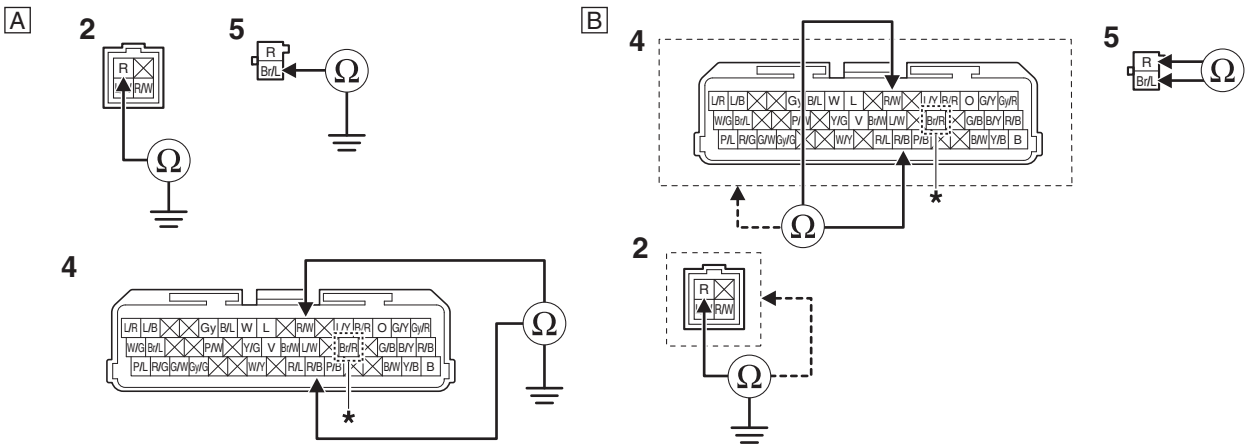
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between starter relay coupler "2" and ground	red–ground
Between ECU coupler "4" and ground	red/black–ground red/white–ground
Between main switch coupler "5" and ground	brown/blue–ground

Lines short circuit check "B"

ECU coupler "4"	red/black–any other coupler terminal red/white–any other coupler terminal
Main switch coupler "5"	brown/blue–red
Starter relay coupler "2"	red–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 6.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
7. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20617
P1604, P1605

EAS33097
TROUBLESHOOTING

Item

- [P1604] Lean angle sensor: short to ground circuit is detected.
- [P1605] Lean angle sensor: open or short to power circuit is detected. Normal signal is not received from the lean angle sensor.

Fail-safe system

- Unable to start engine
- Unable to drive vehicle

Procedure

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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, then to “OFF”, and back to “ON”.
   c. Check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 6, and complete the service.

   NO

   → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to “ON”, then to “OFF”, and back to “ON”.
   c. Check the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

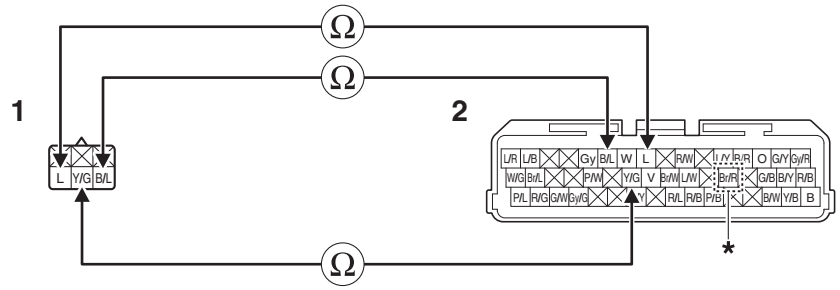
   → Go to step 6, and complete the service.

   NO

   → Go to step 3.

3. Wire harness continuity.
   - Disconnect the lean angle sensor coupler “1” and ECU coupler “2”.
   - Open circuit check

Between ECU coupler “2” and lean angle sensor coupler “1”	blue–blue yellow/green–yellow/green black/blue–black/blue



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, then to “OFF”, and back to “ON”.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to “Short circuit check”.

• Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

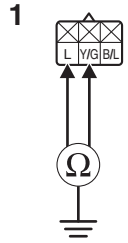
Ground short circuit check “A”

Between lean angle sensor coupler “1” and ground	blue–ground yellow/green–ground

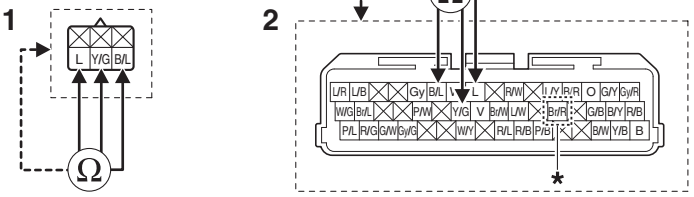
Lines short circuit check “B”

Lean angle sensor coupler “1”	blue–any other coupler terminal yellow/green–any other coupler terminal black/blue–any other coupler terminal
ECU coupler “2”	blue–any other coupler terminal yellow/green–any other coupler terminal black/blue–any other coupler terminal

A



B



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Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, then to “OFF”, and back to “ON”.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 4.

4. Defective lean angle sensor.
   • Execute the diagnostic mode. (Code 08)
   Upright: 0.4–1.4 V
   Overturned: 3.7–4.4 V

Is check result OK?

YES

→ Go to step 5.

NO

a. Replace the lean angle sensor.
b. Turn the main switch to “ON”, then to “OFF”, and back to “ON”.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 5.

5. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
6. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20649
U0155 or Err

EAS33129
TROUBLESHOOTING

Item

Multi-function meter: signals cannot be transmitted between the ECU and the multi-function meter.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

"Err" is displayed on the multi-function meter, but the MIL does not come on.

1. Connection of meter 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).

   Is the coupler condition normal?

   YES

   → Go to step 2.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

      Is it in the "Recovered" condition?

      YES

      → Go to step 6, and complete the service.

      NO

      → Go to step 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).

   Is the coupler condition normal?

   YES

   → Go to step 3.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

      Is it in the "Recovered" condition?

      YES

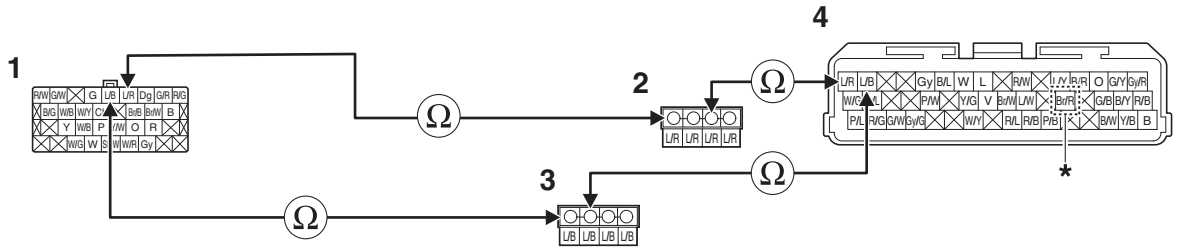
      → Go to step 6, and complete the service.

      NO

      → Go to step 3.

3. Wire harness continuity.
   - Disconnect the meter assembly coupler "1", joint coupler "2" cap, joint coupler "3" cap and ECU coupler "4".
   - Open circuit check

Between the meter assembly coupler “1” and joint coupler “2”	blue/red–blue/red
Between the meter assembly coupler “1” and joint coupler “3”	blue/black–blue/black
Between the joint coupler “2” and ECU coupler “4”	blue/red–blue/red
Between the joint coupler “3” and ECU coupler “4”	blue/black–blue/black



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Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to “Short circuit check”.

• Short circuit check

TIP

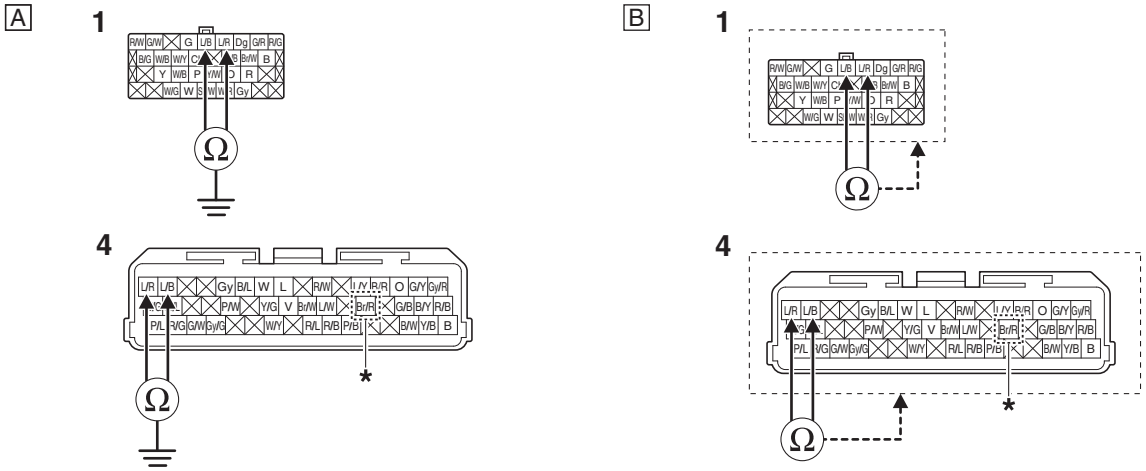
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between meter assembly coupler “1” and ground	blue/red–ground blue/black–ground
Between ECU coupler “4” and ground	blue/red–ground blue/black–ground

Lines short circuit check “B”

Meter assembly coupler “1”	blue/red–any other coupler terminal blue/black–any other coupler terminal
ECU coupler “4”	blue/red–any other coupler terminal blue/black–any other coupler terminal



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Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 4.

4. Defective meter assembly.
   • Replace the meter assembly.
   Refer to “GENERAL CHASSIS (3)” on page 4-7.
   • Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 5.

5. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-40.
6. Delete the DTC and check that the MIL goes off.
   • Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20765
11, 25_ABS

EAS33314
TROUBLESHOOTING

Item

Front wheel sensor (intermittent pulses or no pulses)

Procedure

TIP

With the front wheel stopped, the rear wheel was rotated for longer than about 20 seconds (DTC 11) or for longer than about 2 seconds (DTC 25).

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.

   Is check result OK?

   YES

   → Go to step 2.

   NO

   → Clean the sensor rotor and wheel sensor.

2. Incorrect installation of the front wheel.
   • Check the components for looseness, distortion, and bends.
   Refer to “CHECKING THE FRONT WHEEL” on page 4-22.

   Is check result OK?

   YES

   → Go to step 3.

   NO

   → Replace the wheel axle, tire, front wheel, wheel bearings or oil seals.

3. Defective sensor rotor or incorrect installation of the rotor.
   • Check the surface of the sensor rotor for damage.
   Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

   Is check result OK?

   YES

   → Go to step 4.

   NO

   → Replace the sensor rotor.

4. Defective front wheel sensor or incorrect installation of the sensor.
   • Check the wheel sensor for damage and the installed condition of the sensor.
   Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

   Is check result OK?

   YES

   → Replace the hydraulic unit assembly (ABS ECU).
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

   NO

   → Repair or replace the wheel sensor.
   Refer to “FRONT WHEEL” on page 4-20.

EAS20686
12_ABS

EAS33315
TROUBLESHOOTING
Item
Rear wheel sensor (intermittent pulses or no pulses)

Procedure
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.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → Clean the sensor rotor and wheel sensor.

2. Incorrect installation of the rear wheel.
   • Check the components for looseness, distortion, and bends.
   Refer to “CHECKING THE REAR WHEEL” on page 4-31.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   → Replace the wheel axle, tire, rear wheel, wheel bearings or oil seals.

3. Defective sensor rotor or incorrect installation of the rotor.
   • Check the surface of the sensor rotor for damage.
   Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

   Is check result OK?
   YES
   → Go to step 4.
   NO
   → Replace the sensor rotor.

4. Defective rear wheel sensor or incorrect installation of the sensor.
   • Check the wheel sensor for damage and the installed condition of the sensor.
   Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

   Is check result OK?
   YES
   → Replace the hydraulic unit assembly (ABS ECU).
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.
   NO
   → Repair or replace the wheel sensor.
   Refer to “REAR WHEEL” on page 4-27.

EAS20687
13, 26_ABS

EAS33316
TROUBLESHOOTING

Item

Front wheel sensor (abnormal pulse period)

Procedure

TIP

- If the front brake ABS operates continuously for 20 seconds or more, DTC 26 will be recorded. If the front brake ABS operates continuously for 36 seconds or more, DTC 13 will be recorded.
- Vehicle possibly ridden on uneven roads.

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.

   Is check result OK?

   YES

   → Go to step 2.

   NO

   → Clean the sensor rotor and wheel sensor.

2. Incorrect installation of the front wheel.
   - Check the components for looseness, distortion, and bends.
     Refer to “CHECKING THE FRONT WHEEL” on page 4-22.

   Is check result OK?

   YES

   → Go to step 3.

   NO

   → Replace the wheel axle, tire, front wheel, wheel bearings or oil seals.

3. Defective sensor rotor or incorrect installation of the rotor.
   - Check the surface of the sensor rotor for damage.
     Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

   Is check result OK?

   YES

   → Go to step 4.

   NO

   → Replace the sensor rotor.

4. Defective front wheel sensor or incorrect installation of the sensor.
   - Check the wheel sensor for damage and the installed condition of the sensor.
     Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

Is check result OK?

YES

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

NO

→ Repair or replace the wheel sensor.
Refer to “FRONT WHEEL” on page 4-20.

EAS20688
14, 27_ABS

EAS33317
TROUBLESHOOTING
Item
Rear wheel sensor (abnormal pulse period)

Procedure
TIP
- If the rear brake ABS operates continuously for 20 seconds or more, DTC 27 will be recorded. If the rear brake ABS operates continuously for 36 seconds or more, DTC 14 will be recorded.
- Vehicle possibly ridden on uneven roads.

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.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → Clean the sensor rotor and wheel sensor.
2. Incorrect installation of the rear wheel.
   - Check the components for looseness, distortion, and bends.
     Refer to “CHECKING THE REAR WHEEL” on page 4-31.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   → Replace the wheel axle, tire, rear wheel, wheel bearings or oil seals.
3. Defective sensor rotor or incorrect installation of the rotor.
   - Check the surface of the sensor rotor for damage.
     Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

   Is check result OK?
   YES
   → Go to step 4.
   NO
   → Replace the sensor rotor.
4. Defective rear wheel sensor or incorrect installation of the sensor.
   - Check the wheel sensor for damage and the installed condition of the sensor.
     Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

Is check result OK?

YES

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

NO

→ Repair or replace the wheel sensor.
Refer to “REAR WHEEL” on page 4-27.

EAS20662
15_ABS

EAS33040
TROUBLESHOOTING
Item
Front wheel sensor (open or short circuit)

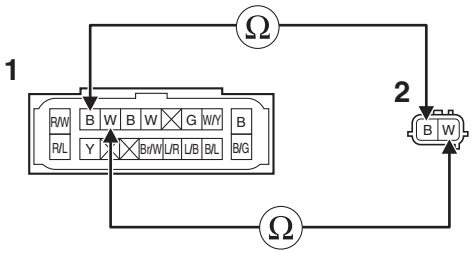
Procedure
1. Defective coupler between the front wheel sensor and the hydraulic unit assembly.
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

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

Is check result OK?
YES
→ Go to step 2.
NO
→ If there is a malfunction, repair it and connect the coupler securely.

2. Wire harness continuity.
   • Disconnect the ABS ECU coupler “1” and front wheel sensor coupler “2”.
   • Open circuit check

Between ABS ECU coupler “1” and front wheel sensor coupler “2”	white–white black–black



Is resistance 0 Ω?
YES
→ Go to “Short circuit check”.
NO
→ Replace the wire harness.

• Short circuit check

TIP
Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

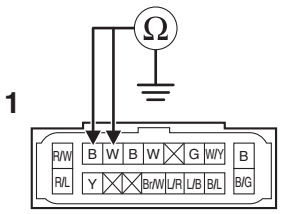
Ground short circuit check “A”

Between ABS ECU coupler “1” and ground	black–ground white–ground

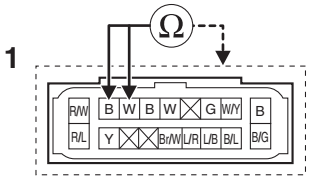
Lines short circuit check “B”

ABS ECU coupler “1”	black–any other coupler terminal white–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 3.

NO

→ Replace the wire harness.

3. Defective front wheel sensor or hydraulic unit assembly.
   - If the above items were performed and no malfunctions were found, the wheel sensor or hydraulic unit assembly is defective.
   - Replace the wheel sensor or hydraulic unit assembly.
     Refer to “FRONT WHEEL” on page 4-20 and “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20663
16_ABS

EAS33285
TROUBLESHOOTING
Item
Rear wheel sensor (open or short circuit)

Procedure
1. Defective coupler between the rear wheel sensor and the hydraulic unit assembly.
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

TIP

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

Is check result OK?

YES

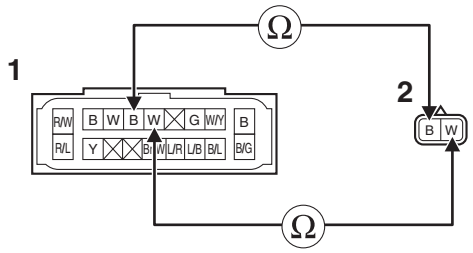
→ Go to step 2.

NO

→ If there is a malfunction, repair it and connect the coupler securely.

2. Wire harness continuity.
   • Disconnect the ABS ECU coupler “1” and rear wheel sensor coupler “2”.
   • Open circuit check

Between ABS ECU coupler “1” and rear wheel sensor coupler “2”	white–white black–black



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

• Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

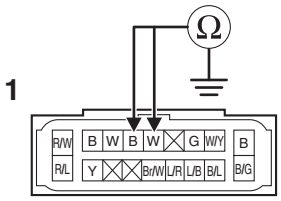
Ground short circuit check “A”

Between ABS ECU coupler “1” and ground	white–ground black–ground

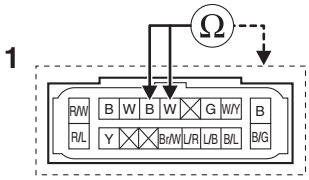
Lines short circuit check “B”

ABS ECU coupler “1”	white–any other coupler terminal black–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 3.

NO

→ Replace the wire harness.

3. Defective rear wheel sensor or hydraulic unit assembly.
   - If the above items were performed and no malfunctions were found, the wheel sensor or hydraulic unit assembly is defective.
   - Replace the wheel sensor or hydraulic unit assembly.
     Refer to “REAR WHEEL” on page 4-27 and “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20708
17, 45_ABS

EAS33330
TROUBLESHOOTING
Item
Front wheel sensor (missing pulses)

Procedure
TIP

If pulse gaps are detected when the vehicle is traveling at a speed of 30 km/h (19 mi/h) or more, DTC 17 will be recorded. If the vehicle is traveling at a speed of 29 km/h (18 mi/h) or less, DTC 45 will be recorded first and DTC 17 will be recorded if the condition continues.

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.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → Clean the sensor rotor and wheel sensor.

2. Incorrect installation of the front wheel.
   • Check the components for looseness, distortion, and bends.
   Refer to “CHECKING THE FRONT WHEEL” on page 4-22.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   → Replace the wheel axle, tire, front wheel, wheel bearings or oil seals.

3. Defective sensor rotor or incorrect installation of the rotor.
   • Check the surface of the sensor rotor for damage.
   Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

   Is check result OK?
   YES
   → Go to step 4.
   NO
   → Replace the sensor rotor.

4. Defective front wheel sensor or incorrect installation of the sensor.
   • Check the wheel sensor for damage and the installed condition of the sensor.
   Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

Is check result OK?

YES

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

NO

→ Repair or replace the wheel sensor.
Refer to “FRONT WHEEL” on page 4-20.

EAS20709
18, 46_ABS

EAS33325
TROUBLESHOOTING
Item
Rear wheel sensor (missing pulses)

Procedure
TIP
If pulse gaps are detected when the vehicle is traveling at a speed of 30 km/h (19 mi/h) or more, DTC 18 will be recorded. If the vehicle is traveling at a speed of 29 km/h (18 mi/h) or less, DTC 46 will be recorded first and DTC 18 will be recorded if the condition continues.

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.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → Clean the sensor rotor and wheel sensor.

2. Incorrect installation of the rear wheel.
   • Check the components for looseness, distortion, and bends.
   Refer to “CHECKING THE REAR WHEEL” on page 4-31.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   → Replace the wheel axle, tire, rear wheel, wheel bearings or oil seals.

3. Defective sensor rotor or incorrect installation of the rotor.
   • Check the surface of the sensor rotor for damage.
   Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

   Is check result OK?
   YES
   → Go to step 4.
   NO
   → Replace the sensor rotor.

4. Defective rear wheel sensor or incorrect installation of the sensor.
   • Check the wheel sensor for damage and the installed condition of the sensor.
   Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

Is check result OK?

YES

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

NO

→ Repair or replace the wheel sensor.
Refer to “REAR WHEEL” on page 4-27.

EAS20690
21_ABS

EAS33320
TROUBLESHOOTING
Item
Hydraulic unit assembly (defective solenoid drive circuit)

Procedure
1. Defective hydraulic unit assembly.
   • Replace the hydraulic unit assembly.
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20710
24_ABS

EAS33374
TROUBLESHOOTING
Item
Brake light switch or tail/brake light

Procedure
1. Defective signaling system. (tail/brake light or brake light switch)
   • Check the brake light switches.
   Refer to “CHECKING THE SWITCHES” on page 8-39.

Is check result OK?
YES
→ Go to step 2.
NO
→ Repair or replace the defective part.

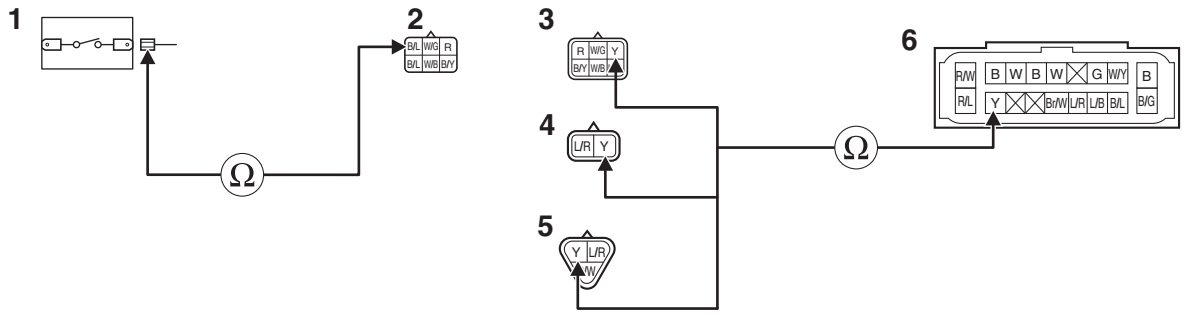
2. Defective coupler between the signaling system (tail/brake light or brake light switch) and the hydraulic unit assembly.
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

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

Is check result OK?
YES
→ Go to step 3.
NO
→ If there is a malfunction, repair it and connect the coupler securely.

3. Wire harness continuity.
   • Disconnect the front brake light switch connector “1”, handlebar switch coupler (right) (handlebar switch side) “2”, handlebar switch coupler (right) (wire harness side) “3”, rear brake light switch coupler “4”, tail/brake light assembly coupler “5”, and ABS ECU coupler “6”.
   • Open circuit check

Between front brake light switch connector “1” and handlebar switch coupler (right) (handlebar switch side) “2”	black/blue–black/blue
Between handlebar switch coupler (right) (wire harness side) “3” and ABS ECU coupler “6”	yellow–yellow
Between rear brake light switch coupler “4” and ABS ECU coupler “6”	yellow–yellow
Between tail/brake light assembly coupler “5” and ABS ECU coupler “6”	yellow–yellow



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

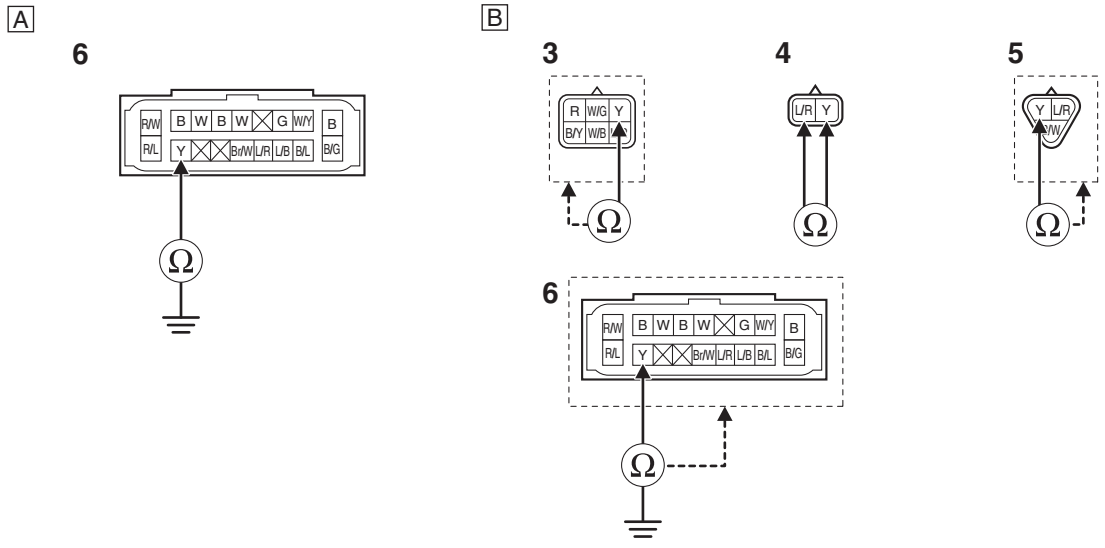
Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

Ground short circuit check “A”

Between ABS ECU coupler “6” and ground	yellow–ground

Lines short circuit check “B”

Handlebar switch coupler (right) (wire harness side) “3”	yellow–any other coupler terminal
Rear brake light switch coupler “4”	yellow–blue/red
Tail/brake light assembly coupler “5”	yellow–any other coupler terminal
ABS ECU coupler “6”	yellow–any other coupler terminal



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Defective hydraulic unit assembly.
   - Replace the hydraulic unit assembly.
     Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20691
31_ABS

EAS33321
TROUBLESHOOTING

Item

Hydraulic unit assembly (defective ABS solenoid power circuit)

Procedure

1. Blown ABS solenoid fuse.
   - Check the ABS solenoid fuse.
     Refer to “CHECKING THE FUSES” on page 8-40.

Is check result OK?

YES

→ Go to step 2.

NO

→ Replace the fuse and check the wire harness.

2. Defective coupler between the battery and the hydraulic unit assembly.
   - Check the coupler for any pins that may be pulled out.
   - Check the locking condition of the coupler.

TIP

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

Is check result OK?

YES

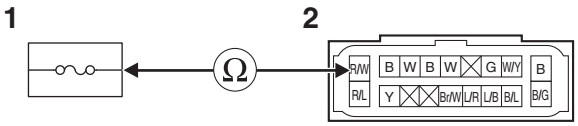
→ Go to step 3.

NO

→ If there is a malfunction, repair it and connect the coupler securely.

3. Wire harness continuity.
   - Disconnect the ABS solenoid fuse “1” and ABS ECU coupler “2”.
   - Open circuit check

Between ABS solenoid fuse “1” holder and ABS ECU coupler “2”	red/white–red/white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

• Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

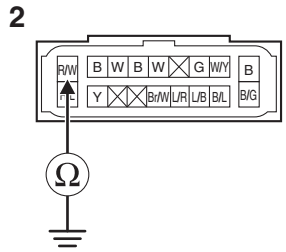
Ground short circuit check “A”

Between ABS ECU coupler “2” and ground	red/white–ground

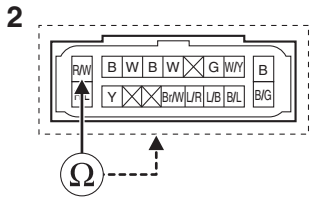
Lines short circuit check “B”

ABS ECU coupler “2”	red/white–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Defective hydraulic unit assembly.
   • Replace the hydraulic unit assembly.
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20712
32_ABS

EAS33376
TROUBLESHOOTING
Item
Hydraulic unit assembly (short circuit in ABS solenoid power supply circuit)

Procedure
1. Defective hydraulic unit assembly.
   - Replace the hydraulic unit assembly.
     Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20692
33_ABS

EAS33322
TROUBLESHOOTING
Item
Hydraulic unit assembly (abnormal ABS motor power supply)

Procedure
1. Blown ABS motor fuse.
   • Check the ABS motor fuse.
   Refer to “CHECKING THE FUSES” on page 8-40.

Is check result OK?
YES
→ Go to step 2.
NO
→ Replace the fuse and check the wire harness.

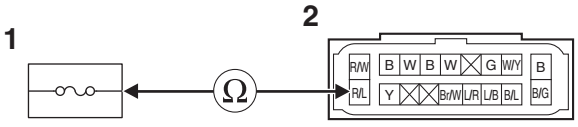
2. Defective coupler between the battery and the hydraulic unit assembly.
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

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

Is check result OK?
YES
→ Go to step 3.
NO
→ If there is a malfunction, repair it and connect the coupler securely.

3. Wire harness continuity.
   • Disconnect the ABS motor fuse “1” and ABS ECU coupler “2”.
   • Open circuit check

Between ABS motor fuse “1” holder and ABS ECU coupler “2”	red/blue–red/blue



Is resistance 0 Ω?
YES
→ Go to “Short circuit check”.
NO
→ Replace the wire harness.

• Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

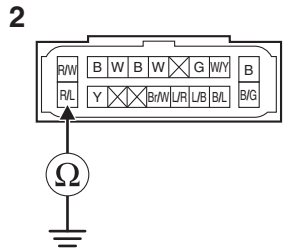
Ground short circuit check “A”

Between ABS ECU coupler “2” and ground	red/blue–ground

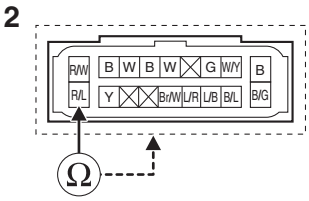
Lines short circuit check “B”

ABS ECU coupler “2”	red/blue–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Defective hydraulic unit assembly.
   • Replace the hydraulic unit assembly.
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20693
34_ABS

EAS33323
TROUBLESHOOTING
Item
Hydraulic unit assembly (short circuit in ABS motor power supply circuit)

Procedure
1. Defective hydraulic unit assembly.
   - Replace the hydraulic unit assembly.
     Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20694
41_ABS

EAS33331
TROUBLESHOOTING
Item
Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)

Procedure
1. Incorrect installation of the front wheel sensor.
   • Check the components for looseness, distortion, and bends.
   Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → Repair or replace the defective part.

2. Incorrect rotation of the front wheel.
   • Check that there is no brake disc drag on the wheel and make sure that it rotates smoothly.
   Refer to “CHECKING THE FRONT WHEEL” on page 4-22 and “CHECKING THE FRONT BRAKE DISCS” on page 4-42.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   → Repair or replace the defective part.

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 DISCS” on page 4-42.

   Is check result OK?
   YES
   → Go to step 4.
   NO
   → Repair or replace the defective part.

4. Defective hydraulic unit assembly.
   • Replace the hydraulic unit assembly.
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20746
42, 47_ABS

EAS33324
TROUBLESHOOTING
Item
Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)

Procedure
1. Conditions when the malfunction occurred.
   • If the rear wheel locks intermittently due to rapid down shifting or due to engine braking on a slippery road surface, DTC 42 and 47 may be indicated.
2. Incorrect installation of the rear wheel sensor (DTC 42).
   • Check the components for looseness, distortion, and bends.
   Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

Is check result OK?
YES
→ Go to step 3.
NO
→ Repair or replace the defective part.

3. 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 4-31 and “CHECKING THE REAR BRAKE DISC” on page 4-54.

Is check result OK?
YES
→ Go to step 4.
NO
→ Repair or replace the defective part.

4. Rear brake dragging.
   • Check that the brake fluid pressure is correctly transmitted to the brake caliper when the brake pedal is operated and that the pressure decreases when the pedal is released.
   Refer to “CHECKING THE REAR BRAKE DISC” on page 4-54.

Is check result OK?
YES
→ Go to step 5.
NO
→ Repair or replace the defective part.

5. Defective hydraulic unit assembly.
   • Replace the hydraulic unit assembly.
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20768
43_ABS

EAS33484
TROUBLESHOOTING
Item
Front wheel sensor (missing pulses)

Procedure
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.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → Clean the sensor rotor and wheel sensor.

2. Incorrect installation of the front wheel.
   • Check the components for looseness, distortion, and bends.
   Refer to “CHECKING THE FRONT WHEEL” on page 4-22.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   → Replace the wheel axle, tire, front wheel, wheel bearings or oil seals.

3. Defective sensor rotor or incorrect installation of the rotor.
   • Check the surface of the sensor rotor for damage.
   Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

   Is check result OK?
   YES
   → Go to step 4.
   NO
   → Replace the sensor rotor.

4. Defective front wheel sensor or incorrect installation of the sensor.
   • Check the wheel sensor for damage and the installed condition of the sensor.
   Refer to “MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR” on page 4-23.

   Is check result OK?
   YES
   → Replace the hydraulic unit assembly (ABS ECU).
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.
   NO
   → Repair or replace the wheel sensor.
   Refer to “FRONT WHEEL” on page 4-20.

EAS20747
44_ABS

EAS33452
TROUBLESHOOTING
Item
Rear wheel sensor (missing pulses)

Procedure
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.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → Clean the sensor rotor and wheel sensor.

2. Incorrect installation of the rear wheel.
   • Check the components for looseness, distortion, and bends.
   Refer to “CHECKING THE REAR WHEEL” on page 4-31.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   → Replace the wheel axle, tire, rear wheel, wheel bearings or oil seals.

3. Defective sensor rotor or incorrect installation of the rotor.
   • Check the surface of the sensor rotor for damage.
   Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

   Is check result OK?
   YES
   → Go to step 4.
   NO
   → Replace the sensor rotor.

4. Defective rear wheel sensor or incorrect installation of the sensor.
   • Check the wheel sensor for damage and the installed condition of the sensor.
   Refer to “MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR” on page 4-32.

   Is check result OK?
   YES
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.
   → Replace the hydraulic unit assembly (ABS ECU).
   NO
   → Repair or replace the wheel sensor.
   Refer to “REAR WHEEL” on page 4-27.

EAS20766
51, 52_ABS

EAS33326
TROUBLESHOOTING

Item

• [51_ABS] Vehicle system power supply (voltage of ABS ECU power supply is high)
• [52_ABS] Vehicle system power supply (voltage of wheel sensor power supply is high)

Procedure

1. Defective battery.
   • Recharge or replace the battery, and check again.
   Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.
2. Disconnected battery terminal.
   • Check the connection.

Is check result OK?

YES

→ Go to step 3.

NO

→ Replace or reconnect the terminal.

3. Defective charging system.
   • Check the charging system.
   Refer to “CHARGING SYSTEM” on page 8-13.

Is check result OK?

YES

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

NO

→ Confirm the cause of the problem and repair it, and check again.

EAS20699
53_ABS

EAS33327
TROUBLESHOOTING
Item
Vehicle system power supply (voltage of ABS ECU power supply is low)

Procedure
1. Defective battery.
   • Recharge or replace the battery, and check again.
   Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.
2. Defective coupler between the battery and the hydraulic unit assembly.
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

TIP

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

Is check result OK?

YES

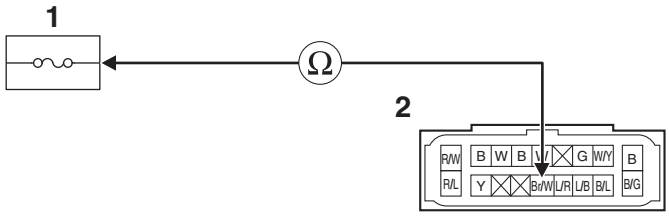
→ Go to step 3.

NO

→ If there is a malfunction, repair it and connect the coupler securely.

3. Wire harness continuity.
   • Disconnect the ABS ECU fuse “1” and ABS ECU coupler “2”.
   • Open circuit check

Between ABS ECU fuse “1” holder and ABS ECU coupler “2”	brown/white–brown/white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

• Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

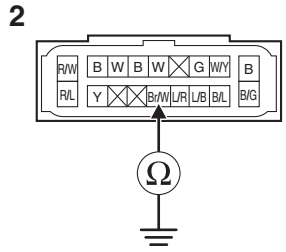
Ground short circuit check “A”

Between ABS ECU coupler “2” and ground	brown/white–ground

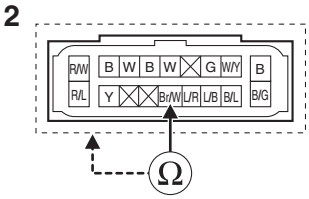
Lines short circuit check “B”

ABS ECU coupler “2”	brown/white–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Defective charging system.
   • Check the charging system.
   Refer to “CHARGING SYSTEM” on page 8-13.

Is check result OK?

YES

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

NO

→ Confirm the cause of the problem and repair it, and check again.

EAS20711
54_ABS

EAS33375
TROUBLESHOOTING
Item
Hydraulic unit assembly (defective ABS solenoid and ABS motor power supply circuits)

Procedure
1. Defective battery.
   • Recharge or replace the battery, and check again.
   Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.
2. Defective coupler between the battery and the hydraulic unit assembly.
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

TIP

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

Is check result OK?

YES

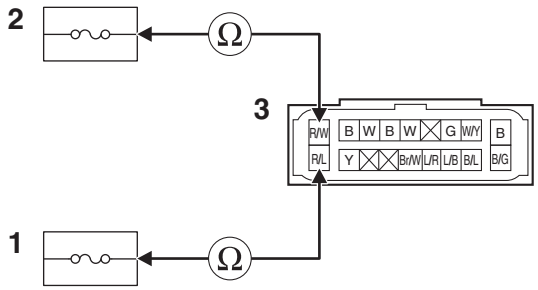
→ Go to step 3.

NO

→ If there is a malfunction, repair it and connect the coupler securely.

3. Wire harness continuity.
   • Disconnect the ABS motor fuse “1”, ABS solenoid fuse “2” and ABS ECU coupler “3”.
   • Open circuit check

Between ABS motor fuse “1” holder and ABS ECU coupler “3”	red/blue–red/blue
Between ABS solenoid fuse “2” holder and ABS ECU coupler “3”	red/white–red/white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

• Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

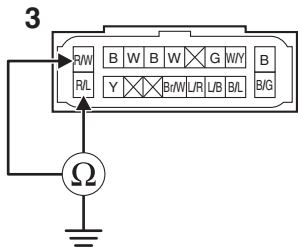
Ground short circuit check “A”

Between ABS ECU coupler “3” and ground	red/blue–ground red/white–ground

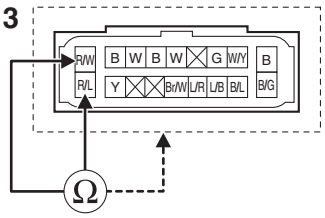
Lines short circuit check “B”

ABS ECU coupler “3”	red/blue–any other coupler terminal red/white–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Defective charging system.
   • Check the charging system.
   Refer to “CHARGING SYSTEM” on page 8-13.

Is check result OK?

YES

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

NO

→ Confirm the cause of the problem and repair it, and check again.

EAS20700
55_ABS

EAS33328
TROUBLESHOOTING
Item
Hydraulic unit assembly (defective ABS ECU)

Procedure
1. Defective hydraulic unit assembly
   - Replace the hydraulic unit assembly.
     Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20701
56_ABS

EAS33329
TROUBLESHOOTING
Item
Hydraulic unit assembly (abnormal internal power supply)

Procedure
1. Defective hydraulic unit assembly.
   • Replace the hydraulic unit assembly.
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20703
63_ABS

EAS33334
TROUBLESHOOTING

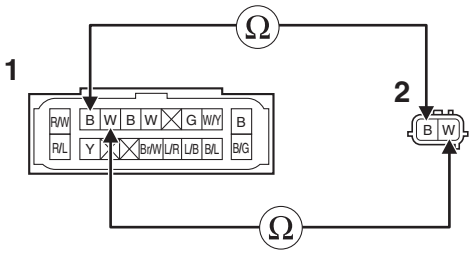
Item

Front wheel sensor power supply (voltage of power supply is low)

Procedure

1. Wire harness continuity.
   - Disconnect the ABS ECU coupler “1” and front wheel sensor coupler “2”.
   - Open circuit check

Between front wheel sensor coupler “2” and ABS ECU coupler “1”	black–black white–white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

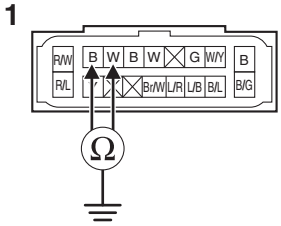
Ground short circuit check “A”

Between ABS ECU coupler “1” and ground	black–ground white–ground

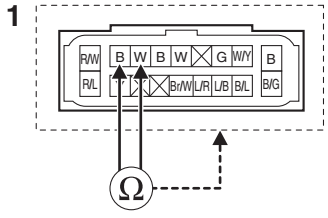
Lines short circuit check “B”

ABS ECU coupler “1”	black–any other coupler terminal white–any other coupler terminal

A



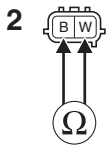
B



Is resistance ∞ Ω?
YES
→ Go to step 2.
NO
→ Replace the wire harness.

2. Defective front wheel sensor.
• Lines short circuit check

Front wheel sensor coupler “2”	white–black



Is resistance 0 Ω?
YES
→ Go to step 3.
NO
→ Replace the wire harness.

3. Defective hydraulic unit assembly.
• Replace the hydraulic unit assembly.
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20704
64_ABS

EAS33335
TROUBLESHOOTING

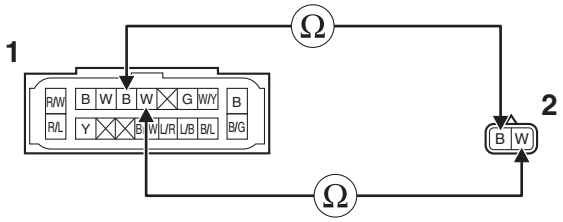
Item

Rear wheel sensor power supply (voltage of power supply is low)

Procedure

1. Wire harness continuity.
   - Disconnect the ABS ECU coupler “1” and rear wheel sensor coupler “2”.
   - Open circuit check

Between rear wheel sensor coupler “2” and ABS ECU coupler “1”	white–white black–black



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

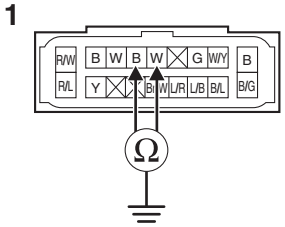
Ground short circuit check “A”

Between ABS ECU coupler “1” and ground	white–ground black–ground

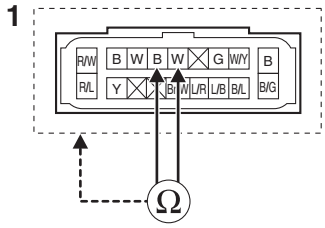
Lines short circuit check “B”

ABS ECU coupler “1”	white–any other coupler terminal black–any other coupler terminal

A



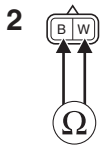
B



Is resistance ∞ Ω?
YES
→ Go to step 2.
NO
→ Replace the wire harness.

2. Defective rear wheel sensor.
• Lines short circuit check

Rear wheel sensor coupler “2”	white–black



Is resistance 0 Ω?
YES
→ Go to step 3.
NO
→ Replace the wire harness.

3. Defective hydraulic unit assembly.
• Replace the hydraulic unit assembly.
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-60.

EAS20091

WIRING DIAGRAM

MT07P/MT07PC 2023

1. Main switch
2. Fuse box 2
3. ABS solenoid fuse
4. ABS motor fuse
5. Accessory fuse
6. ABS ECU fuse
7. Terminal fuse 1
8. Fuse box 1
9. Ignition fuse
10. Signaling system fuse
11. Headlight fuse
12. Fuel injection system fuse
13. Backup fuse
14. Radiator fan motor fuse
15. AC magneto
16. Rectifier/regulator
17. Battery
18. Engine ground
19. Main fuse
20. Starter relay
21. Starter motor
22. Rear brake light switch
23. Relay unit
24. Starting circuit cut-off relay
25. Fuel pump relay
26. Joint coupler
27. Crankshaft position sensor
28. Intake air pressure sensor
29. Lean angle sensor
30. O_2 sensor
31. Throttle position sensor
32. Shift sensor (OPTION)
33. Intake air temperature sensor
34. Coolant temperature sensor
35. ECU (Engine Control Unit)
36. CCU (Communication Control Unit)
37. Ignition coil #1
38. Ignition coil #2
39. Spark plug
40. Fuel injector #1
41. Fuel injector #2
42. ISC (Idle Speed Control) unit
43. Front wheel sensor
44. Rear wheel sensor
45. ABS ECU
46. Fuel sender
47. Fuel pump
48. Oil pressure switch
49. Meter assembly
50. Multi-function meter
51. ABS warning light
52. Horn
53. Gear position switch
54. Sidestand switch
55. Handlebar switch (right)
56. Front brake light switch
57. Start/engine stop switch
58. Wheel switch
59. Handlebar switch (left)
60. Clutch switch
61. Dimmer switch
62. Pass switch
63. Turn signal switch
64. Horn switch
65. Hazard switch
66. Rear turn signal light (right)
67. Rear turn signal light (left)
68. Front turn signal/position light (right)
69. Front turn signal/position light (left)
70. Headlight control unit
71. Headlight (low beam)
72. Headlight (high beam)
73. Auxiliary light
74. License plate light
75. Tail/brake light
76. Radiator fan motor relay
77. Radiator fan motor
78. Grip warmer (OPTION)
79. Auxiliary DC connector (OPTION)
80. Purge cut valve solenoid (for California only)

*.For California: Br/R
Except for California: blank
**.For California: B/R, R/W
Except for California: R/W

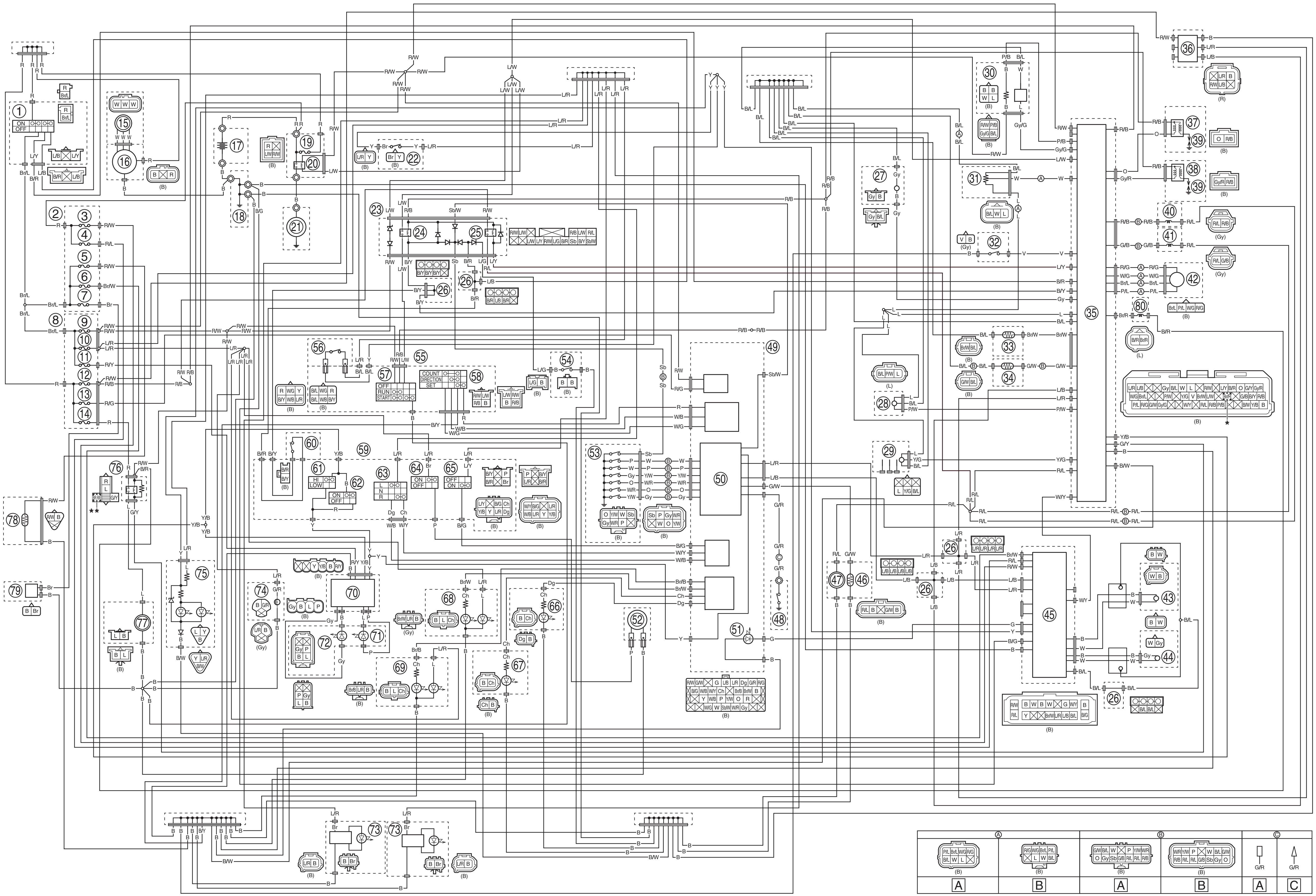
A. Wire harness
B. Sub-wire harness (throttle position sensor, coolant temperature sensor, fuel injector #1, fuel injector #2, ISC (Idle Speed Control) unit, gear position switch)
C. Sub-wire harness (oil pressure switch)

EAS30613

COLOR CODE

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

MT07P/MT07PC 2023
WIRING DIAGRAM



MT07P/MT07PC 2023
WIRING DIAGRAM