YAMAHA 2025

SERVICE MANUAL

MT-07

MT07S
MT07SC

LIT-11616-38-60

BLW-28197-10 ●

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.
- 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

MT07S/MT07SC
SERVICE MANUAL

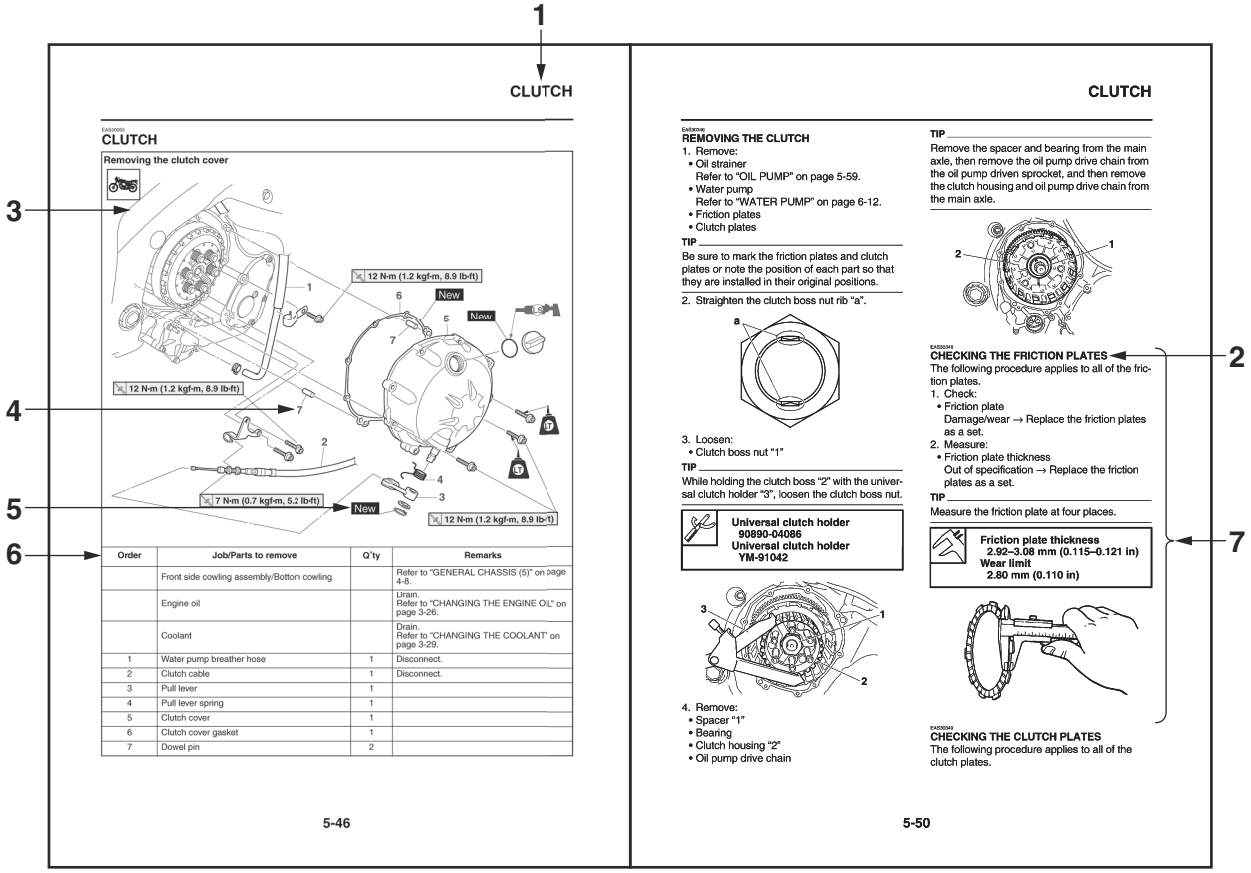
Printed in U.S.A.
P/N LIT-11616-38-60

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	New	Replace the part with a new one.

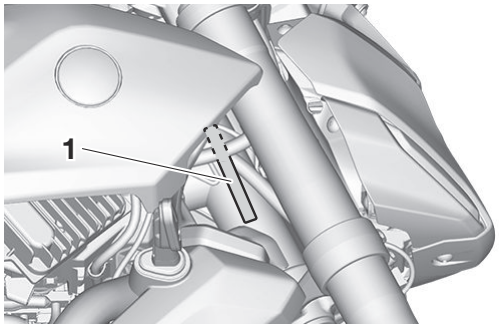
EAS10003

TABLE OF CONTENTS

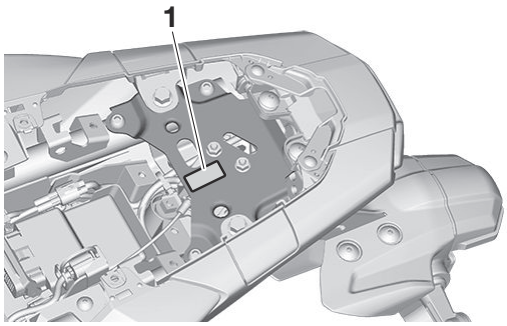
GENERAL INFORMATION

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.

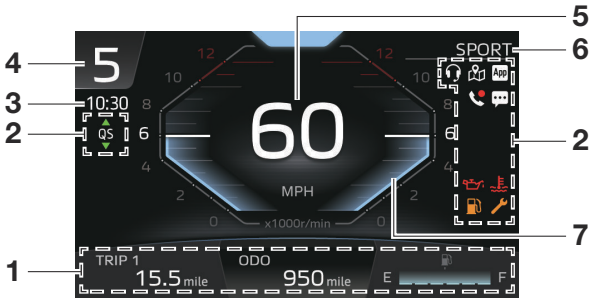


EAS20008
FEATURES

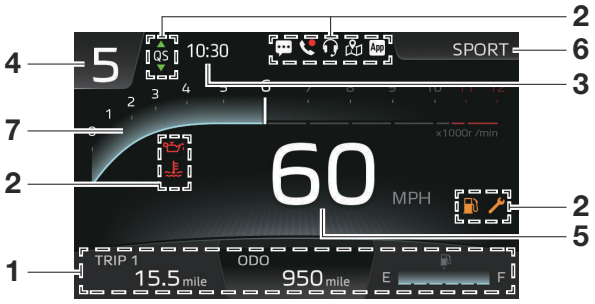
EAS31706
GLOSSARY
ABS - Anti-lock Brake System
ABS ECU - Anti-lock Brake System Electronic Control Unit
BCM - Body Control Module
ECU - Engine Control Unit
GCU - Generator Control Unit
PWR - Power delivery mode
QS - Quick Shifter
TCS - Traction Control System
YRC - Yamaha Ride Control

EAS31707
DISPLAY
The following items can be found on the display:

Theme1

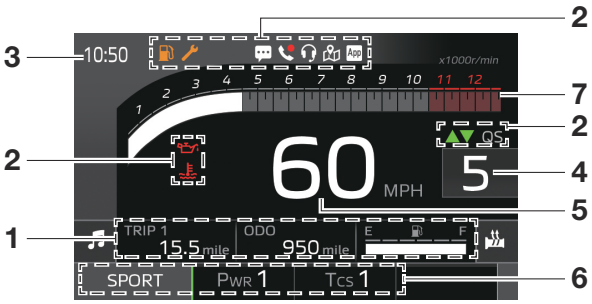


Theme2



Theme3

Theme4



1. Vehicle information display
2. Indicator icons
3. Clock
4. Transmission gear display
5. Speedometer
6. YRC mode display
7. Tachometer

Minimized display view (while menu system/navigation are open)

When the menu system or the navigation function are open, the information on the main display is relocated as shown.

Theme1, 2, 3

Theme4

1. Indicator icons
2. Vehicle information display
3. Transmission gear display
4. Clock
5. Speedometer
6. YRC mode display
7. Tachometer

TIP

- The brightness level of the display screen can be adjusted in the menu system.
- If the display becomes too hot, the display screen brightness levels will automatically reduce to avoid damage.
- 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.
- The navigation system display units can be changed separately using the Garmin Street-Cross app.

Display system controls

The display user interface is controlled with the joystick / "✔" and the home button "⌂". Each control has various functions for different situations, see the following list for details.

Operate the joystick left-right-updown:

Main display active: highlights and adjusts items in the vehicle information display, and also the YRC mode display (Theme4).

Navigation active: up-down zoom the map view in-out.

Turn-by-turn pop-up active: left-right adjust the displayed information.

Menu system active: highlight and adjusts various menu items.

Short press "✔":

Main display active: highlight and select items in the vehicle information display, and also the YRC mode display (Theme4).

Navigation active: directly open the "Navigation" menu display.

Menu system active: select highlighted menu items.

Long press "✔":

Highlighted vehicle information display item flashing: reset the item.

Smartphone connected with music app: play/pause music.

Short press the home button "⌂":

Main display/navigation active: open the first pop-up layer of the menu system.

Menu system active: cancel/return to previous.

Long press the home button "⌂":

Main display active: switch to navigation display.

Navigation active: switch to main display.

Menu system active: exit to the previously open main display/navigation display.

Clock

The clock uses a 12-hour time system. The clock is updated automatically from connected smartphones or can also be manually set in "⚙ Settings" → "Clock".

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.

Transmission gear display

This display shows which gear the transmission is in. This vehicle has 6 gears and a neutral position. The neutral position is indicated by the neutral indicator light "N" and by the transmission gear display reading: "N".

YRC mode display

Indicates which of the following YRC modes are selected: "SPORT", "STREET" and "CUSTOM". Cycle through the YRC modes by using the YRC mode button "MODE" and also view/customize them in the menu system.

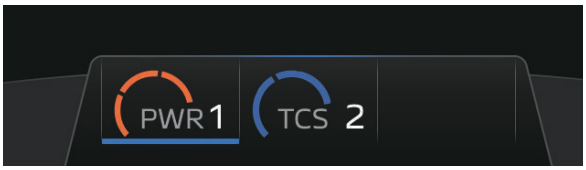
TIP

The name of "CUSTOM" can also be customized via the Yamaha Motorcycle Connect app.

In Theme4:

In this theme, the YRC mode display is expanded to show the current "PWR" and "TCS" settings for each YRC mode. In addition to using the YRC mode button "MODE", you can move the joystick up-down to cycle between the vehicle information display and the YRC mode display. When highlighted, short press "✔" to select the YRC mode display. Move the joystick left-right to cycle between the available items. Move the joystick up-down to cycle the highlighted YRC mode or change the setting for the highlighted item.

In Theme1-3:



Long press the YRC mode button “MODE” to open/close an expanded YRC mode pop-up at the bottom of the screen. While the pop-up is open, short press the YRC mode button “MODE” to cycle through the presets and use the joystick to adjust individual items.

TIP

If the selected YRC mode is customizable, “PWR” and “TCS” can be highlighted and adjusted using the joystick.

Vehicle information display

The vehicle information display contains 3 cells which can be set to display the following:

- Odometer (ODO)
- Two tripmeters (TRIP 1 / TRIP 2)
- Fuel reserve tripmeter (TRIP F)
- Instantaneous fuel consumption (INST FUEL)
- Average fuel consumption (AVG FUEL)
- Estimated fuel range (RANGE)
- Coolant temperature (COOLANT)
- Air temperature (AIR)
- Trip timer (TRIP TIME)
- Fuel Meter

In Theme1-3:

- Move the joystick left-right to cycle between the cells. Move the joystick up-down to cycle the display item for the highlighted cell. If a display item is flashing, long press “✔” to reset it.
- It can also be set in “Ⓐ Vehicle Info” in the menu system.

In Theme4:

Move the joystick up-down to cycle between the vehicle information display and the YRC mode display. When highlighted, short press “✔” to select the vehicle information display. Move the joystick left-right to cycle between the cells. Move the joystick up-down to cycle the display item for the highlighted cell. If a display item is flashing, long press “✔” to reset it.

TIP

- Resettable items can also be individually viewed and reset by navigating to “⚙ Settings” → “Information / Reset” in the menu system.
- While on the navigation display, navigate to “Ⓐ Vehicle Info” in the menu system to highlight the two cells.

Odometer (ODO)

The odometer shows the total distance traveled by the vehicle.

TIP

The odometer will lock at 999999 and cannot be reset.

Tripmeters (TRIP 1 / TRIP 2)

“TRIP 1” and “TRIP 2” show the distance traveled since they were last set to zero.

“TRIP 1” and “TRIP 2” will reset to 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” activates and begins recording distance traveled from that point. After refueling and traveling some distance, “TRIP F” will automatically deactivate and reset.

TIP

When “TRIP F” is inactive it will show as “--.-”.

Instantaneous fuel consumption (INST FUEL)

When using kilometers, the instantaneous fuel consumption display can be set to “km/L” or “L/100km”.

When using miles, the instantaneous fuel consumption is displayed in “MPG”.

Average fuel consumption (AVG FUEL)

When using kilometers, the average fuel consumption display can be set to “km/L” or “L/100km”. When using miles, the average fuel consumption is displayed in “MPG”.

Estimated fuel range (RANGE)

The estimated distance that can be traveled under the current riding conditions with the remaining fuel.

Coolant temperature (COOLANT)

The coolant temperature is displayed from –30 °C (–22 °F) to 130 °C (266 °F) in 1 °C (1 °F) increments.

TIP

- When using Celsius, the coolant temperature display will read “–30” when the vehicle coolant temperature is below –30 °C.
- When using Fahrenheit, the coolant temperature display will read “–22” when the vehicle coolant temperature is below –22 °F.
- If the vehicle coolant temperature is too high the coolant temperature display will read “Hi”.

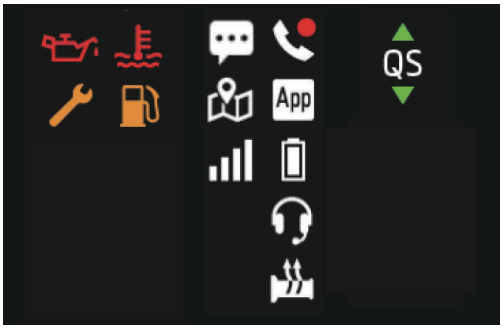
Air temperature (AIR)
The air temperature is displayed from –9 °C (15 °F) to 50 °C (122 °F) in 1 °C (1 °F) increments. The displayed temperature may differ from the actual ambient temperature due to the vehicle temperature and other factors.

TIP
- "---" will be displayed if the detected temperature is lower than –9 °C (15 °F).
- "---" will be displayed if the detected temperature is higher than 50 °C (122 °F).

Trip timer (TRIP TIME)
Displays the engine running time.
Fuel Meter
The fuel meter indicates the amount of fuel in the fuel tank. The display segments of the fuel meter disappear from "F" (full) towards "E" (empty) as the fuel level decreases. When the last segment starts flashing, refuel as soon as possible.

ECAE0121
NOTICE
Do not let the vehicle run completely out of fuel. This may cause damage to the catalytic converter.

Warning and indicator icons



Low fuel indicator " "
This icon comes on when approximately 2.0 L (0.54 US gal, 0.45 Imp.gal) of fuel remains in the tank.
Coolant temperature warning " "
This icon appears when the coolant temperature is 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 " "
This icon appears when the engine oil pressure is low. When the vehicle is first turned on, engine oil pressure has yet to build, so this indicator will come on and stay on until the engine has been started.

TIP
If a malfunction is detected, this icon will flash repeatedly.

ECA26410
NOTICE
Do not continue to operate the engine if the oil pressure is low.

Auxiliary system warning " "
This icon appears if a problem is detected in a system not related to the engine.
Quick shift indicator "QS" (if equipped)
This icon and accompanying arrow icons indicate the status of the quick shifter.
Respective arrow icon off: the quick shifter is disabled.
"△": the system is active for upshifts but cannot currently quickshift.
"▽": the system is active for downshifts but cannot currently quickshift.
"▲": quick upshift available.
"▼": quick downshift available.

TIP
The upshift and downshift functions are independent and can be activated separately in the menu system.

Network connectivity indicator " "
This icon indicates the connected smartphone's network connection status.
Icon off: No smartphone connected.
: A smartphone is connected but has no network connectivity.
: A smartphone is connected and has network connectivity. The icon segments indicate the signal strength.

TIP
This icon may not operate with some smartphone models, even if the connected smartphone has network connectivity.

Smartphone battery level indicator " "
This icon indicates the connected smartphone's battery level.
Icon off: No smartphone connected.
: The center bar moves up and down to indicate the battery level.
: Smartphone is charging.

TIP
The battery level indicated by the icon may not

always be consistent with the battery level displayed on the smartphone.

Headset indicator "🎧"
This icon comes on if a Bluetooth headset is connected to the smartphone.

TIP
For some smartphones, this icon may go off during phone calls.

Yamaha Motorcycle Connect app indicator "App"
This icon comes on when the Yamaha Motorcycle Connect app is successfully connected to the vehicle.
App: The icon turns yellow when the connected smartphone becomes overheated.

TIP
Depending on the smartphone, the icon may remain yellow even after the smartphone is no longer overheating.

Navigation connection indicator "🗺"
This icon comes on when the Garmin StreetCross app is connected.
Telephone indicator "📞"/"📞"
This icon comes on green when there is an active call and red when there is a recent missed call. The missed call icon will disappear when the recent contact list is opened at "App Applications" → "Phone" in the menu system.
Notification indicator "💬"
This icon comes on when the connected smartphone receives an SNS, Email or other notification. After that, the icon stays on until you turn the vehicle off. Check the notifications by navigating to "App Applications" → "Notification" in the menu system.

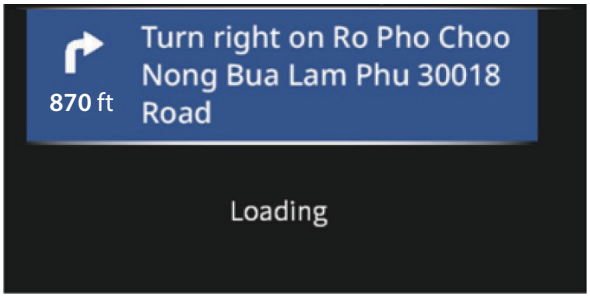
TIP
- This function works only when a smartphone is connected to the CCU via the Yamaha Motorcycle Connect app.
- Permission to access notifications must be granted to the Yamaha Motorcycle Connect app on your smartphone.

Grip warmer indicator "♨"(if equipped)
The grip warmers can be used when the engine is running. There are 3 customizable temperature presets that can be customized between 10 different temperature levels.
The icon displays the current temperature setting:
: Grip warmer off
: Low preset
: Medium preset
: High preset

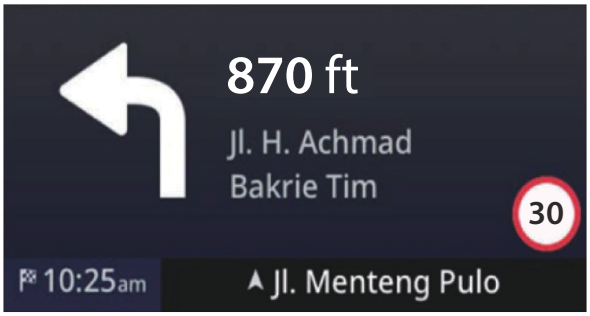
ECA17932
NOTICE
- **Be sure to wear gloves when using the grip warmers.**
- **Do not use the grip warmers in warm weather.**
- **If the handlebar grip or throttle grip becomes worn or damaged, stop using the grip warmers and replace the grips.**

Navigation Display
There are 3 display modes for route guidance: "Default View", "Turn-by-Turn", and "Turn List".
Default View

In "Default View" mode: Operate the joystick up-down to zoom in/out.
Turn List



In "Turn List" mode: Operate the joystick up-down to scroll through the list of turns on the route.
Turn-by-Turn



In "Turn-by-Turn" mode: Operate the joystick

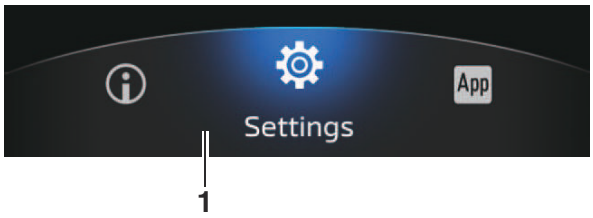
left-right to cycle the information at the bottom of the display between distance remaining to destination/estimated time to arrival and current location.
Short press "✔" to open the menu system and navigate to "App Applications" → "Navigation" → "Change View" to switch between the display modes.

TIP

- If the Bluetooth connection becomes unstable, the navigation display may automatically change to the "Turn-by-Turn" mode or freeze with a loading animation. When the connection improves, the navigation display will return to the former setting.
- For some smartphones, using the phone function while navigation is in progress may display a connection error after returning to the navigation display. If this happens, follow the instructions on the display.
- If the connected smartphone's AI assistant function is deactivated in the smartphone's settings, and a headset is also connected, a connection error may be displayed when using the navigation home display (iOS only).

EAS33897

MENU SYSTEM



1. Pop-up menu

The menu system for this vehicle is controlled with the joystick/home button on the left handlebar.
The first layer of the menu is a pop-up at the bottom of the main display. Deeper layers of the menu system are viewed using the minimized display view.
To open the pop-up menu from the main display:
Short press the home button "⌂".
Menu system operation:

- Operate the joystick left-right-updown to highlight and adjust menu items.
- Short press "✔" to select an item.
- Short press the home button "⌂" to cancel/return to previous.
- Long press the home button "⌂" to close the menu system.

TIP

When arrows appear "∧" / "∨" a menu item, operating the joystick in the direction of the arrows will adjust the selected function.

The pop-up menu is divided into the following main functions:

"Theme"	Select the visual theme of the display.
"Vehicle Info"	Reset/cycle the vehicle information display items.
"Settings"	Adjust settings related to the vehicle's operation.
"Applications"	Access the smartphone related functions.
"Phone" (if call active)	Open the telephone function for an active call.
"Music"	Access simple pop-up audio player.
"Turn-by-Turn"	Activate Turn-by-Turn route guidance.
"Turn-by-Turn OFF"	De-activate Turn-by-Turn route guidance.
"Navigation"	Open the navigation display.
"Meter Display"	Open the main display.
"Grip Warmer"(if equipped)	Control the grip warmers.

TIP

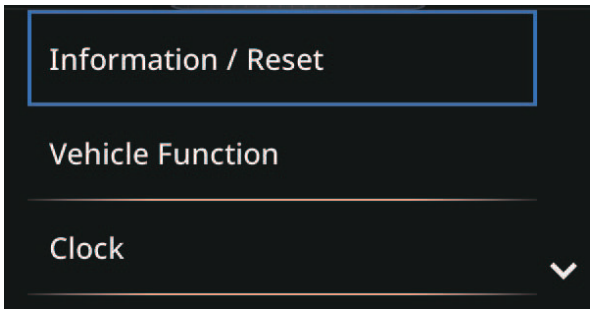
- If the vehicle is in motion, "Theme" and "Settings" will be grayed out.
- If a smartphone is not connected to the vehicle, "Music" and "Turn-by Turn/Turn-by-Turn OFF" will be grayed out.

"Theme"
The visual theme of the main display can be changed between four options.
"Vehicle Info"
This allows you to adjust the vehicle information display items.

TIP

This function is not available in Theme4.

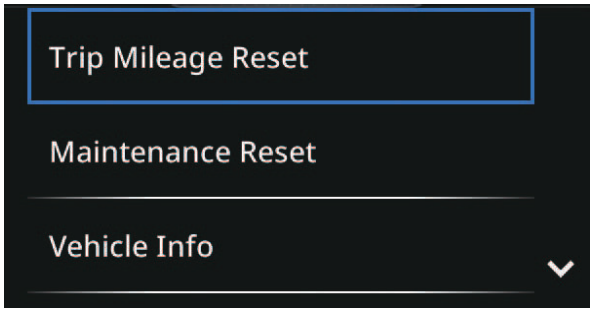
“Settings”



The “Settings” menu contains the following:

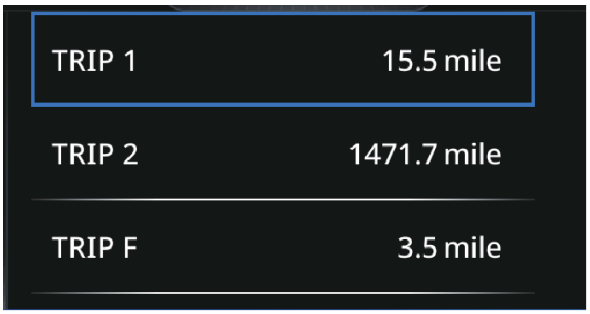
“Information /Reset”	Reset vehicle information.
“Vehicle Function”	Adjust vehicle electronic rider aids.
“Clock”	Adjust time/set automatic update.
“Display”	Change display brightness and background settings.
“Unit”	Change the display units.
“Grip Warmer Settings”(if equipped)	Customize the grip warmer presets.
“Shift Indicator”	Change the shift indicator settings.
“Connectivity Settings”	Smartphone connectivity settings.

“Settings” → “Information / Reset”



This menu allows the viewing and reset of tripmeters, maintenance tripmeters, vehicle information items, and the mass reset of other settings to factory defaults.

“Trip Mileage Reset”

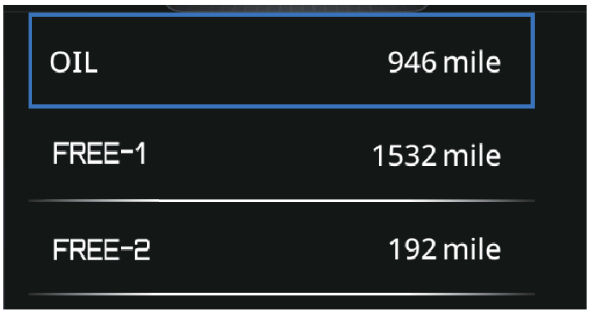


This menu allows reset of the tripmeters on the vehicle information display. Operate the joystick to highlight an item. Short press “✔” to reset the item. Confirm by selecting “OK”.

TIP

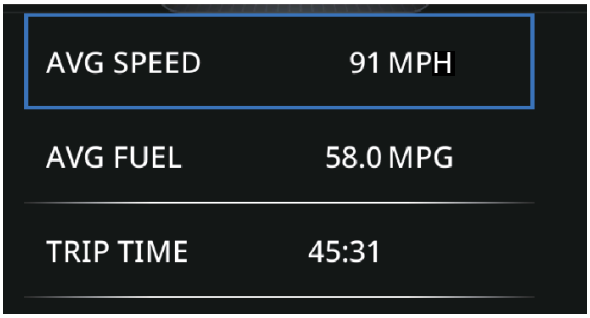
“TRIP F” can only be selected when the fuel is low. Otherwise the item is grayed out.

“Maintenance Reset”



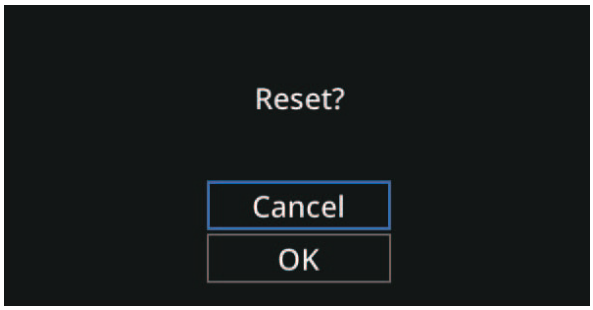
This menu allows you to record distance traveled between engine oil changes “OIL” and two other maintenance items of your choice “FREE-1” and “FREE-2”. After maintenance to one of the items has been completed, operate the joystick to highlight the item. Short press “✔” to reset the item. Confirm by selecting “OK”.

“Vehicle Info”



This menu allows reset of the vehicle information display items. Operate the joystick to highlight an item. Short press “✔” to reset the item. Confirm by selecting “OK”.

“All Reset”

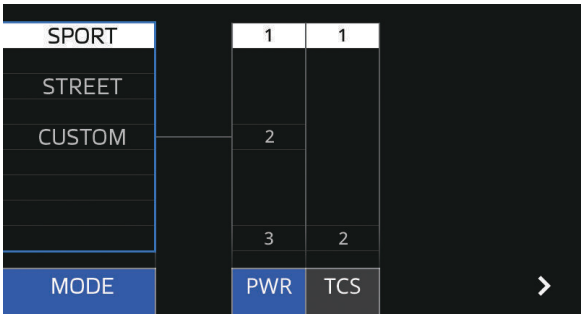


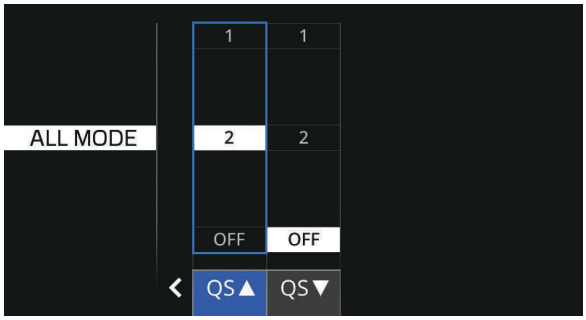
Use this menu to mass reset the multifunction meter to its default settings. This includes YRC settings, display settings, grip warmer presets, traction control, units, Bluetooth connection settings, and vehicle information display items. Confirm by selecting "OK".

TIP

- After a reset, the display will restart and may take several minutes to reboot.
- If "All Reset" is executed, the corresponding pairing record must be deleted from the smartphone in order to pair again.
- Before selling or changing ownership of the vehicle, reset the multifunction meter to ensure all personal data from your smartphone (i.e., call history and contact information) is deleted.
- After the multi-function meter is reset, Bluetooth pairing records and the Yamaha Motorcycle Connect app pairing records must be deleted from your smartphone. If this is not completed, the CCU will not be able to pair with the smartphone again.
- The multi-function meter cannot be reset while the vehicle is in motion.

"Settings" → "Vehicle Function" → "YRC Settings" → "YRC Modes"





This menu allows you to:

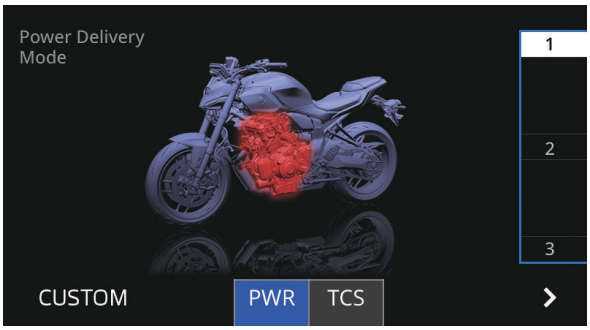
- View the four YRC mode presets: "SPORT", "STREET", "RAIN" and "CUSTOM".
- Customize the "PWR" and "TCS" setting levels for the "CUSTOM" YRC mode preset.
- Customize the "QS△" and "QS▽" setting levels for all YRC mode presets.

Operate the joystick up-down to select the YRC mode preset that you want to adjust.
Operate the joystick left-right to select the YRC item that you want to adjust. Adjust the selected YRC item by operating the joystick up-down.
Short press "✔" to switch to a visual representation of the highlighted YRC item. Short press the home button "⌂" to exit the visual representation.
Short press the home button "⌂" to save and go back to the previous menu.

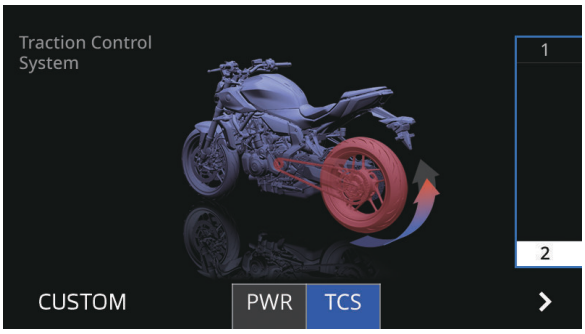
TIP

- The names and setting levels for "CUSTOM" can also be changed via the Yamaha Motorcycle Connect app.
- Adjustments to "QS" settings affect all YRC mode presets.

"PWR" (Power delivery mode)



"PWR" can be set to 1, 2, and 3.
Level 1 - Sporty engine response.
Level 2 - Moderate engine response.
Level 3 - Rainy days or whenever less engine power is desirable.
"TCS" (Traction control system)

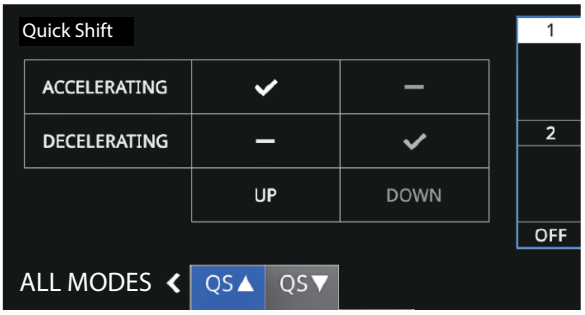


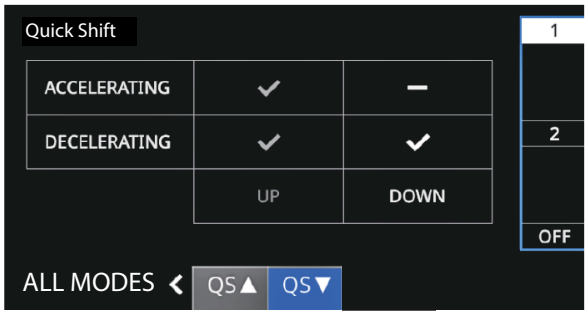
This model uses a variable traction control system. For each setting level, the farther the vehicle is leaned over, the more traction control (system intervention) is applied. There are 2 setting levels available. Level 1 applies the least system intervention, while level 2 applies the most overall traction control to reduce rear wheel slippage.
Level 1 - Suitable for more sporty riding.
Level 2 - Suitable for riding on wet or slippery surfaces.

TIP

The traction control system can only be turned off completely via "⚙ Settings" → "Vehicle Function" → "Stability Control ON/OFF".

"QS△" / "QS▽" (Quick shifter)



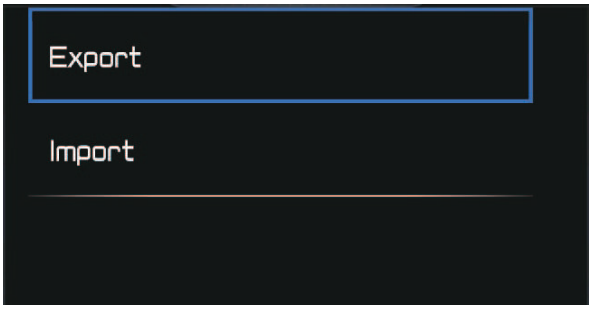


The quick shifter is divided into "QS△" (upshift) and "QS▽" (downshift) sections. "QS△" and "QS▽" are not linked and can be set independently.
Setting 1: Can quick upshift only while accelerating. Can quick downshift only while decelerating.
Setting 2: Can quick upshift while accelerating or decelerating. Can quick downshift while decelerating or accelerating.
"OFF" turns the respective upshift or downshift function off, and the clutch lever must then be used when shifting in that direction.

TIP

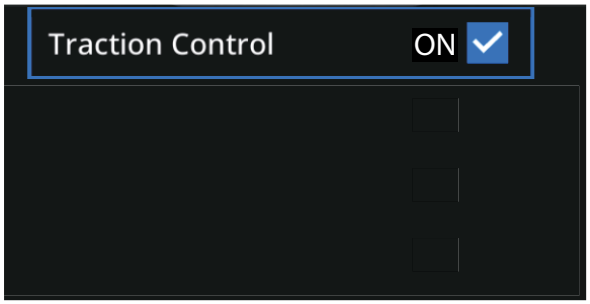
- Setting 1 has more limited conditions for quickshifts and may be preferable for preventing unintentional gearshifts if the shift pedal is touched accidentally when track riding.
- Setting 2 allows quickshifts under a wider array of conditions to better suit normal riding.
- "QS△" / "QS▽" ON/OFF status is reflected by the quick shifter indicator.

"Settings" → "Vehicle Function" → "YRC Settings" → "Import / Export to App"



This menu allows you to import/export custom YRC mode settings using the Yamaha Motorcycle Connect app.

"Settings" → "Vehicle Function" → "Stability Control ON/OFF"



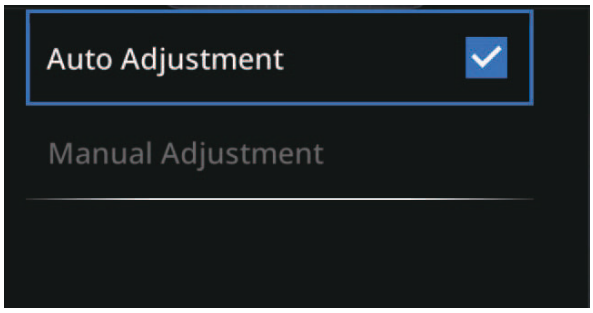
This menu allows you to activate/deactivate the "Traction Control" (TCS).
If a system is turned off, the corresponding indicator will come on.
The traction control system indicator light "TCS" will come on to indicate "TCS" OFF status.

TIP

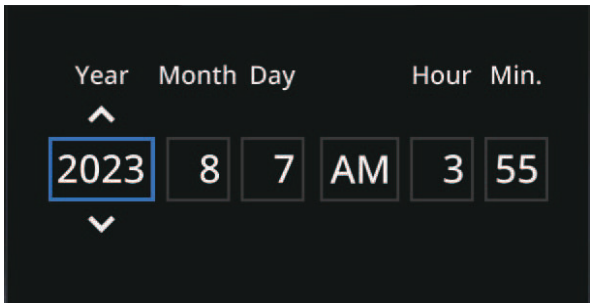
"TCS" turns on automatically when the vehicle

power is turned on.

"Settings" → "Clock"

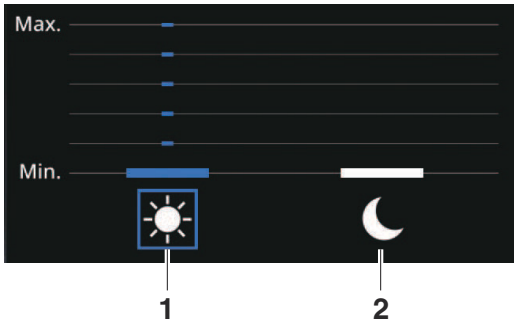


The clock can be set to auto-adjust in sync with a smartphone. "Auto Adjustment" ON is indicated by the checkmark and requires a connection with the Yamaha Motorcycle Connect app.
"Manual Adjustment" allows the clock to be calibrated manually.



To manually adjust the clock, operate the joystick left-right to highlight an item and up-down to adjust the highlighted item. Short press "✔" to finalize the clock setting and then select "OK" to confirm.

"Settings" → "Display" → "Brightness"



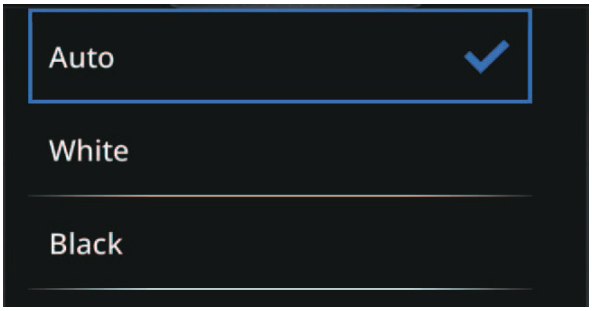
1. Day preset
2. Night preset

The multi-function meter is equipped with a sensor to detect ambient lighting conditions and automatically switch the display between day/night presets. The preset brightness levels can be customized here.
Select a preset by operating the joystick left-right and adjust its brightness level from 1-6 by operating the joystick up-down. Short press "✔" to confirm the setting and return to the previous menu.

TIP

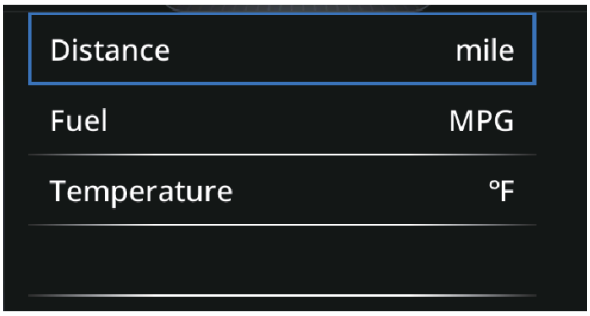
Only adjust brightness presets in ambient light conditions which are appropriate for that preset.

"Settings" → "Display" → "Background"



The multi-function meter is equipped with a sensor to detect ambient lighting conditions and adjust the display between day/night presets.
Select "White" (day) or "Black" (night) to keep the display in that preset.
Select "Auto" to enable automatic switching depending on the ambient light levels.

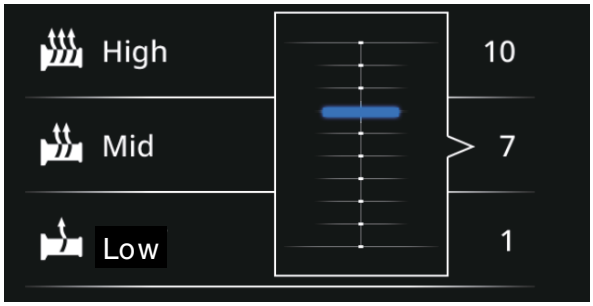
"Settings" → "Unit"



The display units can be customized as follows:
- "Distance": "km" or "mile"
- "Fuel": "km/L", "L/100km" or "MPG"
- "Temperature": "°C" or "°F"

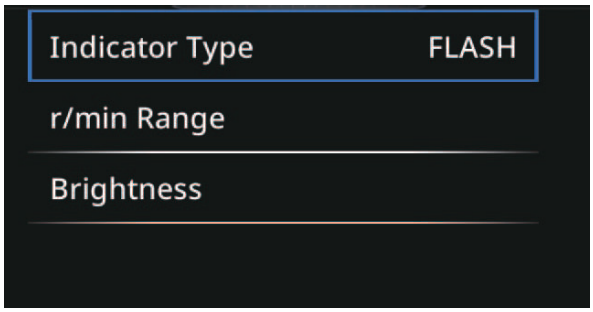
When "mile" is selected for the distance unit, the fuel consumption unit is automatically changed to "MPG". At this time, the "Fuel" is grayed out and cannot be selected.

"Settings" → "Grip Warmer Settings" (if equipped)



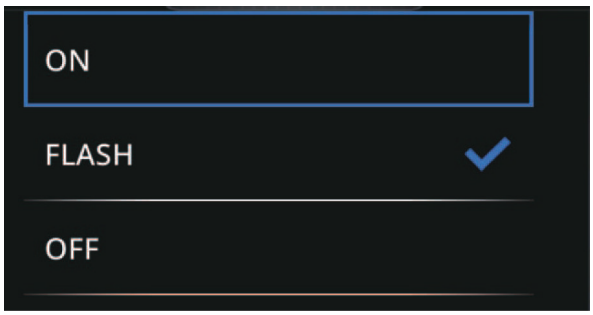
The three grip warmer presets can be customized here. Short press "✔" to select a preset and then adjust its heat level from 1-10 by operating the joystick up-down. Short press "✔" to confirm the setting and return to the previous menu.

"Settings" → "Shift Indicator"



This menu contains settings for the shift indicator light.

"Indicator Type"

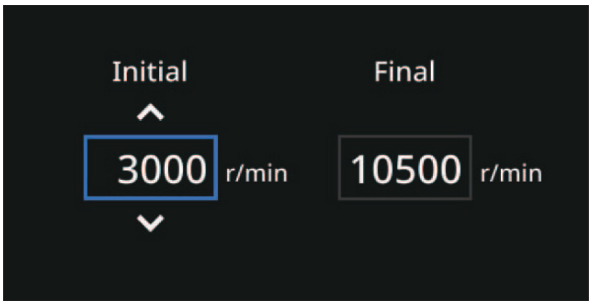


Select "ON" to have the indicator come on at the final r/min. Select "FLASH" to have the indicator start flashing at the initial r/min. When the final r/min is reached, the indicator light will start flashing at a higher frequency. Select "OFF" to turn the indicator off. Short press "✔" to select the highlighted option and return to the previous menu.

TIP

The shift indicator light will come on or flash as a demonstration of each setting in this menu as it is selected.

"r/min Range"

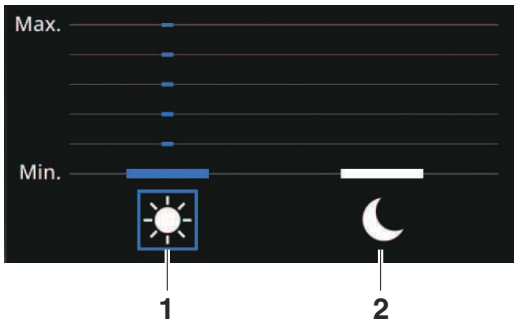


Select the r/min at which the shift indicator light will come on. The operational range is 3000–10500 r/min. It can be adjusted by 250 r/min increments. Short press "✔" to confirm the setting and return to the previous menu.

TIP

- The "Initial" r/min cannot be higher than the "Final" r/min.
- The shift indicator light does not come one when in neutral or 6th gear.

"Brightness"



1. Day preset
2. Night preset

Select the day/night brightness levels of the shift indicator light from 1-6 by operating the joystick up-down. Short press "✔" to confirm the setting and return to the previous menu.

TIP

Only adjust brightness presets in ambient light conditions which are appropriate for that preset.

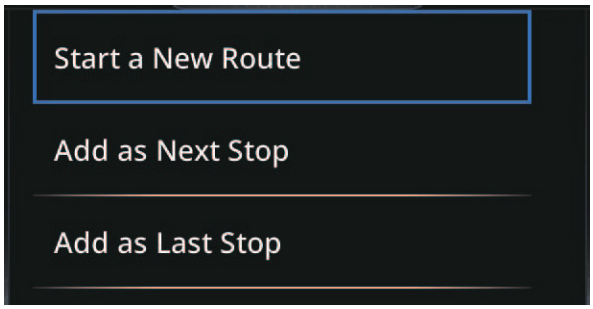
"Applications" → "Navigation"

This menu contains the following commands for

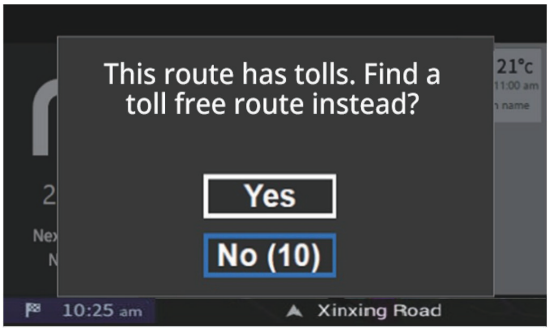
the navigation system:
- “Change View”
- “Stop Navigation”
- “Skip Next Stop”
- “Go Home”
- “Go to Work”
- “Favorites”
- “Nearby Gas Stations”

TIP
- Except for the commands listed above, operate the navigation system using the Garmin StreetCross app on your smartphone.
- “Change View”, “Stop Navigation” and “Skip Next Stop” are not available unless route guidance is active.

When a command is used to select a destination, the navigation display will open and show the new/updated route.



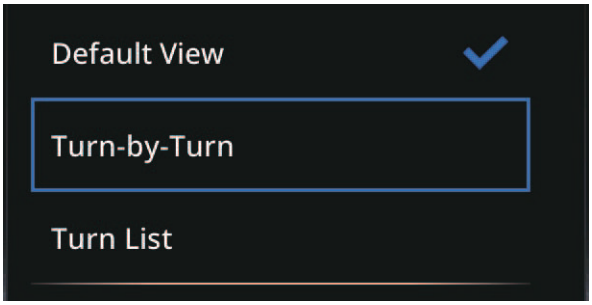
If route guidance is already active when a command is used to select a destination, the following options will be available:
“Start a New Route”: Cancels previous route and sets route to new destination.
“Add as Next Stop”: Adds new destination as the next stop in the current route.
“Add as Last Stop”: Adds new destination as the last stop in the current route.



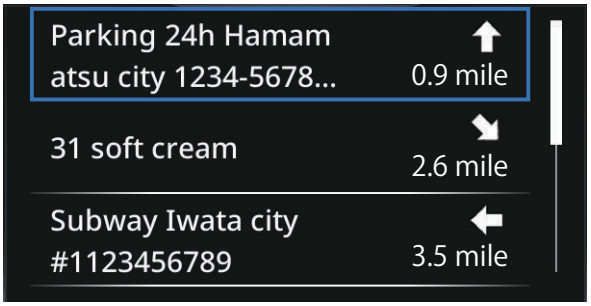
If a route requires a toll, you will be prompted to search for another route without tolls. Select “Yes” to find a route without tolls. Select “No” to accept the current route.

TIP
After 10 seconds, the route (with tolls) will be selected automatically.

“Change View”



This menu changes the navigation system display mode (Default View/Turn List/Turn-by-Turn). After selection, the navigation display will open in the selected display mode.
“Stop Navigation”
Cancels the current route guidance and opens the navigation home display.
“Skip Next Stop”
Skips the next stop in your planned route and opens the navigation home display.
“Go Home”
Sets route guidance for home location (home location must already be set in the Garmin StreetCross app).
“Go to Work”
Sets route guidance for work location (work location must already be set in the Garmin StreetCross app).
“Favorites”



Shows a list of saved locations and their distance from current location (must have saved locations in the Garmin StreetCross).

TIP

If route guidance is in progress, arrows appear showing the direction to the saved locations. The current direction of travel is indicated by the upwards arrow.

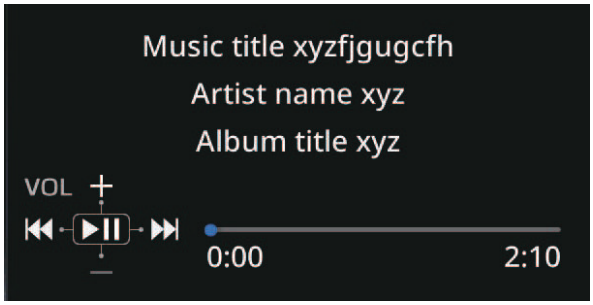
"Nearby Gas Stations"

Shows a list of nearby gas stations and their distance from current location.

TIP

If route guidance is in progress, arrows appear showing direction to the gas stations. The current direction of travel is indicated by the upwards arrow.

"Applications" → "Music"

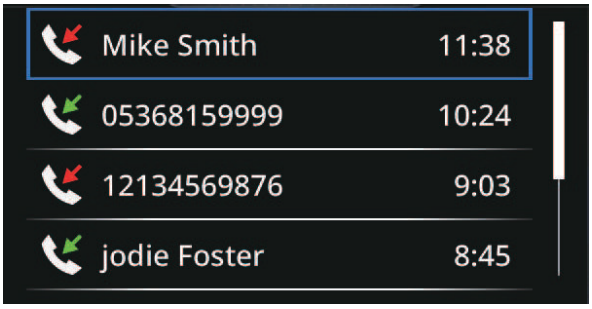


This opens an audio player which interfaces with your smartphone's audio player app.
Operate the joystick up-down to adjust the volume.
Operate the joystick left-right to skip to the next/previous track.
Short press "✔" to play/pause the track.

TIP

- All audio track information is imported from the music player application on your smartphone.
- Depending on the smartphone and music player application, the audio player may start playing automatically, the track information may not display, or the next/previous track and volume adjustment may not function.

"Applications" → "Phone"

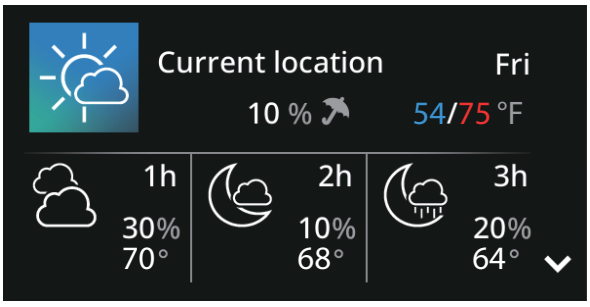


This is a list of recent telephone calls (since connection to CCU) from the connected smartphone. When this list has been viewed, the missed call indicator "" will disappear.
: Inbound missed call (red arrow)
: Inbound call (green arrow)

TIP

- Repeated calls for the same contact are indicated by the number next to the contact in brackets.
- The maximum number of stored items is 30; when the limit is reached, older items will be deleted.

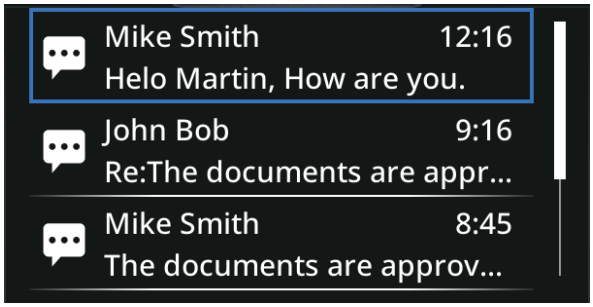
"Applications" → "Weather"



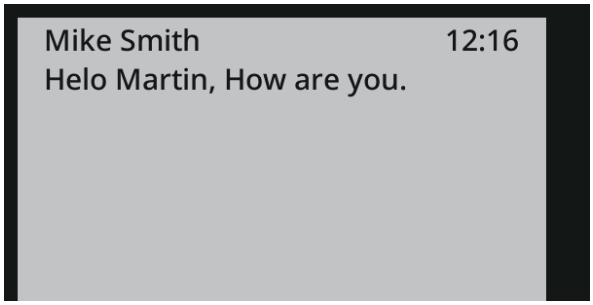
This menu displays weather information at your current location. Operate the joystick up-down to change the timeframe of the weather information (hourly/daily).

TIP
The weather information in this menu may be different than on the navigation home display.

"Applications" → "Notification"



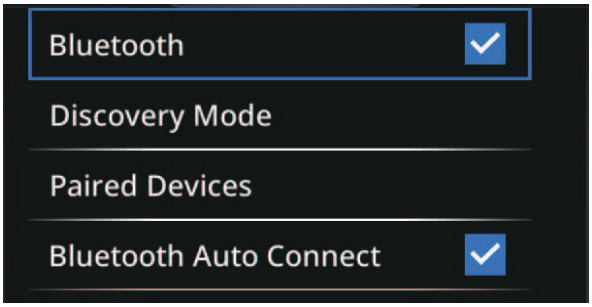
This is a list of notifications (since connection to CCU) from the connected smartphone. Select an item to read the notification message. The notification indicator "" will not turn off until the vehicle power is turned off.



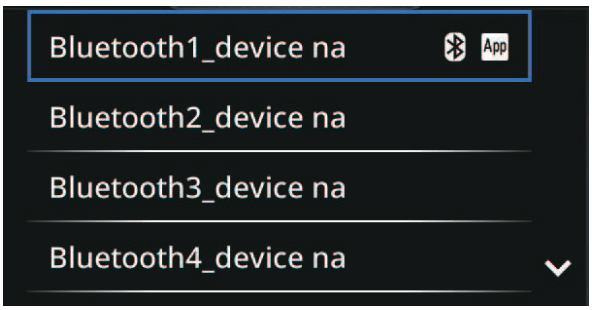
TIP
- For some smartphones and/or applications, notifications may not function.
- The maximum number of stored items is 30. When the limit is reached, older items will be deleted.
- If a message is too long then not all of it will be displayed.
- Messages cannot be opened and read while the vehicle is in motion.
- Notification timestamps may be slightly different than when displayed on your smartphone.

"Applications" → "Information Transfer"
This menu allows you to transfer and display images on the display using the Yamaha Motorcycle Connect app.

"Applications" → "Connectivity Settings" → "Connection" → "Bluetooth"



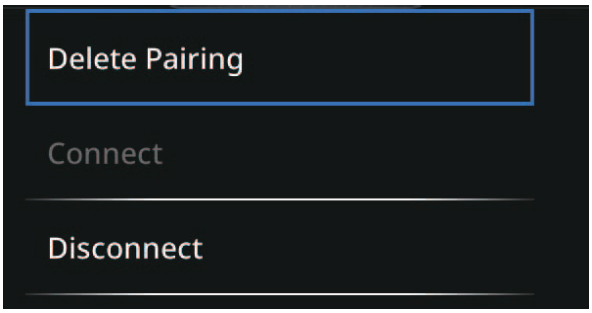
"Bluetooth"
Turns the CCU's Bluetooth ON/OFF. The check-mark indicates ON.
"Discovery Mode"
Puts the CCU in Bluetooth discovery mode when pairing a smartphone.
"Paired Devices"



Paired smartphones are listed here. The Yamaha Motorcycle Connect app symbol "App" next to a device name indicates that the app is currently connected to the CCU. The Bluetooth symbol "" next to a device name indicates that Garmin Street- Cross is currently connected to the CCU.

TIP
There is a maximum of 8 paired devices.

Select a device name for more options:



"Delete Pairing": Deletes the selected paired device from the CCU memory.
"Connect": Connect to the selected paired device.
"Disconnect": Disconnect from the selected paired device.

TIP

If "Bluetooth Auto Connect" is on, the CCU may immediately reconnect to the smartphone after being disconnected.

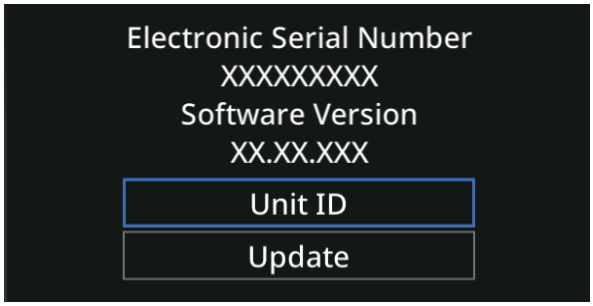
"Bluetooth Auto Connect"

Turns the Bluetooth automatic connection ON/OFF. The checkmark indicates ON. When the auto connect is ON, the CCU will automatically connect to the last connected device. If it is not available, the CCU will attempt to connect to another device in the paired device list.

TIP

If "Bluetooth Auto Connect" is OFF, previously paired devices can be connected manually via the "Paired Devices" list.

"Applications" → "Connectivity Settings" → "System Information"



This menu displays the current system software version.

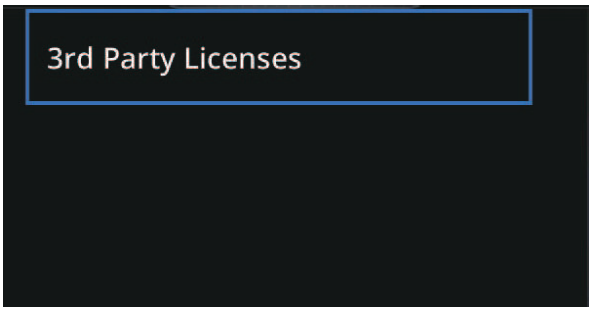
"Unit ID"

This menu contains a QR code with the CCU's unit identification number. Short press "✔" to return to the previous menu.

TIP

The CCU's unit ID is only required for dealer service operations.

"Applications" → "Connectivity Settings" → "Legal Information"



Third-party license agreements can be viewed here.

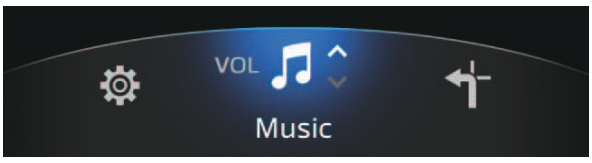
"Phone" (if call active)

Selecting this menu opens an active call display. The contact name and call time are displayed.
Operate the joystick up-down to adjust the call volume.
Short press "✔" to end the call.

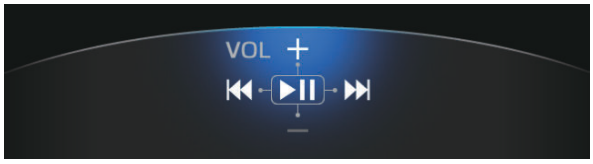
TIP

Call volume control and/or ending call via the vehicle is not available for all types of smartphones. If this function is unavailable, the volume adjustment and end call graphics will be grayed out. If this occurs, the call can be controlled directly on your smartphone.

"Music"



While this item is shown in the menu, operate the joystick up-down to adjust the volume.
Short press "✔" to open additional audio controls.



This opens an audio player which interfaces with your smartphone's audio player app.
Operate the joystick up-down to adjust the volume.
Operate the joystick left-right to skip to the next/previous track.
Short press "✔" to play/pause the track.

TIP

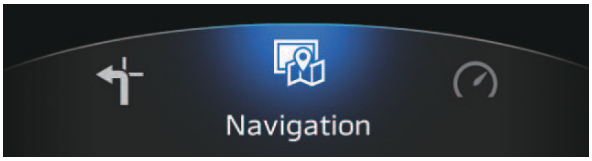
- All audio track information is imported from the music player application on your smartphone.
- Depending on the smartphone and music player application, the audio player may start playing automatically, or the next/previous track and volume adjustment may not function.
- Theme4: This function is not accessible via the menu system and is instead located within the vehicle information display. The function is the same.

"Turn-by-Turn / Turn-by-Turn OFF"

This activates/deactivates a turn-by-turn route guidance at the bottom of the main display.

This menu option is only available from the main display.

"Navigation"



This opens the navigation display. This menu option is only available from the main display.

"Meter Display"

This opens the main display. This menu option is only available from the navigation display.

"Grip Warmer" (if equipped)

With this item highlighted, operate the joystick up-down to cycle between grip warmer OFF and 3 presets which can be customized in "⚙ Settings" → "Grip Warmer Settings".
With this item highlighted, long press "✔" to shortcut to "⚙ Settings" → "Grip Warmer Settings" where the grip warmer presets can be further customized.

TIP

Theme4: This function is not accessible via the menu system and is instead located within the vehicle information display. The function is the

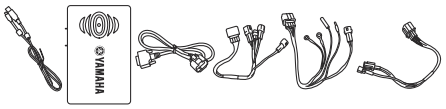
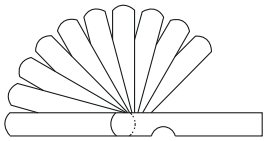
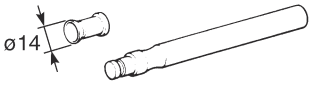
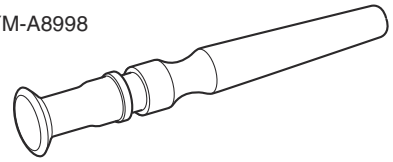
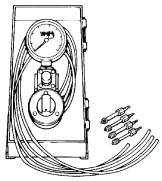
same.

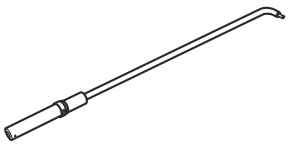
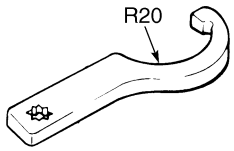
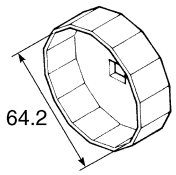
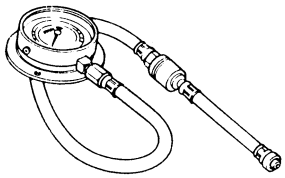
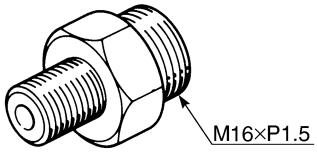
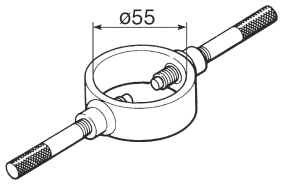
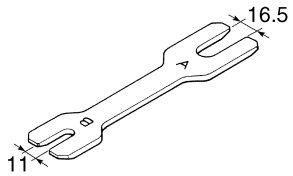
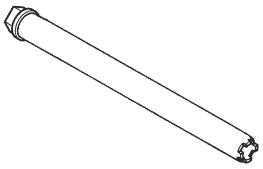
EAS20012
SPECIAL TOOLS

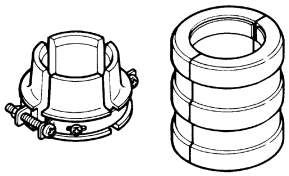
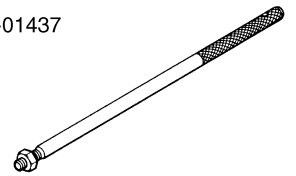
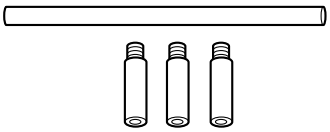
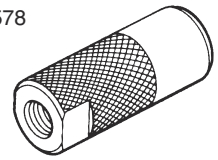
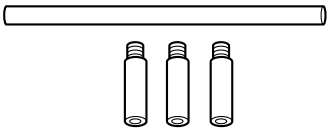
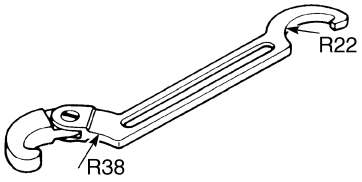
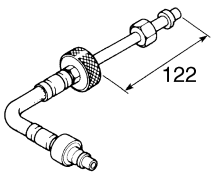
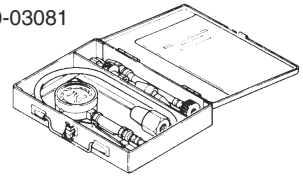
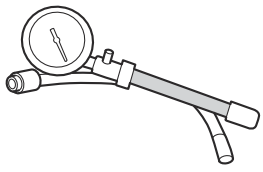
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

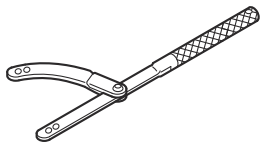
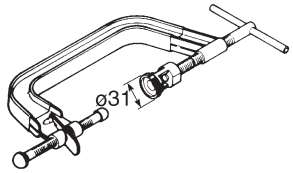
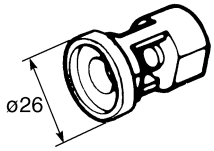
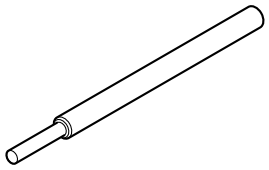
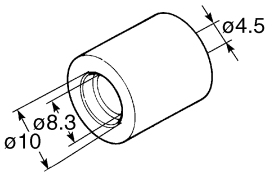
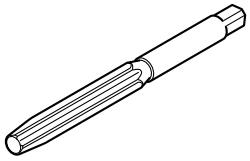
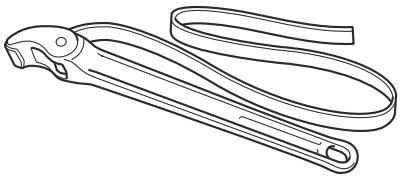
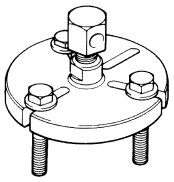
TIP

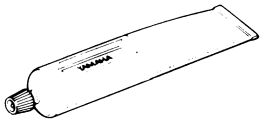
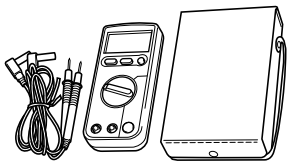
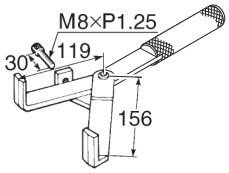
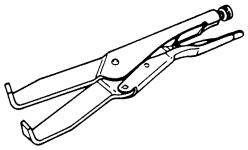
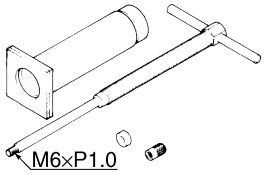
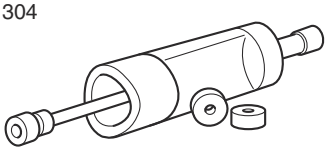
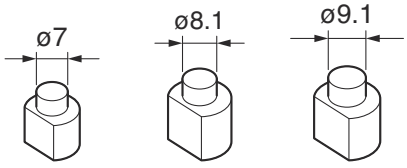
- For U.S.A. and Canada, use part number starting with "YM-", "YU-", or "ACC-".
- For others, use part numbers starting with "90890-".

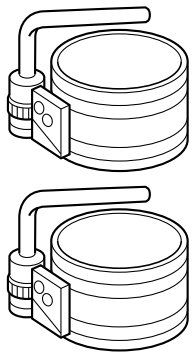
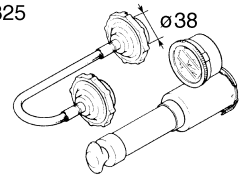
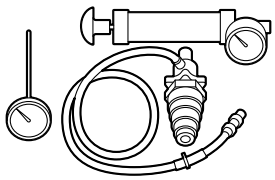
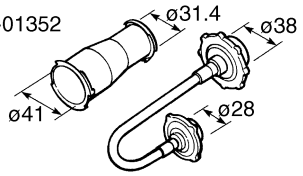
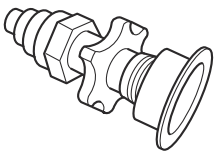
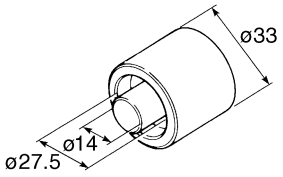
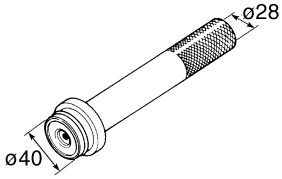
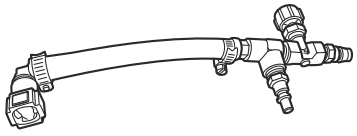
Tool name/Tool No.	Illustration	Reference pages
Yamaha diagnostic tool USB (US) 90890-03275		3-4, 3-8, 4-58, 4-60, 5-23, 7-12, 7-14, 7-14, 7-17, 8-48, 9-2, 9-29, 9-30
Yamaha diagnostic tool (A/I) 90890-03273		3-4, 3-8, 4-58, 4-60, 5-23, 7-12, 7-14, 7-14, 7-17, 8-48, 9-2, 9-29, 9-30
Thickness gauge 90890-03268 Feeler gauge set YU-26900-9		3-6, 4-20, 4-29, 5-64
Valve lapper (ø14) 90890-04101 Valve lapper (ø14) YM-A8998	90890-04101  YM-A8998 	3-6
Vacuum gauge 90890-03094 Vacuummate YU-44456	90890-03094  YU-44456 	3-8

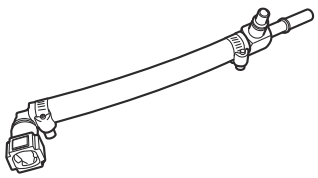
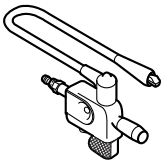
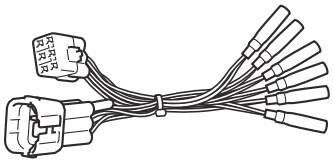
Tool name/Tool No.	Illustration	Reference pages
Carburetor angle driver 2 90890-03173		3-9
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472		3-18, 4-80
Oil filter wrench 90890-01426 Oil filter wrench YU-38411		3-21
Pressure gauge 90890-03153 Pressure gauge YU-03153		3-22, 7-15, 7-16
Oil pressure adapter H 90890-03139		3-22
Fork spring compressor 90890-01441 Fork spring compressor YM-01441		4-71, 4-76
Rod holder 90890-01434 Damper rod holder double ended YM-01434		4-71, 4-76
Damper rod holder (ø27) 90890-01582 Damper rod holder YM-01582		4-72, 4-73

Tool name/Tool No.	Illustration	Reference pages
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-74, 4-74, 4-74
Rod puller 90890-01437 Universal damping rod bleeding tool set YM-A8703	90890-01437  YM-A8703 	4-75, 4-76
Rod puller attachment (M10 long) 90890-01578 Universal damping rod bleeding tool set YM-A8703	90890-01578  YM-A8703 	4-75, 4-76
Ring nut wrench 90890-01268 Spanner wrench YU-01268		4-80
Compression gauge extension 122mm 90890-04136 Compression gauge extension 122mm YM-04136		5-15
Compression gauge 90890-03081 Engine compression tester YU-33223	90890-03081  YU-33223 	5-15

Tool name/Tool No.	Illustration	Reference pages
Rotor holding tool (including handle and 3 pins) 90890-04195		5-30, 5-33
Valve spring compressor 90890-04200 Valve spring compressor YM-04019		5-44, 5-48
Valve spring compressor attachment (ø26) 90890-01243 Valve spring compressor attachment (ø26) YM-01253-1		5-44, 5-48
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-45
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117		5-45
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118		5-45
Rotor holding tool 90890-04166 Rotor holding tool YM-04166		5-52, 5-52, 5-53, 5-53
Flywheel puller 90890-01362 Heavy duty puller YU-33270-B		5-52

Tool name/Tool No.	Illustration	Reference pages
Yamaha bond No. 1215 90890-85505 Three bond No. 1215®		5-54, 5-80, 5-82
Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927		5-57, 8-44, 8-46, 8-47, 8-48, 8-50, 8-51, 8-51, 8-52, 8-52, 8-53, 8-53, 8-54, 8-55, 8-56, 8-56, 8-57
Clutch holder 90890-04199 Universal clutch holder YM-91042	 YM-91042 	5-63, 5-66
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304  YU-01304 	5-86
Connecting rod big end bearing installer 90890-04193 Connecting rod big end bearing installer YM-04193		5-88, 5-91

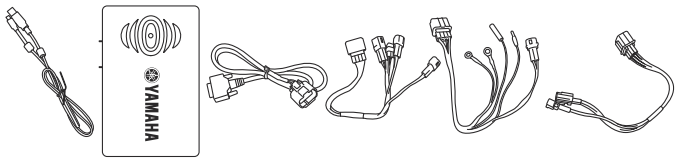
Tool name/Tool No.	Illustration	Reference pages
Piston ring compressor 90890-05158 Piston ring compressor YM-08037		5-93
Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A	90890-01325  YU-24460-A 	6-5, 6-6
Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984	90890-01352  YU-33984 	6-5, 6-6
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		7-15

Tool name/Tool No.	Illustration	Reference pages
Fuel pressure adapter 90890-03176 Fuel pressure adapter YM-03176		7-16
Ignition checker 90890-06754 Oppama pet–4000 spark checker YM-34487		8-51
Test harness– lean angle sensor (6P) 90890-03209 Test harness– lean angle sensor (6P) YU-03209		8-52

TIP

Yamaha diagnostic tool (A/I) 90890-03273

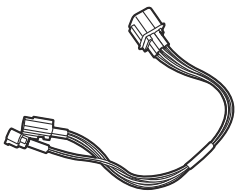
This special tool includes the YDT sub harness (6P) (90890-03266).



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	BLW2 (MT07S) BLW3 (MT07SC)
Dimensions	
Overall length	2065 mm (81.3 in)
Overall width	780 mm (30.7 in)
Overall height	1110 mm (43.7 in)
Wheelbase	1395 mm (54.9 in)
Ground clearance	150 mm (5.91 in)
Minimum turning radius	2.8 m (9.19 ft)
Weight	
Curb weight	183 kg (404 lb) (MT07S) 183 kg (405 lb) (MT07SC)
Loading	
Maximum load	167 kg (368 lb)
Riding capacity	2 person

EAS20014
ENGINE SPECIFICATIONS

Engine	
Combustion cycle	4-stroke
Cooling system	Liquid cooled
Valve train	DOHC
Displacement	689 cm^3
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/cm^2/355 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/cm^2/355 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	2.0 L (0.54 US gal, 0.45 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/cm^2/5000 r/min, 40.6 psi/5000 r/min)
Cooling system	
Coolant quantity	
Radiator (including all routes)	1.57 L (1.66 US qt, 1.38 Imp.qt)
Coolant reservoir (up to the maximum level mark)	0.15 L (0.16 US qt, 0.13 Imp.qt)
Radiator cap valve opening pressure	107.9–137.3 kPa (1.08–1.37 kgf/cm^2, 15.6–19.9 psi)
Cooling system leak test pressure	137.3 kPa (1.37 kgf/cm^2, 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)
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)	38.28 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	0.028–0.052 mm (0.0011–0.0020 in)
Bearing color code	

Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Yellow green
Crankshaft	
Runout limit	0.030 mm (0.0012 in)
Journal oil clearance	0.019–0.043 mm (0.0007–0.0017 in)
Bearing color code	
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
Assembly width	32.7–33.5 mm (1.29–1.32 in)
Clutch lever free play	5.0–10.0 mm (0.20–0.39 in)
Friction plate 1 thickness	2.92–3.08 mm (0.115–0.121 in)
Plate quantity	4 pcs
Wear limit	2.82 mm (0.111 in)
Friction plate 2 thickness	2.92–3.08 mm (0.115–0.121 in)
Plate quantity	3 pcs
Wear limit	2.82 mm (0.111 in)
Clutch plate 2 thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	5 pcs
Warpage limit	0.10 mm (0.004 in)
Clutch plate 1 thickness	2.20–2.40 mm (0.087–0.094 in)
Plate quantity	1 pcs
Warpage limit	0.10 mm (0.004 in)
Clutch spring free length limit	43.46 mm (1.71 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	210.8–212.8 mm (8.30–8.38 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	89–109 °C (192–228 °F)
Difference in vacuum pressure between the cylinders	0 kPa–2.6 kPa (0 mmHg–20 mmHg, 0 inHg–0.8 inHg)
CO%	0.0–0.5 %
Fuel line pressure (at idle)	300–390 kPa (3.0–3.9 kgf/cm^2, 43.5–56.6 psi)

EAS20015
CHASSIS SPECIFICATIONS

Chassis	
Caster angle	24.3 °
Trail	93 mm (3.7 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	0.40 mm (0.02 in)
Front tire	
Type	Tubeless
Size	120/70ZR17 M/C (58W)
Manufacturer/model	DUNLOP/SPORTMAX Q5AF
Rear tire	
Type	Tubeless
Size	180/55ZR17 M/C (73W)
Manufacturer/model	DUNLOP/SPORTMAX Q5A
Tire air pressure (measured on cold tires)	
Front	250 kPa (2.50 kgf/cm^2, 36 psi)
Rear	250 kPa (2.50 kgf/cm^2, 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	255.8 mm (10.07 in)
Inner tube bending limit	0.2 mm (0.01 in)

Recommended oil	Yamaha Suspension Oil S1
Quantity (left)	457.0 cm^3 (15.45 US oz, 16.12 Imp.oz)
Quantity (right)	452.0 cm^3 (15.28 US oz, 15.94 Imp.oz)
Level (left)	132 mm (5.2 in)
Level (right)	132 mm (5.2 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 1/2
Adjustment value from the start position (STD)	1/2
Adjustment value from the start position (Hard)	0
Drive chain	
Size	520
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.)	1.0–5.0 °/1350 r/min
Engine control unit	
Model	TBDFGQ (MT07S) TBDFGR (MT07SC)
Ignition coil	
Primary coil resistance	1.19–1.61 Ω
Secondary coil resistance	9.35–12.65 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, 41.4 A at 5000 r/min
Generator control unit	
Regulated voltage (DC)	14.1–14.9 V
Battery	
Model	YTZ7S(F)
Voltage, capacity	12 V, 6.0 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
Turn signal indicator light	LED
Engine trouble warning light	LED
ABS warning light	LED
Shift timing indicator light	LED
Traction control system indicator 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)	9.0–12.0 Ω
Sender unit resistance (empty)	213.0–219.0 Ω

Solenoid	
Purge cut valve solenoid resistance	22.00–26.00 Ω (MT07SC)
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/cm^2, 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	50.0 A
Headlight fuse	7.5 A
Signaling system fuse	7.5 A
Ignition fuse	10.0 A
Radiator fan motor fuse	15.0 A
Fuel injection system fuse	10.0 A
ABS control unit fuse	7.5 A
ABS motor fuse	30.0 A
ABS solenoid fuse	15.0 A
Terminal fuse 1	5.0 A
Backup fuse	7.5 A
Electronic throttle valve fuse	7.5 A
Ignition fuse 2	7.5 A
Backup fuse 2	15.0 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)	T
Exhaust pipe protector bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	T
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)	E
Generator cover bolt	M6	2	12 N·m (1.2 kgf·m, 8.9 lb·ft)	T
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. E
Clutch spring bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 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)	T
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)	E
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)	
Rear 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	4	40 N·m (4.0 kgf·m, 30 lb·ft)	
Upper handlebar holder bolt	M8	4	22 N·m (2.2 kgf·m, 16 lb·ft)	
Clutch cable locknut	M8	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Lower bracket pinch bolt	M8	4	23 N·m (2.3 kgf·m, 17 lb·ft)	
Upper bracket pinch bolt	M8	2	23 N·m (2.3 kgf·m, 17 lb·ft)	
Lower ring nut	M25	1	See TIP.	
Drive sprocket nut	M22	1	145 N·m (14.5 kgf·m, 107 lb·ft)	Stake.

TIP

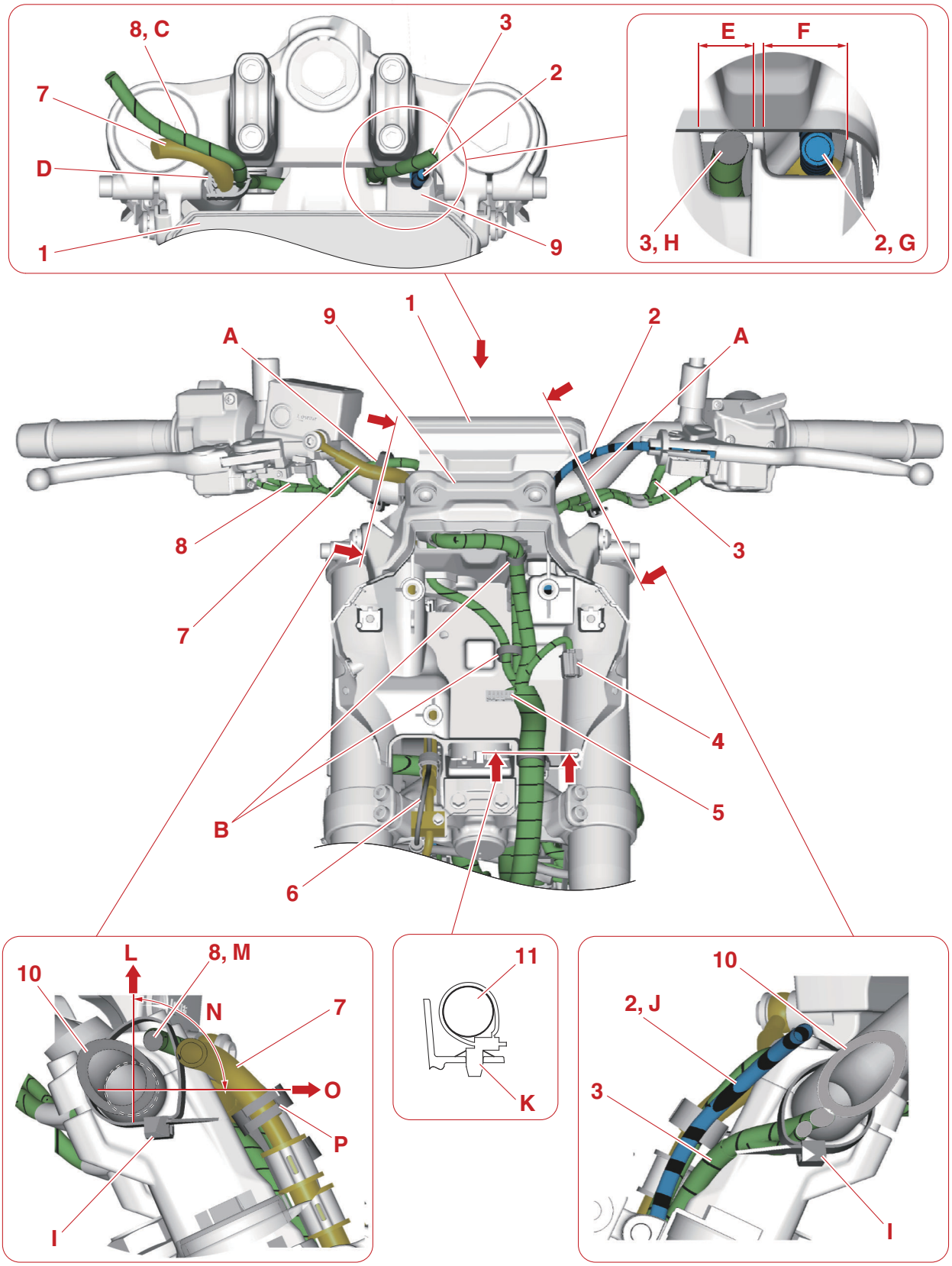
Lower ring nut

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

EAS20021

CABLE ROUTING

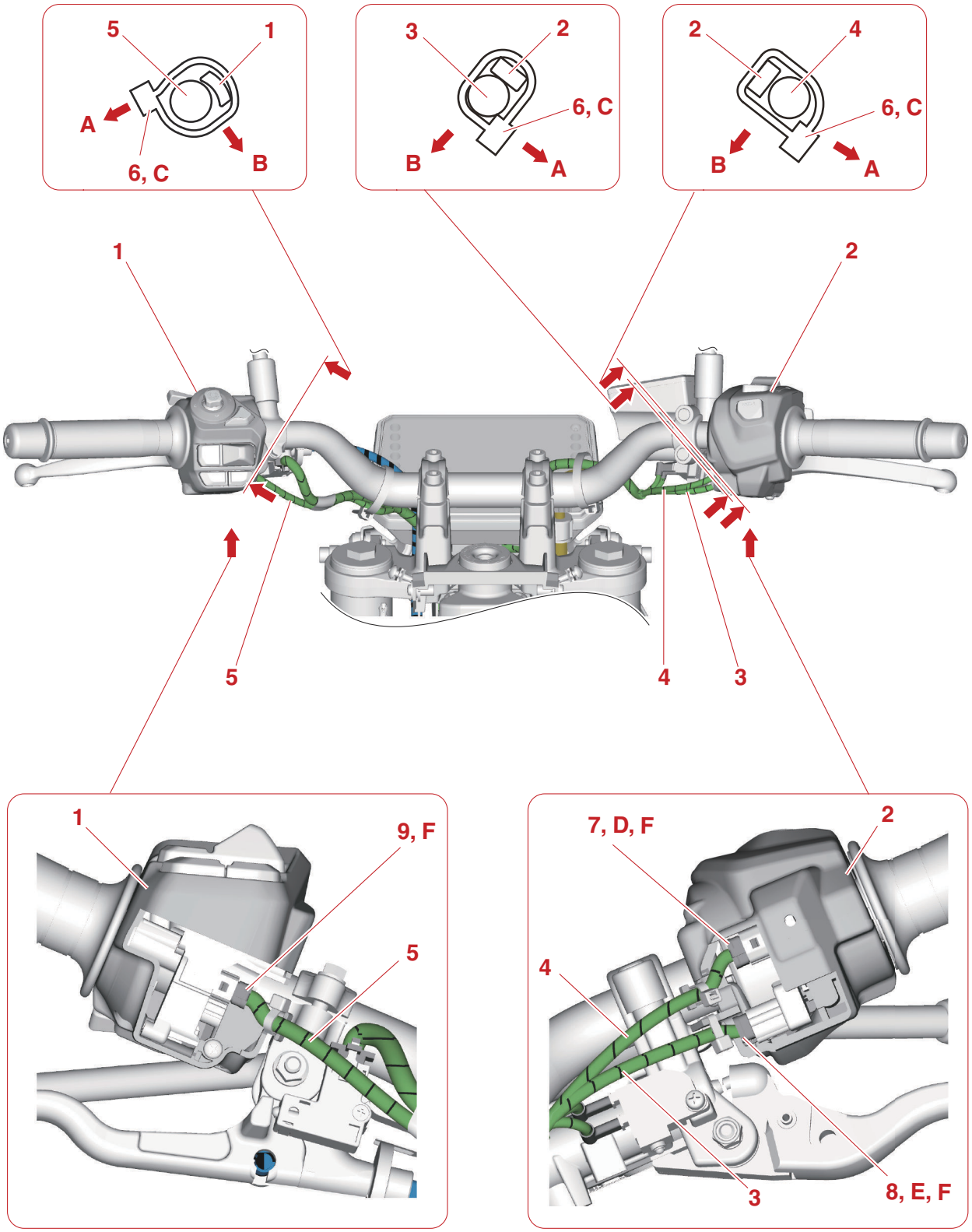
Handlebar (front view)



1. Meter assembly
2. Clutch cable
3. Wire harness (to handlebar switch (left))
4. Auxiliary light coupler
5. Headlight coupler
6. Front wheel sensor lead
7. Brake hose (front brake master cylinder to hydraulic unit)
8. Wire harness (to handlebar switch (right))
9. Meter assembly bracket
10. Handlebar
11. Wire harness

A. Fasten the wire harness at the curved part of the handlebar with a plastic locking tie.
B. Insert the protrusion of the wire harness clamp into the hole in the meter assembly bracket.
C. Route the wire harness (to handlebar switch (right)) through the inside of the brake hose (front brake master cylinder to hydraulic unit).
D. Face the opening of the clamp outside of the vehicle.
E. Wire harness (to handlebar switch (left)) guide slot
F. Clutch cable guide slot
G. Make sure that the clutch cable is routed through the clutch cable guide slot of the meter assembly bracket.
H. Make sure that the wire harness (to handlebar switch (left)) is routed through the wire harness (to handlebar switch (left)) guide slot of the meter assembly bracket.
I. Face the locking part of the plastic locking tie downward of the vehicle and face the end of the plastic locking tie to the forward of the vehicle.
J. Pass the clutch cable more to the front side of the vehicle than the wire harness (to handlebar switch (left)).
K. Insert the protrusion of the wire harness clamp into the hole in the meter assembly bracket from the front side of the vehicle.
L. Upper side of the vehicle
M. When installing the wire harness, make sure it does not interfere with the meter assembly. There will be no problem with interference between the wire harness and the meter assembly after installation.
N. Route the wire harness (to handlebar switch (right)) within the range shown in the illustration.
O. Front side of the vehicle
P. Align the bottom edge of the clamp with the bottom edge of the brake hose protector. The clamp should be on the brake hose protector.

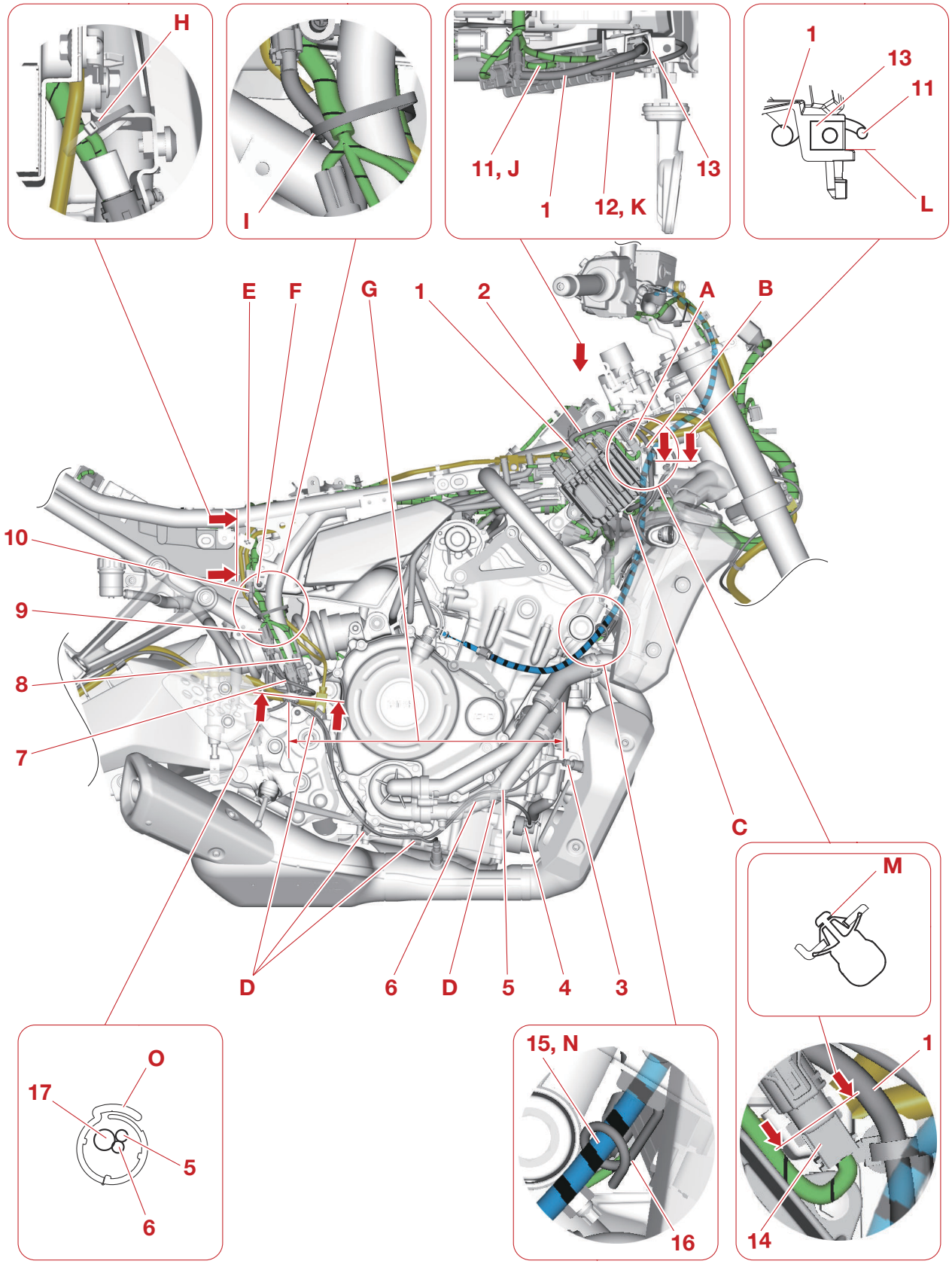
Handlebar (rear view)



1. Handlebar switch (left)
2. Handlebar switch (right)
3. Wire harness (to handlebar switch coupler 1 (right))
4. Wire harness (to handlebar switch coupler 2 (right))
5. Wire harness (to handlebar switch coupler (left))
6. Plastic locking tie
7. Handlebar switch coupler 2 (right) (6-pin terminal)
8. Handlebar switch coupler 1 (right) (8-pin terminal)
9. Handlebar switch coupler (left)

A. Lower side of the vehicle
B. Front side of the vehicle
C. Fasten the protective tube of the wire harness and the protrusion on the handlebar switch with a plastic locking tie. Face the tip lower side of the vehicle and cut it. Do not forcefully pull on the leads when fastening them.
D. Insert the coupler (8-pin terminal) to the rear side of the vehicle.
E. Insert the coupler (6-pin terminal) to the front side of the vehicle.
F. Insert the handlebar switch coupler surely.

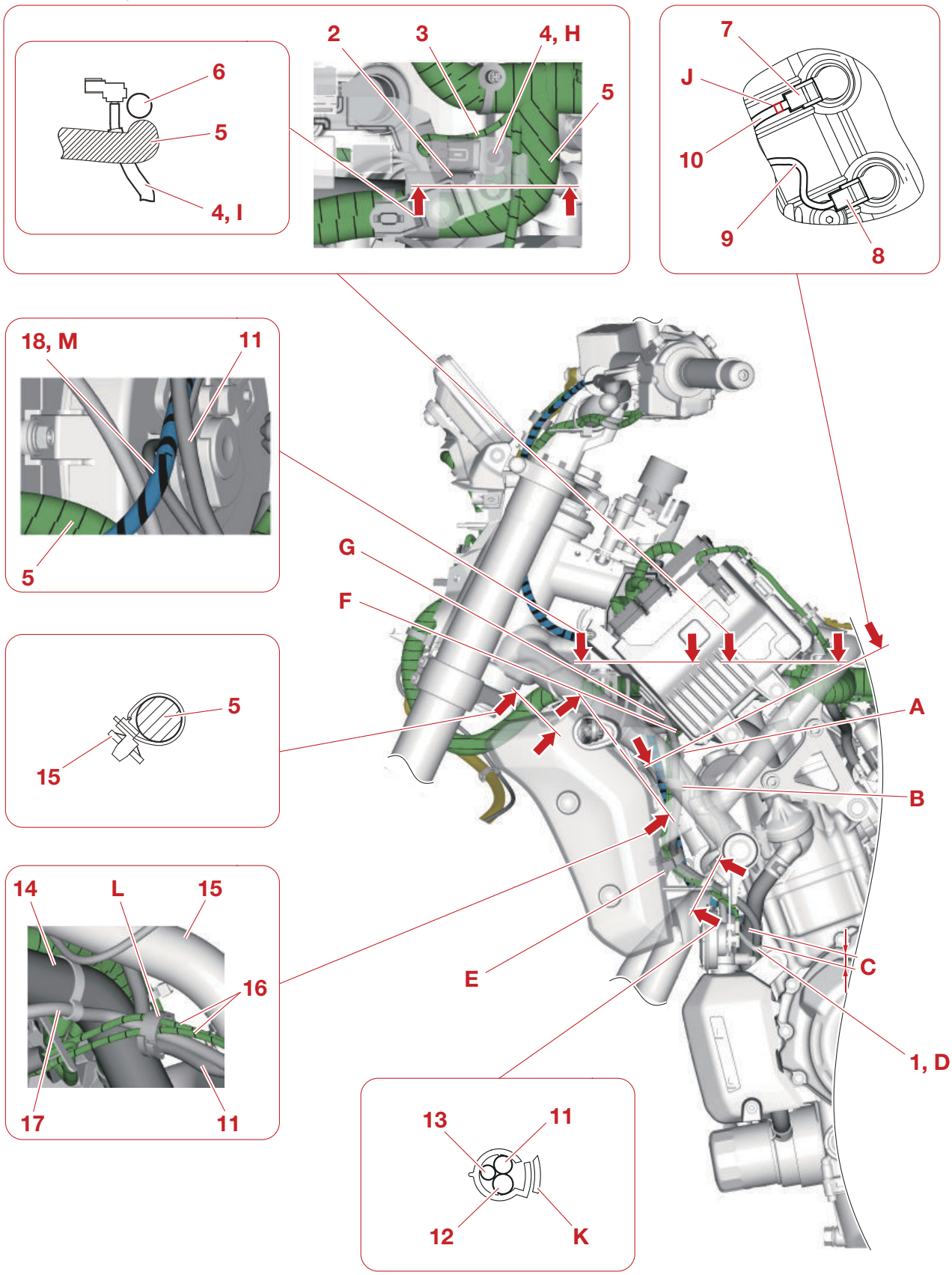
Frame and engine (right side view)



1. GCU (Generator Control Unit)
2. Stator coil lead
3. O_2 sensor
4. Oil pressure switch
5. O_2 sensor lead
6. Oil pressure switch lead
7. Rear wheel sensor lead
8. O_2 sensor coupler
9. Rear brake light switch coupler
10. Rear wheel sensor coupler
11. Wire harness (front turn signal/position light lead (right))
12. Front turn signal/position light lead (right)
13. Electrical components tray 2
14. Front turn signal/position light coupler (right)
15. Clutch cable
16. Clutch cable guide
17. Rear brake light switch lead

A. Position the front turn signal/position light coupler (right) so that the wire harness side is facing to lower side of the vehicle.
B. Insert the clamp into the electrical components tray 2 from the outside of the vehicle.
C. Insert the clamp into the electrical components tray 2 from lower side of the vehicle.
D. Clamp the O_2 sensor and oil pressure switch lead.
E. Insert the clamp from the inside of the vehicle.
F. Insert the clamp into the frame from the inside of the vehicle.
G. Route the O_2 sensor lead and oil pressure switch lead without slack from the O_2 sensor to the clamp. If there is any slack, slacken it at the top of the vehicle at the clamp.
H. Fasten the wire harness and wire harness (to rear wheel sensor) through the hole in the frame using a plastic locking tie. Cut off the end of the plastic locking tie to 5 mm (0.20 in) or less.
I. Thread a plastic locking tie through the hole in the frame and fasten the wire harness and rear wheel sensor leads together on the outside of the frame. Cut off the end of the plastic locking tie to 2 mm (0.08 in) or less and face the locking part to the backward of the vehicle.
J. Route the wire harness (to front turn signal/position light lead (right)) under the stator coil lead.
K. Route the front turn signal/position light lead (right) outside the stator coil lead.
L. Route the front turn signal/position light lead (right) inside the line as shown in the illustration.
M. Insert the protective of the front turn signal/position light coupler (right) into the hole of electrical components tray 2 from the outside of the vehicle.
N. Route the clutch cable through the guide as shown in the illustration.
O. Clamp the O_2 sensor lead, oil pressure switch lead, and the rear brake light switch lead. Position the clamp rearward of the vehicle from the rear brake hose joint. The locking part of the clamp direction does not matter.

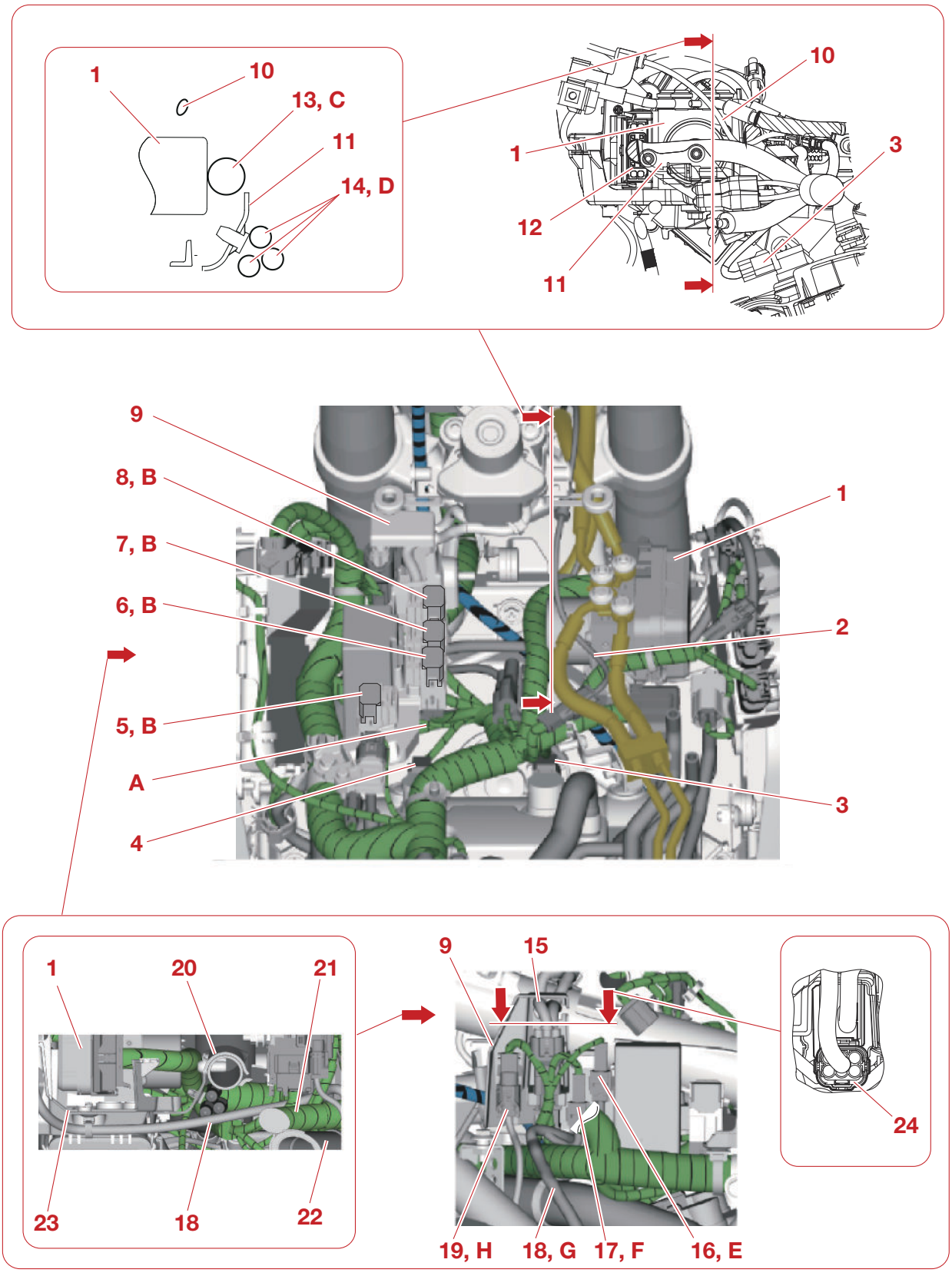
Frame and engine (front left side view)



1. Plastic locking tie
2. Auxiliary DC jack coupler (OPTION)
3. Wire harness (to intake air pressure sensor lead)
4. Intake air pressure sensor hose
5. Wire harness
6. Wire harness (to shift sensor coupler)
7. Ignition coil #2 coupler
8. Ignition coil #1 coupler
9. Wire harness (to ignition coil #1)
10. Wire harness (to ignition coil #2)
11. Stator coil lead
12. Coolant reservoir hose
13. Wire harness (to horn)
14. Radiator inlet hose
15. Frame
16. Wire harness (to horn)
17. Coolant reservoir hose
18. Clutch cable

A. There should be no slack from this clamp to the end of the wire harness.
B. Clamp the stator coil lead, wire harness (to horn), and reservoir hose to the clamps and insert the clamp to the frame. Face the opening of the clamp to the front side of the vehicle. Route the wire harness (to horn) from this clamp to the horn coupler without slack.
C. 5–10 mm (0.20–0.39 in) (from protector end)
D. Clamp the stator coil lead to the outside of the vehicle on the oil cooler hose at the alignment mark using a plastic locking tie. Cut off the end of the plastic locking tie to 2 mm (0.08 in) or less. Face the locking part of the plastic locking tie to the rear side of the vehicle. Be careful do not caught the stator coil lead between the oil cooler inlet hose and the engine.
E. Clamp the stator coil lead, wire harness (to horn), and reservoir hose and attach them to the radiator fan. Do not cross the hoses and leads from the upper clamp.
F. Route the wire harness (to horn) inside the vehicle of the radiator inlet hose.
G. Route the stator coil lead through outside the vehicle of the radiator inlet hose.
H. Route the intake air pressure sensor hose front of the vehicle of the wire harness (to shift sensor coupler).
I. Route the intake air pressure sensor hose front of the vehicle of the wire harness.
J. Blue tape.
K. Clamp the stator coil lead, wire harness (to horn), and reservoir hose in the center of the upper and lower clamps.
L. Clamp the stator coil lead, wire harness (to horn), and reservoir hose between the radiator inlet hose and the clamp of the frame.
M. Route the clutch cable front side of the vehicle of the stator coil lead.

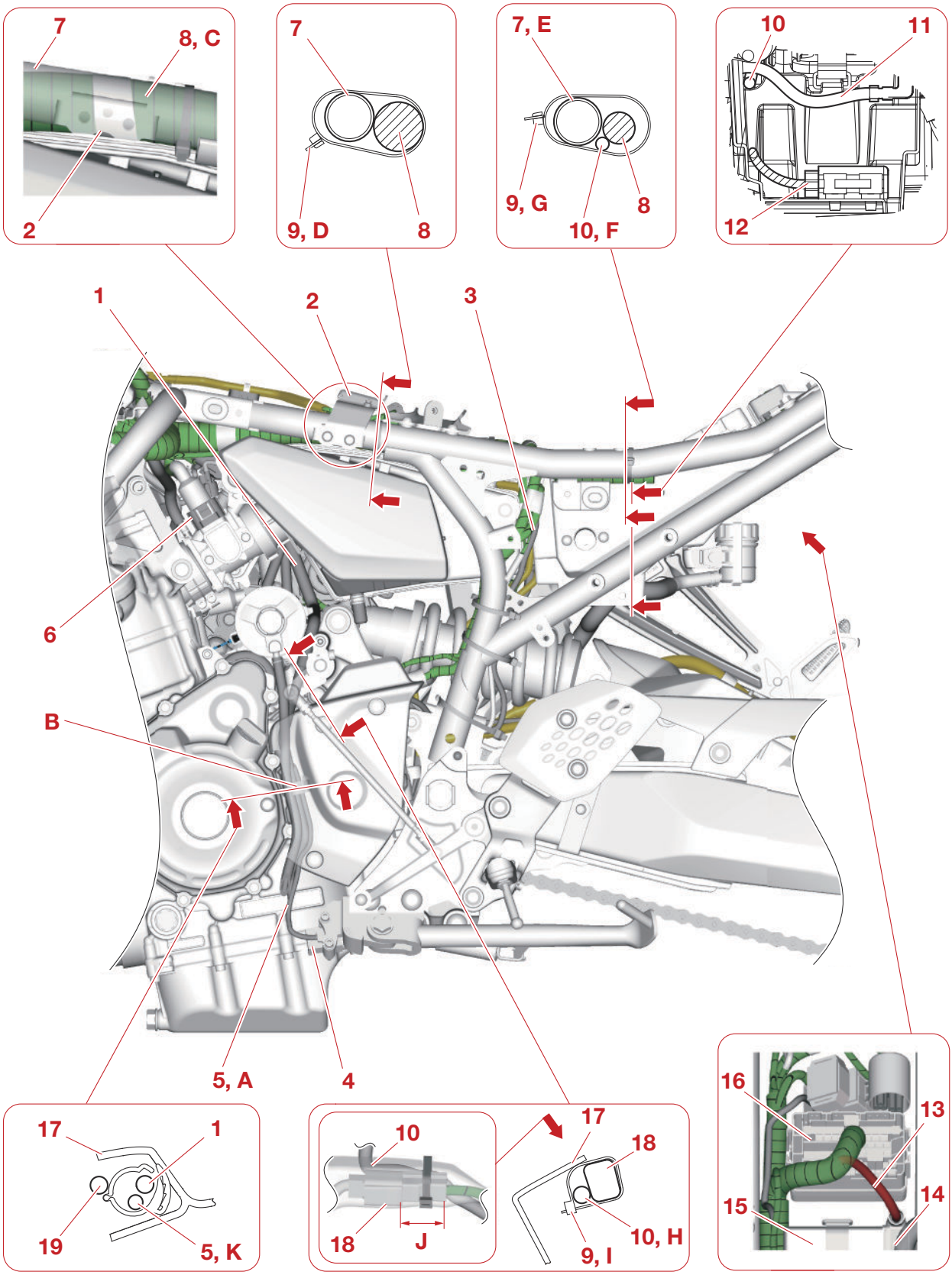
Frame and engine (rear side view)



1. Hydraulic unit assembly
2. Front wheel sensor coupler
3. Ignition coil #2 coupler
4. Ignition coil #1 coupler
5. Starter circuit cut-off relay 2
6. Radiator fan motor relay
7. Horn relay
8. Engine stop relay
9. Electrical components tray 1
10. Front wheel sensor lead
11. Engine bracket (right)
12. ABS ECU coupler
13. Wire harness (to hydraulic unit assembly)
14. Joint coupler
15. Main switch lead
16. Radiator fan motor coupler
17. Crankshaft position sensor coupler
18. Stator coil lead
19. Front turn signal/position light coupler (left)
20. Frame
21. Wire harness
22. Radiator inlet hose
23. Electrical components tray 2
24. Main switch coupler

A. To horn
B. Insert the relay until it hits the stopper of the electrical components tray 1.
C. Route the wire harness (to hydraulic unit assembly) lower side of the vehicle at the front wheel sensor lead and between the bracket and hydraulic unit assembly.
D. Insert the junction coupler clamp to the bracket from the inside of the vehicle.
E. After connecting the radiator fan motor coupler, install it into the hole marked “B” on electric components tray 1 from the outside of the vehicle, with the coupler on the wire harness side facing upwards of the vehicle.
F. After connecting the crankshaft position sensor coupler, install it into the hole marked “W” on electric tray 1 from the outside of the vehicle so that the coupler on the wire harness side is facing upward of the vehicle.
G. Route the stator coil lead to the front side of the vehicle where the wire harness, wire harness (to ECU), and the wire harness (to relay) branches off and the rear side of the vehicle where the front turn signal/position light lead (left) and main switch lead branches off.
H. After connecting the front turn signal/position light coupler (left), install it into the hole mark “W” on electric components tray 1 from the outside of the vehicle so that the coupler on the wire harness side is facing upwards of the vehicle.

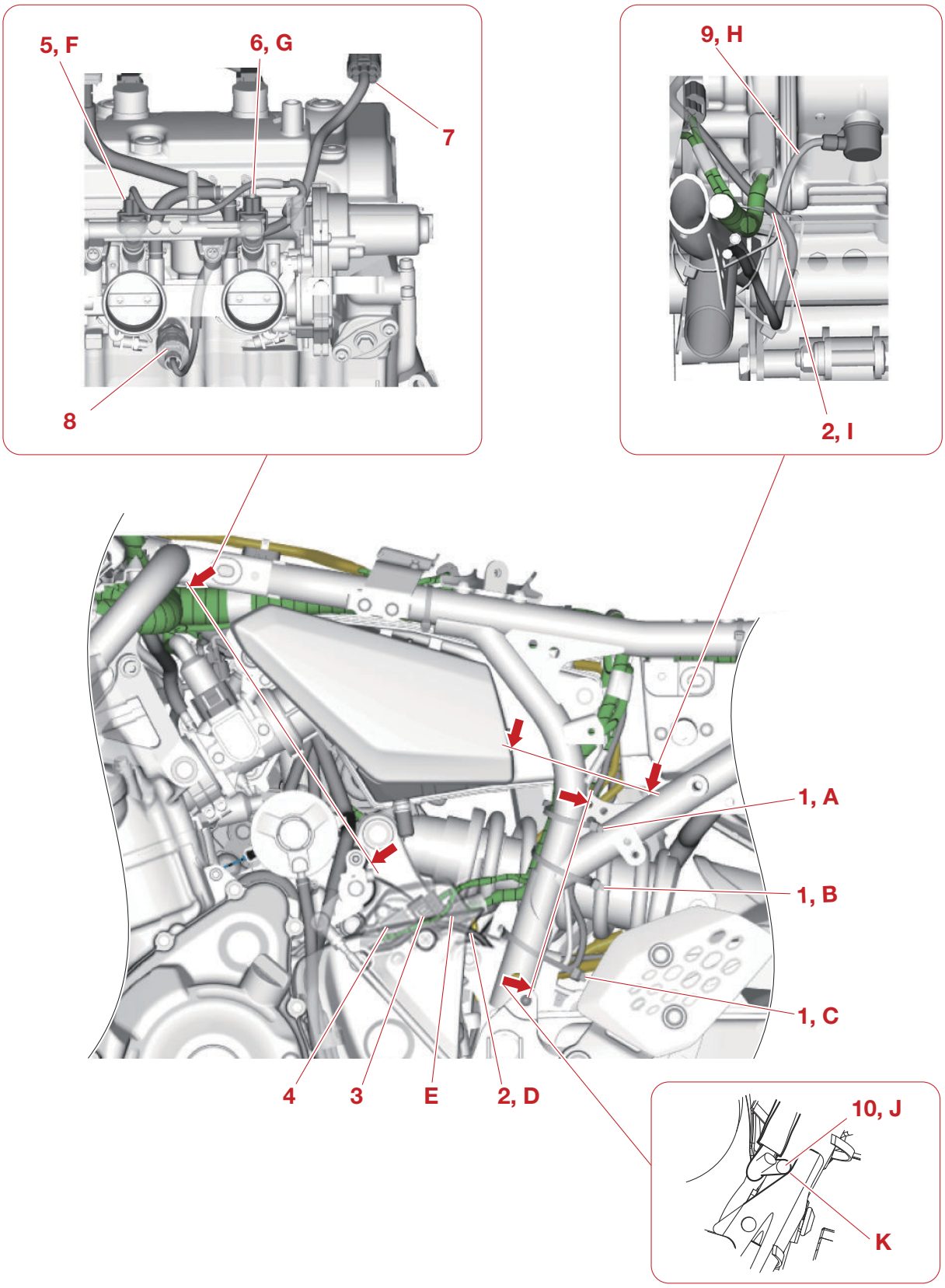
Frame and engine (rear left side view)



1. Fuel tank overflow hose
2. Rear fuel tank bracket
3. Sub-wire harness (neutral switch)
4. Sidestand switch
5. Sidestand switch lead
6. Throttle position sensor coupler
7. Frame
8. Wire harness
9. Plastic locking tie
10. Starter motor lead
11. Negative battery lead
12. Lean angle sensor coupler
13. Positive battery lead
14. Positive battery terminal
15. Battery
16. Fuse box
17. Drive sprocket cover
18. Sidestand switch coupler
19. Canister breather hose (for California)/Fuel tank breather hose (except for California)

A. Pass the sidestand switch lead through the inside of the vehicle of the fuel tank overflow hose and canister breather hose.
B. Position the clamp centered between the generator cover mounting bolts.
C. Route the wire harness so that it does not protrude above the frame.
D. There is no problem with the plastic locking tie riding up onto the weld bead. 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 downward of the vehicle.
E. Place the starter motor lead under the wire harness.
F. Harnesses must not protrude above the frame.
G. 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 outside of the vehicle.
H. Pass the starter motor lead through the outside of the vehicle of the sidestand switch coupler.
I. Fix the starter motor lead and recessed of the sidestand switch coupler with the plastic locking tie and place them into the drive sprocket cover. 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 outside.
J. Attach the plastic locking tie to the thin part of the sidestand switch coupler.
K. Pass the sidestand switch lead through the innermost of the vehicle.

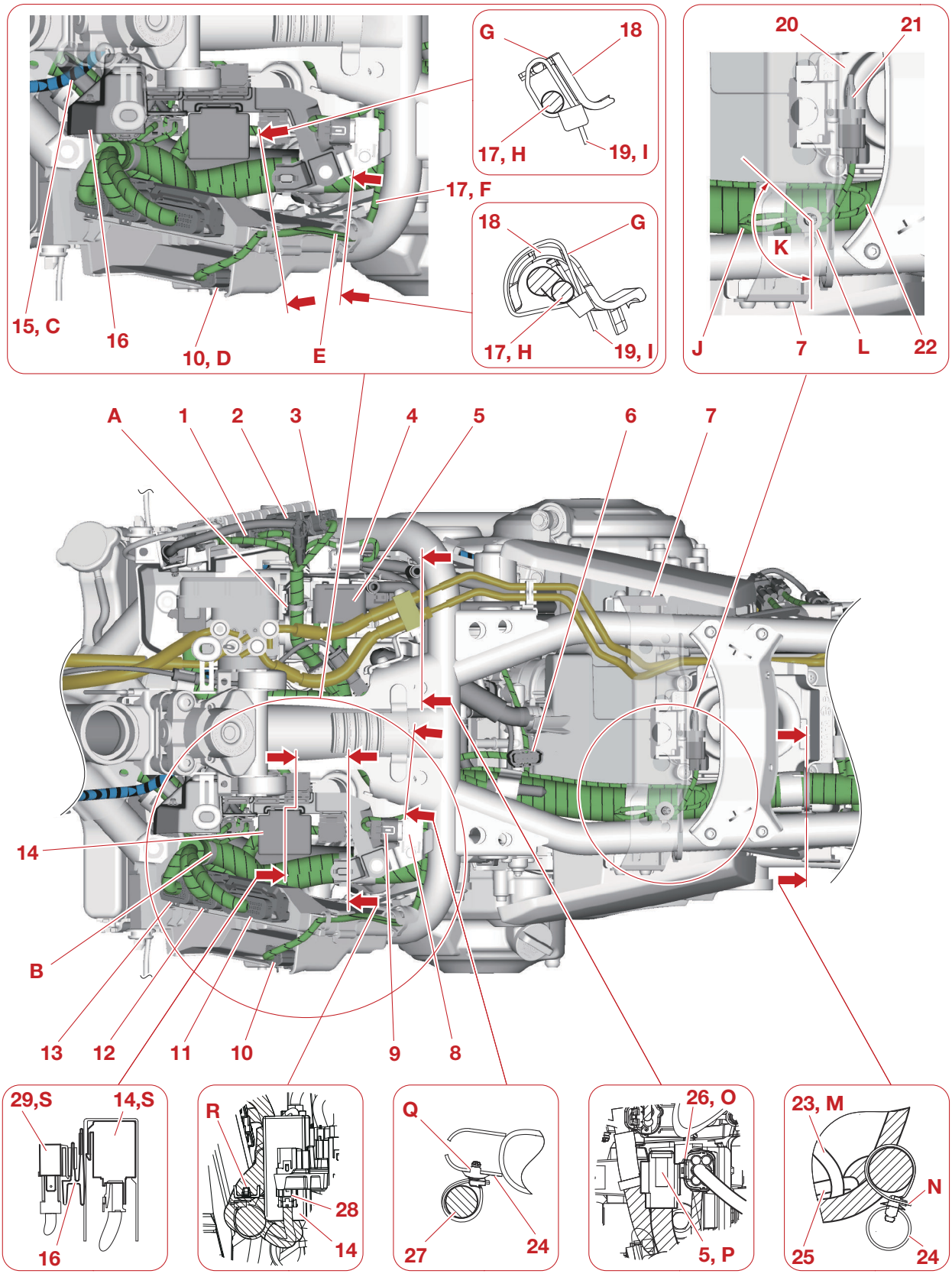
Frame and engine (center left side view)



1. Plastic locking tie
2. Starter motor lead
3. Gear position sensor coupler
4. Gear position sensor
5. Injector #1 coupler
6. Injector #2 coupler
7. Sub-wire harness coupler
8. Coolant temperature sensor coupler
9. Sub-wire harness (neutral switch)
10. Engine ground lead

A. Pass plastic locking tie through the hole in the frame and clamp the engine ground lead, sub-wire harness (neutral switch) and starter motor lead to the frame. 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.
B. Clamp the engine ground lead, sub-wire harness (neutral switch) and starter motor lead to the upper side of the frame reinforcement part. 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
C. Tie the starter motor lead and sub-wire harness (neutral switch) at the white tape position on the starter motor lead.
D. Route the starter motor lead to the downward of the vehicle from the sidestand switch lead, gear position sensor lead and engine ground lead.
E. Attach the round terminal of the engine ground terminal to the outside of the vehicle and cover the engine ground terminals with a rubber boot.
F. Gray
G. Brown
H. Face the sub-wire harness (neutral switch) to the left side of the vehicle.
I. Route the starter motor lead from the sub-wire harness (neutral switch) to the top of the vehicle, and below the engine ground lead, side stand switch lead, and shift position sensor lead.
J. Route the engine ground lead along the curved section of the frame.
K. Curved section.

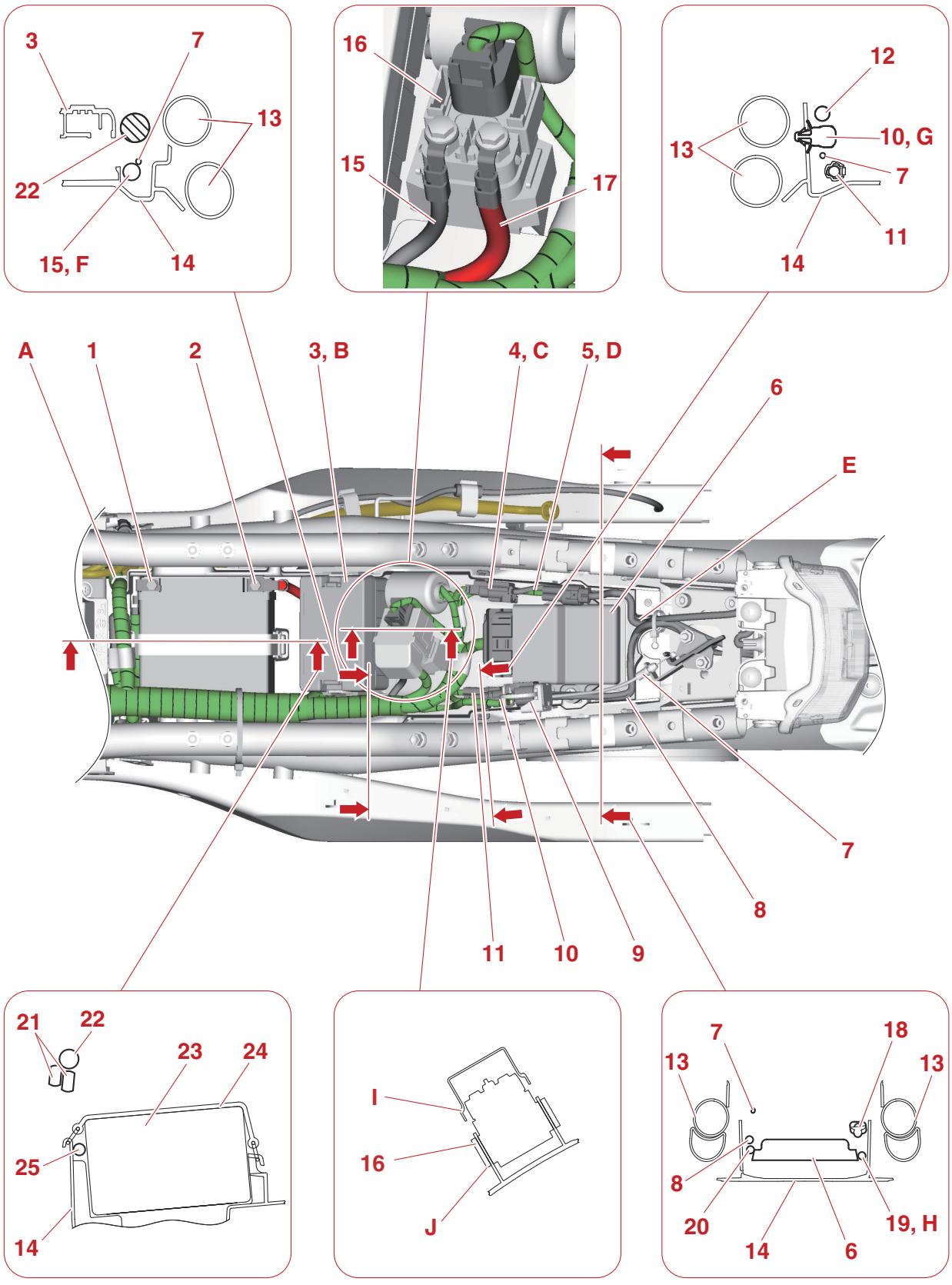
Frame (font top view)



1. GCU coupler 3
2. Stator coil coupler
3. GCU coupler 1
4. Purge cut valve solenoid coupler (for California only)
5. Joint coupler
6. Fuel pump coupler
7. Rear fuel tank bracket
8. Intake air pressure sensor
9. Intake air pressure sensor coupler
10. Shift sensor coupler (OPTION)
11. ECU coupler 3
12. ECU coupler 2
13. ECU coupler 1
14. Relay unit
15. Clutch cable
16. Electrical components tray 1
17. Wire harness (to shift sensor coupler)
18. ECU tray
19. Plastic locking tie
20. Air duct
21. Intake air temperature sensor
22. Wire harness (to intake air temperature sensor)
23. Negative battery lead
24. Frame
25. Starter motor lead
26. Sub-wire harness coupler
27. Wire harness
28. Starting circuit cut-off relay 2 coupler
29. Radiator fan motor relay

A. Insert the protrusion of the wire harness clamp into the hole on the electrical components tray 2.
B. Insert the protrusion of the wire harness clamp into the hole on the ECU tray from backward of the vehicle.
C. Hook the clutch cable onto arm of the electrical components tray 1.
D. Insert the auxiliary DC jack coupler into the protrusion of the ECU tray.
E. Route the auxiliary DC jack lead to the outside of the vehicle of the ECU tray.
F. Route the wire harness (to shift sensor) to the inside of the vehicle of the frame.
G. Pass the plastic locking tie through the hole in the ECU stay.
H. Route the auxiliary DC jack lead to the outside of the vehicle in the ECU tray guide.
I. Cut off the excess end of the plastic locking tie to 5 mm (0.20 in) or less.
J. Position the intake air temperature sensor lead so that its folded part is within the range shown in the illustration.
K. 135°
L. Insert the clamp of the wire harness (to intake air temperature sensor) into the hole of rear fuel tank bracket from lower side of the vehicle.
M. Route the negative battery lead top side the vehicle of the starter motor lead.
N. Insert the clamp of the wire harness into the hole of the frame from inside of the vehicle.
O. Insert the protrusion of the sub-wire harness coupler into the hole of the electrical components tray 2 from top side of the vehicle.
P. Slide the joint coupler and attach it completely to the rib of the electrical components tray 2.
Q. Insert the clamp of the wire harness into the hole of the frame from lower side of the vehicle.
R. Insert the clamp of the wire harness into the hole of the electrical components tray 1 from lower side of the vehicle.
S. Insert the hole of the relay cover completely into the ribs of electrical components tray 1.

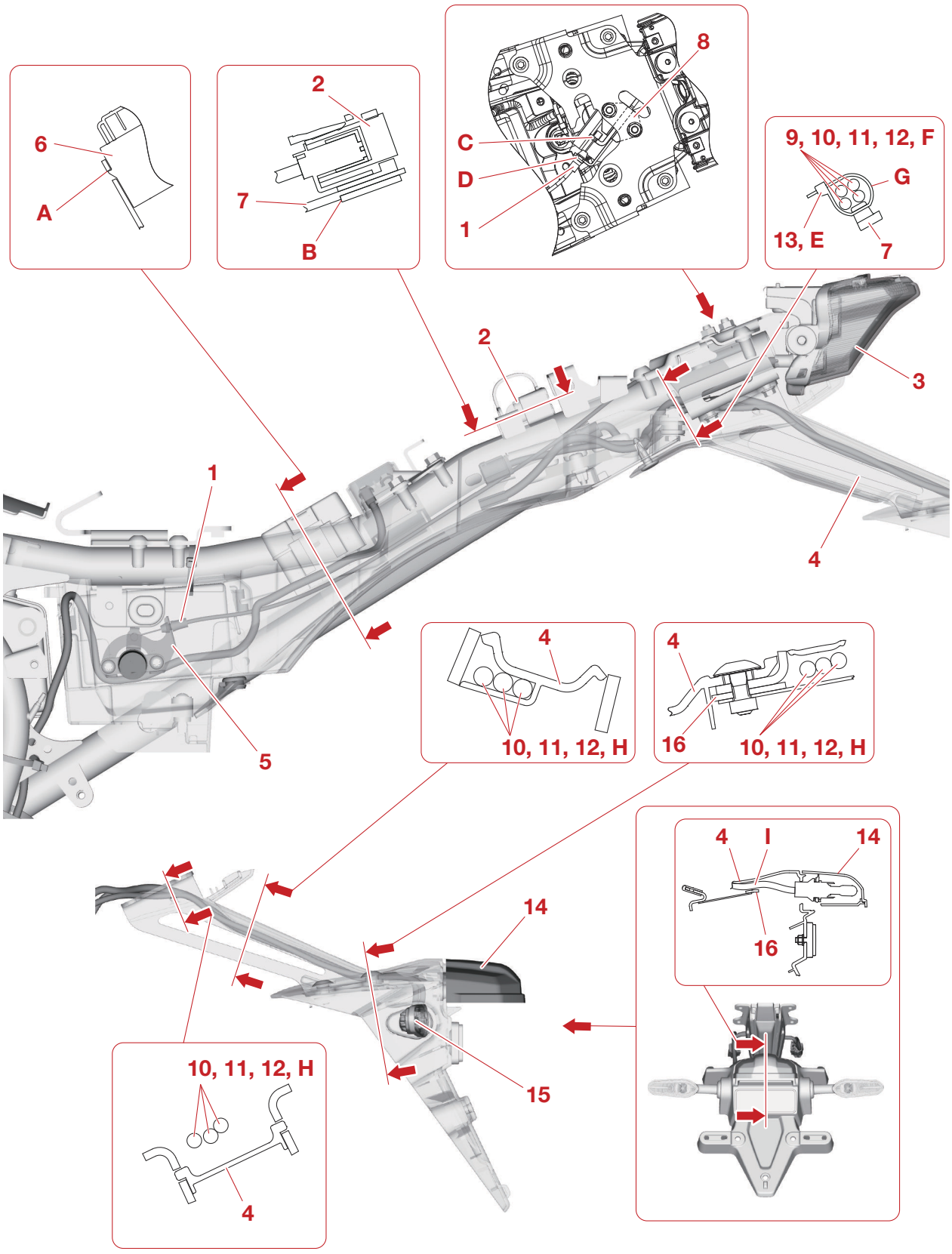
Frame (rear top view)



1. Negative battery terminal
2. Positive battery terminal
3. Fuse box
4. Rear turn signal light coupler (right)
5. Wire harness (to tail/brake light assembly)
6. BCM (Body Control Module)
7. Seat lock cable
8. Rear turn signal light lead (left)
9. YDT coupler
10. Rear turn signal light coupler (left)
11. License plate light coupler
12. Wire harness (to YDT coupler)
13. Frame
14. Battery box
15. Starter motor lead
16. Starter motor relay
17. Positive battery lead
18. Tail/brake light assembly coupler
19. Rear turn signal light lead (right)
20. License plate light lead
21. Joint coupler
22. Wire harness
23. Battery
24. Battery band
25. Negative battery lead

A. Route the wire harness (to O_2 sensor) inside the vehicle of the battery box lib.
B. Install the fuse box cover so that the label faces the right side of the vehicle.
C. Insert the protrusion of the rear turn signal light coupler (right) into the hole on the side of battery box.
D. Route the wire harness (to tail/brake light assembly) lower side the vehicle of the rear turn signal light lead (right).
E. Tuck the rear turn signal light lead, license plate light lead, and tail/brake light assembly leads between the ribs of the battery box and tie them with plastic locking ties, leaving no slack on the leads.
F. Route the starter motor lead and seat lock cable lower side the vehicle of the wire harness.
G. Insert the protrusion of the rear turn signal light coupler (left) into the hole on the side of battery box.
H. Route the rear turn signal light lead (right) lower side the vehicle of the tail/brake light assembly coupler.
I. Make sure the cover hook is securely attached to the starter relay.
J. Insert the rubber part of the starter relay up to the step in the rib of the battery box.

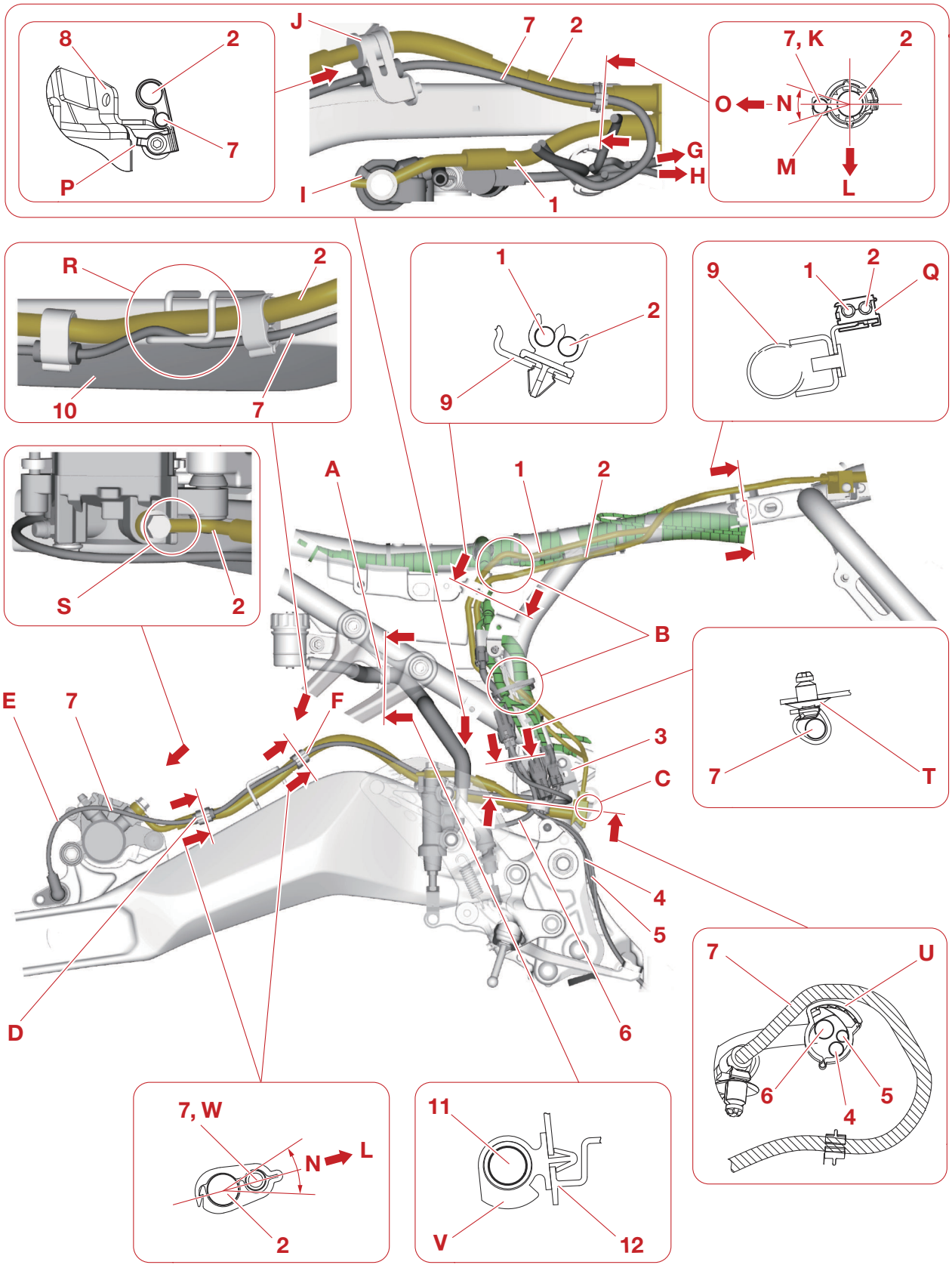
Rear fender (left side view)



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

A. Make sure the fuse box hook is securely attached to the battery box.
B. Insert the rubber cover of the YDT coupler up to the step in the rib of the battery box.
C. Attach the cylindrical part of the seat lock cable to the seat lock assembly securely.
D. Attach the end of the seat lock cable to the seat lock assembly surely.
E. Route the plastic locking tie through the hole in the battery box and then fasten the tail/brake light assembly lead, rear turn signal light leads, and license plate light lead with a plastic locking tie. Cut off the end of the plastic locking tie to 5 mm (0.39 in) or less and face the locking part to the left side of the vehicle. The direction of the tip of the plastic locking tie does not matter.
F. The leads may be fastened in any order.
G. Fasten the plastic locking tie at the white tape portion of the tail/brake light assembly lead.
H. The leads may be routed in any order.
I. Sandwich the tail/brake light assembly lead, rear turn signal light leads, and license plate light lead between the mudguard assembly and lower tail cover. The order of the leads does not matter.

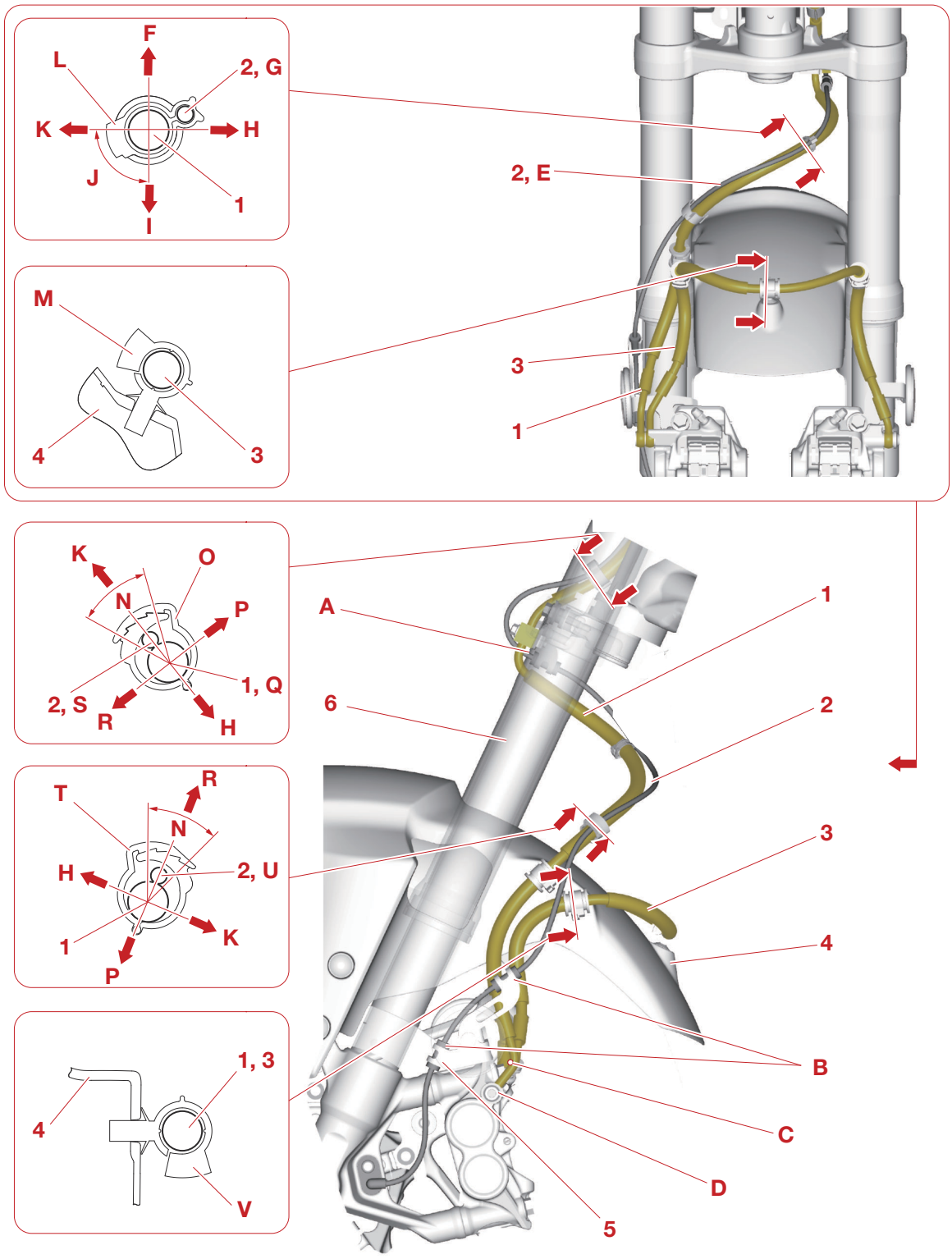
Rear brake hose (right side view)



1. Brake hose (rear brake master cylinder to hydraulic unit)
2. Brake hose (hydraulic unit to rear brake caliper)
3. Rear brake hose joint bracket
4. Oil pressure switch lead
5. O_2 sensor lead
6. Rear brake light switch lead
7. Rear wheel sensor lead
8. Drive chain guard
9. Frame
10. Swingarm
11. Brake fluid reservoir hose
12. Battery box

A. Attach the clamp to the straight section of the brake fluid reservoir hose.
B. Route the rear brake hoses to the inside of the vehicle of the frame.
C. Install the rear brake hose joint by placing the side of the rear brake hose joint against the stopper on the rear brake hose joint bracket. There is no problem with the gap between the rear brake hose joint and the rear brake hose joint bracket stopper after tightening the rear brake hose joint bolt.
D. Clamp the grommet part of the rear wheel sensor lead at the metal part of the brake hose end (hydraulic unit to rear brake caliper).
E. Route the rear wheel sensor lead outside the vehicle of the brake hose (hydraulic unit to rear brake caliper). Install the rear wheel sensor lead between the brake hose (hydraulic unit to rear brake caliper) and the rear wheel sensor so that it does not get twisted.
F. Route the rear wheel sensor lead outside the vehicle of the brake hose (hydraulic unit to rear brake caliper) and clamp them at the paint mark position of the brake hose (hydraulic unit to rear brake caliper).
G. To oil pressure switch lead
H. To O_2 sensor lead
I. Fix the stopper of the brake hose (rear brake master cylinder to hydraulic unit) to contact with the projection of the rear brake master cylinder.
J. Bind the brake hose (hydraulic unit to rear brake caliper) and the grommet of the rear wheel sensor lead with the rear brake hose/lead holder.
K. Position the rear wheel sensor lead on the outside of the vehicle from the brake hose (hydraulic unit to rear brake caliper).
L. Outside of the vehicle
M. Attach the clamp so that it aligns with the paint mark on the brake hose (hydraulic unit to rear brake caliper) and the white tape on the rear wheel sensor lead. The opening of the clip should face the lower side of the vehicle.
N. 45°
O. Top side of the vehicle
P. Fix the metal part of the brake hose (hydraulic unit to rear brake caliper) to contact with the swingarm.
Q. Insert the clamp of the rear brake hose completely into the bracket.
R. Route the brake hose (hydraulic unit to rear brake caliper) and rear wheel sensor lead through inside on the brake hose guide.
S. Assemble the brake hose (hydraulic unit to rear brake caliper) by fitting it into the recess of the rear brake caliper.
T. Clamp the lower end of the clamp to the lower end of the rear wheel sensor lead protector. Cut off the excess end of the clamp to 5 mm (0.20 in) or less and the end of the clamp should face the backward of the vehicle.
U. The lead wires of the rear brake light switch, O_2 sensor, and oil pressure switch are passed between the rear wheel sensor lead.
V. The opening of the clip should face the lower side of the vehicle.
W. Position the rear wheel sensor lead on the outside of the vehicle from the brake hose (hydraulic unit to rear brake caliper).

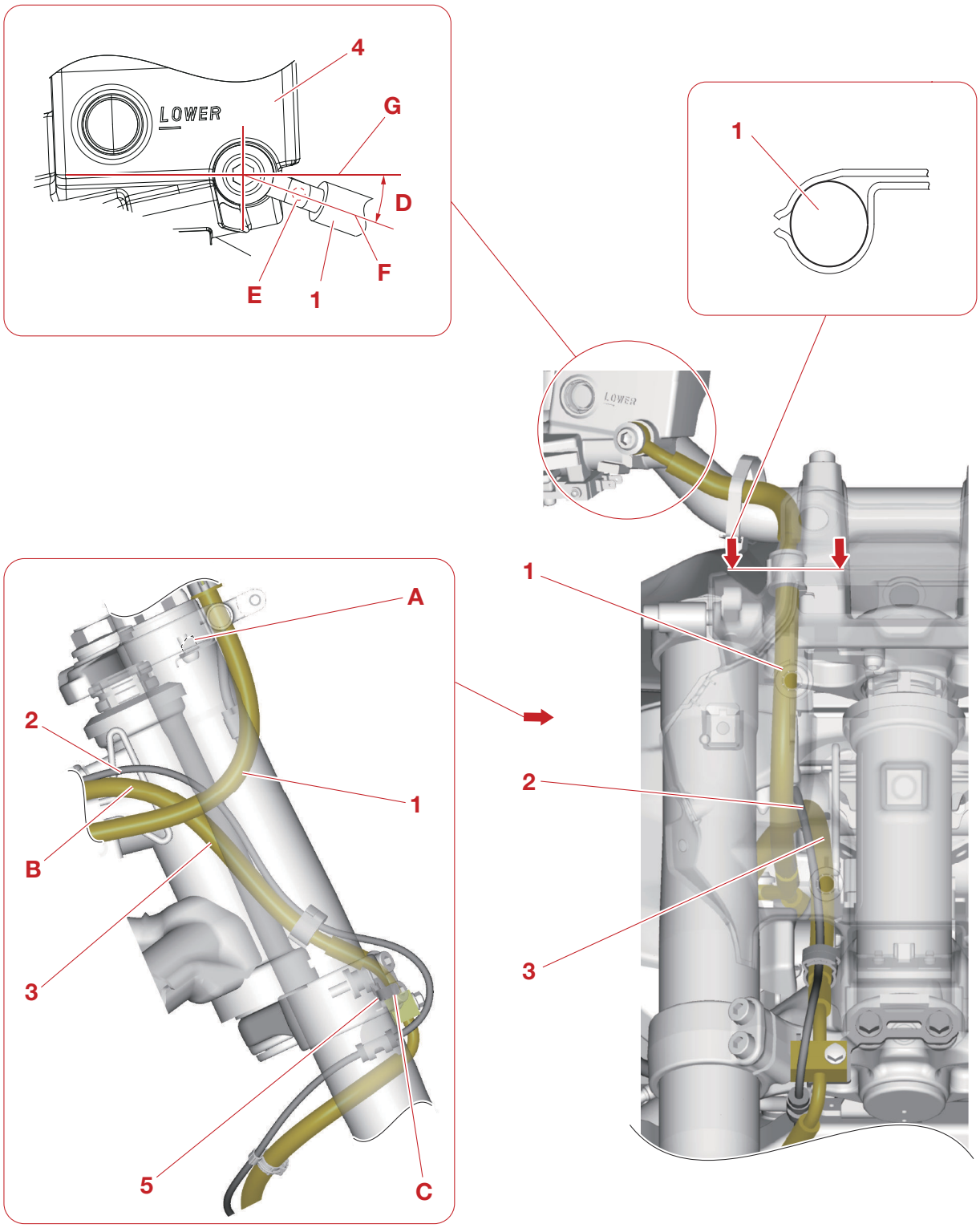
Front brake hose (left side view)



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. Front fender
5. Front reflector bracket
6. Front fork leg

A. Insert the grommet of the front wheel sensor lead into the front brake hose holder.
B. Insert the grommet of the front wheel sensor lead into the front reflector bracket.
C. Face the blue paint mark on the brake hose (hydraulic unit to front brake caliper (left)) to outside of the vehicle and install it.
D. Install the brake pipe (front brake caliper (left) to front brake caliper (right)) until contacted to the stopper of the front brake caliper. Install the brake pipe (hydraulic unit to front brake caliper (left)) so that it is aligned with the brake pipe (front brake caliper (left) to front brake caliper (right)). Install the brake hose or pipe to not contact the brake hose or pipe to brake hose or pipe.
E. Make the front wheel sensor lead to follow the brake hose (hydraulic unit to front brake caliper (left)).
F. Upper side of the vehicle
G. Pass the front wheel sensor lead to between the upper side of the vehicle from the rear side of the vehicle of the brake hose (hydraulic unit to front brake caliper (left)), and fasten the clamp to the paint mark of the brake hose.
H. Rear side of the vehicle
I. Lower side of the vehicle
J. 90°
K. Front side of the vehicle
L. Fasten the clamp to the paint mark of the brake hose. Face the opening of the clamp from lower the vehicle towards the front of the vehicle.
M. Insert the protrusion of the clamp completely into the front fender holes. Face the opening of the clamp to the front side of the vehicle.
N. 45°
O. Face the opening of the clamp to the front side of the vehicle. Tighten the claws of the clamps at least 4 notches.
P. Inside of the vehicle
Q. Align the clamp position with the end of the brake hose protector.
R. Outside of the vehicle
S. Pass the front wheel sensor lead to the front side of the vehicle of the brake hose (hydraulic unit to front brake caliper (left)) and fasten the clamp to the white tape of the front wheel sensor lead.
T. Attach the clamp so that it aligns with the white tape on the wheel sensor lead and the paint mark on the brake hose (hydraulic unit to front brake caliper (left)).
U. Position the wheel sensor lead on the outside of the vehicle from the brake hose (hydraulic unit to front brake caliper (left)).
V. Insert the protrusion of the clamp completely into the front fender holes. Tighten the claws of the clamps at least 2 notches. Face the opening of the clamp to the downward of the vehicle.

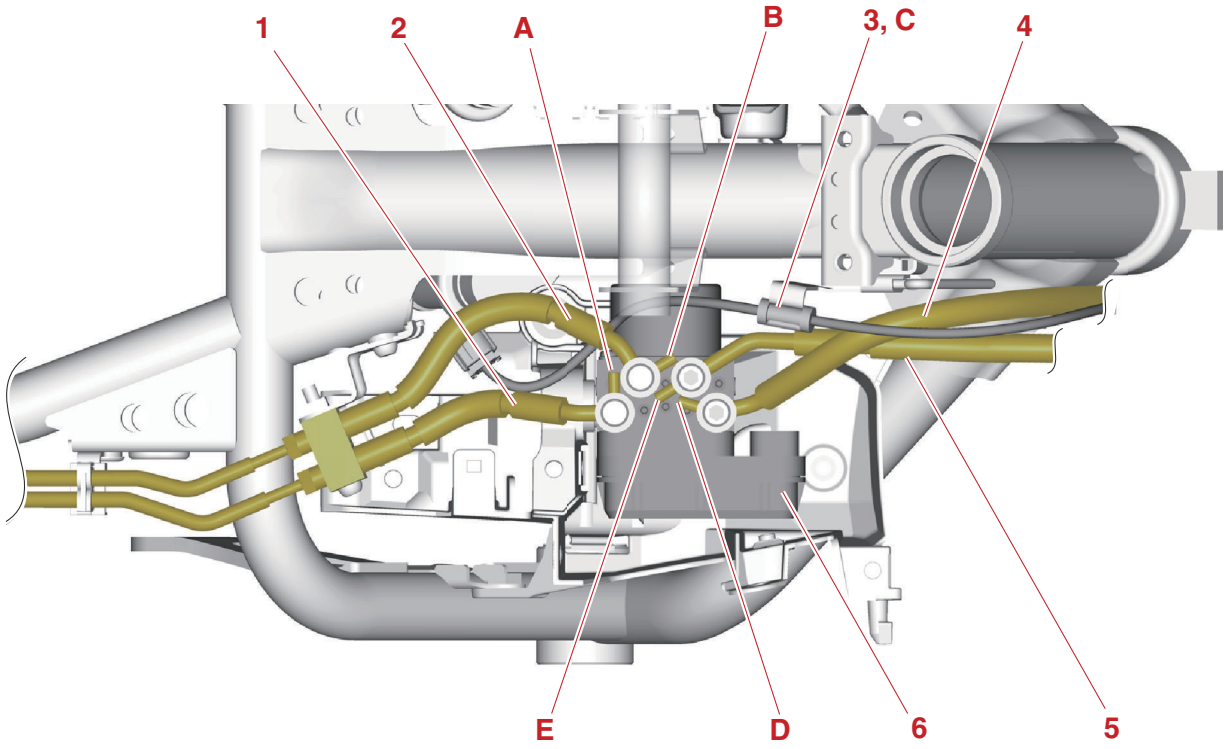
Front brake hose (front view)

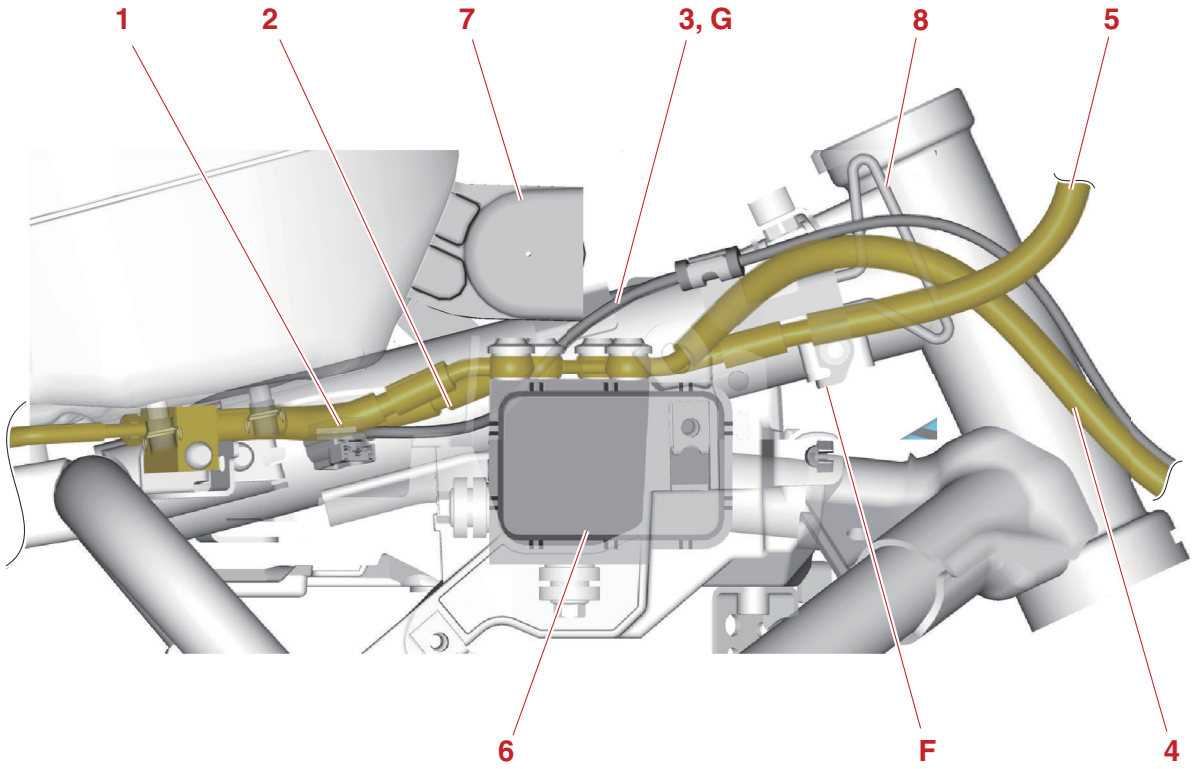


1. Brake hose (front brake master cylinder to hydraulic unit)
2. Front wheel sensor lead
3. Brake hose (hydraulic unit to front brake caliper (left))
4. Front brake master cylinder assembly
5. Front brake hose holder

A. Install the brake hose holder contact with the upper bracket.
B. Route the brake hose (hydraulic unit to front brake caliper (left)) inside the vehicle of the brake hose (front brake master cylinder to hydraulic unit).
C. Install the brake hose joint of the brake hose (hydraulic unit to front brake caliper (left)) to contact with the front brake hose holder.
D. 15°–25°
E. Install the brake hose (hydraulic unit to front brake caliper (left)) with the painted mark facing towards the rear side of the vehicle.
F. Center line
G. Install the brake hose (hydraulic unit to front brake caliper (left)) so that its center line is aligned 20° downward from the horizontal line of the front master cylinder upper end.

Hydraulic unit assembly (top and right side view)

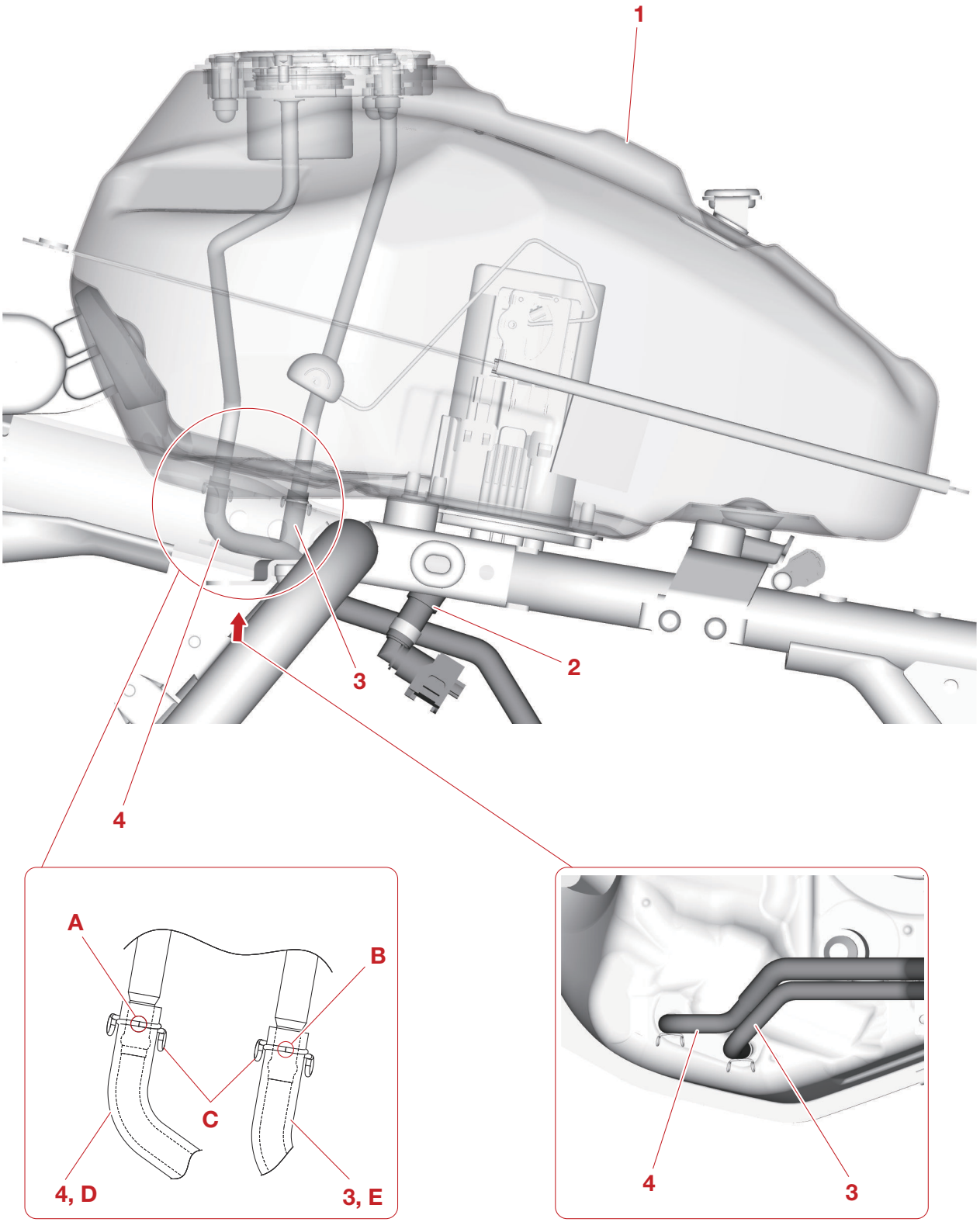




1. Brake hose (hydraulic unit to rear brake caliper)
2. Brake hose (rear brake master cylinder to hydraulic unit)
3. Front wheel sensor lead
4. Brake hose (hydraulic unit to front brake caliper (left))
5. Brake hose (front brake master cylinder to hydraulic unit)
6. Hydraulic unit assembly
7. Front fuel tank bracket
8. Wire harness guide

A. Tighten while keeping the pin of the brake hose (hydraulic unit to rear brake caliper) against the brake hose (rear brake master cylinder to hydraulic unit).
B. Tighten while keeping the pin of the brake hose (rear brake master cylinder to hydraulic unit) against the brake hose (front brake master cylinder to hydraulic unit).
C. Insert the grommet of the front wheel sensor lead to the wire harness guide.
D. Tighten while keeping the pin of the brake hose (hydraulic unit to front brake caliper (left)) against the brake hose (front brake master cylinder to hydraulic unit).
E. Tighten while keeping the pin of the brake hose (front brake master cylinder to hydraulic unit) against the brake hose (rear brake master cylinder to hydraulic unit).
F. Install the protrusion of the wire harness guide by pressing to contact with protrusion against the frame.
G. Route the front wheel sensor lead to the down side of the vehicle of the front fuel tank bracket.

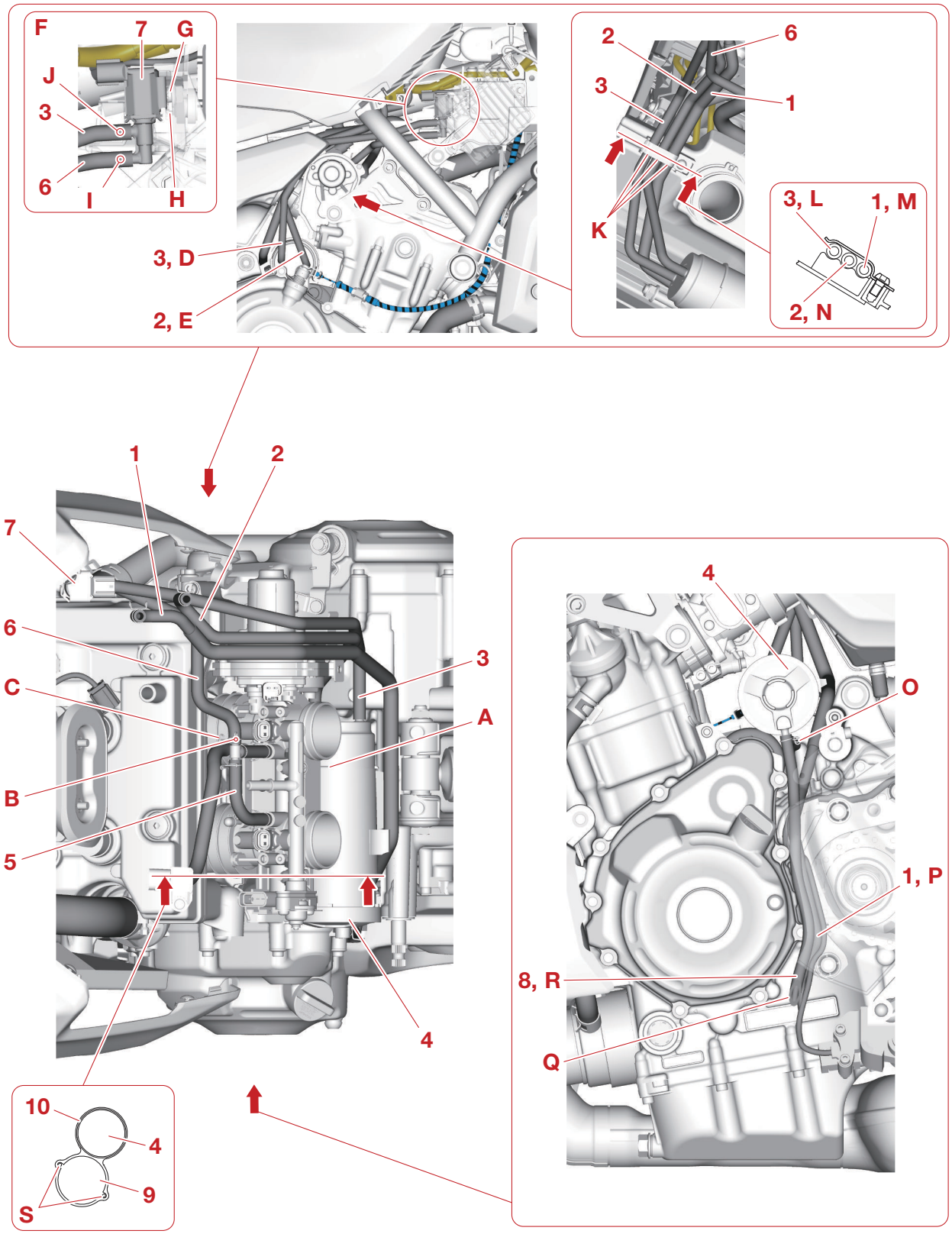
Fuel tank (left side view)



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

A. White paint mark
B. Yellow paint mark
C. Install the hose clip onto the paint mark. Do not locate the clip on the spool part. Face the opening of the hose clip to the right side of the vehicle, and make sure that the hose clamp does not contact the bottom of the fuel tank.
D. Face the white paint mark on the fuel tank overflow hose to the right side of the vehicle. Install the hose up to the wide portion of the fuel tank pipe.
E. Face the yellow paint mark on the fuel tank breather hose to the right side of the vehicle. Install the hose up to the wide portion of the fuel tank pipe.

Canister (for California only)

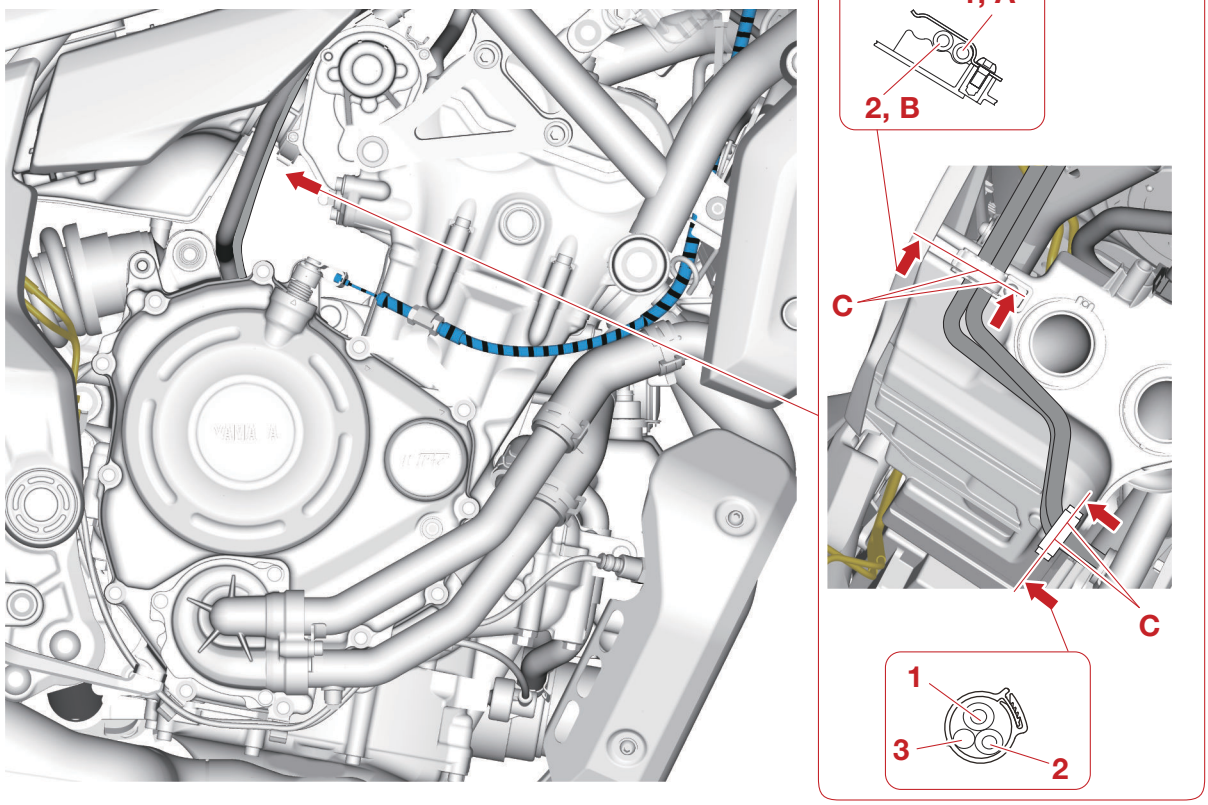


1. Fuel tank overflow hose
2. Fuel tank breather hose
3. Canister purge hose (canister to purge cut valve solenoid)
4. Canister
5. Canister purge hose (hose joint to throttle body)
6. Canister purge hose (purge cut valve solenoid to hose joint)
7. Purge cut valve solenoid
8. Canister breather hose
9.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

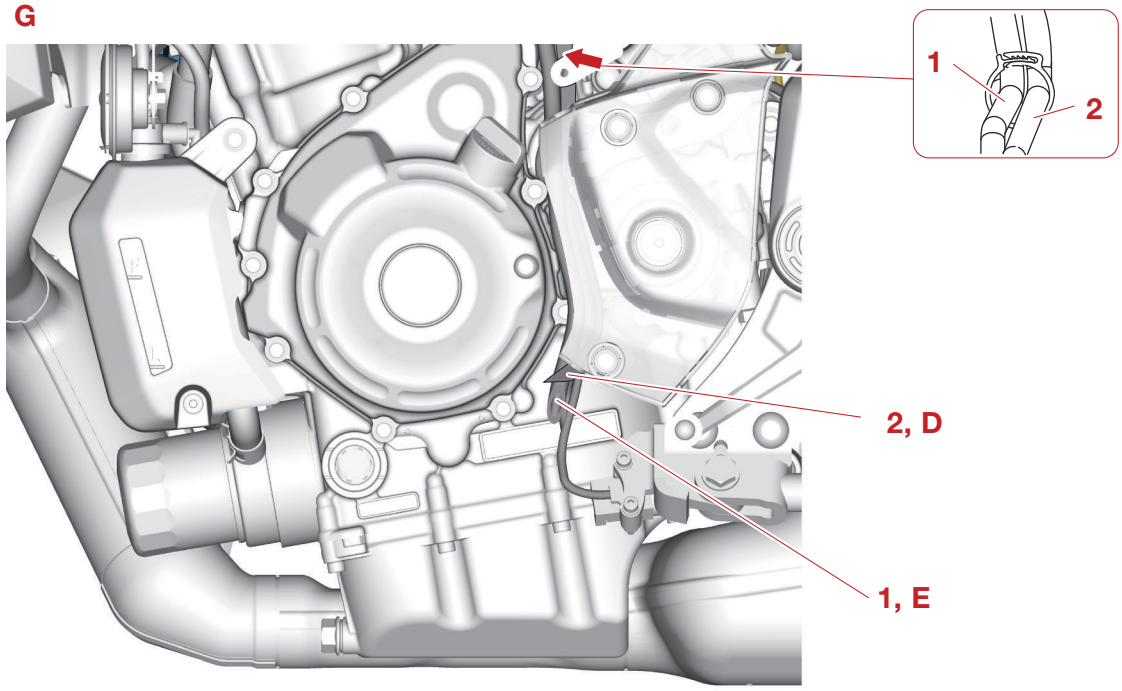
A. Fit the ribs of the canister with the grooves of the canister holder.
B. Point the yellow paint mark to the upper side of the vehicle.
C. Install the opening of the clip facing the upward of the vehicle.
D. Point the pink paint mark to the downward of the vehicle.
E. Point the green paint mark to the downward of the vehicle.
F. Detailed drawing of the purge cut valve solenoid
G. The flange of the collar must be attached to the inside of the electrical components tray 2.
H. Insert the stopper of the purge cut valve solenoid into the hole in the electrical components tray 2.
I. Point the white paint mark to the outside of the vehicle.
J. Point the blue paint mark to the outside of the vehicle.
K. Clamp the fuel tank overflow hose, canister purge hose (canister to purge cut valve solenoid) and fuel tank breather hose should be aimed at the R part of them. It is allowed even if they are out of position.
L. Blue and pink paint mark
M. White paint mark
N. Yellow and green paint mark
O. Point the opening of the clip to the rear side of the vehicle, making sure that it does not interfere with the canister body.
P. The tip of the fuel tank overflow hose protrudes between the bottom edge of marking base and drive sprocket cover.
Q. The tip of the canister breather hose protrudes from the lower side of the drive sprocket cover.
R. Place the canister breather hose in front side of the vehicle of the fuel tank overflow hose.
S. The groove in the canister holder.

Fuel tank drain hose and fuel tank breather hose (except for California)

F



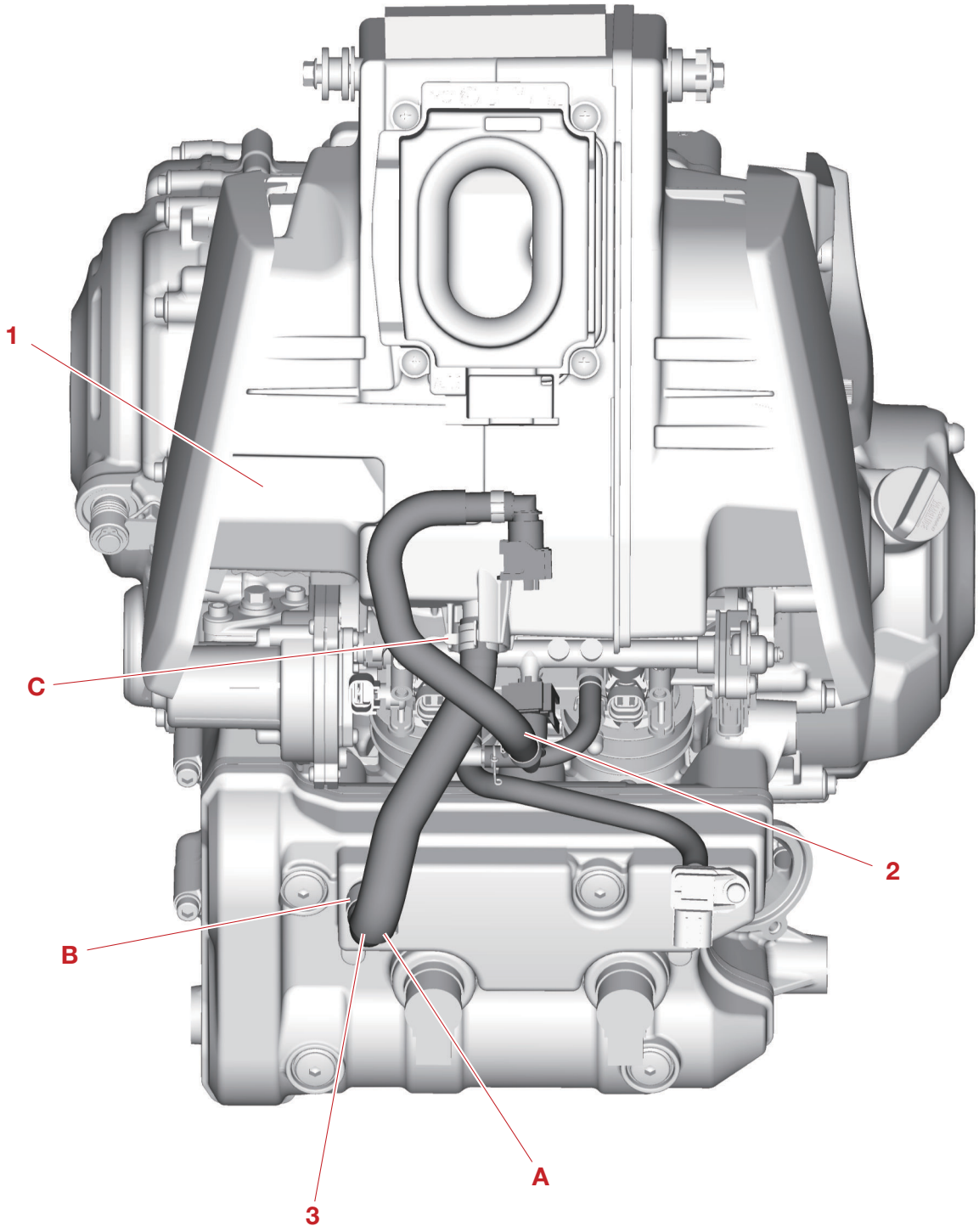
G



1. Fuel tank overflow hose
2. Fuel tank breather hose
3. Starter motor lead

A. White paint mark
B. Yellow and green paint mark
C. Clamp the fuel tank overflow hose and fuel tank breather hose should be aimed at the R part of them. It is allowed even if they are out of position.
D. The tip of the fuel tank breather hose protrudes between the bottom edge of marking base and drive sprocket cover.
E. The tip of the fuel tank overflow hose protrudes between the bottom edge of marking base and drive sprocket cover.
F. Right side of the vehicle
G. Left side of the vehicle

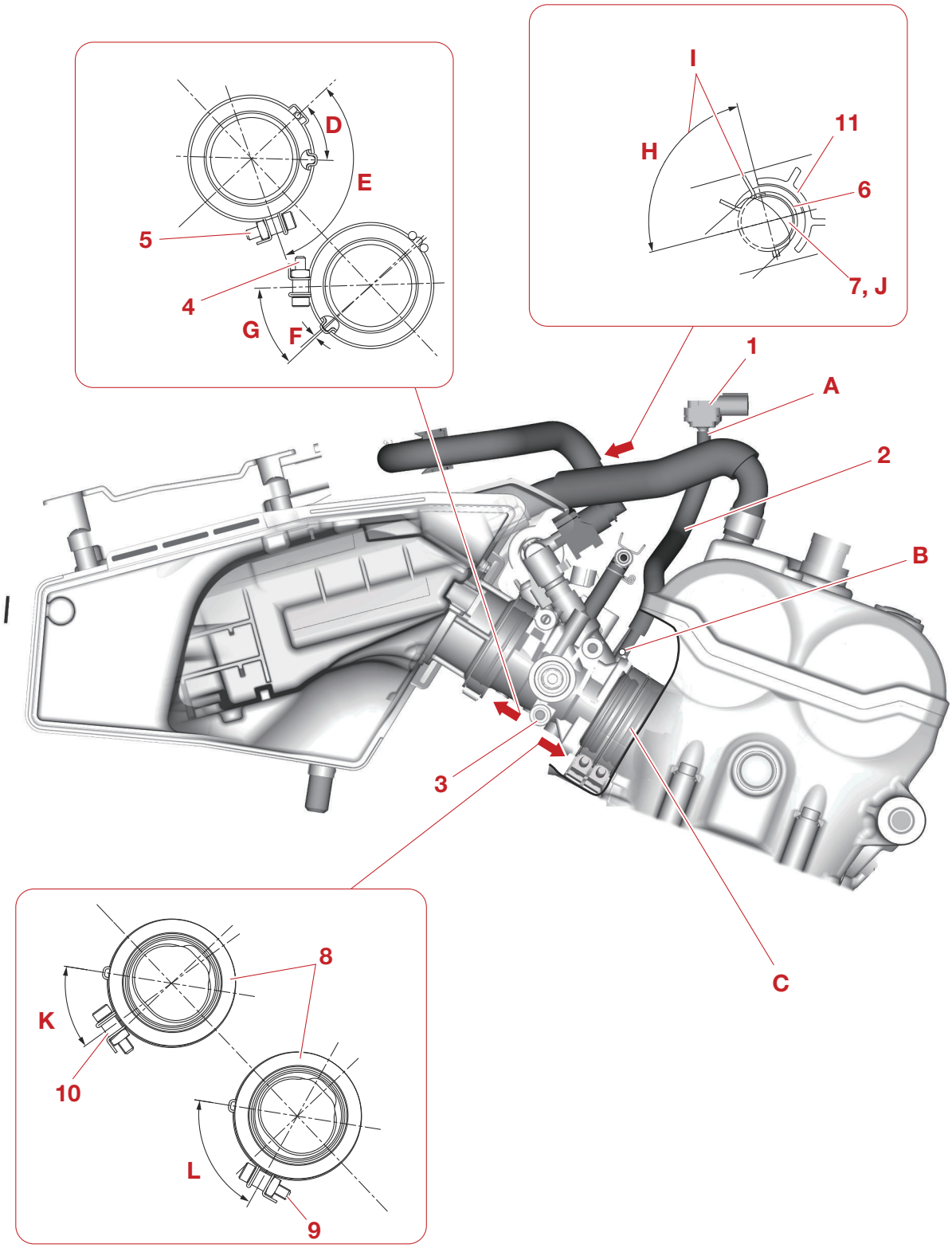
Throttle bodies (top view)



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

A. Insert the cylinder head breather hose until it reaches the rounded end of the cylinder head cover pipe. Face the white paint mark on the cylinder head breather hose to the left side of the vehicle.
B. Position the hose clip 1–4 mm (0.04–0.16 in) from the end of the hose. Point the ends of the hose clip to the left side of the vehicle.
C. Position the hose clip 1–4 mm (0.04–0.16 in) from the end of the hose.

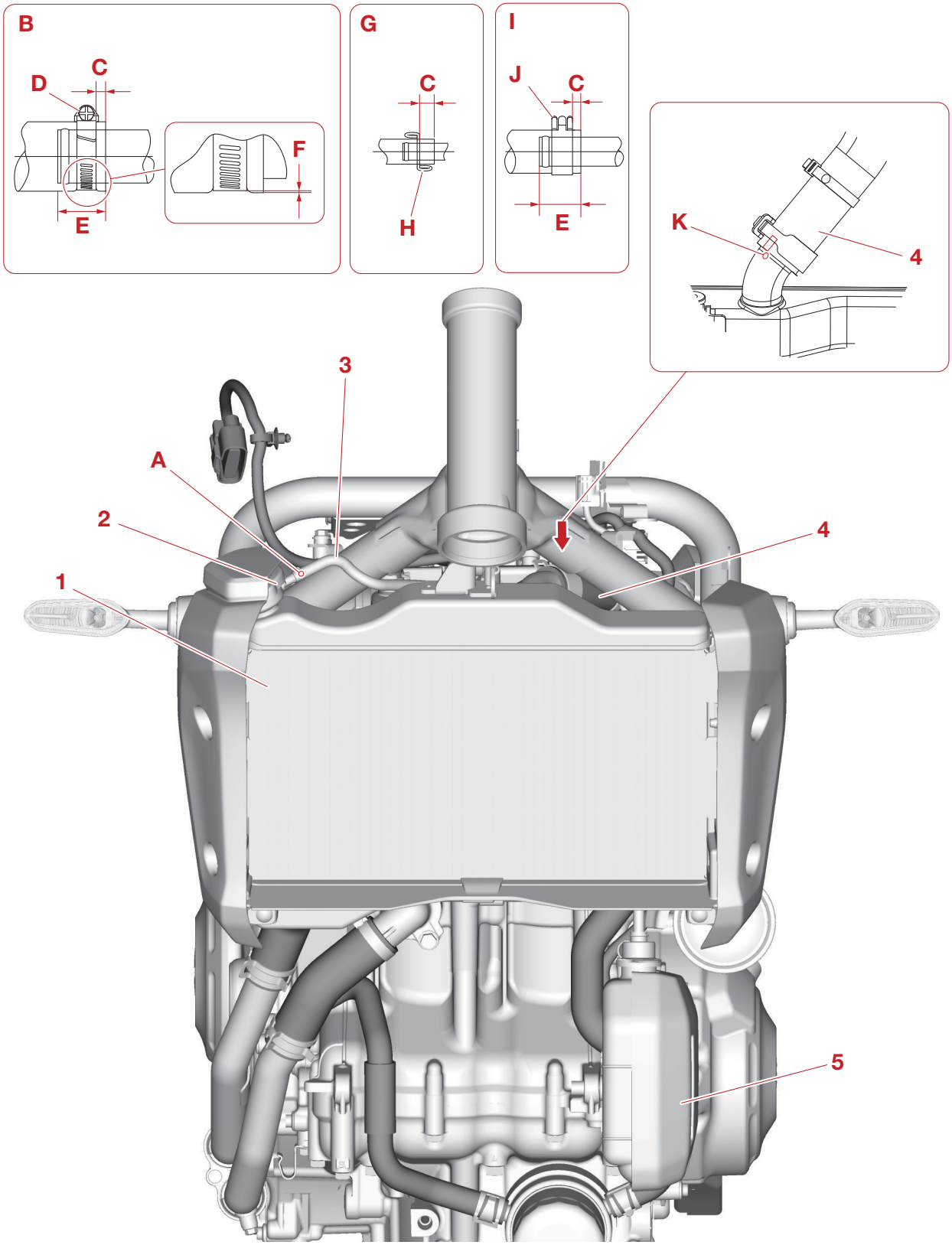
Air filter case (right side view)



1. Intake air pressure sensor
2. Intake air pressure sensor hose
3. Throttle body
4. Air filter case joint clamp (left)
5. Air filter case joint clamp (right)
6. Cylinder head breather hose clamp
7. Cylinder head breather hose
8. Throttle body joint
9. Throttle body joint clamp (right)
10. Throttle body joint clamp (left)
11. Air filter case lib

A. Install the intake air pressure sensor hose up to the rounded end in the hose fitting of the intake air pressure sensor.
B. Face the pink paint mark on the intake air pressure sensor hose right side of the vehicle. Insert the intake air pressure sensor hose until it contacts the throttle body.
C. There is no gap or misalignment between the throttle body and throttle body joint.
D. 43°
E. 113°
F. 2°
G. 47°
H. 90°
I. Place the opening of the hose clip within the range as shown in the illustration.
J. Face the blue paint mark on the cylinder head breather hose upper side of the vehicle. Insert the cylinder head breather hose until it contacts the air filter case.
K. 45°
L. 70°

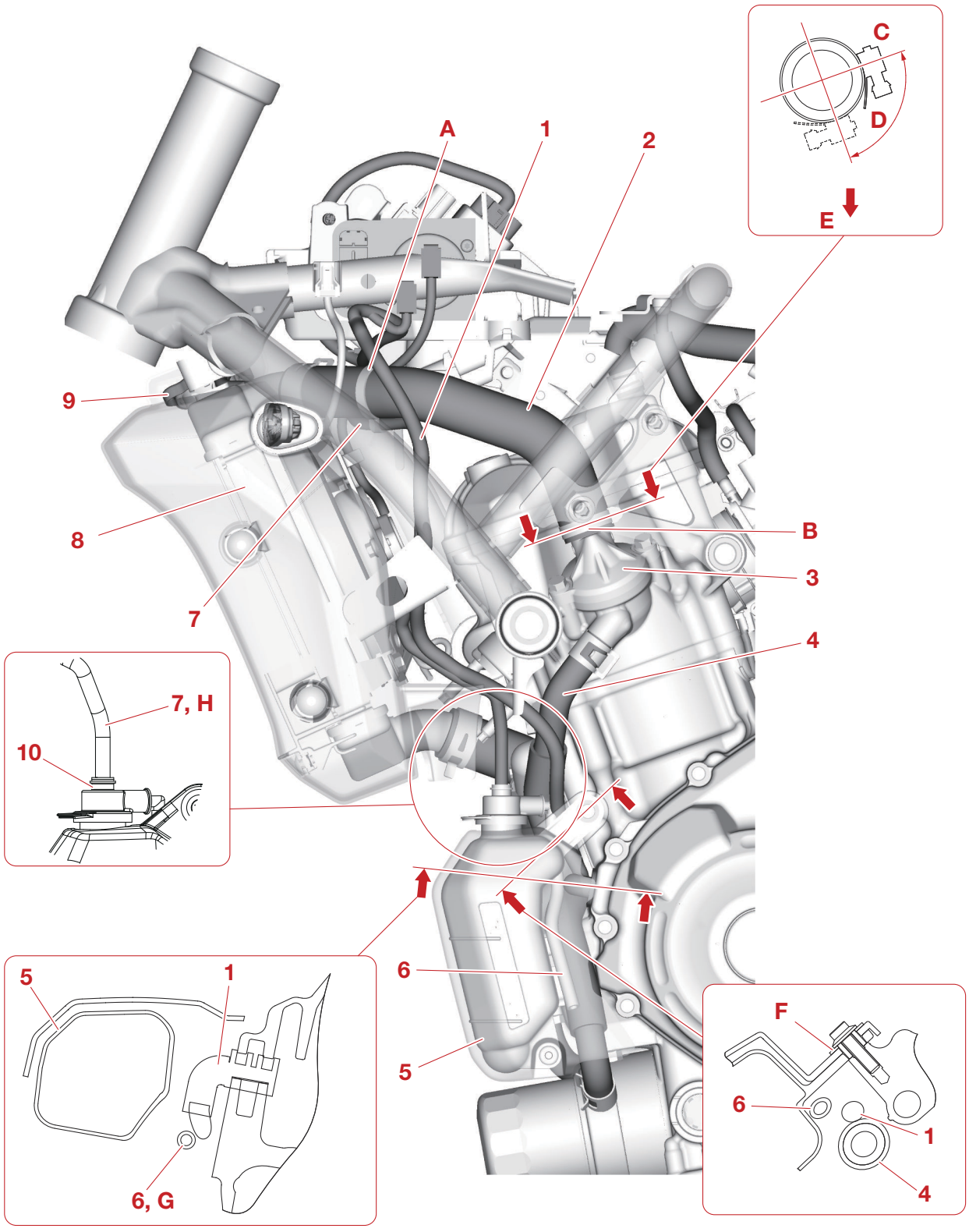
Radiator (front view)



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

A. Connect the coolant reservoir hose with the yellow paint mark facing the radiator cap side.
B. Hose clamp fixed position details.
C. 3 mm (0.12 in) or more
D. Do not locate the hose clamp on the spool part.
E. Insertion value (Insetting value)
F. 0–1 mm (0–0.04 in)
G. Clip fixed position details.
H. Do not locate the clip on the spool part.
I. Hose clip fixed position details.
J. Do not locate the hose clip on the spool part.
K. Align the yellow paint mark on the radiator inlet hose with the protrusion on the radiator and insert the radiator inlet hose until it touches the protrusion.

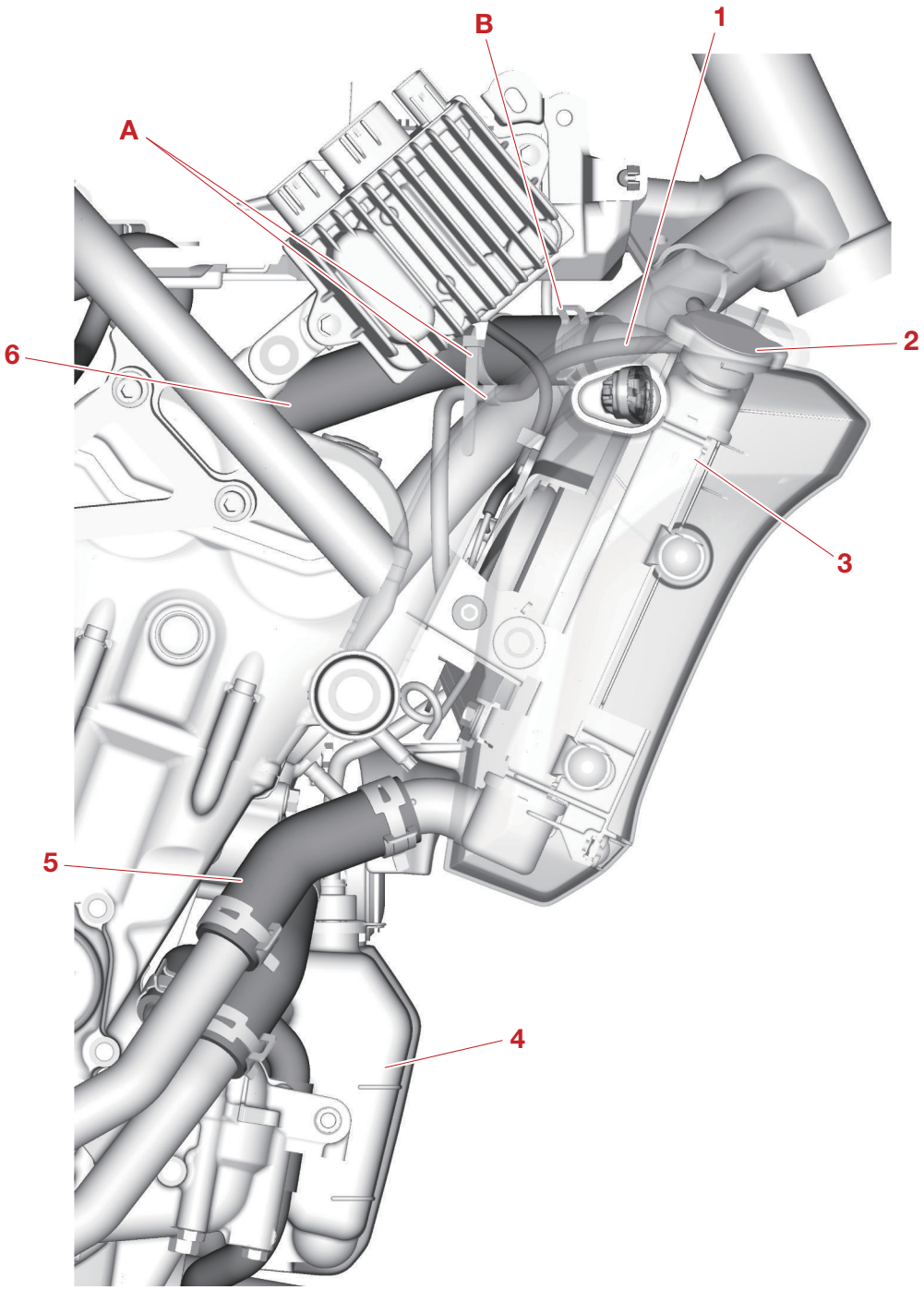
Radiator (left side view)



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

A. Position the coolant reservoir hose to the lower side of the vehicle of the radiator inlet hose and fasten the coolant reservoir hose to the radiator inlet hose with the plastic locking tie. Face the buckle of the plastic locking tie inward with the end of it to the lower side of the vehicle.
B. Align the white paint mark on the radiator inlet hose with the projection on the thermostat cover. Install the radiator inlet hose onto the thermostat cover, making sure that the radiator inlet hose contacts the projection on the thermostat cover.
C. Position the radiator inlet hose clamp screw within the range shown in the illustration. Face the screw head as shown in illustration.
D. 90°
E. Outside of the vehicle
F. Face the flange of the collar to the outward of the vehicle.
G. The coolant reservoir breather hose should be routed inside of the vehicle beyond the curved part of the stator coil lead.
H. Insert the end of the coolant reservoir hose until it contacts the coolant reservoir tank cap.

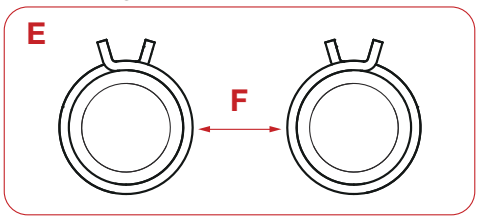
Radiator (right side view)

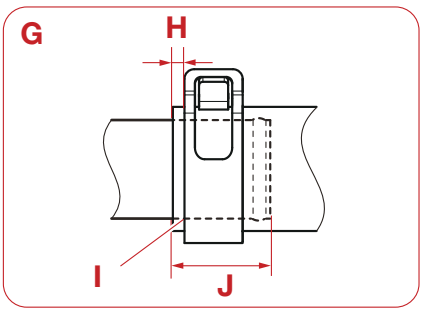


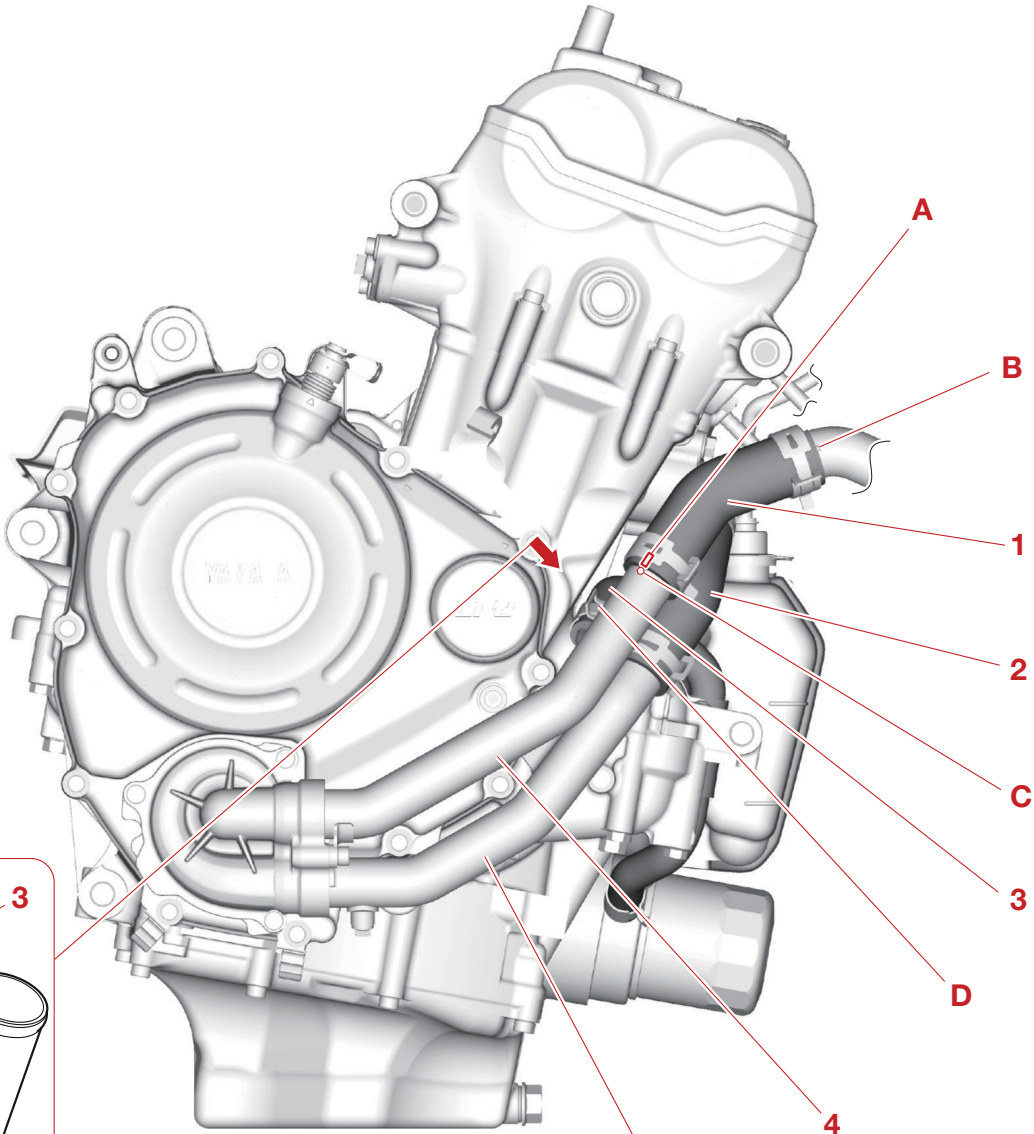
1. Coolant reservoir hose
2. Radiator cap
3. Radiator
4. Coolant reservoir
5. Radiator outlet hose
6. Radiator inlet hose

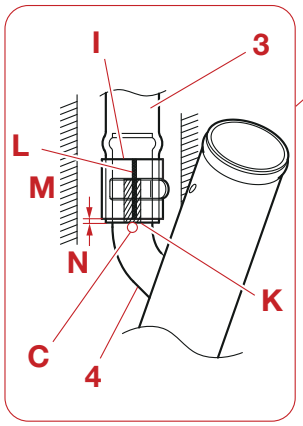
A. Fasten the plastic locking tie by aligning the plastic locking tie with the white paint marks on the radiator inlet hose and the yellow paint mark on the coolant reservoir hose. Do not deform the hose with the clamp.
B. Point the opening of the hose clamp in the direction shown in the illustration. Make sure that the opening of the hose clamp do not contact the coolant reservoir hose.

Cooling water hoses (right side view)





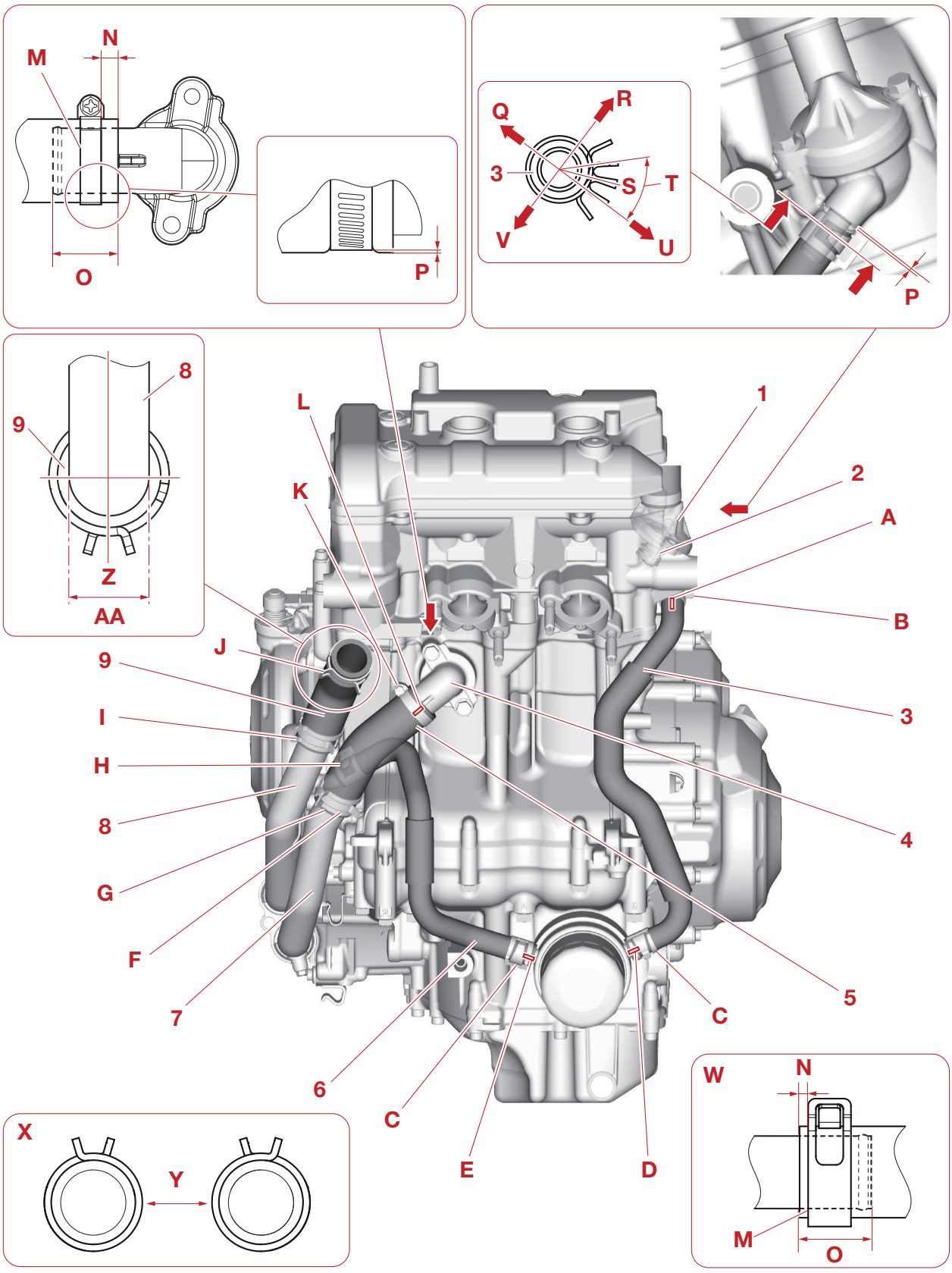




1. Radiator outlet hose
2. Water jacket joint inlet hose
3. Oil cooler outlet hose
4. Water pump inlet pipe
5. Water pump outlet pipe

A. Align the tip of the radiator outlet hose paint mark with the paint mark on the water pump inlet pipe and insert it.
B. Insert the tip of the radiator outlet hose to the projection on the radiator pipe side.
C. Paint mark
D. Align the opening end (engine side) of the hose clip with the paint mark on the water pump inlet pipe (small diameter).
E. Hose clip install direction.
F. The direction in which the hose clip is inserted does not matter.
G. Hose clip fixed position details.
H. More than 3 mm (0.12 in)
I. Do not locate the hose clip on the spool part.
J. Insertion value (Insetting value)
K. Align the tab on the engine side of the hose clip with the paint mark on the oil cooler outlet hose.
L. The opening end (engine side) of the clip
M. Engine side
N. More than 1 mm (0.04 in)

Cooling water hoses (front view)



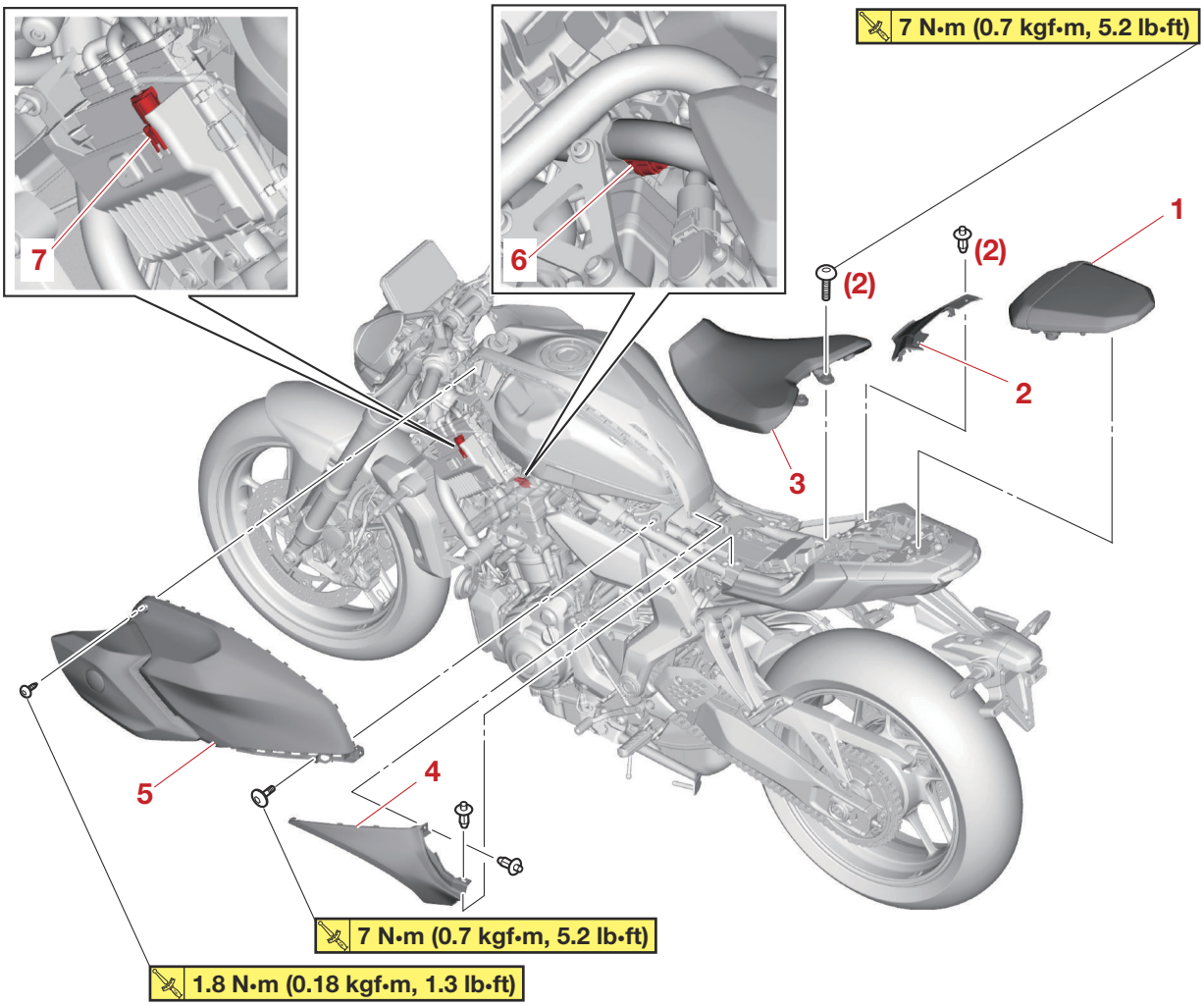
1. Thermostat cover
2. Thermostat
3. Oil cooler inlet hose
4. Water jacket joint
5. Water jacket joint inlet hose
6. Oil cooler outlet hose
7. Water pump outlet pipe
8. Water pump inlet pipe
9. Radiator outlet hose

A. Point the blue paint part of the oil cooler inlet hose toward the top of the engine and insert it until it contacts the machined surface of the cylinder head.
B. Attach the hose clip 0–1 mm (0–0.04 in) from the end of the oil cooler hose, and does not locate the hose clip on the spool part, and hose clip with the center of the opening pointing downward of the engine and between 0–45° outside of the vehicle.
C. Face the opening of the hose clip to forward of the vehicle.
D. Insert the green paint part of the oil cooler inlet hose toward the front side of the vehicle to the spool end of the oil cooler.
E. Insert the green paint part of the oil cooler outlet hose toward the front side of the vehicle to the spool end of the oil cooler.
F. Face the opening of the hose clip to forward of the vehicle.
G. Insert the tip of the water jacket joint inlet hose to the paint mark of the water pump outlet pipe and assemble it.
H. Insert the tip of oil cooler outlet hose to the water pump inlet pipe (small diameter) aligning with the paint mark of the oil cooler outlet hose.
I. The opening of the hose clip should face the downward of the vehicle, then turn it about 32° to outside of the vehicle.
J. Align the opening of the hose clip with the underside of the radiator outlet hose clip.
K. Align the head of the hose clamp bolt with the head of the water jacket mounting bolt and install it.
L. Align the paint mark on the water jacket joint inlet hose with the protrusion on the water jacket joint, and insert it until it stops.
M. Do not locate the hose clip on the spool part.
N. More than 3 mm (0.12 in)
O. Insertion value (Insetting value)
P. 0–1 mm (0–0.04 in)
Q. Top side of the vehicle
R. Outside of the vehicle
S. 0–45°
T. Clipping range (Clipping area)
U. Lower side of the vehicle
V. Inside of the vehicle
W. Clip fixed position details.
X. Hose clip install direction.
Y. The direction in which the hose clip is inserted does not matter.
Z. As shown in the illustration, align the opening of the clip on the extension of the center line of the water pump inlet pipe.
AA. After installing the clip, check that the clip hose clamp is within the width of the inlet pipe.

EAS34037

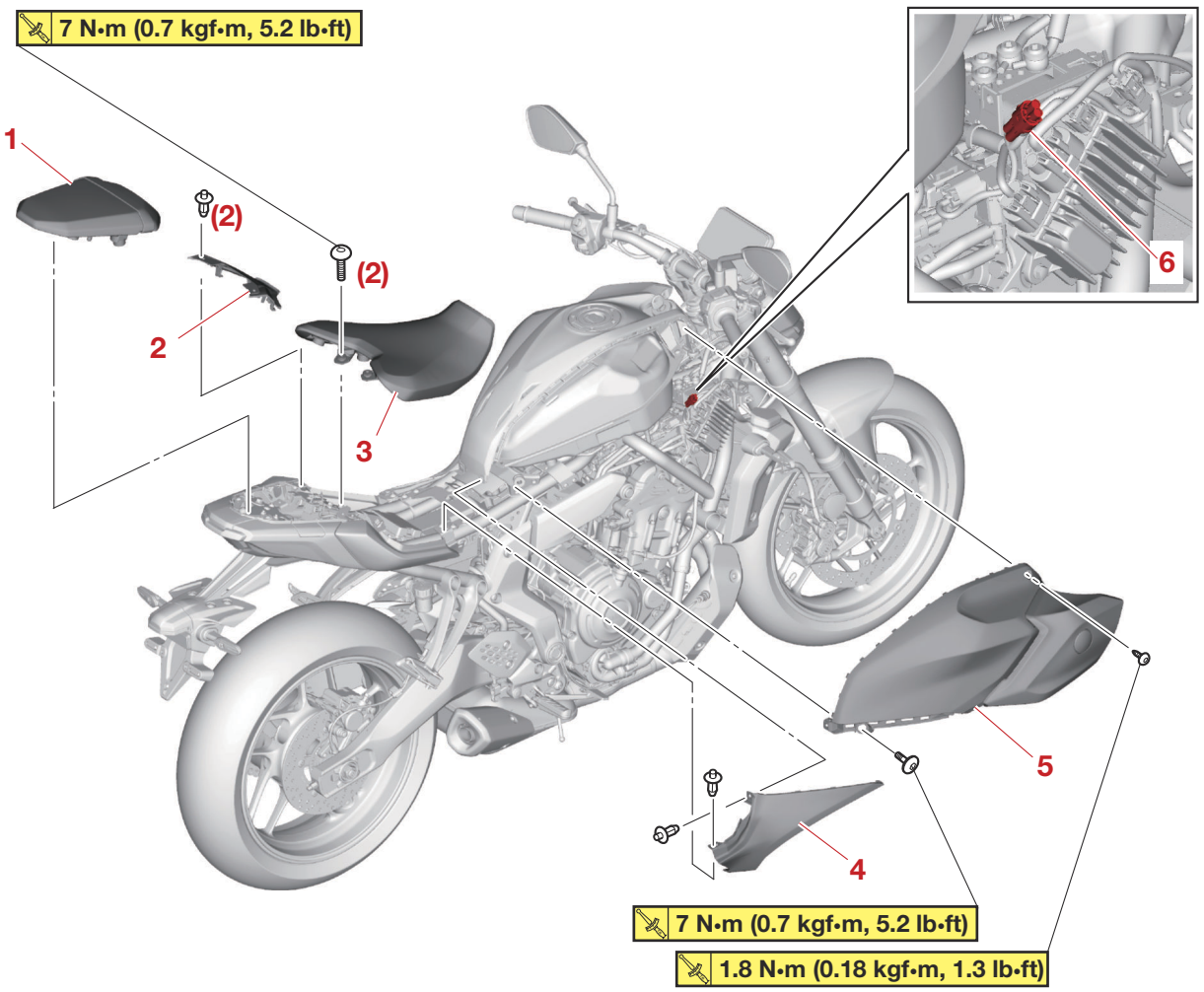
OPTION COUPLER LOCATION CHART

Option coupler (auxiliary DC jack and shift sensor)



Order	Job/Parts to remove	Q'ty	Remarks
1	Passenger seat	1	
2	Center cover	1	
3	Rider seat	1	
4	Front side cover (left)	1	
5	Fuel tank side cover assembly (left)	1	
6	Auxiliary DC jack coupler	1	
7	Shift sensor coupler	1	

Option coupler (grip warmer)



Order	Job/Parts to remove	Q'ty	Remarks
1	Passenger seat	1	
2	Center cover	1	
3	Rider seat	1	
4	Front side cover (left)	1	
5	Fuel tank side cover assembly (left)	1	
6	Grip warmer coupler	1	

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.

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.

EAS30614
PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
1	*	Fuel line	• 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	• Check engine idle speed.	√	√	√	√	√	√
			• Adjust synchronization.		√	√	√	√	√
6	*	Exhaust system	• Check for leakage. • Tighten if necessary. • Replace gasket(s) 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 error codes.	√	√	√	√	√	√
2	*	Air filter element	• Replace.	Every 24000 mi (37000 km)					
3		Air filter check hose	• Clean.	√	√	√	√	√	√

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
4	*	Clutch	• Check operation. • Adjust or replace cable.	√	√	√	√	√	√
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.	√	√	√	√	√	√

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
22	*	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 relay arm and connecting arm pivoting points	• Check operation.		√	√	√	√	√
25		Engine oil	• Change (warm engine before draining). • Check oil level and vehicle for oil leakage.	√	√	√	√	√	√
26		Engine oil filter cartridge	• Replace.	√		√		√	
27	*	Cooling system	• Check coolant level and vehicle for coolant leakage.		√	√	√	√	√
			• Change coolant.	Every 3 years					
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. • Lubricate throttle grip housing tube guides.		√	√	√	√	√
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. Remove the protective cap, and then connect the YDT to the YDT coupler.
   Refer to "YDT" on page 9-2.

Yamaha diagnostic tool USB (US)
90890-03275
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.

3. Check:
   - DTC or fault code

TIP
Use the "Diagnosis of malfunction" function of the YDT to check the DTC or fault code. For information about using the YDT, 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 9-31.
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.

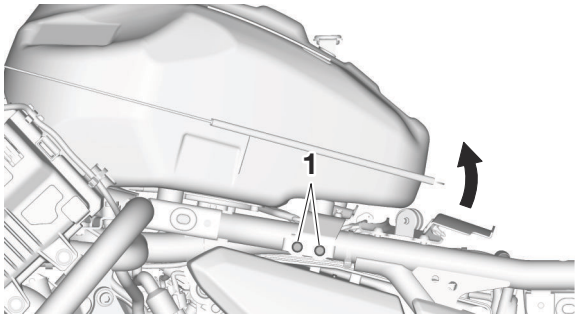
5. Install:
   - Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

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 4-9.
   - Rear fuel tank bracket bolt "1"

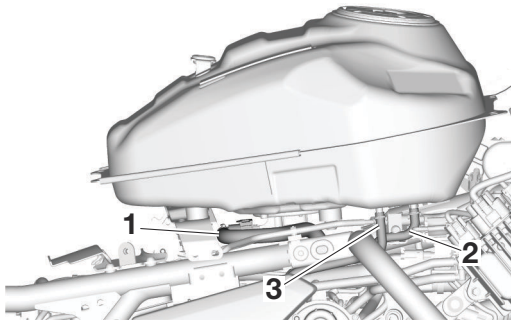
TIP
After removing the rear fuel tank bracket bolts, lift up the rear of the fuel tank.

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 4-9.
   - 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 4-9.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Remove:
   - Ignition coil
   - Spark plug

ECA13320
NOTICE

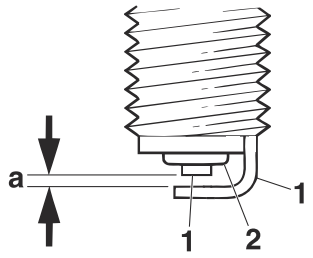
Before removing the spark plugs, blow away any dirt accumulated in the spark plug wells with compressed air to prevent it from falling into the cylinders.

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 4-9.
   - 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 3-23.
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 4-9.
- Radiator
  Refer to "RADIATOR" on page 6-3.

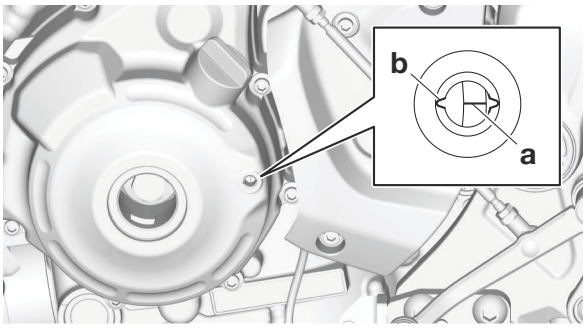
3. Remove:
- Ignition coil
- Spark plug
- Cylinder head cover
- Cylinder head cover gasket
  Refer to "CAMSHAFTS" on page 5-26.

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.

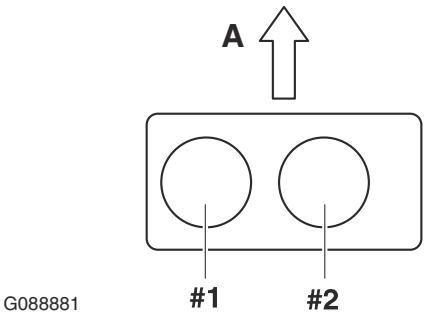


c. Measure the valve clearance with a thickness gauge.

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.

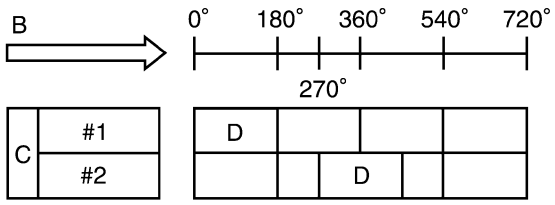
Valve clearance measuring sequence
Cylinder #1 → #2



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 3-23.
- 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

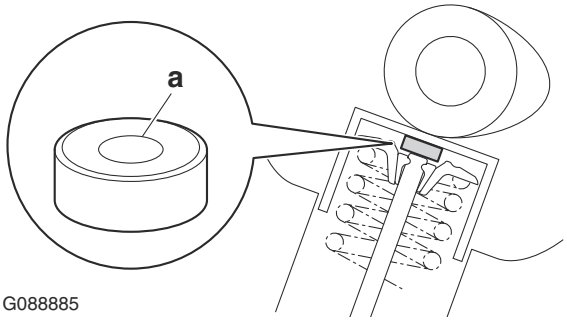
TIP
- Cover the timing chain opening with a rag to prevent the valve pad from falling into the

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 5-26.
- 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 "CHECKING AND CLEANING THE THROTTLE BODIES" on page 7-13.
   a. Remove the protective cap, and then connect the YDT to the coupler.
   Refer to "YDT" on page 9-2.

Yamaha diagnostic tool USB (US)
90890-03275
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.

   b. Start the YDT and display the diagnosis of function.
   c. Select the "FI".
   d. Display the diagnostic mode (Code 67) and check the ISC (idle speed control) leaning value.
   Refer to "YDT" on page 9-2.

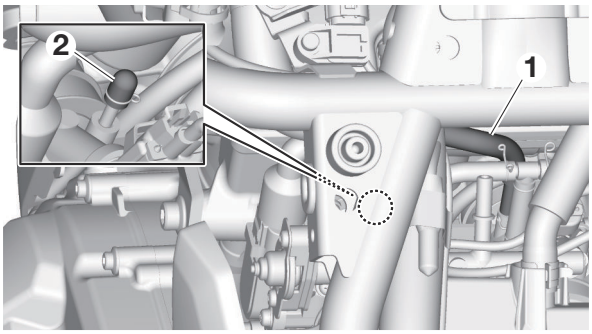
EAS30797
SYNCHRONIZING THE THROTTLE BODIES

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.

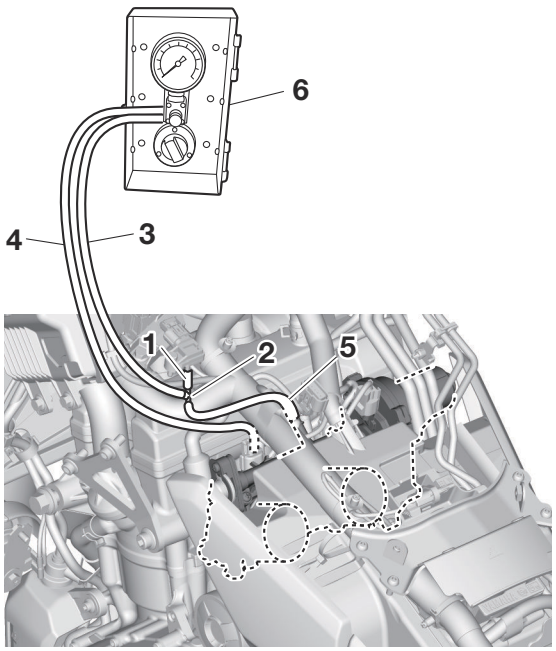
TIP
Place the vehicle on a maintenance stand.

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 4-9.
   • Fuel tank
   Refer to "FUEL TANK" on page 7-1.
3. Disconnect:
   • Intake air pressure sensor hose "1"
   Refer to "THROTTLE BODIES" on page 7-9.
4. Remove:
   • Service hose cap "2"



5. 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



6. Install:
   • Fuel tank
   Refer to "FUEL TANK" on page 7-1.
7. 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 2.60 kPa (19.5 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. Using the throttle body that has the bypass air screw "1" with a white paint mark as the standard, adjust the other throttle bodies by turning its bypass air screw in or out.

ECA21300

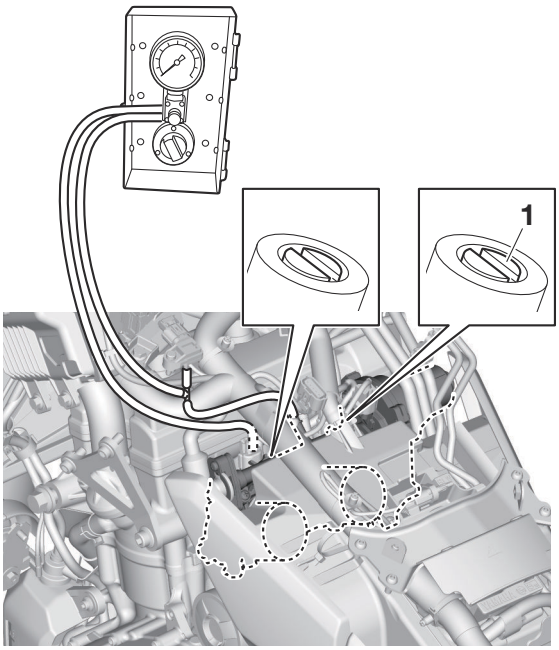
NOTICE

Do not turn the bypass air screw (white paint mark) of the throttle body that is the standard. Otherwise, the engine may run roughly at idle and the throttle bodies may not operate properly.

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 2.60 kPa (19.5 mmHg).

	Carburetor angle driver 2 **90890-03173**



2. Stop the engine and remove the measuring equipment.
3. Install:
   • Service hose cap

4. Connect:
   • Intake air pressure sensor hose
   Refer to "THROTTLE BODIES" on page 7-9.
5. Install:
   • Fuel tank
   Refer to "FUEL TANK" on page 7-1.
   • Fuel tank cover assembly
   Refer to "GENERAL CHASSIS (4)" on page 4-9.
   • Rider seat
   • Passenger seat
   Refer to "GENERAL CHASSIS (1)" on page 4-1.

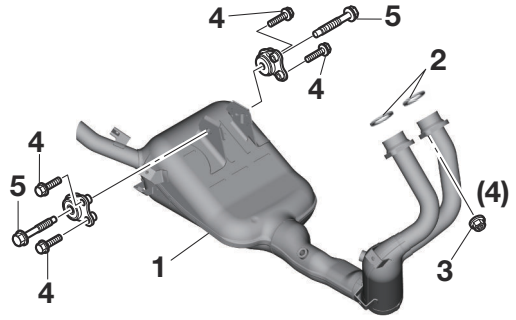
EAS30798
CHECKING THE THROTTLE BODY JOINTS

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 4-9.
   • 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 4-9.
   • 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 "3"
20 N·m (2.0 kgf·m, 15 lb·ft)
Muffler bracket bolt "4"
10 N·m (1.0 kgf·m, 7.4 lb·ft)
Muffler bracket bolt "5"
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 4-9.
   • 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 4-9.
   - Rider seat
   - Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

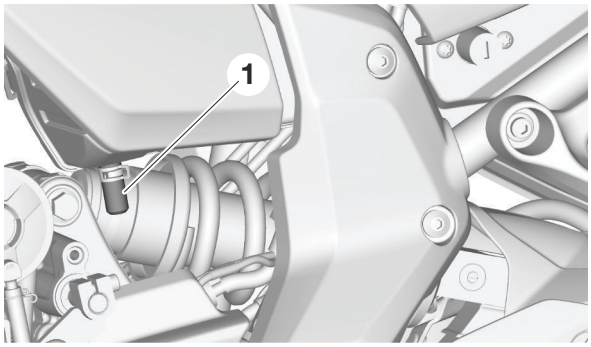
EAS33546
CHECKING THE PURGE CUT VALVE SOLENOID (for California only)

1. Remove:
   - Passenger seat
   - Rider seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-9.
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 8-56.
4. Install:
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-9.
   - 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 4-9.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
2. Remove:
   - Frame cross member
   - Air duct
   - Air filter element
     Refer to "AIR FILTER" on page 7-8.
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
   - Frame cross member

Air filter element screw
1.6 N·m (0.16 kgf·m, 1.2 lb·ft)
Air duct screw
1.6 N·m (0.16 kgf·m, 1.2 lb·ft)
Frame cross member bolt
7 N·m (0.7 kgf·m, 5.2 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

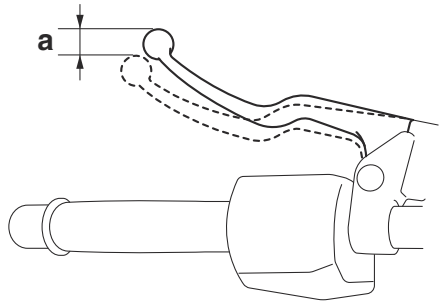
performance and possible overheating.

5. Install:
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Fuel tank cover assembly
     Refer to "GENERAL CHASSIS (4)" on page 4-9.
   - 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)**

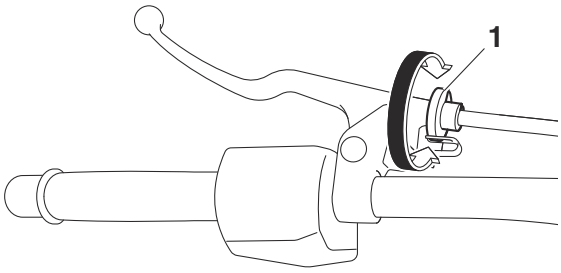


G088887

2. Adjust:
   - Clutch lever free play

   Handlebar side

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



G088888

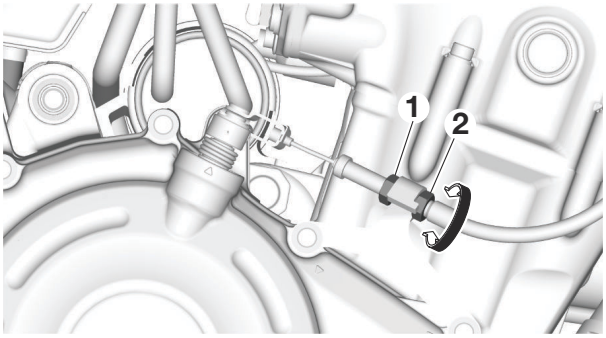
TIP

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

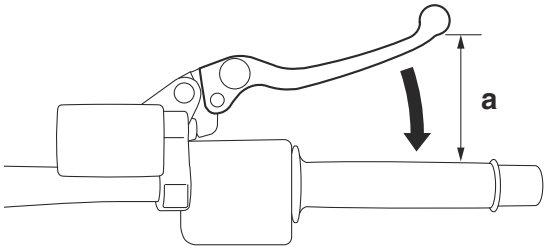
1. Check:
   - Brake operation
     Brake not working properly → Check the brake system.
     Refer to "FRONT BRAKE" on page 4-30 and "REAR BRAKE" on page 4-42.

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

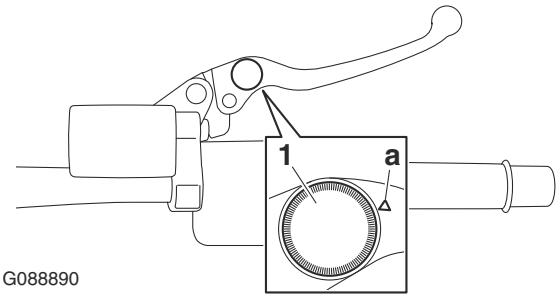
1. Adjust:
   - Brake lever position
     (distance "a" from the throttle grip to the brake lever)



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

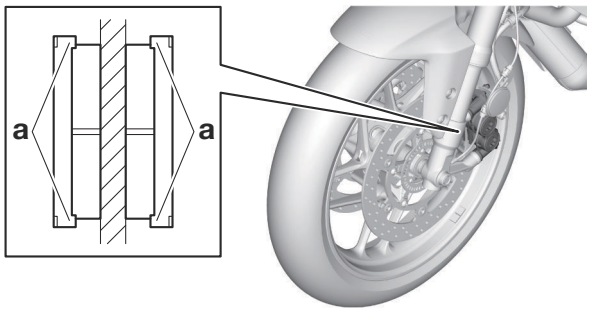
After adjusting the brake lever position, make sure there is no brake drag.

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 4-30.



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

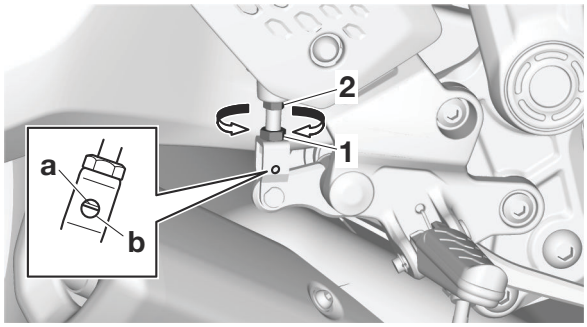
WARNING

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 3-25.

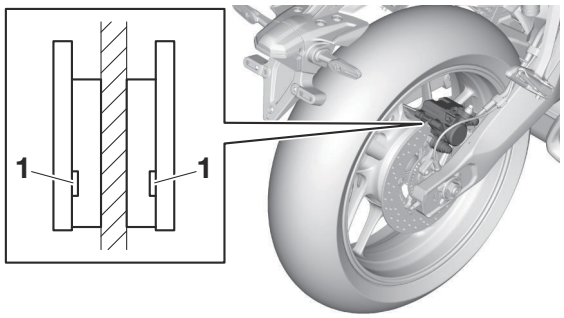
EAS30634

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 4-42.



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 4-30, “REAR BRAKE” on page 4-42 and “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-54.

EAS30893
BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)

EWA14000
⚠ WARNING

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

ECA18050
NOTICE

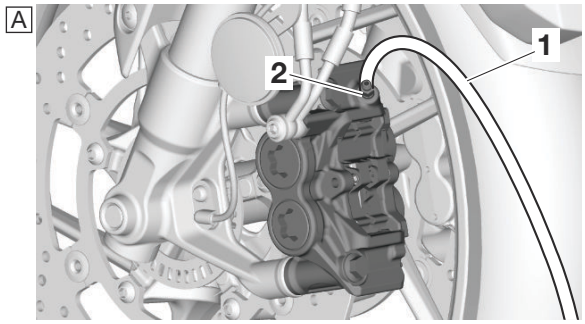
- **Bleed the brake system in the following order.**
- **1st step: Front brake calipers**
- **2nd step: Rear brake caliper**

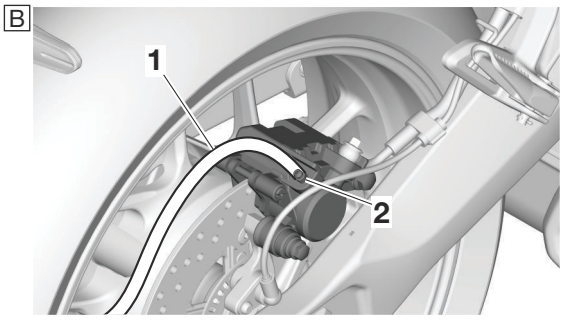
EWA16530
⚠ WARNING

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. 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 4-58.

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
250 kPa (2.50 kgf/cm², 36 psi)
Rear
250 kPa (2.50 kgf/cm², 36 psi)
Maximum load
167 kg (368 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.

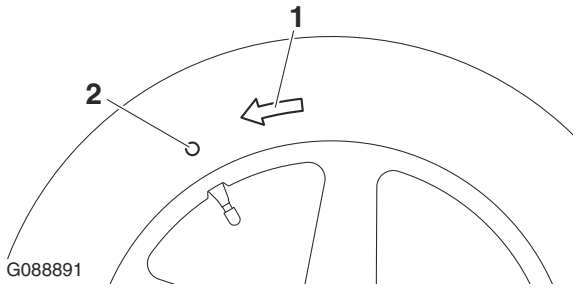
Front tire
Size
120/70ZR17 M/C (58W)
Manufacturer/model
DUNLOP/SPORTMAX Q5AF

Rear tire
Size
180/55ZR17 M/C (73W)
Manufacturer/model
DUNLOP/SPORTMAX Q5A

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 4-16 and "CHECKING THE REAR WHEEL" on page 4-25.

EAS30802
CHECKING THE SWINGARM OPERATION

1. Check:
   • Swingarm operation
   Swingarm not working properly → Check the swingarm.
   Refer to "SWINGARM" on page 4-87.
2. Check:
   • Swingarm excessive play
   Refer to "SWINGARM" on page 4-87.

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 4-91.

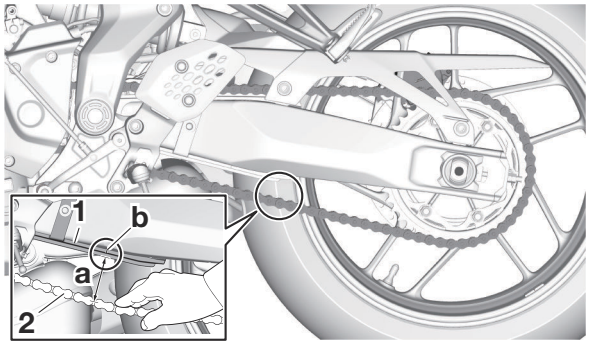
EAS31923
DRIVE CHAIN SLACK
Checking the drive chain slack
EWA13120
WARNING
Securely support the vehicle so that there is no danger of it falling over.

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)

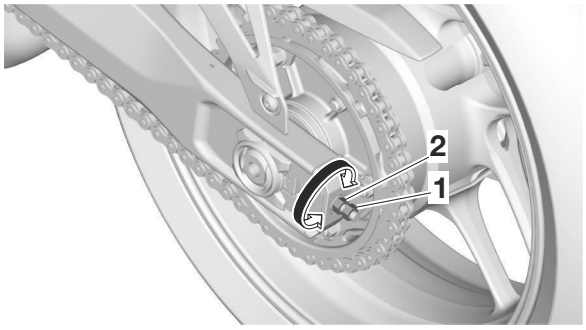
TIP
Measure the distance (drive chain slack) "a" between the projection "b" on the drive chain guide "1" and the center of the drive chain "2".



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 4-21.
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.

Rear 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

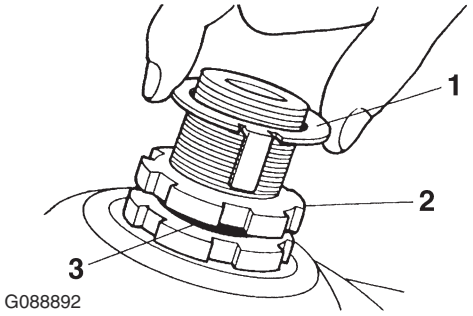
1. Stand the vehicle on a level surface.

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.

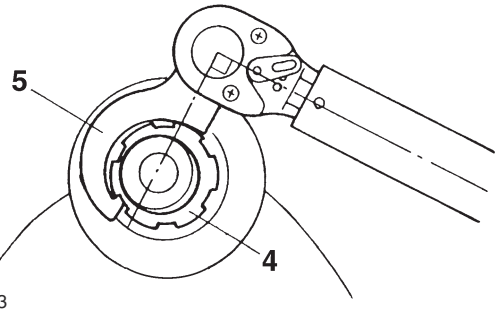
2. Check:
   - Steering head
     Grasp the bottom of the front fork legs and gently rock the front fork.
     Blinding/looseness → Adjust the steering head.
3. Remove:
   - Upper bracket
     Refer to "FRONT FORK" on page 4-68.
4. Adjust:
   - Steering head
     a. Remove the lock washer "1", the upper ring nut "2", and the rubber washer "3".



G088892

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

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



G088893

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

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

     c. Loosen the lower ring nut completely, then tighten it to specification.

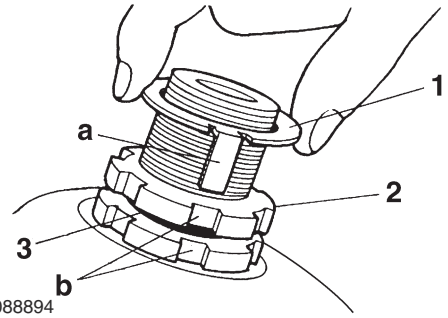
EWA13140
⚠ WARNING

Do not overtighten the lower ring nut.

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

     d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.
     Refer to "STEERING HEAD" on page 4-78.
     e. Install the rubber washer "3".
     f. Install the upper ring nut "2".
     g. Finger tighten the upper ring nut, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
     h. Install the lock washer "1".

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



G088894

5. Install:
   - Upper bracket
     Refer to "FRONT FORK" on page 4-68.

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 8-42.

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 4-68.

EAS30808
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY
Refer to "CHECKING THE REAR SHOCK ABSORBER ASSEMBLY" on page 4-84.

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

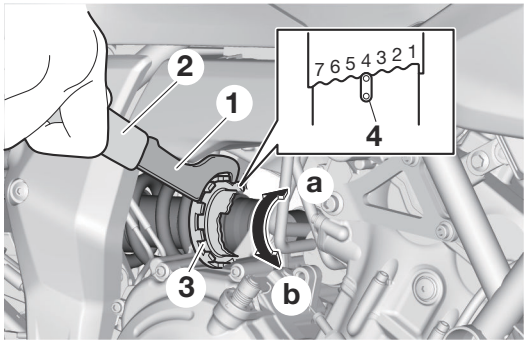
ECA13590
NOTICE

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.

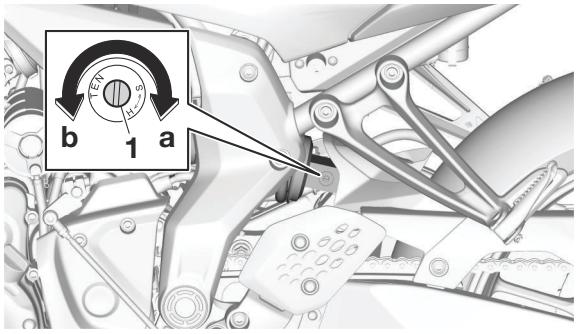
1. Adjust:
   - Rebound damping
     a. Turn the adjusting screw “1” in direction “a” or “b”.

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

Rebound damping
Adjustment value from the start position (Soft)
2 1/2
Adjustment value from the start position (STD)
1/2
Adjustment value from the start position (Hard)
0
***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 4-84 and “CHECKING THE CONNECTING ARM” on page 4-91.

EAS30656

CHECKING THE ENGINE OIL LEVEL

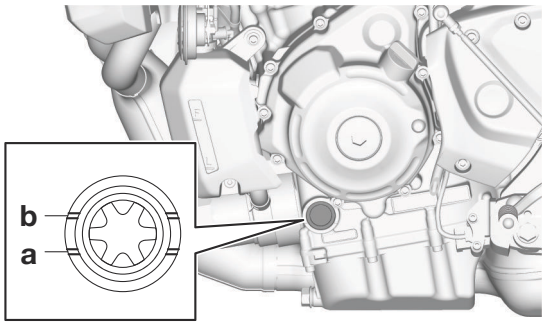
1. Stand the vehicle on a level surface.

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

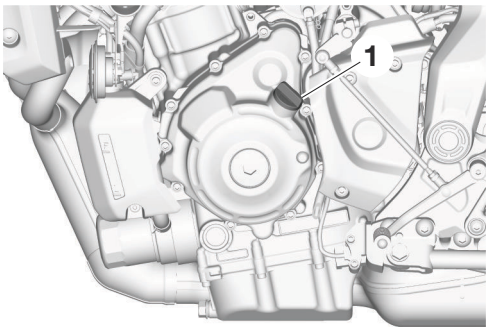
ECA13361
NOTICE
- **Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use engine oils with a grade of "CD" or higher and do not use oils labeled "ENERGY CONSERVING II".**
- **Do not allow foreign materials to enter the crankcase.**

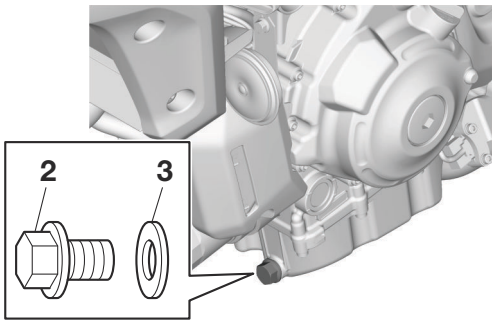
4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check the engine oil level again.

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

EAS30657
CHANGING THE ENGINE OIL

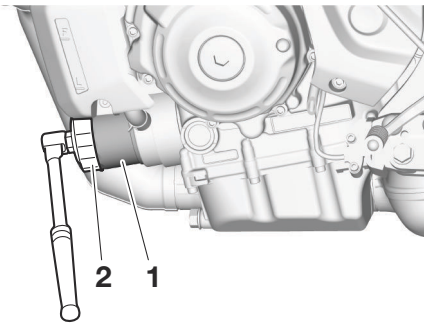
1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
   - Engine oil filler cap "1"
   - Engine oil drain bolt "2" (along with the gasket "3")





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)**

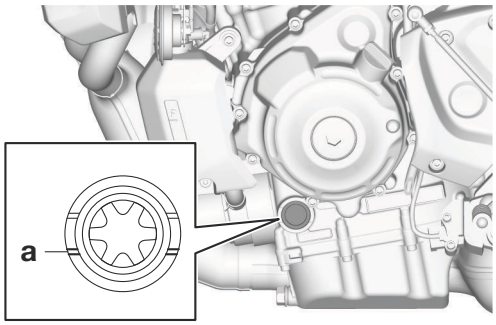
8. Install:
   • Engine oil filler cap
   (along with the O-ring New)
9. Start the engine, warm it up for several minutes, and then turn it off.
10. Check:
    • Engine
    (for engine oil leaks)
11. Check:
    • Engine oil level
    Refer to "CHECKING THE ENGINE OIL LEVEL" on page 3-20.

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.

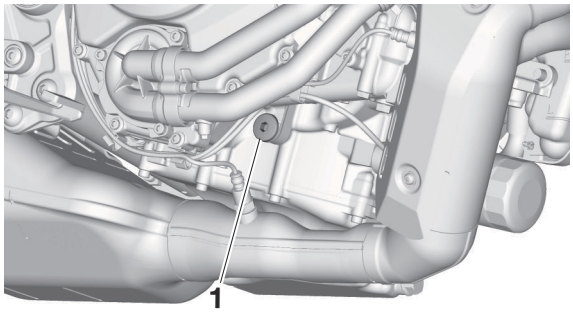
ECA13410
NOTICE

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"

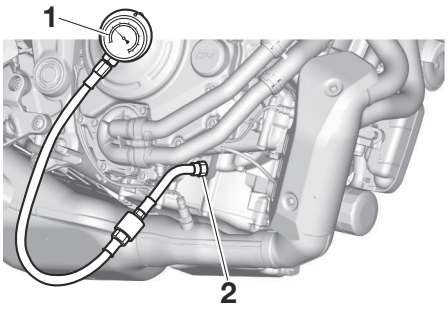
EWA12980
⚠ WARNING

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

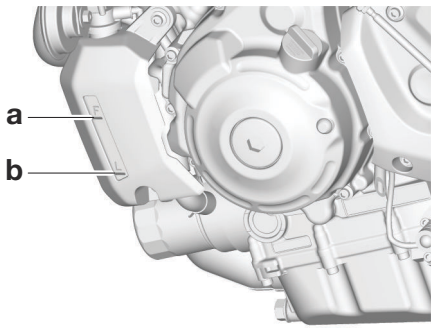
	**Main gallery bolt** **8 N·m (0.8 kgf·m, 5.9 lb·ft)**

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.

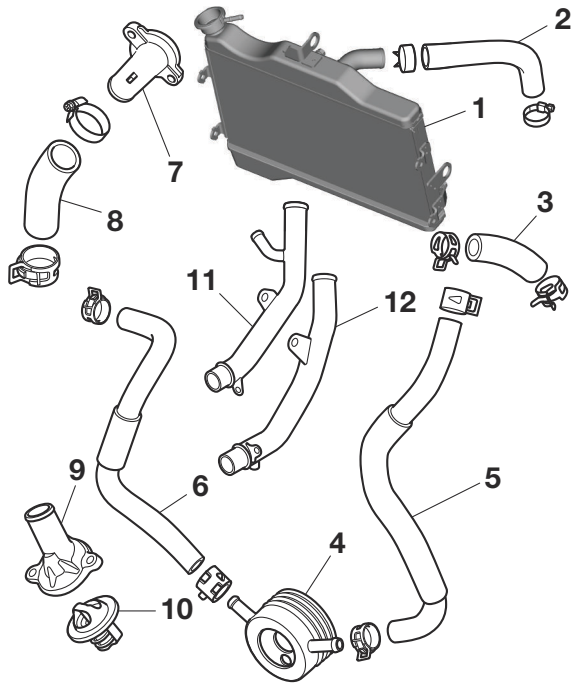


ECA13470
NOTICE
• Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.
• Use only distilled water. However, if distilled water is not available, soft water may be 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 6-3, "OIL COOLER" on page 6-7, "THERMOSTAT" on page 6-9 and "WATER PUMP" on page 6-11.



EAS30813
CHANGING THE COOLANT
1. Remove:
   • Fuel tank cover assembly

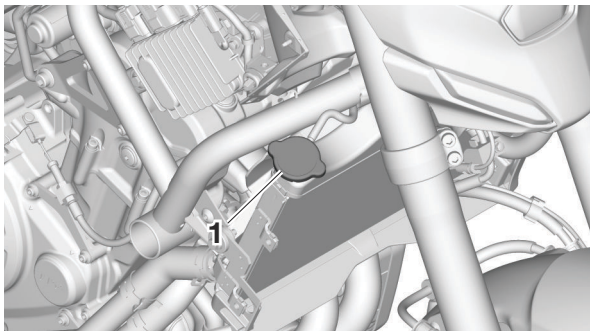
Refer to "GENERAL CHASSIS (4)" on page 4-9.

2. Remove:
   • Radiator side cover (right)
   Refer to "RADIATOR" on page 6-3.
3. Remove:
   • Radiator cap "1"

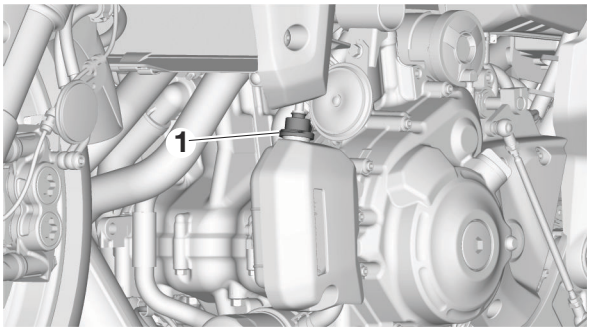
EWA13030

⚠ WARNING

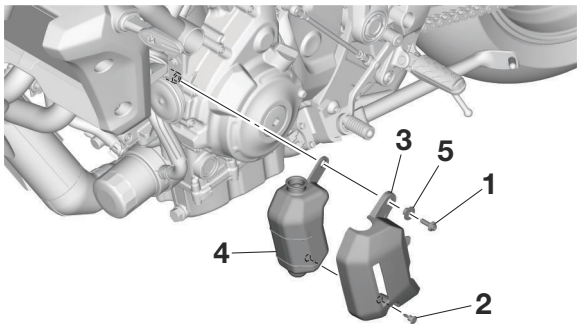
A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:
Place a thick rag or a towel over the radiator cap and slowly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



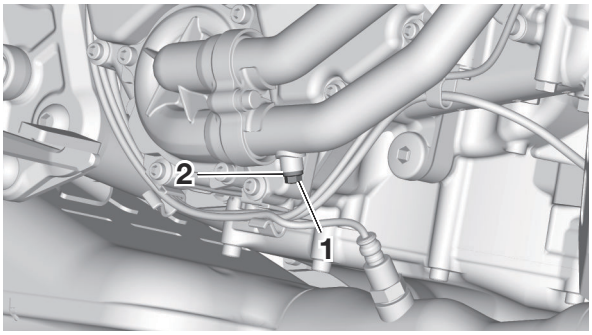
4. Remove:
   • Coolant reservoir cap "1"



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



6. Drain:
   • Coolant
   (from the coolant reservoir)
7. Remove:
   • Coolant drain bolt "1"
   • Copper washer "2"



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

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

10. 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)**

11. 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)
1.57 L (1.66 US qt, 1.38 Imp.qt)
Coolant reservoir (up to the maximum level mark)
0.15 L (0.16 US qt, 0.13 Imp.qt)

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

EWA13040

WARNING

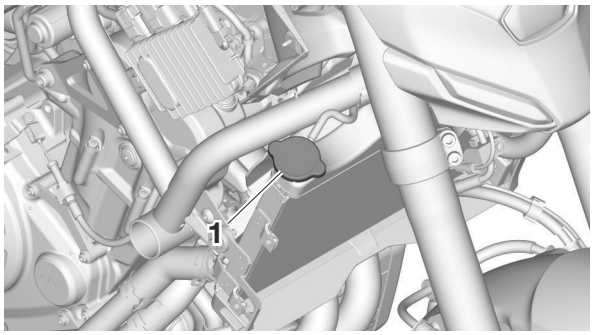
- **If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.**
- **If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.**
- **If coolant is swallowed, induce vomiting and get immediate medical attention.**

ECA13481

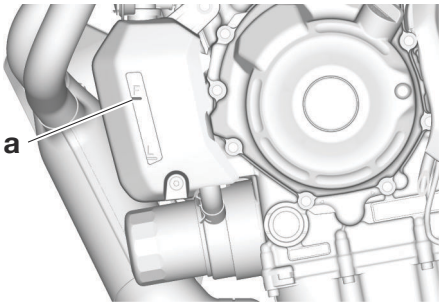
NOTICE

- **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.**

12. Install:
    - Radiator cap "1"



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



14. Install:
    - Coolant reservoir cap
15. Start the engine, warm it up for several minutes, and then turn it off.
16. 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.

17. Install:
    - Fuel tank side cover assembly
    - Fuel tank top cover
      Refer to "GENERAL CHASSIS (4)" on page 4-9.

EAS31145

CHECKING THE FRONT BRAKE LIGHT SWITCH

Refer to "CHECKING THE SWITCHES" on page 8-42.

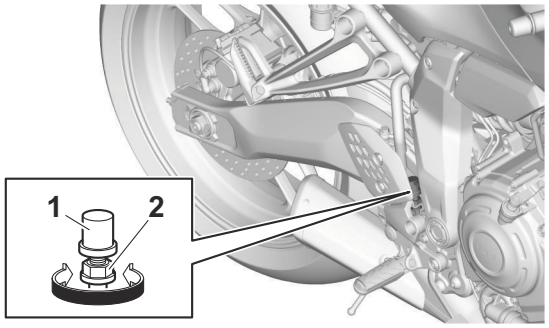
EAS30659

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.

EAS30815
CHECKING THE THROTTLE GRIP

1. Check:
   - Throttle grip movement
     Rough movement → Lubricate or replace the defective part(s).

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.

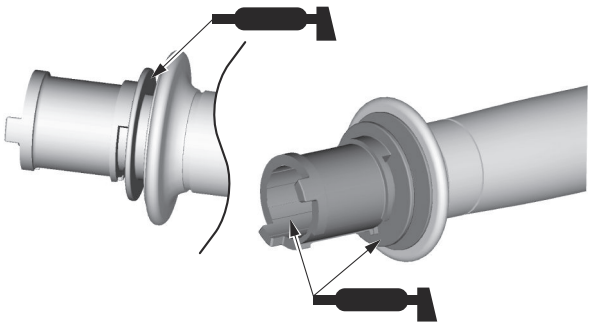
EAS32558
LUBRICATING THE THROTTLE GRIP

1. Remove:
   - Throttle grip
     Refer to "HANDLEBAR" on page 4-62.
2. Lubricate:
   - Throttle grip

EWA23100
⚠ WARNING

If improper grease is used, it can cause swelling of the rubber inside the switch, causing control malfunction.

Specified lubricant
YAMAHA GREASE "R"
(Fluorine-based grease)



3. Install:
   - Throttle grip
     Refer to "INSTALLING THE HANDLEBAR" on page 4-65.

EAS30816
CHECKING AND CHARGING THE BATTERY

Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-48.

EAS30662
CHECKING THE FUSES

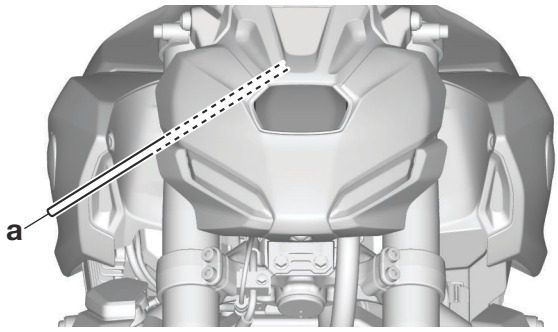
Refer to "CHECKING THE FUSES" on page 8-47.

EAS30664
ADJUSTING THE HEADLIGHT BEAMS

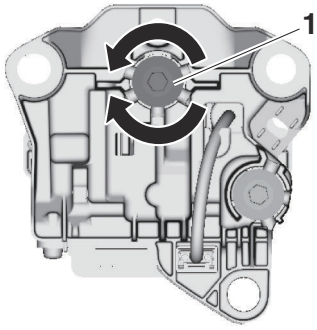
1. Adjust:
   - Headlight beam (vertically)

TIP

To adjust the headlight beam (vertically), insert a crosshead screwdriver "a" into the hole in the meter bracket, and then turn the adjusting screw.



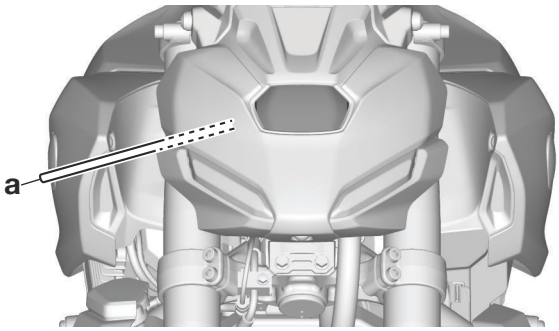
a. Turn the adjusting screw "1".



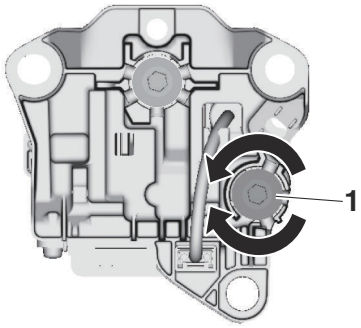
2. Adjust:
   • Headlight beam (horizontally)

TIP

To adjust the headlight beam (horizontally), insert a crosshead screwdriver "a" into the hole in the meter bracket, and then turn the adjusting screw.



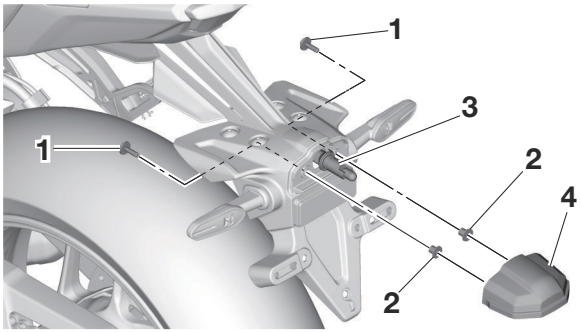
a. Turn the adjusting screw "1".



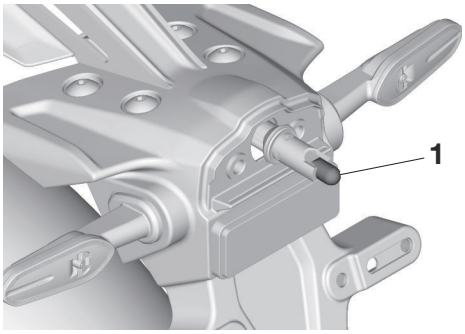
EAS31831

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

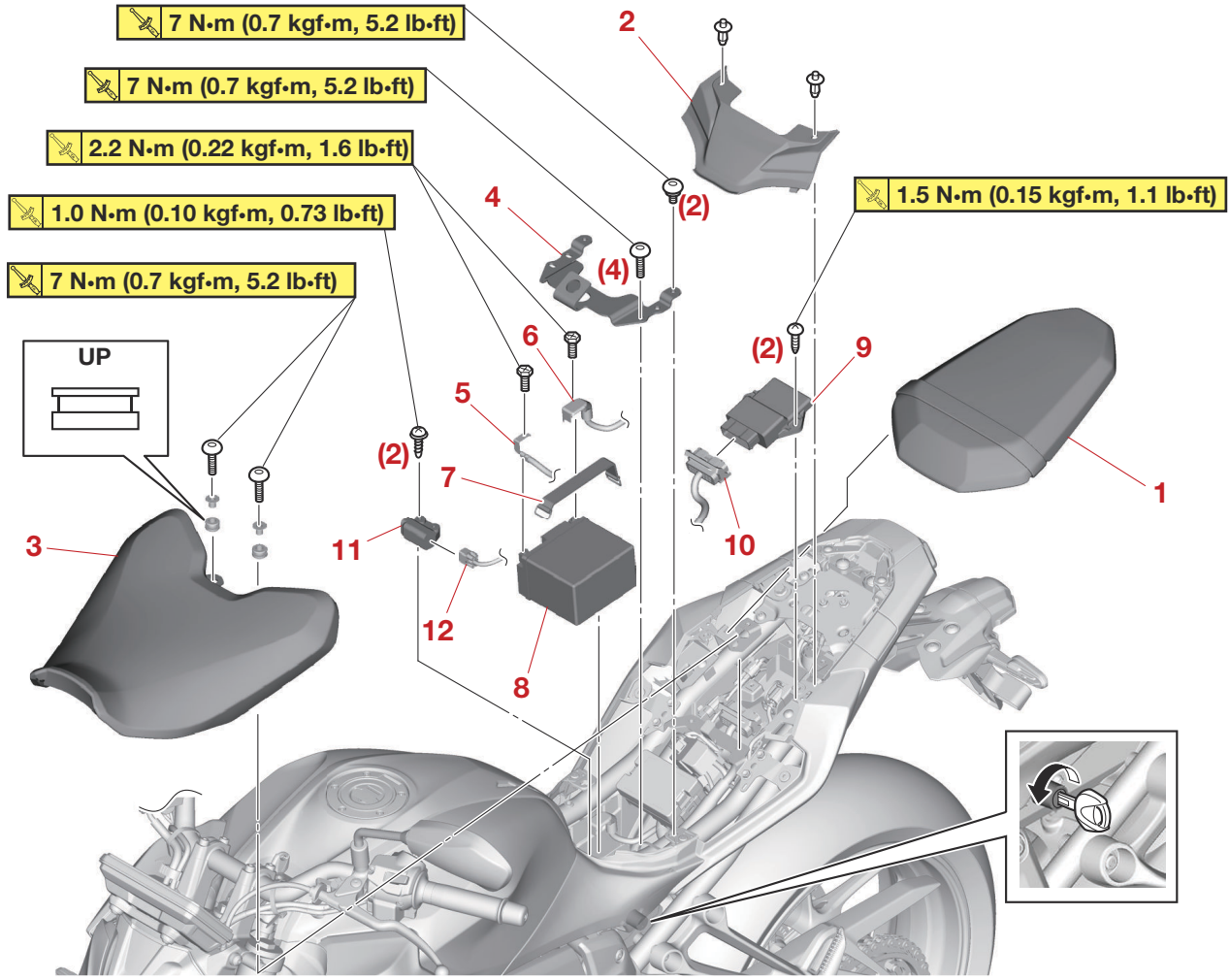
	License plate light unit bolt 3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

CHASSIS

EAS20026

GENERAL CHASSIS (1)

Removing the seats, battery and BCM

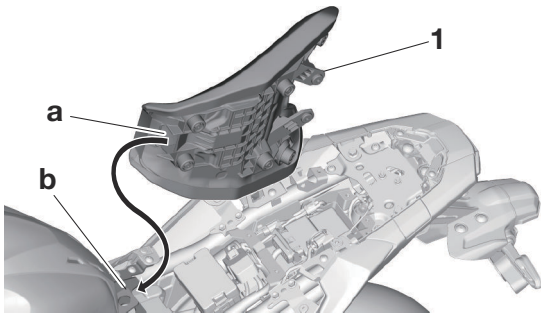


Order	Job/Parts to remove	Q'ty	Remarks
1	Passenger seat	1	
2	Center cover	1	
3	Rider seat	1	
4	Rider seat bracket 1	1	
5	Negative battery lead	1	Disconnect.
6	Positive battery lead	1	Disconnect.
7	Battery band	1	
8	Battery	1	
9	BCM (Body Control Module)	1	
10	BCM coupler	1	Disconnect.
11	Lean angle sensor	1	
12	Lean angle sensor coupler	1	Disconnect.

EAS31125
INSTALLING THE RIDER SEAT
1. Install:
   • Rider seat “1”

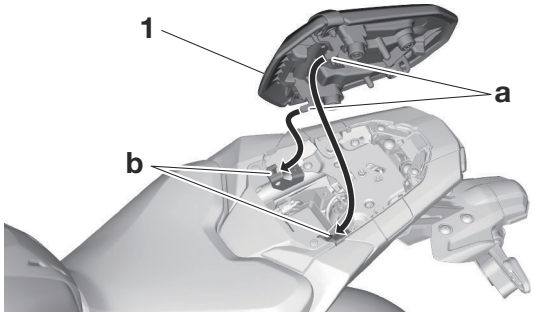
	Rider seat bolt **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

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.



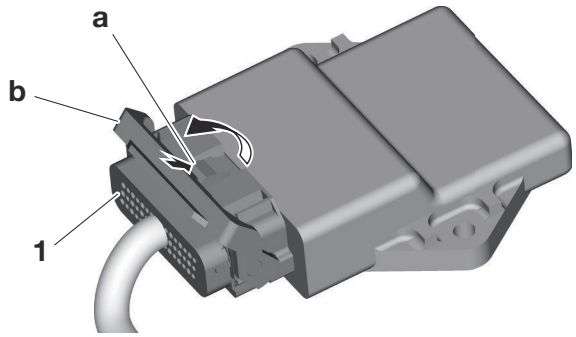
EAS31126
INSTALLING THE PASSENGER SEAT
1. Install:
   • Passenger seat “1”

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.



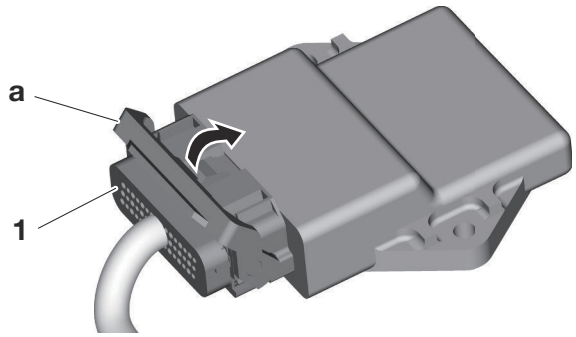
EAS34230
REMOVING THE BCM (Body control module)
1. Disconnect:
   • BCM coupler “1”

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



EAS34231
INSTALLING THE BCM (Body control module)
1. Connect:
   • BCM coupler “1”

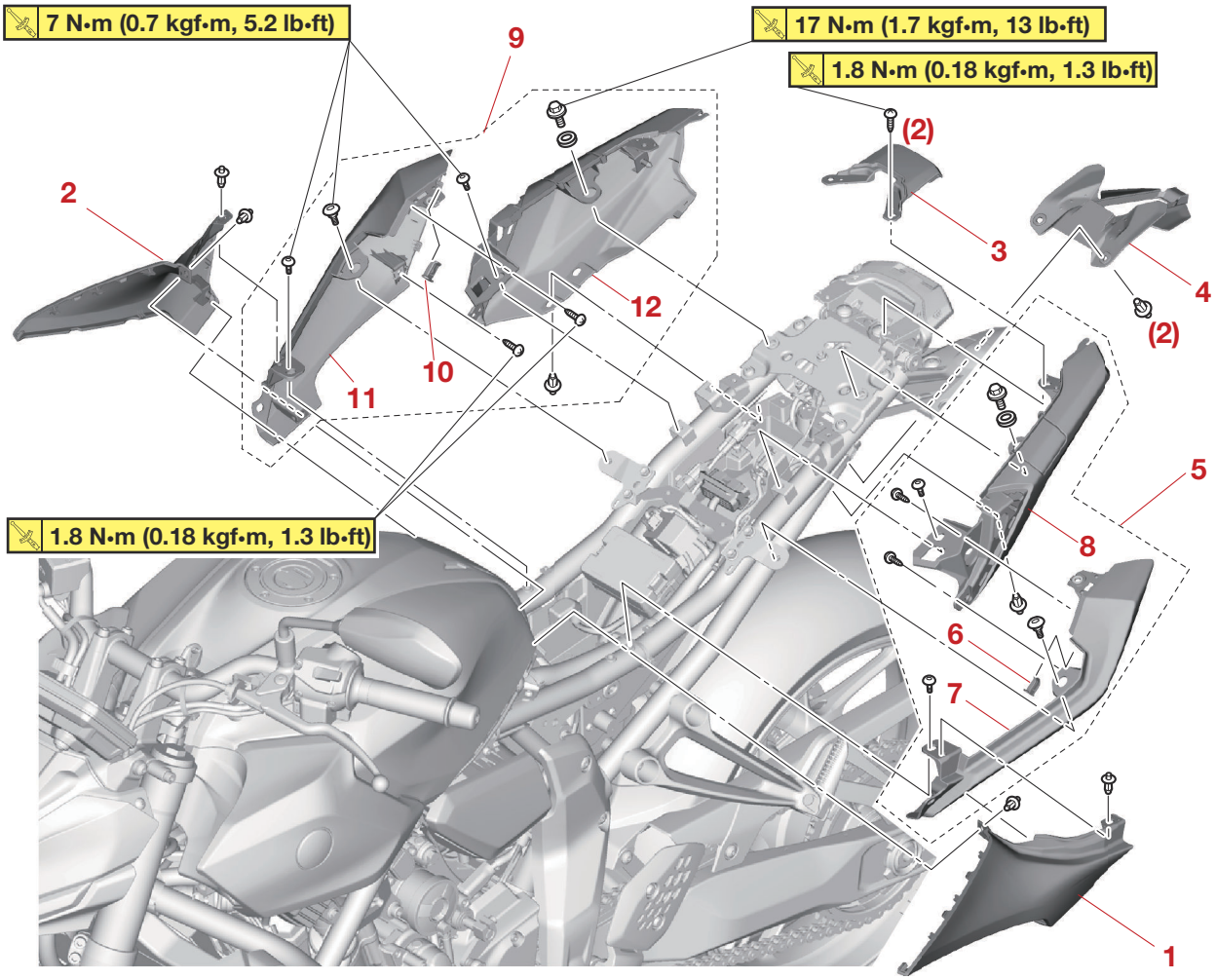
TIP
Connect the BCU coupler, and then push the lock lever “a” of the coupler in the direction of the arrow shown.



EAS20155

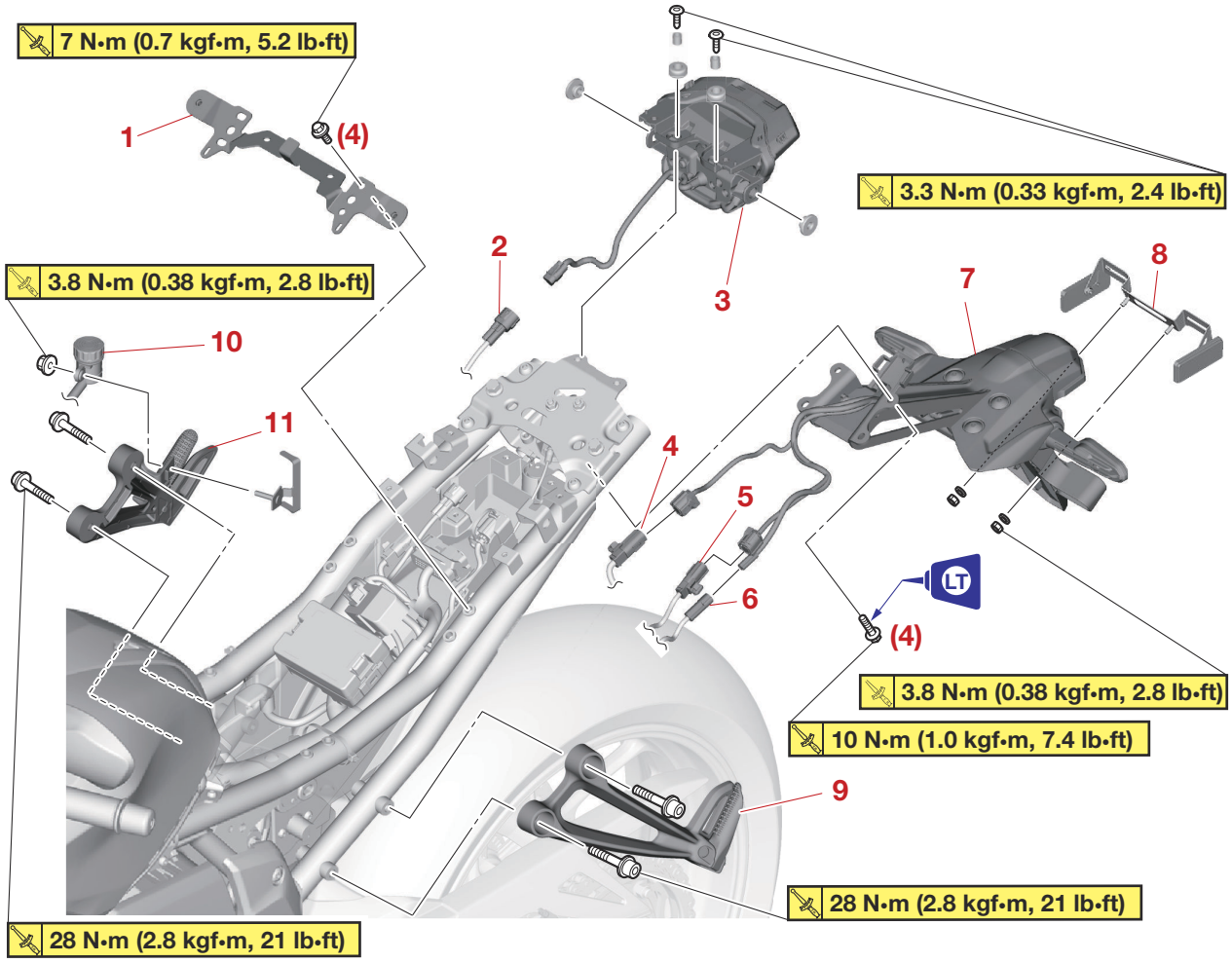
GENERAL CHASSIS (2)

Removing the covers



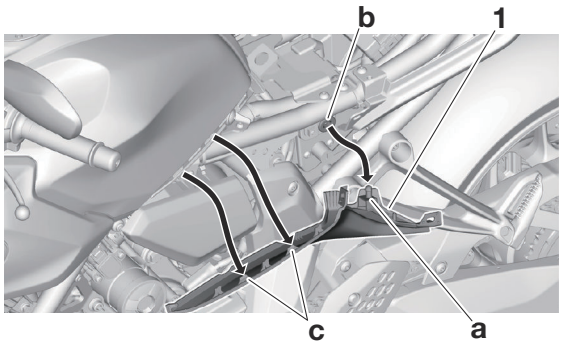
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
1	Front side cover (left)	1	
2	Front side cover (right)	1	
3	Upper tail cover	1	
4	Lower tail cover	1	
5	Rear side cover assembly (left)	1	
6	Clip	1	
7	Rear side cover (left)	1	
8	Lining cover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

Removing the tail/brake light assembly, mudguard and passenger footrests

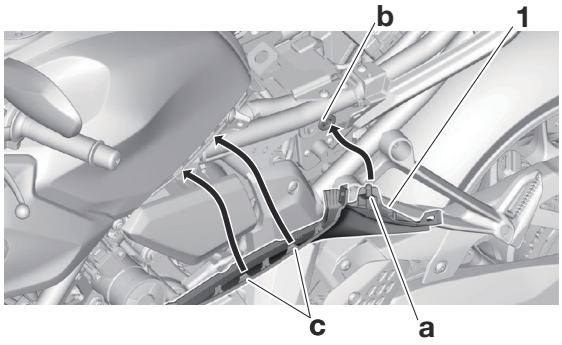


Order	Job/Parts to remove	Q'ty	Remarks
1	Rider seat bracket 2	1	
2	Tail/brake light coupler	1	Disconnect.
3	Tail/brake light assembly	1	
4	Rear turn signal light coupler (right)	1	Disconnect.
5	Rear turn signal light coupler (left)	1	Disconnect.
6	License plate light coupler	1	Disconnect.
7	Mudguard assembly	1	
8	Reflector bracket	1	
9	Passenger footrest (left)	1	
10	Brake fluid reservoir	1	
11	Passenger footrest (right)	1	

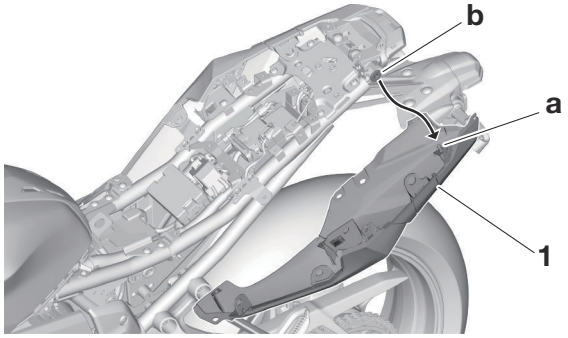
EAS31683
REMOVING THE FRONT SIDE COVER
The following procedure applies to both of the front side covers.
1. Remove:
   - Front side cover "1"
     a. Remove the front side cover quick fasteners.
     b. Remove the projection "a" on the front side cover from the grommet "b" on the frame.
     c. Remove the projections "c" on the front side cover from the fuel tank side cover.



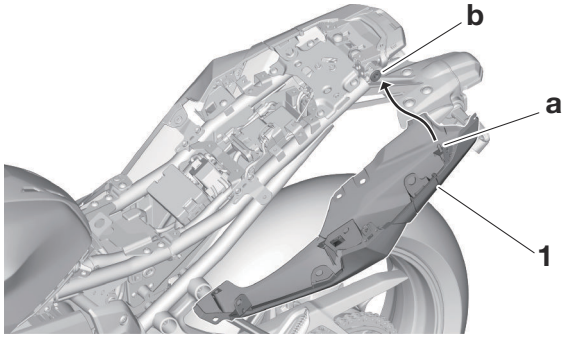
EAS31684
INSTALLING THE FRONT SIDE COVER
The following procedure applies to both of the front side covers.
1. Install:
   - Front side cover "1"
     a. Install the projection "a" on the front side cover from the grommet "b" on the frame.
     b. Install the projections "c" on the front side cover to the fuel tank side cover holes.
     c. Install the front side cover quick fasteners.



EAS31098
REMOVING THE REAR SIDE COVER ASSEMBLY
The following procedure applies to both of the rear side cover assembly.
1. Remove:
   - Upper tail cover
   - Lower tail cover
   - Rear side cover assembly "1"
     a. Remove the rear side cover assembly bolts and quick fastener.
     b. Remove the projection "a" on the lining cover from grommet "b" on the tail/brake light assembly.



EAS31099
INSTALLING THE REAR SIDE COVER ASSEMBLY
The following procedure applies to both of the rear side cover assembly.
1. Install:
   - Rear side cover assembly "1"
     a. Install the projection "a" on the lining cover to grommet "b" on the tail/brake light assembly.

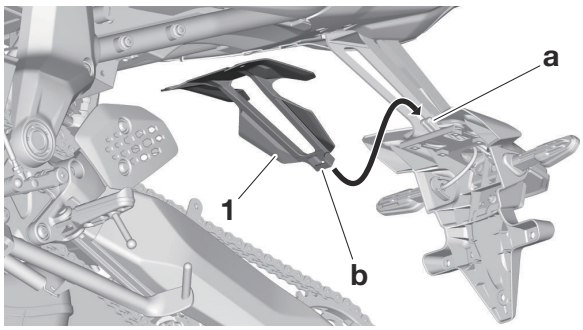


     b. Install the rear side cover assembly bolts and quick fastener.

Lining cover bolt (M8 × 16 mm)
17 N·m (1.7 kgf·m, 13 lb·ft)
Lining cover screw (M5 × 16 mm)
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)
Rear side cover bolt (M5 × 12 mm)
7 N·m (0.7 kgf·m, 5.2 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

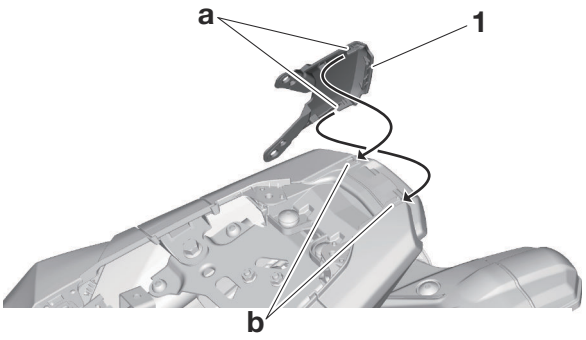
cover.
b. Install the quick fasteners.



EAS31097

INSTALLING THE UPPER TAIL COVER

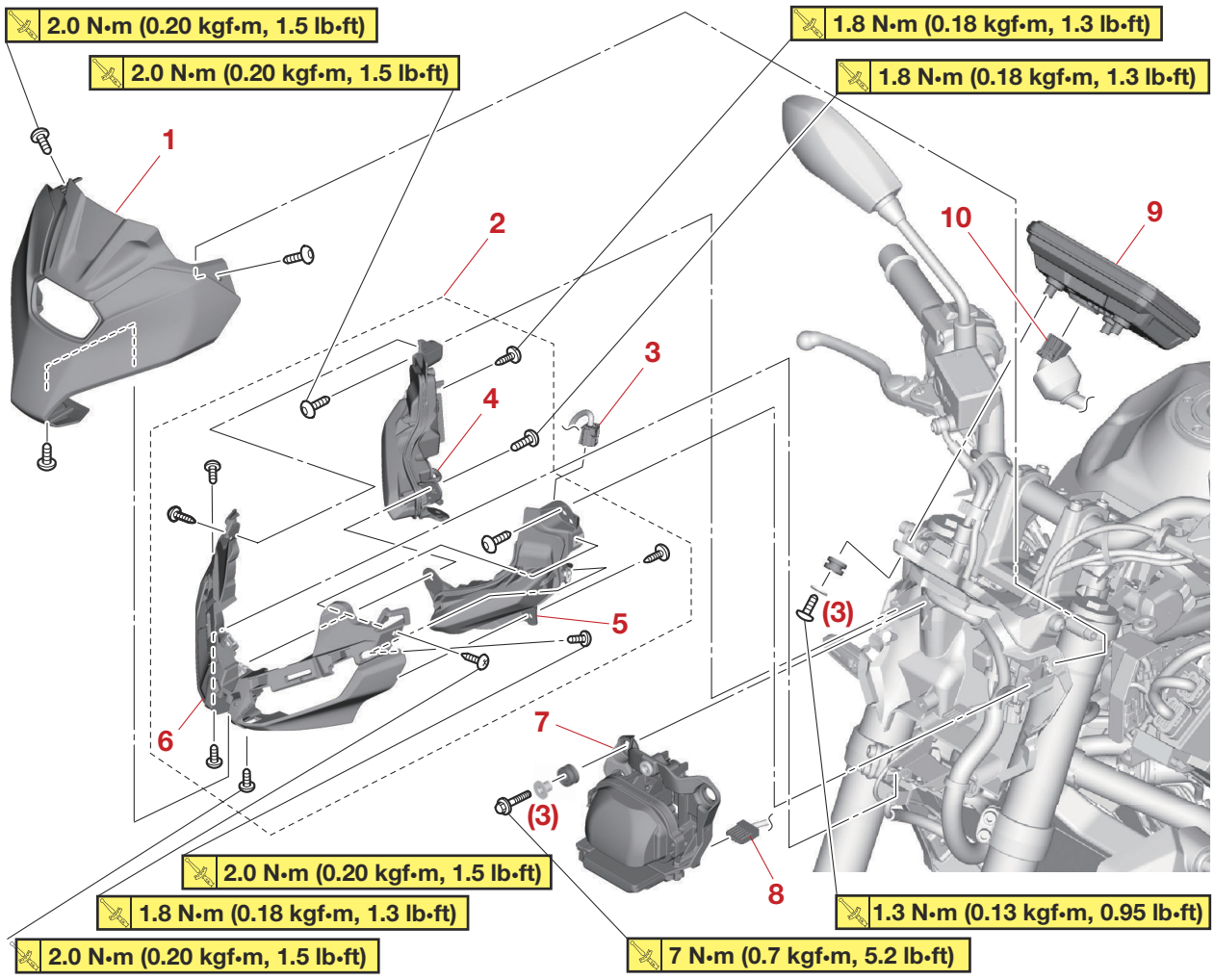
1. Install:
   - Upper tail cover "1"
     a. Fit the projections "a" on the upper tail cover into the holes "b" in the lining covers.
     b. Install the screws.



EAS20156

GENERAL CHASSIS (3)

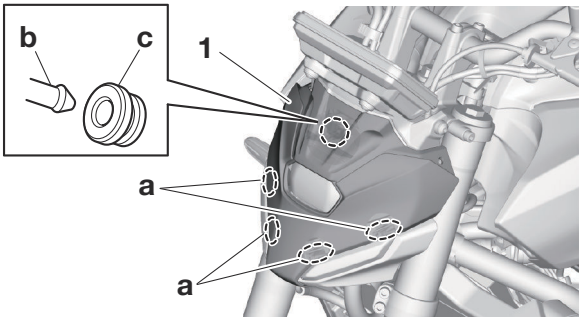
Removing the auxiliary light, headlight assembly and meter assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Headlight front cover	1	
2	Auxiliary light cover assembly	1	
3	Auxiliary light coupler	1	Disconnect.
4	Auxiliary light (right)	1	
5	Auxiliary light (left)	1	
6	Auxiliary light cover	1	
7	Headlight	1	
8	Headlight coupler	1	Disconnect.
9	Meter assembly	1	
10	Meter assembly coupler	1	Disconnect.

EAS34233
REMOVING THE HEADLIGHT FRONT COVER

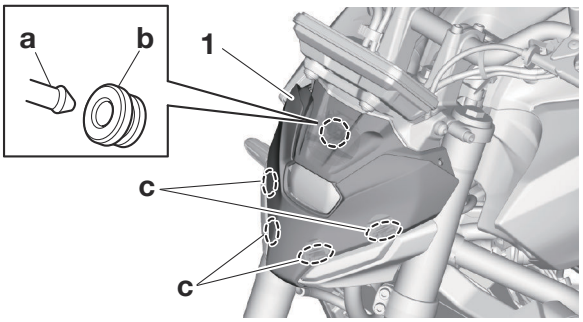
1. Remove:
   - Headlight front cover "1"
     a. Remove the headlight front cover bolts.
     b. Remove the projections "a" on the headlight front cover from the headlight cover.
     c. Remove the projection "b" on the auxiliary light front cover from grommet "c" on the headlight.



EAS34234
INSTALLING THE HEADLIGHT FRONT COVER

1. Install:
   - Headlight front cover "1"
     a. Insert the projection "a" on the auxiliary light front cover into the grommet "b" on the headlight.
     b. Insert the projections "c" on the headlight front cover from holes into the headlight cover.
     c. Install the headlight front cover bolts.

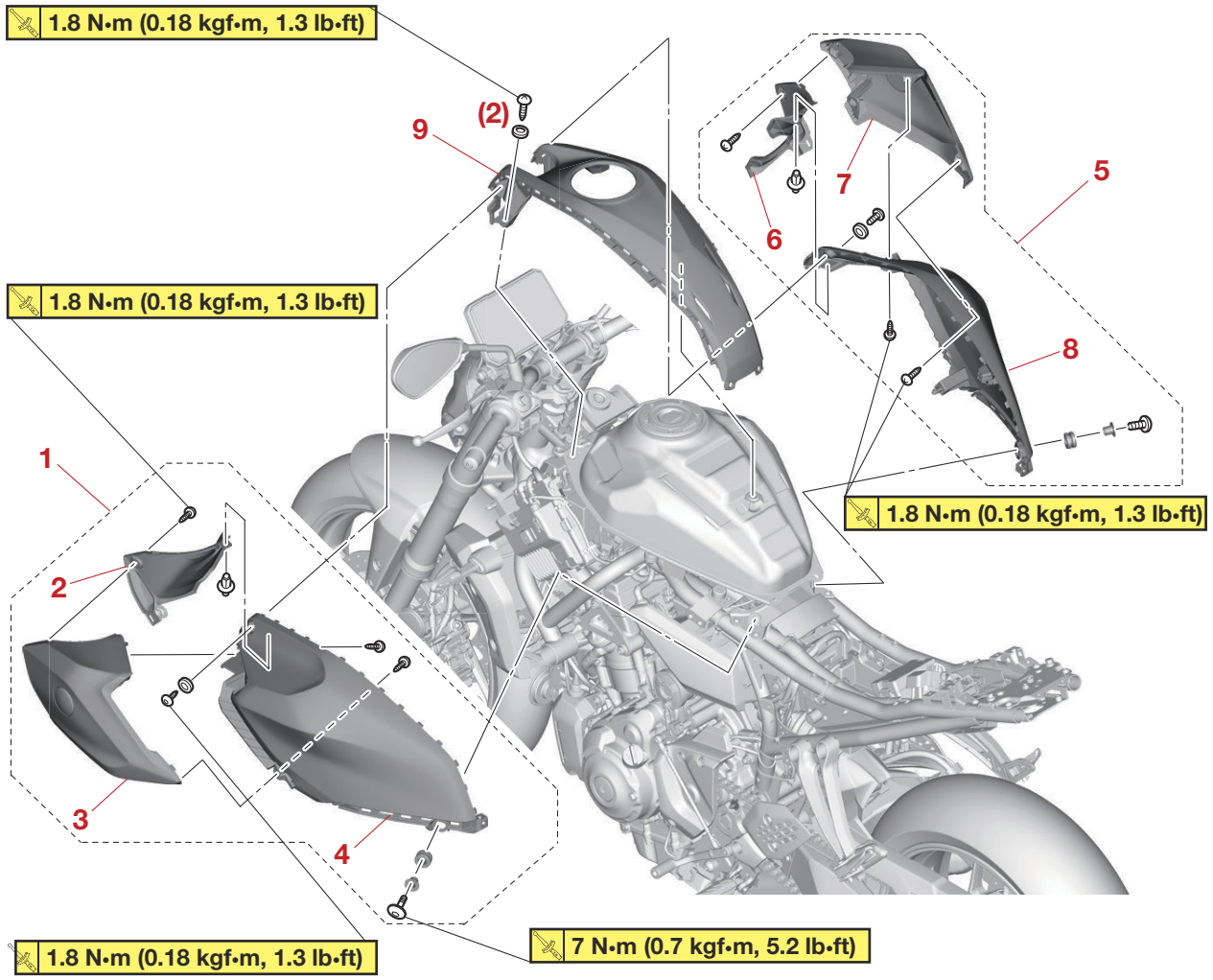
	Headlight front cover bolt **2.0 N·m (0.20 kgf·m, 1.5 lb·ft)**



EAS20157

GENERAL CHASSIS (4)

Removing the air scoop and fuel tank covers

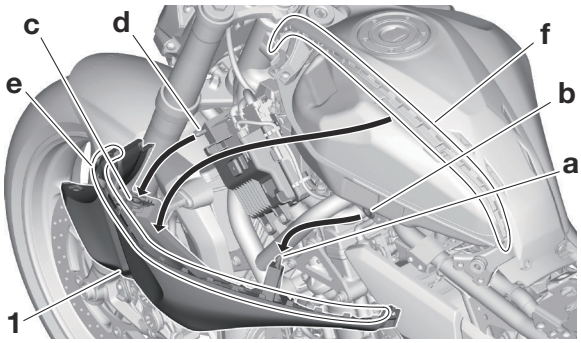


Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Front side cover		Refer to "GENERAL CHASSIS (2)" on page 4-3.
1	Fuel tank side cover assembly (left)	1	
2	Air scoop inner panel (left)	1	
3	Air scoop (left)	1	
4	Fuel tank side cover (left)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

EAS33574
REMOVING THE FUEL TANK SIDE COVER ASSEMBLY

The following procedure applies to both of the fuel tank side cover assemblies.

1. Remove:
   - Fuel tank side cover assembly "1"
     a. Remove the fuel tank side cover bolt and screw.
     b. Remove the projection "a" on the fuel tank side cover assembly from the grommet "b" on the frame.
     c. Remove the grommet "c" on the fuel tank side cover assembly from projection "d" on the ECU tray.
     d. Disengage the projections "e" of the fuel tank side cover assembly from the holes "f" in the fuel tank top cover.

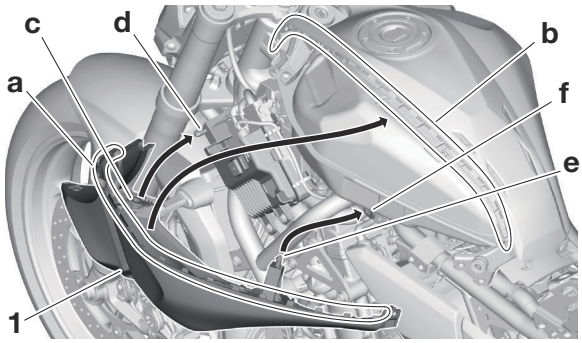


EAS33575
INSTALLING THE FUEL TANK SIDE COVER ASSEMBLY

The following procedure applies to both of the fuel tank side cover assemblies.

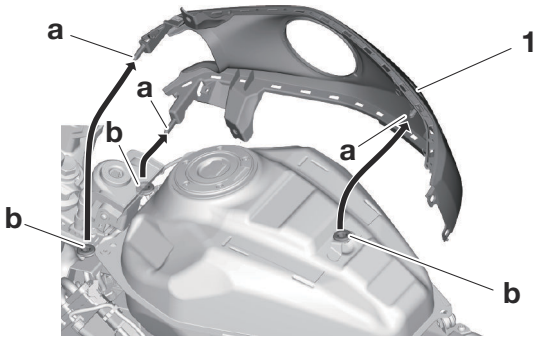
1. Install:
   - Fuel tank side cover assembly "1"
     a. Insert the projection "a" of the fuel tank side cover assembly into the hole "b" in the fuel tank top cover.
     b. Install the grommet "c" on the fuel tank side cover assembly to the projection "d" on the ECU tray.
     c. Install the projection "e" on the fuel tank side cover assembly to the grommet "f" on the frame.
     d. Install the fuel tank side cover assembly bolt and screw.

	Fuel tank side cover assembly bolt **7 N·m (0.7 kgf·m, 5.2 lb·ft)** **Fuel tank side cover assembly screw** **1.8 N·m (0.18 kgf·m, 1.3 lb·ft)**



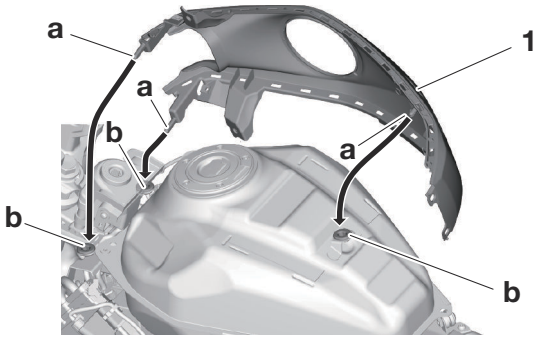
EAS31102
REMOVING THE FUEL TANK TOP COVER

1. Remove:
   - Fuel tank top cover "1"
     a. Remove the fuel top cover screws.
     b. Lift up the fuel top cover upwards, and then disengage the projections "a" on the fuel tank top cover from the grommets "b" in the fuel tank and main switch stay.



EAS31103
INSTALLING THE FUEL TANK TOP COVER

1. Install:
   - Fuel tank top cover "1"
     a. Insert the projections "a" on the fuel tank top cover into the grommets "b" in the fuel tank and main switch stay.



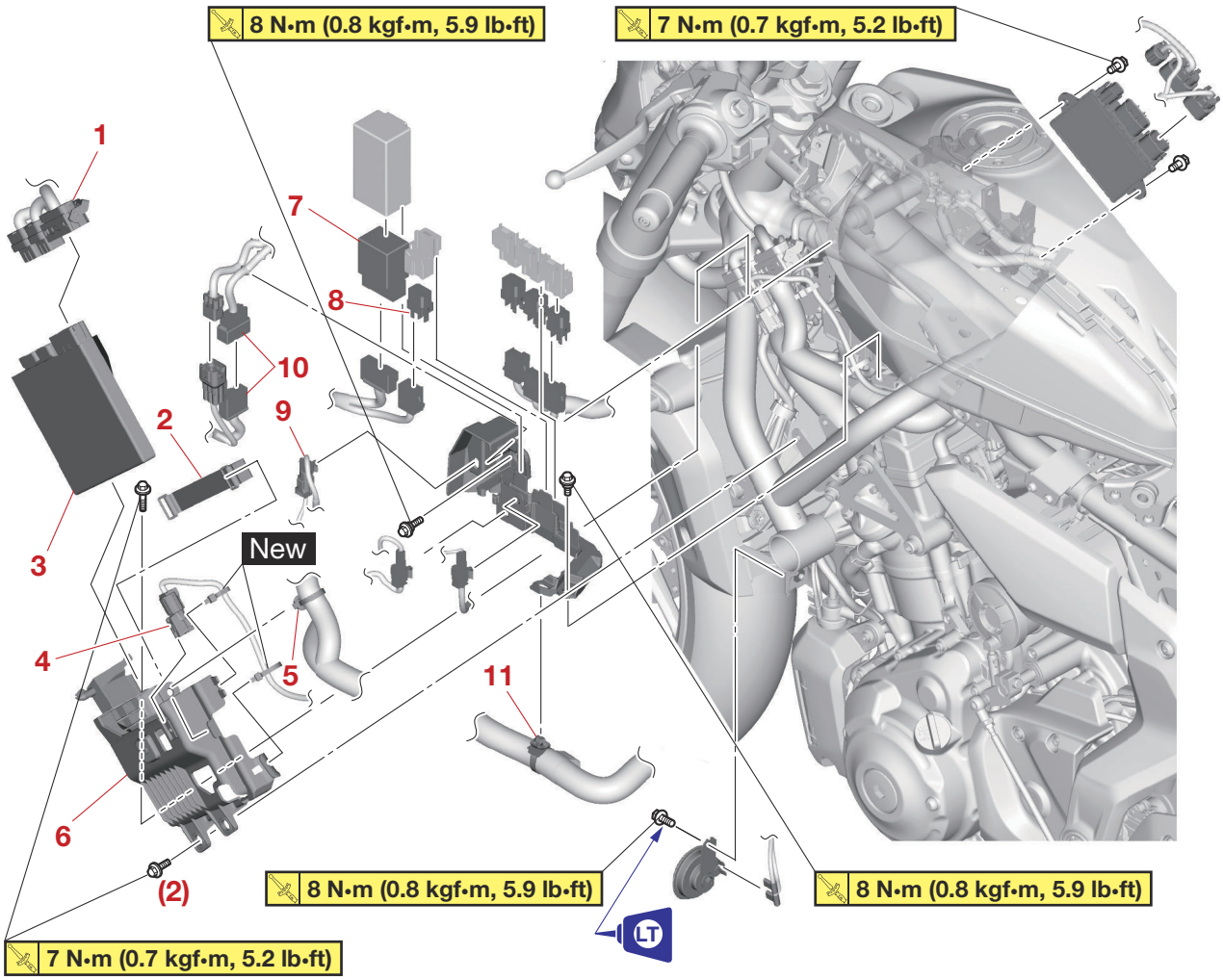
TIP

Check that the projections "a" on the fuel tank top cover is securely inserted and that the fuel tank top cover does not float.

EAS20158

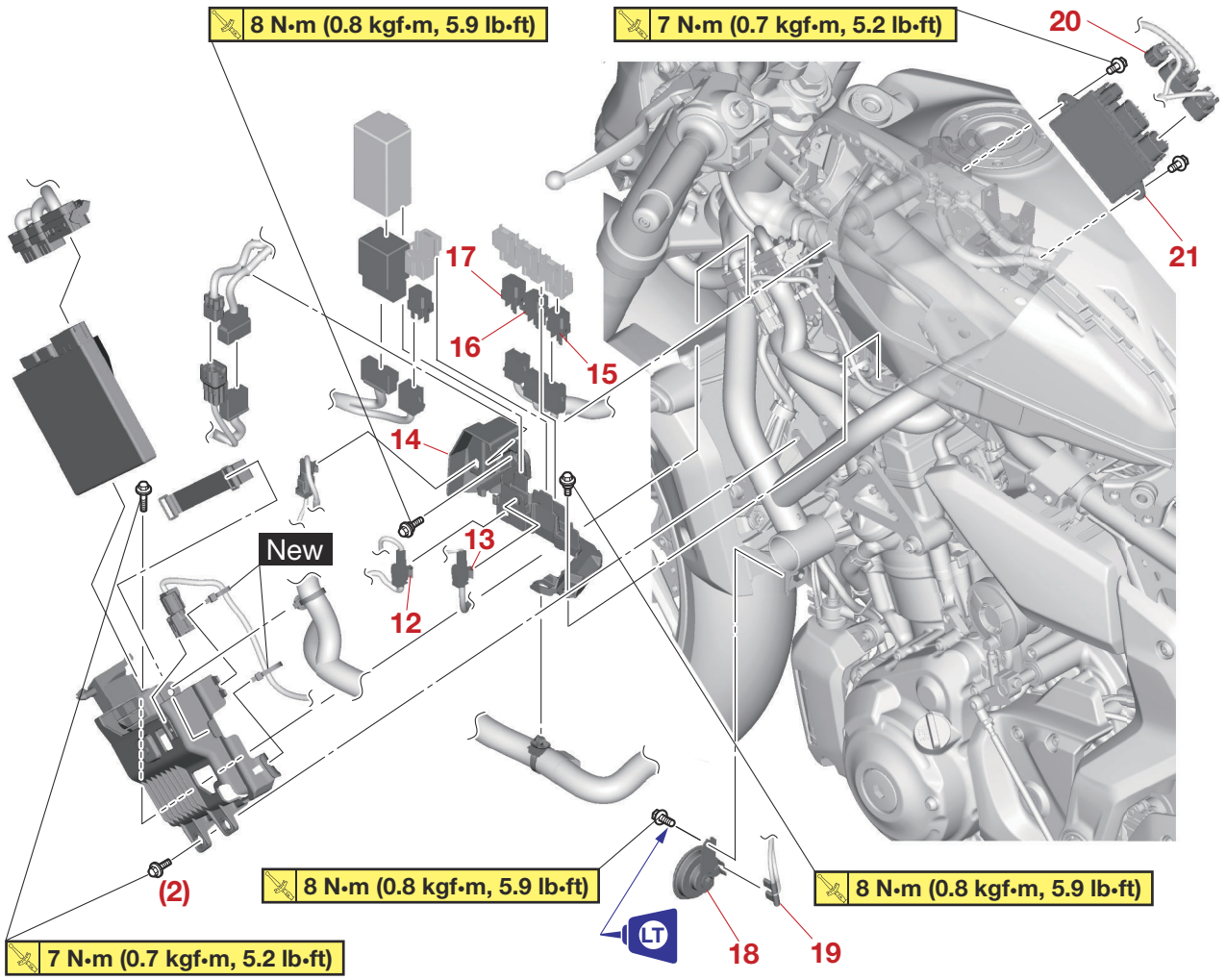
GENERAL CHASSIS (5)

Removing the ECU, electrical components tray and horn



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank side cover assembly		Refer to "GENERAL CHASSIS (4)" on page 4-9.
1	ECU coupler	3	Disconnect.
2	Rubber band	1	
3	ECU (Engine Control Unit)	1	
4	Auxiliary DC jack coupler	1	
5	Wire harness clamp	1	
6	ECU tray	1	
7	Relay unit	1	
8	Starter circuit cut-off relay	1	
9	Front turn signal/position light coupler (left)	1	
10	Main switch coupler	1	Disconnect.
11	Wire harness clamp	1	

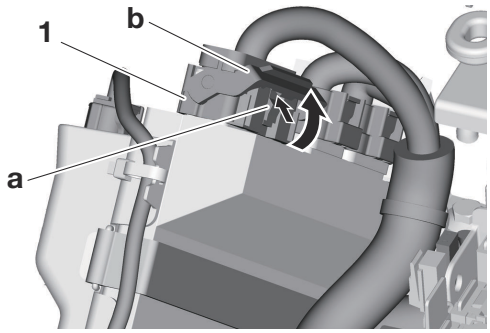
Removing the ECU, electrical components tray and horn



Order	Job/Parts to remove	Q'ty	Remarks
12	Crankshaft position sensor coupler	1	
13	Radiator fan motor coupler	1	
14	Electrical components tray 1	1	
15	Engine stop relay	1	
16	Horn relay	1	
17	Radiator fan motor relay	1	
18	Horn connector	2	Disconnect.
19	Horn	1	
20	GCU coupler	3	Disconnect.
21	GCU (Generator Control Unit)	1	

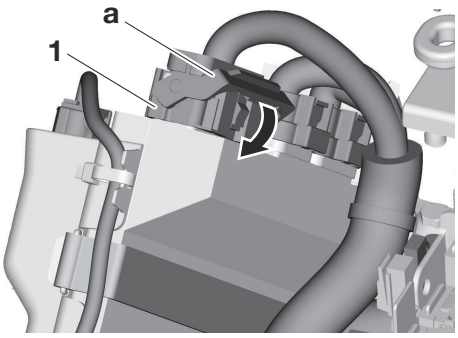
EAS31108
REMOVING THE ECU (Engine Control Unit)
1. Disconnect:
   • ECU coupler “1”

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”

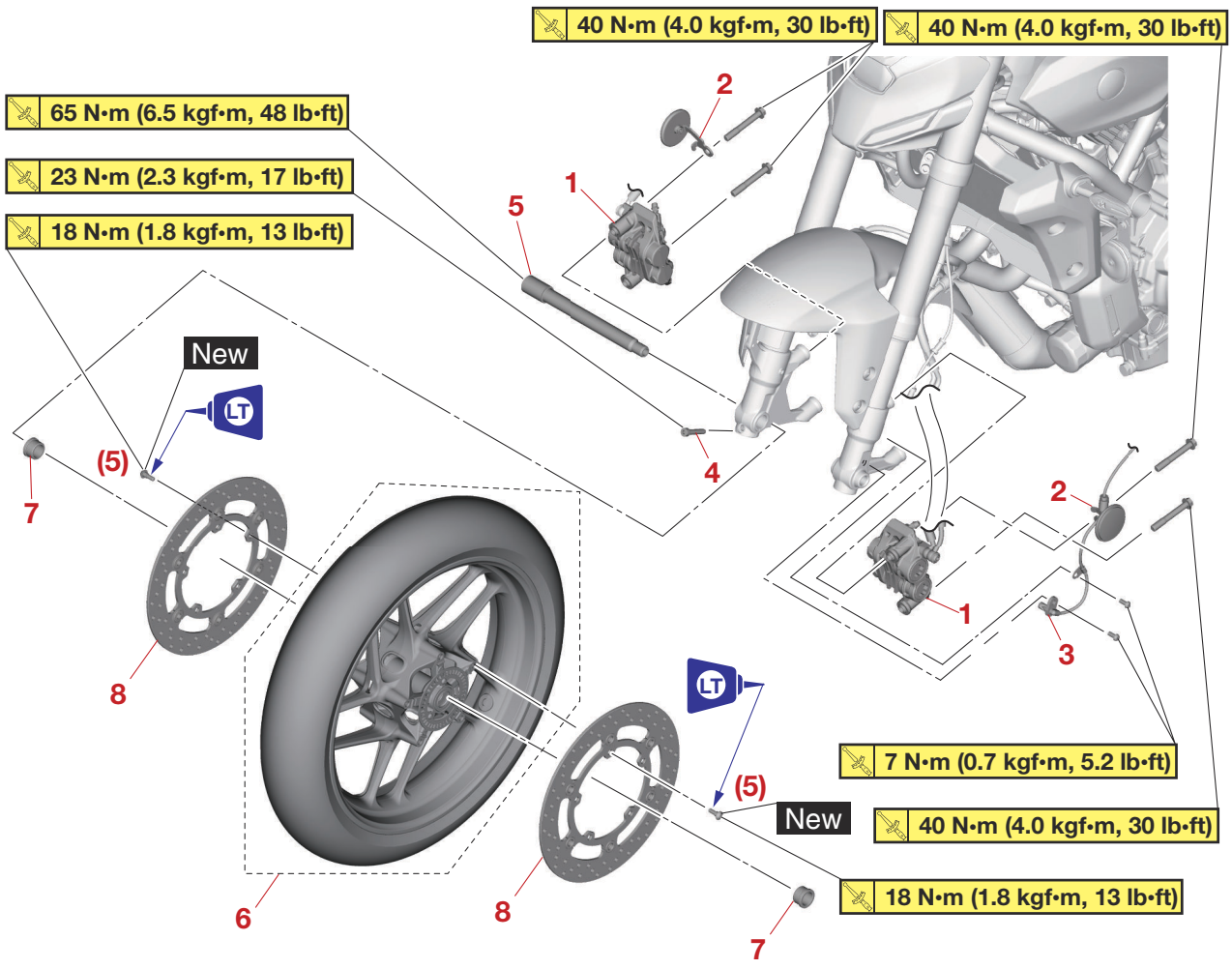
TIP
Connect the ECU coupler, and then push the lock lever “a” of the coupler in the direction of the arrow shown.



EAS20028

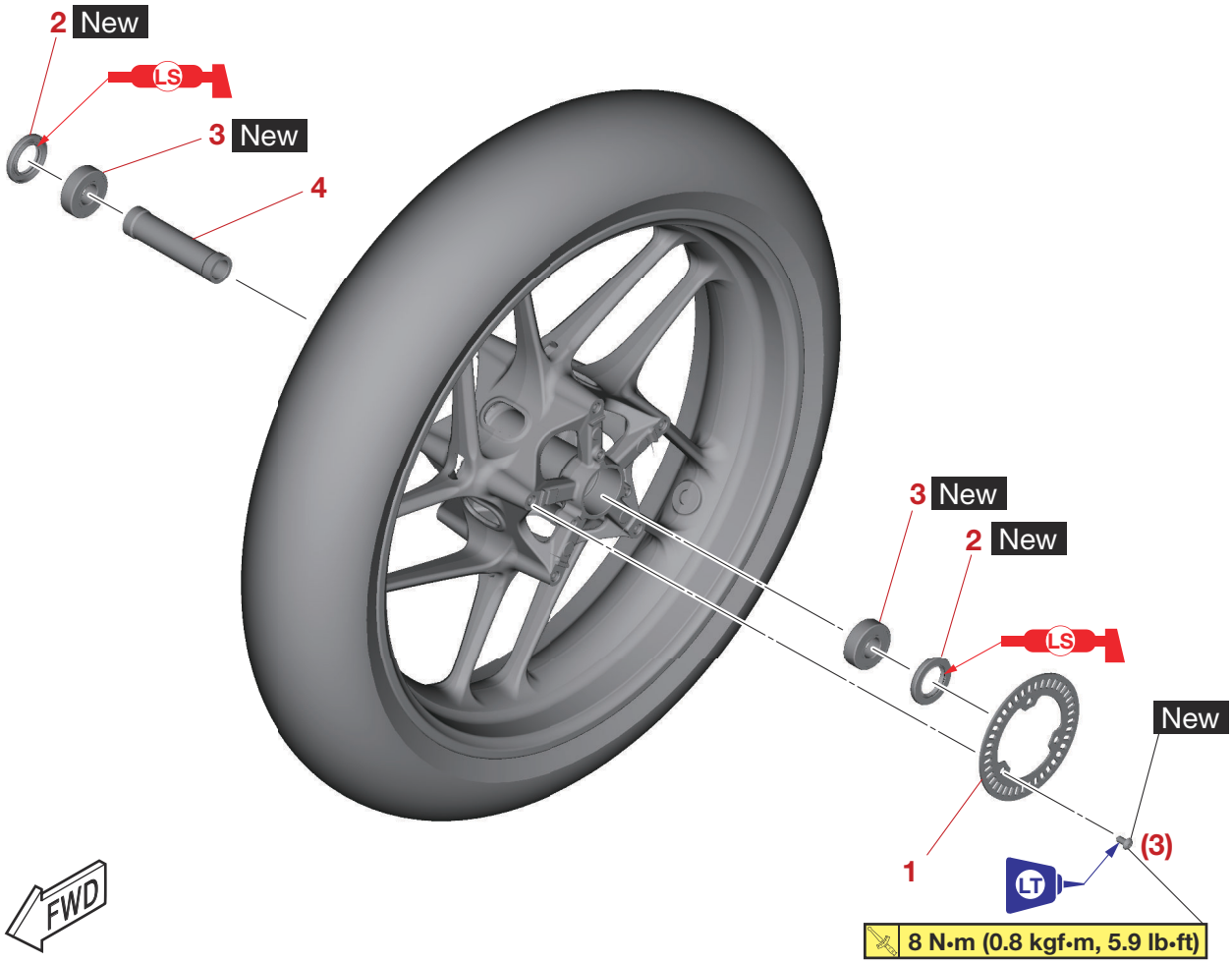
FRONT WHEEL

Removing the front wheel and brake discs



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

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Front wheel sensor rotor	1	
2	Oil seal	2	
3	Wheel bearing	2	
4	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:
   - Brake caliper (left)
   - Brake caliper (right)
   - Front wheel sensor

ECA21440
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 sensor housing.**

3. Elevate:
   - Front wheel

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

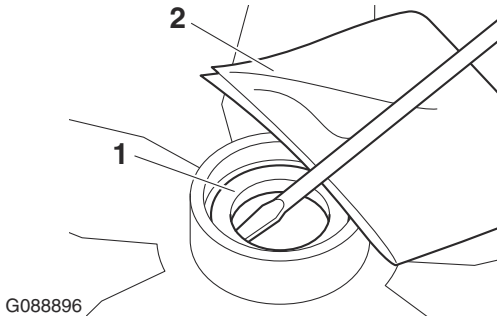
4. Loosen:
   - Wheel axle pinch bolt
5. Remove:
   - Wheel axle
   - Front wheel

EAS30146
DISASSEMBLING THE FRONT WHEEL
ECA21340
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. 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.



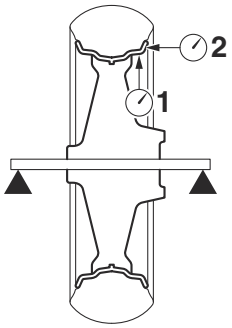
   c. Remove the wheel bearings with a general bearing puller.

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 3-15 and “CHECKING THE WHEELS” on page 3-15.
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.

EAS30151
ASSEMBLING THE FRONT WHEEL

ECA21340
NOTICE

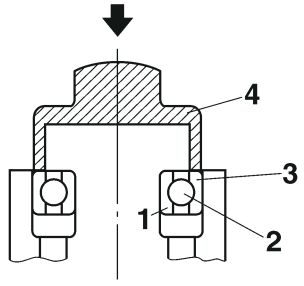
- **Do not drop the wheel sensor rotor or subject it to shocks.**
- **If any solvent gets on the wheel sensor rotor, wipe it off immediately.**

1. Install:
   - Wheel bearing New
   - Oil seal New
   a. Install the new wheel bearing (left 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".

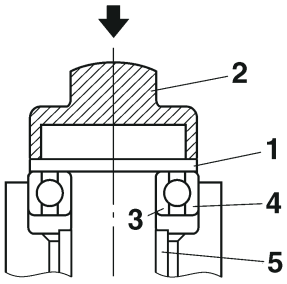
TIP
Use a socket "4" that matches the diameter of the wheel bearing outer race.



G088898

   b. Install the spacer.
   c. Install the new wheel bearing (right 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

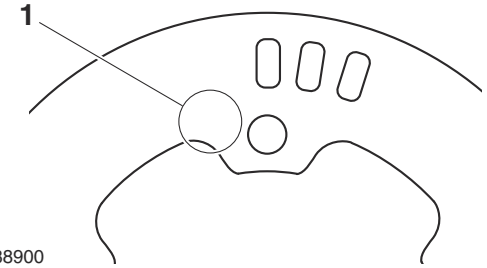
   d. Install the new oil seals.
2. Install:
   - Front wheel sensor rotor

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

ECA17200
NOTICE

Replace the wheel sensor rotor bolts with new ones.

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



G088900

3. Measure:
   - Wheel sensor rotor runout
     Out of specification → Correct the wheel sensor rotor runout or replace the wheel sensor rotor.
     Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-18.

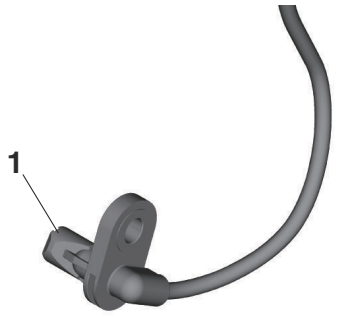
	Wheel sensor rotor runout limit **0.25 mm (0.01 in)**

EAS30155
MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR

ECA21070
NOTICE

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

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



2. Check:
   - Front wheel sensor rotor
     Cracks/damage/scratches → Replace the front wheel sensor rotor.
     Iron powder/dust/solvent → Clean.

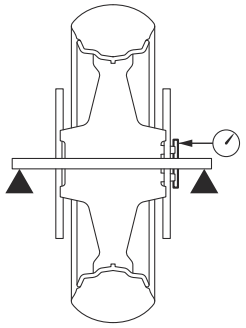
TIP

- 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 runout
     Out of specification → Clean the installation surface of the wheel sensor rotor and correct the wheel sensor rotor runout, or replace the wheel sensor rotor.

	Wheel sensor rotor runout limit **0.25 mm (0.01 in)**

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



G088902

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

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

ECA17200
NOTICE

Replace the wheel sensor rotor bolts with new ones.

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

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.
- Attach the balance weight so that it does not overlap the wheel graphics.
- Refer to "ADJUSTING THE WHEEL STATIC BALANCE" in "BASIC INFORMATION" (separate volume).

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 brake disc

	Front brake disc bolt **18 N·m (1.8 kgf·m, 13 lb·ft)** **LOCTITE®**

ECA19150
NOTICE

Replace the brake disc bolts with new ones.

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

2. Check:
   • Front brake disc
   Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-36.
3. Lubricate:
   • Oil seal lip

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

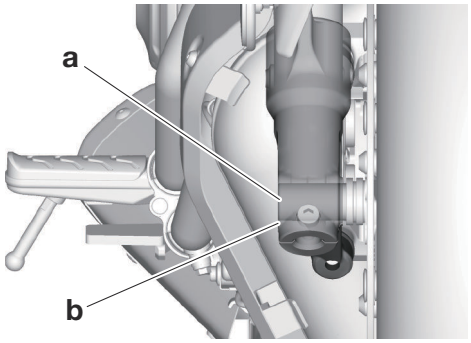
4. Install:
   • Collar
   • Front wheel
   • Wheel axle
5. Tighten:
   • Wheel axle
   • Wheel axle pinch bolt

	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
Check that wheel axle end "a" is flush with front fork surface "b" and then tighten the wheel axle pinch bolt. If wheel axle end "a" is not flush with surface "b", align the ends manually or with a plastic hammer.



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.

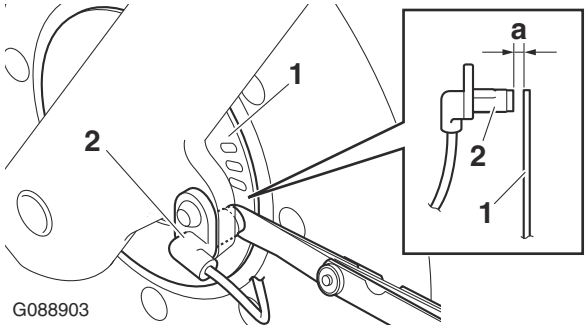
TIP
When installing the front wheel sensor, check the wheel sensor lead for twists.

7. Measure:
   • Distance "a"
   (between the wheel sensor rotor "1" and 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) **1.01–1.77 mm (0.040–0.069 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 brake caliper

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

EWA13500

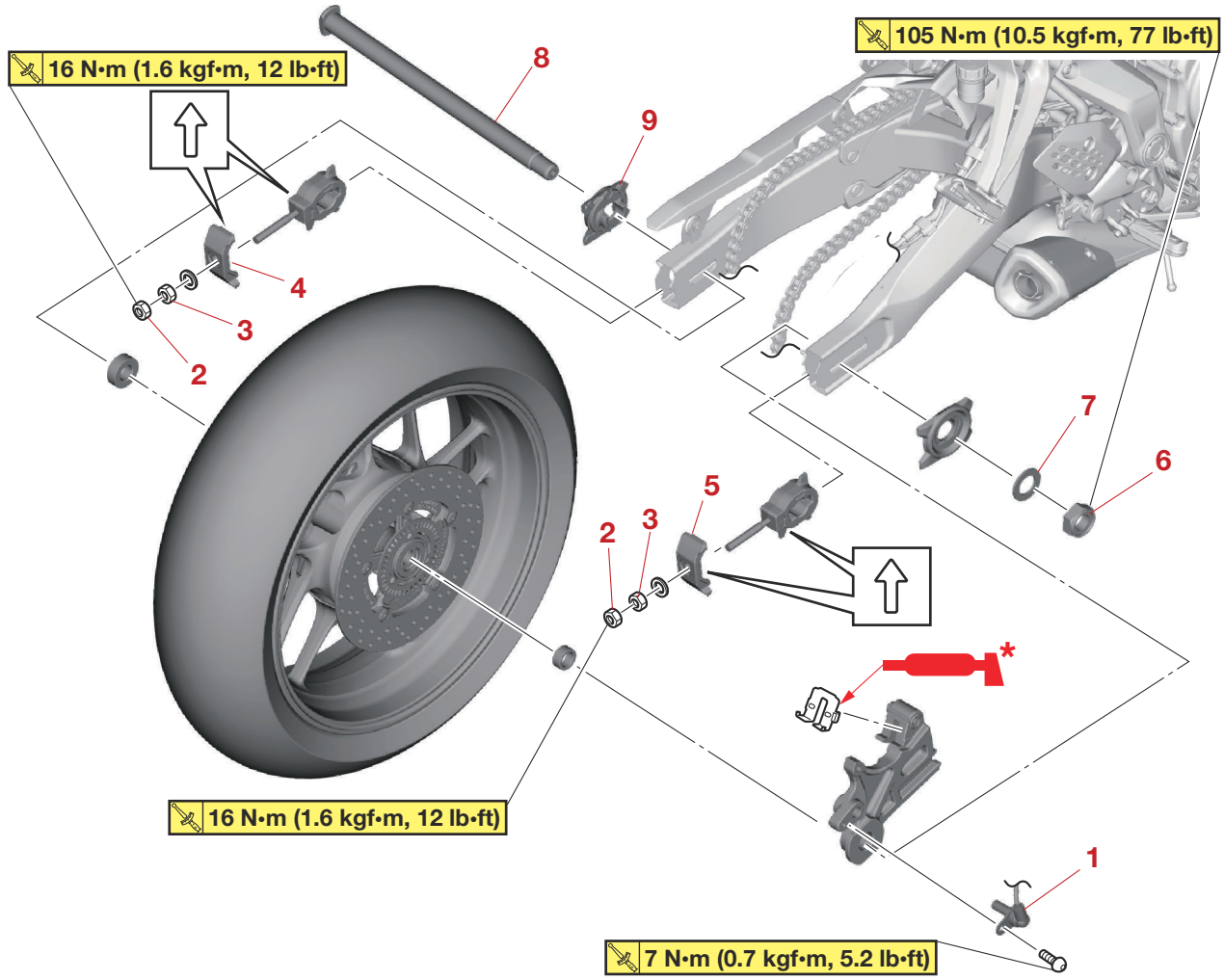
⚠ WARNING

Make sure the brake hose is routed properly.

EAS20029

REAR WHEEL

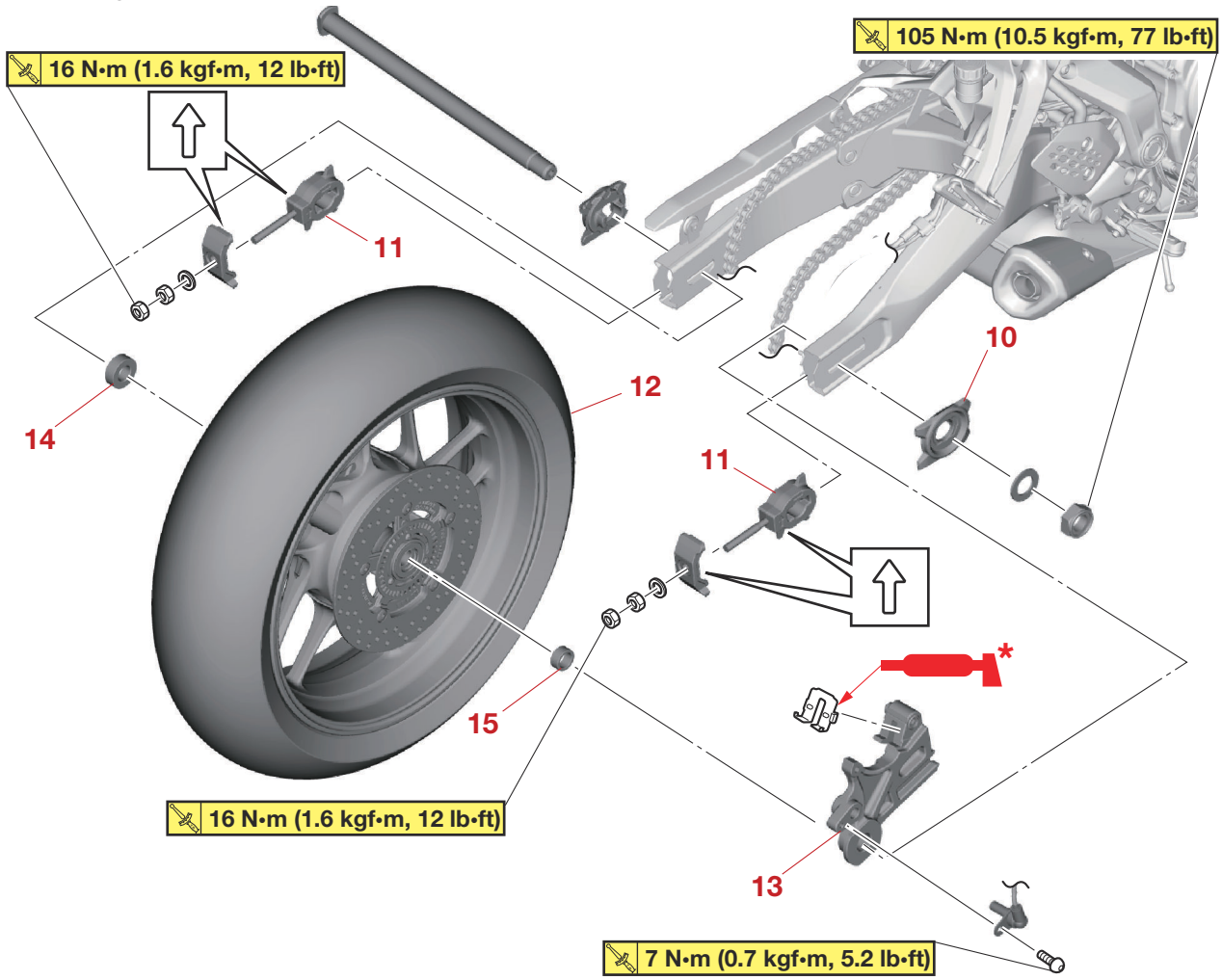
Removing the rear wheel



*** Three Bond No. 1521.**

Order	Job/Parts to remove	Q'ty	Remarks
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-42.
1	Rear wheel sensor	1	
2	Drive chain puller locknut	2	
3	Drive chain adjusting nut	2	
4	Swingarm end plate (left)	1	Loosen.
5	Swingarm end plate (right)	1	Loosen.
6	Wheel axle nut	1	
7	Washer	1	
8	Rear wheel axle	1	
9	Drive chain slack adjusting plate (left)	1	

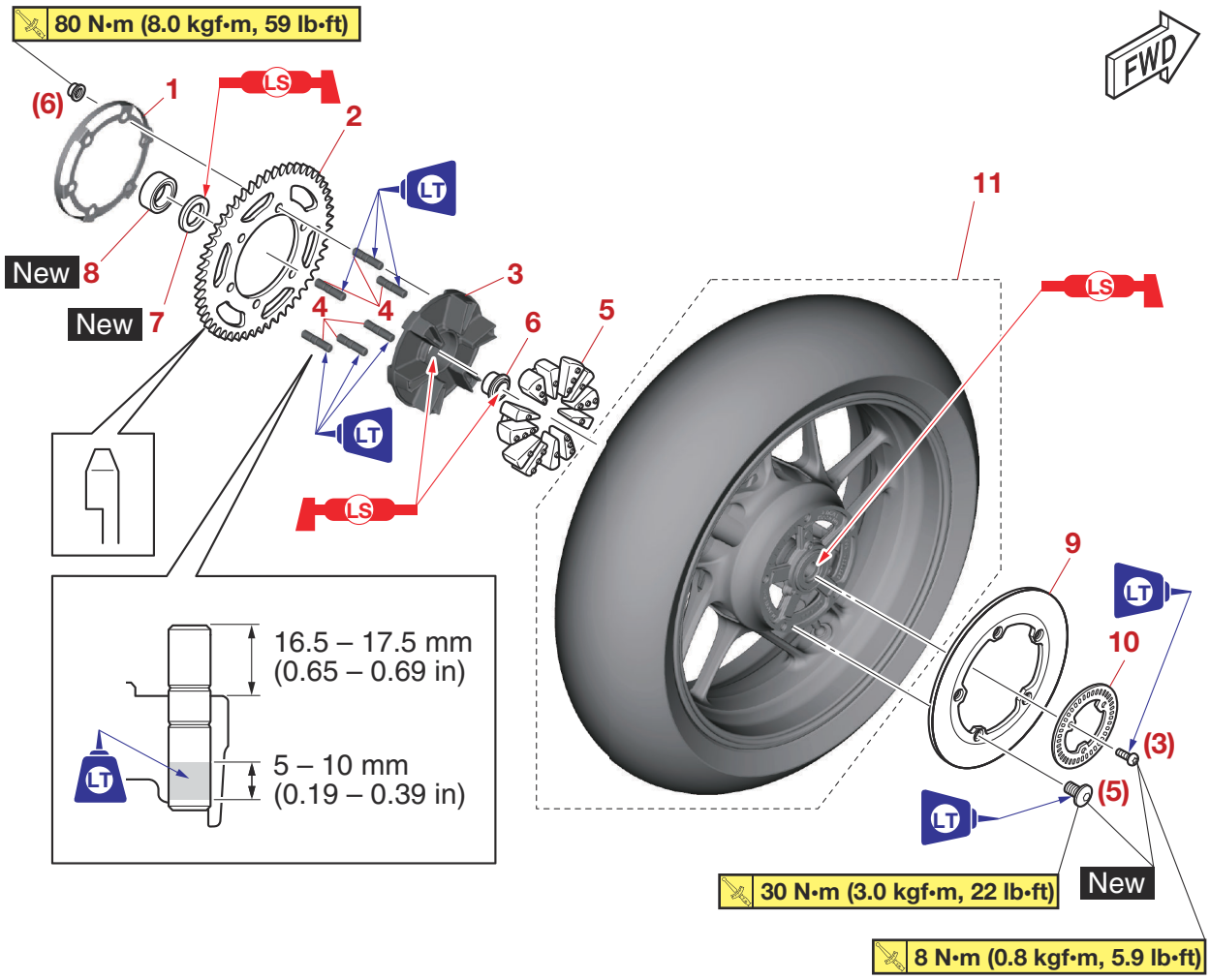
Removing the rear wheel



*** Three Bond No. 1521.**

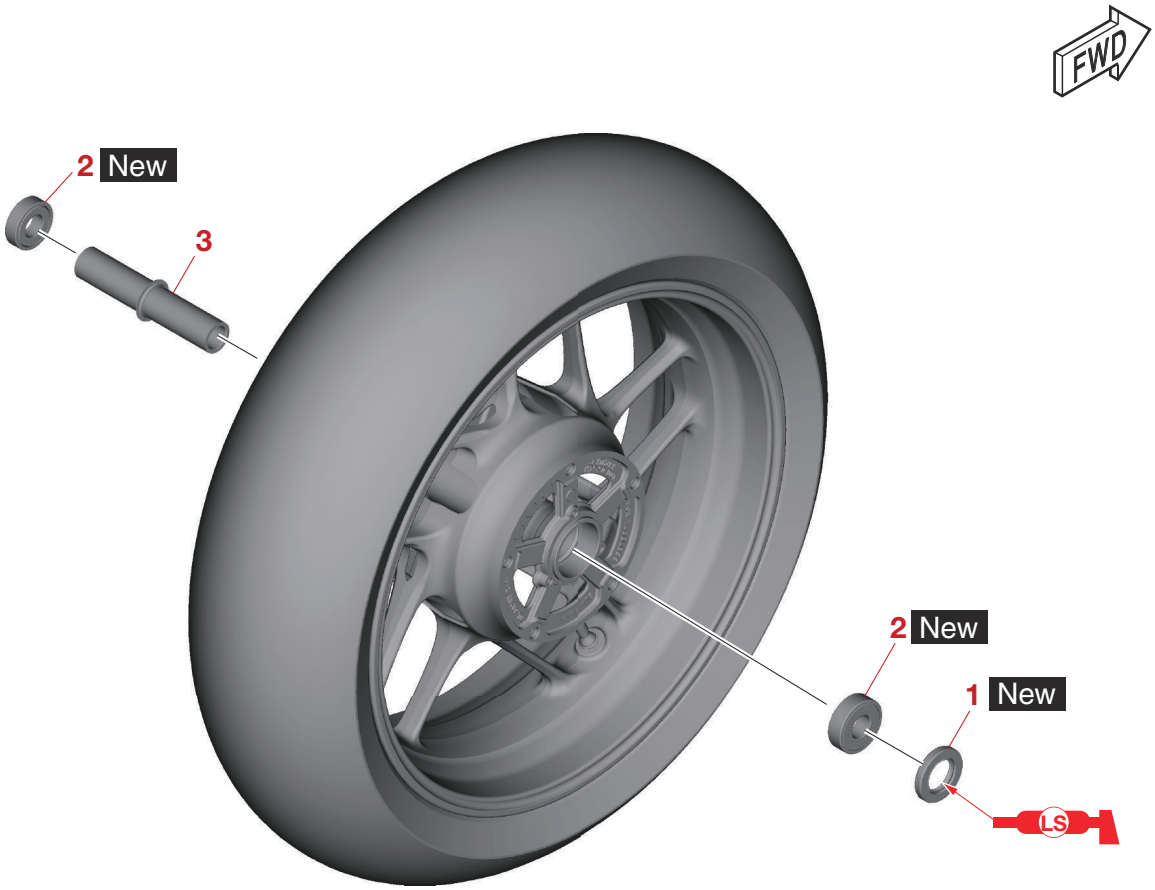
Order	Job/Parts to remove	Q'ty	Remarks
10	Drive chain slack adjusting plate (right)	1	
11	Chain puller	2	
12	Rear wheel	1	
13	Brake caliper bracket	1	
14	Collar (left)	1	
15	Collar (right)	1	

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	

Removing the rear brake disc and rear wheel sprocket



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.

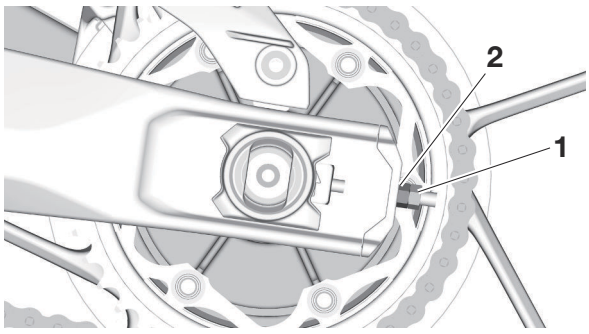
TIP
Place the vehicle on a maintenance stand so that the rear wheel is elevated.

2. Remove:
   - Rear wheel sensor
   - Rear brake caliper
     Refer to "REAR BRAKE" on page 4-42.

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 4-16.

EAS30159
CHECKING THE REAR WHEEL

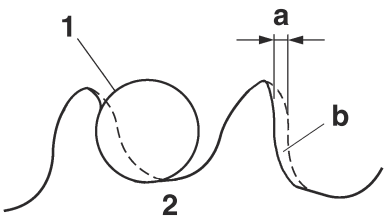
1. Check:
   - Rear wheel axle
   - Wheel bearing
   - Oil seal
     Refer to "CHECKING THE FRONT WHEEL" on page 4-16.
2. Check:
   - Tire
   - Rear wheel
     Damage/wear → Replace.
     Refer to "CHECKING THE TIRES" on page 3-15 and "CHECKING THE WHEELS" on page 3-15.
3. Measure:
   - Radial wheel runout
   - Lateral wheel runout
     Refer to "CHECKING THE FRONT WHEEL" on page 4-16.

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 4-18.
2. Check:
   - Rear wheel sensor rotor
     Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-18.
3. Measure:
   - Wheel sensor rotor deflection
     Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-18.

	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 4-17.

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.
- Attach the balance weight so that it does not overlap the wheel graphics.
  Refer to "ADJUSTING THE WHEEL STATIC BALANCE" in "BASIC INFORMATION" (separate volume).

1. Adjust:
   - Rear wheel static balance
     Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-18.

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®**

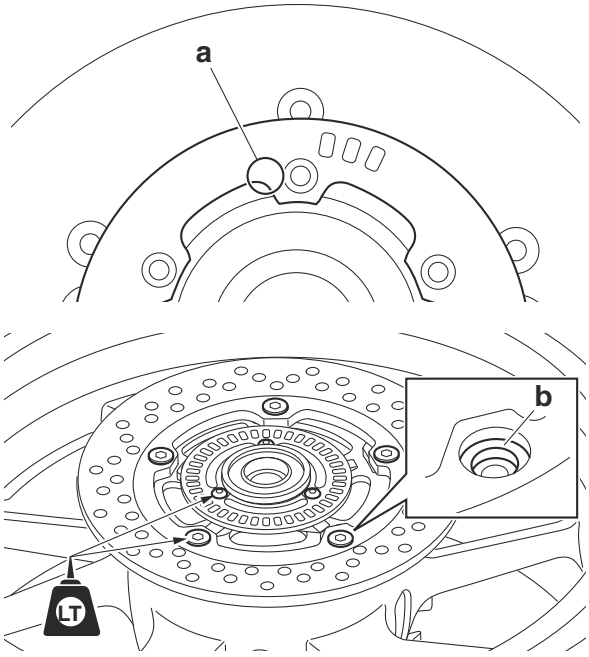
ECA21011

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.



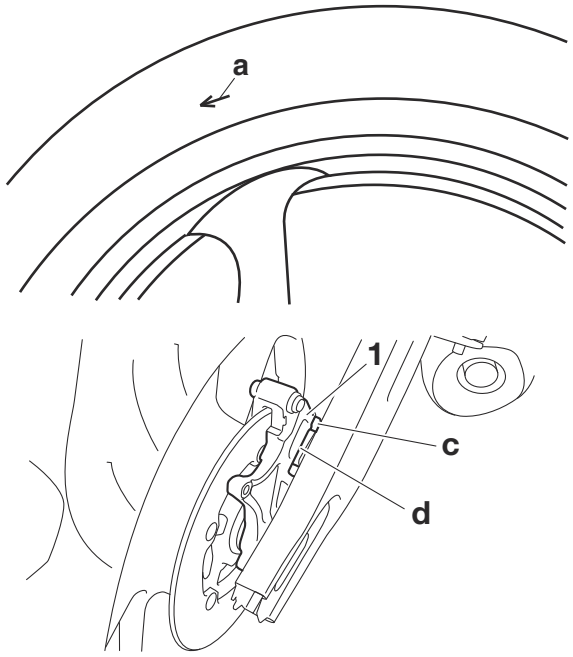
2. Install:
   • Rear wheel sprocket
   Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-25.
3. Check:
   • Rear brake disc
   Refer to "CHECKING THE REAR BRAKE DISC" on page 4-48.
4. Lubricate:
   • Oil seal lip

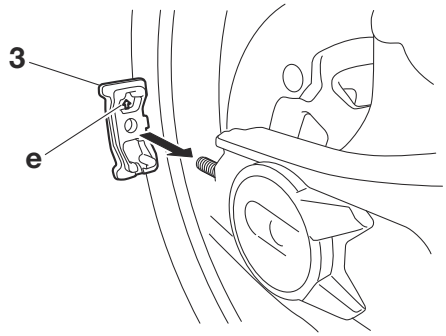
	Recommended lubricant **Lithium-soap-based grease**

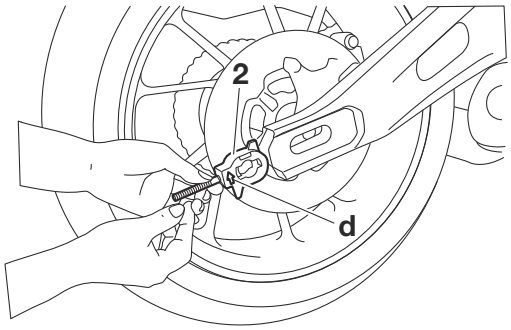
5. Install:
   • Collar (right)
   • Collar (left)
   • Brake caliper bracket "1"
   • Rear wheel
   • Chain puller "2"
   • Drive chain slack adjusting plate
   • Rear wheel axle
   • Washer
   • Wheel axle nut
   • Swingarm end plate "3"

TIP

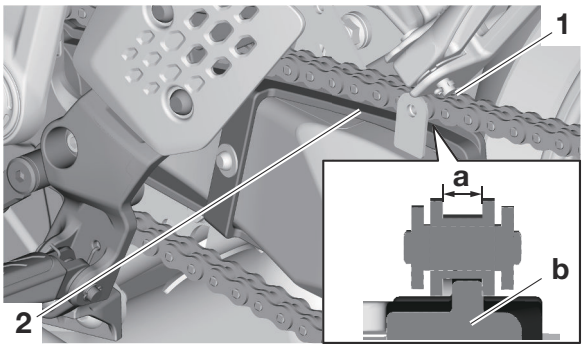
- Install the rear wheel with the mark "a" on the rear tire pointing in the direction of wheel rotation.
- Align the projection "b" on the swingarm with the slot "c" in the brake caliper bracket.
- Make sure that the arrow mark "d" on each chain puller points upward.
- Make sure that the arrow mark "e"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







6. Install:
   - Rear brake caliper
     Refer to "REAR BRAKE" on page 4-42.
   - 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)

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

Rear wheel axle nut
105 N·m (10.5 kgf·m, 77 lb·ft)

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.

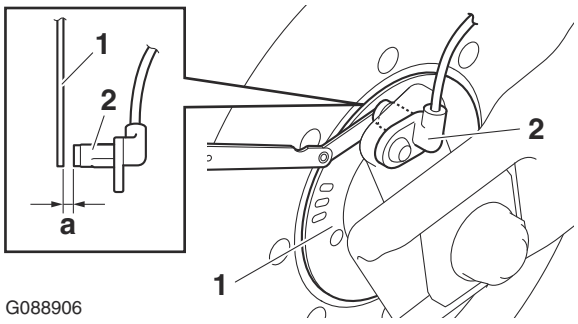
TIP
To route the rear wheel sensor lead, refer to "CABLE ROUTING" on page 2-13.

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)
0.72–1.48 mm (0.029–0.058 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.

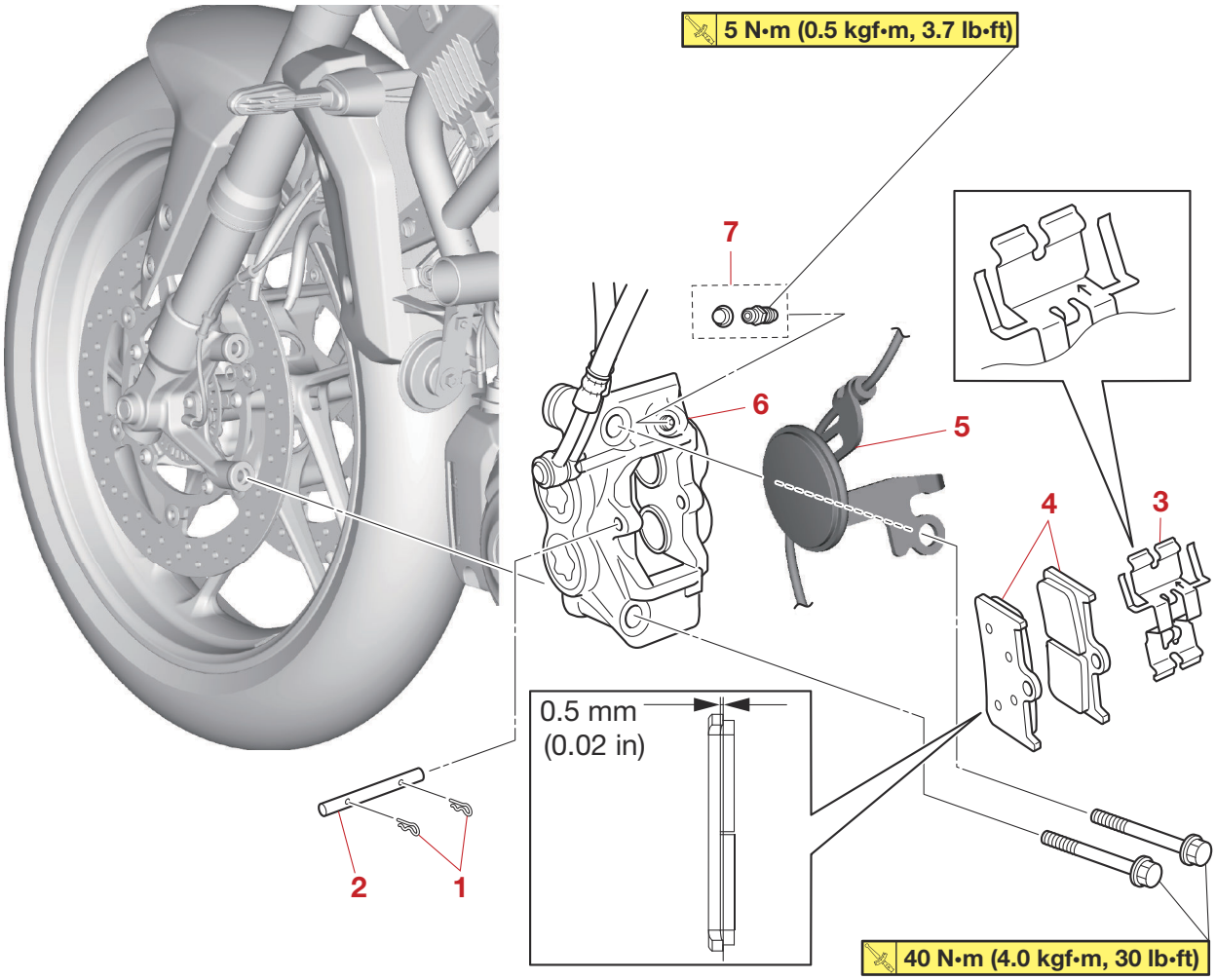
Thickness gauge
90890-03268
Feeler gauge set
YU-26900-9



G088906

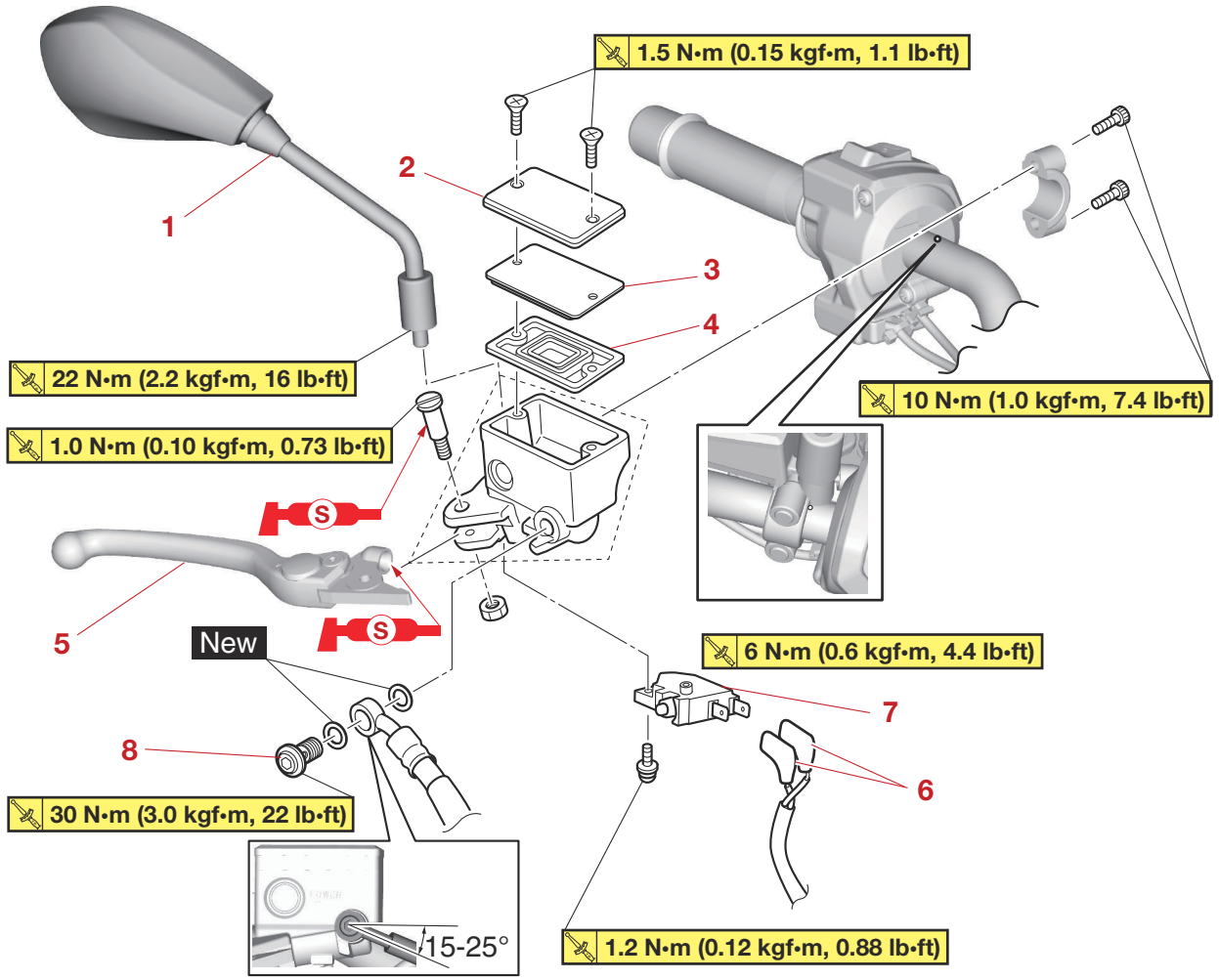
EAS20030
FRONT BRAKE

Removing the front brake pads



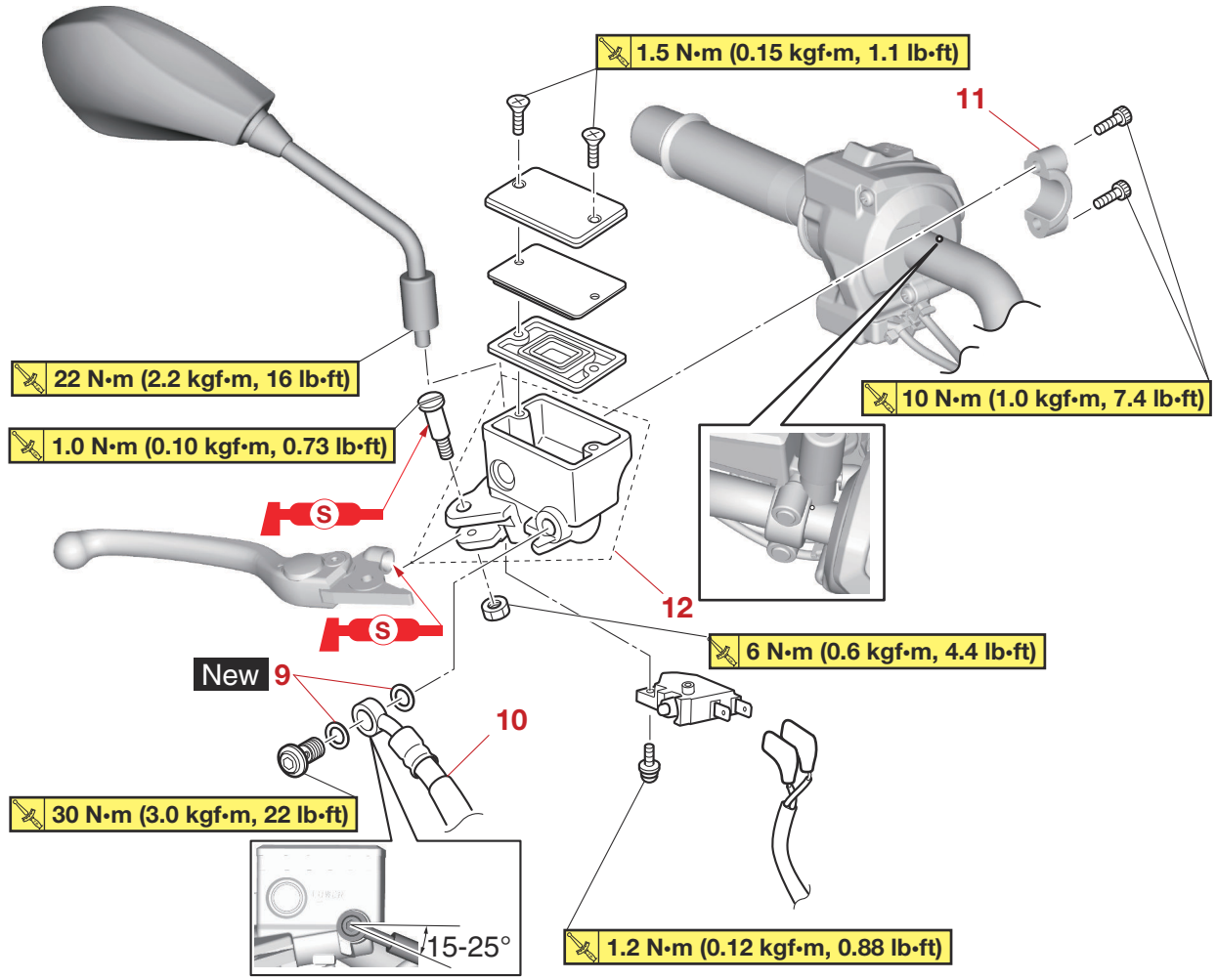
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front brake calipers.
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad spring	1	
4	Brake pad	2	
5	Reflector bracket	1	
6	Front brake caliper	1	
7	Bleed screw	1	

Removing the front brake master cylinder



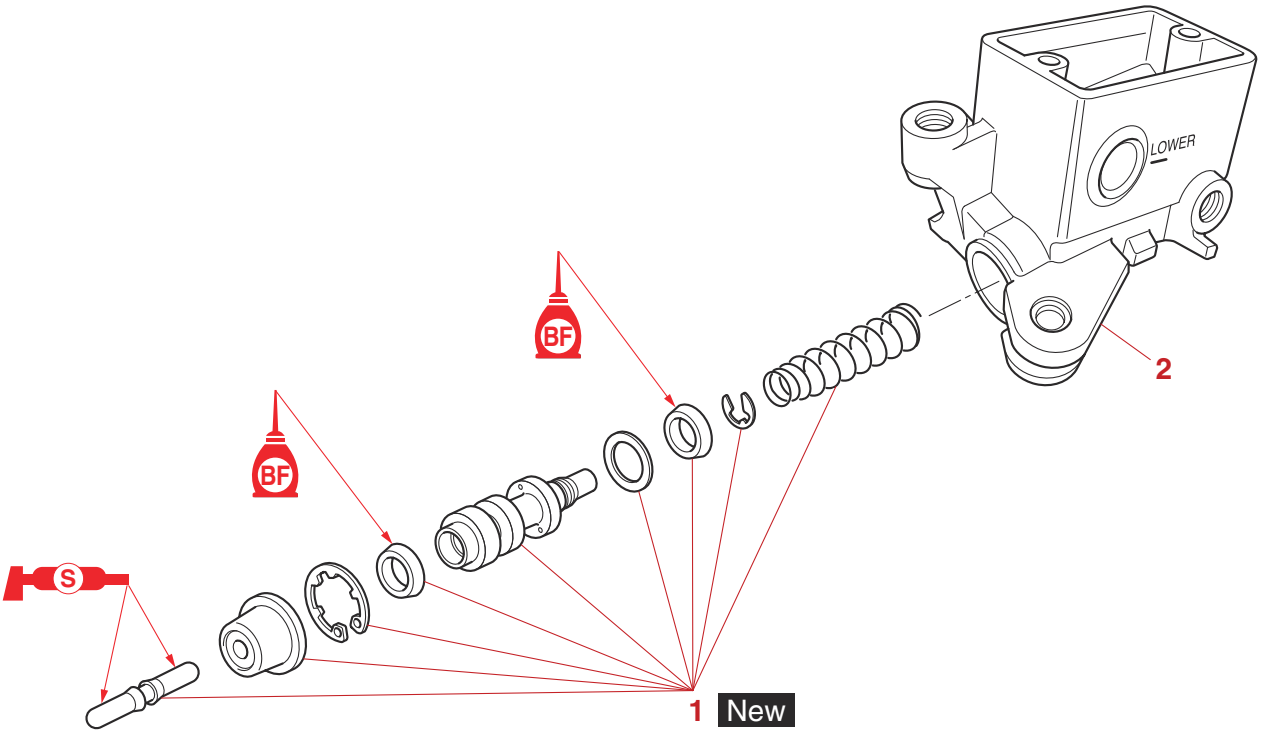
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.
1	Rearview mirror (right)	1	
2	Brake master cylinder reservoir cap	1	
3	Brake master cylinder reservoir diaphragm holder	1	
4	Brake master cylinder reservoir diaphragm	1	
5	Brake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

Removing the front brake master cylinder



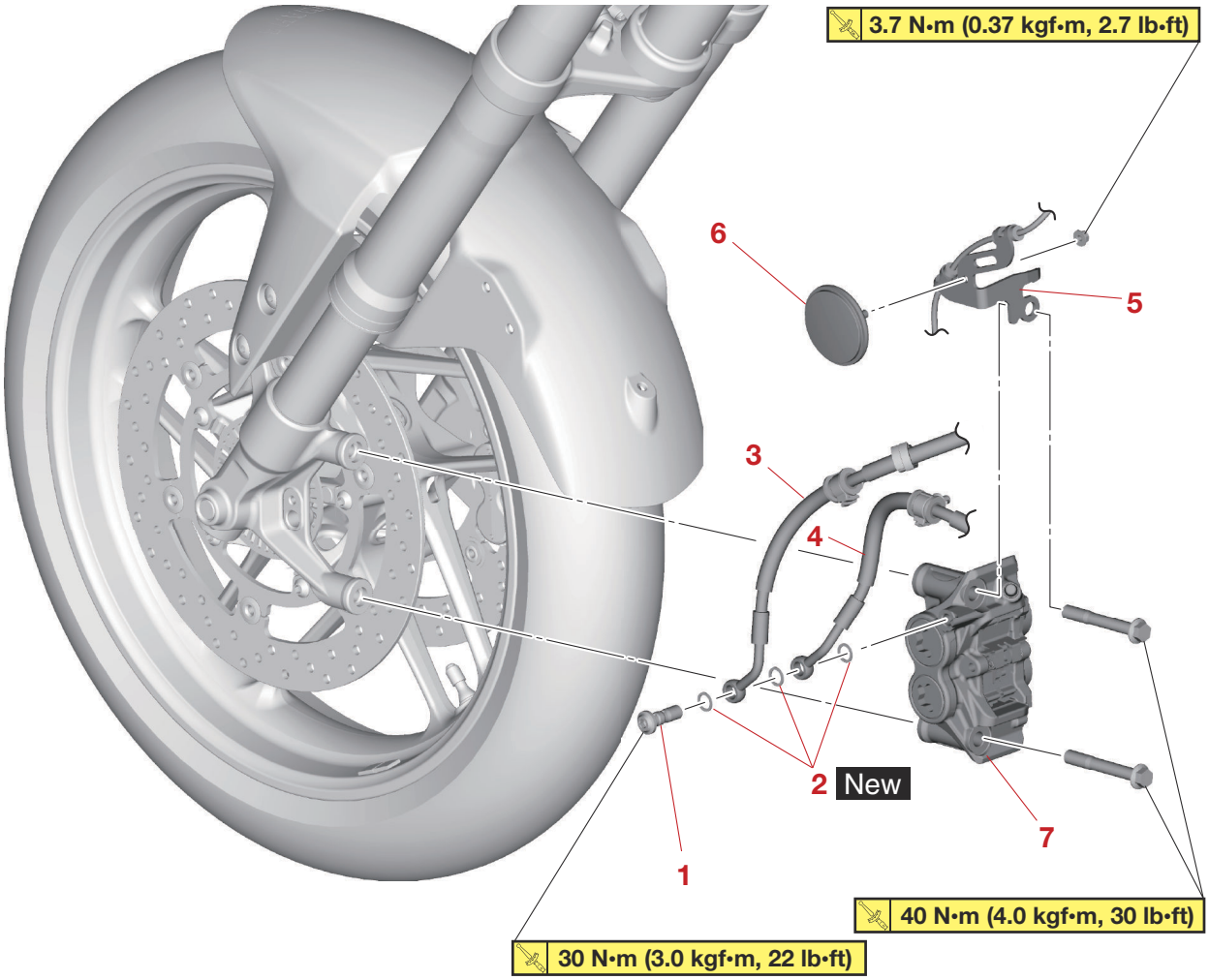
Order	Job/Parts to remove	Q'ty	Remarks
9	Brake hose gasket	2	
10	Brake hose (front brake master cylinder to hydraulic unit)	1	
11	Front brake master cylinder holder	1	
12	Front brake master cylinder assembly	1	

Disassembling the front brake master cylinder



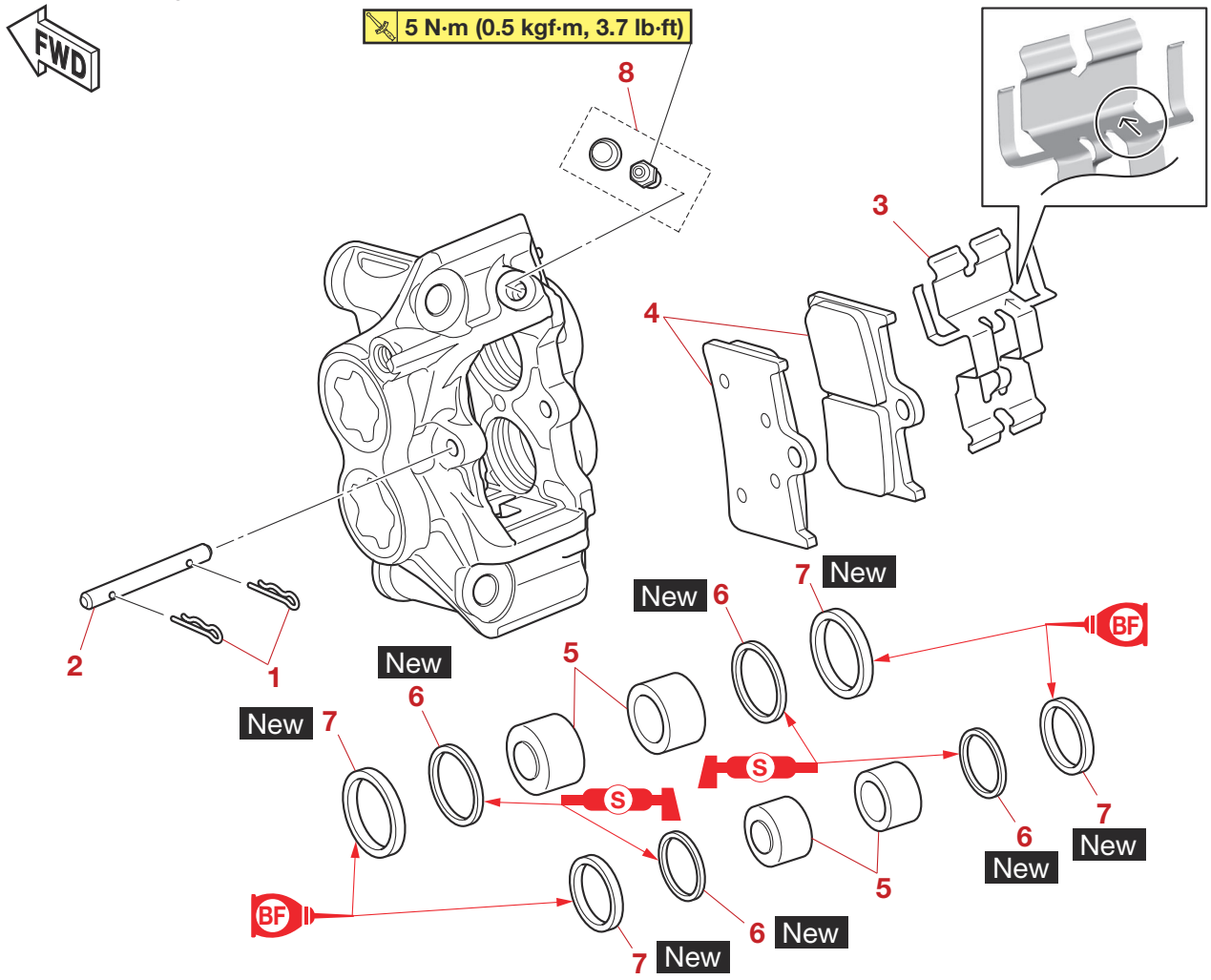
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Brake master cylinder body	1	

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	3	
3	Brake hose (hydraulic unit to front brake caliper (left))	1	
4	Brake hose (front brake caliper (left) to front brake caliper (right))	1	
5	Front reflector bracket	1	
6	Front reflector	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	Bleed screw	1	

EAS30168
INTRODUCTION
EWA14101
⚠ WARNING

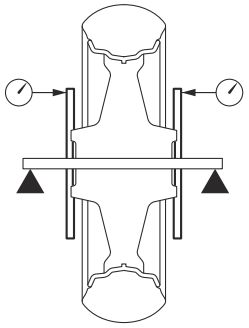
Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:
- **Never disassemble brake components unless absolutely necessary.**
- **If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, 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 runout
     Out of specification → Replace.

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


G088908

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 4-14.

Front brake disc bolt
18 N·m (1.8 kgf·m, 13 lb·ft)
LOCTITE®

ECA19150
NOTICE

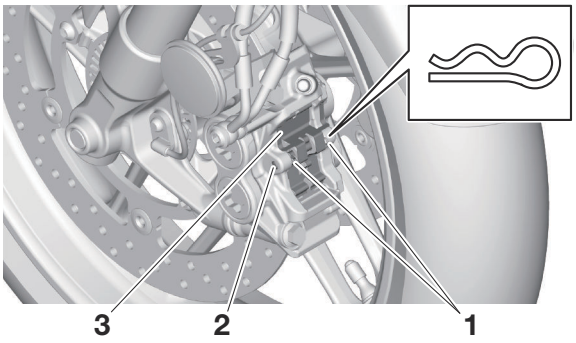
Replace the brake disc bolts with new ones.

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

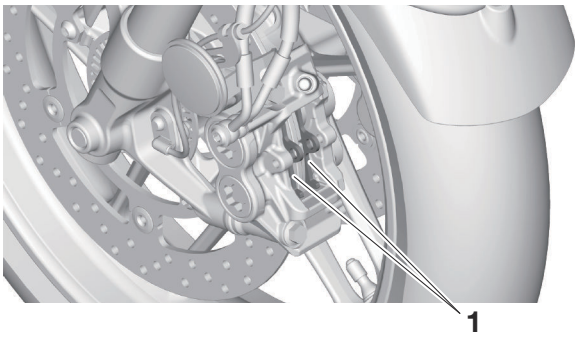
EAS30170
REPLACING THE FRONT BRAKE PADS
The following procedure applies to both brake calipers.

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"

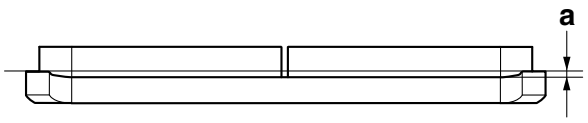


2. Remove:
   • Brake pad "1"



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)

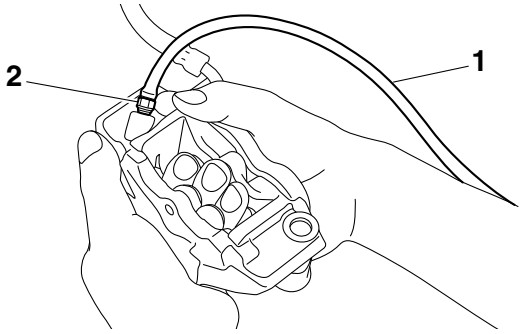


4. Remove:
   • Brake caliper bolt
5. Install:
   • Brake pad
   • Brake pad spring

TIP

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

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



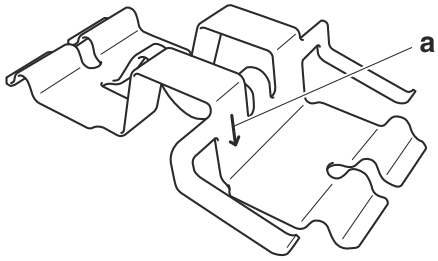
   c. Tighten the bleed screw.

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

   d. Install the brake pads and brake pad spring.

TIP

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



6. Install:
   • Brake pad pin
   • Brake pad clip
   • Front brake caliper

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

7. 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.
8. 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.

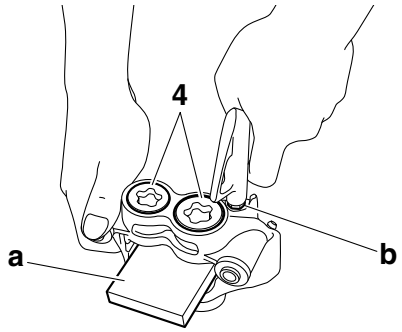
TIP
Before removing the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:
   - Brake hose union bolt
   - Brake hose gasket
   - Brake hose

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 passages (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
EWA16560
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" (temporarily)
   - Brake hose gasket **New**
   - Brake hose "2"
   - Brake hose union bolt "3"

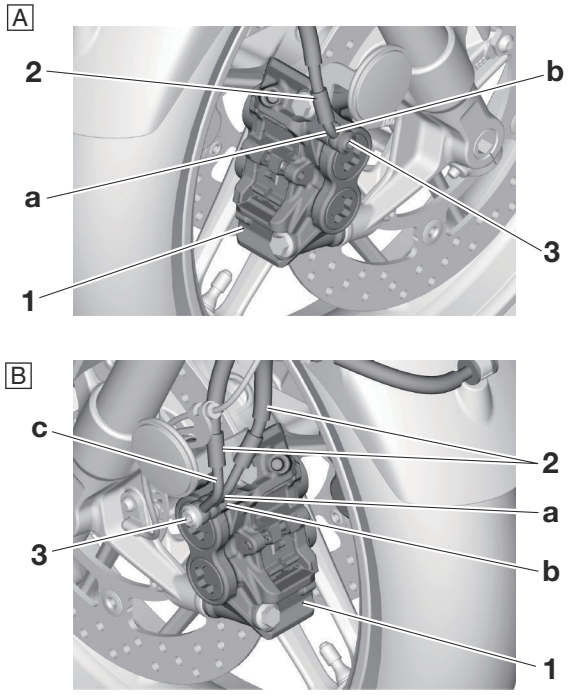
	Front brake hose union bolt 30 N·m (3.0 kgf·m, 22 lb·ft)

EWA13531
⚠ WARNING

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

ECA21410
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.**
- **Install the brake pipe "c" so that it is aligned with the brake pipe "a".**



A. Right side
B. Left side

2. Remove:
   - Front brake caliper

3. Install:
   - Brake pad
   - Brake pad spring
   - Brake pad pin
   - Brake pad clip
   - Front brake caliper

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

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

4. 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.

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 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

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

EAS30725
CHECKING THE FRONT BRAKE MASTER CYLINDER

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

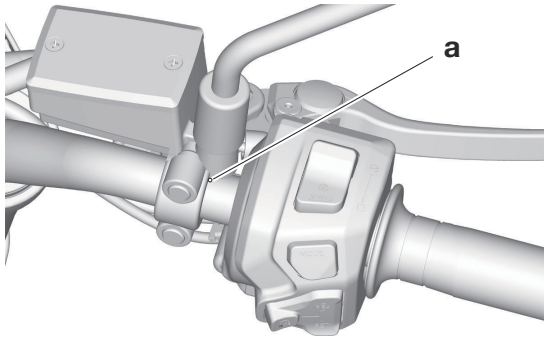
	Specified brake fluid **DOT 4**

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
- Align the extension of division surface of the between master cylinder assembly and brake master cylinder holder with the punch mark "a" 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.



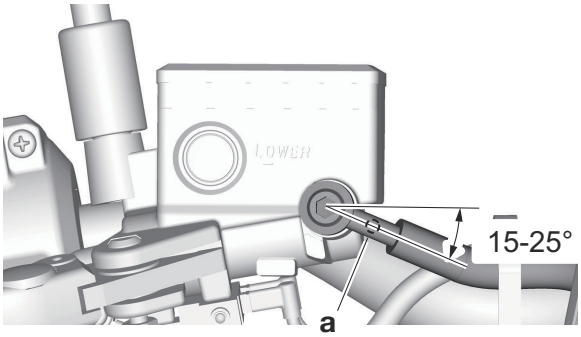
2. Install:
   - Brake hose (front brake master cylinder to hydraulic unit)
   - Brake hose gasket New
   - Brake hose union bolt

	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

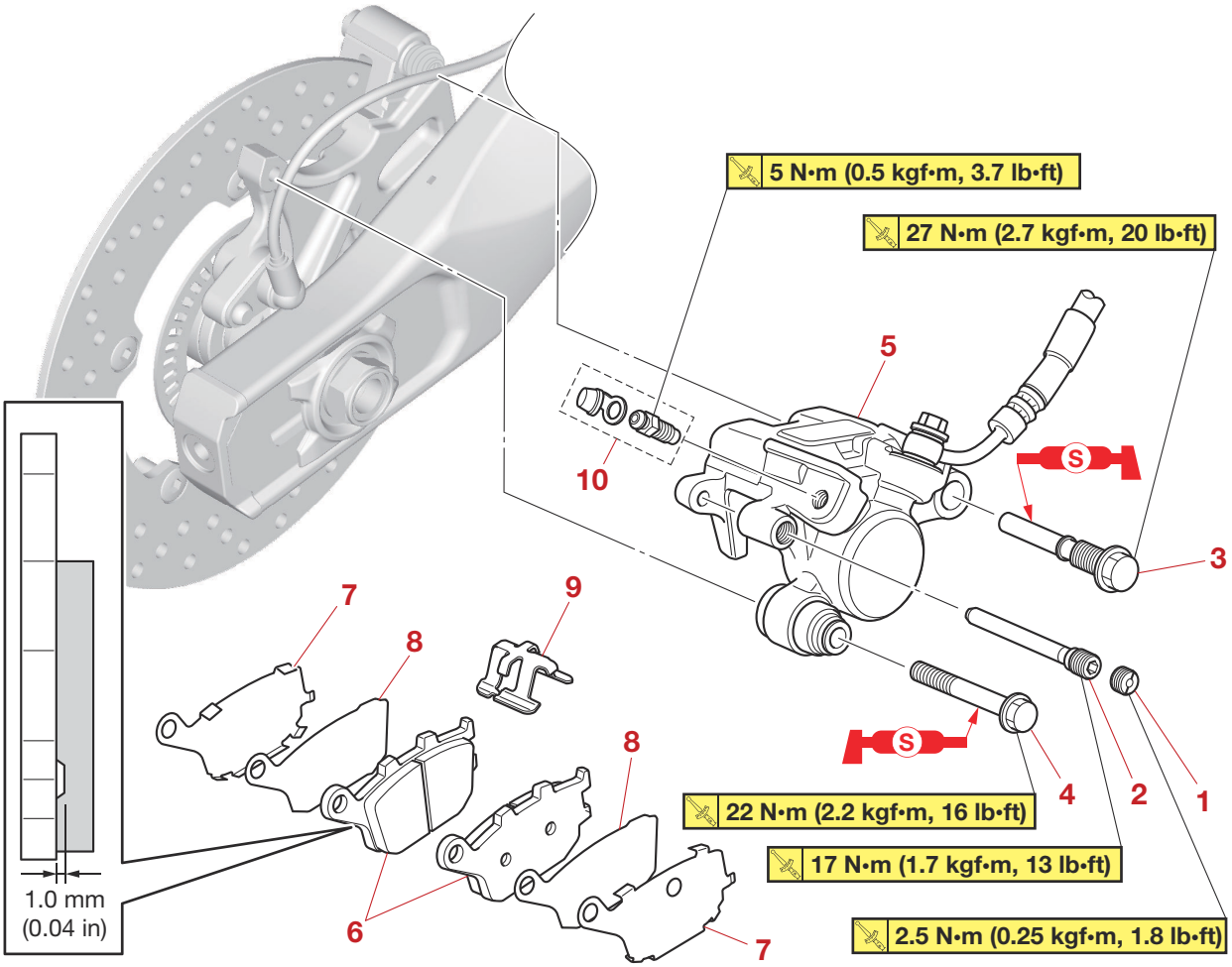
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

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

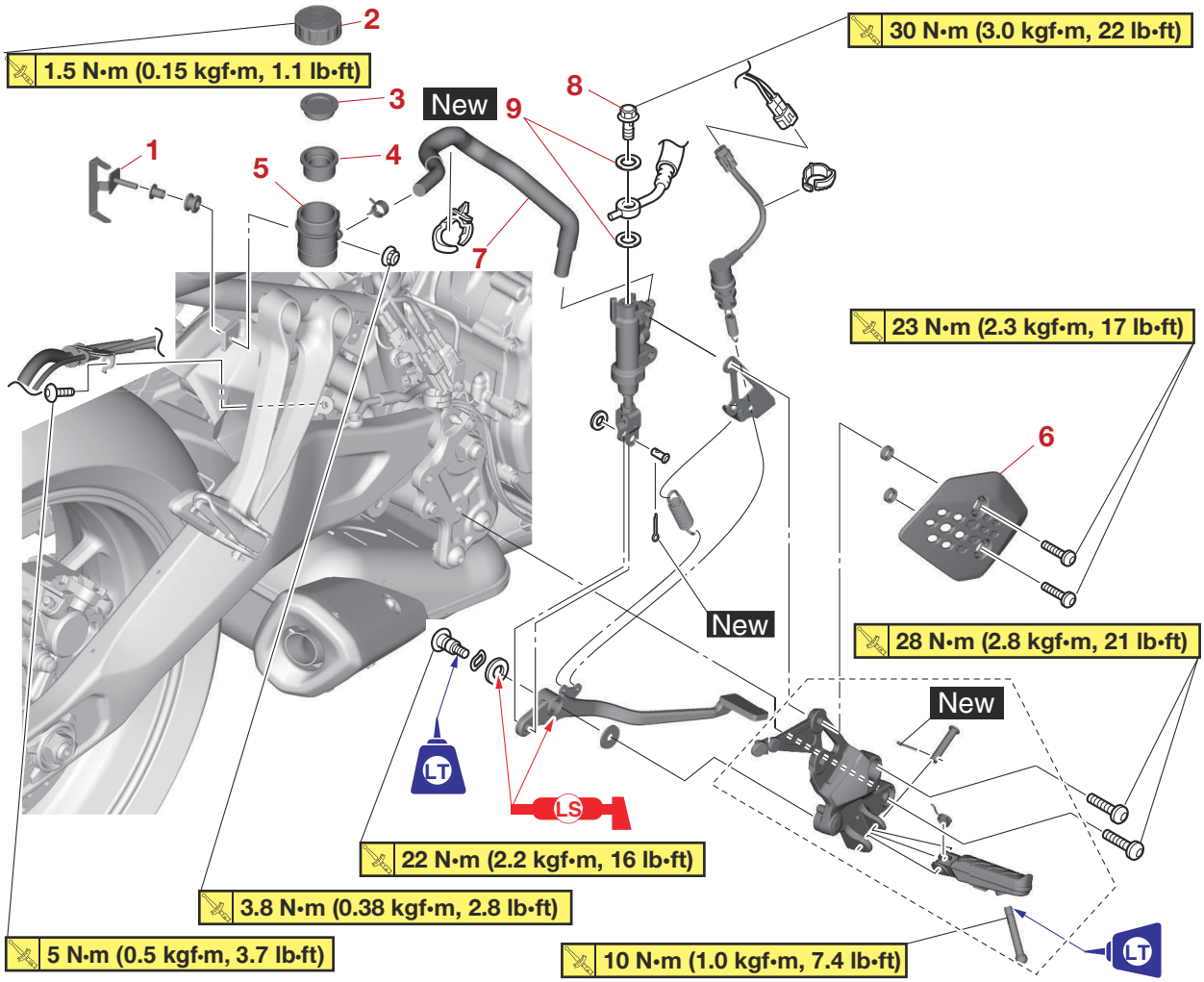
REAR BRAKE

Removing the rear brake pads



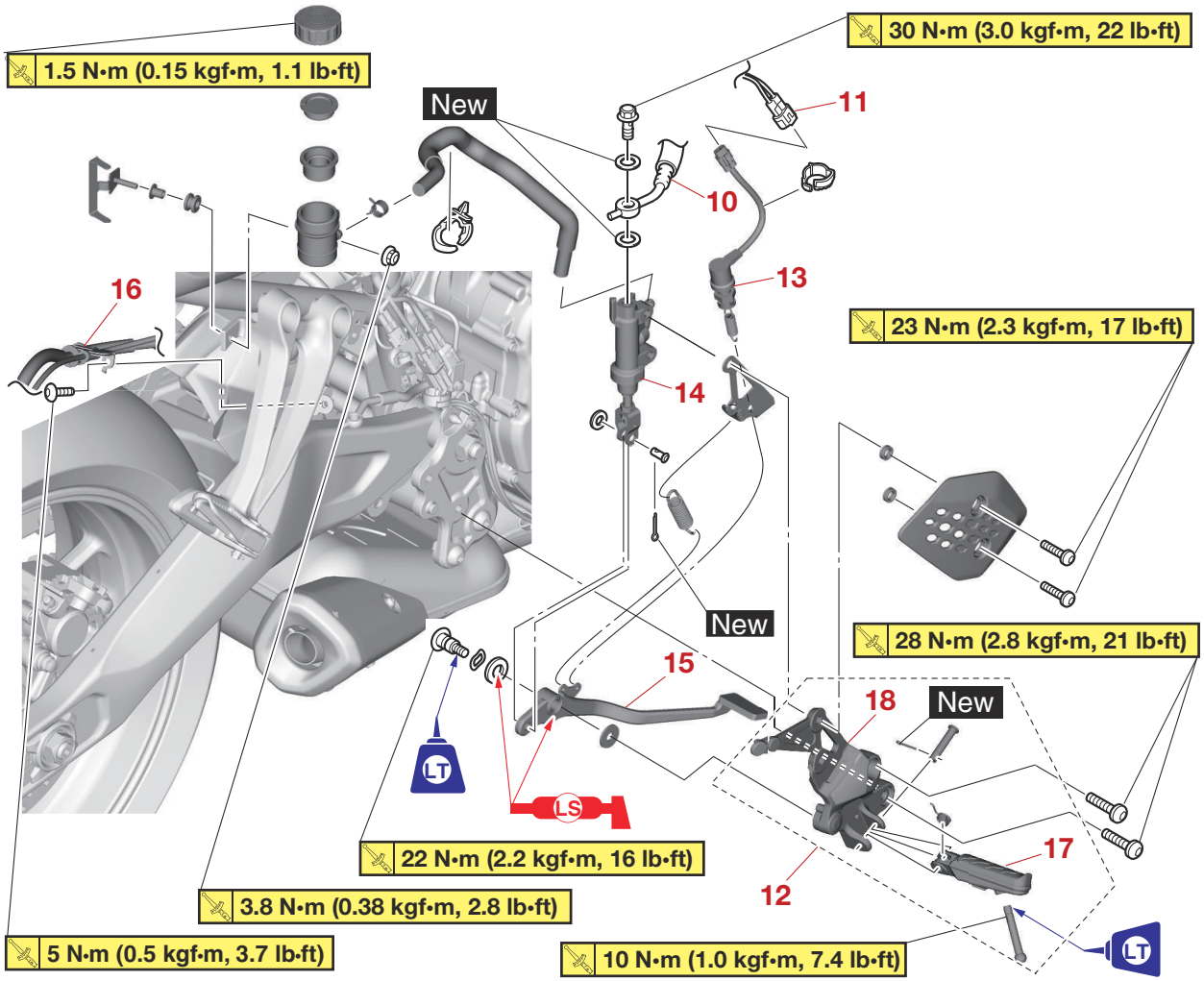
Order	Job/Parts to remove	Q'ty	Remarks
1	Screw plug	1	
2	Brake pad retaining bolt	1	
3	Rear brake caliper retaining bolt	1	
4	Rear brake caliper bolt	1	
5	Rear brake caliper	1	
6	Brake pad	2	
7	Brake pad shim	2	
8	Brake pad insulator	2	
9	Brake pad spring	1	
10	Brake caliper bleed screw	1	

Removing the rear brake master cylinder



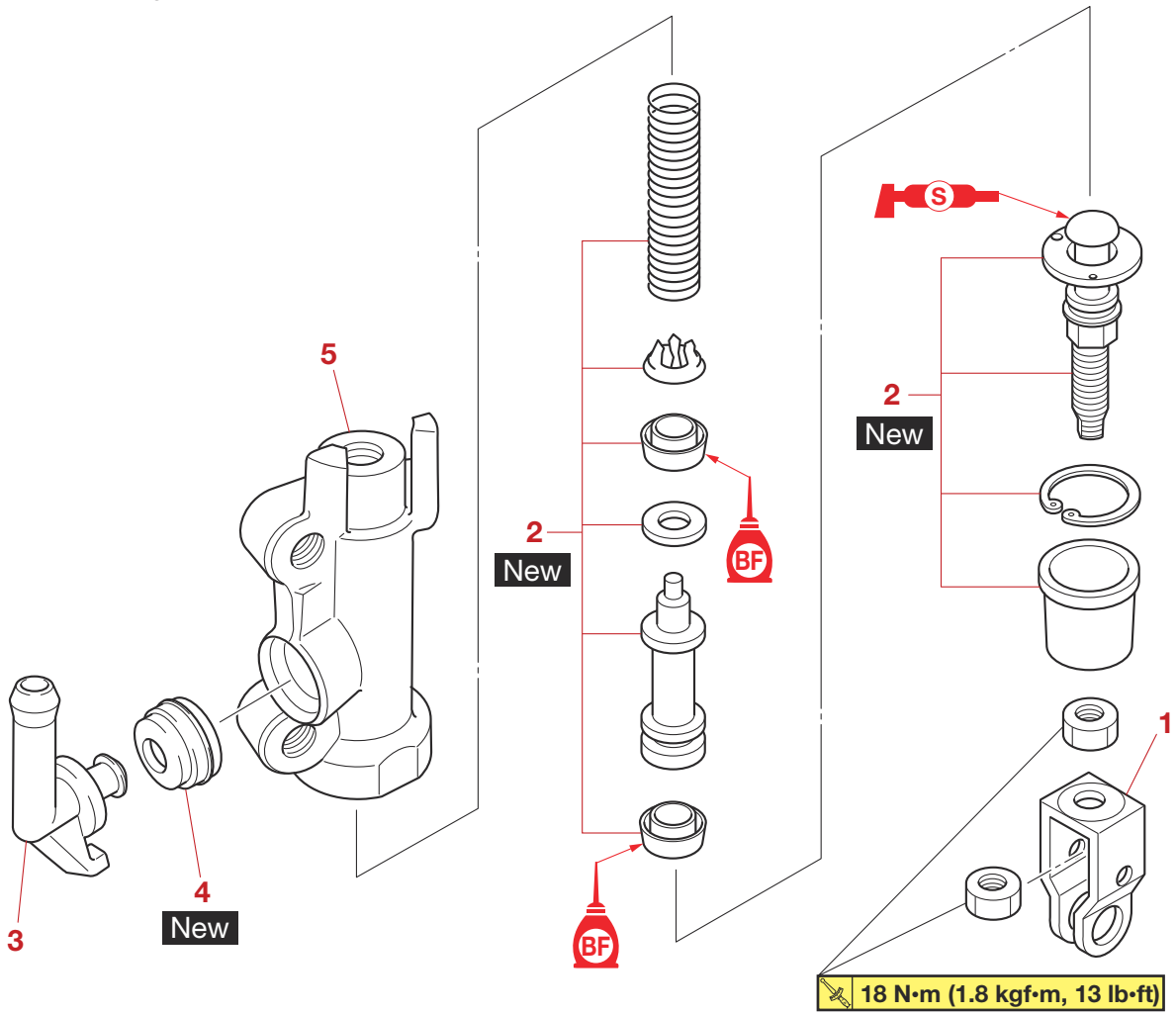
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-14.
1	Brake fluid reservoir holder	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6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

Removing the rear brake master cylinder



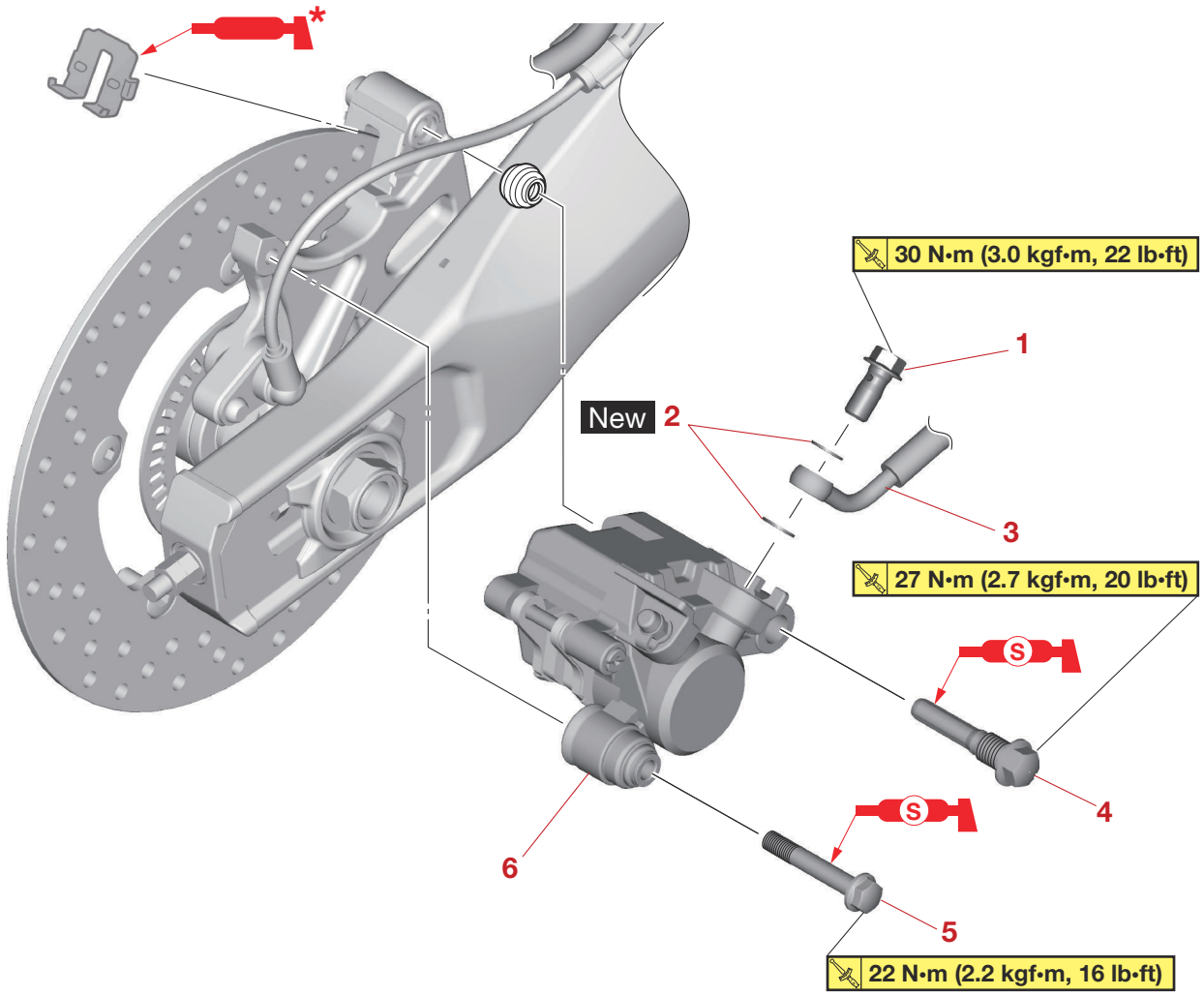
Order	Job/Parts to remove	Q'ty	Remarks
10	Brake hose (rear brake master cylinder to hydraulic unit)	1	Disconnect.
11	Rear brake light switch coupler	1	Disconnect.
12	Footrest assembly (right)	1	
13	Rear brake light switch	1	
14	Rear brake master cylinder	1	
15	Brake pedal	1	
16	Rear brake hose/rear wheel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

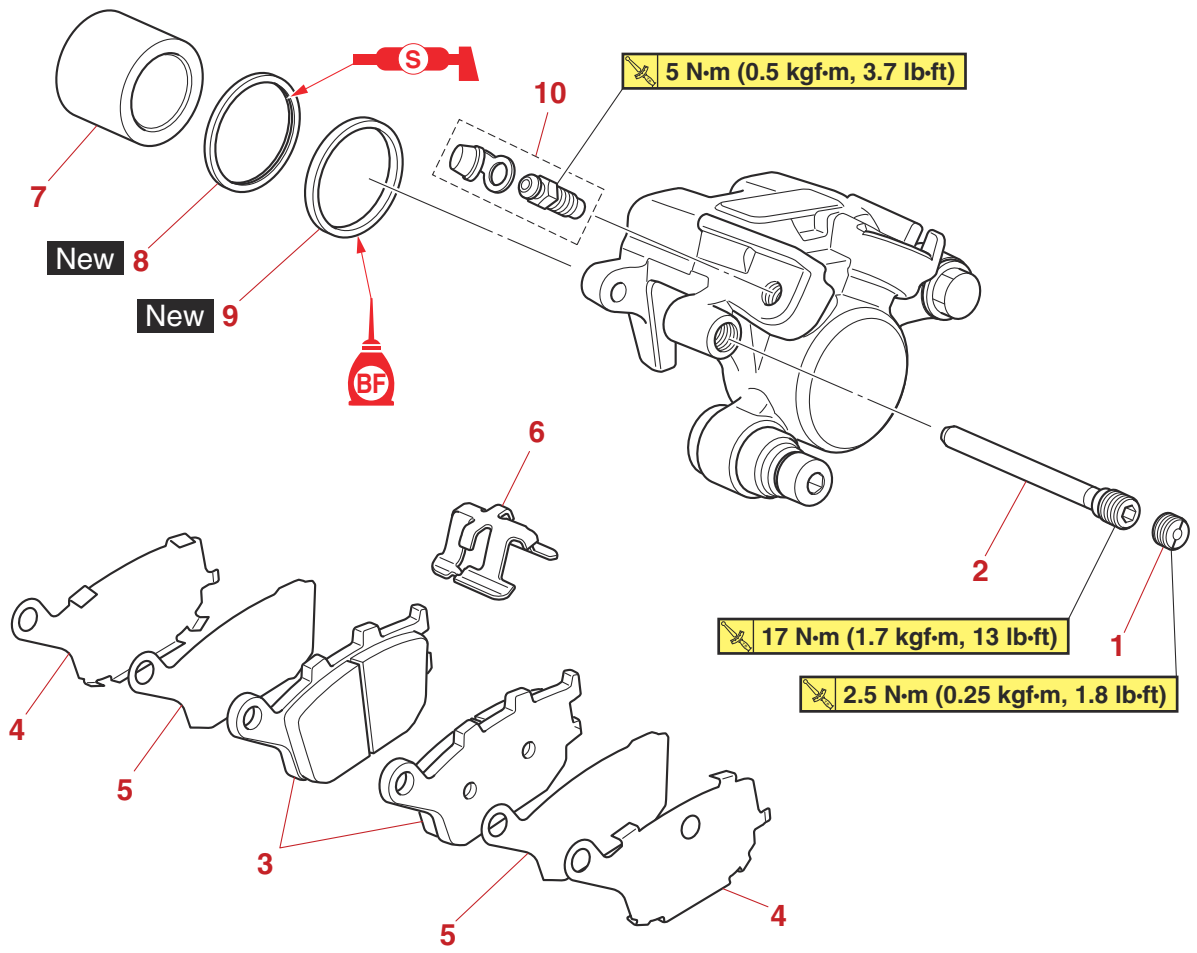
Removing the rear brake caliper



*** Three Bond No. 1521.**

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 4-21.
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 4-36.

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 4-36.

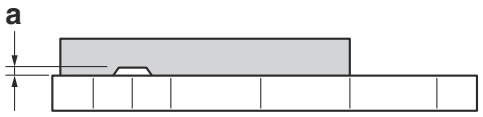
Brake disc thickness limit
4.5 mm (0.18 in)

5. Replace:
   - Brake disc
     Refer to "REAR WHEEL" on page 4-21.
6. Install:
   - Rear wheel
     Refer to "REAR WHEEL" on page 4-21.

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.

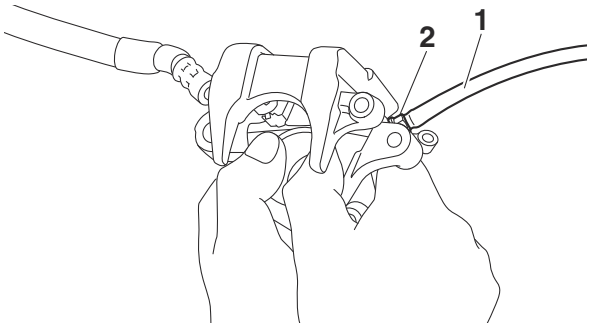
Brake pad lining thickness limit
1.0 mm (0.04 in)



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

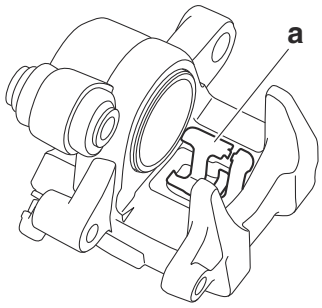
NOTICE

- **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)** **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

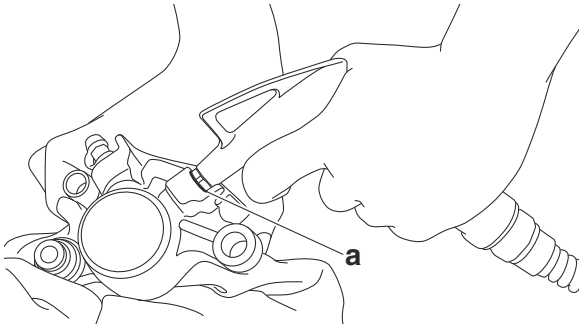
   a. Blow compressed air into the brake hose joint opening "a" to force out the piston from the brake caliper.

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

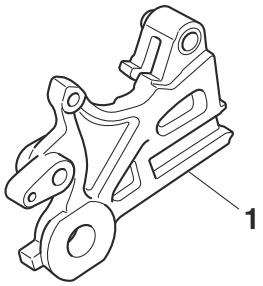
Recommended brake component replacement schedule	
Brake pads	If necessary
Piston seal	Every two years
Piston dust seal	Every two years
Brake hoses	Every four years
Brake fluid	Every two years and whenever the brake is disassembled

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 4-21.



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)

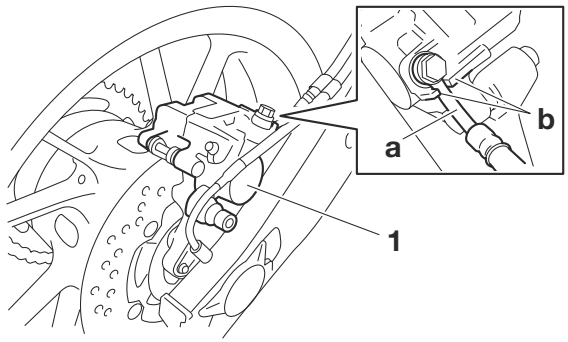
EWA13531
WARNING

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.

TIP
Apply Three Bond No. 1521 onto the mating surfaces of the brake caliper bracket and brake caliper bracket retainer.



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 4-48.

Rear brake caliper bolt
22 N·m (2.2 kgf·m, 16 lb·ft)
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
   - Brake fluid reservoir diaphragm holder
     Cracks/damage → Replace.
   - Brake fluid reservoir diaphragm
     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

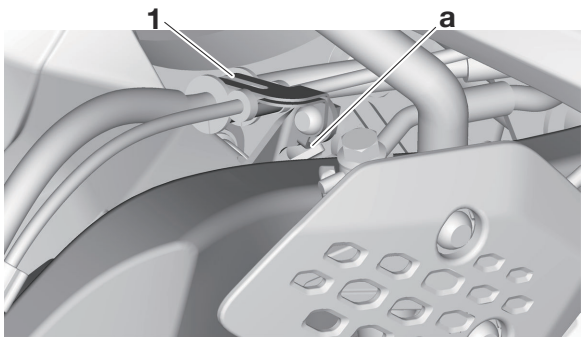
1. Install:
   - Brake master cylinder kit New

EAS30196
INSTALLING THE REAR BRAKE MASTER CYLINDER

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

TIP
Make sure that the projection "a" on the rear brake hose/lead holder contacts the swingarm.

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

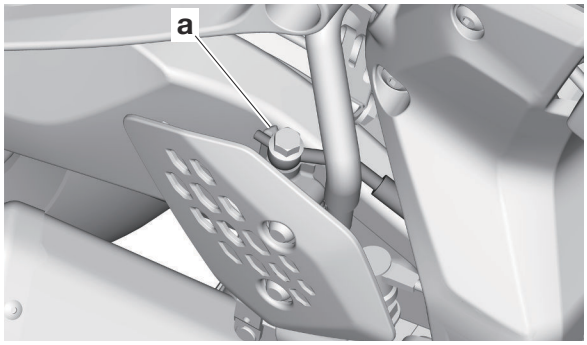
Rear brake hose union bolt
30 N·m (3.0 kgf·m, 22 lb·ft)

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

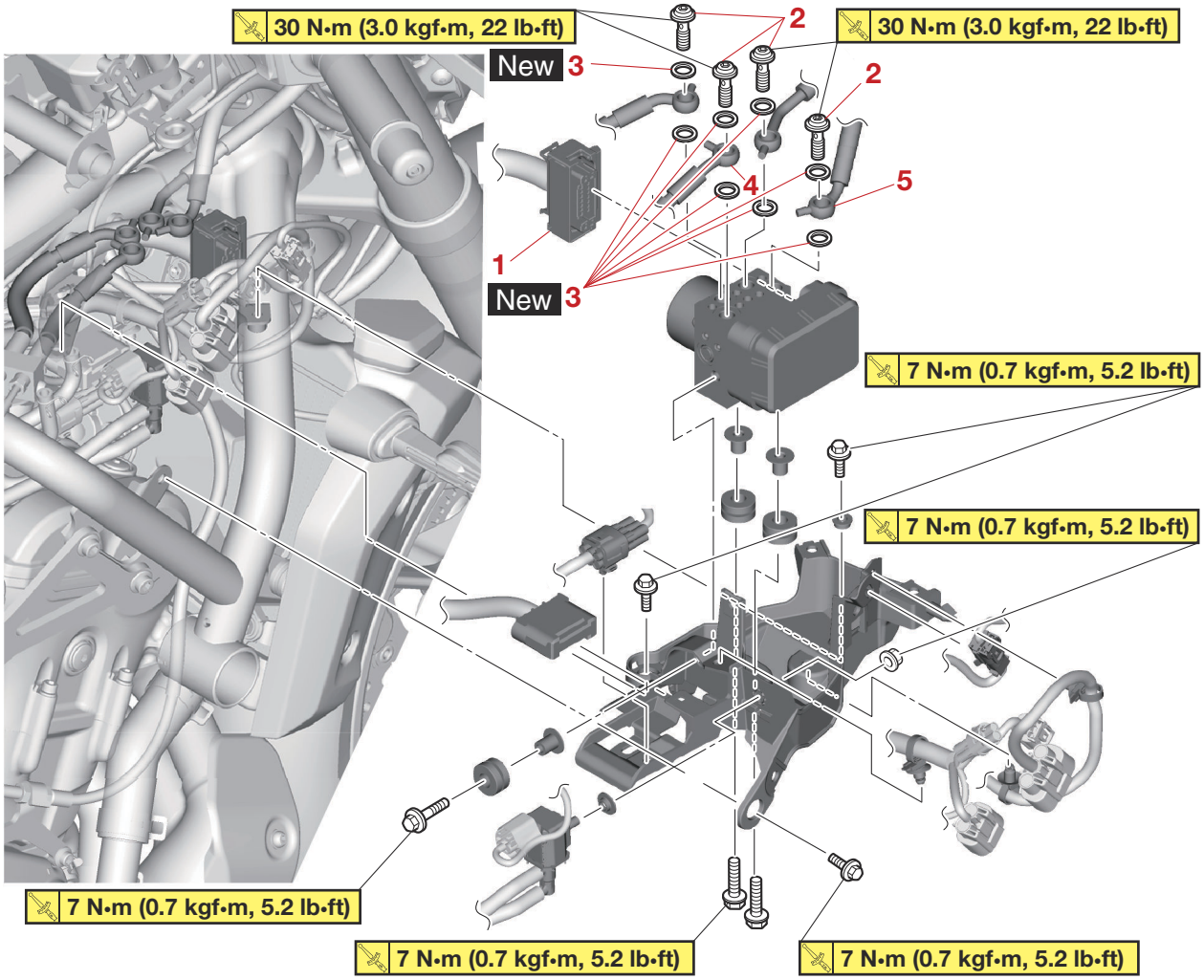
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

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 3-25.

EAS20032

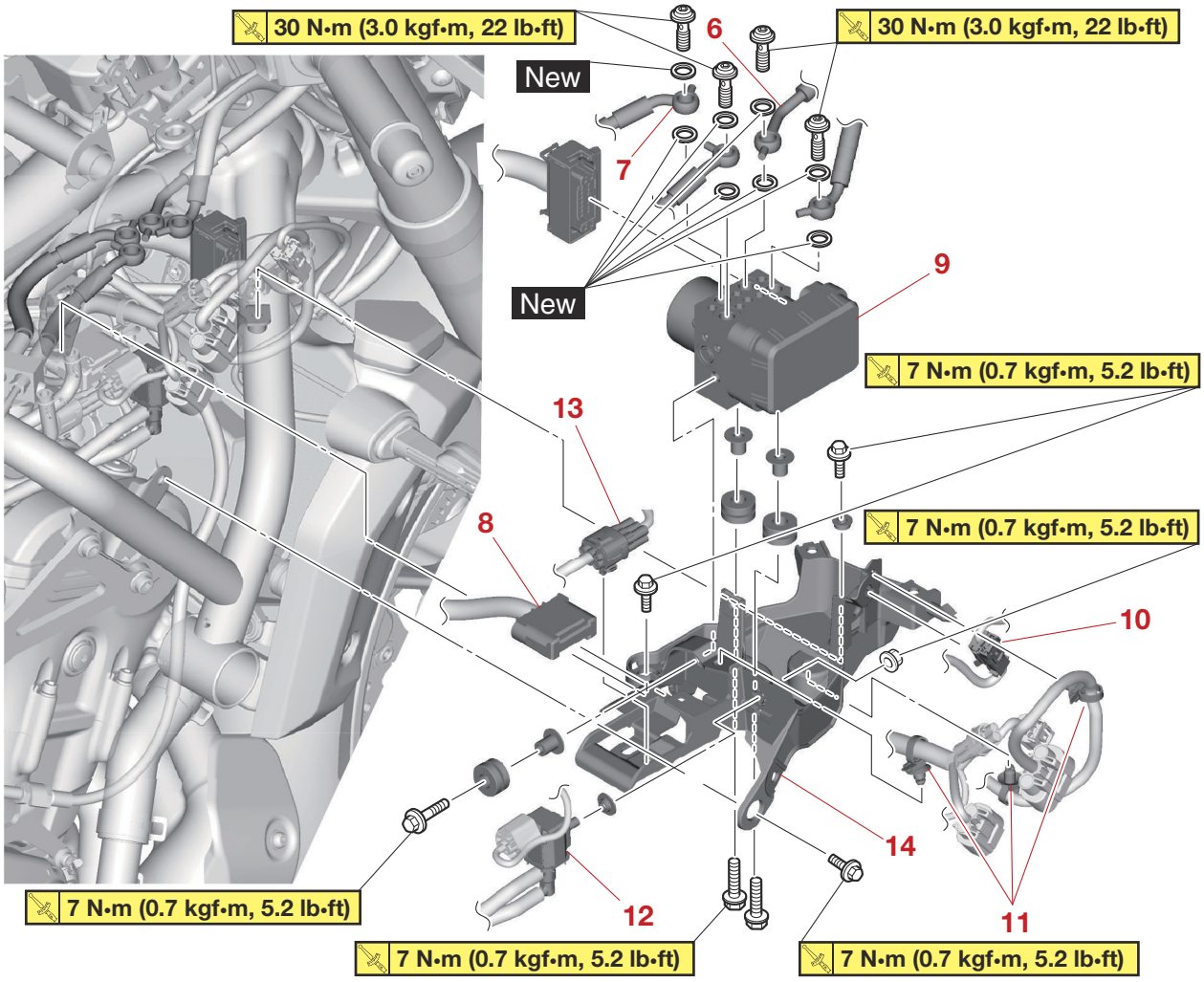
ABS (ANTI-LOCK BRAKE SYSTEM)

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 4-9.
	GCU (Generator Control Unit)		Refer to "GENERAL CHASSIS (4)" on page 4-9.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	ABS ECU coupler	1	
2	Brake hose union bolt	4	
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.

Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
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	Joint coupler	1	
9	Hydraulic unit assembly	1	
10	Front turn signal/position light coupler (right)	1	
11	Wire harness clamp	3	
12	Purge cut valve solenoid	1	For California only
13	Coolant temperature sensor coupler	1	
14	Electrical components tray 2	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.

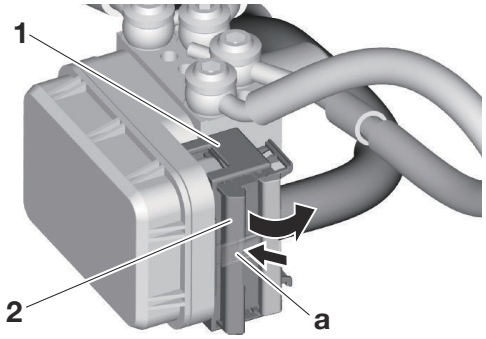
ECA18241
NOTICE

- **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

While pushing the portion "a" of the ABS ECU coupler, pull the lock lever "2" up to release the lock.



2. Remove:
   - Brake hose

TIP

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

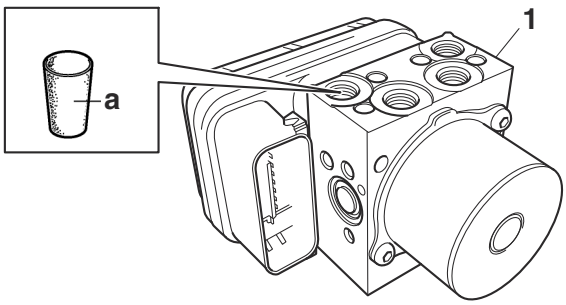
ECA14530
NOTICE

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

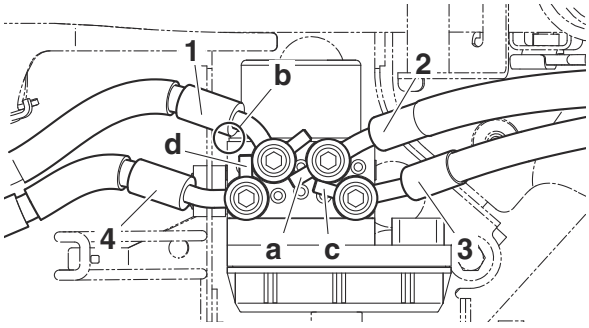
If the brake hose union bolt does not turn easily, replace the hydraulic unit assembly, brake hoses, and related parts as a set.

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.

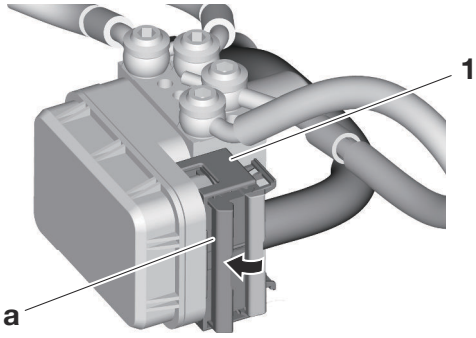
d. Position the brake hose (hydraulic unit to front brake caliper (left)) "3" so that its projection "c" contacts the brake hose (front brake master cylinder to hydraulic unit) "2", and then temporarily tighten the union bolt for the brake hose (hydraulic unit to front brake caliper (left)).
e. Position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



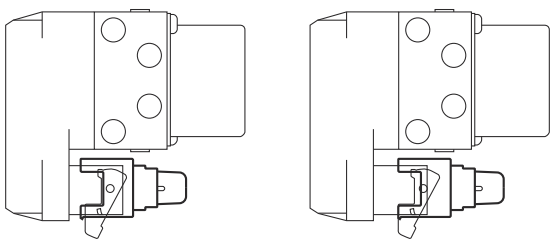
4. Connect:
   - ABS ECU coupler "1"

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 B



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 4-58.)

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 FAULT CODES" on page 9-30.)
9. Perform a trial run. (Refer to "CHECKING THE ABS WARNING LIGHT" on page 4-61.)

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

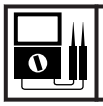
WARNING

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 YDT.
- 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. Removing the protective cap, and then connect the YDT to the YDT coupler (6P).
   Refer to "YDT" on page 9-2.

Yamaha diagnostic tool USB (US)
90890-03275
Yamaha diagnostic tool (A/I)
90890-03273

TIP

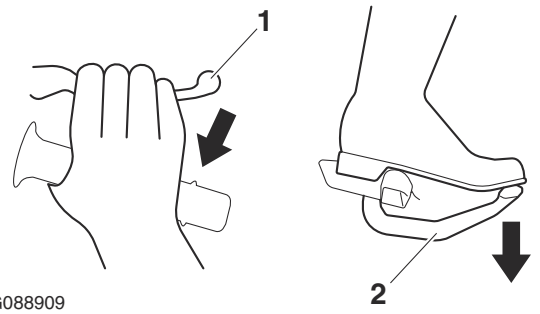
- Yamaha diagnostic tool (A/I) (90890-03273) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/

l) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

6. Start the YDT and display the diagnosis of function screen.
7. Select the "ABS".
8. Select code No. 2, "Brake line routing confirmation".
9. Click "Actuator Check", and then operate the brake lever "1" and brake pedal "2" simultaneously.

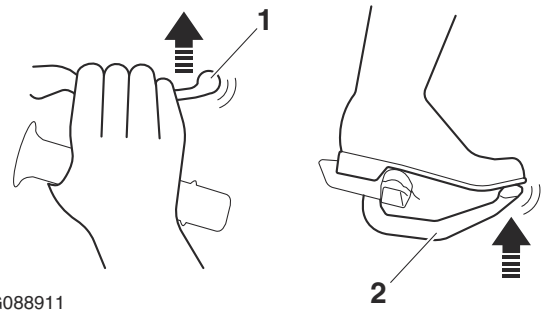
TIP

- 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

10. 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.**

11. 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 YDT. For more information, refer to the operation manual of the YDT.
- 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.

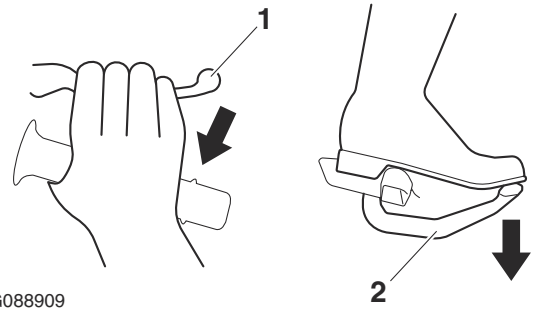
5. Removing the protective cap, and then connect the YDT to the YDT coupler (6P).
   Refer to "YDT" on page 9-2.

Yamaha diagnostic tool USB (US)
90890-03275
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.

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

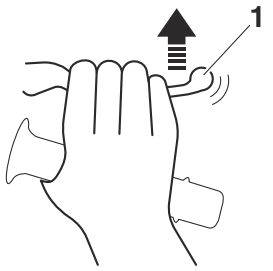
TIP
- The hydraulic unit operates 1 second after the brake lever and brake pedal are operated simultaneously and continues for approximately 5 seconds.
- The operation of the hydraulic unit can be confirmed using the indicator.
  On: The hydraulic unit is operating.
  Flashing: The conditions for operating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



G088909

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

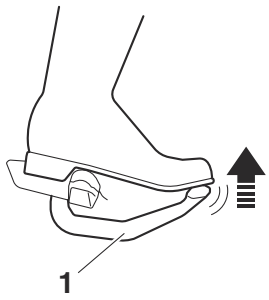
TIP
- The reaction-force pulsating action consists of quick pulses.
- Be sure to continue operating the brake lever and brake pedal even after the pulsating action has stopped.
- "ON" and "OFF" on the tool screen indicate when the brakes are being applied and released respectively.



G088913

11. 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

12. 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.

13. Turn the main switch to “OFF”.
14. Disconnect the YDT from the YDT coupler, and then install the protective cap.
15. Turn the main switch to “ON”.
16. Set the start/engine stop switch to “ ”.
17. Check for brake fluid leakage around the hydraulic unit.
    Brake fluid leakage → Replace the hydraulic unit, brake hoses, and related parts as a set.
18. If the operation of the hydraulic unit is normal, delete all of the fault code.

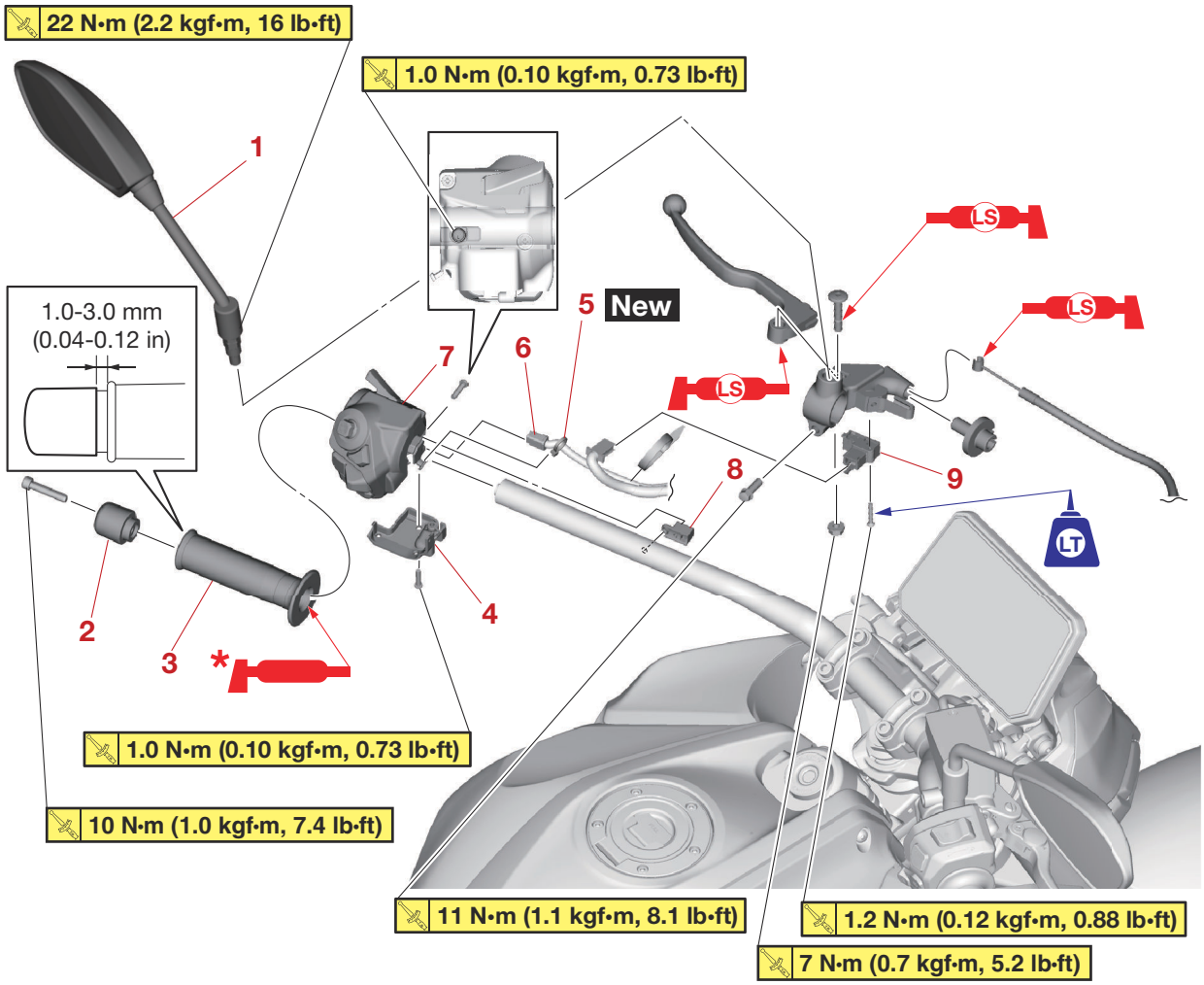
EAS31041

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 5 km/h (3 mi/h) or performing a trial run.

EAS20033
HANDLEBAR

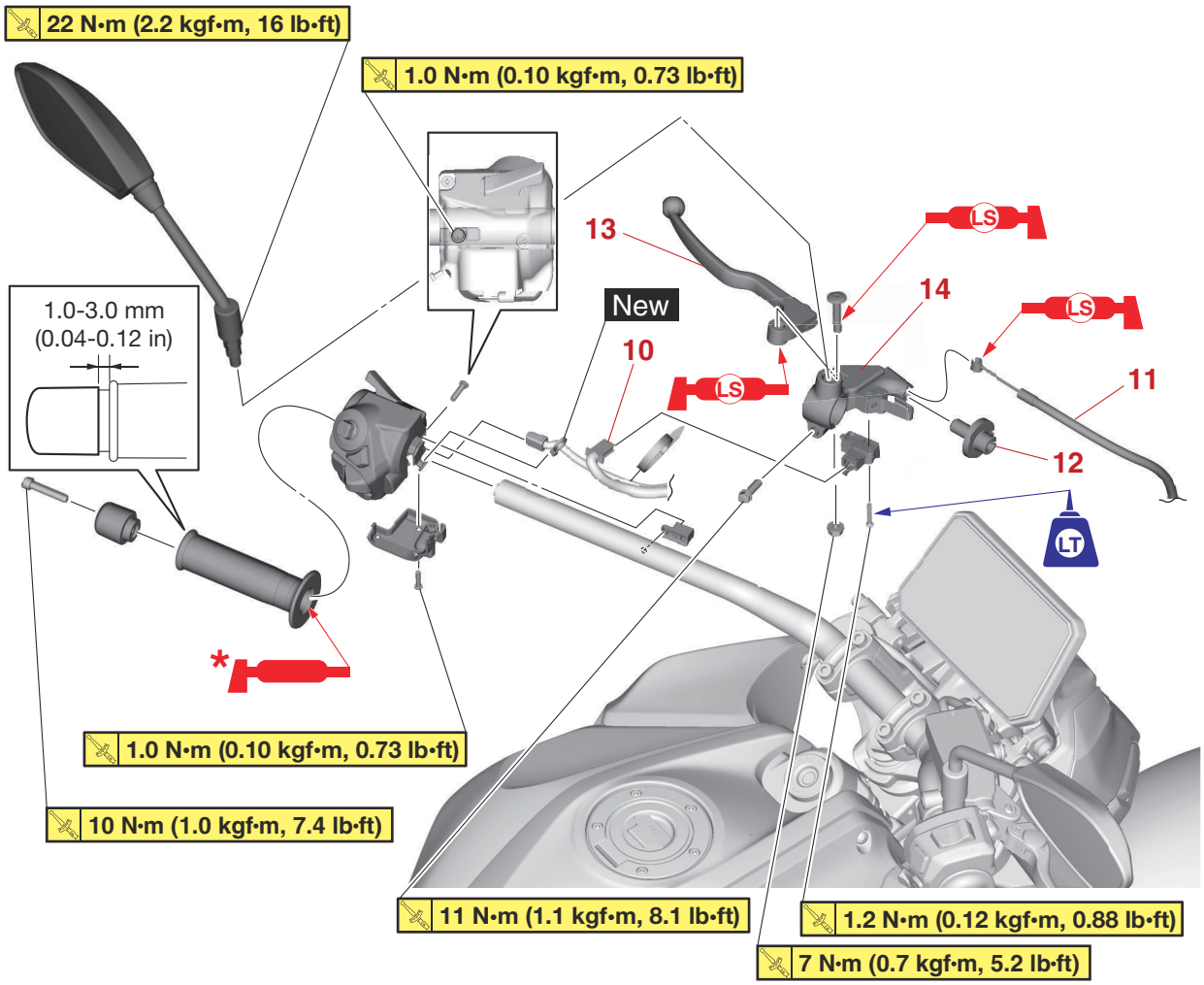
Removing the clutch lever and handlebar switch (left)



*** Rubber adhesive**

Order	Job/Parts to remove	Q'ty	Remarks
1	Rearview mirror (left)	1	
2	Grip end (left)	1	
3	Handlebar grip	1	
4	Handlebar switch cover	1	
5	Plastic locking tie	1	
6	Handlebar switch coupler (left)	1	Disconnect.
7	Handlebar switch (left)	1	
8	Handlebar switch clip	1	
9	Clutch switch	1	

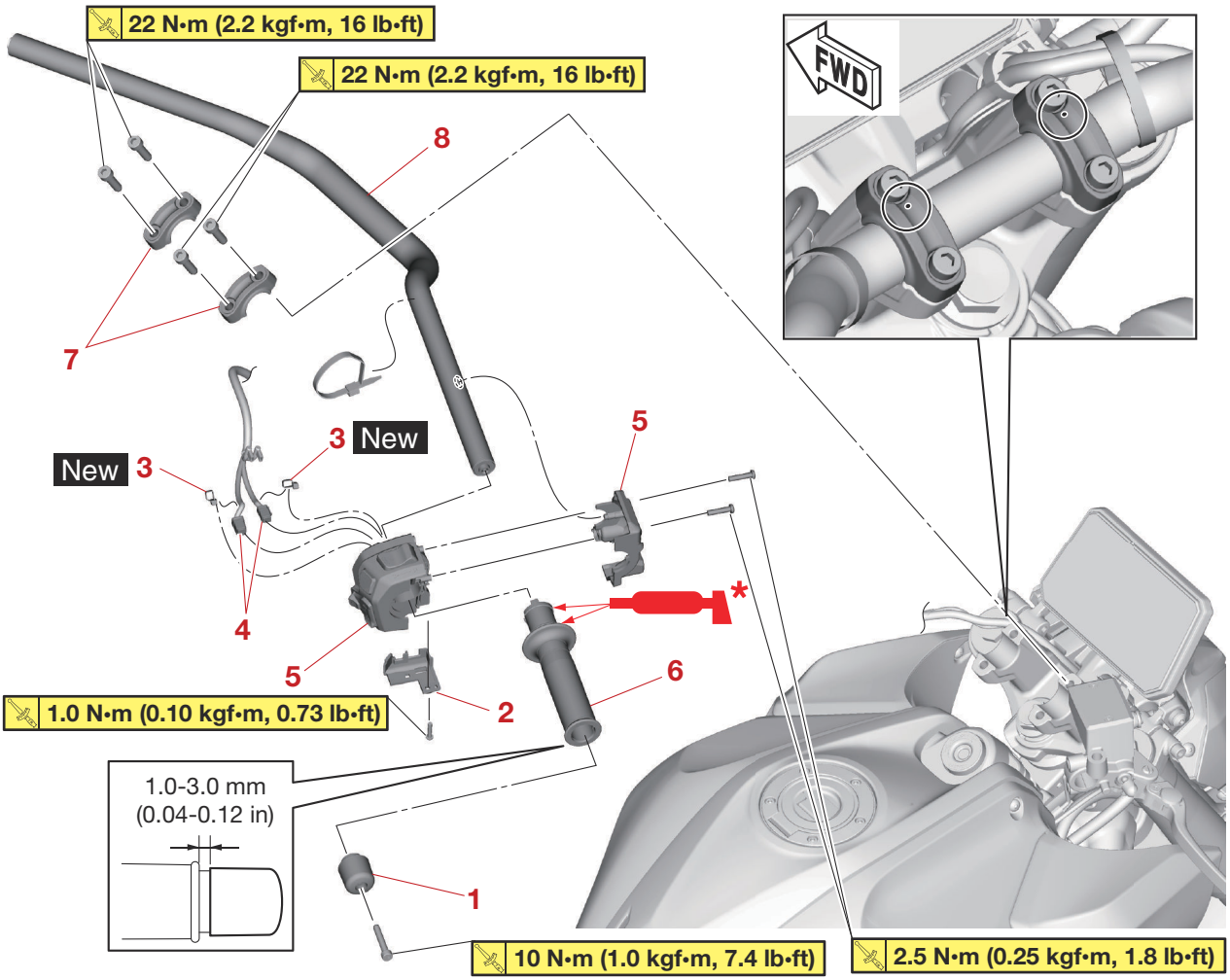
Removing the clutch lever and handlebar switch (left)



*** Rubber adhesive**

Order	Job/Parts to remove	Q'ty	Remarks
10	Clutch switch coupler	1	Disconnect.
11	Clutch cable	1	Disconnect.
12	Adjusting bolt/Locknut	1/1	
13	Clutch lever	1	
14	Clutch lever holder	1	

Removing the handlebar switch (right) and handlebar



*** YAMAHA GREASE R (Fluorine-based grease)**

Order	Job/Parts to remove	Q'ty	Remarks
	Front brake master cylinder assembly		Refer to "FRONT BRAKE" on page 4-30.
1	Grip end (right)	1	
2	Handlebar switch cover	1	
3	Plastic locking tie	2	
4	Handlebar switch coupler (right)	2	Disconnect.
5	Handlebar switch (right)	1	
6	Throttle grip	1	
7	Upper handlebar holder	2	
8	Handlebar	1	

EAS30203
REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

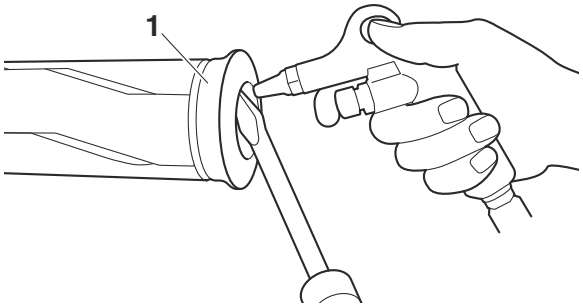
EWA13120
⚠ WARNING

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

2. Remove:
   - Handlebar grip "1"

TIP

Blow compressed air between the handlebar and the handlebar grip, and gradually pull 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:
   - Handlebar "1"
   - Upper handlebar holder "2"

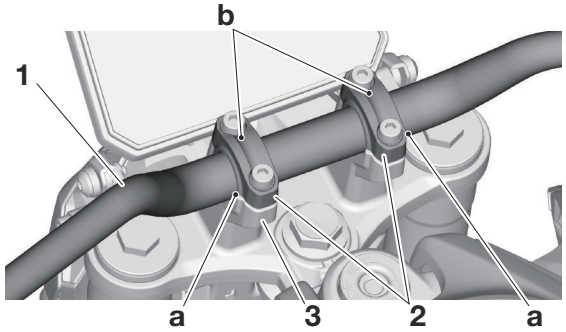
	Upper handlebar holder bolt 22 N·m (2.2 kgf·m, 16 lb·ft)

ECA18300
NOTICE

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

TIP

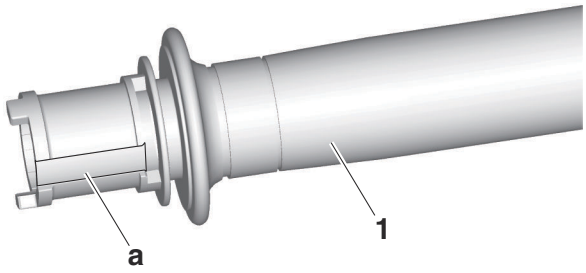
- Align the punch mark "a" on the handlebar "1" with the outside upper surface of the upper bracket "3".
- The upper handlebar holders "2" should be installed with the punch marks "b" facing forward.

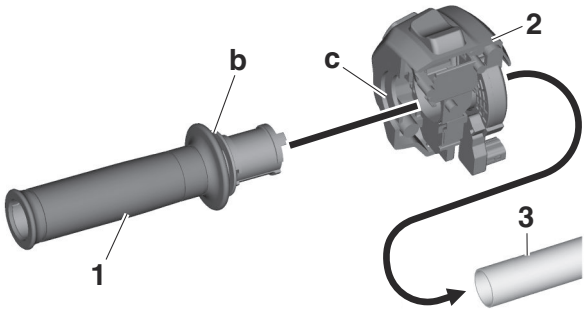


3. Lubricate:
   - Throttle grip
4. Install:
   - Throttle grip "1"
   - Handlebar switch (right)

	Handlebar switch screw 2.5 N·m (0.25 kgf·m, 1.8 lb·ft)

a. Face the groove "a" in the throttle grip to the rear side of the vehicle, and then fit the flange "b" on the throttle grip into the groove "c" in the handlebar switch (right, front side) "2" and the throttle grip onto the handlebar "3".

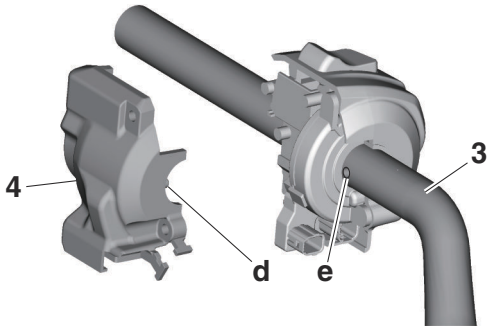




b. Install the handlebar switch (right, rear side) "4".

TIP

Align the projection "d" on the handlebar switch (right, rear side) with the hole "e" in the handlebar "3".



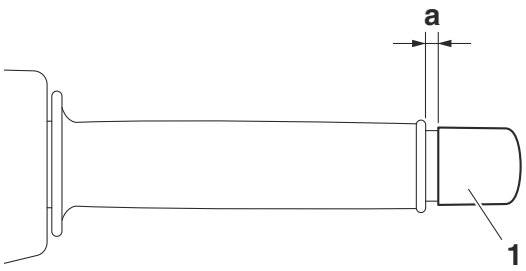
c. Make sure that the throttle grip turns smoothly.

5. Install:
   - Grip end (right) "1"
   - Grip end bolt

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

TIP

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

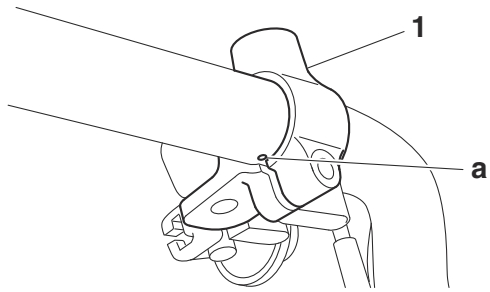


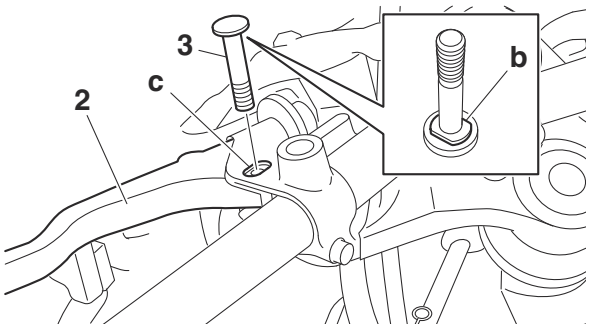
6. Install:
   - Front brake master cylinder assembly
     Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER" on page 4-40.
7. Install:
   - Clutch lever holder "1"
   - Clutch lever "2"
   - Clutch lever pivot bolt "3"
   - Clutch cable
   - Clutch switch "4"

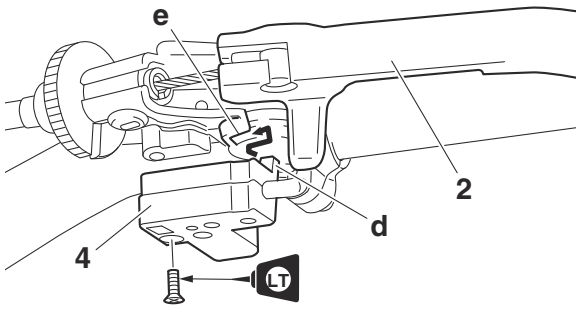
	Clutch lever holder pinch bolt **11 N·m (1.1 kgf·m, 8.1 lb·ft)** **Clutch lever pivot nut** **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

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.





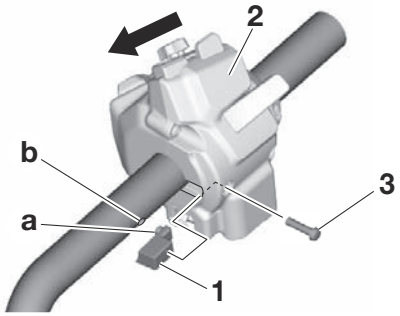


8. Install:
   - Handlebar switch clip "1"
   - Handlebar switch "2"
   - Handlebar switch screw "3"

	Handlebar switch screw **1.0 N·m (0.10 kgf·m, 0.73 lb·ft)**

a. Align the projection "a" on the handlebar switch clip with the hole "b" in the handlebar.

b. Insert the handlebar switch (left) into the handlebar switch clip, and tighten the handlebar switch screw to the specified torque.



9. Install:
   - Clutch lever holder
   - Clutch cable

	Clutch lever holder bolt **16 N·m (1.6 kgf·m, 12 lb·ft)**

10. Install:
    - Handlebar grip
    - Grip end (left) "1"

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

a. Degrease the adhesive surfaces of the handlebar grip and handlebar.
b. Apply a thin coat of rubber adhesive onto the end of the handlebar (left).
c. Slide the handlebar grip over the end of the handlebar (left).
d. Wipe off any excess rubber adhesive with a clean rag.

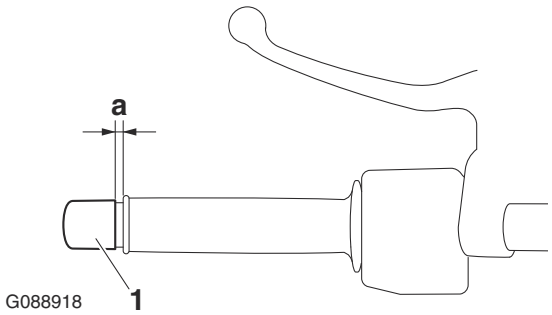
EWA13700

⚠ 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.

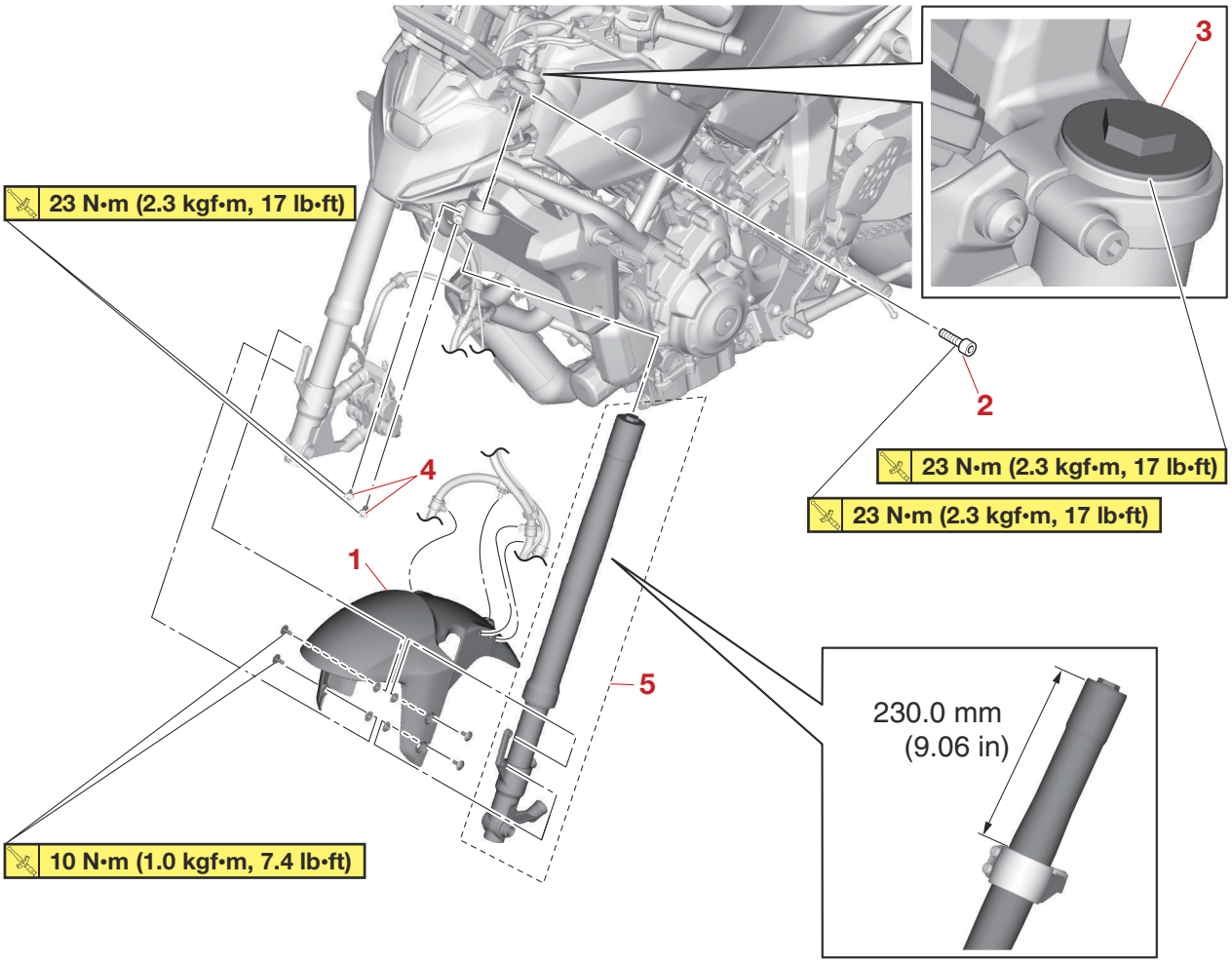


11. Adjust:
    - Clutch lever free play
      Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-12.

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

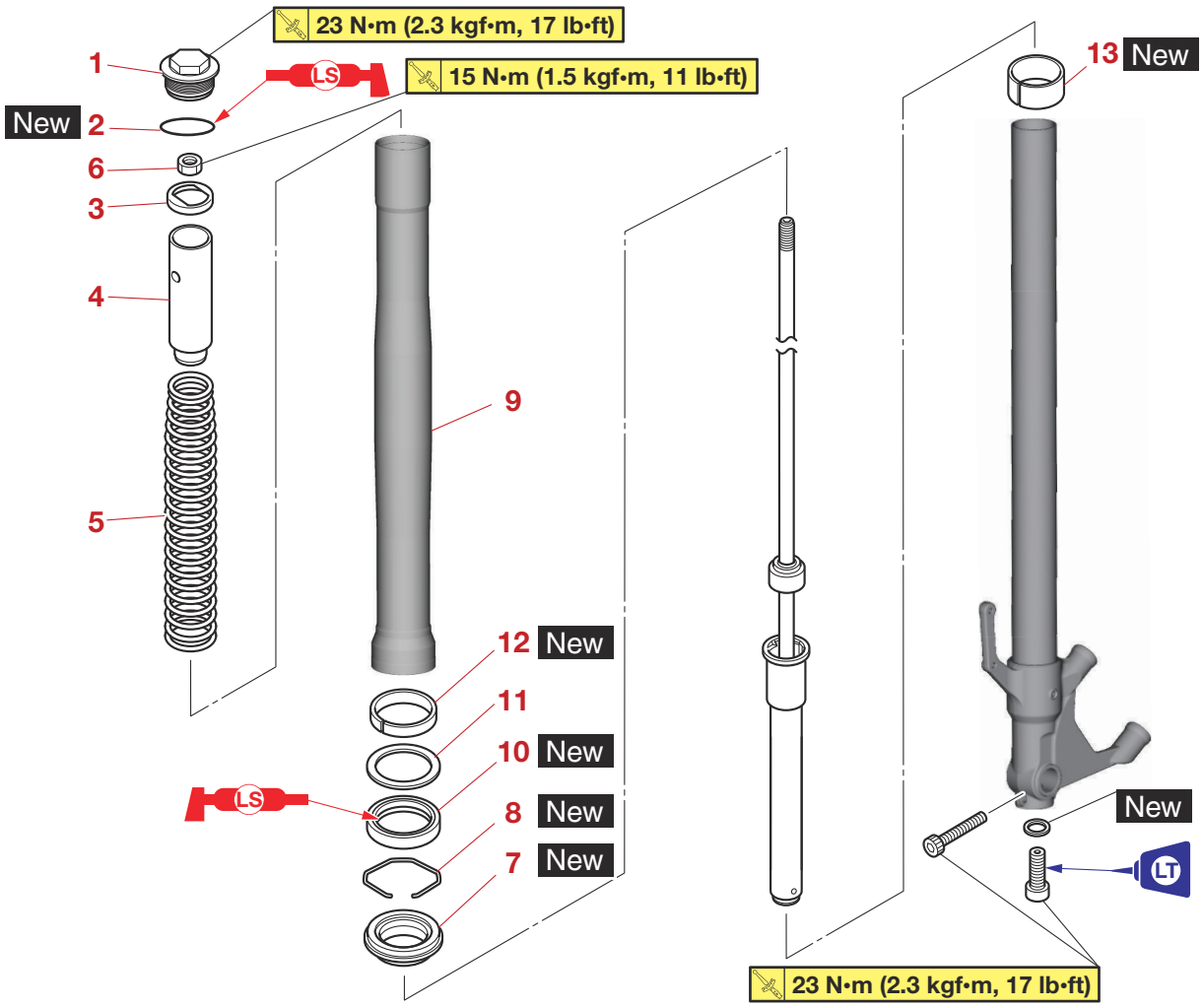
EAS20034
FRONT FORK

Removing the front fork legs



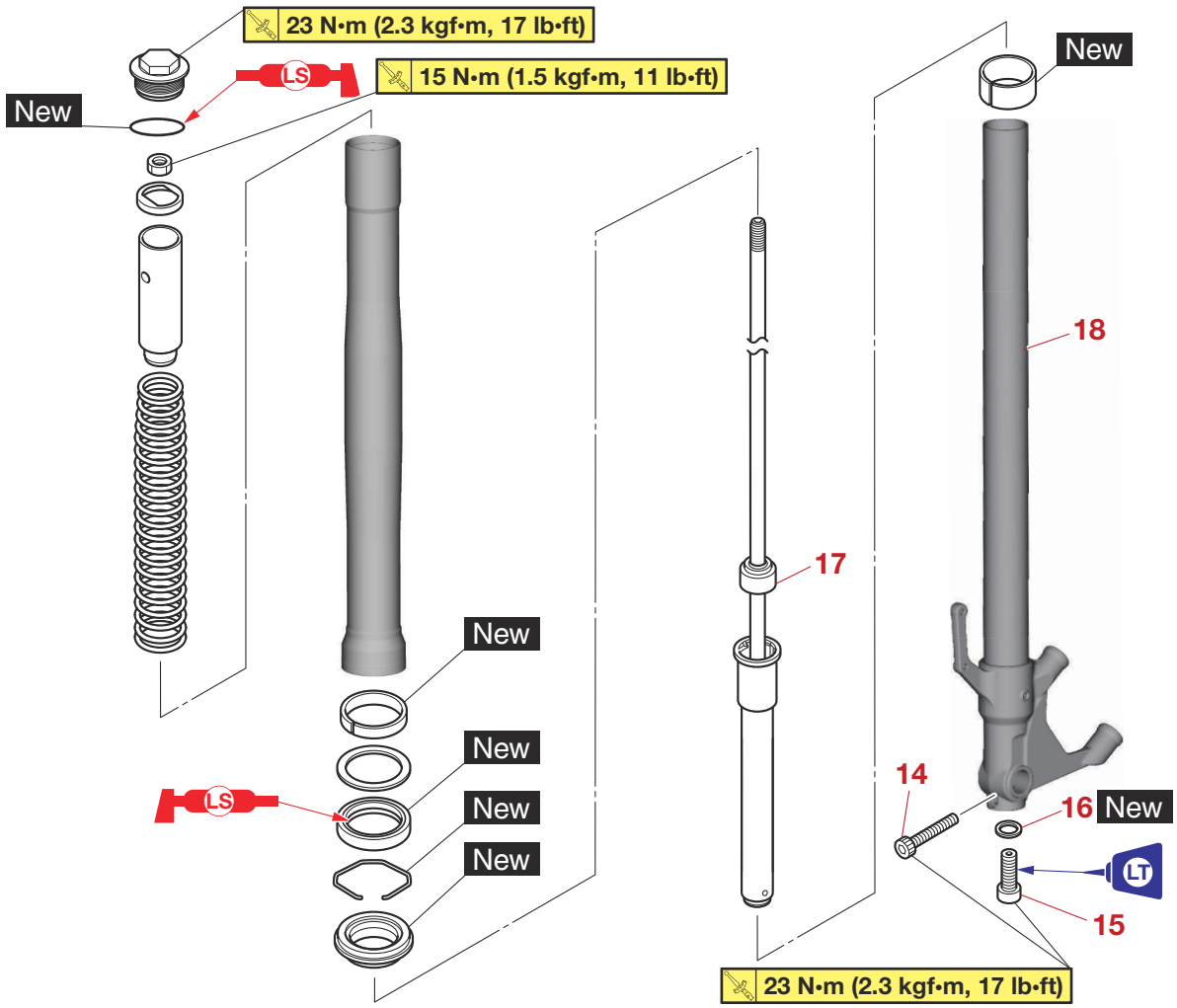
Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Front wheel		Refer to "FRONT WHEEL" on page 4-14.
1	Front fender	1	
2	Upper bracket pinch bolt	1	Loosen.
3	Cap bolt	1	Loosen.
4	Lower bracket pinch bolt	2	Loosen.
5	Front fork leg	1	

Disassembling the front fork leg



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

Disassembling the front fork leg



Order	Job/Parts to remove	Q'ty	Remarks
14	Wheel axle pinch bolt	1	Right side only.
15	Damper rod assembly bolt	1	
16	Copper washer	1	
17	Damper rod assembly	1	
18	Inner tube	1	

EAS30206
REMOVING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.

TIP
Each front fork leg is equipped with a spring preload adjusting bolt, the fork leg (right) is equipped with a rebound damping force adjusting screw, the fork leg (left) is equipped with a compression damping force adjusting screw. Pay attention not to mistake the right and left.

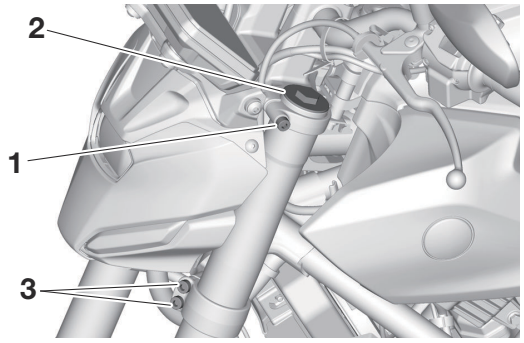
1. Stand the vehicle on a level surface.

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. Remove:
   - Front brake caliper
     Refer to "FRONT BRAKE" on page 4-30.
   - Front wheel
     Refer to "FRONT WHEEL" on page 4-14.
3. Loosen:
   - Upper bracket pinch bolt "1"
   - Cap bolt "2"
   - Lower bracket pinch bolt "3"

EWA13640
⚠ WARNING
Before loosening the upper and lower bracket pinch bolts, support the front fork leg.

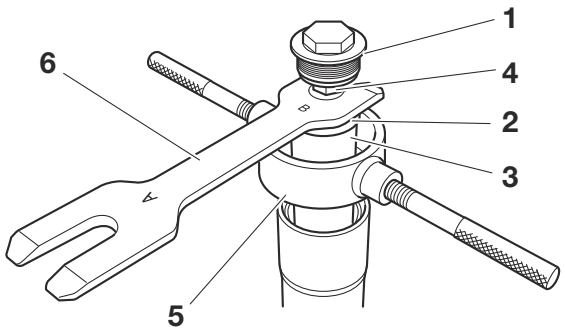


4. Remove:
   - Front fork leg

EAS30207
DISASSEMBLING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.
1. Remove:
   - Cap bolt "1"
     (from the damper rod assembly)
   - Washer "2"
   - Spacer "3"
   - Locknut "4"
   a. Press down on the spacer with the fork spring compressor "5".
   b. Install the rod holder "6" between the locknut "4" and the washer "2".

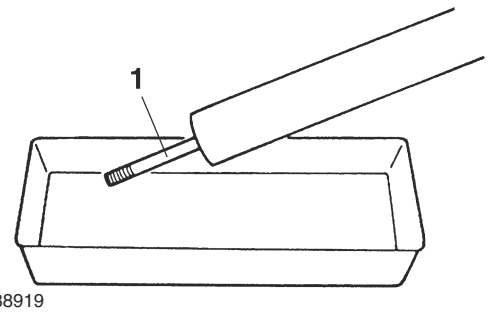
Fork spring compressor
90890-01441
Fork spring compressor
YM-01441
Rod holder
90890-01434
Damper rod holder double ended
YM-01434

TIP
Use the side of the rod holder that is marked "B".



   c. Hold the cap bolt and loosen the locknut.
   d. Remove the cap bolt.
   e. Remove the rod holder and fork spring compressor.
   f. Remove the washer, spacer and locknut.
2. Drain:
   - Fork oil

TIP
Stroke the damper rod assembly "1" several times while draining the fork oil.



G088919

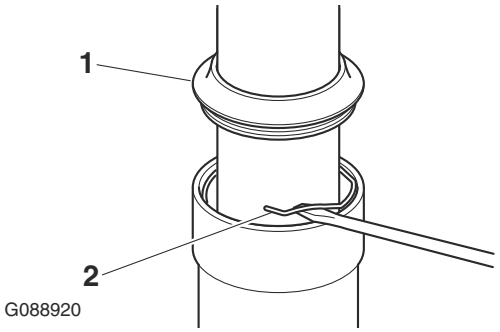
3. Remove:
   - Dust seal "1"
   - Oil seal clip "2"

(with a flat-head screwdriver)

ECA19100

NOTICE

Do not scratch the outer tube.



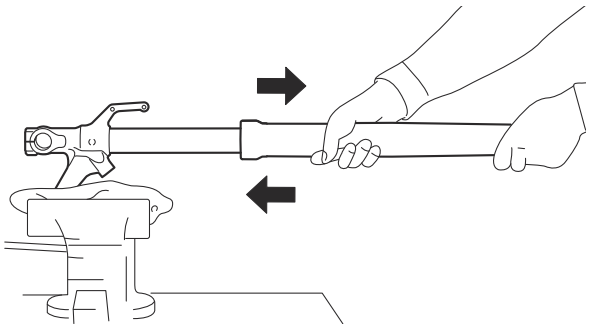
G088920

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

ECA19880

NOTICE

Excessive force will damage the bushings. Damaged bushings must be replaced.

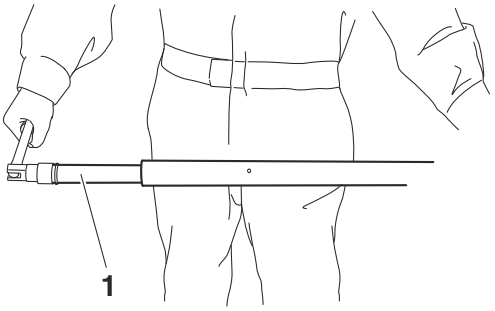


5. Remove:
   - Damper rod assembly bolt
   - Damper rod assembly

TIP

While holding the damper rod with the damper rod holder "1", loosen the damper rod assembly bolt.

	Damper rod holder (ø27) **90890-01582** **Damper rod holder** **YM-01582**



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

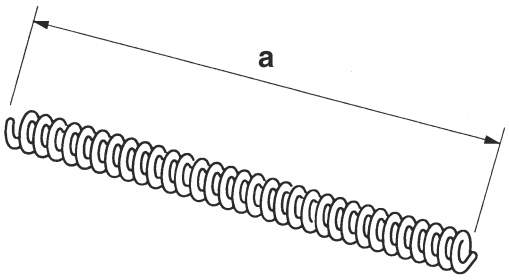
⚠ WARNING

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 **255.8 mm (10.07 in)**



G088921

3. Check:
   - Damper rod

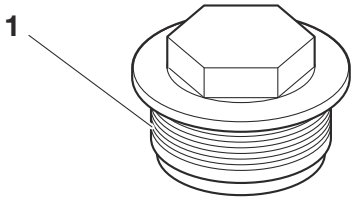
   Damage/wear → Replace.
   Obstruction → Blow out all of the oil passages with compressed air.

ECA19110

NOTICE

- **The front fork leg has 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.**

4. Check:
   • Cap bolt "1"
   Cracks/damage → Replace.



EAS30209
ASSEMBLING THE FRONT FORK LEGS

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

EWA17090
WARNING

- **Note that the amount of the fork oil is different in the left and right front fork legs. Make sure to fill each of the left and right front fork legs with the specified amount of the fork oil.**
- **If both front fork legs are not filled with the specified amount of the fork oil, it may cause poor handling and a loss of stability.**

EWA18360
WARNING

If both front fork legs are not filled with the specified amount of the fork oil, it may cause 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
  – Copper washer
  – O-ring
- Before assembling the front fork leg, make sure all of the components are clean.

1. Install:
   • Damper rod assembly

ECA22560
NOTICE

Allow the damper rod assembly to slide slowly down the inner tube. Be careful not to damage the inner tube.

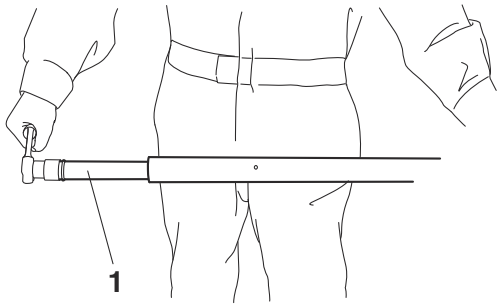
2. Tighten:
   • Damper rod assembly bolt
   (along with the copper washer New)

Front fork damper rod assembly bolt
23 N·m (2.3 kgf·m, 17 lb·ft)
LOCTITE®

TIP

While holding the damper rod assembly with the damper rod holder "1", tighten the damper rod assembly bolt.

Damper rod holder (ø27)
90890-01582
Damper rod holder
YM-01582



3. Lubricate:
   • Inner tube's outer surface

Recommended oil
Yamaha Suspension Oil S1

4. Install:
   • Dust seal "1" New
   • Oil seal clip "2" New
   • Oil seal "3" New
   • Washer "4"
   • Outer tube bushing "5" New
   • Inner tube bushing "6" New

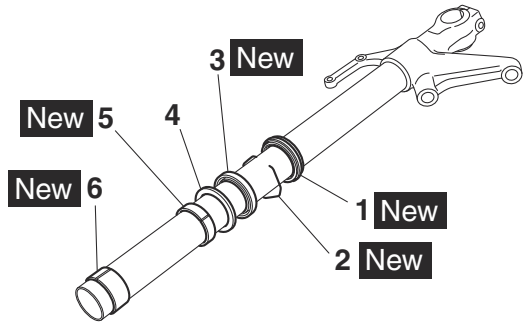
ECA19170
NOTICE

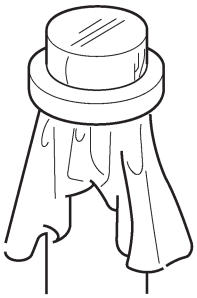
Make sure the numbered side of the oil seal faces bottom side.

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.

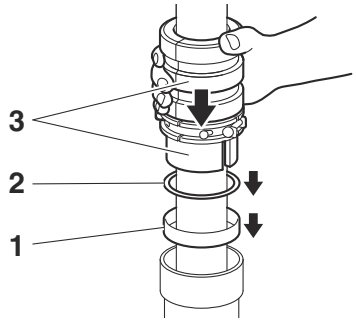




G088922

5. Install:
   • Outer tube
     (to the inner tube)
6. Install:
   • Outer tube bushing "1"
   • Washer "2"
     (with the fork seal driver "3")

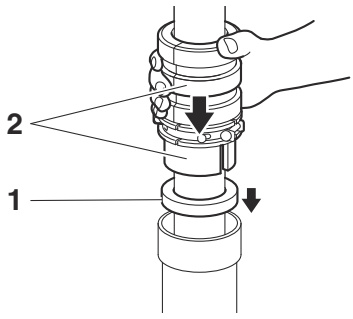
	**Fork seal driver** **90890-01442** **Adjustable fork seal driver (36–46 mm)** **YM-01442**



G088923

7. Install:
   • Oil seal "1"
     (with the fork seal driver "2")

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

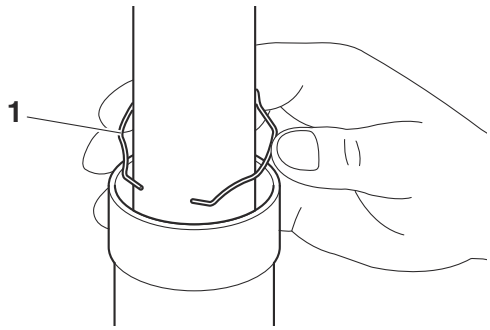


G088924

8. Install:
   • Oil seal clip "1"

TIP

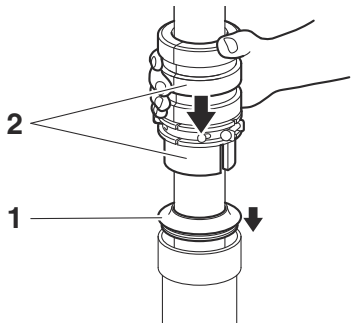
Adjust the oil seal clip so that it fits into the outer tube's groove.



G088925

9. Install:
   • Dust seal "1"
     (with the fork seal driver "2")

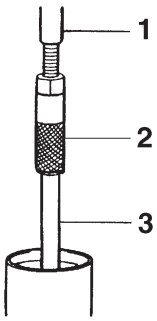
	**Fork seal driver** **90890-01442** **Adjustable fork seal driver (36–46 mm)** **YM-01442**



G088926

10. Install:
    • Rod puller "1"
    • Rod puller attachment (M10) "2"
      (onto the damper rod "3")

Rod puller
90890-01437
Universal damping rod bleeding tool set
YM-A8703
Rod puller attachment (M10 long)
90890-01578
Universal damping rod bleeding tool set
YM-A8703



G088927

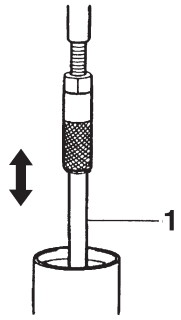
11. Fill:
- Front fork leg
  (with the specified amount of the recommended fork oil)

Recommended oil
Yamaha Suspension Oil S1
Quantity (left)
457.0 cm³ (15.45 US oz, 16.12 Imp.oz)
Quantity (right)
452.0 cm³ (15.28 US oz, 15.94 Imp.oz)

ECA14230
NOTICE
- **Be sure to use the recommended fork oil. Other oils may have an adverse effect on front fork performance.**
- **When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.**

12. After filling the front fork leg, slowly stroke the damper rod "1" up and down (at least ten times) to distribute the fork oil.

TIP
Be sure to stroke the damper rod slowly because the fork oil may spurt out.



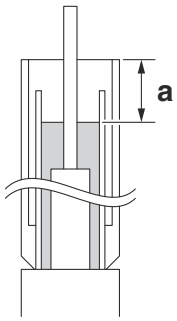
G088929

13. Before measuring the fork oil level, wait ten minutes until the oil has settled and the air bubbles have dispersed.

TIP
Be sure to bleed the front fork leg of any residual air.

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

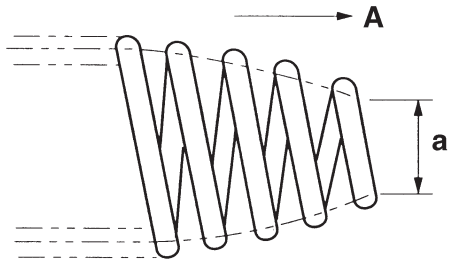
Level (left)
132 mm (5.2 in)
Level (right)
132 mm (5.2 in)



G088930

15. Install:
- Fork spring
- Spacer
- Locknut
- Damper adjusting rod (damper rod assembly)
- Washer
- Cap bolt
  (along with the O-ring New)
  a. Remove the rod puller and rod puller attachment.
  b. Install the fork spring.

TIP
Install the fork spring with the smaller diameter "a" facing up "A".

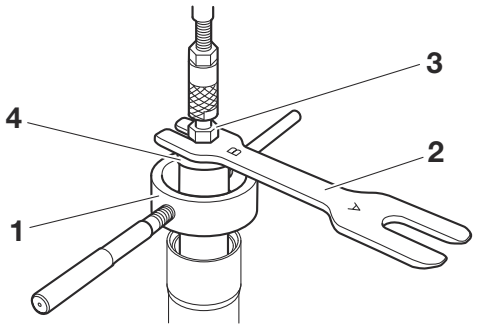


G088931

c. Install the locknut all the way onto the damper rod assembly.
d. Install the rod puller and rod puller attachment.
e. Install the spacer and washer.
f. Install the fork spring compressor.
g. Press down on the spacer with the fork spring compressor "1".
h. Pull up the rod puller and install the rod holder "2" between the locknut "3" and the washer "4".

Rod puller
90890-01437
Universal damping rod bleeding tool set
YM-A8703
Rod puller attachment (M10 long)
90890-01578
Universal damping rod bleeding tool set
YM-A8703
Fork spring compressor
90890-01441
Fork spring compressor
YM-01441
Rod holder
90890-01434
Damper rod holder double ended
YM-01434

TIP
Use the side of the rod holder that is marked "B".

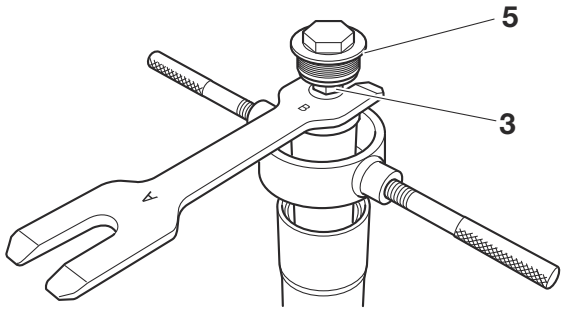


i. Remove the rod puller and rod puller attachment.
j. Screw the cap bolt by hand until it touches the damper rod assembly.

EWA13670
WARNING
Always use a new cap bolt O-ring.

k. Hold the cap bolt "5" and tighten the locknut "3" to specification.

Front fork cap bolt locknut
15 N·m (1.5 kgf·m, 11 lb·ft)



l. Remove the rod holder and fork spring compressor.

16. Install:
- Cap bolt
(to the outer tube)

TIP
- Temporarily tighten the cap bolt.
- When to tighten the cap bolt to the specified torque is after installing the front fork leg to the vehicle and tightening the lower bracket pinch bolts.

EAS30210
INSTALLING THE FRONT FORK LEGS

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

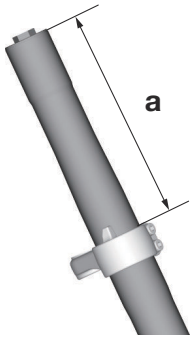
1. Install:
- Front fork leg
Temporarily tighten the upper and lower bracket pinch bolts.

Installed length (from the top of the outer tube) "a"
230.0 mm (9.06 in)

EWA13680
WARNING
Make sure the brake hoses are routed properly.

TIP
When installing the front fork, set the outer tube

with the specified length “a” from the top of the outer tube to the top of the lower bracket.



2. Tighten:
   • Lower bracket pinch bolt “1”

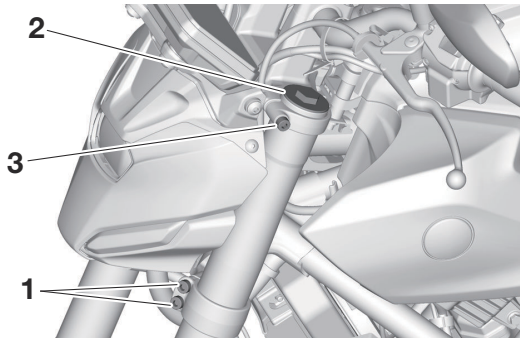
	Lower bracket pinch bolt **23 N·m (2.3 kgf·m, 17 lb·ft)**

   • Cap bolt “2”

	Front fork cap bolt **23 N·m (2.3 kgf·m, 17 lb·ft)**

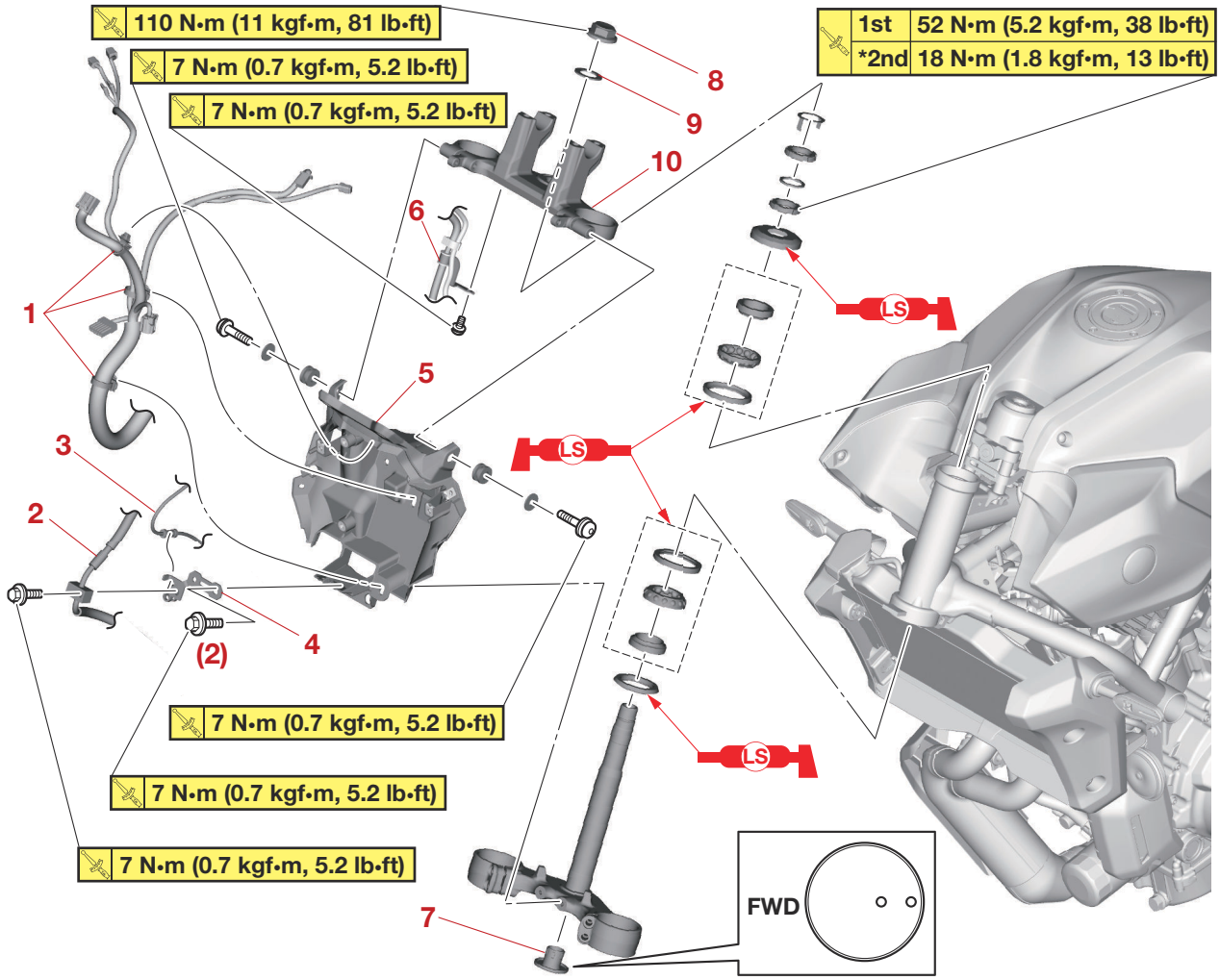
   • Upper bracket pinch bolt “3”

	Upper bracket pinch bolt **23 N·m (2.3 kgf·m, 17 lb·ft)**



EAS20035
STEERING HEAD

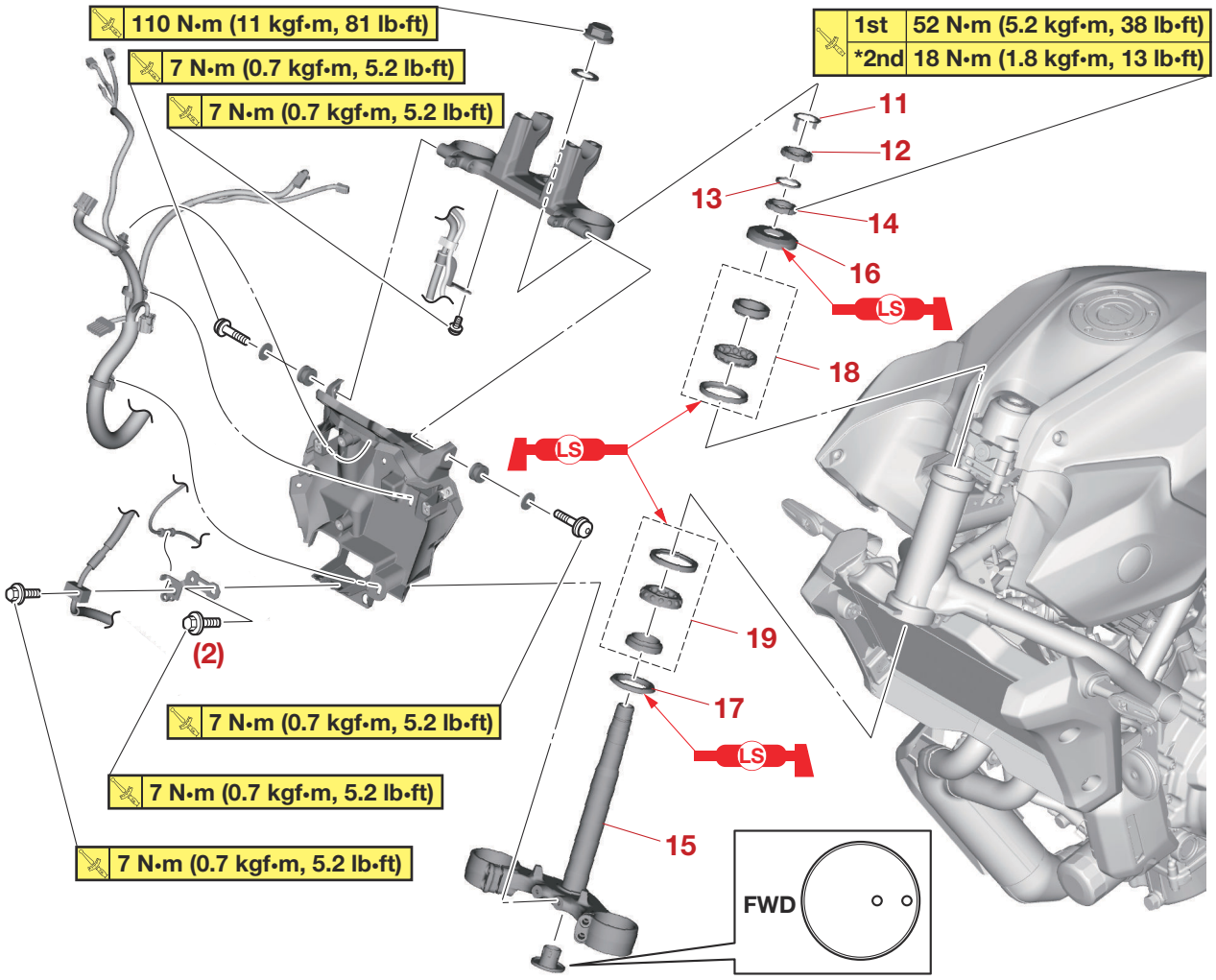
Removing the lower bracket



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

Order	Job/Parts to remove	Q'ty	Remarks
	Meter assembly		Refer to "GENERAL CHASSIS (4)" on page 4-9.
	Handlebar switch coupler		Refer to "HANDLEBAR" on page 4-62.
1	Wire harness clamp	3	
2	Front brake hose	1	Disconnect.
3	Front wheel sensor lead	1	Disconnect.
4	Front brake hose bracket (lower bracket)	1	
5	Meter assembly bracket	1	
6	Front brake hose bracket (upper bracket)	1	
7	Lower bracket cap	1	
8	Steering stem nut	1	
9	Lock washer	1	
10	Upper bracket	1	

Removing the lower bracket



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

Order	Job/Parts to remove	Q'ty	Remarks
11	Lock washer	1	
12	Upper ring nut	1	
13	Rubber washer	1	
14	Lower ring nut	1	
15	Lower bracket	1	
16	Bearing cover	1	
17	Lower bearing dust seal	1	
18	Upper bearing	1	
19	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.

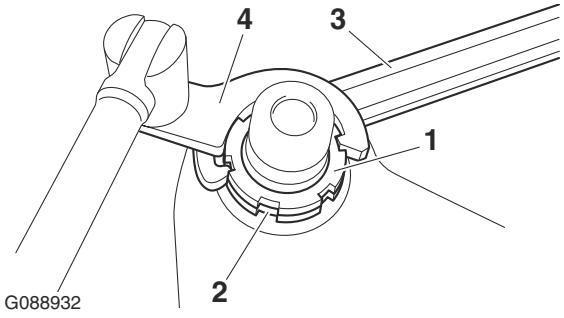
2. Remove:
   - Upper ring nut "1"
   - Rubber washer
   - Lower ring nut "2"
   - Lower bracket

EWA13730
⚠ WARNING

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

TIP
- Hold the lower ring nut with ring nut wrench "3", and then remove the upper ring nut with the steering nut wrench "4".
- Remove the lower ring nut with the steering nut wrench.

Ring nut wrench
90890-01268
Spanner wrench
YU-01268
Steering nut wrench
90890-01403
Exhaust flange nut wrench
YU-A9472



G088932

EAS30214
CHECKING THE STEERING HEAD
1. Wash:
   - Bearing
   - Bearing race

Recommended cleaning solvent
Kerosene

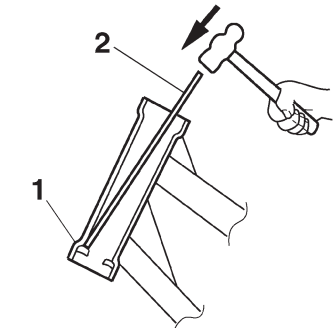
2. Check:
   - Bearing
   - Bearing race

   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 from the lower bracket "3" with a floor chisel "4" and hammer.
     c. Install a new dust seal and new bearing races.

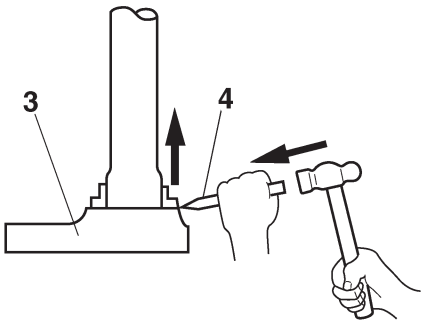
ECA14270
NOTICE

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

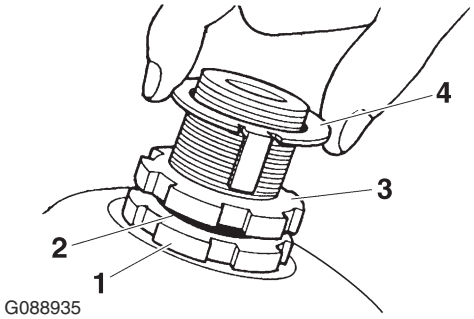
4. Check:
   - Upper bracket
   - Lower bracket
     (along with the steering stem)
     Bends/cracks/damage → Replace.

EAS30216
INSTALLING THE STEERING HEAD
1. Lubricate:
   - Upper bearing
   - Lower bearing

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

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

   Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” on page 3-18.



G088935

3. Install:
   - Upper bracket
   - Steering stem nut

TIP

Temporarily tighten the steering stem nut.

4. Install:
   - Front fork legs

   Refer to “FRONT FORK” on page 4-68.

TIP

Temporarily tighten the upper and lower bracket pinch bolts.

5. Tighten:
   - Steering stem nut

	Steering stem nut **110 N·m (11 kgf·m, 81 lb·ft)**

6. Tighten:
   - Lower bracket pinch bolt

	Lower bracket pinch bolt **23 N·m (2.3 kgf·m, 17 lb·ft)**

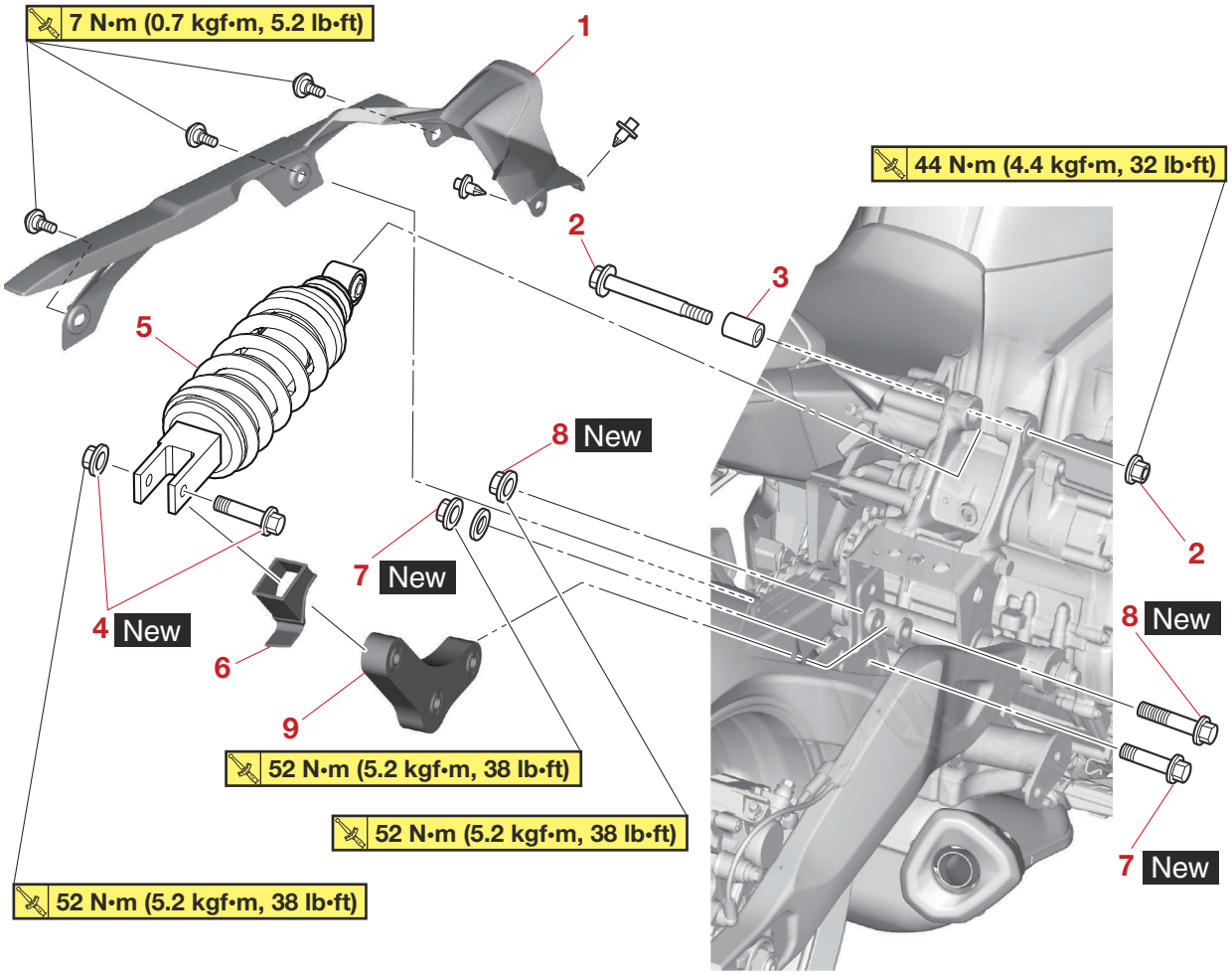
   - Upper bracket pinch bolt

	Upper bracket pinch bolt **23 N·m (2.3 kgf·m, 17 lb·ft)**

EAS20036

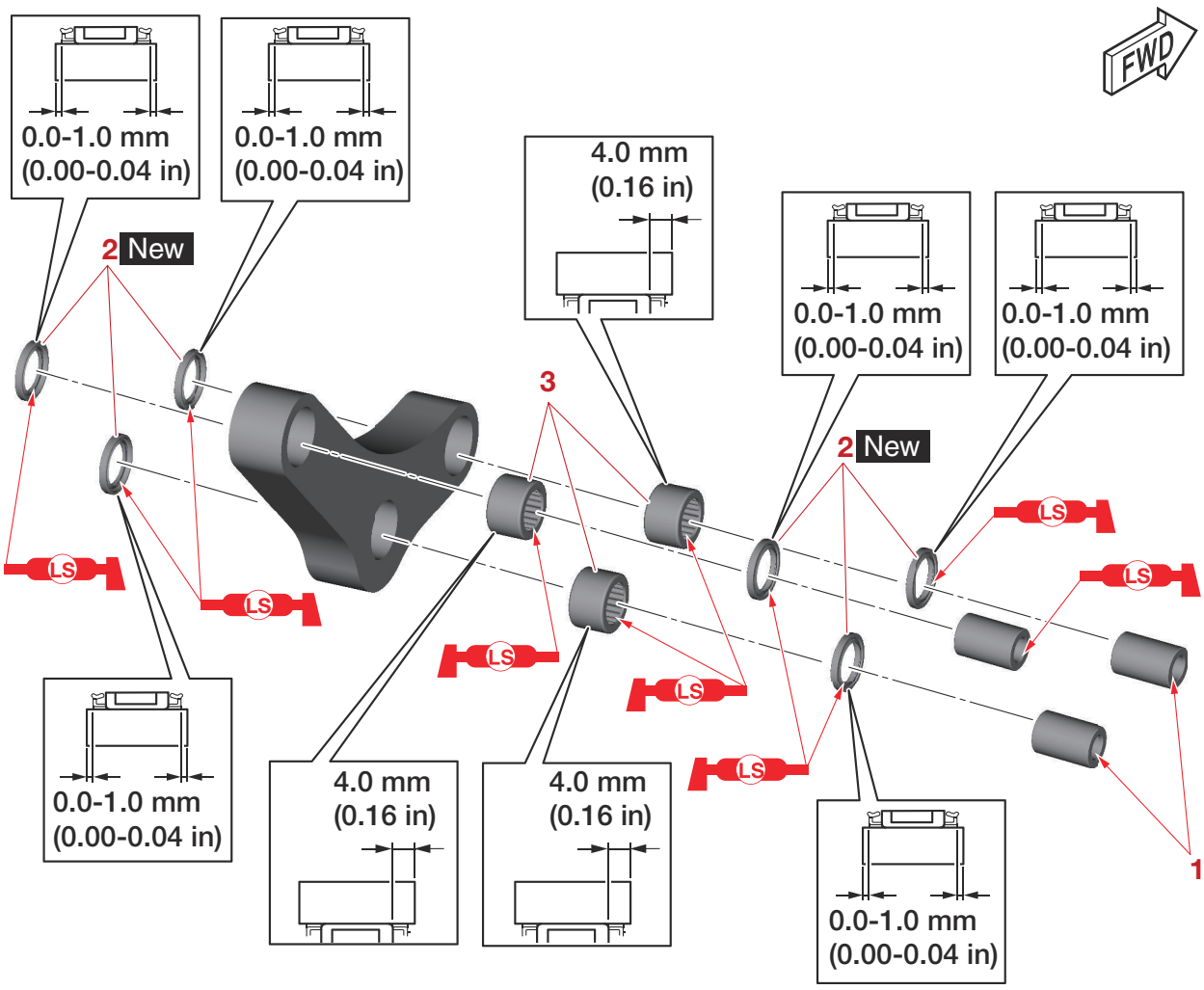
REAR SHOCK ABSORBER ASSEMBLY

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	Relay arm nut/Bolt	1	
8	Connecting arm nut/Bolt (relay arm side)	1	
9	Relay arm	1	

Disassembling the relay arm



Order	Job/Parts to remove	Q'ty	Remarks
1	Spacer	3	
2	Oil seal	6	
3	Bearing	3	

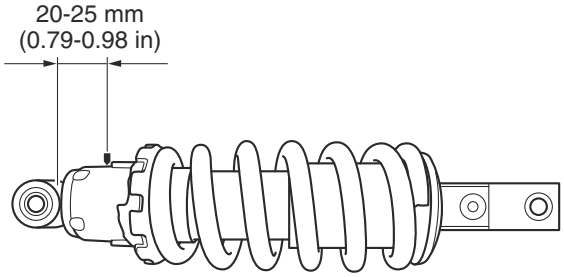
EAS30826
HANDLING THE REAR SHOCK ABSORBER
EWA13740
⚠ WARNING

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.



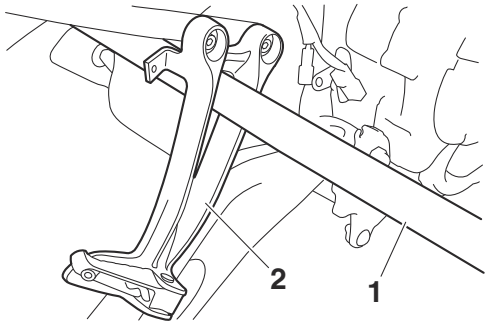
EAS30219
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY
1. Stand the vehicle on a level surface.

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.

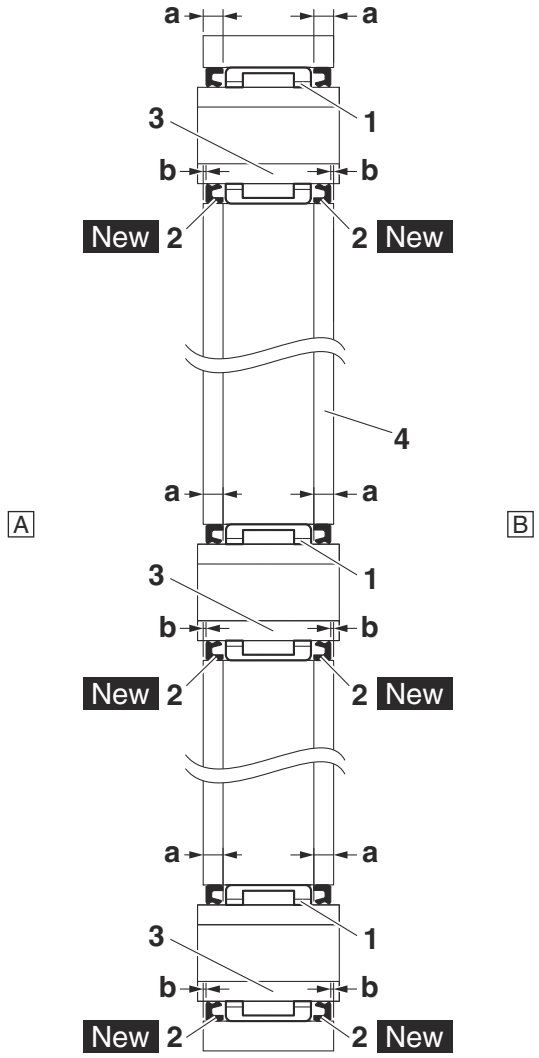
EAS30222
INSTALLING THE RELAY ARM
1. Lubricate:
   - Spacer
   - Bearing
   - Oil seal

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)

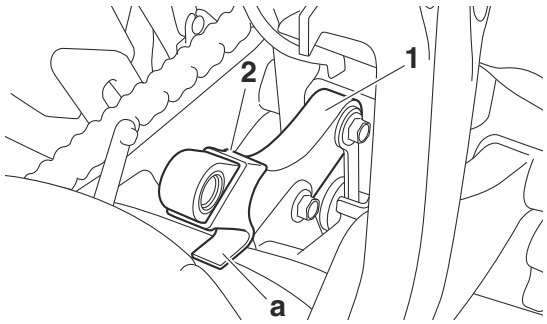
TIP
When installing the oil seals to the relay arm, face the character stamps of the oil seals outside.



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.



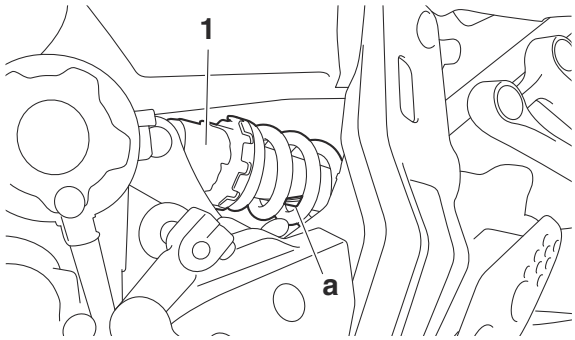
4. Tighten:
   - Connecting arm nut
   - Relay arm nut

Connecting arm nut (relay arm side)
52 N·m (5.2 kgf·m, 38 lb·ft)
Relay arm nut
52 N·m (5.2 kgf·m, 38 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.

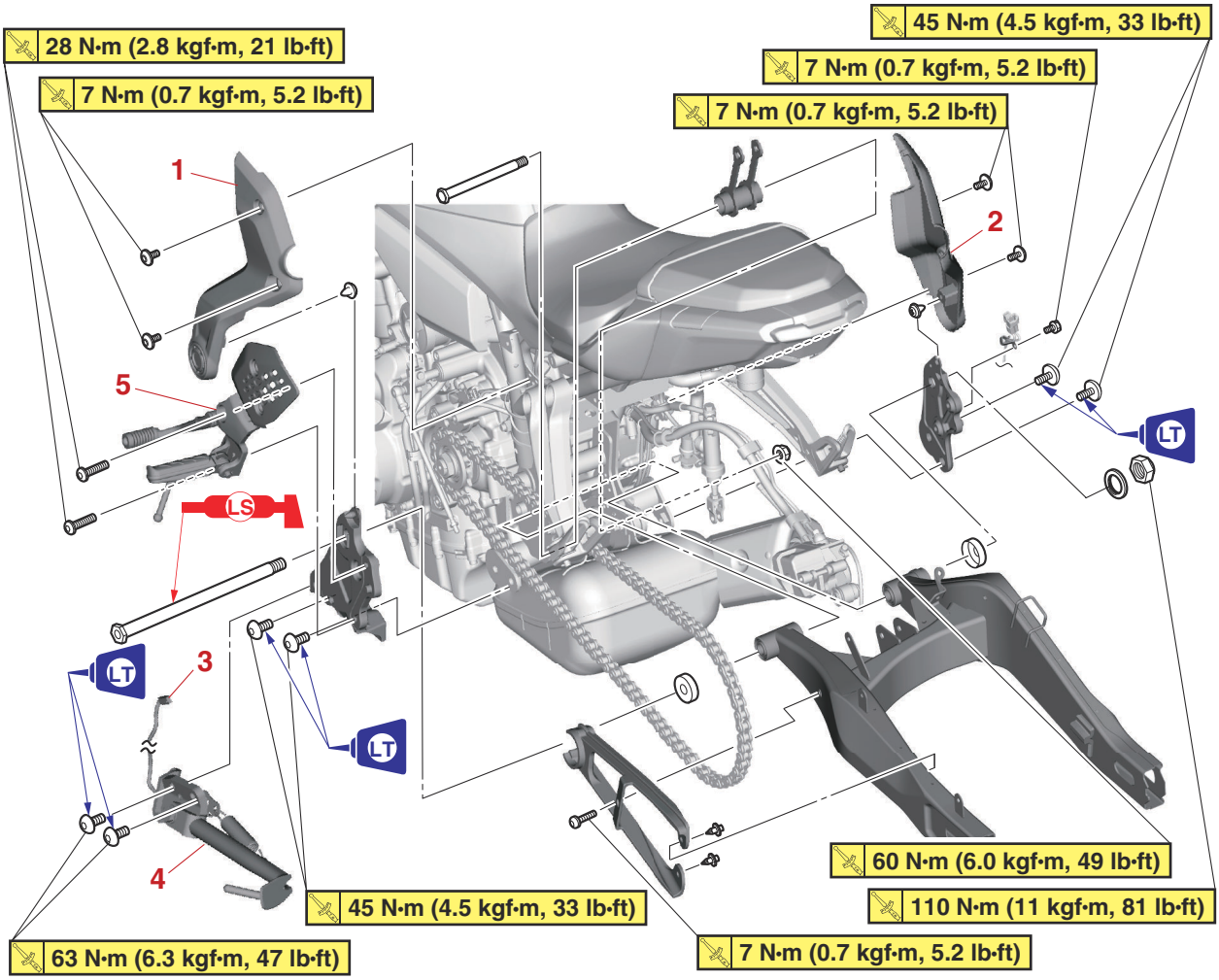


2. Tighten:
   - Rear shock absorber assembly bolt (front side)
   - Rear shock absorber nut (rear side)

Rear shock absorber assembly bolt (front side)
44 N·m (4.4 kgf·m, 32 lb·ft)
Rear shock absorber assembly nut (rear side)
52 N·m (5.2 kgf·m, 38 lb·ft)

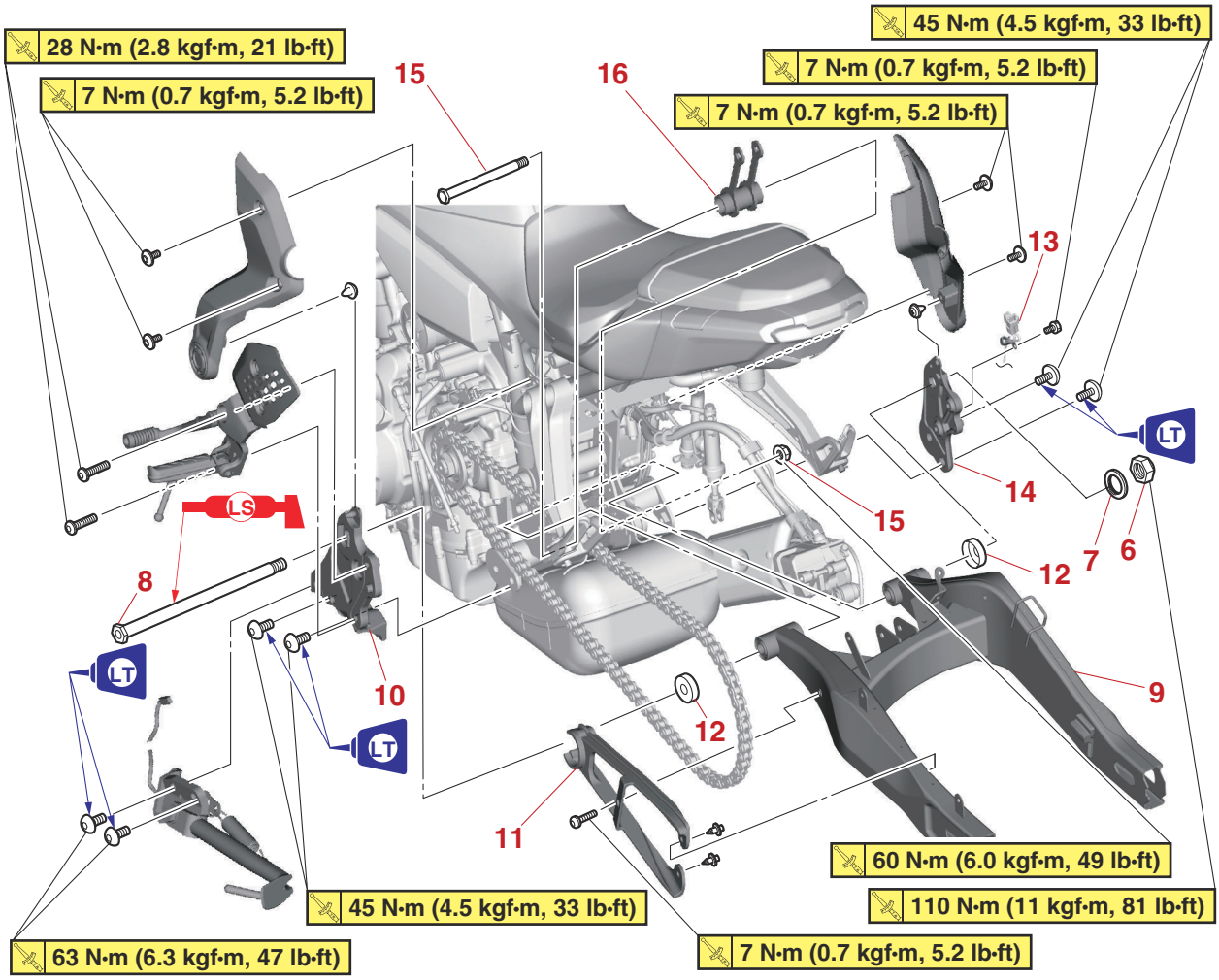
EAS20037
SWINGARM

Removing the swingarm



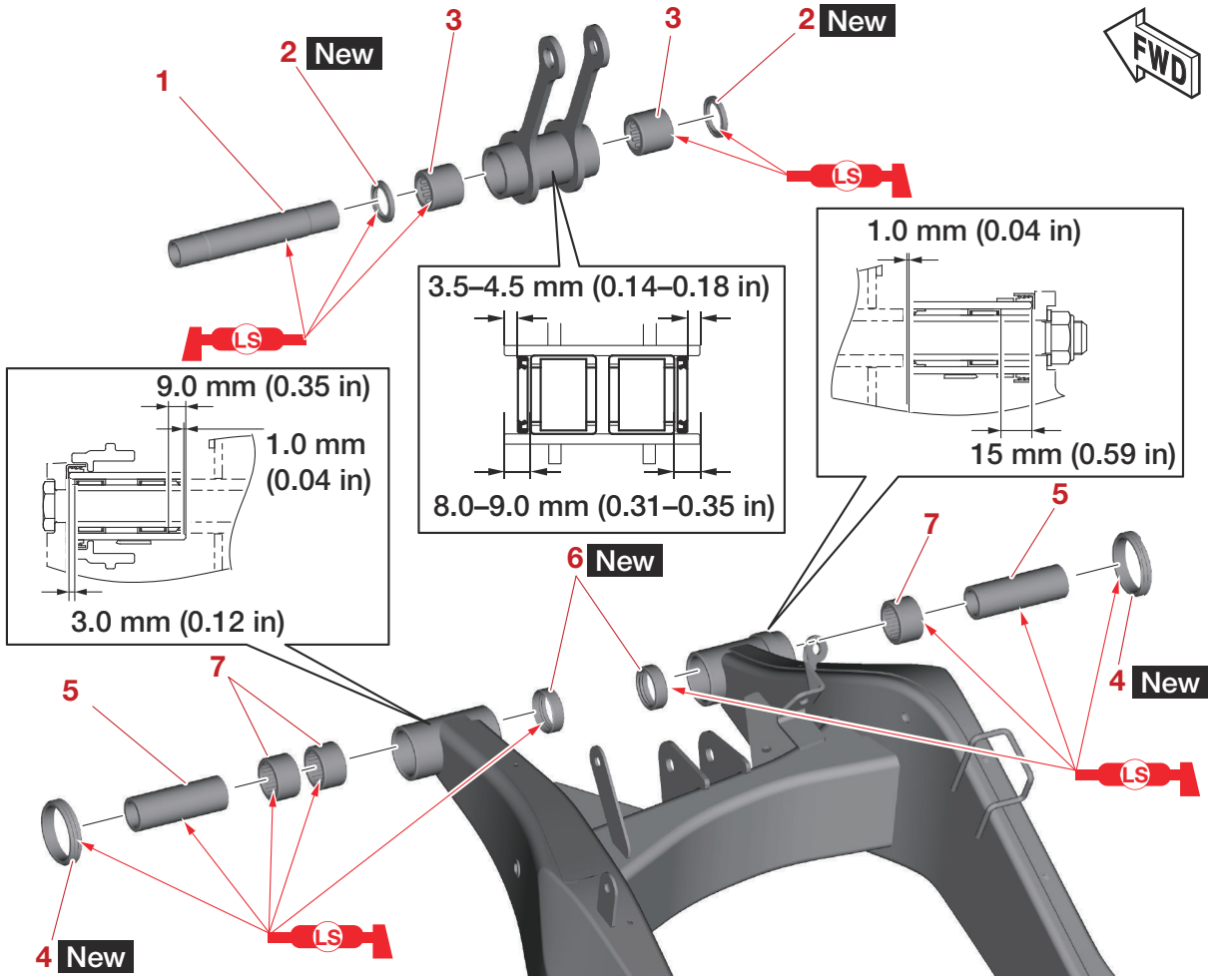
Order	Job/Parts to remove	Q'ty	Remarks
	Rear brake caliper/Rear brake hose guide/Rear brake hose holder		Refer to "REAR BRAKE" on page 4-42.
	Rear wheel		Refer to "REAR WHEEL" on page 4-21.
	Relay arm		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-82.
	Drive sprocket cover		Refer to "CHAIN DRIVE" on page 4-93.
1	Pivot shaft protector (left)	1	
2	Pivot shaft protector (right)	1	
3	Sidestand switch coupler	1	Disconnect.
4	Sidestand	1	
5	Footrest assembly (left)	1	

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
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	O_2 sensor harness clamp	2	
14	Footrest assembly (right)	2	
15	Connecting arm nut/Bolt (frame side)	2	
16	Connecting arm	3	

Disassembling the swingarm and connecting arm



Order	Job/Parts to remove	Q'ty	Remarks
1	Spacer	1	
2	Oil seal	2	
3	Bearing	2	
4	Oil seal	2	
5	Spacer	2	
6	Oil seal	2	
7	Bearing	3	

EAS30226
REMOVING THE SWINGARM

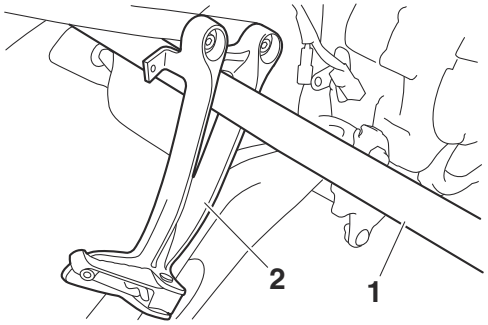
1. Stand the vehicle on a level surface.

EWA13120
⚠ WARNING

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

TIP

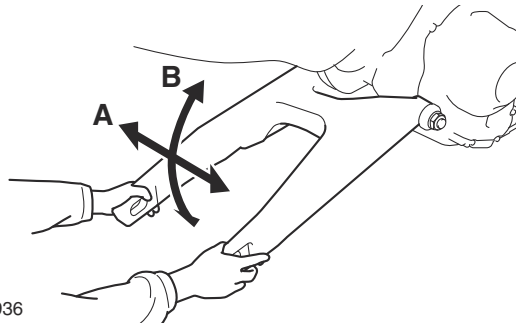
Pass a suitable rod "1" through the holes in the brackets of the passenger footrests "2" and secure the rod to support the vehicle. Before securing the rod, move the brake fluid reservoir hose to a place where the brake fluid reservoir hose does not contact the rod.



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.



G088936

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.

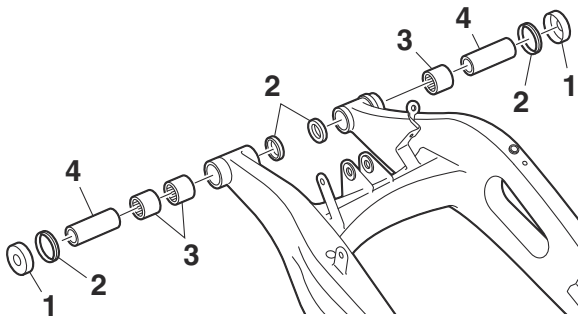
EWA13770
⚠ WARNING

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.

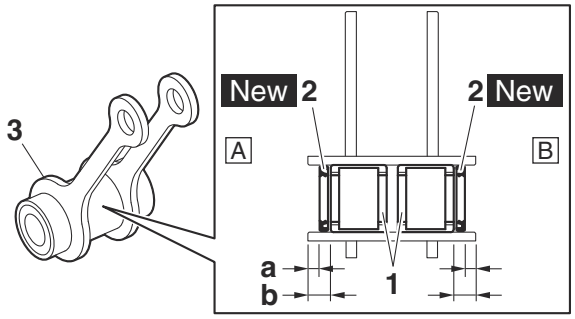
EAS31114
INSTALLING THE CONNECTING ARM

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.



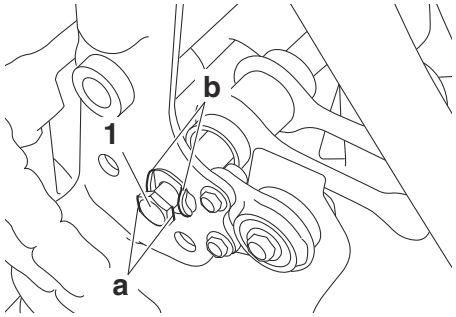
A. Left side
B. Right side

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)
60 N·m (6.0 kgf·m, 44 lb·ft)

TIP
Align two flat sides "a" of the connecting arm bolt with the projections "b" on the frame.



EAS30228
INSTALLING THE SWINGARM

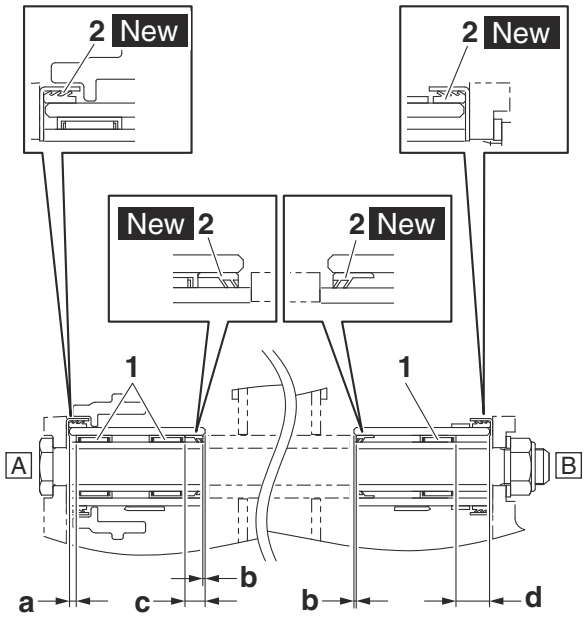
1. Lubricate:
   - Spacer
   - Pivot shaft
   - Bearing
   - Oil seal

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

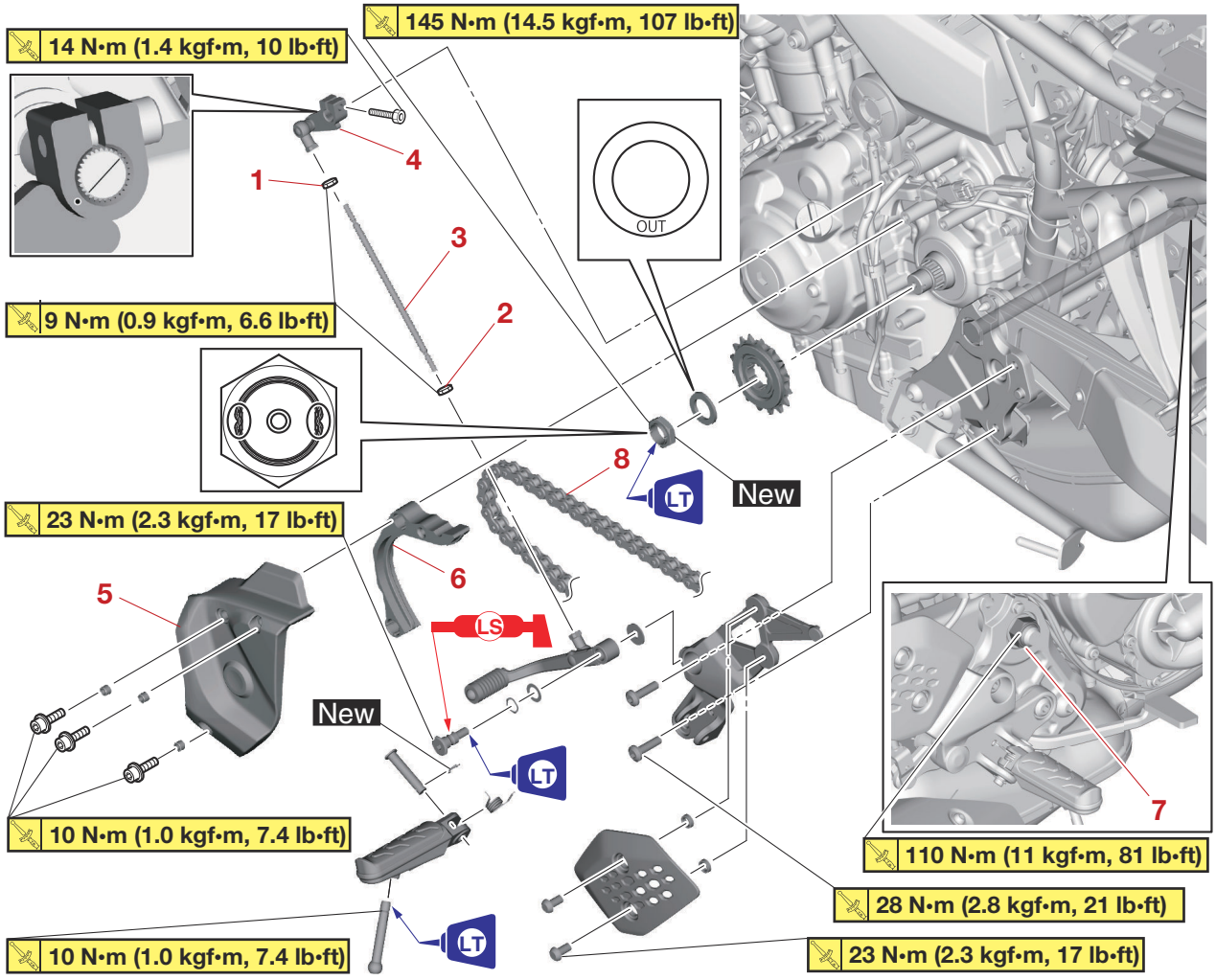
3. Adjust:
   • Drive chain slack
   Refer to "DRIVE CHAIN SLACK" on page 3-17.

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)

EAS20038

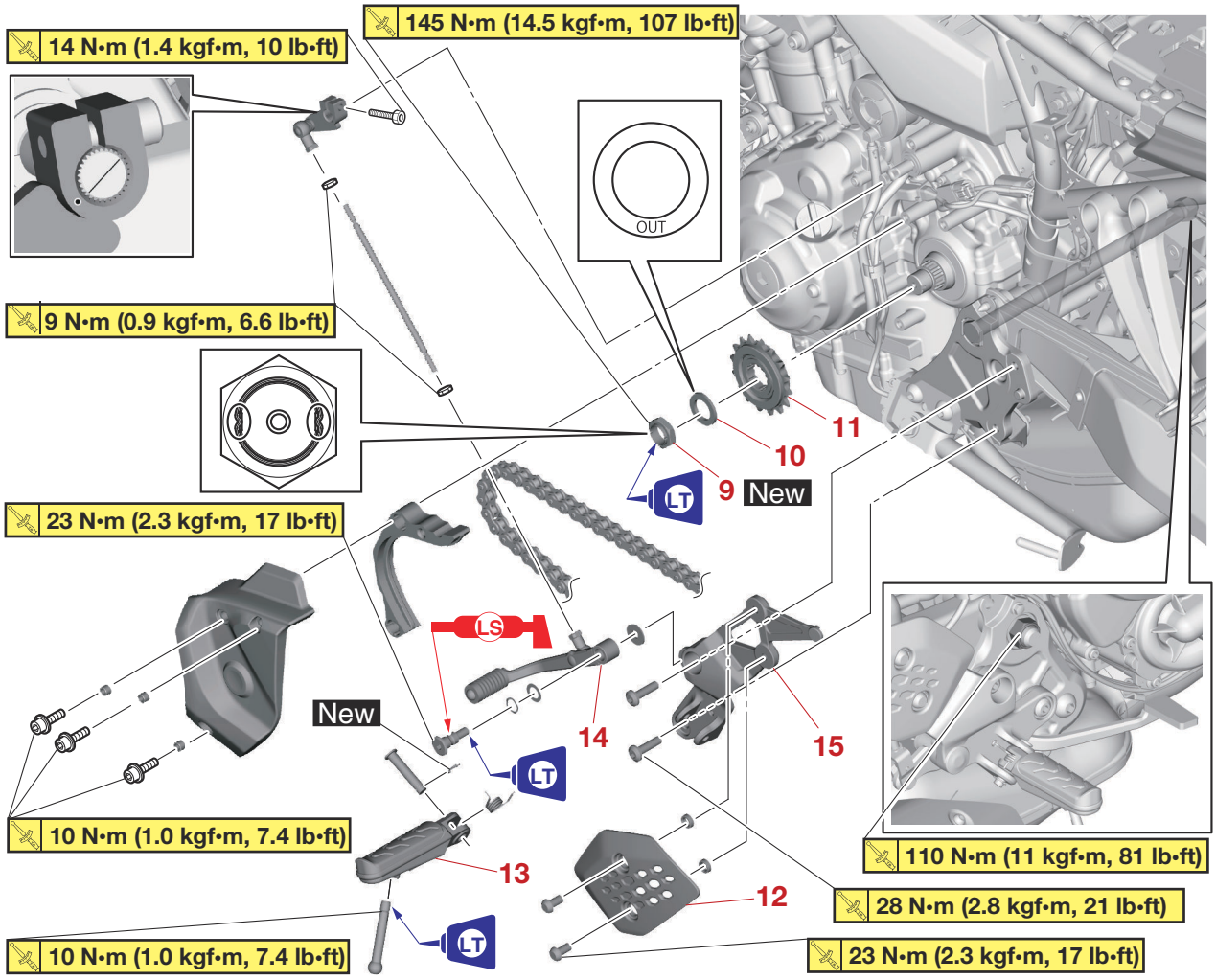
CHAIN DRIVE

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Drive chain guard		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-82.
	Pivot shaft protectors/sidestand		Refer to "SWINGARM" on page 4-87.
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 arm	1	
5	Drive sprocket cover	1	
6	Drive chain guide	1	
7	Pivot shaft nut	1	Loosen.
8	Drive chain	1	

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
9	Drive sprocket nut	1	
10	Washer	1	
11	Drive sprocket	1	
12	Footrest plate (left)	1	
13	Footrest (left)	1	
14	Shift pedal	1	
15	Footrest bracket (left)	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"

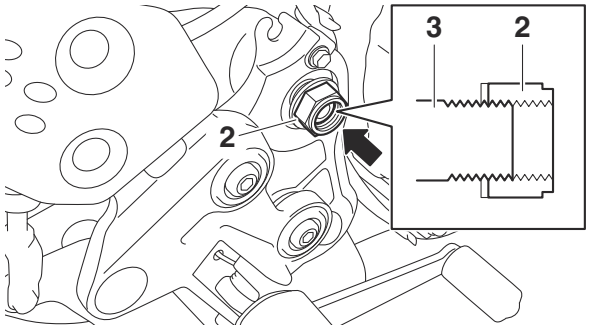
TIP
Push the rear wheel forward and remove the drive chain from the rear wheel sprocket.
Refer to "DRIVE CHAIN SLACK" on page 3-17.

   a. Loosen the pivot shaft nut "2" so that the engaged thread length on the pivot shaft "3" is 3–4 ridges.

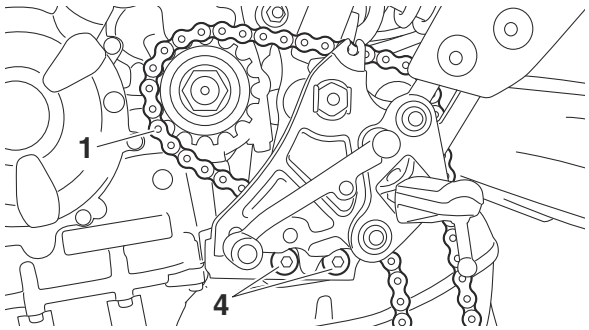
ECA21200
NOTICE

Make sure that the pivot shaft nut does not come off the pivot shaft.

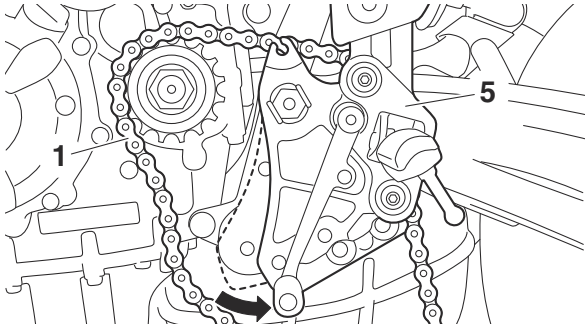
   b. Tap the pivot shaft nut to push the pivot shaft to the left.



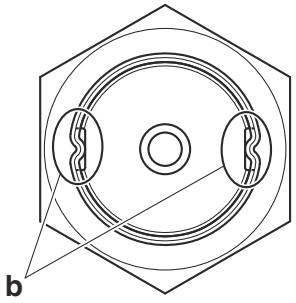
   c. Remove the footrest bracket bolts "4".



   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".



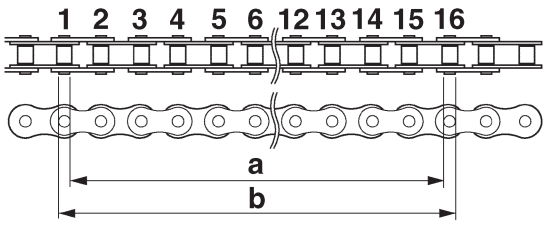
2. Loosen:
   • Drive sprocket nut

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)**

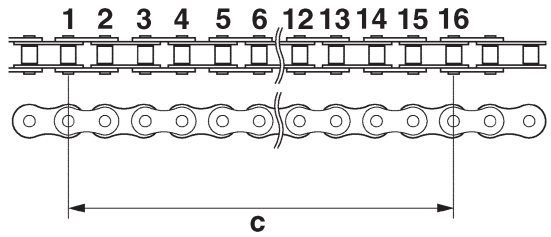
   a. Measure the length "a" between the inner sides of the pins and the length "b" between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.



G088937

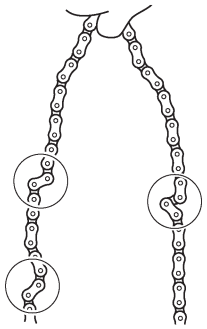
b. Calculate the length "c" of the 15-link section of the drive chain using the following formula.
Drive chain 15-link section length "c" = (length "a" between pin inner sides + length "b" between pin outer sides)/2

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.



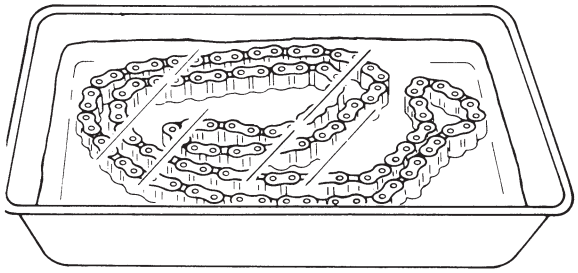
G088938

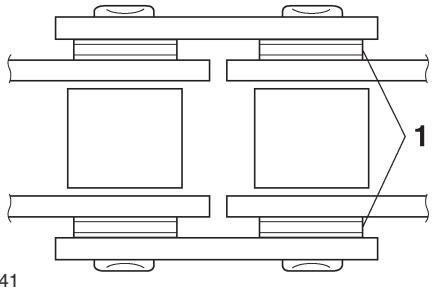
2. Check:
- Drive chain
Stiffness → Clean and lubricate or replace.


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.

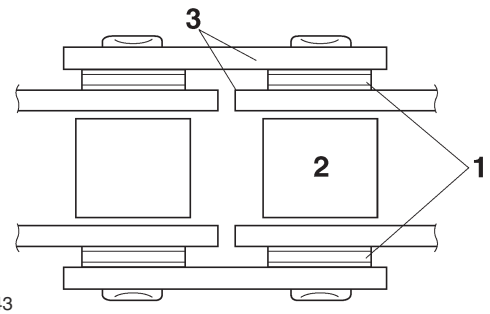
ECA14290
NOTICE
- **This motorcycle has a drive chain with small rubber O-rings "1" between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzine), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water 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.



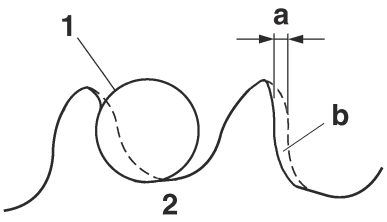
G088943

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

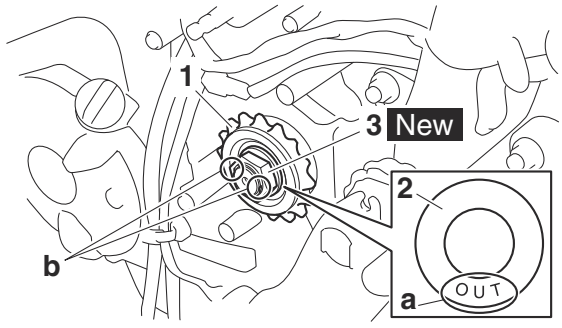
EAS30232
CHECKING THE REAR WHEEL SPROCKET
Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-25.

EAS30233
CHECKING THE REAR WHEEL DRIVE HUB
Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-25.

EAS31116
INSTALLING THE DRIVE SPROCKET
1. Install:
   - Drive sprocket "1"
   - Washer "2"
   - Drive sprocket nut "3" New

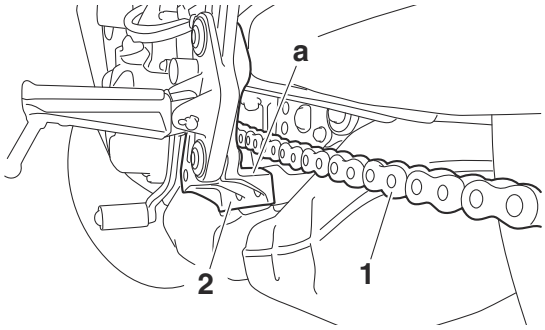
	Drive sprocket nut **145 N·m (14.5 kgf·m, 107 lb·ft)** **LOCTITE®**

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.



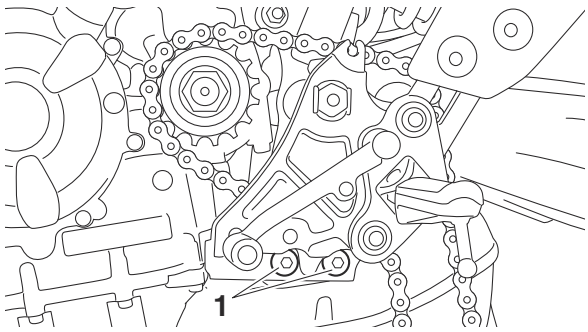
EAS30234
INSTALLING THE DRIVE CHAIN
1. Install:
   - Drive chain "1"

TIP
Make sure that the drive chain is positioned above the portion "a" of the footrest bracket "2".



2. Tighten:
   - Footrest bracket bolt "1"

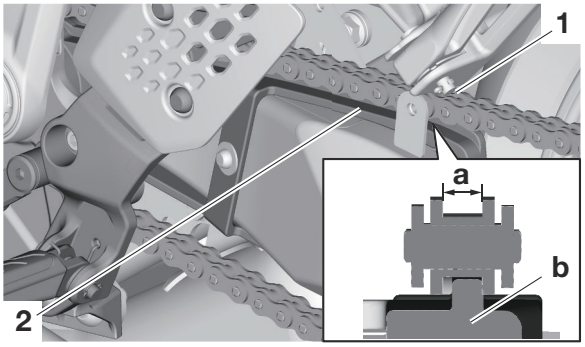
	Footrest bracket bolt **45 N·m (4.5 kgf·m, 33 lb·ft)** **LOCTITE®**



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".

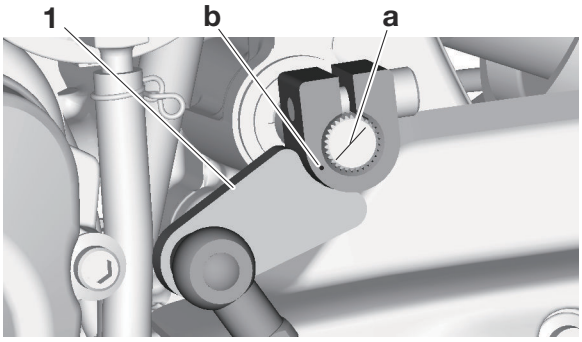


5. Install:
   - Shift arm "1"
   - Shift rod joint
   - Shift rod
   - Shift rod locknut

TIP

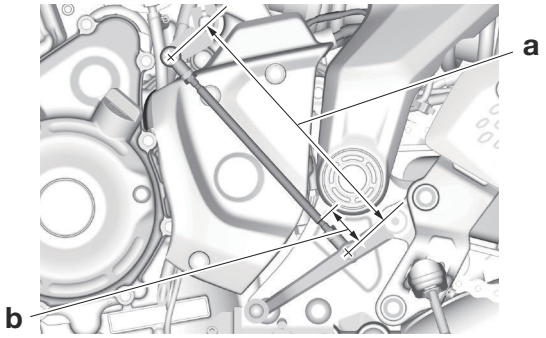
Before installing, make sure to align the mark "a" of the shift shaft with the punch mark "b" of the shift arm.

	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 **210.8–212.8 mm (8.30–8.38 in)** **Installed length "b"** **34.5–35.5 mm (1.36–1.40 in)**

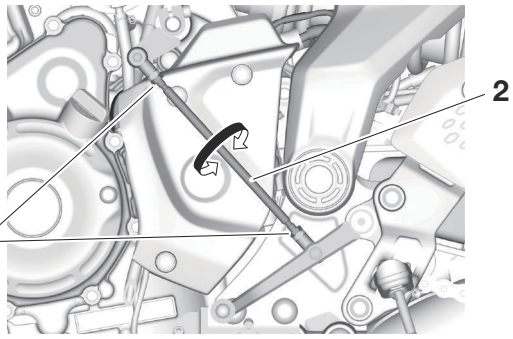


7. Adjust:
   - Installed shift rod length
     a. Loosen both locknuts "1".

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.



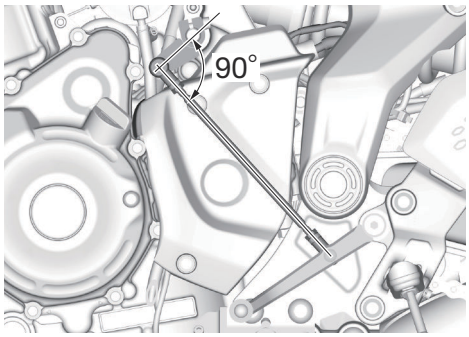
     c. Tighten both locknuts.

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 approximately 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)

ECA13550

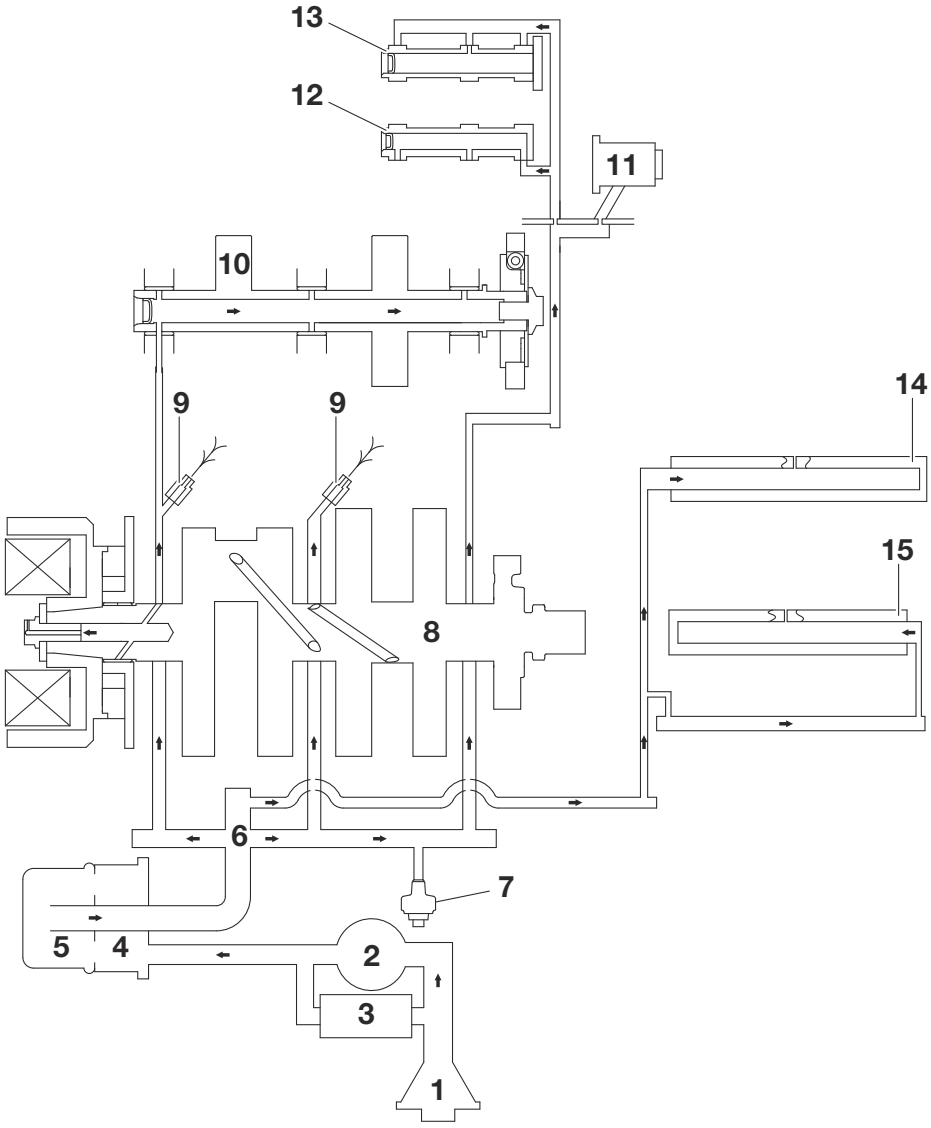
NOTICE

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

EAS20997
LUBRICATION SYSTEM CHART

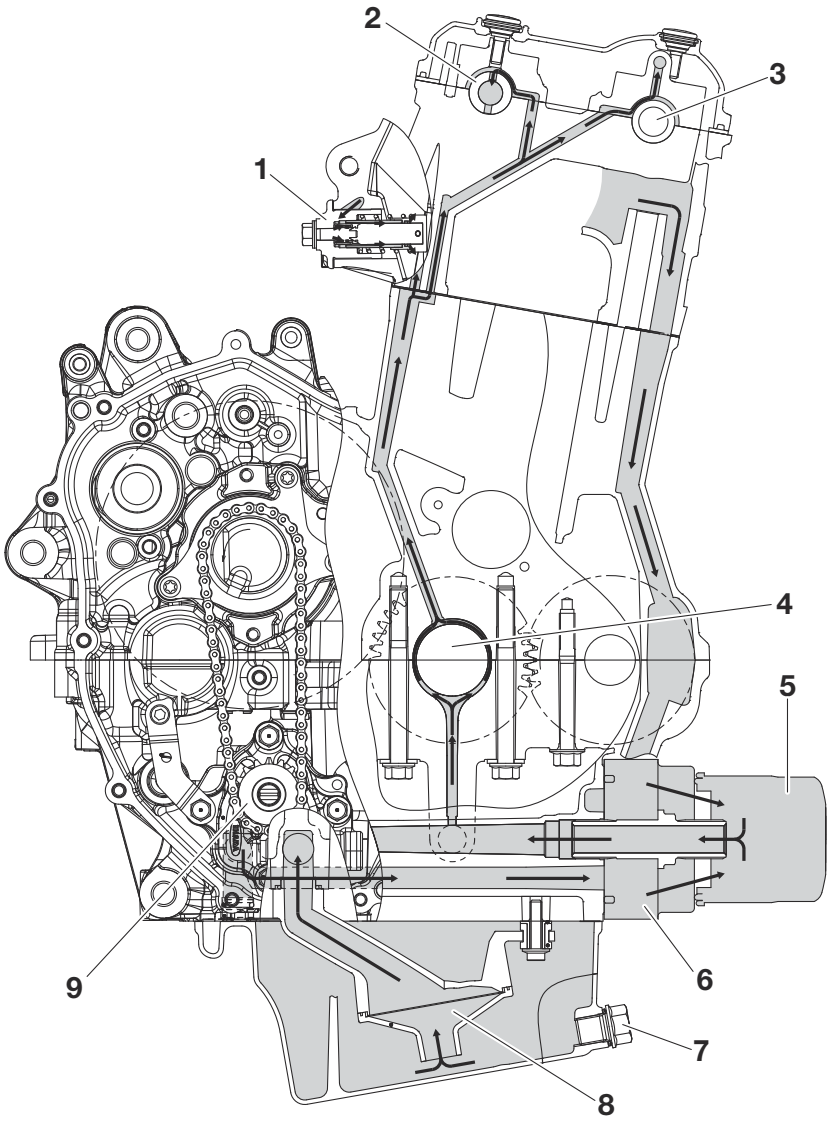
EAS32362
ENGINE OIL LUBRICATION CHART



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

EAS20319
LUBRICATION SYSTEM DIAGRAMS

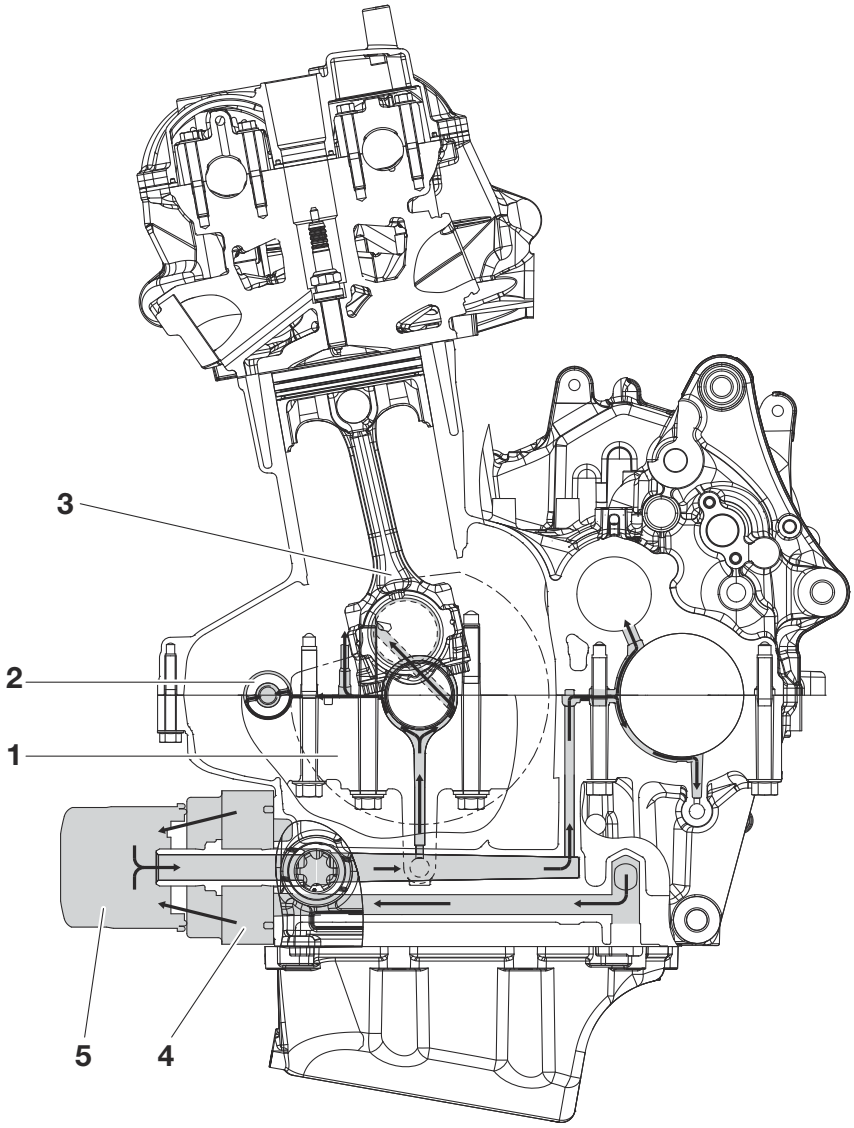
EAS34255
CRANKCASE, CYLINDER, AND CYLINDER HEAD (RIGHT SIDE VIEW)



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

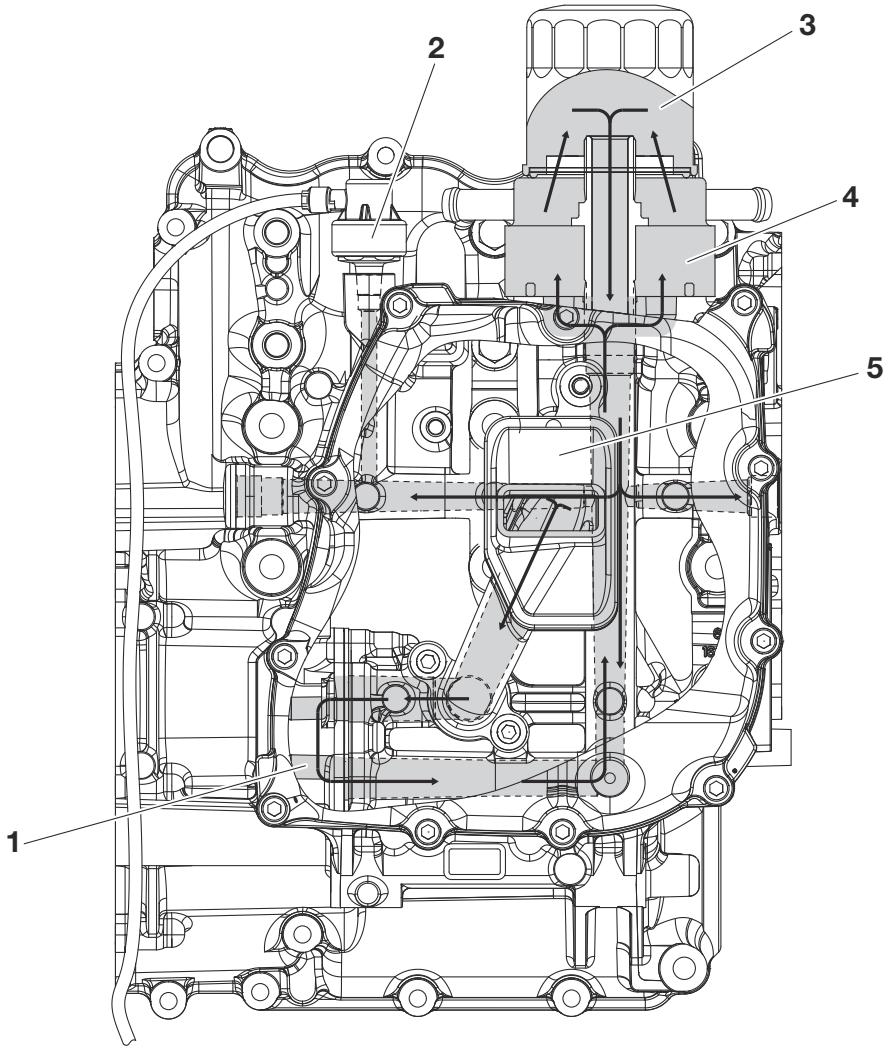
EAS34256

CRANKCASE, CYLINDER, AND CYLINDER HEAD (LEFT SIDE VIEW)



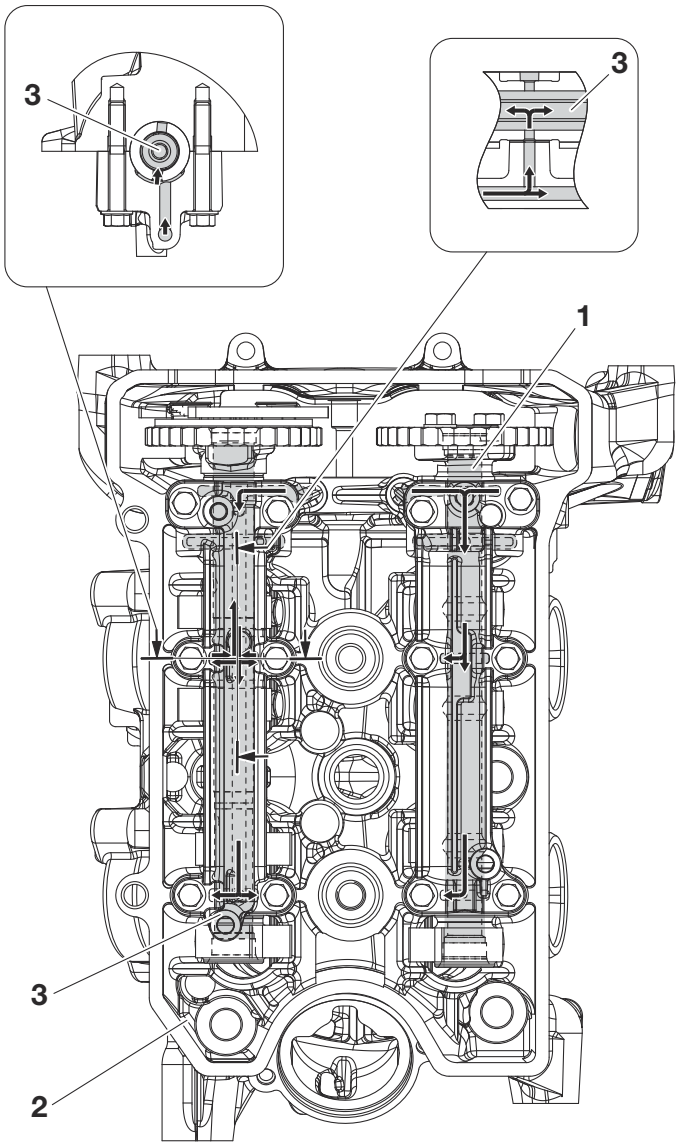
1. Crankshaft
2. Balancer shaft assembly
3. Connecting rod
4. Oil cooler
5. Oil filter cartridge

EAS34257
OIL PUMP (BOTTOM VIEW)



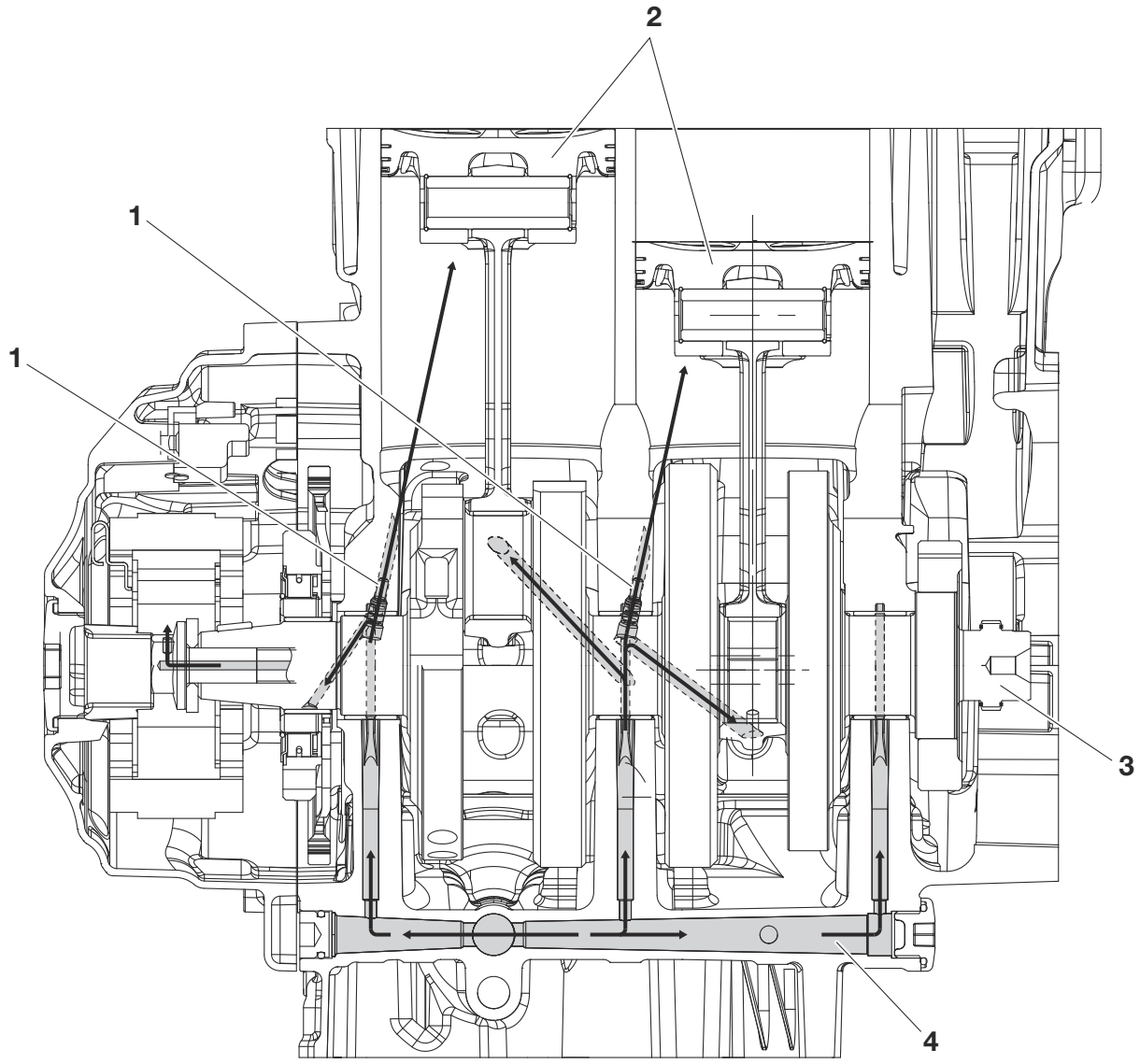
1. Oil pump
2. Oil pressure switch
3. Oil filter cartridge
4. Oil cooler
5. Oil strainer

EAS34258
CAMSHAFT (TOP VIEW)



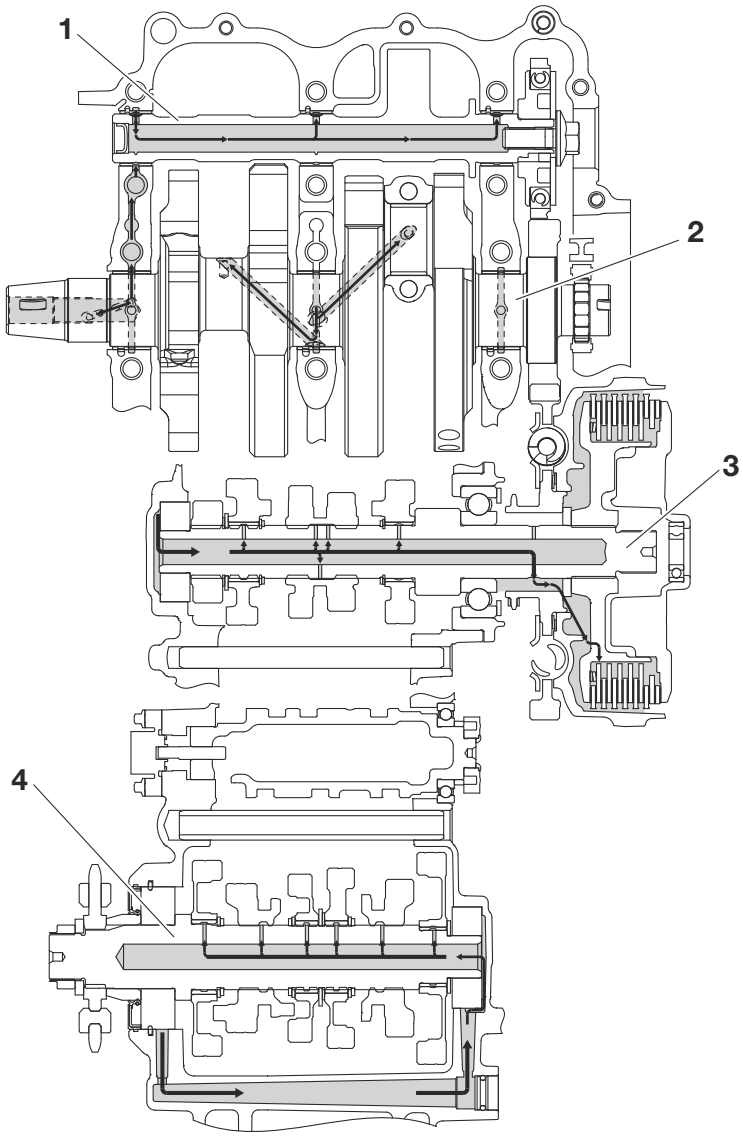
1. Intake camshaft
2. Cylinder head
3. Exhaust camshaft

EAS34259
CRANKSHAFT (FRONT VIEW)



1. Oil nozzle
2. Piston
3. Crankshaft
4. Main gallery

EAS34260
CRANKSHAFT AND TRANSMISSION (TOP VIEW)



1. Balancer shaft assembly
2. Crankshaft
3. Main axle
4. Drive axle

EAS20041
ENGINE INSPECTION

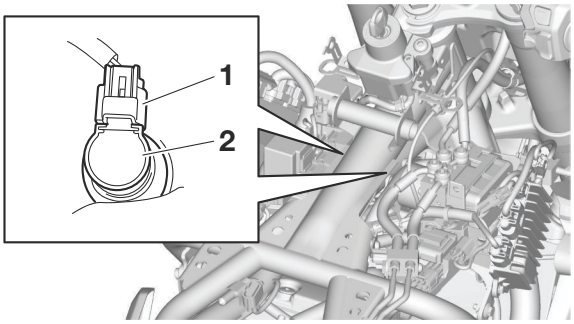
EAS30249
MEASURE THE COMPRESSION PRESSURE

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 3-5.
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 top cover
     Refer to "GENERAL CHASSIS (4)" on page 4-9.
   - Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   - Electrical components tray 1
     Refer to "GENERAL CHASSIS (5)" on page 4-11.
4. Disconnect:
   - Ignition coil coupler "1"
5. Remove:
   - Ignition coil "2"



6. Remove:
   - Spark plug

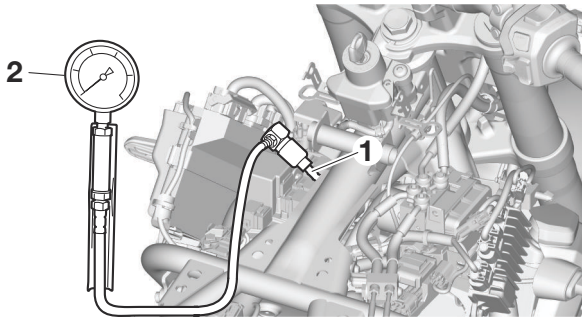
ECA13340

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)**

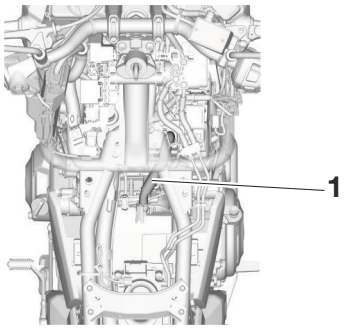
10. Connect:
    • Ignition coil coupler
11. Install:
    • Electrical components tray 1
      Refer to "GENERAL CHASSIS (5)" on page 4-11.
    • Fuel tank
      Refer to "FUEL TANK" on page 7-1.
    • Fuel tank top cover
      Refer to "GENERAL CHASSIS (4)" on page 4-9.
    • Rider seat
    • Passenger 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.
   • Fuel tank top cover
     Refer to "GENERAL CHASSIS (4)" on page 4-9.
   • 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.

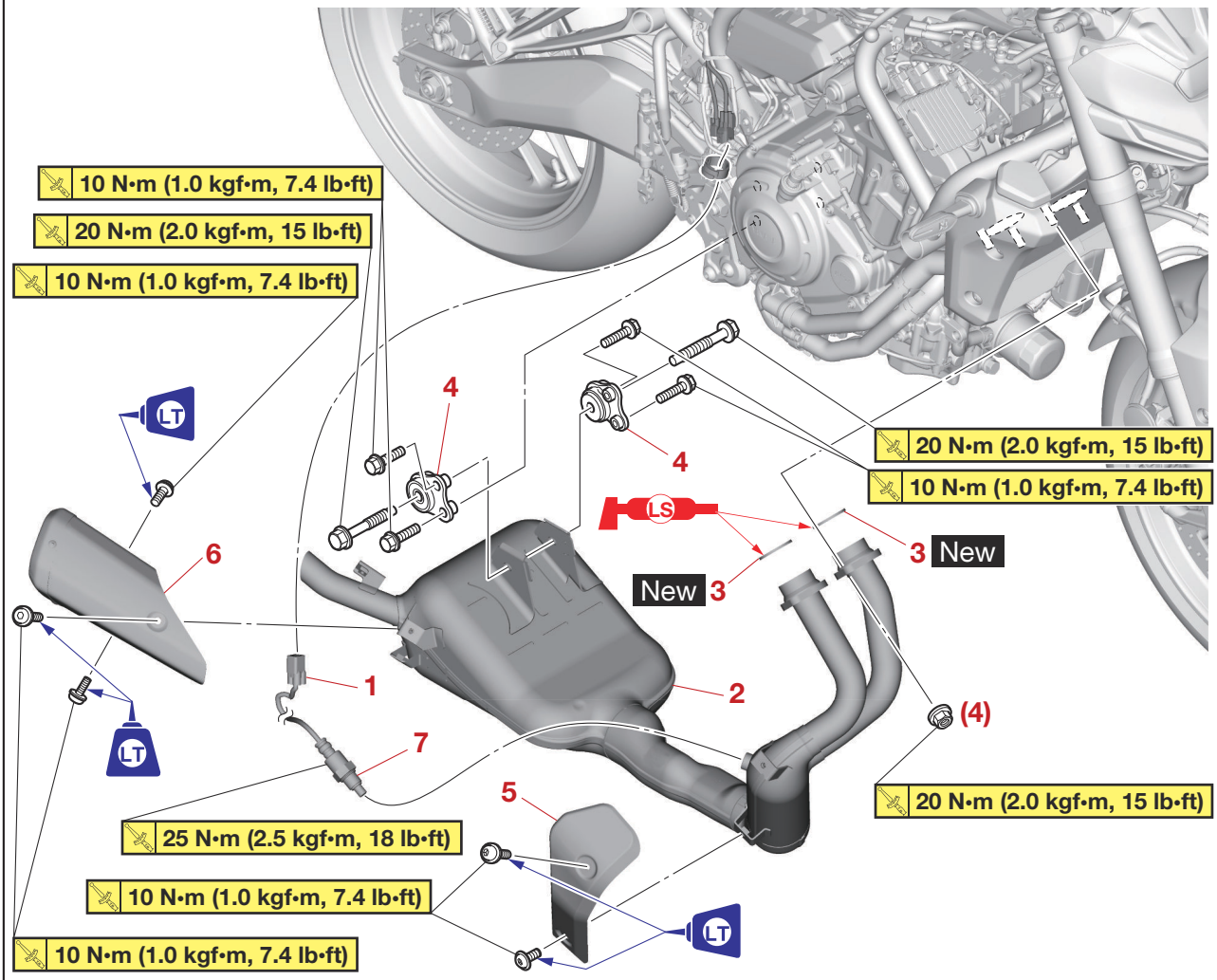


3. Install:
   • Fuel tank
     Refer to "FUEL TANK" on page 7-1.
   • Fuel tank top cover
     Refer to "GENERAL CHASSIS (4)" on page 4-9.
   • Rider seat
   • Passenger seat
     Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS20042

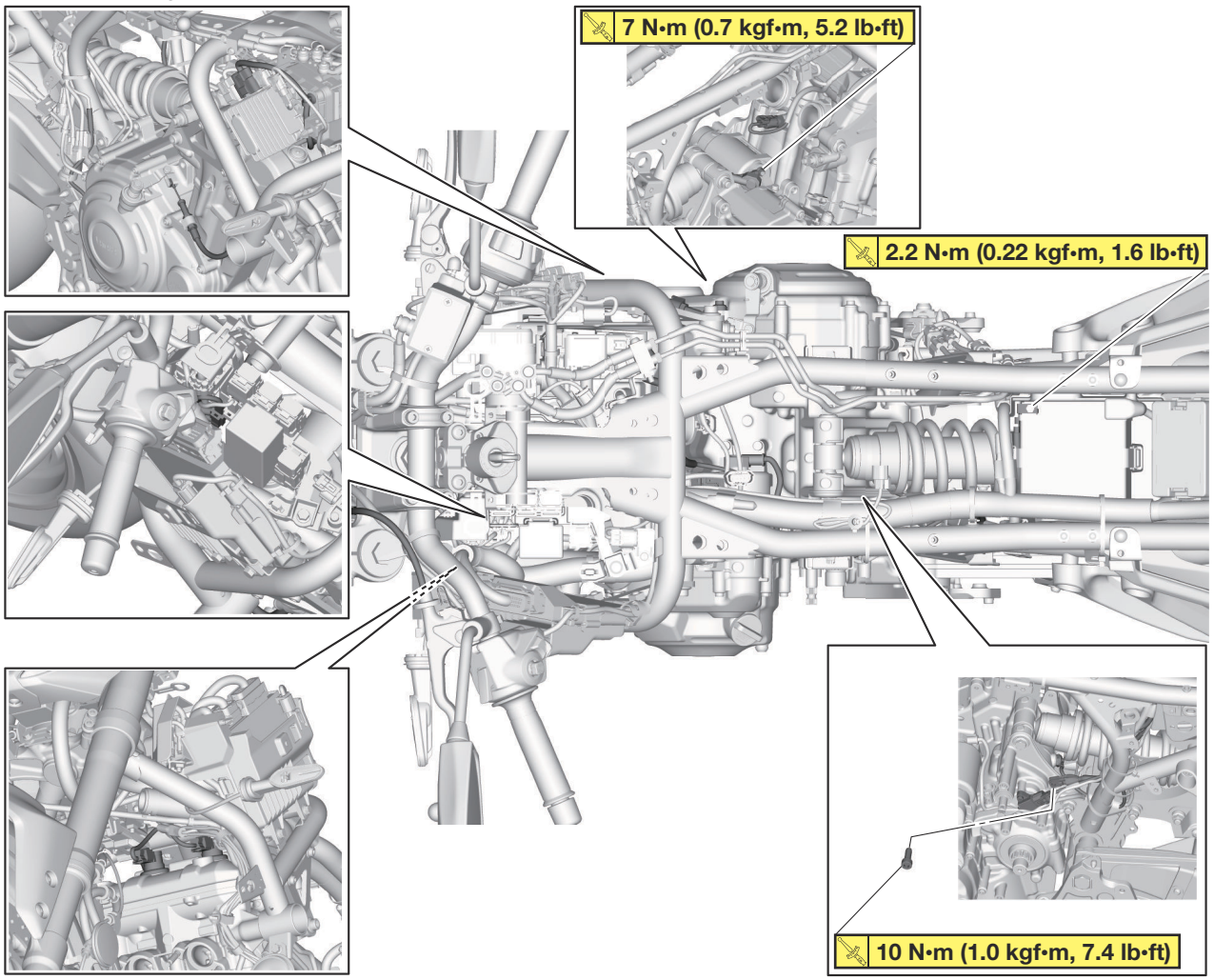
ENGINE REMOVAL

Removing the muffler and exhaust pipe



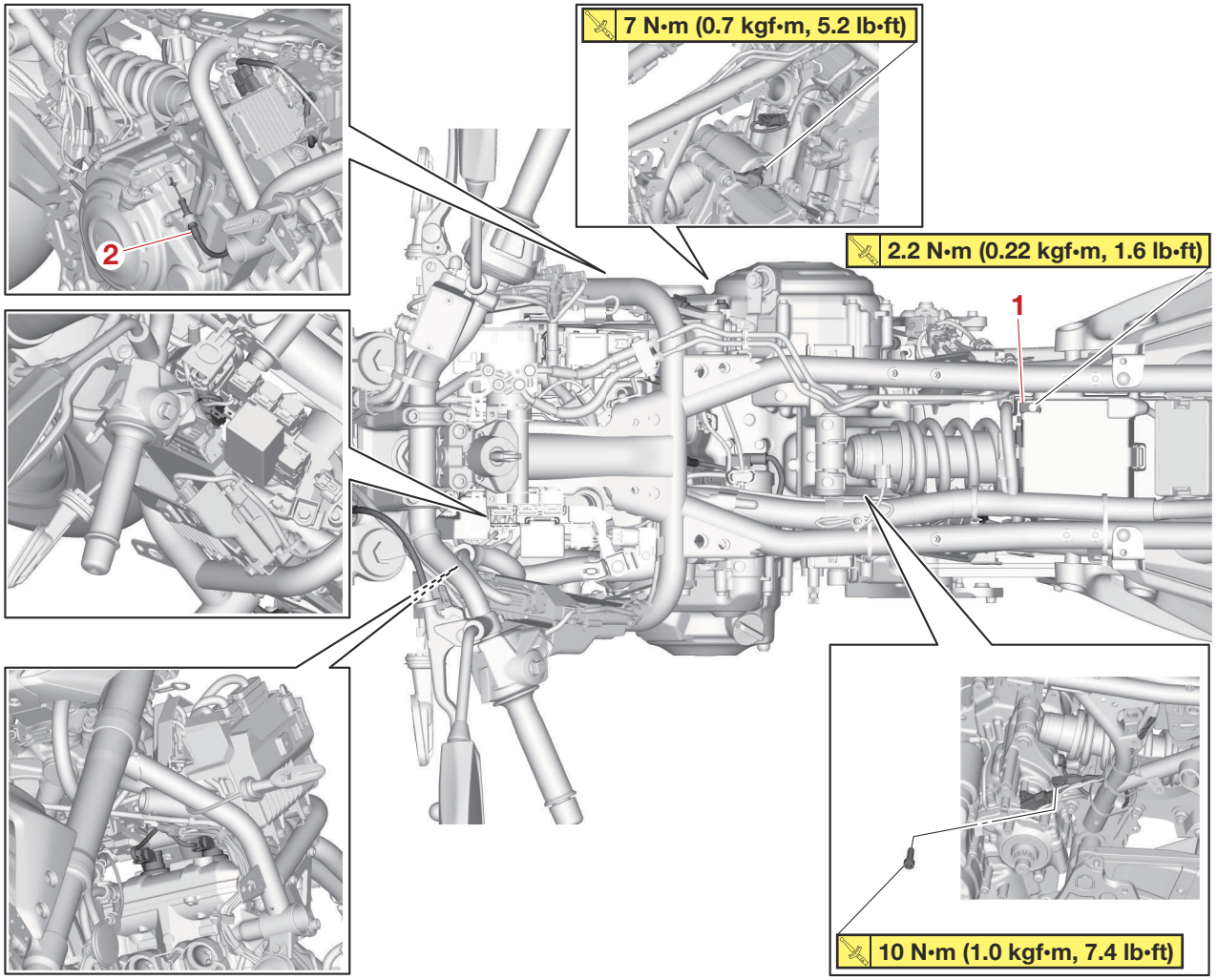
Order	Job/Parts to remove	Q'ty	Remarks
	Pivot shaft protector (right)		Refer to "SWINGARM" on page 4-87.
	Footrest assembly (right)		Refer to "REAR BRAKE" on page 4-42.
1	O_2 sensor coupler	1	Disconnect.
2	Muffler assembly	1	
3	Exhaust gasket	2	
4	Muffler bracket	2	
5	Exhaust pipe protector	1	
6	Muffler cover	1	
7	O_2 sensor	1	Remove the O_2 sensor only when necessary.

Disconnecting the leads and hoses



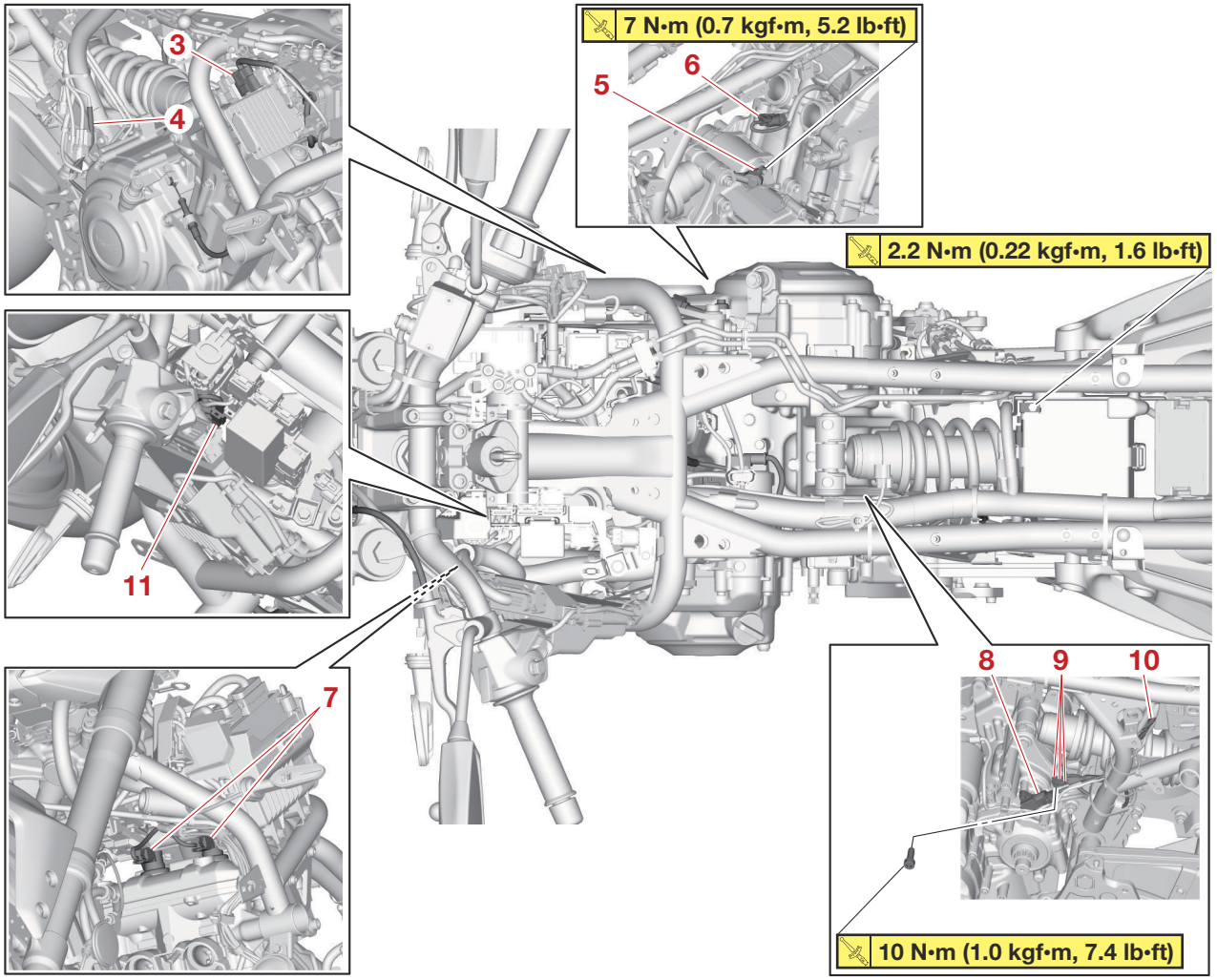
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Pivot shaft protectors/Sidestand/Footrest assembly (left)		Refer to "SWINGARM" on page 4-87.
	Fuel tank top cover		Refer to "GENERAL CHASSIS (4)" on page 4-9.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Canister/Purge cut valve solenoid		For California only Refer to "FUEL TANK" on page 7-1.
	Frame cross member		Refer to "AIR FILTER" on page 7-8.
	Throttle bodies/Air filter case/Cylinder head breather hose		Refer to "THROTTLE BODIES" on page 7-9.

Disconnecting the leads and hoses



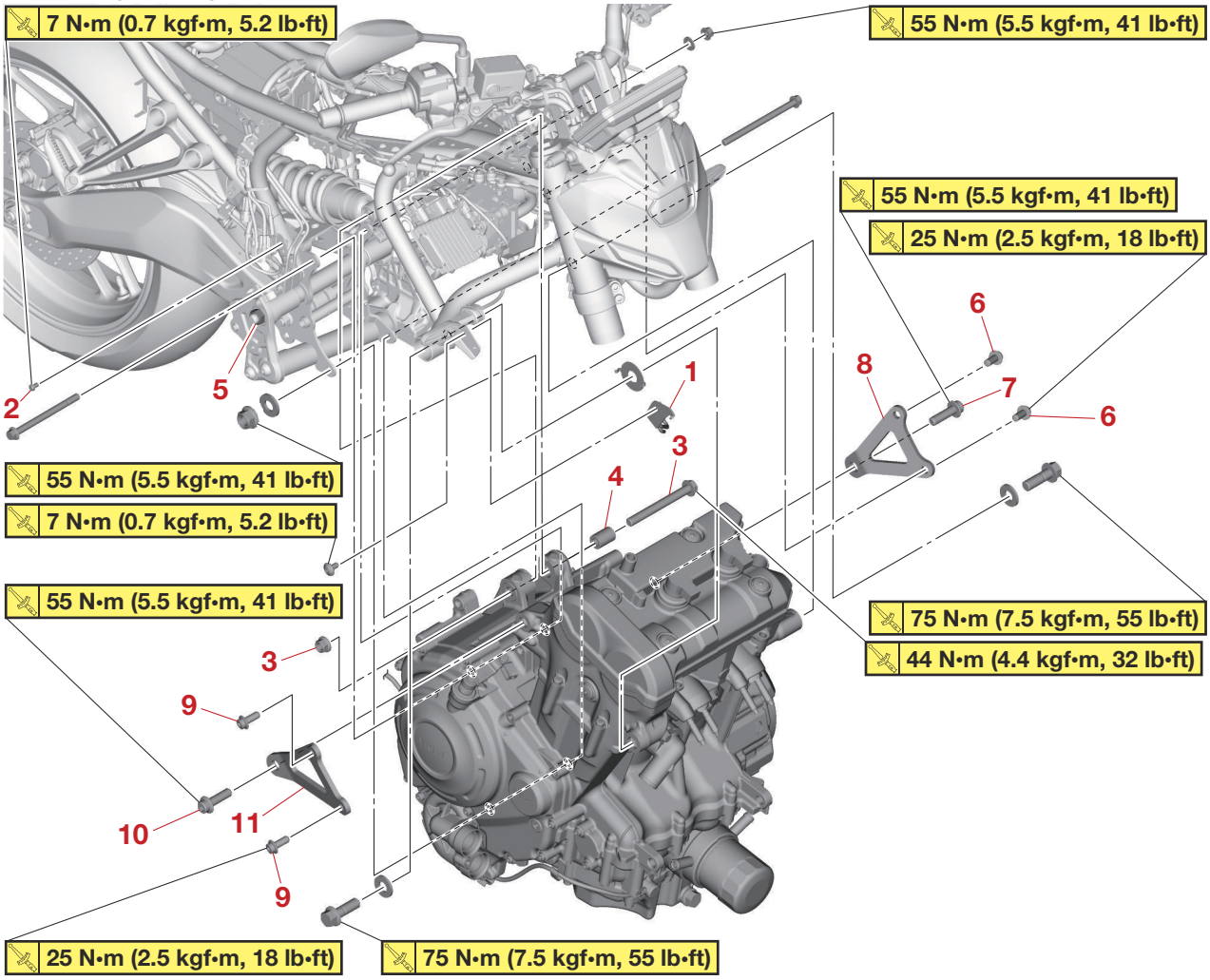
Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-23.
	Radiator/Coolant reservoir		Refer to "RADIATOR" on page 6-3.
	Oil cooler outlet hose/Oil cooler inlet hose		Refer to "OIL COOLER" on page 6-7.
	Water pump inlet pipe/Water pump outlet pipe		Refer to "WATER PUMP" on page 6-11.
	Drive chain/Drive sprocket		Refer to "CHAIN DRIVE" on page 4-93.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
1	Negative battery lead	1	Disconnect.
2	Clutch cable	1	Disconnect.

Disconnecting the leads and hoses



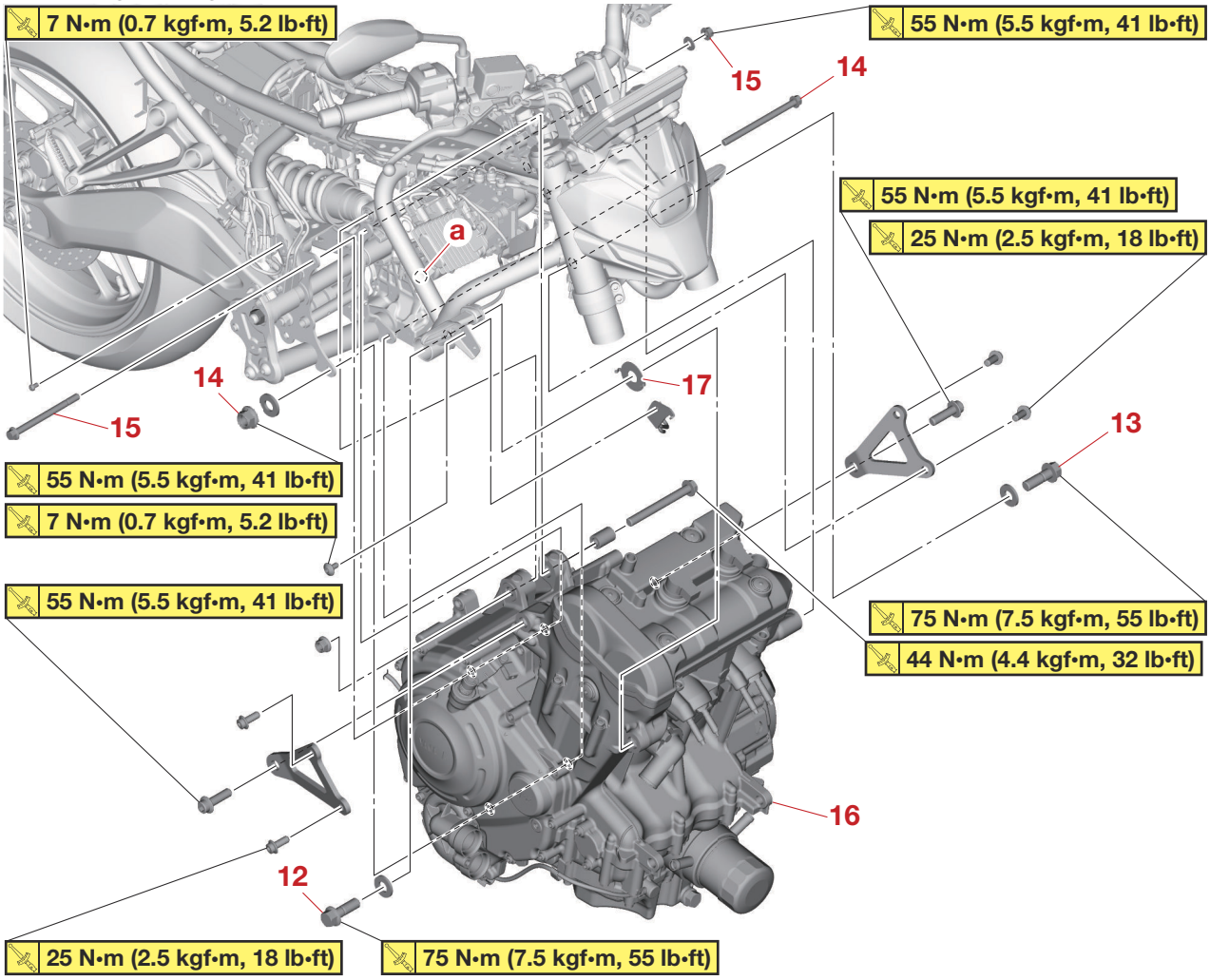
Order	Job/Parts to remove	Q'ty	Remarks
3	Stator coil coupler	1	Disconnect.
4	Oil pressure switch connector	1	Disconnect.
5	Starter motor lead	1	Disconnect.
6	Coolant temperature sensor coupler	1	Disconnect.
7	Ignition coil coupler	2	Disconnect.
8	Gear position sensor coupler	1	Disconnect.
9	Engine ground lead	3	Disconnect.
10	Neutral switch connector	1	Disconnect.
11	Crankshaft position sensor coupler	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".

EAS34109
REPLACING THE O_2 SENSOR

1. Tighten:
   - O_2 sensor

	O_2 sensor **25 N·m (2.5 kgf·m, 18 lb·ft)**

2. Reset:
   - O_2 feedback cycle value
     a. Remove the protective cap, and then connect the YDT to the YDT coupler.
     Refer to "YDT" on page 9-2.

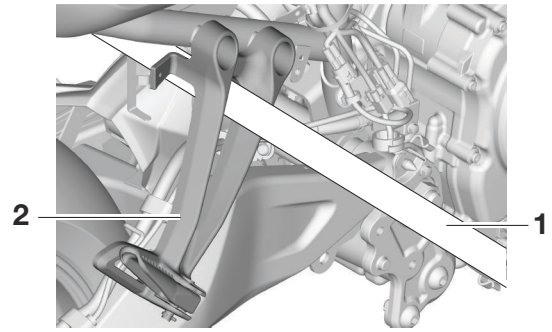
	Yamaha diagnostic tool USB (US) **90890-03275** **Yamaha diagnostic tool (A/I)** **90890-03273**

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.

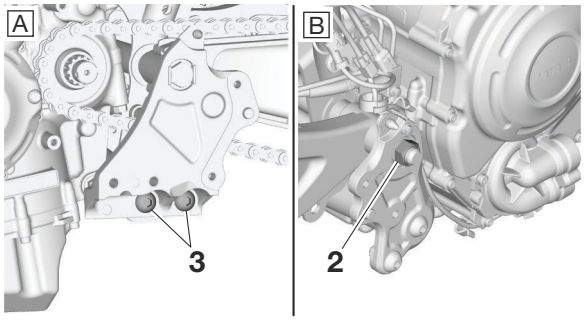
     b. Start the YDT and display the diagnosis of function.
     c. Select the "FI".
     d. Execute the diagnostic mode (Code 104).
     Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-48.

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.

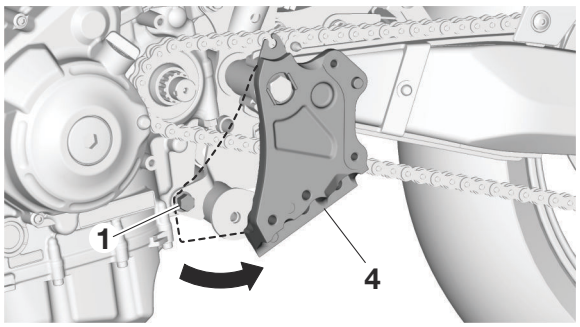


1. Remove:
   - Engine mounting bolt (rear lower side) "1"
     a. Loosen the pivot shaft nut "2", and then remove the footrest bracket bolts "3".



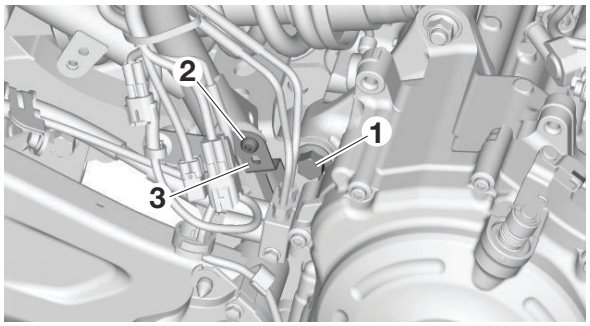
A. Left side
B. Right side

     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.



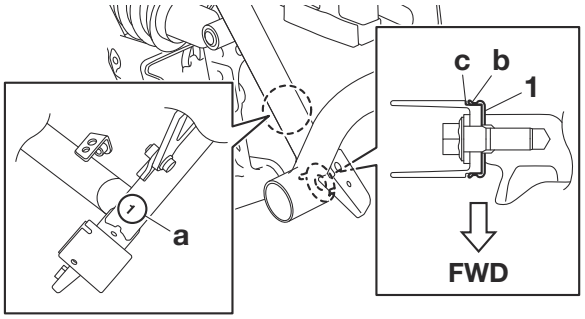
EAS30251
INSTALLING THE ENGINE

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)

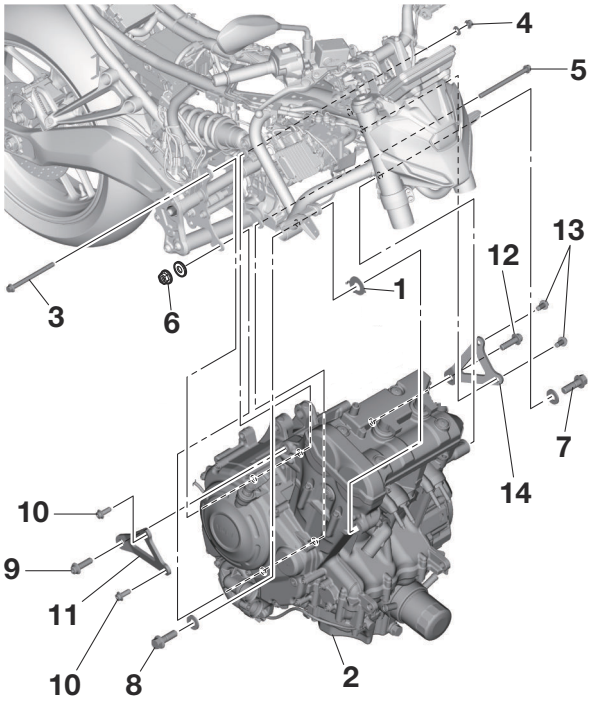
5. Install:
   • Engine mounting bolt (left upper side) “12”
   • Engine bracket bolt (left) “13”
   • Engine bracket (left) “14”

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)

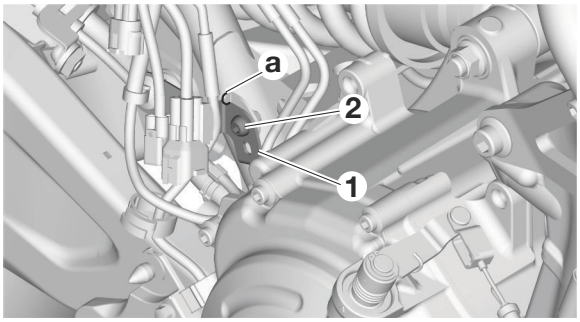


7. Install:
   • Rear brake hose joint bracket “1”
   • Rear brake hose joint bracket bolt “2”

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.

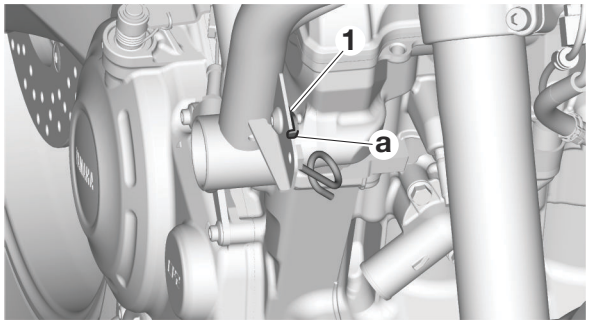


8. Install:
   • Clutch cable guide "1"

	Clutch cable guide bolt **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

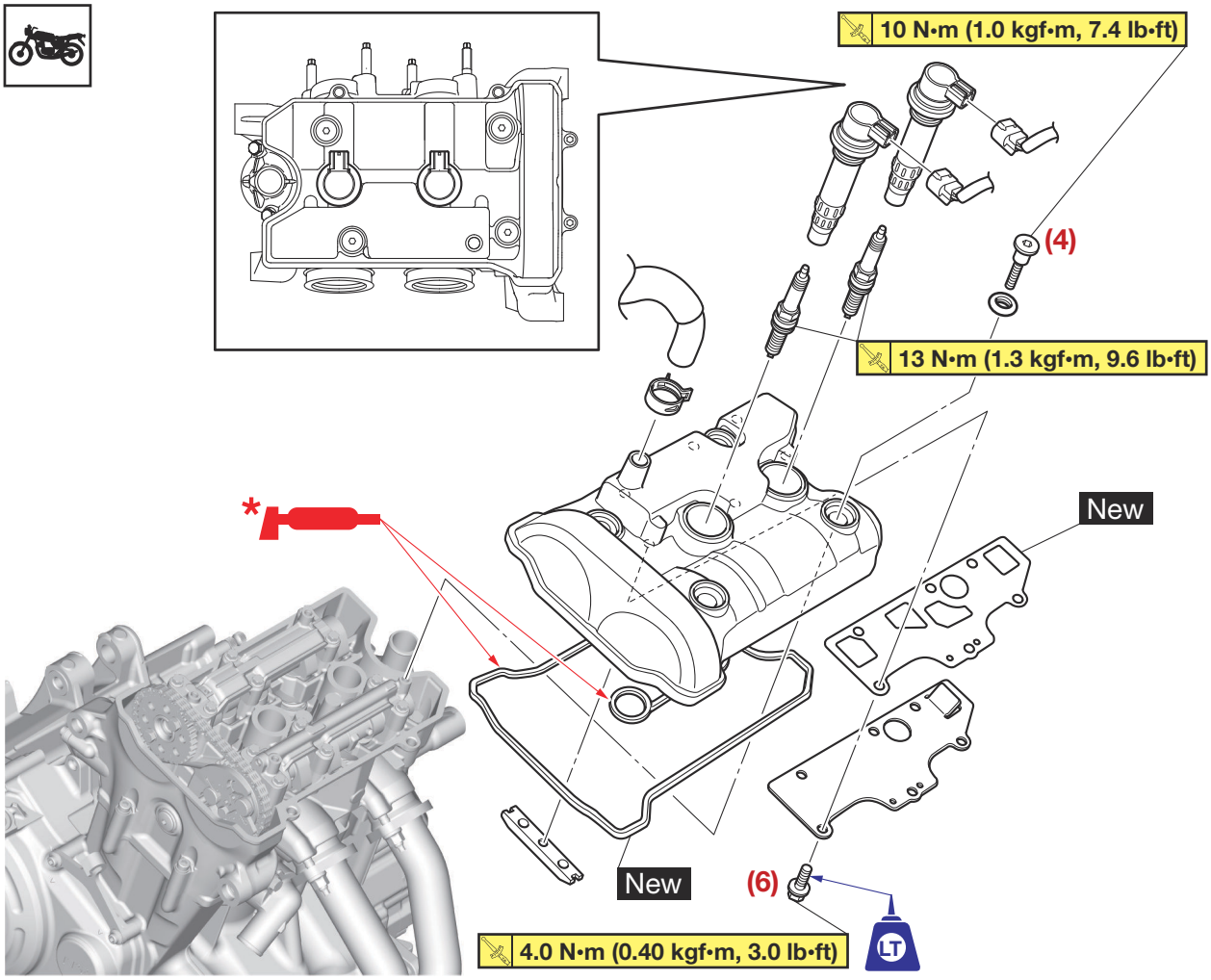
TIP

Make sure that the projection "a" on the clutch cable guide contacts the frame.



EAS20043
CAMSHAFTS

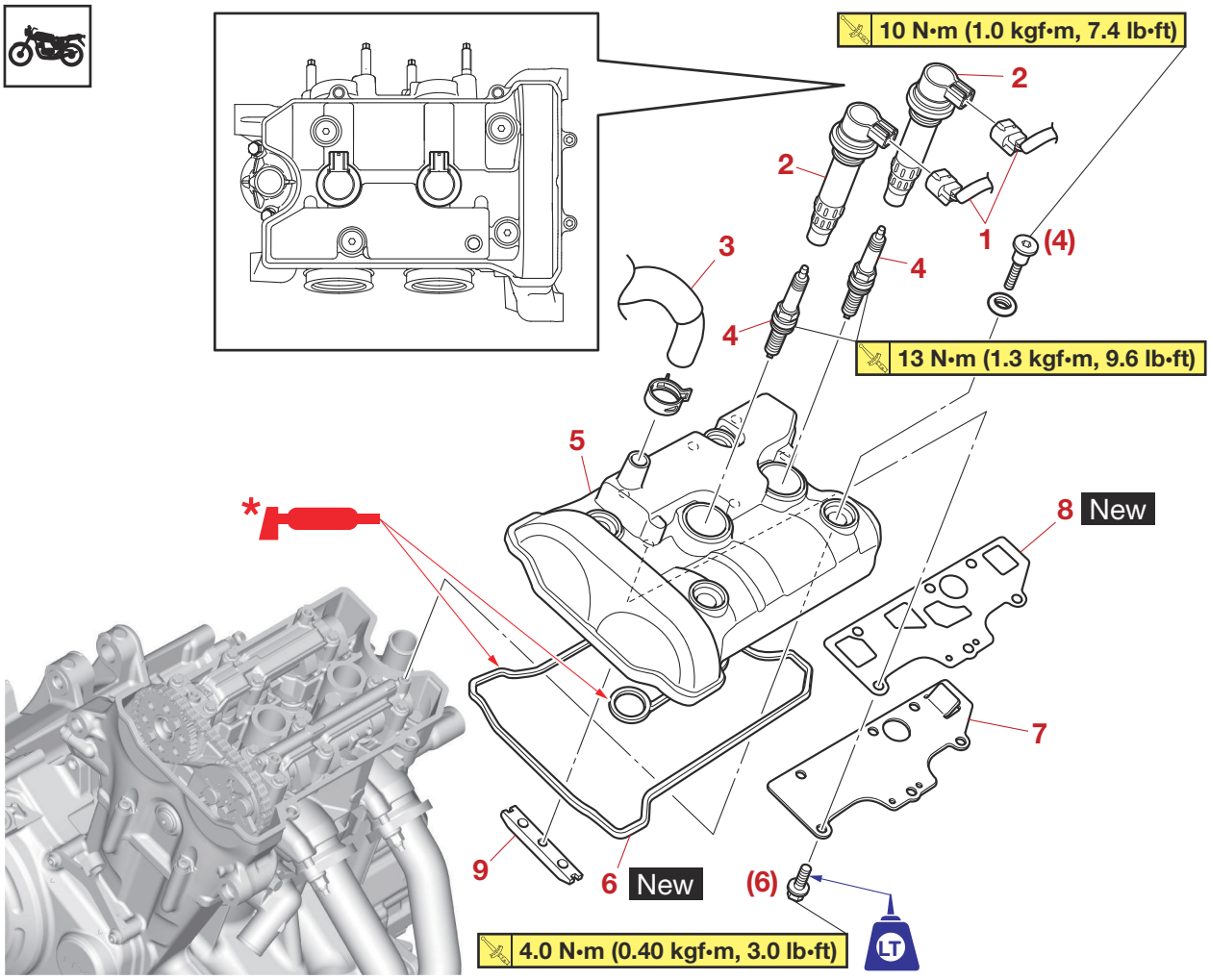
Removing the cylinder head cover



*** Three Bond No. 1541C®**

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		Refer to "GENERAL CHASSIS (4)" on page 4-9.
	Electrical components tray 1		Refer to "GENERAL CHASSIS (5)" on page 4-11.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-23.
	Radiator inlet hose/Radiator		Refer to "RADIATOR" on page 6-3.
	Clutch cable guide		Refer to "ENGINE REMOVAL" on page 5-17.

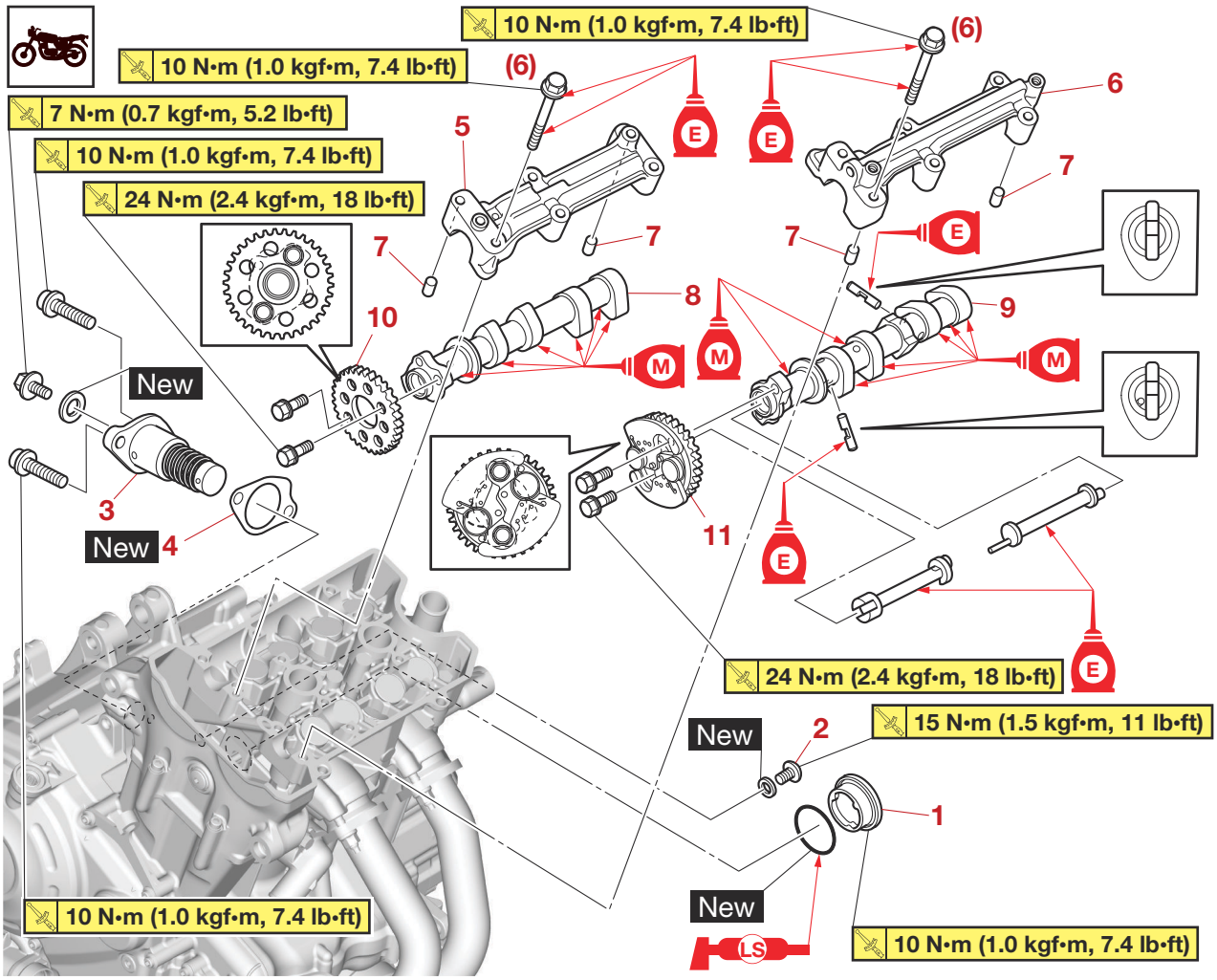
Removing the cylinder head cover



*** Three Bond No. 1541C®**

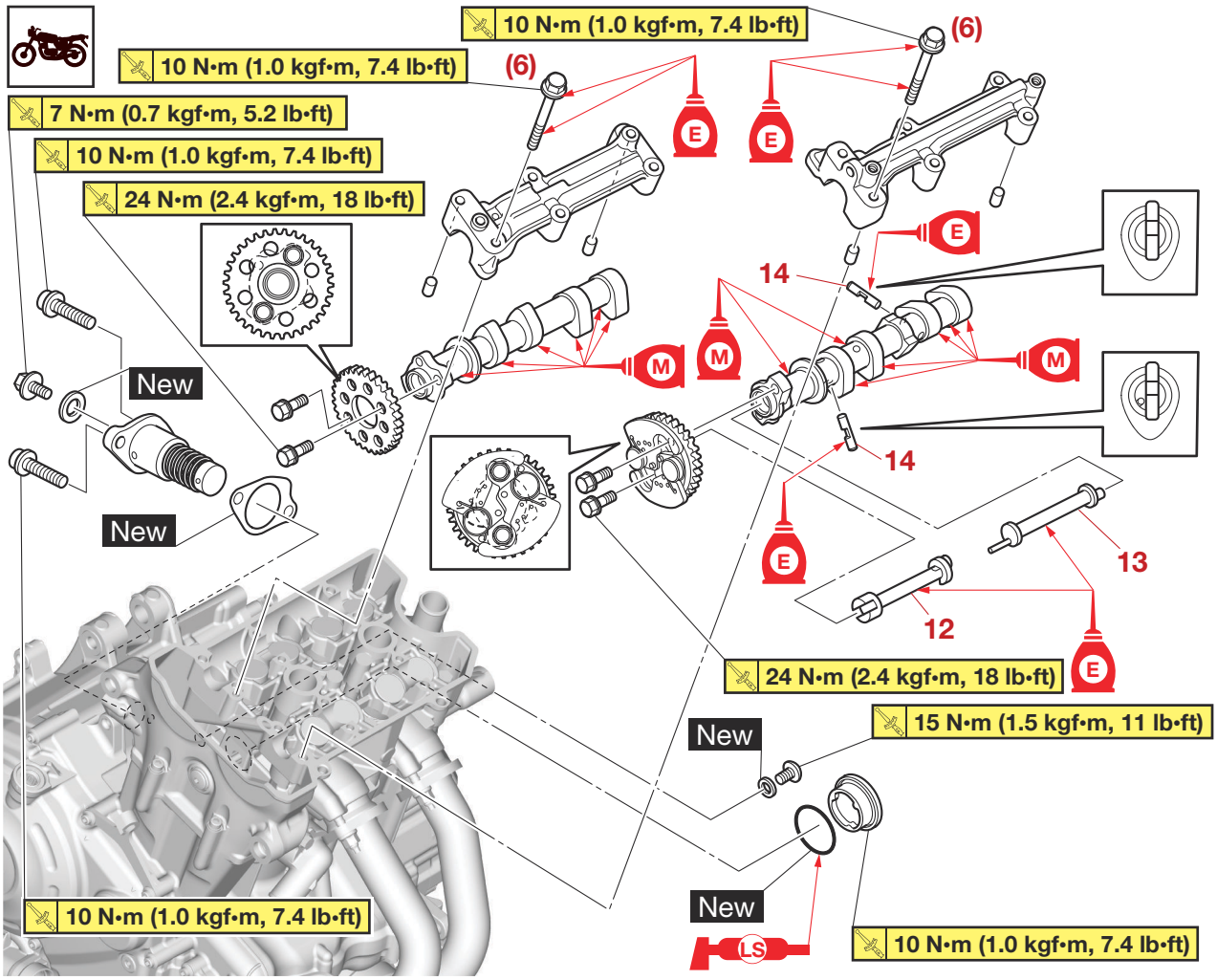
Order	Job/Parts to remove	Q'ty	Remarks
1	Ignition coil coupler	2	Disconnect.
2	Ignition coil	2	
3	Cylinder head breather hose	1	Disconnect.
4	Spark plug	2	
5	Cylinder head cover	1	
6	Cylinder head cover gasket	1	
7	Breather plate	1	
8	Breather plate gasket	1	
9	Timing chain guide (upper side)	1	

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	

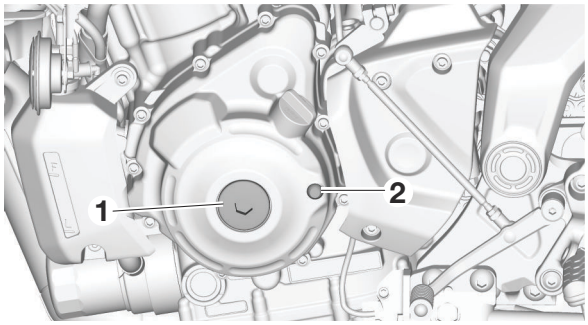
Removing the camshafts



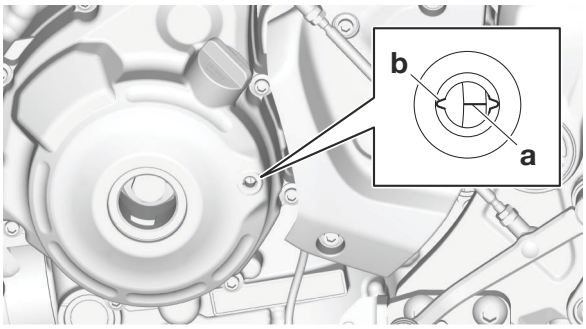
Order	Job/Parts to remove	Q'ty	Remarks
12	Decompressor lever #2	1	
13	Decompressor lever #1	1	
14	Decompressor lever pin	2	

EAS30256
REMOVING THE CAMSHAFTS

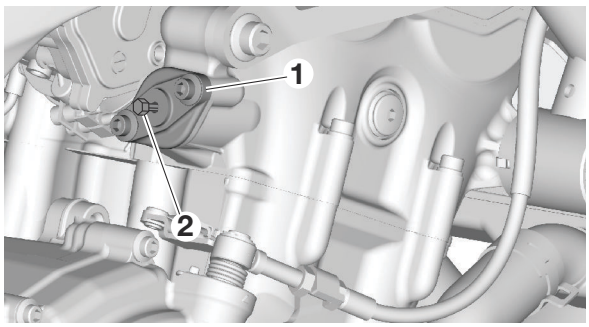
1. Remove:
   - Crankshaft end cover "1"
   - Timing mark accessing bolt "2"



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

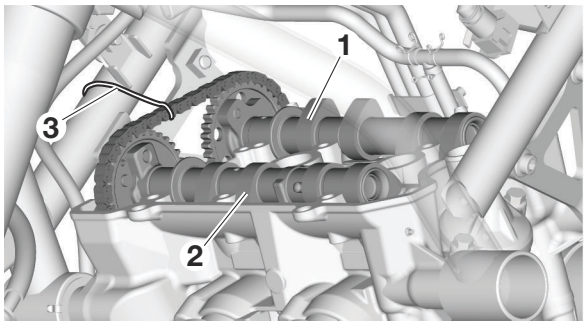
ECA13720
NOTICE

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".

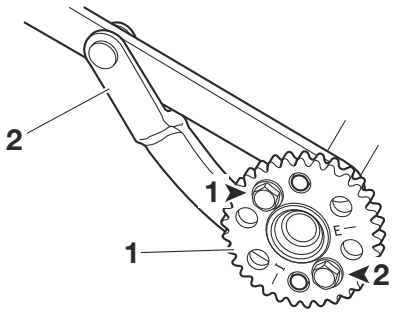


6. Remove:
   - Intake camshaft sprocket "1"

TIP

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

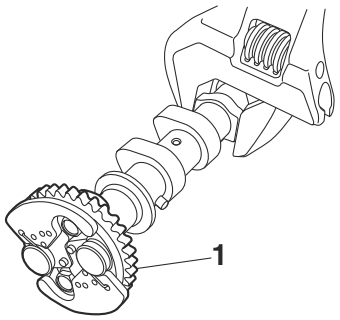
Rotor holding tool (including handle and 3 pins)
90890-04195



7. Remove:
   - Exhaust camshaft sprocket "1"

TIP

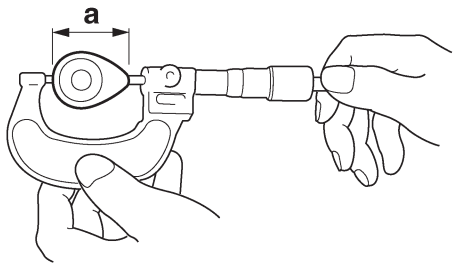
While holding the exhaust camshaft with a suitable tool, loosen the exhaust camshaft sprocket bolts.



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.

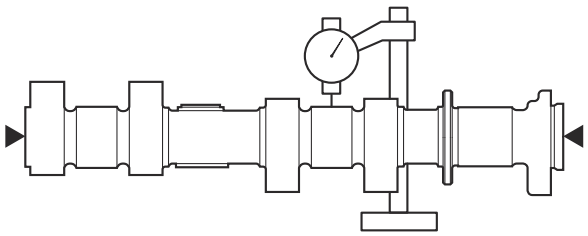
Camshaft lobe dimensions
Lobe height limit (Intake)
35.510 mm (1.3980 in)
Lobe height limit (Exhaust)
35.610 mm (1.4020 in)



G088946

3. Measure:
   • Camshaft runout
   Out of specification → Replace.

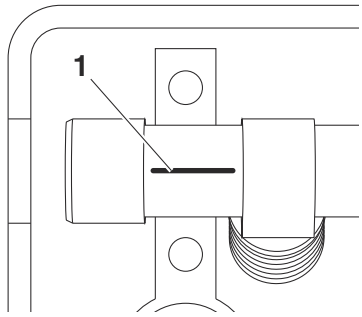
Camshaft runout limit
0.030 mm (0.0012 in)



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.



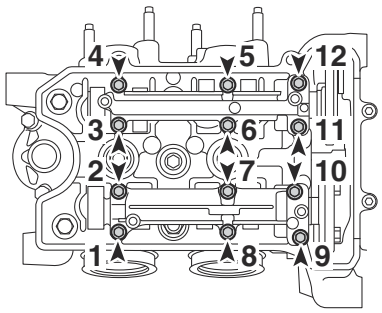
G088947

c. Install the dowel pins and camshaft caps.

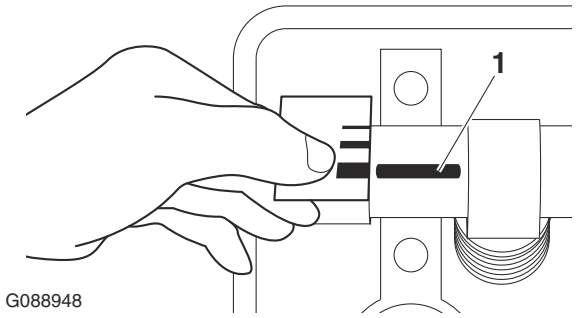
ECA13730
NOTICE
The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft caps, and camshafts will result.

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)

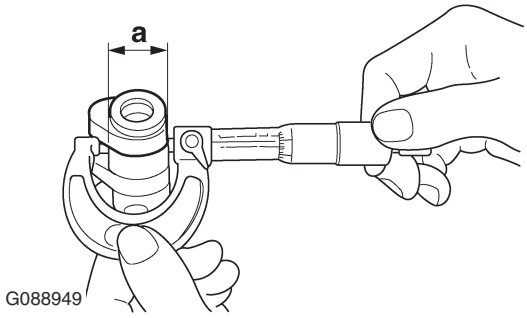


d. Remove the camshaft caps, and then measure the width of the Plastigauge® "1".



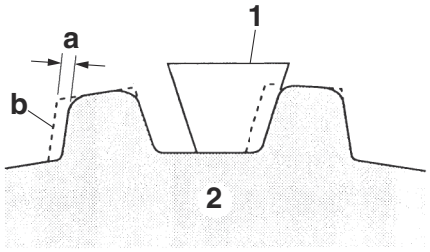
5. Measure:
   • Camshaft journal diameter "a"
   Out of specification → Replace the camshaft.
   Within specification → Replace the cylinder head and camshaft caps as a set.

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.



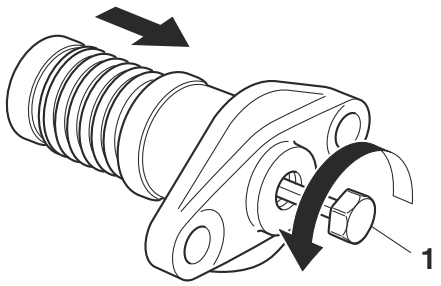
a. 1/4 tooth
b. Correct

1. Timing chain
2. Camshaft sprocket

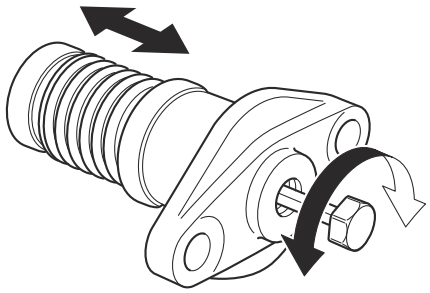
EAS30266
CHECKING THE TIMING CHAIN TENSIONER

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.



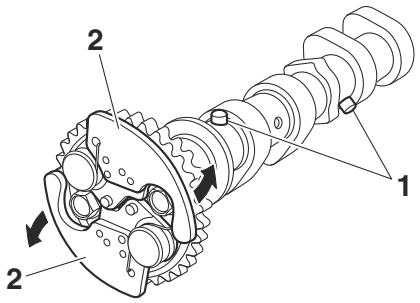
   b. Make sure that the timing chain tensioner rod moves in and out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

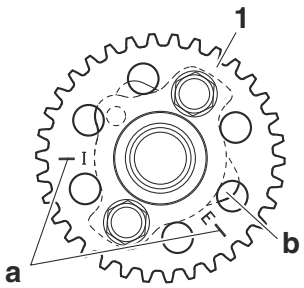


EAS30267
CHECKING THE DECOMPRESSION SYSTEM

1. Check:
   • Decompression system

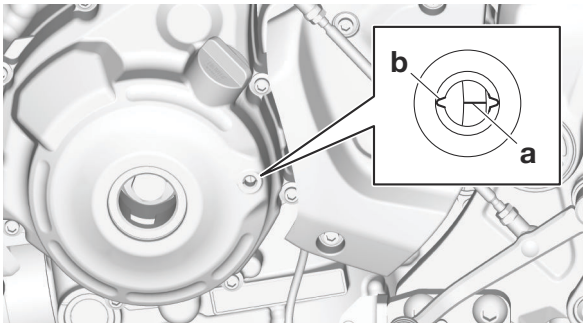
TIP
- Check that the decompressor lever pins "1" projects from the camshaft.
- Check that the decompressor cams "2" and decompressor lever pins "1" moves smoothly.





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"

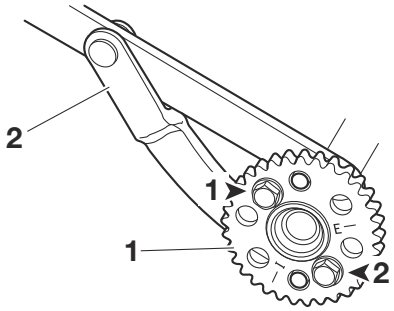
	Intake camshaft sprocket bolt 24 N·m (2.4 kgf·m, 18 lb·ft)

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.

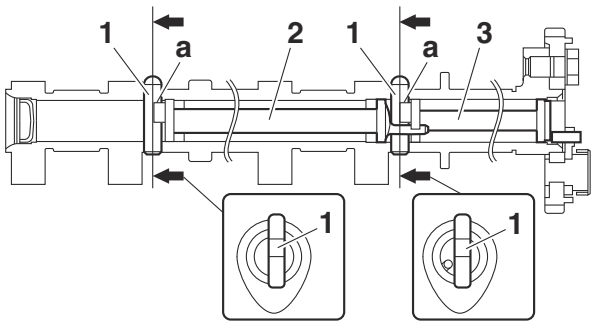
TIP
- Make sure that the marks "a" on the intake camshaft sprocket are aligned with camshaft lobe #1 "b" as shown in the illustration.
- While holding the intake camshaft sprocket with the rotor holding tool "2", tighten the intake camshaft sprocket bolts in the proper tightening sequence as shown.

	Rotor holding tool (including handle and 3 pins) 90890-04195



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.



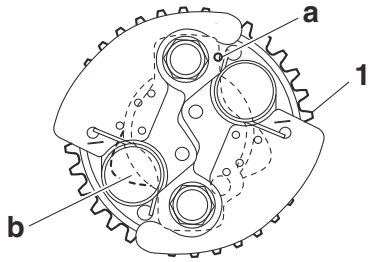
4. Install:
   - Exhaust camshaft sprocket "1"

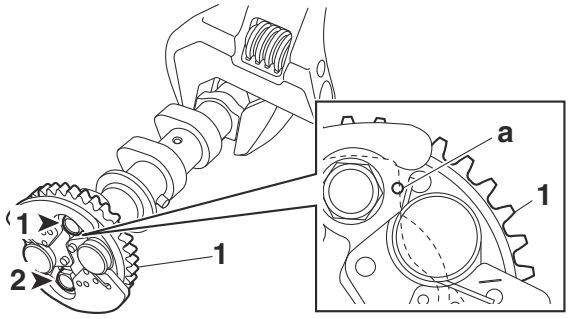
	Exhaust camshaft sprocket bolt 24 N·m (2.4 kgf·m, 18 lb·ft)

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 camshaft 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. Lubricate:
   - Exhaust camshaft
   - Intake camshaft
   (with the recommended lubricant)

	Recommended lubricant **Molybdenum disulfide oil**

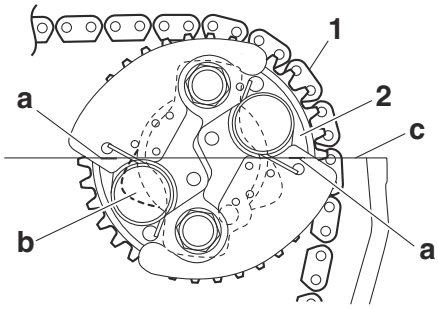
6. Install:
   - Timing chain "1"
   (onto the exhaust camshaft sprocket "2")
   - Exhaust camshaft
   - Exhaust camshaft cap

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 camshaft lobe #1 "b" are aligned with the cylinder head edge "c" as shown in the illustration.
- Temporarily tighten the exhaust camshaft cap bolts.



7. Install:
   - Timing chain "1"
   (onto the intake camshaft sprocket "2")
   - Intake camshaft
   - Intake camshaft cap

ECA20930

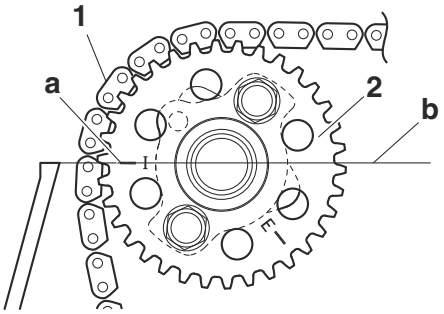
NOTICE

- **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.

8. Tighten:
   - Exhaust camshaft cap bolt
   - Intake camshaft cap bolt

ECA13730

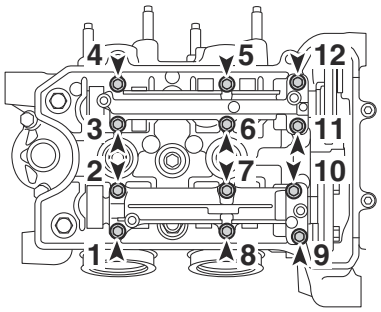
NOTICE

The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft caps, and camshafts will result.

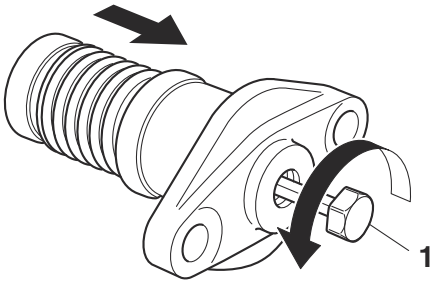
TIP

Tighten the camshaft cap bolts in the tightening sequence as shown.

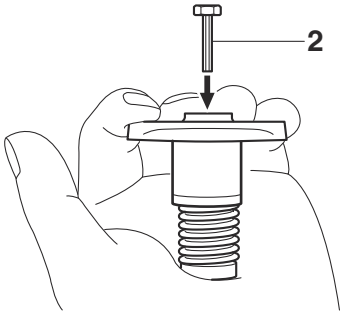
	Exhaust camshaft cap bolt **10 N·m (1.0 kgf·m, 7.4 lb·ft)** **Intake camshaft cap bolt** **10 N·m (1.0 kgf·m, 7.4 lb·ft)**



9. 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".



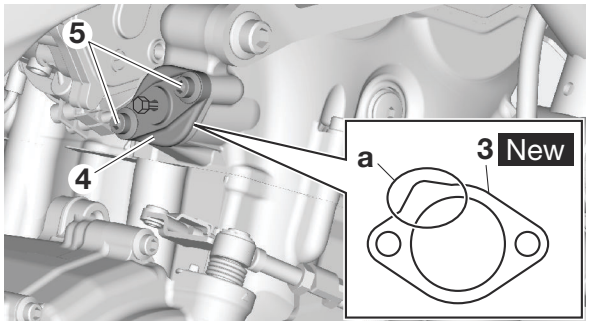
b. Keep pressing the timing chain tensioner rod by hand, remove the hexagon wrench, and then insert the hexagon wrench "2" (Parts No.: 1WS-12228-00) into the timing chain tensioner rod.



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.

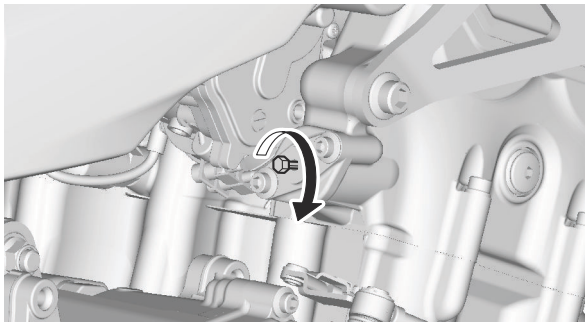
	Timing chain tensioner bolt **10 N·m (1.0 kgf·m, 7.4 lb·ft)**

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.

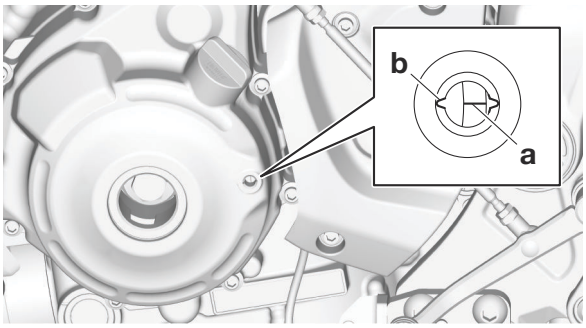


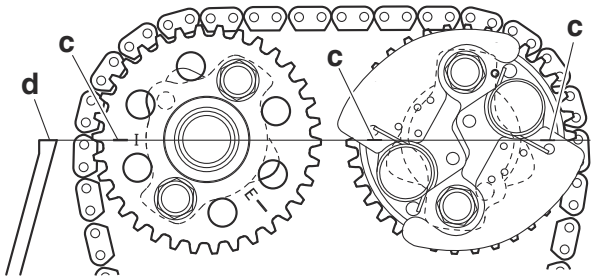
f. Remove the hexagon wrench.
g. Install the timing chain tensioner cap bolt and new gasket, and then tighten the timing chain tensioner cap bolt to specification.

	Timing chain tensioner cap bolt **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

10. Turn:
- Crankshaft
  (several turns counterclockwise)

11. 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.





12. Measure:
- Valve clearance
  Out of specification → Adjust.
  Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-5.

13. Install:
- Timing mark accessing bolt "1"
  (along with the O-ring New)

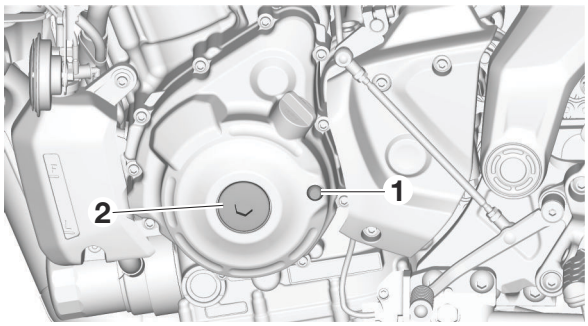
	Timing mark accessing bolt **15 N·m (1.5 kgf·m, 11 lb·ft)**

TIP

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

- Crankshaft end cover "2"
  (along with the gasket New)

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



EAS30274

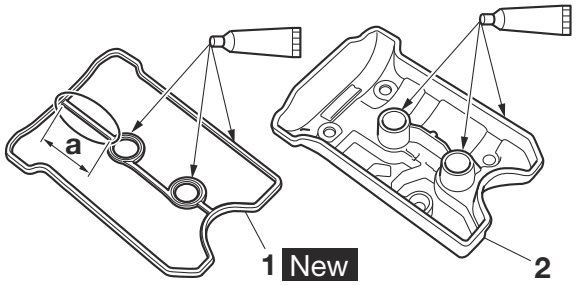
INSTALLING THE CYLINDER HEAD COVER

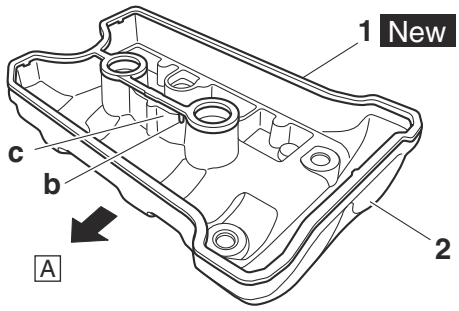
1. Install:
- Timing chain guide (top side)
- Cylinder head cover gasket "1" New
  (to the cylinder head cover)
- Breather plate bolt
- Cylinder head cover "2"

	Breather plate bolt **4.0 N·m (0.40 kgf·m, 3.0 lb·ft)** **LOCTITE®** **Cylinder head cover bolt** **10 N·m (1.0 kgf·m, 7.4 lb·ft)**

TIP

- Apply Three bond No. 1541C® 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.





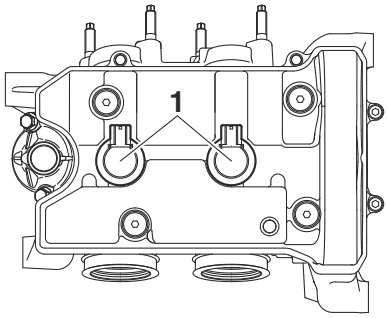
A. Exhaust side

2. Install:
   - Spark plug
   - Ignition coil "1"

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

TIP

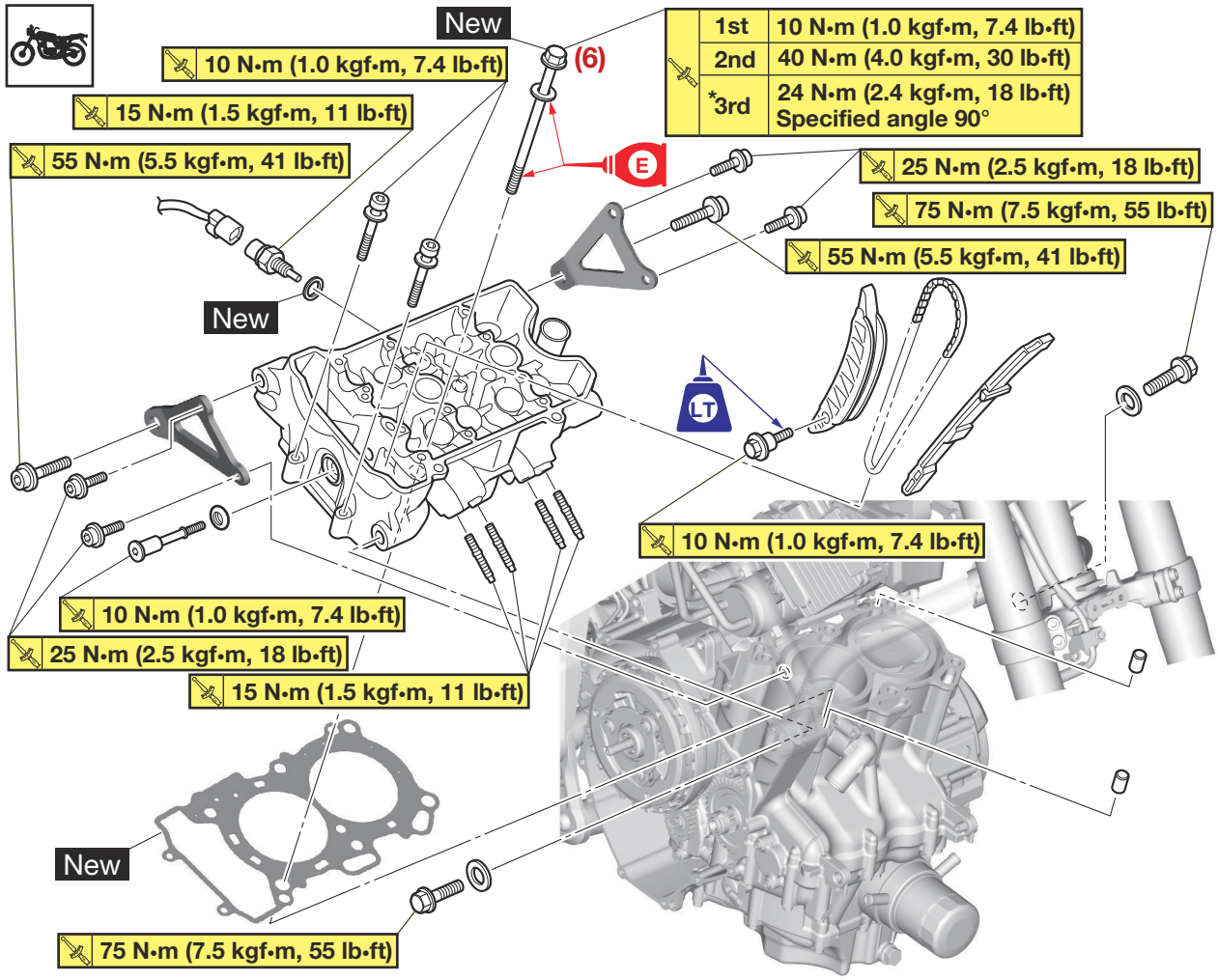
Install the ignition coils "1" in the direction shown in the illustration.



EAS20044

CYLINDER HEAD

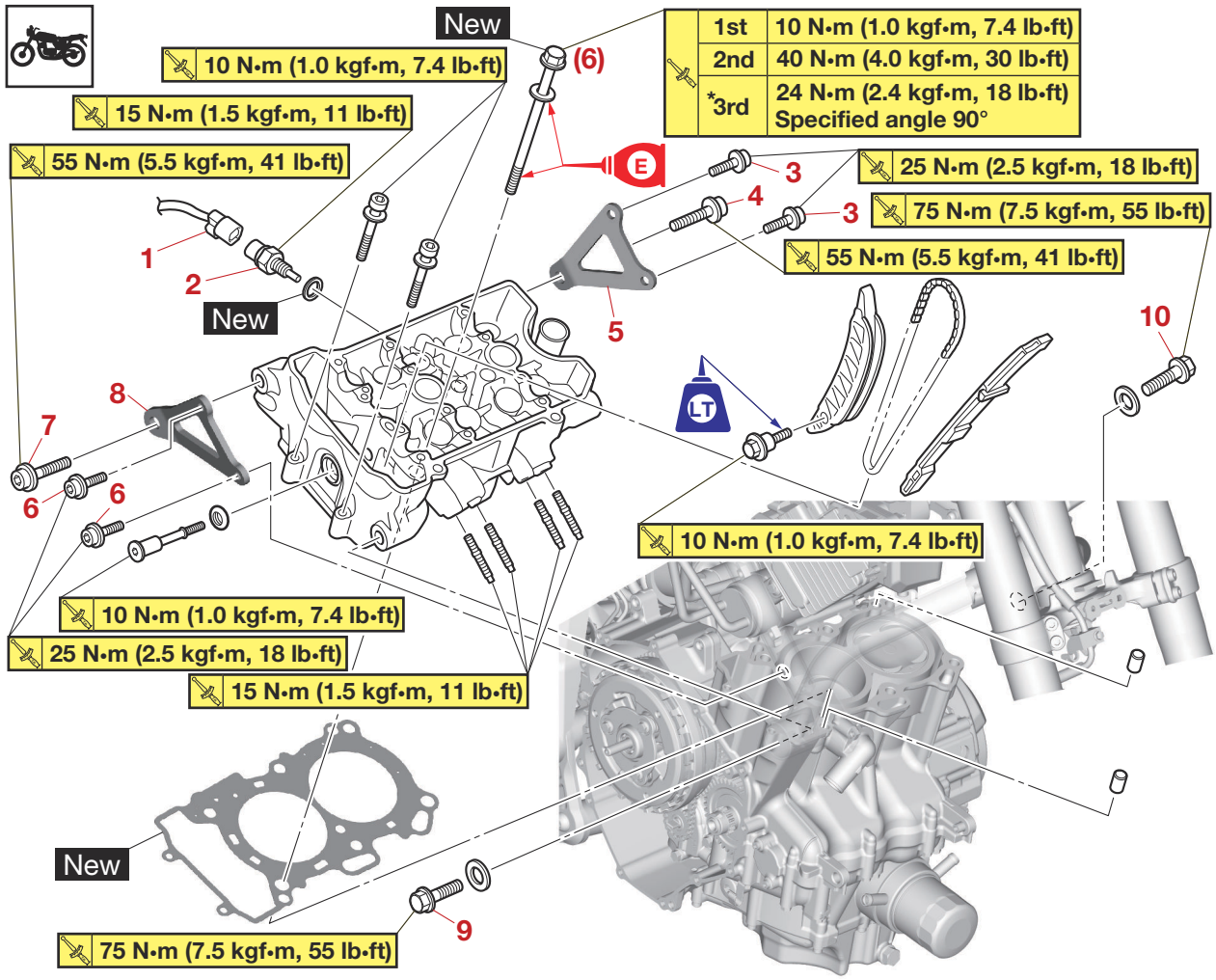
Removing the cylinder head



*** 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 top cover		Refer to "GENERAL CHASSIS (4)" on page 4-9.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Frame cross member		Refer to "AIR FILTER" on page 7-8.
	Throttle body		Refer to "THROTTLE BODIES" on page 7-9.
	Footrest assembly (right)		Refer to "REAR BRAKE" on page 4-42.
	Muffler assembly		Refer to "ENGINE REMOVAL" on page 5-17.
	Oil cooler inlet hose		Disconnect. Refer to "OIL COOLER" on page 6-7.
	Radiator		Refer to "RADIATOR" on page 6-3.
	Cylinder head cover/Intake camshaft/Exhaust camshaft		Refer to "CAMSHAFTS" on page 5-26.
	Clutch cover		Refer to "CLUTCH" on page 5-59.
	Thermostat		Refer to "THERMOSTAT" on page 6-9.

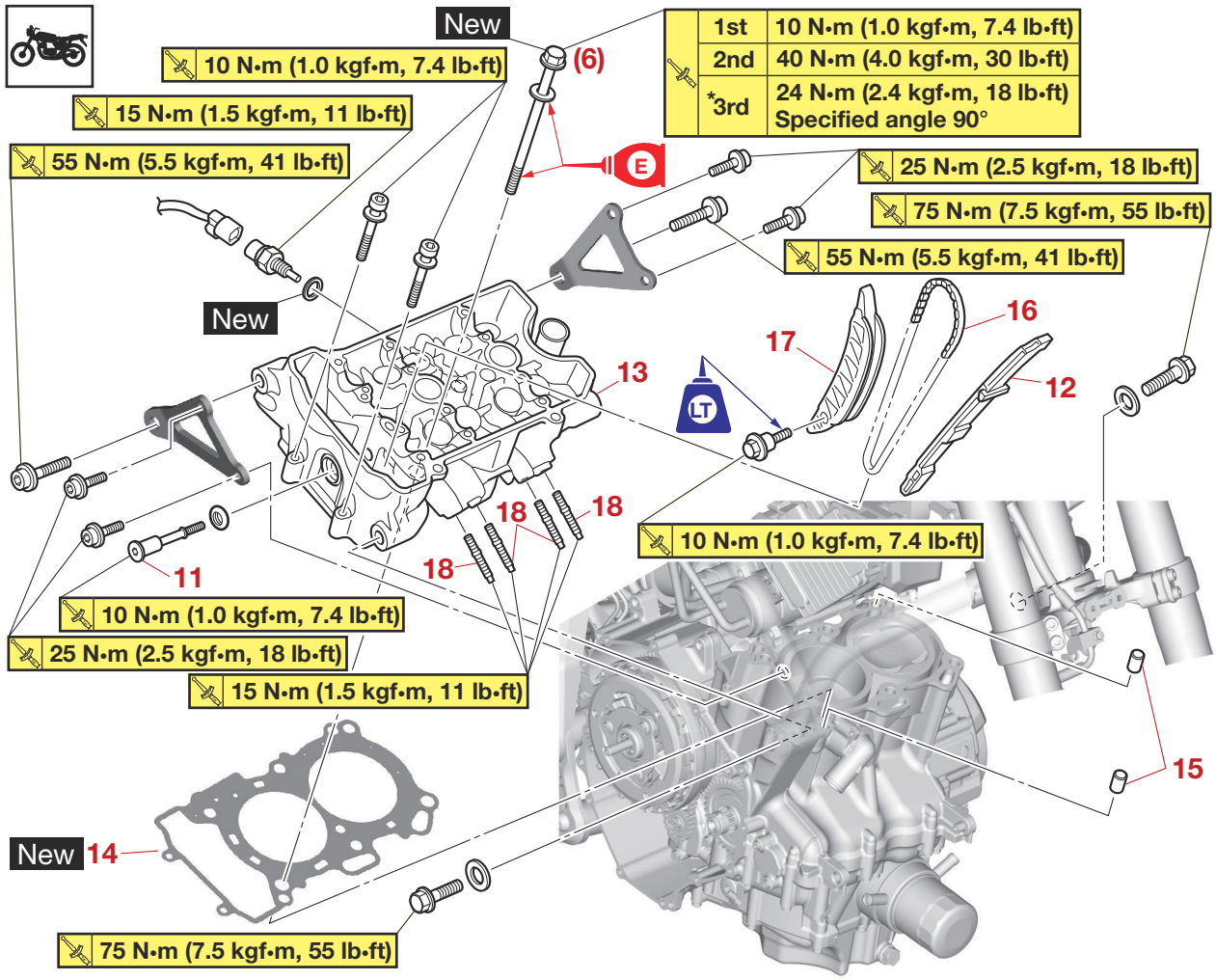
Removing the cylinder head



*** 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
1	Coolant temperature sensor coupler	1	Disconnect.
2	Coolant temperature sensor	1	
3	Engine bracket bolt (left)	2	
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 (right side of cylinder head)	1	

Removing the cylinder head



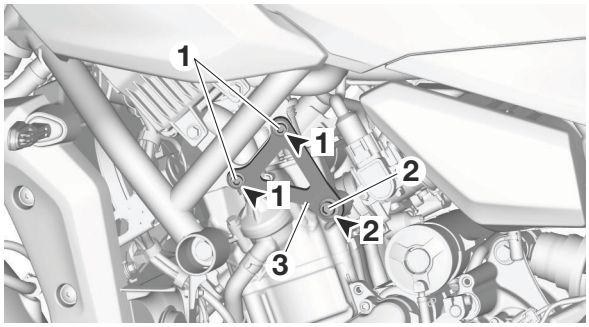
*** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.**

Order	Job/Parts to remove	Q'ty	Remarks
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	
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"

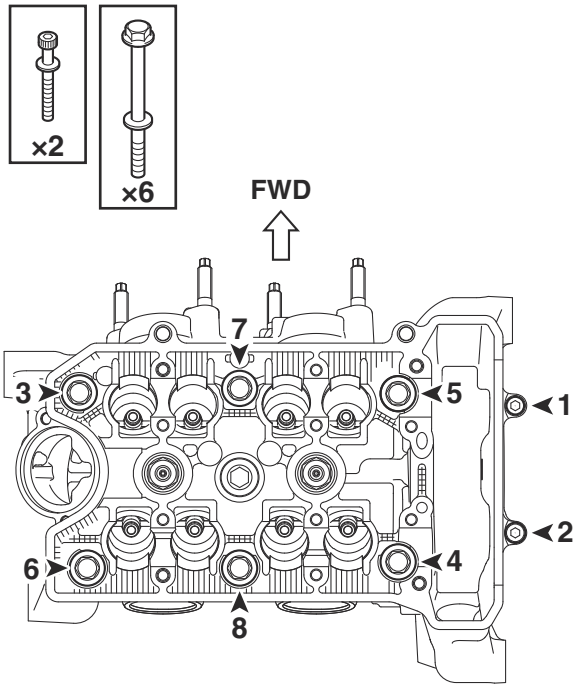
TIP
- Place a suitable stand under the engine.
- Loosen the bolts in the proper sequence as shown.



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.

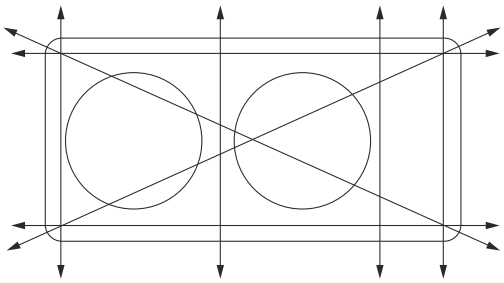
EAS30277
CHECKING THE CYLINDER HEAD

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

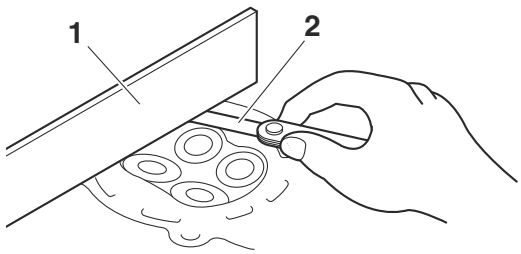
2. Check:
   - Cylinder head
   Damage/scratches → Replace.
   - Cylinder head water jacket
   Mineral deposits/rust → Eliminate.
3. Measure:
   - Cylinder head warpage
   Out of specification → Resurface the cylinder head.

	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.

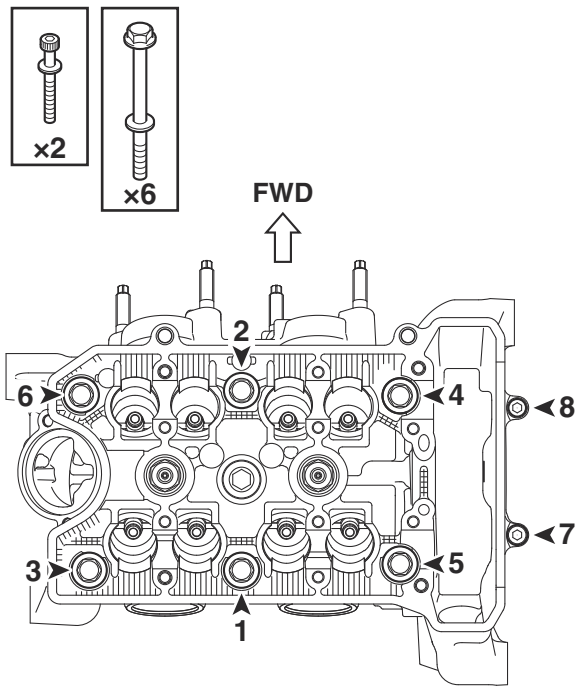
2. Tighten:
   - Cylinder head bolt "1"–"6"
   - Cylinder head bolt "7", "8"

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: 24 N·m (2.4 kgf·m, 18 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

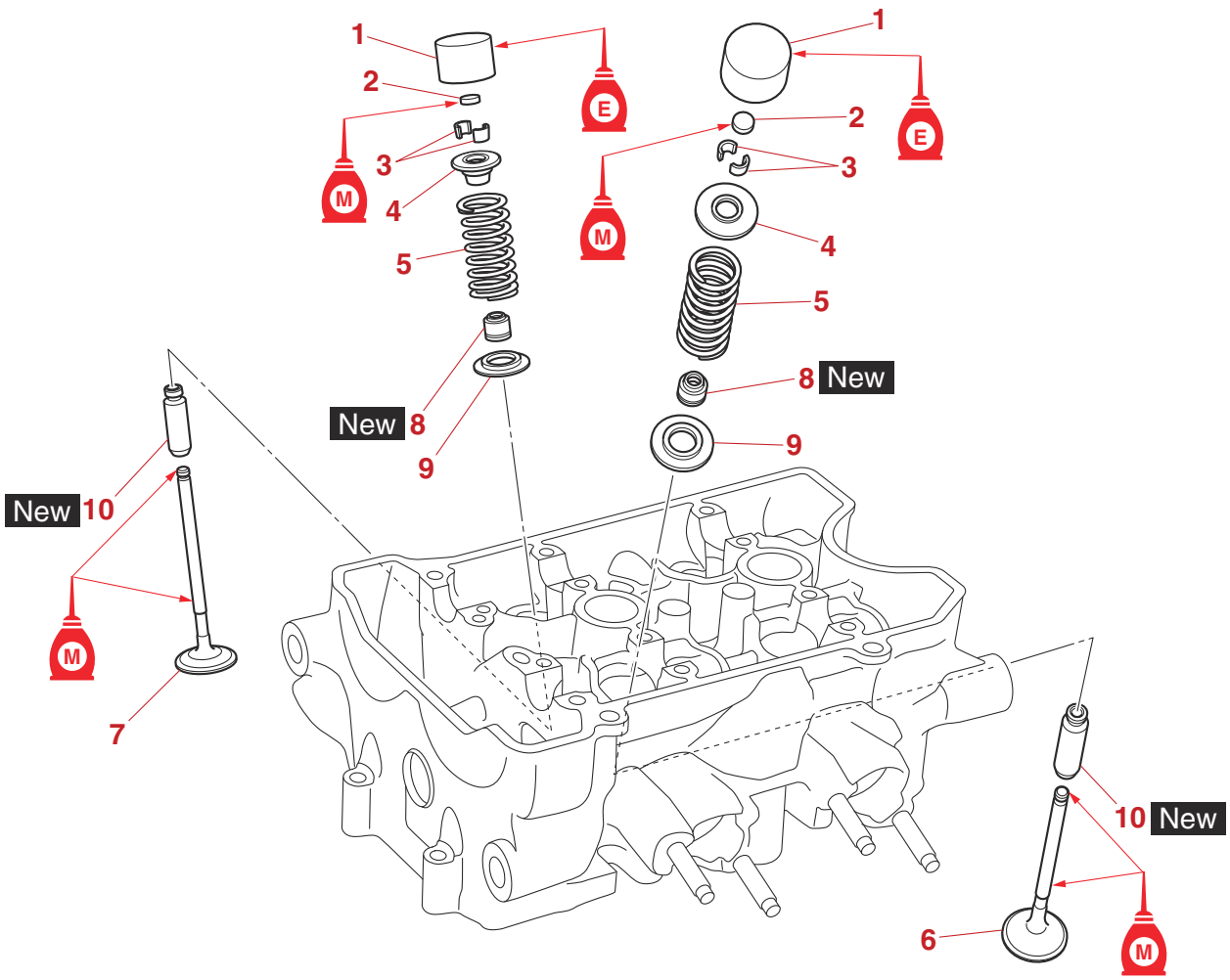
Tighten the cylinder head bolts in the tightening sequence as shown and torque them in 4 stages.



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 5-38.
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.

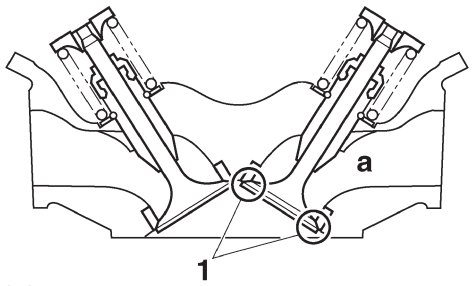
TIP
Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.

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 5-46.
     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".

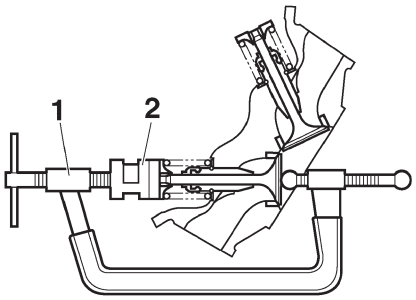


G088958

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

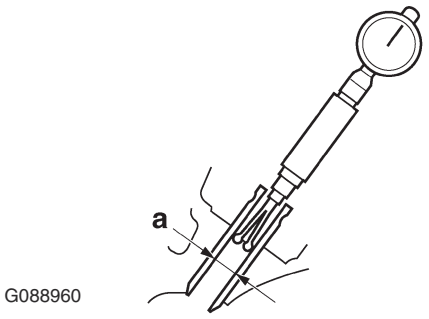
TIP
Identify the position of each part very carefully so that it can be reinstalled in its original place.

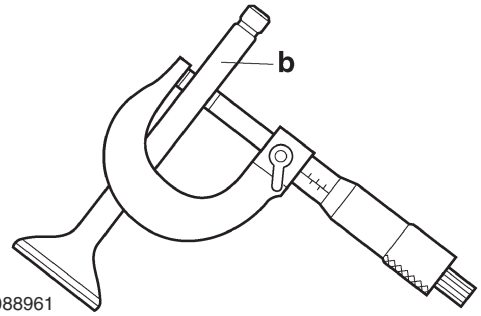
EAS30284
CHECKING THE VALVES AND VALVE GUIDES
The following procedure applies to all of the valves and valve guides.

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)

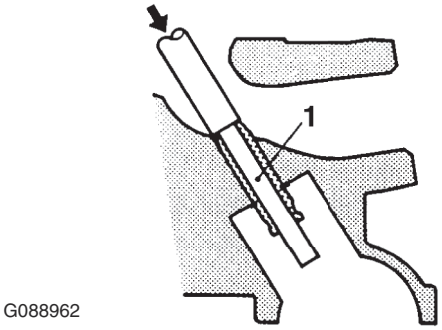




2. Replace:
   • Valve guide

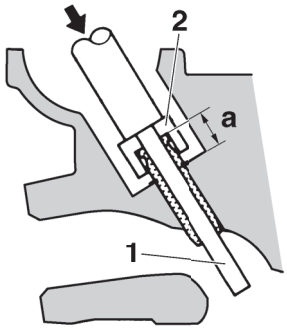
TIP
To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100 °C (212 °F) in an oven.

a. Remove the valve guide with the valve guide remover "1".



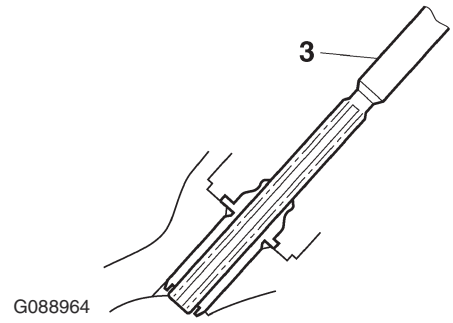
b. Install the new valve guide with the valve guide installer "2" and valve guide remover "1".

	Valve guide position **14.8–15.2 mm (0.58–0.60 in)**



a. Valve guide position

c. After installing the valve guide, bore the valve guide with the valve guide reamer "3" to obtain the proper valve-stem-to-valve-guide clearance.



TIP
After replacing the valve guide, reface the valve seat.

	Valve guide remover (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**

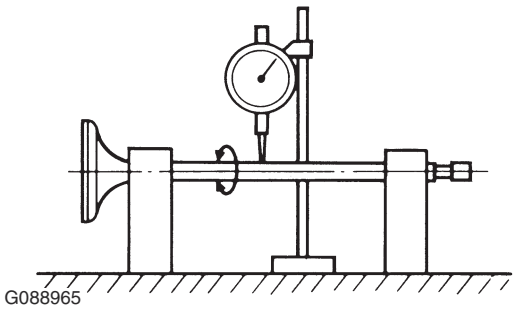
3. Eliminate:
   • Carbon deposit
   (from the valve face and valve seat)
4. Check:
   • Valve face
   Pitting/wear → Grind the valve face.
   • Valve stem end
   Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
   • Valve stem runout

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

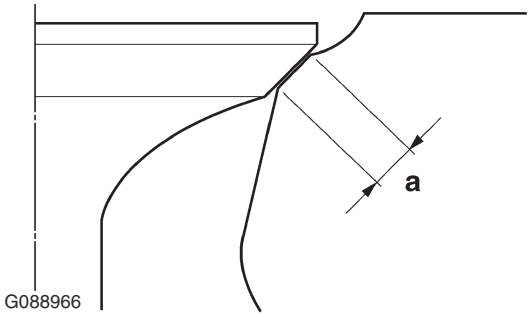
EAS30285

CHECKING THE VALVE SEATS

The following procedure applies to all of the valves and valve seats.

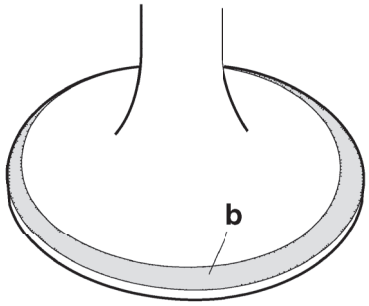
1. Eliminate:
   - Carbon deposit
     (from the valve face and valve seat)
2. Check:
   - Valve seat
     Pitting/wear → Replace the cylinder head.
3. Measure:
   - Valve seat width "a"
     Out of specification → Replace the cylinder head.

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

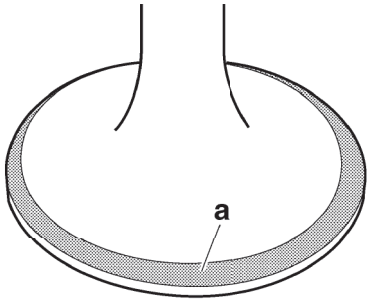
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

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.



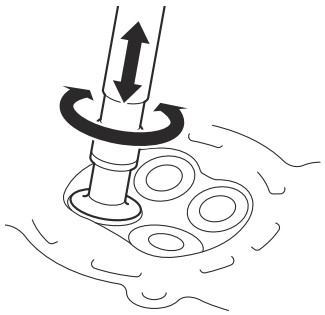
G088968

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

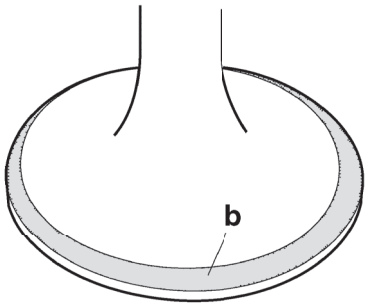
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth

between your hands.



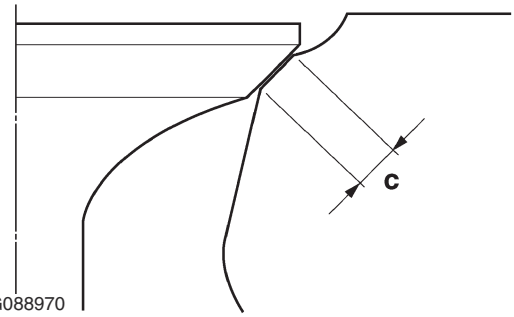
G088969

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

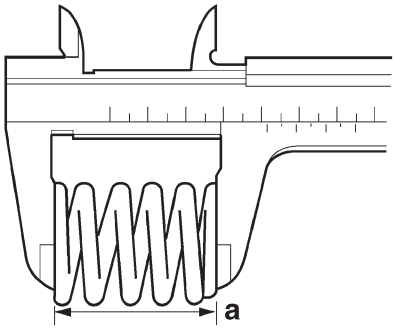
EAS30286

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)
38.28 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.

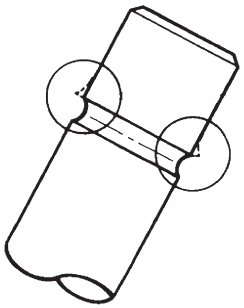
1. Check:
   • Valve lifter
   Damage/scratches → Replace the valve lifters and cylinder head.

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)

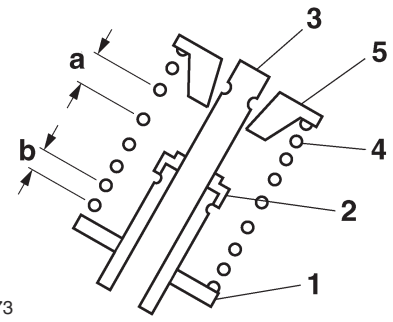
Recommended lubricant
Molybdenum disulfide oil

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

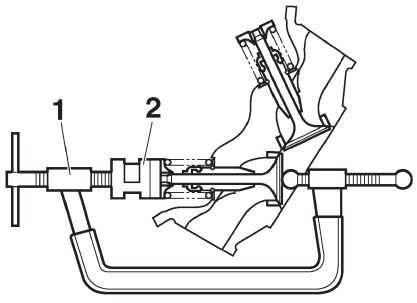
b. Smaller pitch

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**



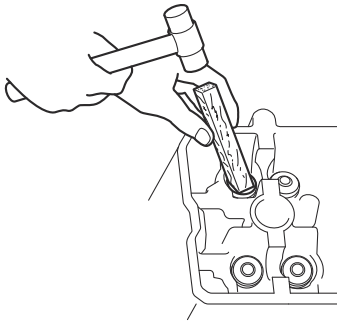
G088959

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
   - Valve pad
   (with the recommended lubricant)

	Recommended lubricant **Engine oil**

7. Install:
   - Valve pad
   - Valve lifter

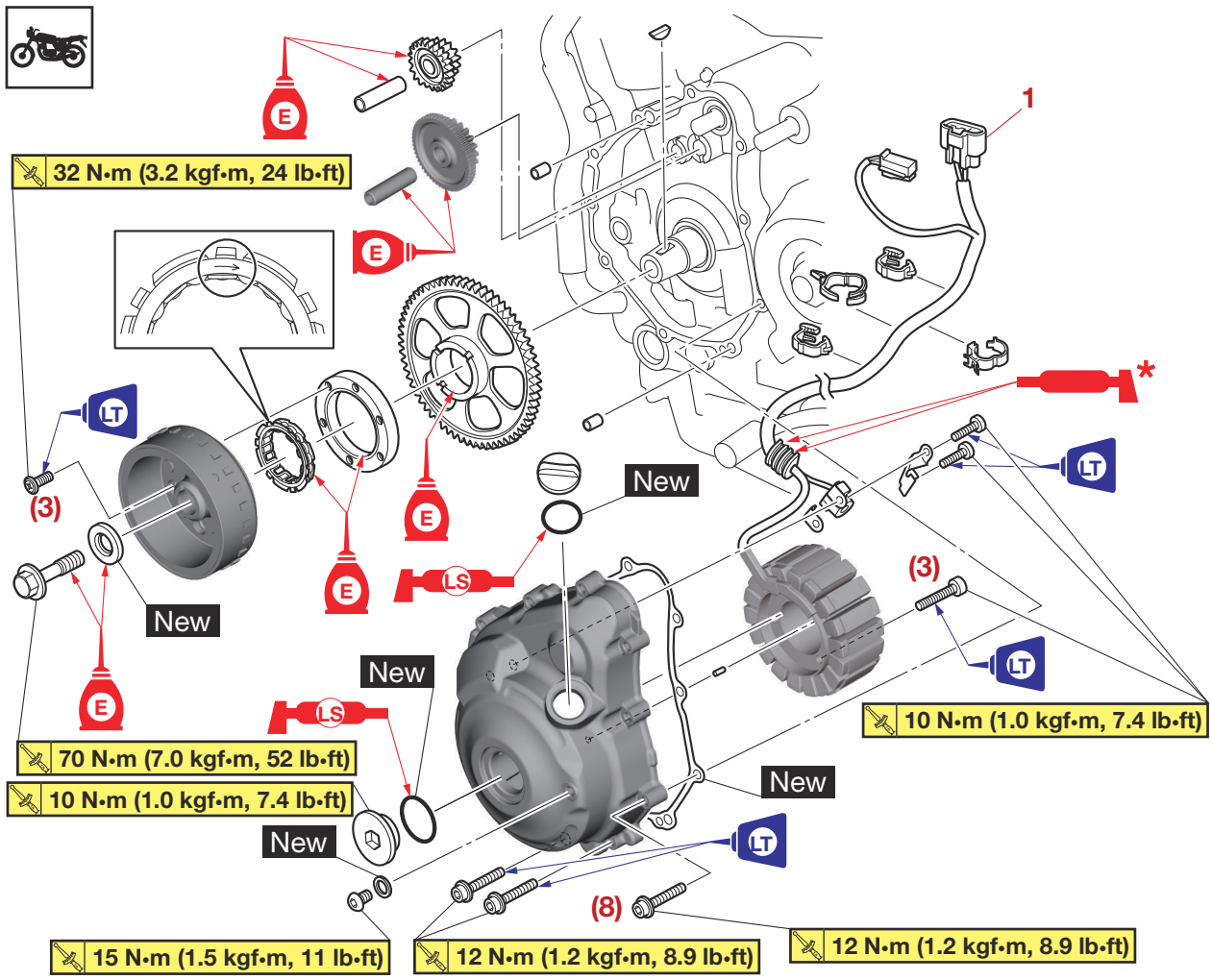
TIP

- 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

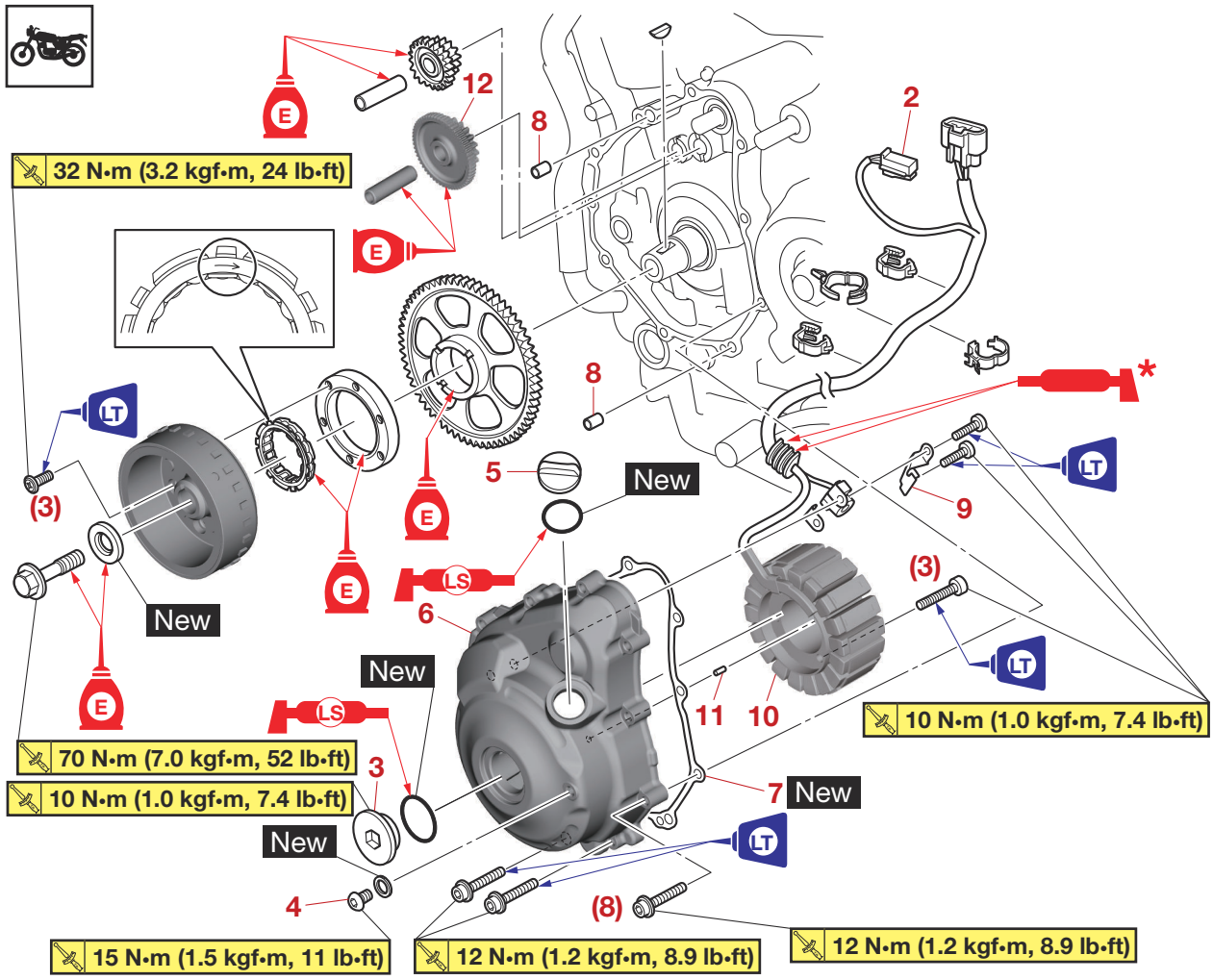
Removing the stator coil, generator rotor and starter clutch



*** YAMAHA bond No. 1215 (Three bond No. 1215®)**

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		Refer to "GENERAL CHASSIS (4)" on page 4-9.
	Electrical components tray 1		Refer to "GENERAL CHASSIS (5)" on page 4-11.
	Drive sprocket cover		Refer to "CHAIN DRIVE" on page 4-93.
	Coolant reservoir		Refer to "RADIATOR" on page 6-3.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
1	Stator coil coupler	1	Disconnect.

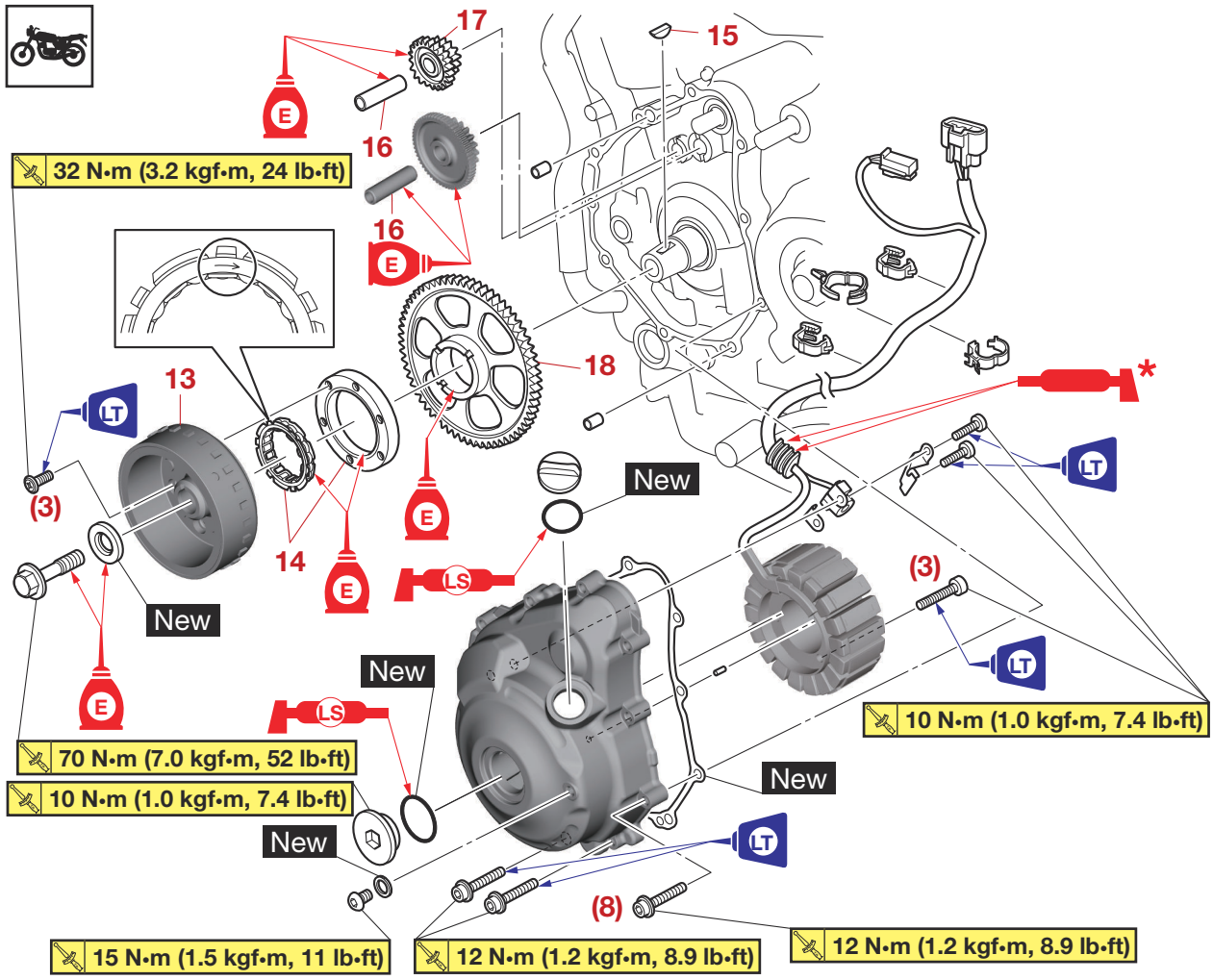
Removing the stator coil, generator rotor and starter clutch



* YAMAHA bond No. 1215 (Three bond No. 1215®)

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	Dowel pin	2	
9	Stator coil lead holder	1	
10	Stator coil assembly (Stator coil/Crankshaft position sensor)	1	
11	Pin	1	
12	Starter clutch idle gear 1	1	

Removing the stator coil, generator rotor and starter clutch



*** YAMAHA bond No. 1215 (Three bond No. 1215®)**

Order	Job/Parts to remove	Q'ty	Remarks
13	Generator rotor	1	
14	Starter clutch	1	
15	Woodruff key	1	
16	Starter clutch idle gear shaft	2	
17	Starter clutch idle gear 2	1	
18	Starter clutch gear	1	

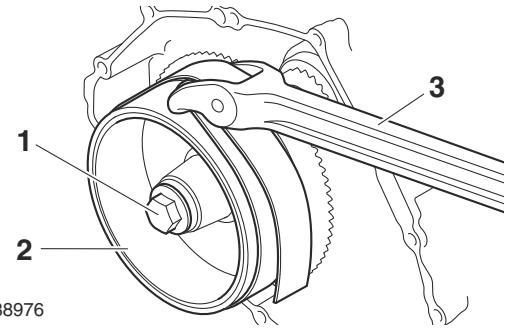
EAS30867
REMOVING THE GENERATOR

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

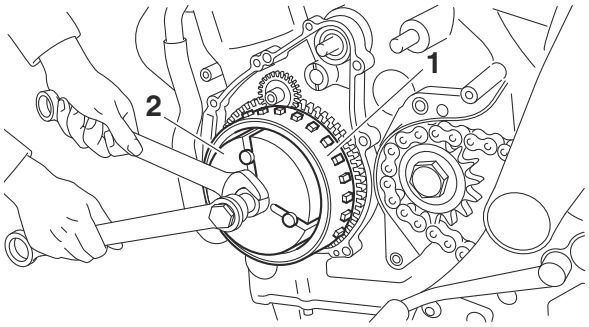
NOTICE

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



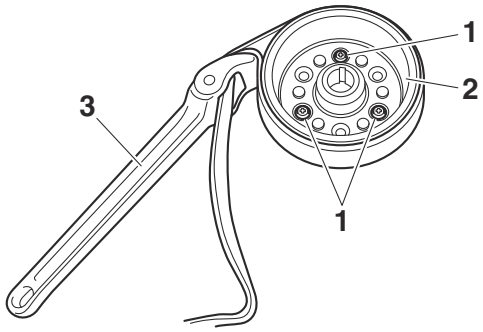
EAS30868
REMOVING THE STARTER CLUTCH

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



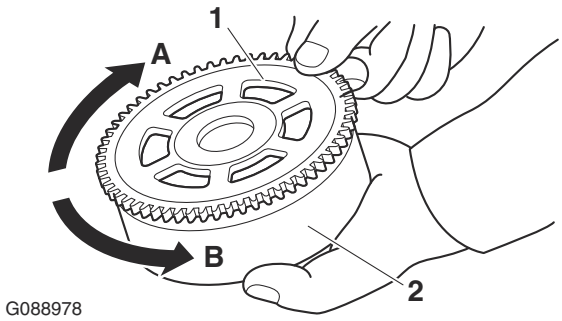
EAS30869
CHECKING THE STARTER CLUTCH

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

EAS30871

INSTALLING THE STARTER CLUTCH

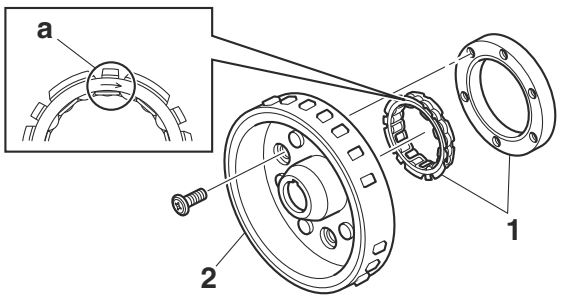
1. Install:
   - Starter clutch "1"

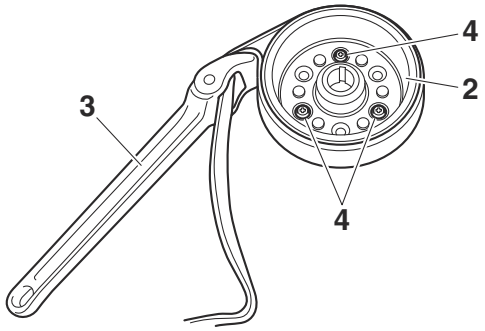
	Starter clutch bolt **32 N·m (3.2 kgf·m, 24 lb·ft)** **LOCTITE®**

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.

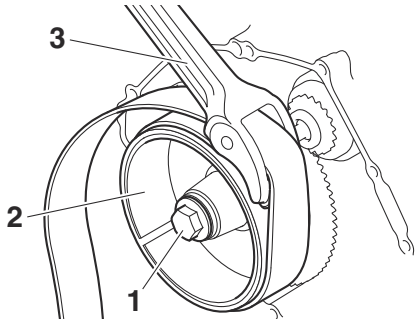
2. Tighten:
   - Generator rotor bolt "1"

	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.

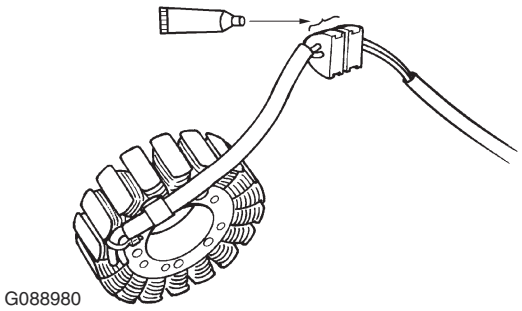
	Rotor holding tool **90890-04166** **Rotor holding tool** **YM-04166**



G088979

3. Apply:
   - Sealant
     (onto the stator coil lead grommet)

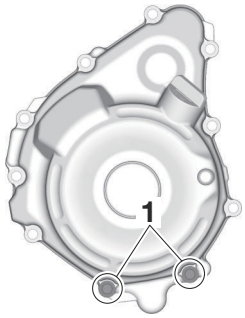
Yamaha bond No. 1215
90890-85505
Three bond No. 1215®



4. Install:
   - Generator cover gasket New
   - Generator cover

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.

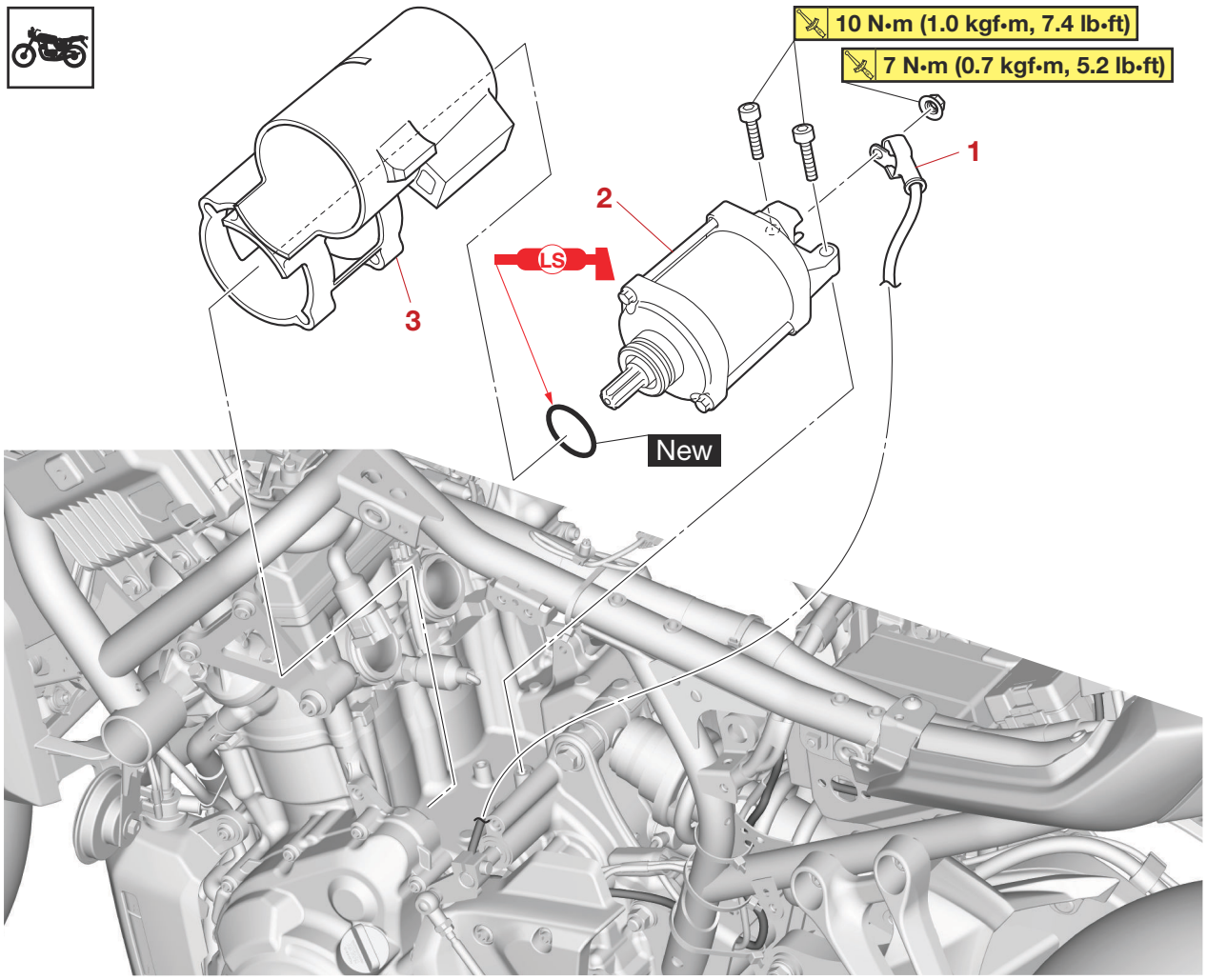


5. Connect:
   - Stator coil coupler
   - Crankshaft position sensor coupler

TIP
To route the stator coil lead, refer to "CABLE ROUTING" on page 2-13.

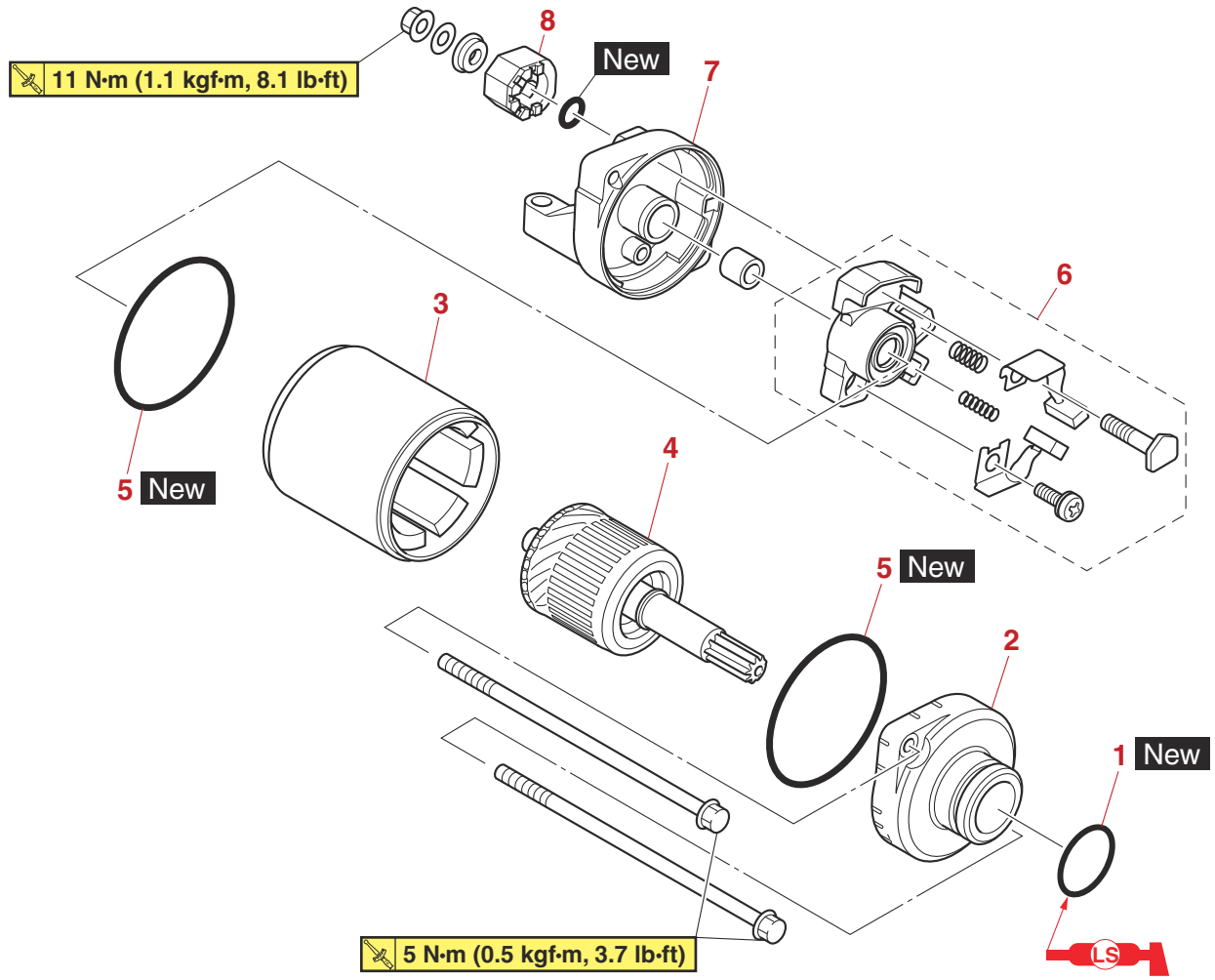
EAS20052
ELECTRIC STARTER

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		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 4-87.
	Frame cross member		Refer to "AIR FILTER" on page 7-8.
	Throttle bodies/Air filter case		Refer to "THROTTLE BODIES" on page 7-9.
1	Starter motor lead	1	Disconnect.
2	Starter motor	1	
3	Canister holder	1	For California only

Disassembling the starter motor



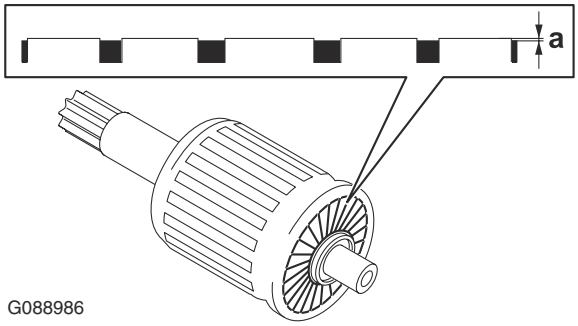
Order	Job/Parts to remove	Q'ty	Remarks
1	O-ring	1	
2	Starter motor front cover	1	
3	Starter motor yoke	1	
4	Armature assembly	1	
5	Gasket	2	
6	Brush holder set	1	
7	Starter motor rear cover	1	
8	Lead guide	1	

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.

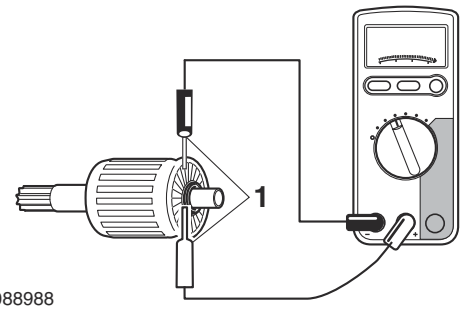


G088986

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**

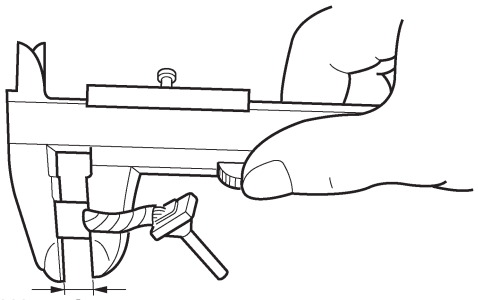
   b. If there is no continuity, replace the starter motor.



G088988

4. Measure:
   • Brush length "a"
   Out of specification → Replace the brush holder set.

	Brush overall length limit **6.5 mm (0.26 in)**



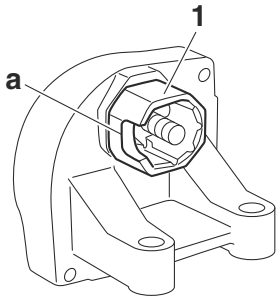
G088989

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

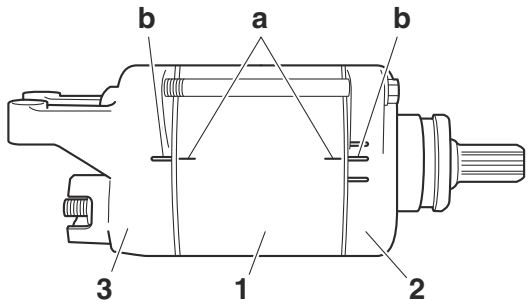
1. Install:
   • Lead guide "1"

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.



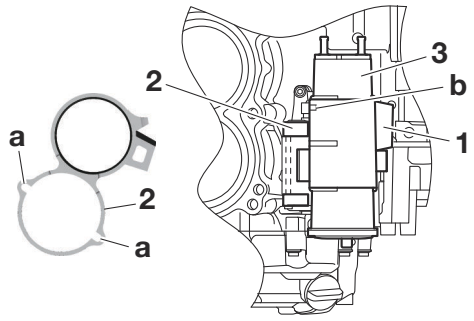
EAS30327

INSTALLING THE STARTER MOTOR

1. Install:
   - Canister holder “1” (for California only)
   - Starter motor “2”
   - Canister “3” (for California only)

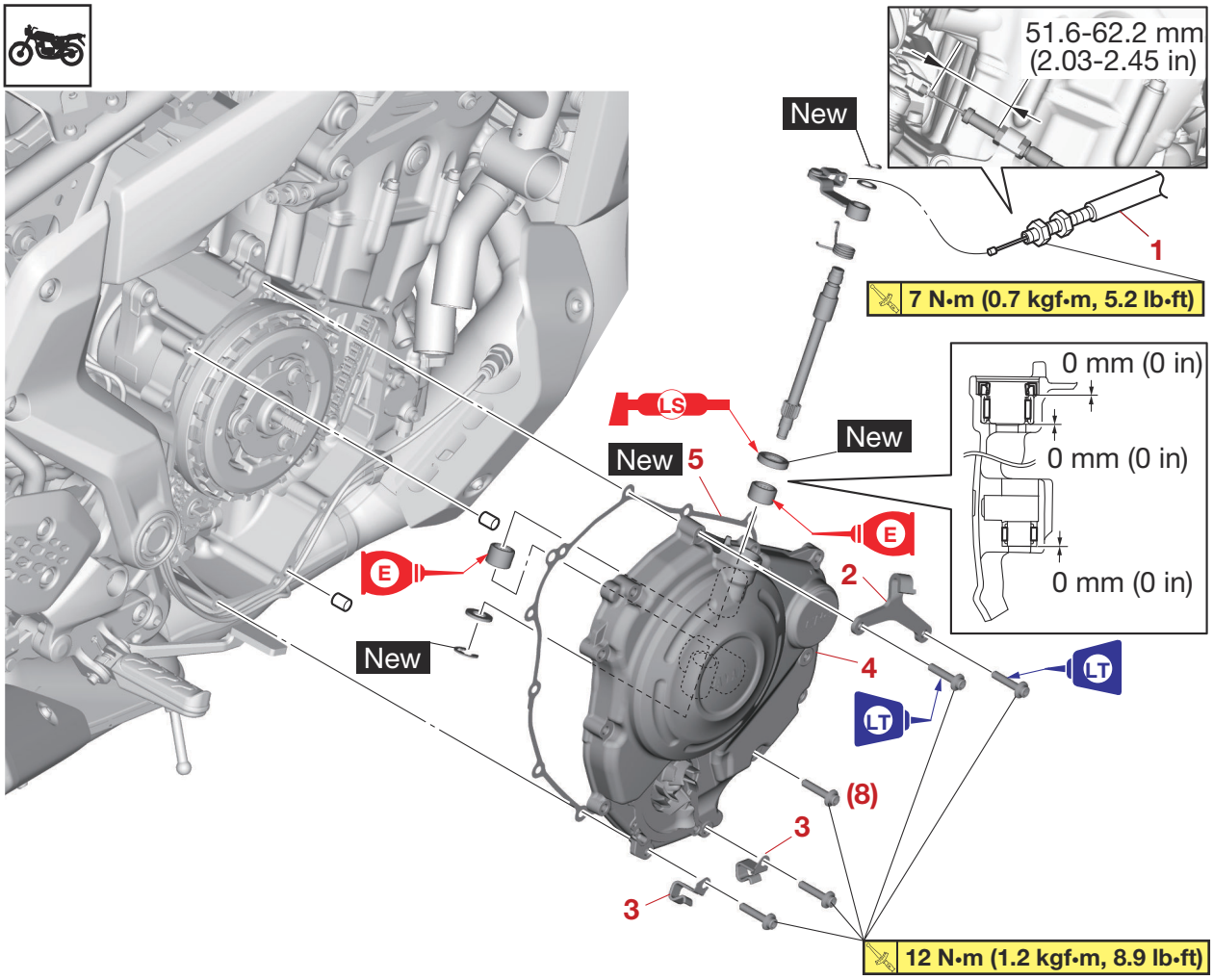
TIP

- 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.



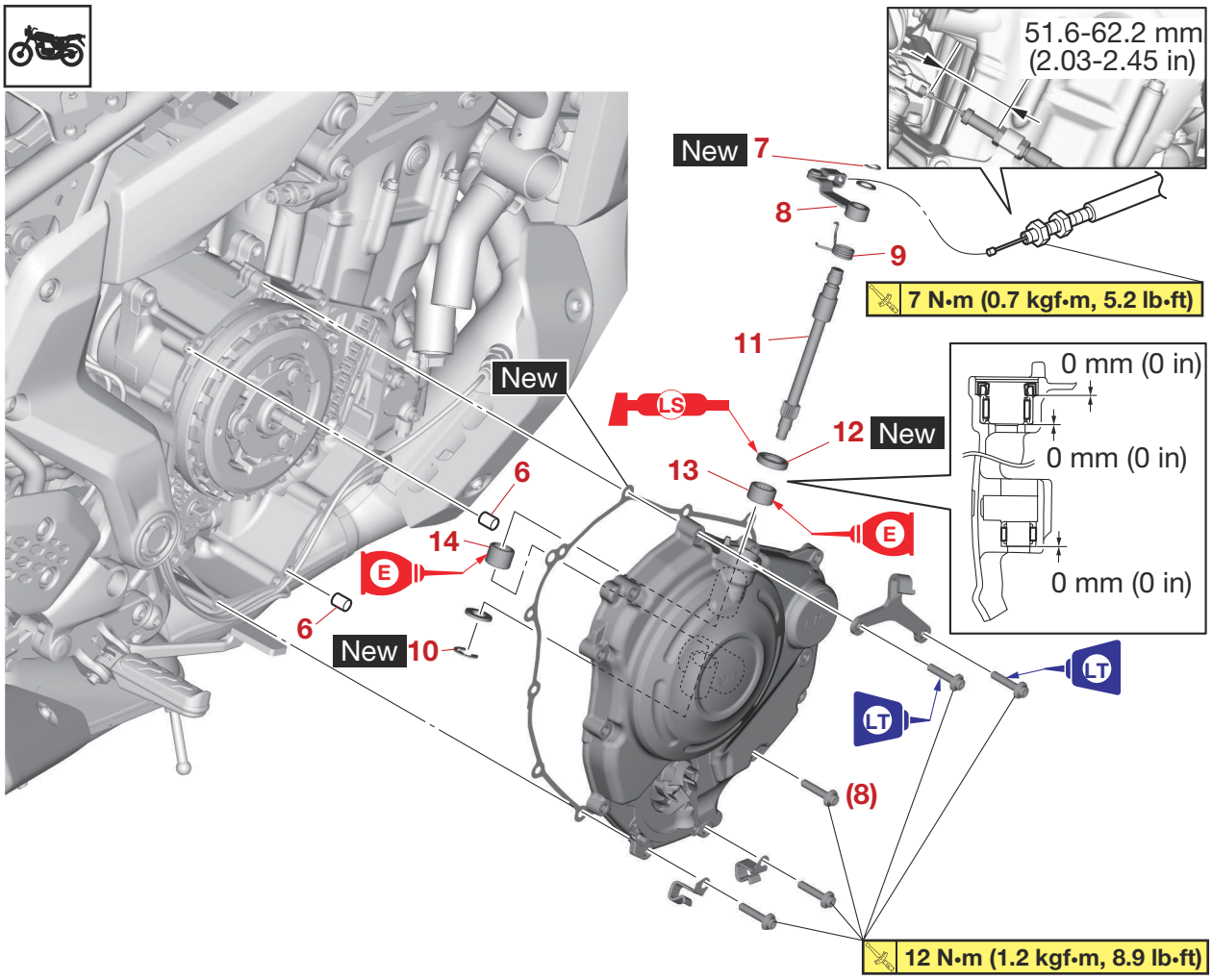
EAS20055
CLUTCH

Removing the clutch cover and pull lever shaft



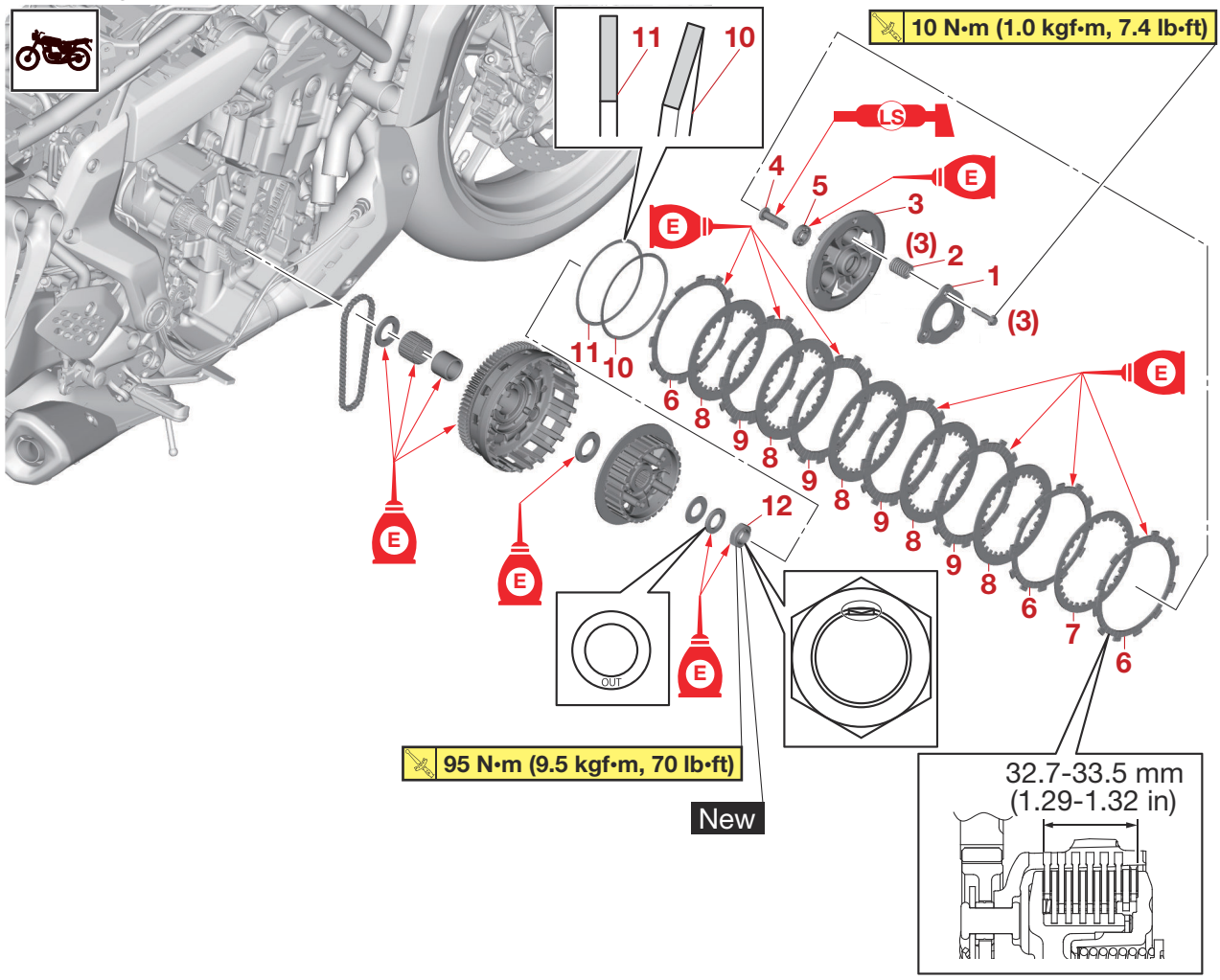
Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
	Water pump housing		Refer to "WATER PUMP" on page 6-11.
1	Clutch cable	1	Disconnect.
2	Clutch cable holder	1	
3	Holder (O_2 sensor lead and oil pressure switch lead)	2	
4	Clutch cover	1	
5	Clutch cover gasket	1	

Removing the clutch cover and pull lever shaft



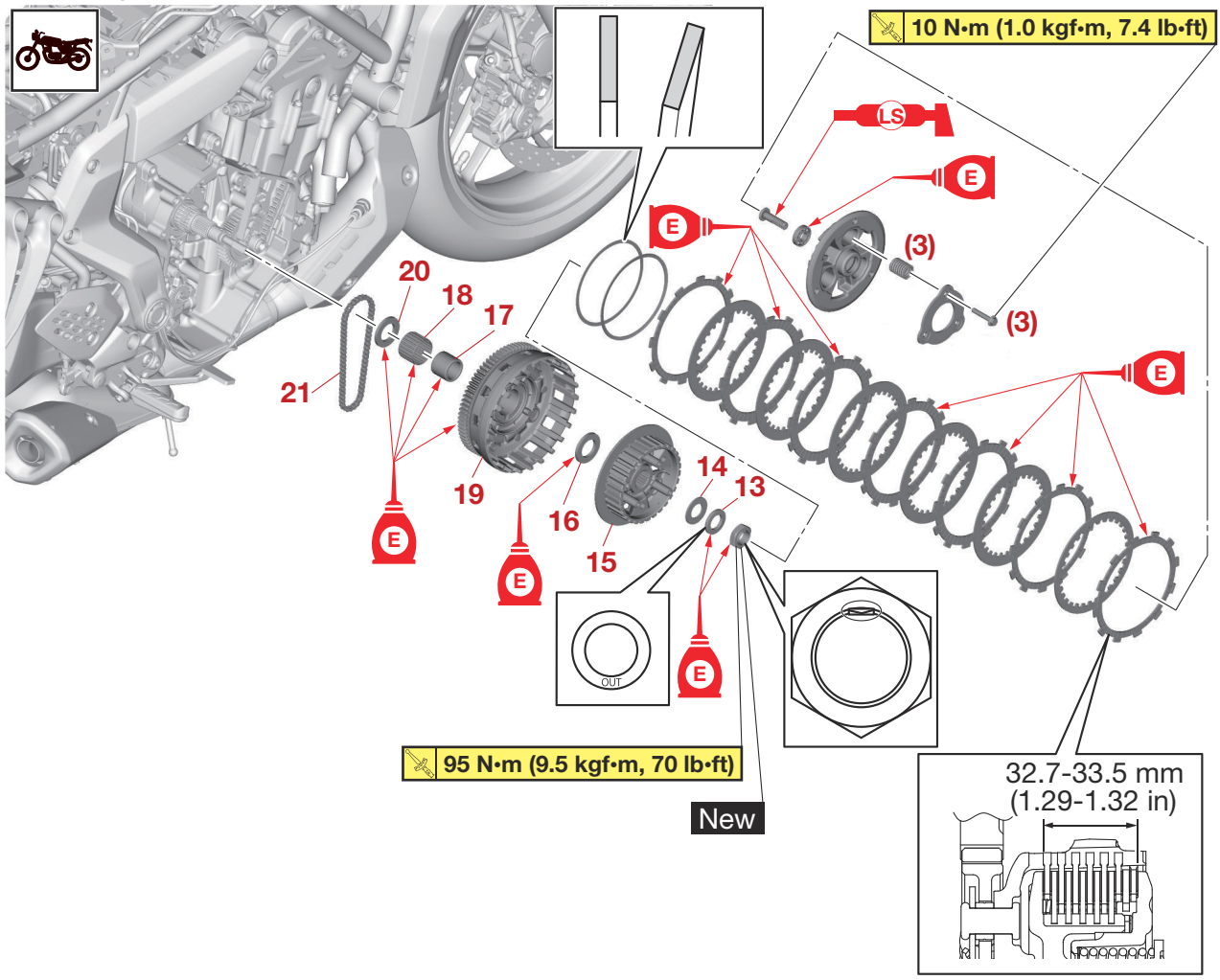
Order	Job/Parts to remove	Q'ty	Remarks
6	Dowel pin	2	
7	Circlip	1	
8	Pull lever	1	
9	Pull lever spring	1	
10	Circlip	1	
11	Pull lever shaft	1	
12	Oil seal	1	
13	Bearing	1	
14	Bearing	1	

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
1	Pressure plate 1	1	
2	Clutch spring	3	
3	Pressure plate 2	1	
4	Pull rod	1	
5	Bearing	1	
6	Friction plate 2	3	Inside diameter: 126 mm (4.96 in)
7	Clutch plate 1	1	
8	Clutch plate 2	5	
9	Friction plate 1	4	Inside diameter: 119 mm (4.69 in)
10	Clutch damper spring	1	
11	Clutch damper spring seat	1	
12	Clutch boss nut	1	

Removing the clutch

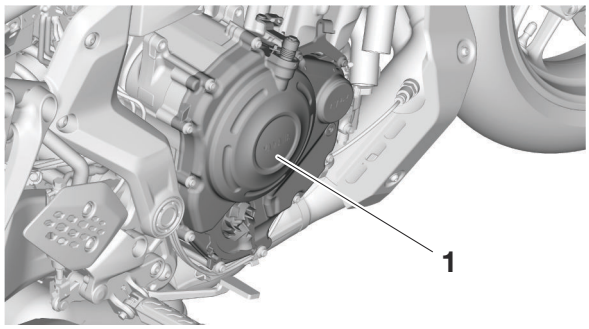


Order	Job/Parts to remove	Q'ty	Remarks
13	Conical spring washer	1	
14	Washer	1	
15	Clutch boss	1	
16	Thrust plate	1	
17	Spacer	1	
18	Bearing	1	
19	Clutch housing	1	
20	Thrust plate	1	
21	Oil pump drive chain	1	

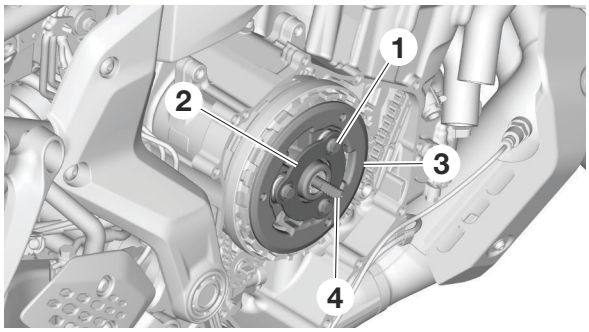
EAS30346
REMOVING THE CLUTCH

1. Remove:
   • Clutch cover “1”
   • Gasket

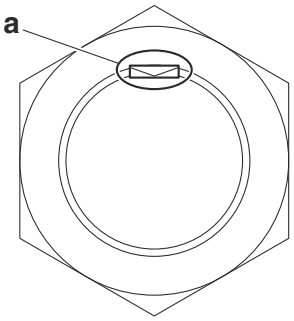
TIP
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



2. Remove:
   • Clutch spring bolt “1”
   • Pressure plate 1 “2”
   • Clutch spring
   • Pressure plate 2 “3”
   • Pull rod “4”



3. Remove:
   • Friction plate 2
   • Clutch plate 1
   • Clutch plate 2
   • Friction plate 1
   • Clutch damper spring
   • Clutch damper spring seat
4. Straighten the clutch boss nut rib “a”.

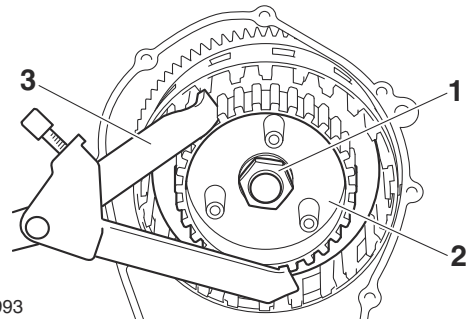


G088991

5. Loosen:
   • Clutch boss nut “1”

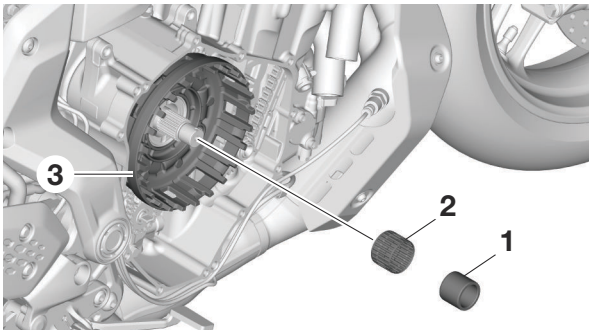
TIP
While holding the clutch boss “2” with the universal clutch holder “3”, loosen the clutch boss nut.

Clutch holder
90890-04199
Universal clutch holder
YM-91042

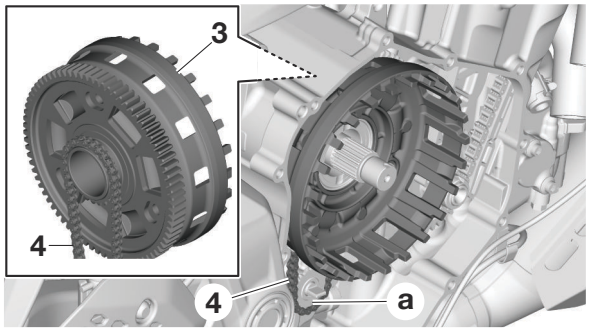


G088993

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.



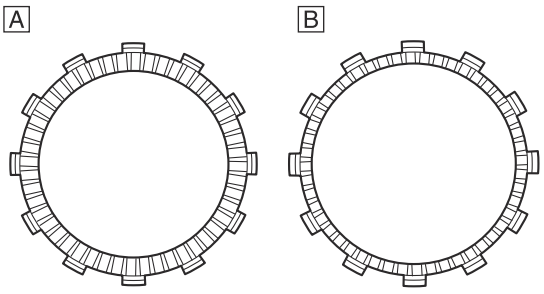
EAS30348
CHECKING THE FRICTION PLATES

The following procedure applies to all of the

friction plates.
1. Check:
   • Friction plate 1,2
   Damage/wear → Replace the friction plates as a set.
2. Measure:
   • Friction plate 1,2 thickness
   Out of specification → Replace the friction plates as a set.

TIP
Measure the friction plate at four places.

Friction plate 1 thickness
2.92–3.08 mm (0.115–0.121 in)
Wear limit
2.82 mm (0.111 in)
Friction plate 2 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 1, 2
   Damage → Replace the clutch plates as a set.
2. Measure:
   • Clutch plate 1, 2 warpage
   (with a surface plate and thickness gauge)
   Out of specification → Replace the clutch plates as a set.

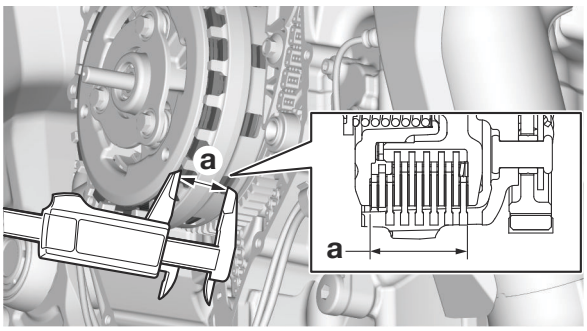
Thickness gauge
90890-03268
Feeler gauge set
YU-26900-9

Clutch plate 1 thickness
2.20–2.40 mm (0.087–0.094 in)
Warpage limit
0.10 mm (0.004 in)
Clutch plate 2 thickness
1.90–2.10 mm (0.075–0.083 in)
Warpage limit
0.10 mm (0.004 in)

3. Measure:
   • Assembly width “a” of the friction plates and clutch plates
   Out of specification → Adjust.

Assembly width
32.7–33.5 mm (1.29–1.32 in)

TIP
- Perform the thickness measurement without applying the oil.
- This step should be performed only if the friction plates and clutch plates were replaced.
- To measure the total width of the friction plates and clutch plates, combine 7 friction plates and 6 clutch plates as shown.



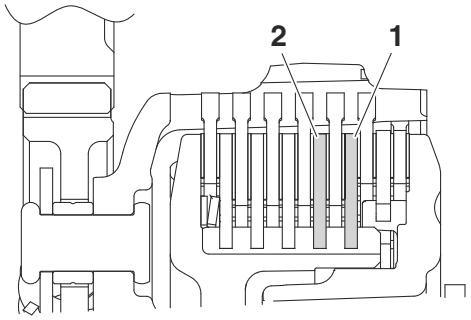
a. Adjust the assembly width by clutch plate 2 “1” and “2”.
b. Select the clutch plate 2 from the following table.

Clutch plate 2 “1”		
BR9-16324-10	1.6 mm (0.063 in)	
5VY-16325-10	2.0 mm (0.079 in)	STD
4B1-16325-00	2.3 mm (0.091 in)	

Clutch plate 2 “2”		
BR9-16324-10	1.6 mm (0.063 in)	
5VY-16325-10	2.0 mm (0.079 in)	STD
4B1-16325-00	2.3 mm (0.091 in)	

TIP
When adjusting the clutch assembly width [by

replacing the clutch plate(s)], be sure to replace the clutch plate 2 "1" first.
After replacing the clutch plate 2 "1", if specifications cannot be met, replace the clutch plate 2 "2".

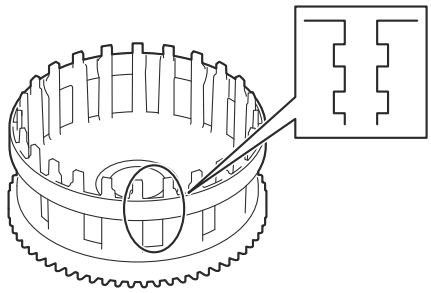


EAS30351
CHECKING THE CLUTCH SPRINGS
The following procedure applies to all of the clutch springs.
1. Check:
   • Clutch spring
   Damage → Replace the clutch springs as a set.
2. Measure:
   • Clutch spring free length
   Out of specification → Replace the clutch springs as a set.

	Clutch spring free length limit 43.46 mm (1.71 in)

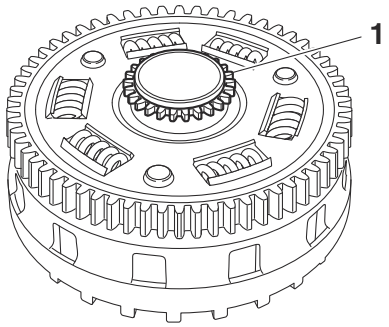
EAS30352
CHECKING THE CLUTCH HOUSING
1. Check:
   • Clutch housing dog
   Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

TIP
Pitting on the clutch housing dogs will cause erratic clutch operation.



G088994

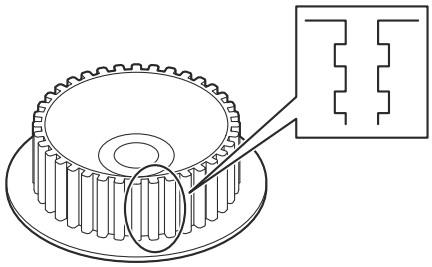
2. Check:
   • Oil pump drive sprocket "1"
   Cracks/damage/wear → Replace.



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.

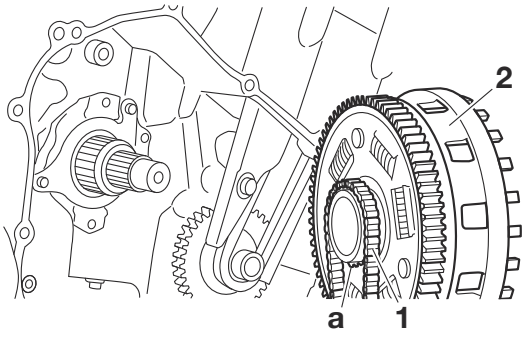
EAS30356
CHECKING THE PRIMARY DRIVE GEAR
1. Check:
   • Primary drive gear
   Damage/wear → Replace the crankshaft and clutch housing as a set.
   Excessive noise during operation → Replace the crankshaft and clutch housing as a set.

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
- Lubricate the oil pump drive chain "1", thrust plate, clutch housing "2", bearing, and spacer with engine oil.
- Install the oil pump drive chain onto the oil pump drive sprocket "a".

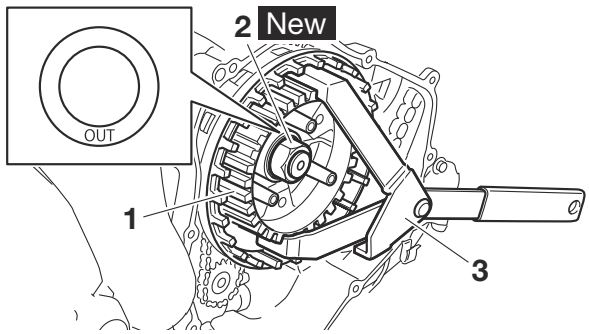


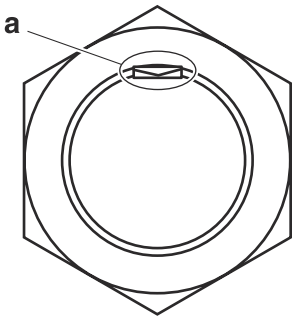
2. Install:
   - Thrust plate
   - Clutch boss "1"
   - Washer
   - Conical spring washer
   - Clutch boss nut "2" New

	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.

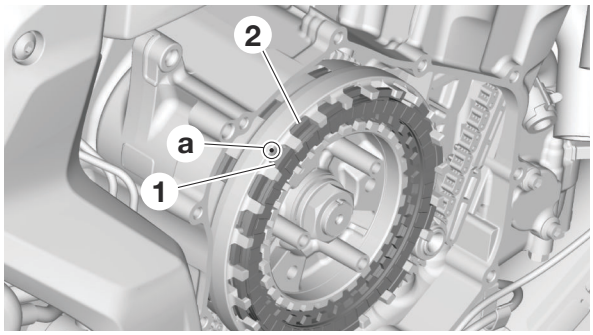
	Clutch holder **90890-04199** **Universal clutch holder** **YM-91042**





3. Install:
   - Clutch damper spring seat
   - Clutch damper spring
   - Friction plate 2
   - Clutch plate 2
   - Friction plate 1
   - Clutch plate 1

TIP
- Lubricate the friction plate 1 and friction plate 2 with engine oil to both sides.
- First, install a friction plate and then alternate between a clutch plate and a friction plate.
- Install the last friction plate "1" offset from the other friction plates "2", making sure to align a projection on the friction plate with the punch mark "a" on the clutch housing.



4. Install:
   - Bearing
   - Pull rod
   - Pressure plate 2
   - Clutch spring
   - Pressure plate 1
   - Clutch spring bolt

	Clutch spring bolt **10 N·m (1.0 kgf·m, 7.4 lb·ft)**

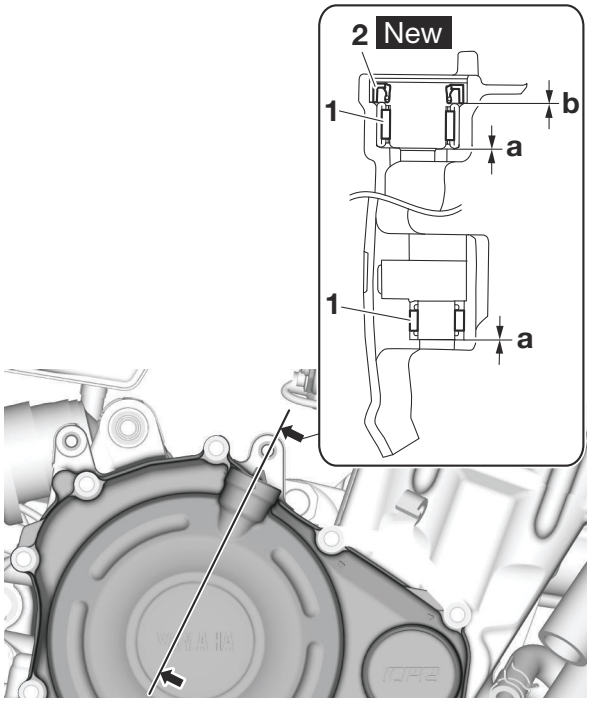
TIP

Apply lithium-soap-based grease onto the pull rod.

5. Install:
   - Bearing "1"
   - Oil seal "2" New
     (to the clutch cover)

TIP

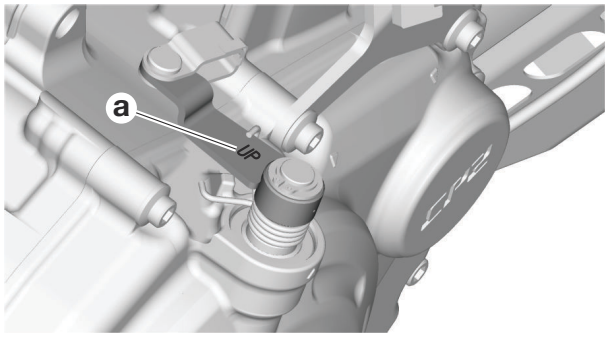
- Lubricate the bearings with engine oil and lubricate the oil seal with lithium-soap-based grease.
- Install the bearings until they contact the surfaces "a" and install the oil seal until it contacts the surface "b" as shown in the illustration.

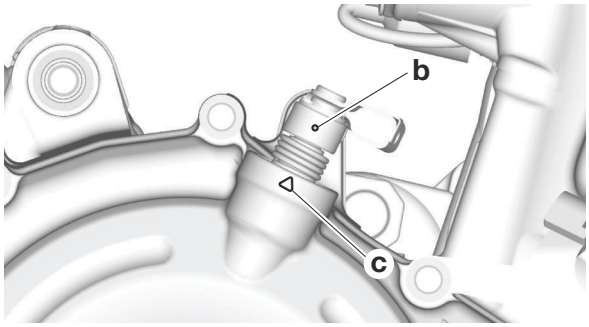


6. Install:
   - Pull lever

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.





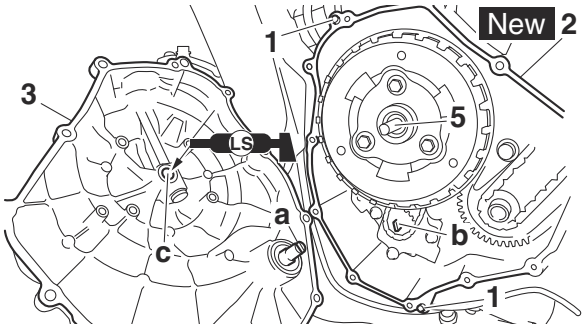
7. Install:
   - Dowel pin "1"
   - Clutch cover gasket "2" New

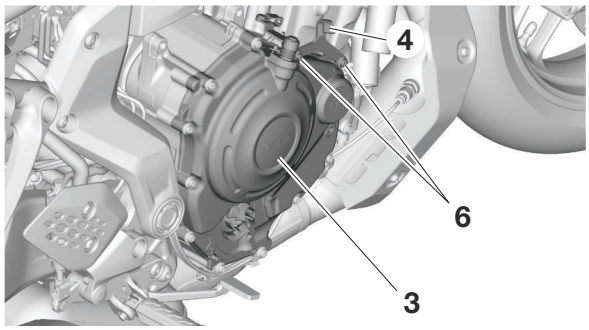
- Clutch cover “3”
- Clutch cable holder “4”

	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.

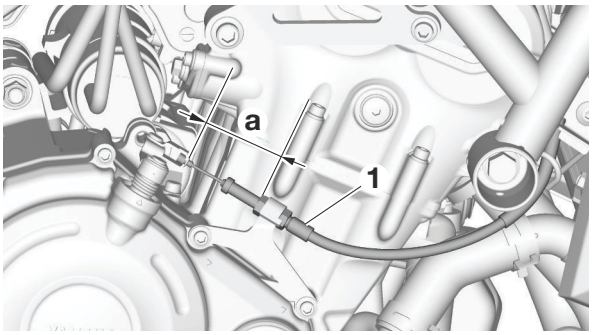


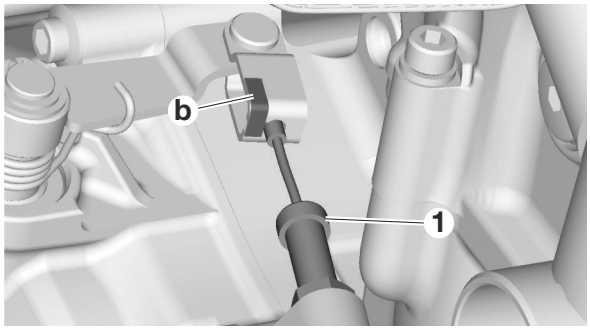


8. Connect:
   - Clutch cable “1”

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.





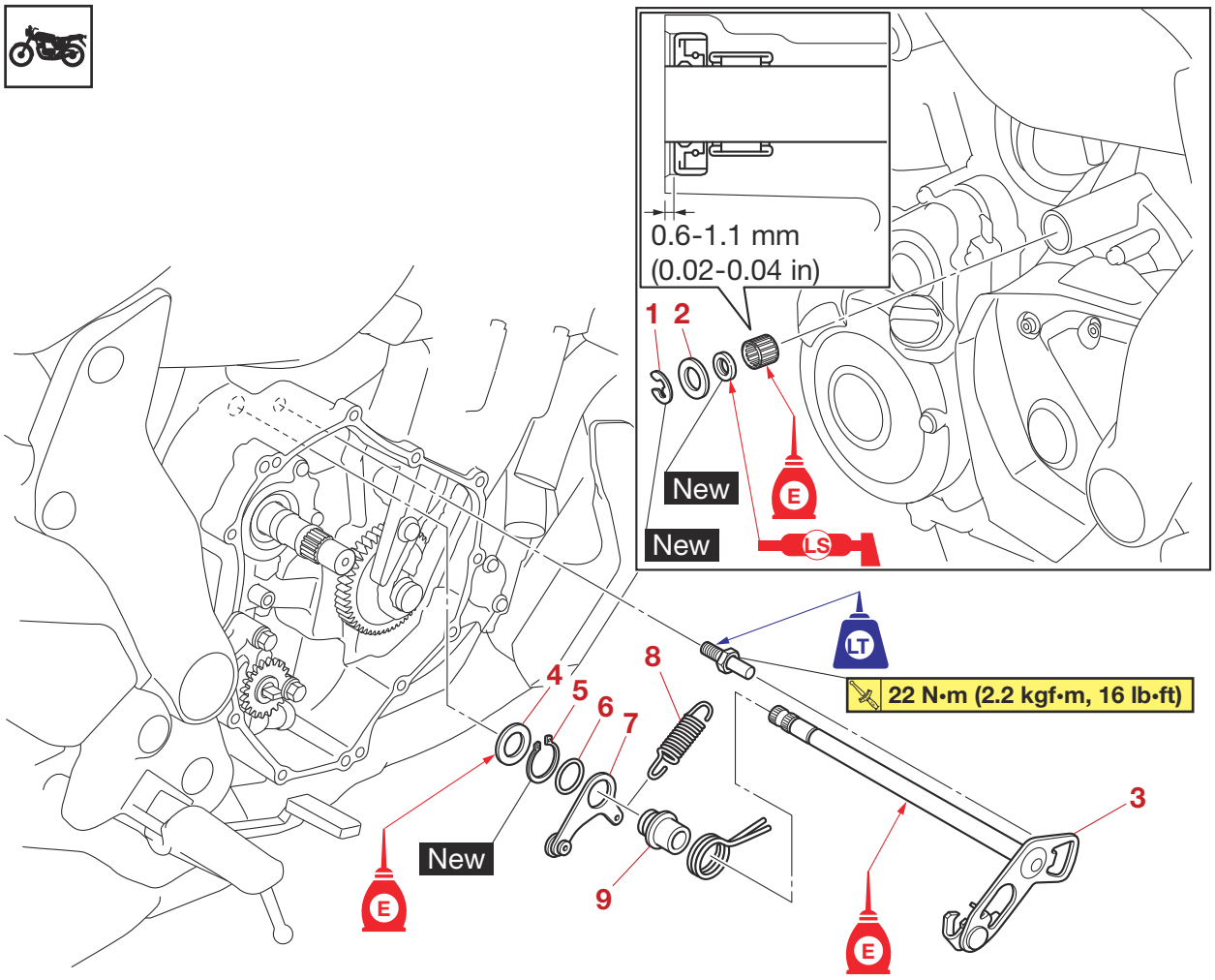
9. Adjust:
   - Clutch lever free play
     Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-12.

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

EAS20057

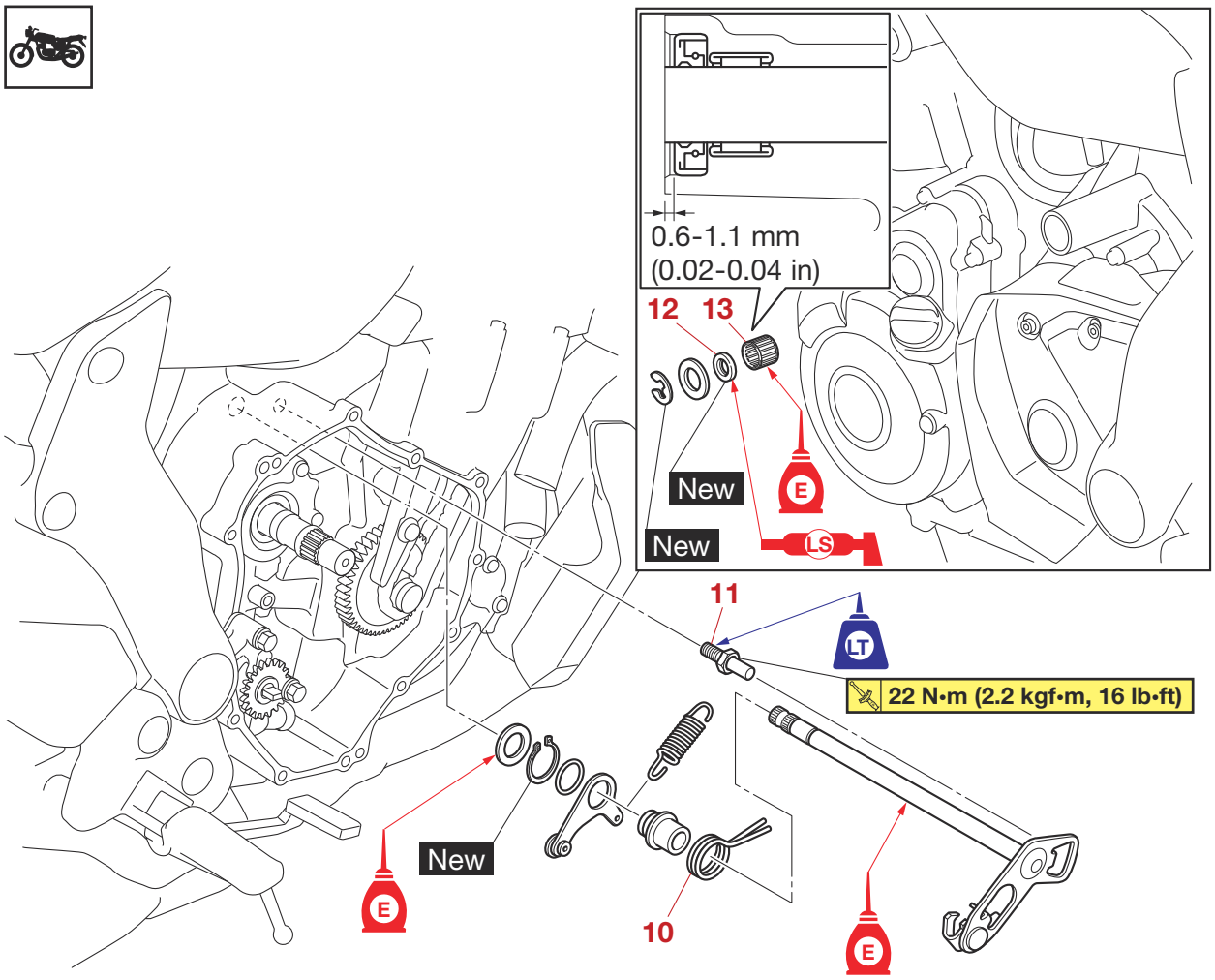
SHIFT SHAFT

Removing the shift shaft and stopper lever



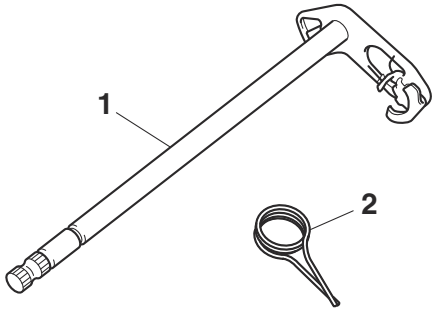
Order	Job/Parts to remove	Q'ty	Remarks
	Clutch housing		Refer to "CLUTCH" on page 5-59.
	Shift arm		Refer to "CHAIN DRIVE" on page 4-93.
1	Circlip	1	
2	Washer	1	
3	Shift shaft	1	
4	Washer	1	
5	Circlip	1	
6	Washer	1	
7	Stopper lever	1	
8	Stopper lever spring	1	
9	Collar	1	

Removing the shift shaft and stopper lever

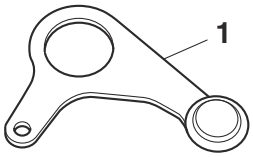


Order	Job/Parts to remove	Q'ty	Remarks
10	Shift shaft spring	1	
11	Shift shaft spring stopper	1	
12	Oil seal	1	
13	Bearing	1	

EAS30377
CHECKING THE SHIFT SHAFT
1. Check:
   - Shift shaft "1"
     Bends/damage/wear → Replace.
   - Shift shaft spring "2"
   - Collar
     Damage/wear → Replace.



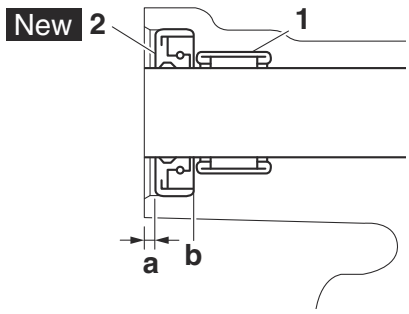
EAS30378
CHECKING THE STOPPER LEVER
1. Check:
   - Stopper lever "1"
     Bends/damage → Replace.
     Roller turns roughly → Replace the stopper lever.



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)**

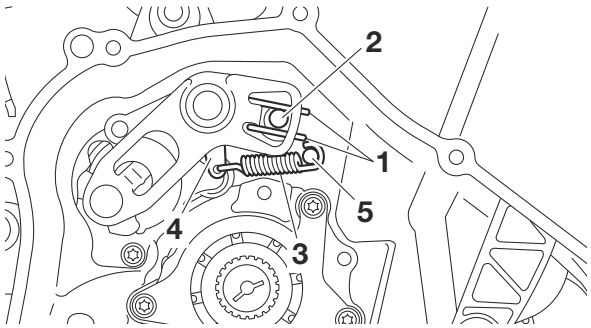
TIP
- Apply engine oil onto the bearing.
- Make sure that the bearing does not protrude past the line "b" shown in the illustration.
- Lubricate the oil seal lips with lithium-soap-based grease.



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®**

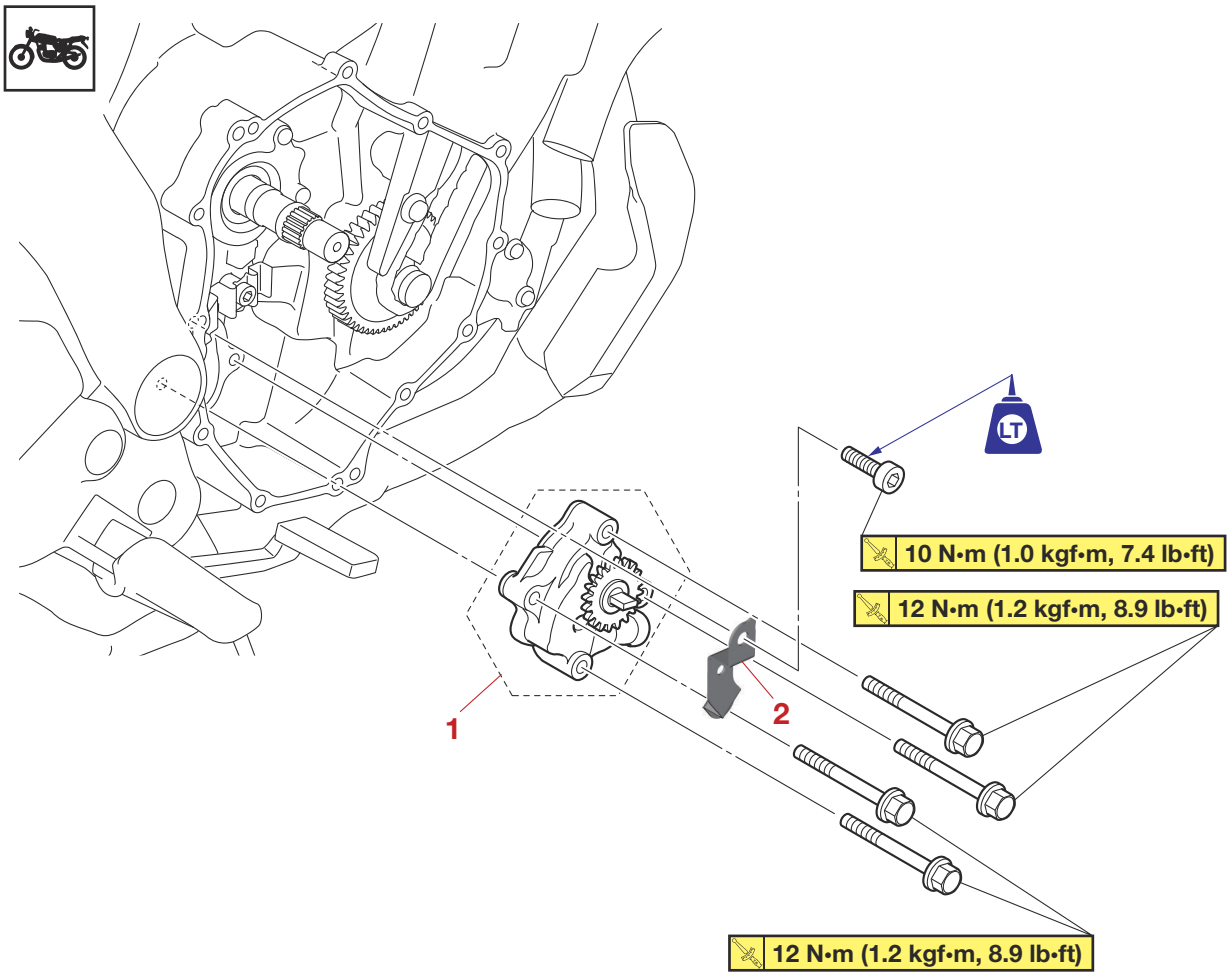
TIP
- Lubricate the washer and shift shaft assembly with engine oil.
- Hook the end of the shift shaft spring "1" onto the shift shaft spring stopper "2".
- Hook the ends of the stopper lever spring "3" onto the stopper lever "4" and the stopper lever spring hook "5".
- Mesh the stopper lever with the shift drum segment assembly.



EAS20054

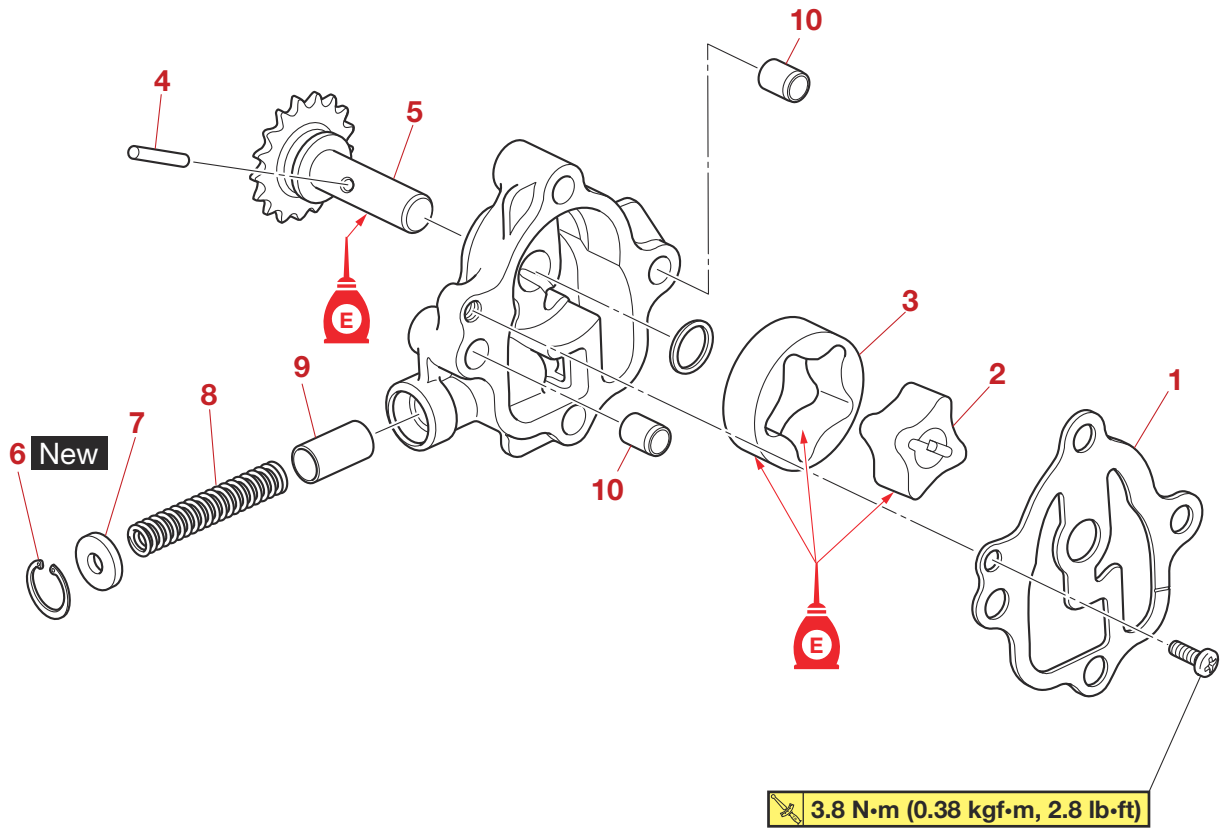
OIL PUMP

Removing the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch housing		Refer to "CLUTCH" on page 5-59.
1	Oil pump assembly	1	
2	Holder	1	

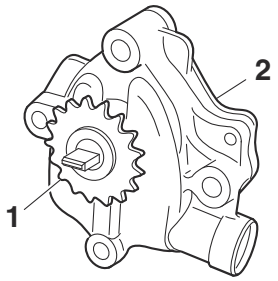
Disassembling the oil pump



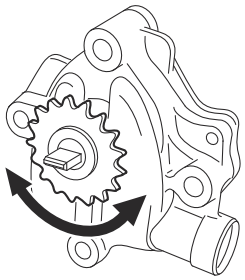
Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump cover	1	
2	Oil pump inner rotor	1	
3	Oil pump outer rotor	1	
4	Pin	1	
5	Oil pump driven sprocket	1	
6	Circlip	1	Hold down the washer when removing the circlip.
7	Washer	1	
8	Spring	1	
9	Relief valve	1	
10	Dowel pin	2	

EAS30336
CHECKING THE SPROCKET AND CHAIN
1. Check:
   - Oil pump drive sprocket
     Refer to "CHECKING THE CLUTCH HOUSING" on page 5-65.
   - Oil pump driven sprocket
     Refer to "CHECKING THE OIL PUMP" on page 5-74.
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.

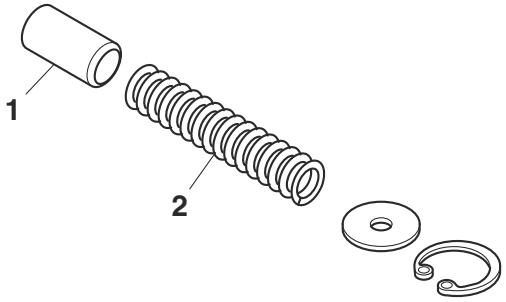
EAS30337
CHECKING THE OIL PUMP
1. Check:
   - Oil pump driven sprocket "1"
   - Oil pump housing "2"
     Cracks/damage/wear → Replace the oil pump assembly.



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**

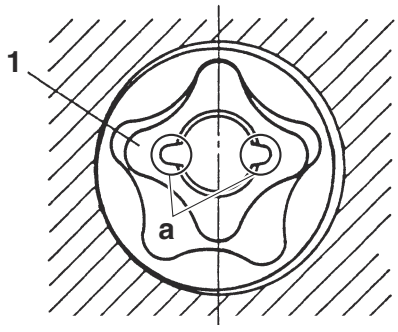
2. Lubricate:
   - Oil pump driven sprocket
     (with the recommended lubricant)

	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 5-74.

EAS30343

INSTALLING THE OIL PUMP

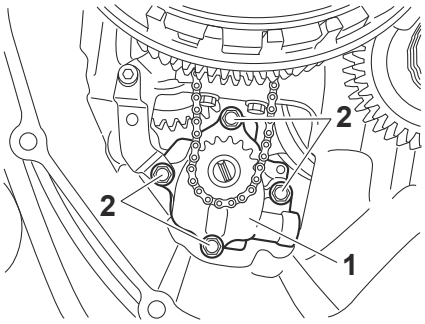
1. Install:
   - Oil pump “1”
   - Oil pump bolt “2”

	Oil pump bolt **12 N·m (1.2 kgf·m, 8.9 lb·ft)**

ECA20940

NOTICE

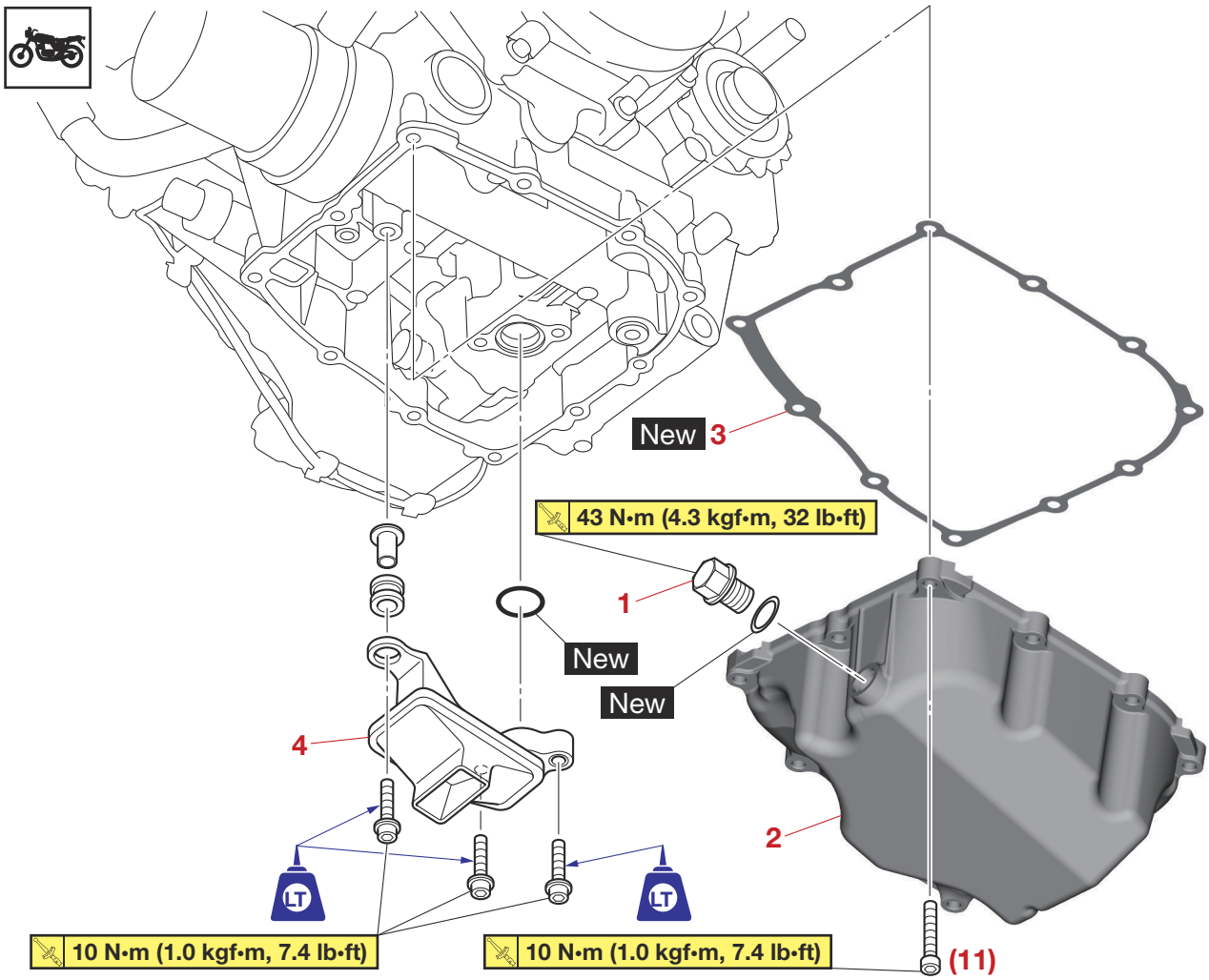
After installing the oil pump drive chain and driven sprocket, make sure the oil pump turns smoothly.



EAS20177

OIL PAN

Removing the oil pan



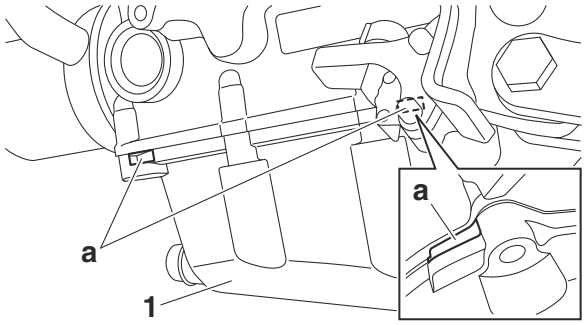
Order	Job/Parts to remove	Q'ty	Remarks
	Pivot shaft protector (right)		Refer to "SWINGARM" on page 4-87.
	Footrest assembly (right)		Refer to "REAR BRAKE" on page 4-42.
	Muffler assembly		Refer to "ENGINE REMOVAL" on page 5-17.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
1	Engine 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 criss-cross pattern.

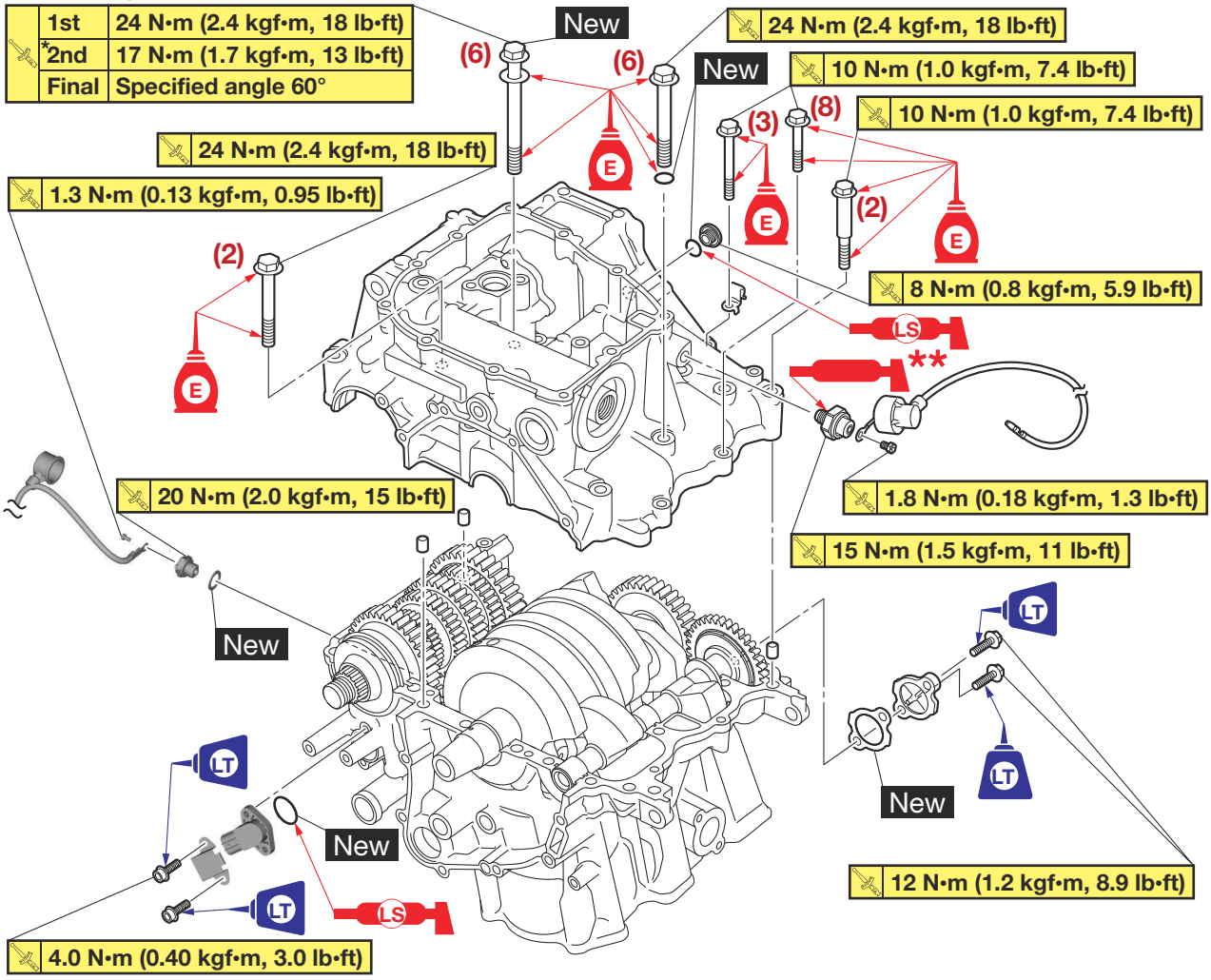
2. Install:
   - Gasket New
   - Engine oil drain bolt

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

EAS20059

CRANKCASE

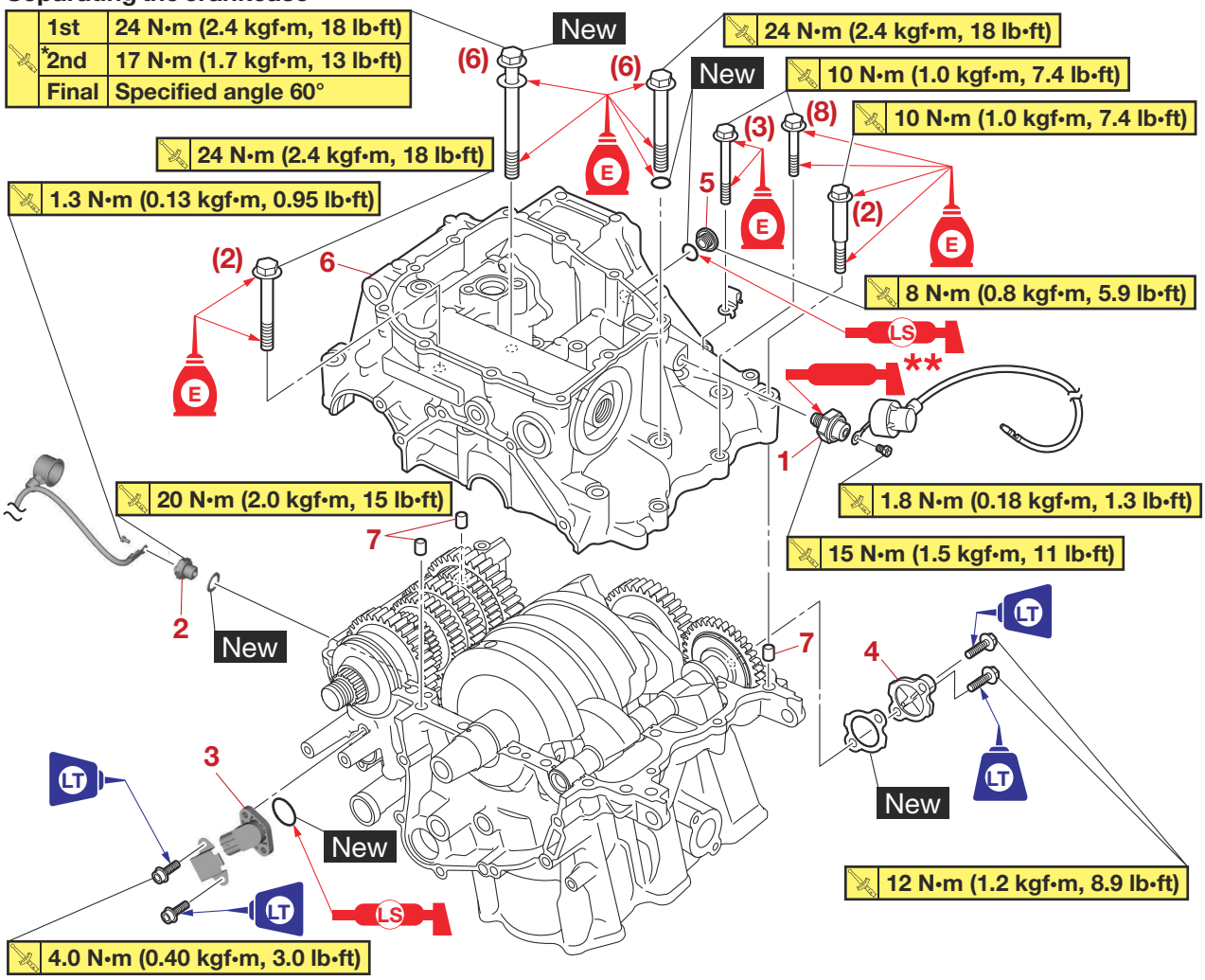
Separating the crankcase



* Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.
**YAMAHA bond No. 1215 (Three bond No. 1215®)

Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-17.
	Cylinder head cover		Refer to "CAMSHAFTS" on page 5-26.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-38.
	Starter clutch		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-49.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-55.
	Clutch housing		Refer to "CLUTCH" on page 5-59.
	Oil strainer		Refer to "OIL PAN" on page 5-76.

Separating the crankcase



*** Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque.**
****YAMAHA bond No. 1215 (Three bond No. 1215®)**

Order	Job/Parts to remove	Q'ty	Remarks
	Oil cooler		Refer to "OIL COOLER" on page 6-7.
	Drive sprocket		Refer to "CHAIN DRIVE" on page 4-93.
1	Oil pressure switch	1	
2	Neutral switch	1	
3	Gear position sensor	1	
4	Balancer shaft access cover	1	
5	Main gallery bolt	1	
6	Crankcase	1	
7	Dowel pin	3	

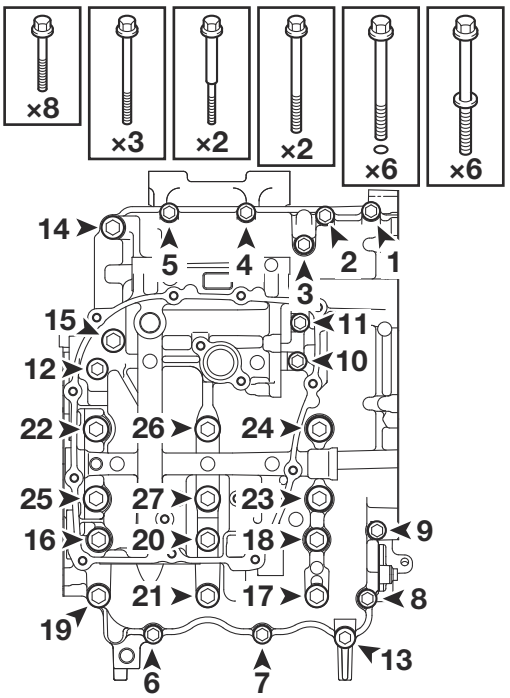
EAS30389
DISASSEMBLING THE CRANKCASE

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 (×6) (bolts with washers): "22"–"27"



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)

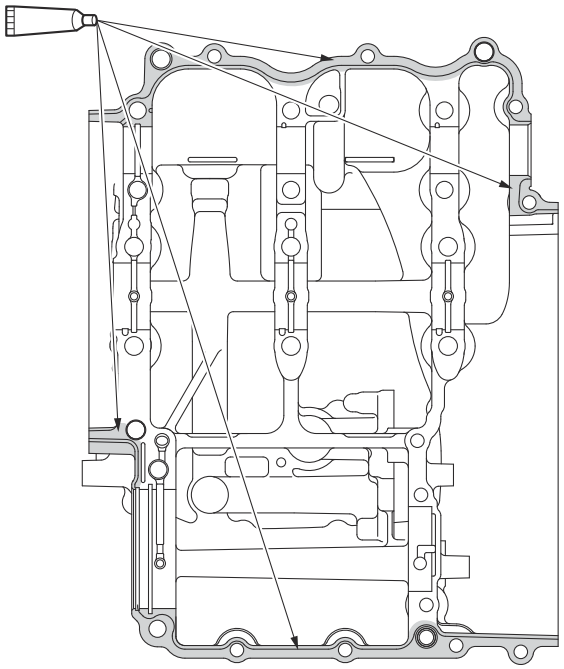
	Recommended lubricant **Engine oil**

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.

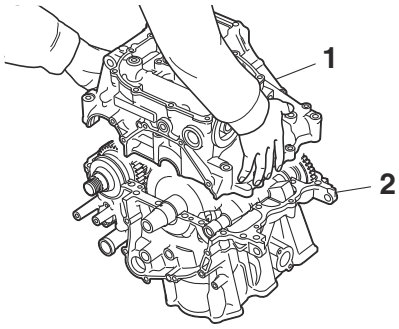


3. Install:
   • Dowel pin
4. Set the shift drum assembly and transmission gears in the neutral position.
5. Install:
   • Crankcase "1"
   (onto the cylinder "2")

ECA13980

NOTICE

Before tightening the crankcase bolts, make sure the transmission gears shift correctly when the shift drum assembly is turned by hand.

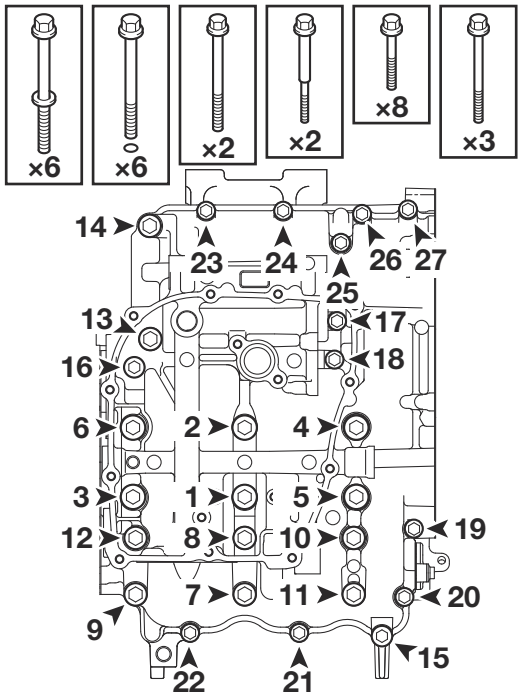


6. Install:
   • Crankcase bolt (×27)

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 (×6) (bolts with washers): "1"–"6" 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

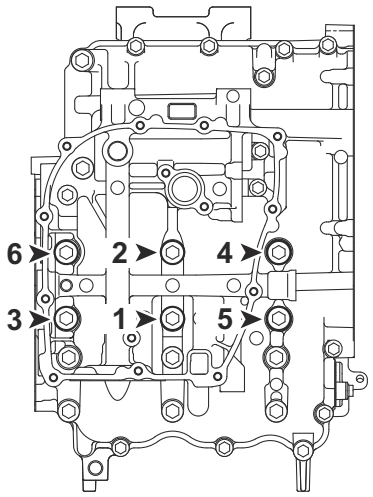
NOTICE

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.

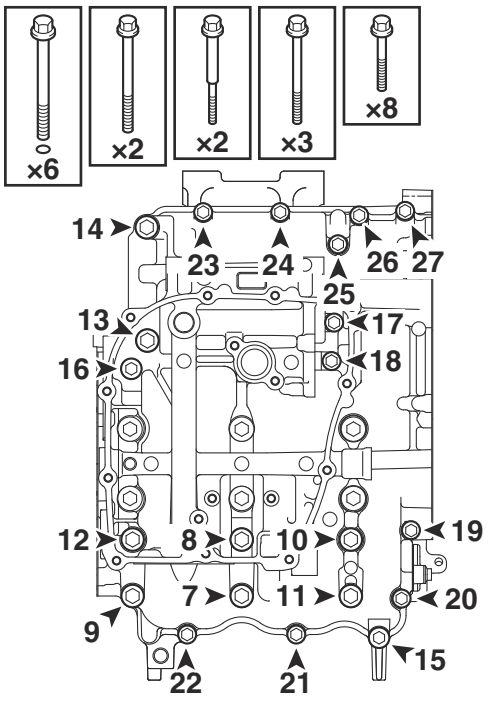


8. Tighten:
   - Crankcase bolt "7"–"27"

	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"

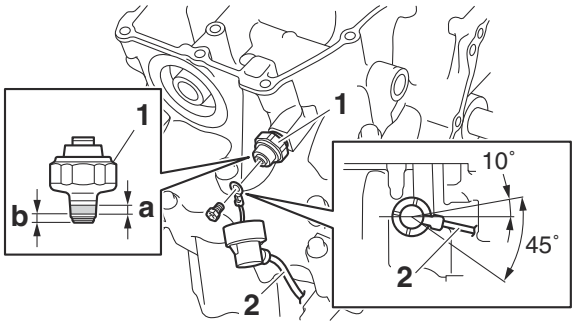
	Oil pressure switch **15 N·m (1.5 kgf·m, 11 lb·ft)** **Oil pressure switch lead bolt** **1.8 N·m (0.18 kgf·m, 1.3 lb·ft)**

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.



EAS31658

INSTALLING THE GEAR POSITION SENSOR

ECA22630

NOTICE

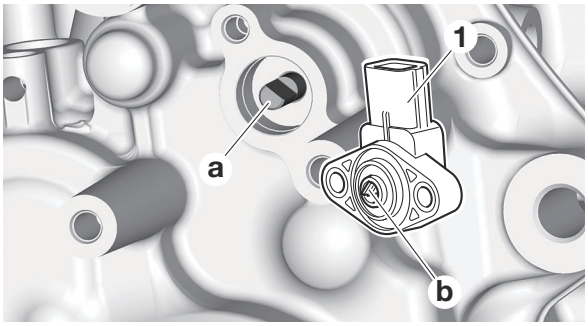
To prevent damage to the gear position sensor, keep magnets (including any pickup tool with a magnet, magnetized screwdrivers, etc.) away from the gear position sensor.

1. Install:
   - O-ring New
   - Gear position sensor "1"
   - Gear position sensor plate

	Gear position sensor bolt **4.0 N·m (0.40 kgf·m, 3.0 lb·ft)** **LOCTITE®**

TIP

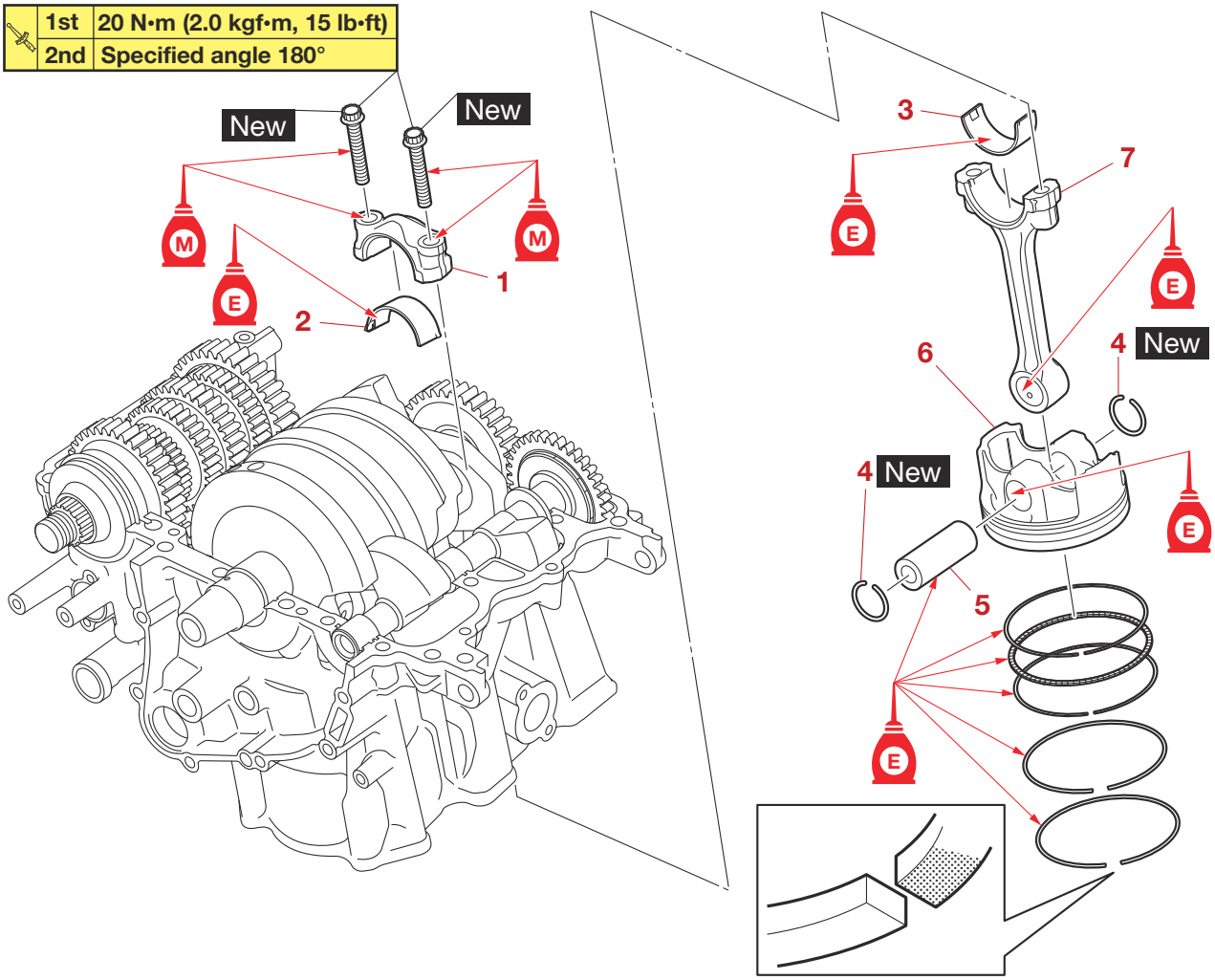
- Lubricate the O-ring with lithium-soap-based grease.
- Fit the end “a” of the shift drum assembly into the opening “b” in the gear position sensor “1”.



EAS20132
CONNECTING RODS AND PISTONS

Removing the connecting rods and pistons

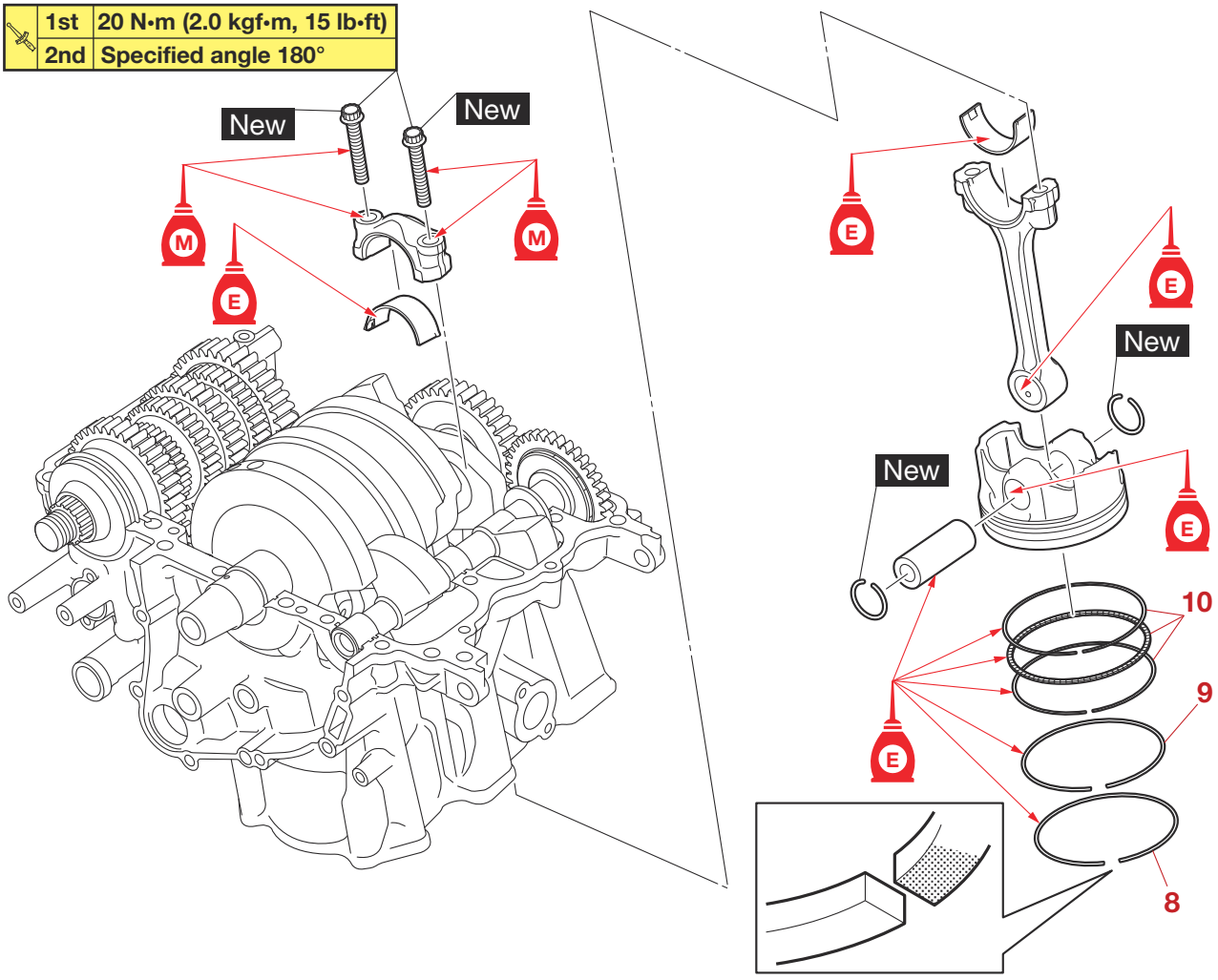
	1st	20 N·m (2.0 kgf·m, 15 lb·ft)
	2nd	Specified angle 180°



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 5-78.
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

	1st	20 N•m (2.0 kgf•m, 15 lb•ft)
	2nd	Specified angle 180°



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

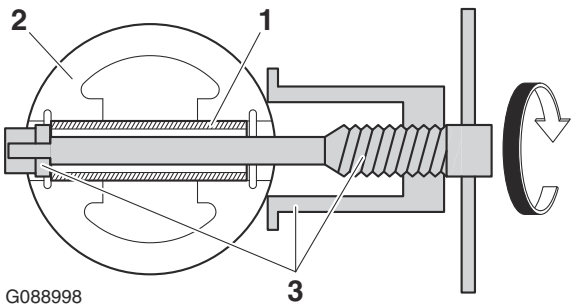
NOTICE

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

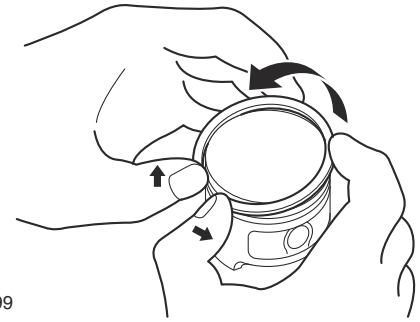


G088998

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.

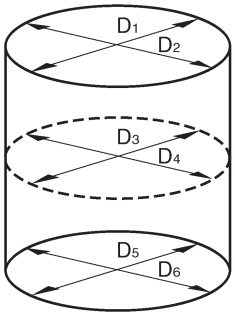
1. Check:
   - Piston wall
   - Cylinder wall
     Vertical scratches → Replace the cylinder, and replace the piston and piston rings as a set.
2. Measure:
   - Piston-to-cylinder clearance
     a. Measure cylinder bore with the cylinder bore gauge.

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



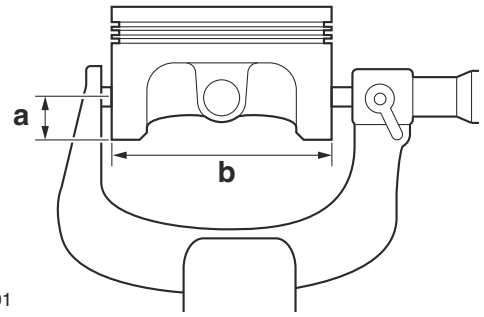
G089000

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

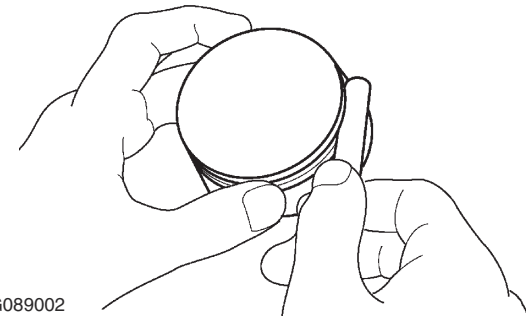
CHECKING THE PISTON RINGS

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

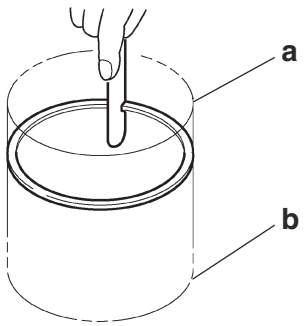
Use the piston crown to level the piston ring near bottom of cylinder "a", where cylinder wear is lowest.

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

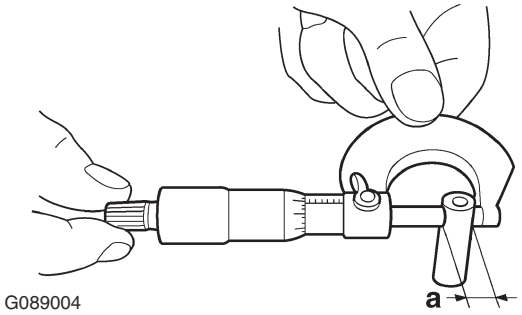
CHECKING THE PISTON PIN

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.

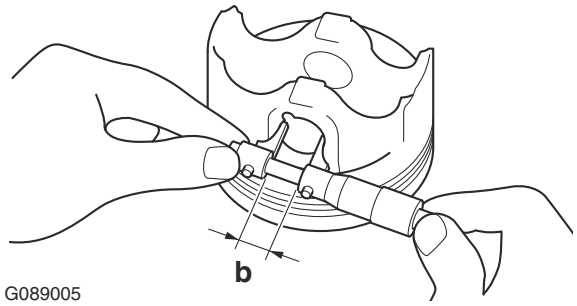
	Piston pin outside diameter limit **17.970 mm (0.7075 in)**



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 **0.028–0.052 mm (0.0011–0.0020 in)**

The following procedure applies to all of the connecting rods.

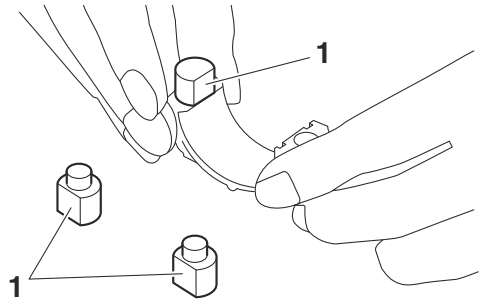
ECA13930
NOTICE

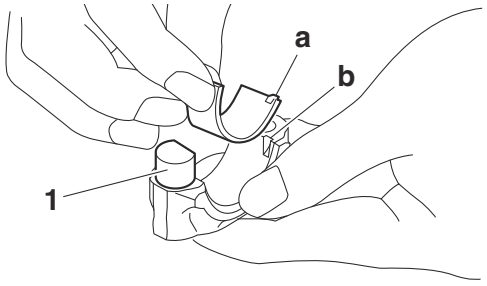
Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft-pin-to-big-end-bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.

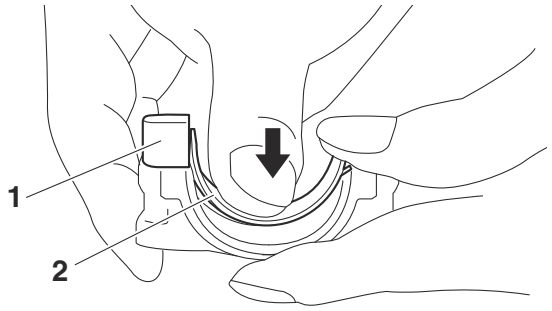
a. Clean the big end bearings, crankshaft pins, and the inside of the connecting rods halves.
b. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap with the connecting rod big end bearing installer "1".

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.

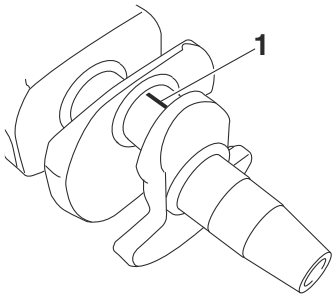
	Connecting rod big end bearing installer **90890-04193** **Connecting rod big end bearing installer** **YM-04193**







c. Put a piece of Plastigauge® "1" on the crankshaft pin.



G089008

d. Assemble the connecting rod halves.

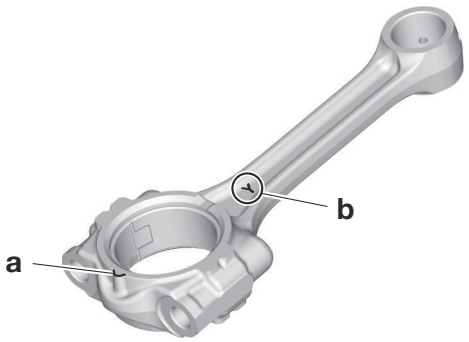
ECA18390

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

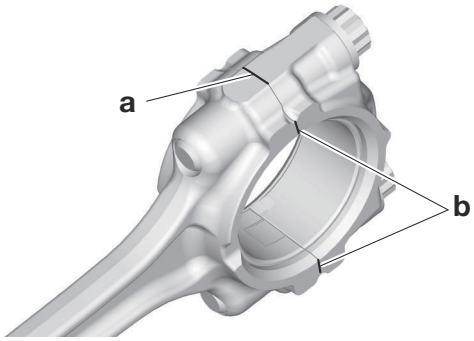
Install by carrying out the following procedures in order to assemble in the most suitable condition.

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.

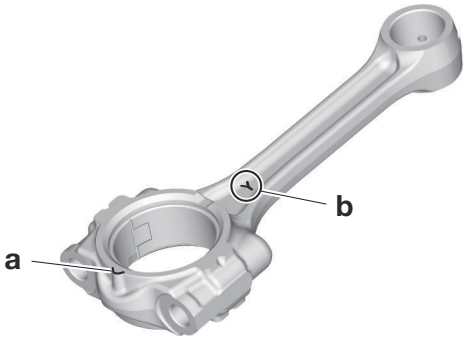


a. Side machined face
b. Thrusting faces

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

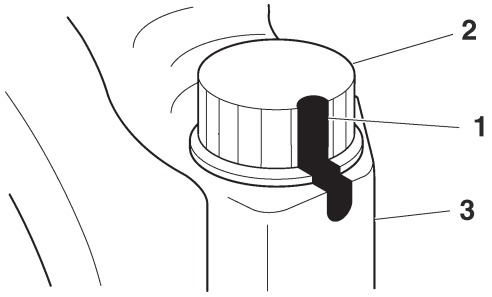
- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Make sure that the projection "a" on the connecting rod cap faces the same direction as the "Y" mark "b" on the connecting rod.
- Make sure the "Y" marks "b" on the connecting rods face towards the left side of the crankshaft.



g. Tighten the connecting rod bolts with a torque wrench.

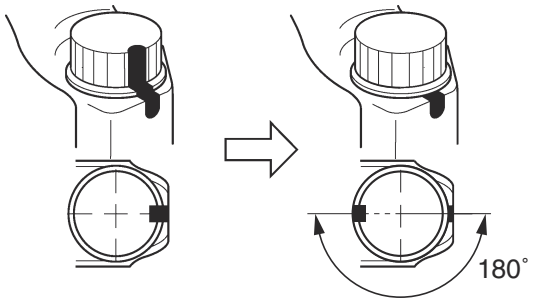
	Connecting rod bolt (1st) 20 N·m (2.0 kgf·m, 15 lb·ft)

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 (2nd) Specified angle 180°



EWA16610

WARNING

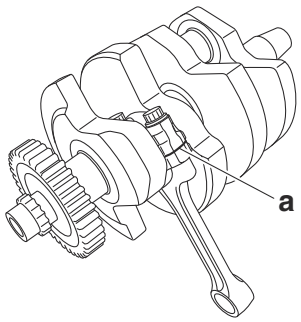
If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

ECA20890

NOTICE

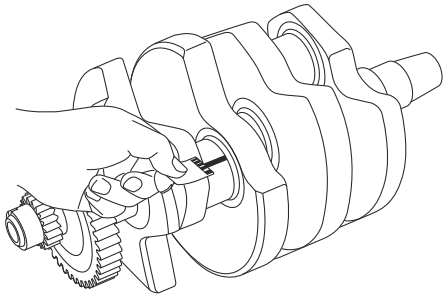
Do not use a torque wrench to tighten the bolt to the specified angle.

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.

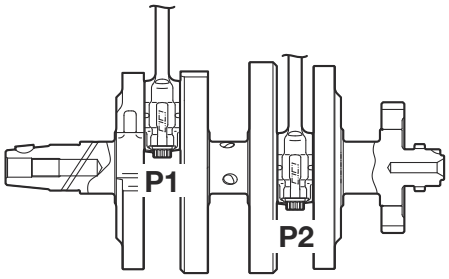
l. Measure the compressed Plastigauge® width on the crankshaft pin. If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



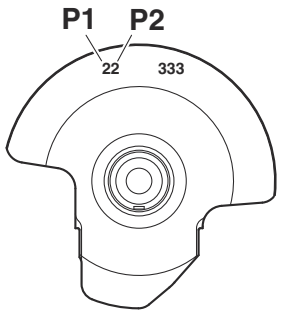
2. Select:
   • Big end bearing (P_1–P_2)

TIP

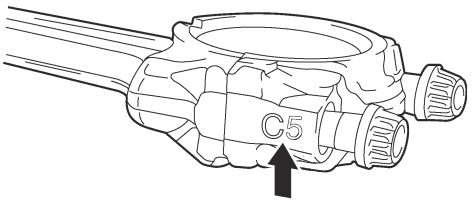
- The numbers “A” stamped into the crankshaft web and the numbers “B” on the connecting rods are used to determine the replacement big end bearings sizes.
- “P_1”–“P_2” refer to the bearings shown in the crankshaft illustration.



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
Yellow green

EAS30751

INSTALLING THE CONNECTING ROD AND PISTON

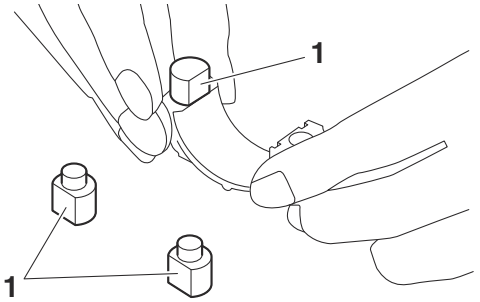
The following procedure applies to all of the connecting rods and pistons.

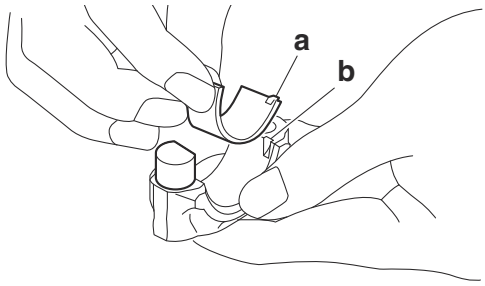
1. Install:
   - Big end bearing
   - Connecting rod cap
     (onto the connecting rod)

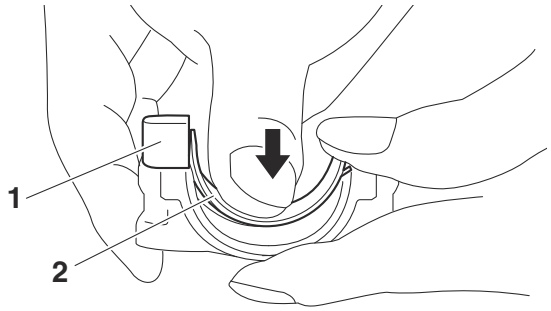
TIP

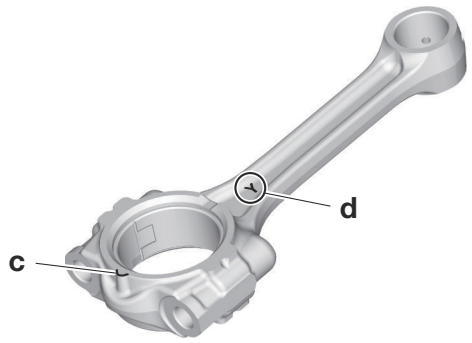
- Clean the big end bearings, crankshaft pins, and the inside of the connecting rods halves.
- Be sure to reinstall each big end bearing in its original place.
- From the 3 types, choose the connecting rod big end bearing installer "1" that fits exactly, and install it to the connecting rod and connecting 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

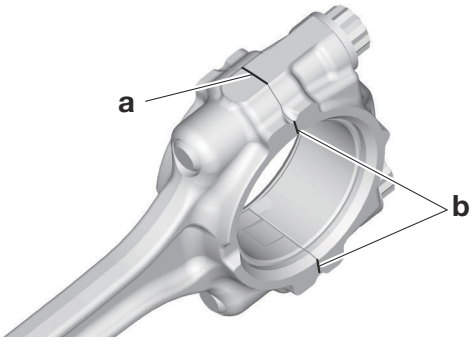
Install by carrying out the following procedures in order to assemble in the most suitable condition.

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.



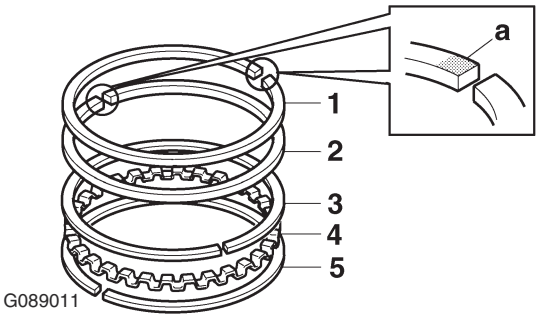
a. Side machined face
b. Thrusting faces

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

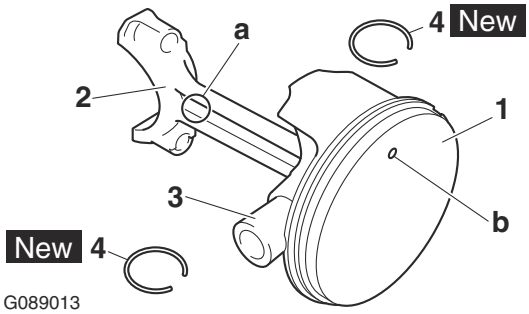
Be sure to install the piston rings so that the manufacturer's marks "a" face up.

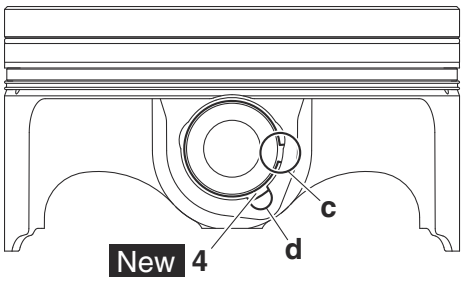


4. Install:
   • Piston "1"
   (onto the respective connecting rod "2")
   • Piston pin "3"
   • Piston pin clip "4" New

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.

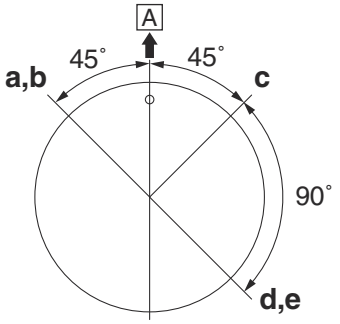




5. Lubricate:
   - Piston
   - Piston ring
   - Cylinder
   (with the recommended lubricant)

	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)

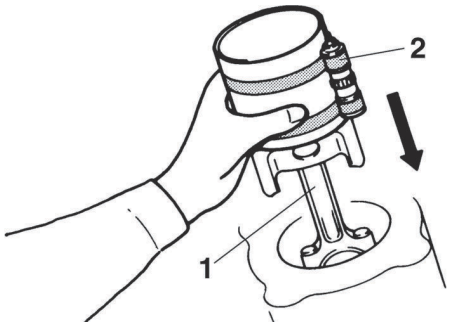
	Recommended lubricant **Engine oil**

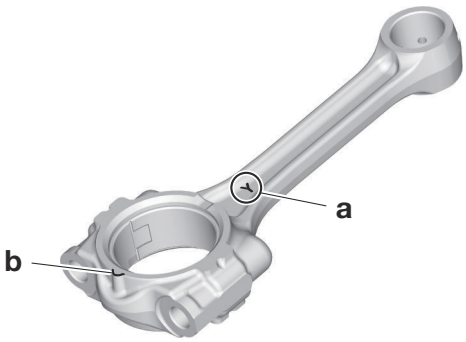
8. Install:
   - Connecting rod assembly "1"
   (into the cylinder and onto the crankshaft pin)
   - Connecting rod cap
   (onto the connecting rod)

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

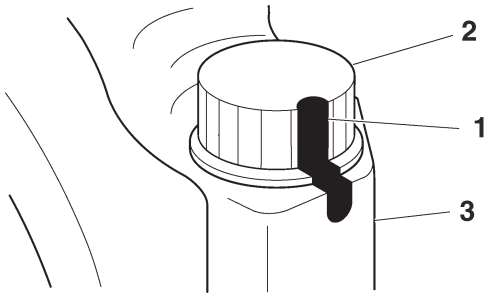
TIP

Tighten the connecting rod bolts using the following procedure.

a. Tighten the connecting rod bolts with a torque wrench.

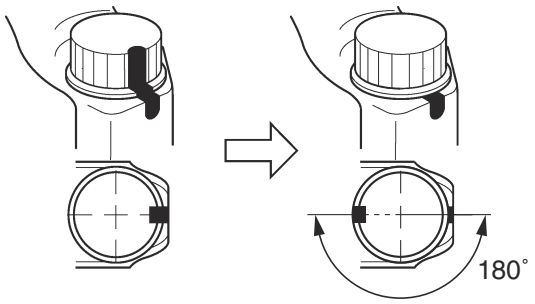
	Connecting rod bolt (1st) **20 N·m (2.0 kgf·m, 15 lb·ft)**

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 (2nd) **Specified angle 180°**



EWA16610

WARNING

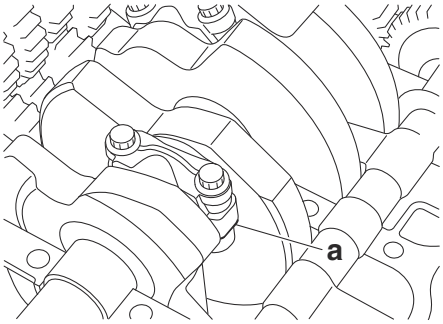
If the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it. Instead, replace the bolt with a new one and perform the procedure again.

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

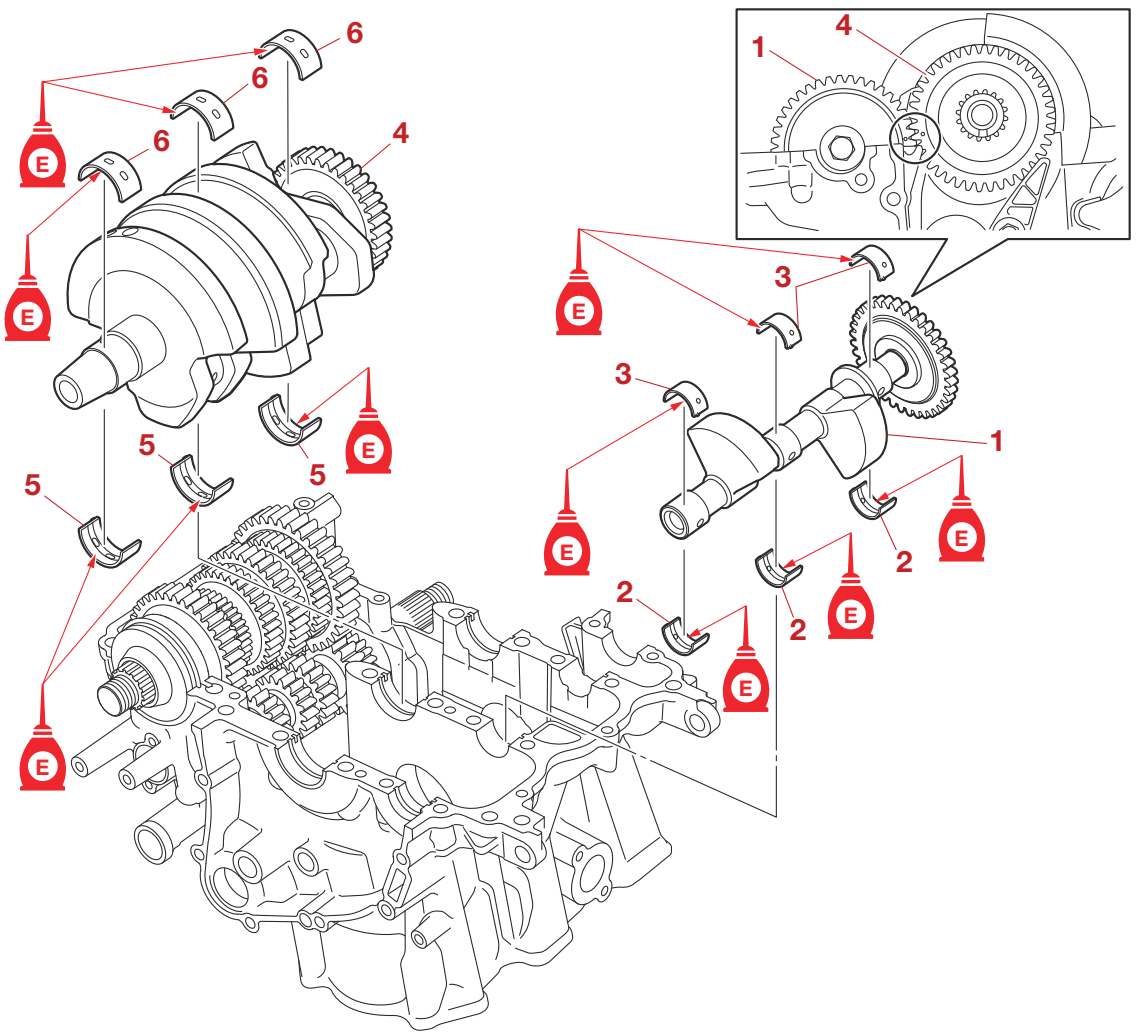
WARNING

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 5-78.
	Connecting rod		Refer to "CONNECTING RODS AND PISTONS" on page 5-84.
1	Balancer shaft assembly	1	
2	Balancer shaft journal upper bearing	3	
3	Balancer shaft journal lower bearing	3	
4	Crankshaft assembly	1	
5	Crankshaft journal upper bearing	3	
6	Crankshaft journal lower 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)

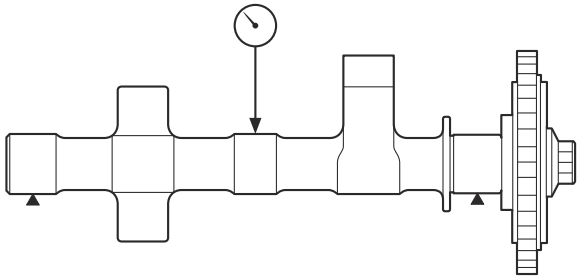
TIP
Identify the position of each balancer shaft journal bearing so that it can be reinstalled in its original place.

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
0.030 mm (0.0012 in)



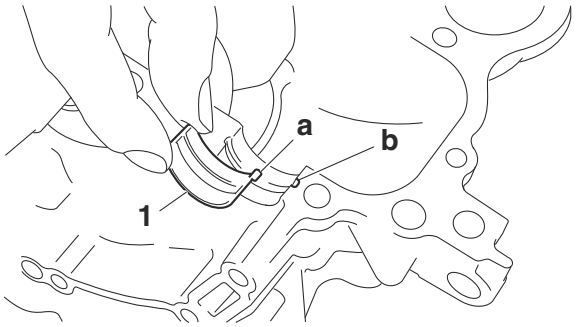
3. Check:
   - Balancer shaft assembly
     Cracks/damage/wear → Replace the balancer shaft assembly and journal bearings.
     Dirt → Clean.
   - Bearing
     Damage/wear → Replace.
4. Measure:
   - Balancer shaft-journal-to-balancer shaft-journal-bearing clearance
     Out of specification → Replace 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.

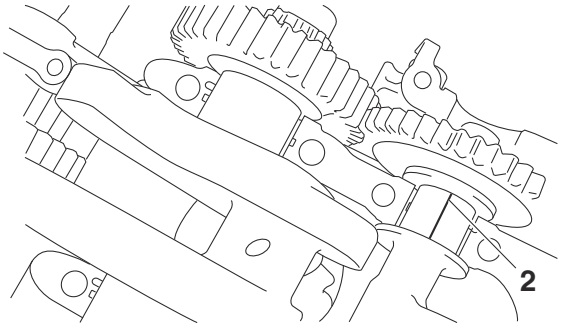
a. Clean the balancer shaft journal bearings, balancer shaft journals, and bearing portions of the crankcase and cylinder.
b. Install the balancer shaft journal upper bearings “1” and the balancer shaft assembly into the cylinder.

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.

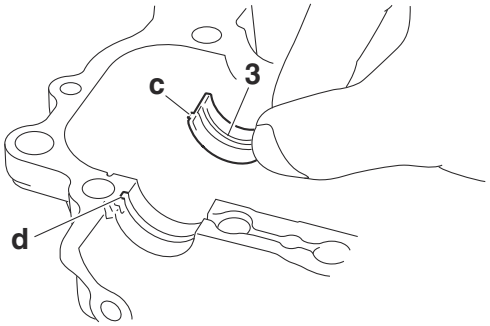
TIP
Do not put the Plastigauge® over the oil hole in the balancer shaft journal.



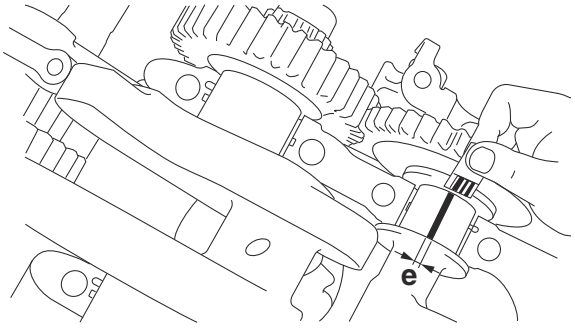
d. Install the balancer shaft journal lower bearings "3" into the crankcase and assemble the crankcase and cylinder.

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.



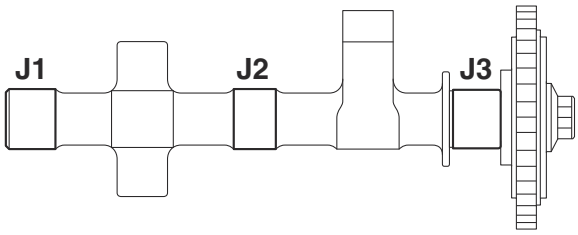
e. Tighten the bolts to specification in the tightening sequence cast on the crankcase.
   Refer to "CRANKCASE" on page 5-78.
f. Remove the crankcase and the balancer shaft journal lower bearings.
g. Measure the compressed Plastigauge® width "e" on each balancer shaft journal.
   If the balancer shaft-journal-to-balancer shaft-journal-bearing clearance is out of specification, select replacement balancer shaft journal bearings.

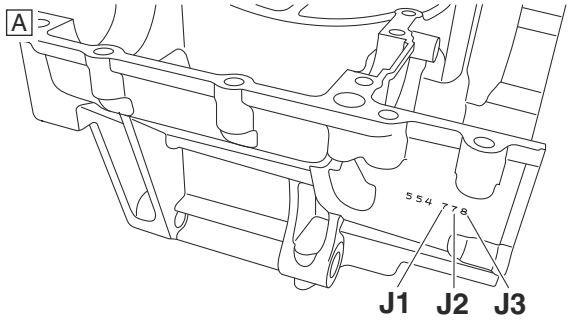


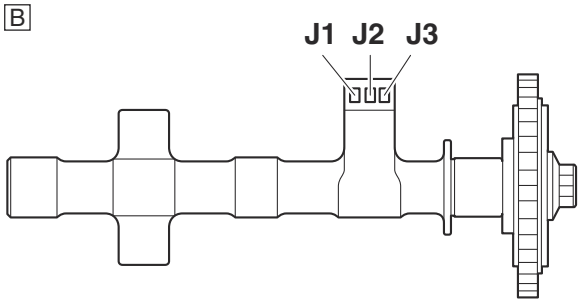
5. Select:
   - Balancer shaft journal bearing (J_1–J_3)

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:

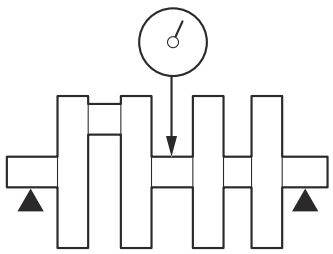
"J_1" (crankcase) – "J_1" (balancer shaft web)
= 6 – 5 = 1 (blue)

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.

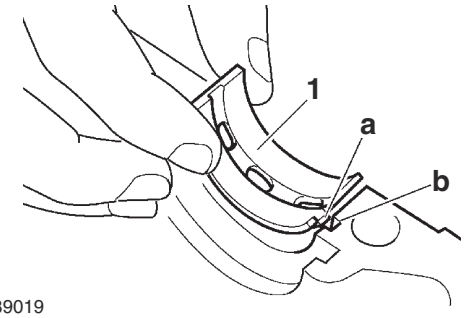
Journal oil clearance
0.019–0.043 mm (0.0007–0.0017 in)

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.

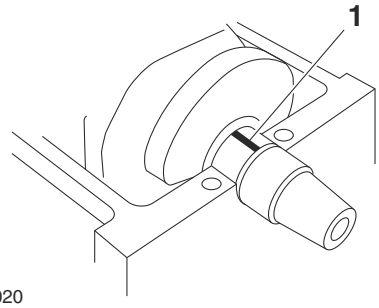
TIP
Align the projections “a” on the crankshaft journal upper bearings with the notches “b” in the cylinder.



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.

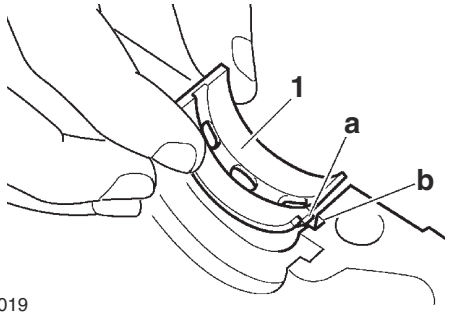


G089020

d. Install the crankshaft journal lower bearings “1” into the crankcase and assemble the crankcase and cylinder.

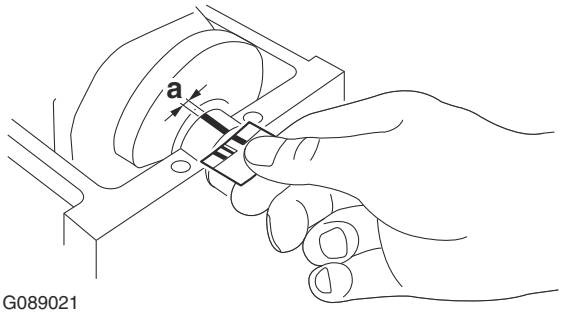
TIP
- Align the projections “a” of the crankshaft journal lower bearings with the notches “b” in the crankcase.
- Do not move the crankshaft until the clearance

measurement has been completed.



G089019

e. Tighten the bolts to specification in the tightening sequence cast on the crankcase.
   Refer to "CRANKCASE" on page 5-78.
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.

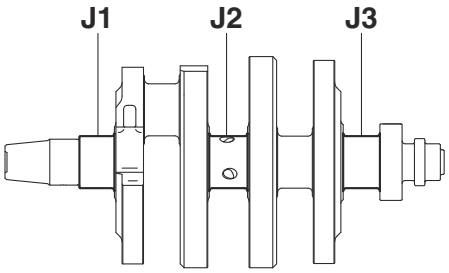


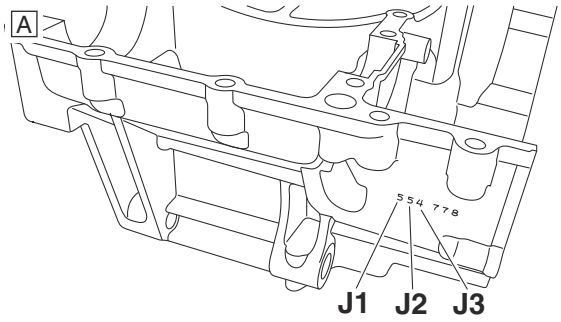
G089021

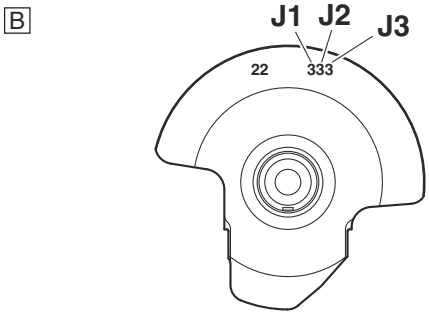
5. Select:
   • Crankshaft journal bearing (J_1–J_3)

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)

Bearing color code
Code -1
Purple
Code 0
White
Code 1
Blue
Code 2
Black
Code 3
Brown

EAS31077

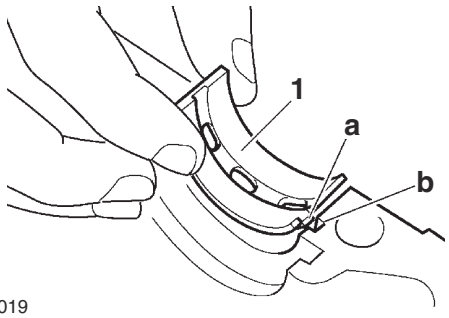
INSTALLING THE CRANKSHAFT

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

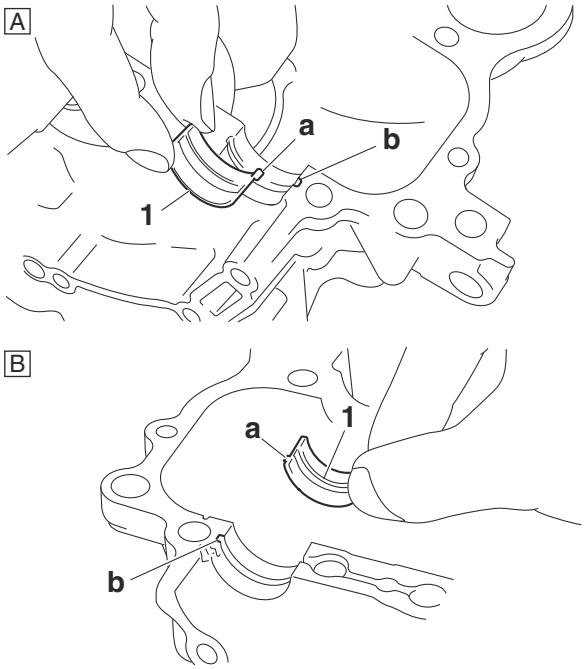
EAS31078

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.

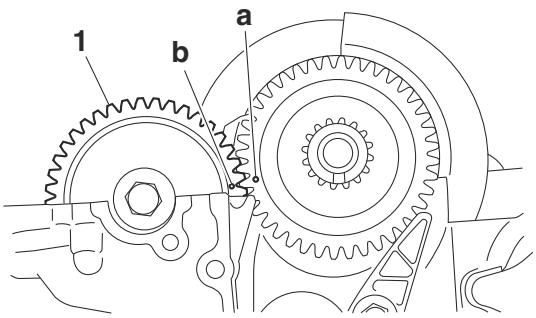


A. Upper crankcase
B. Lower crankcase

2. Install:
   - Balancer shaft "1"

TIP

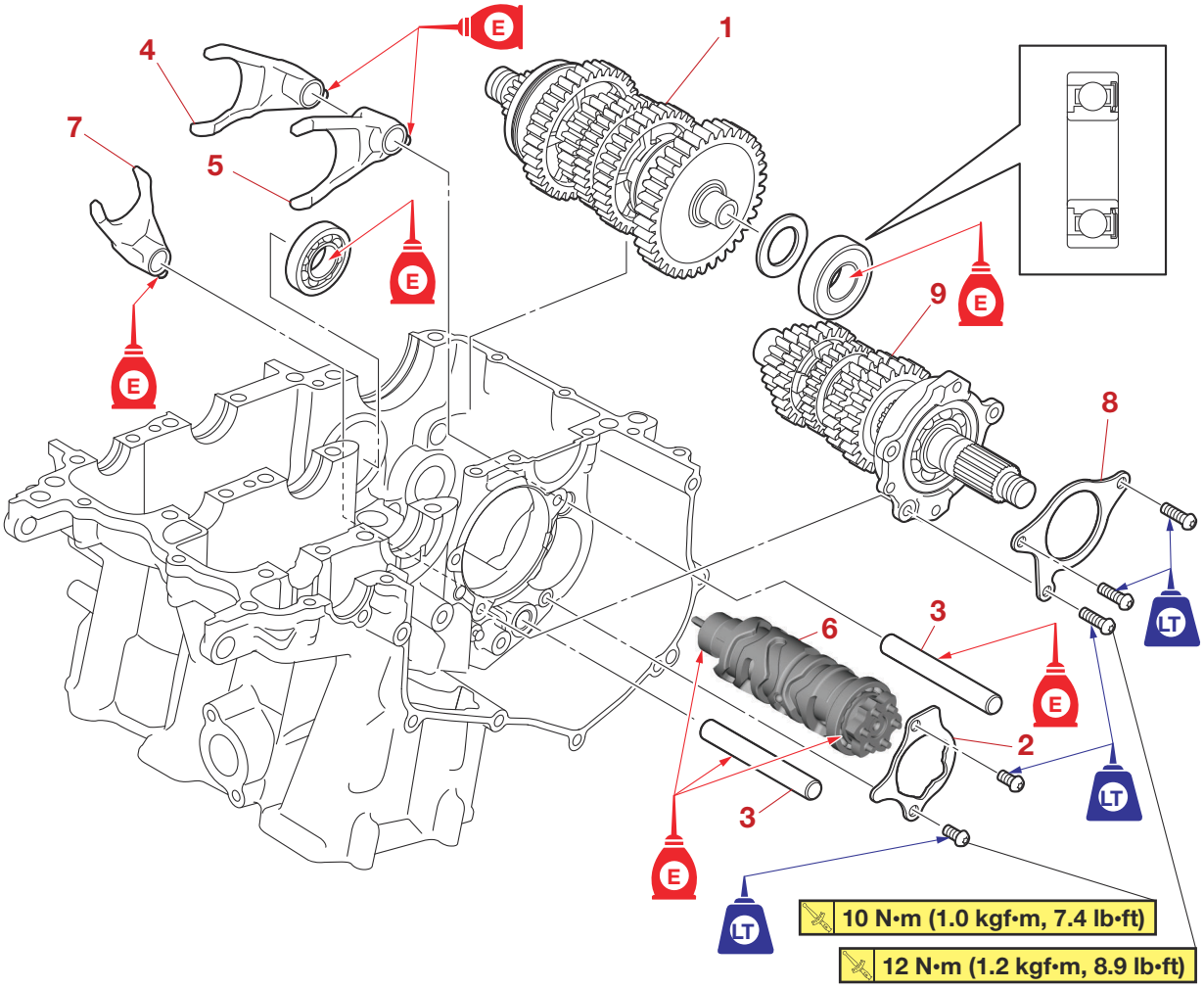
Align the punch mark "a" in the balancer drive gear with the punch mark "b" in the balancer driven gear.



EAS20062

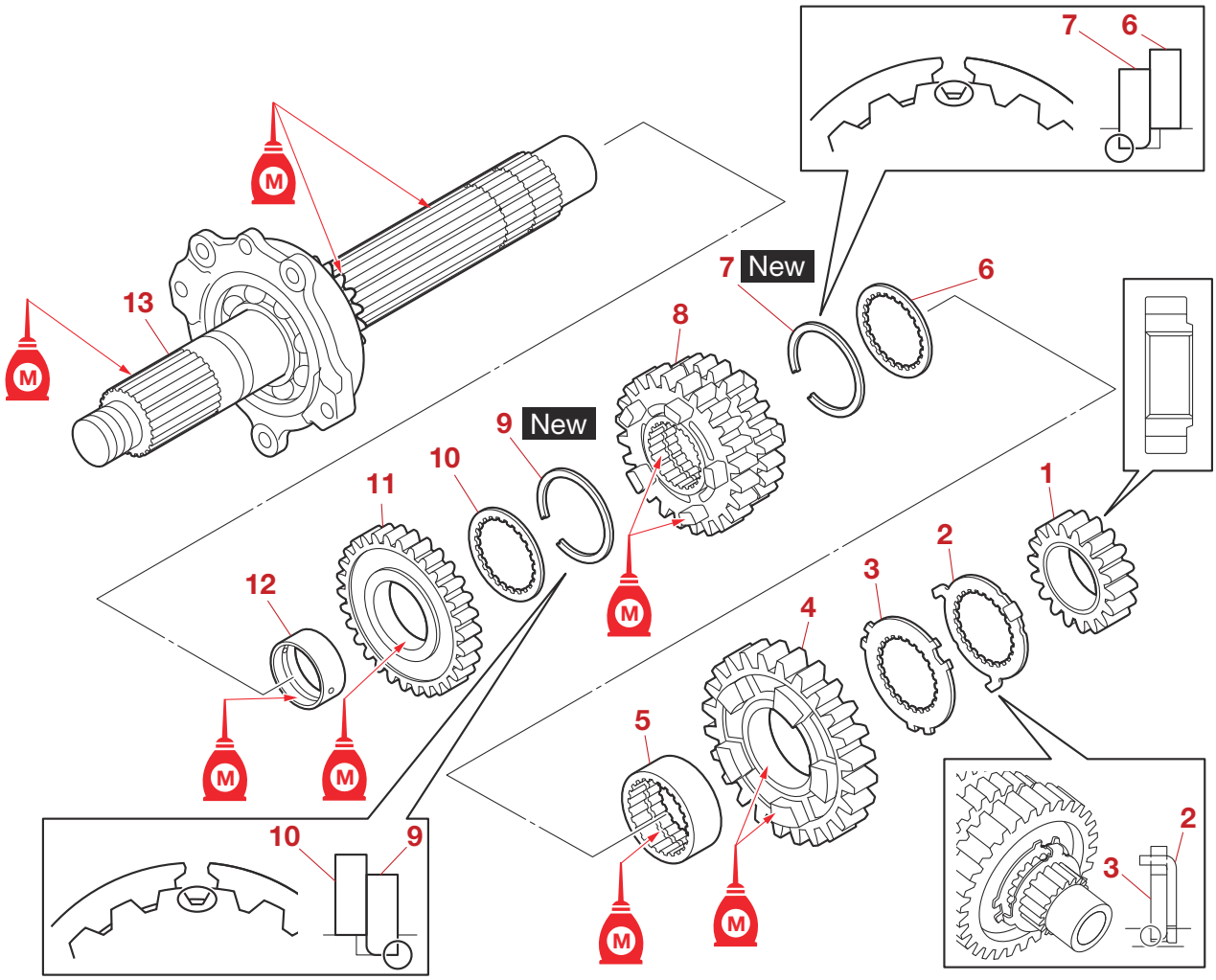
TRANSMISSION

Removing the transmission, shift drum assembly, and shift forks



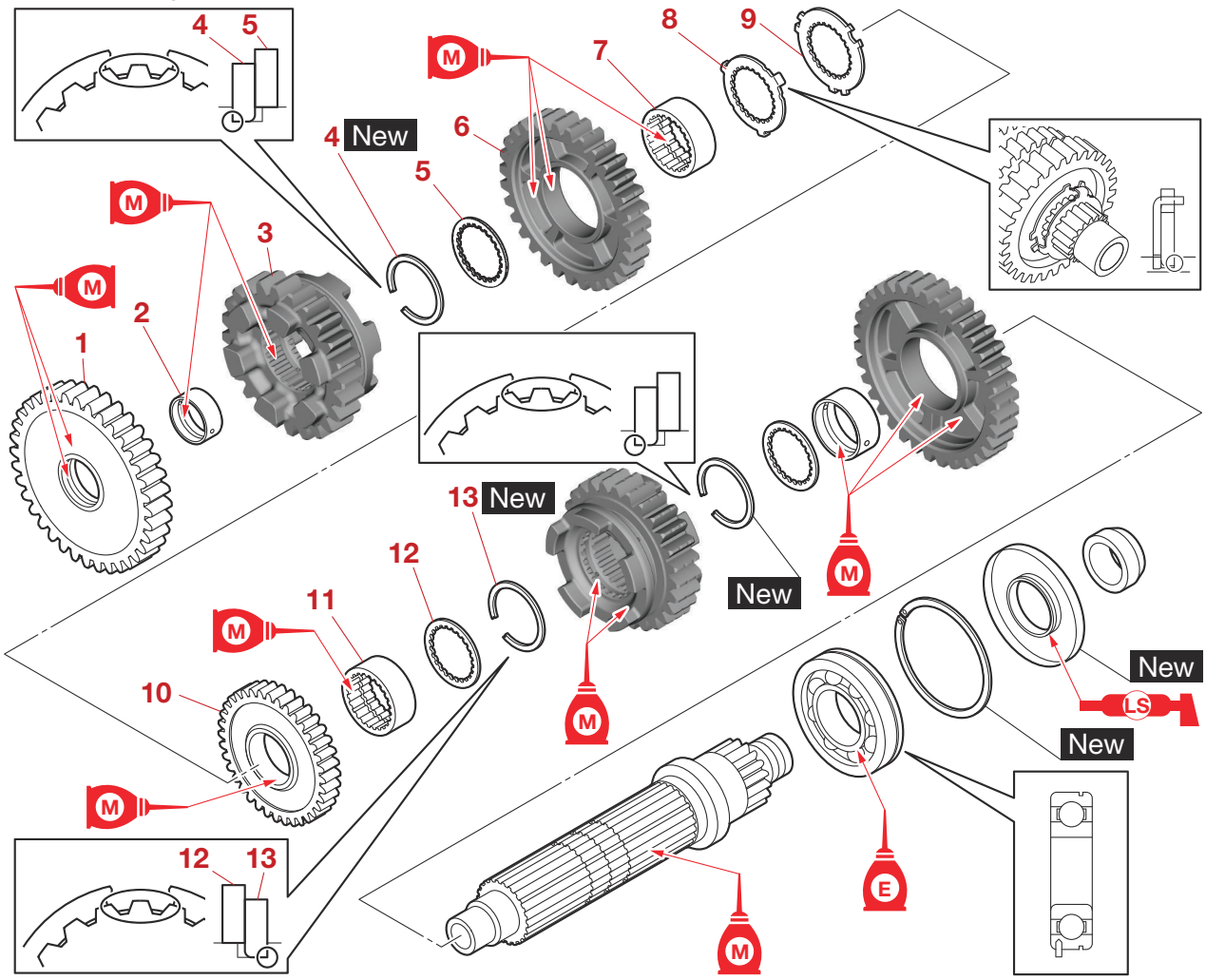
Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Refer to "CRANKCASE" on page 5-78.
1	Drive axle assembly	1	
2	Shift drum retainer	1	
3	Shift fork guide bar	2	
4	Shift fork "L"	1	
5	Shift fork "R"	1	
6	Shift drum assembly	1	
7	Shift fork "C"	1	
8	Bearing retainer	1	
9	Main axle assembly	1	

Disassembling the main axle assembly



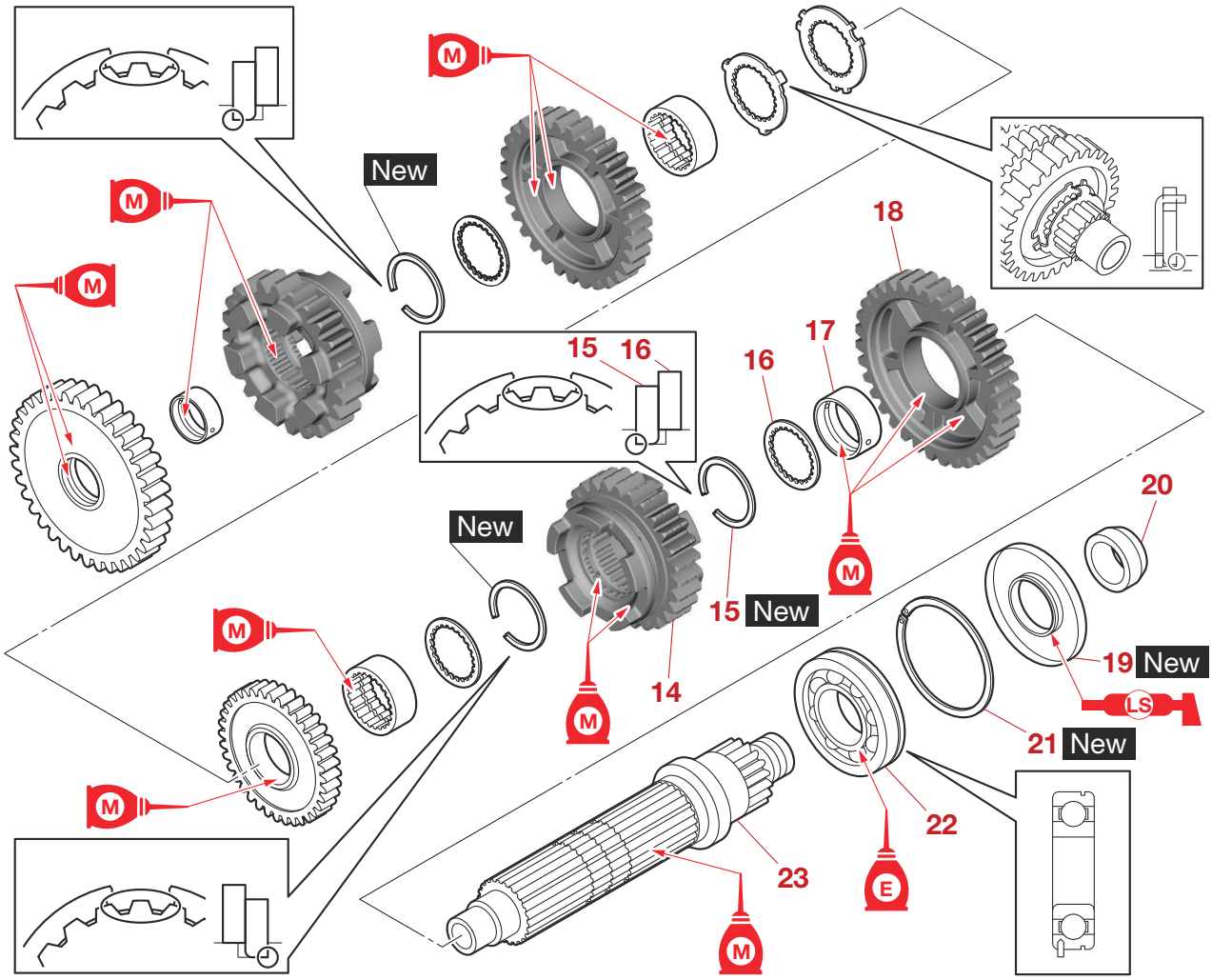
Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	
2	Toothed lock washer	1	
3	Toothed lock washer retainer	1	
4	6th pinion gear	1	
5	Collar	1	
6	Washer	1	
7	Circlip	1	
8	3rd pinion gear	1	
9	Circlip	1	
10	Washer	1	
11	5th pinion gear	1	
12	Collar	1	
13	Main axle	1	

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	
13	Circlip	1	

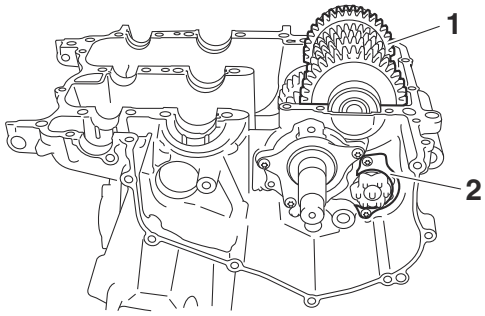
Disassembling the drive axle assembly



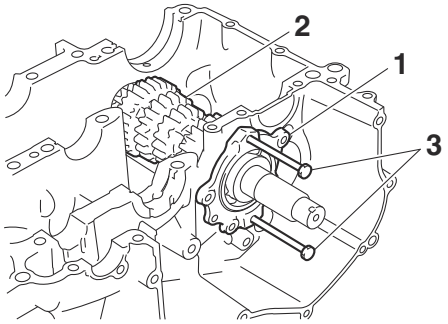
Order	Job/Parts to remove	Q'ty	Remarks
14	6th wheel gear	1	
15	Circlip	1	
16	Washer	1	
17	Collar	1	
18	2nd wheel gear	1	
19	Oil seal	1	
20	Collar	1	
21	Circlip	1	
22	Bearing	1	
23	Drive axle	1	

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.

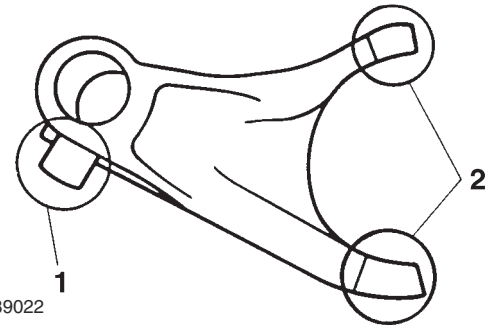


     b. Tighten the bolts until they contact the crankcase surface.
     c. Continue tightening the bolts until the main axle assembly comes free from the cylinder.

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

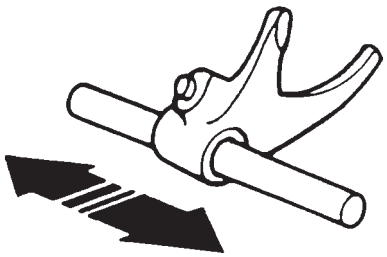
2. Check:
   - Shift fork guide bar
     Roll the shift fork guide bar on a flat surface.
     Bends → Replace.

EWA12840

⚠ WARNING

Do not attempt to straighten a bent shift fork guide bar.

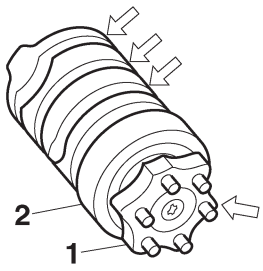
3. Check:
   - Shift fork movement
     (along the shift fork guide bar)
     Rough movement → Replace the shift forks and shift fork guide bar as a set.



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.

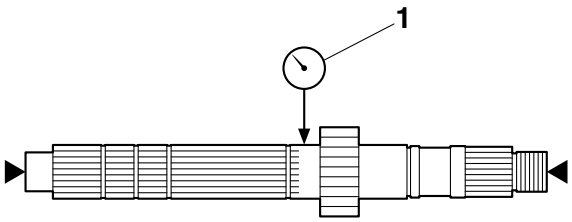


G089024

EAS30433
CHECKING THE TRANSMISSION

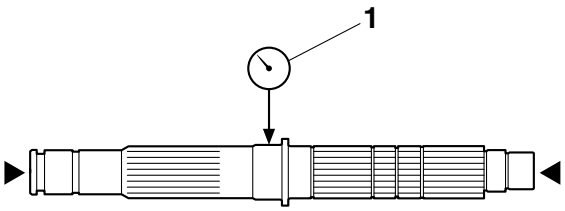
1. Measure:
   • Main axle runout
   (with a centering device and dial gauge "1")
   Out of specification → Replace the main axle.

	Main axle runout limit **0.08 mm (0.0032 in)**

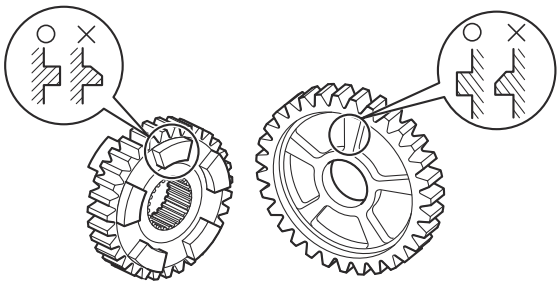


2. Measure:
   • Drive axle runout
   (with a centering device and dial gauge "1")
   Out of specification → Replace the drive axle.

	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

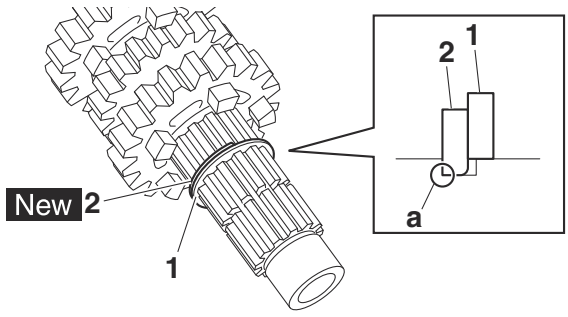
1. Lubricate the sliding parts of each gear with molybdenum disulfide oil.

	Recommended lubricant **Molybdenum disulfide oil**

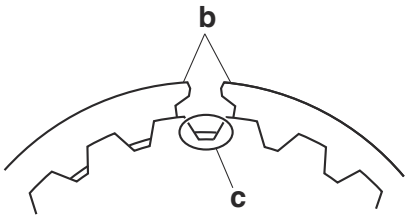
2. Install:
   • Toothed washer "1"
   • Circlip "2" New

TIP

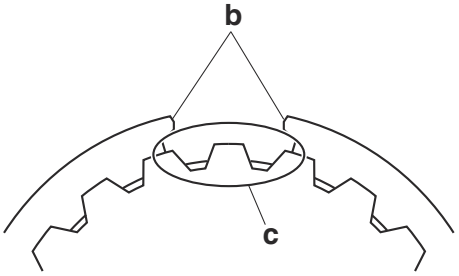
- Be sure the circlip sharp-edged corner "a" is positioned opposite side to the toothed washer and gear.
- Align the opening between the ends "b" of the circlip with a groove "c" in the axle.



A



B

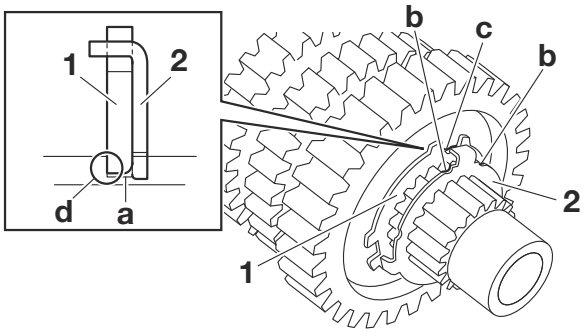


A. Main axle
B. Drive axle

3. 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 on the retainer with an axle spline and then install the toothed lock washer.
- Be sure to align the projection on the toothed lock washer that is between the alignment marks "b" with the alignment mark "c" on the retainer.
- Be sure the toothed lock washer retainer sharp-edged corner "d" is positioned opposite side to the toothed lock washer.



EAS30438

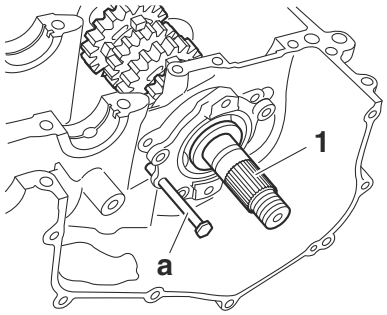
INSTALLING THE TRANSMISSION

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

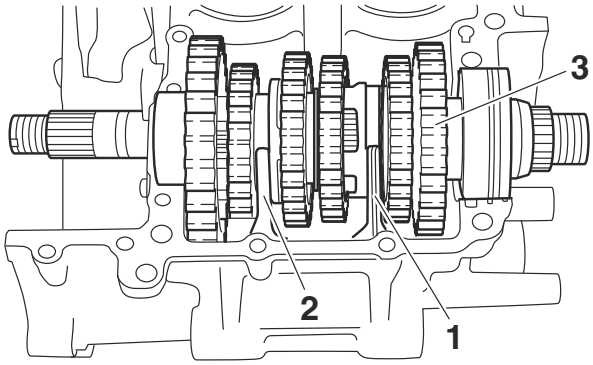
- The embossed marks on the shift forks should face towards the right side of the engine.
- Install shift fork "C" into the groove in the 3rd pinion gear on the main axle.

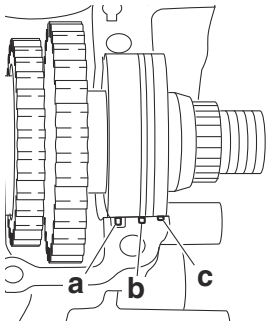
3. Install:
   - Shift fork "L" "1"
   - Shift fork "R" "2"
   - Shift fork guide bar
   - Shift drum retainer
   - Drive axle assembly "3"

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.





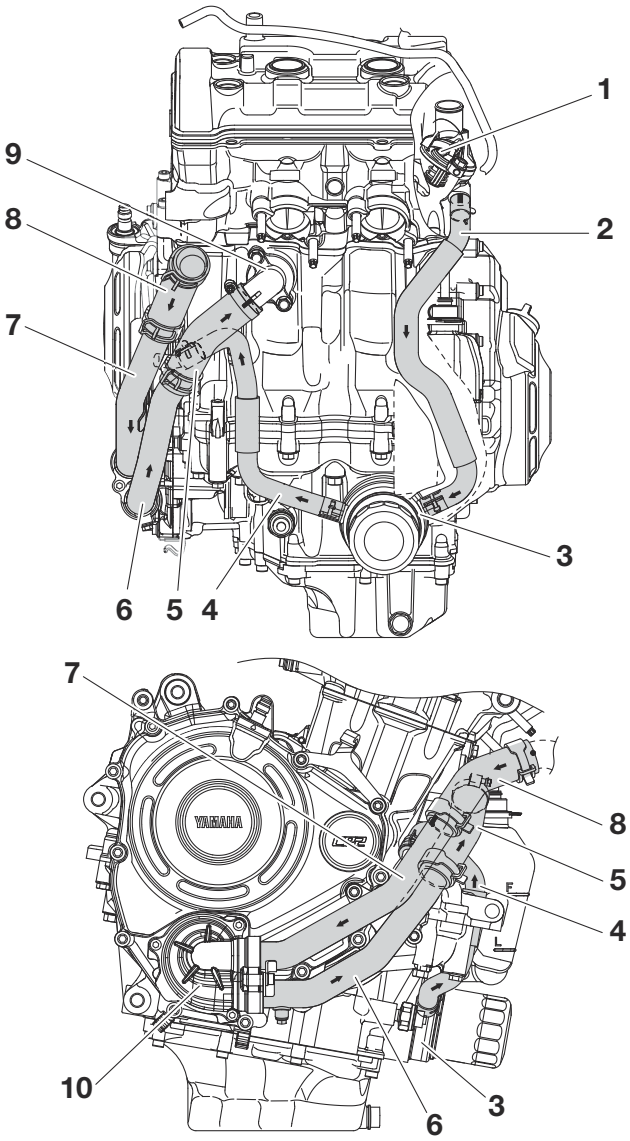
4. Check:
   - Transmission
     Rough movement → Repair.

TIP

Oil each gear, shaft, and bearing thoroughly.

COOLING SYSTEM

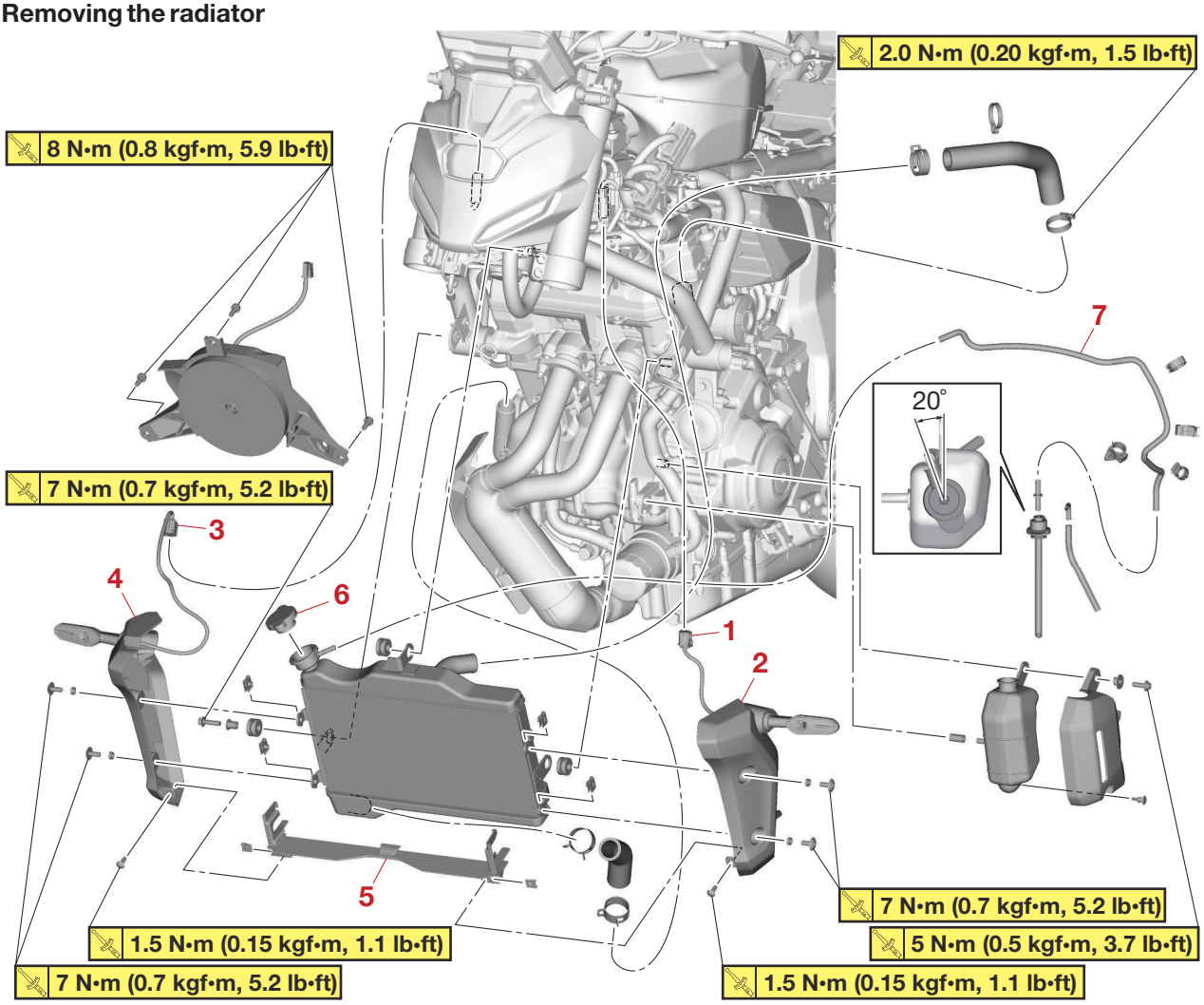
EAS20299
COOLING SYSTEM DIAGRAMS



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

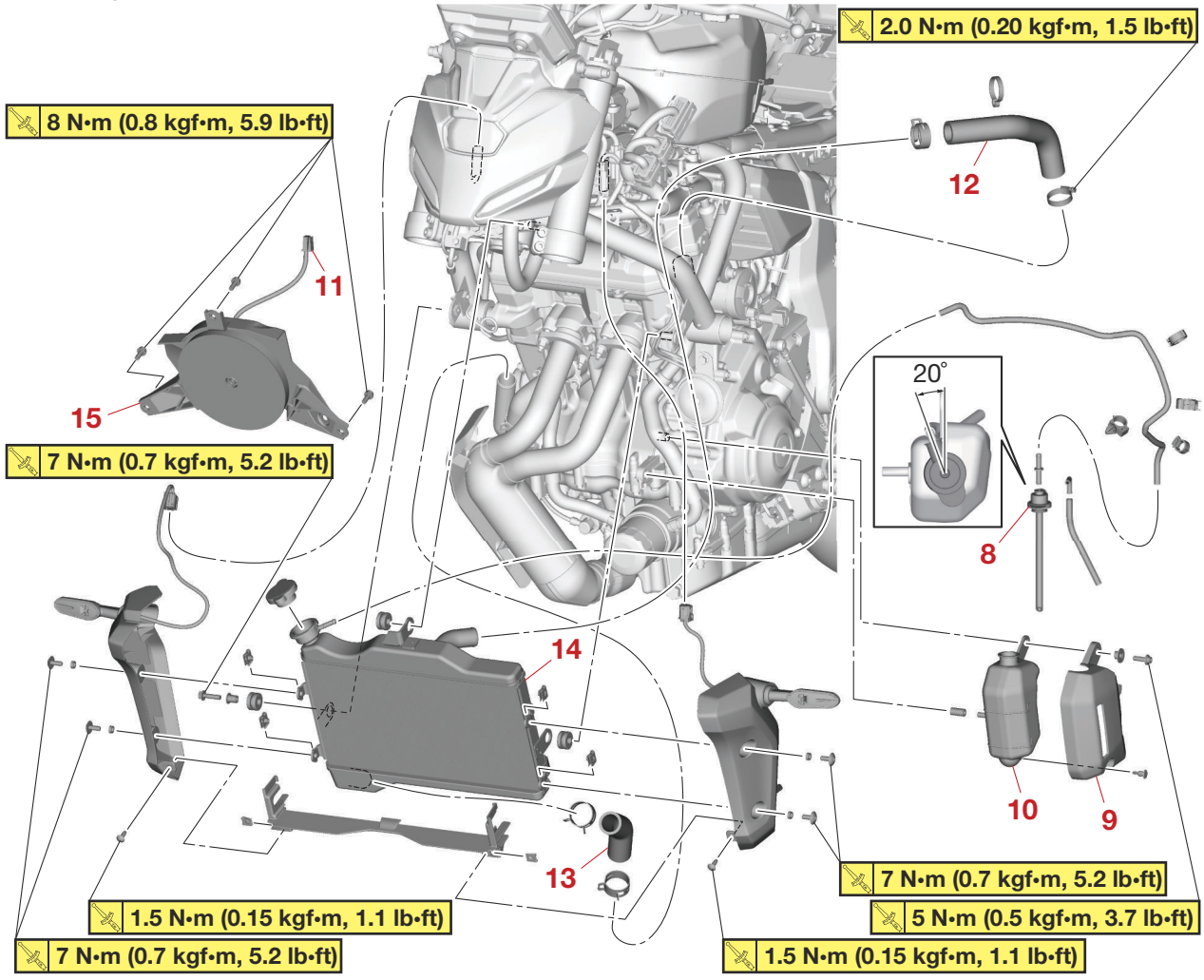
EAS20063
RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-23.
	Fuel tank cover assembly/Fuel tank top cover		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	ECU (Engine Control Unit)/ECU tray/Electrical components tray 1		Refer to "GENERAL CHASSIS (5)" on page 4-11.
1	Front turn signal/position light coupler (left)	1	Disconnect.
2	Radiator side cover (left)	1	
3	Front turn signal/position light coupler (right)	1	Disconnect.
4	Radiator side cover (right)	1	
5	Lower panel	1	
6	Radiator cap	1	
7	Coolant reservoir hose	1	

Removing the radiator

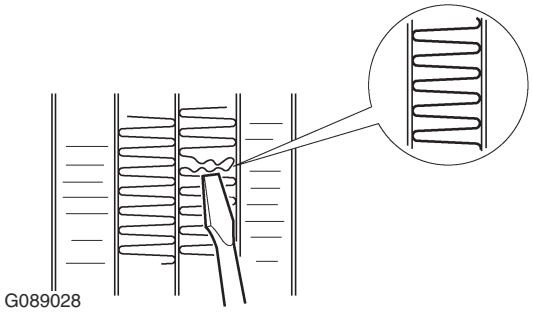


Order	Job/Parts to remove	Q'ty	Remarks
8	Coolant reservoir cap	1	
9	Coolant reservoir cover	1	
10	Coolant reservoir	1	
11	Radiator fan motor coupler	1	Disconnect.
12	Radiator inlet hose	1	
13	Radiator outlet hose	1	
14	Radiator	1	
15	Radiator fan	1	

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.

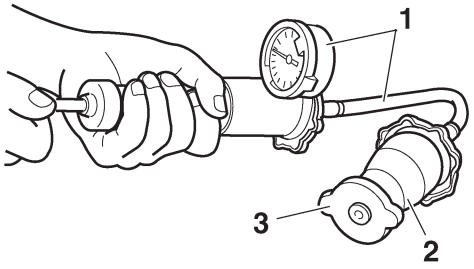

G089028

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



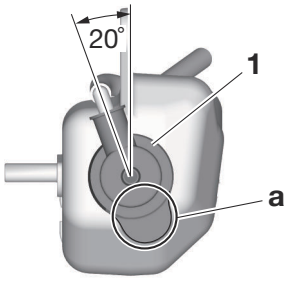
G089029

   b. Apply the specified pressure, and then make sure that there is no drop in pressure for 10 seconds. If it is not keep the pressure, replace it.
4. Check:
   - Radiator fan
     Damage → Replace.
     Malfunction → Check and repair.
     Refer to "COOLING SYSTEM" on page 8-29.

EAS30440
INSTALLING THE RADIATOR

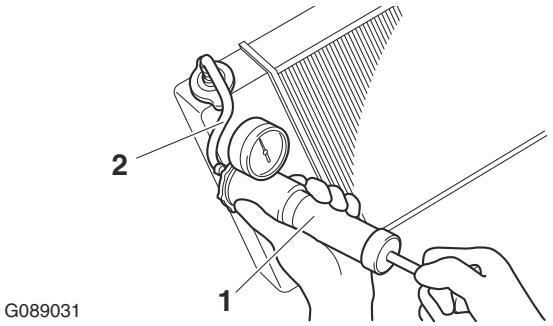
1. Install:
   - Coolant reservoir cap "1"

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 3-23.
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



b. Apply the specified pressure.

Cooling system leak test pressure
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

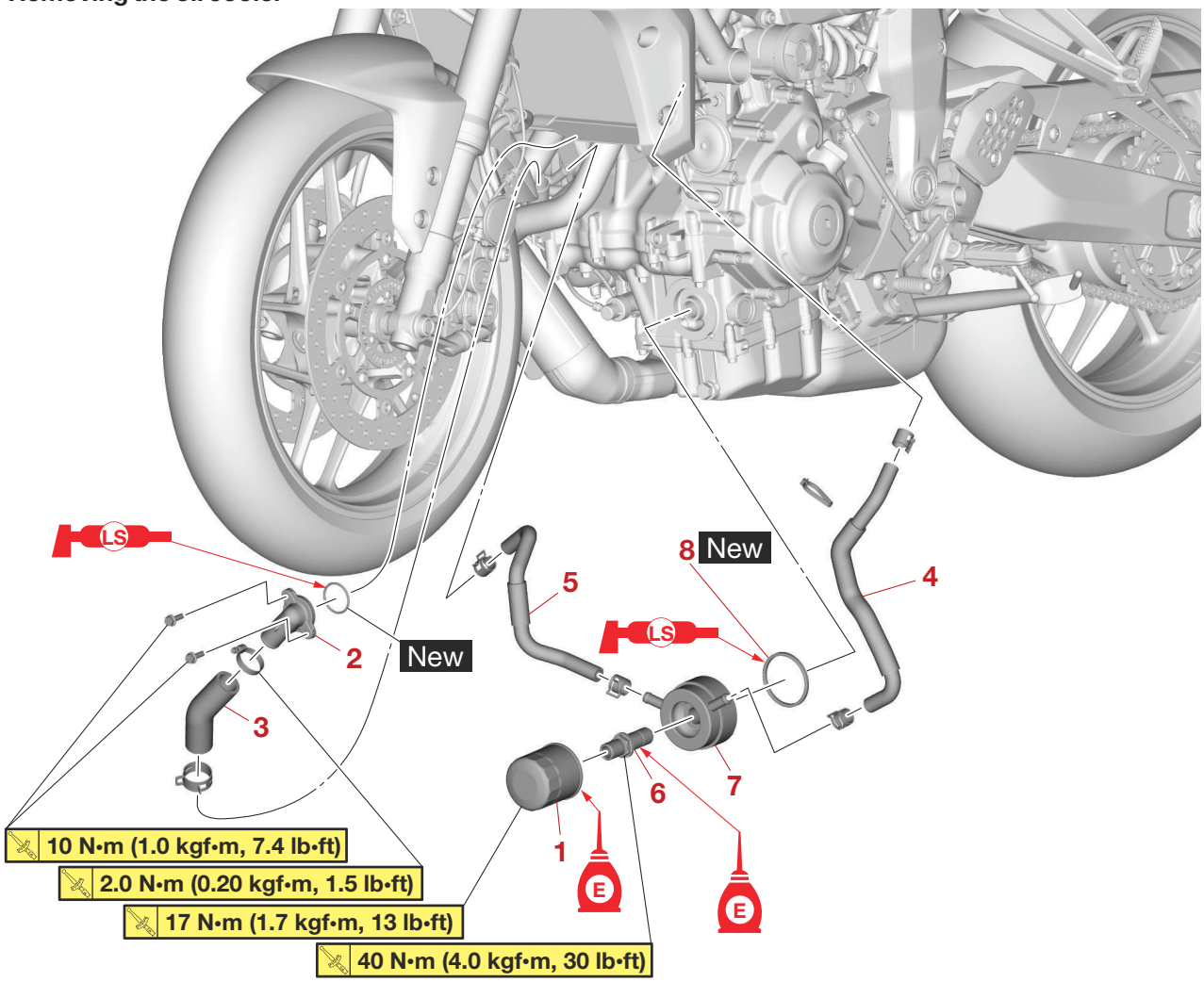
⚠ WARNING

When the radiator cap tester is removed, coolant will spout; therefore, cover it with a cloth beforehand.

EAS20064

OIL COOLER

Removing the oil cooler

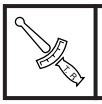


Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-23.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-21.
	Coolant reservoir		Refer to "RADIATOR" on page 6-3.
1	Oil filter cartridge	1	
2	Water jacket joint	1	
3	Water jacket joint inlet hose	1	
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	

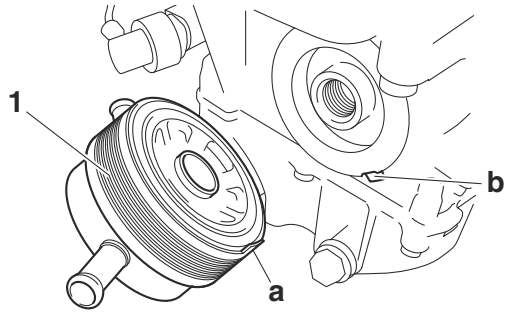
EAS30441
CHECKING THE OIL COOLER
1. Check:
   • Oil cooler
   Cracks/damage → Replace.
2. Check:
   • Oil cooler inlet hose
   • Oil cooler outlet hose
   • Water pump outlet hose
   Cracks/damage → Replace.

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)**

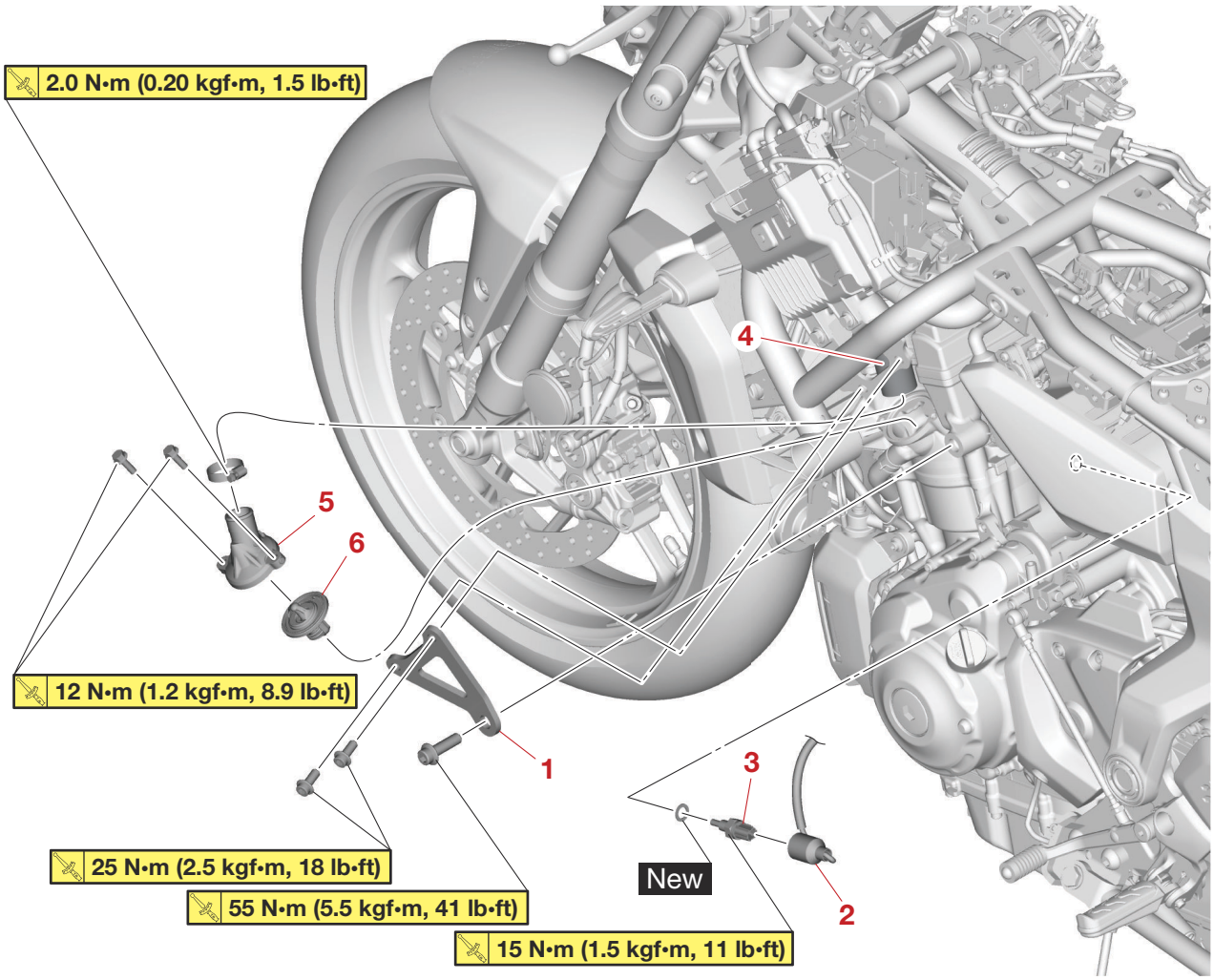
TIP
- Before installing the oil cooler, apply engine oil lightly to the oil filter cartridge union bolt.
- Align the projection "a" on the oil cooler with the slot "b" in the crankcase.



3. Fill:
   • Cooling system
   (with the specified amount of the recommended coolant)
   Refer to "CHANGING THE COOLANT" on page 3-23.
   • 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 6-5.
5. Measure:
   • Radiator cap opening pressure
   Below the specified pressure → Replace the radiator cap.
   Refer to "CHECKING THE RADIATOR" on page 6-5.

EAS20065
THERMOSTAT

Removing the thermostat



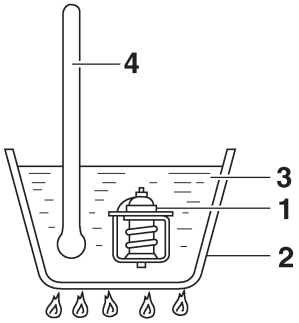
Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-23.
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank side cover assembly/Fuel tank top cover		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Canister		For California only Refer to "FUEL TANK" on page 7-1.
1	Engine bracket (left)	1	
2	Coolant temperature sensor coupler	1	Disconnect.
3	Coolant temperature sensor	1	
4	Radiator inlet hose	1	Disconnect.
5	Thermostat cover	1	
6	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

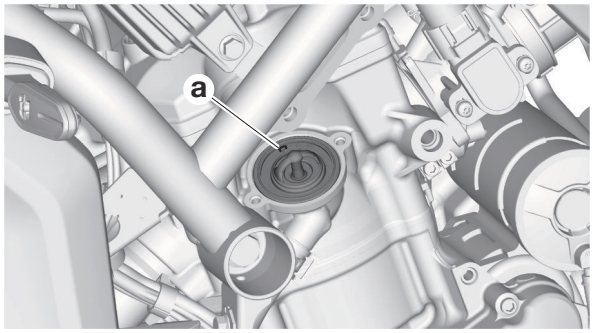
TIP
If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

2. Check:
   - Thermostat cover
     Cracks/damage → Replace.

EAS30939
INSTALLING THE THERMOSTAT

1. Install:
   - Thermostat

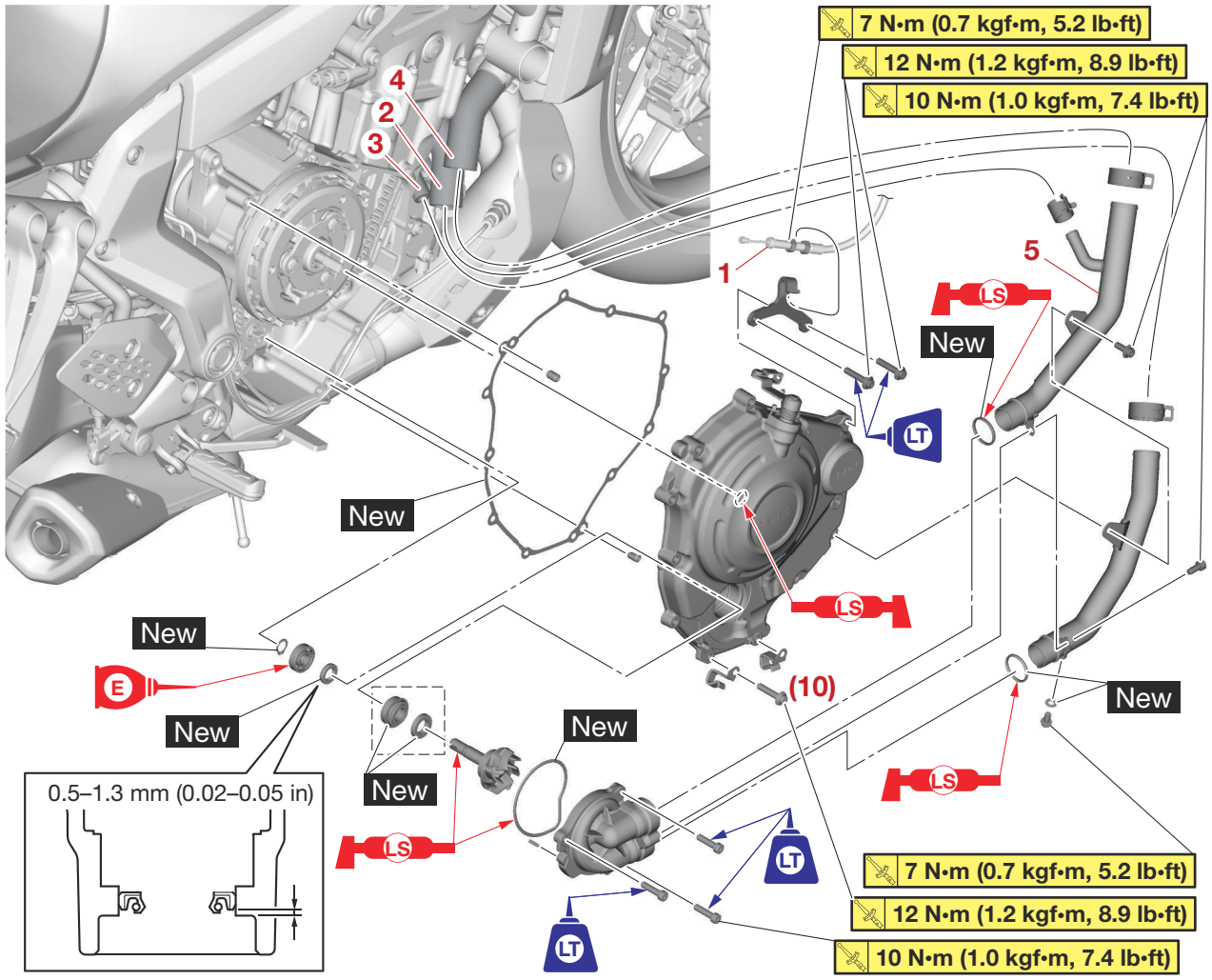
TIP
Install the thermostat with its breather valve "a" facing inward.



2. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT" on page 3-23.
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 6-5.

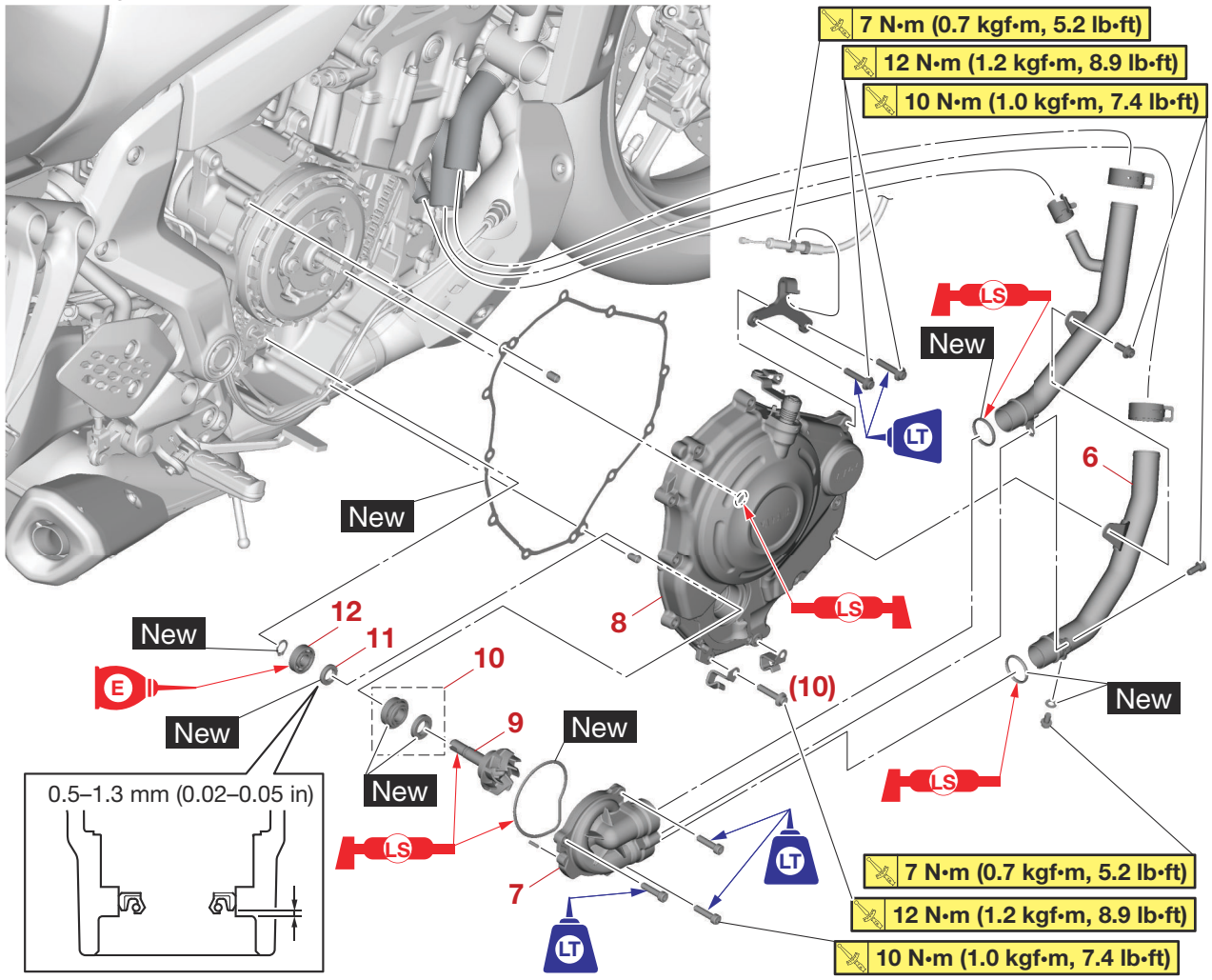
EAS20066
WATER PUMP

Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-23.
	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

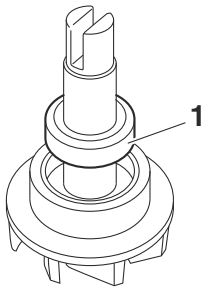


Order	Job/Parts to remove	Q'ty	Remarks
6	Water pump outlet pipe	1	
7	Water pump housing	1	
8	Clutch cover	1	
9	Impeller shaft	1	
10	Water pump seal assembly	1	
11	Oil seal	1	
12	Bearing	1	

EAS30446
DISASSEMBLING THE WATER PUMP

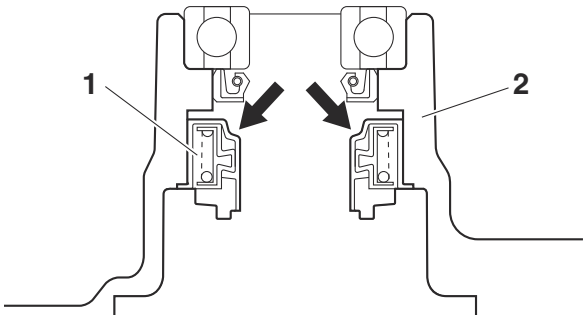
1. Remove:
   • Mechanical seal (impeller side) “1”
   (from the impeller, with a thin, flat-head screwdriver)

TIP
Do not scratch the impeller shaft.



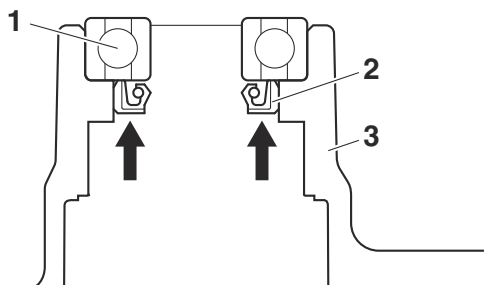
2. Remove:
   • Mechanical seal (housing side) “1”

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

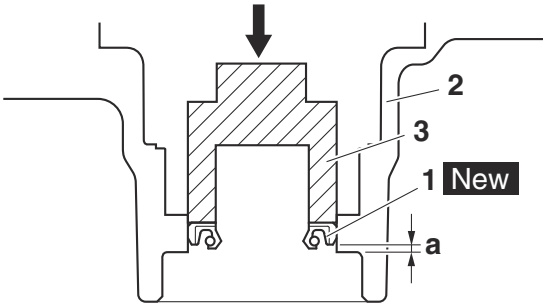
1. Check:
   • Water pump housing
   • Clutch cover
   • Impeller shaft
   Cracks/damage/wear → Replace.
2. Check:
   • Bearing
   Rough movement → Replace.
3. Check:
   • Water pump outlet pipe
   • Water pump inlet pipe
   Cracks/damage/wear → Replace.

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)

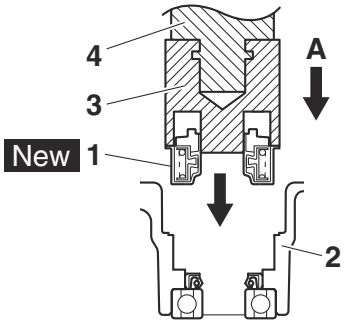


2. Install:
   • Mechanical seal (housing side) “1” New
   (into the clutch cover “2”)

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.

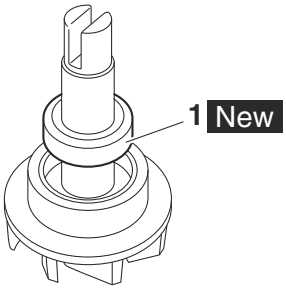
Mechanical seal installer (ø33)
90890-04132
Water pump seal installer (ø33)
YM-33221-A
Middle driven shaft bearing driver
90890-04058
Middle drive bearing installer 40 & 50 mm
YM-04058



3. Mechanical seal installer
4. Middle driven shaft bearing driver
A. Push down

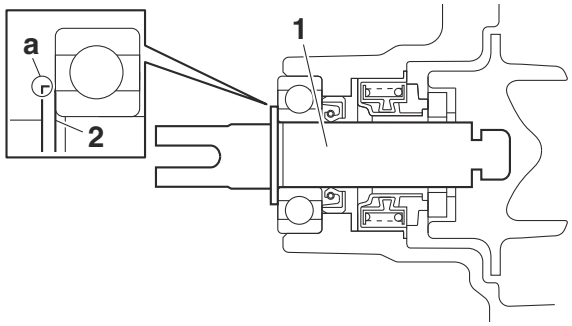
3. Install:
• Mechanical seal (impeller side) "1" New

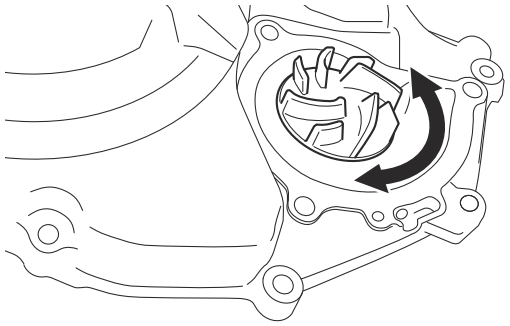
TIP
Before installing the mechanical seal (impeller side), apply tap water or coolant onto its outer surface.



4. 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.



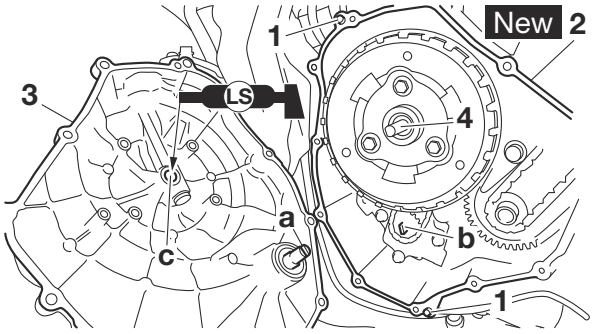


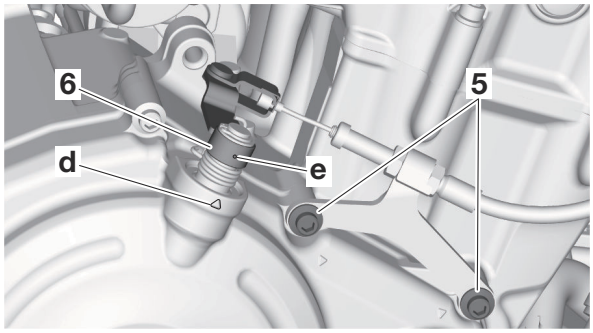
EAS31117
INSTALLING THE CLUTCH COVER

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".





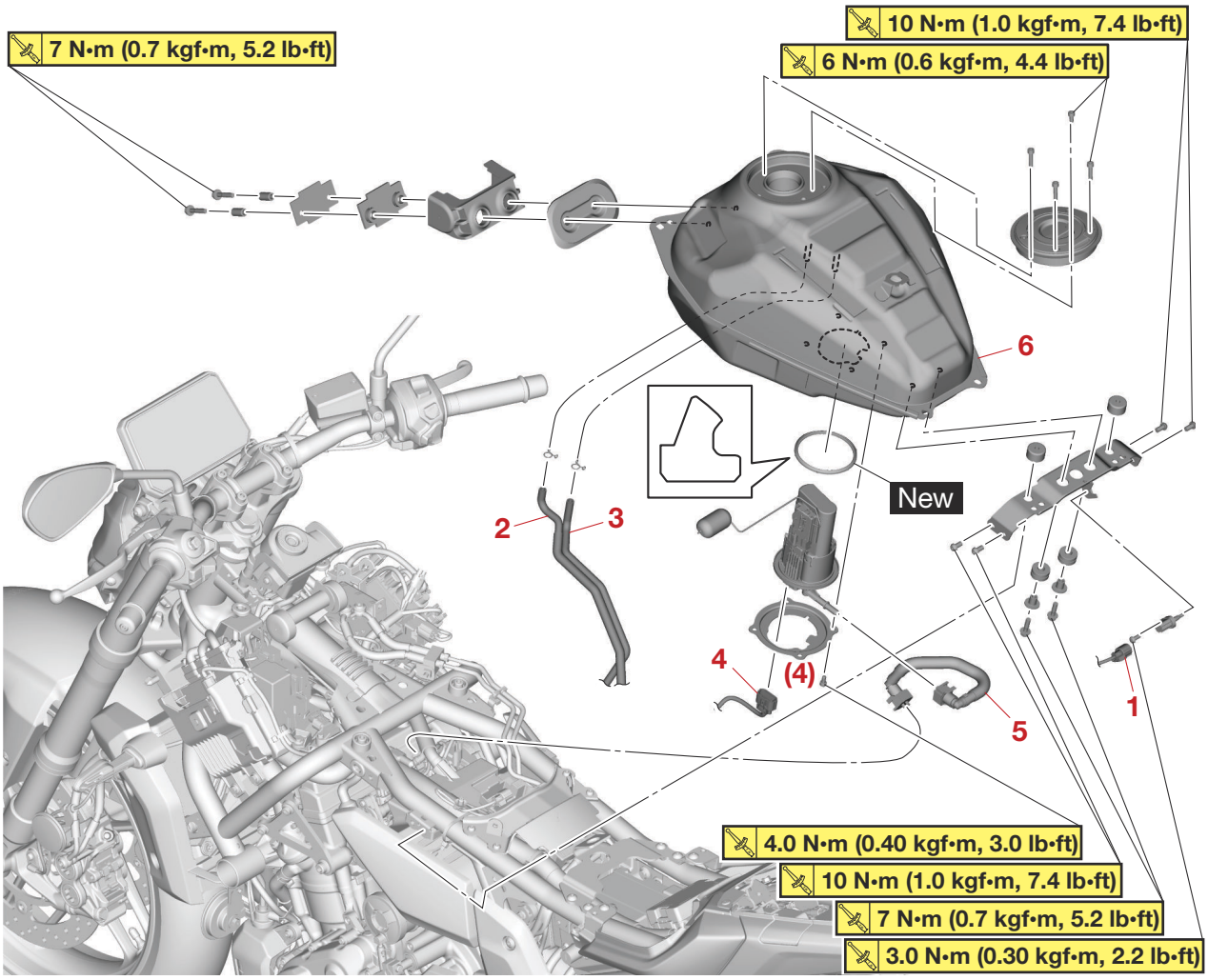
2. Fill:
   - Cooling system
     (with the specified amount of the recommended coolant)
     Refer to "CHANGING THE COOLANT" on page 3-23.
3. Check:
   - Cooling system
     Leaks → Repair or replace the faulty part.
4. Measure:
   - Radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to "CHECKING THE RADIATOR" on page 6-5.
5. Adjust:
   - Clutch lever free play
     Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-12.

FUEL SYSTEM

EAS20067

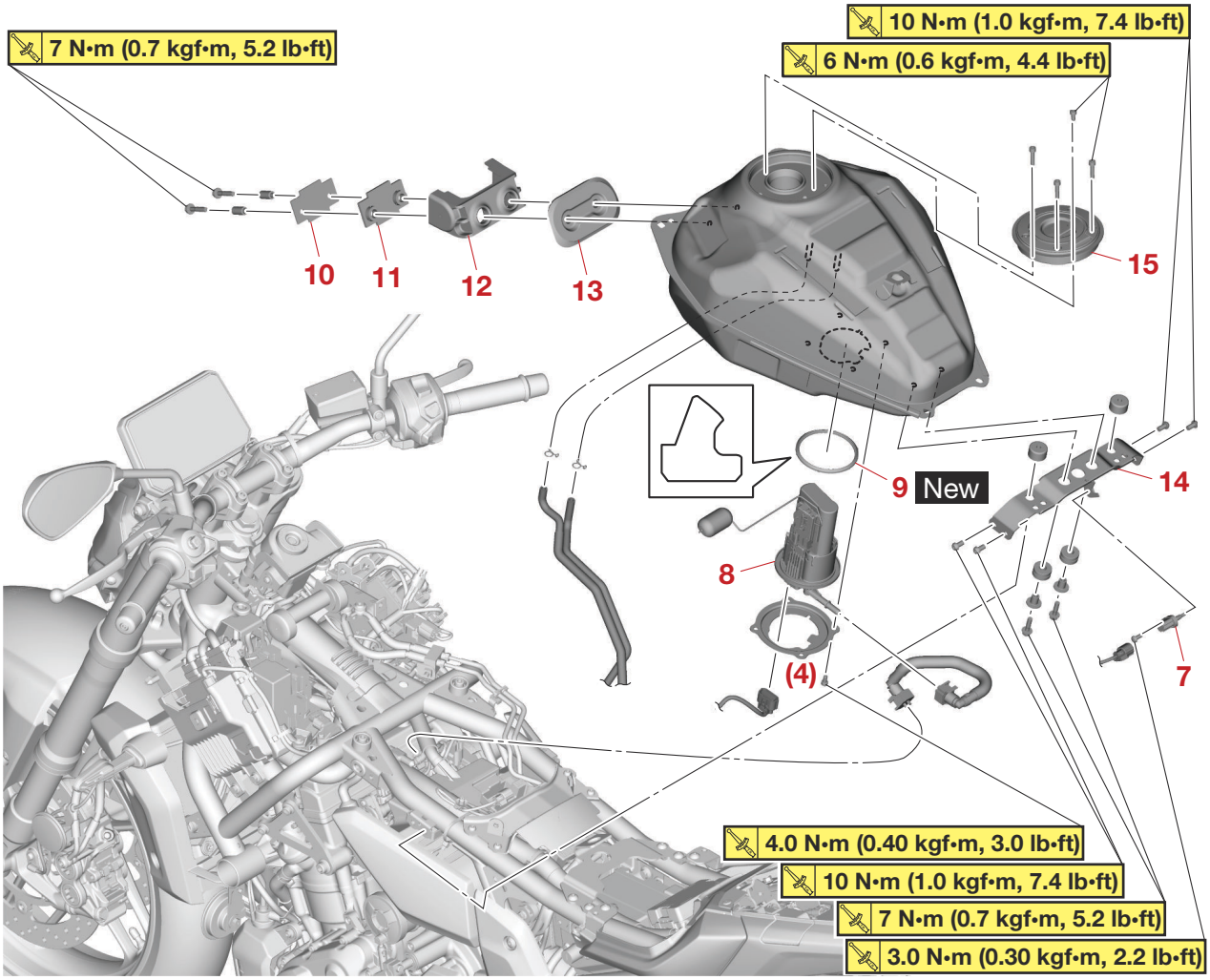
FUEL TANK

Removing the fuel tank and fuel pump



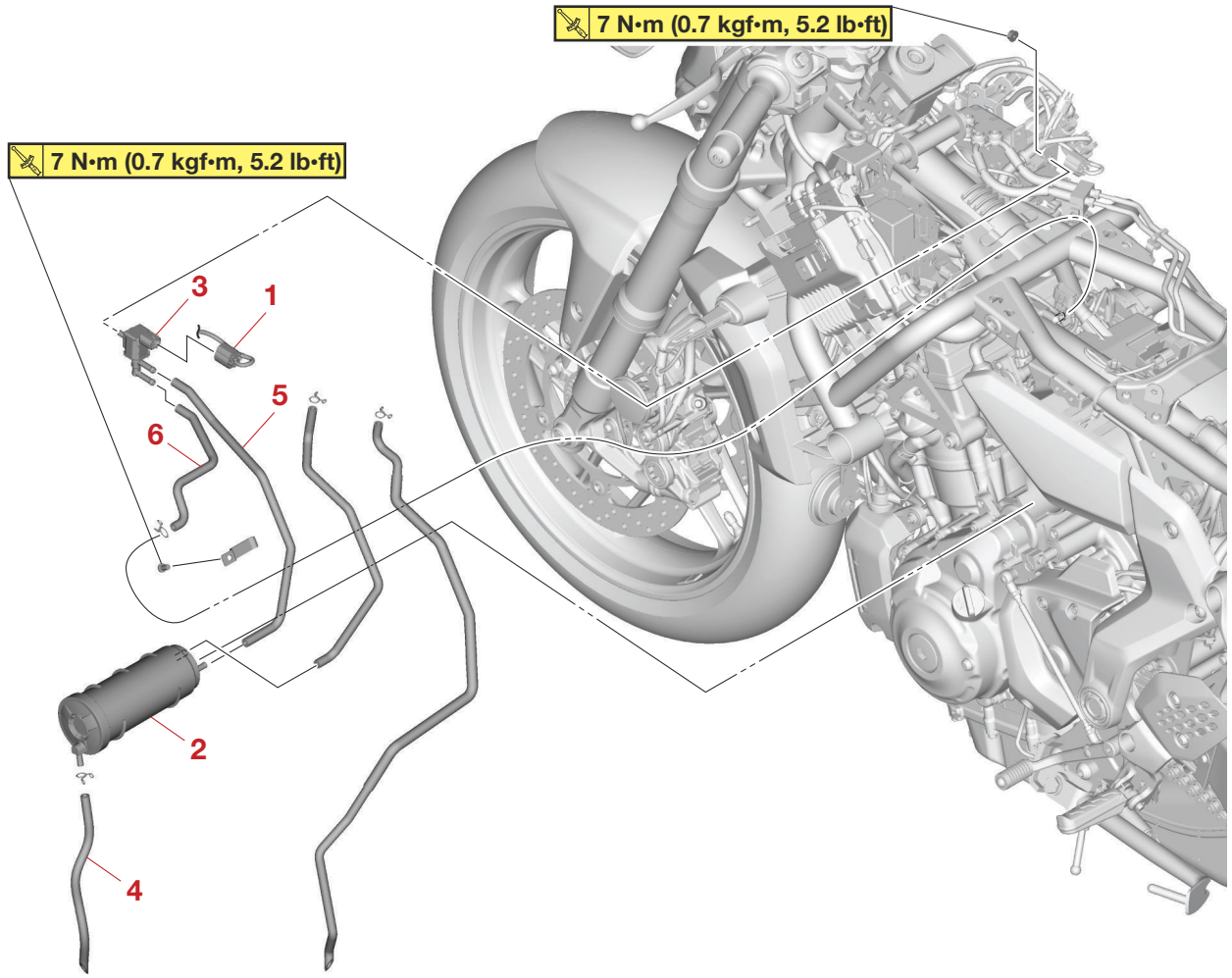
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank side cover assembly/Fuel tank top cover		Refer to "GENERAL CHASSIS (3)" on page 4-7.
1	Intake air temperature sensor coupler	1	Disconnect.
2	Fuel tank overflow hose	1	Disconnect.
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



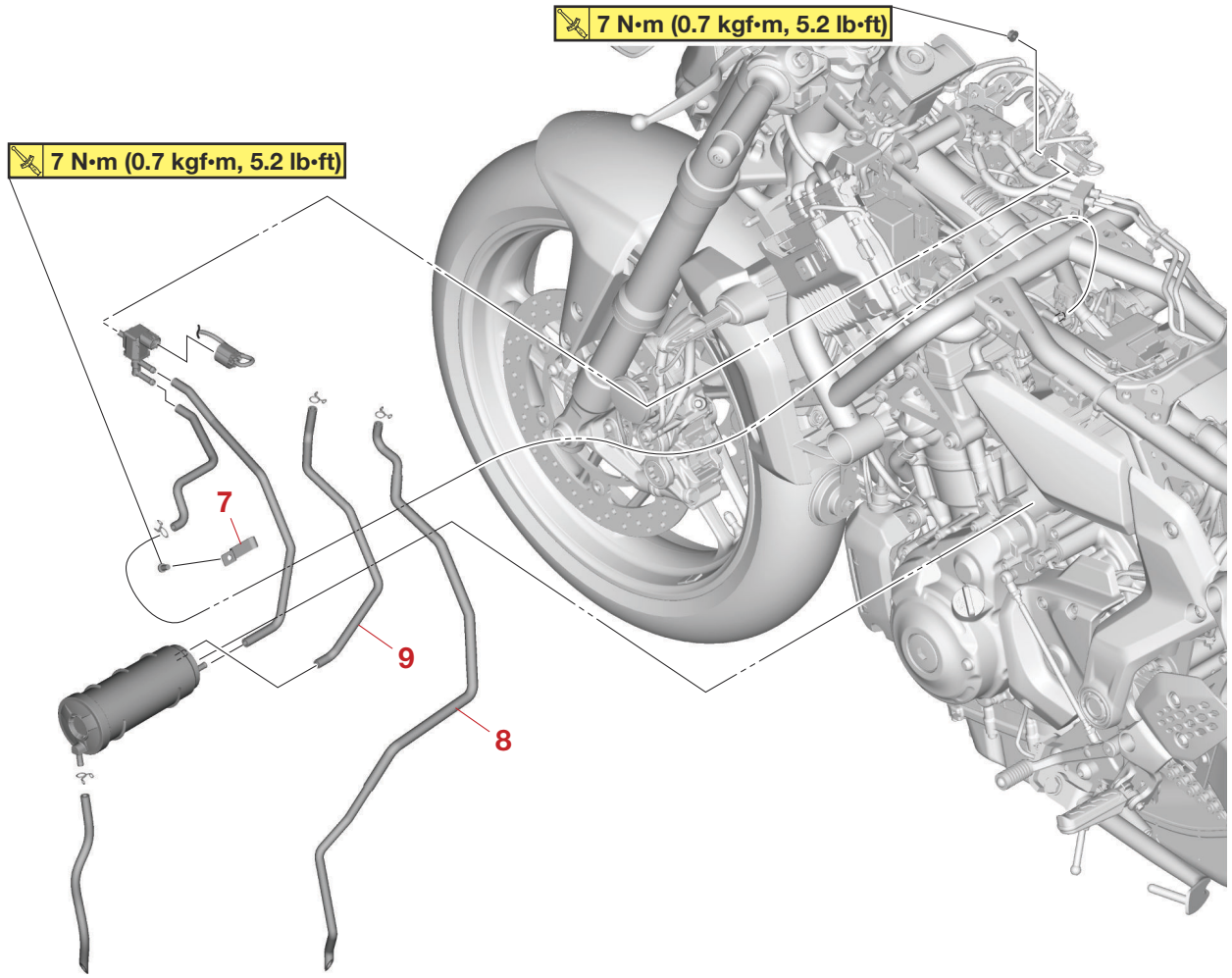
Order	Job/Parts to remove	Q'ty	Remarks
7	Intake air temperature sensor	1	
8	Fuel pump	1	
9	Fuel pump gasket	1	
10	Special washer	1	
11	Fuel tank bracket damper	1	
12	Front fuel tank bracket	1	
13	Fuel tank damper	1	
14	Rear fuel tank bracket	1	
15	Fuel tank cap	1	

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 side cover assembly/Fuel tank top cover		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	GCU (Generator Control Unit)		Refer to "GENERAL CHASSIS (5)" on page 4-11.
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	

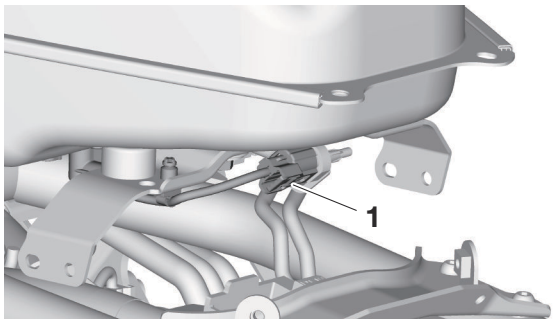
Removing the canister (for California only)



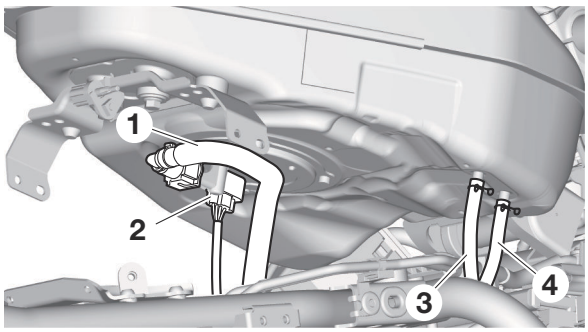
Order	Job/Parts to remove	Q'ty	Remarks
7	Fuel tank breather hose and fuel tank overflow hose clamp	1	
8	Fuel tank overflow hose	1	
9	Fuel tank breather hose (fuel tank to canister)	1	

EAS30450
REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
   - Passenger seat
   - Rider seat
   - Fuel tank side cover assembly
     Refer to "GENERAL CHASSIS (3)" on page 4-7.
   - Fuel tank top cover
     Refer to "GENERAL CHASSIS (3)" on page 4-7.
   - Bracket bolt
3. Disconnect:
   - Intake air temperature sensor coupler "1"



   - Fuel hose (fuel tank side) "1"
   - Fuel pump coupler "2"
   - Fuel tank breather hose "3"
   - Fuel tank overflow hose "4"



EWA17320
WARNING

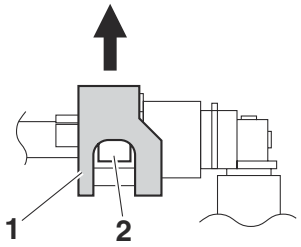
Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

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

4. 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.

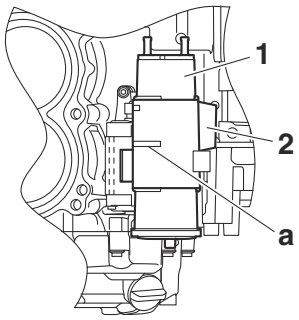
EAS30455
CHECKING THE FUEL PUMP OPERATION

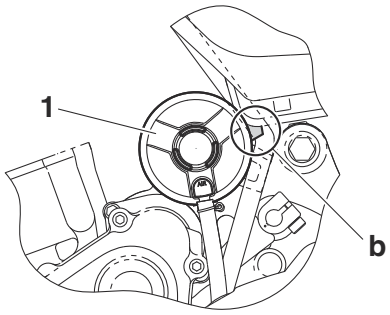
1. Check:
   - Fuel pump operation
     Refer to "CHECKING THE FUEL PRESSURE" on page 7-16.

EAS33542
CHECKING THE PURGE CUT VALVE SOLENOID (for California only)
1. Check:
   - Canister purge hose
     Loose connection → Connect properly.
     Cracks/damage/wear → Replace.
2. Check:
   - Purge cut valve solenoid resistance
     Refer to "CHECKING THE PURGE CUT VALVE SOLENOID (for California only)" on page 8-56.

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.

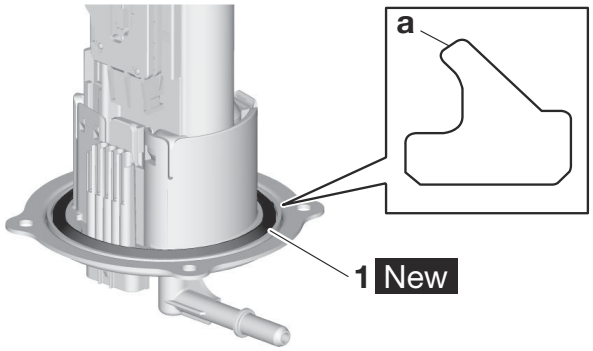


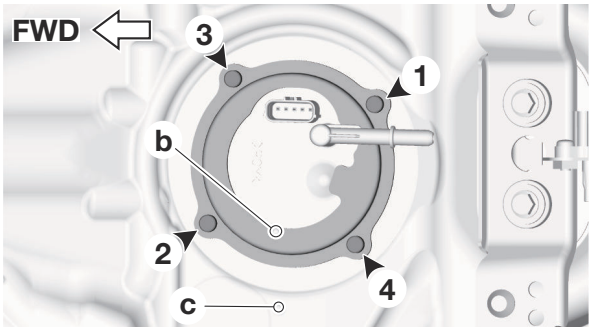


EAS30456
INSTALLING THE FUEL PUMP
1. Install:
   - Fuel pump gasket "1" New
   - Fuel pump
   - Fuel pump bracket

	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.

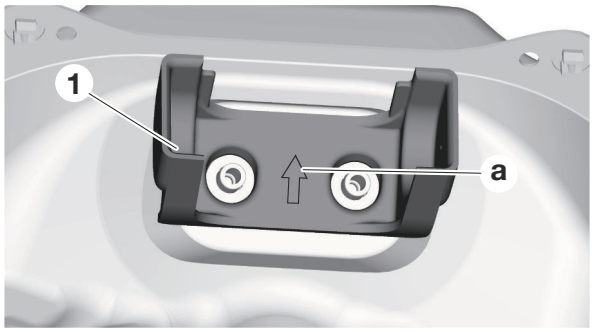


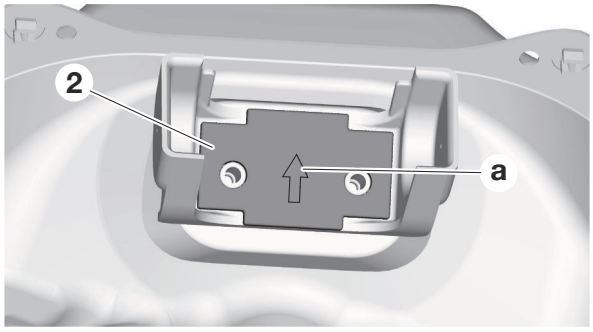


EAS31081
INSTALLING THE FUEL TANK BRACKET
1. Install:
   - Collar
   - Fuel tank damper
   - Front fuel tank bracket "1"
   - Fuel tank bracket damper
   - Special washer "2"

	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 special washer and front fuel tank bracket facing up.



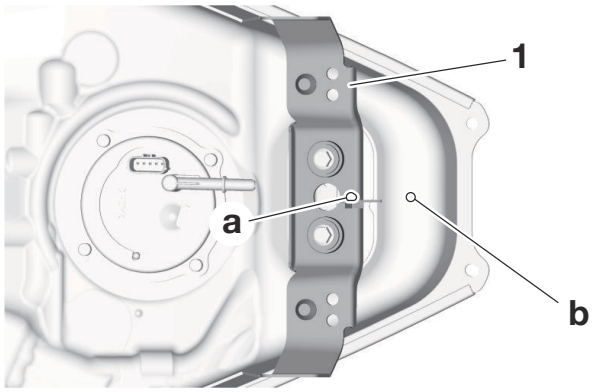


2. Install:
   - Grommet
   - Collar
   - Rear fuel tank bracket "1"

	Fuel tank bolt (rear side) **7 N·m (0.7 kgf·m, 5.2 lb·ft)**

TIP

Make sure that the hole "a" on the rear fuel tank bracket points toward the punch mark "b" on the fuel tank.



EAS30457

INSTALLING THE FUEL TANK

1. Install:
   - Fuel hose

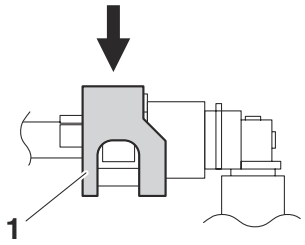
ECA18420

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.



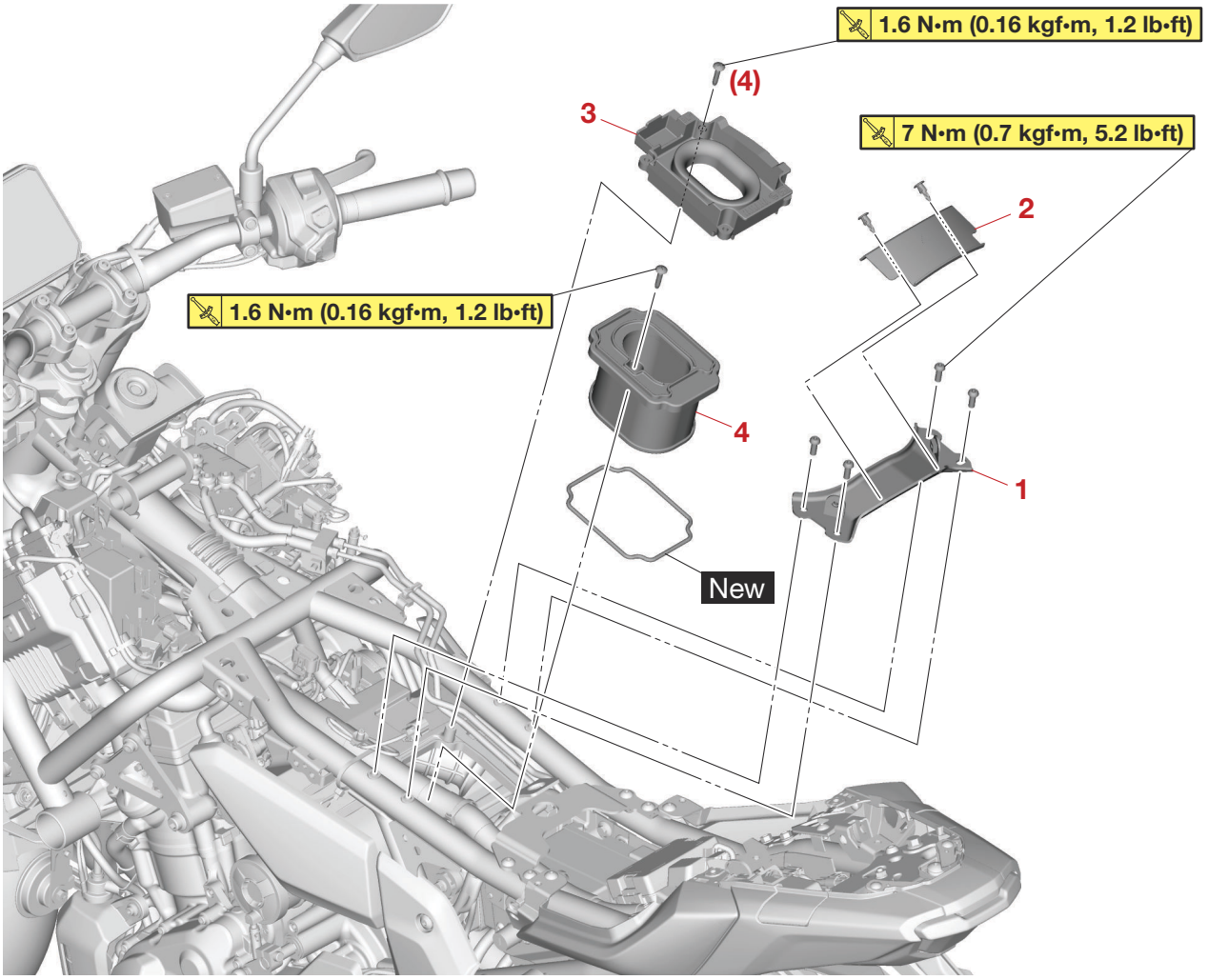
G089039

2. Connect:
   - Fuel pump coupler
   - Fuel tank breather hose
   - Fuel tank overflow hose
   - Intake air temperature sensor coupler
3. Tighten:
   - Rear fuel tank bracket bolt

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

EAS20198
AIR FILTER

Removing the air filter element

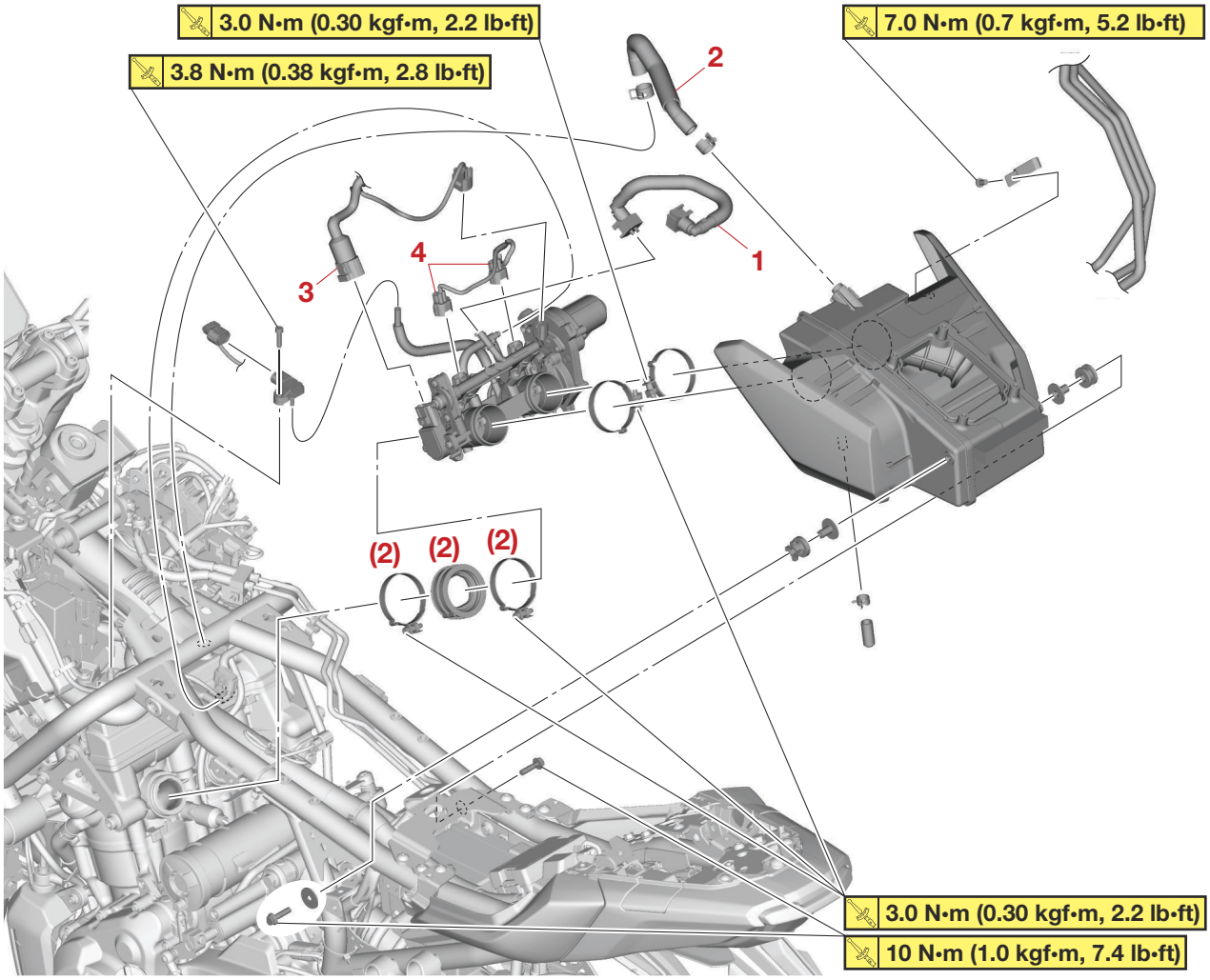


Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank side cover assembly/Fuel tank top cover		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Frame cross member	1	
2	Air duct cover	1	
3	Air duct	1	
4	Air filter element	1	

EAS20070

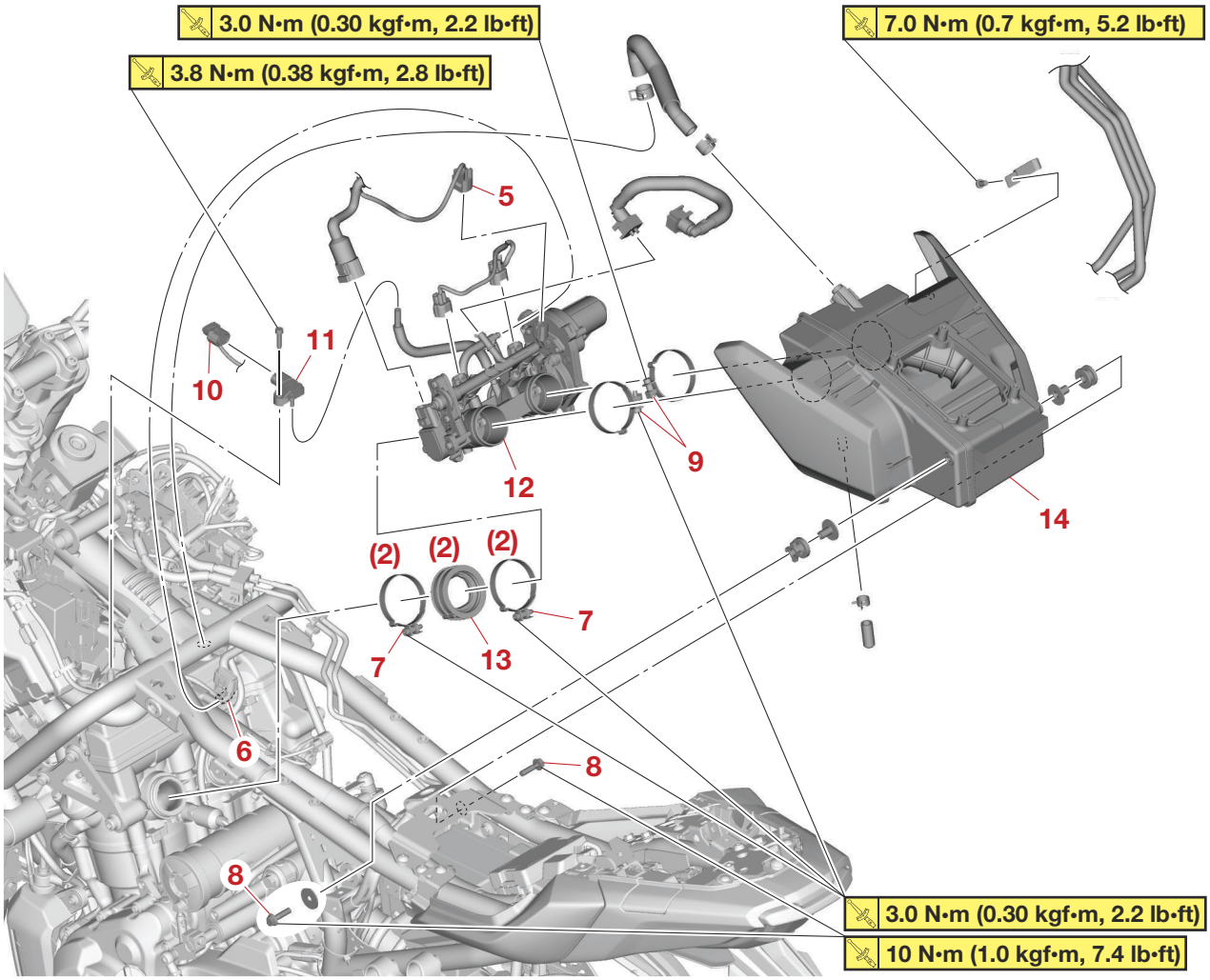
THROTTLE BODIES

Removing the air filter case and throttle bodies



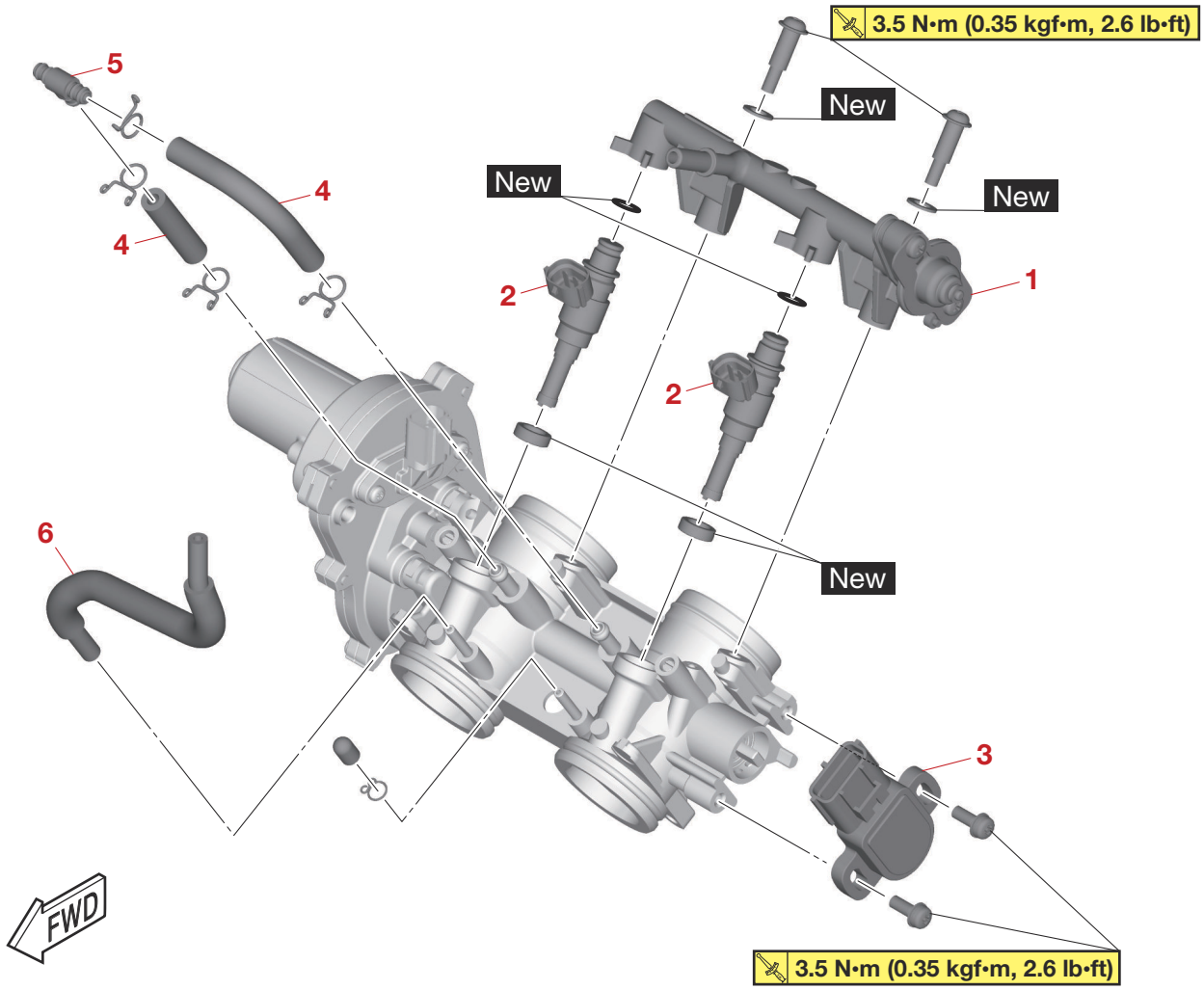
Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat/Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank side cover assembly/Fuel tank top cover		Refer to "GENERAL CHASSIS (3)" on page 4-7.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Canister		For California only Refer to "FUEL TANK" on page 7-1.
	Frame cross member		Refer to "AIR FILTER" on page 7-8.
	Pivot shaft protector (left/right)		Refer to "SWINGARM" on page 4-87.
1	Fuel hose	1	
2	Cylinder head breather hose	1	
3	Throttle servo motor coupler	1	Disconnect.
4	Injector coupler	2	Disconnect.

Removing the air filter case and throttle bodies



Order	Job/Parts to remove	Q'ty	Remarks
5	Throttle position sensor coupler	1	Disconnect.
6	Canister purge hose	1	For California only Disconnect.
7	Throttle body joint clamp screw	4	Loosen.
8	Air filter case bolt	2	
9	Air filter case joint clamp screw	2	Loosen.
10	Intake air pressure sensor coupler	1	Disconnect.
11	Intake air pressure sensor	1	
12	Throttle body	1	
13	Throttle body joint	2	
14	Air filter case	1	

Removing the fuel injectors



Order	Job/Parts to remove	Q'ty	Remarks
1	Fuel rail	1	
2	Injector	2	
3	Throttle position sensor	1	
4	Canister purge hose	2	For California only
5	Hose joint	1	For California only
6	Intake air pressure sensor hose	1	

EAS30475
CHECKING THE INJECTORS (BEFORE REMOVING)

1. Check:
   • Injector
   a. Remove the protective cap, and then connect the YDT to the coupler.
   Refer to "YDT" on page 9-2.

Yamaha diagnostic tool USB (US)
90890-03275
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.

   b. Start the YDT and display the diagnosis of function.
   c. Select the "FI".
   d. Execute the diagnostic mode (Code 36 and 37).
   Refer to "DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE" on page 9-51.

EAS31158
REMOVING THE FUEL HOSE (FUEL RAIL SIDE)

1. Remove:
   • Fuel tank
   Refer to "REMOVING THE FUEL TANK" on page 7-5.
2. Remove:
   • Fuel hose (fuel rail side)

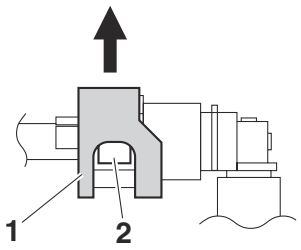
EWA17320
WARNING

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

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
   a. Remove the fuel rail bolts.

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 8-56.

EAS30769
CHECKING AND CLEANING THE THROTTLE BODIES

TIP

Clean the throttle bodies only if they cannot be synchronized using the bypass air screws. Before cleaning the throttle bodies, check the following items:

- Valve clearance
- Spark plug
- Air filter element
- Throttle body joint
- Fuel hose
- Exhaust system
- Cylinder head breather hose
- Intake air pressure sensor hose
- Canister purge hose (for California only)

EWA17340

⚠ WARNING

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

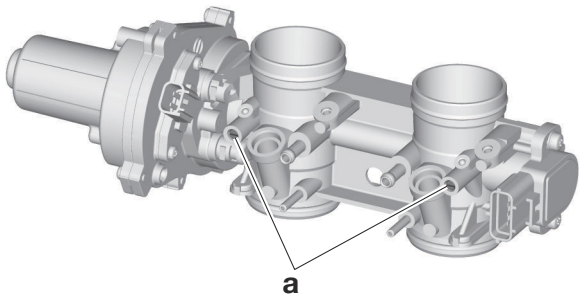
1. Check:
   - Throttle bodies
     Cracks/damage → Replace the throttle bodies as a set.
2. Clean:
   - Throttle bodies

ECA21540

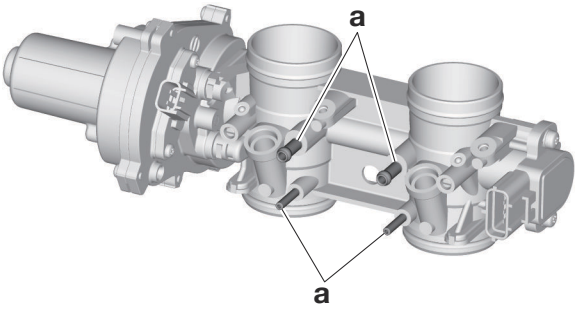
NOTICE

- **Observe the following precautions; otherwise, the throttle bodies may not operate properly.**
- **Do not subject the throttle bodies to excessive force.**
- **Clean the throttle bodies in the recommended cleaning solvent.**
- **Do not use any caustic carburetor cleaning solution.**
- **Do not apply cleaning solvent directly to any plastic parts, sensors, or seals.**
- **Be careful not to remove the white paint mark that identifies the standard throttle body.**
- **Do not turn the bypass air screws "a"; otherwise, the throttle body synchronization will be affected.**

	Recommended cleaning solvent **Yamaha Oil & Brake Cleaner**



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. Hold the throttle valves in the open position.

EWA15940

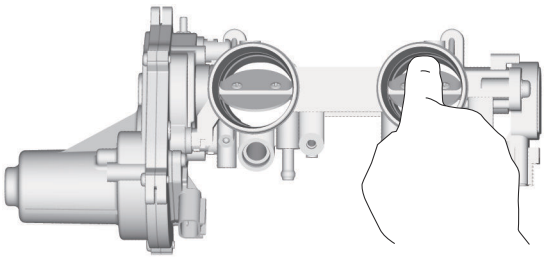
⚠ WARNING

When cleaning the throttle bodies, be careful not to injure yourself on the throttle valves or other components of the throttle bodies.

ECA20380

NOTICE

- **Do not open the throttle valves by supplying electrical power to the throttle bodies.**
- **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 the recommended cleaning solvent to the throttle valves and the inside of the throttle bodies to remove any carbon deposits.

TIP
- Do not allow any cleaning solvent to enter the opening for the injectors.
- Do not apply any cleaning solvent to the portions of the throttle valve shafts between the throttle bodies.

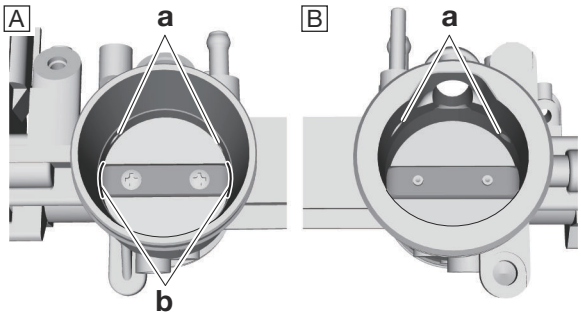
e. Remove the carbon deposits from the inside of each throttle body in a downward direction, from the air filter case side of the throttle body to the engine side.

ECA17590

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 the recommended cleaning 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.



A. Air filter case side
B. Throttle body joint side

3. Install the throttle bodies.
4. Reset:
   - ISC (idle speed control) learning values
   a. Remove the protective cap, and then connect the YDT to the coupler.
   Refer to "YDT" on page 9-2.

Yamaha diagnostic tool USB (US)
90890-03275
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.

   b. Start the YDT and display the diagnosis of function.
   c. Select the "FI".
   d. Execute the diagnostic mode (Code 67).
   Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-48.
5. 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
   a. Remove the protective cap, and then connect the YDT to the coupler.
   Refer to "YDT" on page 9-2.

Yamaha diagnostic tool USB (US)
90890-03275
Yamaha diagnostic tool (A/I)
90890-03273

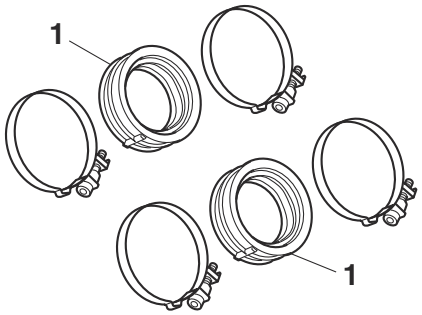
TIP
- Yamaha diagnostic tool (A/I) (90890-03273) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

   b. Start the YDT and display the diagnosis of function.
   c. Select the "FI".
   d. Execute the diagnostic mode (Code 67).
   Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-48.
4. Reset:
   - A/F control learning value
   Execute the diagnostic mode (Code 87).

Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-48.
5. Adjust:
   • Throttle bodies synchronizing
   Refer to "SYNCHRONIZING THE THROTTLE BODIES" on page 3-8.
6. Place the vehicle on a maintenance stand so that the rear wheel is elevated.
7. Check:
   • Engine idling speed
   Start the engine, warm it up, and then measure the engine idling speed.

	Engine idling speed **1250–1450 r/min**

EAS30792
CHECKING THE THROTTLE BODY JOINTS
1. Check:
   • Throttle body joint "1"
   Cracks/damage → Replace.



EAS31124
INSTALLING THE FUEL INJECTORS
ECA19400
NOTICE
- **Always use new O-rings.**
- **When installing the injectors, do not allow any foreign material to enter or adhere to the injectors, fuel rails, or O-rings.**
- **Be careful not to twist or pinch the O-rings when installing the injectors.**
- **When installing the injector, install it at the same position as the removed cylinder.**
- **If an injector is subject to strong shocks or excessive force, replace it.**

1. Install new seals onto the end of each injector.
2. Install the fuel injectors to the fuel rail.
3. Install the fuel injector assemblies to the throttle bodies.

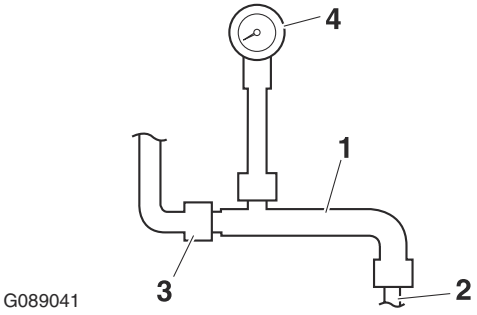
	Fuel rail bolt **3.5 N·m (0.35 kgf·m, 2.6 lb·ft)**

4. Check the injector pressure after the fuel injectors are installed to the throttle bodies.
   Refer to "CHECKING THE INJECTOR PRESSURE" on page 7-15.

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.
   Out of specification → Replace fuel injectors.

EAS30482
CHECKING THE FUEL PRESSURE

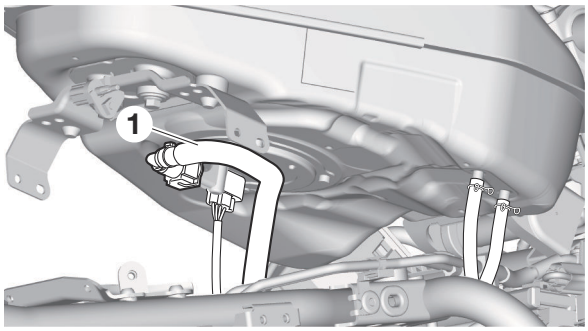
1. Check:
   • Fuel pressure
   a. Remove the passenger seat, rider seat, fuel tank side cover assembly and fuel tank top cover.
      Refer to "GENERAL CHASSIS (1)" on page 4-1.
   b. Remove the rear fuel bracket bolt and hold up the fuel tank.
   c. Disconnect the fuel hose "1" from the fuel pump.
      Refer to "REMOVING THE FUEL TANK" on page 7-5.

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.

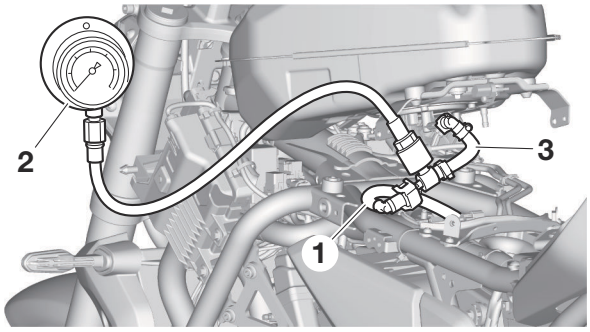
ECA20010
NOTICE

Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.



   d. Connect the pressure gauge "2" and adapter "3" to the fuel hose "1".

Pressure gauge
90890-03153
Pressure gauge
YU-03153
Fuel pressure adapter
90890-03176
Fuel pressure adapter
YM-03176



   e. Start the engine.
   f. Measure the fuel pressure.
      Faulty → Replace the fuel pump.

Fuel line pressure (at idle)
300–390 kPa (3.0–3.9 kgf/cm², 43.5–56.6 psi)

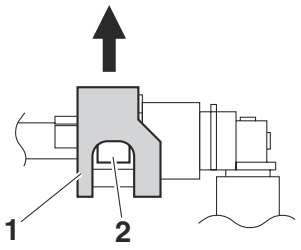
EAS31159
INSTALLING THE FUEL HOSE (FUEL RAIL SIDE)

1. Connect:
   • Fuel hose (fuel rail side)

ECA17500
NOTICE

When installing the fuel hose, make sure that it is securely connected, and that the fuel hose connector cover on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.

TIP
- Install the fuel hose securely onto the fuel 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.



G089038

EAS30937

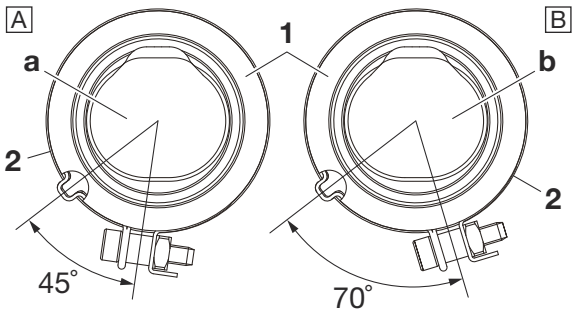
INSTALLING THE THROTTLE BODY JOINTS

1. Install:
   - Throttle body joint "1"
   - Throttle body joint clamp "2"

	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 and clamps as shown in the illustration.



a. #1 cylinder
b. #2 cylinder

A. Left
B. Right

EAS31092

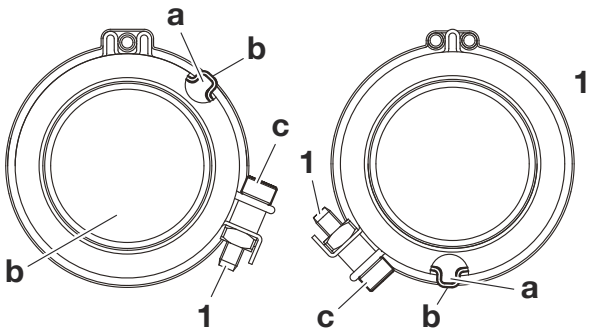
INSTALLING THE AIR FILTER CASE

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 as shown in the illustration.



EAS30485

ADJUSTING THE THROTTLE POSITION SENSOR

ECA17540

NOTICE

- **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 signal 1 and 2
     a. Remove the protective cap, and then connect the YDT to coupler.
        Refer to "YDT" on page 9-2.

	Yamaha diagnostic tool USB (US) 90890-03275 **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.

     b. Start the YDT and display the diagnosis of function.
     c. Select the "FI".
     d. Execute the diagnostic mode (Code 01 and 13).
        Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-48.
2. Adjust:
   - Throttle position sensor angle

TIP

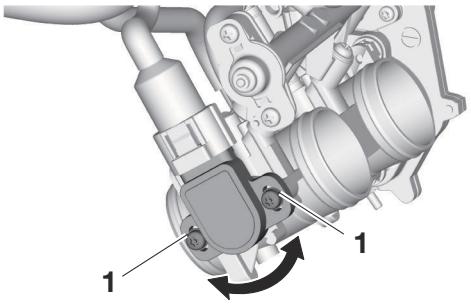
Before adjusting the throttle position sensor, the throttle bodies must be removed.

     a. Temporary tighten the throttle position sensor screws "1".
     b. Check that the throttle valves are fully

closed.

c. Connect the throttle position sensor to the wire harness.
d. Start the YDT and display the diagnosis of function.
e. Select the “FI”.
f. Execute the diagnostic mode (Code 01). Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-48.
g. Adjust the position of the throttle position sensor angle so that 14–16 can appear in the YDT screen.
h. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws.

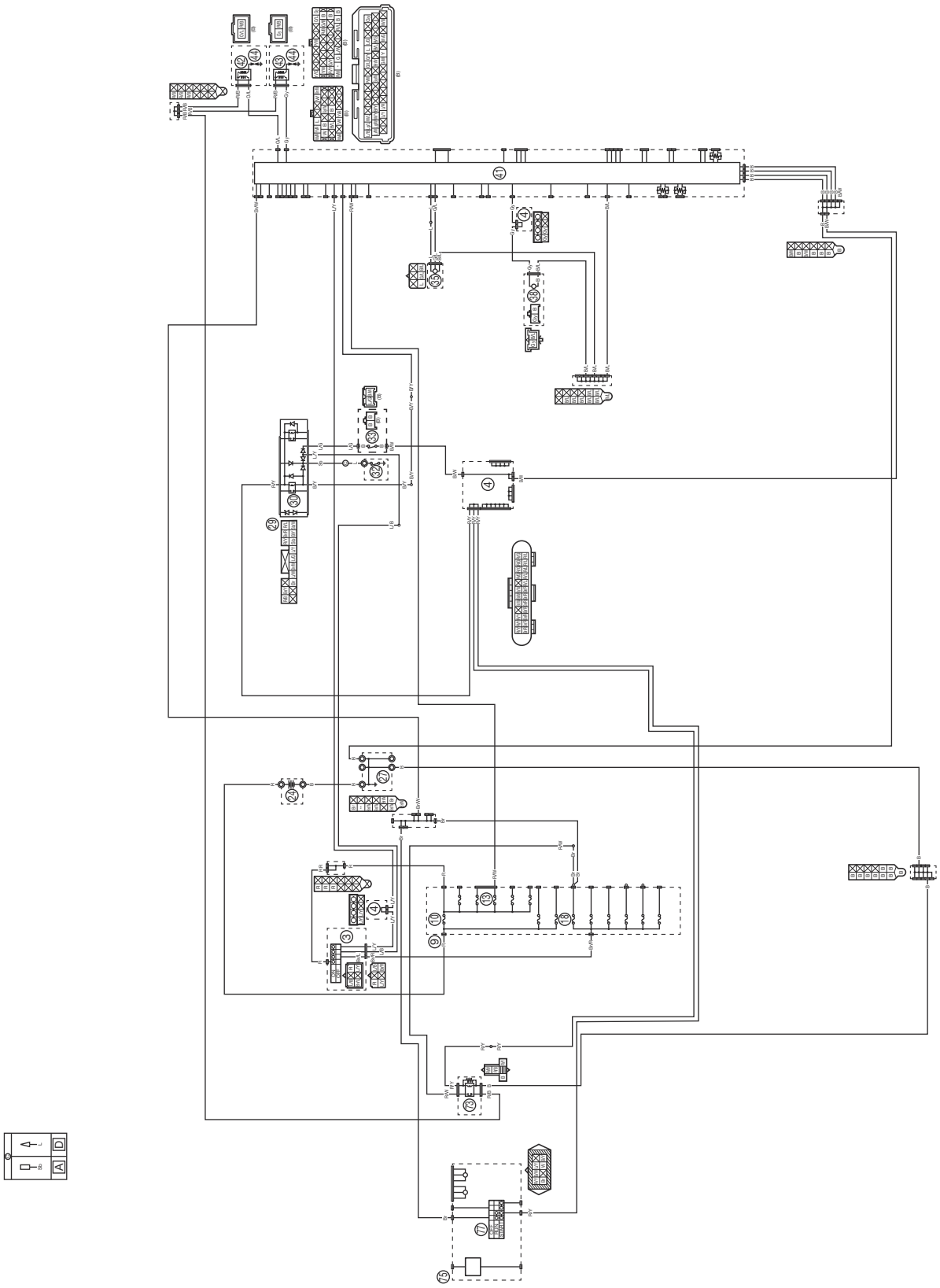
	**Throttle position sensor screw 3.5 N·m (0.35 kgf·m, 2.6 lb·ft)**



ELECTRICAL SYSTEM

EAS20072
IGNITION SYSTEM

EAS30490
CIRCUIT DIAGRAM



3. Main switch
4. Joint coupler
9. Fuse box
10. Main fuse
13. Backup fuse 2
18. Ignition fuse
24. Battery
27. Engine ground
29. Relay unit
30. Starting circuit cut-off relay
32. Neutral switch
33. Sidestand switch
35. Lean angle sensor
38. Crankshaft position sensor
41. ECU (Engine Control Unit)
42. Ignition coil #1
43. Ignition coil #2
44. Spark plug
73. Engine stop relay
75. Handlebar switch (right)
77. Stop/run/start switch

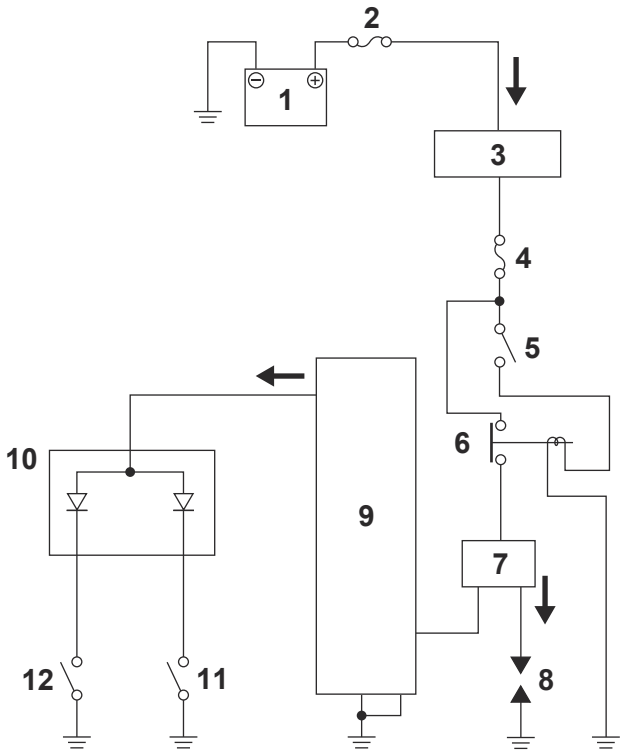
A. Wire harness
D. Sub-wire harness (neutral switch)

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

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 neutral switch or sidestand switch is open. However, the engine continues to run under the following conditions:

- The transmission is in gear (the neutral switch is open) and the sidestand is up (the sidestand switch circuit is closed).
- The transmission is in neutral (the neutral 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. Stop/run/start switch
6. Engine stop relay
7. Ignition coil
8. Spark plug
9. ECU (Engine Control Unit)
10. Relay unit (diode)
11. Sidestand switch
12. Neutral 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 side cover assembly (left)
4. Electrical components tray 1
5. Radiator
6. Drive sprocket cover

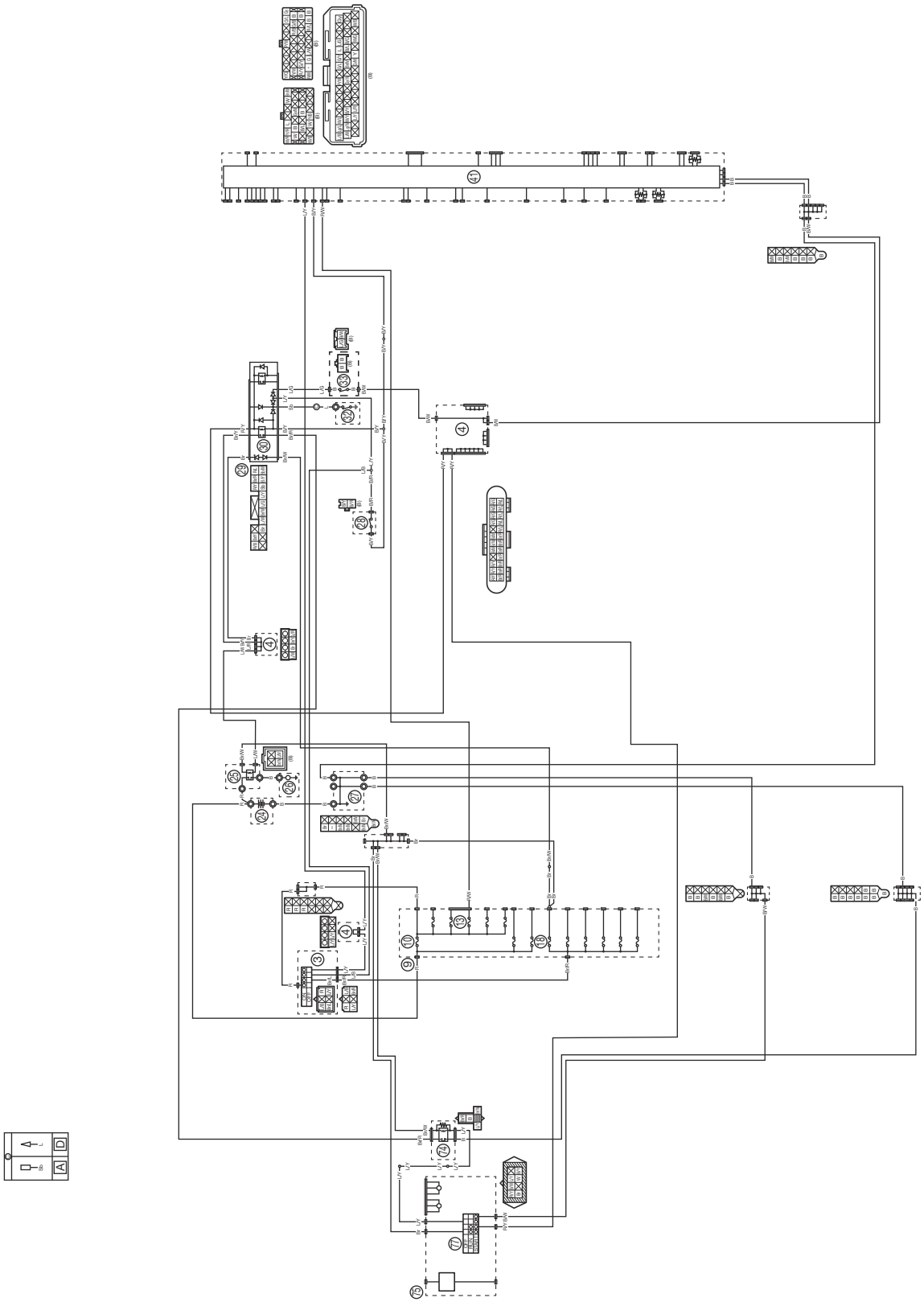
1. Check the fuses. (Main, backup 2 and ignition) Refer to "CHECKING THE FUSES" on page 8-47.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-48.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the spark 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 8-51.	OK→	Ignition system is OK.
NG↓		
5. Check the ignition coils. Refer to "CHECKING THE IGNITION COILS" on page 8-51.	NG→	Replace the ignition coil(s).
OK↓		
6. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-52.	NG→	Replace the stator coil assembly.
OK↓		
7. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-42.	NG→	Replace the main switch.
OK↓		
8. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-42.	NG→	Replace the neutral switch.
OK↓		

9. Check the sidestand switch.
   Refer to “CHECKING THE RELAYS” on page 8-48.
   NG→ Replace the sidestand switch.
   OK↓
10. Check the engine stop relay.
    Refer to “CHECKING THE RELAYS” on page 8-48.
    NG→ Replace the engine stop relay.
    OK↓
11. Check the relay unit (diode).
    Refer to “CHECKING THE RELAY UNIT (DIODE)” on page 8-50.
    NG→ Replace the relay unit.
    OK↓
12. Check the lean angle sensor.
    Refer to “CHECKING THE LEAN ANGLE SENSOR” on page 8-52.
    NG→ Replace the lean angle sensor.
    OK↓
13. Check the stop/run/start switch.
    Refer to “CHECKING THE HANDLEBAR SWITCH (RIGHT)” on page 8-46.
    NG→
    • The stop/run/start switch is faulty.
    • Replace the handlebar switch (right).
    OK↓
14. Check the entire ignition system's wiring.
    Refer to “CIRCUIT DIAGRAM” on page 8-1.
    NG→ Properly connect or replace the ignition system's wiring.
    OK↓

Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.

EAS20073
ELECTRIC STARTING SYSTEM

EAS30493
CIRCUIT DIAGRAM



3. Main switch
4. Joint coupler
9. Fuse box
10. Main fuse
13. Backup fuse 2
18. Ignition fuse
24. Battery
25. Starter relay
26. Starter motor
27. Engine ground
28. Clutch switch
29. Relay unit
30. Starting circuit cut-off relay
32. Neutral switch
33. Sidestand switch
41. ECU (Engine Control Unit)
74. Starting circuit cut-off relay 2
75. Handlebar switch (right)
77. Stop/run/start switch

A. Wire harness
D. Sub-wire harness (neutral switch)

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

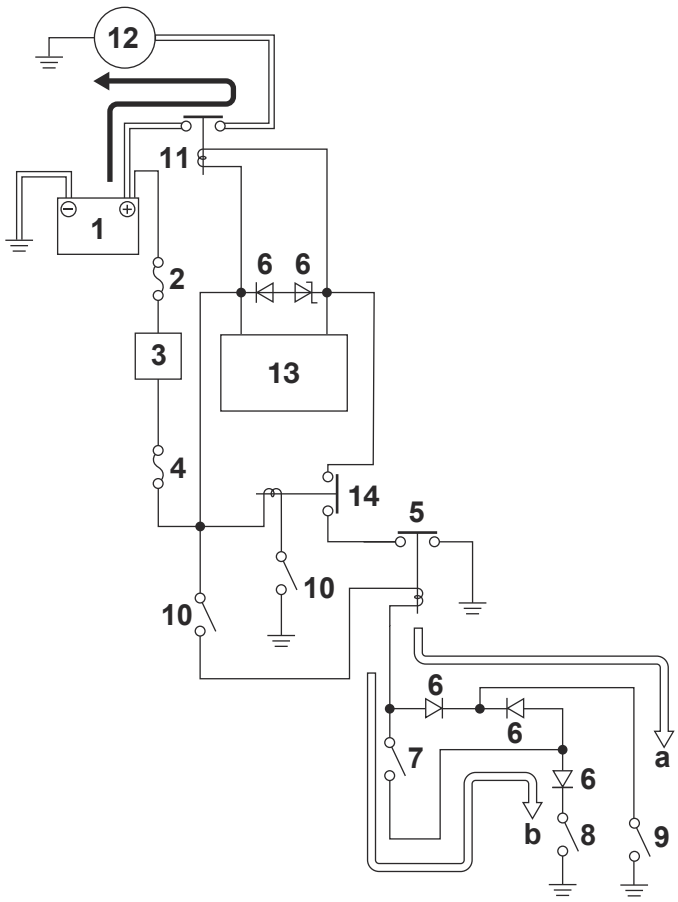
EAS30494

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the main switch is turned to "ON" and the "(≋)" side of the stop/run/start 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 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 stop/run/start switch.



a. WHEN THE TRANSMISSION IS IN NEUTRAL
b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR

1. Battery
2. Main fuse
3. Main switch
4. Ignition fuse
5. Starting circuit cut-off relay
6. Relay unit (diode)
7. Clutch switch
8. Sidestand switch
9. Neutral switch
10. Stop/run/start switch
11. Starter relay
12. Starter motor
13. ECU (Engine Control Unit)
14. Starting circuit cut-off relay 2

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 side cover assembly (left)
4. Electrical components tray 1
5. Fuel tank
6. Canister (for California only)
7. Throttle body/Air filter case
8. Drive sprocket cover

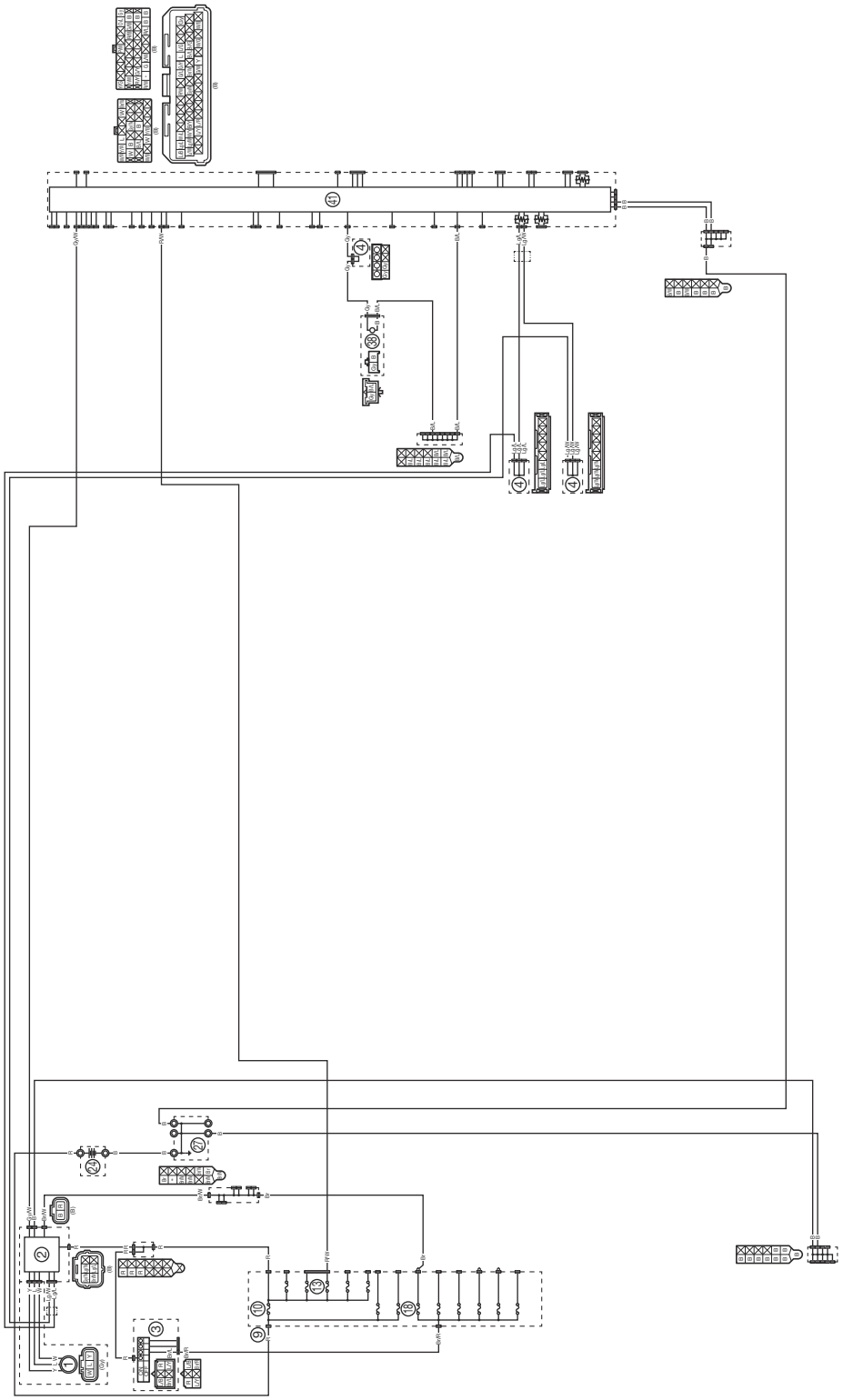
1. Check the fuses. (Main, backup 2 and ignition) Refer to "CHECKING THE FUSES" on page 8-47.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-48.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the starter motor operation. Refer to "CHECKING THE STARTER MOTOR OPERATION" on page 8-52.	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 5-57.	NG→	Repair or replace the starter motor.
OK↓		
5. Check the relay unit (starting circuit cut-off relay). Refer to "CHECKING THE RELAYS" on page 8-48.	NG→	Replace the relay unit.
OK↓		
6. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-50.	NG→	Replace the relay unit.
OK↓		
7. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-48.	NG→	Replace the starter relay.
OK↓		

8. Check the starting circuit cut-off relay 2.
   Refer to “CHECKING THE RELAYS” on page 8-48.
   NG→ Replace the starting circuit cut-off relay 2.
   OK↓
9. Check the main switch.
   Refer to “CHECKING THE SWITCHES” on page 8-42.
   NG→ Replace the main switch.
   OK↓
10. Check the neutral switch.
    Refer to “CHECKING THE SWITCHES” on page 8-42.
    NG→ Replace the neutral switch.
    OK↓
11. Check the sidestand switch.
    Refer to “CHECKING THE SWITCHES” on page 8-42.
    NG→ Replace the sidestand switch.
    OK↓
12. Check the clutch switch.
    Refer to “CHECKING THE SWITCHES” on page 8-42.
    NG→ Replace the clutch switch.
    OK↓
13. Check the stop/run/start switch.
    Refer to “CHECKING THE HANDLEBAR SWITCH (RIGHT)” on page 8-46.
    NG→
    • The stop/run/start switch is faulty.
    • Replace the handlebar switch (right).
    OK↓
14. Check the entire starting system's wiring.
    Refer to “CIRCUIT DIAGRAM” on page 8-7.
    NG→ Properly connect or replace the starting system's wiring.
    OK↓

Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.

EAS20074
CHARGING SYSTEM

EAS30496
CIRCUIT DIAGRAM



1. AC magneto
2. GCU (Generator Control Unit)
3. Main switch
4. Joint coupler
9. Fuse box
10. Main fuse
13. Backup fuse 2
18. Ignition fuse
24. Battery
27. Engine ground
38. Crankshaft position sensor
41. ECU (Engine Control Unit)

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

EAS30497

TROUBLESHOOTING

The battery is not being charged.

TIP

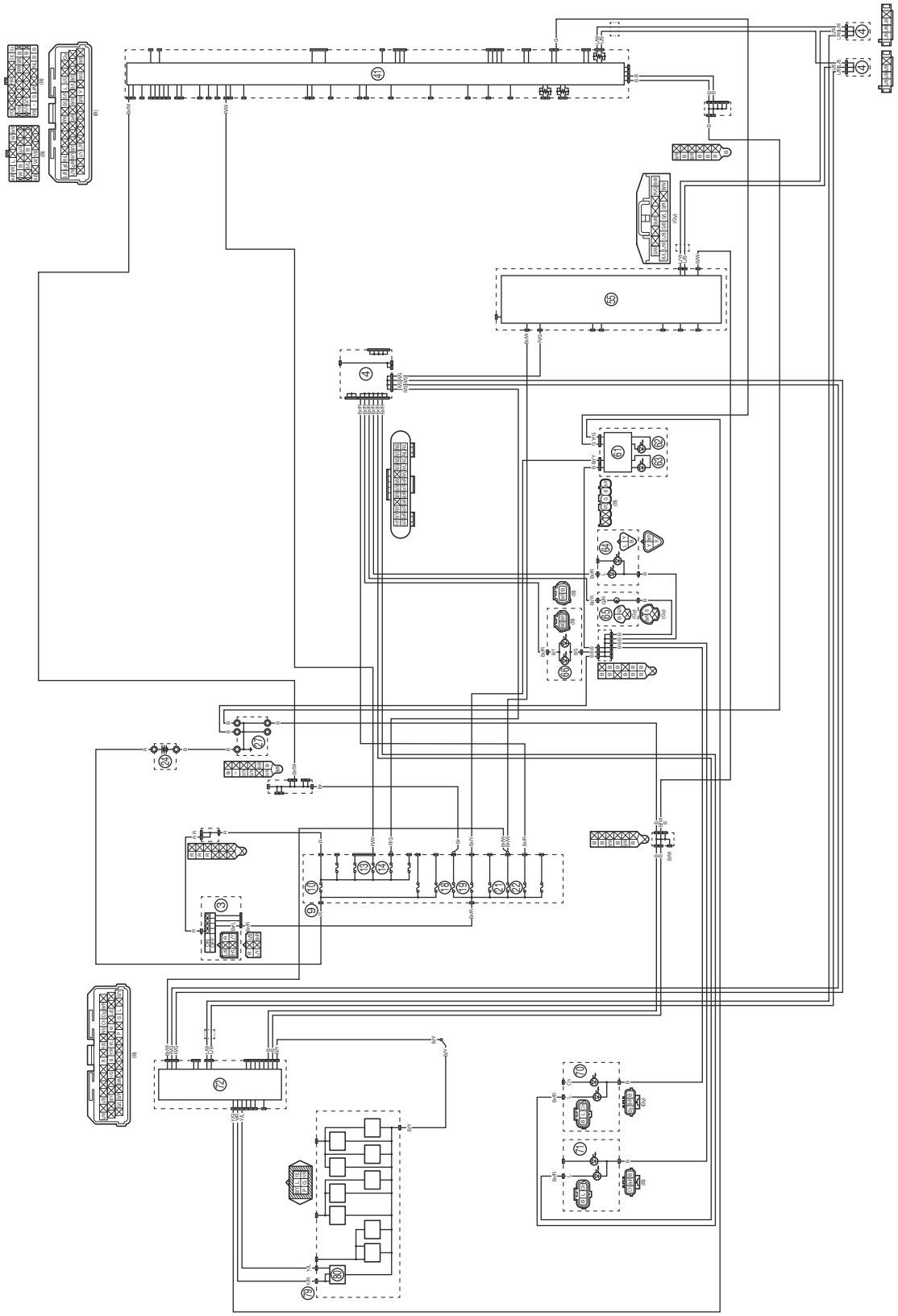
- Before troubleshooting, remove the following part(s):

1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank side cover assembly (left and right)
4. ECU tray

1. Check the fuses. (Main, backup 2 and ignition) Refer to "CHECKING THE FUSES" on page 8-47.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-48.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 8-53.	NG→	Replace the stator coil assembly.
OK↓		
4. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-52.	NG→	Replace the stator coil assembly.
OK↓		
5. Check the GCU (Generator Control Unit). Refer to "CHECKING THE GCU (Generator Control Unit)" on page 8-53.	NG→	Replace the GCU (Generator Control Unit).
OK↓		
6. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-13.	NG→	Properly connect or replace the charging system's wiring.
OK↓		
Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.		

EAS20075
LIGHTING SYSTEM

EAS30498
CIRCUIT DIAGRAM



3. Main switch
4. Joint coupler
9. Fuse box
10. Main fuse
13. Backup fuse 2
14. Backup fuse
18. Ignition fuse
19. Headlight fuse
21. Ignition fuse 2
22. Signaling system fuse
24. Battery
27. Engine ground
41. ECU (Engine Control Unit)
55. Meter assembly
61. Headlight control unit
62. Headlight (high)
63. Headlight (low)
64. Tail/brake light
65. License plate light
66. Auxiliary light
70. Front turn signal/position light (right)
71. Front turn signal/position light (left)
72. BCM (Body Control Module)
79. Handlebar switch (left)
80. Dimmer/pass switch

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
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

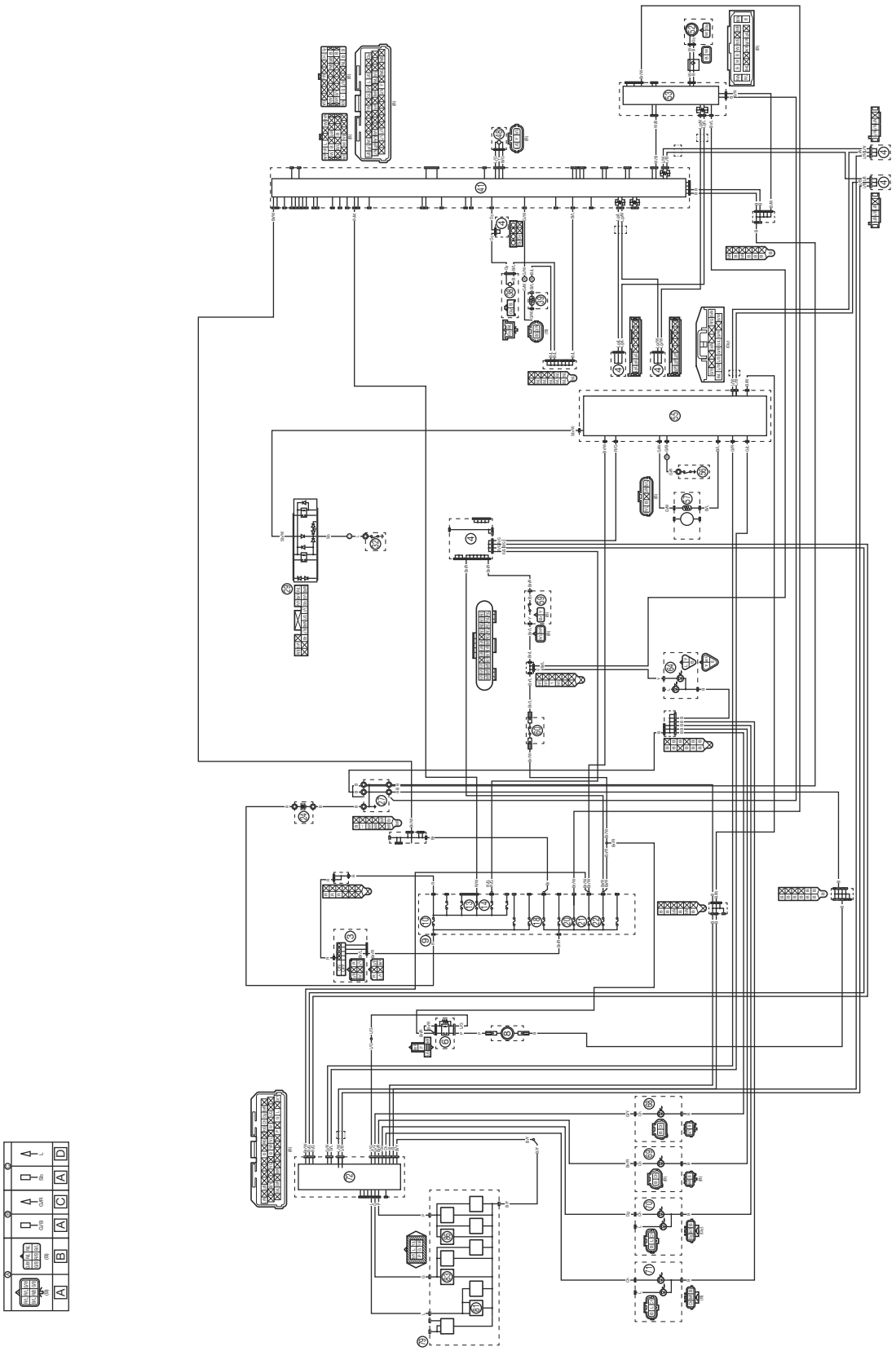
• Before troubleshooting, remove the following part(s):

1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Rear side cover assembly
4. Rider seat bracket 2
5. Fuel tank side cover assembly (left)
6. Headlight front cover

1. Check the fuses. (Main, backup, backup 2, ignition, ignition 2, headlight and signaling system) Refer to "CHECKING THE FUSES" on page 8-47.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-48.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-42.	NG→	Replace the main switch.
OK↓		
4. Check the dimmer switch. Refer to "CHECKING THE HANDLEBAR SWITCH (LEFT)" on page 8-44.	NG→	• The dimmer switch is faulty. • Replace the handlebar switch (left).
OK↓		
5. Check the pass switch. Refer to "CHECKING THE HANDLEBAR SWITCH (LEFT)" on page 8-44.	NG→	• The pass switch is faulty. • Replace the handlebar switch (left).
OK↓		
6. Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-17.	NG→	Properly connect or replace the lighting system's wiring.
OK↓		
Replace the ECU, BCM (Body Control Module), headlight, meter assembly, tail/brake light, license plate light, auxiliary light or front turn signal/position light. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.		

EAS20076
SIGNALING SYSTEM

EAS30500
CIRCUIT DIAGRAM



3. Main switch
4. Joint coupler
6. Horn relay
8. Horn
9. Fuse box
10. Main fuse
13. Backup fuse 2
14. Backup fuse
18. Ignition fuse
20. ABS control unit fuse
21. Ignition fuse 2
22. Signaling system fuse
24. Battery
27. Engine ground
29. Relay unit
32. Neutral switch
38. Crankshaft position sensor
39. Coolant temperature sensor
41. ECU (Engine Control Unit)
48. Gear position sensor
52. Rear wheel sensor
53. ABS ECU (electronic control unit)
55. Meter assembly
56. Oil pressure switch
57. Fuel sender
59. Rear brake light switch
60. Front brake light switch
64. Tail/brake light
68. Rear turn signal light (right)
69. Rear turn signal light (left)
70. Front turn signal/position light (right)
71. Front turn signal/position light (left)
72. BCM (Body Control Module)
79. Handlebar switch (left)
81. Turn signal switch
83. Hazard switch
86. Horn switch

A. Wire harness
B. Sub-wire harness (coolant temperature sensor, fuel injector #1, fuel injector #2)
C. Sub-wire harness (oil pressure switch)
D. Sub-wire harness (neutral switch)

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

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. Rider seat bracket 2
4. Fuel tank side cover assembly (left and right)
5. Fuel tank
6. Throttle body/Air filter case
7. Pivot shaft protector
8. Drive sprocket cover

1. Check the fuses. (Main, backup, backup 2, ignition, ignition 2, ABS control unit and signaling system) Refer to “CHECKING THE FUSES” on page 8-47.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-48.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 8-42.	NG→	Replace the main switch.
OK↓		
4. Check the entire signaling system's wiring. Refer to “CIRCUIT DIAGRAM” on page 8-21.	NG→	Properly connect or replace the signaling system's wiring.
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. Refer to “CHECKING THE HORN” on page 8-53.	NG→	Replace the horn.
OK↓		

2. Check the horn relay.
   Refer to "CHECKING THE RELAYS" on page 8-48.
   NG→ Replace the horn relay.
   OK↓
3. Check the horn switch.
   Refer to "CHECKING THE HANDLEBAR SWITCH (LEFT)" on page 8-44.
   NG→ Replace the handlebar switch (left).
   OK↓
4. Check the entire signaling system's wiring.
   Refer to "CIRCUIT DIAGRAM" on page 8-21.
   NG→ Properly connect or replace the signaling system's wiring.
   OK↓

Replace the BCM (Body Control Module).

The brake light fails to come on.

1. Check the front brake light switch.
   Refer to "CHECKING THE SWITCHES" on page 8-42.
   NG→ Replace the front brake light switch.
   OK↓
2. Check the rear brake light switch.
   Refer to "CHECKING THE SWITCHES" on page 8-42.
   NG→ Replace the rear brake light switch.
   OK↓
3. Check the entire signaling system's wiring.
   Refer to "CIRCUIT DIAGRAM" on page 8-21.
   NG→ Properly connect or replace the signaling system's wiring.
   OK↓

Replace the tail/brake light.

The turn signal light, turn signal indicator light or both fail to blink.

1. Check the turn signal switch.
   Refer to "CHECKING THE HANDLEBAR SWITCH (LEFT)" on page 8-44.
   NG→ • The turn signal switch is faulty.
   • Replace the handlebar switch (left).
   OK↓
2. Check the hazard switch.
   Refer to "CHECKING THE HANDLEBAR SWITCH (LEFT)" on page 8-44.
   NG→ • The hazard switch is faulty.
   • Replace the handlebar switch (left).
   OK↓

3. Check the entire signaling system's wiring.
   Refer to “CIRCUIT DIAGRAM” on page 8-21.
   NG→ Properly connect or replace the signaling system’s wiring.
   OK↓
Replace the BCM (Body Control Module), front turn signal/position light, rear turn signal light or meter assembly.

The neutral indicator light fails to come on.

1. Check the neutral switch.
   Refer to “CHECKING THE SWITCHES” on page 8-42.
   NG→ Replace the neutral switch.
   OK↓
2. Check the relay unit (diode).
   Refer to “CHECKING THE RELAY UNIT (DIODE)” on page 8-50.
   NG→ Replace the relay unit.
   OK↓
3. Check the entire signaling system’s wiring.
   Refer to “CIRCUIT DIAGRAM” on page 8-21.
   NG→ Properly connect or replace the signaling system’s wiring.
   OK↓

Replace the meter assembly.

The oil pressure warning icon fails to come on, or flashes when the main switch is set to “ON”.

1. Check the entire signaling system’s wiring.
   Refer to “CIRCUIT DIAGRAM” on page 8-21.
   NG→ Properly connect or replace the signaling system’s wiring.
   OK↓
2. Disconnect the oil pressure switch lead from the oil pressure switch, and then check whether the oil pressure warning icon 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 icon remains on after the engine is started.

1. Check the entire signaling system's wiring.
   Refer to “CIRCUIT DIAGRAM” on page 8-21.
   NG→ Properly connect or replace the signaling system’s wiring.
   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 8-53.	NG→	Replace the fuel pump.

OK↓

2. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.	NG→	Properly connect or replace the signaling system's wiring.

OK↓

Replace the meter assembly.

The coolant temperature meter, coolant temperature warning icon, or both fails to come on.

1. Check the coolant temperature sensor. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-54.	NG→	Replace the coolant temperature sensor.

OK↓

2. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.	NG→	Properly connect or replace the signaling system's wiring.

OK↓

Replace the ECU or meter assembly. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.

The speedometer fails to operate.

1. Check the rear wheel sensor. Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-26.	NG→	Replace the rear wheel sensor.

OK↓

2. Check the entire rear wheel sensor wiring. Refer to TIP.	NG→	Properly connect or replace the rear wheel sensor wiring.

OK↓

Replace the ECU, ABS ECU, or meter assembly. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.

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 ECU coupler.
  (white/black–white/black)
- Between ECU coupler and joint coupler.
  (blue/white–blue/white)
  (blue/black–blue/black)
- Between joint coupler and meter assembly coupler.
  (blue/white–blue/white)
  (blue/black–blue/black)

The tachometer fails to operate.

1. Check the crankshaft position sensor.
   Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-52.

NG→ Replace the stator coil assembly.

OK↓

2. Check the entire signaling system's wiring.
   Refer to "CIRCUIT DIAGRAM" on page 8-21.

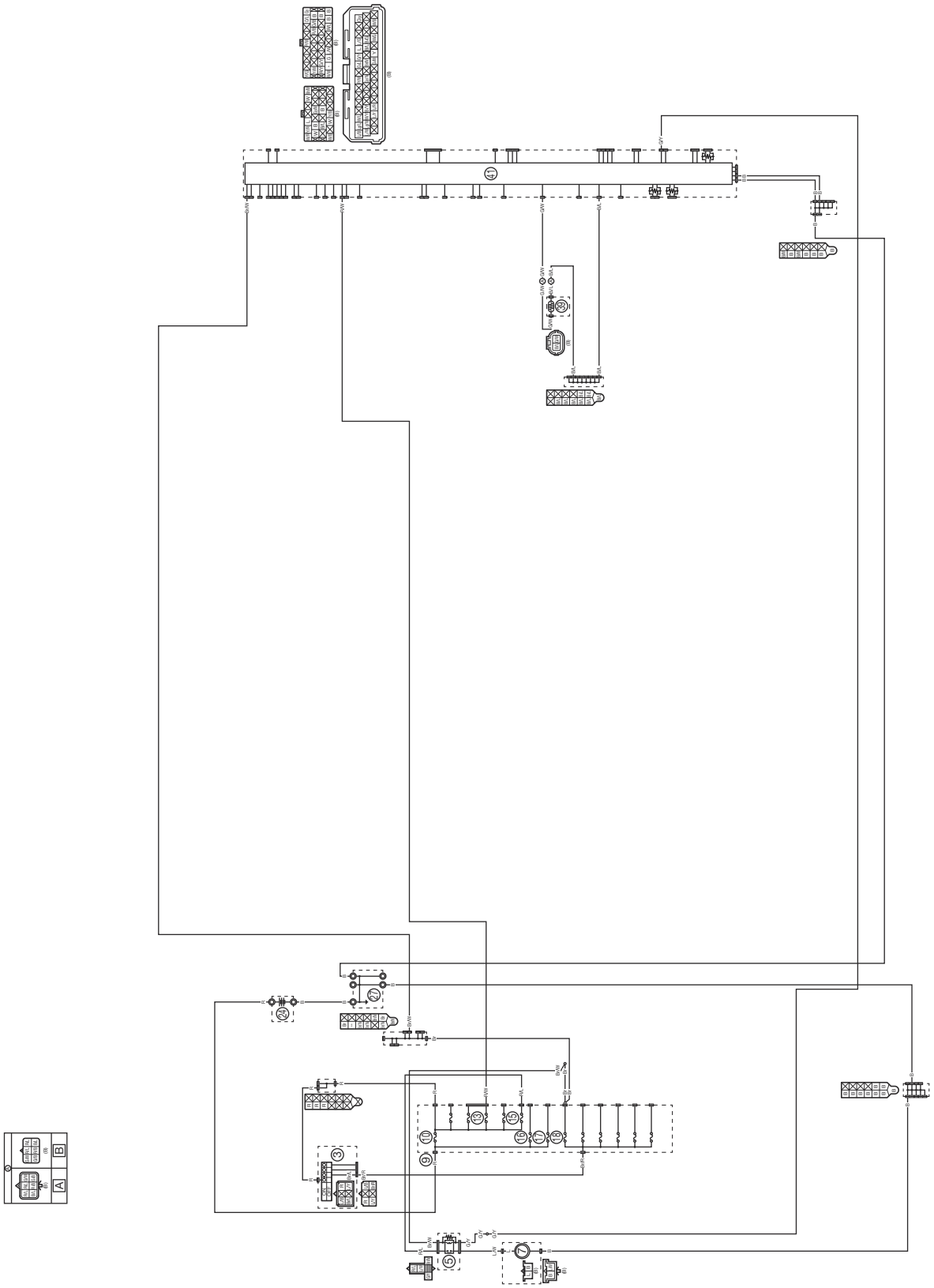
NG→ Properly connect or replace the signaling system's wiring.

OK↓

Replace the ECU or meter assembly. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.

EAS20077
COOLING SYSTEM

EAS30502
CIRCUIT DIAGRAM



3. Main switch
5. Radiator fan motor relay
7. Radiator fan motor
9. Fuse box
10. Main fuse
13. Backup fuse 2
15. Radiator fan motor fuse
18. Ignition fuse
24. Battery
27. Engine ground
39. Coolant temperature sensor
41. ECU (Engine Control Unit)

A. Wire harness
B. Sub-wire harness (coolant temperature sensor, fuel injector #1, fuel injector #2)

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

EAS30503

TROUBLESHOOTING

The radiator fan motor fails to turn.

TIP

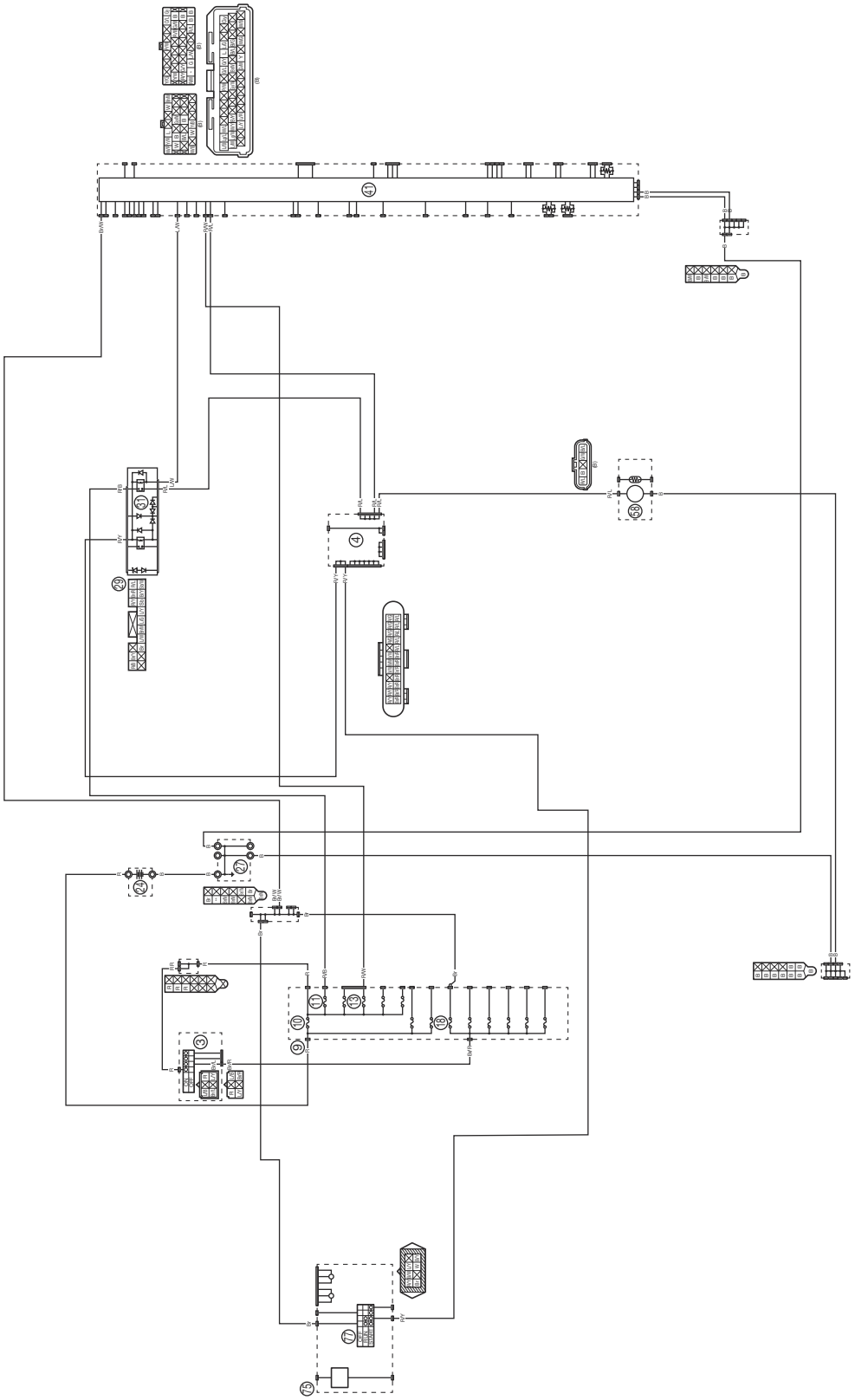
• Before troubleshooting, remove the following part(s):

1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank side cover assembly (left)
4. Electrical components tray 1
5. Fuel tank
6. Throttle body/Air filter case

1. Check the fuses. (Main, backup 2, ignition and radiator fan motor) Refer to “CHECKING THE FUSES” on page 8-47.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-48.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 8-42.	NG→	Replace the main switch.
OK↓		
4. Check the radiator fan motor. Refer to “CHECKING THE RADIATOR FAN MOTOR” on page 8-54.	NG→	Replace the radiator fan motor.
OK↓		
5. Check the radiator fan motor relay. Refer to “CHECKING THE RELAYS” on page 8-48.	NG→	Replace the radiator fan motor relay.
OK↓		
6. Check the coolant temperature sensor. Refer to “CHECKING THE COOLANT TEMPERATURE SENSOR” on page 8-54.	NG→	Replace the coolant temperature sensor.
OK↓		
7. Check the entire cooling system's wiring. Refer to “CIRCUIT DIAGRAM” on page 8-29.	NG→	Properly connect or replace the cooling system's wiring.
OK↓		
Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.		

EAS20081
FUEL PUMP SYSTEM

EAS30513
CIRCUIT DIAGRAM



3. Main switch
4. Joint coupler
9. Fuse box
10. Main fuse
11. Fuel injection system fuse
13. Backup fuse 2
18. Ignition fuse
24. Battery
27. Engine ground
29. Relay unit
31. Fuel pump relay
41. ECU (Engine Control Unit)
58. Fuel pump
75. Handlebar switch (right)
77. Stop/run/start switch

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

EAS30514
TROUBLESHOOTING

If the fuel pump fails to operate.

TIP

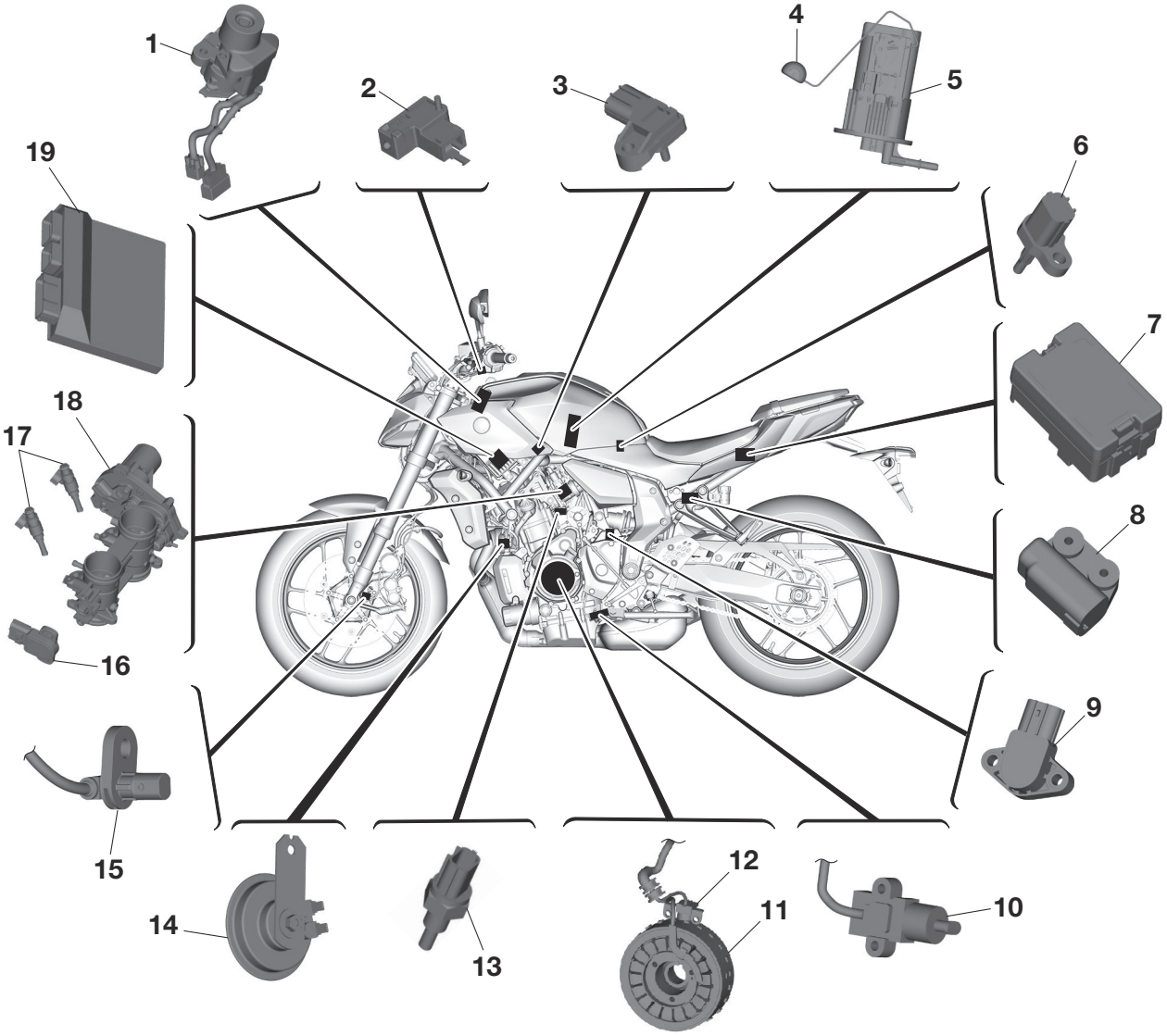
• Before troubleshooting, remove the following part(s):

1. Passenger seat/Rider seat
2. Rider seat bracket 1/Battery band
3. Fuel tank side cover assembly (left)
4. Electrical components tray 1
5. Fuel tank
6. Throttle body/Air filter case

1. Check the fuses. (Main, backup 2, ignition, ignition 2 and fuel injection system) Refer to “CHECKING THE FUSES” on page 8-47.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-48.	NG→	• Clean the battery terminals. • Recharge or replace the battery.
OK↓		
3. Check the main switch. Refer to “CHECKING THE SWITCHES” on page 8-42.	NG→	Replace the main switch.
OK↓		
4. Check the relay unit (fuel pump relay). Refer to “CHECKING THE RELAYS” on page 8-48.	NG→	Replace the relay unit.
OK↓		
5. Check the fuel pump. Refer to “CHECKING THE FUEL PUMP BODY” on page 7-5.	NG→	Replace the fuel pump.
OK↓		
6. Check the stop/run/start switch. Refer to “CHECKING THE HANDLEBAR SWITCH (RIGHT)” on page 8-46.	NG→	• The stop/run/start switch is faulty. • Replace the handlebar switch (right).
OK↓		
7. Check the entire fuel pump system's wiring. Refer to “CIRCUIT DIAGRAM” on page 8-33.	NG→	Properly connect or replace the fuel pump system's wiring.
OK↓		
Replace the ECU. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.		

EAS20089
ELECTRICAL COMPONENTS

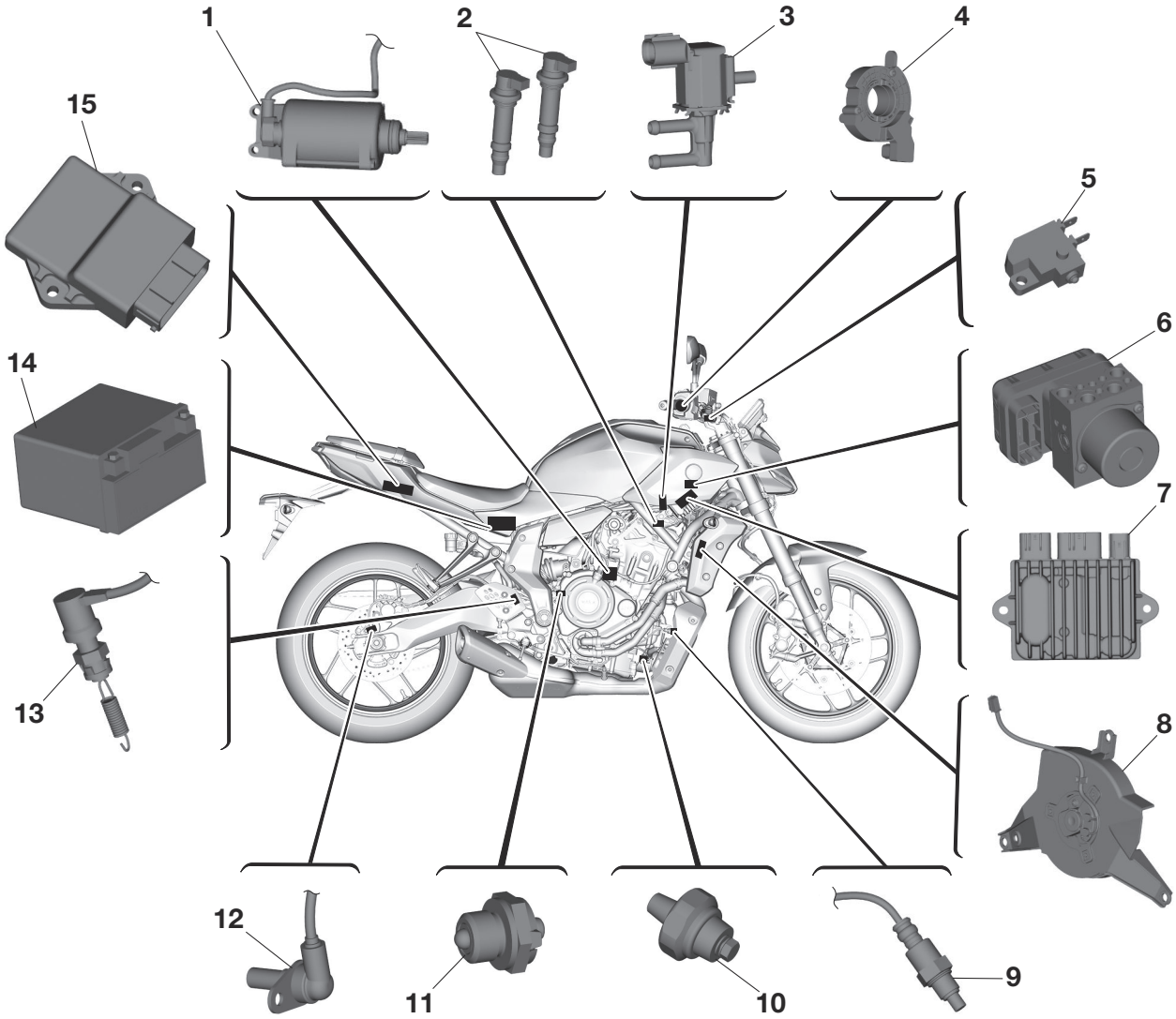
EAS34262
ELECTRICAL COMPONENTS CHART (LEFT SIDE VIEW)



1. Main switch
2. Clutch switch
3. Intake air pressure sensor
4. Fuel sender
5. Fuel pump
6. Intake air temperature sensor
7. Fuse box
8. Lean angle sensor
9. Gear position sensor
10. Sidestand switch
11. AC magneto
12. Crankshaft position sensor
13. Coolant temperature sensor
14. Horn
15. Front wheel sensor
16. Throttle position sensor
17. Fuel injector
18. Throttle servo motor
19. ECU (Engine Control Unit)

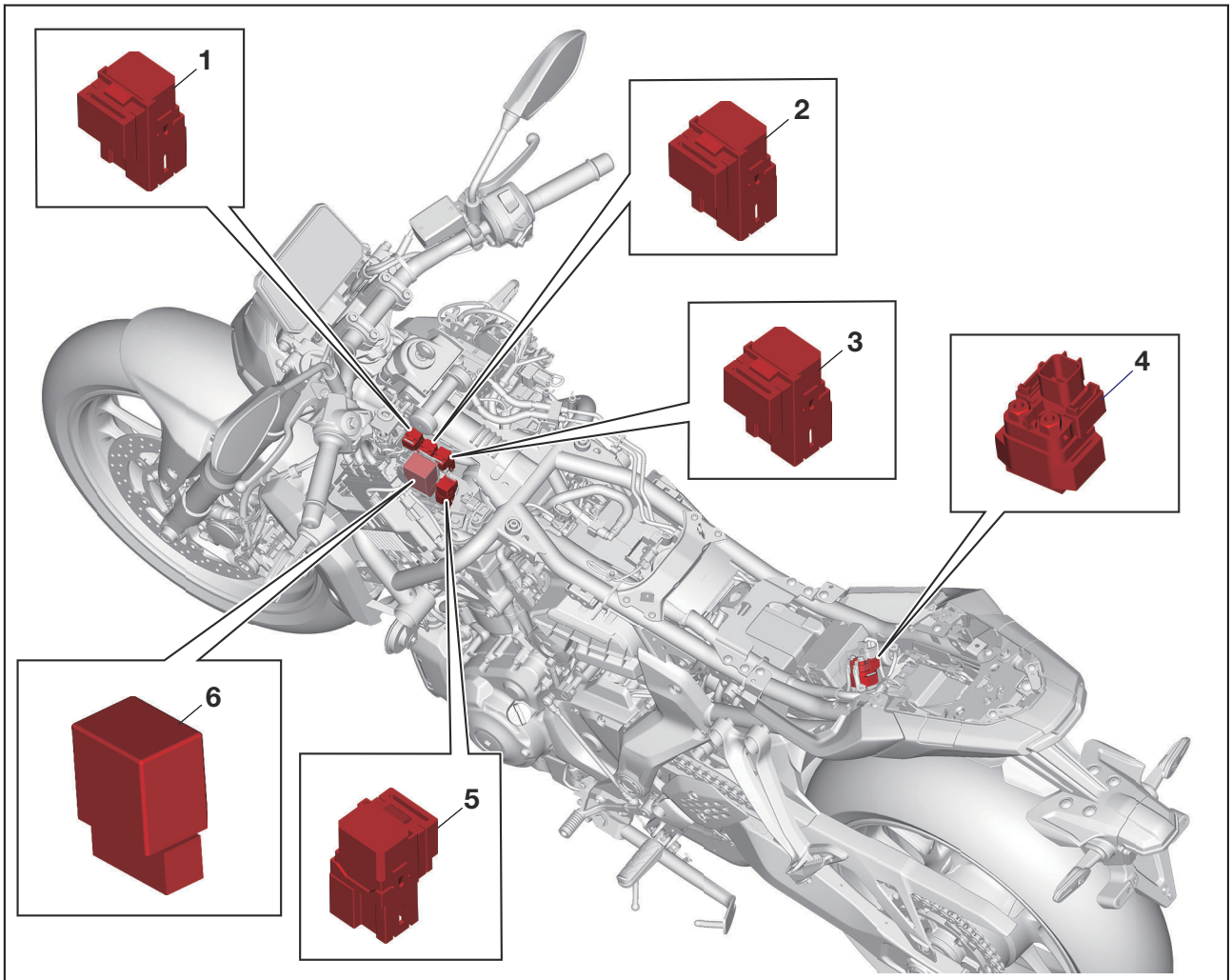
EAS34261

ELECTRICAL COMPONENTS CHART (RIGHT SIDE VIEW)



1. Starter motor
2. Ignition coil
3. Purge cut valve solenoid (for California only)
4. Accelerator position sensor
5. Front brake light switch
6. ABS ECU (electronic control unit)
7. GCU (Generator Control Unit)
8. Radiator fan motor
9. O_2 sensor
10. Oil pressure switch
11. Neutral switch
12. Rear wheel sensor
13. Rear brake light switch
14. Battery
15. BCM (Body Control Module)

EAS34036
RELAY LOCATION CHART



No.	Part name	Part number
1	Engine stop relay	1TP-81950-00
2	Horn relay	1TP-81950-00
3	Radiator fan motor relay	1TP-81950-00
4	Starter relay	B7N-81940-00
5	Starting circuit cut-off relay 2	1TP-81950-00
6	Relay unit (starting circuit cut-off relay and fuel pump relay)	5VK-81950-53

TIP
The part number is subject to change. In that case, refer to parts catalogue.

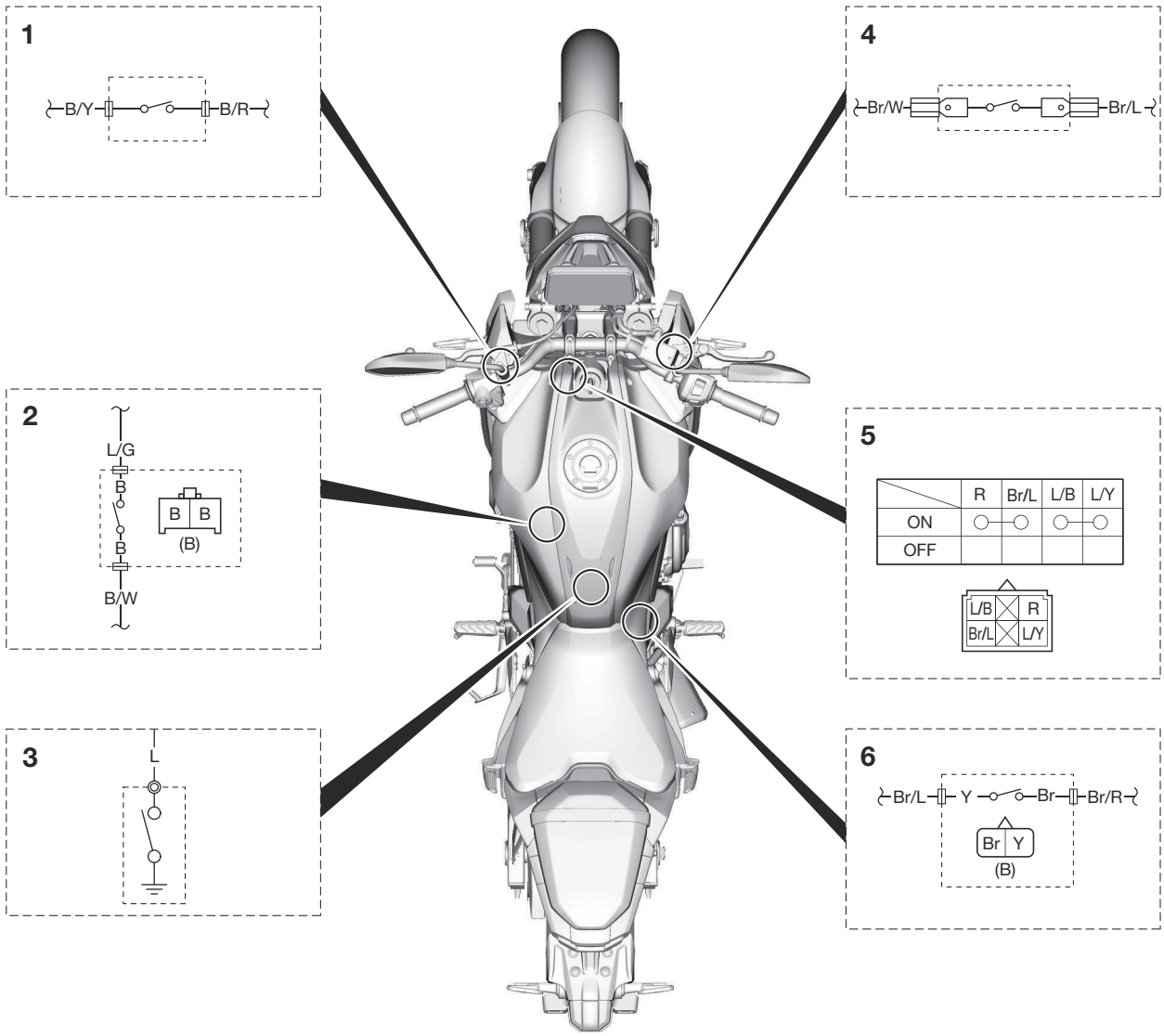
EAS30549

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.

TIP

Refer to “CHECKING THE SWITCHES” in “BASIC INFORMATION” (separate volume).



1. Clutch switch
2. Sidestand switch
3. Neutral switch
4. Front brake light switch
5. Main switch
6. Rear brake light switch

EAS34058
CHECKING THE HANDLEBAR SWITCH (LEFT)

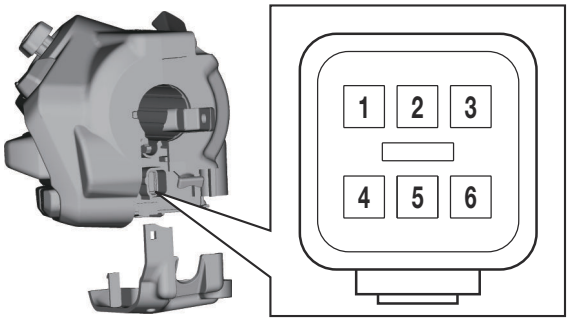
Check each switch for resistance with the digital circuit tester. If out of specification, replace the handlebar switch (left).

TIP

When connecting the tester to the terminals, be careful not to bend the terminals.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

1. Disconnect the handlebar switch (left) coupler.
2. Connect the digital circuit tester (Ω) to the handlebar switch (left) terminal as shown.



Dimmer/pass switch

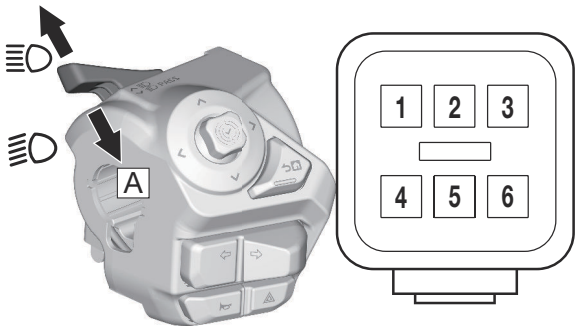
1. Check:
   - Dimmer/pass switch resistance
     Out of specification → Replace.

Resistance (high beam)
0.19–0.23 kΩ
(between "3" and "4")
Resistance (low beam)
0.46–0.52 kΩ
(between "3" and "4")
Resistance (free)
9.44–10.56 kΩ
(between "3" and "4")
Resistance (passing)
0.19–0.23 kΩ
(between "6" and "4")
Resistance (free)
9.44–10.56 kΩ
(between "6" and "4")

TIP

While the headlights are set to low beam, push the switch inwards (direction A) to momentarily flash the high beam.

a. Connect the digital circuit tester (Ω) to the handlebar switch (left) terminal.



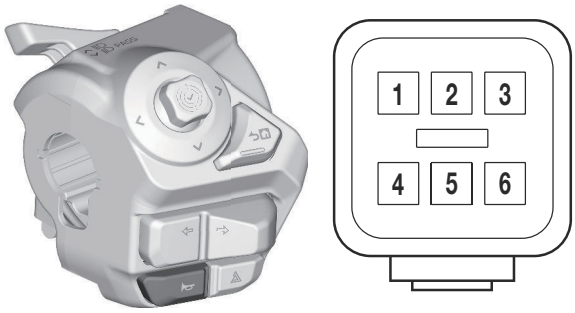
b. Measure the dimmer/pass switch resistance.

Horn switch

1. Check:
   - Horn switch resistance
     Out of specification → Replace.

Resistance (pushed)
0.19–0.23 kΩ
(between "1" and "4")
Resistance (free)
0.19–10.56 kΩ
(between "1" and "4")

a. Connect the digital circuit tester (Ω) to the handlebar switch (left) terminal.



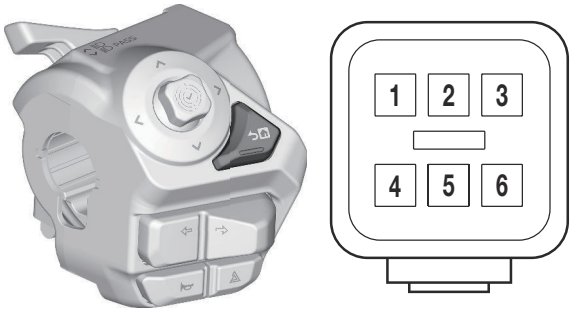
b. Measure the horn switch resistance.

Home Button

1. Check:
   - Home button resistance
     Out of specification → Replace.

Resistance (pushed)
0.46–0.52 kΩ
(between "1" and "4")
Resistance (free)
9.44–10.56 kΩ
(between "1" and "4")

a. Connect the digital circuit tester (Ω) to the handlebar switch (left) terminal.



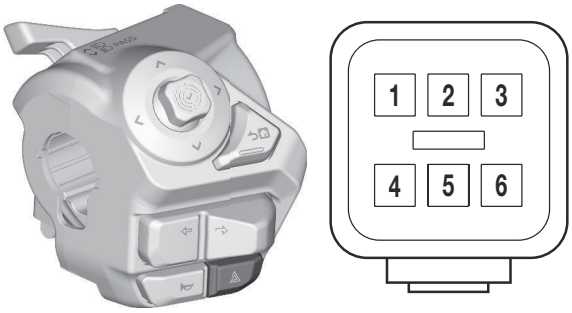
b. Measure the Home button resistance.

Hazard switch

1. Check:
   - Hazard switch resistance
     Out of specification → Replace.

Resistance (pushed)
0.87–0.98 kΩ
(between "2" and "4")
Resistance (free)
9.44–10.56 kΩ
(between "2" and "4")

a. Connect the digital circuit tester (Ω) to the handlebar switch (left) terminal.



b. Measure the hazard switch resistance.

Turn signal switch

TIP

To cancel a turn signal manually, press the switch a second time in the same direction.

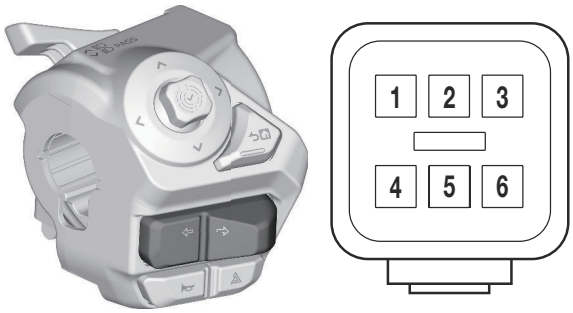
1. Check:
   - Turn signal switch resistance
     Out of specification → Replace.

Resistance (left (soft press))
0.46–0.52 kΩ
(between "5" and "4")
Resistance (left (hard press))
0.19–0.23 kΩ
(between "5" and "4")
Resistance (right (soft press))
1.65–1.85 kΩ
(between "5" and "4")
Resistance (right (hard press))
0.87–0.98 kΩ
(between "5" and "4")
Resistance (free)
9.44–10.56 kΩ
(between "5" and "4")

TIP

This switch controls the turn signal lights. This is a 2-stage switch, meaning that pressing it soft or hard has a different effect.

a. Connect the digital circuit tester (Ω) to the handlebar switch (left) terminal.



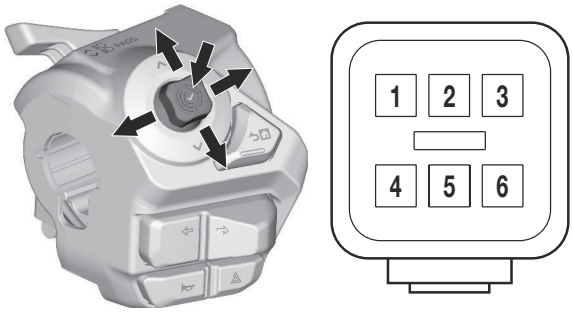
b. Measure the turn signal switch resistance.

Joystick

1. Check:
   - Joystick resistance
     Out of specification → Replace.

Resistance (left)
1.65–1.85 kΩ
(between “2” and “4”)
Resistance (right)
3.44–3.84 kΩ
(between “2” and “4”)
Resistance (free)
9.44–10.56 kΩ
(between “2” and “4”)
Resistance (up)
0.87–0.98 kΩ
(between “1” and “4”)
Resistance (down)
1.65–1.85 kΩ
(between “1” and “4”)
Resistance (free)
9.44–10.56 kΩ
(between “1” and “4”)
Resistance (pushed)
3.44–3.84 kΩ
(between “5” and “4”)
Resistance (free)
9.44–10.56 kΩ
(between “5” and “4”)

a. Connect the digital circuit tester (Ω) to the handlebar switch (left) terminal.



b. Measure the joystick resistance.

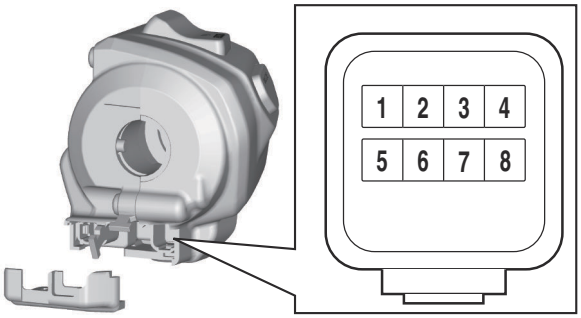
EAS34059
CHECKING THE HANDLEBAR SWITCH (RIGHT)

Check each switch for continuity or resistance with the digital circuit tester. If out of specification, replace the handlebar switch (right).

TIP
When connecting the tester to the terminals, be careful not to bend the terminals.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

1. Disconnect the handlebar switch (right) coupler.
2. Connect the digital circuit tester (Ω) to the handlebar switch (right) terminal as shown.

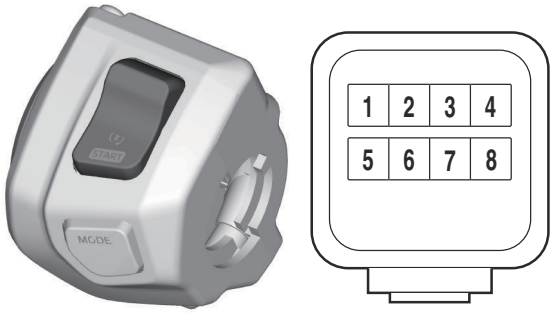


Stop/run/start switch

1. Check:
   • Stop/run/start switch continuity
   Out of specification → Replace.

Stop ⊠
No continuity
(between “1” and “5”)
(between “6” and “7”)
Run ○
Continuity
(between “1” and “5”)
No continuity
(between “6” and “7”)
Start (while pressing)
Continuity
(between “1” and “5”)
(between “6” and “7”)

a. Connect the digital circuit tester (Ω) to the handlebar switch (right) terminal.



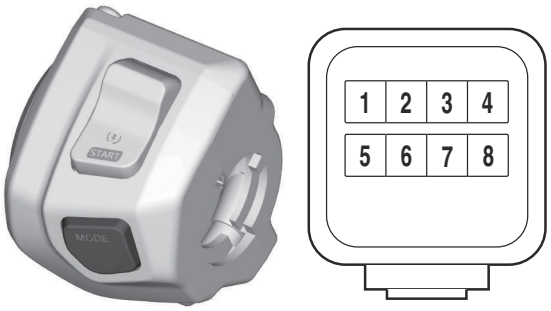
b. Measure the stop/run/start switch continuity.

YRC mode button

1. Check:
   • YRC mode button resistance
   Out of specification → Replace.

Resistance (pushed)
1.65–1.85 kΩ
(between "3" and "4")
Resistance (free)
9.44–10.56 kΩ
(between "3" and "4")

a. Connect the digital circuit tester (Ω) to the handlebar switch (right) terminal.



b. Measure the YRC mode button resistance.

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.
   - Fuse box cover
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	50 A	1
Headlight	7.5 A	1
Signaling system	7.5 A	1
Ignition	10 A	1
Ignition 2	7.5 A	1
Fuel injection system	10 A	1
Radiator fan motor	15 A	1
Backup	7.5 A	1
Backup 2	15 A	1
Electronic throttle valve	7.5 A	1
ABS motor	30 A	1
ABS solenoid	15 A	1
ABS control unit	7.5 A	1
Terminal 1	5.0 A	1
Spare	30 A	1
Spare	15 A	1
Spare	10 A	1
Spare	7.5 A	1
Spare	5.0 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:
   - Fuse box cover
   - Rider seat
   - Passenger seat
   Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS31006
REPLACING THE ECU (Engine Control Unit)

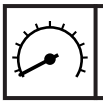
1. Turn the main switch to "OFF".

2. Replace the ECU (Engine Control Unit).
   Refer to "REMOVING THE ECU (Engine Control Unit)" on page 4-13.
3. Clean the ISC (Idle Speed Control).
   Refer to "CHECKING AND CLEANING THE THROTTLE BODIES" on page 7-13.
4. Reset:
   • O_2 feedback learning value
   a. Remove the protective cap, and then connect the YDT to the coupler.
      Refer to "YDT" on page 9-2.

Yamaha diagnostic tool USB (US)
90890-03275
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.

   b. Start the YDT and display the diagnosis of function.
   c. Select the "FI".
   d. Execute the diagnostic mode (Code 87).
      Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-48.
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).

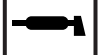
1. Remove:
   • Passenger seat
   • Rider seat
   • Rider seat bracket 1
   • Battery band
   Refer to "GENERAL CHASSIS (1)" on page 4-1.
2. Disconnect:
   • Battery lead
   (from the battery terminals)

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

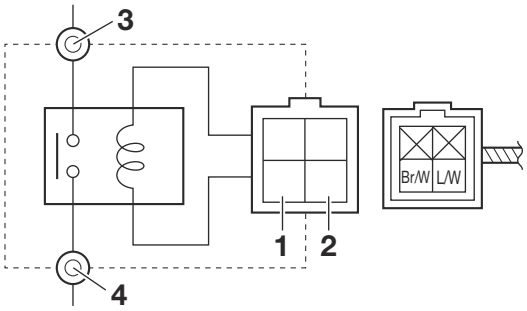
Check each relay for continuity with the digital circuit tester. If the continuity reading is incorrect, replace the relay.

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.

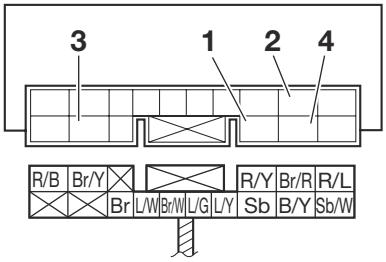
Starter relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Relay operation
Continuity
(between "3" and "4")

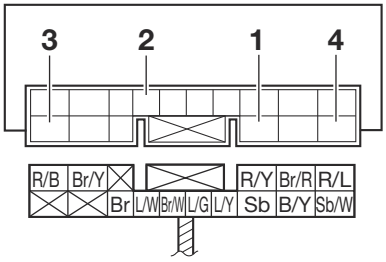
Relay unit (starting circuit cut-off relay)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
(between "3" and "4")

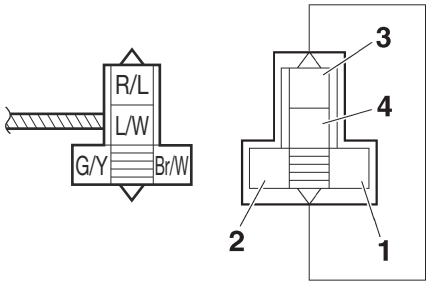
Relay unit (fuel pump relay)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
(between "3" and "4")

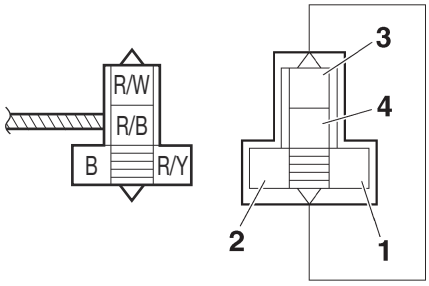
Radiator fan motor relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
(between "3" and "4")

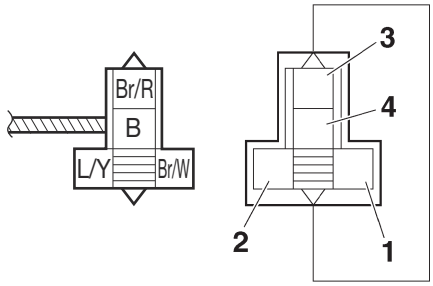
Engine stop relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
(between "3" and "4")

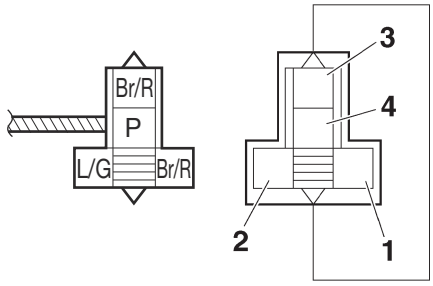
Starting circuit cut-off relay 2



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
(between "3" and "4")

Horn relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
(between "3" and "4")

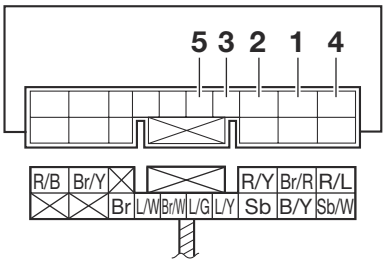
EAS30795

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
blue/yellow "3"
Negative tester probe
sky blue "2"
No continuity
Positive tester probe
sky blue "2"
Negative tester probe
blue/yellow "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
blue/yellow "3"
Negative tester probe
blue/green "5"
No continuity
Positive tester probe
blue/green "5"
Negative tester probe
blue/yellow "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.

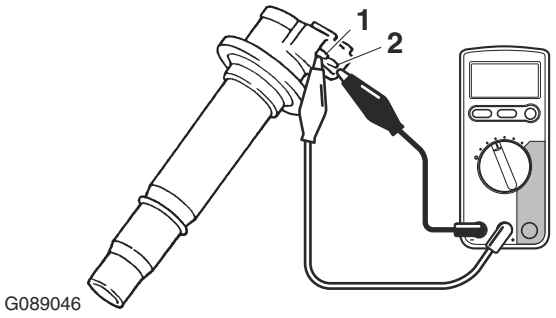
1. Check:
   • Primary coil resistance
   Out of specification → Replace.

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"



c. Measure the primary coil resistance.

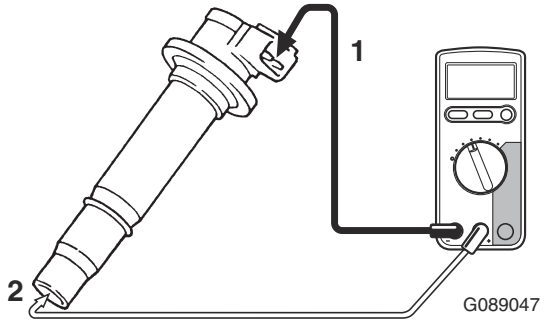
2. Check:
   • Secondary coil resistance
   Out of specification → Replace.

Secondary coil resistance
9.35–12.65 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

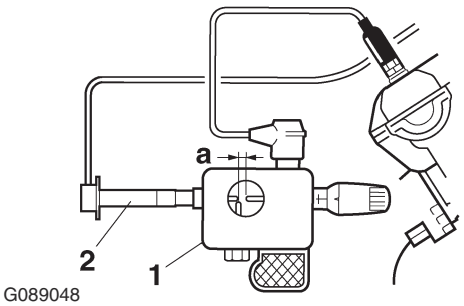
1. Check:
   • Ignition spark gap
   Out of specification → Perform the ignition system troubleshooting, starting with step (5).
   Refer to "TROUBLESHOOTING" on page 8-5.

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

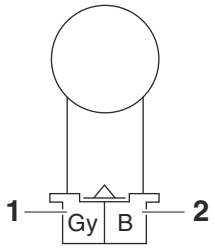
1. Disconnect:
   • Crankshaft position sensor coupler (from the wire harness)
2. Check:
   • Crankshaft position sensor resistance
   Out of specification → Replace the stator coil assembly.

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

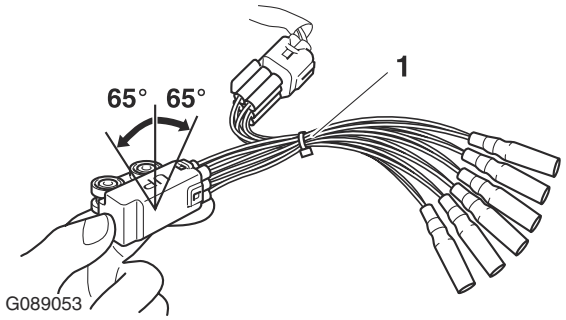
1. Remove:
   • Lean angle sensor (from the battery box)
2. Check:
   • Lean angle sensor output voltage
   Out of specification → Replace.

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

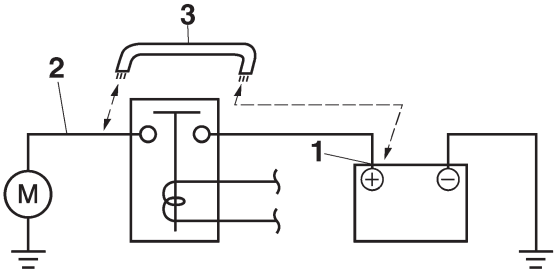
8-11.

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.**



G089054

b. Check the starter motor operation.

EAS30566

CHECKING THE STATOR COIL

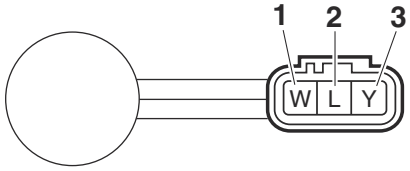
1. Disconnect:
   - Stator coil coupler (from the GCU (Generator Control Unit))
2. Check:
   - Stator coil
     a. Connect the digital circuit tester to the stator coil coupler as shown.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe
  White "1"
- Negative tester probe
  Blue "2"

- Positive tester probe
  White "1"
- Negative tester probe
  Yellow "3"

- Positive tester probe
  Blue "2"
- Negative tester probe
  Yellow "3"



b. Check the stator coil continuity.
c. If there is no continuity, replace the stator coil assembly.

EAS34072

CHECKING THE GCU (Generator Control Unit)

1. Check:
   - Battery charging voltage
     Out of specification → Check the stator coil condition. If the stator coil does not have a problem, replace the GCU (Generator Control Unit).
     Refer to "CHECKING THE STATOR COIL" on page 8-53.

Battery charging voltage
above 14 V at 5000 r/min

a. Connect the digital circuit tester to the battery terminal.

Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → Battery positive terminal
- Negative tester probe → Battery negative terminal

b. Start the engine and let it run at approximately 5000 r/min.
c. Measure the battery charging voltage.

EAS30569

CHECKING THE HORN

1. Check:
   - Horn sound
     Faulty sound → Replace.

EAS30573

CHECKING THE FUEL SENDER

1. Disconnect:
   - Fuel pump coupler

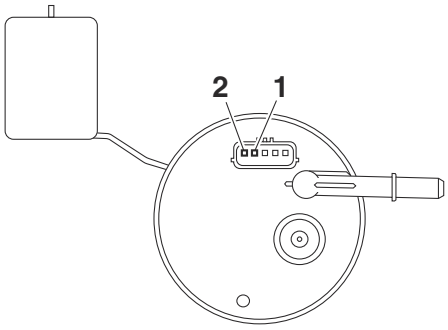
(from the fuel pump)
2. Remove:
   • Fuel tank
3. Remove:
   • Fuel pump
   (from the fuel tank)
4. Check:
   • Fuel sender resistance
   Out of specification → Replace the fuel pump.

Sender unit resistance (full)
9.0–12.0 Ω
Sender unit resistance (empty)
213.0–219.0 Ω

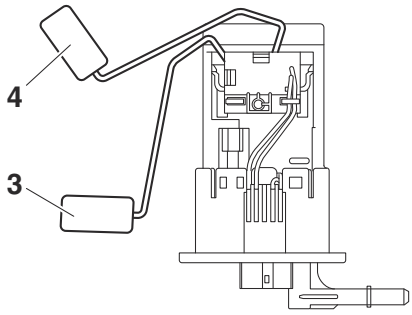
a. Connect the digital circuit tester to the fuel sender terminals as shown.

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"



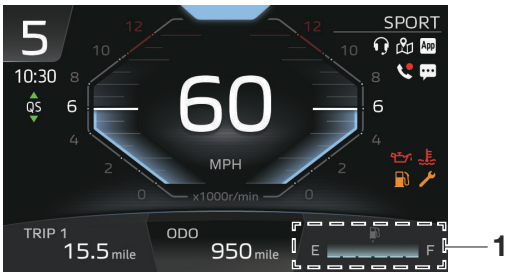
b. Move the fuel sender float to minimum "3" and maximum "4" level position.



c. Measure the fuel sender resistance.

EAS31372
CHECKING THE FUEL METER

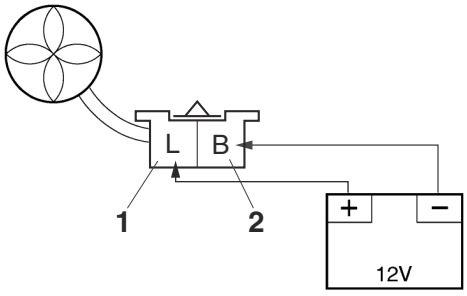
This model is equipped with a self-diagnosis device for the fuel level detection circuit.
1. Check:
   • Fuel meter "1"
   (Turn the main switch to "ON".)
   Fuel meter comes on for a few seconds, then goes off → Fuel meter is OK.
   Fuel meter does not come on → Replace the meter assembly.
   Fuel meter 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 5-38.

EWA14130
WARNING
- **Handle the coolant temperature sensor with special care.**
- **Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.**

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

Coolant temperature sensor resistance
2513–2777 Ω at 20 °C (2513–2777 Ω at 68 °F)
Coolant temperature sensor resistance
210–221 Ω at 100 °C (210–221 Ω at 212 °F)

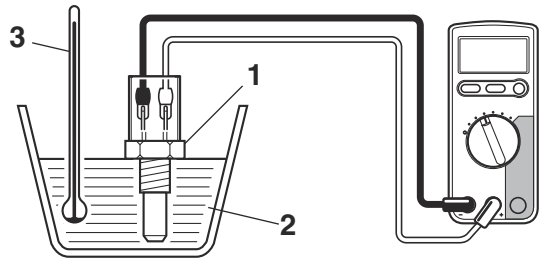
a. Connect the digital circuit tester to the coolant temperature sensor as shown.

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)

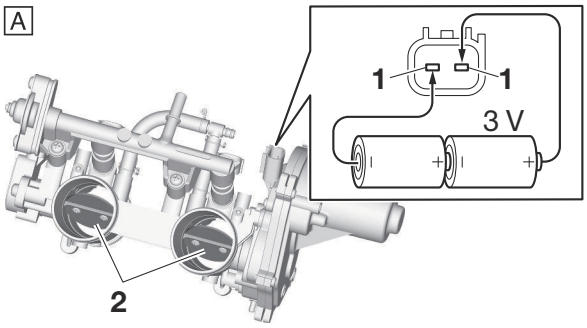
EAS30592
CHECKING THE THROTTLE SERVO MOTOR

1. Remove:
   - Throttle body assembly
     Refer to "THROTTLE BODIES" on page 7-9.
2. Check:
   - Throttle valve operation
     Throttle valves do not fully close → Replace the throttle bodies.
     a. Connect two C-size batteries to the throttle servo motor terminals "1" as shown.

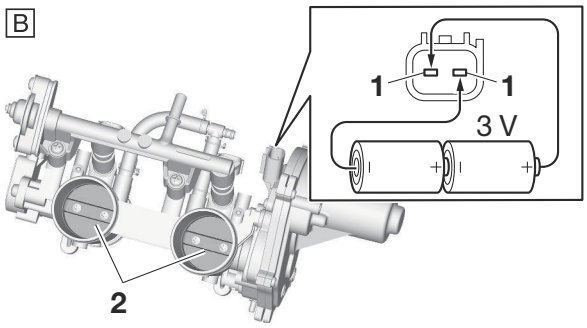
ECA17660
NOTICE
Do not use a 12 V battery to operate the throttle servo motor.

TIP
Do not use old batteries to operate the throttle servo motor.

A



B



A. Check that the throttle valves "2" open.
B. Check that the throttle valves "2" fully close.

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
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)

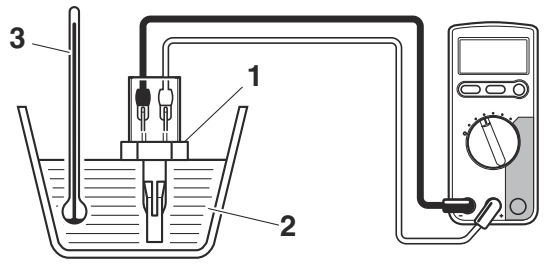
   a. Connect the digital circuit tester to the intake air temperature sensor terminal as shown.

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)

EAS30681
CHECKING THE FUEL INJECTORS
The following procedure applies to all of the fuel injectors.

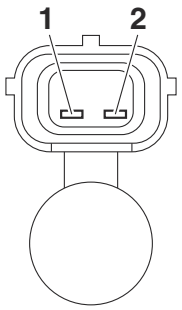
1. Remove:
   • Fuel injector
   Refer to "THROTTLE BODIES" on page 7-9.
2. Check:
   • Fuel injector resistance
   Out of specification → Replace the fuel injector.

Resistance
12.0 Ω

   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.

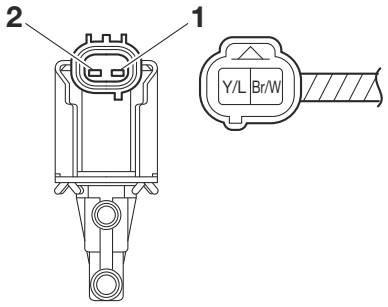
EAS32604
CHECKING THE PURGE CUT VALVE SOLENOID (for California only)
1. Check:
   • Purge cut valve solenoid resistance
   Out of specification → Replace.

Purge cut valve solenoid resistance
22.00–26.00 Ω

   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.

SELF DIAGNOSTIC

EAS20437
SELF-DIAGNOSTIC FUNCTION

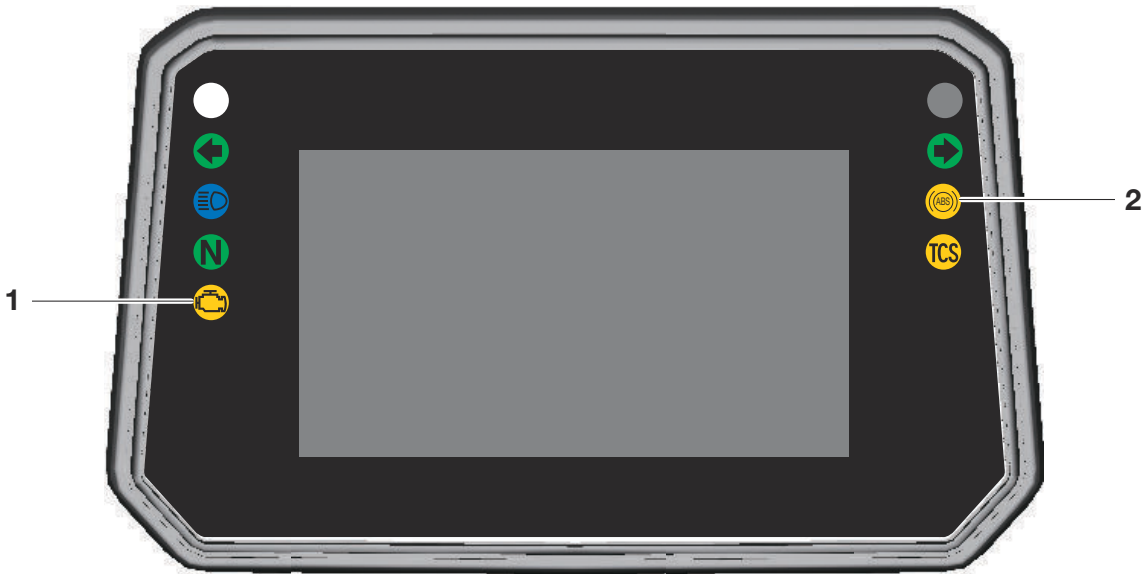
EAS33142
GLOSSARY

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.

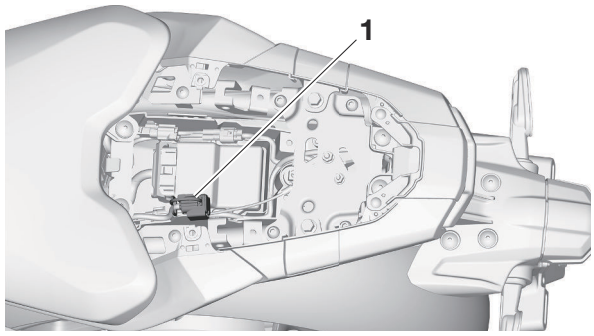
Yamaha diagnostic tool USB (US)
90890-03275
Yamaha diagnostic tool (A/I)
90890-03273

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

Remove the protective cap, and then connect the YDT to the coupler “1”.



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
- Gear position sensor
- Throttle position sensor
- Intake air pressure sensor
- Coolant temperature sensor
- Intake air temperature sensor
- Lean angle sensor
- Shift sensor (OPTION)
- Clutch switch
- Grip warmer (OPTION)
- Purge cut valve solenoid (for California only)
- Fuel pump
- O_2 sensor
- Throttle servo motor
- Relay unit
- Starter relay
- Radiator fan motor relay
- Starting circuit cut-off relay 2
- Handlebar switch (right)
- Meter assembly
- Headlight control unit
- Hydraulic unit assembly (ABS ECU)
- GCU (Generator Control Unit)
- BCM (Body Control Module)

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.

- GCU (Generator Control Unit)
- ECU (Engine Control Unit)
- Front wheel sensor
- Rear wheel sensor
- Handlebar switch (right)
- Meter assembly
- Front brake light switch
- Rear brake light switch
- Tail/brake light

EAS34063
PARTS CONNECTED TO THE BCM
The following parts are connected to the BCM.
When checking for a power short circuit, the couplers must be disconnected from all of the following parts beforehand.

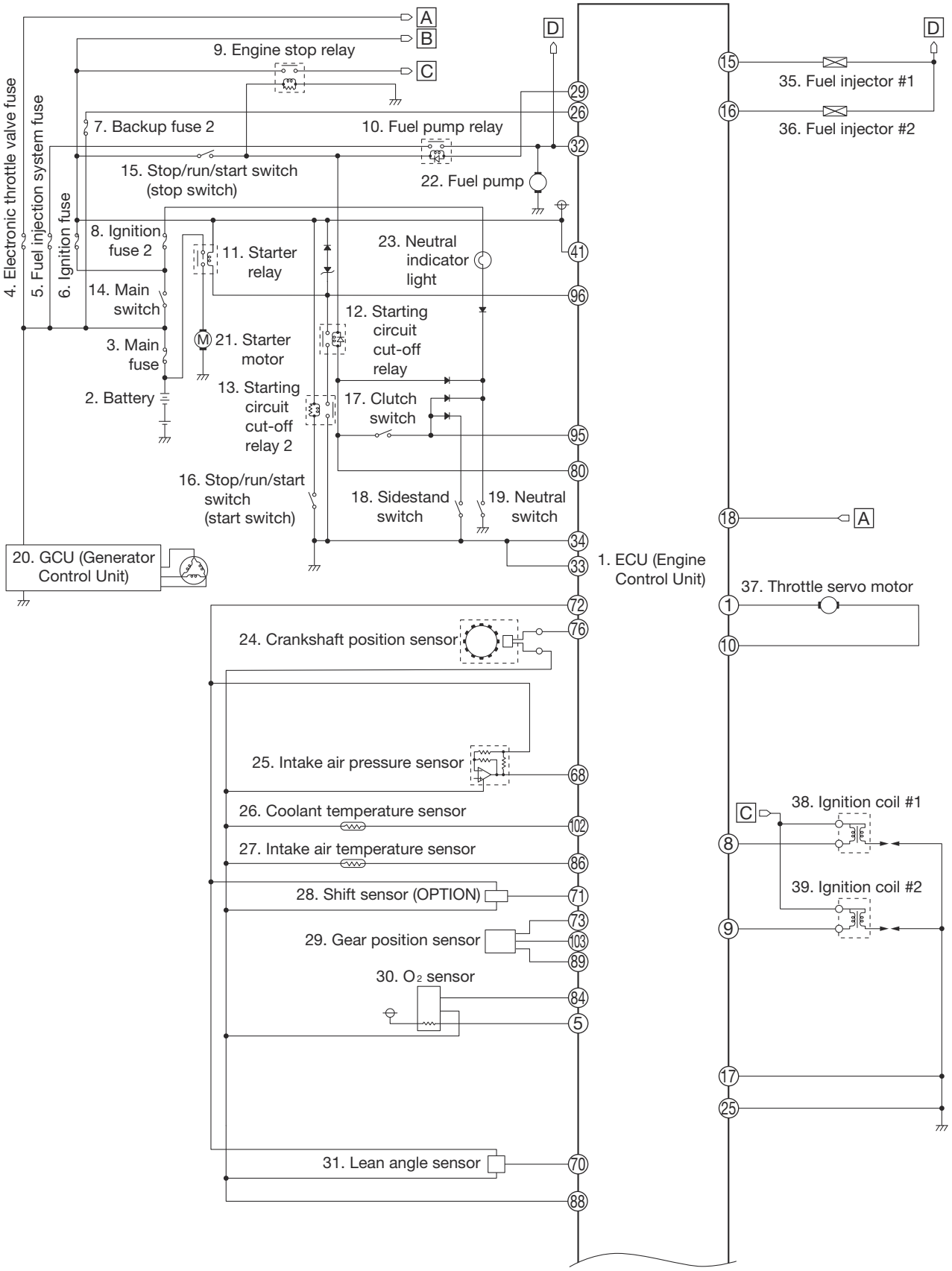
- Meter assembly
- ECU (Engine Control Unit)
- Rear turn signal light (right)
- Rear turn signal light (left)
- Front turn signal/position light (right)
- Front turn signal/position light (left)
- Horn relay
- Headlight control unit
- Handlebar switch (right)
- Handlebar switch (left)

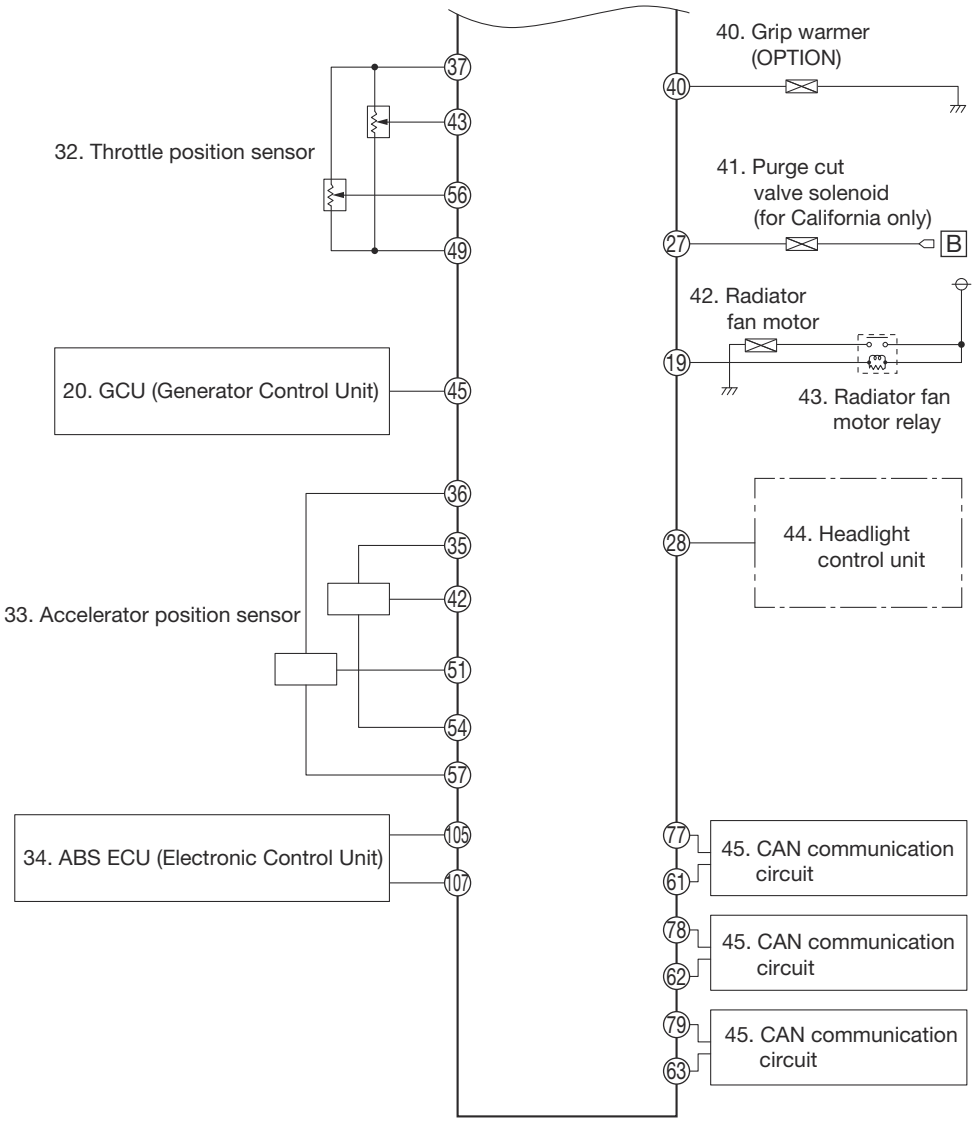
EAS33137
PRECAUTIONS FOR ROAD TEST
EWA20860
WARNING

When test riding the vehicle, always comply with local traffic regulations.

EAS20387
SYSTEM DIAGRAM

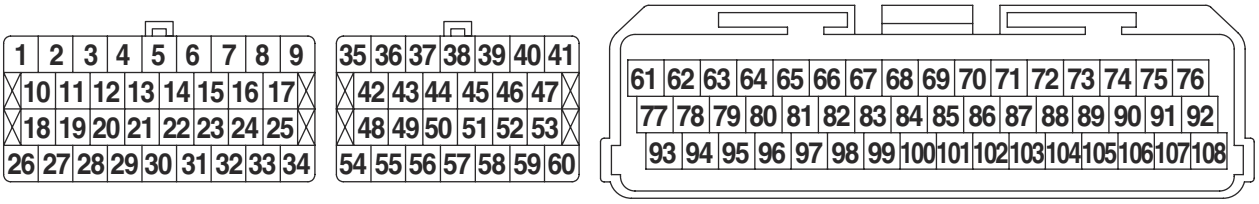
EAS32920
ECU CIRCUIT DIAGRAM




40. Grip warmer
(OPTION)
40
37
43
32. Throttle position sensor
56
49
41. Purge cut
valve solenoid
(for California only)
27
B
42. Radiator
fan motor
19
20. GCU (Generator Control Unit)
45
43. Radiator fan
motor relay
36
35
28
44. Headlight
control unit
33. Accelerator position sensor
42
51
54
57
77
45. CAN communication
circuit
61
105
34. ABS ECU (Electronic Control Unit)
107
78
45. CAN communication
circuit
62
79
45. CAN communication
circuit
63

1. ECU (Engine Control Unit)
2. Battery
3. Main fuse
4. Electronic throttle valve fuse
5. Fuel injection system fuse
6. Ignition fuse
7. Backup fuse 2
8. Ignition fuse 2
9. Engine stop relay
10. Fuel pump relay
11. Starter relay
12. Starting circuit cut-off relay
13. Starting circuit cut-off relay 2
14. Main switch
15. Stop/run/start switch (stop switch)
16. Stop/run/start switch (start switch)
17. Clutch switch
18. Sidestand switch
19. Neutral switch
20. GCU (Generator Control Unit)
21. Starter motor
22. Fuel pump
23. Neutral indicator light
24. Crankshaft position sensor
25. Intake air pressure sensor
26. Coolant temperature sensor
27. Intake air temperature sensor
28. Shift sensor (OPTION)
29. Gear position sensor
30. O_2 sensor
31. Lean angle sensor
32. Throttle position sensor
33. Accelerator position sensor
34. ABS ECU (Electronic Control Unit)
35. Fuel injector #1
36. Fuel injector #2
37. Throttle servo motor
38. Ignition coil #1
39. Ignition coil #2
40. Grip warmer (OPTION)
41. Purge cut valve solenoid (for California only)
42. Radiator fan motor
43. Radiator fan motor relay
44. Headlight control unit
45. CAN communication circuit

EAS33369
ECU COUPLER LAYOUT



No.	Connected parts	Wire harness color
1	Throttle servo motor	Y/G
2	—	—
3	—	—
4	—	—
5	O_2 sensor	P/W
6	—	—
7	—	—
8	Ignition coil #1	O/L
9	Ignition coil #2	Gy
10	Throttle servo motor	Y/W
11	—	—
12	—	—
13	—	—
14	—	—
15	Fuel injector #1	R/B
16	Fuel injector #2	G/B
17	Ground	B
18	Electronic throttle valve fuse	R/Y
19	Radiator fan motor relay	G/Y
20	—	—
21	—	—
22	—	—
23	—	—
24	—	—
25	Ground	B
26	Backup fuse 2	R/W

No.	Connected parts	Wire harness color
27	Purge cut valve solenoid (for California only)	Y/L
28	Headlight control unit	G
29	Fuel pump relay	L/W
30	—	—
31	—	—
32	Fuel pump relay, Fuel injector #1, Fuel injector #2, Fuel pump	R/L
33	Ground	B
34	Ground	B
35	Accelerator position sensor	W/R Y/R
36	Accelerator position sensor	Y/R
37	Throttle position sensor	L
38	—	—
39	—	—
40	Grip warmer (OPTION)	W
41	Ignition fuse	Br/W
42	Accelerator position sensor	W
43	Throttle position sensor	B
44	—	—
45	GCU (Generator Control Unit)	Gy/W
46	—	—
47	—	—
48	—	—

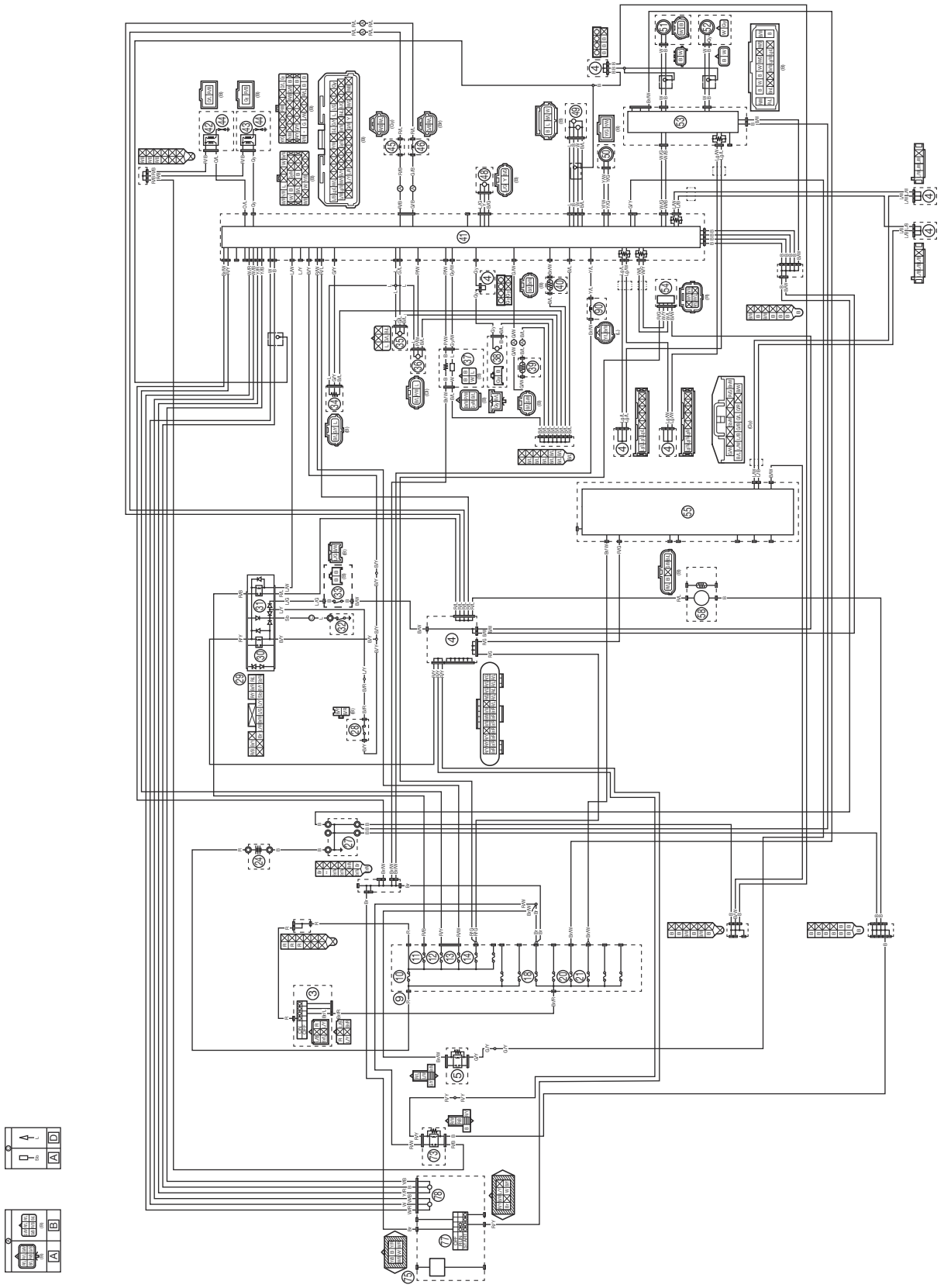
No.	Connected parts	Wire harness color
49	Throttle position sensor	B/L
50	—	—
51	Accelerator position sensor	B
52	—	—
53	—	—
54	Accelerator position sensor	W/B
55	—	—
56	Throttle position sensor	W
57	Accelerator position sensor	Y/B
58	—	—
59	—	—
60	—	—
61	CAN communication circuit	L/B
62	CAN communication circuit	Lg/L
63	CAN communication circuit	W/L
64	—	—
65	—	—
66	—	—
67	—	—
68	Intake air pressure sensor	P/W
69	—	—
70	Lean angle sensor	G/L
71	Shift sensor (OPTION)	G/Y
72	Intake air pressure sensor, Lean angle sensor, Shift sensor (OPTION)	L
73	Gear position sensor	L/G
74	—	—
75	—	—
76	Crankshaft position sensor	Gy

No.	Connected parts	Wire harness color
77	CAN communication circuit	L/W
78	CAN communication circuit	Lg/W
79	CAN communication circuit	W/Y
80	Starting circuit cut-off relay, Clutch switch	B/Y
81	—	—
82	—	—
83	—	—
84	O_2 sensor	Gy/W
85	—	—
86	Intake air temperature sensor	Br/W
87	—	—
88	O_2 sensor, Crankshaft position sensor, Intake air pressure sensor, Lean angle sensor, Coolant temperature sensor, Intake air temperature sensor, Shift sensor (OPTION)	B/L
89	Gear position sensor	B/G
90	—	—
91	—	—
92	—	—
93	—	—
94	—	—
95	Relay unit (diode), Clutch switch	B/R
96	Relay unit (diode), Starting circuit cut-off relay, Clutch switch	L/R
97	—	—
98	—	—
99	—	—
100	—	—
101	—	—
102	Coolant temperature sensor	G/W
103	Gear position sensor	Y

No.	Connected parts	Wire harness color
104	—	—
105	ABS ECU (Electronic Control Unit)	W/G
106	—	—
107	ABS ECU (Electronic Control Unit)	W/B
108	—	—

EAS20440
FUEL INJECTION SYSTEM

EAS32871
CIRCUIT DIAGRAM



3. Main switch
4. Joint coupler
5. Radiator fan motor relay
9. Fuse box
10. Main fuse
11. Fuel injection system fuse
12. Electronic throttle valve fuse
13. Backup fuse 2
14. Backup fuse
18. Ignition fuse
20. ABS control unit fuse
21. Ignition fuse 2
24. Battery
27. Engine ground
28. Clutch switch
29. Relay unit
30. Starting circuit cut-off relay
31. Fuel pump relay
32. Neutral switch
33. Sidestand switch
34. Shift sensor (OPTION)
35. Lean angle sensor
36. Intake air pressure sensor
37. O_2 sensor
38. Crankshaft position sensor
39. Coolant temperature sensor
40. Intake air temperature sensor
41. ECU (Engine Control Unit)
42. Ignition coil #1
43. Ignition coil #2
44. Spark plug
45. Fuel injector #1
46. Fuel injector #2
48. Gear position sensor
49. Throttle position sensor
50. Throttle servo motor
51. Front wheel sensor
52. Rear wheel sensor
53. ABS ECU (electronic control unit)
54. YDT coupler
55. Meter assembly
58. Fuel pump
73. Engine stop relay
75. Handlebar switch (right)
77. Stop/run/start switch
78. Accelerator position sensor
90. Purge cut valve solenoid (for California only)

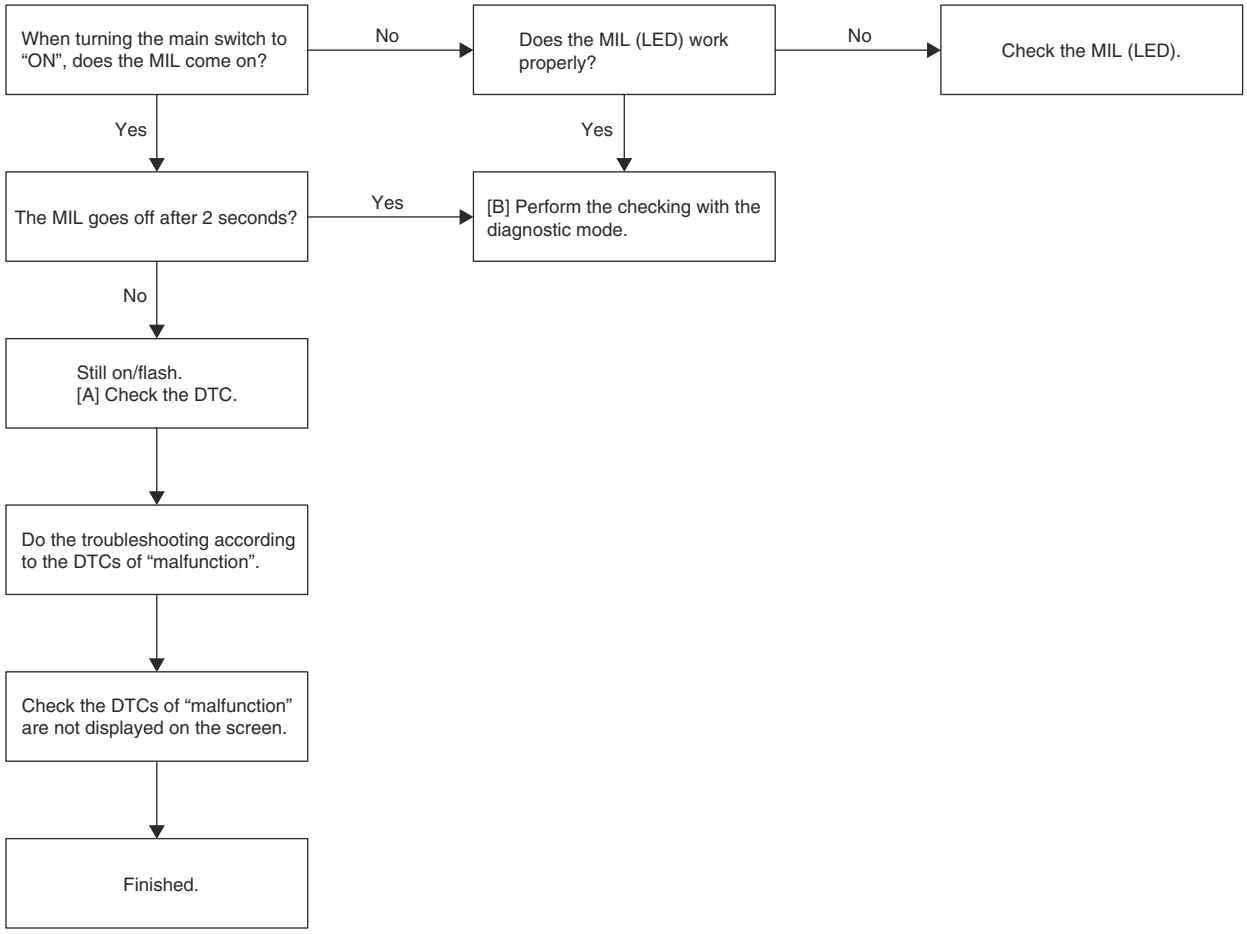
A. Wire harness
B. Sub-wire harness (coolant temperature sensor, fuel injector #1, fuel injector #2)
D. Sub-wire harness (neutral switch)

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

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

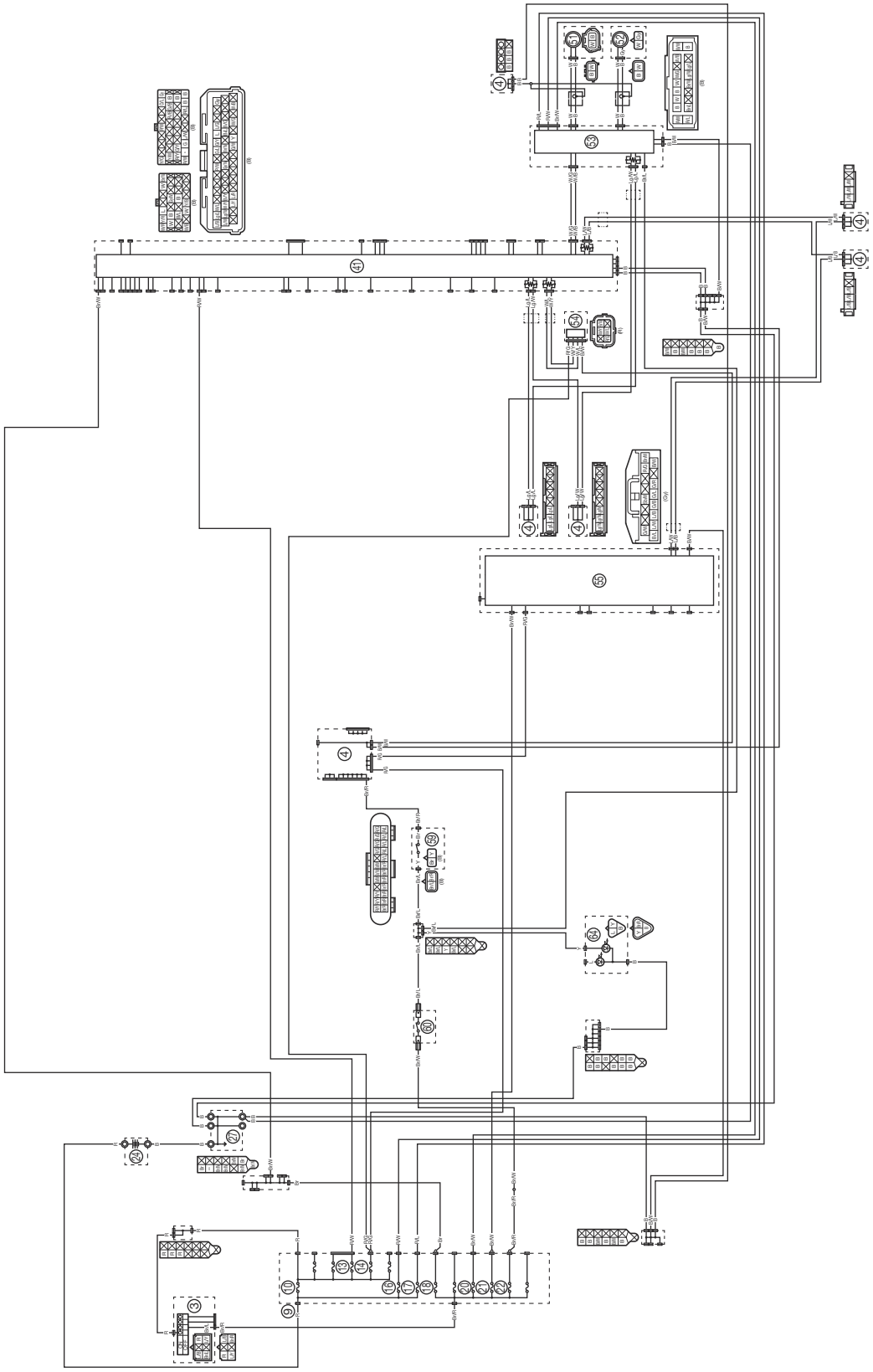
1. Monitor the operation of these sensors and actuators by using the YDT in the diagnostic mode.
   Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-48 and "DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE" on page 9-51.

01: Throttle position sensor signal 1 (throttle angle)
13: Throttle position sensor signal 2 (throttle angle)
14: Accelerator position sensor signal 1 (throttle angle)
15: Accelerator position sensor signal 2 (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)

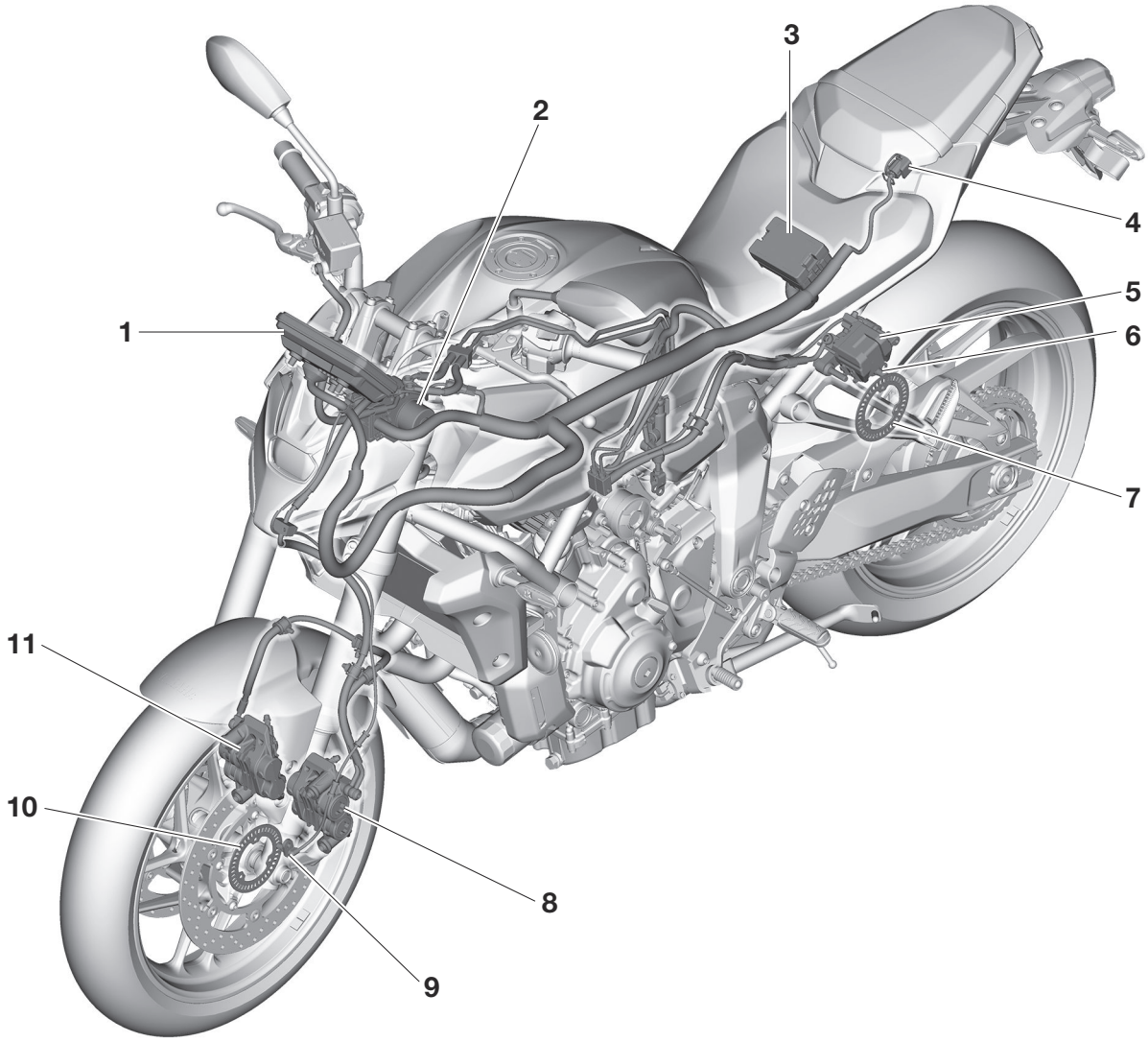
EAS32890
CIRCUIT DIAGRAM



3. Main switch
4. Joint coupler
9. Fuse box
10. Main fuse
13. Backup fuse 2
14. Backup fuse
16. ABS solenoid fuse
17. ABS motor fuse
18. Ignition fuse
20. ABS control unit fuse
21. Ignition fuse 2
22. Signaling system fuse
24. Battery
27. Engine ground
41. ECU (Engine Control Unit)
51. Front wheel sensor
52. Rear wheel sensor
53. ABS ECU (electronic control unit)
54. YDT coupler
55. Meter assembly
59. Rear brake light switch
60. Front brake light switch
64. Tail/brake light

*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

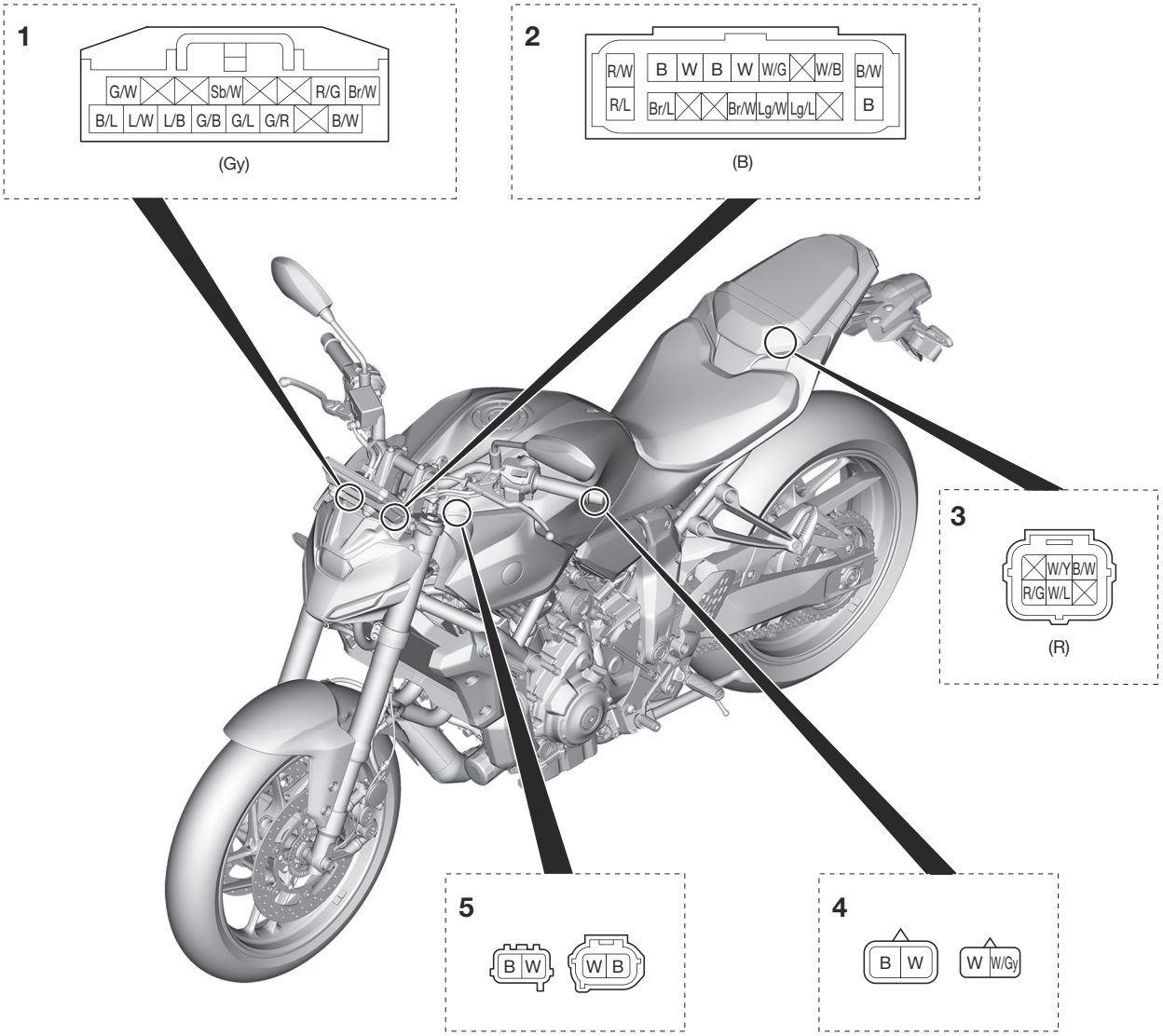
EAS32891
ABS COMPONENTS CHART



1. Meter assembly
2. Hydraulic unit assembly (ABS ECU)
3. Fuse box (ABS motor fuse, ABS solenoid fuse, ABS control unit fuse)
4. YDT coupler
5. Rear brake caliper
6. Rear wheel sensor
7. Rear wheel sensor rotor
8. Front brake caliper (left)
9. Front wheel sensor
10. Front wheel sensor rotor
11. Front brake caliper (right)

EAS32892

ABS COUPLER LOCATION CHART



1. Meter assembly coupler
2. ABS ECU coupler
3. YDT coupler
4. Rear wheel sensor coupler
5. Front wheel sensor coupler

EAS32893

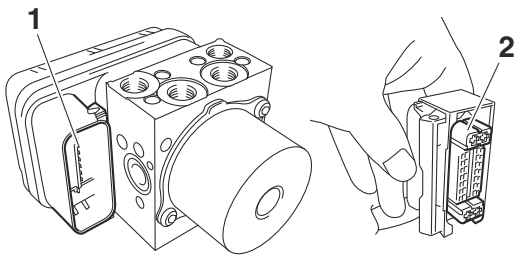
MAINTENANCE OF THE ABS ECU

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 9-30.

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 5 km/h (3 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 5 km/h (3 mi/h)). → ABS operation is normal.
3. The ABS warning light flashes → ABS operation is normal.
   - Refer to "BASIC INSTRUCTIONS FOR TROUBLESHOOTING" on page 9-26.

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 fault code when the service is finished. (This is because the past fault code will be displayed again if another malfunction occurs.)

EAS32895
BASIC INSTRUCTIONS FOR TROUBLESHOOTING
1. Check the fault code of "malfunction" using the YDT.
2. Check and repair the malfunction according to applicable fault code troubleshooting.
3. Turn the main switch from "OFF" to "ON", and then check the fault code of "malfunction" is not displayed.

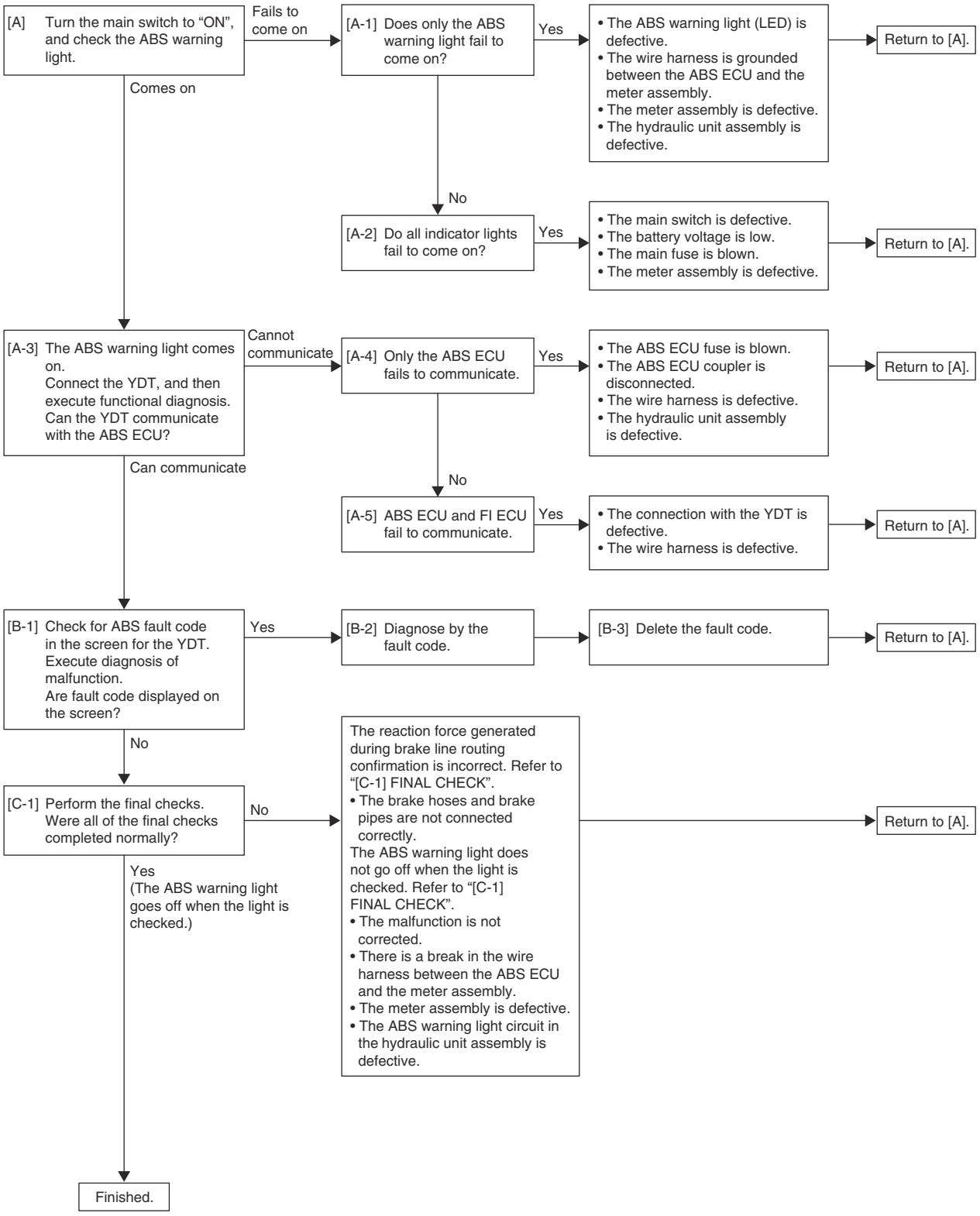
TIP
- If another fault code is displayed, repeat steps (1) to (3) until no fault code is displayed.
- Turning the main switch to "OFF" will not erase the malfunction history.

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.



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 8-42.
   • 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 8-48.
   • 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 8-47.
   • If the main fuse is blown, replace the fuse.
4. Circuit
   • Check the meter assembly circuit.
   Refer to "CIRCUIT DIAGRAM" on page 9-20.
   • 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 YDT 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 control unit fuse
   • Check the ABS control unit fuse for continuity.
   Refer to "CHECKING THE FUSES" on page 8-47.
   • If the ABS control unit 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 4-56.
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 YDT coupler.
   Check for continuity between blue/red terminal of the ABS ECU coupler and blue/red terminal of the YDT coupler. (CANH)
   Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the YDT 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 YDT coupler.
   Check for continuity between blue/white terminal of the ABS ECU coupler and blue/red terminal of the YDT coupler. (CANH)
   Check for continuity between blue/black terminal of the ABS ECU coupler and blue/black terminal of the YDT coupler. (CANL)

EAS32903
[B-1] MALFUNCTION ARE CURRENTLY DETECTED
When the YDT is connected to the YDT coupler, the fault code will be displayed on the computer screen.
• A fault code is displayed. [B-2]
• A fault code is not displayed. [C-1]

EAS32904
[B-2] DIAGNOSIS USING THE FAULT CODES
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)
90890-03275
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 9-2.
Details about the displayed fault codes are shown in the following chart. Refer to this chart and check the vehicle.
Once all the work is complete, delete the fault codes. [B-3]

TIP
Do the final check after terminating the connection with the YDT and turning the main switch off. [C-1]

EAS33339
[B-3] DELETING THE FAULT CODES
To delete the fault codes, use the YDT. For information about deleting the fault codes, refer to the operation manual of the YDT.
Check that all the displayed fault codes are deleted.

Yamaha diagnostic tool USB (US)
90890-03275
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 9-2.

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 4-19 and “INSTALLING THE REAR WHEEL (REAR BRAKE DISC)” on page 4-26.
3. Perform brake line routing confirmation.
   Refer to “HYDRAULIC UNIT OPERATION TESTS” on page 4-58.
   If it does not have reaction-force properly, the brake hose is not properly routed or connected.
4. Delete the fault codes.
   Refer to “[B-3] DELETING THE FAULT CODES” on page 9-30.
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 9-28.
   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 (FOR FUEL INJECTION SYSTEM)

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"P0030"	O_2 sensor heater: defective heater or heater driver ON/OFF command and error signal is mismatching.	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. Normal signal is not received from the coolant temperature sensor circuit. [P0118] Coolant temperature sensor: open or short to power circuit is detected. Normal signal is not received from the coolant temperature sensor circuit.	Able	Able	06
"P0122, P0123, P0222, P0223"	[P0122] Throttle position sensor: short to ground circuit is detected. Normal signal is not received from the throttle position sensor circuit. [P0123] Throttle position sensor: open or short to power circuit is detected. Normal signal is not received from the throttle position sensor circuit. [P0222] Throttle position sensor: open or short to ground circuit is detected. Normal signal is not received from the throttle position sensor circuit. [P0223] Throttle position sensor: short to power circuit is detected. Normal signal is not received from the throttle position sensor circuit.	Able (depending on the situation)	Able (depending on the situation)	01, 13
"P0132"	Front O_2 sensor: short to power circuit is detected. Normal signal is not received from the O_2 sensor.	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

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"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
"P0500, P1500"	[P0500] Rear wheel sensor: open or short circuit is detected. Normal signal is not received from the rear wheel sensor or ABS unit to ECU. [P1500] Neutral switch: open or short circuit is detected. Normal signal is not received from the rear wheel sensor to ECU when the gear-in. [P1500] Clutch switch: open or short circuit is detected. Normal signal is not received from the rear wheel sensor to ECU when the gear-in.	Able	Able	07, 21
"P0560, P0563"	[P0560] Battery charging voltage is abnormal. (Discharged condition) [P0563] Battery charging voltage is abnormal. (Overcharged condition)	Able	Able	—
"P0601"	ROM error. Internal malfunction in ECU. (When this malfunction is detected in the ECU, the DTC might not appear on the tool display.)	Unable	Unable	—
"P0606"	Processor error. Internal malfunction in ECU. (When this malfunction is detected in the ECU, the DTC might not appear on the tool display.)	Able/Unable (depending on the situation)	Able/Unable (depending on the situation)	—
"P062F"	EEPROM DTC: an error is detected while reading or writing on EEPROM.	Able/Unable (depending on the situation of EEPROM failure)	Able/Unable (depending on the situation of EEPROM failure)	60
"P0638"	YCC-T drive system: malfunction detected.	Able (depending on the situation)	Able (depending on the situation)	—
"P0657"	Fuel system voltage: normal voltage is not supplied to the fuel injector, fuel pump and relay unit.	Able	Able	09, 50

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"P0916, P0917"	[P0916] Gear position sensor: open or short to ground circuit is detected. Normal signal is not received from the gear position sensor to ECU. [P0917] Gear position sensor: short to power circuit is detected. Normal signal is not received from the gear position sensor to ECU.	Able	Able	—
"P1601"	Sidestand switch: open or short circuit of the wire harness 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).	Able/Unable (depending on the situation)	Able/Unable (depending on the situation)	—
"P1604, P1605"	[P1604] Lean angle sensor: short to ground circuit is detected. Normal signal is not received from the lean angle sensor. [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
"P1806, P1807 (OPTION)"	[P1806] Shift sensor (OPTION): open or short to ground circuit is detected. Normal signal is not received from the shift sensor to ECU. [P1807] Shift sensor (OPTION): short to power circuit is detected. Normal signal is not received from the shift sensor to ECU.	Able	Able	95
"P2122, P2123, P2127, P2128, P2138"	[P2122] Accelerator position sensor: open or short to ground circuit is detected. Normal signal is not received from the accelerator position sensor. [P2123] Accelerator position sensor: short to power circuit is detected. Normal signal is not received from the accelerator position sensor. [P2127] Accelerator position sensor: open or short to ground circuit is detected. Normal signal is not received from the accelerator position sensor. [P2128] Accelerator position sensor: short to power circuit is detected. Normal signal is not received from the accelerator position sensor. [P2138] Deviation error. Normal signal is not received from the accelerator position sensor.	Able (depending on the situation)	Able (depending on the situation)	14, 15
"P2135"	Throttle position sensor: output voltage deviation error. Normal signal is not received from the throttle position sensor circuit.	Able (depending on the situation)	Able (depending on the situation)	01, 13
"P2158"	Front wheel sensor: normal signal is not received from the front wheel sensor.	Able	Able	16
"P2195"	O_2 sensor: open circuit is detected. Normal signal is not received from the O_2 sensor.	Able	Able	—
"U0155 or Err"	Abnormal CAN communication: signals cannot be transmitted between the ECU and the meter assembly.	Able	Able	—

* "P0458" is indicated for California only.

EAS34180
DTC TABLE (FOR BODY CONTROL MODULE)

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"U0100_BCM"	Abnormal CAN communication: signals cannot be transmitted between the ECU and the BCM.	Able	Able	—
"U0121_BCM"	Abnormal CAN communication: signals cannot be transmitted between the ABS ECU and the BCM.	Able	Able	—
"U0155_BCM"	Abnormal CAN communication: signals cannot be transmitted between the BCM and the meter assembly.	Able	Able	—

EAS34182
FAULT CODE TABLE (FOR EVENT)

Fault code	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"30_EVENT"	Overturn is detected.	Unable	Unable	08
"70_EVENT"	Engine forcibly stops when the vehicle is left idling for a long period.	Able/Unable (depending on the situation)	Able/Unable (depending on the situation)	—

EAS34178
FAULT CODE TABLE (FOR ANTI-LOCK BRAKE SYSTEM)

Fault code	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"11_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)	—	—	—
"21_ABS"	Hydraulic unit assembly (defective solenoid drive circuit)	—	—	—
"31_ABS"	Hydraulic unit assembly (defective ABS solenoid power circuit)	—	—	—
"33_ABS"	Hydraulic unit assembly (abnormal ABS motor power supply)	—	—	—
"34_ABS"	Hydraulic unit assembly (short circuit in ABS motor power supply circuit)	—	—	—

Fault code	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
“41_ABS”	Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	—	—	—
“42_ABS”	Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	—	—	—
“43, 45_ABS”	Front wheel sensor (missing pulses)	—	—	—
“44, 46_ABS”	Rear wheel sensor (missing pulses)	—	—	—
“51_ABS”	Vehicle system power supply (voltage of ABS ECU power supply is high)	—	—	—
“53_ABS”	Vehicle system power supply (voltage of ABS ECU power supply is low)	—	—	—
“55_ABS”	Hydraulic unit assembly (defective ABS ECU)	—	—	—
“56_ABS”	Hydraulic unit assembly (abnormal internal circuit)	—	—	—
“57_ABS”	Vehicle CAN communication line or power source of vehicle system	—	—	—
“62_ABS”	Power supply voltage failure in pressure sensor	—	—	—
“68_ABS”	Defective hydraulic unit assembly (defective front pressure sensor)	—	—	—
“89_ABS”	CAN communication (between meter assembly and hydraulic unit assembly)	—	—	—
“90_ABS”	CAN communication (between ECU and hydraulic unit assembly)	—	—	—

EAS33028

SELF-DIAGNOSTIC FUNCTION TABLE (FOR FUEL INJECTION SYSTEM)

TIP

For details of the DTC, refer to “BASIC PROCESS FOR TROUBLESHOOTING” on page 9-17.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
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.)

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. Quick shift system 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. Quick shift system 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. Normal signal is not received from the coolant temperature sensor circuit. [P0118] Coolant temperature sensor: open or short to power circuit is detected. Normal signal is not received from the coolant temperature sensor circuit.	[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]. Quick shift system is not carried out.
P0122 P0123 P0222 P0223 P2135	[P0122] Throttle position sensor: short to ground circuit is detected. Normal signal is not received from the throttle position sensor circuit. [P0123] Throttle position sensor: open or short to power circuit is detected. Normal signal is not received from the throttle position sensor circuit. [P0222] Throttle position sensor: open or short to ground circuit is detected. Normal signal is not received from the throttle position sensor circuit. [P0223] Throttle position sensor: short to power circuit is detected. Normal signal is not received from the throttle position sensor circuit. [P2135] Throttle position sensor: output voltage deviation error. Normal signal is not received from the throttle position sensor circuit.	[P0122, P0222] Low voltage of the throttle position sensor circuit (0.25 V or less) [P0123, P0223] High voltage of the throttle position sensor circuit (4.75 V or more) [P2135] Difference in output voltage 1 and output voltage 2 of the throttle position sensor • 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[°]. 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. O_2 sensor heater driving is not carried out. Quick shift system 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. Normal signal is not received from the O_2 sensor.	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. Quick shift system 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. Injection to the applicable cylinder group is cut off. Quick shift system 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.
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. Quick shift system is not carried out.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
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.
P0500 P1500	[P0500] Rear wheel sensor: open or short circuit is detected. Normal signal is not received from the rear wheel sensor or ABS unit to ECU. [P1500] Neutral switch: open or short circuit is detected. Normal signal is not received from the rear wheel sensor to ECU when the gear-in. [P1500] Clutch switch: open or short circuit is detected. Normal signal is not received from the rear wheel sensor to ECU when the gear-in.	• Open or short circuit in wire harness between rear wheel sensor and ABS unit. • Open or short circuit in wire harness between ABS unit and ECU. • [P1500] Open or short circuit in wire harness between neutral switch and ECU. • [P1500] Open or short circuit in wire harness between clutch switch and ECU. • Defective rear wheel sensor. • [P1500] Defective neutral switch. • [P1500] Defective clutch switch. • [P1500] Improper adjustment of clutch lever. • Malfunction in ECU.	Vehicle speed is not displayed on the meter. [P1500] Indication of the neutral indicator light is incorrect. Engine idling speed is unstable. Traction control does not work.	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 neutral switch malfunctions is carried out. ISC feedback is not carried out. ISC learning is not carried out. Traction control does not work. Quick shift system is not carried out.
P0560	Battery charging voltage is abnormal. (Discharged condition)	• Battery discharging (broken or disconnected lead in charging system). • Battery discharging (defective GCU).	Engine is difficult to start. Increased exhaust emissions. Battery performance has deteriorated or battery is defective.	O_2 feedback is not carried out.
P0563	Battery charging voltage is abnormal. (Overcharged condition)	• Battery overcharging (defective GCU). • Battery overcharging (broken or disconnected lead in GCU 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	ROM error. 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.
P0606	Processor error. 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 response is poor. Loss of engine power.	Engine cannot be started. Ignition and injection are not carried out. Judgment for other DTCs is not carried out. Load control is not carried out. (The relay unit, radiator fan motor relay, and other relays are all turned off.) The CO adjustment mode and diagnostic mode cannot be activated. Output is restricted.
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.
P0638	YCC-T drive system: malfunction detected.	• Defective coupler between throttle servo motor and ECU. • Open or short circuit in wire harness between throttle servo motor and ECU. • Defective throttle servo motor. • Throttle servo motor is stuck (mechanism or motor). • Malfunction in ECU. • Blown electric throttle valve fuse.	Engine response is poor. Loss of engine power. Engine idling speed is unstable.	O_2 feedback is not carried out. YCC-T evacuation is activated. Output is restricted. ISC feedback is not carried out. ISC learning is not carried out.
P0657	Fuel system voltage: normal voltage is not supplied to the fuel injector, fuel pump and relay unit.	• 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
P0916 P0917	[P0916] Gear position sensor: open or short to ground circuit is detected. Normal signal is not received from the gear position sensor to ECU. [P0917] Gear position sensor: short to power circuit is detected. Normal signal is not received from the gear position sensor to ECU.	[P0916] Low voltage of the gear position sensor circuit (0.2 V or less) [P0917] High voltage of the gear position sensor circuit (4.8 V or more) • Defective coupler between gear position sensor and ECU. • Open or short circuit in wire harness between gear position sensor and ECU. • Poor circuit continuity in wire harness between gear position sensor and ECU. • Improperly installed gear position sensor. • Defective gear position sensor. • Malfunction in ECU.	Improper display for position. Engine response is poor.	Maintains the gear position value at the previous value. Quick shift system is not carried out.
P1601	Sidestand switch: open or short circuit of the wire harness 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).
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.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P1604 P1605	[P1604] Lean angle sensor: short to ground circuit is detected. Normal signal is not received from the lean angle sensor. [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.
P1806 P1807 (OPTION)	[P1806] Shift sensor (OPTION): open or short to ground circuit is detected. Normal signal is not received from the shift sensor to ECU. [P1807] Shift sensor (OPTION): short to power circuit is detected. Normal signal is not received from the shift sensor to ECU.	• Defective coupler between shift sensor (OPTION) and ECU. • Open or power short circuit in wire harness between shift sensor (OPTION) and ECU. • Improperly installed shift sensor (OPTION). • Defective shift sensor (OPTION). • Malfunction in ECU.	Unable to carry out Quick shift system. (If this abnormality occurs during actual shifting, the operation will be carried out until the process is completed.)	Quick shift system is not carried out.
P2122 P2123 P2127 P2128 P2138	[P2122] Accelerator position sensor: open or short to ground circuit is detected. Normal signal is not received from the accelerator position sensor. [P2123] Accelerator position sensor: short to power circuit is detected. Normal signal is not received from the accelerator position sensor. [P2127] Accelerator position sensor: open or short to ground circuit is detected. Normal signal is not received from the accelerator position sensor. [P2128] Accelerator position sensor: short to power circuit is detected. Normal signal is not received from the accelerator position sensor. [P2138] Deviation error. Normal signal is not received from the accelerator position sensor.	[P2122, P2127] Low voltage of the accelerator position sensor circuit (0.25 V or less) [P2123, P2128] High voltage of the accelerator position sensor circuit (4.75 V or more) [P2138] Difference in output voltage 1 and output voltage 2 of the accelerator position sensor • Defective coupler between accelerator position sensor and ECU. • Open or short circuit in wire harness between accelerator position sensor and ECU. • Improperly installed accelerator position sensor. • Defective accelerator position sensor. • Malfunction in ECU.	Engine response is poor. Loss of engine power. Engine idling speed is unstable.	No change in accelerator opening (transient control is not carried out). Accelerator opening is fixed to 0[°]. O_2 feedback is not carried out. YCC-T evacuation is activated. Fuel cut is prohibited by accelerator 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
P2158	Front wheel sensor: normal signal is not received from the front wheel sensor.	• Open or short circuit in wire harness between front wheel sensor and ABS ECU. • Defective front wheel sensor. • Malfunction in ABS ECU. • Malfunction in ECU.	Traction control does not work. Traction control system indicator on the meter comes on. Traction control system switch is disabled. (Traction control system indicator on the meter goes OFF.)	Traction control does not work.
P2195	O_2 sensor: open circuit is detected. Normal signal is not received from the O_2 sensor.	• Low voltage of the O_2 sensor circuit (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. Quick shift system is not carried out.

* "P0458" is indicated for California only.

EAS34060

SELF-DIAGNOSTIC FUNCTION TABLE (FOR BODY CONTROL MODULE)

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
U0100	Abnormal CAN communication: signals cannot be transmitted between the ECU and the BCM.	• Defective ECU coupler or BCM coupler. • Open or short circuit in wire harness between ECU and BCM. • Malfunction in ECU. • Malfunction in BCM.	Flasher auto cancel function stopped.	Flasher auto cancel function stopped.
U0121	Abnormal CAN communication: signals cannot be transmitted between the ABS ECU and the BCM.	• Defective ABS ECU coupler or BCM coupler. • Open or short circuit in wire harness between ABS ECU and BCM. • Malfunction in ABS ECU. • Malfunction in BCM.	Hazard flashing function stopped due to ESS (emergency stop signaling).	Hazard flashing function stopped due to ESS (emergency stop signaling).
U0155	Abnormal CAN communication: signals cannot be transmitted between the meter assembly and the BCM.	• Defective meter assembly coupler or BCM coupler. • Open or short circuit in wire harness between meter assembly and BCM. • Malfunction in meter assembly. • Malfunction in BCM.	Meter screen cannot be operated using joystick and home button on the handlebar switch (left). The spanner mark lights up and Err is displayed on the meter screen.	Meter screen cannot be operated using joystick and home button on the handlebar switch (left).

EAS34183
SELF-DIAGNOSTIC FUNCTION TABLE (FOR EVENT)

TIP
For details of the fault code, refer to "BASIC PROCESS FOR TROUBLESHOOTING" on page 9-17.

Fault code	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
30	Overturn is detected.	• The vehicle has overturned. • Installed condition of lean angle sensor. • Defective lean angle sensor. • Malfunction in ECU.	—	—
70	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.	—	—

EAS33286
SELF-DIAGNOSTIC FUNCTION TABLE (FOR ABS (Anti-lock Brake System))

TIP
For details of the fault code, refer to "BASIC INSTRUCTIONS FOR TROUBLESHOOTING" on page 9-26.

Fault code	Item	Symptom	Check point
11	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

Fault code	Item	Symptom	Check point
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
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
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
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
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

Fault code	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	Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	• Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. • 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 • Incorrect rotation of the rear wheel • Rear brake dragging • Defective hydraulic unit assembly
43* 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
44* 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
51	Vehicle system power supply (voltage of ABS ECU power supply is high)	Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too high.	• Defective battery • Disconnected battery terminal • Defective charging system
53	Vehicle system power supply (voltage of ABS ECU power supply is low)	Power voltage supplied to the ABS ECU in the hydraulic unit assembly is too low.	• 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
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 circuit)	Abnormality detected in of hydraulic unit assembly.	• Defective hydraulic unit assembly

Fault code	Item	Symptom	Check point
57	Vehicle CAN communication line or power source of vehicle system	Short-circuit in CAN communication line or the voltage that supplies the hydraulic unit assembly is too low.	• Short-circuit in CAN communication line • Defective battery • Defective coupler between battery and hydraulic unit assembly • Wire harness between battery and hydraulic unit is interrupted or has short-circuited • Defective charging system
62	Power supply voltage failure in pressure sensor	Abnormality detected in pressure sensor power supply circuit of hydraulic unit assembly.	• Defective hydraulic unit assembly
68	Defective hydraulic unit assembly (defective front pressure sensor)	Abnormality detected in pressure sensor circuit at front caliper side of hydraulic unit assembly.	In case of electrical interlocking brake • Defective front brake line • Defective hydraulic unit assembly
89	CAN communication (between meter assembly and hydraulic unit assembly)	Transmitted data from the meter cannot be normally received.	• Defective coupler between meter assembly and hydraulic unit assembly • Harness is broken or short-circuit between meter assembly and hydraulic unit assembly • Defective meter assembly • Defective hydraulic unit assembly
90	CAN communication (between ECU and hydraulic unit assembly)	Transmitted data from the FI ECU cannot be normally received.	• Defective coupler between FI ECU and hydraulic unit assembly • Harness is broken or short-circuit between FI ECU and hydraulic unit assembly • Defective FI ECU • Defective hydraulic unit assembly

* The fault code 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 (meter display)	Abnormal CAN communication: signals cannot be transmitted between the ECU and the meter assembly.	Communication between the ECU and the meter is not possible. • Defective meter assembly coupler and ECU coupler. • Open or short circuit in the wire harness between the meter assembly and the ECU. • Defective meter assembly. • Defective ECU.	Defective meter display.	MAP changeover: State is fixed. Traction control does not work. Meter switch input: OFF is fixed. Quick shift system is not carried out.

EAS33031
DIAGNOSTIC CODE: SENSOR OPERATION TABLE

Code	Item	Tool display	Procedure
01	Throttle position sensor signal 1	Displays the throttle valve opening angle 1.	
	• Fully closed position	14–16 [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	Operate the throttle while pushing the "≋" side of the stop/run/start switch. (If the display 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 intake 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.
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	Displays the lean angle sensor output voltage	Remove the lean angle sensor and incline it more than 45 degrees.
	• Upright	0.4–1.4 [V]	
	• Overturned	3.7–4.4 [V]	
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.)

Code	Item	Tool display	Procedure
13	Throttle position sensor signal 2	Displays the throttle valve opening angle 2.	
	• Fully closed position	9–23	Check with throttle valves fully closed position.
	• Fully open position	93–109	Check with throttle valves fully open position.
14	Accelerator position sensor signal 1	0–125	
	• Fully closed position	14–18	Check with throttle grip fully closed position.
	• Fully open position	82–92	Check with throttle grip fully open position.
	• Turn the throttle grip past the closed position in the deceleration direction.	7–12	
15	Accelerator position sensor signal 2	0–125	
	• Fully closed position	14–18	Check with throttle grip fully closed position.
	• Fully open position	82–92	Check with throttle grip fully open position.
	• Turn the throttle grip past the closed position in the deceleration direction.	7–12	
16	Front wheel vehicle speed pulses	Front wheel speed pulse 0–999	Check that the number increases when the front wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.
20	Sidestand switch		Check the sidestand switch condition. (with the transmission in gear).
	• Sidestand retracted	ON	
	• Sidestand extended	OFF	
21	Neutral switch and clutch switch		Operate the transmission, clutch lever, and sidestand.
	• Transmission is in neutral	ON	
	• Transmission is in gear or the clutch lever released	OFF	
	• Clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON	
	• Clutch lever is squeezed with the transmission in gear and when the sidestand is extended	OFF	

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.
95	Shift sensor (OPTION) • Shift sensor output voltage display • With no shift weighting input • Shift up weighting • Shift down weighting	 0.2–4.8 [V] Approx. 2.5 [V] Changes to the high side Changes to the low side	Check the sensor condition by operating the shift pedal.
104	O_2 feedback cycle data erasure	00 O_2 feedback cycle data has been erased. 01 O_2 feedback cycle data has been erased.	To erase the O_2 feedback cycle data, push the "Operation" button 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.
52	Headlight	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 comes on five times.
57	Grip warmer (OPTION)	Turns on the grip warmers for 2 minutes.	Check that the grip warmers become warm.

* 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 number P0122, P0123, P0222 and P0223	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.
207	Accelerator position sensor	Brief abnormality detected in the accelerator position sensor	Same as for DTC number P2122, P2123, P2127 and P2128	Perform the inspection items listed for DTC number P2122, P2123, P2127 and P2128.
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.
251	Shift sensor (OPTION)	Brief abnormality detected in the shift sensor	Same as for DTC number P1806 and P1807	Perform the inspection items listed for DTC number P1806 and P1807.

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

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.
   • Display the diagnosis of function.
   • Select the “FI”.
   • 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.
   Refer to “GENERAL CHASSIS (1)” on page 4-1.
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 8-47.

EAS20554
70_EVENT

EAS33034
TROUBLESHOOTING
Item
Engine forcibly stops when the vehicle is left idling for a long period.
Procedure
TIP
If another fault code is displayed at the same time, check the other fault code 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 8-47.

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.
- Display only (If the O_2 sensor does not operate, O_2 feedback is not carried out.)

Procedure

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. Start the engine and warm-up the vehicle (5 min or more), 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 stop/run/start switch to run.

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 warm-up the vehicle (5 min or more), 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

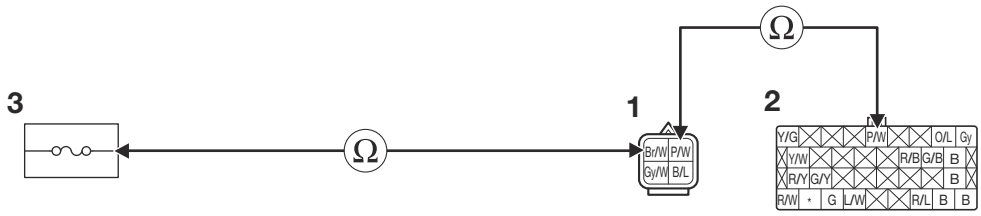
→ Go to step 3.

TIP

For this check, also set the stop/run/start switch to run.

3. Wire harness continuity.
   - Disconnect the O_2 sensor coupler "1", ECU coupler "2" and ignition fuse "3".
   - Open circuit check

Between O_2 sensor coupler "1" and ECU coupler "2"	pink/white–pink/white
Between O_2 sensor coupler "1" and ignition fuse holder "3"	brown/white–brown



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Start the engine and warm-up the vehicle (5 min or more), 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 stop/run/start switch to run.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-3.

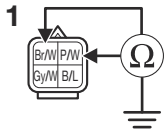
Ground short circuit check "A"

Between O_2 sensor coupler "1" and ground	brown/white–ground pink/white–ground

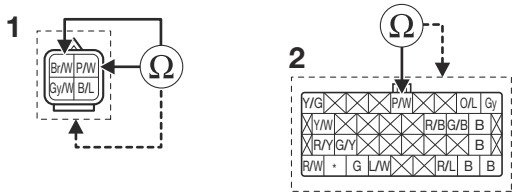
Lines short circuit check "B"

O_2 sensor coupler "1"	brown/white–any other coupler terminal pink/white–any other coupler terminal
ECU coupler "2"	pink/white–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

a. Replace the wire harness.
b. Start the engine and warm-up the vehicle (5 min or more), 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 stop/run/start switch to run.

4. Defective O_2 sensor.
   - Replace the O_2 sensor.
     Refer to "ENGINE REMOVAL" on page 5-17.
   - 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 stop/run/start switch to run.

5. Malfunction in ECU.
   - Replace the ECU, and complete the service.
     Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.
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.

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.
- 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.
- Quick shift system is not carried out.

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

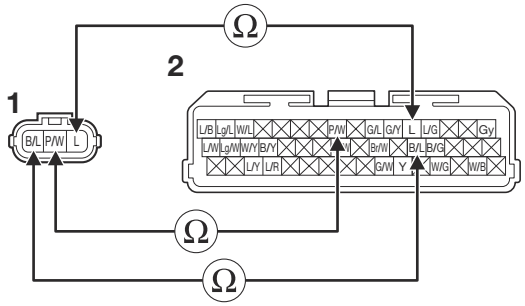
→ Go to step 7, and complete the service.
NO
→ Go to step 3.

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



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 9-3.

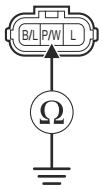
Ground short circuit check "A"

Between intake air pressure sensor coupler "1" and ground	[P0107] pink/white–ground

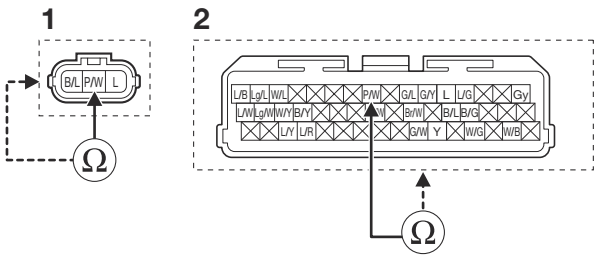
Lines short circuit check "B"

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



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 "THROTTLE BODIES" on page 7-9.

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.
   • Display the diagnosis of function.
   • Select the "FI".
   • 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 "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 8-47.
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.
- 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.
- Quick shift system is not carried out.

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

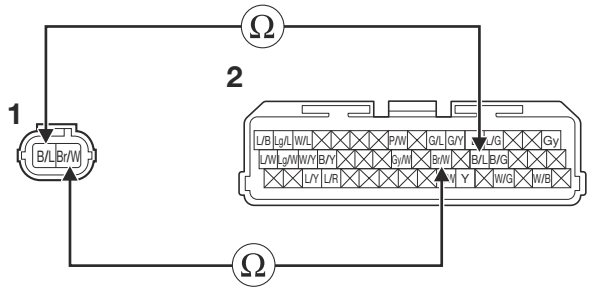
→ Go to step 7, and complete the service.
NO
→ Go to step 3.

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



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 9-3.

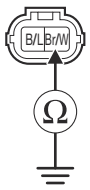
Ground short circuit check "A"

Between intake air temperature sensor coupler "1" and ground	[P0112] brown/white–ground

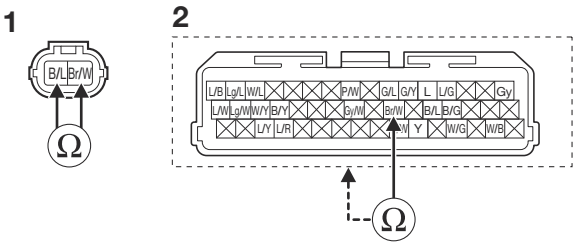
Lines short circuit check "B"

Intake air temperature sensor coupler "1"	[P0113] brown/white–black/blue
ECU coupler "2"	[P0113] brown/white–any other coupler terminal

A



B



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.
   • Display the diagnosis of function.
   • Select the "FI".
   • 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 8-55.

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 8-47.
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. Normal signal is not received from the coolant temperature sensor circuit.
- [P0118] Coolant temperature sensor: open or short to power circuit is detected. Normal signal is not received from the coolant temperature sensor circuit.

Fail-safe system
- Able to start engine.
- Able to drive vehicle.
- 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].
- Quick shift system is not carried out.

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.

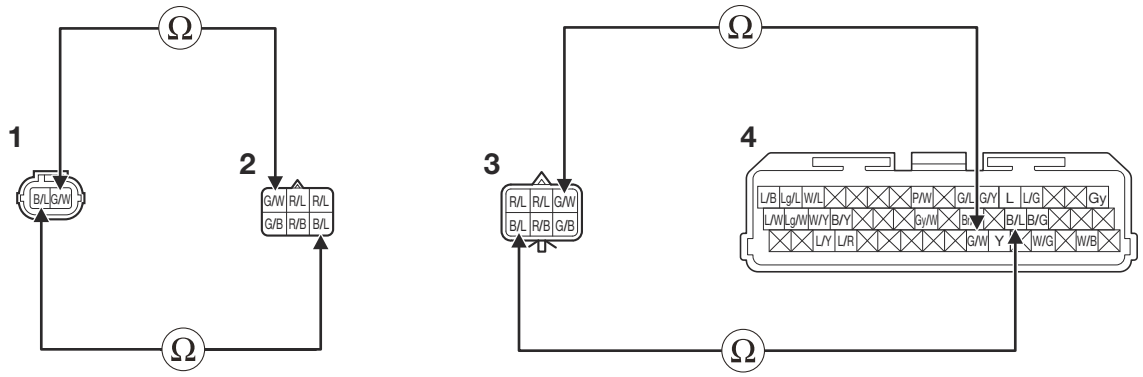
Is it in the "Recovered" condition?
YES
→ Go to step 8, and complete the service.
NO
→ Go to step 4.

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



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

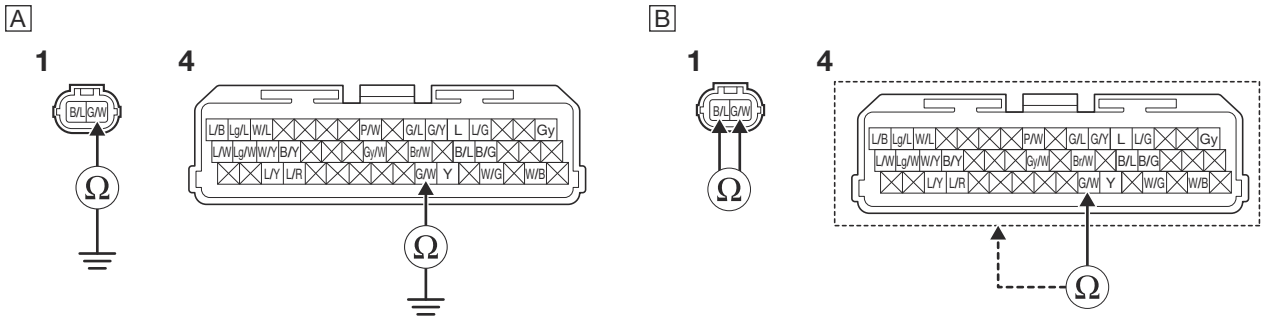
TIP
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-3.

Ground short circuit check "A"

Between coolant temperature sensor coupler "1" and ground	[P0117] green/white–ground
Between ECU coupler "4" and ground	[P0117] green/white–ground

Lines short circuit check "B"

Coolant temperature sensor coupler "1"	[P0118] green/white–black/blue
ECU coupler "4"	[P0118] green/white–any other coupler terminal



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 5-38.

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.
   - Display the diagnosis of function.
   - Select the "FI".
   - 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 8-54.

Is check result OK?

YES

→ Go to step 7.

NO

a. Replace the coolant temperature sensor.
   Refer to "CYLINDER HEAD" on page 5-38.
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 8-47.
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.

EAS20813
P0122, P0123, P0222, P0223

EAS33050
TROUBLESHOOTING
Item
- [P0122] Throttle position sensor: short to ground circuit is detected. Normal signal is not received from the throttle position sensor circuit.
- [P0123] Throttle position sensor: open or short to power circuit is detected. Normal signal is not received from the throttle position sensor circuit.
- [P0222] Throttle position sensor: open or short to ground circuit is detected. Normal signal is not received from the throttle position sensor circuit.
- [P0223] Throttle position sensor: short to power circuit is detected. Normal signal is not received from the throttle position sensor circuit.

Fail-safe system
- Able to start engine (depending on the situation).
- Able to drive vehicle (depending on the situation).
- Change in the throttle opening value is 0 (transient control is not carried out).
- D–j is fixed.
- Throttle opening is fixed to 125[°].
- O_2 feedback is not carried out.
- Output is restricted.
- ISC feedback is not carried out.
- ISC learning is not carried out.
- O_2 sensor heater driving is not carried out.
- Quick shift system is not carried out.

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 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 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.

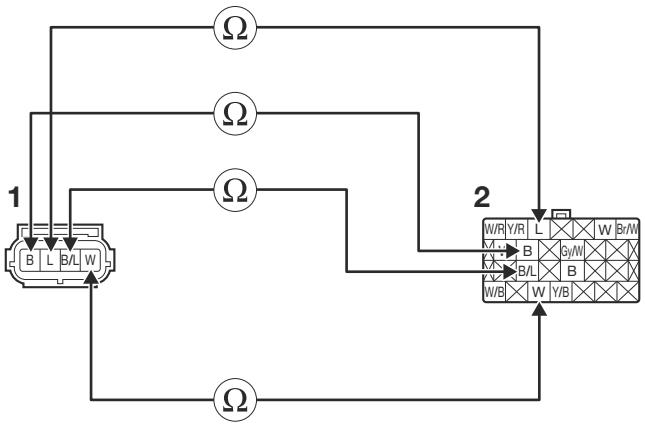
Is it in the "Recovered" condition?
YES
→ Go to step 8, and complete the service.
NO
→ Go to step 3.

3. Wire harness continuity.
• Disconnect the throttle position sensor coupler "1" and ECU coupler "2".

Is DTC P0122 or P0223 displayed?
YES
→ Go to "Short circuit check".
NO
→ Go to "Open circuit check".

• Open circuit check

Between throttle position sensor coupler "1" and ECU coupler "2"	[P0123, P0222] black–black [P0123, P0222] white–white [P0123, P0222] blue–blue [P0123, P0222] black/blue–black/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 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 9-3.

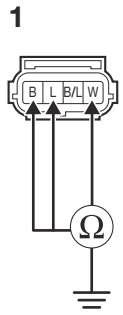
Ground short circuit check “A”

Between throttle position sensor coupler “1” and ground	[P0122, P0222] black–ground [P0122, P0222] white–ground [P0122, P0222] blue–ground

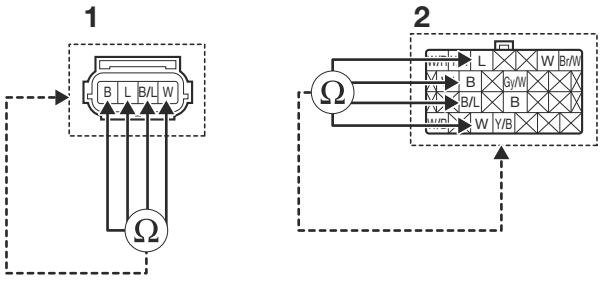
Lines short circuit check “B”

Throttle position sensor coupler “1”	[P0123, P0223] black–any other coupler terminal [P0123, P0223] white–any other coupler terminal [P0123, P0223] blue–any other coupler terminal [P0123, P0223] black/blue–any other coupler terminal
ECU coupler “2”	[P0123, P0223] black–any other coupler terminal [P0123, P0223] white–any other coupler terminal [P0123, P0223] blue–any other coupler terminal [P0123, P0223] black/blue–any other coupler terminal

A



B



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 8, and complete the service.

NO

→ Go to step 4.

4. Installed condition of throttle position sensor.
   • Check for looseness or pinching.
   Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-17.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or adjust the 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 5.

5. Defective throttle position sensor.
   • Check throttle position sensor signal 1.
   • Display the diagnosis of function.
   • Select the "FI".
   • Execute the diagnostic mode. (Code 01)

When the throttle valves are fully closed	14–16
When throttle valves are fully open	96–107

Is check result OK?
YES
→ Go to step 6.
NO
a. Replace the throttle position sensor.
   Refer to "ADJUSTING THE THROTTLE POSITION SENSOR" on page 7-17.
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 throttle position sensor.
   • Check throttle position sensor signal 2.
   • Display the diagnosis of function.
   • Select the "FI".
   • Execute the diagnostic mode. (Code 13)

When the throttle valves are fully closed	9–23
When throttle valves are fully open	93–109

Is check result OK?
YES
→ Go to step 7.
NO
a. Replace the throttle position sensor.
   Refer to "ADJUSTING THE THROTTLE POSITION SENSOR" on page 7-17.
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 8-47.

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.

EAS20571
P0132

EAS33051
TROUBLESHOOTING

Item

O_2 sensor: short to power circuit is detected. Normal signal is not received from the O_2 sensor.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- O_2 feedback is not carried out.
- O_2 feedback learning is not carried out.
- Quick shift system is not carried out.

Procedure

1. Installed condition of O_2 sensor.
   - Check for looseness or pinching.
     Refer to "ENGINE REMOVAL" on page 5-17.

   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).

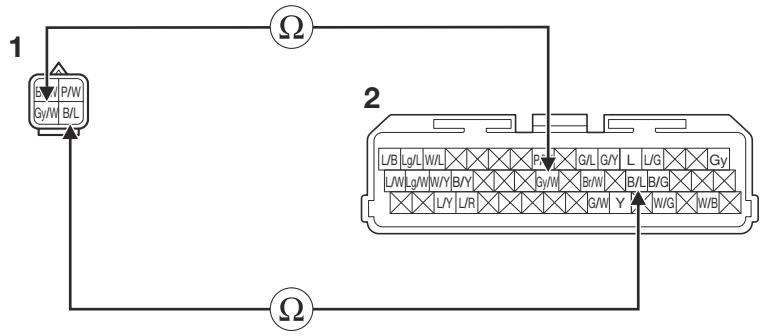
   Is the coupler condition normal?

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".
• Open circuit check

Between O_2 sensor coupler "1" and ECU coupler "2"	gray/white–gray/white black/blue–black/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 "PARTS CONNECTED TO THE ECU" on page 9-3.

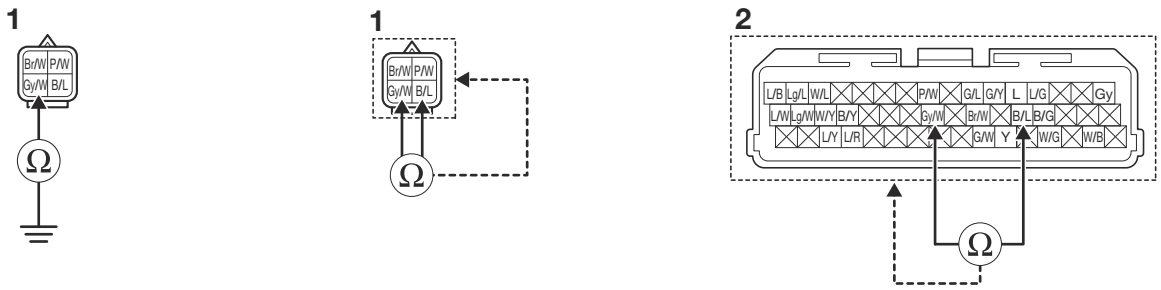
Ground short circuit check "A"

Between O_2 sensor coupler "1" and ground	gray/white–ground

Lines short circuit check "B"

O_2 sensor coupler "1"	gray/white–any other coupler terminal black/blue–any other coupler terminal
ECU coupler "2"	gray/white–any other coupler terminal black/blue–any other coupler terminal

A B



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.
   a. Replace the O_2 sensor.
      Refer to "ENGINE REMOVAL" on page 5-17.
   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 8-47.
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
- Able to start engine (depending on the number of faulty cylinders).
- Able to drive vehicle (depending on the number of faulty cylinders).
- O_2 feedback is not carried out.
- ISC feedback is not carried out.
- ISC learning is not carried out.
- Injection to the applicable cylinder group is cut off.
- Quick shift system is not carried out.

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. Display the diagnosis of function.
c. Select the "FI".
d. 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 8-56.

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. Display the diagnosis of function.
c. Select the "FI".
d. 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. Display the diagnosis of function.
c. Select the "FI".
d. 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. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 36)

Is it in the "Recovered" condition?

YES

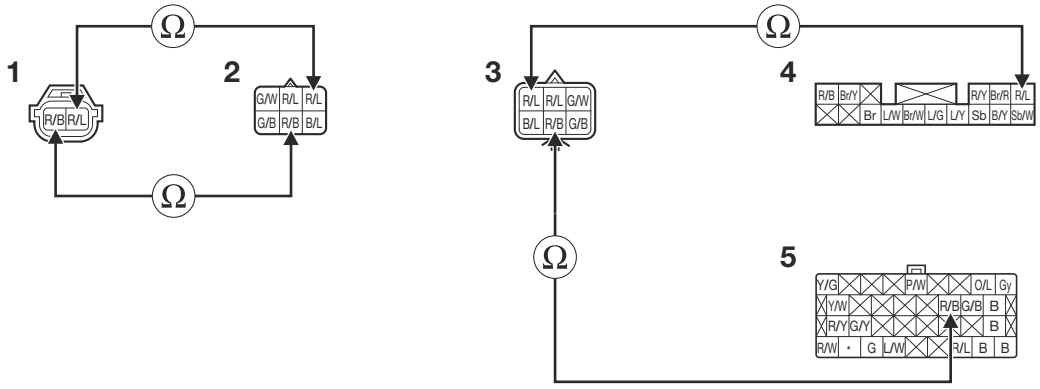
→ Go to step 7, and complete the service.

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", relay unit coupler "4" and ECU 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 "4"	red/blue–red/blue
Between wire harness coupler "3" and ECU coupler "5"	red/black–red/black



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness and/or sub-wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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 9-3.

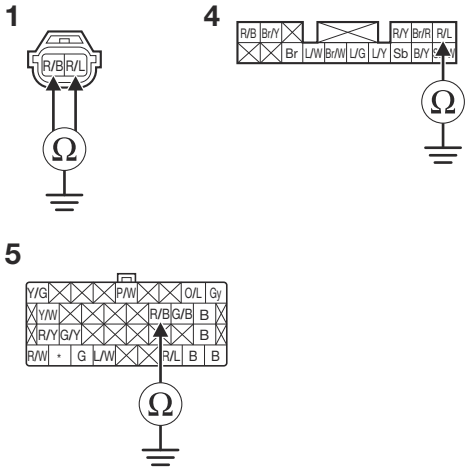
Ground short circuit check "A"

Between fuel injector #1 coupler "1" and ground	red/black–ground red/blue–ground
Between relay unit coupler "4" and ground	red/blue–ground
Between ECU coupler "5" and ground	red/black–ground

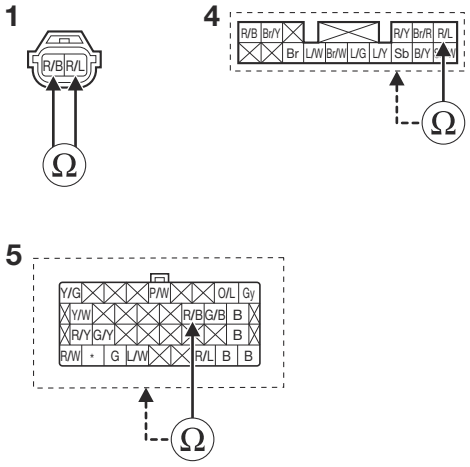
Lines short circuit check "B"

Fuel injector #1 coupler "1"	red/black–red/blue
Relay unit coupler "4"	red/blue–any other coupler terminal
ECU coupler "5"	red/black–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 6.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Display the diagnosis of function.
c. Select the “FI”.
d. 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 8-47.
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
- Able to start engine (depending on the number of faulty cylinders).
- Able to drive vehicle (depending on the number of faulty cylinders).
- O_2 feedback is not carried out.
- ISC feedback is not carried out.
- ISC learning is not carried out.
- Injection to the applicable cylinder group is cut off.
- Quick shift system is not carried out.

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. Display the diagnosis of function.
c. Select the “FI”.
d. 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 8-56.

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. Display the diagnosis of function.
c. Select the “FI”.
d. 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. Display the diagnosis of function.
c. Select the "FI".
d. 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. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 37)

Is it in the "Recovered" condition?

YES

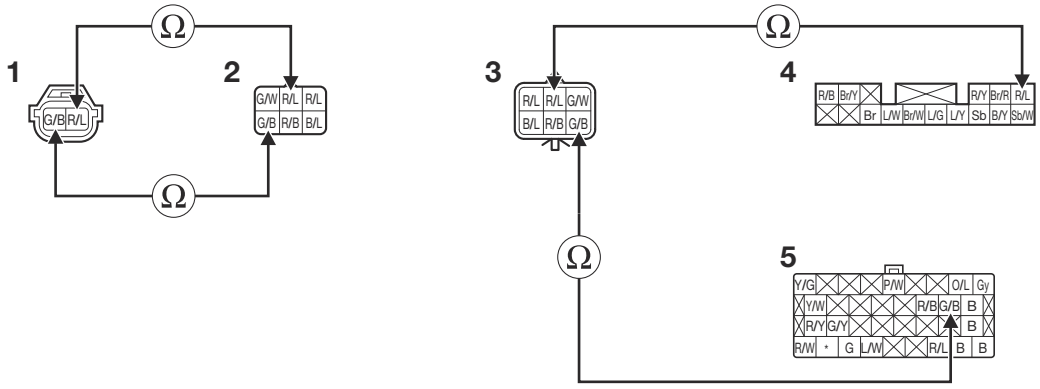
→ Go to step 7, and complete the service.

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", relay unit coupler "4" and ECU 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 "4"	red/blue–red/blue
Between wire harness coupler "3" and ECU coupler "5"	green/black–green/black



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness and/or sub-wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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

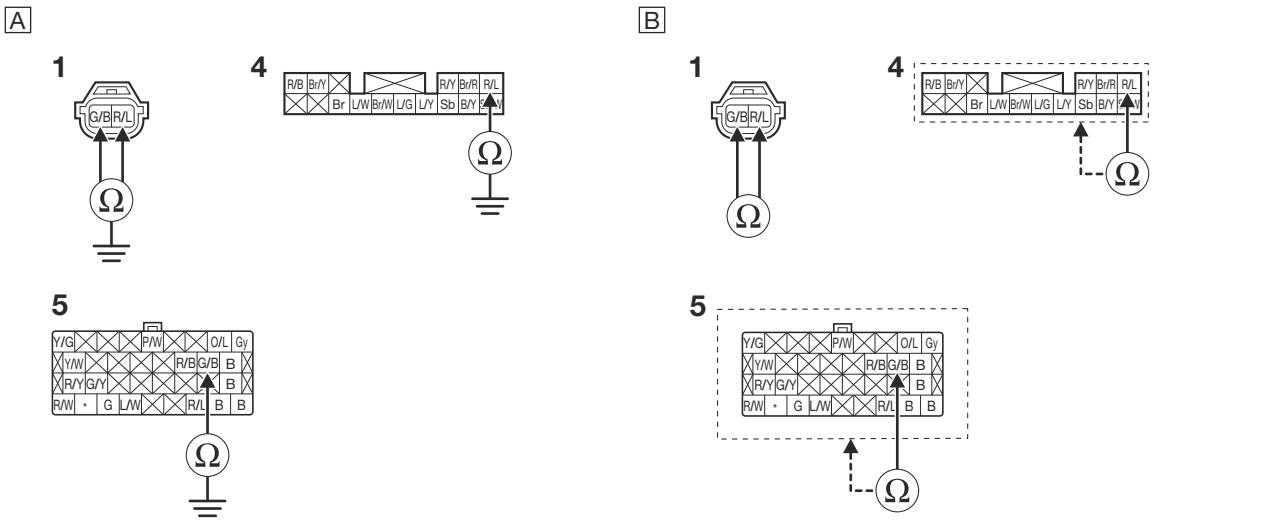
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-3.

Ground short circuit check "A"

Between fuel injector #2 coupler "1" and ground	green/black–ground red/blue–ground
Between relay unit coupler "4" and ground	red/blue–ground
Between ECU coupler "5" and ground	green/black–ground

Lines short circuit check "B"

Fuel injector #2 coupler "1"	green/black–red/blue
Relay unit coupler "4"	red/blue–any other coupler terminal
ECU coupler "5"	green/black–any other coupler terminal



Is resistance ∞ Ω?

YES

→ Go to step 6.

NO

a. Replace the wire harness and/or sub-wire harness.
b. Display the diagnosis of function.
c. Select the “FI”.
d. 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 8-47.
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.
- Does not operate.
- ISC feedback is not carried out.
- ISC learning is not carried out.

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.

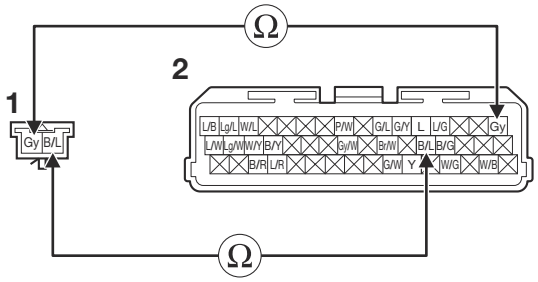
2. Connection of ECU coupler.
   - Check the locking condition of the coupler.
   - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

   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"	gray–gray black/blue–black/blue



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 9-3.

Ground short circuit check "A"

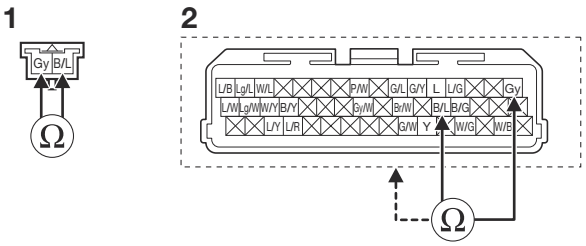
Between crankshaft position sensor coupler "1" and ground	gray–ground

Lines short circuit check "B"

Crankshaft position sensor coupler "1"	gray–black/blue
ECU coupler "2"	gray–any other coupler terminal black/blue–any other coupler terminal

A

B



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 5-49.
   - 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 8-52.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the stator coil assembly.
   Refer to "GENERATOR AND STARTER CLUTCH" on page 5-49.
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 8-47.
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.
- 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.
- Quick shift system is not carried out.

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.

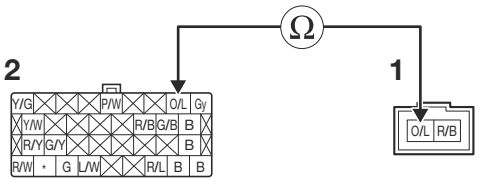
2. Connection of ECU coupler.
   - Check the locking condition of the coupler.
   - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

   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" and ECU coupler "2".
   - Open circuit check

Between cylinder-#1 ignition coil coupler "1" and ECU coupler "2"	orange/blue–orange/blue



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 9-3.

Ground short circuit check "A"

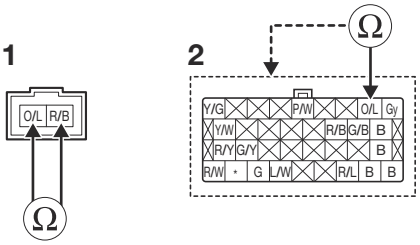
Between cylinder-#1 ignition coil coupler "1" and ground	orange/blue–ground

Lines short circuit check "B"

Cylinder-#1 ignition coil coupler "1"	orange/blue–red/black
ECU coupler "2"	orange/blue–any other coupler terminal

A

B



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 5-26.

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 8-51.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the cylinder-#1 ignition coil.
   Refer to “CAMSHAFTS” on page 5-26.
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.
   - Display the diagnosis of function.
   - Select the “FI”.
   - 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 8-47.
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.
- 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.
- Quick shift system is not carried out.

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

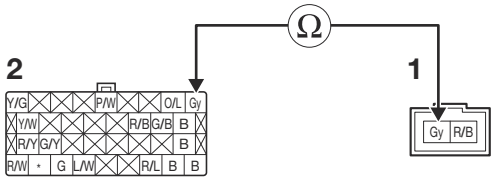
→ Go to step 7, and complete the service.

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–gray



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 9-3.

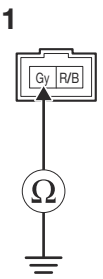
Ground short circuit check “A”

Between cylinder-#2 ignition coil coupler “1” and ground	gray–ground

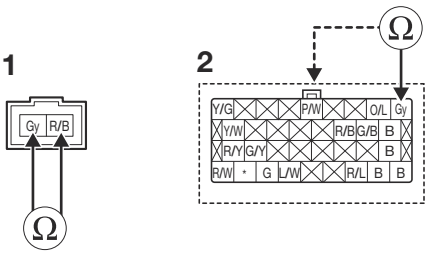
Lines short circuit check “B”

Cylinder-#2 ignition coil coupler “1”	gray–red/black
ECU coupler “2”	gray–any other coupler terminal

A



B



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 5-26.

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 8-51.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the cylinder-#2 ignition coil.
   Refer to “CAMSHAFTS” on page 5-26.
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.
   - Display the diagnosis of function.
   - Select the “FI”.
   - 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 8-47.
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.
- Closing side on purge cut valve solenoid is fixed.

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.

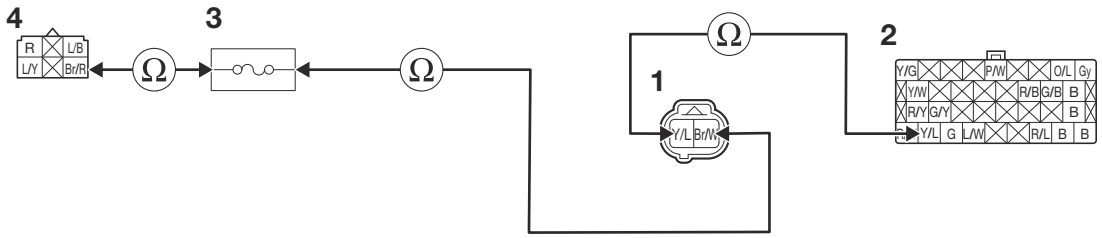
2. Connection of ECU coupler.
   - Check the locking condition of the coupler.
   - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

   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"	yellow/blue–yellow/blue
Between purge cut valve solenoid coupler "1" and ignition fuse "3" holder	brown/white–brown
Between main switch coupler "4" and ignition fuse "3" holder	brown/red–brown/red



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 8-47.

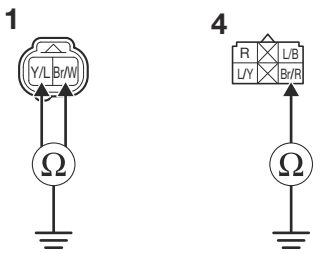
Ground short circuit check "A"

Between purge cut valve solenoid coupler "1" and ground	yellow/blue–ground brown/white–ground
Between main switch coupler "4" and ground	brown/red–ground

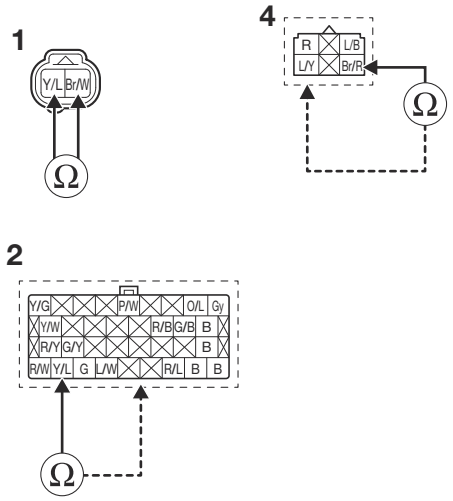
Lines short circuit check "B"

Purge cut valve solenoid coupler "1"	yellow/blue–brown/white
ECU coupler "2"	yellow/blue–any other coupler terminal
Main switch coupler "4"	brown/red–any other coupler terminal

A



B



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.
   • Display the diagnosis of function.
   • Select the "FI".
   • Execute the diagnostic mode. (Code 46)

Is it hear operating sound?

YES

→ Go to step 7, and complete the service.

NO

→ Check the purge cut valve solenoid.
Refer to "CHECKING THE PURGE CUT VALVE SOLENOID (for California only)" on page 8-56.

Is check result OK?

YES

→ Go to step 6.

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 8-47.
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.
- 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.

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

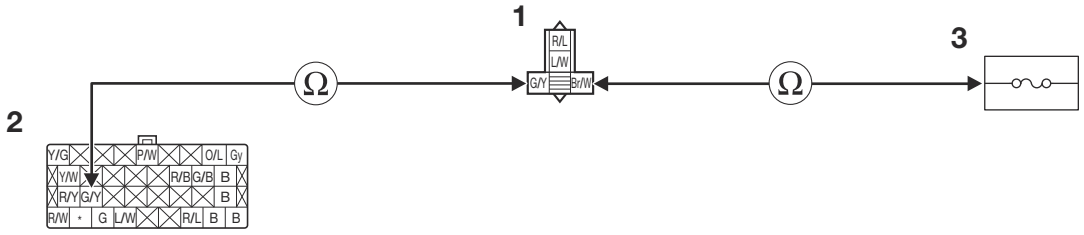
   → Go to step 6, and complete the service.

   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	brown/white–brown
Between radiator fan motor relay coupler "1" and ECU coupler "2"	green/yellow–green/yellow



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 9-3.

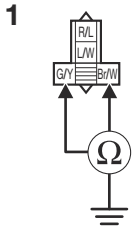
Ground short circuit check "A"

Between radiator fan motor relay coupler "1" and ground	green/yellow–ground brown/white–ground

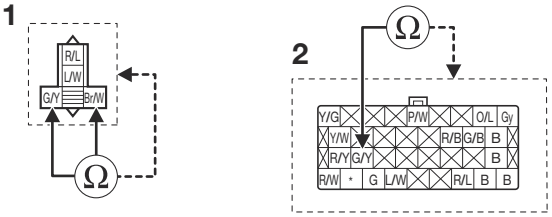
Lines short circuit check "B"

Radiator fan motor relay coupler "1"	green/yellow–any other coupler terminal brown/white–any other coupler terminal
ECU coupler "2"	green/yellow–any other coupler terminal

A



B



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 4-11.
   - 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 8-47.
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.

EAS20774
P0500, P1500

EAS34235
TROUBLESHOOTING
Item
- [P0500] Rear wheel sensor: open or short circuit is detected. Normal signal is not received from the rear wheel sensor or ABS unit to ECU.
- [P1500] Neutral switch: open or short circuit is detected. Normal signal is not received from the rear wheel sensor to ECU when the gear-in.
- [P1500] Clutch switch: open or short circuit is detected. Normal signal is not received from the rear wheel sensor to ECU when the gear-in.

Fail-safe system
- Able to start engine.
- Able to drive vehicle.
- 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 neutral switch malfunctions is carried out.
- ISC feedback is not carried out.
- ISC learning is not carried out.
- Traction control does not work.
- Quick shift system is not carried out.

Procedure
TIP
- In case P0500 is detected, or both P0500 and P1500 are detected, proceed from step 1.
- If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.
- P0335

1. Locate the malfunction.
   - DTCs P0500 or P0500 and P1500 detected.
     a. Display the diagnosis of function.
     b. Select the “FI”.
     c. Execute the diagnostic mode. (Code 07)
     d. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?
YES
→ Go to step 23.
NO
→ Go to step 2.

TIP
Perform the procedure from step 2 to step 7 and step 23.

- DTC P1500 detected.
  a. Display the diagnosis of function.
  b. Select the “FI”.
  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. Execute the diagnostic mode. (Code 21)”.

NO
→ Go to step 8.

TIP
Perform the procedure from step 8 to step 16 and step 23.

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 23.
NO
→ Go to step 17.

TIP
Perform the procedure from step 17 to step 23.

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. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 07)
e. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?
YES
→ Go to step 23.
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. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 07)
e. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 23.

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. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 07)
e. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

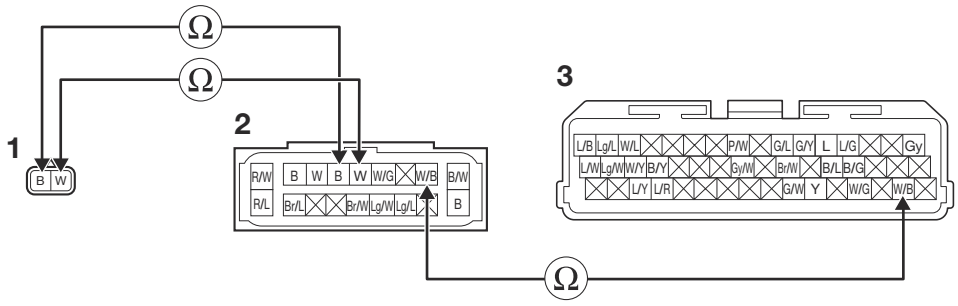
→ Go to step 23.

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/black–white/black



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 07)
e. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 23.

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 9-3.

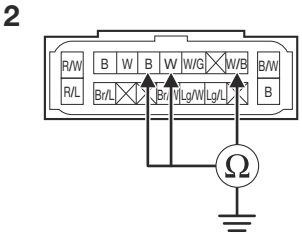
Ground short circuit check "A"

Between ABS ECU coupler "2" and ground	black–ground white–ground white/black–ground

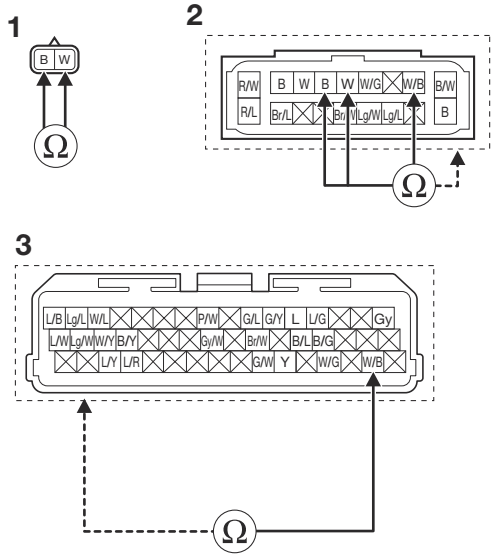
Lines short circuit check "B"

Rear wheel sensor coupler "1"	black–white
ABS ECU coupler "2"	black–any other coupler terminal white–any other coupler terminal white/black–any other coupler terminal
ECU coupler "3"	white/black–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 6.

NO

a. Replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 07)
e. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?
YES
→ Go to step 23.
NO
→ Go to step 6.

6. Malfunction in ECU.
- Replace the ECU.
  Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.
- Display the diagnosis of function.
- Select the "FI".
- 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 23.
NO
→ Go to step 7.

7. Malfunction in ABS ECU.
- Replace the ABS ECU and go to step 23.
  Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-54.

8. Connection of neutral 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 wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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 23.
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. Display the diagnosis of function.
c. Select the "FI".
d. 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 23.

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. Display the diagnosis of function.
c. Select the "FI".
d. 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

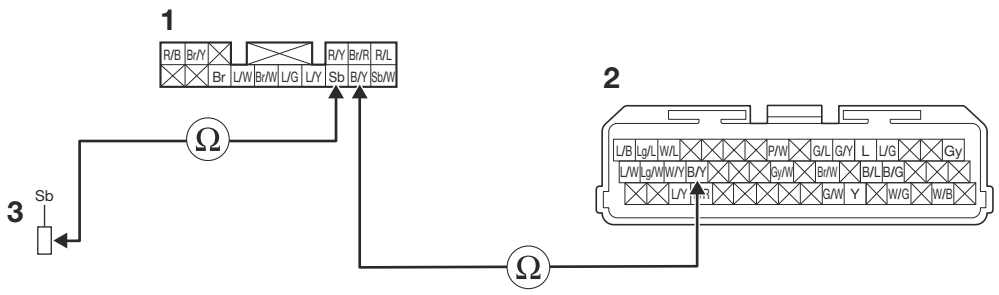
→ Go to step 23.

NO

→ Go to step 11.

11. Wire harness continuity.
• Disconnect the relay unit coupler "1", ECU coupler "2" and wire harness connector "3".
• Open circuit check

Between relay unit coupler "1" and ECU coupler "2"	black/yellow–black/yellow
Between relay unit coupler "1" and wire harness connector "3"	sky blue–sky blue



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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 23.

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 9-3.

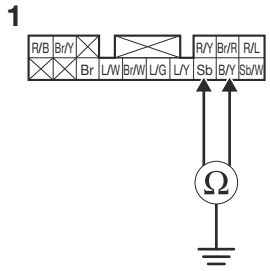
Ground short circuit check "A"

Between relay unit coupler "1" and ground	black/yellow–ground sky blue–ground

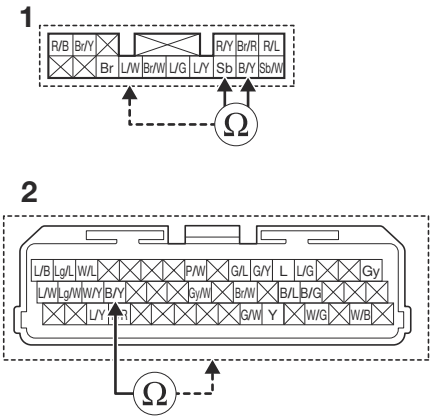
Lines short circuit check "B"

Relay unit coupler "1"	black/yellow–any other coupler terminal sky blue–any other coupler terminal
ECU coupler "2"	black/yellow–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 12.

NO

a. Replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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

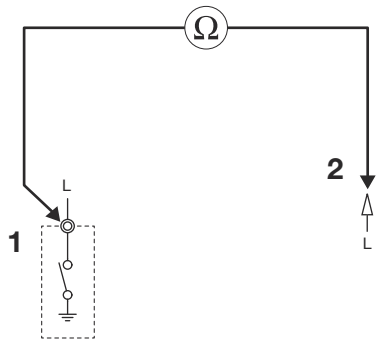
→ Go to step 23.

NO

→ Go to step 12.

12. Sub-wire harness continuity.
- Disconnect the neutral switch terminal "1".
- Open circuit check

Between neutral switch terminal "1" and sub-wire harness connector "2"	blue–blue



Is resistance 0 Ω?

YES

→ Go to step 13.

NO

a. Replace the sub-wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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 23.

NO

→ Go to step 13.

13. Defective relay unit.
- Check the relay unit.
  Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-50.

Is check result OK?

YES

→ Go to step 14.

NO

a. Replace the relay unit.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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 23.

NO

→ Go to step 14.

14. Defective neutral switch.
- Check the neutral switch.
- Refer to "CHECKING THE SWITCHES" on page 8-42.

Is check result OK?

YES

→ Go to step 15.

NO

a. Replace the neutral switch.
   Refer to "CRANKCASE" on page 5-78.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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 23.

NO

→ Go to step 15.

15. Faulty shift drum (neutral detection area).
- Check the shift drum.
  Refer to "CHECKING THE SHIFT DRUM ASSEMBLY" on page 5-105.

Is check result OK?

YES

→ Go to step 16.

NO

→ Replace the shift drum and go to step 23.
Refer to "TRANSMISSION" on page 5-101.

16. Malfunction in ECU.
- Replace the ECU, and complete the service.
  Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.

17. Clutch lever adjustment.
- Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-12.
- Display the diagnosis of function.
- Select the "FI".
- 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 23.

NO

→ Go to step 18.

18. Connection of 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 19.

NO

a. Connect the coupler securely or replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the side-stand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the side-stand is retracted	ON

Is it correct indication?

YES

→ Go to step 23.

NO

→ Go to step 19.

19. 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 20.

NO

a. Connect the coupler securely or replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the side-stand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the side-stand is retracted	ON

Is it correct indication?

YES

→ Go to step 23.

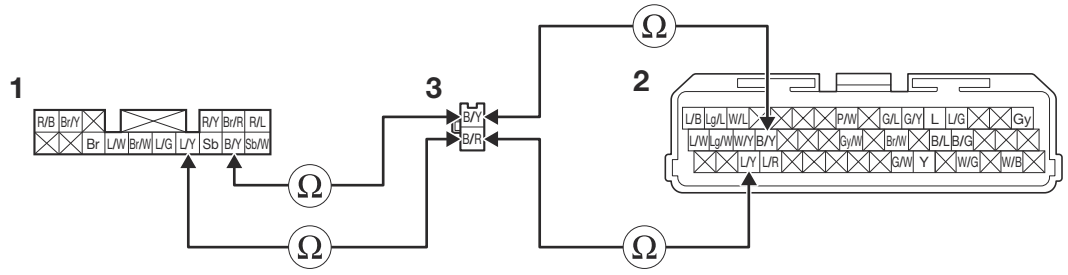
NO

→ Go to step 20.

20. Wire harness continuity.
- Disconnect the ECU coupler "2", relay unit coupler "1" and clutch switch coupler "3".

• Open circuit check

Between clutch switch coupler "3" and ECU coupler "2"	black/red–black/red black/yellow–black/yellow
Between clutch switch coupler "3" and relay unit coupler "1"	black/red–blue/yellow black/yellow–black/yellow



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. 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 23.

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 9-3.

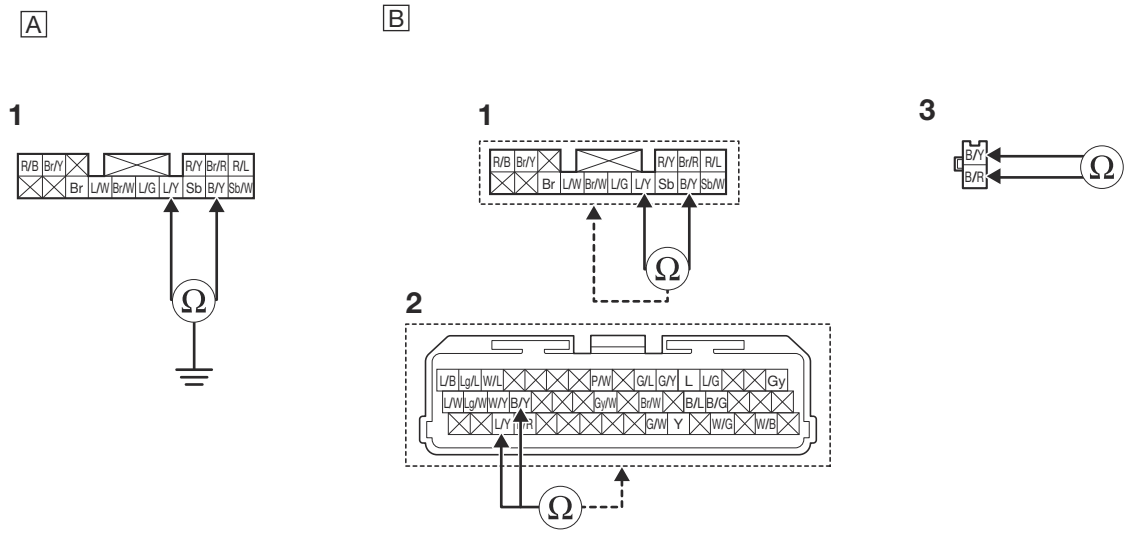
Ground short circuit check "A"

Between relay unit coupler "1" and ground	black/yellow–ground blue/yellow–ground

Lines short circuit check "B"

Relay unit coupler "1"	black/yellow–any other coupler terminal blue/yellow–any other coupler terminal

ECU coupler "2"	black/red–any other coupler terminal black/yellow–any other coupler terminal
Clutch switch coupler "3"	black/red–black/yellow



Is resistance ∞ Ω?

YES

→ Go to step 21.

NO

a. Replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the side-stand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the side-stand is retracted	ON

Is it correct indication?

YES

→ Go to step 23.

NO

→ Go to step 21.

21. Defective clutch switch.
- Check the clutch switch.
  Refer to "CHECKING THE SWITCHES" on page 8-42.

Is check result OK?

YES

→ Go to step 22.

NO

a. Replace the clutch switch.
   Refer to “HANDLEBAR” on page 4-62.
b. Display the diagnosis of function.
c. Select the “FI”.
d. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the side-stand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the side-stand is retracted	ON

Is it correct indication?

YES

→ Go to step 23.

NO

→ Go to step 22.

22. Malfunction in ECU.
- Replace the ECU, and complete the service.
  Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.

23. 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”.

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.
- O_2 feedback is not carried out.

Procedure

TIP

If the following DTCs are detected at the same time, perform the check and service for DTC listed bellow 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 GCU 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

ROM error. 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 8-47.
   - Turn the main switch to “ON”.
   - Check that the MIL does not come on.

EAS20677
P0606

EAS33306
TROUBLESHOOTING

Item

Processor error. Internal malfunction in ECU. (When this malfunction is detected in the ECU, the DTC might not appear on the tool display.)

Fail-safe system

- Able/Unable to start engine (depends on the situation).
- Able/Unable to drive vehicle (depends on the situation).
- Ignition and injection are not carried out.
- Judgment for other DTCs is not carried out.
- Load control is not carried out. (The relay unit, radiator fan motor relay, and other relays are all turned off.)
- The CO adjustment mode and diagnostic mode cannot be activated.
- Output is restricted.

Procedure

1. Check and repair for simultaneous malfunction.
   - Check the items of DTCs P0122, P0123, P0222, P0223 and P2135, if they are detected at the same time, correct the P0122, P0123, P0222, P0223 and P2135 first.
   - Turn the main switch to “ON”, and then check the condition of the DTC using the malfunction mode of the YDT.

   Is it in the “Recovered” condition?

   YES

   → Go to step 3, and complete the service.

   NO

   → Go to step 2.

2. Malfunction in ECU.
   - Replace the ECU.
     Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.
   - Turn the main switch to “ON”.
   - Check that the MIL does not come on.
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.

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 (depending on the situation of EEPROM failure).
- Able/Unable to drive vehicle (depending on the situation of EEPROM failure).
- 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.

Procedure

1. Locate the malfunction.
   - Display the diagnosis of function.
   - Select the "FI".
   - 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 8-47.
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.

EAS20599
P0638

EAS33079
TROUBLESHOOTING

Item

YCC-T drive system: malfunction detected.

Fail-safe system

- Able to start engine (depending on the situation).
- Able to drive vehicle (depending on the situation).
- O_2 feedback is not carried out.
- YCC-T evacuation is activated.
- Output is restricted.
- ISC feedback is not carried out.
- ISC learning is not carried out.

Procedure

1. Connection of throttle servo motor 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. Check the electronic throttle valve fuse.

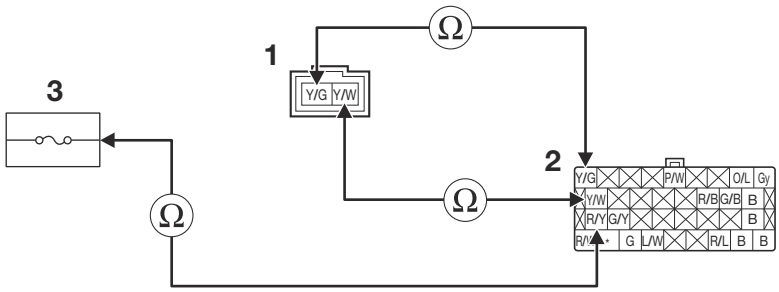
   Is check result OK?

YES
→ Go to step 4.
NO
a. Replace the electronic throttle valve 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 4.

4. Wire harness continuity.
- Disconnect the throttle servo motor coupler "1", ECU coupler "2" and electronic throttle valve fuse "3".
- Open circuit check

Between throttle servo motor coupler "1" and ECU coupler "2"	yellow/green–yellow/green yellow/white–yellow/white
Between ECU coupler "2" and electronic throttle valve fuse holder "3"	red/yellow–red/yellow



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 9-3.

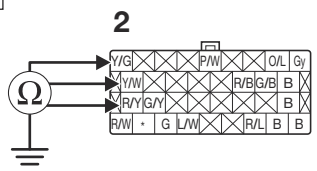
Ground short circuit check "A"

Between ECU coupler "2" and ground	yellow/green–ground yellow/white–ground red/yellow–ground

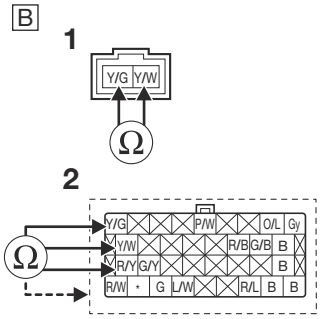
Lines short circuit check “B”

Throttle servo motor coupler “1”	yellow/green–yellow/white
ECU coupler “2”	yellow/green–any other coupler terminal yellow/white–any other coupler terminal red/yellow–any other coupler terminal

A



B



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 throttle bodies.
   • Check the throttle bodies.
   Refer to “CHECKING THE THROTTLE SERVO MOTOR” on page 8-55.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the throttle bodies.
   Refer to “REPLACING THE THROTTLE BODIES” on page 7-14.
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 8-47.
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.

EAS20601
P0657

EAS33081
TROUBLESHOOTING

Item

Fuel system voltage: normal voltage is not supplied to the fuel injector, fuel pump and relay unit.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- Monitor voltage = 12 [V]
- O_2 feedback is not carried out.

Procedure

TIP

If the following DTCs are detected at the same time, perform the check and service for DTC listed bellow 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

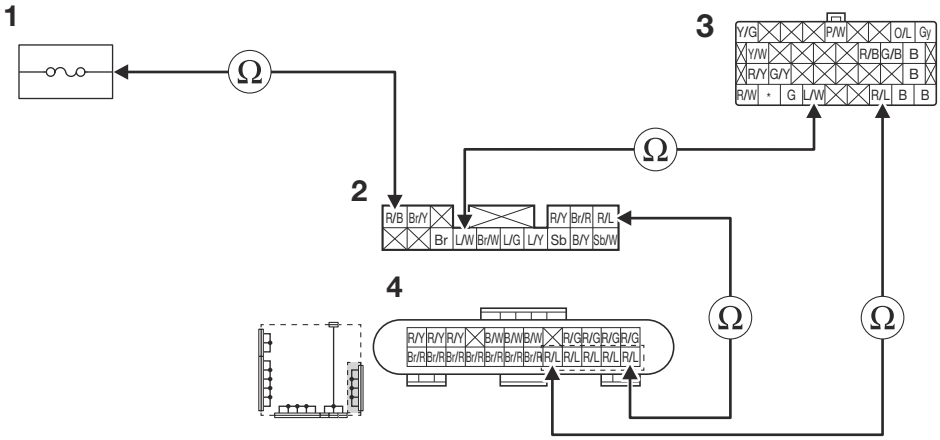
→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Wire harness continuity.
   - Disconnect the fuel injection system fuse “1”, relay unit coupler “2” and ECU coupler “3”.
   - Remove the joint coupler cap “4”.
   - Open circuit check

Between fuel injection system fuse “1” holder and relay unit coupler “2”	red/black–red/black
Between relay unit coupler “2” and ECU coupler “3”	blue/white–blue/white
Between relay unit coupler “2” and joint coupler “4”	red/blue–red/blue
Between joint coupler “4” and ECU coupler “3”	red/blue–red/blue



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 9-3.

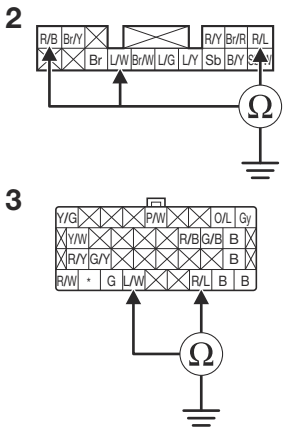
Ground short circuit check “A”

Between relay unit coupler “2” and ground	red/black–ground red/blue–ground blue/white–ground
Between ECU coupler “3” and ground	red/blue–ground blue/white–ground

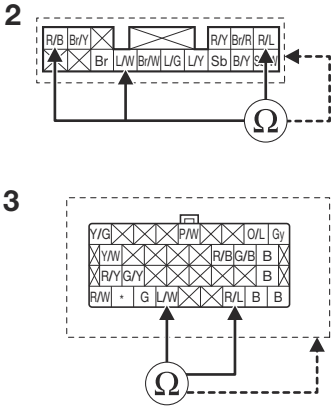
Lines short circuit check “B”

Relay unit coupler "2"	red/black–any other coupler terminal red/blue–any other coupler terminal blue/white–any other coupler terminal
ECU coupler "3"	red/blue–any other coupler terminal blue/white–any other coupler terminal

A



B



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.
- Display the diagnosis of function.
- Select the "FI".
- 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 4-11.
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.
   - Display the diagnosis of function.
   - Select the "FI".
   - 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 4-11.
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 8-47.
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.

EAS20611
P0916, P0917

EAS33091
TROUBLESHOOTING

Item

- [P0916] Gear position sensor: open or short to ground circuit is detected. Normal signal is not received from the gear position sensor to ECU.
- [P0917] Gear position sensor: short to power circuit is detected. Normal signal is not received from the gear position sensor to ECU.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- Maintains the gear position value at the previous value.
- Quick shift system is not carried out.

Procedure

1. Connection of gear 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. 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 gear position sensor coupler “1” and ECU coupler “2”.

Is DTC P0917 displayed?

YES

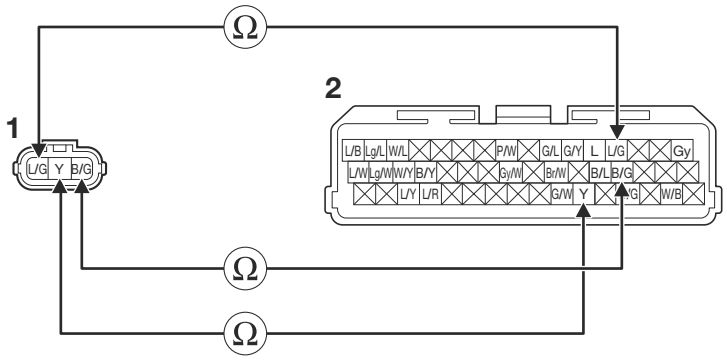
→ Go to "Short circuit check".

NO

→ Go to "Open circuit check".

• Open circuit check

Between gear position sensor coupler "1" and ECU coupler "2"	[P0916] blue/green–blue/green [P0916] black/green–black/green [P0916] yellow–yellow



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 9-3.

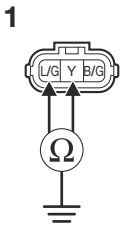
Ground short circuit check "A"

Between gear position sensor coupler "1" and ground	[P0916] blue/green–ground [P0916] yellow–ground

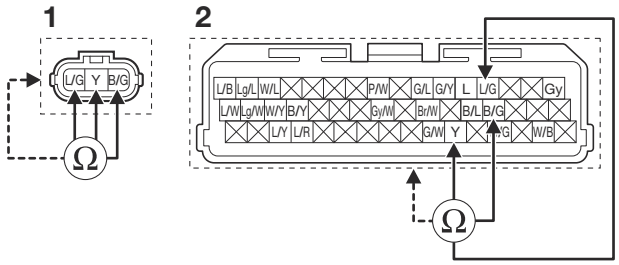
Lines short circuit check "B"

Gear position sensor coupler "1"	[P0917] blue/green–any other coupler terminal [P0917] black/green–any other coupler terminal [P0917] yellow–any other coupler terminal
ECU coupler "2"	[P0917] blue/green–any other coupler terminal [P0917] black/green–any other coupler terminal [P0917] yellow–any other coupler terminal

A



B



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 gear position sensor.
   • Check for looseness or pinching.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or replace the sensor.
   Refer to “CRANKCASE” on page 5-78.
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 gear position sensor.
   • Make sure that the position of each gear is correctly displayed on the meter.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the gear position sensor.
   Refer to “CRANKCASE” on page 5-78.
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 8-47.
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.

EAS20614
P1601

EAS33094
TROUBLESHOOTING
Item
Sidestand switch: open or short circuit of the wire harness 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.
- Engine is forcefully stopped (the injector output is stopped).

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

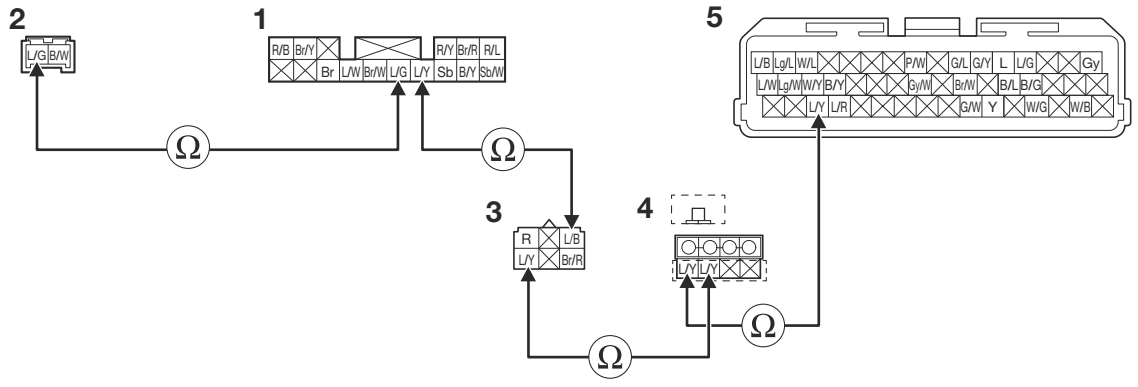
→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Wire harness continuity.
   - Disconnect the relay unit coupler "1", sidestand switch coupler "2", main switch coupler "3" and ECU coupler "5".
   - Remove the joint coupler cap "4".
   - Open circuit check

Between relay unit coupler "1" and sidestand switch coupler "2"	blue/green–blue/green
Between relay unit coupler "1" and main switch coupler "3"	blue/yellow–blue/black
Between main switch coupler "3" and joint coupler "4"	blue/yellow–blue/yellow
Between joint coupler "4" and ECU coupler "5"	blue/yellow–blue/yellow



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

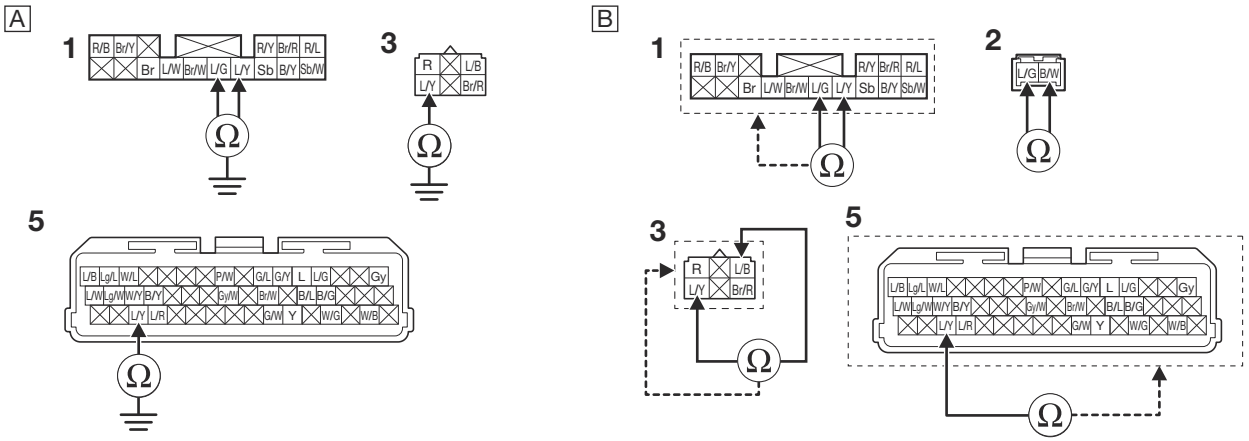
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-3.

Ground short circuit check “A”

Between relay unit coupler “1” and ground	blue/green–ground blue/yellow–ground
Between main switch coupler “3” and ground	blue/yellow–ground
Between ECU coupler “5” and ground	blue/yellow–ground

Lines short circuit check “B”

Relay unit coupler “1”	blue/yellow–any other coupler terminal blue/green–any other coupler terminal
Sidestand switch coupler “2”	blue/green–black/white
Main switch coupler “3”	blue/black–any other coupler terminal blue/yellow–any other coupler terminal
ECU coupler “5”	blue/yellow–any other coupler terminal



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.
   • Display the diagnosis of function.
   • Select the “FI”.

- 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 4-87.
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 8-47.
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).
- O_2 feedback learning is not carried out.
- O_2 feedback learning value is not written.

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 backup fuse 2.

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

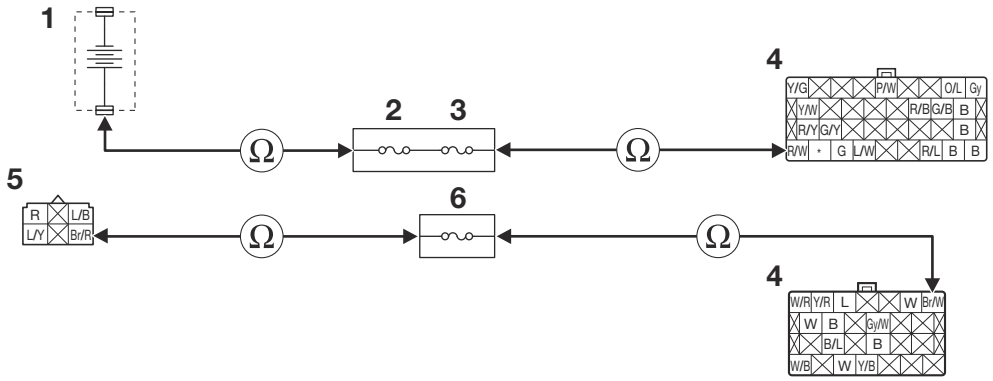
→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Wire harness continuity.
   - Disconnect the battery terminal "1", main fuse "2", backup fuse 2 "3", ECU coupler "4", main switch coupler "5" and ignition fuse "6".
   - Open circuit check

Between battery terminal "1" and main fuse "2" holder	red–red
Between backup fuse 2 "3" holder and ECU coupler "4"	red/white–red/white
Between main switch coupler "5" and ignition fuse "6" holder	brown/red–brown/red
Between ignition fuse "6" holder and ECU coupler "4"	brown–brown/white



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

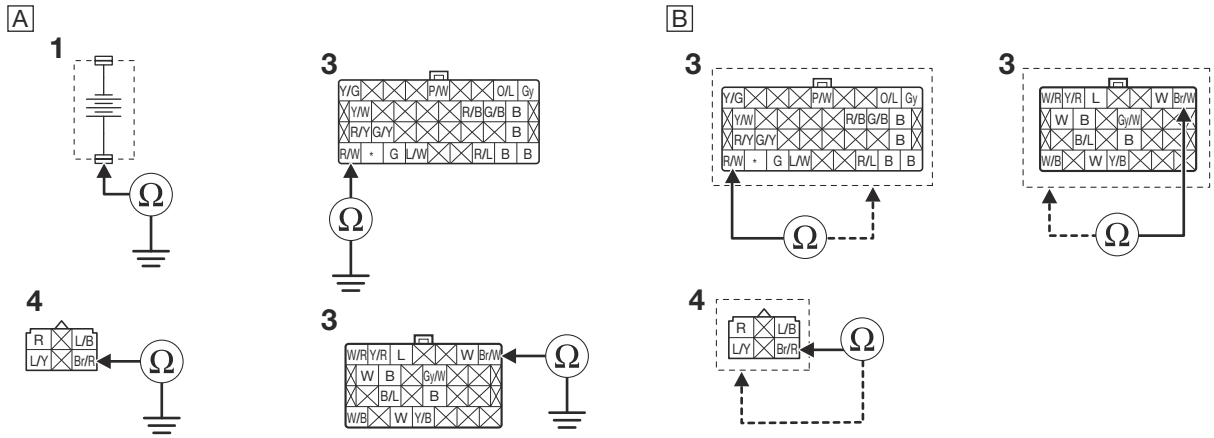
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-3.

Ground short circuit check “A”

Between battery “1” and ground	red–ground
Between ECU coupler “3” and ground	red/white–ground brown/white–ground
Between main switch coupler “4” and ground	brown/red–ground

Lines short circuit check “B”

ECU coupler “3”	red/white–any other coupler terminal brown/white–any other coupler terminal
Main switch coupler “4”	brown/red–any other coupler terminal



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 8-47.
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. Normal signal is not received from the lean angle sensor.
- [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”.

Is DTC P1604 displayed?

YES

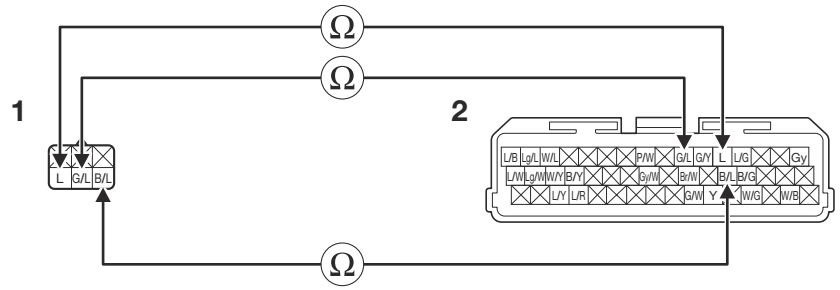
→ Go to "Short circuit check".

NO

→ Go to "Open circuit check".

• Open circuit check

Between ECU coupler "2" and lean angle sensor coupler "1"	[P1605] blue–blue [P1605] green/blue–green/blue [P1605] black/blue–black/blue



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 9-3.

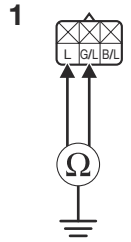
Ground short circuit check "A"

Between lean angle sensor coupler "1" and ground	[P1604] blue–ground [P1604] green/blue–ground

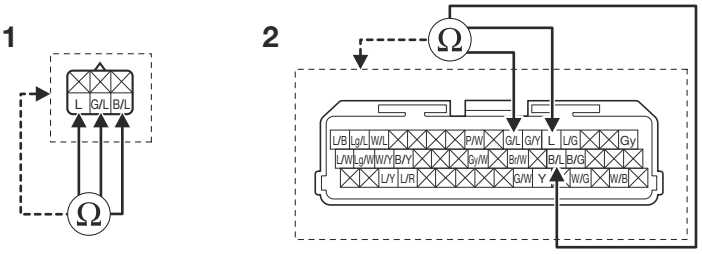
Lines short circuit check "B"

Lean angle sensor coupler "1"	[P1605] blue–any other coupler terminal [P1605] green/blue–any other coupler terminal [P1605] black/blue–any other coupler terminal
ECU coupler "2"	[P1605] blue–any other coupler terminal [P1605] green/blue–any other coupler terminal [P1605] black/blue–any other coupler terminal

A



B



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.
   - Display the diagnosis of function.
   - Select the "FI".
   - 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 8-47.
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.

EAS20623
P1806, P1807 (OPTION)

EAS33103
TROUBLESHOOTING

Item

- [P1806] Shift sensor (OPTION): open or short to ground circuit is detected. Normal signal is not received from the shift sensor to ECU.
- [P1807] Shift sensor (OPTION): short to power circuit is detected. Normal signal is not received from the shift sensor to ECU.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- Quick shift system is not carried out.

Procedure

1. Connection of shift 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.

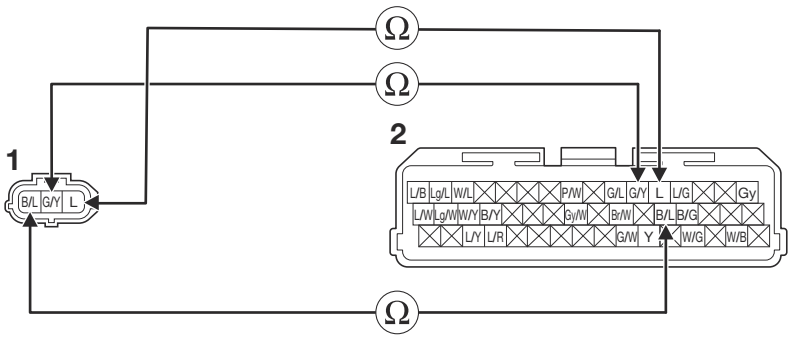
3. Wire harness continuity
   - Disconnect the shift sensor coupler “1” and ECU coupler “2”.

Is DTC P1807 displayed?

YES
→ Go to "Short circuit check".
NO
→ Go to "Open circuit check".

• Open circuit check

Between shift sensor coupler "1" and ECU coupler "2"	[P1806] blue–blue [P1806] green/yellow–green/yellow [P1806] black/blue–black/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 "PARTS CONNECTED TO THE ECU" on page 9-3.

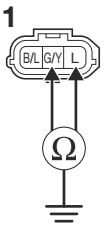
Ground short circuit check "A"

Between shift sensor coupler "1" and ground	[P1806] green/yellow–ground [P1806] blue–ground

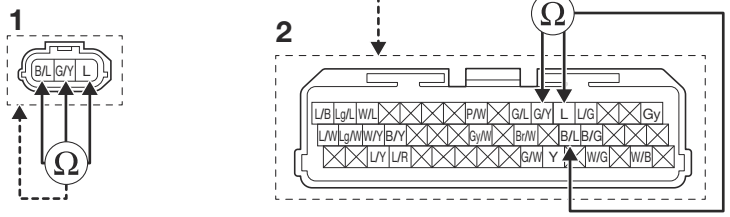
Lines short circuit check "B"

Shift sensor coupler "1"	[P1807] black/blue–any other coupler terminal [P1807] green/yellow–any other coupler terminal [P1807] blue–any other coupler terminal
ECU coupler "2"	[P1807] black/blue–any other coupler terminal [P1807] green/yellow–any other coupler terminal [P1807] blue–any other coupler terminal

A



B



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 shift sensor.
   • Check for looseness or pinching.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or replace the sensor.
   Refer to "CHAIN DRIVE" on page 4-93.
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 shift sensor.
   • Display the diagnosis of function.
   • Select the "FI".
   • Execute the diagnostic mode. (Code 95)

Shift sensor output voltage display	0.2–4.8 [V]
With no shift weighting input	Approx. 2.5 [V]
Shift up weighting	Changes to the high side
Shift down weighting	Changes to the low side

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the shift 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 6.

6. Malfunction in ECU.
   • Replace the ECU, and complete the service.
   Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-47.
7. Delete the DTC and check that the Auxiliary system warning goes off.
   • Confirm that the DTC has a condition of "Recovered" using the YDT, and then delete the DTC.

EAS20632
P2122, P2123, P2127, P2128, P2138

EAS33112
TROUBLESHOOTING

Item

- [P2122] Accelerator position sensor: open or short to ground circuit is detected. Normal signal is not received from the accelerator position sensor.
- [P2123] Accelerator position sensor: short to power circuit is detected. Normal signal is not received from the accelerator position sensor.
- [P2127] Accelerator position sensor: open or short to ground circuit is detected. Normal signal is not received from the accelerator position sensor.
- [P2128] Accelerator position sensor: short to power circuit is detected. Normal signal is not received from the accelerator position sensor.
- [P2138] Deviation error. Normal signal is not received from the accelerator position sensor.

Fail-safe system

- Able to start engine (depending on the situation).
- Able to drive vehicle (depending on the situation).
- No change in accelerator opening (transient control is not carried out).
- Accelerator opening is fixed to 0[°].
- O_2 feedback is not carried out.
- YCC-T evacuation is activated.
- Fuel cut is prohibited by accelerator opening.
- Output is restricted.
- ISC feedback is not carried out.
- ISC learning is not carried out.

Procedure

TIP

If a DTC other than P2138 (P2122, P2123, P2127, or P2128) is indicated, perform troubleshooting first.

1. Connection of accelerator 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. 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 accelerator position sensor coupler "1" and ECU coupler "2".

Is DTC P2123 or P2128 displayed?

YES

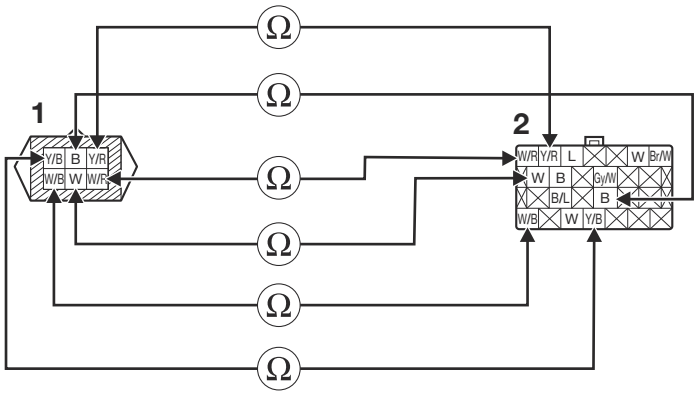
→ Go to "Short circuit check".

NO

→ Go to "Open circuit check".

• Open circuit check

Between accelerator position sensor coupler "1" and ECU coupler "2"	[P2122, P2127] yellow/red–yellow/red [P2122, P2127] white/red–white/red [P2122, P2127] white–white [P2122, P2127] white/black–white/black [P2122, P2127] yellow/black–yellow/black [P2122, P2127] black–black



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 9-3.

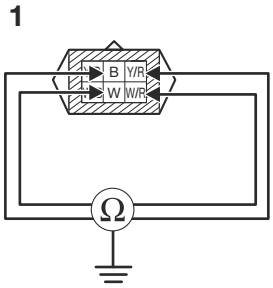
Ground short circuit check “A”

Between accelerator position sensor coupler “1” and ground	[P2122, P2127] white–ground [P2122, P2127] white/red–ground [P2122, P2127] yellow/red–ground [P2122, P2127] black–ground

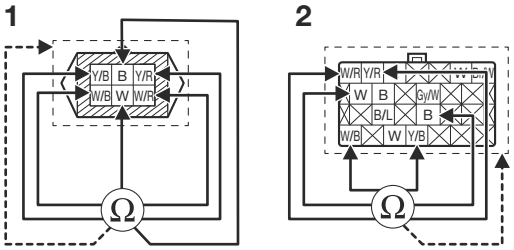
Lines short circuit check “B”

Accelerator position sensor coupler “1”	[P2123, P2128] white–any other coupler terminal [P2123, P2128] white/red–any other coupler terminal [P2123, P2128] yellow/red–any other coupler terminal [P2123, P2128] black–any other coupler terminal [P2123, P2128] yellow/black–any other coupler terminal [P2123, P2128] white/black–any other coupler terminal
ECU coupler “2”	[P2123, P2128] white–any other coupler terminal [P2123, P2128] white/red–any other coupler terminal [P2123, P2128] yellow/red–any other coupler terminal [P2123, P2128] black–any other coupler terminal [P2123, P2128] yellow/black–any other coupler terminal [P2123, P2128] white/black–any other coupler terminal

A



B



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 accelerator position sensor.
   • Display the diagnosis of function.
   • Select the "FI".
   • Execute the diagnostic mode. (Code 14) (Accelerator position sensor signal 1.)

When the throttle valves are fully closed	14–18
When the throttle valves are fully open	82–92
Turn the throttle grip past the closed position in the deceleration direction.	7–12

   • Execute the diagnostic mode. (Code 15) (Accelerator position sensor signal 2.)

When the throttle valves are fully closed	14–18
When the throttle valves are fully open	82–92
Turn the throttle grip past the closed position in the deceleration direction.	7–12

Is check result OK?
YES
→ Go to step 5.
NO
→ Replace the handlebar switch (right).
Refer to "HANDLEBAR" on page 4-62.

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 8-47.
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.

EAS20812
P2135

EAS33652
TROUBLESHOOTING

Item

Throttle position sensor: output voltage deviation error. Normal signal is not received from the throttle position sensor circuit.

Fail-safe system

- Able to start engine (depending on the situation).
- Able to drive vehicle (depending on the situation).
- Change in the throttle opening value is 0 (transient control is not carried out).
- D–j is fixed.
- Throttle opening is fixed to 125[°].
- 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.
- O_2 sensor heater driving is not carried out.
- Quick shift system is not carried out.

Procedure

TIP

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.
- P0122, P0123, P0222, P0223, P0638

1. Check the starting and racing the engine possibility.
   - Turn the main switch to “ON”, and then start the engine and racing the engine.

Unable to starting the engine and racing the engine.

YES

→ Go to step 2.

NO

a. Replace the throttle position sensor.
   Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-17.
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 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 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 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. Installed condition of throttle position sensor.
   - Check for looseness or pinching.
     Refer to "ADJUSTING THE THROTTLE POSITION SENSOR" on page 7-17.

Is check result OK?

YES

→ Go to step 5.

NO

a. Reinstall or adjust the 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 5.

5. Defective throttle position sensor.
   - Check throttle position sensor signal 1.
   - Display the diagnosis of function.
   - Select the "FI".
   - Execute the diagnostic mode. (Code 01)

When the throttle valves are fully closed	14–16
When throttle valves are fully open	96–107

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the throttle position sensor.
Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-17.
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 throttle position sensor.
- Check throttle position sensor signal 2.
- Display the diagnosis of function.
- Select the “FI”.
- Execute the diagnostic mode. (Code 13)

When the throttle valves are fully closed	9–23
When throttle valves are fully open	93–109

Is check result OK?

YES

→ Go to step 7.

NO

a. Replace the throttle position sensor.
Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-17.
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 8-47.

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.

EAS20633
P2158

EAS33113
TROUBLESHOOTING

Item

Front wheel sensor: normal signal is not received from the front wheel sensor.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- Traction control does not work.

Procedure

1. Locate the malfunction.
   - Check the ABS warning light.

   Is the ABS warning light on?

   YES

   → Refer to "BASIC INSTRUCTIONS FOR TROUBLESHOOTING" on page 9-26.

   NO

   → Go to step 2.

2. Execute the diagnostic mode.
   - Display the diagnosis of function.
   - Select the "FI".
   - Execute the diagnostic mode. (Code 16)
   - Rotate the front wheel by hand and check that the indicated value increases.

   Is that value increased?

   YES

   → Go to step 10, and complete the service.

   NO

   → Go to step 3.

3. Connection of front wheel sensor coupler.
   - Check the locking condition of the coupler.
   - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

   Is the coupler condition normal?

   YES

   → Go to step 4.

   NO

   a. Connect the coupler securely or replace the wire harness.
   b. Display the diagnosis of function.
   c. Select the "FI".
   d. Execute the diagnostic mode. (Code 16)
   e. Rotate the front wheel by hand and check that the indicated value increases.

   Is that value increased?

   YES

   → Go to step 10, and complete the service.

   NO

   → Go to step 4.

4. 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 5.

NO

a. Connect the coupler securely or replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 16)
e. Rotate the front wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 10, and complete the service.

NO

→ Go to step 5.

5. 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 6.

NO

a. Connect the coupler securely or replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 16)
e. Rotate the front wheel by hand and check that the indicated value increases.

Is that value increased?

YES

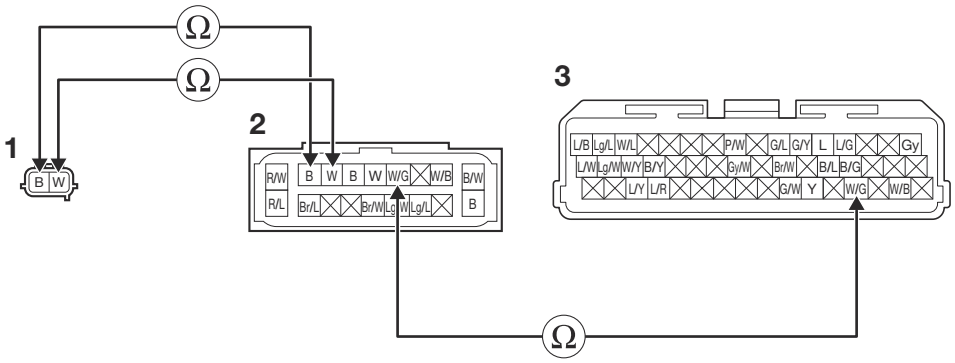
→ Go to step 10, and complete the service.

NO

→ Go to step 6.

6. Wire harness continuity.
   - Disconnect the front wheel sensor coupler "1", ABS ECU coupler "2" and ECU coupler "3".
   - Open circuit check

Between front wheel sensor coupler "1" and ABS ECU coupler "2"	white–white black–black
Between ABS ECU coupler "2" and ECU coupler "3"	white/green–white/green



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 16)
e. Rotate the front wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 10, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

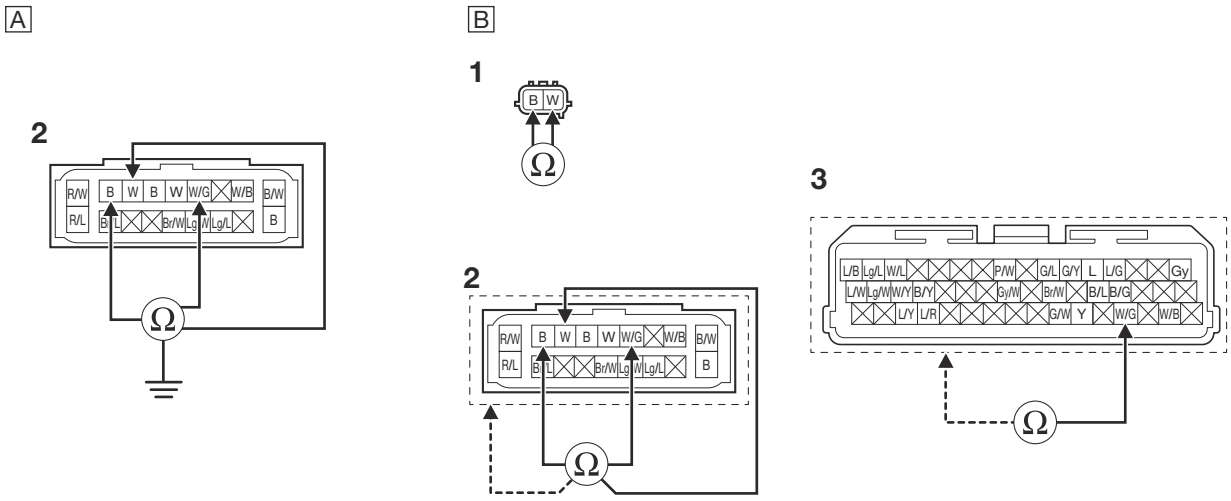
Disconnect the ECU and ABS ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-3 and "PARTS CONNECTED TO THE ABS ECU" on page 9-3.

Ground short circuit check "A"

Between ABS ECU coupler "2" and ground	white–ground black–ground white/green–ground

Lines short circuit check "B"

Front wheel sensor coupler "1"	white–black
ABS ECU coupler "2"	white–any other coupler terminal black–any other coupler terminal white/green–any other coupler terminal
ECU coupler "3"	white/green–any other coupler terminal



Is resistance ∞ Ω?

YES

→ Go to step 7.

NO

a. Replace the wire harness.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 16)
e. Rotate the front wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 10, and complete the service.

NO

→ Go to step 7.

7. Defective front wheel sensor.
   • Check the front wheel sensor.
   Refer to "FRONT WHEEL" on page 4-14.

Is check result OK?

YES

→ Go to step 8.

NO

a. Reinstall or replace the front wheel sensor.
   Refer to "FRONT WHEEL" on page 4-14.
b. Display the diagnosis of function.
c. Select the "FI".
d. Execute the diagnostic mode. (Code 16)
e. Rotate the front wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 10, and complete the service.

NO

→ Go to step 8.

8. Malfunction in ECU.
   - Replace the ECU.
     Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.
   - Display the diagnosis of function.
   - Select the “FI”.
   - Execute the diagnostic mode. (Code 16)
   - Rotate the front wheel by hand and check that the indicated value increases.

   Is that value increased?
   YES
   → Go to step 10, and complete the service.
   NO
   → Go to step 9.

9. Malfunction in ABS ECU.
   - Replace the ABS ECU.
     Refer to “REMOVING THE HYDRAULIC UNIT ASSEMBLY” on page 4-56.
   - Go to step 10, and complete the service.

10. Delete the DTC and check that the MIL goes off.
    - Turn the main switch to “ON”, and then rotate the front 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”.

EAS20660
P2195

EAS33115
TROUBLESHOOTING

Item

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.
- O_2 feedback is not carried out.
- O_2 feedback learning is not carried out
- Quick shift system is not carried out.

Procedure

TIP

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.
- 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 5-17.
b. Start the engine, warm-up the vehicle (5 min or more), and then racing the engine.
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, or delete this DTC even if it has a condition of "Detected".

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, warm-up the vehicle (5 min or more), and then racing the engine.
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, or delete this DTC even if it has a condition of "Detected".

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, warm-up the vehicle (5 min or more), and then racing the engine.
c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

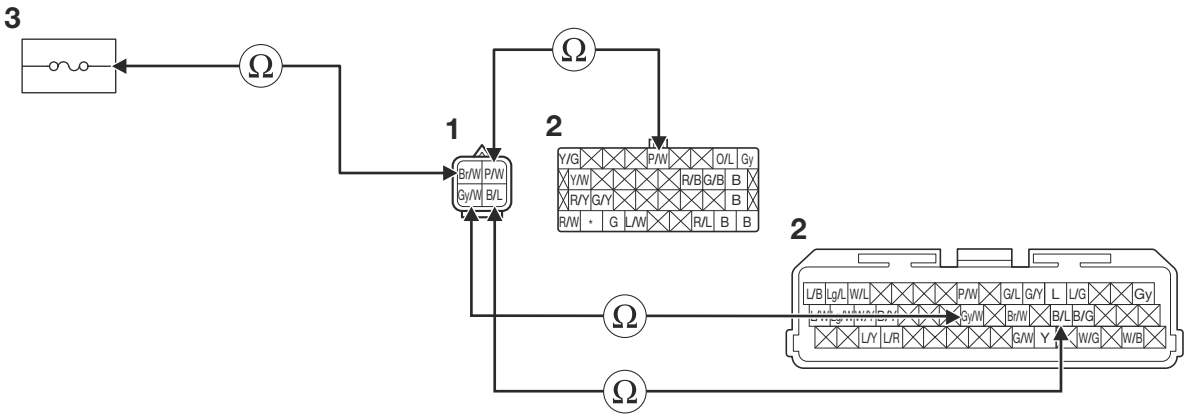
→ Go to step 8, and complete the service.

NO

→ Go to step 4, or delete this DTC even if it has a condition of "Detected".

4. Wire harness continuity.
   - Disconnect the O_2 sensor coupler "1", ECU coupler "2" and ignition fuse "3".
   - Open circuit check

Between O_2 sensor coupler "1" and ECU coupler "2"	gray/white–gray/white pink/white–pink/white black/blue–black/blue
Between O_2 sensor coupler "1" and ignition fuse holder "3"	brown/white–brown



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

a. Replace the wire harness.
b. Start the engine, warm-up the vehicle (5 min or more), and then racing the engine.
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”, or delete this DTC even if it has a condition of “Detected”.

• Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-3.

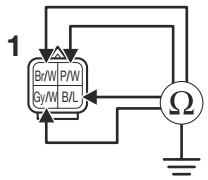
Ground short circuit check “A”

Between O_2 sensor coupler “1” and ground	gray/white–ground pink/white–ground black/blue–ground brown/white–ground

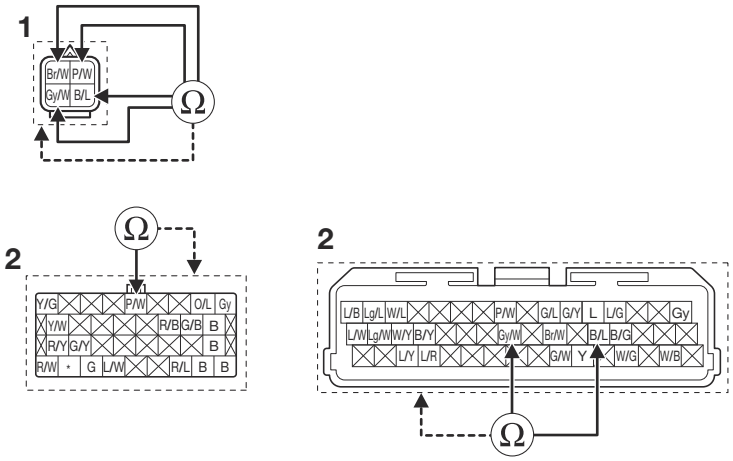
Lines short circuit check “B”

O_2 sensor coupler “1”	gray/white–any other coupler terminal pink/white–any other coupler terminal black/blue–any other coupler terminal brown/white–any other coupler terminal
ECU coupler “2”	gray/white–any other coupler terminal pink/white–any other coupler terminal black/blue–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

a. Replace the wire harness.
b. Start the engine, warm-up the vehicle (5 min or more), and then racing the engine.
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, or delete this DTC even if it has a condition of “Detected”.

5. Check fuel pressure.
   • Check the fuel pressure.
   Refer to “CHECKING THE FUEL PRESSURE” on page 7-16.

Is check result OK?

YES

→ Go to step 6.

NO

a. Replace the fuel pump.
   Refer to “REMOVING THE FUEL PUMP” on page 7-5.
b. Start the engine, warm-up the vehicle (5 min or more), and then racing the engine.
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, or delete this DTC even if it has a condition of “Detected”.

6. Defective O_2 sensor.
   - Replace the O_2 sensor.
     Refer to “ENGINE REMOVAL” on page 5-17.
   - Start the engine, warm-up the vehicle (5 min or more), and then racing the engine.
   - 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, or delete this DTC even if it has a condition of “Detected”.

7. Malfunction in ECU.
   - Replace the ECU, and complete the service.
     Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.
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.

EAS20649
U0155 or Err

EAS33129
TROUBLESHOOTING

Item

Abnormal CAN communication: signals cannot be transmitted between the ECU and the meter assembly.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- MAP changeover: State is fixed.
- Traction control does not work.
- Meter switch input: OFF is fixed.
- Quick shift system is not carried out.

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

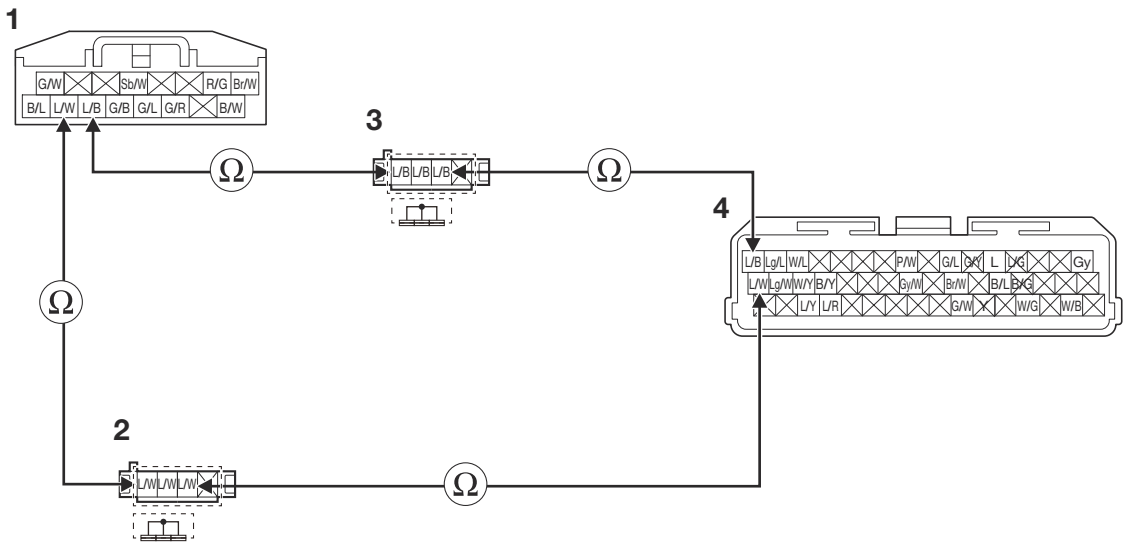
→ Go to step 6, and complete the service.

NO

→ Go to step 3.

3. Wire harness continuity.
   • Disconnect the meter assembly coupler "1" and ECU coupler "4".
   • Remove the joint coupler cap "2" and joint coupler cap "3".
   • Open circuit check

Between the meter assembly coupler "1" and joint coupler "2"	blue/white–blue/white
Between the meter assembly coupler "1" and joint coupler "3"	blue/black–blue/black
Between the joint coupler "2" and ECU coupler "4"	blue/white–blue/white
Between the joint coupler "3" and ECU coupler "4"	blue/black–blue/black



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 9-3.

Ground short circuit check "A"

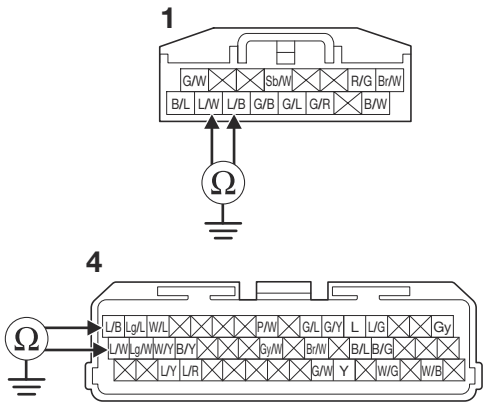
Between meter assembly coupler "1" and ground	blue/white–ground blue/black–ground

Between ECU coupler "4" and ground	blue/white–ground blue/black–ground

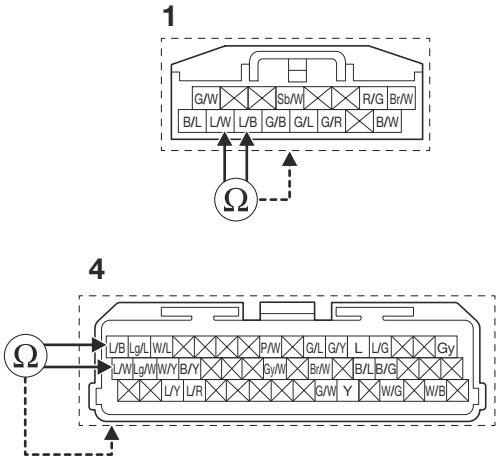
Lines short circuit check "B"

Meter assembly coupler "1"	blue/white–any other coupler terminal blue/black–any other coupler terminal
ECU coupler "4"	blue/white–any other coupler terminal blue/black–any other coupler terminal

A



B



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 (4)" on page 4-9.
   - 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 8-47.

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.

EAS20644
U0100_BCM

EAS33124
TROUBLESHOOTING

Item

Abnormal CAN communication: signals cannot be transmitted between the ECU and the BCM.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- Flasher auto cancel function stopped.

Procedure

TIP

This code detects past recovered malfunction. If there is a current malfunction, the YDT cannot recognize the BCM.

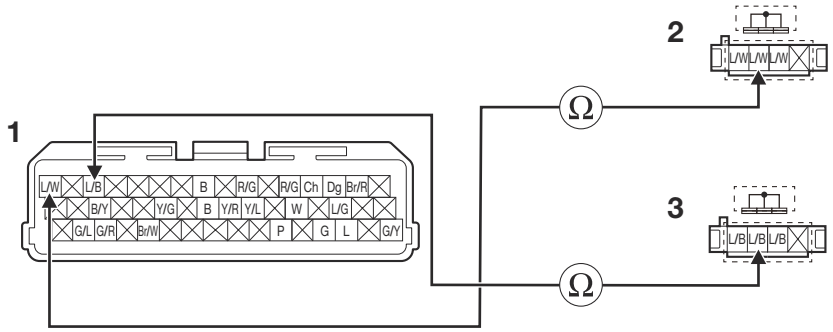
1. Locate the malfunction.
   - Check the recovered malfunction using the YDT.

   U0100/U0121/U0155
   → Go to step 2.
   U0100/U0121
   → Go to step 6.
2. Connection of BCM 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 10, and complete the service.
   NO
   → Go to step 3.
3. Wire harness continuity.
   - Disconnect the BCM coupler "1".
   - Remove the joint coupler cap "2" and joint coupler cap "3".
   - Open circuit check

Between BCM coupler "1" and joint coupler "2"	blue/white–blue/white
Between BCM coupler "1" and joint coupler "3"	blue/black–blue/black



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 10, and complete the service.

NO

→ Go to "Short circuit check".

• Short circuit check

TIP

Disconnect the BCM related connectors before checking.
Refer to "PARTS CONNECTED TO THE BCM" on page 9-3.

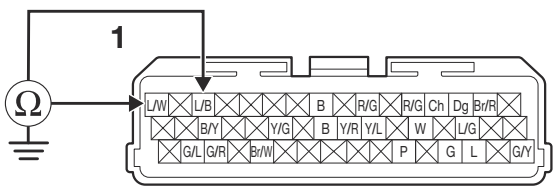
Ground short circuit check "A"

Between BCM coupler "1" and ground	blue/white–ground blue/black–ground

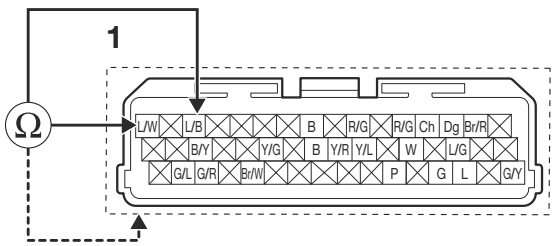
Ground short circuit check "B"

BCM coupler "1"	blue/white–any other coupler terminal blue/black–any other coupler terminal

A



B



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 10, and complete the service.

NO

→ Go to step 5.

4. Check the DTC.
   a. 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 10, and complete the service.

NO

→ Go to step 5.

5. Malfunction in BCM.
   • Replace the BCM.
   Refer to “GENERAL CHASSIS (1)” on page 4-1.
   • Go to step 10, and complete the service.
6. 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 7.

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

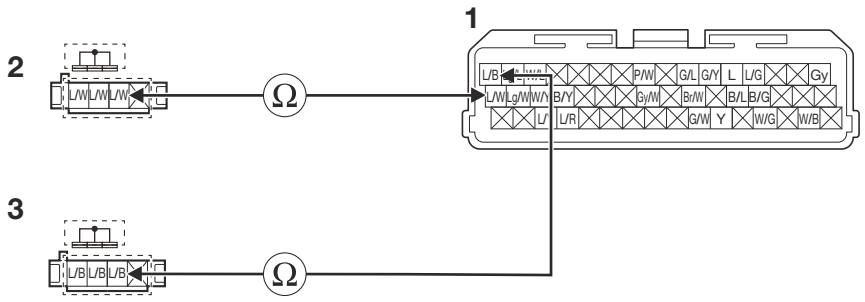
→ Go to step 10, and complete the service.

NO

→ Go to step 7.

7. Wire harness continuity.
   • Disconnect the ECU coupler “1”.
   • Remove the joint coupler cap “2” and joint coupler cap “3”.
   • Open circuit check

Between ECU coupler “1” and joint coupler “2”	blue/white–blue/white
Between ECU coupler “1” and joint coupler “3”	blue/black–blue/black



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 10, 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 9-3.

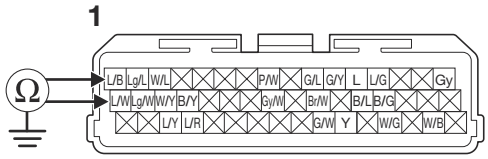
Ground short circuit check "A"

Between ECU coupler "1" and ground	blue/white–ground blue/black–ground

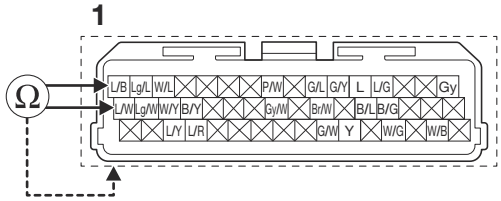
Ground short circuit check "B"

ECU coupler "1"	blue/white–any other coupler terminal blue/black–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 8.

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 10, and complete the service.

NO

→ Go to step 9.

8. Check the DTC.
   a. 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 10, and complete the service.

NO

→ Go to step 9.

9. Malfunction in ECU.
   • Replace the ECU.
   Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-47.
   • Go to step 10, and complete the service.
10. 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.

EAS20646
U0121_BCM

EAS33126
TROUBLESHOOTING

Item

Abnormal CAN communication: signals cannot be transmitted between the BCM and the ABS ECU.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- Hazard flashing function stopped due to ESS (emergency stop signaling).

Procedure

1. 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 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 BCM 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

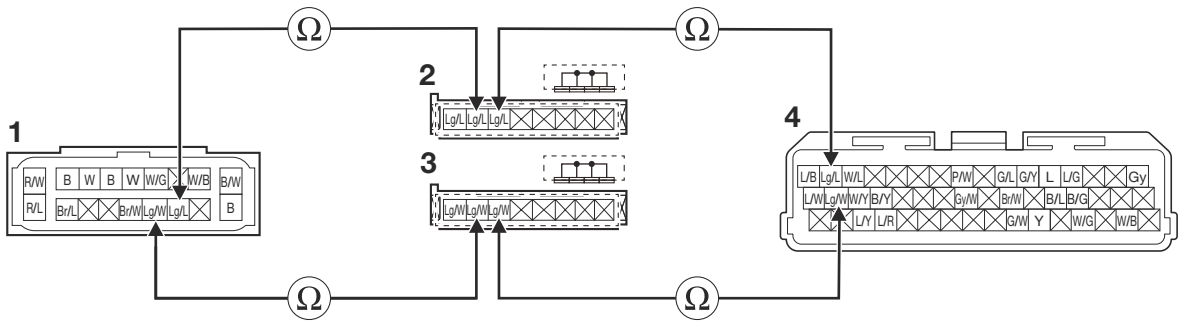
→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Wire harness continuity.
- Disconnect the ABS ECU coupler "1" and ECU coupler "4".
- Remove the joint coupler cap "2" and joint coupler cap "3".
- Open circuit check

Between ECU coupler "4" and joint coupler "2"	light green/blue–light green/blue
Between ECU coupler "4" and joint coupler "3"	light green/white–light green/white
Between ABS ECU coupler "1" and joint coupler "2"	light green/blue–light green/blue
Between ABS ECU coupler "1" and joint coupler "3"	light green/white–light green/white



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 and ABS ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-3 and "PARTS CONNECTED TO THE ABS

ECU" on page 9-3.

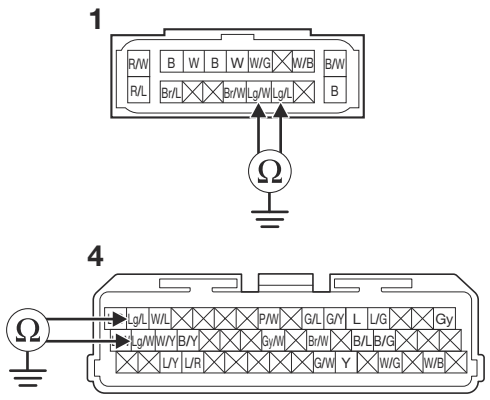
Ground short circuit check "A"

Between ECU coupler "4" and ground	light green/white–ground light green/blue–ground
Between ABS ECU coupler "1" and ground	light green/white–ground light green/blue–ground

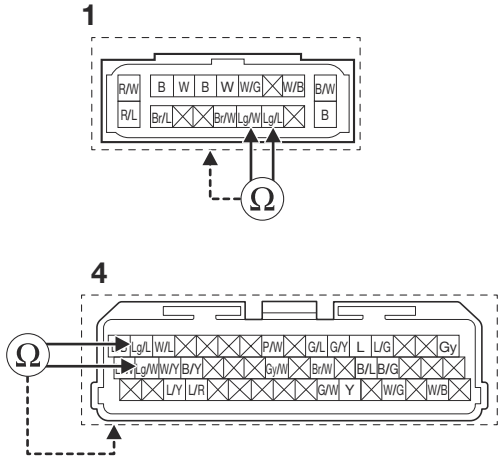
Lines short circuit check "B"

ECU coupler "4"	light green/white–any other coupler terminal light green/blue–any other coupler terminal
ABS ECU coupler "1"	light green/white–any other coupler terminal light green/blue–any other coupler terminal

A



B



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. Malfunction in BCM.
   - Replace the BCM.
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - 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 ABS ECU.
   - Replace the ABS ECU, and complete the service.
     Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-54.
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.

EAS20942
U0155_BCM

EAS34077
TROUBLESHOOTING

Item

Abnormal CAN communication: signals cannot be transmitted between the BCM and the meter assembly.

Fail-safe system

- Able to start engine.
- Able to drive vehicle.
- Meter screen cannot be operated using joystick and home button on the handlebar switch (left).

Procedure

TIP

"Err" is displayed on the clock display of the multi-function meter and the spanner mark light up.

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 BCM 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.

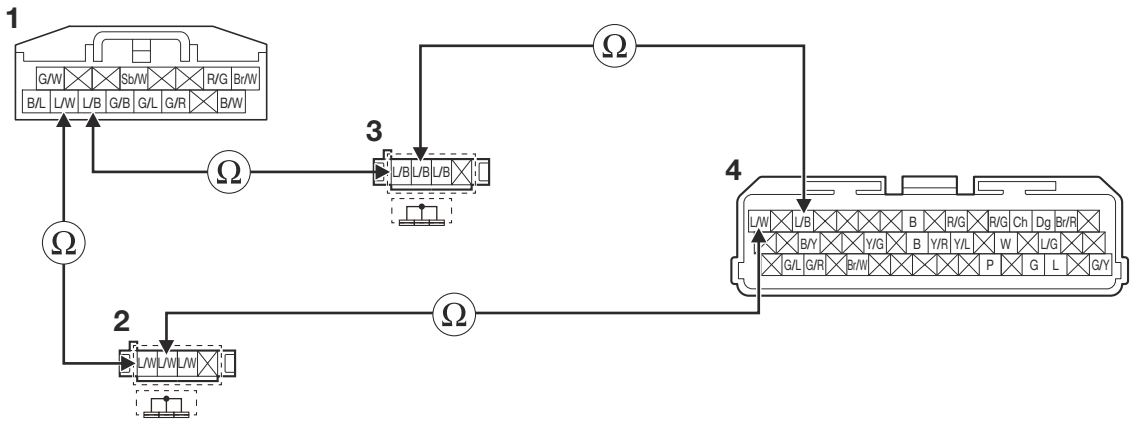
   NO

   → Go to step 3.

3. Wire harness continuity.
   - Disconnect the meter assembly coupler "1" and BCM coupler "4".
   - Remove the joint coupler cap "2" and joint coupler cap "3".

• Open circuit check

Between meter assembly coupler "1" and joint coupler "2"	blue/white–blue/white
Between meter assembly coupler "1" and joint coupler "3"	blue/black–blue/black
Between joint coupler "2" and BCM coupler "4"	blue/white–blue/white
Between joint coupler "3" and BCM coupler "4"	blue/black–blue/black



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

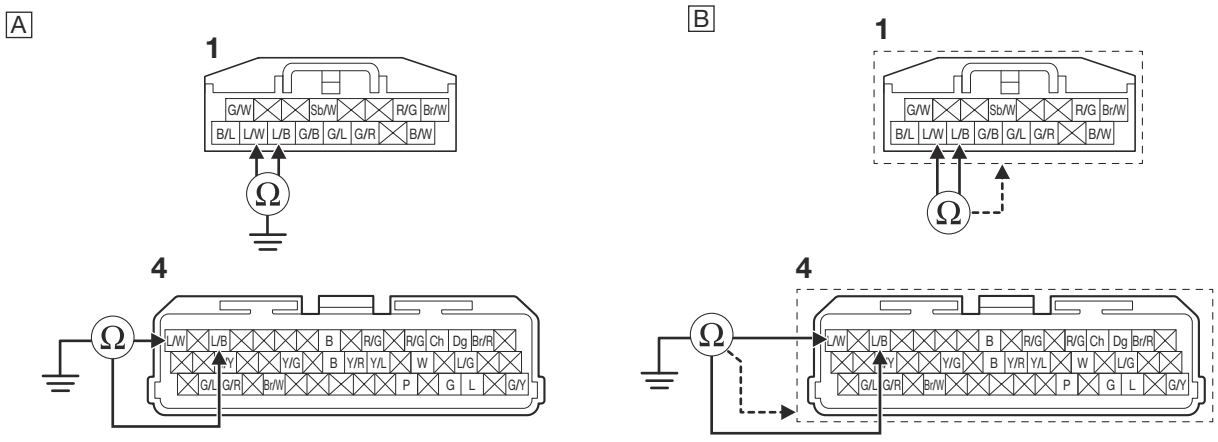
Disconnect the BCM related connectors before checking.
Refer to "PARTS CONNECTED TO THE BCM" on page 9-3.

Ground short circuit check "A"

Between meter assembly coupler "1" and ground	blue/white–ground blue/black–ground
Between BCM coupler "4" and ground	blue/white–ground blue/black–ground

Lines short circuit check "B"

Meter assembly coupler "1"	blue/white–any other coupler terminal blue/black–any other coupler terminal
BCM coupler "4"	blue/white–any other coupler terminal blue/black–any other coupler terminal



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. Malfunction in BCM.
   - Replace the BCM.
     Refer to "GENERAL CHASSIS (1)" on page 4-1.
   - 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. Defective meter assembly.
   - Replace the meter assembly, and complete the service.
     Refer to "GENERAL CHASSIS (4)" on page 4-9.
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.

EAS20685
11_ABS

EAS33314
TROUBLESHOOTING
Item
Front wheel sensor (intermittent pulses or no pulses)
Procedure
TIP
If the rear wheel continues to turn for more than 20 seconds after the front wheel has stopped, this will be recorded.

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 4-16.

   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 4-18.

   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 4-18.

   Is check result OK?
   YES
   → Replace the hydraulic unit assembly (ABS ECU).
   Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-54.
   NO
   → Repair or replace the wheel sensor.
   Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-54.

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 4-25.

   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 4-26.

   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 4-26.

   Is check result OK?
   YES
   → Replace the hydraulic unit assembly (ABS ECU).
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-54.
   NO
   → Repair or replace the wheel sensor.
   Refer to “REAR WHEEL” on page 4-21.

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, fault code No. 26 will be recorded. If the front brake ABS operates continuously for 36 seconds or more, fault code No. 13 will be recorded.
- Vehicle possibly ridden on uneven roads.

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 4-16.

   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 4-18.

   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 4-18.

   Is check result OK?
   YES
   → Replace the hydraulic unit assembly (ABS ECU).
   Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-54.
   NO
   → Repair or replace the wheel sensor.
   Refer to "FRONT WHEEL" on page 4-14.

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, fault code No. 27 will be recorded. If the rear brake ABS operates continuously for 36 seconds or more, fault code No. 14 will be recorded.
- Vehicle possibly ridden on uneven roads.

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 4-25.

   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 4-26.

   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 4-26.

   Is check result OK?
   YES
   → Replace the hydraulic unit assembly (ABS ECU).
   Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-54.
   NO
   → Repair or replace the wheel sensor.
   Refer to "REAR WHEEL" on page 4-21.

EAS20662
15_ABS

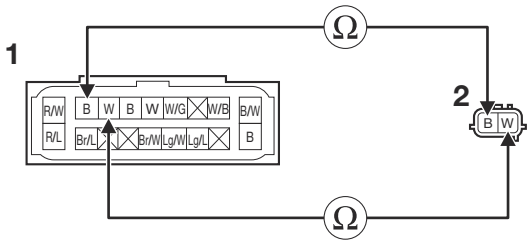
EAS33040
TROUBLESHOOTING
Item
Front wheel sensor (open or short circuit)
Procedure
1. Defective coupler between the front wheel sensor and the hydraulic unit assembly.
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

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 9-3.

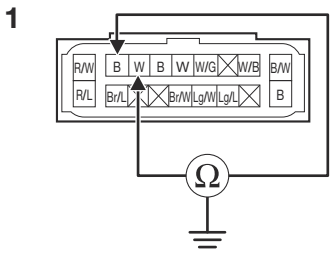
Ground short circuit check "A"

Between ABS ECU coupler "1" and ground	black–ground white–ground

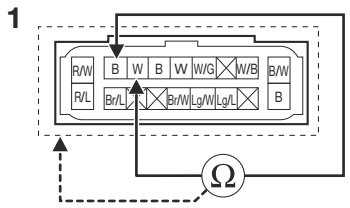
Lines short circuit check "B"

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 4-14 and "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-54.

EAS20663
16_ABS

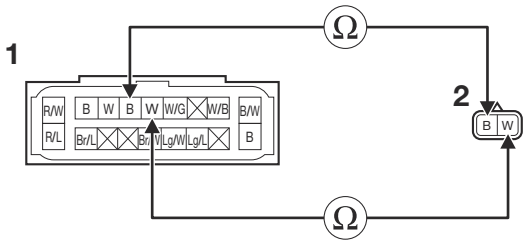
EAS33285
TROUBLESHOOTING
Item
Rear wheel sensor (open or short circuit)
Procedure
1. Defective coupler between the rear wheel sensor and the hydraulic unit assembly.
   - Check the coupler for any pins that may be pulled out.
   - Check the locking condition of the coupler.

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 9-3.

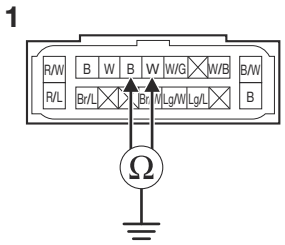
Ground short circuit check "A"

Between ABS ECU coupler "1" and ground	white–ground black–ground

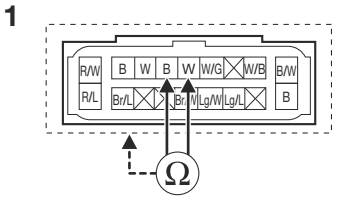
Lines short circuit check "B"

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 4-21 and "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-54.

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 4-54.

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 8-47.

Is check result OK?
YES
→ Go to step 2.
NO
→ Replace the fuse and check the wire harness.

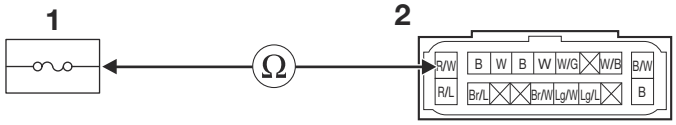
2. Defective coupler between the battery and the hydraulic unit assembly.
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

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 9-3.

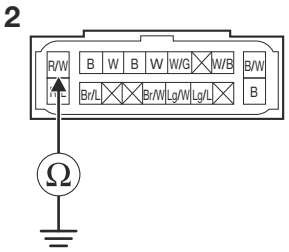
Ground short circuit check "A"

Between ABS ECU coupler "2" and ground	red/white–ground

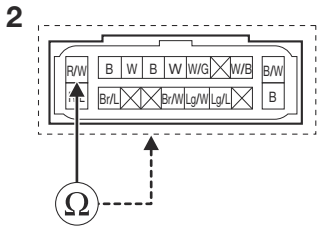
Lines short circuit check "B"

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 4-54.

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 8-47.

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 9-3.

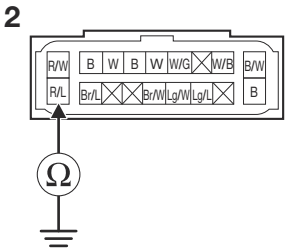
Ground short circuit check “A”

Between ABS ECU coupler “2” and ground	red/blue–ground

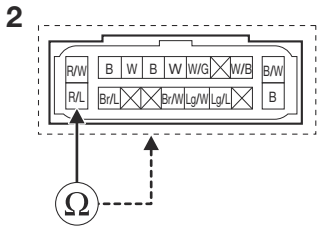
Lines short circuit check “B”

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 4-54.

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 4-54.

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 4-18.

   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 4-16 and "CHECKING THE FRONT BRAKE DISCS" on page 4-36.

   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 4-36.

   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 4-54.

EAS20695
42_ABS

EAS33324
TROUBLESHOOTING
Item
Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)
Procedure
1. Incorrect installation of the rear wheel sensor
   • Check the components for looseness, distortion, and bends.
   Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-26.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → Repair or replace the defective part.

2. Incorrect rotation of the rear wheel
   • Check that there is no brake disc drag on the wheel and make sure that it rotates smoothly.
   Refer to "CHECKING THE REAR WHEEL" on page 4-25 and "CHECKING THE REAR BRAKE DISC" on page 4-48.

   Is check result OK?
   YES
   → Go to step 3.
   NO
   → Repair or replace the defective part.

3. 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 4-48.

   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 4-54.

EAS20696
43, 45_ABS

EAS33330
TROUBLESHOOTING
Item
Front wheel sensor (missing pulses)
Procedure
TIP
After the fault code 45 is recorded, fault code 43 will be recorded if a certain speed and time are exceeded.

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 4-16.

   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 4-18.

   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 4-18.

   Is check result OK?
   YES
   → Replace the hydraulic unit assembly (ABS ECU).
   NO
   → Repair or replace the wheel sensor.

EAS20697
44, 46_ABS

EAS33325
TROUBLESHOOTING
Item
Rear wheel sensor (missing pulses)
Procedure
TIP
After the fault code 46 is recorded, fault code 44 will be recorded if a certain speed and time are exceeded.

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 4-25.

   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 4-26.

   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 4-26.

   Is check result OK?
   YES
   → Replace the hydraulic unit assembly (ABS ECU).
   NO
   → Repair or replace the wheel sensor.

EAS20698
51_ABS

EAS33326
TROUBLESHOOTING
Item
Vehicle system power supply (voltage of ABS ECU 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 8-48.
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).

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 8-48.
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

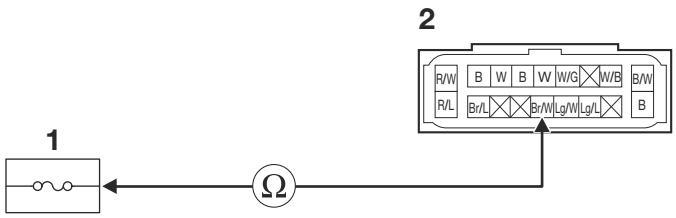
→ Go to step 3.

NO

→ If there is a malfunction, repair it and connect the coupler securely.

3. Wire harness continuity.
   - Disconnect the ABS control unit fuse "1" and ABS ECU coupler "2".
   - Open circuit check

Between ABS control unit 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 9-3.

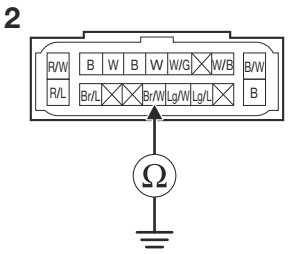
Ground short circuit check "A"

Between ABS ECU coupler "2" and ground	brown/white–ground

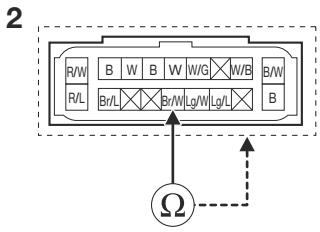
Lines short circuit check “B”

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 4-54.

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 4-54.

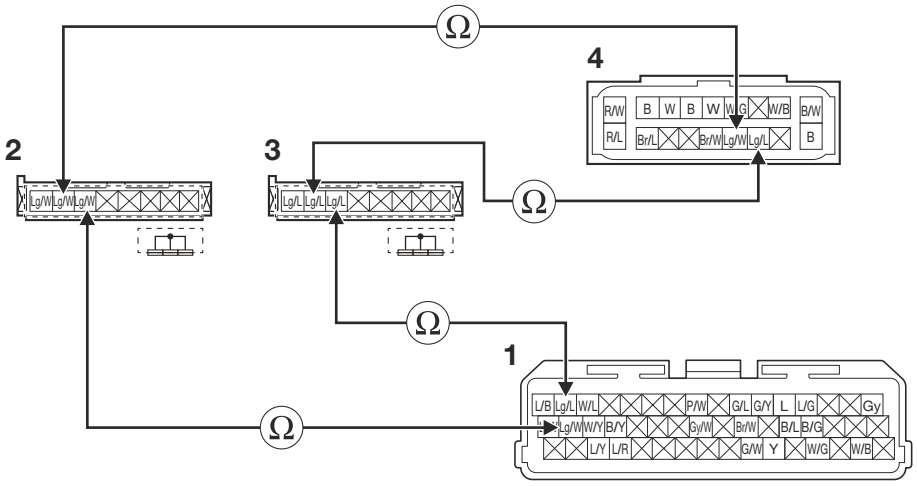
EAS20701
56_ABS

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 4-54.

EAS20666
57_ABS

EAS33292
TROUBLESHOOTING
Item
Vehicle CAN communication line or power source of vehicle system
Procedure
1. Wire harness continuity.
   • Disconnect the ECU coupler “1” and ABS ECU coupler “4”.
   • Remove the joint coupler cap “2” and joint coupler cap “3”.
   • Open circuit check

Between ECU coupler “1” and joint coupler “2”	light green/white–light green/white
Between ECU coupler “1” and joint coupler “3”	light green/blue–light green/blue
Between joint coupler “2” and ABS ECU coupler “4”	light green/white–light green/white
Between joint coupler “3” and ABS ECU coupler “4”	light green/blue–light green/blue



Is resistance 0 Ω?
YES
→ Go to “Short circuit check”
NO
→ Replace the wire harness.

• Short circuit check

TIP
Disconnect the ECU and ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-3 and “PARTS CONNECTED TO THE ABS ECU” on page 9-3.

Ground short circuit check “A”

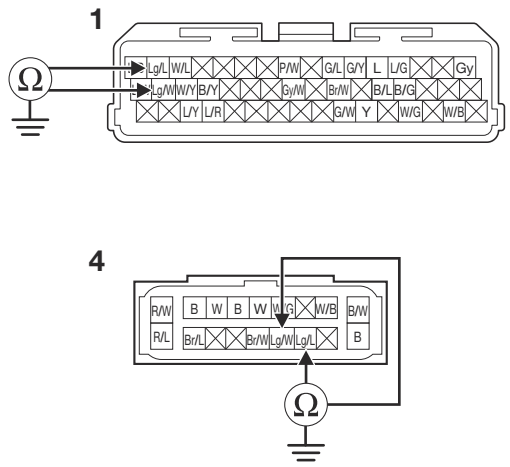
Between ECU coupler “1” and ground	light green/white–ground light green/blue–ground

Between ABS ECU coupler "4" and ground	light green/white–ground light green/blue–ground

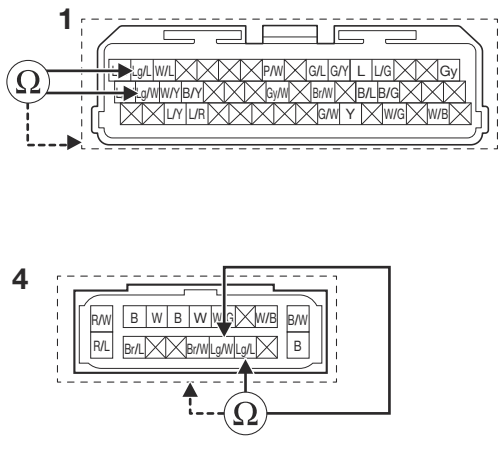
Lines short circuit check "B"

ECU coupler "1"	light green/white–any other coupler terminal light green/blue–any other coupler terminal
ABS ECU coupler "4"	light green/white–any other coupler terminal light green/blue–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 2.

NO

→ Replace the wire harness.

2. Defective battery
   - Recharge or replace the battery, and check again.
     Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-48.
3. 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

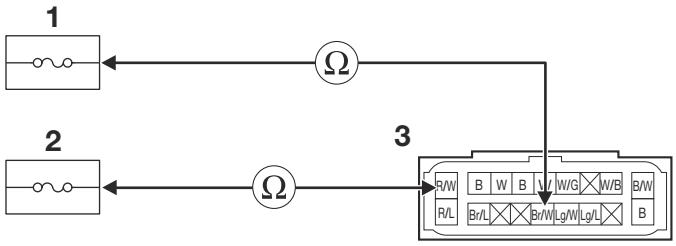
→ Go to step 4.

NO

→ If there is a malfunction, repair it and connect the coupler securely.

4. Wire harness continuity
   - Disconnect the ABS control unit fuse "1", ABS solenoid fuse "2" and ABS ECU coupler "3".
   - Open circuit check

Between ABS control unit fuse "1" holder and ABS ECU coupler "3"	brown/white–brown/white
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 9-3.

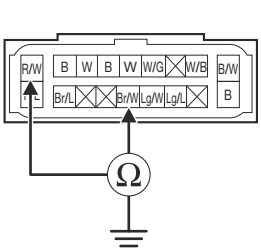
Ground short circuit check "A"

Between ABS ECU coupler "3" and ground	brown/white–ground red/white–ground

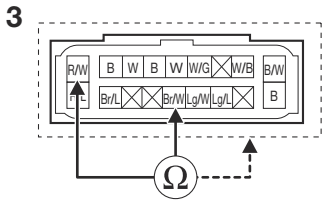
Lines short circuit check "B"

ABS ECU coupler "3"	brown/white–any other coupler terminal red/white–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

→ Replace the wire harness.

5. Defective charging system
   - Check the charging system.
     Refer to "CHARGING SYSTEM" on page 8-13.

Is resistance ∞ Ω?

YES

→ Replace the hydraulic unit assembly (ABS ECU).

NO

→ Confirm the cause of the problem and repair it, and check again.

EAS20702
62_ABS

EAS33333
TROUBLESHOOTING
Item
Power supply voltage failure in pressure sensor
Procedure
1. Defective hydraulic unit assembly
   - Replace the hydraulic unit assembly.
     Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-54.

EAS20705
68_ABS

EAS33336
TROUBLESHOOTING
Item
Defective hydraulic unit assembly (defective front pressure sensor)
Procedure
1. Defective front brake line
   • Check the front brake line.

   Is check result OK?
   YES
   → Go to step 2.
   NO
   → If there is bending or blocking, replace the front brake line.

2. Defective hydraulic unit assembly
   • Replace the hydraulic unit assembly.
   Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-54.

EAS20669
89_ABS

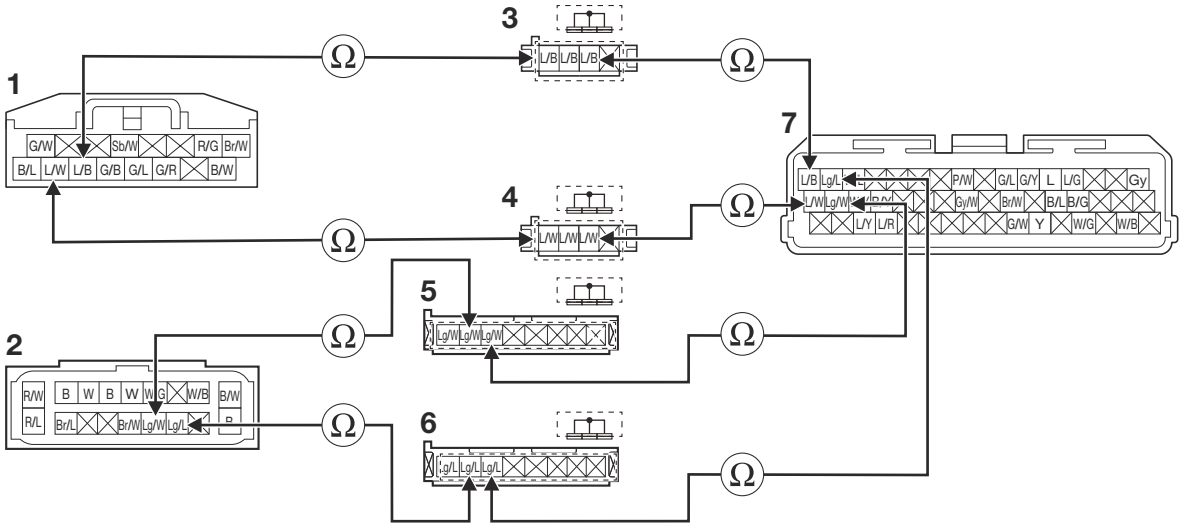
EAS33299
TROUBLESHOOTING
Item
CAN communication (between meter assembly and hydraulic unit assembly)
Procedure
1. Defective coupler between the meter assembly and the hydraulic unit assembly
   - Check the coupler for any pins that may be pulled out.
   - Check the locking condition of the coupler.

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 meter assembly coupler "1", ABS ECU coupler "2" and ECU coupler "7".
   - Remove the joint coupler cap "3", joint coupler cap "4", joint coupler cap "5" and joint coupler cap "6".
   - Open circuit check

Between meter assembly coupler "1" and joint coupler "3"	blue/black–blue/black
Between meter assembly coupler "1" and joint coupler "4"	blue/white–blue/white
Between joint coupler "3" and ECU coupler "7"	blue/black–blue/black
Between joint coupler "4" and ECU coupler "7"	blue/white–blue/white
Between ABS ECU coupler "2" and joint coupler "5"	light green/white–light green/white
Between ABS ECU coupler "2" and joint coupler "6"	light green/blue–light green/blue
Between joint coupler "5" and ECU coupler "7"	light green/white–light green/white
Between joint coupler "6" and ECU coupler "7"	light green/blue–light green/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 9-3.

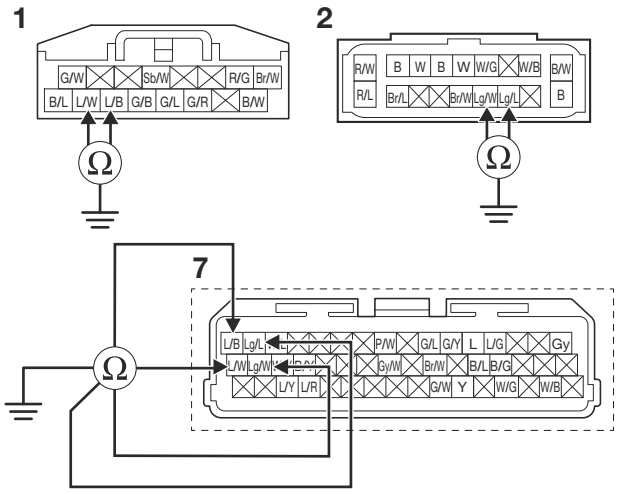
Ground short circuit check "A"

Between meter assembly coupler "1" and ground	blue/black–ground blue/white–ground
Between ABS ECU coupler "2" and ground	light green/white–ground light green/blue–ground
Between ECU coupler "7" and ground	blue/black–ground blue/white–ground light green/white–ground light green/blue–ground

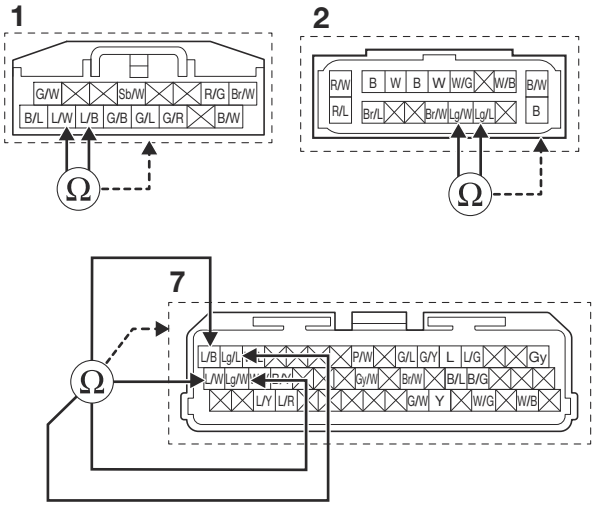
Lines short circuit check "B"

Meter assembly coupler "1"	blue/black–any other coupler terminal blue/white–any other coupler terminal
ABS ECU coupler "2"	light green/white–any other coupler terminal light green/blue–any other coupler terminal
ECU coupler "7"	blue/black–any other coupler terminal blue/white–any other coupler terminal light green/white–any other coupler terminal light green/blue–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 3.

NO

→ Replace the wire harness.

3. Defective meter assembly
   - Replace the meter assembly, and check again.
4. Defective hydraulic unit assembly
   - Replace the hydraulic unit assembly.

EAS20670
90_ABS

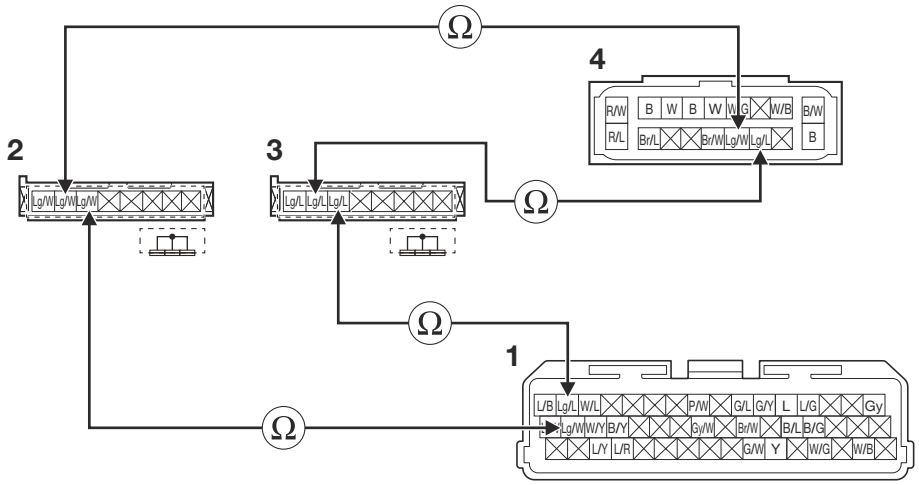
EAS33300
TROUBLESHOOTING
Item
CAN communication (between ECU and hydraulic unit assembly)
Procedure
1. Defective coupler between the ECU and the hydraulic unit assembly
   • Check the coupler for any pins that may be pulled out.
   • Check the locking condition of the coupler.

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 ECU coupler "1" and ABS ECU coupler "4".
   • Remove the joint coupler cap "2" and joint coupler cap "3".
   • Open circuit check

Between ECU coupler "1" and joint coupler "2"	light green/white–light green/white
Between ECU coupler "1" and joint coupler "3"	light green/blue–light green/blue
Between joint coupler "2" and ABS ECU coupler "4"	light green/white–light green/white
Between joint coupler "3" and ABS ECU coupler "4"	light green/blue–light green/blue



Is resistance 0 Ω?
YES
→ Go to "Short circuit check".
NO

→ Replace the wire harness.

• Short circuit check

TIP

Disconnect the ECU and ABS ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-3 and "PARTS CONNECTED TO THE ABS ECU" on page 9-3.

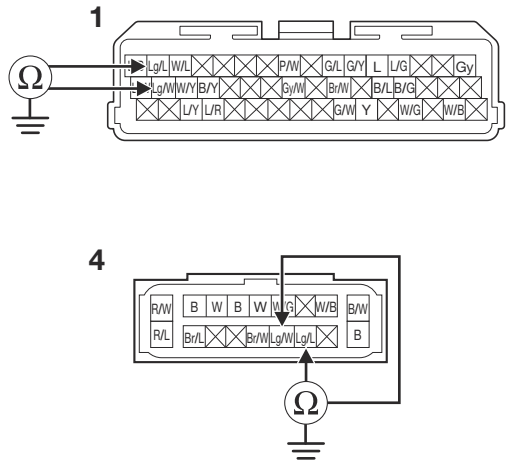
Ground short circuit check "A"

Between ECU coupler "1" and ground	light green/white–ground light green/blue–ground
Between ABS ECU coupler "4" and ground	light green/white–ground light green/blue–ground

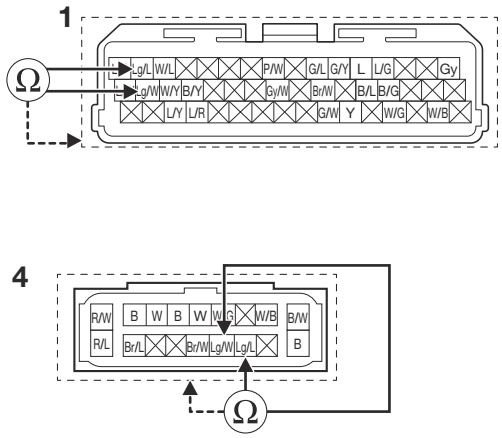
Lines short circuit check "B"

ECU coupler "1"	light green/white–any other coupler terminal light green/blue–any other coupler terminal
ABS ECU coupler "4"	light green/white–any other coupler terminal light green/blue–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 3.

NO

→ Replace the wire harness.

3. Defective ECU
   • Replace the ECU, and check again.
4. Defective hydraulic unit assembly
   • Replace the hydraulic unit assembly.

EAS20091

WIRING DIAGRAM

MT07S/MT07SC 2025

1. AC magneto
2. GCU (Generator Control Unit)
3. Main switch
4. Joint coupler
5. Radiator fan motor relay
6. Horn relay
7. Radiator fan motor
8. Horn
9. Fuse box
10. Main fuse
11. Fuel injection system fuse
12. Electronic throttle valve fuse
13. Backup fuse 2
14. Backup fuse
15. Radiator fan motor fuse
16. ABS solenoid fuse
17. ABS motor fuse
18. Ignition fuse
19. Headlight fuse
20. ABS control unit fuse
21. Ignition fuse 2
22. Signaling system fuse
23. Terminal fuse 1
24. Battery
25. Starter relay
26. Starter motor
27. Engine ground
28. Clutch switch
29. Relay unit
30. Starting circuit cut-off relay
31. Fuel pump relay
32. Neutral switch
33. Sidestand switch
34. Shift sensor (OPTION)
35. Lean angle sensor
36. Intake air pressure sensor
37. O_2 sensor
38. Crankshaft position sensor
39. Coolant temperature sensor
40. Intake air temperature sensor
41. ECU (Engine Control Unit)
42. Ignition coil #1
43. Ignition coil #2
44. Spark plug
45. Fuel injector #1
46. Fuel injector #2
47. Grip warmer (OPTION)
48. Gear position sensor
49. Throttle position sensor
50. Throttle servo motor
51. Front wheel sensor
52. Rear wheel sensor
53. ABS ECU (electronic control unit)
54. YDT coupler
55. Meter assembly
56. Oil pressure switch
57. Fuel sender
58. Fuel pump
59. Rear brake light switch
60. Front brake light switch
61. Headlight control unit
62. Headlight (high)
63. Headlight (low)
64. Tail/brake light
65. License plate light
66. Auxiliary light
67. Auxiliary DC connector (OPTION)
68. Rear turn signal light (right)
69. Rear turn signal light (left)
70. Front turn signal/position light (right)
71. Front turn signal/position light (left)
72. BCM (Body Control Module)
73. Engine stop relay
74. Starting circuit cut-off relay 2
75. Handlebar switch (right)
76. YRC mode button
77. Stop/run/start switch
78. Accelerator position sensor
79. Handlebar switch (left)
80. Dimmer/pass switch
81. Turn signal switch
82. Joystick (push)
83. Hazard switch
84. Joystick (left)
85. Joystick (right)
86. Horn switch
87. Joystick (up)
88. Home Button
89. Joystick (down)
90. Purge cut valve solenoid

A. Wire harness
B. Sub-wire harness (coolant temperature sensor, fuel injector #1, fuel injector #2)
C. Sub-wire harness (oil pressure switch)
D. Sub-wire harness (neutral switch)

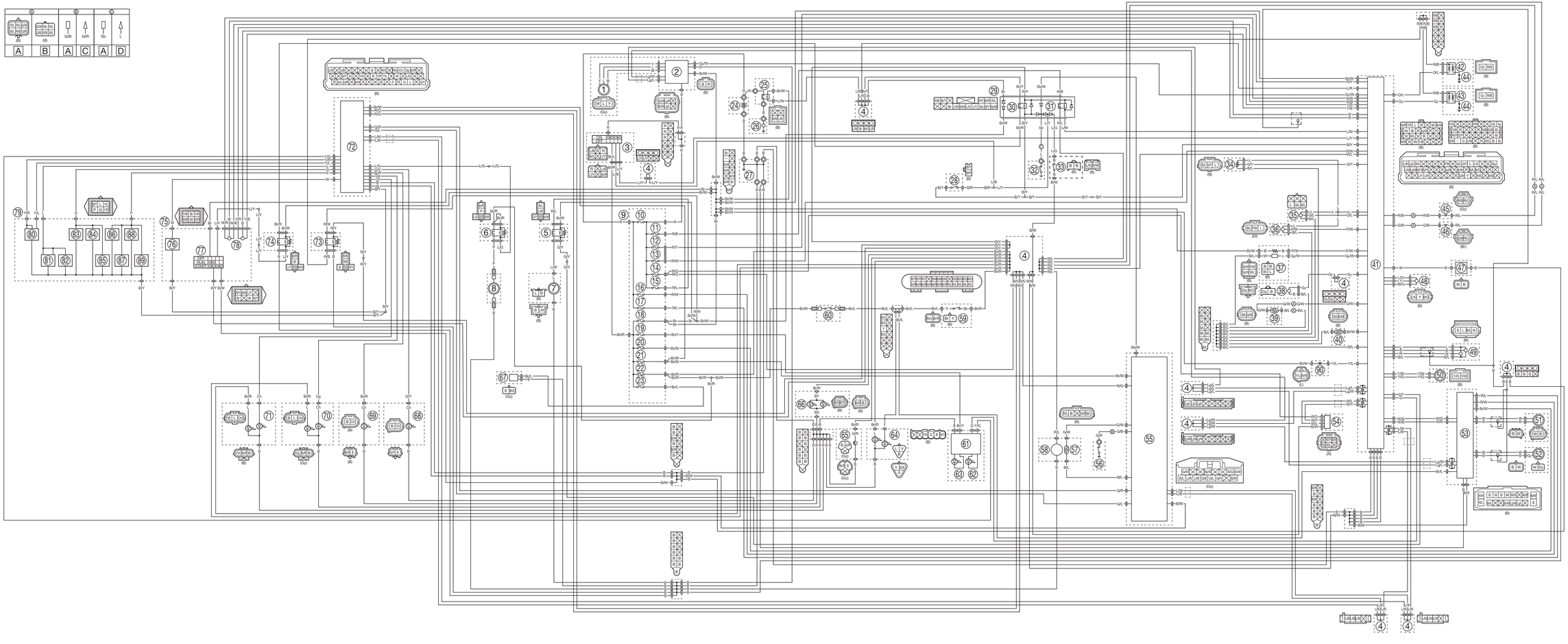
*. For California only: Y/L
Except for California: blank
**. For California only: Br/W
Except for California: blank

EAS30613

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
Lg	Light green
P	Pink
R	Red
Sb	Sky blue
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/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
Br/Y	Brown/Yellow
G/B	Green/Black
G/L	Green/Blue
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/W	Gray/White
L/B	Blue/Black
L/G	Blue/Green
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
Lg/L	Light green/Blue
Lg/W	Light green/White
O/L	Orange/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/L	White/Blue
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red
Y/W	Yellow/White

MT07S/MT07SC 2025
WIRING DIAGRAM



MT07S/MT07SC 2025
WIRING DIAGRAM