



YAMAHA

2022

SERVICE MANUAL

XSR 900

MTM890

BEA-28197-E0

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-E0*) for basic instructions that must be observed during servicing. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.




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.

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.
	A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	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.

**MTM890
SERVICE MANUAL
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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.

1
↓
CLUTCH

CLUTCH

Removing the clutch cover

3

4

5

6

Order	Job/Parts to remove	Q'ty	Remarks
	Front side cowling assembly/Bottom cowling		Refer to "GENERAL CHASSIS (5)" on page 4-8.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-26.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-29.
1	Water pump breather hose	1	Disconnect.
2	Clutch cable	1	Disconnect.
3	Pull lever	1	
4	Pull lever spring	1	
5	Clutch cover	1	
6	Clutch cover gasket	1	
7	Dowel pin	2	

5-46

CLUTCH

WORKS

REMOVING THE CLUTCH

1. Remove:

- Oil strainer
Refer to "OIL PUMP" on page 5-59.
- Water pump
Refer to "WATER PUMP" on page 6-12.
- Friction plates
- Clutch plates

TIP

Be sure to mark the friction plates and clutch plates or note the position of each part so that they are installed in their original positions.

2. Straighten the clutch boss nut rib "a".

3. Loosen:

- Clutch boss nut "1"

TIP

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

Universal clutch holder
90890-04086
Universal clutch holder
YM-91042

4. Remove:

- Spacer "1"
- Bearing
- Clutch housing "2"
- Oil pump drive chain

TIP

Remove the spacer and bearing from the main axle, then remove the oil pump drive chain from the oil pump driven sprocket, and then remove the clutch housing and oil pump drive chain from the main axle.

WARNING

CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

1. Check:

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

2. Measure:

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

TIP

Measure the friction plate at four places.

Friction plate thickness
2.92-3.08 mm (0.115-0.121 in)
Wear limit
2.80 mm (0.110 in)

WARNING

CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

5-50

SYMBOLS

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

TIP

The following symbols are not relevant to every vehicle.



















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

TABLE OF CONTENTS

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

GENERAL INFORMATION

IDENTIFICATION	1-1
VEHICLE IDENTIFICATION NUMBER	1-1
MODEL LABEL.....	1-1
FEATURES.....	1-2
GLOSSARY	1-2
DISPLAY	1-2
BASIC SERVICE INFORMATION.....	1-11
ELECTRICAL SYSTEM.....	1-11
SPECIAL TOOLS	1-12

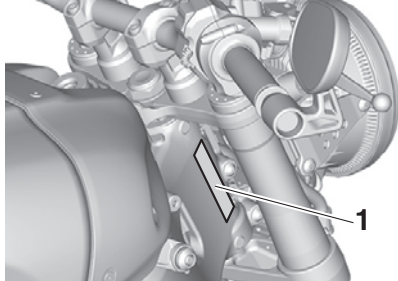
EAS20007

IDENTIFICATION

EAS30002

VEHICLE IDENTIFICATION NUMBER

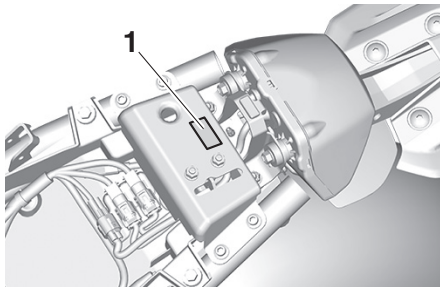
The vehicle identification number “1” is stamped into the right side of the steering head pipe.



EAS30003

MODEL LABEL

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



EAS20008

FEATURES

EAS31706

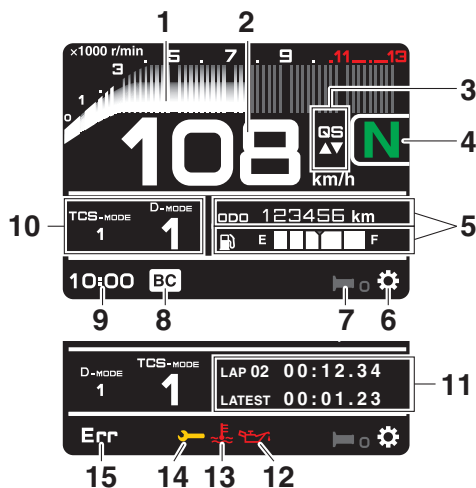
GLOSSARY

- ABS - Anti-lock Brake System
- ABS ECU - Anti-lock Brake System Electronic Control Unit
- BC - Brake Control
- ECU - Engine Control Unit
- LIF - Lift Control System
- QS - Quick Shift
- SCS - Slide Control System
- TCS - Traction Control System

EAS31707

DISPLAY

The following items can be found on the display:



1. Tachometer
2. Speedometer
3. Quick shifter indicator "QS"
4. Transmission gear display
5. Vehicle information displays
6. Settings MENU icon "⚙"
7. Grip warmer indicator (option)
8. Brake control icon "BC"
9. Clock
10. MODE display
11. Lap timer
12. Oil pressure warning "🛢"
13. Coolant temperature warning "🌡"
14. Auxiliary system warning "🔑"
15. Error mode warning "Err" (replaces clock when activated)

TIP

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

EWA18210

⚠ WARNING

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

Speedometer

The speedometer shows the vehicle's traveling speed.

TIP

The display can be switched between kilometers and miles.

Tachometer

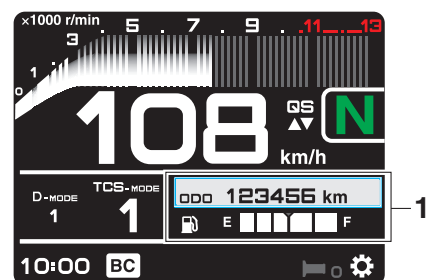
The tachometer shows the engine speed, as measured by the rotational velocity of the crankshaft, in revolutions per minute (r/min).

ECA19660

NOTICE

Do not operate the engine in the tachometer red zone.

Vehicle information displays



1. Vehicle information displays

The two vehicle information displays can be individually set to show the following items:

- ODO: odometer
- F-TRIP: fuel reserve tripmeter
- TRIP1: tripmeter
- TRIP2: tripmeter
- F.AVE: average fuel economy
- F.CRNT: instantaneous fuel economy
- A.TEMP: air temperature
- C.TEMP: coolant temperature
- Fuel meter
- FUEL CON: amount of fuel consumed
- TRIP TIME: running time

Operate the vehicle information display as follows:

Rotate the wheel switch to move the cursor over a display.

Press the wheel switch inward and the selected display will highlight gray.


Rotate the wheel switch to choose a different display item.

Press the wheel switch inward to confirm the new display item.

TIP

- In LAP TIME mode, the vehicle information display is replaced by the lap information.
- TRIP1, TRIP2, F-TRIP, F.AVE, FUEL CON and TRIP TIME items can be individually reset.

Odometer:



ODO 123456 km

The odometer shows the total distance traveled by the vehicle.

TIP

ODO will lock at 999999 and cannot be reset.

Fuel reserve tripmeter:



F-TRIP 20.0 km

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

Tripmeters:



TRIP1 98.7 km
TRIP2 43.2 km

TRIP1 and TRIP2 show the distance traveled since they were last set to zero.

TIP

TRIP1 and TRIP2 will reset to 0 and begin counting again after 9999.9 has been reached.

Average fuel economy:



F.AVE 8.7 km/L

The average fuel economy display can be set to “km/L” or “L/100km”.

TIP

After resetting the average fuel economy display, “-.-” will be shown until the vehicle has traveled 1 km.

Instantaneous fuel economy:



The instant fuel economy display can be set to "km/L" or "L/100km".

TIP

- If traveling at speeds under 10 km/h, "--." will be displayed.
- The instantaneous fuel economy function should be used for general reference only. Do not use this figure to estimate the distance that can be traveled on the current tank of fuel.

Air temperature:



The air temperature is displayed from $-9\text{ }^{\circ}\text{C}$ ($16\text{ }^{\circ}\text{F}$) to $50\text{ }^{\circ}\text{C}$ ($122\text{ }^{\circ}\text{F}$) in $1\text{ }^{\circ}\text{C}$ ($1\text{ }^{\circ}\text{F}$) increments. The temperature displayed may vary from the actual ambient temperature.

TIP

- "--" will be displayed if the detected temperature is lower.
- "--" will be displayed if the detected temperature is higher.

Coolant temperature:



The coolant temperature is displayed from $40\text{ }^{\circ}\text{C}$ ($104\text{ }^{\circ}\text{F}$) to $124\text{ }^{\circ}\text{C}$ ($255\text{ }^{\circ}\text{F}$) in $1\text{ }^{\circ}\text{C}$ ($1\text{ }^{\circ}\text{F}$) increments.

TIP

- If the vehicle coolant temperature is below $40\text{ }^{\circ}\text{C}$ ($104\text{ }^{\circ}\text{F}$) the coolant temperature display will read "Lo"
- If the vehicle coolant temperature is above $124\text{ }^{\circ}\text{C}$ ($255\text{ }^{\circ}\text{F}$) the coolant temperature display will read "Hi"

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.

Fuel consumption trip meter:



Displays how much fuel has been consumed since the trip meter was last reset.

Trip time:



Displays engine running time.

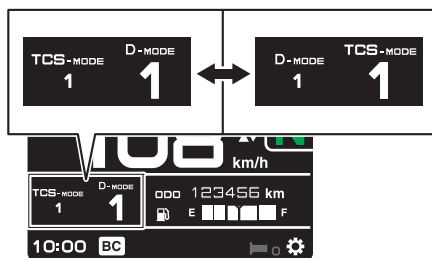
To reset information display items

1. Rotate the wheel switch to select one of the two vehicle information displays.
2. Press the wheel switch inward to highlight the information display.
3. Rotate the wheel switch to select the desired information display item.
4. Press and hold the wheel switch inward until the highlighted display item is reset.

Transmission gear display

This shows which gear the transmission is in. This model has 6 gears and a neutral position. The neutral position is indicated by the neutral indicator light “N” and by the transmission gear display “N”.

MODE display



This display shows the currently selected “D-MODE” and “TCS-MODE” settings. The mode that is enlarged and displayed on the right can be adjusted using the MODE up/down switches. Use the “MODE” switch to toggle left-right between “TCS-MODE” and “D-MODE”.

TIP

- When the malfunction indicator light “”, the auxiliary system warning “”, or the coolant temperature warning “” are on, “D-MODE” and “TCS-MODE” cannot be adjusted.
- The previously selected modes will be displayed when the vehicle power is turned on.

To turn off the traction control system, select “TCS-MODE” with the “MODE” switch, then press and hold the MODE up switch until “OFF” is displayed. To turn the traction control system back on, press the MODE down switch (“TCS-MODE” will return to its previous setting).

TIP

- When “TCS-MODE” has been set to “OFF”, the traction control system, SCS and LIF systems are all turned off together.
- The “TCS-MODE OFF” and “TCS-MODE M” settings can only be selected while the vehicle is stopped.

Clock

The clock uses a 12-hour time system.

Quick shifter indicator “QS”

When able to shift, the respective QS or turns green.

When unable to shift, QS is white.

If the quick shifter function is turned OFF, QS itself is not displayed.

The quick shifter functions can be turned on or off in the setting MENU.

TIP

The upshift and downshift functions are independent and can be activated separately. For more information on the quick shifter.

Setting menu icon “”

Choose this icon and press the wheel switch inward to change the settings MENU screen.

Grip warmer indicator (Option)

The grip warmers can be used when the engine is running. There are 10 temperature levels. When activated, the indicator will display the temperature level from 1 (lowest) to 10 (highest). To activate the grip warmer, use the wheel switch to highlight the grip warmer display with the cursor.

Press the wheel switch inward to select the grip warmer function.

Once selected, rotate the wheel switch up and down to adjust the temperature level.

Press the wheel switch inward to confirm the temperature level and exit the grip warmer function.

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.**

The function of the wheel switch can be locked into grip warmer mode by pressing and holding the wheel switch inward while the grip warmer indicator is highlighted by the cursor.

In this mode, the temperature levels can be instantly adjusted by rotating the wheel switch up/down.

To exit this mode and return the wheel switch to its normal functionality, press and hold the wheel switch inward.

TIP

The current grip warmer setting is saved when the vehicle is turned off.

Lap timer

This stopwatch function can be activated through the setting MENU.

Once activated, the vehicle information display is replaced with:



1. Lap count
2. Current lap time
3. Latest/Previous lap time

To start the timer, push the dimmer/pass switch down towards “PASS”.

Each push of the dimmer/pass switch will increase the lap count by 1 and reset the current lap timer.

To pause the lap timer, press the wheel switch inward.

To unpause the timer, push the dimmer/pass switch down towards “PASS” and the timer will resume without counting a new lap.

To exit the lap time mode, turn it off in the settings MENU.

TIP

- The engine must be running to start the lap timer.
- The headlight will flash when the dimmer/pass switch is pressed.
- Whenever the lap timer is paused, it can be resumed using the dimmer/pass switch.

Brake control icon “BC”

This icon is replaced by the auxiliary system warning and coolant temperature warning indicators when they are activated.

Error mode warning “Err”

When an internal error occurs (e.g., communication with a system controller has been cut off), the error mode warning will appear as follows.

“Err” and “SC” indicator light indicates an ECU error.

“Err” only indicates an ABS ECU error.

TIP

Depending on the nature of the error, the display may not function properly and the traction control system settings may be impossible to change. Additionally, ABS may not function properly. Use extra care when braking and have a Yamaha dealer check the vehicle immediately.

Auxiliary system warning “”

This icon appears if a problem is detected in a non-engine-related system.

Coolant temperature warning “”

This icon appears if the coolant temperature reaches 116 °C (241 °F) or higher. 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 icon will come on and stay on until the engine has been started.

TIP

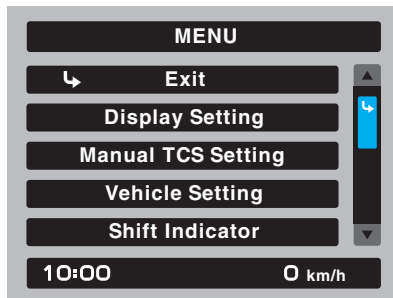
If a malfunction is detected, the oil pressure warning icon will flash repeatedly.

ECA27240

NOTICE

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

Settings MENU



The settings MENU screen contains the following settings modules. Select a module to make related settings changes.

Module	Description
“Exit”	Exit MENU and return the main display
“Display Setting”	Switch lap time mode on/off and adjust the tachometer color
“Manual TCS Setting”	Adjust traction control system/SCS/LIF settings for the “TCS-MODE M”
“Vehicle Setting”	Adjust BC/quick shifter settings
“Shift Indicator”	Turn the shift indicator on/off and adjust tachometer settings
“Maintenance”	View and reset maintenance intervals
“Unit”	Set fuel consumption and measurement units
“Brightness”	Adjust screen brightness
“Clock”	Adjust the clock
“All Reset”	Return all settings to factory default

Settings MENU access and operation

How to use the settings MENU:

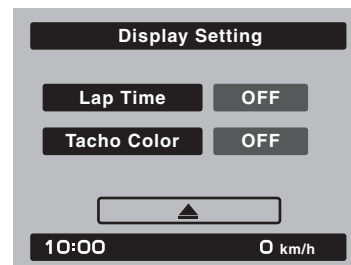
Rotate the wheel switch up or down to highlight items or increase/decrease values and briefly press the wheel switch inward to confirm the selection.

Press and hold the wheel switch until the screen returns to the main display to exit the MENU at any time.

TIP

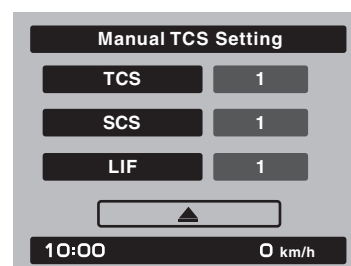
- Certain settings menu screens have an upward pointing triangle mark item. Select the triangle mark to save settings changes and exit the current screen.
- Should vehicle motion be detected, the screen will automatically exit the settings MENU and return to the main display.
- To ensure that the desired settings changes are saved, be sure to exit each menu via the triangle mark (if displayed). Exiting the settings menu by pressing and holding the wheel switch may not save settings changes.

“Display Setting”



This module allows you to switch the lap time mode and tachometer color mode ON/OFF. When the lap time mode is selected, the twin vehicle information displays on the main screen will display a lap timer and a lap counter. To exit the lap time mode, the turn lap timer OFF in the display setting module. To change the tachometer to color mode, select ON.

“Manual TCS Setting”



This module allows you to customize the “TCS-MODE M” which is accessible on the main display using the MODE switches.

Traction control system

This model uses a variable traction control system. For each setting level, the further the vehicle is leaned over, the greater the amount of traction control (system intervention) is applied. There are 3 setting levels available for the “TCS-MODE M”.

Setting level 1 applies the least amount of overall system intervention, while setting level 3 applies the greatest amount of overall traction control.

TIP

- The traction control system can only be turned on or off via the main screen using the MODE switches.
- SCS and LIF can be turned off independently of traction control system for “TCS-MODE M”.
- When “TCS-MODE” has been set to “OFF” on the main screen: traction control system, SCS and LIF are all turned off together.

SCS

SCS can be set to OFF, 1, 2, and 3.

OFF turns the slide control system off, setting level 1 provides the least amount of system intervention, and setting level 3 provides the greatest amount of system intervention.

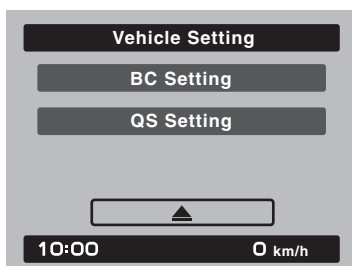
LIF

LIF can be set to OFF, 1, 2, and 3.

Setting level 1 provides the least amount of system intervention and setting 3 most strongly reduces the rate of wheel lift.

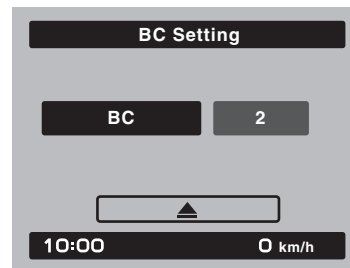
OFF turns LIF off.

“Vehicle Setting”



The vehicle setting module allows you to adjust setting for the BC and quick shifter.

BC

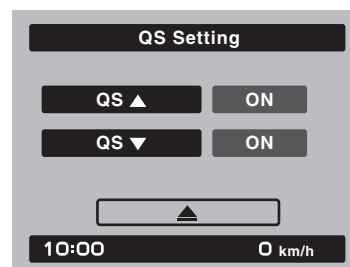


The brake control system has two settings, BC1 and BC2. Select BC1 when only standard ABS is desired. Select BC2 to have the brake control system further regulate brake pressure while cornering to suppress lateral wheel slip.

TIP

For skilled riders and when riding at the track, due to varying conditions, the BC2 brake system may engage sooner than expected relative to your desired cornering speed or intended cornering line.

Quick shifter



The quick shifter indicators are divided into QS \triangle and QS ∇ sections.

QS \triangle and QS ∇ are not linked and can be independently turned on or off.

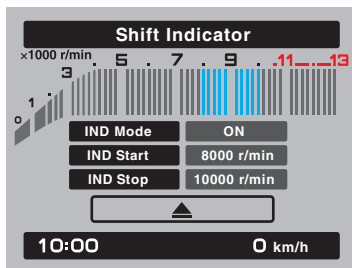
The quick shifter can be set to ON or OFF.

OFF turns the respective upshift or downshift function off, and the clutch lever must then be used when shifting in that direction.

TIP

If the quick shifter setting cannot be changed: turn the engine off with the gear position set to neutral, then change the setting.

“Shift Indicator”



This module allows a custom shift indicator to be set. When the engine r/min (rotations per minute) are in the specified range, the gear indicator will flash.

This module has 3 options:

“IND Mode” - the shift indicator can be turned ON/OFF

“IND Start” - the r/min at which the indicator starts flashing can be chosen.

Once selected, rotate the wheel switch up/down to increase or decrease the r/min value by increments of 200 r/min.

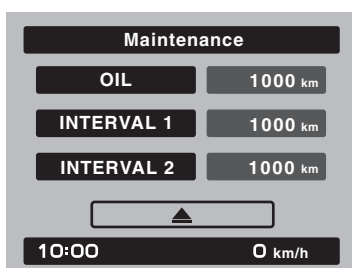
“IND Start” is settable between 6000–12800 r/min.

“IND Stop” - the r/min at which the indicator stops flashing can be chosen.

Once selected, rotate the wheel switch up/down to increase or decrease the r/min value by increments of 200 r/min.

“IND Stop” is settable between 6200–13000 r/min.

“Maintenance”



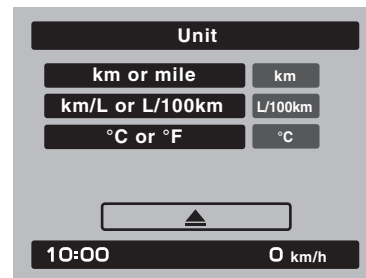
This module allows you to record the distance traveled between engine oil changes (use the OIL item), and for two other items of your choice (use INTERVAL 1 and INTERVAL 2).

To reset a maintenance trip meter, select it and then press and hold the wheel switch.

TIP

Maintenance item names cannot be changed.

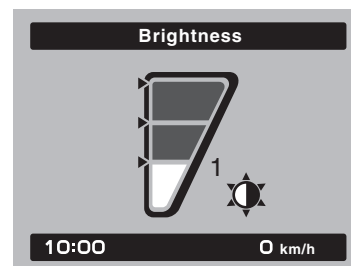
“Unit”



This module allows you to switch the display between metric and imperial measurement units. When using kilometers, the fuel consumption units can be changed between “km/L” or “L/100km”. When using miles, MPG will be available.

Temperature units can be switched between Celsius and Fahrenheit.

“Brightness”



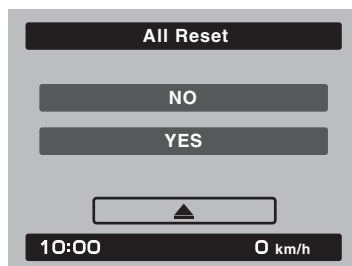
This module allows you to adjust the general brightness level of the display screen. Select the desired brightness level by rotating the wheel switch, and then press the wheel switch to fix the setting and return to the top MENU screen.

“Clock”



This module allows you to set the clock. When the clock module is selected, the hours will be highlighted. Set the hours by rotating the wheel switch. Press the wheel switch inward to confirm and highlight the minutes. After confirming the minutes, you will be returned to the top MENU screen.

“All Reset”



This module resets all settings items (except the odometer and clock) to their default or factory presets. Select YES to reset all items. After selecting YES, all items will be reset and the screen will automatically return to the top MENU screen.

EAS20010

BASIC SERVICE INFORMATION

EAS30014

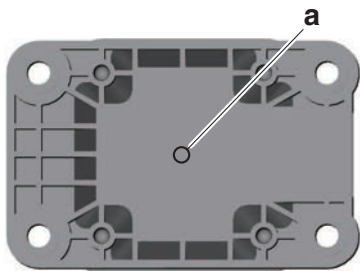
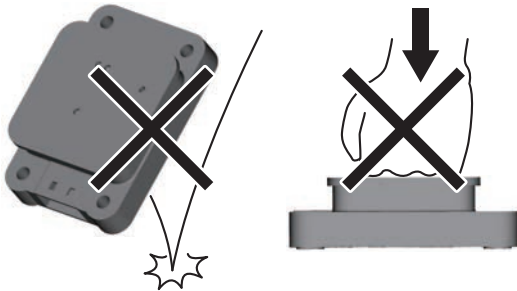
ELECTRICAL SYSTEM

Electrical parts handling

ECA22611

NOTICE

- Do not perform angle adjustment of the IMU and battery box by pinching the washer and related parts.
- When installing the IMU, apply a thin coat of silicone grease onto the washer where contacting the IMU grommet.
- When installing the IMU, use only a genuine bolt and washer, and tighten the bolt to the specified torque.
- Pay attention not to expose the IMU to strong shocks, such as striking or dropping it.
- Do not place any foreign objects in and around the battery box.
- Do not obstruct breather opening “a” of the IMU.
- Do not clean the breather opening and do not blow it with compressed air.
- When replacing the collar or grommet, replace all four collars and grommets.




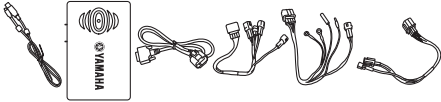
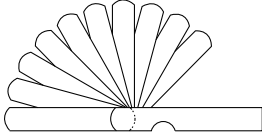

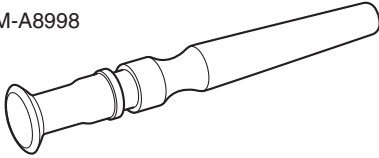
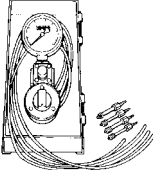

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SPECIAL TOOLS

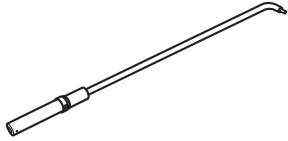
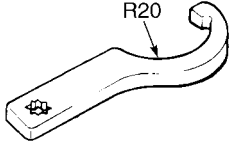
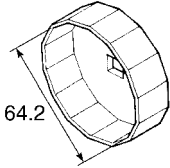
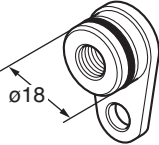
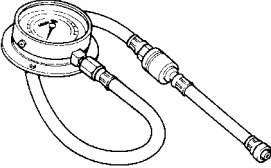
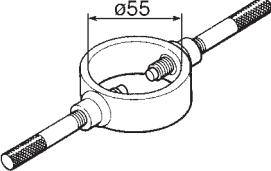
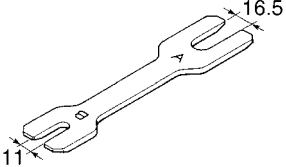
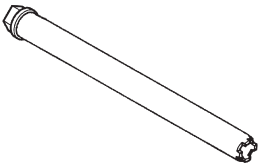
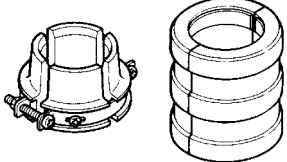
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

TIP

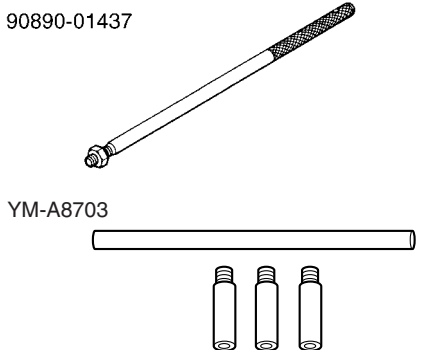
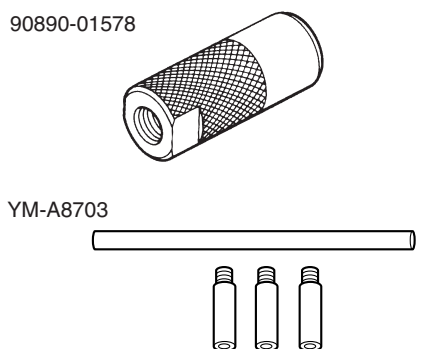
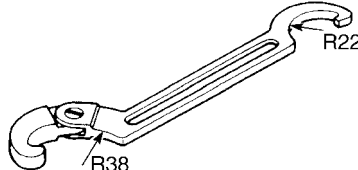
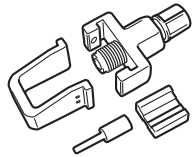
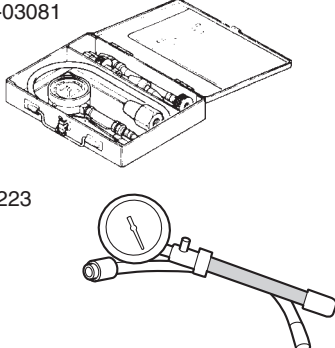
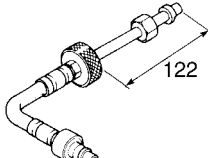
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part number starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Yamaha diagnostic tool USB 90890-03267		3-4, 3-11, 4-57, 4-58, 7-12, 9-3, 9-41, 9-41
Yamaha diagnostic tool (A/I) 90890-03264		3-4, 3-11, 4-57, 4-58, 7-12, 9-3, 9-41, 9-41
Thickness gauge 90890-03268 Feeler gauge set YU-26900-9		3-6, 4-18, 4-26, 5-28, 5-51
Valve lapper (ø14) 90890-04101 Valve lapper (ø14) YM-A8998	<p>90890-04101</p>  <p>YM-A8998</p> 	3-7
Vacuum gauge 90890-03094 Vacuummate YU-44456	<p>90890-03094</p>  <p>YU-44456</p> 	3-9

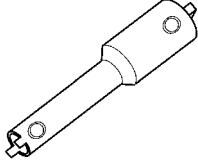

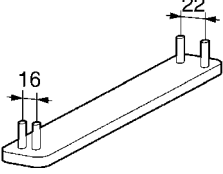
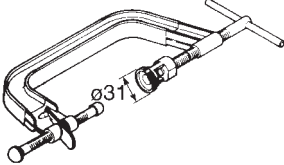
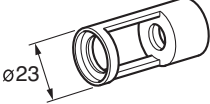
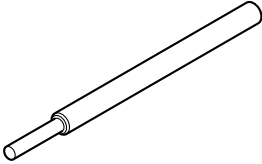
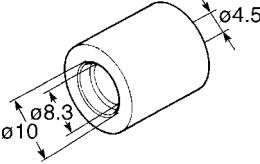
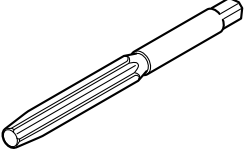
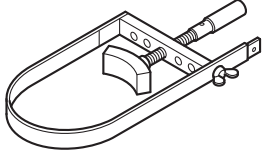
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Carburetor angle driver 2 90890-03173		3-10
Steering nut wrench 90890-01403 Exhaust flange nut wrench YU-A9472		3-20, 4-79
Oil filter wrench 90890-01426 Oil filter wrench YU-38411		3-25
Oil pressure gauge joint 18 mm 90890-04176 YU-04176		3-26
Oil pressure gauge set 90890-03120		3-26
Fork spring compressor 90890-01441 Fork spring compressor YM-01441		4-69, 4-74
Rod holder 90890-01434 Damper rod holder double ended YM-01434		4-69, 4-74
Damper rod holder (ø27) 90890-01582 Damper rod holder YM-01582		4-70, 4-71
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-72, 4-72, 4-73

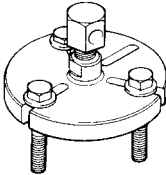
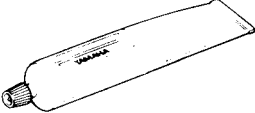

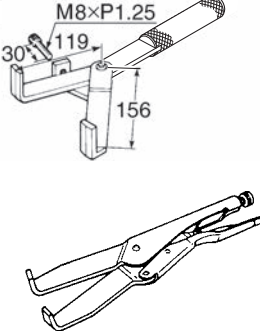
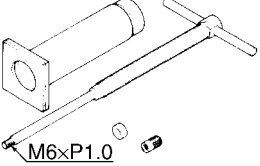
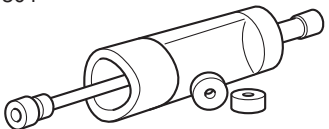
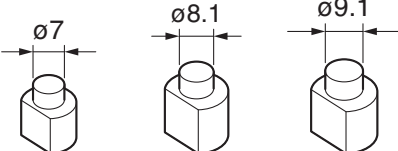
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Rod puller 90890-01437 Universal damping rod bleeding tool set YM-A8703		4-73, 4-74
Rod puller attachment (M10 long) 90890-01578 Universal damping rod bleeding tool set YM-A8703		4-73, 4-74
Ring nut wrench 90890-01268 Spanner wrench YU-01268		4-79
Drive chain cut & rivet tool 90890-01550 Drive chain cut & rivet tool YM-01550		4-89, 4-91
Compression gauge 90890-03081 Engine compression tester YU-33223		5-7
Compression gauge extension 122mm 90890-04136 Compression gauge extension 122mm YM-04136		5-7


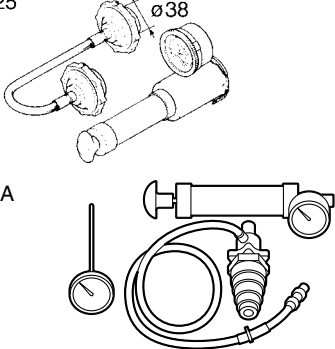
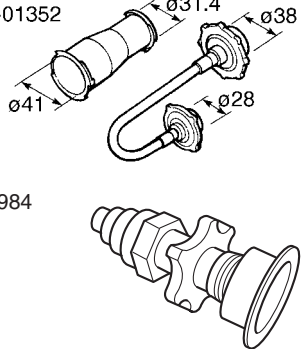
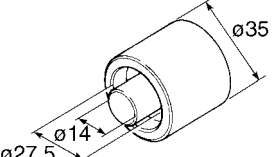
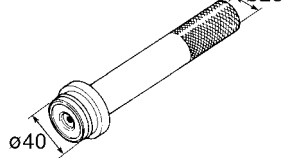
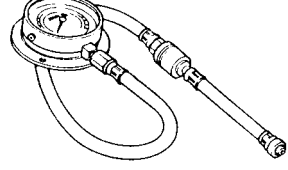
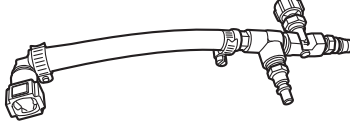
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Pivot shaft wrench 90890-01518 Frame spanner socket YM-01518		5-14, 5-14, 5-15
Pivot shaft wrench adapter 90890-01476		5-14, 5-14, 5-15
Camshaft wrench 90890-04162 Camshaft wrench YM-04162		5-20, 5-23
Valve spring compressor 90890-04200 Valve spring compressor YM-04019		5-32, 5-36
Valve spring compressor attachment (ø23) 90890-04179 Valve spring compressor adapter (ø23) YM-04179		5-32, 5-36
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-33
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117		5-33
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118		5-33
Sheave holder 90890-01903 Primary clutch holder YS-01880-A		5-39, 5-39, 5-40, 5-40

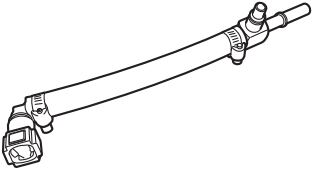
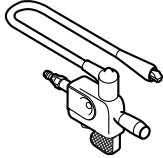
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Flywheel puller 90890-01362 Heavy duty puller YU-33270-B		5-39
Yamaha bond No. 1215 90890-85505 Three bond No. 1215®		5-41, 5-66
Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927		5-44, 8-40, 8-42, 8-43, 8-44, 8-44, 8-45, 8-46, 8-46, 8-47, 8-48, 8-49, 8-49, 8-50, 8-50, 8-50
Clutch holder 90890-04199 Universal clutch holder YM-91042	 <p>YM-91042</p>	5-50, 5-54
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304  <p>M6xP1.0</p> YU-01304 	5-71
Connecting rod big end bearing installer 90890-04193 Connecting rod big end bearing installer YM-04193		5-73, 5-76

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Piston installing tool 90890-04161 Piston installing tool YM-04161		5-79
Radiator cap tester 90890-01325 Mityvac cooling system tester kit YU-24460-A	 <p>90890-01325</p> <p>YU-24460-A</p>	6-5, 6-5
Radiator cap tester adapter 90890-01352 Pressure tester adapter YU-33984	 <p>90890-01352</p> <p>YU-33984</p>	6-5, 6-5
Mechanical seal installer 90890-04078 Water pump seal installer YM-33221-A		6-14
Middle driven shaft bearing driver 90890-04058 Middle drive bearing installer 40 & 50 mm YM-04058		6-14
Pressure gauge 90890-03153 Pressure gauge YU-03153		7-11, 7-12
Fuel injector pressure adapter 90890-03210 Fuel injector pressure adapter YU-03210		7-11

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Fuel pressure adapter 90890-03176 Fuel pressure adapter YM-03176		7-12
Ignition checker 90890-06754 Oppama pet-4000 spark checker YM-34487		8-45

SPECIFICATIONS

GENERAL SPECIFICATIONS	2-1
ENGINE SPECIFICATIONS	2-2
CHASSIS SPECIFICATIONS	2-6
ELECTRICAL SPECIFICATIONS	2-9
TIGHTENING TORQUES	2-11
ENGINE TIGHTENING TORQUES	2-11
CHASSIS TIGHTENING TORQUES	2-11
CABLE ROUTING	2-13

GENERAL SPECIFICATIONS

EAS20013

GENERAL SPECIFICATIONS

Model

Model	BEA1
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Dimensions

Overall length	2155 mm (84.8 in)
Overall width	860 mm (33.9 in)
Overall height	1155 mm (45.5 in)
Wheelbase	1495 mm (58.9 in)
Ground clearance	140 mm (5.51 in)
Minimum turning radius	3.5 m (11.48 ft)

Weight

Curb weight	193 kg (425 lb)
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Loading

Maximum load	221 kg (487 lb)
Riding capacity	2 person

ENGINE SPECIFICATIONS

EAS20014

ENGINE SPECIFICATIONS

Engine

Combustion cycle	4-stroke
Cooling system	Liquid cooled
Valve train	DOHC
Displacement	890 cm ³
Cylinder arrangement	Inline
Number of cylinders	3-cylinder
Bore × stroke	78.0 × 62.1 mm (3.07 × 2.44 in)
Compression ratio	11.5 : 1
Compression pressure	1365–1758 kPa/600 r/min (13.7–17.6 kgf/cm ² /600 r/min, 194.3–250.1 psi/600 r/min)

Fuel

Recommended fuel	Unleaded gasoline (E10 acceptable)
Octane number	95
Fuel tank capacity	14 L (3.7 US gal, 3.1 Imp.gal)
Fuel reserve amount	2.7 L (0.71 US gal, 0.59 Imp.gal)

Engine oil

Recommended brand	YAMALUBE
SAE viscosity grades	10W-40
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Lubrication system	Wet sump
Engine oil quantity	
Oil change	2.80 L (2.96 US qt, 2.46 Imp.qt)
With oil filter removal	3.20 L (3.38 US qt, 2.82 Imp.qt)
Quantity (disassembled)	3.50 L (3.70 US qt, 3.08 Imp.qt)

Oil filter

Oil filter type	Cartridge
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Oil pump

Oil pressure	200.0 kPa/5000 r/min (2.00 kgf/cm ² /5000 r/min, 29.0 psi/5000 r/min)
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Cooling system

Coolant quantity	
Radiator (including all routes)	1.72 L (1.82 US qt, 1.51 Imp.qt)
Coolant reservoir (up to the maximum level mark)	0.28 L (0.30 US qt, 0.25 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)

ENGINE SPECIFICATIONS

Water pump

Impeller shaft tilt limit 0.15 mm (0.006 in)

Spark plug(s)

Manufacturer/model NGK/LMAR9A-9
Spark plug gap 0.8–0.9 mm (0.031–0.035 in)

Cylinder head

Warping limit 0.10 mm (0.0039 in)

Camshaft

Camshaft cap inside diameter 24.500–24.521 mm (0.9646–0.9654 in)
Camshaft journal diameter 24.459–24.472 mm (0.9630–0.9635 in)
Camshaft-journal-to-camshaft-cap clearance limit 0.080 mm (0.0032 in)
Camshaft lobe dimensions
Lobe height limit (Intake) 35.590 mm (1.4012 in)
Lobe height limit (Exhaust) 35.620 mm (1.4024 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 0.28–0.32 mm (0.0110–0.0126 in)
Valve dimensions
Valve seat contact width limit (intake) 1.6 mm (0.06 in)
Valve seat contact width limit (exhaust) 1.8 mm (0.07 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) 37.34 mm (1.47 in)
Free length limit (exhaust) 39.31 mm (1.55 in)

Cylinder

Bore 78.000–78.010 mm (3.0709–3.0713 in)
Wear limit 78.060 mm (3.0732 in)

ENGINE SPECIFICATIONS

Piston

Diameter	77.975–77.990 mm (3.0699–3.0705 in)
Measuring point (from piston skirt bottom)	9.0 mm (0.35 in)
Piston-to-cylinder clearance	0.010–0.035 mm (0.0004–0.0014 in)
Piston pin bore inside diameter limit	17.043 mm (0.6710 in)
Piston pin outside diameter limit	16.970 mm (0.6681 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	1.15 mm (0.0453 in)
Side clearance limit	0.115 mm (0.0045 in)

Connecting rod

Oil clearance	0.027–0.051 mm (0.0011–0.0020 in)
Bearing color code	
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green

Crankshaft

Runout limit	0.030 mm (0.0012 in)
Journal oil clearance	0.013–0.037 mm (0.0005–0.0015 in)
Bearing color code	
Code 0	White
Code 1	Blue
Code 2	Black
Code 3	Brown
Code 4	Green

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	0.023–0.047 mm (0.0009–0.0019 in)

Clutch

Clutch type	Wet, multiple-disc
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Assembly width	42.7–43.5 mm (1.68–1.71 in)
Friction plate 1 thickness	2.92–3.08 mm (0.115–0.121 in)

ENGINE SPECIFICATIONS

Plate quantity	6 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 1 thickness	2.18–2.42 mm (0.086–0.095 in)
Plate quantity	1 pcs
Warping limit	0.10 mm (0.004 in)
Clutch plate 2 thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	7 pcs
Warping limit	0.10 mm (0.004 in)
Clutch spring free length limit	42.53 mm (1.67 in)

Drivetrain

Transmission type	Constant mesh 6-speed
Gear ratio	
Primary reduction ratio	1.681 (79/47)
1st	2.571 (36/14)
2nd	1.947 (37/19)
3rd	1.619 (34/21)
4th	1.381 (29/21)
5th	1.190 (25/21)
6th	1.037 (28/27)
Secondary reduction ratio	2.813 (45/16)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)

Shifting mechanism

Installed shift rod length	236.0–238.0 mm (9.29–9.37 in)
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Air filter

Air filter element	Oil-coated paper element
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Fuel injector

Resistance	12.0 Ω
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Idling condition

Engine idling speed	1200–1400 r/min
O ₂ feedback control	Active
Coolant temperature	90–110 °C (194–230 °F)
Difference in vacuum pressure between the cylinders	0 kPa–1.3 kPa (0 mmHg–10 mmHg, 0 inHg–0.4 inHg)
CO%	0.0–2.0 %
Fuel line pressure (at idle)	300–390 kPa (3.0–3.9 kgf/cm ² , 43.5–56.6 psi)

CHASSIS SPECIFICATIONS

EAS20015

CHASSIS SPECIFICATIONS

Chassis

Caster angle	25.0 °
Trail	108 mm (4.3 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	0.40 mm (0.02 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	120/70ZR17M/C (58W)
Manufacturer/model	BRIDGESTONE/BATTLAX HYPERSPORT S22F

Rear tire

Type	Tubeless
Size	180/55ZR17M/C (73W)
Manufacturer/model	BRIDGESTONE/BATTLAX HYPERSPORT S22R

Tire air pressure (measured on cold tires)

1 person	
Front	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	290 kPa (2.90 kgf/cm ² , 42 psi)
2 persons	
Front	250 kPa (2.50 kgf/cm ² , 36 psi)
Rear	290 kPa (2.90 kgf/cm ² , 42 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	16.00 mm (0.63 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

CHASSIS SPECIFICATIONS

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	268.9 mm (10.59 in)
Inner tube bending limit	0.2 mm (0.01 in)
Recommended oil	Yamaha Suspension Oil 01
Quantity (left)	466.0 cm ³ (15.76 US oz, 16.44 Imp.oz)
Quantity (right)	470.0 cm ³ (15.89 US oz, 16.58 Imp.oz)
Level (left)	107 mm (4.2 in)
Level (right)	107 mm (4.2 in)
Spring preload	
Adjustment value (Soft)	19.0 mm (0.75 in)
Adjustment value (STD)	14.0 mm (0.55 in)
Adjustment value (Hard)	4.0 mm (0.16 in)
Rebound damping	
Unit for adjustment	Click
Adjustment value from the start position (Soft)	11
Adjustment value from the start position (STD)	6
Adjustment value from the start position (Hard)	1
Compression damping	
Unit for compression damping adjustment	Click
Adjustment value from the start position (Soft)	11
Adjustment value from the start position (STD)	6
Adjustment value from the start position (Hard)	1

CHASSIS SPECIFICATIONS

Rear suspension

Shock absorber	Gas-hydraulic damper
Spring preload	
Unit for adjustment	Cam position
Adjustment value (Soft)	1
Adjustment value (STD)	5
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
Adjustment value from the start position (Hard)	0

Drive chain

Size	525
Chain type	Sealed type
Number of links	118
Drive chain slack (Maintenance Stand)	45.0–50.0 mm (1.77–1.97 in)
Drive chain slack (Sidestand)	45.0–50.0 mm (1.77–1.97 in)
Drive chain slack limit	55.0 mm (2.17 in)
15-link length limit	239.3 mm (9.42 in)

ELECTRICAL SPECIFICATIONS

EAS20016

ELECTRICAL SPECIFICATIONS

Voltage

System voltage 12 V

Ignition system

Ignition timing (B.T.D.C.) 3.0–7.0 °/1300 r/min

Engine control unit

Model TBDF6Z

Ignition coil

Primary coil resistance 1.19–1.61 Ω

Secondary coil resistance 8.50–11.50 kΩ

Charging system

Charging system AC magneto

Standard output 14.0 V, 29.6 A at 5000 r/min

Stator coil resistance 0.152–0.228 Ω

Rectifier/regulator

Regulated voltage (DC) 14.3–14.7 V

Battery

Model YTZ10S

Voltage, capacity 12 V, 8.6 Ah (10 HR)

Bulb wattage

Headlight LED

Brake/tail light LED

Front turn signal 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

Stability control indicator light LED

Engine oil and Coolant warning light LED

High beam indicator light LED

Turn signal indicator light LED

Fuel level warning light LED

Malfunction indicator light LED

ABS warning light LED

Cruise control "SET" indicator light LED

Cruise control "ON" indicator light LED

Auxiliary system warning light LED

Immobilizer system indicator light LED

ELECTRICAL SPECIFICATIONS

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

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	289–391 Ω at 80 °C (289–391 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
Brake light fuse	2.0 A
Signaling system fuse	7.5 A
Ignition fuse	10.0 A
Radiator fan motor fuse	15.0 A
ABS ECU fuse	7.5 A
Fuel injection system fuse	7.5 A
ABS motor fuse	30.0 A
ABS solenoid fuse	15.0 A
Terminal fuse 1	2.0 A
Cruise control fuse	2.0 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

TIGHTENING TORQUES

EAS20017

TIGHTENING TORQUES

EAS30016

ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Exhaust pipe nut	M8	6	20 N·m (2.0 kgf·m, 15 lb·ft)	
Spark plug	M10	3	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	75 N·m (7.5 kgf·m, 55 lb·ft)	
Generator cover bolt	M6	2	12 N·m (1.2 kgf·m, 8.9 lb·ft)	
Generator cover bolt	M6	8	12 N·m (1.2 kgf·m, 8.9 lb·ft)	
Clutch boss nut	M20	1	125 N·m (12.5 kgf·m, 92 lb·ft)	Stake.
Clutch spring bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Clutch cover bolt	M6	11	12 N·m (1.2 kgf·m, 8.9 lb·ft)	
Oil filter cartridge	M20	1	17 N·m (1.7 kgf·m, 13 lb·ft)	
Oil filter cartridge union bolt	M20	1	70 N·m (7.0 kgf·m, 52 lb·ft)	
Water pump drain bolt	M6	1	10 N·m (1.0 kgf·m, 7.4 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	M18	1	72 N·m (7.2 kgf·m, 53 lb·ft)	
Front wheel axle pinch bolt	M8	1	23 N·m (2.3 kgf·m, 17 lb·ft)	
Rear wheel sprocket nut	M10	5	80 N·m (8.0 kgf·m, 59 lb·ft)	
Rear wheel axle nut	M24	1	105 N·m (10.5 kgf·m, 77 lb·ft)	
Rear brake caliper bolt (front)	M12	1	27 N·m (2.7 kgf·m, 20 lb·ft)	
Rear brake caliper bolt (rear)	M8	1	22 N·m (2.2 kgf·m, 16 lb·ft)	 and
Brake caliper bleed screw	M8	3	5 N·m (0.5 kgf·m, 3.7 lb·ft)	
Front brake caliper bolt	M10	4	35 N·m (3.5 kgf·m, 26 lb·ft)	
Upper handlebar holder bolt	M8	4	22 N·m (2.2 kgf·m, 16 lb·ft)	
Lower handlebar holder nut	M10	2	40 N·m (4.0 kgf·m, 30 lb·ft)	
Clutch cable locknut	M8	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Lower bracket pinch bolt	M8	4	23 N·m (2.3 kgf·m, 17 lb·ft)	
Upper bracket pinch bolt	M8	2	26 N·m (2.6 kgf·m, 19 lb·ft)	
Lower ring nut	M30	1	See TIP.	
Drive sprocket nut	M22	1	160 N·m (16 kgf·m, 118 lb·ft)	Stake.

TIGHTENING TORQUES

TIP

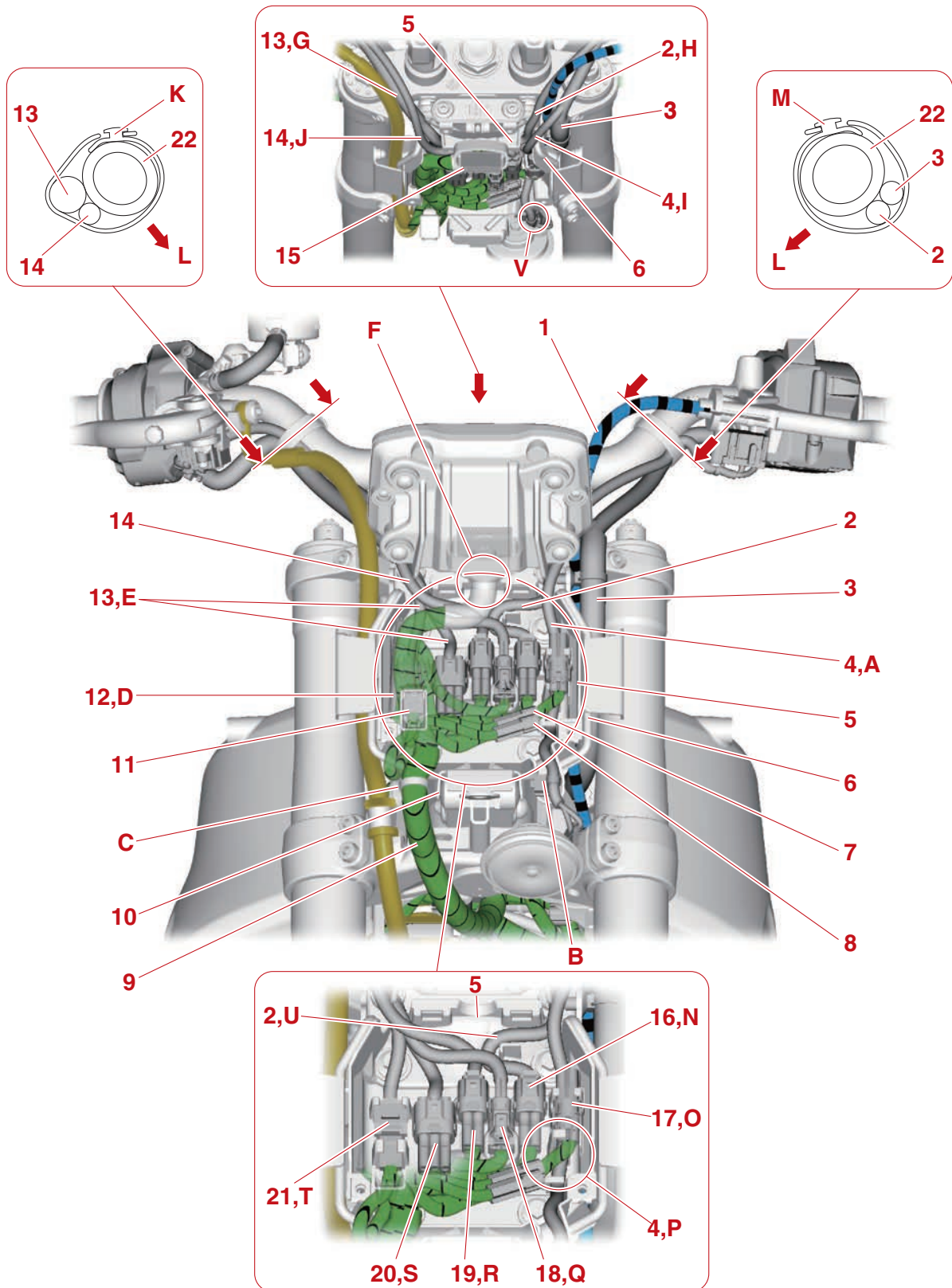
Lower ring nut

1. Tighten the 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 14 N·m (1.4 kgf·m, 10 lb·ft).
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EAS20021

CABLE ROUTING

Handlebar (front view)

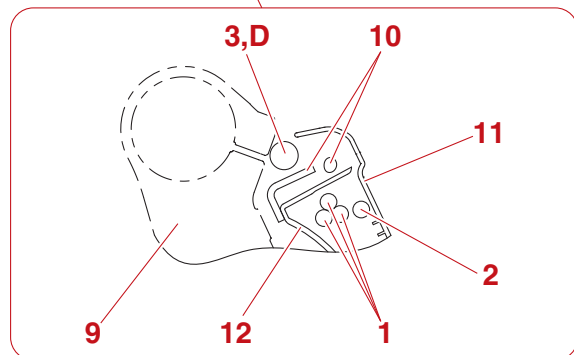
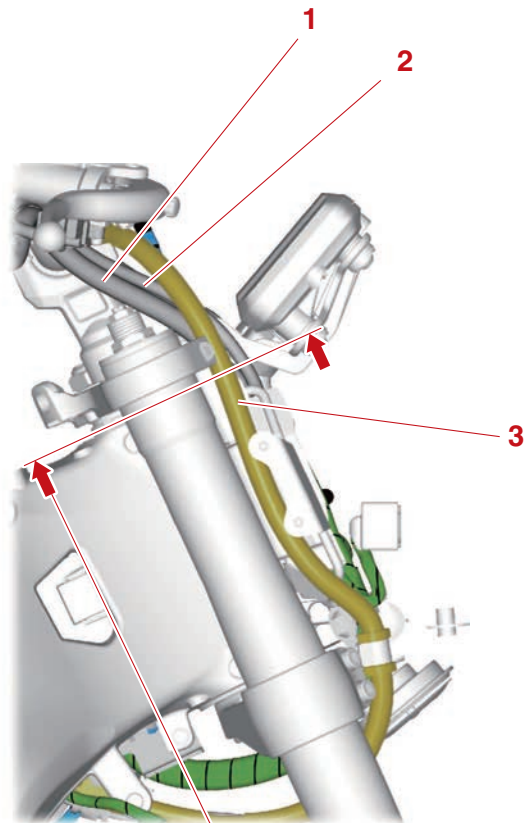
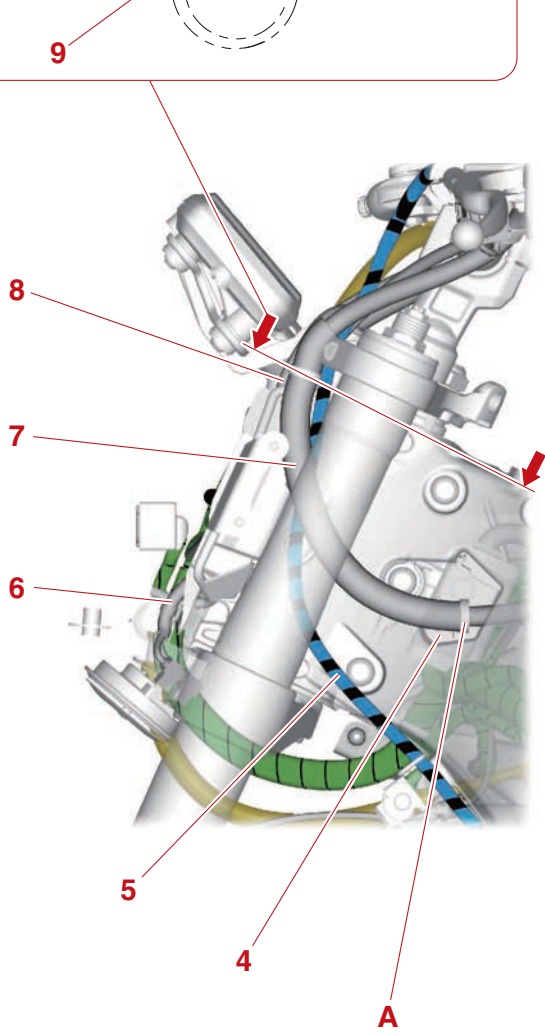
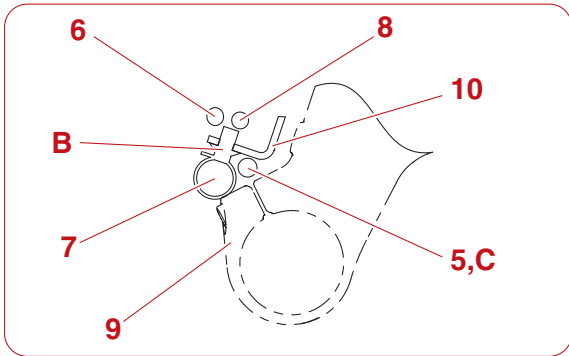


CABLE ROUTING

1. Clutch cable
 2. Clutch switch lead
 3. Handlebar switch lead (left)
 4. Horn lead
 5. Coupler holder
 6. Headlight bracket 2
 7. Grip warmer coupler (right) (OPTION)
 8. Grip warmer coupler (left) (OPTION)
 9. Wire harness
 10. Headlight bracket
 11. Headlight control unit coupler
 12. Joint coupler
 13. Handlebar switch lead (right)
 14. Front brake light switch lead
 15. Meter coupler
 16. Clutch switch coupler
 17. Auxiliary DC jack coupler (OPTION)
 18. Accelerator position sensor coupler
 19. Front brake light switch coupler
 20. Handlebar switch coupler 2 (right)
 21. Handlebar switch coupler 1 (right)
 22. Handlebar
- A. Route the horn lead to the rearward of the wire harness.
 - B. Insert the harness clamp into the hole of the coupler holder.
 - C. Insert the harness clamp to the hole of the headlight bracket.
 - D. Route the joint coupler to the rearward of the wire harness (to meter).
 - E. Route the handlebar switch lead (right) to the rearward of the wire harness (to meter).
 - F. Route the wire harness (to meter) through the groove in the center of the coupler holder.
 - G. Route the handlebar switch lead (right) between the coupler holder and coupler cover.
 - H. Route the clutch switch lead between the coupler holder and coupler cover.
 - I. Route the horn lead between the coupler holder and coupler cover. Route the horn lead to the forward of the clutch switch lead.
 - J. Route the front brake light switch lead between the coupler holder and coupler cover.
 - K. Fasten the front brake light switch lead and handlebar switch lead (right) with a rubber band. Face the buckle of the rubber band upward with the end pointing forward. Fasten the straight portion of the handlebar with the rubber band.
 - L. Forward of the vehicle
 - M. Fasten the clutch switch lead and handlebar switch lead (left) with a rubber band. Face the buckle of the rubber band upward with the end pointing forward. Fasten the straight portion of the handlebar with the rubber band.
 - N. Insert the projection on the clutch switch coupler into the hole in the coupler holder.
 - O. Insert the auxiliary DC jack coupler (OPTION) into the rib of the coupler holder.
 - P. Pass the horn lead through the guide of the coupler holder.
 - Q. Insert the projection on the accelerator position sensor coupler into the hole in the coupler holder.
 - R. Insert the projection on the front brake light switch coupler into the hole in the coupler holder.
 - S. Insert the projection on the handlebar switch coupler 2 (right) into the hole in the holder.
 - T. Insert the handlebar switch coupler 1 (right) into the rib of the holder.
 - U. Pass the clutch switch lead to the right side of the vehicle with the rib of the coupler holder.
 - V. Face the terminal of the horn forward.

CABLE ROUTING

Handlebar (side view)

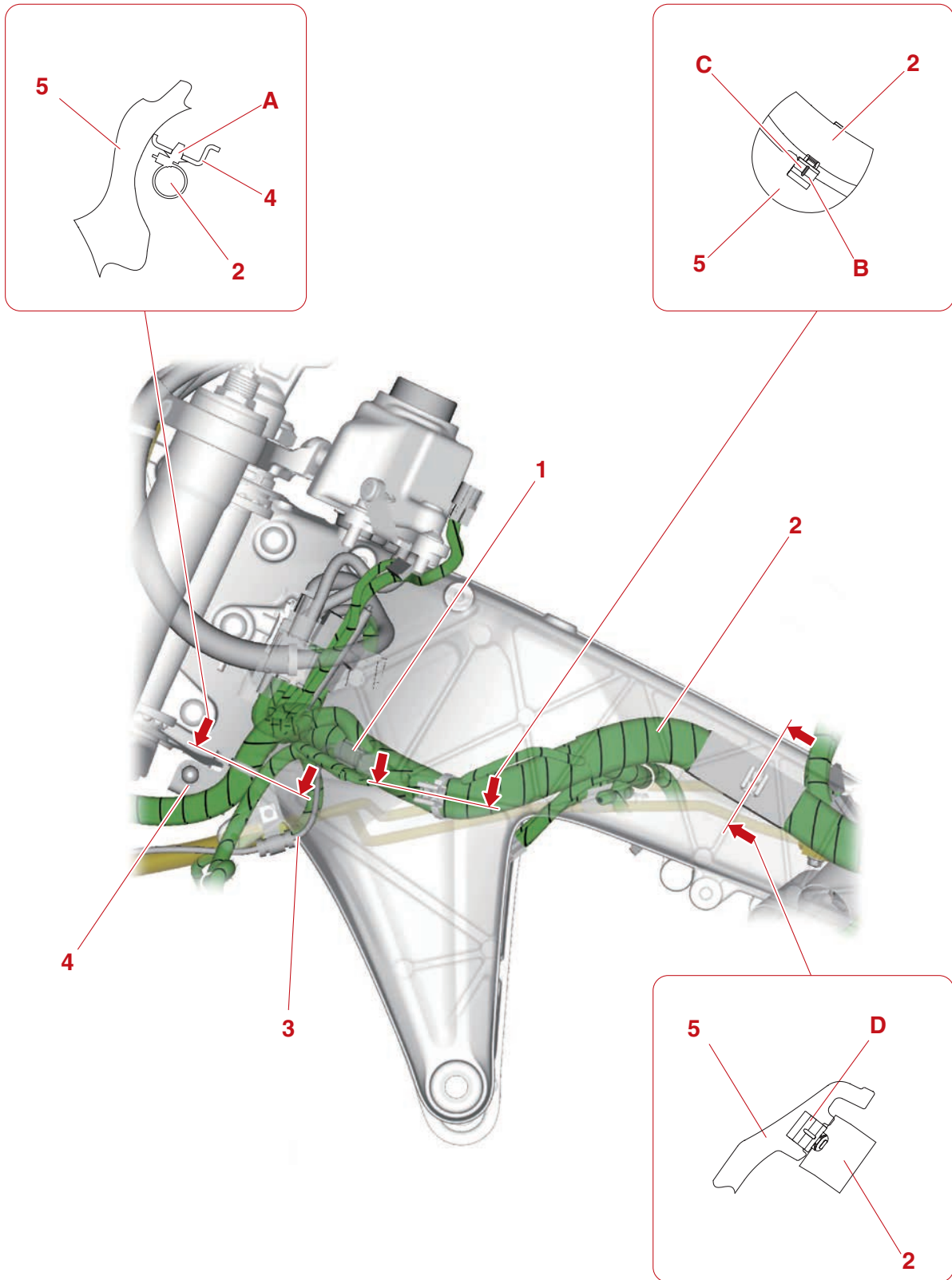


CABLE ROUTING

1. Handlebar switch lead (right)
 2. Front brake light switch lead
 3. Brake hose
 4. Connector cover
 5. Clutch cable
 6. Horn lead
 7. Handlebar switch lead (left)
 8. Clutch switch lead
 9. Upper bracket
 10. Headlight bracket 2
 11. Coupler cover
 12. Coupler holder
-
- A. Insert the clamp of the handlebar switch lead (left) into the hole in the connector cover.
 - B. Insert the clamp of the handlebar switch lead (left) into the hole in the headlight bracket 2.
 - C. Route the clutch cable to the rearward of the handlebar switch lead (left).
 - D. Route the brake hose to the inside of the upper bracket.

CABLE ROUTING

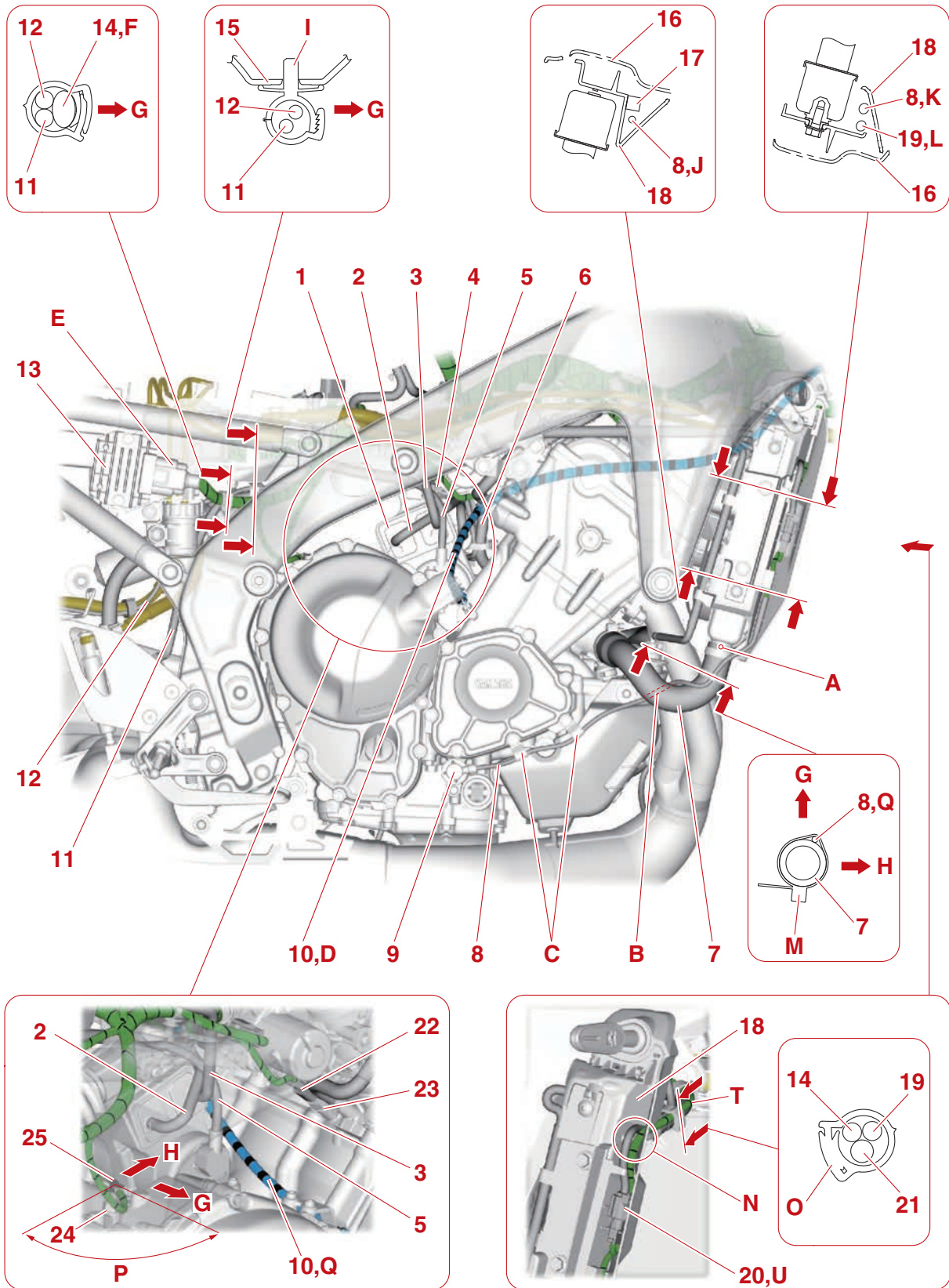
Main switch (left side view)



1. Front wheel sensor coupler
 2. Wire harness
 3. Front wheel sensor lead
 4. Bracket
 5. Frame
-
- A. Insert the clamp into the hole of the bracket.
 - B. Insert the clamp into the rib of the frame.
 - C. Insert the clamp with touched the protrusion on the frame.
 - D. Insert the clamp between the protrusions on the frame.

CABLE ROUTING

Frame and engine (right side view)

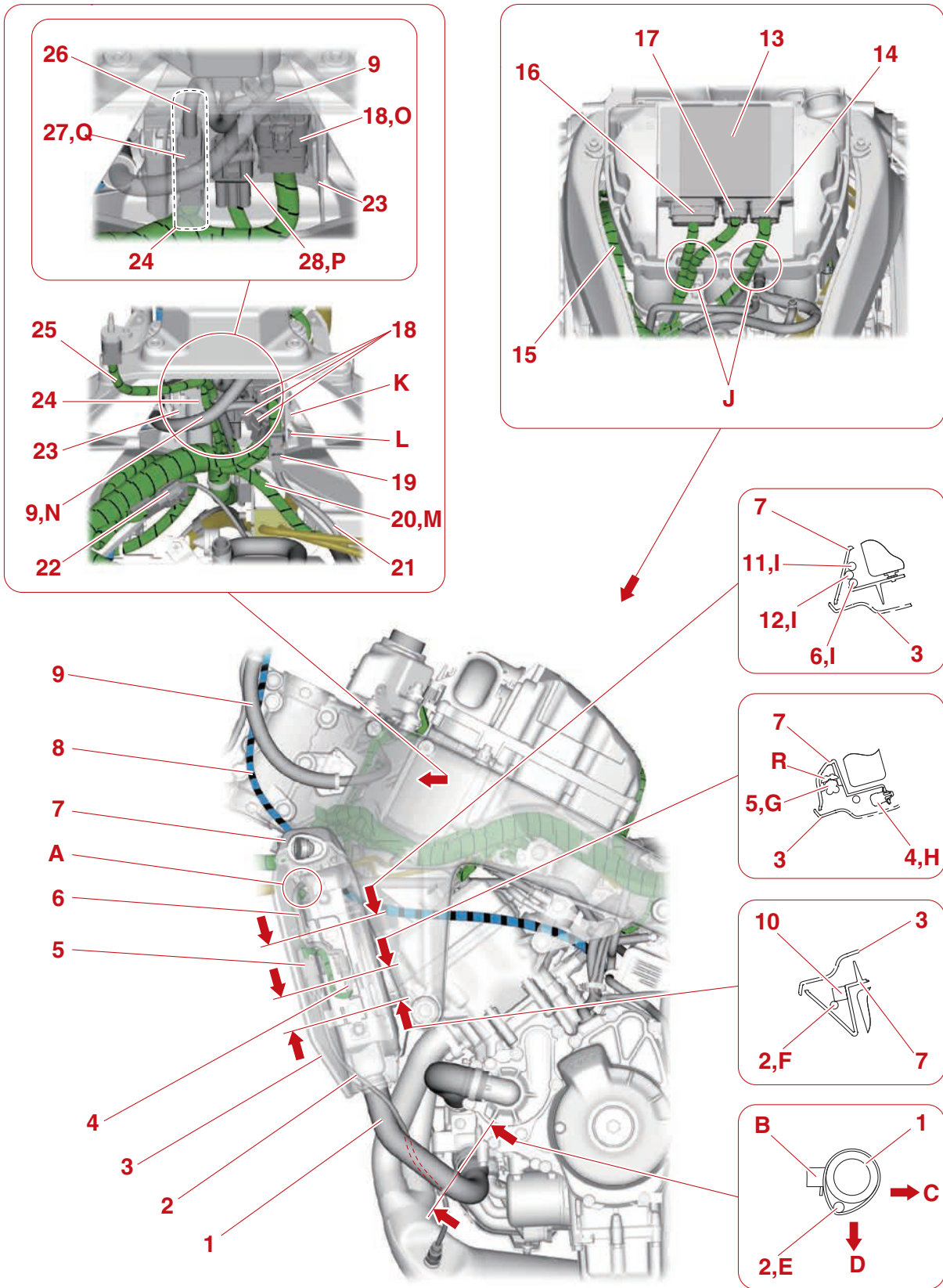


CABLE ROUTING

1. Canister
 2. Canister purge hose (purge cut valve solenoid to canister)
 3. Fuel tank breather hose (fuel tank to canister)
 4. Purge cut valve solenoid coupler
 5. Starter motor lead
 6. Stator coil lead
 7. Radiator inlet hose
 8. Sub-wire harness (oil pressure switch)
 9. Oil pressure switch
 10. Clutch cable
 11. Rear brake light switch lead
 12. Rear wheel sensor lead
 13. Rectifier/regulator
 14. Wire harness
 15. Battery box
 16. Radiator cover (right)
 17. Damper
 18. Front side panel (right)
 19. Front turn signal light lead (right)
 20. Front turn signal light coupler (right)
 21. Radiator hose (cylinder head to radiator)
 22. Coolant temperature sensor coupler
 23. Coolant temperature sensor
 24. Neutral switch
 25. Neutral switch coupler
- A. Fix the clamp, after aligning with the lower end of the paint mark on the radiator inlet hose.
 - B. Route the sub-wire harness (oil pressure switch) to the inside of the radiator inlet hose.
 - C. Fasten the sub-wire harness (oil pressure switch) with the holder.
 - D. Route the clutch cable to the front of the stator coil lead and canister.
 - E. After connecting the rectifier/regulator coupler, cover it with the coupler cover.
 - F. Fasten the gray tape portion of the wire harness (to rectifier/regulator) with the clamp. The opening of the clamp should face the right.
 - G. Right side of the vehicle
 - H. Forward of the vehicle
 - I. Insert the clamp into the hole of the battery box. The opening of the clamp should face the right.
 - J. Route the sub-wire harness (oil pressure switch) to the inside of the damper.
 - K. Route the sub-wire harness (oil pressure switch) through the guide in the front side panel (right).
 - L. Route the front turn signal light lead (right) through the guide in the front side panel (right).
 - M. Face the buckle of the clamp inward. Face the end of the clamp rearward.
 - N. Route the wire harness and front turn signal light lead (right) through the hole in the front side panel (right).
 - O. Install the clamp align to the protector part of the radiator hose (cylinder head to radiator). Point the open ends of the clamp to the forward.
 - P. Position the neutral switch coupler installation direction within the range as shown in the illustration.
 - Q. Route the clutch cable on the front side of the starter motor lead.
 - R. Route the sub-wire harness (oil pressure switch) to the outside of the radiator inlet hose.
 - S. Insert the front turn signal light coupler (right) to the ribs on the front side panel (right).
 - T. Route the front turn signal light coupler (right) on the rear side of the wire harness (to oil pressure switch sub-lead) and frame (radiator mounting boss).
 - U. Insert the front turn signal light coupler (right) to the ribs on the front side panel (right).

CABLE ROUTING

Frame 1 (front left side view)

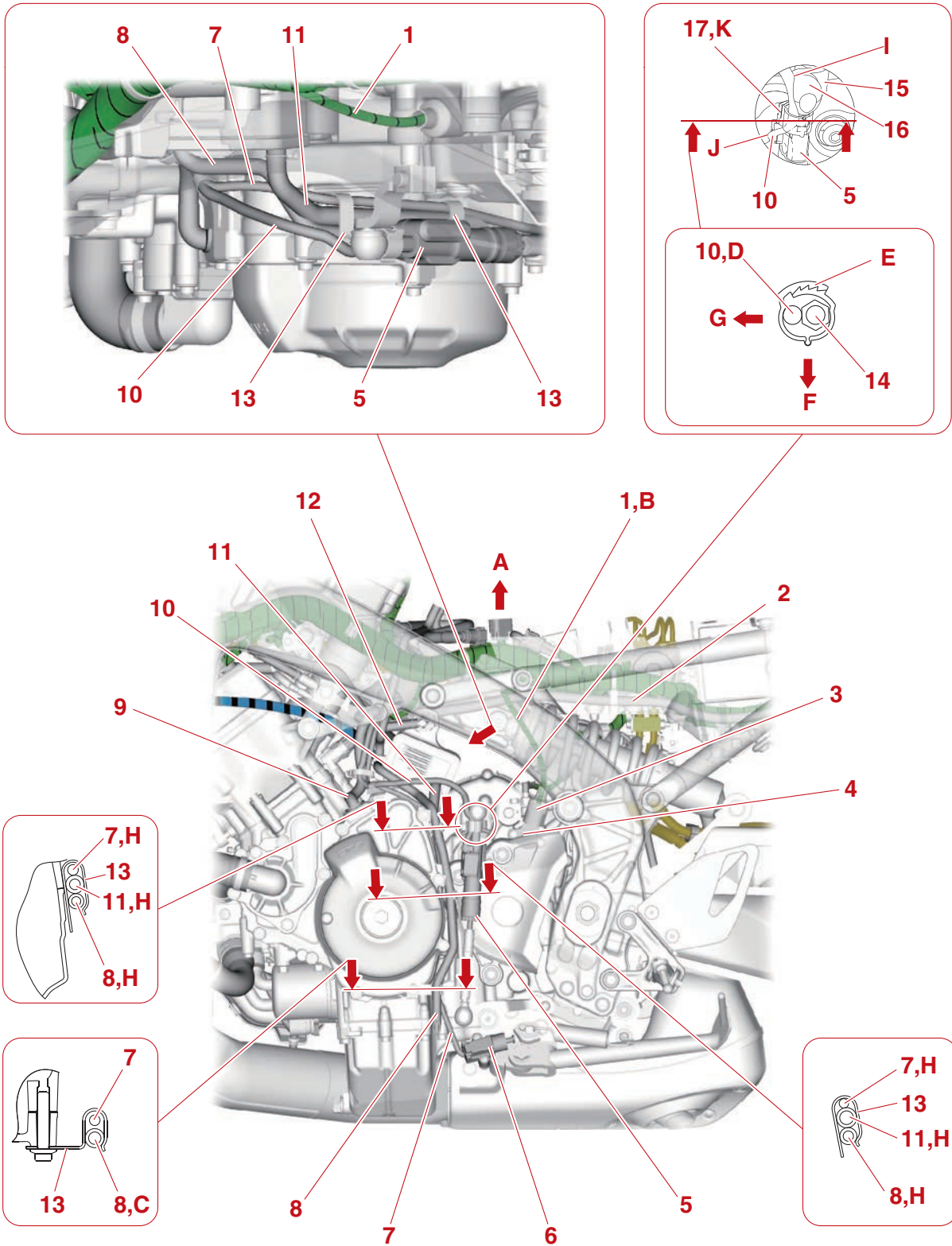


CABLE ROUTING

1. Radiator outlet hose
 2. O₂ sensor lead
 3. Radiator cover (left)
 4. Front turn signal light coupler (left)
 5. O₂ sensor coupler
 6. Front turn signal light lead (left)
 7. Front side panel (left)
 8. Clutch cable
 9. Handlebar switch lead (left)
 10. Damper
 11. Wire harness (to O₂ sensor)
 12. Wire harness (to front turn signal light (left))
 13. ECU (Engine Control Unit)
 14. ECU coupler 1
 15. Wire harness
 16. ECU coupler 3
 17. ECU coupler 2
 18. Handlebar switch coupler (left)
 19. Radiator fan motor coupler
 20. Wire harness (to oil pressure switch)
 21. Radiator fan motor lead
 22. Front wheel sensor coupler
 23. Coupler cover
 24. Coupler protector
 25. Wire harness (to intake air temperature sensor)
 26. Main switch lead
 27. Main switch coupler
 28. Immobilizer unit coupler
- A. Route the front turn signal light lead (left) and wire harness (to O₂ sensor coupler) through the hole in the front side panel (left).
 - B. Face the buckle of the plastic locking tie inward. Face the end of the plastic locking tie downward and cut off the excess.
 - C. Left outside of the vehicle
 - D. Lower side of the vehicle
 - E. Route the O₂ sensor lead to the inside of the radiator outlet hose.
 - F. Place the O₂ sensor lead inside the vehicle on the damper.
 - G. Insert the O₂ sensor coupler into the groove of front side panel (left).
 - H. Insert the projection on the front turn signal light coupler (left) into the hole in the front side panel (left).
 - I. Route the leads through the guide in the front side panel (left).
 - J. Pass the wire harness through the guide of the air filter assembly.
 - K. Insert the camp of the wire harness (to radiator fan motor) into the hole of coupler cover.
 - L. Insert the camp of the radiator fan motor coupler into the hole of coupler cover.
 - M. Route the wire harness (to oil pressure switch) between the brake hoses and frame.
 - N. Route the handlebar switch lead (left) on the rear side of the wire harness. (to intake air temperature sensor)
 - O. Insert the projection on the handlebar switch coupler (left) into the hole of coupler cover.
 - P. Insert the immobilizer unit coupler into the rib of coupler cover.
 - Q. Wrap the main switch coupler with a coupler protector.
 - R. Face the hook of the coupler inward.

CABLE ROUTING

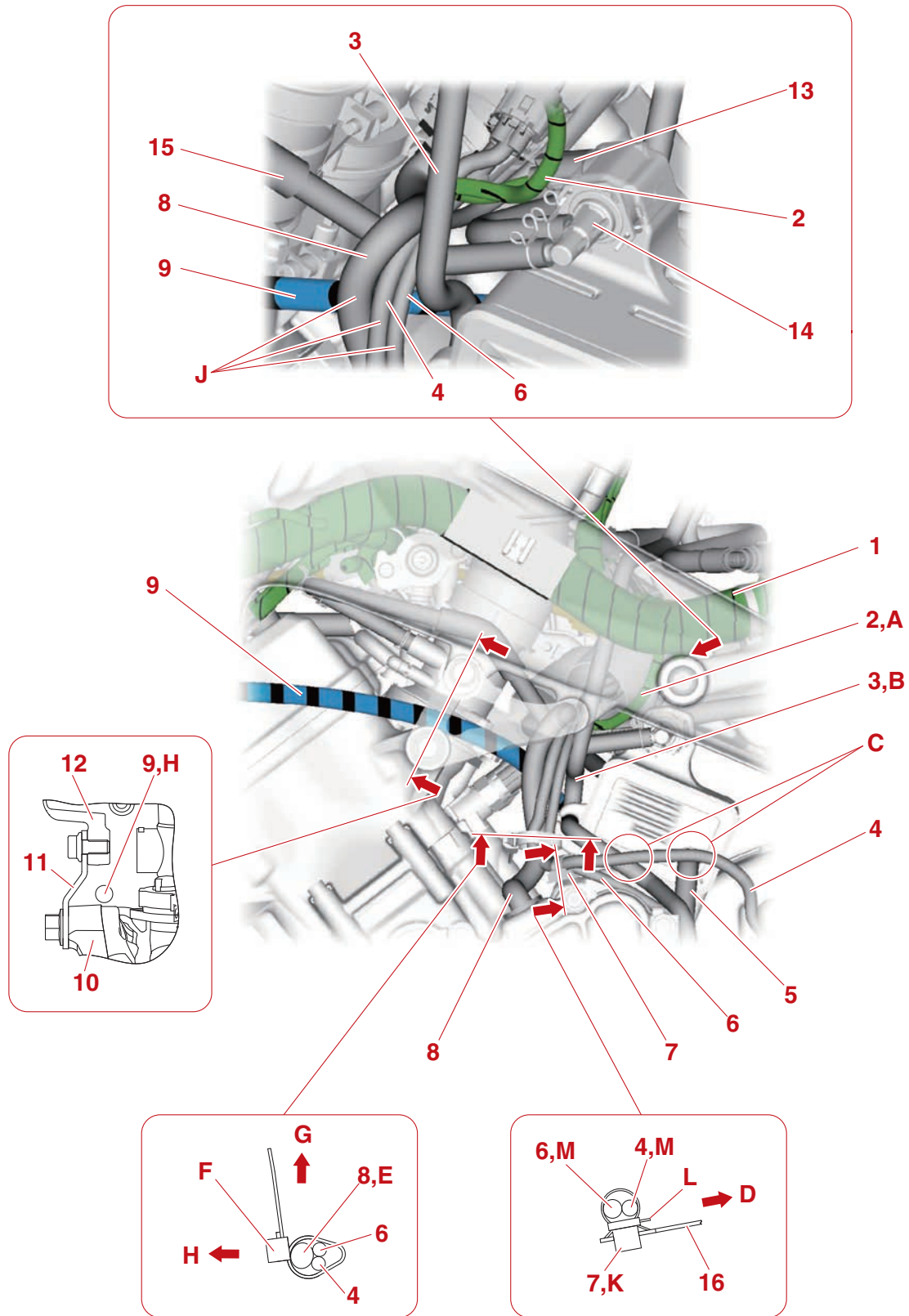
Frame 2 (rear left side view)



1. Wire harness (to gear position sensor)
 2. Starter motor lead
 3. Gear position sensor coupler
 4. Gear position sensor
 5. Shift sensor
 6. Sidestand switch
 7. Sidestand switch lead
 8. Fuel tank drain hose
 9. Stator coil assembly lead
 10. Shift sensor lead
 11. Canister breather hose
 12. Canister purge hose (purge cut valve solenoid to canister)
 13. Holder
 14. Shift rod joint
 15. Shift arm
 16. Shift rod joint and dust cover
 17. Clamp
- A. To fuel pump
 - B. Route the wire harness (to gear position sensor) on the left side of the starter motor lead.
 - C. Face the paint mark on the fuel tank drain hose outward. Align the holder with the paint mark on the fuel tank drain hose.
 - D. Route the shift sensor lead to the front of the shift sensor.
 - E. Point the open ends of the clamp to the right.
 - F. Left side of the vehicle
 - G. Forward of the vehicle
 - H. Arrange the sidestand switch lead, canister breather hose and fuel tank drain hose from inside of the vehicle in order.
 - I. Pass the shift sensor lead in front of the shift rod joint and shift arm.
 - J. Bend the shift sensor lead upward at the bottom of the sensor side.
 - K. Fix the shift sensor and its lead to the top part of the locknut on the shift sensor with the clamp.

CABLE ROUTING

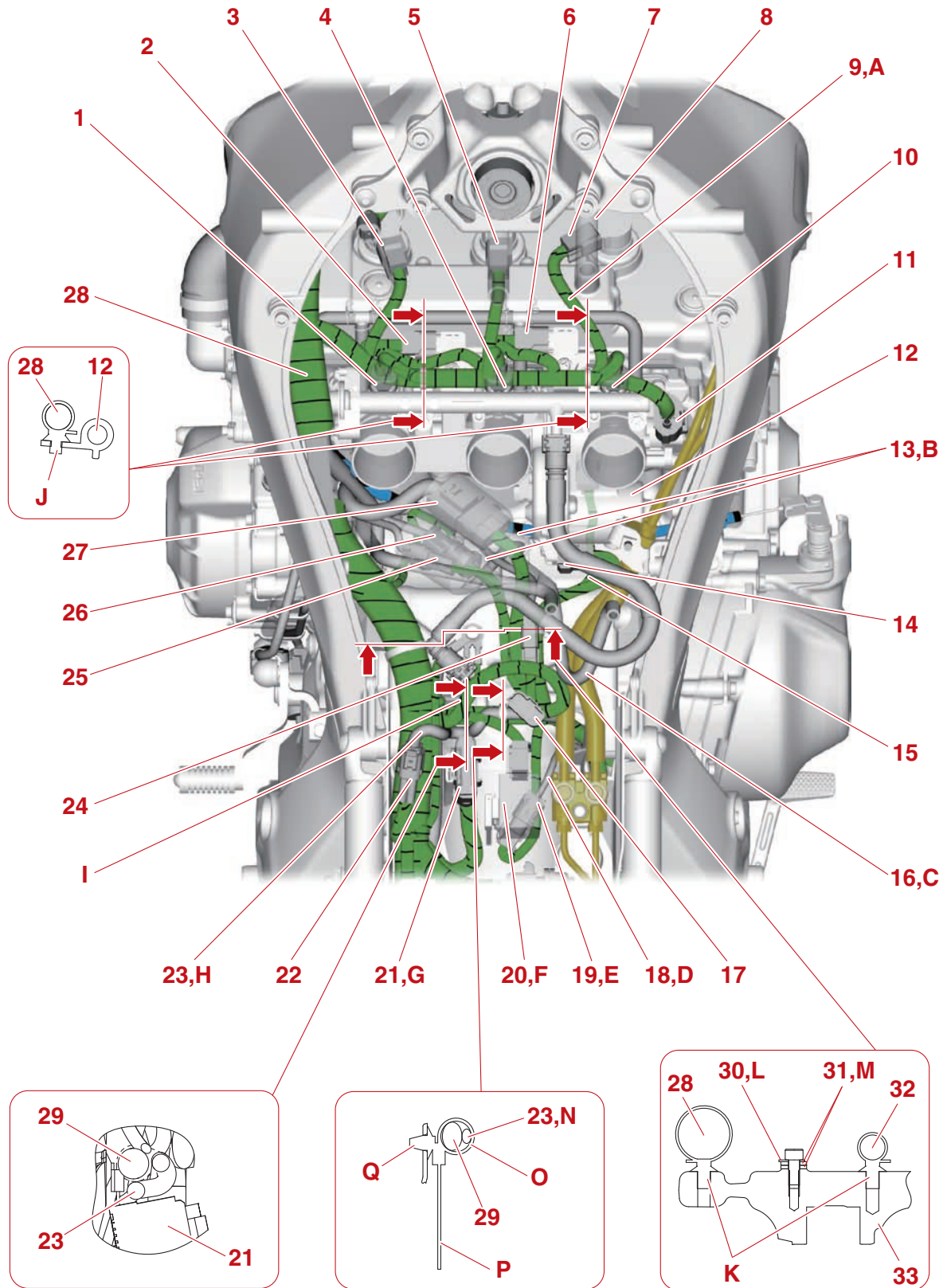
Frame 3 (rear left side view)



1. Wire harness
 2. Wire harness (to purge cut valve solenoid)
 3. Fuel tank drain hose
 4. Shift sensor lead
 5. Canister breather hose
 6. Sidestand switch lead
 7. Plastic locking tie
 8. Stator coil lead
 9. Clutch cable
 10. Cylinder head
 11. Engine bracket
 12. Frame
 13. Purge cut valve solenoid coupler
 14. Purge cut valve solenoid
 15. Canister purge hose (purge cut valve solenoid to canister)
 16. Bracket
- A. Route the wire harness (to purge cut valve solenoid) on the rear side of the stator coil lead, sidestand switch lead and shift sensor lead.
 - B. Route the fuel tank drain hose to the rear side of the stator coil lead, sidestand switch lead and shift sensor lead. Route the fuel tank drain hose to the left side of the canister purge hose (purge cut valve solenoid to canister).
 - C. Route the shift sensor lead to the outside of the fuel tank drain hose and canister breather hose.
 - D. Left side of the vehicle
 - E. Route the stator coil lead to the front of the vehicle and fix the gray tape part with a plastic locking tie.
 - F. Fix the plastic locking tie is located 20–30 mm (0.79–1.18 in) away from the plastic locking tie “7”. Face the locking part of the plastic locking tie forward. Face the end of the plastic locking tie rightward and do not cut off the excess.
 - G. Right side of the vehicle
 - H. Forward of the vehicle
 - I. Route the clutch cable between the cylinder head and the bracket.
 - J. Route the stator coil lead, shift sensor lead and sidestand switch lead on the left side of the clutch cable and canister purge hose (purge cut valve solenoid to canister).
 - K. Insert the plastic locking tie into the hole of the bracket.
 - L. Face the end of the plastic locking tie leftward and cut off the excess.
 - M. Gray tape of shift sensor lead and side stand switch lead. The plastic locking tie position is aligned with the end of the gray tape (shift sensor side and sidestand switch side).

CABLE ROUTING

Top view 1

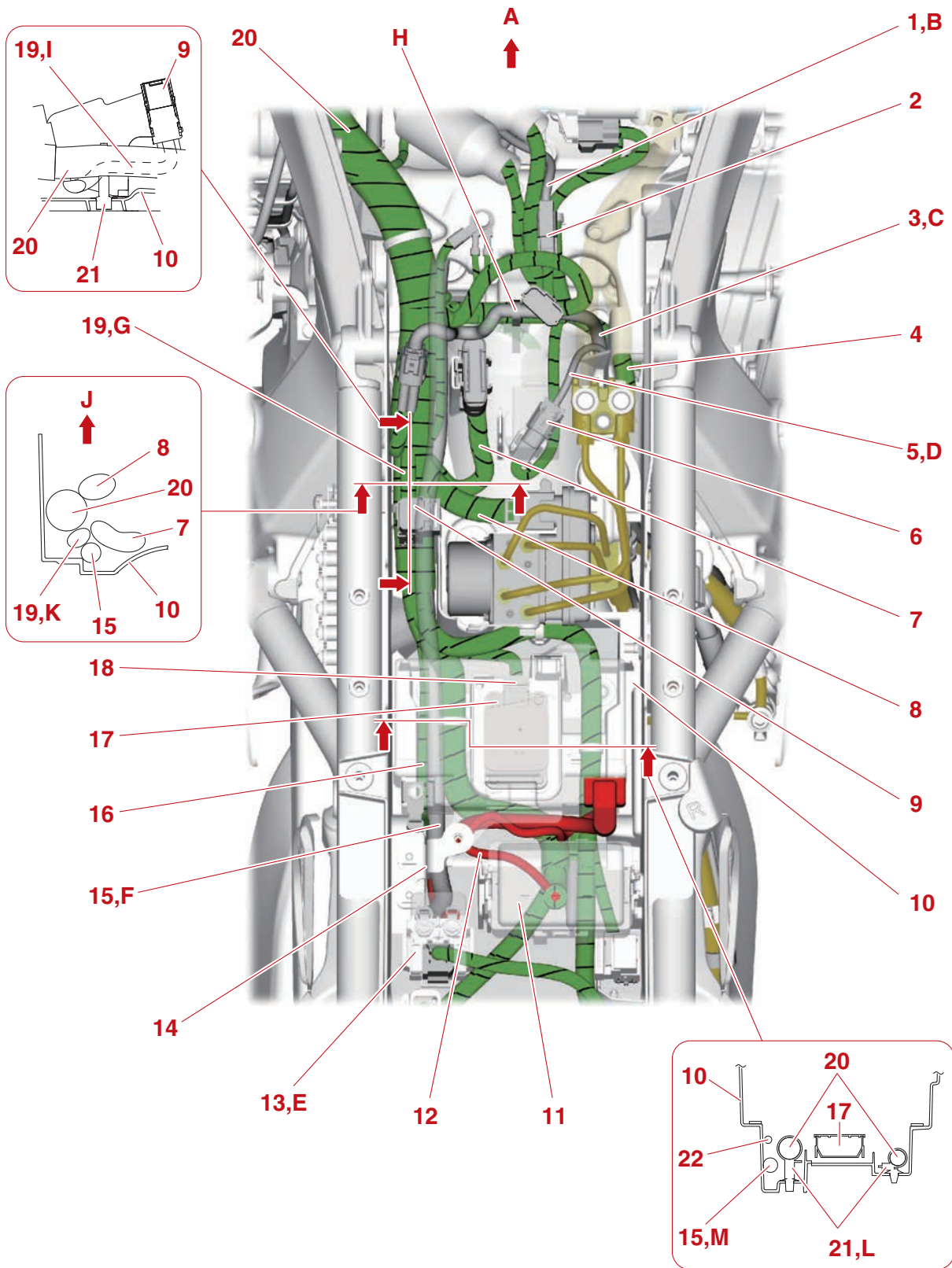


CABLE ROUTING

1. Injector #1 coupler
 2. Intake air pressure sensor 2 coupler
 3. Ignition coil #1 coupler
 4. Injector #2 coupler
 5. Ignition coil #2 coupler
 6. Intake air pressure sensor 1 coupler
 7. Ignition coil #3 coupler
 8. Cylinder head breather hose
 9. Wire harness (to ignition coil #3)
 10. Injector #3 coupler
 11. Throttle position sensor coupler
 12. Throttle body
 13. Coupler cover
 14. Throttle servo motor coupler
 15. Wire harness (to coolant temperature sensor)
 16. Fuel tank breather hose
 17. Fuel pump coupler
 18. Rear wheel sensor lead
 19. Rear wheel sensor coupler
 20. Relay unit
 21. Joint coupler
 22. Rear brake light switch coupler
 23. Rear brake light switch lead
 24. Crankshaft position sensor coupler
 25. Sidestand switch coupler
 26. Shift sensor coupler
 27. Stator coil coupler
 28. Wire harness
 29. Wire harness (to rectifier/regulator)
 30. Body ground 3
 31. Body ground 1, 2, 4, 5
 32. Wire harness
 33. Frame
- A. Route the wire harness (to ignition coil #3) to the left side of the cylinder head breather hose.
 - B. Slide the coupler cover until the coupler is covered and face the open side of the coupler cover to underside of the vehicle.
 - C. Route the fuel tank breather hose to the left side of the wire harness (to throttle servo motor) and wire harness (to coolant temperature sensor). Route the fuel tank breather hose to the right side of the wire harness (to stator coil), wire harness (to shift sensor), wire harness (to sidestand switch).
 - D. Route the rear wheel sensor lead over the wire harness.
 - E. Insert the rear wheel sensor coupler into the hole of the battery box.
 - F. Insert the relay unit until it touches the rib on the battery box.
 - G. Insert the joint coupler into the rib of the battery box.
 - H. Route the rear brake light switch lead between the wire harness and joint coupler. (between clamp and rear brake light switch coupler)
 - I. Route the wire harness (to fuel pump) on the front side of the rear brake light switch lead.
 - J. Insert the clamp into the hole of the throttle body.
 - K. Insert the clamp into the hole of the frame.
 - L. Route the body ground 3 is located above the body grounds 1, 2, 4, and 5, and their crimped parts of the terminals do not overlap and face them upper side.
 - M. Install the crimped parts of the terminals of body ground 1, 2, 4, and 5 to face the upper side.
 - N. Fasten the rear brake light switch lead at the gray tape with a clamp.
 - O. Fasten the wire harness (to rectifier/regulator coupler) at the white tape with a clamp.
 - P. Point the end of the clamp rearward.
 - Q. Insert the clamp into the hole of the battery box.

CABLE ROUTING

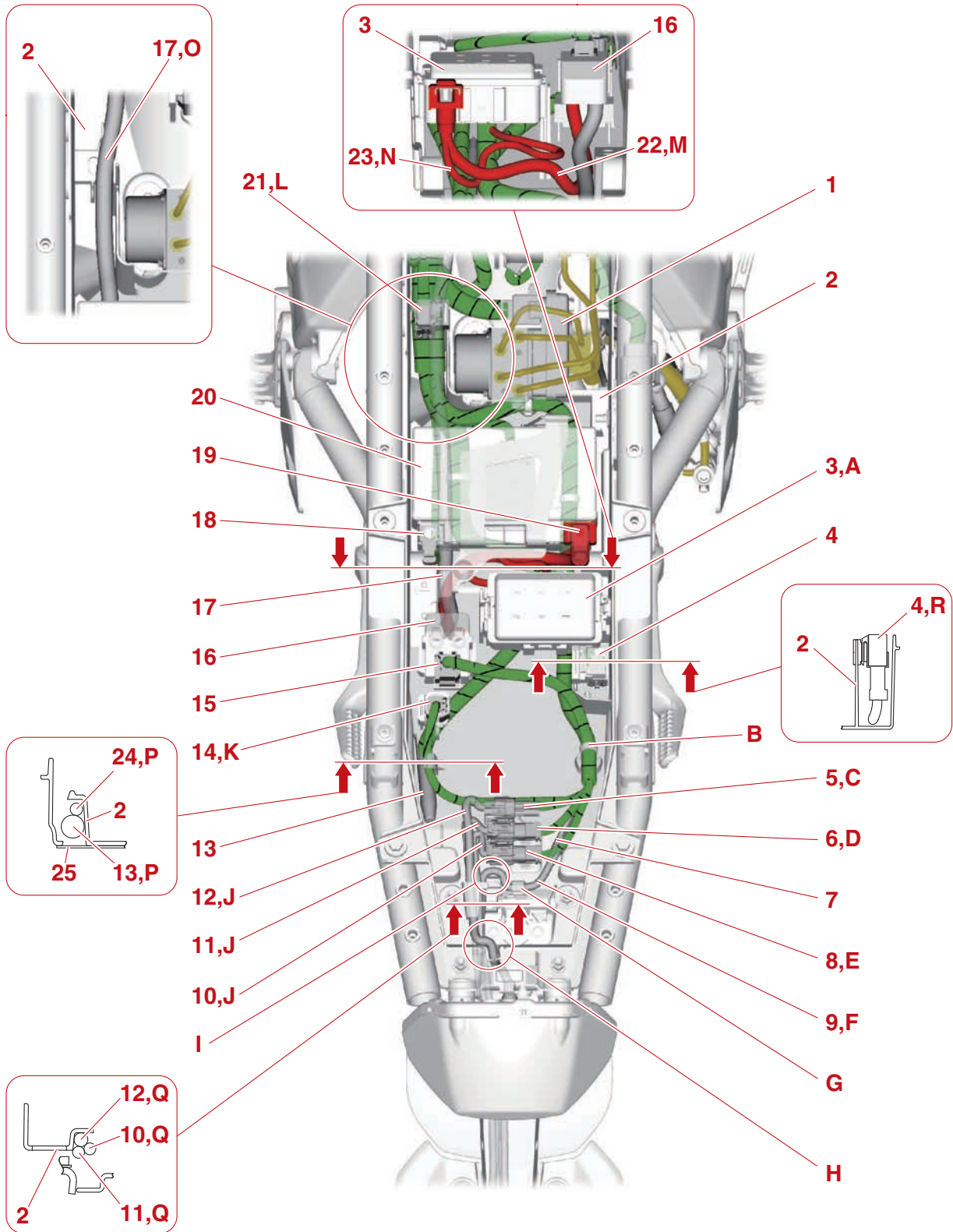
Top view 2



1. Crankshaft position sensor lead
 2. Crankshaft position sensor coupler
 3. Rear brake light switch lead
 4. Wire harness (to rectifier/regulator)
 5. Rear wheel sensor lead
 6. Rear wheel sensor coupler
 7. Wire harness (to joint coupler)
 8. Wire harness (to ABS)
 9. Radiator fan motor relay
 10. Battery box
 11. Fuse box
 12. Positive battery lead
 13. Starter relay
 14. Bracket
 15. Starter motor lead
 16. Wire harness (to battery negative terminal)
 17. IMU (Inertial Measurement Unit)
 18. IMU coupler
 19. Wire harness (to radiator fan motor relay)
 20. Wire harness
 21. Clamp
 22. Negative battery lead
- A. Forward of vehicle
 - B. Pass the crankshaft position sensor lead beneath the wire harness (to stator coil assembly) and connect the crankshaft position sensor coupler on the right side of the vehicle.
 - C. Route the rear brake light switch lead on the rear side of the wire harness (to rectifier/regulator).
 - D. Route the rear wheel sensor lead on the rear side of the wire harness (to rectifier/regulator).
 - E. Insert the starter relay until it stops the rib stopper on the battery box.
 - F. Pass the starter motor lead under the bracket.
 - G. Route the wire harness (to radiator fan motor relay) on the rear side of the wire harness (to ABS ECU) and wire harness (to joint coupler).
 - H. Route the rear brake light switch lead on the top side of the wire harness.
 - I. Pass the wire harness (to radiator fan motor relay) to the forward of the vehicle on the clamp.
 - J. Top of the vehicle
 - K. Route the wire harness (to radiator fan motor relay) over the starter motor lead.
 - L. Insert the projection on the wire harness clamp into the hole in the battery box.
 - M. Pass the starter motor lead under the wire harness.

CABLE ROUTING

Top view 3

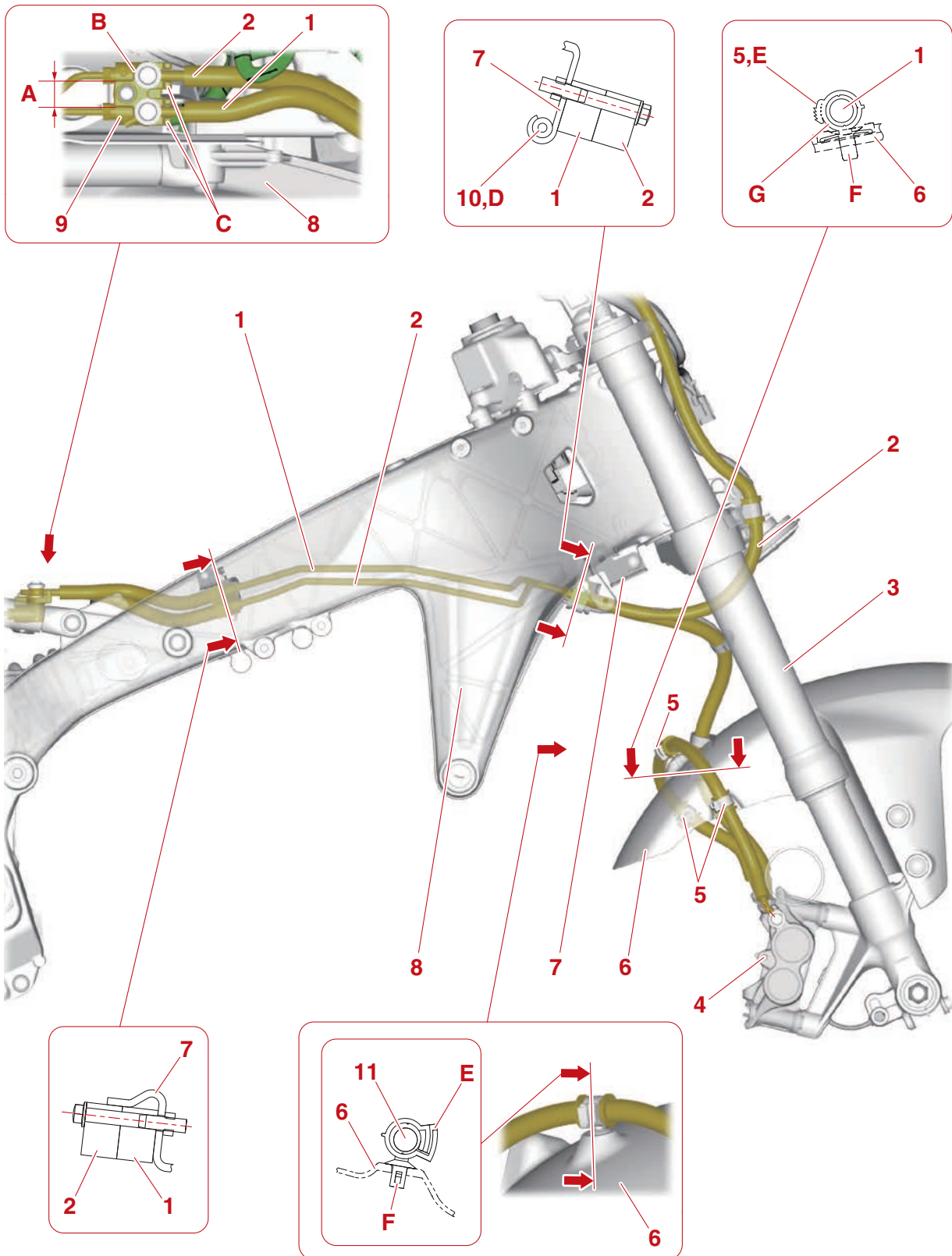


CABLE ROUTING

1. ABS ECU (Electronic Control Unit)
 2. Battery box
 3. Fuse box
 4. Brake light relay
 5. Tail/brake light coupler
 6. Rear turn signal light coupler (right)
 7. License plate light coupler
 8. Rear turn signal light coupler (left)
 9. License plate light lead
 10. Rear turn signal light lead (left)
 11. Rear turn signal light lead (right)
 12. Tail/brake light lead
 13. Joint coupler
 14. YDT coupler
 15. Starter relay coupler
 16. Starter relay
 17. Starter motor lead
 18. Negative battery lead
 19. Positive battery lead
 20. Battery
 21. Radiator fan motor relay
 22. Positive battery lead (to starter relay)
 23. Positive battery lead (to fuse box)
 24. Wire harness (to YDT coupler)
 25. Lower fender cover
- A. Insert the fuse box to the ribs on the battery box.
 - B. Insert the clamp into the hole of the battery box.
 - C. Insert the tail/brake light coupler into the hole of the battery box.
 - D. Insert the rear turn signal light coupler (right) into the hole of the battery box.
 - E. Insert the rear turn signal light coupler (left) into the hole of the battery box.
 - F. Pass the license plate light lead from the front side of the vehicle, and arrange it under the wire harness (to rear turn signal light), wire harness (to tail/brake light lead) and wire harness (to YDT).
 - G. Align with the white tape of the license plate light lead and route the license plate light lead through the guide of the battery box.
 - H. Align with the black tape of the tail/brake light lead and route the tail/brake light lead through the guide of the battery box. Pass the license plate light lead to the rearward of the vehicle on the rib of the battery box.
 - I. Pass the license plate light lead to the left side of the rib of battery box.
 - J. Place the loose part of the wiring to the front side of the vehicle.
 - K. Insert the YDT coupler until it stops the rib stopper on the battery box.
 - L. Insert the radiator fan motor relay until it stops the rib stopper on the battery box.
 - M. Pass the starter motor lead under the positive battery lead (to starter relay).
 - N. Bend the positive battery lead as shown in the illustration and fit it between the fuse box and the battery.
 - O. Push the starter motor lead into the ribs of the battery box.
 - P. Pass the joint coupler and wire harness (to YDT coupler) through the guide of the battery box.
 - Q. Pass the rear turn signal light lead (left), rear turn signal light lead (right) and tail/brake light lead through the guide of the battery box.
 - R. Insert the brake light relay until it stops the rib stopper on the battery box.

CABLE ROUTING

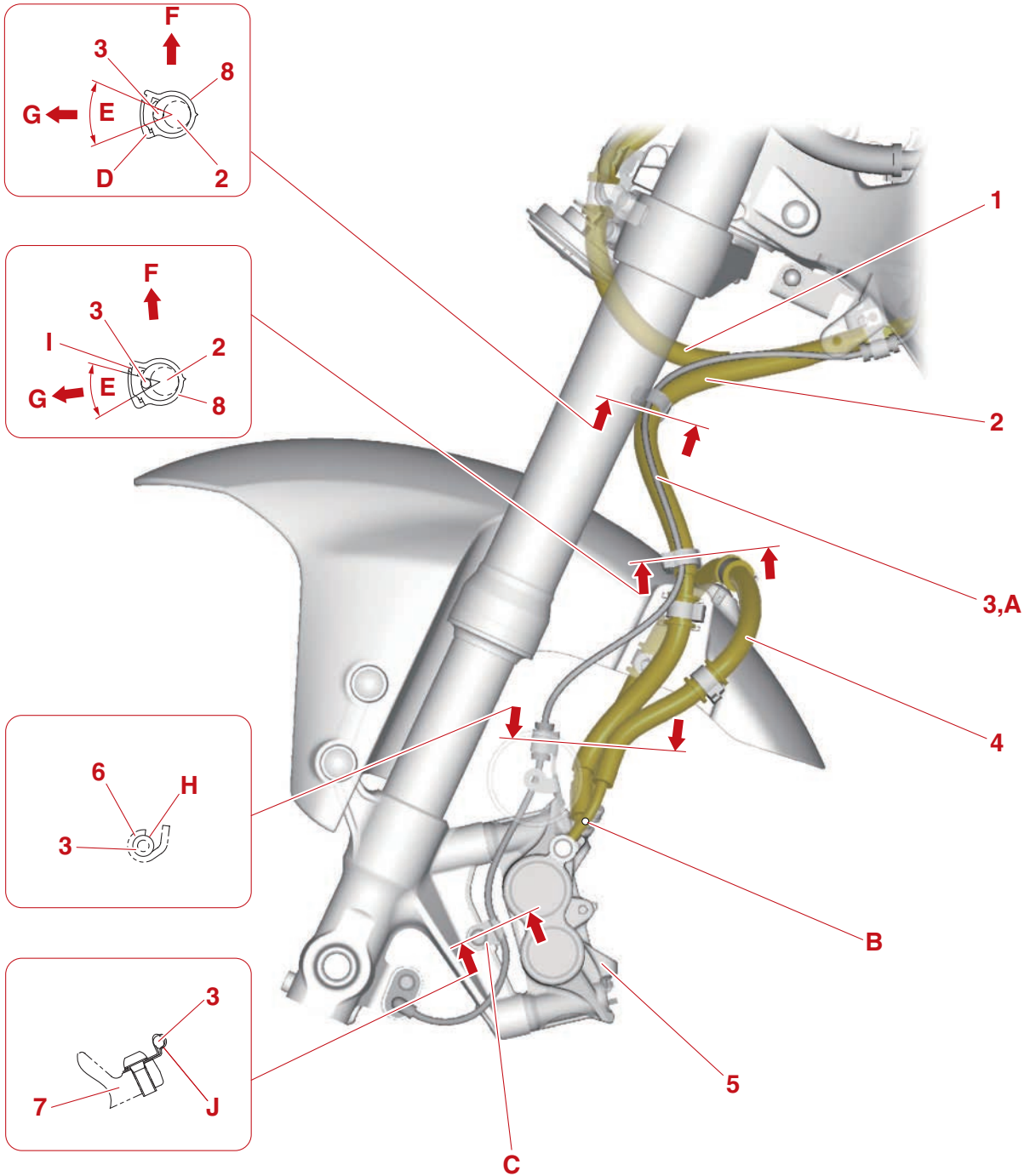
Front brake hose (right side view)



1. Brake hose (hydraulic unit to front brake caliper (left))
 2. Brake hose (front brake master cylinder to hydraulic unit)
 3. Front fork
 4. Front brake caliper assembly (right)
 5. Clamp
 6. Front fender
 7. Bracket
 8. Frame
 9. Brake hose joint
 10. Front wheel sensor lead
 11. Brake hose (front brake caliper (left) to front brake caliper (right))
- A. After holding the protrusion (17 mm (0.67 in)) on the brake hose joint with an appropriate tool, tighten the brake hose union bolts to the specified torque.
 - B. Fit the metal fitting for the front brake hose to the recess of the brake hose joint.
 - C. Install the brake hose between the stoppers on the brake hose joint.
 - D. Insert the grommet of the front wheel sensor lead.
 - E. Make sure the clamp is engaged by 2 or more notches. Engage the claws so that they face toward the rear of the vehicle.
 - F. Insert the clamp into the hole of the front fender.
 - G. Fit the clamp between the ribs on the front fender.

CABLE ROUTING

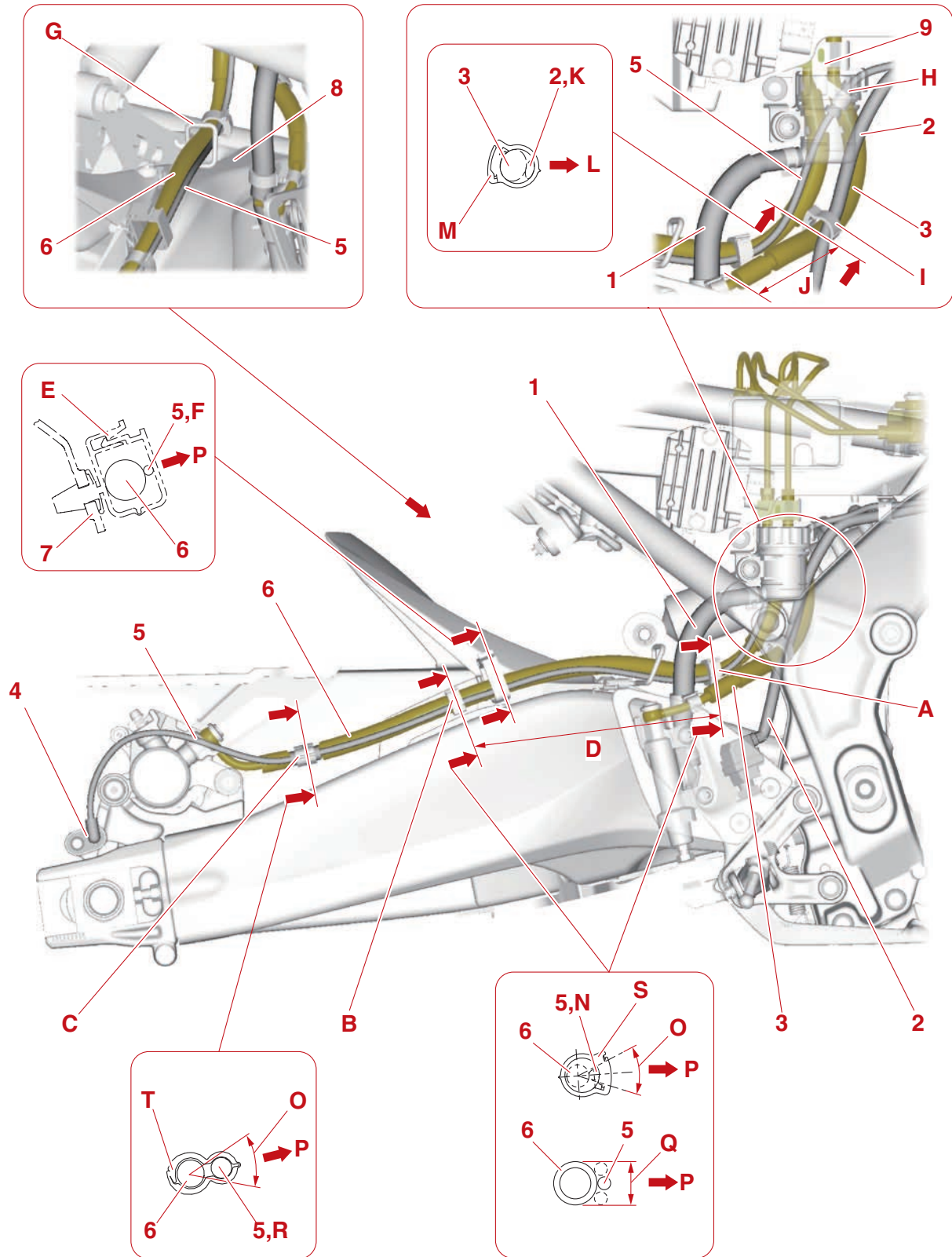
Front brake hose (left side view)



1. Brake hose (front brake master cylinder to hydraulic unit)
 2. Brake hose (hydraulic unit to front brake caliper (left))
 3. Front wheel sensor lead
 4. Brake hose (front brake caliper (left) to front brake caliper (right))
 5. Front brake caliper assembly (left)
 6. Reflector bracket
 7. Front fork
 8. Clamp
-
- A. Make the front wheel sensor lead to follow the brake hose (brake hose joint to front brake caliper (left)) without slacking.
 - B. Install the brake hose (front brake caliper (left) to front brake caliper (right)) with its white paint mark facing outward.
 - C. Install the holder with contacted the front fork leg.
 - D. Route the front wheel sensor lead on the front side of the brake hose, and clamp the white tape portion. The opening of the clamp should face the front. Make sure the clamp is engaged by 3 or more notches.
 - E. 45°
 - F. Left side of the vehicle
 - G. Front side of the vehicle
 - H. Insert the grommet of the front wheel sensor lead.
 - I. Route the front wheel sensor lead on the front side of the brake hose, and clamp the white tape portion. Fasten the protector of the brake hose with the clamp. The opening of the clamp should face the front. Make sure the clamp is engaged by 3 or more notches.
 - J. Fasten the white tape portion of the front wheel sensor lead with the clamp.

CABLE ROUTING

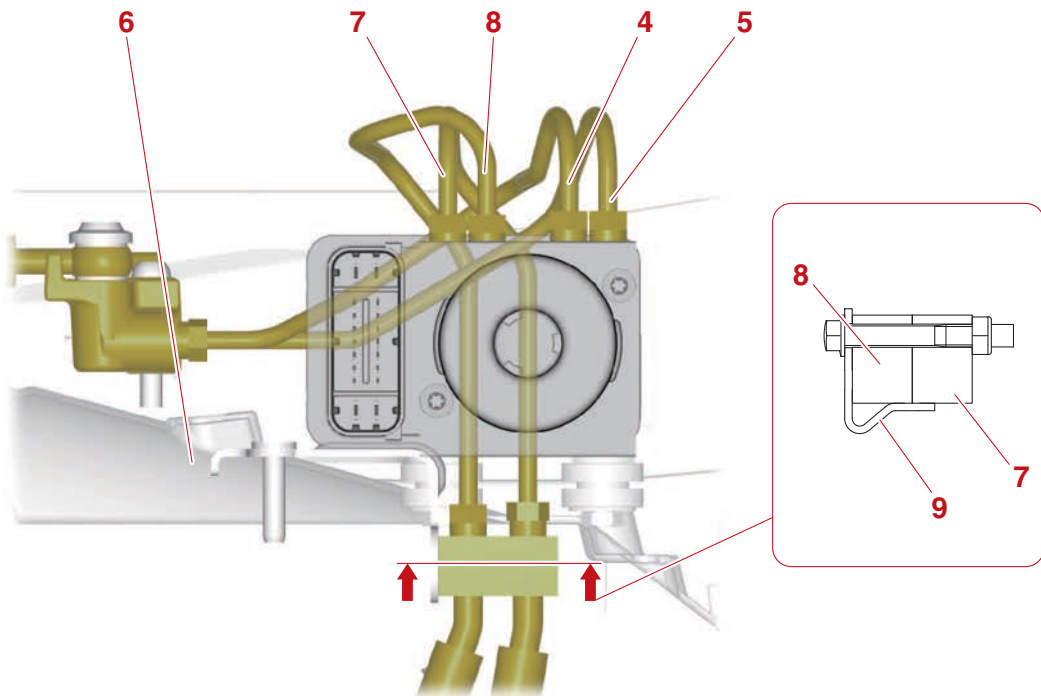
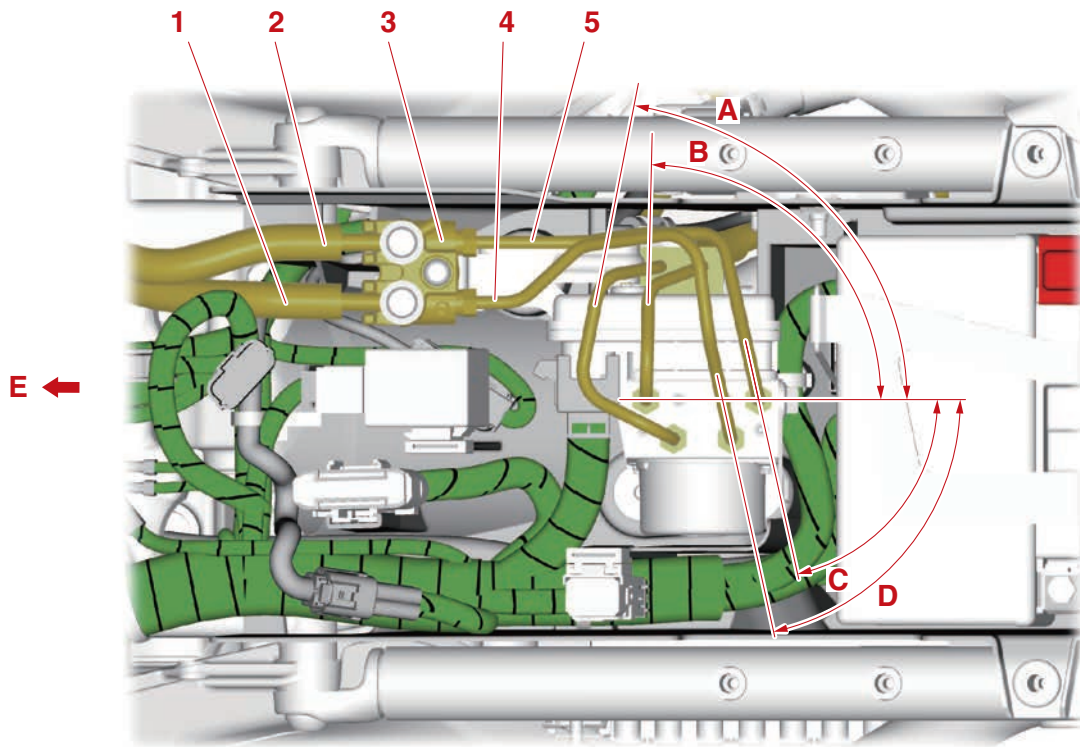
Rear brake hose (right side view)



CABLE ROUTING

1. Brake fluid reservoir hose
 2. Rear brake light switch lead
 3. Rear brake hose (rear brake master cylinder to hydraulic unit)
 4. Rear wheel sensor
 5. Rear wheel sensor lead
 6. Rear brake hose (hydraulic unit to rear brake caliper)
 7. Rear fender
 8. Swingarm
 9. Bracket
- A. Align the white paint mark on the rear brake hose (hydraulic unit to rear brake caliper) and white tape on the rear wheel sensor lead, and then fasten the rear wheel sensor lead and rear brake hose (hydraulic unit to rear brake caliper) with the clamp.
 - B. Align the white tape on the rear wheel sensor lead, and then fasten the rear wheel sensor lead and rear brake hose (hydraulic unit to rear brake caliper) with the clamp.
 - C. Fasten the rear brake hose with the clamp at the hose protector on the rear brake hose.
 - D. Route the rear wheel sensor leads between the clamps along the outside of the rear brake hose (hydraulic unit to rear brake caliper).
 - E. Face the catch of the clamp upward.
 - F. Route the rear wheel sensor lead on the outside of the rear brake hose (hydraulic unit to rear brake caliper).
 - G. Route the rear wheel sensor lead and rear brake hose (hydraulic unit to rear brake caliper) through the guide.
 - H. Fasten the grommet on the rear wheel sensor lead with the bracket.
 - I. Align the gray tape on the rear brake light switch lead, and then fasten the rear brake light switch lead and rear brake hose (rear brake master cylinder to hydraulic unit) with the clamp.
 - J. 70 mm (2.76 in)
 - K. Route the rear brake light switch lead on the forward of the rear brake hose (rear brake master cylinder to hydraulic unit).
 - L. Forward of the vehicle
 - M. The opening of the clamp should face the rear. Make sure the clamp is engaged by 3 or more notches.
 - N. Route the rear wheel sensor lead on the outside of the rear brake hose (hydraulic unit to rear brake caliper).
 - O. 45°
 - P. Outward
 - Q. Route the rear wheel sensor lead along the rear brake hose (hydraulic unit to rear brake caliper). Position the rear wheel sensor lead within the range shown in the illustration.
 - R. Fasten the grommet of the rear wheel sensor lead with the clamp. Route the rear wheel sensor lead on the outside of the rear brake hose (hydraulic unit to rear brake caliper).
 - S. The opening of the clamp should face the outside. Make sure the clamp is engaged by 3 or more notches.
 - T. The opening of the clamp should face the inside.

ABS ECU (Electronic Control Unit) (top and left side view)

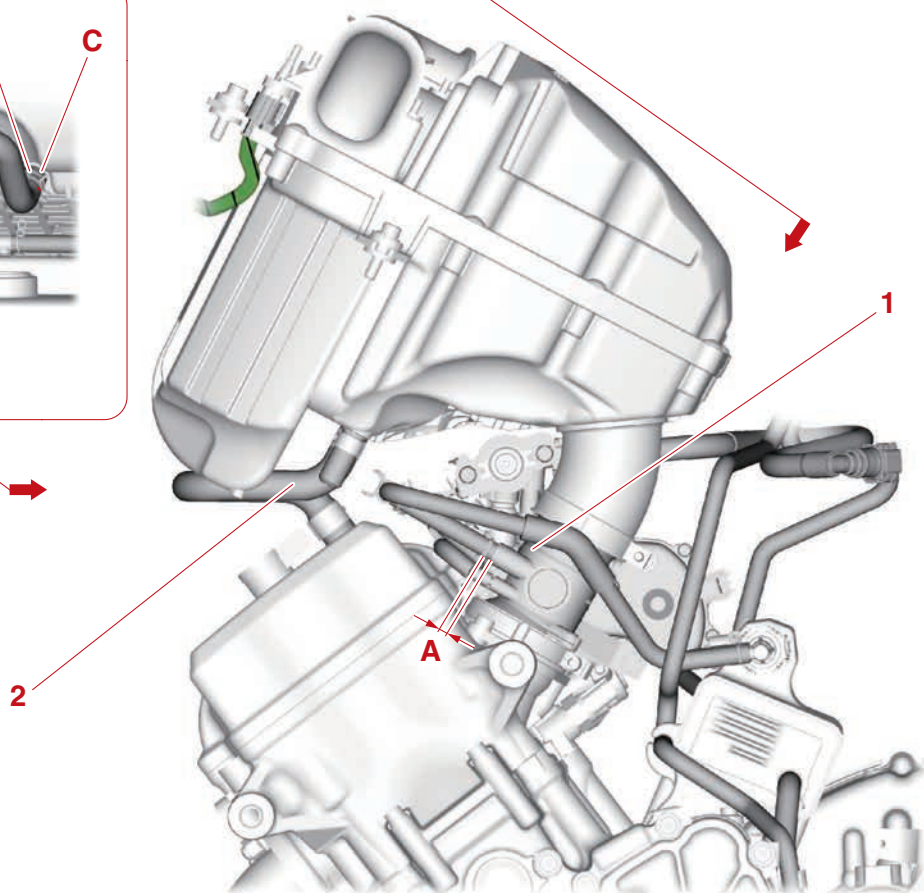
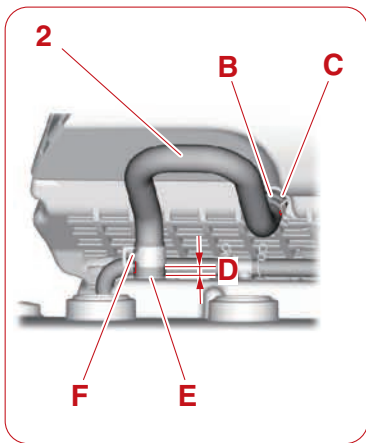
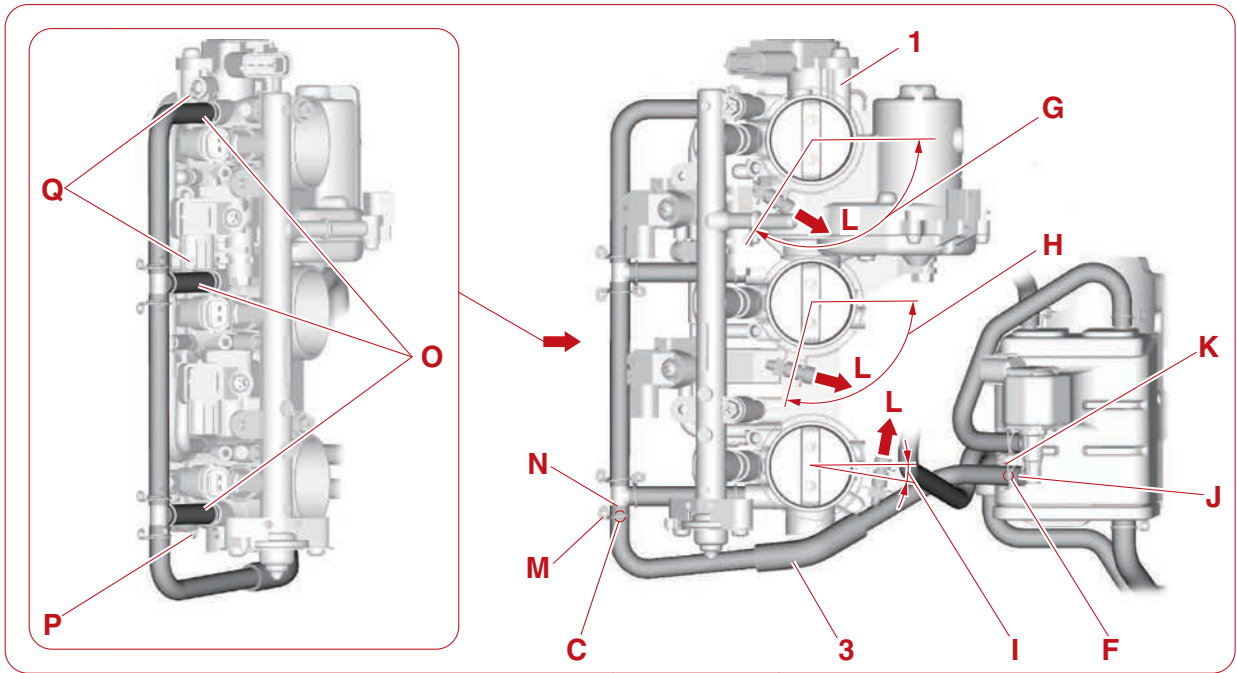


CABLE ROUTING

1. Front brake hose (front brake master cylinder to hydraulic unit)
 2. Front brake hose (hydraulic unit to front brake caliper (left))
 3. Brake hose joint
 4. Hydraulic unit brake pipe (rear brake master cylinder to hydraulic unit)
 5. Hydraulic unit brake pipe (hydraulic unit to front brake calipers)
 6. Battery box
 7. Hydraulic unit brake pipe (hydraulic unit to rear brake caliper)
 8. Hydraulic unit brake pipe (rear brake master cylinder to hydraulic unit)
 9. Bracket
- A. 79°
 - B. 89°
 - C. 77°
 - D. 78°
 - E. Forward

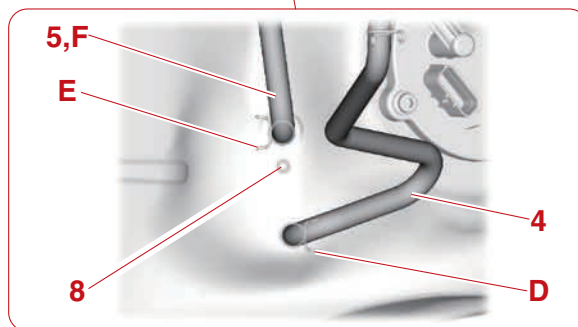
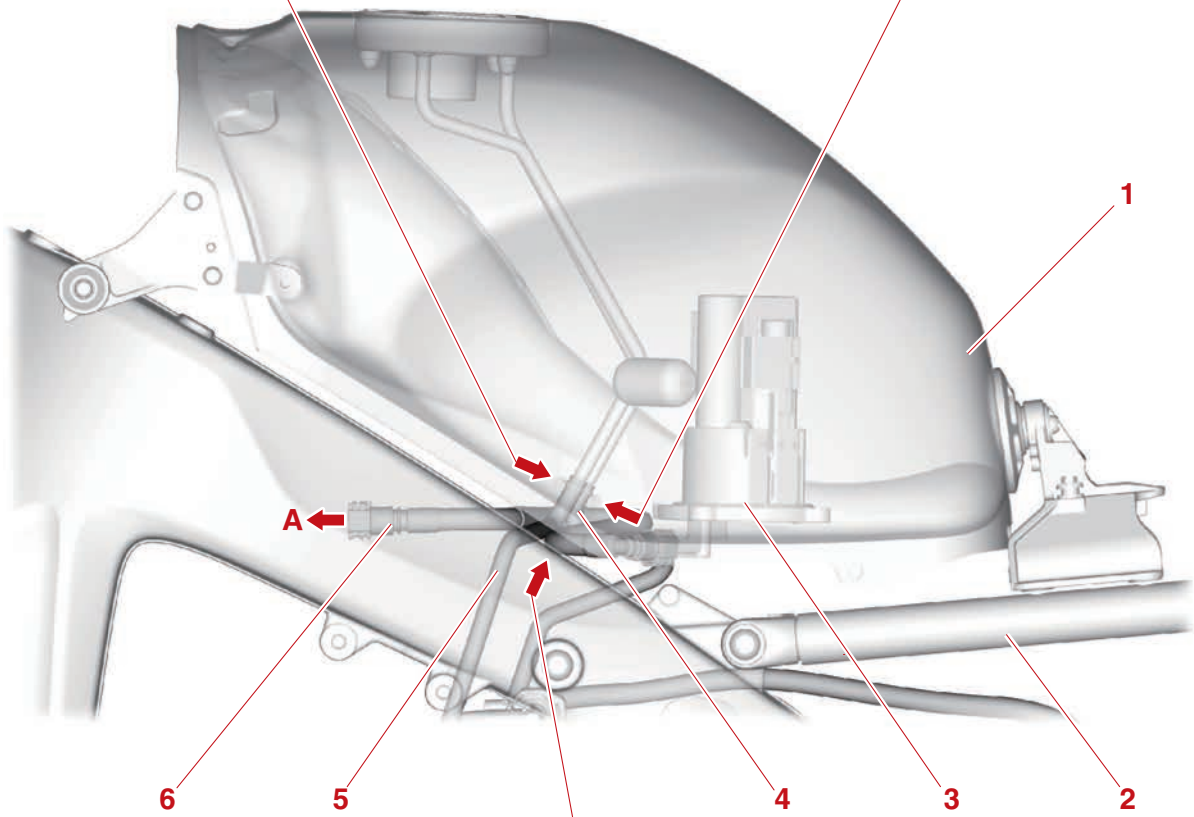
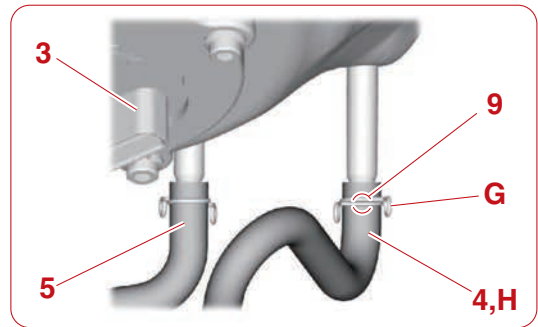
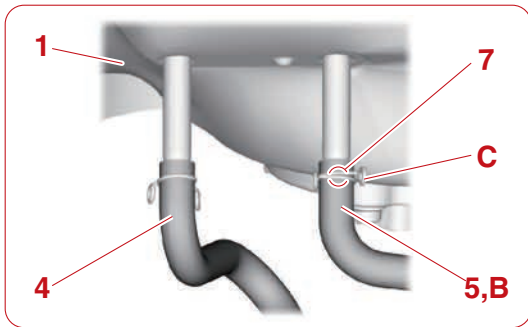
CABLE ROUTING

Air filter case and throttle bodies (left side view)



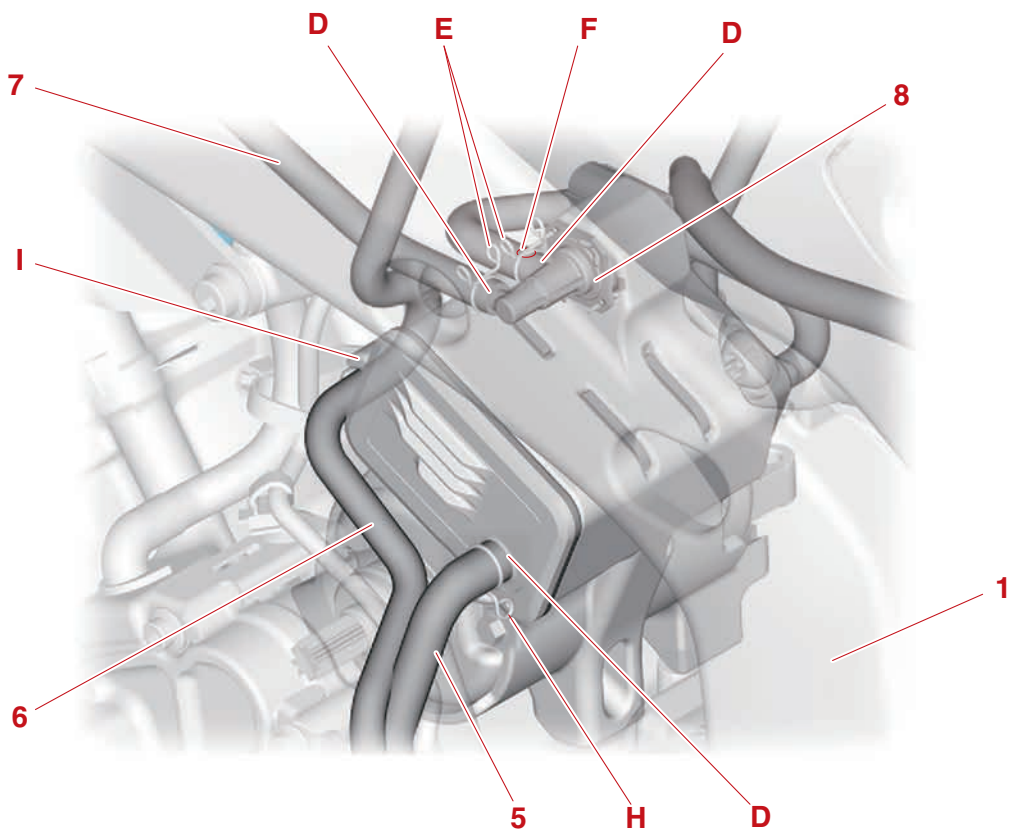
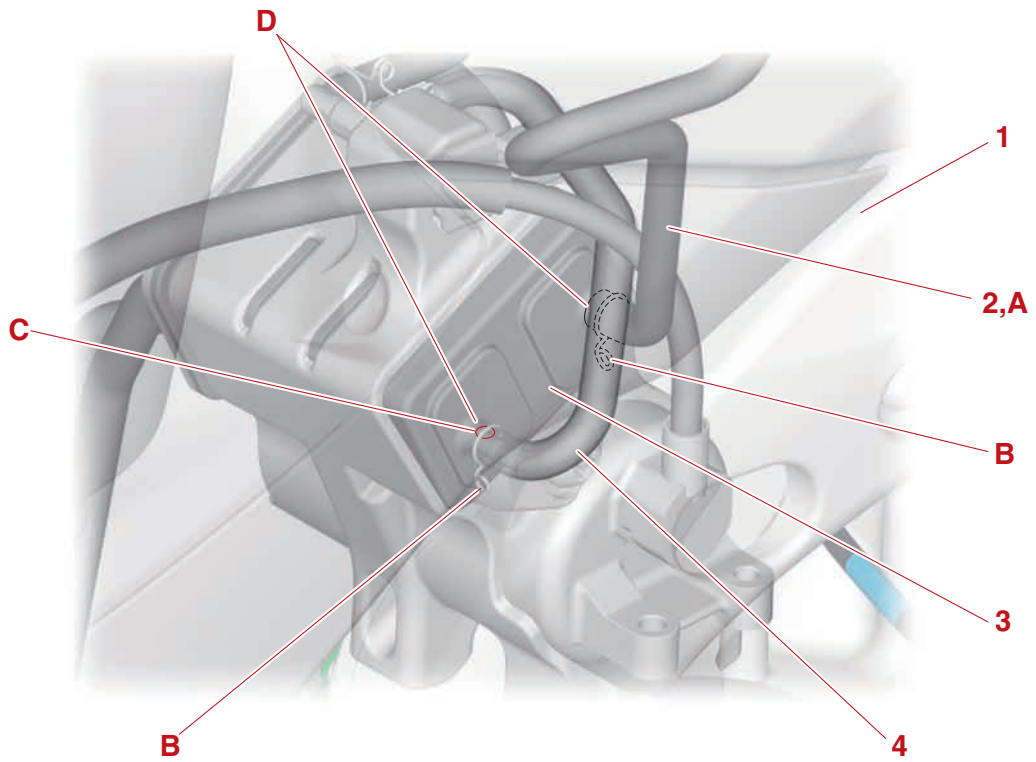
1. Throttle body
2. Cylinder head breather hose
3. Canister purge hose (purge cut valve solenoid to hose joint)
 - A. 5–7 mm (0.20–0.28 in) (3 places)
 - B. Insert the cylinder head breather hose until it reaches the rounded end of the pipe. Install the cylinder head breather hose with the yellow paint mark facing the left. Install the clip with its end facing the left.
 - C. Yellow paint mark
 - D. 1–3 mm (0.04–0.12 in)
 - E. Insert the cylinder head breather hose until it reaches the rounded end of the pipe. Install the cylinder head breather hose with the white paint mark facing the right. Install the clip with its end facing the right.
 - F. White paint mark
 - G. 123°
 - H. 105°
 - I. 10°
 - J. Install the canister purge hose completely onto the purge cut valve solenoid.
 - K. Point the ends of the hose clamp upward.
 - L. Face the bolt head to the position as shown in the illustration.
 - M. Point the ends of the hose clamp forward.
 - N. Install the canister purge hose completely onto the hose joint.
 - O. Hose until it butts against the throttle body.
 - P. Point the ends of the hose clamp to the left.
 - Q. Point the ends of the hose clamp to the right.

Fuel tank (left side view)



1. Fuel tank
 2. Frame
 3. Fuel pump
 4. Fuel tank breather hose
 5. Fuel tank drain hose
 6. Fuel hose
 7. White paint mark
 8. Projection
 9. Yellow paint mark
- A. To engine
 - B. Insert the fuel tank drain hose up to the section where the fuel tank pipe increases in diameter. Install it so that the paint mark faces the front.
 - C. Align the hose clip with the paint mark on the fuel tank drain hose and install it. Make sure not to install the hose clip on the raised portion of the hose fitting.
 - D. Face the tip of the clip backward from the central axis of the fuel tank breather hose.
 - E. Face the tip of the hose clip forward from the central axis of the fuel tank drain hose.
 - F. Install the fuel tank drain hose on the projection side of the fuel tank.
 - G. Align the hose clip with the paint mark on the fuel tank breather hose and install it. Make sure not to install the hose clip on the raised portion of the hose fitting.
 - H. Insert the fuel tank breather hose up to the section where the fuel tank pipe increases in diameter. Install it so that the paint mark faces the rear.

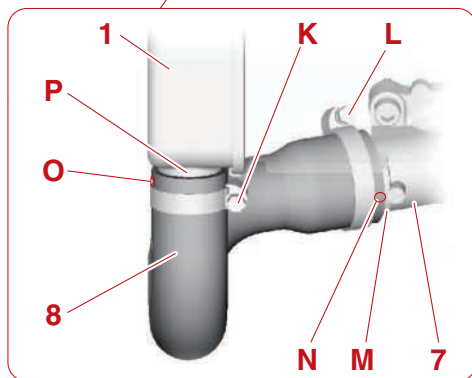
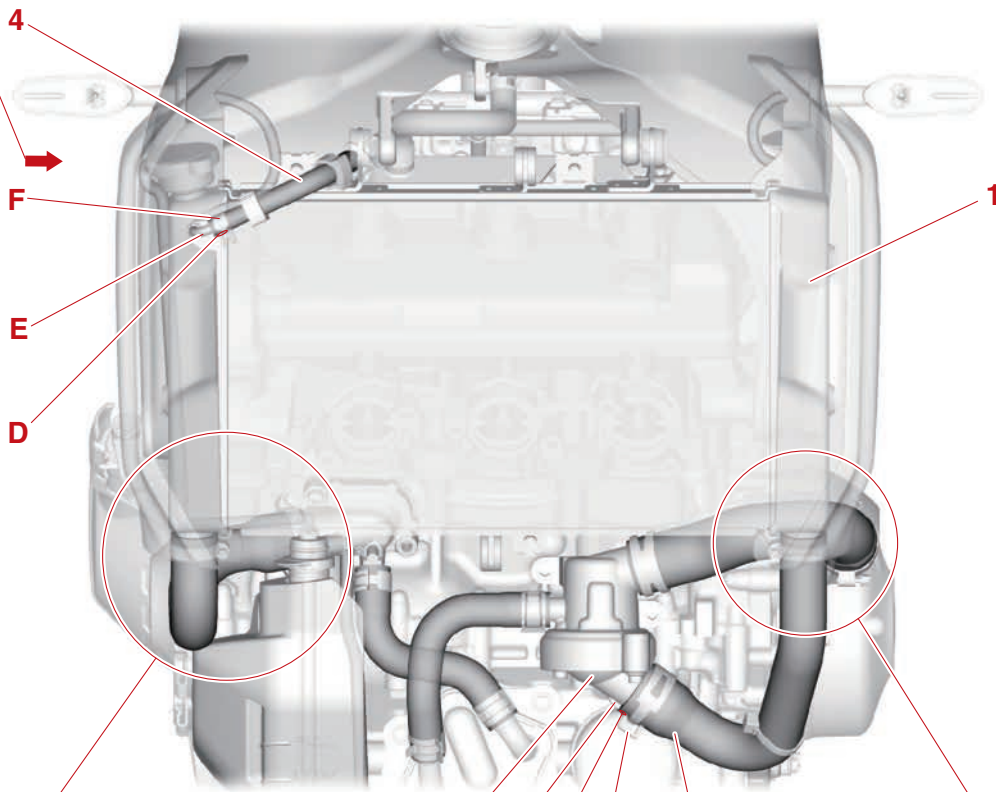
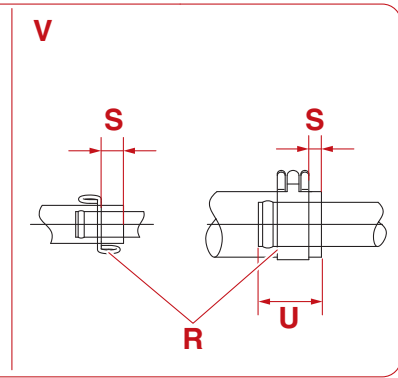
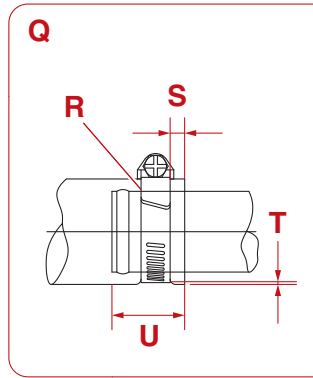
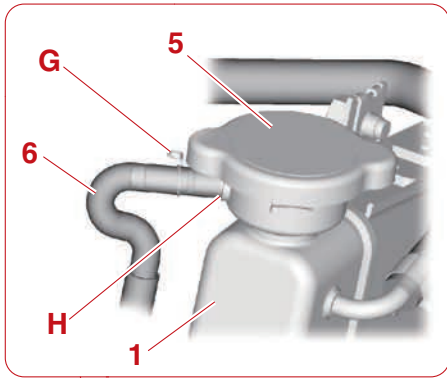
Canister



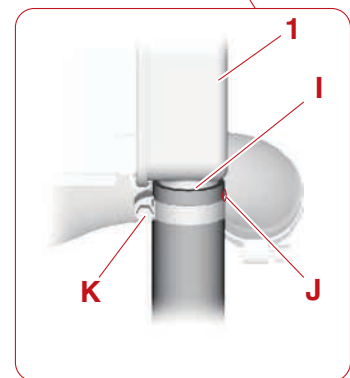
1. Frame
 2. Fuel tank breather hose (fuel tank to canister)
 3. Canister
 4. Canister purge hose (purge cut valve solenoid to canister)
 5. Canister breather hose
 6. Fuel tank drain hose
 7. Canister purge hose (purge cut valve solenoid to hose joint)
 8. Purge cut valve solenoid
-
- A. Face the white paint mark on the fuel tank breather hose (fuel tank to canister) upward.
 - B. Install the clip with its end facing the down.
 - C. Face the yellow paint mark on the canister purge hose (purge cut valve solenoid to canister) upward.
 - D. Insert each hose until it stops each part.
 - E. Install the clip with its end facing the top.
 - F. Face the blue paint mark on the canister purge hose (purge cut valve solenoid to canister) upward.
 - G. Install the clip with its end facing the rear.
 - H. Fit the fuel tank drain hose into the canister holder as shown in the illustration.

CABLE ROUTING

Radiator (front side view)

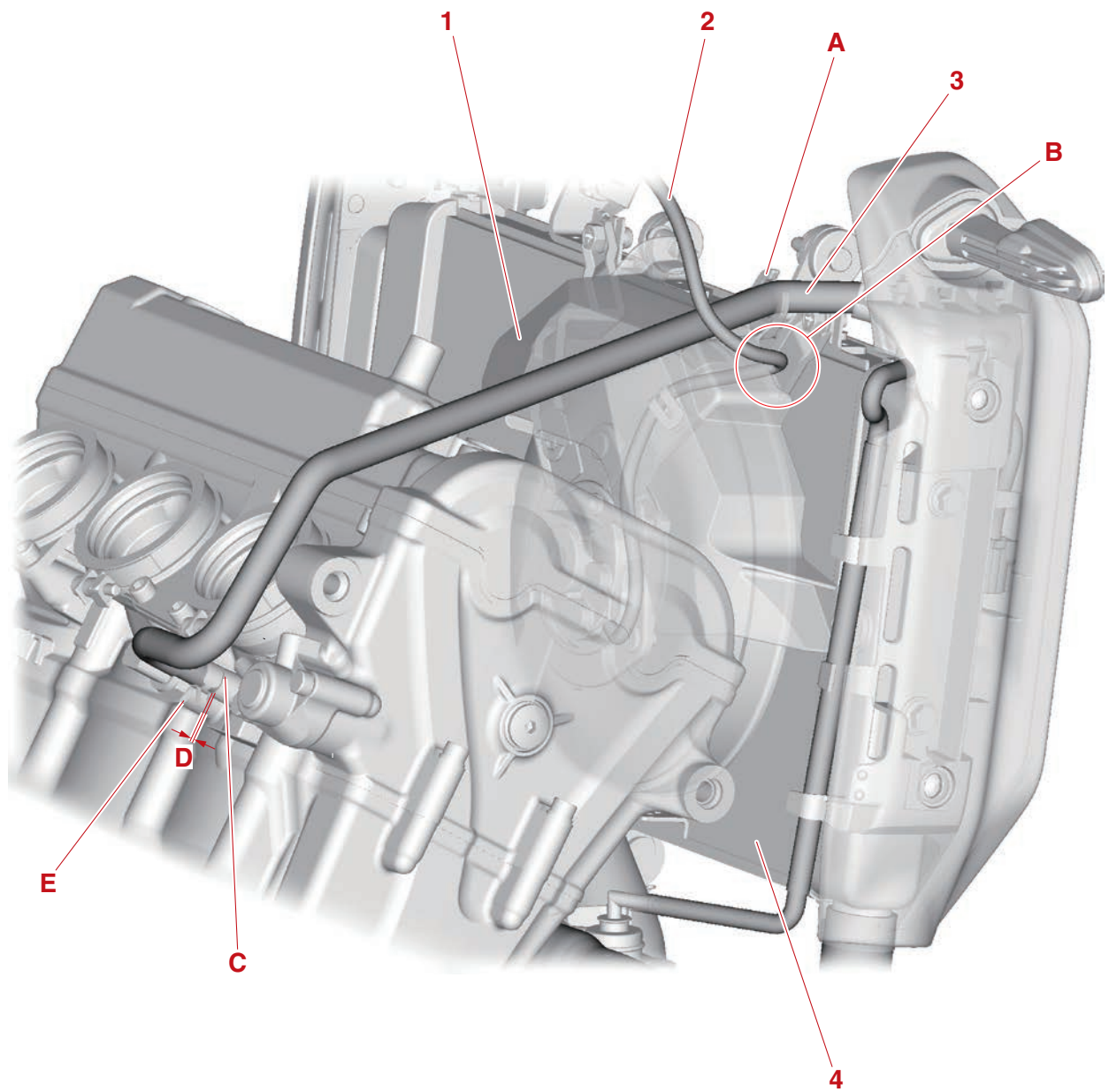
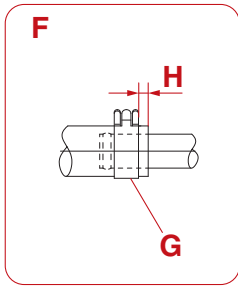


3 C B A 2



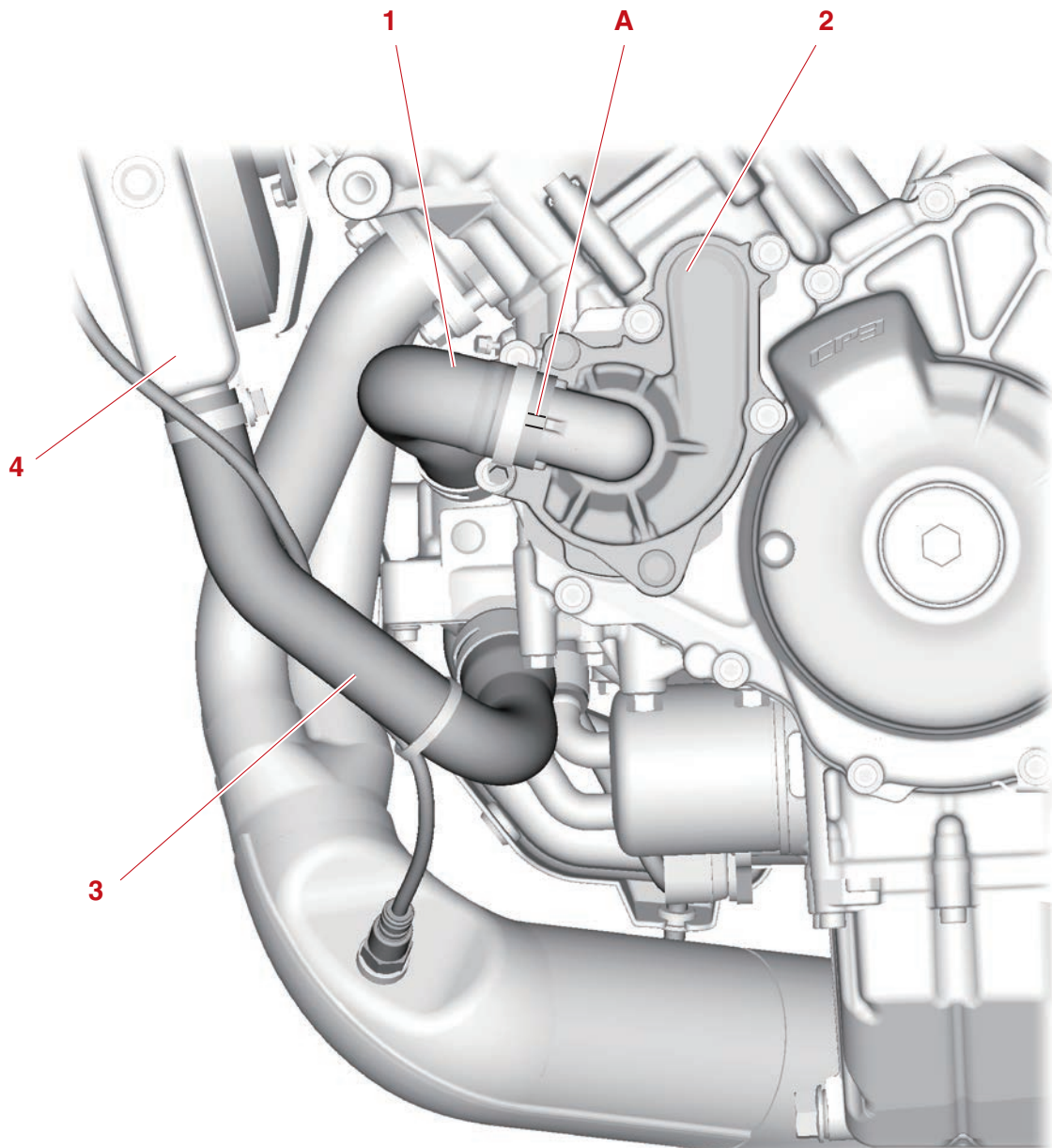
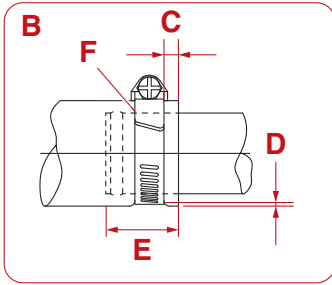
1. Radiator
 2. Radiator outlet hose
 3. Thermostat assembly
 4. Radiator hose (cylinder head to radiator)
 5. Radiator cap
 6. Coolant reservoir hose
 7. Water jacket joint
 8. Radiator inlet hose
-
- A. Face the tip of the clip toward the yellow paint mark on the radiator outlet hose.
 - B. Align the yellow paint mark on the radiator outlet hose with the rib on the thermostat assembly.
 - C. Insert the radiator outlet hose until it touches the rib of the thermostat assembly.
 - D. Install the radiator hose (cylinder head to radiator) with its white paint mark facing forward.
 - E. Install the radiator hose (cylinder head to radiator) up to the base of the bend in the radiator pipe.
 - F. Install the clip with its end facing the down.
 - G. Fit the clip with its end facing inward. Fit the clip in the center between the spools, never ride on the spool.
 - H. Insert the coolant reservoir hose up to the section where the radiator pipe increases in diameter.
 - I. Insert the radiator outlet hose up to the section where the radiator pipe increases in diameter.
 - J. Install the radiator outlet hose with its white paint mark facing outward.
 - K. Install the hose clamp with the screw head facing the inward.
 - L. Install the hose clamp screw to face it top side.
 - M. Insert the radiator inlet hose until it touches the rib of the water jacket joint.
 - N. Align the yellow paint mark on the radiator inlet hose with the rib on the water jacket joint.
 - O. Install the radiator inlet hose with its white paint mark facing outward.
 - P. Insert the radiator inlet hose up to the section where the radiator pipe increases in diameter.
 - Q. Hose clamp fixed position details.
 - R. Make sure not to install the hose clamp on the raised portion of the hose fitting.
 - S. 3 mm (0.12 in) or more
 - T. 0–1 mm (0–0.04 in)
 - U. Hose plug-in section
 - V. Hose clip fixed position details.
 - W. Make sure not to install the hose clip on the raised portion of the hose fitting.

Radiator (right side view)



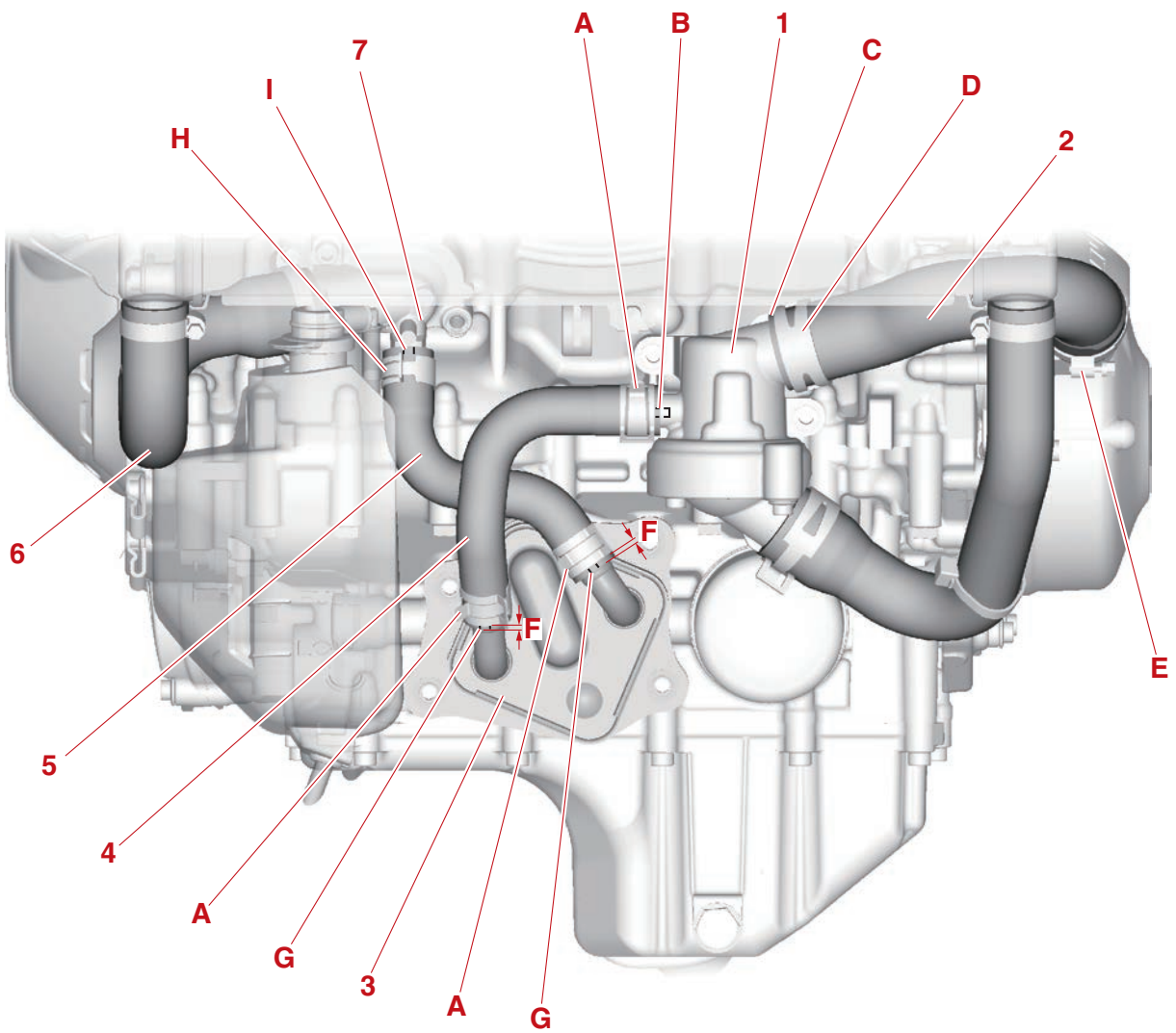
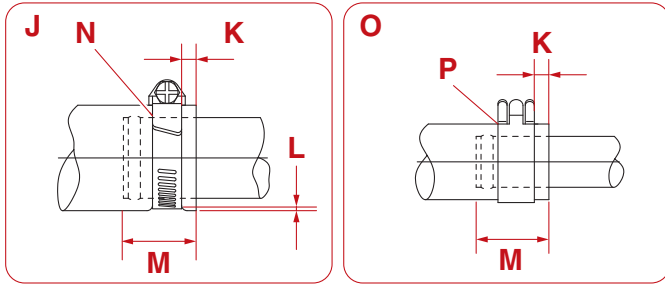
1. Radiator fan cover
 2. Radiator fan motor lead
 3. Radiator hose (cylinder head to radiator)
 4. Radiator
-
- A. Route the radiator hose (cylinder head to radiator) through the notch of the radiator fan cover.
 - B. Route the radiator fan motor lead through the notch of the radiator fan cover.
 - C. Insert the radiator hose (cylinder head to radiator) until it contacts the cylinder head.
 - D. 0–2 mm (0–0.08 in)
 - E. Point the end of clamp rearward.
 - F. Hose clamp fixed position details.
 - G. Make sure not to install the hose clamp on the raised portion of the hose fitting.
 - H. 3 mm (0.12 in) or more
 - I. Hose plug-in section

Water pump (left side view)



1. Water pump inlet hose
 2. Water pump assembly
 3. Radiator outlet hose
 4. Radiator
-
- A. Align the white paint mark on the water pump inlet hose with the rib on the water pump and insert until the hose stops.
 - B. Hose clamp fixed position details.
 - C. 3 mm (0.12 in) or more
 - D. 0–1 mm (0–0.04 in)
 - E. Hose plug-in section
 - F. Make sure not to install the hose clamp on the raised portion of the hose fitting.

Oil cooler and thermostat (front side view)



1. Thermostat assembly
 2. Water pump inlet hose
 3. Oil cooler
 4. Oil cooler outlet hose
 5. Oil cooler inlet hose
 6. Radiator inlet hose
 7. Water jacket joint
-
- A. Install the hose clamp with its end facing the front.
 - B. Face the white paint mark on the oil cooler outlet hose forward and insert until the hose stops.
 - C. Align the yellow paint mark on the water pump inlet hose with the rib on the thermostat assembly, and insert until the hose stops.
 - D. Install the hose clamp with its end facing the rear.
 - E. Install the hose clamp with its end the screw head facing the down.
 - F. Fit the clip at a position more than 1 mm (0.04 in) from the end of the hose, and do not ride on the spool.
 - G. Face the yellow paint mark on the hoses forward, insert them up to the step where the thick part of pipe.
 - H. Install the hose clamp with its end facing the right.
 - I. Align the white paint mark on the oil cooler inlet hose with the rib on the water jacket joint, and insert until the hose stops.
 - J. Hose clamp fixed position details.
 - K. 3 mm (0.12 in) or more
 - L. 0–1 mm (0–0.04 in)
 - M. Hose plug-in section
 - N. Make sure not to install the hose clamp on the raised portion of the hose fitting.
 - O. Hose clip fixed position details.
 - P. Make sure not to install the hose clip on the raised portion of the hose fitting.

PERIODIC CHECKS AND ADJUSTMENTS

PERIODIC MAINTENANCE	3-1
INTRODUCTION	3-1
PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM	3-1
GENERAL MAINTENANCE AND LUBRICATION CHART	3-1
CHECKING THE VEHICLE USING THE YAMAHA DIAGNOSTIC TOOL	3-4
CHECKING THE FUEL LINE	3-4
CHECKING THE SPARK PLUGS	3-5
ADJUSTING THE VALVE CLEARANCE	3-5
CHECKING THE ENGINE IDLING SPEED	3-8
SYNCHRONIZING THE THROTTLE BODIES	3-8
CHECKING THE THROTTLE BODY JOINTS	3-10
CHECKING THE CYLINDER HEAD BREATHER HOSE	3-10
CHECKING THE EXHAUST SYSTEM	3-11
CHECKING THE CANISTER	3-11
CHECKING THE PURGE CUT VALVE SOLENOID	3-11
ADJUSTING THE EXHAUST GAS VOLUME	3-11
REPLACING THE AIR FILTER ELEMENT	3-12
ADJUSTING THE CLUTCH LEVER FREE PLAY	3-12
CHECKING THE BRAKE OPERATION	3-13
CHECKING THE BRAKE FLUID LEVEL	3-13
ADJUSTING THE FRONT DISC BRAKE	3-14
CHECKING THE FRONT BRAKE PADS	3-14
ADJUSTING THE REAR DISC BRAKE	3-14
CHECKING THE REAR BRAKE PADS	3-15
CHECKING THE FRONT BRAKE HOSE	3-15
CHECKING THE REAR BRAKE HOSE	3-15
BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)	3-15
CHECKING THE WHEELS	3-16
CHECKING THE TIRES	3-17
CHECKING THE WHEEL BEARINGS	3-18
CHECKING THE SWINGARM OPERATION	3-18
LUBRICATING THE SWINGARM PIVOT	3-18
DRIVE CHAIN SLACK	3-18
LUBRICATING THE DRIVE CHAIN	3-19
CHECKING AND ADJUSTING THE STEERING HEAD	3-19
LUBRICATING THE STEERING HEAD	3-20
CHECKING THE CHASSIS FASTENERS	3-20
LUBRICATING THE BRAKE LEVER	3-20
LUBRICATING THE CLUTCH LEVER	3-21
LUBRICATING THE PEDAL	3-21
ADJUSTING THE SHIFT PEDAL	3-21
CHECKING THE SIDESTAND	3-21
LUBRICATING THE SIDESTAND	3-21
CHECKING THE SIDESTAND SWITCH	3-21
CHECKING THE FRONT FORK	3-21
ADJUSTING THE FRONT FORK LEGS	3-21
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY	3-23
ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY	3-23

CHECKING THE CONNECTING ARM AND RELAY ARM.....	3-24
CHECKING THE ENGINE OIL LEVEL.....	3-24
CHANGING THE ENGINE OIL	3-25
MEASURING THE ENGINE OIL PRESSURE	3-26
CHECKING THE COOLANT LEVEL.....	3-27
CHECKING THE COOLING SYSTEM	3-28
CHANGING THE COOLANT.....	3-28
CHECKING THE FRONT BRAKE LIGHT SWITCH.....	3-30
ADJUSTING THE REAR BRAKE LIGHT SWITCH	3-30
CHECKING AND LUBRICATING THE CABLES	3-30
CHECKING THE THROTTLE GRIP.....	3-31
CHECKING AND CHARGING THE BATTERY	3-31
CHECKING THE FUSES	3-31
ADJUSTING THE HEADLIGHT BEAM	3-31

PERIODIC MAINTENANCE

EAS20022

PERIODIC MAINTENANCE

EAS30022

INTRODUCTION

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

TIP

- Items marked with an asterisk should be performed by your Yamaha dealer because these items require special tools, data, and technical skills.
- From 50000 km (30000 mi), repeat the maintenance intervals starting from 10000 km (6000 mi).
- **The annual checks must be performed every year, except if a distance-based maintenance is performed instead.**

EAS30614

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

No.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
1	* Fuel line	<ul style="list-style-type: none"> • Check fuel hoses for cracks or damage. • Replace if necessary. 		√	√	√	√	√
2	* Spark plugs	<ul style="list-style-type: none"> • Check condition. • Adjust gap and clean. 		√		√		
		<ul style="list-style-type: none"> • Replace. 			√		√	
3	* Valve clearance	<ul style="list-style-type: none"> • Check and adjust. 	Every 40000 km (24000 mi)					
4	* Fuel injection	<ul style="list-style-type: none"> • Check engine idle speed. 	√	√	√	√	√	√
		<ul style="list-style-type: none"> • Check and adjust synchronization. 		√	√	√	√	√
5	* Exhaust system	<ul style="list-style-type: none"> • Check for leakage. • Tighten if necessary. • Replace gaskets if necessary. 	√	√	√	√	√	
6	* Evaporative emission control system	<ul style="list-style-type: none"> • Check control system for damage. • Replace if necessary. 			√		√	

EAS30615

GENERAL MAINTENANCE AND LUBRICATION CHART

No.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
1	* Diagnostic system check	<ul style="list-style-type: none"> • Perform dynamic inspection using YDT. • Check the error codes. 	√	√	√	√	√	√
2	* Air filter element	<ul style="list-style-type: none"> • Replace. 	Every 40000 km (24000 mi)					
3	Clutch	<ul style="list-style-type: none"> • Check operation. • Adjust. 	√	√	√	√	√	
4	* Front brake	<ul style="list-style-type: none"> • Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary. 	√	√	√	√	√	√
5	* Rear brake	<ul style="list-style-type: none"> • Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary. 	√	√	√	√	√	√

PERIODIC MAINTENANCE

No.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
6 *	Brake hoses	• Check for cracks or damage.		√	√	√	√	√
		• Replace.	Every 4 years					
7 *	Brake fluid	• Change.	Every 2 years					
8 *	Wheels	• Check runout and for damage. • Replace if necessary.		√	√	√	√	
9 *	Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
10 *	Wheel bearings	• Check bearing for looseness or damage.		√	√	√	√	
11 *	Swingarm pivot bearings	• Check operation and for excessive play.		√	√	√	√	
		• Lubricate with lithium-soap-based grease.	Every 50000 km (30000 mi)					
12	Drive chain	• Check chain slack, alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 1000 km (600 mi) and after washing the motorcycle, riding in the rain or riding in wet areas					
13 *	Steering bearings	• Check bearing assemblies for looseness.	√	√		√		
		• Moderately repack with lithium-soap-based grease.			√		√	
14 *	Chassis fasteners	• Make sure that all nuts, bolts and screws are properly tightened.		√	√	√	√	√
15 *	Brake lever pivot shaft	• Lubricate with silicone grease.		√	√	√	√	√
16	Brake pedal pivot shaft	• Lubricate with lithium-soap-based grease.		√	√	√	√	√
17	Clutch lever pivot shaft	• Lubricate with lithium-soap-based grease.		√	√	√	√	√
18	Shift pedal pivot shaft	• Lubricate with lithium-soap-based grease.		√	√	√	√	√
19	Sidestand	• Check operation. • Lubricate with molybdenum disulfide grease.		√	√	√	√	√
20 *	Sidestand switch	• Check operation and replace if necessary.	√	√	√	√	√	√
21 *	Front fork	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	
22 *	Shock absorber assembly	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	
23 *	Rear suspension relay arm and connecting arm pivoting points	• Check operation.		√	√	√	√	
24 *	Engine oil	• Change (warm engine before draining). • Check oil level and vehicle for oil leakage.	√	√	√	√	√	√
25 *	Engine oil filter cartridge	• Replace.	√		√		√	
26 *	Cooling system	• Check coolant level and vehicle for coolant leakage.		√	√	√	√	√
		• Change.	Every 3 years					
27 *	Front and rear brake switches	• Check operation.	√	√	√	√	√	√

PERIODIC MAINTENANCE

No.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
28	* Moving parts and cables	• Lubricate.		√	√	√	√	√
29	* Throttle grip	• Check operation. • Lubricate the throttle grip housing tube guides.		√	√	√	√	√
30	* Lights, signals and switches	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

TIP

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

EAS32024

CHECKING THE VEHICLE USING THE YAMAHA DIAGNOSTIC TOOL

Use the YDT and check the vehicle according to the following procedure.

1. Remove:
 - Rider 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 9-3.



Yamaha diagnostic tool USB
90890-03267
Yamaha diagnostic tool (A/I)
90890-03264

TIP

- Yamaha diagnostic tool (A/I) (90890-03264) 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

TIP

Use the “Diagnosis of malfunction” function of the YDT to check the DTC. 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 9-43.

4. Perform:

- Dynamic inspection

TIP

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

5. Install:

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

EAS30619

CHECKING THE FUEL LINE

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

1. Remove:
 - Rider seat
Refer to “GENERAL CHASSIS (1)” on page 4-1.
 - Side cover
Refer to “GENERAL CHASSIS (1)” on page 4-1.
 - Fuel tank cover
Refer to “GENERAL CHASSIS (4)” on page 4-10.
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
2. Check:
 - Fuel hose “1”
 - Fuel tank breather hose “2”
 - Fuel tank drain hose “3”
Cracks/damage → Replace.
Loose connection → Connect properly.

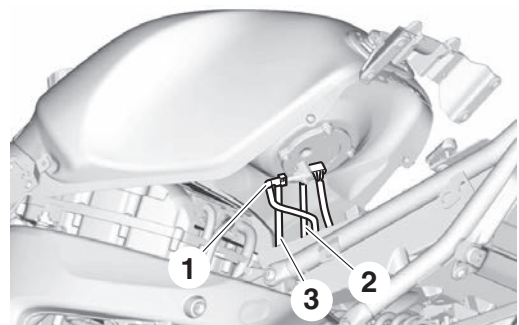
ECA14940

NOTICE

Make sure the fuel tank breather hose is routed correctly.

TIP

Before removing the fuel hoses, place a few rags in the area under where it will be removed.



3. Install:

- Fuel tank
Refer to “FUEL TANK” on page 7-1.
- Fuel tank cover
Refer to “GENERAL CHASSIS (4)” on page 4-10.
- Side cover
- Rider seat
Refer to “GENERAL CHASSIS (1)” on page 4-1.

PERIODIC MAINTENANCE

EAS30620

CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

1. Remove:
 - Rider seat
 - Side cover
Refer to "GENERAL CHASSIS (1)" on page 4-1.
 - Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Air filter case
Refer to "GENERAL CHASSIS (5)" on page 4-11.
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.



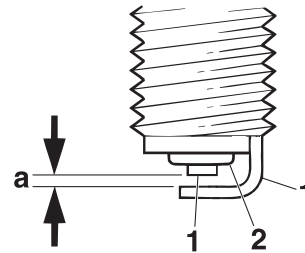
Manufacturer/model
NGK/LMAR9A-9

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.

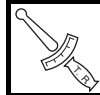


Spark plug gap
0.8–0.9 mm (0.031–0.035 in)



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:
 - Air filter case
Refer to "GENERAL CHASSIS (5)" on page 4-11.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Side cover
 - Rider seat
Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30622

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

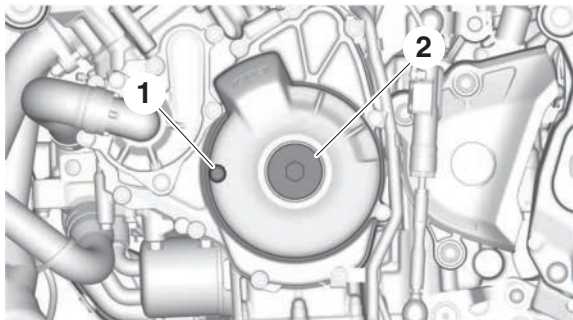
TIP

Valve clearance adjustment should be made on a cold engine, at room temperature.

PERIODIC MAINTENANCE

1. Remove:
 - Rider seat
 - Side cover
Refer to "GENERAL CHASSIS (1)" on page 4-1.
 - Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Air filter case
Refer to "GENERAL CHASSIS (5)" on page 4-11.
 - Radiator cover
 - Front side panel
Refer to "GENERAL CHASSIS (3)" on page 4-8.
 - Radiator
Refer to "RADIATOR" on page 6-3.

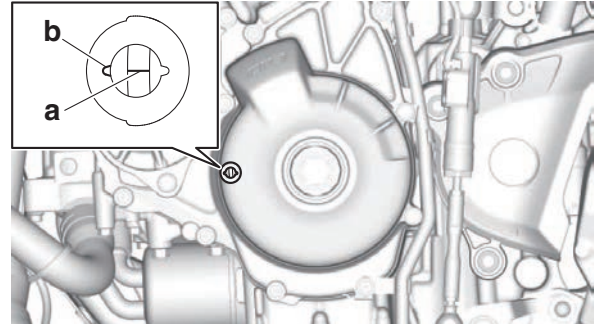
2. Remove:
 - Ignition coil
 - Spark plug
 - Cylinder head cover
 - Cylinder head cover gasket
Refer to "CAMSHAFTS" on page 5-16.
3. Remove:
 - Timing mark accessing bolt "1"
 - Crankshaft end cover "2"



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

	Valve clearance (cold)
	Intake
	0.11–0.20 mm (0.0043–0.0079 in)
	Exhaust
	0.28–0.32 mm (0.0110–0.0126 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 generator rotor cover mark "b".



TIP

TDC on the compression stroke can be found when the camshaft lobes are turned away from each other.

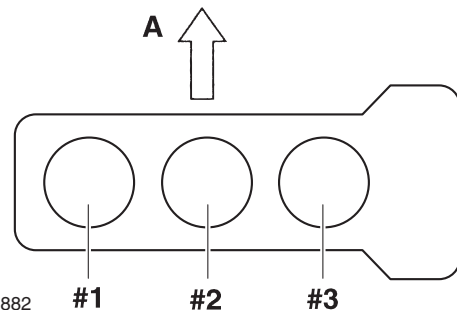
- c. Measure the valve clearance with a thickness gauge.

	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.

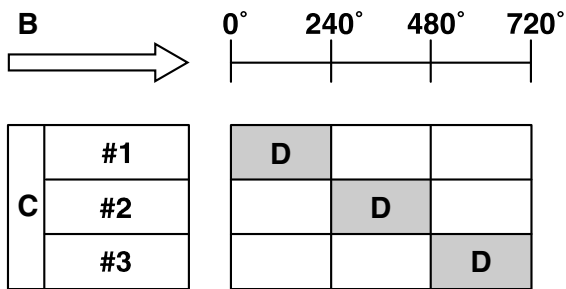
Valve clearance measuring sequence
Cylinder #1 → #2 → #3



A. Front

- d. To measure the valve clearances of the other cylinders, starting with cylinder #1 at TDC, turn the crankshaft counterclockwise as specified in the following table.

PERIODIC MAINTENANCE



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

Cylinder #2	240°
Cylinder #3	480°

5. Remove:

- Camshaft

TIP

- Refer to “CAMSHAFTS” on page 5-16.
- When removing the timing chain and camshafts, fasten the timing chain with a wire to retrieve it if it falls into the crankcase.

6. 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 (0.004–0.008 in)

Measured valve clearance = 0.25 mm (0.010 in)

0.25 mm (0.010 in) - 0.20 mm (0.008 in) = 0.05 mm (0.002 in)

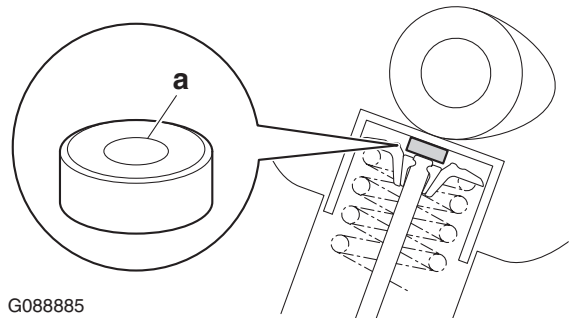
- c. Check the thickness of the current valve pad.

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 (0.062 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 (0.062 in) + 0.05 mm (0.002 in) = 1.63 mm (0.064 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.

PERIODIC MAINTENANCE

Valve pad range	Nos. 150–240
Valve pad thickness	1.50–2.40 mm (0.0590–0.0944 in)
Available valve pads	25 thicknesses in 0.05 mm (0.002 in) in- crements

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 (Top side) with molybdenum disulfide oil.
- Lubricate the valve lifter (Outer side) 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.



Camshaft cap bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

- Refer to “CAMSHAFTS” on page 5-16.
- Lubricate the camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshafts marks with the camshaft cap marks.
- 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.

7. 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
1200–1400 r/min

3. Check:
 - ISC (idle speed control) learning value “00” or “01” → Check the intake system.
 - “02” → Clean the throttle bodies. Refer to “CHECKING AND CLEANING THE THROTTLE BODIES” on page 7-9.
 - a. Connect the YDT. Use the diagnostic code number “67”. Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-77.
 - b. Check the ISC (idle speed control) leaning value.

EAS30797

SYNCHRONIZING THE THROTTLE BODIES

TIP

Before synchronizing the throttle bodies, check the following items:

- Valve clearance
- Spark plug
- Air filter element
- Throttle body joint
- Fuel hose
- Exhaust system
- Breather hose

Checking the throttle body synchronization

1. Stand the vehicle on a level surface.

TIP

Place the vehicle on a maintenance stand.

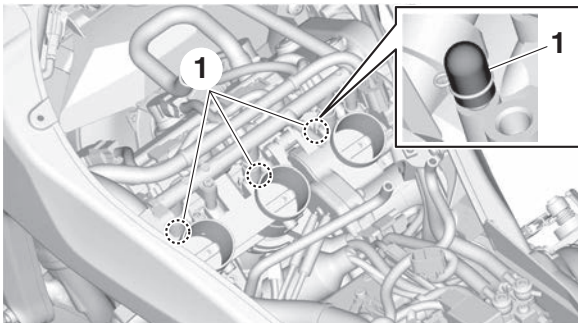
PERIODIC MAINTENANCE

2. Remove:

- Rider seat
- Side cover
Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
- Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Air filter case
Refer to "GENERAL CHASSIS (5)" on page 4-11.

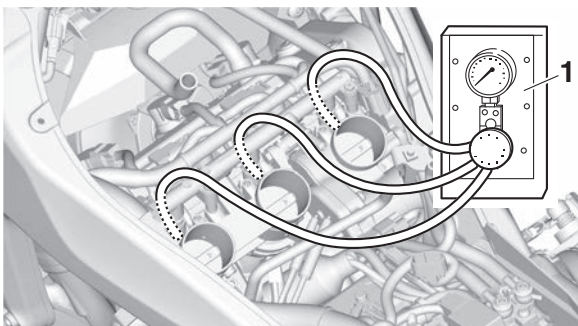
3. Remove:

- Service hose cap "1"



4. Install:

- Vacuum gauge "1"



5. Install:

- Air filter case
Refer to "GENERAL CHASSIS (5)" on page 4-11.
- Fuel tank
Refer to "FUEL TANK" on page 7-1.

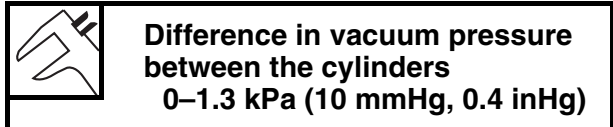
6. Check:

- Throttle body synchronization

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



- Check the vacuum pressure.

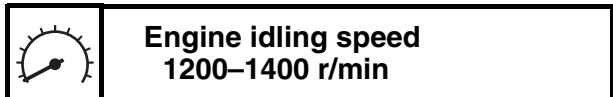


If out of specification → Adjust the throttle body synchronization.

Adjusting the throttle body synchronization

1. Adjust:

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



- 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

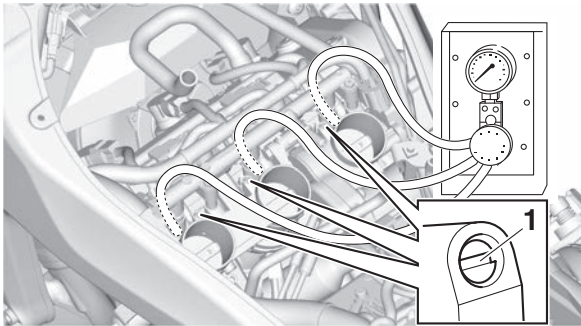
Do not turn the bypass air screw (white paint mark) of the throttle body that is the standard. Otherwise, the engine may run roughly at idle and the throttle bodies may not operate properly.

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 1.3 kPa (10 mmHg).



Carburetor angle driver 2 90890-03173



2. Stop the engine and remove the measuring equipment.
3. Install:
 - Service hose cap
4. Install:
 - Air filter case
Refer to "GENERAL CHASSIS (5)" on page 4-11.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Side cover
 - Rider seat
Refer to "GENERAL CHASSIS (1)" on page 4-1.

EAS30798

CHECKING THE THROTTLE BODY JOINTS

1. Remove:
 - Throttle body
Refer to "THROTTLE BODIES" on page 7-6.
2. Check:
 - Throttle body joint
Cracks/damage → Replace.
3. Install:
 - Throttle body
Refer to "THROTTLE BODIES" on page 7-6.

EAS30623

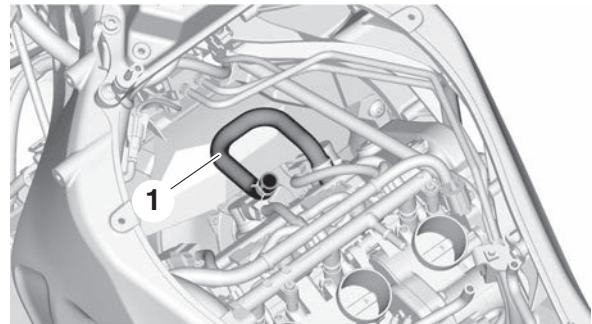
CHECKING THE CYLINDER HEAD BREATHER HOSE

1. Remove:
 - Rider seat
Refer to "GENERAL CHASSIS (1)" on page 4-1.
 - Side cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Air filter case
Refer to "GENERAL CHASSIS (5)" on page 4-11.
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:
 - Air filter case
Refer to "GENERAL CHASSIS (5)" on page 4-11.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Side cover
 - Rider seat
Refer to "GENERAL CHASSIS (1)" on page 4-1.

PERIODIC MAINTENANCE

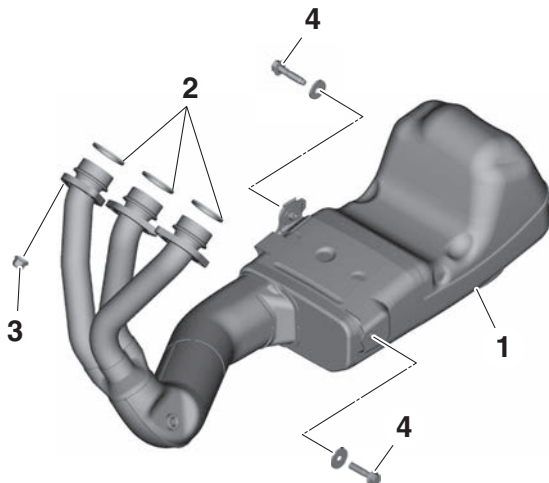
EAS30625

CHECKING THE EXHAUST SYSTEM

1. Check:
 - Muffler assembly “1”
Cracks/damage → Replace.
 - Gasket “2”
Exhaust gas leaks → Replace.
2. Check:
Tightening torque
 - Exhaust pipe nut “3”
 - Muffler bolt “4”



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



EAS31922

CHECKING THE CANISTER

1. Remove:
 - Rider seat
Refer to “GENERAL CHASSIS (1)” on page 4-1.
 - Side cover
Refer to “GENERAL CHASSIS (4)” on page 4-10.
 - Fuel tank cover
Refer to “GENERAL CHASSIS (4)” on page 4-10.
 - 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.
Loose connection → Connect properly.
Refer to “FUEL TANK” on page 7-1.
3. Install:
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
 - Fuel tank cover
Refer to “GENERAL CHASSIS (4)” on page 4-10.
 - Side cover
 - Rider seat
Refer to “GENERAL CHASSIS (1)” on page 4-1.

EAS33546

CHECKING THE PURGE CUT VALVE SOLENOID

Refer to “CHECKING THE PURGE CUT VALVE SOLENOID” on page 7-5.

EAS30799

ADJUSTING THE EXHAUST GAS VOLUME

TIP

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

1. Remove the protective cap, and then connect the YDT to coupler.
Refer to “YDT” on page 9-3.



Yamaha diagnostic tool USB
90890-03267
Yamaha diagnostic tool (A/I)
90890-03264

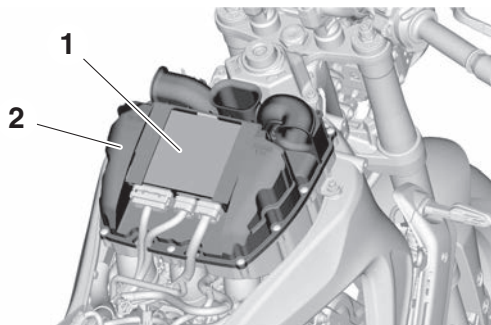
TIP

- Yamaha diagnostic tool (A/I) (90890-03264) 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.

EAS30628

REPLACING THE AIR FILTER ELEMENT

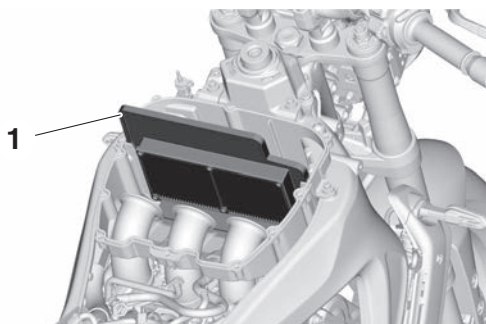
- Remove:
 - Rider seat
 - Side cover
Refer to "GENERAL CHASSIS (1)" on page 4-1.
 - Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Remove:
 - ECU (Engine Control Unit) "1"
 - Air filter case cover "2"
Refer to "GENERAL CHASSIS (5)" on page 4-11.



- Check:
 - Air filter element "1"
 - Air filter seal
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.



- Install:
 - Air filter element
 - Air filter case cover
 - ECU (Engine Control Unit)
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

ECA20710

NOTICE

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

TIP

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

- Install:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Fuel tank cover
Refer to "GENERAL CHASSIS (4)" on page 4-10.
 - Side cover
 - Rider seat
Refer to "GENERAL CHASSIS (1)" on page 4-1.

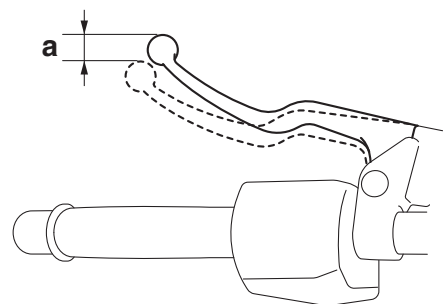
EAS30629

ADJUSTING THE CLUTCH LEVER FREE PLAY

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



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



G088887

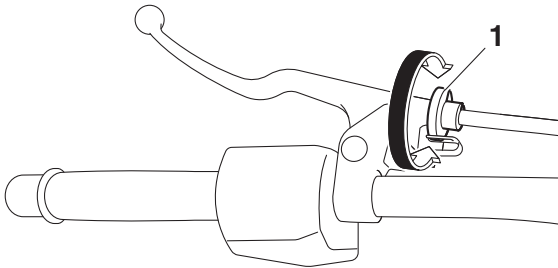
PERIODIC MAINTENANCE

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

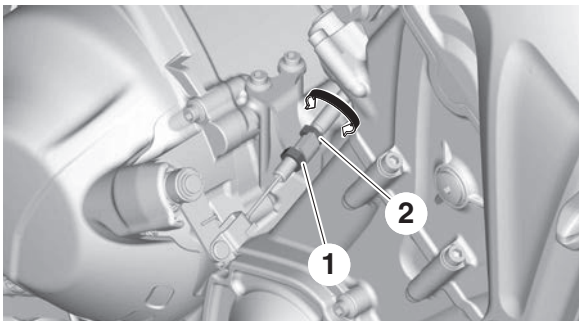
If the specified clutch lever free play cannot be obtained on the handlebar side of the cable, use the adjusting nut on the engine side.

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 4-27 and "REAR BRAKE" on page 4-40.

TIP

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

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.



Front brake
Specified brake fluid
DOT 4
Rear brake
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

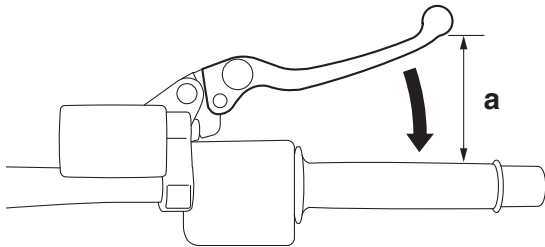
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

PERIODIC MAINTENANCE

EAS30630

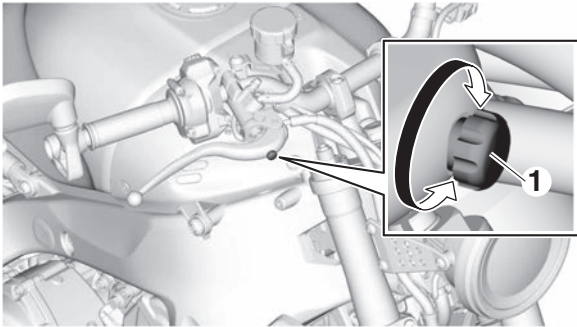
ADJUSTING THE FRONT DISC BRAKE

1. Adjust:
 - Front brake lever position
(distance “a” from the throttle grip to the brake lever)



G088889

- a. Push the brake lever forward.
- b. Turn the adjusting knob “1” until the brake lever is in the desired position.



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

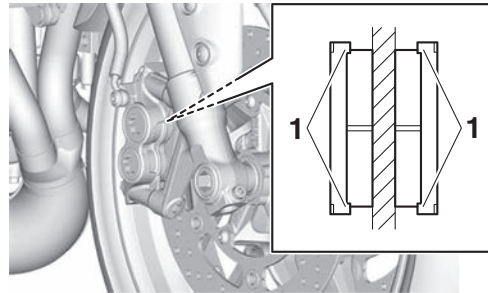
After adjusting the brake lever position, make sure there is no brake drag.

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 “1” almost touch the brake disc → Replace the brake pads as a set.
Refer to “FRONT BRAKE” on page 4-27.



EAS30631

ADJUSTING THE REAR DISC BRAKE

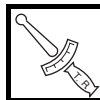
1. Adjust:
 - Brake pedal position
 - a. Loosen the locknut “1”.
 - b. Turn the adjusting bolt “2” until the specified brake pedal position is obtained.

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 master cylinder locknut
18 N·m (1.8 kgf·m, 13 lb·ft)

EWA17030

⚠ WARNING

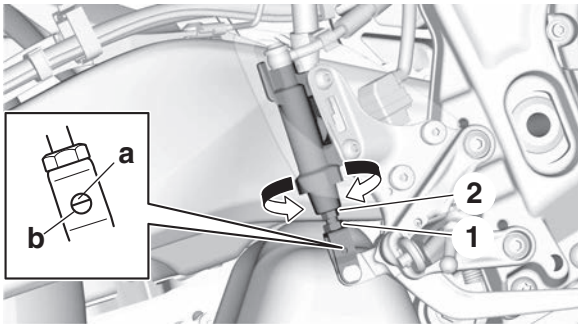
A soft or spongy feeling in the brake pedal can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance.

ECA13510

NOTICE

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

PERIODIC MAINTENANCE



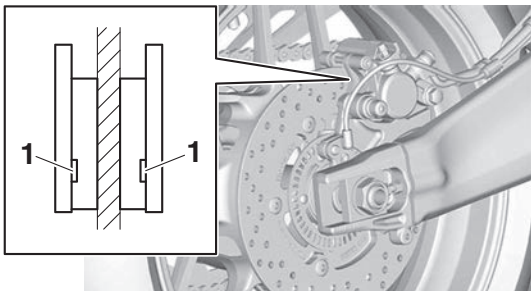
2. Adjust:
 - Rear brake light switch
Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH” on page 3-30.

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 indicator grooves “1” almost disappeared → Replace the brake pads as a set.
Refer to “REAR BRAKE” on page 4-40.



EAS30635

CHECKING THE FRONT BRAKE HOSE

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 bolt.
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 4-27.

EAS30636

CHECKING THE REAR BRAKE HOSE

1. Check:
 - Brake hose
Cracks/damage/wear → Replace.
2. Check:
 - Brake hose holder
Loose Connection → Tighten the holder bolt.
3. Hold the vehicle upright and apply the rear brake several times.
4. Check:
 - Brake hose
Brake fluid leakage → Replace the damaged hose.
Refer to “REAR BRAKE” on page 4-40.

EAS30893

BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)

EWA14000



WARNING

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

ECA22640

NOTICE

- Bleed the brake system in the following order.
- 1st step: Front brake master cylinder
- 2nd step: Front brake calipers
- 3rd 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

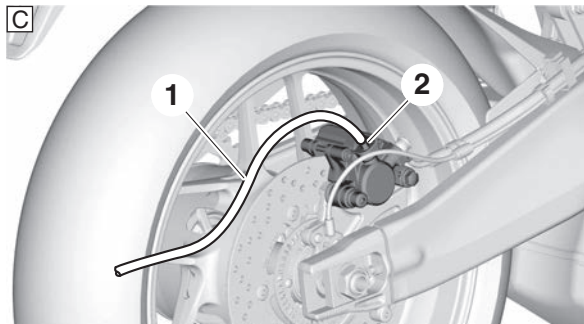
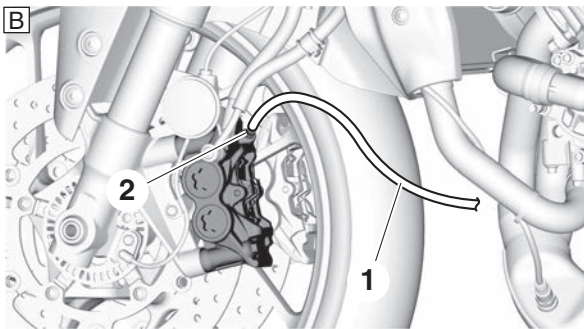
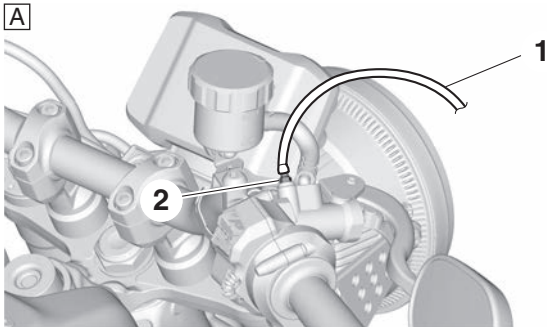
- Be careful not to spill any brake fluid or allow the brake fluid reservoir to overflow.
- When bleeding the ABS, make sure that there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the ABS, considerably lengthening the bleeding procedure.
- 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.

PERIODIC MAINTENANCE

1. Bleed:

• ABS

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



- A. Front brake master cylinder
B. Front brake caliper (left/right)
C. Rear brake caliper

- Place the other end of the hose into a container.
- Slowly apply the brake several times.
- Fully squeeze the brake lever or fully depress the brake pedal and hold it in position.
- Loosen the bleed screw.

TIP

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

- Tighten the bleed screw and then release the brake lever or brake pedal.
- Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.
- Check the operation of the hydraulic unit. Refer to "HYDRAULIC UNIT OPERATION TESTS" on page 4-56.

ECA17061

NOTICE

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

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



Front brake master cylinder bleed screw

5 N·m (0.5 kgf·m, 3.7 lb·ft)

Brake caliper bleed screw

5 N·m (0.5 kgf·m, 3.7 lb·ft)

- Fill the brake fluid reservoir to the proper level with the specified brake fluid. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-13.

EWA13110

WARNING

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

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.

PERIODIC MAINTENANCE

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)

1 person
 Front
 250 kPa (2.50 kgf/cm², 36 psi)
 Rear
 290 kPa (2.90 kgf/cm², 42 psi)

2 persons
 Front
 250 kPa (2.50 kgf/cm², 36 psi)
 Rear
 290 kPa (2.90 kgf/cm², 42 psi)

Maximum load
 221 kg (487 lb)

* Maximum load: Total weight of rider, passenger, cargo and accessories

2. Check:
 - Tire surfaces
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)
 1.6 mm (0.06 in)
 Wear limit (rear)
 1.6 mm (0.06 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
 120/70ZR17M/C (58W)
 Manufacturer/model
 BRIDGESTONE/BATTLAX HY-PERSPORT S22F



Rear tire
 Size
 180/55ZR17M/C (73W)
 Manufacturer/model
 BRIDGESTONE/BATTLAX HY-PERSPORT S22R

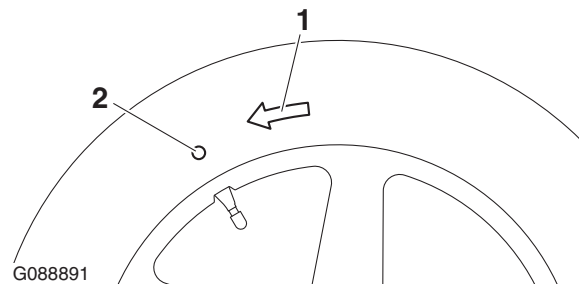
EWA13210

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.



PERIODIC MAINTENANCE

EAS30641

CHECKING THE WHEEL BEARINGS

The following procedure applies to all of the wheel bearing.

1. Check:
 - Wheel bearing
Refer to "CHECKING THE FRONT WHEEL" on page 4-14 and "CHECKING THE REAR WHEEL" on page 4-22.

EAS30802

CHECKING THE SWINGARM OPERATION

1. Check:
 - Swingarm operation
Swingarm not working properly → Check the swingarm.
Refer to "SWINGARM" on page 4-84.
2. Check:
 - Swingarm excessive play
Refer to "SWINGARM" on page 4-84.

EAS30643

LUBRICATING THE SWINGARM PIVOT

1. Lubricate:
 - Dust cover
 - Pivot shaft
 - Bearing
 - Oil seal
 - Collar



Recommended lubricant
Lithium-soap-based grease

Refer to "INSTALLING THE SWINGARM" on page 4-87.

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
Out of specification → Adjust.

TIP

- Measure the distance "a" between the rib end on the drive chain guide "1" and the center point of the drive chain "2".
- The center point "b" of the drive chain is approx. 53 mm (2.09 in) "c" forward from the edge "d" of the drive chain guide.



Drive chain slack (Maintenance Stand)

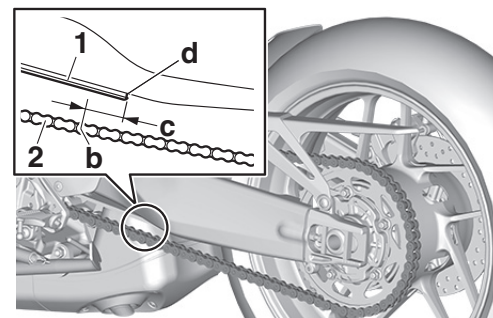
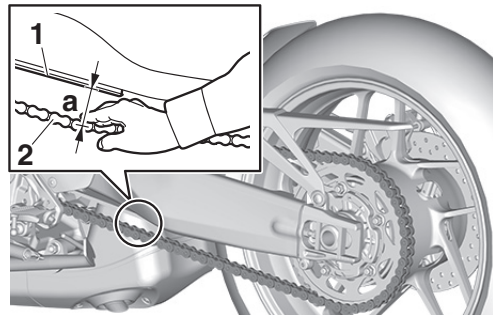
45.0–50.0 mm (1.77–1.97 in)

Drive chain slack (Sidestand)

45.0–50.0 mm (1.77–1.97 in)

Drive chain slack limit

55.0 mm (2.17 in)



ECA20870

NOTICE

Improper drive chain slack will overload the engine as well as other vital parts of the motorcycle and can lead to chain slippage or breakage. If the drive chain slack is more than the specified limit, the chain can damage the frame, swingarm, and other parts. To prevent this from occurring, keep the drive chain slack within the specified limits.

PERIODIC MAINTENANCE

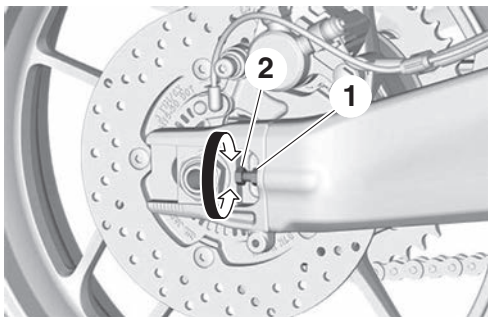
Adjusting the drive chain slack

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 4-19.
2. Adjust:
 - Drive chain slack
 - a. Loosen both locknuts “1”.
 - b. Turn both adjusting bolts “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 adjusting block and adjusting bolt.
- 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 locknuts to specification.



Chain puller adjusting bolt lock-nut
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

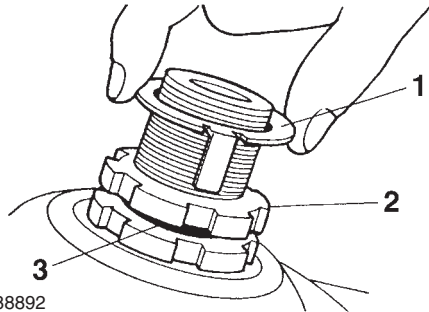
Place the vehicle on a maintenance stand so that the front wheel is elevated.

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

PERIODIC MAINTENANCE

4. Adjust:

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

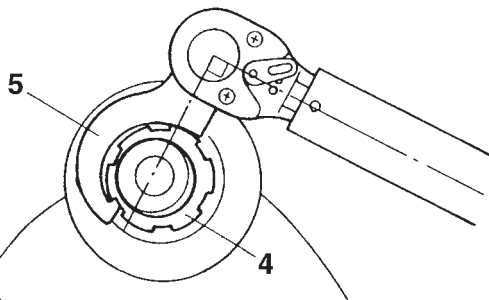


G088892

- 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

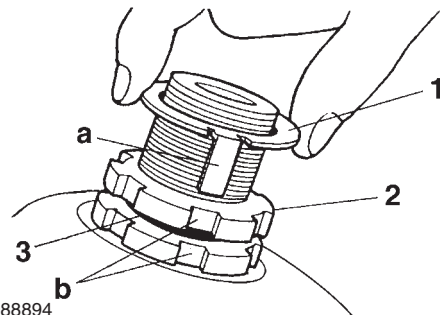
Do not overtighten the lower ring nut.

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

- d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings. Refer to "STEERING HEAD" on page 4-77.
- 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 "STEERING HEAD" on page 4-77.

EAS30646

LUBRICATING THE STEERING HEAD

1. Lubricate:
 - Upper bearing
 - Lower bearing
 - Bearing race

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

EAS31186

CHECKING THE CHASSIS FASTENERS

Make sure that all nuts, bolts, and screws are properly tightened. Refer to "CHASSIS TIGHTENING TORQUES" on page 2-11.

EAS30804

LUBRICATING THE BRAKE LEVER

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

	Recommended lubricant Silicone grease
---	--

PERIODIC MAINTENANCE

EAS30805

LUBRICATING THE CLUTCH LEVER

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



Recommended lubricant
Lithium-soap-based grease

EAS30649

LUBRICATING THE PEDAL

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



Recommended lubricant
Lithium-soap-based grease

EAS30851

ADJUSTING THE SHIFT PEDAL

Refer to "ADJUSTING THE SHIFT PEDAL" on page 4-93.

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 "ELECTRICAL COMPONENTS" on page 8-37.

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 4-66.

EAS30806

ADJUSTING THE FRONT FORK LEGS

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

EWA13120



WARNING

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

Spring preload

EWA17040



WARNING

Always adjust both front fork legs evenly. Uneven adjustment can result in poor handling and loss of stability.

ECA13590



NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:

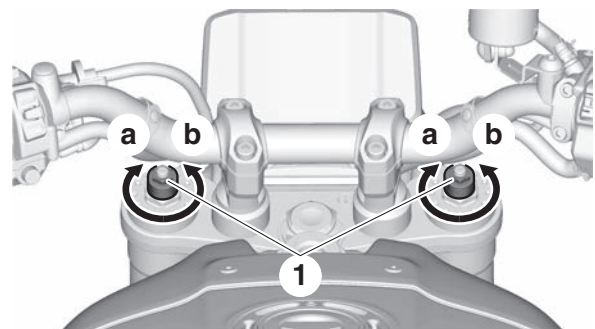
- Spring preload
a. Turn the adjusting bolt "1" in direction "a" or "b".

Direction "a"

Spring preload is increased (suspension is harder).

Direction "b"

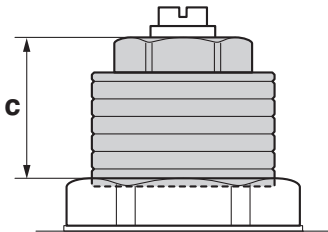
Spring preload is decreased (suspension is softer).



PERIODIC MAINTENANCE

TIP

The spring preload setting is determined by measuring the distance “c” shown in the illustration. The shorter distance “c” is, the higher the spring preload; the longer distance “c” is, the lower the spring preload.



Spring preload

Adjustment value (Soft)

19.0 mm (0.75 in)

Adjustment value (STD)

14.0 mm (0.55 in)

Adjustment value (Hard)

4.0 mm (0.16 in)

Rebound damping (right side only)

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)

11

Adjustment value from the start position (STD)

6

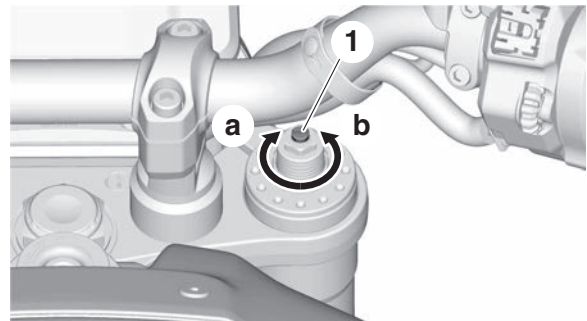
Adjustment value from the start position (Hard)

1

* Start position: With the adjusting screw fully turned in direction “a”

TIP

- Although the total number of clicks of a damping force adjusting mechanism may not exactly match the above specifications due to small differences in production, the actual number of clicks always represents the entire adjusting range. To obtain a precise adjustment, it would be advisable to check the number of clicks of each damping force adjusting mechanism and to modify the specifications as necessary.
- When turning the damping force adjusting bolt in direction “a”, the 0 click position and the 1 click position may be the same.



Compression damping (left side only)

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:

- Compression damping

PERIODIC MAINTENANCE

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

Direction "a"

Compression damping is increased (suspension is harder).

Direction "b"

Compression damping is decreased (suspension is softer).



Compression damping

Adjustment value from the start position (Soft)

11

Adjustment value from the start position (STD)

6

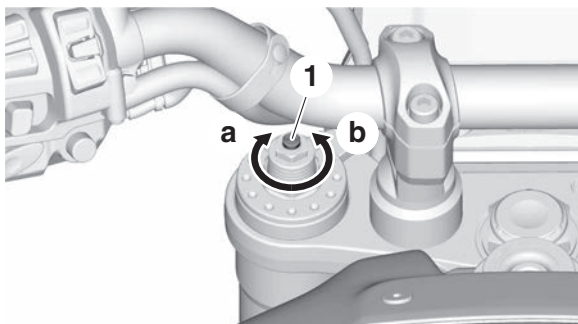
Adjustment value from the start position (Hard)

1

* Start position: With the adjusting screw fully turned in direction "a"

TIP

- Although the total number of clicks of a damping force adjusting mechanism may not exactly match the above specifications due to small differences in production, the actual number of clicks always represents the entire adjusting range. To obtain a precise adjustment, it would be advisable to check the number of clicks of each damping force adjusting mechanism and to modify the specifications as necessary.
- When turning the damping force adjusting bolt in direction "a", the 0 click position and the 1 click position may be the same.



EAS30808

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

Refer to "CHECKING THE REAR SHOCK ABSORBER ASSEMBLY" on page 4-82.

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. Remove:
 - Side cover
Refer to "GENERAL CHASSIS (1)" on page 4-1.
2. 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).



Spring preload

Adjustment value (Soft)

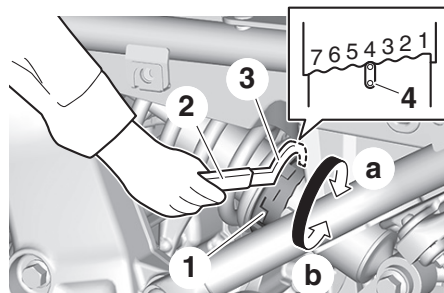
1

Adjustment value (STD)

5

Adjustment value (Hard)

7



PERIODIC MAINTENANCE

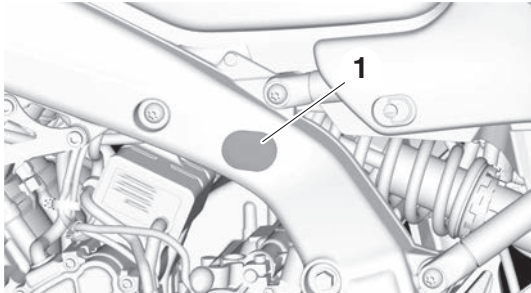
Rebound damping

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Remove:
 - Cover "1"



2. 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

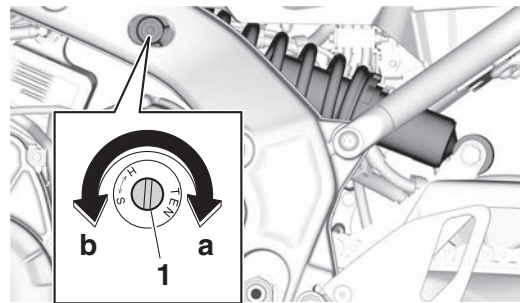
Adjustment value from the start position (Hard)

0

* Start position: With the adjusting screw fully turned in direction "a"

TIP

Although the total number of turns of a damping force adjusting mechanism may not exactly match the above specifications due to small differences in production, the actual number of turns always represents the entire adjusting range. To obtain a precise adjustment, it would be advisable to check the number of turns of each damping force adjusting mechanism and to modify the specifications as necessary.



EAS30809

CHECKING THE CONNECTING ARM AND RELAY ARM

Refer to "CHECKING THE CONNECTING ARM AND RELAY ARM" on page 4-82.

EAS30656

CHECKING THE ENGINE OIL LEVEL

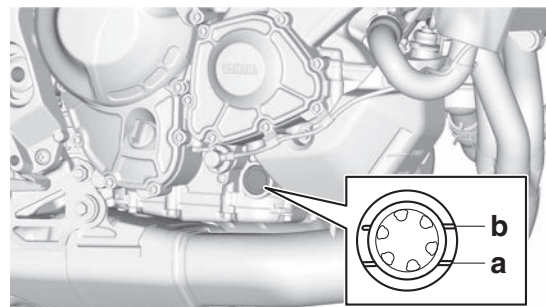
1. Stand the vehicle on a level surface.

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.



Recommended brand
YAMALUBE

SAE viscosity grades
10W-40

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

PERIODIC MAINTENANCE

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.

TIP

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

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

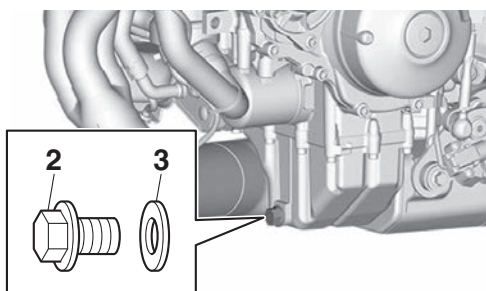
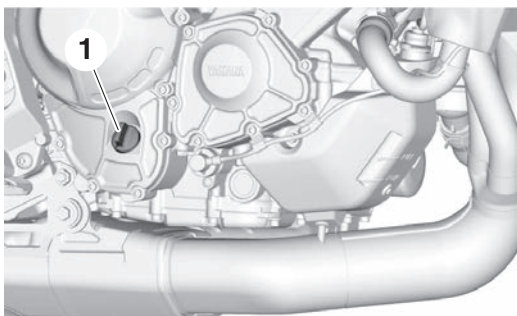
TIP

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

EAS30657

CHANGING THE ENGINE OIL

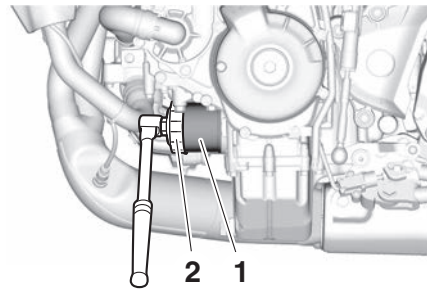
1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
 - Engine oil filler cap “1”
 - Engine oil drain bolt “2”
 - Gasket “3”



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



Oil filter wrench
90890-01426
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)

PERIODIC MAINTENANCE

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



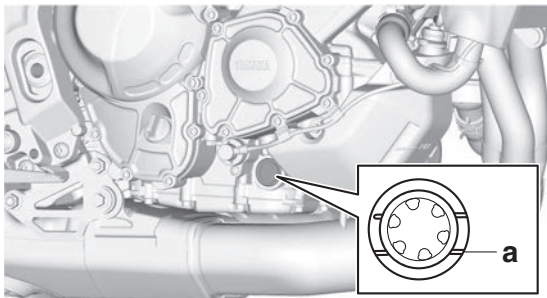
Engine oil quantity
Quantity (disassembled)
 3.50 L (3.70 US qt, 3.08 Imp.qt)
Oil change
 2.80 L (2.96 US qt, 2.46 Imp.qt)
With oil filter removal
 3.20 L (3.38 US qt, 2.82 Imp.qt)

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 3-24.

EAS30810

MEASURING THE ENGINE OIL PRESSURE

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



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

ECA13410

NOTICE

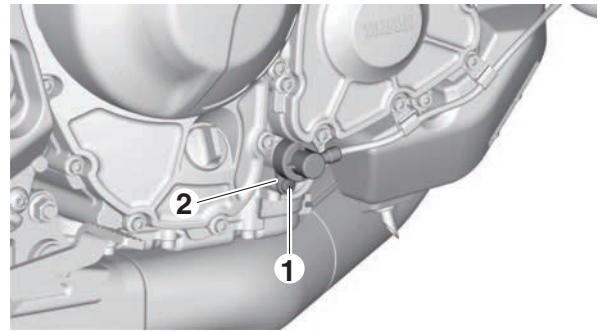
When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

3. Remove:
- Oil pressure switch joint bolt "1"
 - Oil pressure switch joint (with the oil pressure switch) "2"

EWA12980

WARNING

The engine, muffler and engine oil are extremely hot.



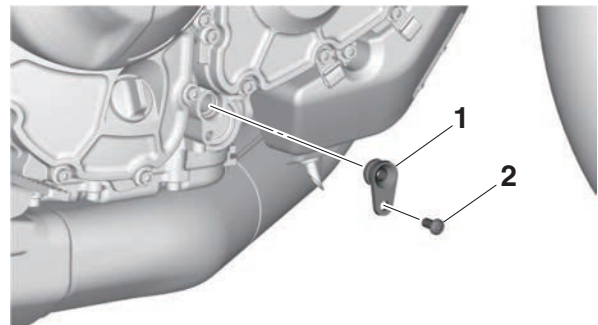
4. Install:
- Oil pressure gauge joint 18 mm "1"
 - Oil pressure switch joint bolt "2"



Oil pressure gauge joint 18 mm
 90890-04176
 YU-04176



Oil pressure switch joint bolt
 10 N·m (1.0 kgf·m, 7.4 lb·ft)

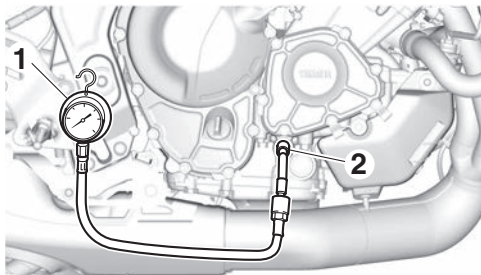


5. Install:
- Oil pressure gauge "1"
 - Adapter C "2"



Oil pressure gauge set
 90890-03120

PERIODIC MAINTENANCE



6. Start the engine, warm it up for several minutes.

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.

7. Measure:

- Engine oil pressure (at the following conditions)



Oil pressure
200.0 kPa/5000 r/min (2.00 kgf/cm²/5000 r/min, 29.0 psi/5000 r/min)

Out of specification → Check.

Engine oil pressure	Possible causes
Below specification	<ul style="list-style-type: none"> • Faulty oil pump • Clogged oil filter • Leaking oil passage • Broken or damaged oil seal
Above specification	<ul style="list-style-type: none"> • Faulty oil filter • Oil viscosity too high

8. Remove:

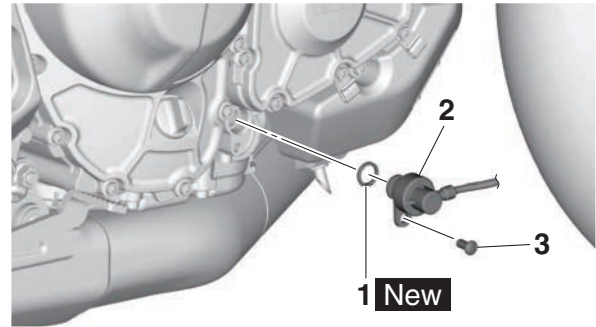
- Oil pressure gauge
- Adapter C
- Oil pressure switch joint bolt
- Oil pressure switch joint (with the O-ring)

9. Install:

- O-ring "1" **New**
- Oil pressure switch joint (with the oil pressure switch) "2"
- Oil pressure switch joint bolt "3"



Oil pressure switch joint bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)



EAS30811

CHECKING THE COOLANT LEVEL

1. Stand the vehicle on a level surface.

TIP

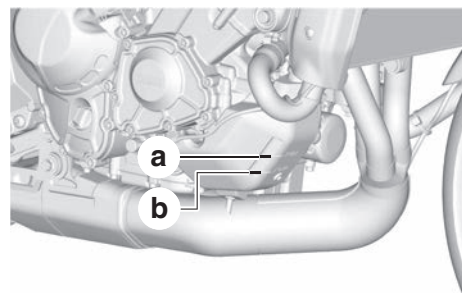
- Place the vehicle on a maintenance stand.
- Make sure the vehicle is upright.

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.



ECA21281

NOTICE

- **Adding water instead of coolant dilutes the antifreeze concentration 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.

PERIODIC MAINTENANCE

EAS30812

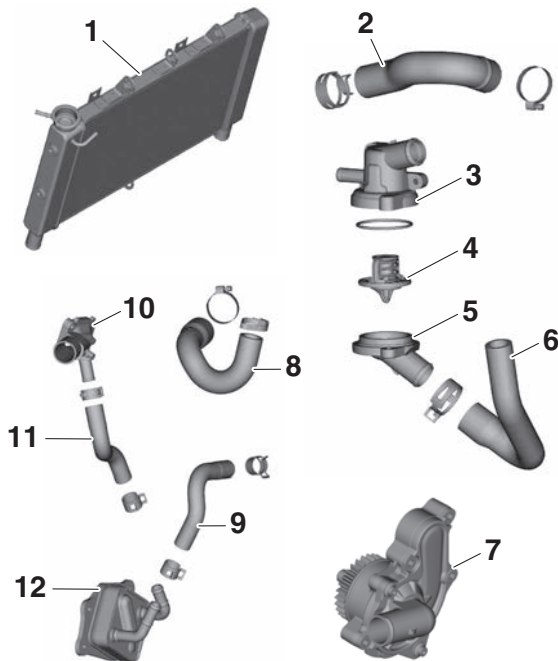
CHECKING THE COOLING SYSTEM

1. Check:

- Radiator "1"
- Water pump inlet hose "2"
- Thermostat housing "3"
- Thermostat "4"
- Thermostat cover "5"
- Radiator outlet hose "6"
- Water pump "7"
- Radiator inlet hose "8"
- Oil cooler outlet hose "9"
- Water jacket joint "10"
- Oil cooler inlet hose "11"
- Oil cooler "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:

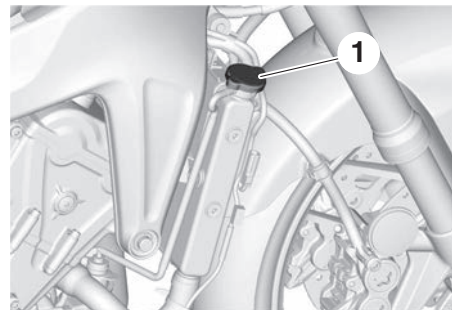
- Front side panel (right side)
Refer to "GENERAL CHASSIS (3)" on page 4-8.
- Radiator cap "1"

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:

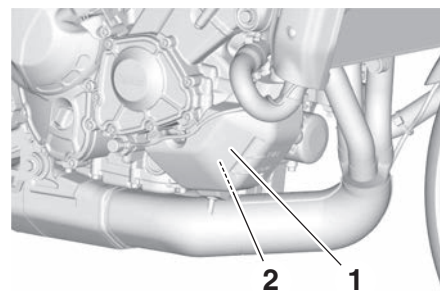
Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, press down on the radiator cap and turn it counterclockwise to remove.



2. Remove:

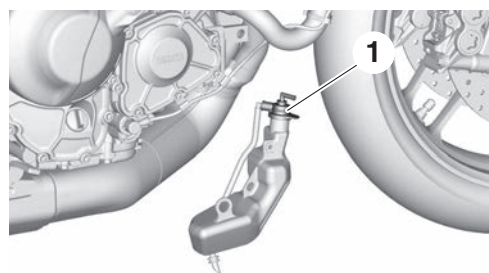
- Coolant reservoir bolt
- Coolant reservoir cover "1"
- Coolant reservoir "2"
- Collar

Refer to "RADIATOR" on page 6-3.



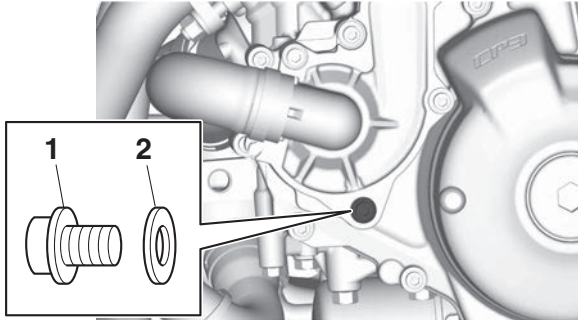
3. Remove:

- Coolant reservoir cap "1"

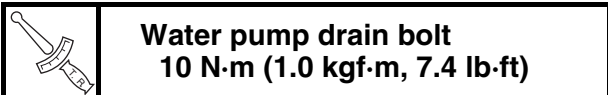


PERIODIC MAINTENANCE

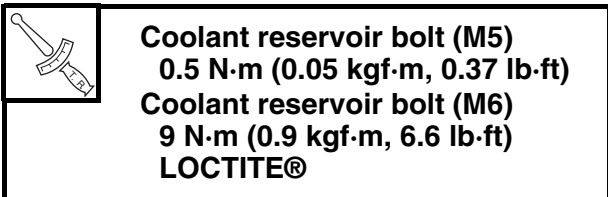
4. Drain:
 - Coolant (from the coolant reservoir)
5. Remove:
 - Water pump drain bolt "1"
 - Copper washer "2"




6. Drain:
 - Coolant (from the engine and radiator)
7. Install:
 - Water pump drain bolt
 - Copper washer **New**



8. Install:
 - Collar
 - Coolant reservoir
 - Coolant reservoir cover
 - Coolant reservoir boltRefer to "RADIATOR" on page 6-3.



9. 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)
1.72 L (1.82 US qt, 1.51 Imp.qt)
Coolant reservoir (up to the maximum level mark)
0.28 L (0.30 US qt, 0.25 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.

ECA21291

NOTICE

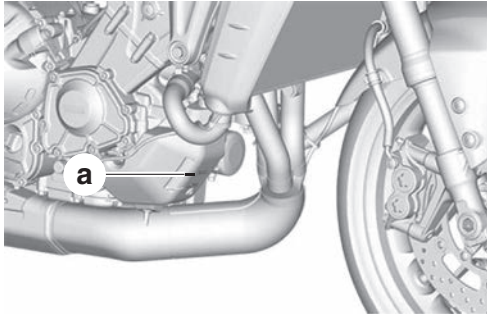
- Adding water instead of coolant dilutes the antifreeze concentration of the coolant. If water is used instead of coolant; check, and if necessary, correct the antifreeze concentration of the coolant.
- Use only distilled water. However, if distilled water is not available, soft water may be used.
- If coolant comes into contact with painted surfaces, immediately wash them with water.
- Do not mix different types of antifreeze.

10. Install:
 - Radiator cap

PERIODIC MAINTENANCE

11. Fill:

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



12. Install:

- Coolant reservoir cap

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

14. Check:

- Coolant level
Refer to “CHECKING THE COOLANT LEVEL” on page 3-27.

TIP

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

EAS30814

CHECKING THE FRONT BRAKE LIGHT SWITCH

Refer to “ELECTRICAL COMPONENTS” on page 8-37.

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:

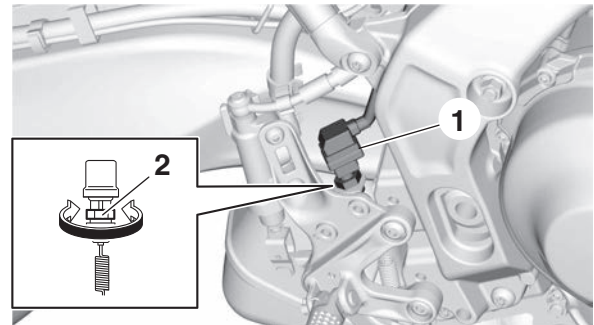
- Rear brake light operation timing
Incorrect → Adjust.

2. Remove:

- Footrest plate
Refer to “REAR BRAKE” on page 4-40.

3. 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.



TIP

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

PERIODIC MAINTENANCE

EAS30815

CHECKING THE THROTTLE GRIP

1. Check:

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

	Recommended lubricant Suitable cable lubricant
---	---

TIP

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

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

EAS30816

CHECKING AND CHARGING THE BATTERY

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

EAS30662

CHECKING THE FUSES

Refer to “CHECKING THE FUSES” on page 8-40.

EAS30664

ADJUSTING THE HEADLIGHT BEAM

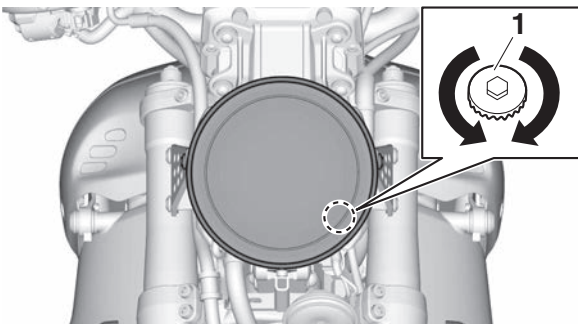
1. Adjust:

- Headlight beam (vertically)

TIP

To adjust the headlight beam (vertically), turn the adjusting screw.

- a. Turn the adjusting screw “1”.



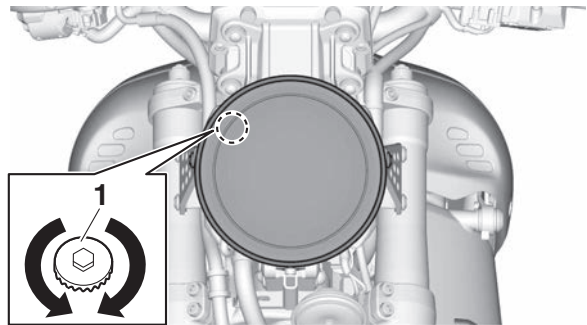
2. Adjust:

- Headlight beam (horizontally)

TIP

To adjust the headlight beam (horizontally), turn the adjusting screw.

- a. Turn the adjusting screw “1”.



PERIODIC MAINTENANCE

CHASSIS

GENERAL CHASSIS (1)	4-1
REMOVING THE SEAT	4-4
REMOVING THE SIDE COVER.....	4-4
INSTALLING THE IMU.....	4-4
INSTALLING THE SIDE COVER	4-5
INSTALLING THE SEAT	4-5
GENERAL CHASSIS (2)	4-6
GENERAL CHASSIS (3)	4-8
REMOVING THE RADIATOR COVER	4-9
INSTALLING THE RADIATOR COVER	4-9
GENERAL CHASSIS (4)	4-10
GENERAL CHASSIS (5)	4-11
FRONT WHEEL	4-12
REMOVING THE FRONT WHEEL.....	4-14
DISASSEMBLING THE FRONT WHEEL.....	4-14
CHECKING THE FRONT WHEEL	4-14
ASSEMBLING THE FRONT WHEEL.....	4-15
MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR	4-16
ADJUSTING THE FRONT WHEEL STATIC BALANCE	4-16
INSTALLING THE FRONT WHEEL (FRONT BRAKE DISCS)	4-17
REAR WHEEL	4-19
REMOVING THE REAR WHEEL	4-22
DISASSEMBLING THE REAR WHEEL	4-22
CHECKING THE REAR WHEEL.....	4-22
CHECKING THE REAR WHEEL DRIVE HUB.....	4-22
CHECKING AND REPLACING THE REAR WHEEL SPROCKET	4-23
ASSEMBLING THE REAR WHEEL	4-23
MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR	4-24
ADJUSTING THE REAR WHEEL STATIC BALANCE.....	4-24
INSTALLING THE REAR WHEEL (REAR BRAKE DISC)	4-24

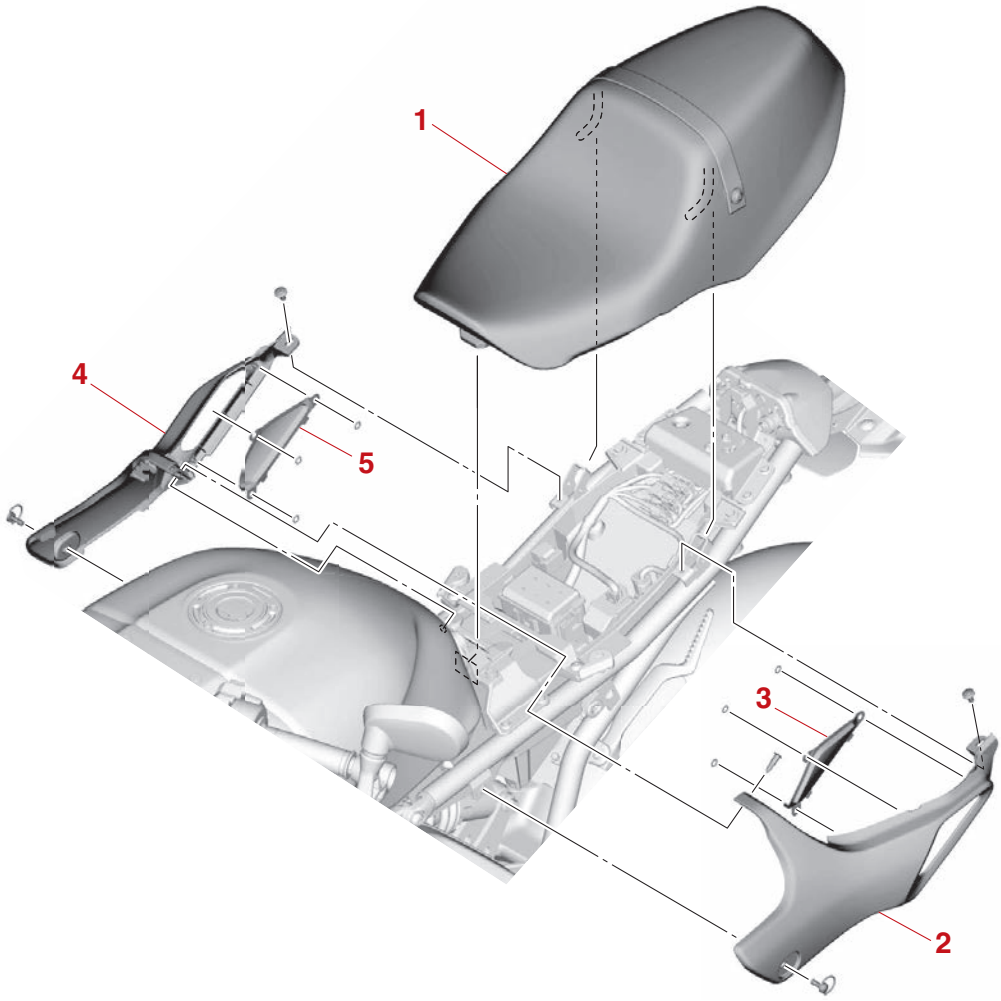
FRONT BRAKE	4-27
INTRODUCTION	4-33
CHECKING THE FRONT BRAKE DISCS	4-33
REPLACING THE FRONT BRAKE PADS	4-33
REMOVING THE FRONT BRAKE CALIPERS	4-35
DISASSEMBLING THE FRONT BRAKE CALIPERS	4-35
CHECKING THE FRONT BRAKE CALIPERS	4-35
ASSEMBLING THE FRONT BRAKE CALIPERS	4-36
INSTALLING THE FRONT BRAKE CALIPERS	4-36
REMOVING THE FRONT BRAKE MASTER CYLINDER	4-37
CHECKING THE FRONT BRAKE MASTER CYLINDER	4-37
ASSEMBLING THE FRONT BRAKE MASTER CYLINDER	4-37
INSTALLING THE FRONT BRAKE MASTER CYLINDER	4-37
REAR BRAKE	4-40
ADJUSTING THE FOOTREST POSITION	4-46
INTRODUCTION	4-46
CHECKING THE REAR BRAKE DISC	4-46
REPLACING THE REAR BRAKE PADS	4-47
REMOVING THE REAR BRAKE CALIPER	4-48
DISASSEMBLING THE REAR BRAKE CALIPER	4-48
CHECKING THE REAR BRAKE CALIPER	4-48
ASSEMBLING THE REAR BRAKE CALIPER	4-49
INSTALLING THE REAR BRAKE CALIPER	4-49
REMOVING THE REAR BRAKE MASTER CYLINDER	4-50
CHECKING THE REAR BRAKE MASTER CYLINDER	4-50
ASSEMBLING THE REAR BRAKE MASTER CYLINDER	4-50
INSTALLING THE REAR BRAKE MASTER CYLINDER	4-50
ABS (ANTI-LOCK BRAKE SYSTEM)	4-52
REMOVING THE HYDRAULIC UNIT ASSEMBLY	4-54
CHECKING THE HYDRAULIC UNIT ASSEMBLY	4-54
CHECKING THE BRAKE PIPES	4-55
INSTALLING THE HYDRAULIC UNIT ASSEMBLY	4-55
HYDRAULIC UNIT OPERATION TESTS	4-56
CHECKING THE ABS WARNING LIGHT	4-59
HANDLEBAR	4-60
ADJUSTING THE HANDLEBAR POSITION	4-62
REMOVING THE HANDLEBAR	4-62
CHECKING THE HANDLEBAR	4-63
INSTALLING THE HANDLEBAR	4-63
FRONT FORK	4-66
REMOVING THE FRONT FORK LEGS	4-69
DISASSEMBLING THE FRONT FORK LEGS	4-69
CHECKING THE FRONT FORK LEGS	4-70
ASSEMBLING THE FRONT FORK LEGS	4-71
INSTALLING THE FRONT FORK LEGS	4-75

STEERING HEAD	4-77
REMOVING THE LOWER BRACKET	4-79
CHECKING THE STEERING HEAD	4-79
INSTALLING THE STEERING HEAD	4-80
REAR SHOCK ABSORBER ASSEMBLY	4-81
HANDLING THE REAR SHOCK ABSORBER	4-82
DISPOSING OF A REAR SHOCK ABSORBER	4-82
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY	4-82
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY	4-82
CHECKING THE CONNECTING ARM AND RELAY ARM	4-82
INSTALLING THE RELAY ARM.....	4-83
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY	4-83
SWINGARM	4-84
REMOVING THE SWINGARM.....	4-86
CHECKING THE SWINGARM	4-86
INSTALLING THE SWINGARM	4-87
CHAIN DRIVE	4-88
REMOVING THE DRIVE CHAIN.....	4-89
CHECKING THE DRIVE CHAIN	4-89
CHECKING THE DRIVE SPROCKET	4-90
CHECKING THE REAR WHEEL SPROCKET	4-90
CHECKING THE REAR WHEEL DRIVE HUB	4-91
INSTALLING THE DRIVE CHAIN	4-91
ADJUSTING THE SHIFT PEDAL.....	4-93

EAS20026

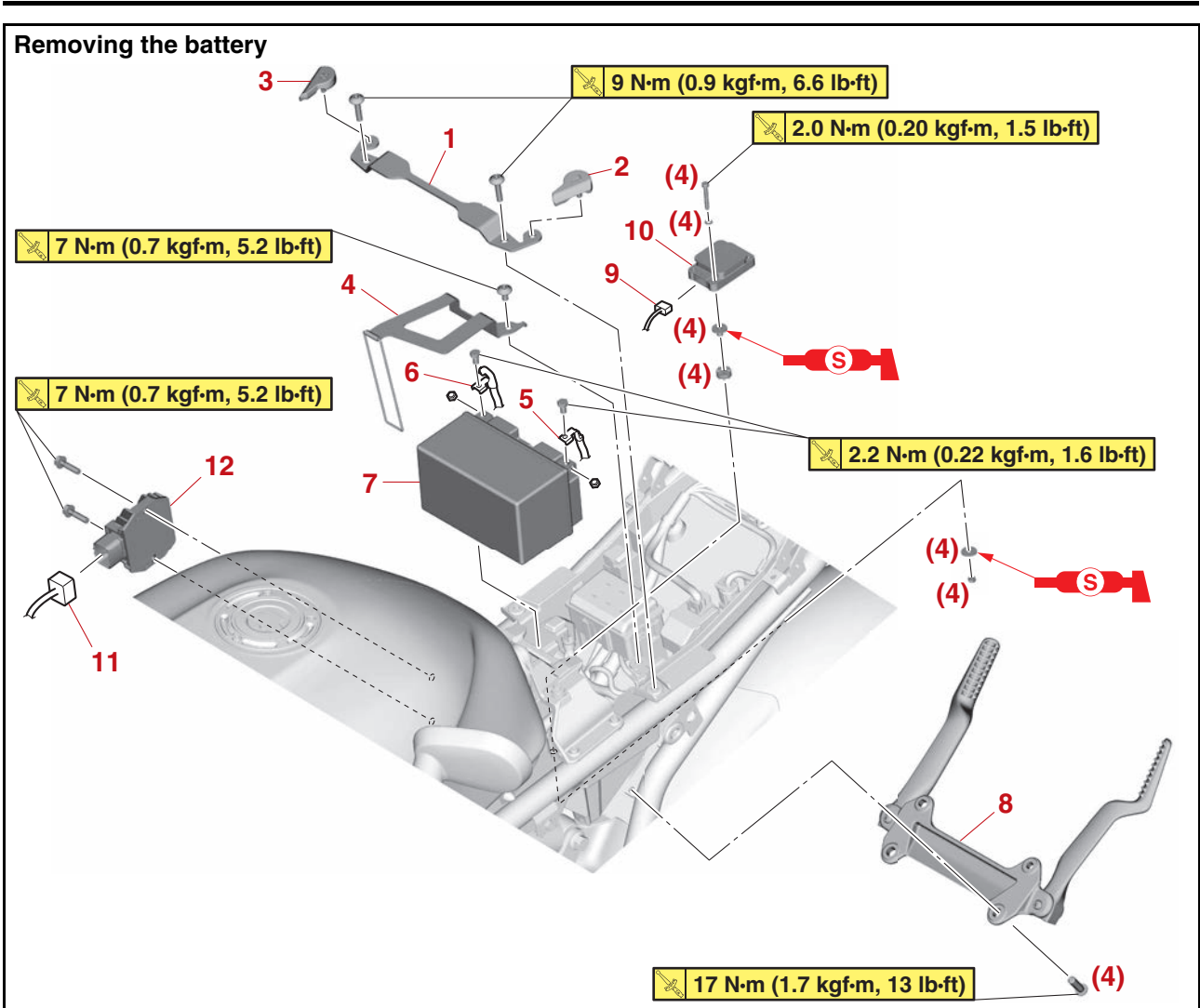
GENERAL CHASSIS (1)

Removing the seat and side covers



Order	Job/Parts to remove	Q'ty	Remarks
1	Rider seat	1	
2	Side cover (left)	1	
3	Side cover grille (left)	1	
4	Side cover (right)	1	
5	Side cover grille (right)	1	

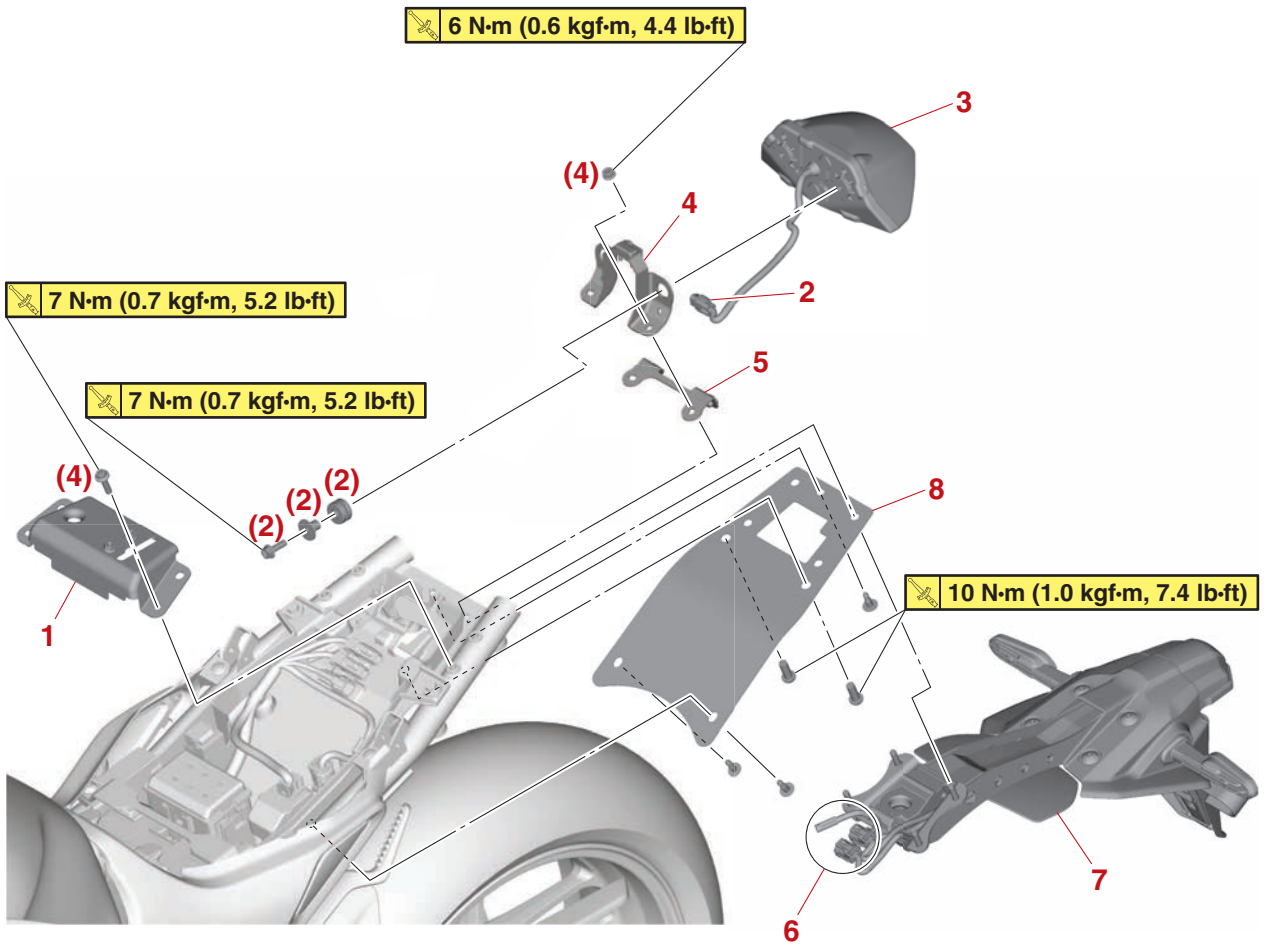
GENERAL CHASSIS (1)



Order	Job/Parts to remove	Q'ty	Remarks
	Seat/Side cover		Refer to "GENERAL CHASSIS (1)" on page 4-1.
1	Bracket	1	
2	Damper (left)	1	
3	Damper (right)	1	
4	Battery holding bracket	1	
5	Negative battery lead	1	Disconnect.
6	Positive battery lead	1	Disconnect.
7	Battery	1	
8	Passenger footrest	1	
9	IMU coupler	1	Disconnect.
10	IMU (Inertial Measurement Unit)	1	
11	Rectifier/regulator coupler	1	Disconnect.
12	Rectifier/regulator	1	

GENERAL CHASSIS (1)

Removing the tail/brake light and mudguard assembly



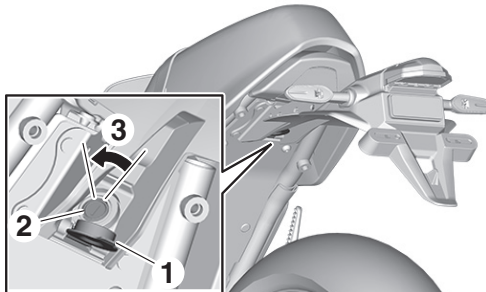
Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
1	Seat bracket	1	
2	Tail/brake light coupler	1	Disconnect.
3	Tail/brake light	1	
4	Tail/brake light bracket	1	
5	Bracket	1	
6	Rear turn signal light coupler/License plate light coupler	2/1	Disconnect.
7	Mudguard assembly	1	
8	Lower fender cover	1	

GENERAL CHASSIS (1)

EAS32229

REMOVING THE SEAT

1. Remove:
 - a. Open the seat lock cover "1", insert the key into the seat lock "2", and then turn the key counterclockwise "3".



- b. While holding the key in that position, slide the seat backward and then lift the rear of the seat up, and then pull the seat off.

EAS31519

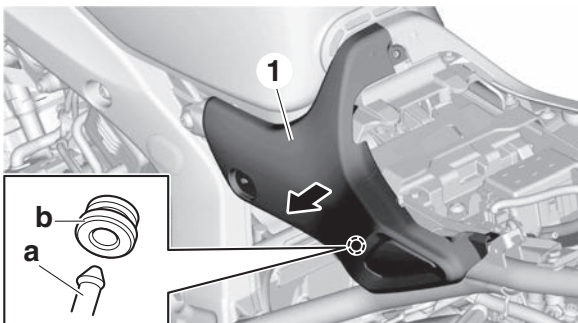
REMOVING THE SIDE COVER

The following procedure applies to both of the side cover.

1. Remove:
 - Side cover "1"

TIP

Remove the projection "a" on the side cover from grommet "b".



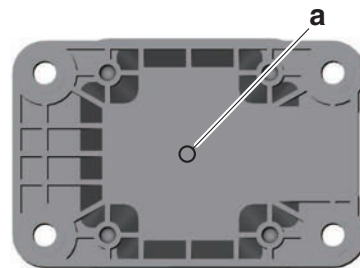
EAS31636

INSTALLING THE IMU

ECA22611

NOTICE

- Do not perform angle adjustment of the IMU and battery box by pinching the washer and related parts.
- When installing the IMU, apply a thin coat of silicone grease onto the washer where contacting the IMU grommet.
- When installing the IMU, use only a genuine bolt and washer, and tighten the bolt to the specified torque.
- Pay attention not to expose the IMU to strong shocks, such as striking or dropping it.
- Do not place any foreign objects in and around the battery box.
- Do not obstruct breather opening "a" of the IMU.
- Do not clean the breather opening and do not blow it with compressed air.
- When replacing the collar or grommet, replace all four collars and grommets.




1. Install:
 - IMU (Inertial Measurement Unit) "1"
 - a. Connect the IMU coupler "2" to the IMU.
 - b. Install the grommets, collars, IMU "1", washers, IMU nuts and IMU bolts, and then tighten the bolts to specification.

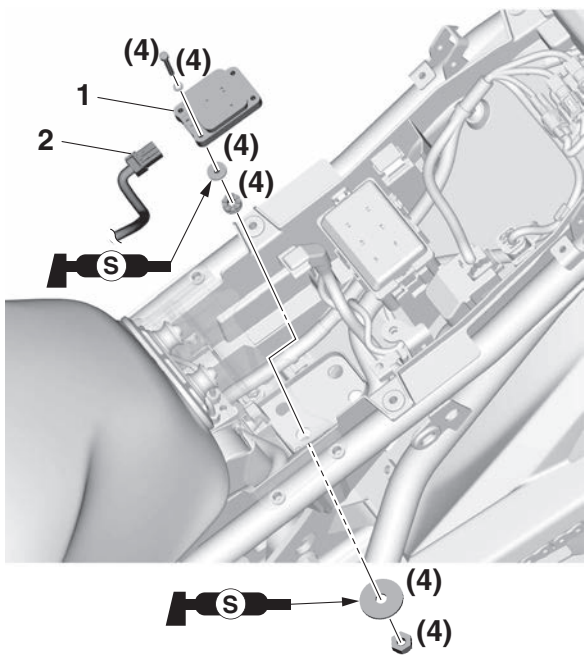
TIP

Apply a thin coat of silicone grease onto the collars and washers where contacting the grommets.

	Recommended lubricant Silicone grease
---	---

	IMU bolt 2.0 N·m (0.20 kgf·m, 1.5 lb·ft)
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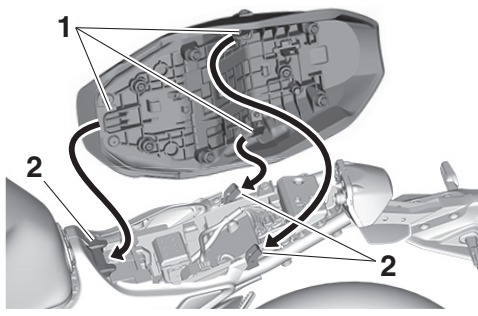
GENERAL CHASSIS (1)



EAS30125

INSTALLING THE SEAT

1. Install:
 - Seat
 - a. Insert the projections “1” into the seat holders “2” as shown.



- b. Push the rear of the seat down to lock it in place.

TIP _____
 Make sure that the seat is properly secured before riding.

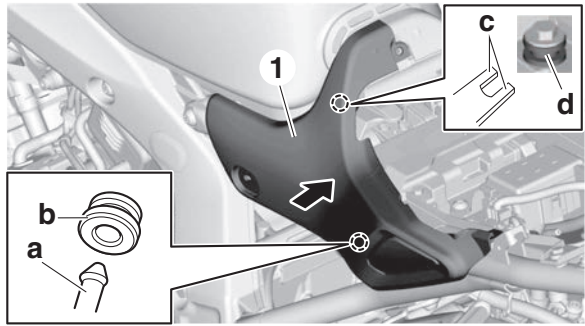
EAS31520

INSTALLING THE SIDE COVER

The following procedure applies to both of the side cover.

1. Install:
 - Side cover “1”

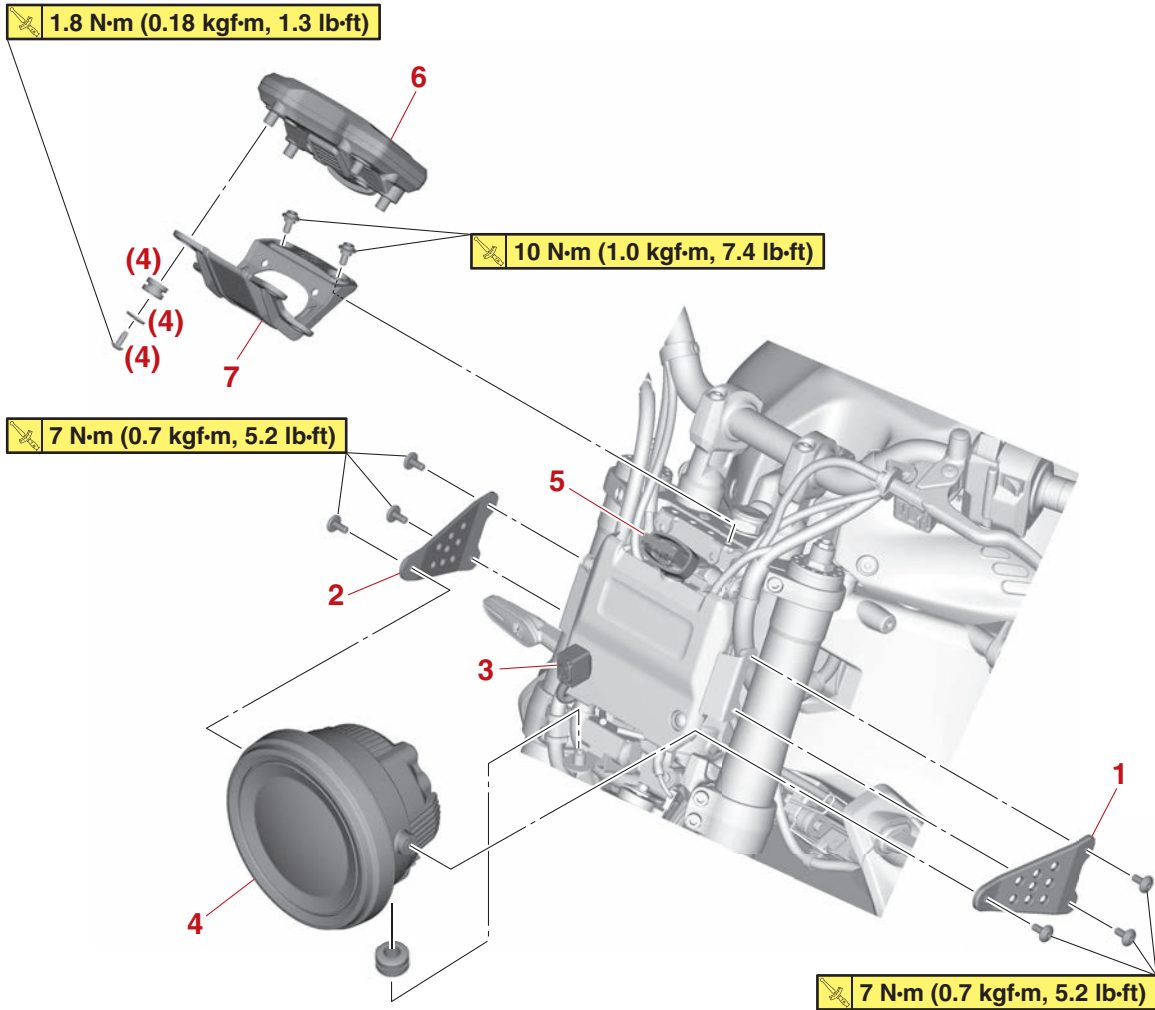
- TIP** _____
- Insert the projection “a” on the side cover into the grommet “b”.
 - Insert the slit “c” of the side cover into the grommet “d”.



EAS20155

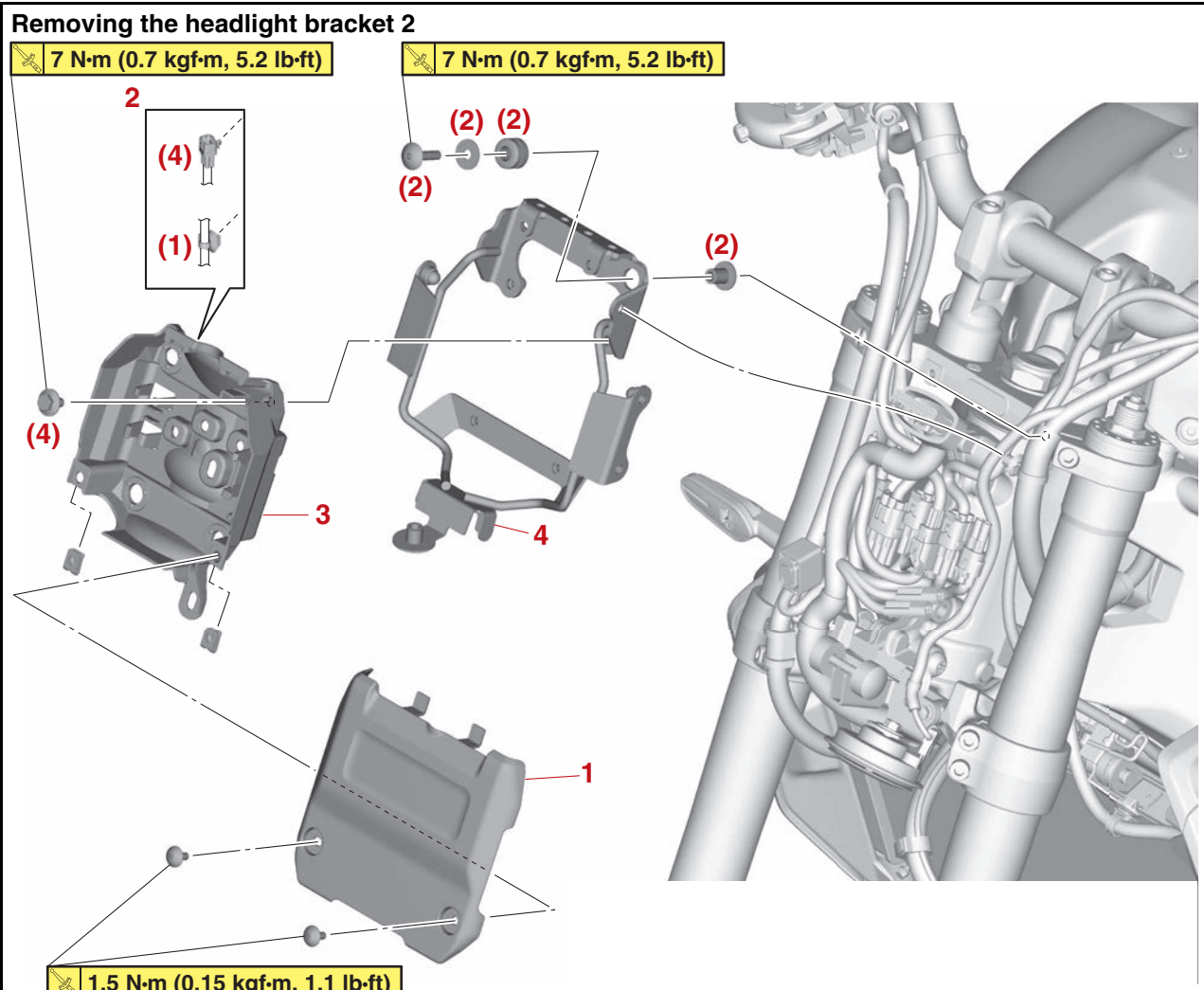
GENERAL CHASSIS (2)

Removing the headlight assembly and meter assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Headlight bracket 1 (left)	1	
2	Headlight bracket 1 (right)	1	
3	Headlight control unit coupler	1	Disconnect.
4	Headlight assembly	1	
5	Meter assembly coupler	1	Disconnect.
6	Meter assembly	1	
7	Meter bracket	1	

GENERAL CHASSIS (2)

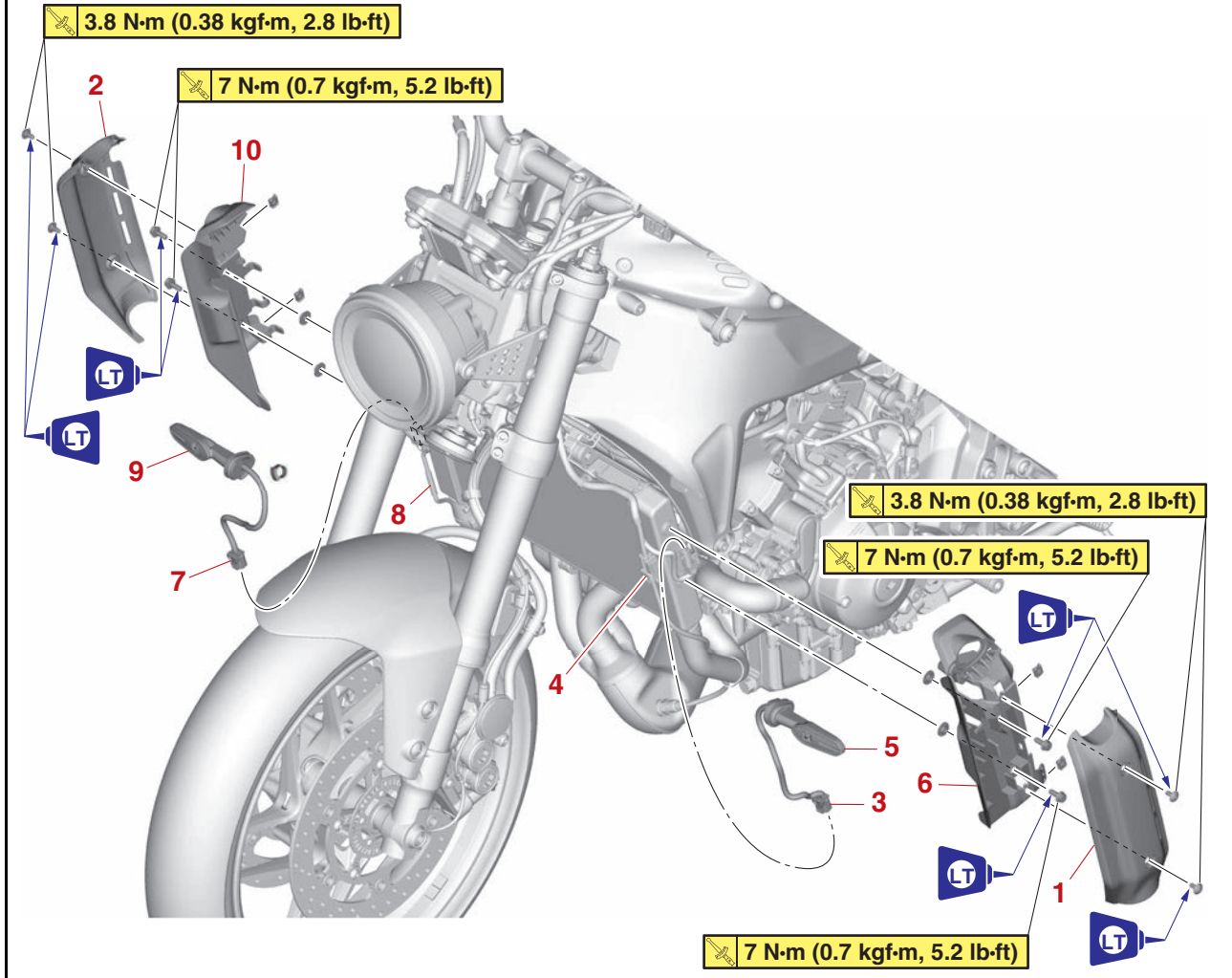


Order	Job/Parts to remove	Q'ty	Remarks
1	Coupler cover	1	
2	Harness clamp/Coupler clamp	4/1	Disconnect.
3	Coupler holder	1	
4	Headlight bracket 2	1	

EAS20156

GENERAL CHASSIS (3)

Removing the radiator cover and front turn signal light (left/right)



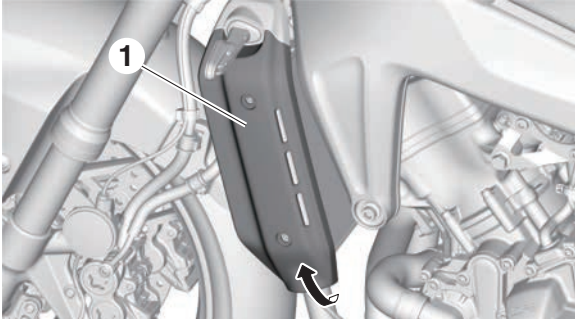
Order	Job/Parts to remove	Q'ty	Remarks
1	Radiator cover (left)	1	
2	Radiator cover (right)	1	
3	Front turn signal light coupler (left)	1	Disconnect.
4	O ₂ sensor coupler	1	Disconnect.
5	Front turn signal light (left)	1	
6	Front side panel (left)	1	
7	Front turn signal light coupler (right)	1	Disconnect.
8	Sub-wire harness coupler (Oil pressure switch)	1	Disconnect.
9	Front turn signal light (right)	1	
10	Front side panel (right)	1	

EAS33427

REMOVING THE RADIATOR COVER

The following procedure applies to both of the radiator cover.

1. Remove:
 - Radiator cover “1”
 - a. Remove the radiator cover bolts.
 - b. Remove the radiator cover.



EAS32348

INSTALLING THE RADIATOR COVER

The following procedure applies to both of the radiator cover.

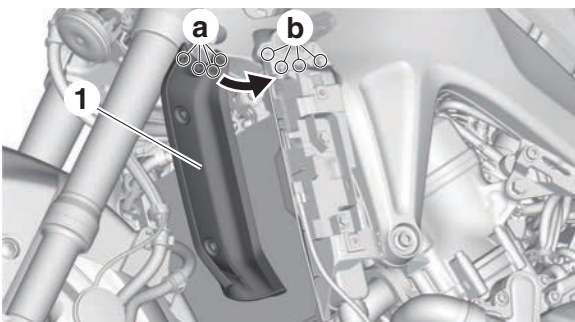
1. Install:
 - Radiator cover “1”
 - Radiator cover bolt



Radiator cover bolt
3.8 N·m (0.38 kgf·m, 2.8 lb·ft)

TIP

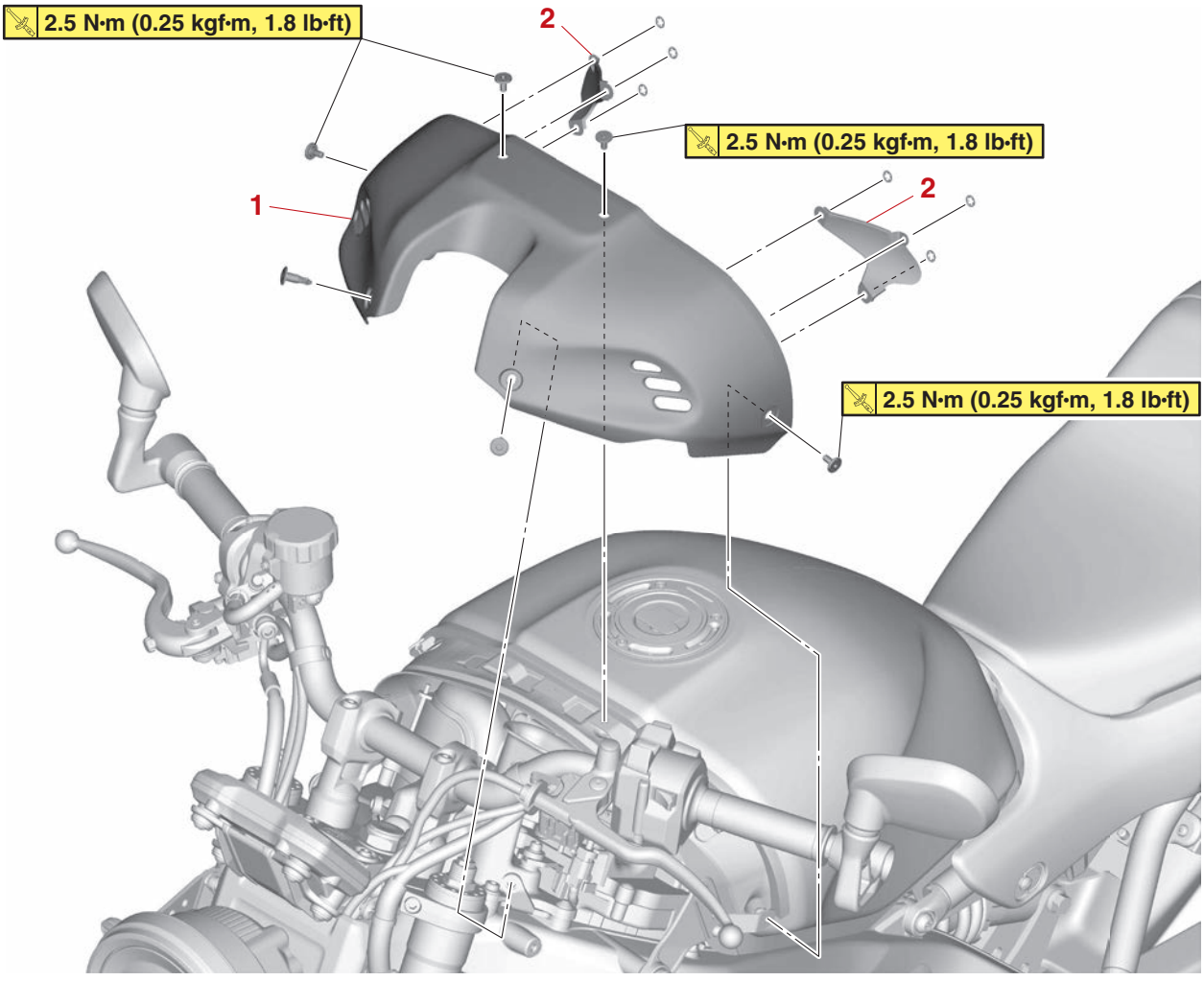
Insert projections “a” on the radiator cover into slots “b”.



EAS20157

GENERAL CHASSIS (4)

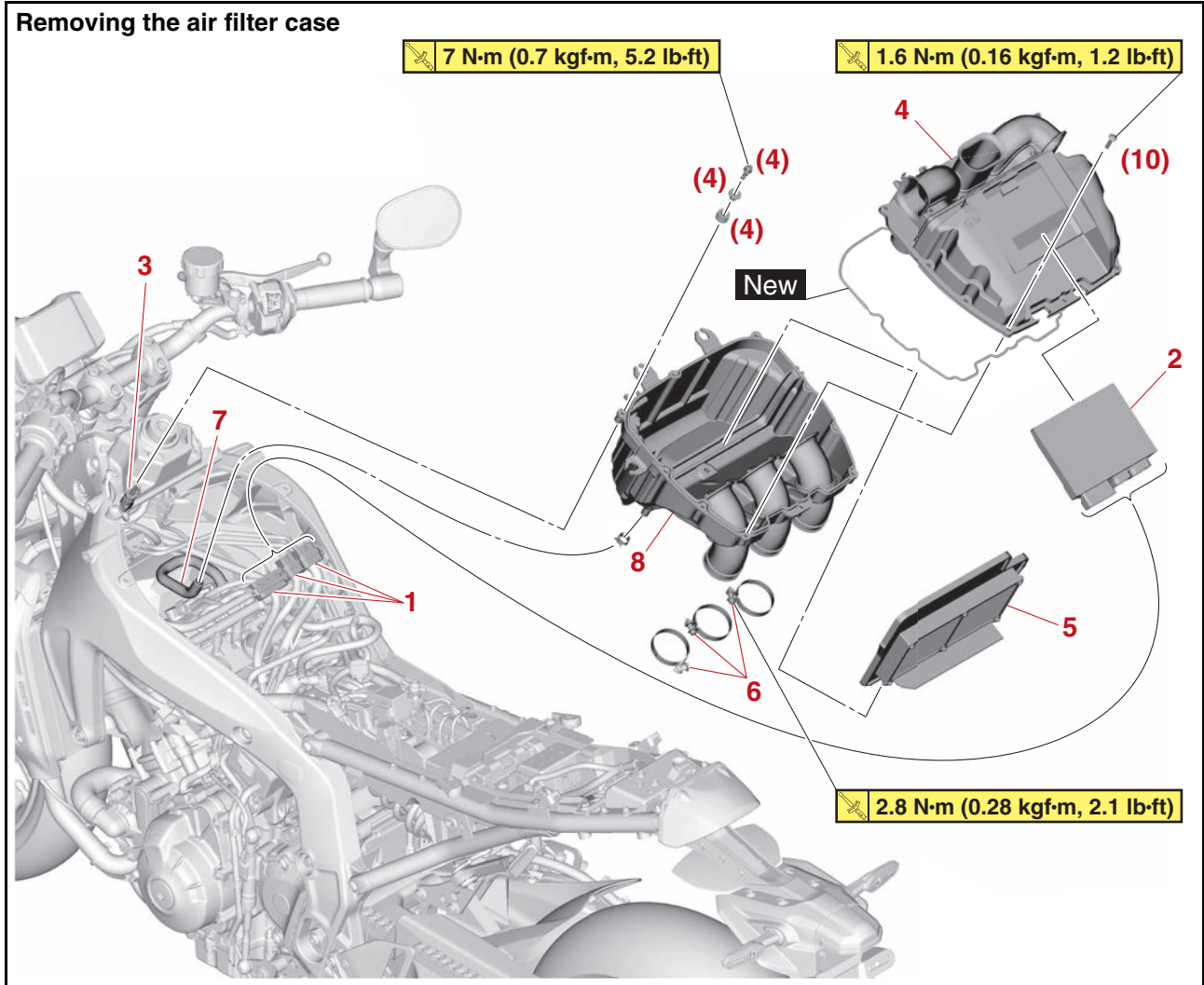
Removing the fuel tank cover



Order	Job/Parts to remove	Q'ty	Remarks
1	Fuel tank cover	1	
2	Fuel tank cover grille	2	

EAS20158

GENERAL CHASSIS (5)

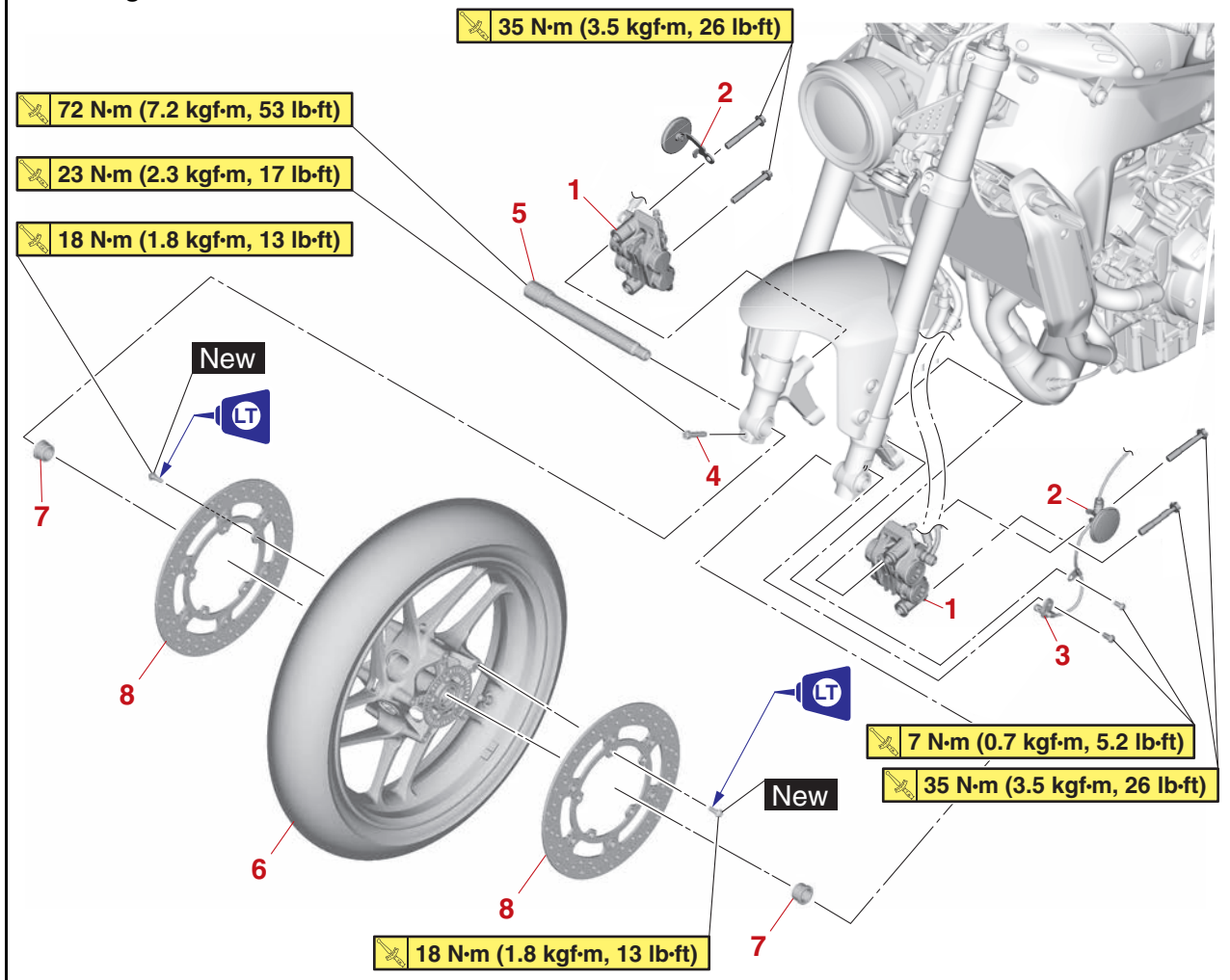


Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	ECU coupler	3	Disconnect.
2	ECU (Engine Control Unit)	1	
3	Intake air temperature sensor	1	Disconnect.
4	Air filter case cover	1	
5	Air filter element	1	
6	Air filter case joint clamp screw	3	Loosen.
7	Cylinder head breather hose	1	Disconnect.
8	Air filter case	1	

EAS20028

FRONT WHEEL

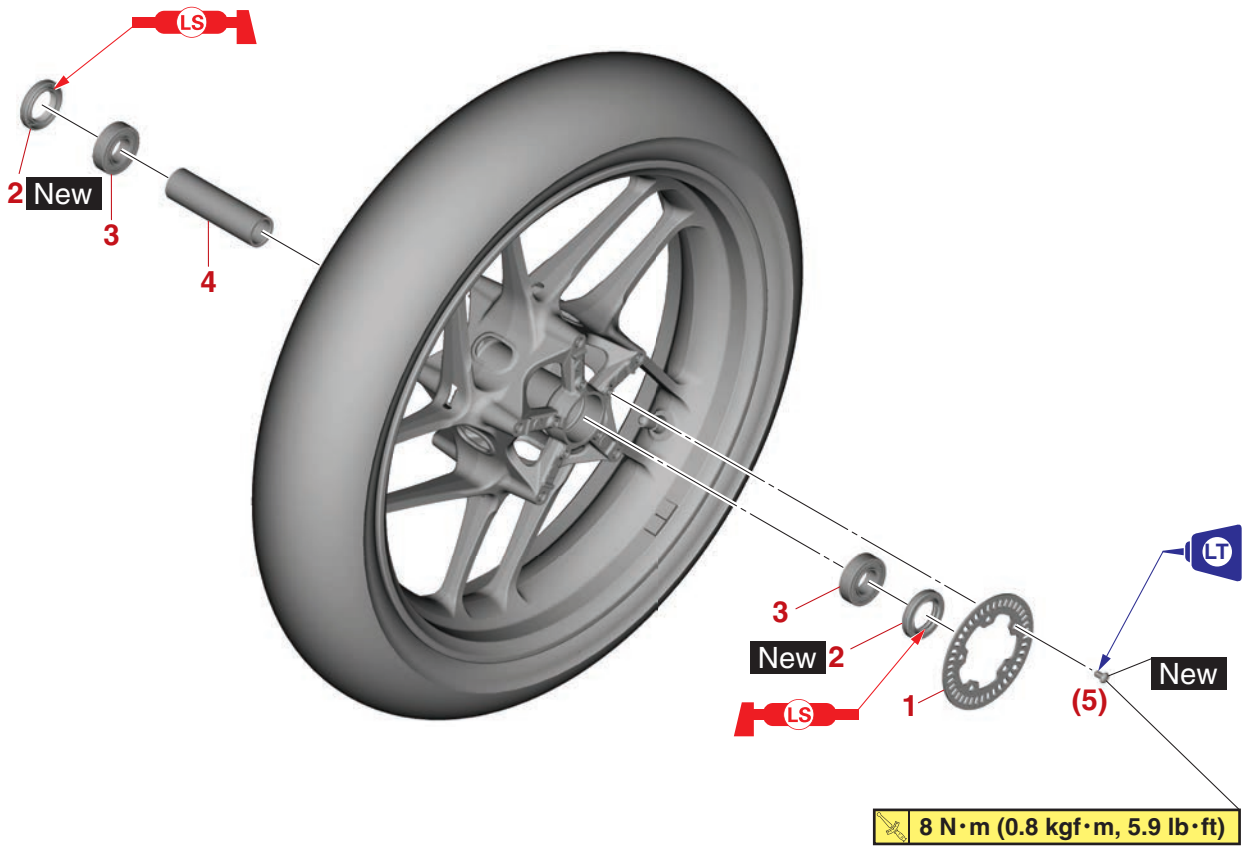
Removing the front wheel and brake discs



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	Wheel axle	1	
6	Front wheel	1	
7	Collar	2	
8	Front brake disc	2	

FRONT WHEEL

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	

EAS31148

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

EAS31149

DISASSEMBLING THE FRONT WHEEL

ECA21340

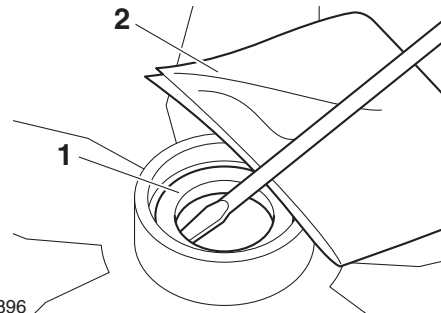
NOTICE

- 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.



G088896

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

EAS30147

CHECKING THE FRONT WHEEL

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

EWA13460

WARNING

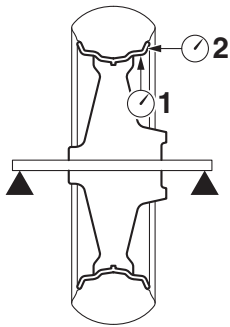
Do not attempt to straighten a bent wheel axle.

2. Check:
 - Tire
 - Front wheel
 - Damage/wear → Replace.
 - Refer to “CHECKING THE TIRES” on page 3-17 and “CHECKING THE WHEELS” on page 3-16.
3. Measure:
 - Radial wheel runout “1”
 - Lateral wheel runout “2”
 - Over the specified limits → Replace.



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

FRONT WHEEL



G088897

4. Check:

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

EAS31150

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).

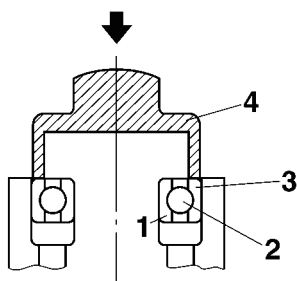
ECA18110

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.

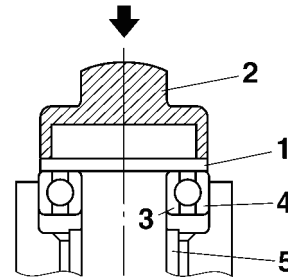


G088898

- 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".

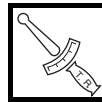


G088899

- 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®

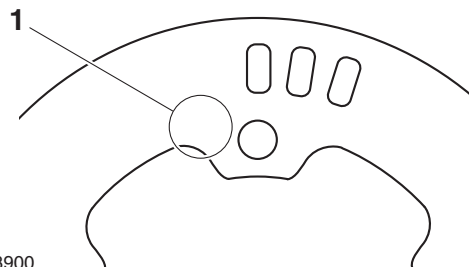
ECA17200

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 4-16.



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

EAS31151

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.

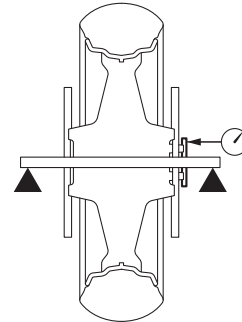
3. Measure:

- 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)**

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



G088902

- 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.

- 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.
- Refer to “ADJUSTING THE WHEEL STATIC BALANCE” in “BASIC INFORMATION” (separate volume).

- Remove:
 - Balancing weight(s)
- Find:
 - Front wheel’s heavy spot
- Adjust:
 - Front wheel static balance
- Check:
 - Front wheel static balance

EAS31327

INSTALLING THE FRONT WHEEL (FRONT BRAKE DISCS)

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 4-33.

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
72 N·m (7.2 kgf·m, 53 lb·ft)
Front wheel axle pinch bolt
23 N·m (2.3 kgf·m, 17 lb·ft)

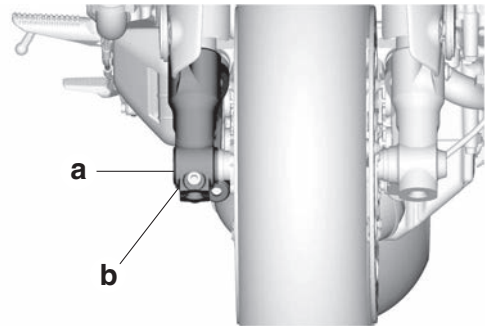
ECA19760

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.



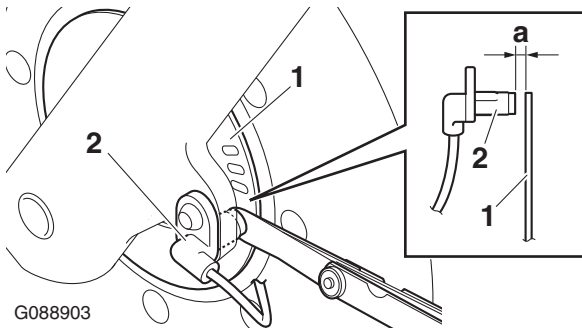
Distance “a” (between the wheel sensor rotor and front wheel sensor)
0.6–1.8 mm (0.02–0.07 in)

TIP

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



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



G088903

8. Install:

- Front brake caliper



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

EWA13500



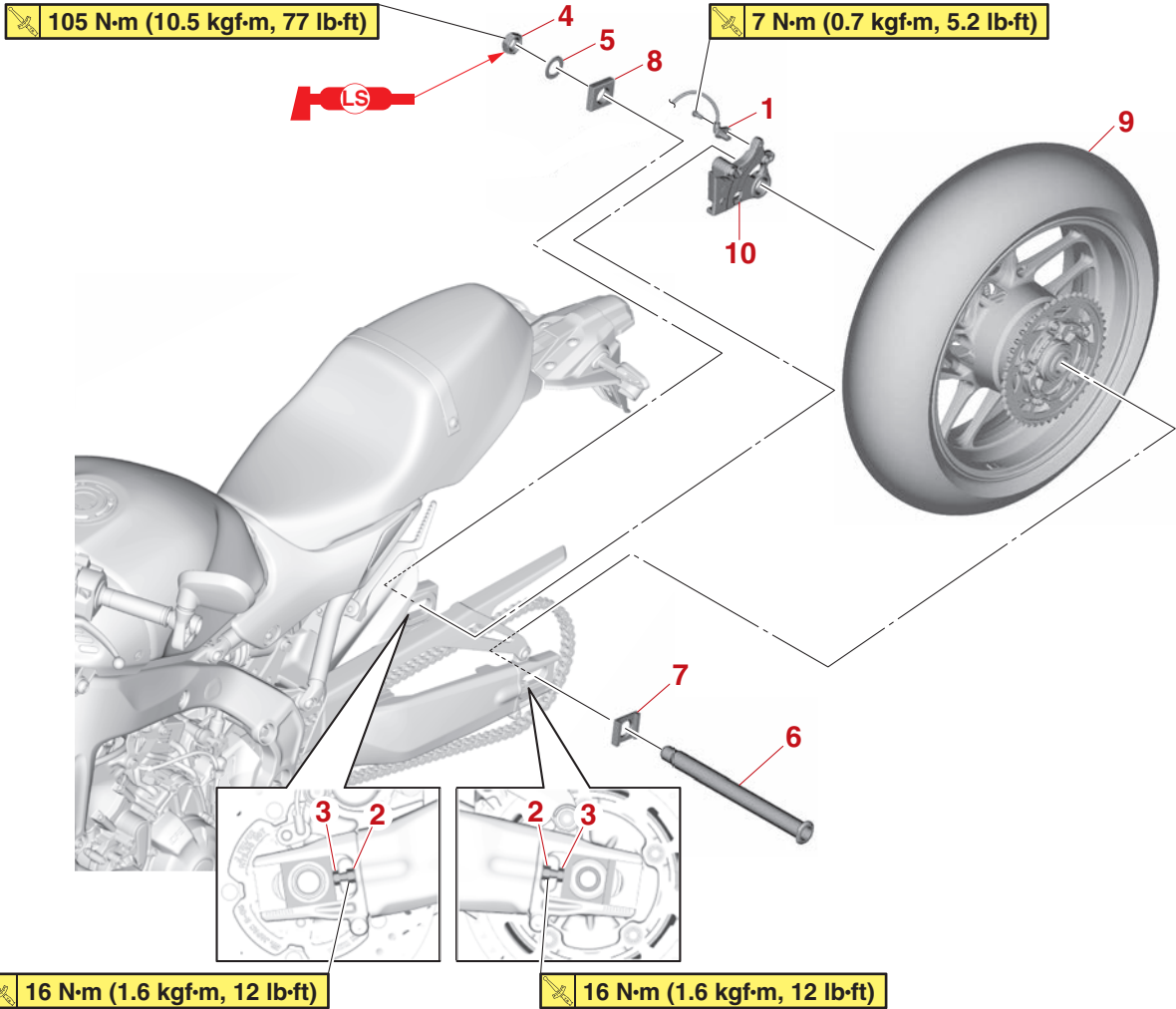
WARNING

Make sure the brake hose is routed properly.

EAS20029

REAR WHEEL

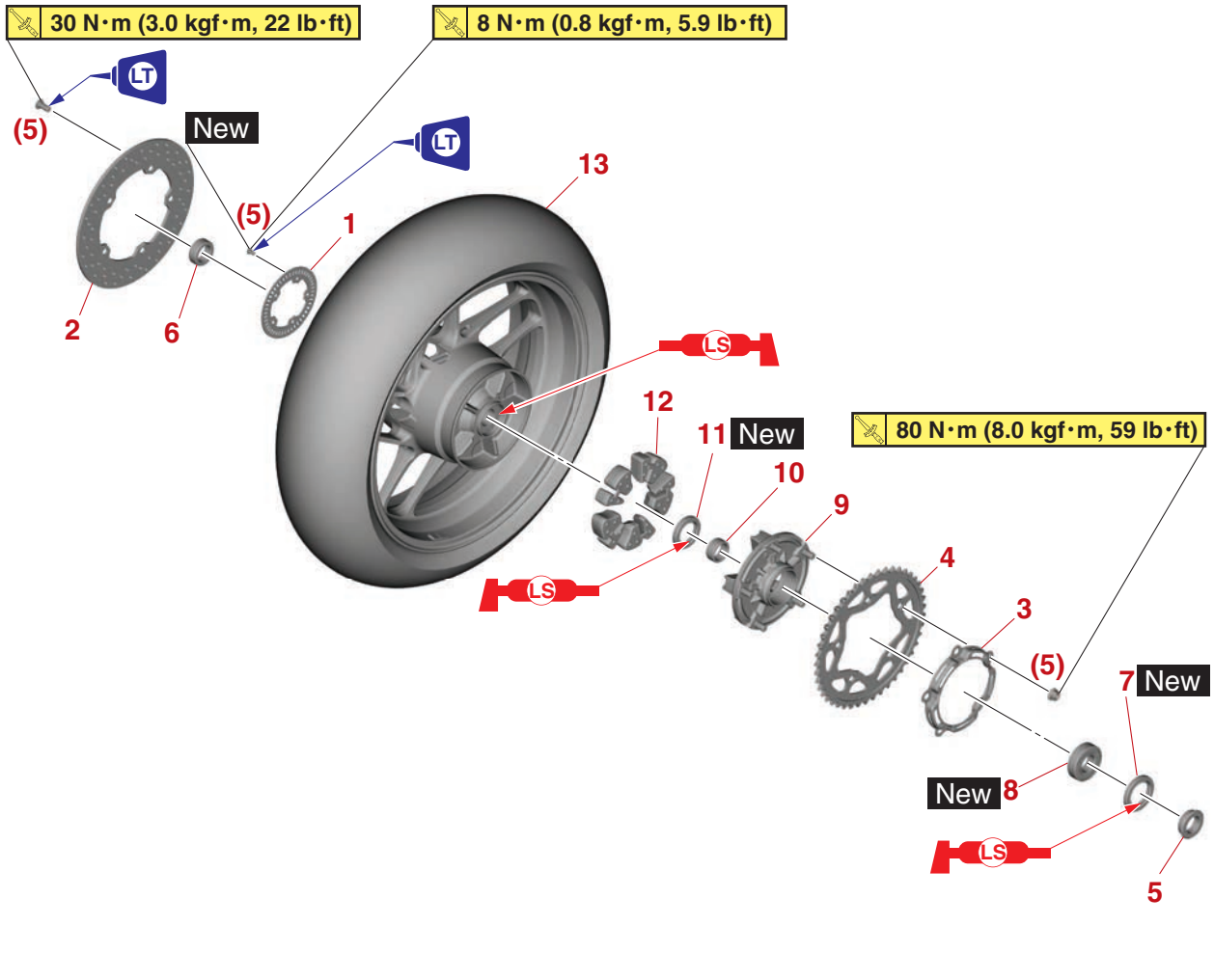
Removing the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-40.
1	Rear wheel sensor	1	
2	Locknut	2	Loosen.
3	Adjusting bolt	2	Loosen.
4	Wheel axle nut	1	
5	Washer	1	
6	Wheel axle	1	
7	Adjusting block (left)	1	
8	Adjusting block (right)	1	
9	Rear wheel	1	
10	Brake caliper bracket assembly	1	

REAR WHEEL

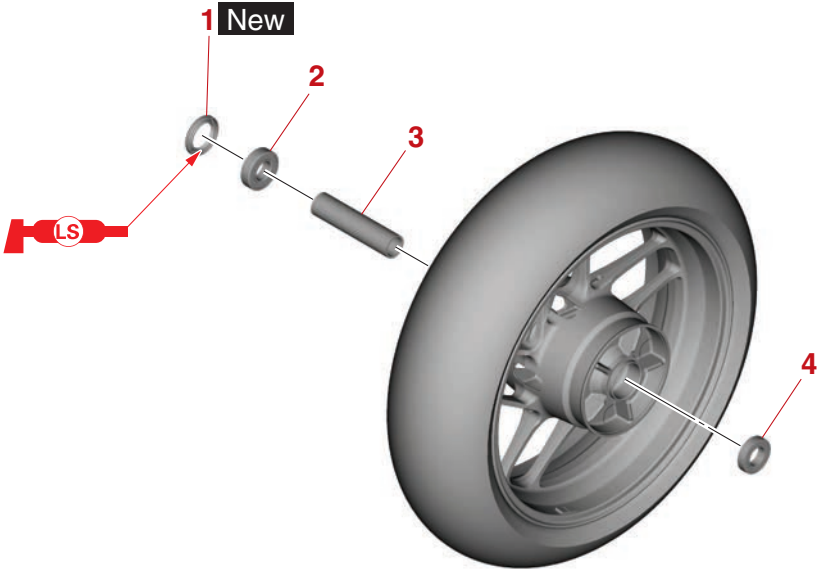
Removing the brake disc and rear wheel sprocket



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

REAR WHEEL

Disassembling the rear wheel



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

EAS30910

REMOVING THE REAR WHEEL

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 brake caliper
 - Rear wheel sensor

ECA27270

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 assembly.

3. Loosen:
 - Locknut
 - Adjusting bolt

4. Remove:
 - Wheel axle nut
 - Washer
 - Wheel axle
 - Rear wheel
 - Brake caliper bracket assembly

ECA27280

NOTICE

Be sure to remove the rear wheel sensor before removing the brake caliper bracket assembly, otherwise the sensor could be damaged.

TIP

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

EAS31154

DISASSEMBLING THE REAR 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 bearingRefer to "DISASSEMBLING THE FRONT WHEEL" on page 4-14.

EAS30159

CHECKING THE REAR WHEEL

1. Check:
 - Wheel axle
 - Wheel bearing
 - Oil sealRefer to "CHECKING THE FRONT WHEEL" on page 4-14.
2. Check:
 - Tire
 - Rear wheelDamage/wear → Replace.
Refer to "CHECKING THE TIRES" on page 3-17 and "CHECKING THE WHEELS" on page 3-16.
3. Measure:
 - Radial wheel runout
 - Lateral wheel runoutRefer to "CHECKING THE FRONT WHEEL" on page 4-14.

EAS30160

CHECKING THE REAR WHEEL DRIVE HUB

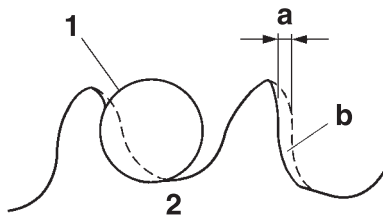
1. Check:
 - Rear wheel drive hubCracks/damage → Replace.
- Rear wheel drive hub damper
Damage/wear → Replace.

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 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 the new rear wheel sprocket.



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

TIP

Tighten the rear wheel sprocket nuts in stages and in a crisscross pattern.

EAS30163

ASSEMBLING THE REAR 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 (right side).

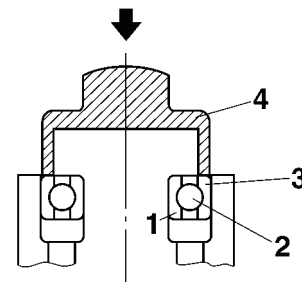
ECA18110

NOTICE

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

TIP

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

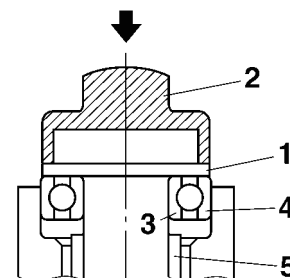


G088898

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

TIP

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



G088899

- d. Install the new oil seals.

EAS31156

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 4-16.

2. Check:

- Rear wheel sensor rotor
Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-16.

3. Measure:

- Wheel sensor rotor runout
Refer to "MAINTENANCE OF THE FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-16.

EAS30164

ADJUSTING THE REAR WHEEL STATIC BALANCE

TIP

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

1. Adjust:

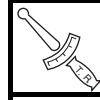
- Rear wheel static balance
Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE" on page 4-16.

EAS31157

INSTALLING THE REAR WHEEL (REAR BRAKE DISC)

1. Install:

- Rear brake disc



Rear brake disc bolt
30 N·m (3.0 kgf·m, 22 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:

- Rear brake disc
Refer to "CHECKING THE REAR BRAKE DISC" on page 4-46.

3. Lubricate:

- Oil seal lip



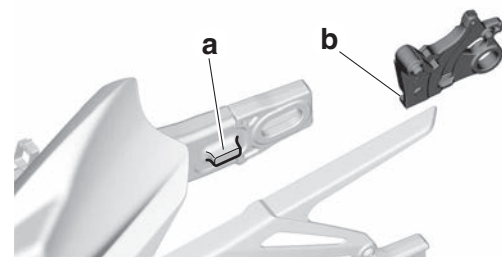
Recommended lubricant
Lithium-soap-based grease

4. Install:

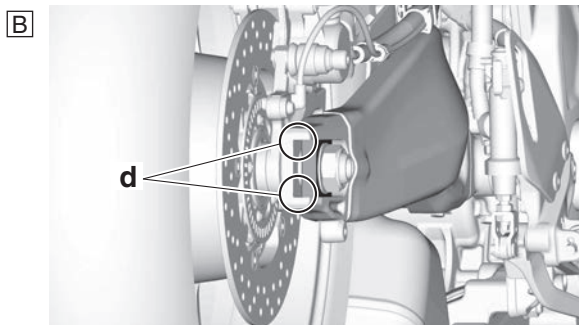
- Brake caliper bracket assembly
- Rear wheel
- Adjusting block
- Wheel axle
- Washer
- Wheel axle nut

TIP

- Do not install the brake caliper.
- Align the projection "a" in the swingarm with the slot "b" of the brake caliper bracket assembly.
- Install the adjusting block (left) so that projection "c" faces to the front of the vehicle.
- Install the adjusting block (right) with the chamfered "d" facing the inside.



REAR WHEEL



- A. Left side
B. Right side

5. Install:

- Rear brake caliper
- Rear brake caliper bolt

6. Adjust:

- Drive chain slack
Refer to "DRIVE CHAIN SLACK" on page 3-18.



Drive chain slack (Maintenance Stand)

45.0–50.0 mm (1.77–1.97 in)

Drive chain slack (Sidestand)
45.0–50.0 mm (1.77–1.97 in)

Drive chain slack limit
55.0 mm (2.17 in)

7. Tighten:

- Wheel axle nut
- Rear brake caliper bolt



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

Rear brake caliper bolt (front)
27 N·m (2.7 kgf·m, 20 lb·ft)

Rear brake caliper bolt (rear)
22 N·m (2.2 kgf·m, 16 lb·ft)
LOCTITE®

EWA13500

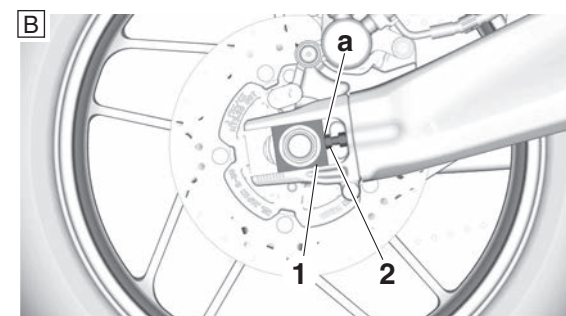
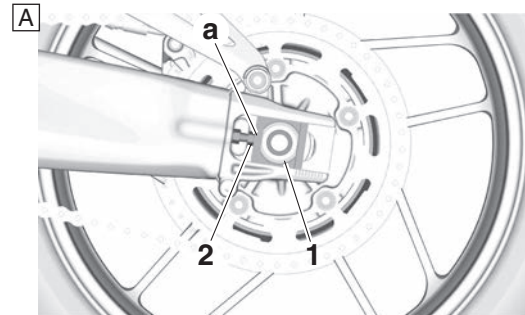


WARNING

Make sure the brake hose is routed properly.

TIP

When tightening the wheel axle nut, there should be no clearance "a" between the adjusting block "1" and adjusting bolt "2".



- A. Left side
B. Right side

8. 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

When installing the rear wheel sensor, check the rear wheel sensor lead for twists.

9. Measure:

- Distance “a”

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

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



Distance “a” (between the wheel sensor rotor and rear wheel sensor)

0.6–1.7 mm (0.02–0.07 in)

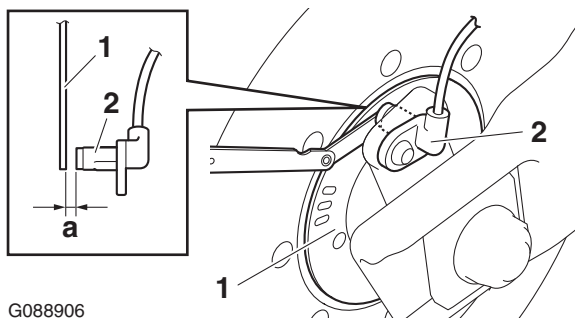
TIP

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



**Thickness gauge
90890-03268**

**Feeler gauge set
YU-26900-9**

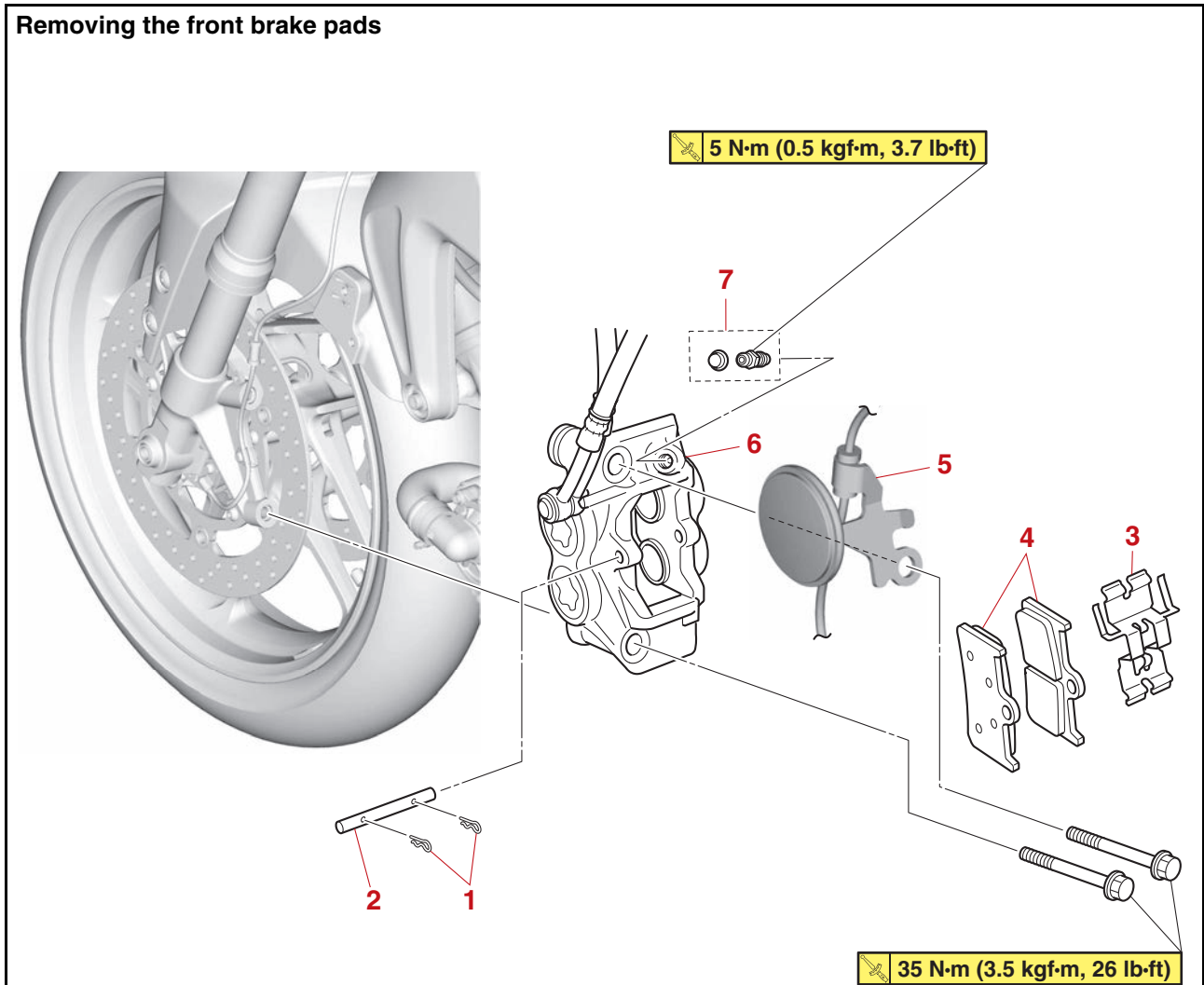


G088906

EAS20030

FRONT BRAKE

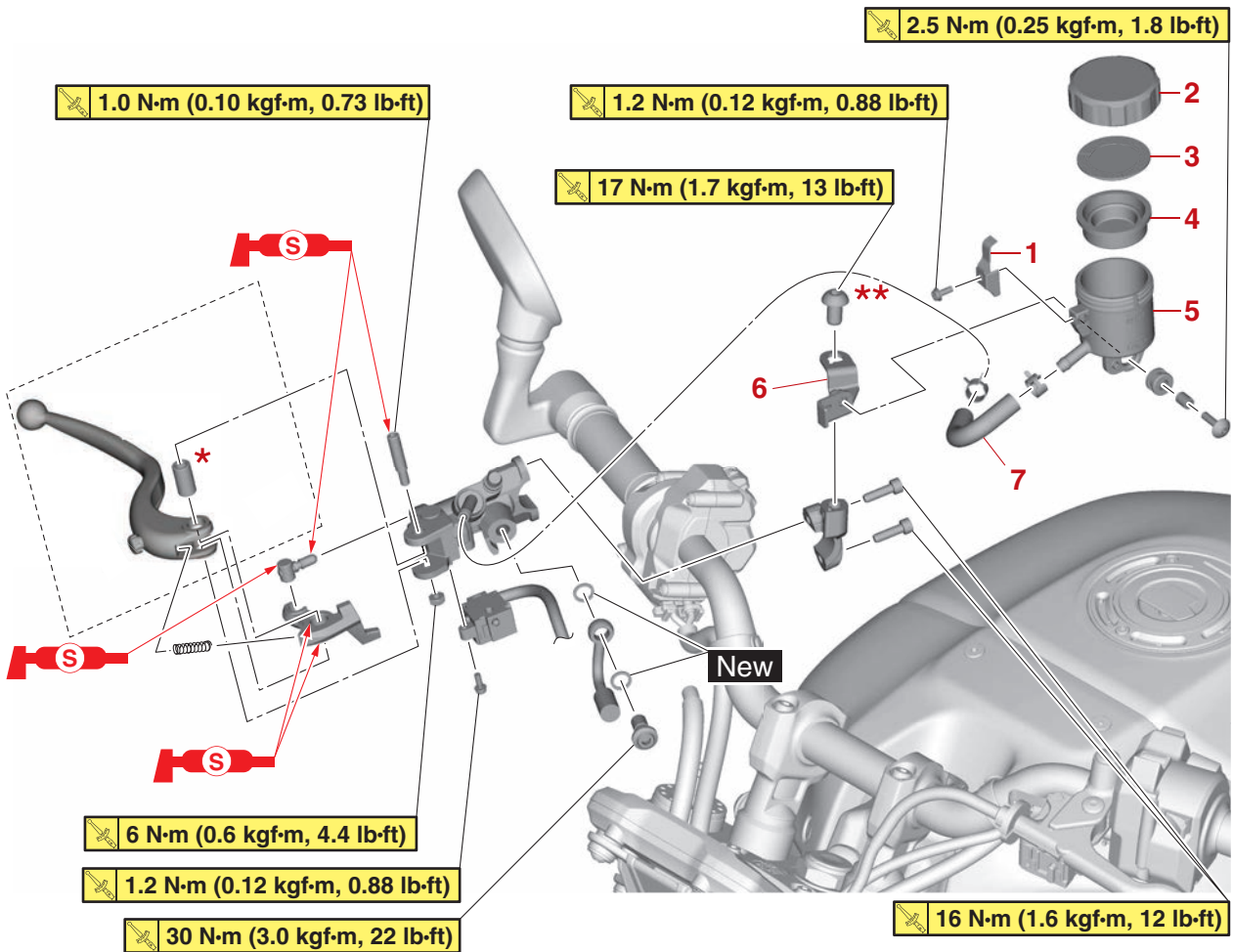
Removing the front brake pads



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	

FRONT BRAKE

Removing the front brake master cylinder



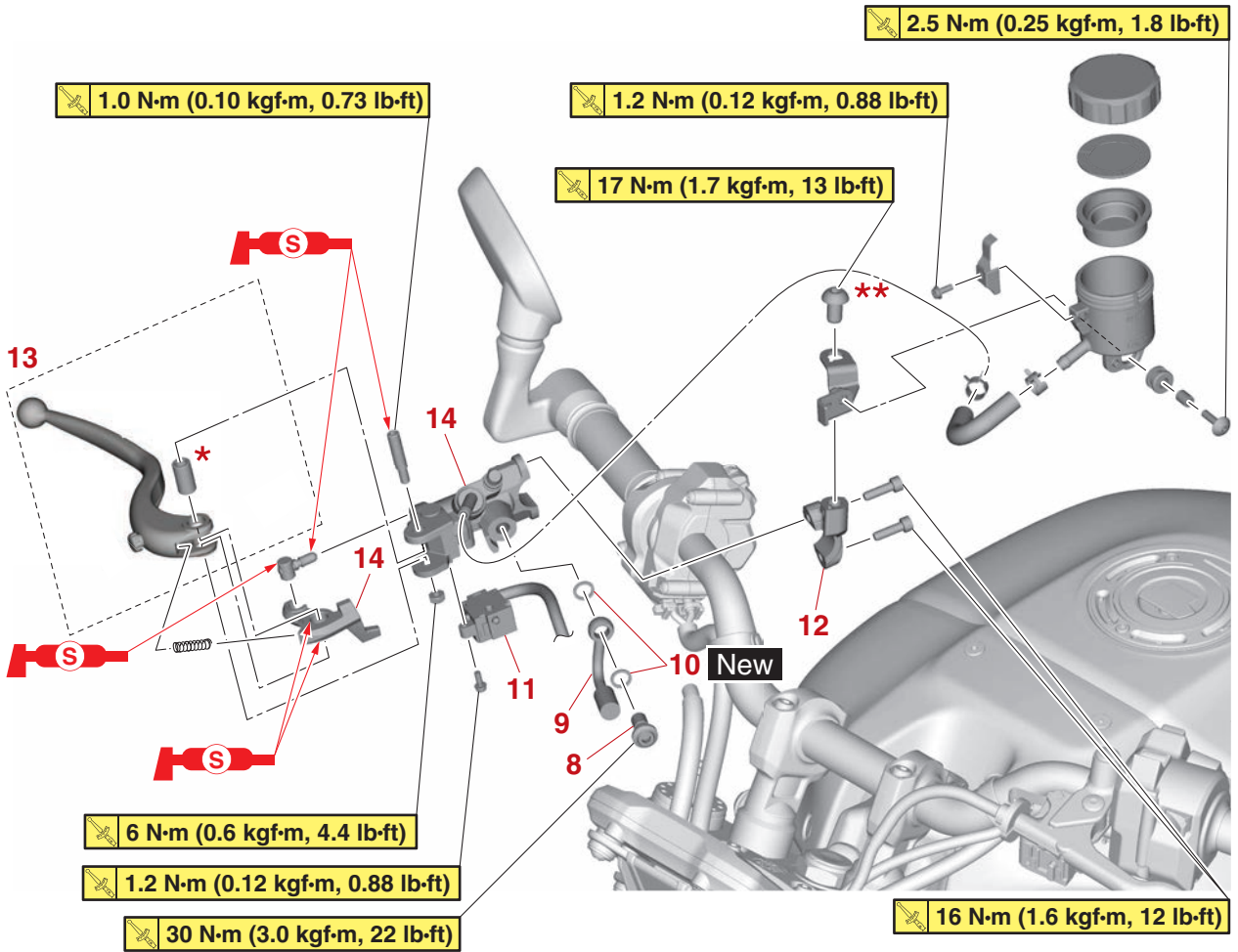
* This collar is press-fitted in the brake lever. When press-fitting the collar into the brake lever, press-fit it from the chamfered side where the collar mounting hole.

** Left-hand threads

Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-15.
1	Brake fluid reservoir cap stopper	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir bracket	1	
7	Brake fluid reservoir hose	1	

FRONT BRAKE

Removing the front brake master cylinder

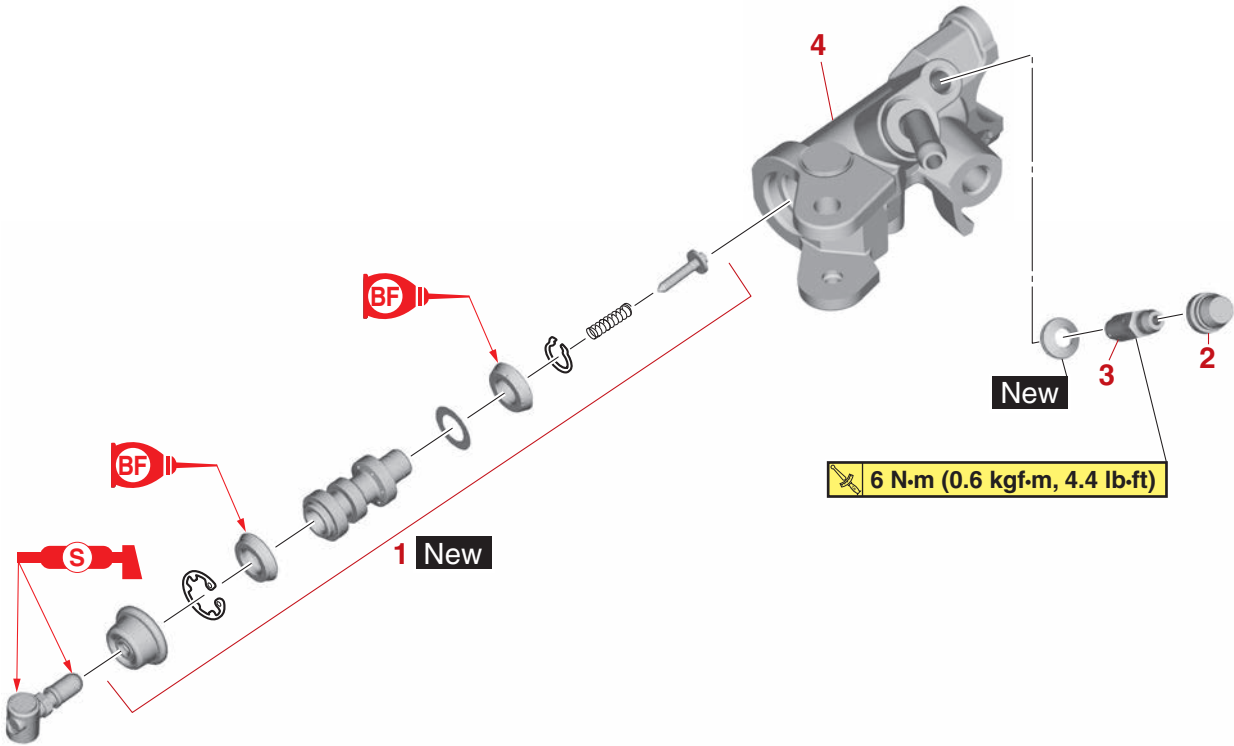


* This collar is press-fitted in the brake lever. When press-fitting the collar into the brake lever, press-fit it from the chamfered side where the collar mounting hole.
 ** Left-hand threads

Order	Job/Parts to remove	Q'ty	Remarks
8	Brake hose union bolt	1	
9	Brake hose	1	
10	Brake hose gasket	2	
11	Front brake light switch	1	
12	Front brake master cylinder holder	1	
13	Brake lever	1	
14	Front brake master cylinder	1	

FRONT BRAKE

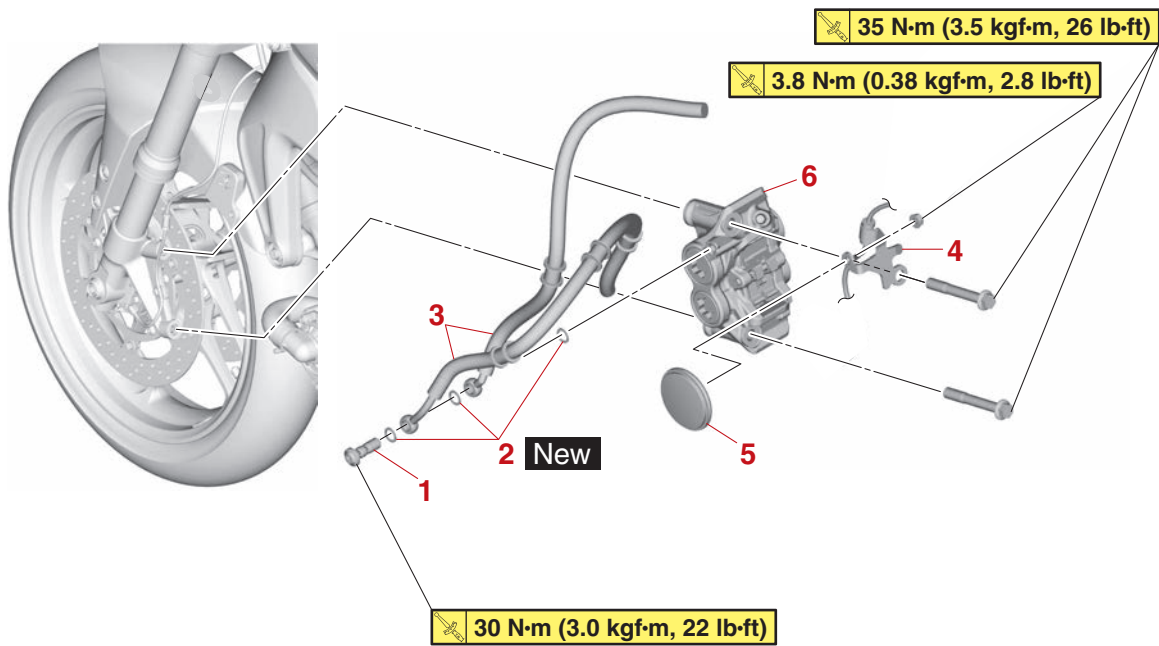
Disassembling the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake master cylinder kit	1	
2	Bleed screw	1	
3	Cap	1	
4	Brake master cylinder body	1	

FRONT BRAKE

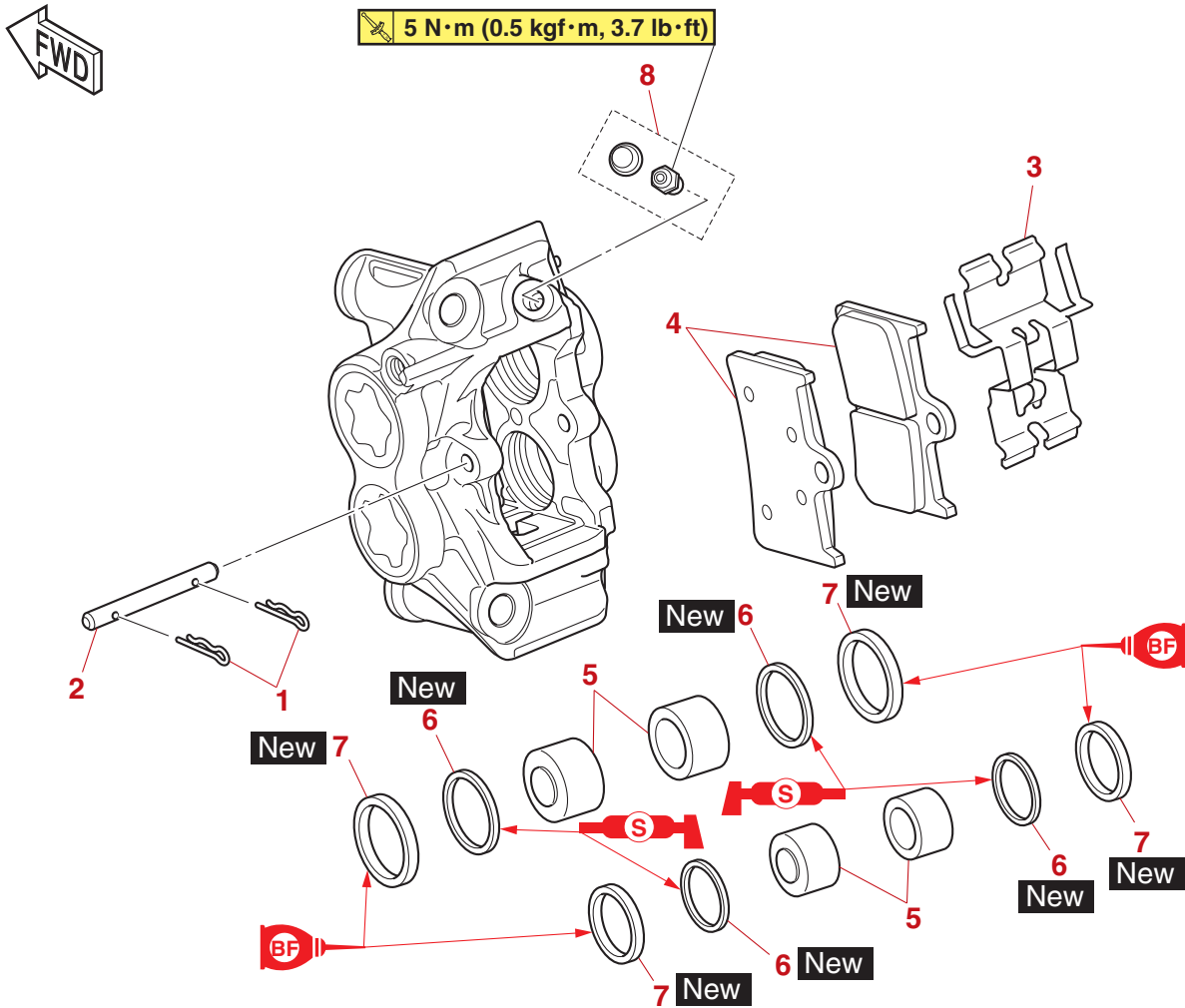
Removing the front brake calipers



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 3-15.
1	Brake hose union bolt	1	
2	Brake hose gasket	3	
3	Brake hose	2	
4	Reflector bracket	1	
5	Reflector	1	
6	Front brake caliper	1	

FRONT BRAKE

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 spilled 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

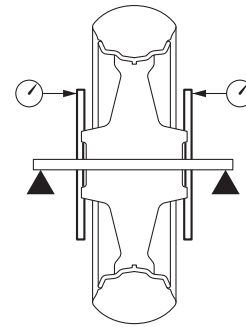
The following procedure applies to both brake discs.

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 4-12.



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

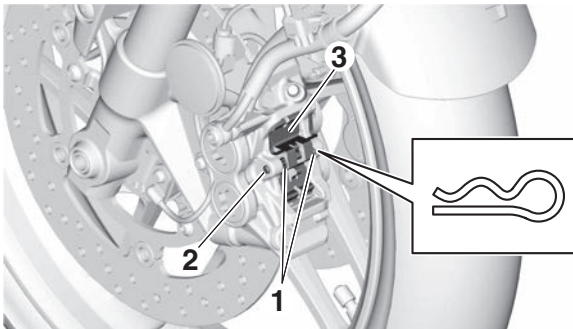
The following procedure applies to both brake calipers.

TIP

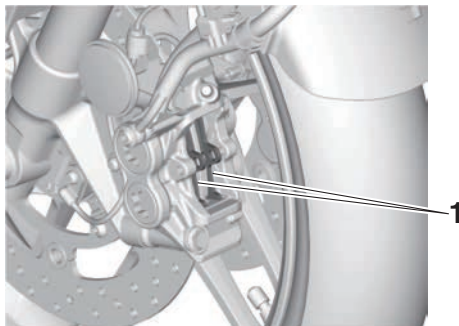
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

FRONT BRAKE

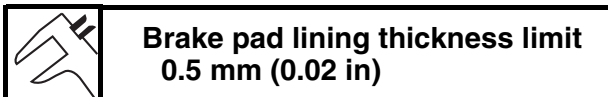
- Remove:
 - Brake pad clip "1"
 - Brake pad pin "2"
 - Brake pad spring "3"



- Remove:
 - Brake pad "1"



- 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)

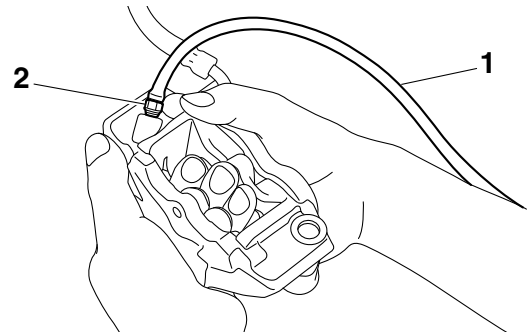


- Remove:
 - Brake caliper bolt
- Install:
 - Brake pad
 - Brake pad spring

TIP

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

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



- Tighten the bleed screw.

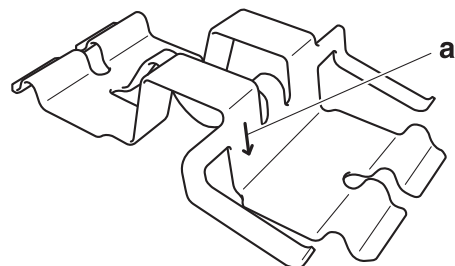


Brake caliper bleed screw
5 N·m (0.5 kgf·m, 3.7 lb·ft)

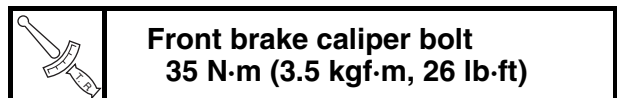
- Install the brake pads and brake pad spring.

TIP

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



- Install:
 - Brake pad pin
 - Brake pad clip
 - Front brake caliper



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

- 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 3-13.

8. Check:
- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-15.

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

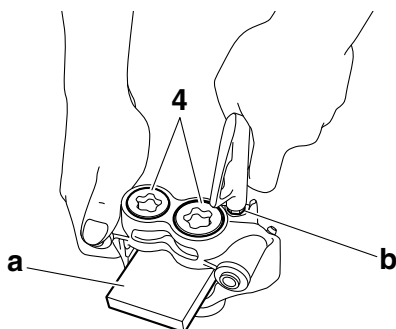
The following procedure applies to both of the brake calipers.

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

EWA13531

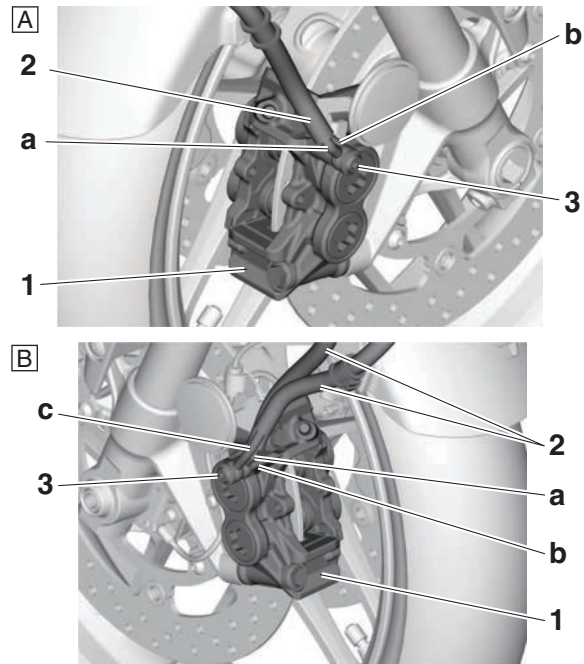
WARNING

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
35 N·m (3.5 kgf·m, 26 lb·ft)**

Refer to "REPLACING THE FRONT BRAKE PADS" on page 4-33.

4. Fill:

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



**Specified brake fluid
DOT 4**

EWA13590

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 3-15.
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 3-13.
7. Check:
 - Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-15.

EAS30179

REMOVING THE FRONT BRAKE MASTER CYLINDER

TIP

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

1. Remove:
 - 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
 - Front brake master cylinder holder “1”
 - Brake fluid reservoir bracket “2”

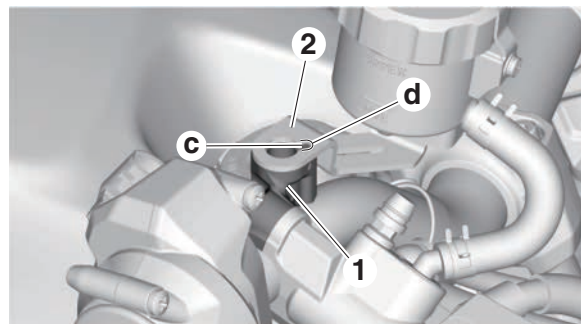
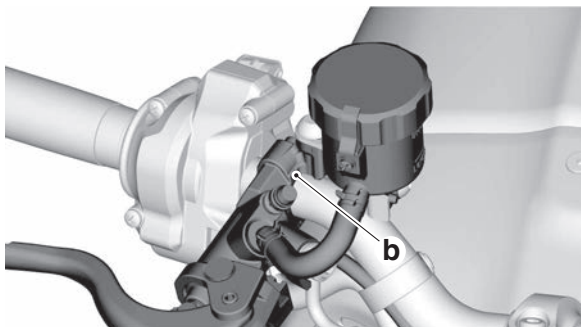
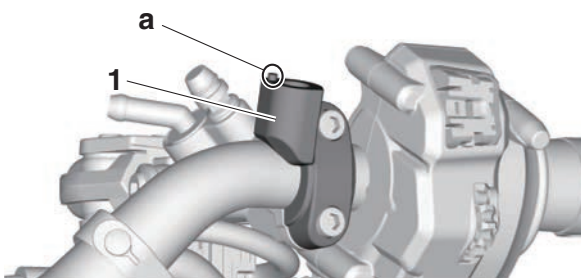


**Front brake master cylinder holder bolt
16 N·m (1.6 kgf·m, 12 lb·ft)**

FRONT BRAKE

TIP

- Install the front brake master cylinder holder with the pin “a” facing up.
- Align the end of the front brake master cylinder holder with the punch mark “b” on the handlebar.
- First, tighten the upper bolt, then the lower bolt.
- Align the pin “c” of the front brake master cylinder holder with the groove “d” of the brake fluid reservoir bracket.



2. Install:

- Brake hose gasket **New**
- Brake hose
- Brake hose union bolt



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

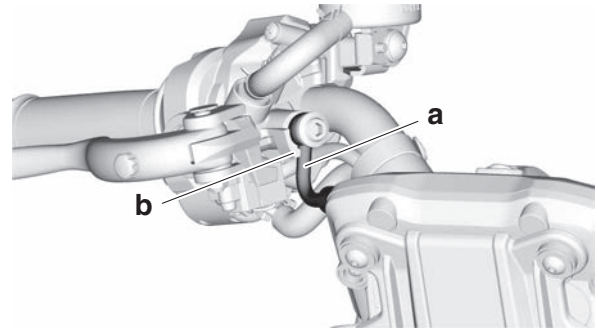
EWA13531

WARNING

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

TIP

- When installing the brake hose onto the master cylinder, make sure the brake pipe “a” touches the projection “b” on the master cylinder.
- 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 3-15.

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 3-13.

6. Check:

- Brake lever operation

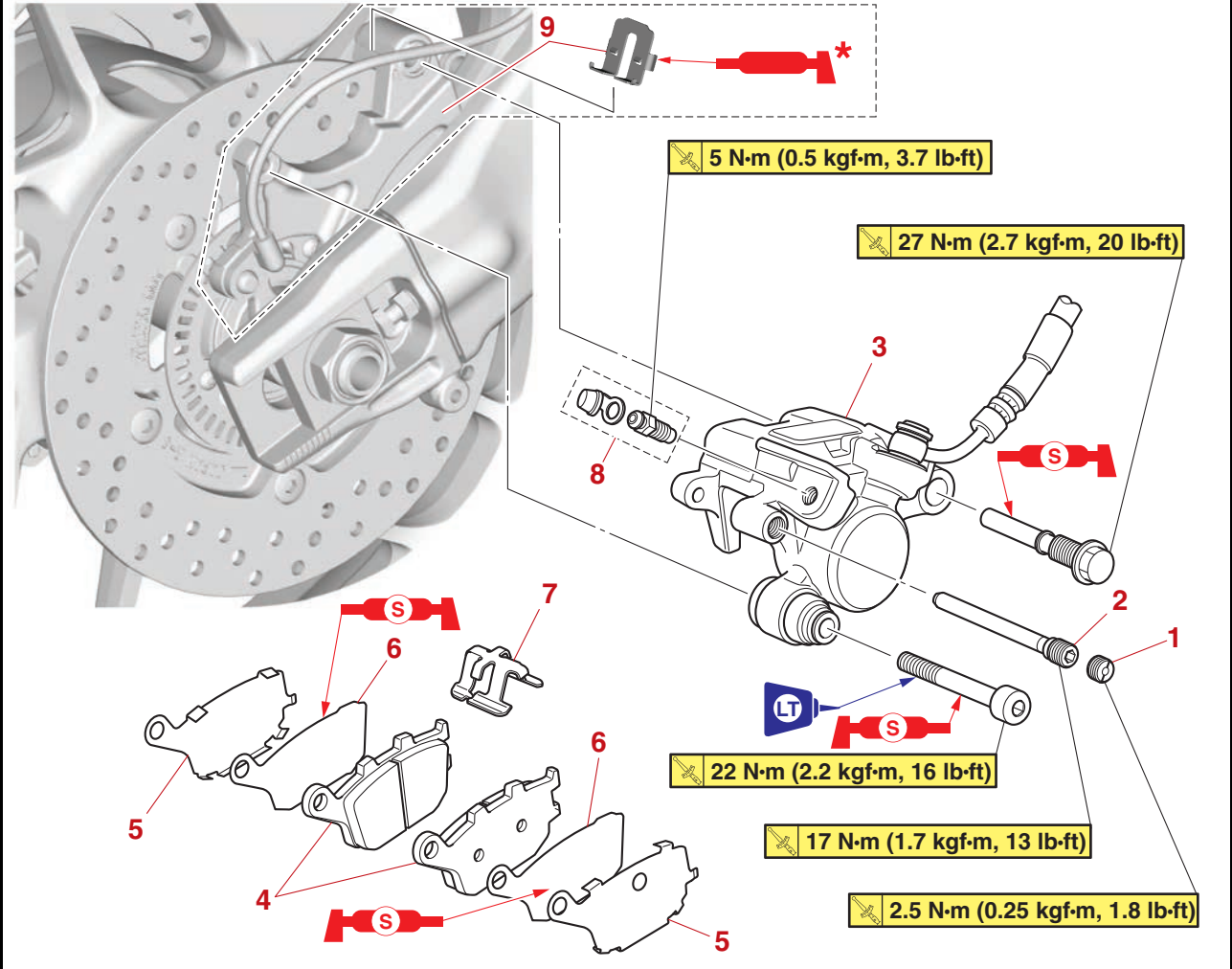
Soft or spongy feeling → Bleed the brake system.

Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-15.

EAS20031

REAR BRAKE

Removing the rear brake pads

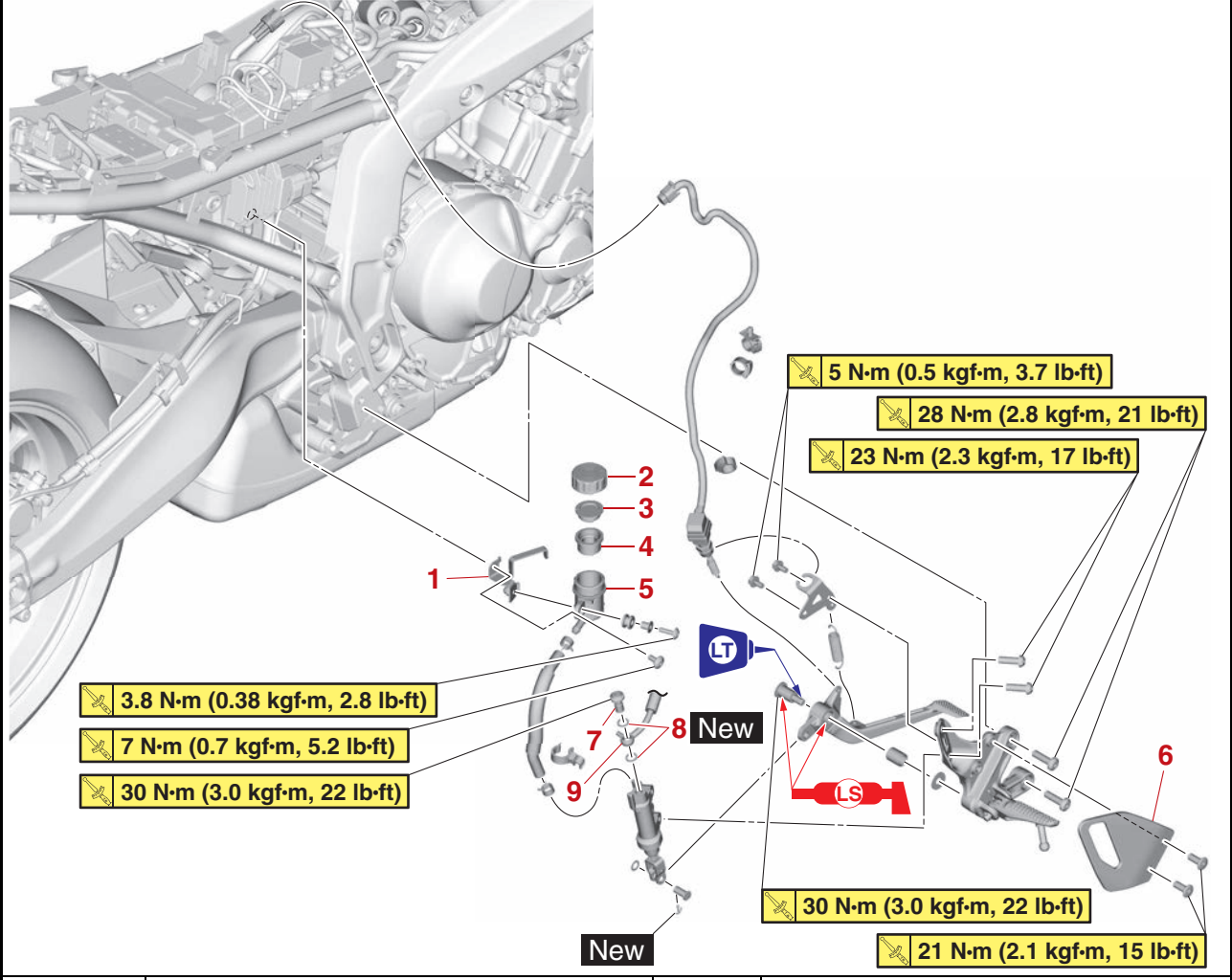


* Three Bond No. 1521.

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

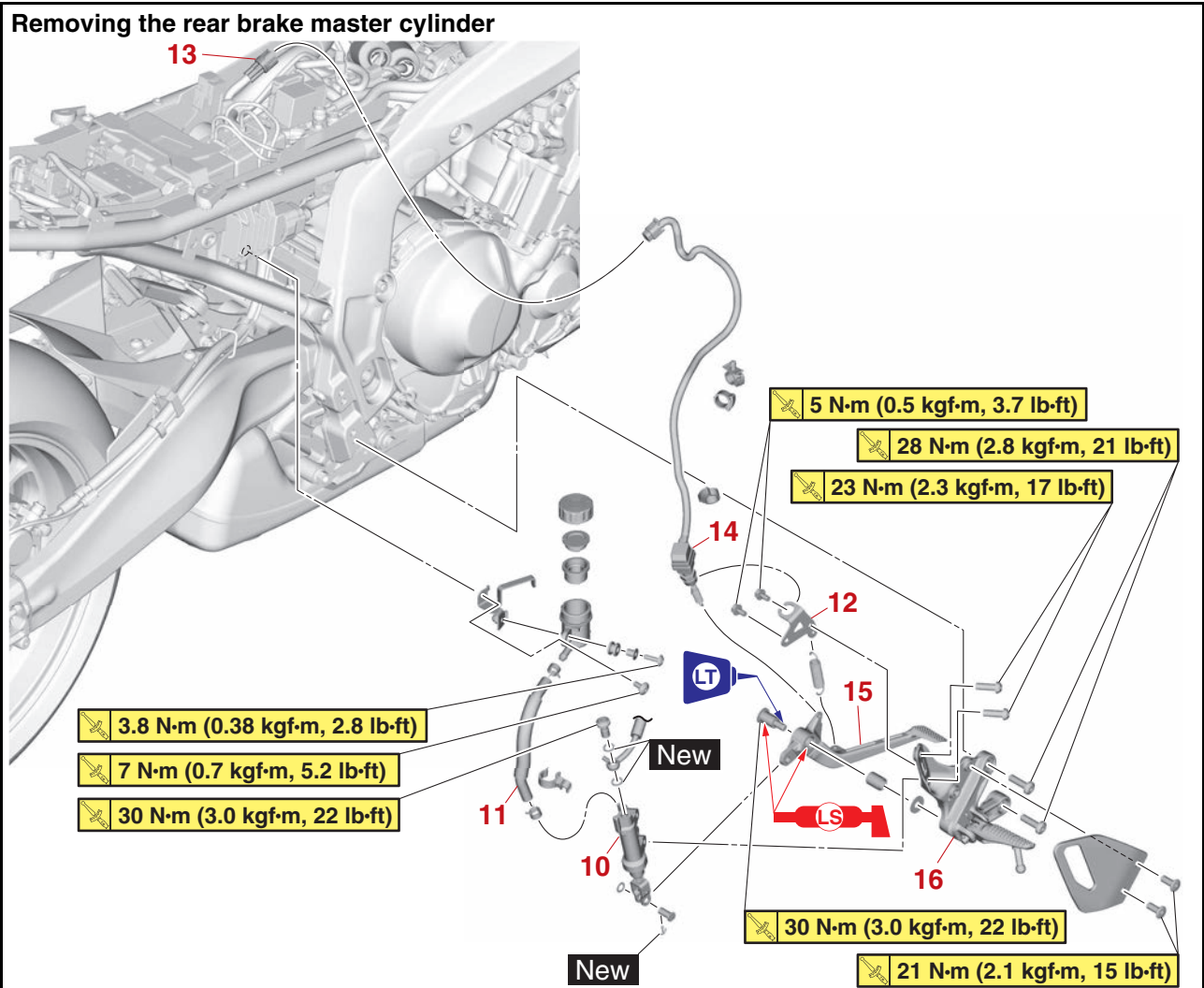
REAR BRAKE

Removing the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-15.
1	Brake fluid reservoir bracket	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	1	
7	Brake hose union bolt	1	
8	Brake hose gasket	2	
9	Brake hose	1	

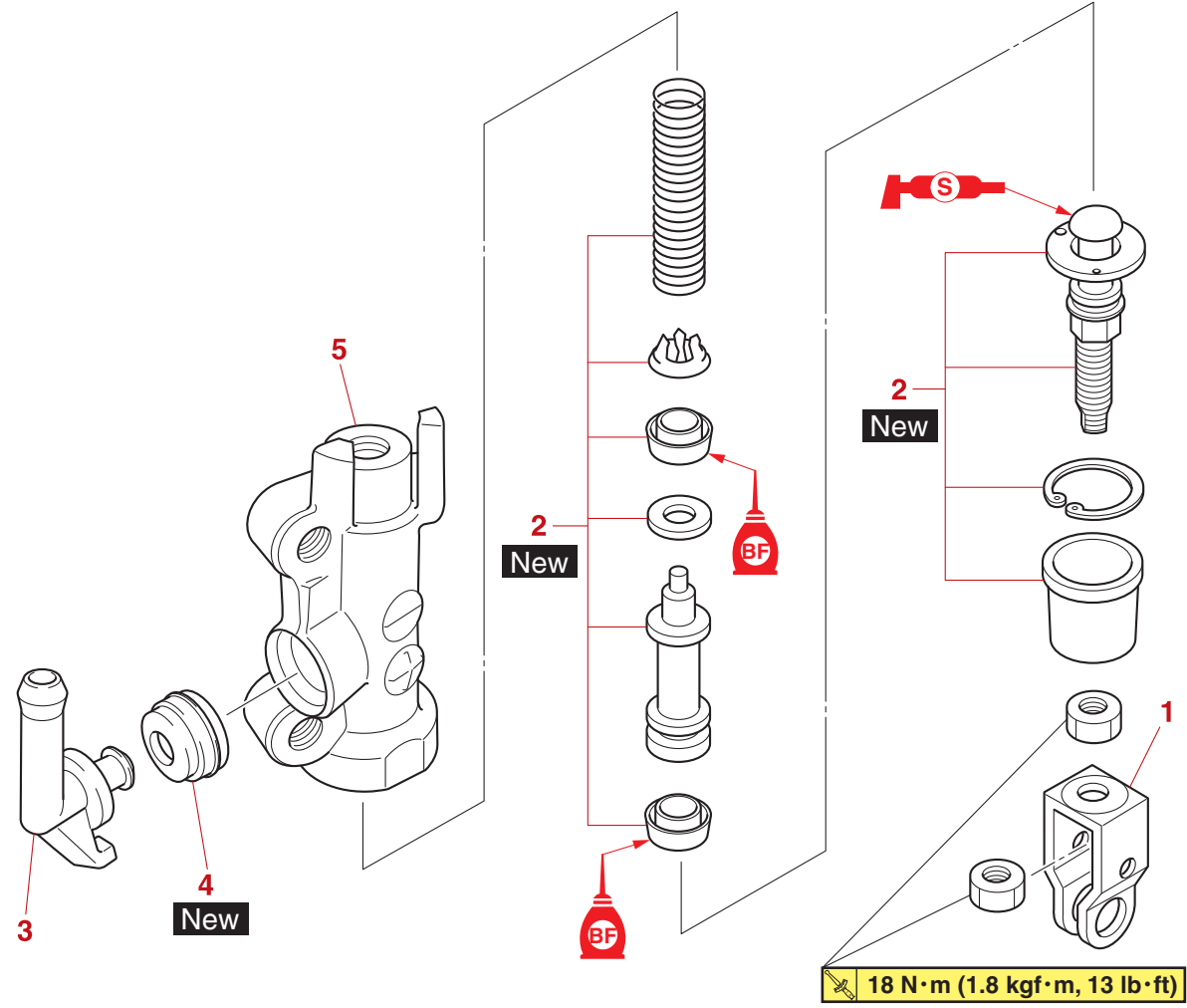
REAR BRAKE



Order	Job/Parts to remove	Q'ty	Remarks
10	Rear brake master cylinder assembly	1	
11	Brake fluid reservoir hose	1	
12	Rear brake light switch bracket	1	
13	Rear brake light switch coupler	1	Disconnect.
14	Rear brake light switch	1	
15	Brake pedal	1	
16	Footrest assembly	1	

REAR BRAKE

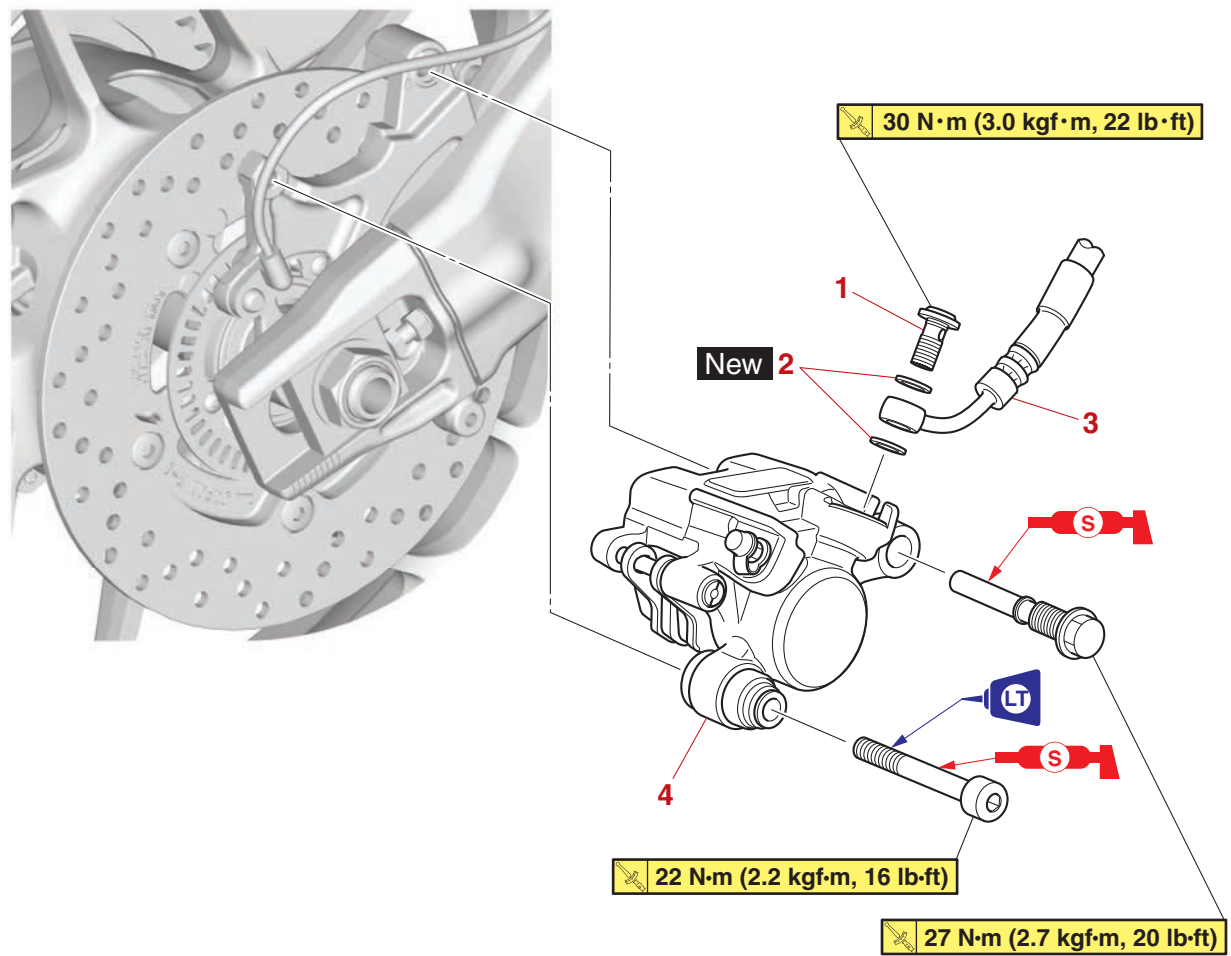
Disassembling the rear brake master cylinder



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	

REAR BRAKE

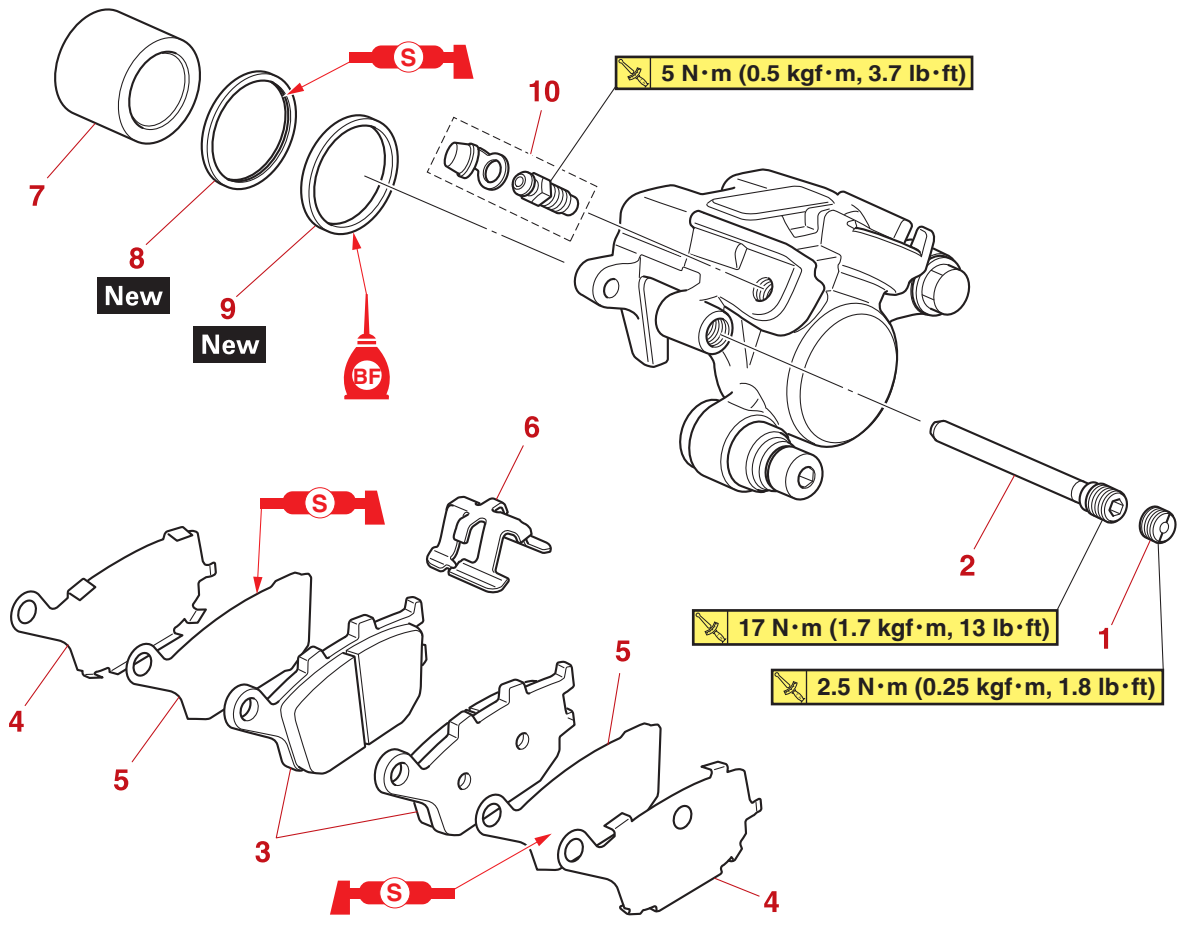
Removing the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-15.
1	Brake hose union bolt	1	
2	Brake hose gasket	2	
3	Brake hose	1	
4	Rear brake caliper	1	

REAR BRAKE

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	Bleed screw	1	

EAS33521

ADJUSTING THE FOOTREST POSITION

1. Check:
 - Footrest position

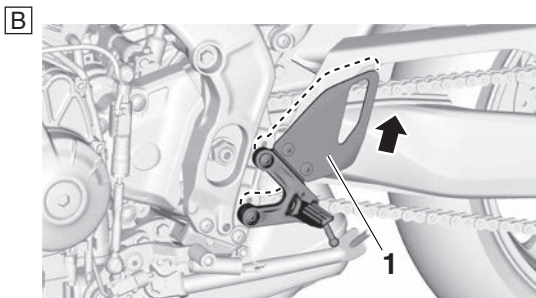
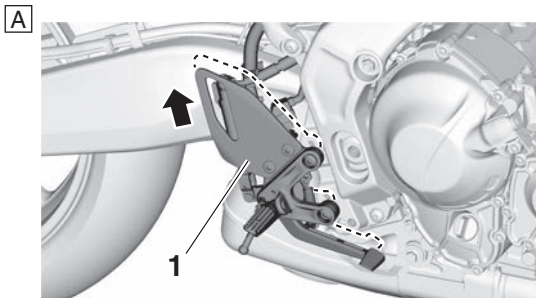
TIP

The rider footrests can be adjusted to one of two positions. From the factory, the footrests are in the low position.

2. Adjust:
 - a. Remove the footrest assembly (left and right) "1".
 - b. Adjust the footrest position (low or high position).
 - c. Install the footrest assembly (left and right).



Footrest assembly bolt
28 N·m (2.8 kgf·m, 21 lb·ft)



- A. Left side
 B. Right side

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 spilled 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. Check:
 - Rear brake disc
 Damage/galling → Replace.
2. Measure:
 - Brake disc runout
 Out of specification → Replace.
 Refer to "CHECKING THE FRONT BRAKE DISCS" on page 4-33.



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

3. 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 4-33.



Brake disc thickness limit
4.5 mm (0.18 in)

4. Replace:
- Brake disc
- Refer to "REAR WHEEL" on page 4-19.



Rear brake disc bolt
30 N·m (3.0 kgf·m, 22 lb·ft)
LOCTITE®

EAS30185

REPLACING THE REAR BRAKE PADS

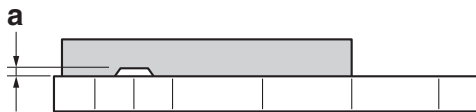
TIP

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)

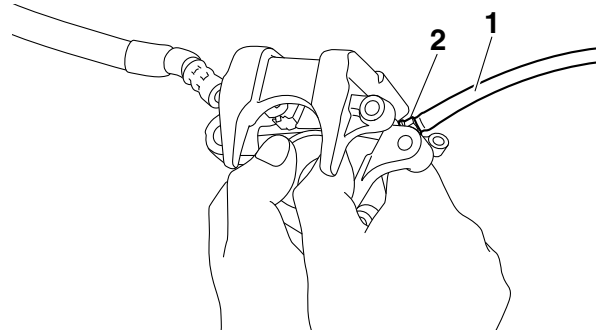


2. Install:
- Brake pad insulator
 - Brake pad shim (onto the brake pad)
 - Brake pad spring (into the rear brake caliper)
 - Brake pad

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.

TIP

Apply silicone grease between the brake pad insulator and brake pad shim.

ECA14150

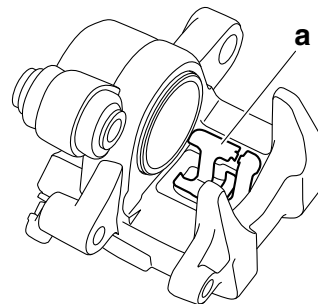
NOTICE

- 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



Recommended lubricant
Silicone grease

ECA14150

NOTICE

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

4. Install:

- Rear brake caliper
- Brake pad retaining bolt
- Screw plug



Rear brake caliper bolt (front)
27 N·m (2.7 kgf·m, 20 lb·ft)
Rear brake caliper bolt (rear)
22 N·m (2.2 kgf·m, 16 lb·ft)
LOCTITE®
Rear brake pad retaining bolt
17 N·m (1.7 kgf·m, 13 lb·ft)
Rear brake caliper 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 3-13.

6. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system. Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-15.

EAS30186

REMOVING THE REAR BRAKE CALIPER

TIP

Before disassembling 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.

EAS30187

DISASSEMBLING THE REAR BRAKE CALIPER

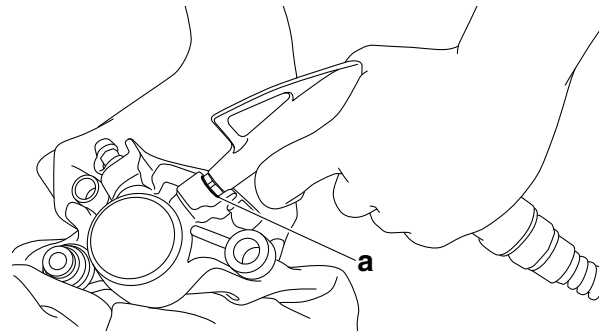
1. Remove:

- 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 passages (brake caliper body)
Obstruction → Blow out with compressed air.

EWA13601

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
- Rear brake caliper bracket retainer
Cracks/damage → Replace the rear brake caliper bracket assembly.
Refer to “REAR WHEEL” on page 4-19.

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:

- Brake caliper bracket retainer
- Rear brake caliper (temporarily)
- Brake hose gasket **New**
- Brake hose
- 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.

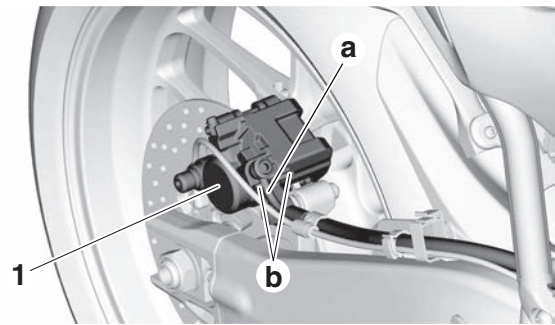
ECA19080

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
- Brake pad shim (onto the brake pad)
- Brake pad spring (into the rear brake caliper)
- Brake pad
- Rear brake caliper

Refer to “REPLACING THE REAR BRAKE PADS” on page 4-47.



Rear brake caliper bolt (front)
27 N·m (2.7 kgf·m, 20 lb·ft)

Rear brake caliper bolt (rear)
22 N·m (2.2 kgf·m, 16 lb·ft)
LOCTITE®

Rear brake pad retaining bolt
17 N·m (1.7 kgf·m, 13 lb·ft)

Rear brake caliper 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 3-15.
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 3-13.
7. Check:
 - Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-15.

EAS30193

REMOVING THE REAR BRAKE MASTER CYLINDER

1. 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.

EAS30194

CHECKING THE REAR BRAKE MASTER CYLINDER

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

EAS30195

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

EWA13520

WARNING

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



Specified brake fluid
DOT 4

1. Install:
 - Brake master cylinder kit **New**

EAS30196

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:
 - Brake hose gasket **New**
 - Brake hose
 - Brake fluid reservoir hose
 - Brake hose union bolt



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

EWA13531

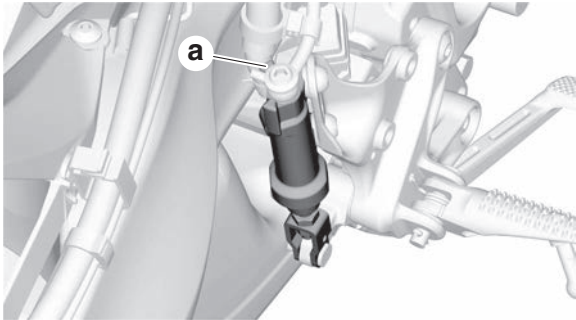
WARNING

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

ECA14160

NOTICE

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



2. 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.

3. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-15.

4. 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 3-13.

5. Adjust:

- Brake pedal position
Refer to “ADJUSTING THE REAR DISC BRAKE” on page 3-14.

6. Adjust:

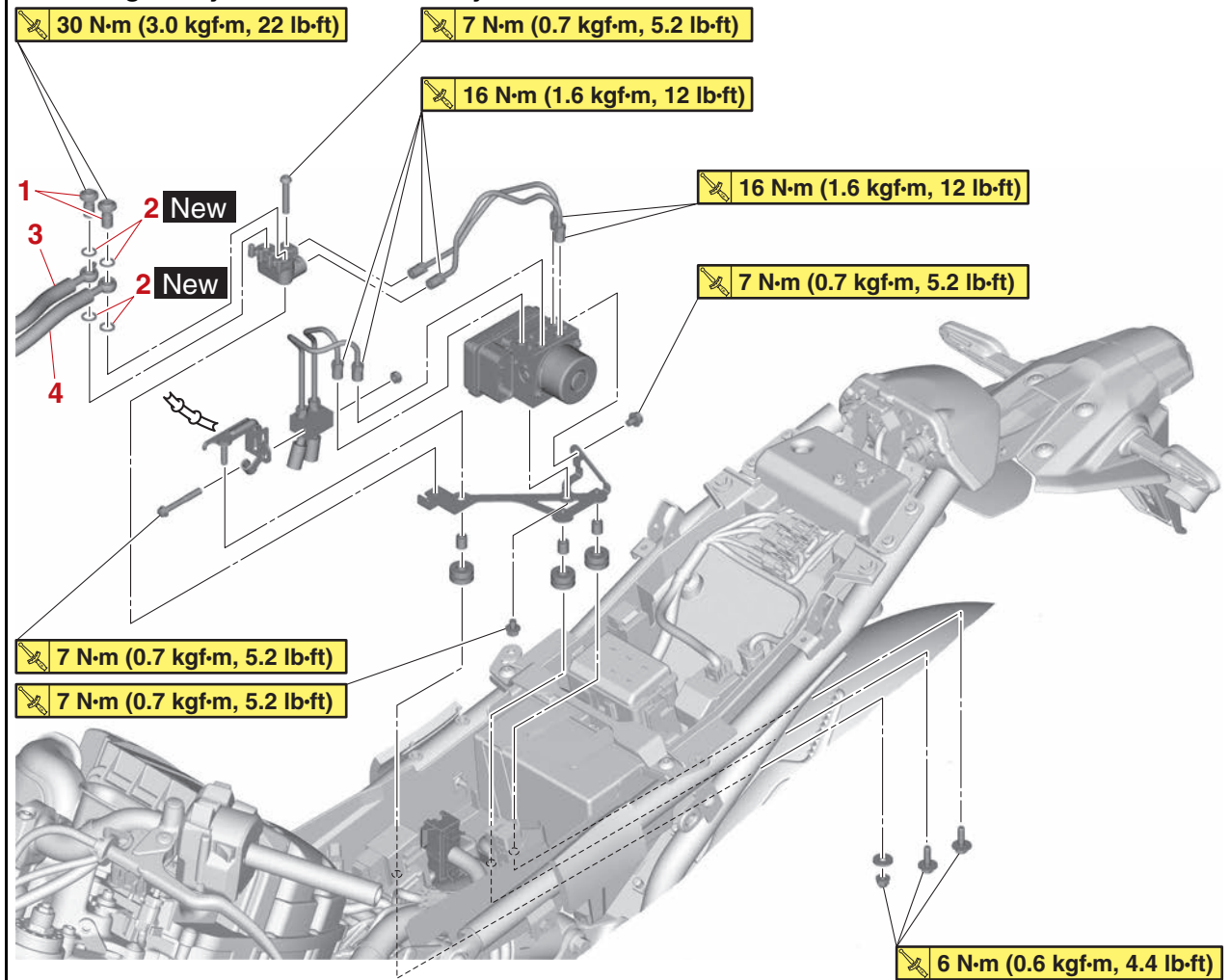
- Rear brake light operation timing
Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH” on page 3-30.

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS20032

ABS (ANTI-LOCK BRAKE SYSTEM)

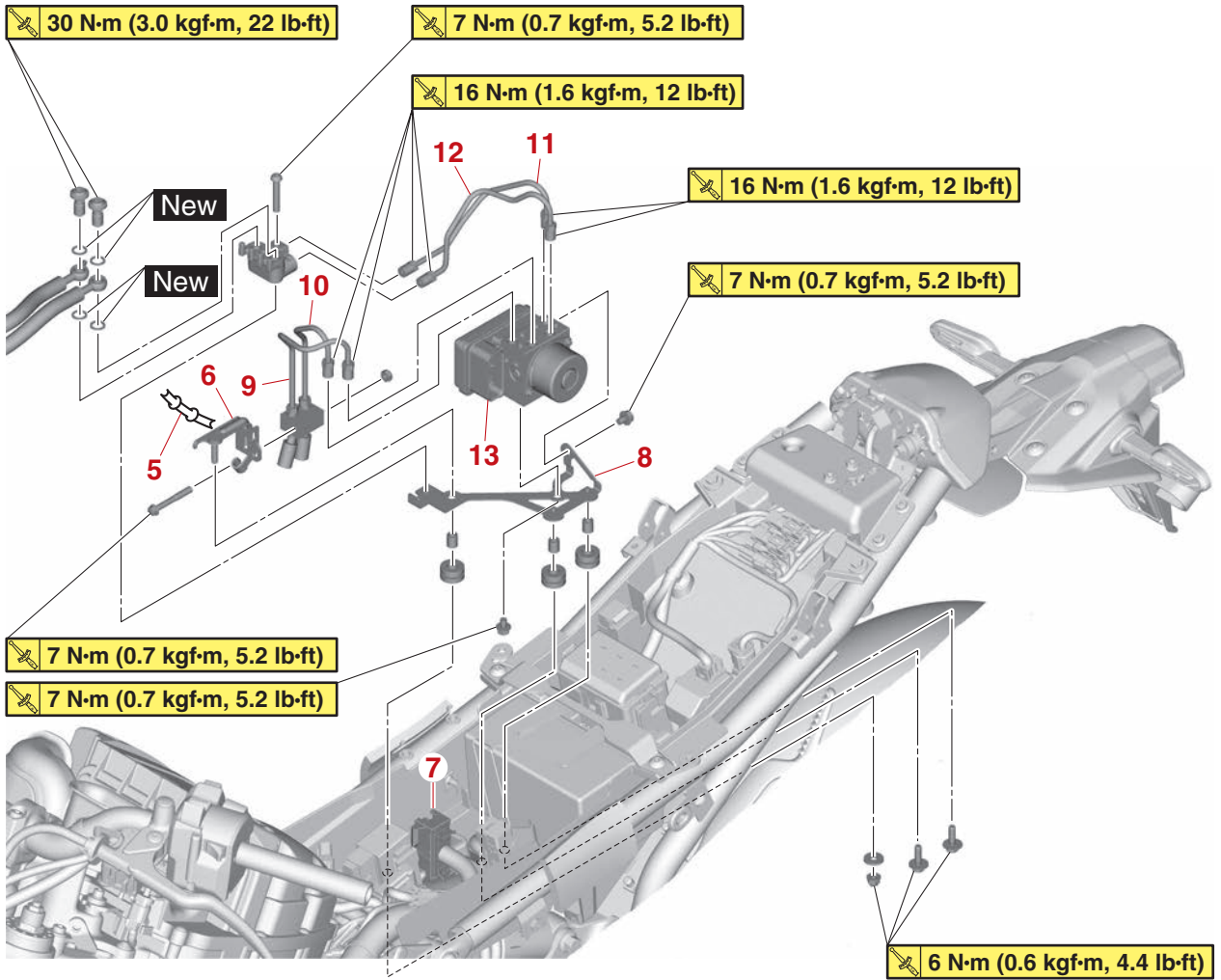
Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "GENERAL CHASSIS (5)" on page 4-11.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-6.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)" on page 3-15.
1	Brake hose union bolt	2	
2	Gasket	4	
3	Brake hose (hydraulic unit to front brake calipers)	1	Disconnect.
4	Brake hose (front brake master cylinder to hydraulic unit)	1	Disconnect.

ABS (ANTI-LOCK BRAKE SYSTEM)

Removing the hydraulic unit assembly



Order	Job/Parts to remove	Q'ty	Remarks
5	Rear wheel sensor lead	1	
6	Bracket	1	
7	ABS ECU coupler	1	Disconnect.
8	Hydraulic unit bracket	1	
9	Hydraulic unit brake pipe (rear brake master cylinder to hydraulic unit)	1	Disconnect.
10	Hydraulic unit brake pipe (hydraulic unit to rear brake caliper)	1	Disconnect.
11	Hydraulic unit brake pipe (hydraulic unit to front brake calipers)	1	
12	Hydraulic unit brake pipe (front brake master cylinder to hydraulic unit)	1	
13	Hydraulic unit assembly	1	

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS30197

REMOVING THE HYDRAULIC UNIT ASSEMBLY

ECA21091

NOTICE

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

EWA13930

WARNING

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

ECA18241

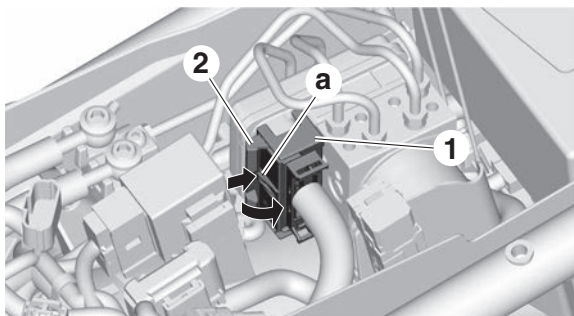
NOTICE

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

1. Disconnect:
 - ABS ECU coupler “1”

TIP

While pushing the portion “a” of the ABS ECU coupler, 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.
- Do not bend the brake pipe when loosening the brake pipe flare nuts.

ECA19800

NOTICE

- When removing the brake hoses and brake pipes, cover the area around the hydraulic unit assembly to catch any spilt brake fluid. Do not allow the brake fluid to contact other parts.
- Before disconnecting the brake pipes from the hydraulic unit assembly, do not lift up or move the brake pipes.

3. Remove:
 - Hydraulic unit assembly “1”

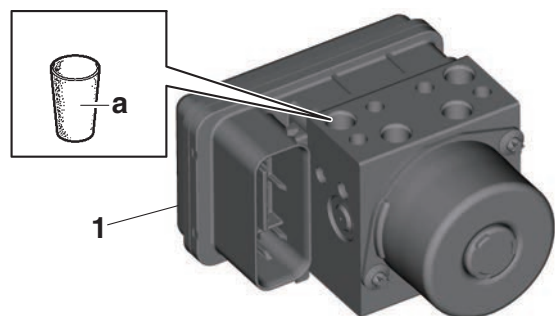
TIP

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 × 1.0) into each brake hose union bolt hole.

ECA19810

NOTICE

When using a bolt, do not tighten the bolt until the bolt head touches the hydraulic unit. Otherwise, the brake pipe seating surface could be deformed.



EAS30198

CHECKING THE HYDRAULIC UNIT ASSEMBLY

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

ABS (ANTI-LOCK BRAKE SYSTEM)

EAS30935

CHECKING THE BRAKE PIPES

The following procedure applies to all of the brake pipes.

1. Check:
 - Brake pipe end (flare nut)
Damage → Replace the hydraulic unit assembly, brake pipes, and related parts as a set.

EAS30200

INSTALLING THE HYDRAULIC UNIT ASSEMBLY

1. Install:
 - Hydraulic unit assembly

ECA21371

NOTICE

Do not remove the rubber plugs or bolts (M10 × 1.0) installed in the brake hose union bolt holes before installing the hydraulic unit assembly.

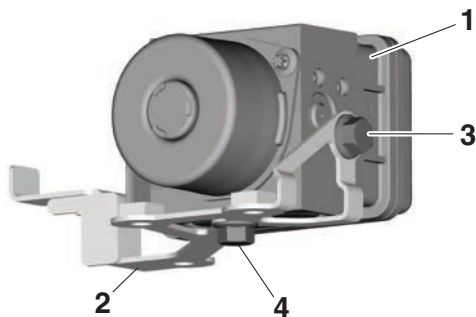
TIP

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

- a. Install the hydraulic unit assembly "1" on the hydraulic unit bracket "2".
- b. Tighten the hydraulic unit assembly bolt "3", and bolt "4" to the specified torque in this order.



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



2. Remove:
 - Rubber plugs or bolt (M10 × 1.0)
3. Install:
 - Hydraulic unit brake pipe

4. Tighten:
 - Hydraulic unit brake pipe flare nut



**Hydraulic unit brake pipe flare nut
16 N·m (1.6 kgf·m, 12 lb·ft)**

ECA19820

NOTICE

If the brake pipe flare nut does not turn easily, replace the hydraulic unit assembly, brake pipes, and related parts as a set.

TIP

Do not bend the brake pipe when tightening the brake pipe flare nuts.

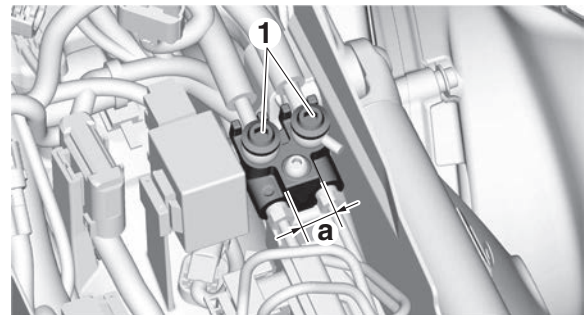
5. Install:
 - Gasket **New**
 - Brake hose union bolt "1"
 - Brake hose
Refer to "CABLE ROUTING" on page 2-13.

TIP

After holding the protrusion "a" (17 mm (0.67 in)) on the brake hose joint with an appropriate tool, tighten the brake hose union bolts to the specified torque.



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

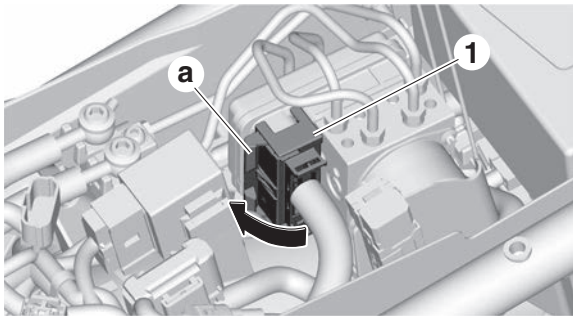


6. Connect:
 - ABS ECU coupler "1"

TIP

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

ABS (ANTI-LOCK BRAKE SYSTEM)



7. Fill:

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



**Specified brake fluid
DOT 4**

EWA17280

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 or 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.

8. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM (ABS)” on page 3-15.

9. 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 4-56.)

ECA14770

NOTICE

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

10. Delete the DTC. (Refer to “SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE” on page 9-43.)

11. Perform a trial run. (Refer to “CHECKING THE ABS WARNING LIGHT” on page 4-59.)

EAS30930

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:

- Rider seat
- Bracket

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**

ABS (ANTI-LOCK BRAKE SYSTEM)

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).



Yamaha diagnostic tool USB
90890-03267
Yamaha diagnostic tool (A/I)
90890-03264

TIP

- Yamaha diagnostic tool (A/I) (90890-03264) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

Refer to “YDT” on page 9-3.

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

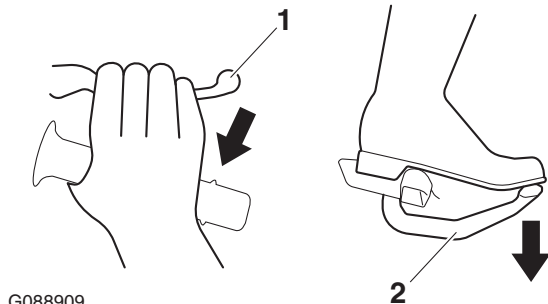
TIP

- The hydraulic unit operates 1 second after the brake lever and brake pedal are operated simultaneously and continues for approximately 5 seconds.
- The operation of the hydraulic unit can be confirmed using the indicator.

On: The hydraulic unit is operating.

Flashing: The conditions for operating the hydraulic unit have not been met.

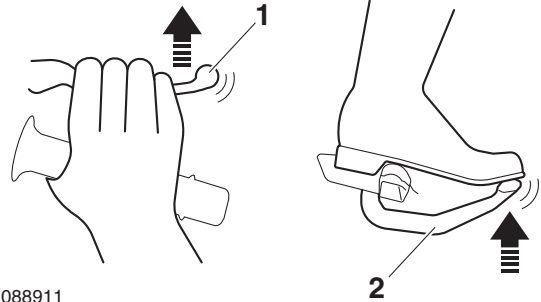
Off: The brake lever and brake pedal are not being operated.



G088909

9. Check:

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



G088911

TIP

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

ECA17371

NOTICE

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

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

ABS reaction-force confirmation

EWA13120

WARNING

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

TIP

- For the ABS reaction-force confirmation, use the diagnosis of function of the 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.

ABS (ANTI-LOCK BRAKE SYSTEM)

1. Place the vehicle on a maintenance stand.
2. Turn the main switch to "OFF".
3. Remove:
 - Rider seat
 - BracketRefer to "GENERAL CHASSIS (1)" on page 4-1.
4. Check:
 - Battery voltageLower 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).



**Yamaha diagnostic tool USB
90890-03267**
**Yamaha diagnostic tool (A/I)
90890-03264**

TIP

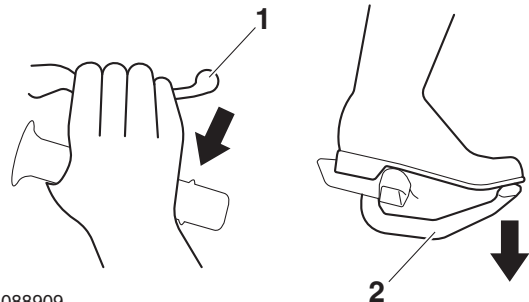
- Yamaha diagnostic tool (A/I) (90890-03264) includes YDT sub harness (6P) (90890-03266).
- If you already have Yamaha diagnostic tool (A/I) (90890-03262), YDT sub harness (6P) (90890-03266) is separately required.

Refer to "YDT" on page 9-3.

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

TIP

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

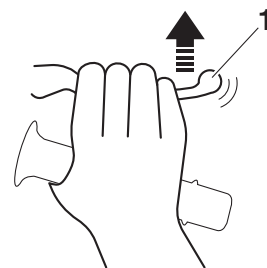


G088909

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

TIP

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



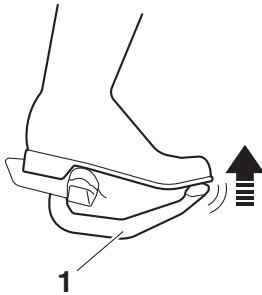
G088913

ABS (ANTI-LOCK BRAKE SYSTEM)

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

TIP

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



G088914

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

TIP

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

ECA17371

NOTICE

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

12. Turn the main switch to "OFF".

13. Remove the YDT from the YDT coupler, and then install the protective cap.

14. Turn the main switch to "ON".

15. Set the stop/run/start switch to "○".

16. Check for brake fluid leakage around the hydraulic unit.

Brake fluid leakage → Replace the hydraulic unit, brake pipes, and related parts as a set.

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

EAS30202

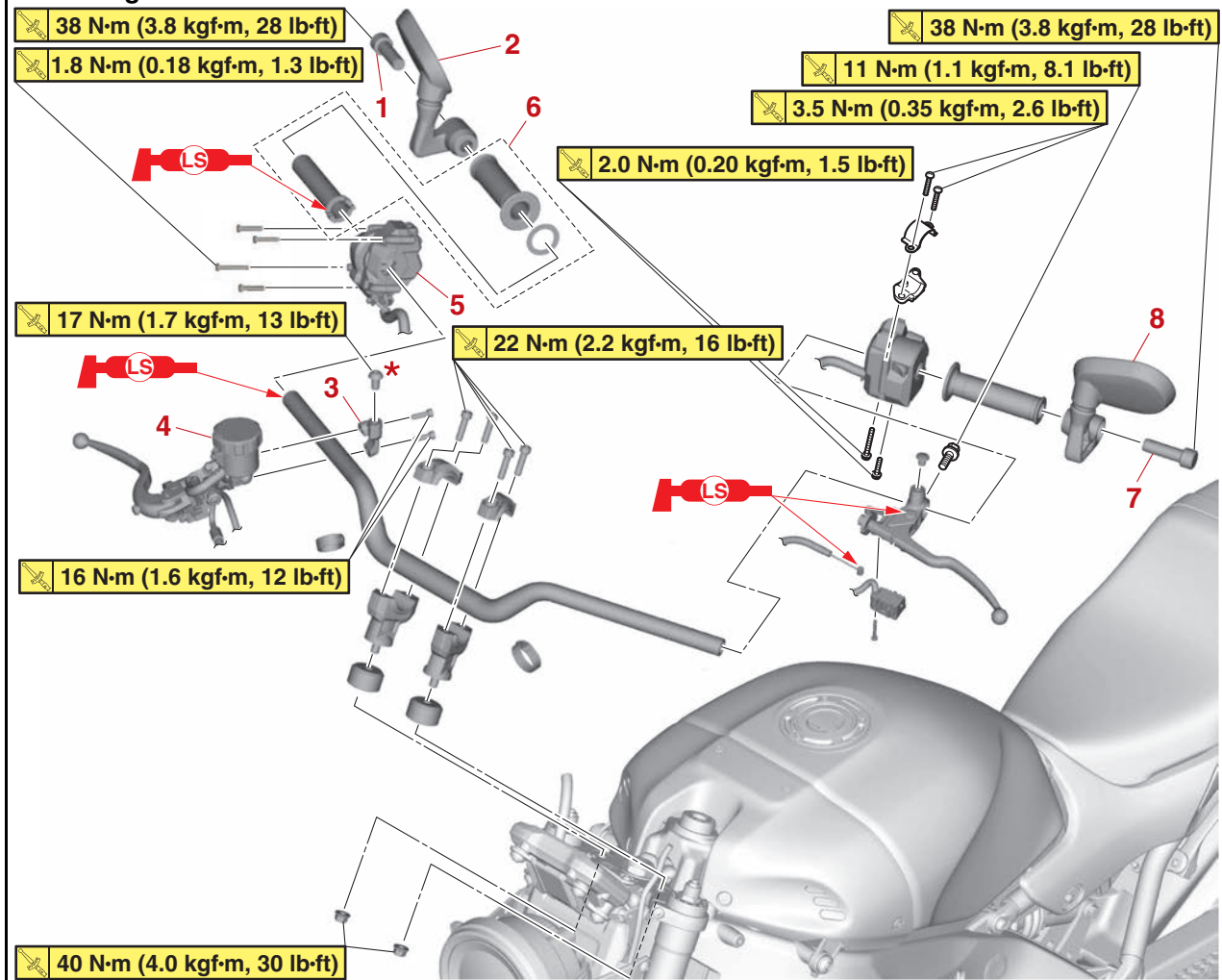
CHECKING THE ABS WARNING LIGHT

After all checks and servicing are completed, ensure that the ABS warning light goes off by walking the vehicle at a speed of faster than 5 km/h (3 mi/h) or performing a trial run.

EAS20033

HANDLEBAR

Removing the handlebar

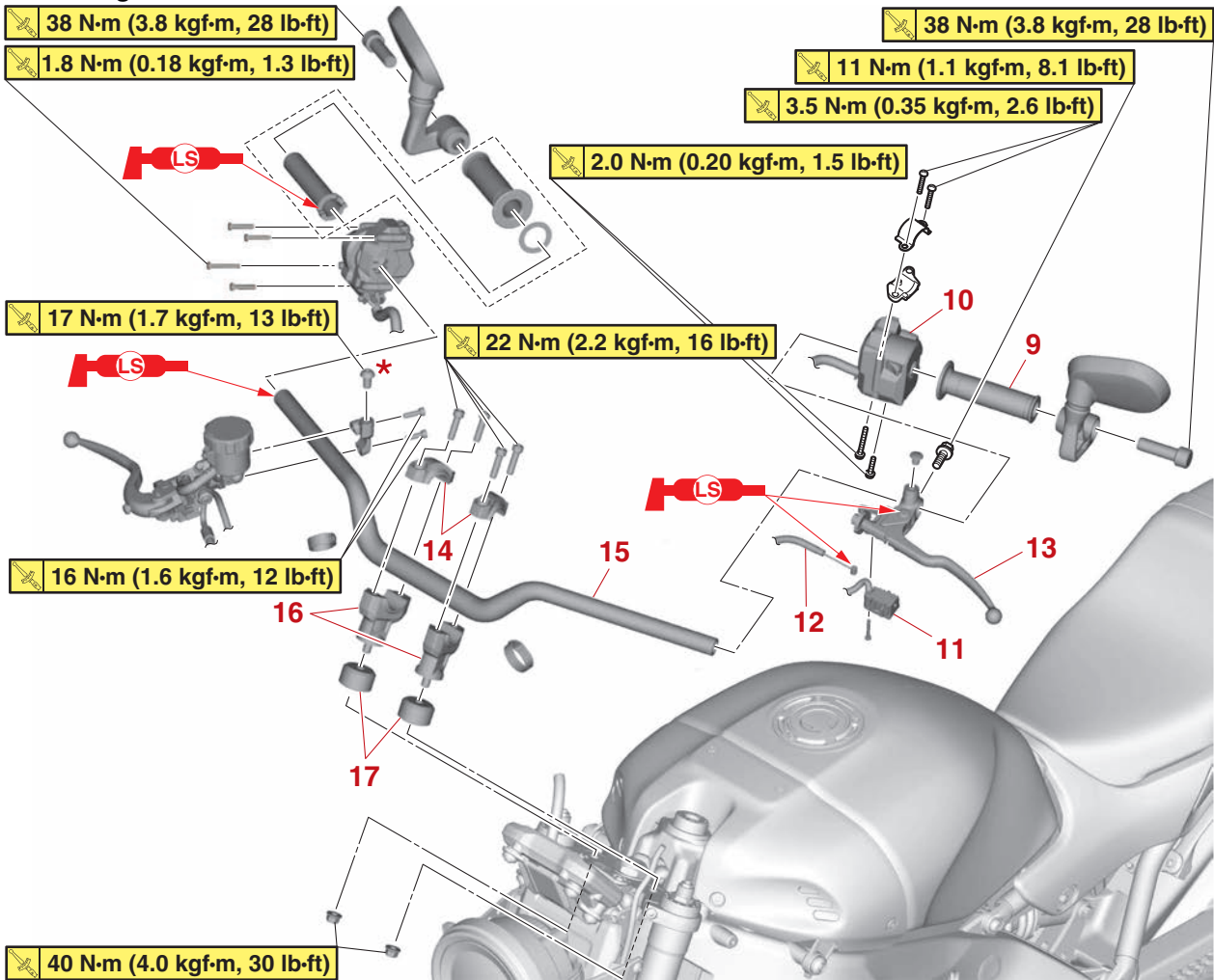


* Left-hand threads

Order	Job/Parts to remove	Q'ty	Remarks
1	Rearview mirror bolt (right)	1	
2	Rearview mirror (right)	1	
3	Front brake master cylinder holder	1	
4	Front brake master cylinder assembly	1	
5	Handlebar switch (right)	1	
6	Throttle grip	1	
7	Rearview mirror bolt (left)	1	
8	Rearview mirror (left)	1	

HANDLEBAR

Removing the handlebar



* Left-hand threads

Order	Job/Parts to remove	Q'ty	Remarks
9	Handlebar grip	1	
10	Handlebar switch (left)	1	
11	Clutch switch	1	
12	Clutch cable	1	
13	Clutch lever holder	1	
14	Upper handlebar holder	2	
15	Handlebar	1	
16	Lower handlebar holder	2	
17	Collar	2	

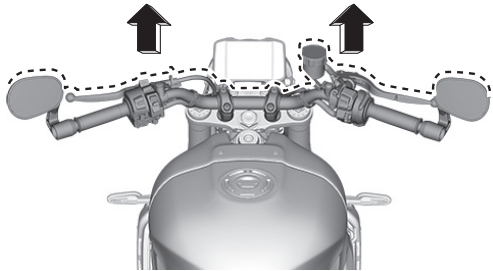
EAS31396

ADJUSTING THE HANDLEBAR POSITION

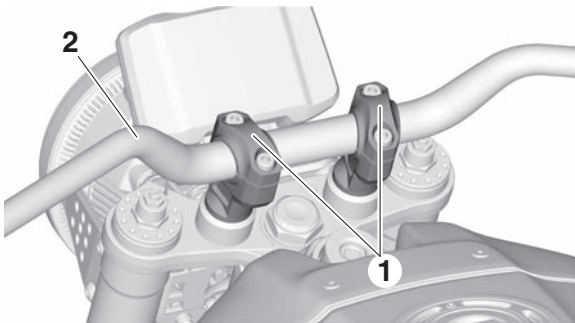
1. Check:
 - Handlebar position

TIP

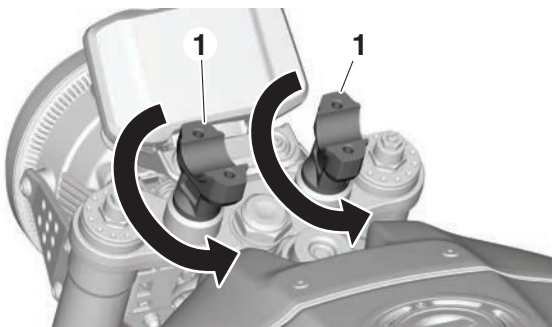
The handlebar position can be adjusted in two positions to suit the rider's preference.



2. Adjust:
 - Handlebar position
 - a. Remove the upper handlebar holders "1" and handlebar "2".



- b. Loosen the lower handlebar holder nuts.
- c. Adjust the handlebar position by rotating both of the lower handlebar holders "1" in 180°.



- d. Install the handlebar "1" and upper handlebar holders "2".



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

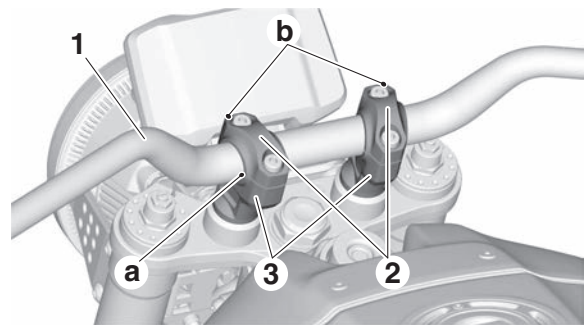
ECA18300

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 with the left side upper surface of the lower handlebar holder (left) "3".
- The upper handlebar holders should be installed with the punch marks "b" facing forward.



- e. Tighten the lower handlebar holder nuts.



Lower handlebar holder nut
40 N·m (4.0 kgf·m, 30 lb-ft)

EAS30203

REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

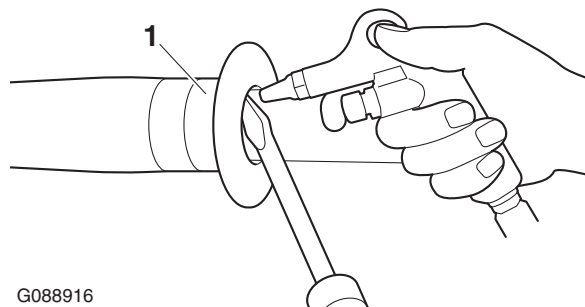
WARNING

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 (left) and the handlebar grip, and gradually push the grip off the handlebar.



G088916

HANDLEBAR

EAS30204

CHECKING THE HANDLEBAR

- 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

- Stand the vehicle on a level surface.

EWA13120

WARNING

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

- Install:
 - Collar
 - Lower handlebar holder (temporarily)
 - Handlebar “1”
 - Upper handlebar holder “2”



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

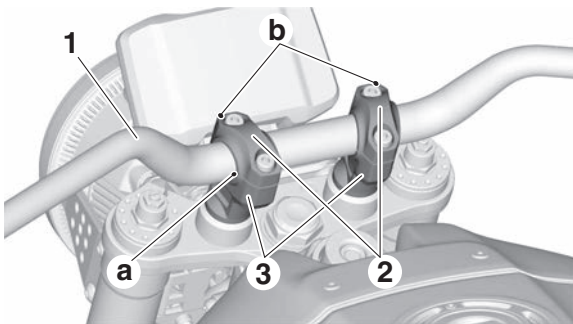
ECA18300

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 with the left side upper surface of the lower handlebar holder (left) “3”.
- The upper handlebar holders should be installed with the punch marks “b” facing forward.



- Tighten:
 - Lower handlebar holder nut



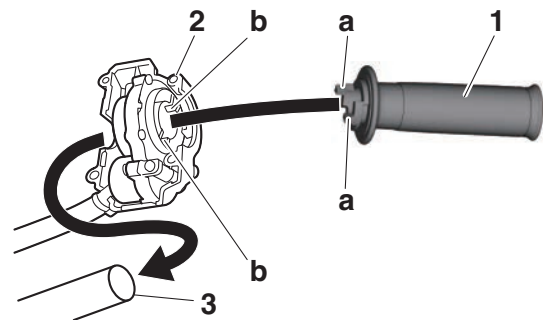
Lower handlebar holder nut
40 N·m (4.0 kgf·m, 30 lb·ft)

- Install:
 - Handlebar switch (right)
 - Throttle grip
 - Rearview mirror (right)

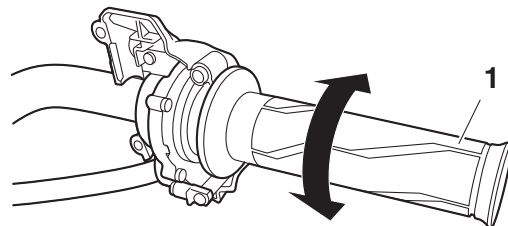


Handlebar switch screw (handlebar switch (right))
3.5 N·m (0.35 kgf·m, 2.6 lb·ft)
Rearview mirror bolt (right)
38 N·m (3.8 kgf·m, 28 lb·ft)

- Fit the slot “a” in the throttle grip “1” into the projection “b” in the handlebar switch (right, front side) “2” and the throttle grip onto the handlebar “3”.



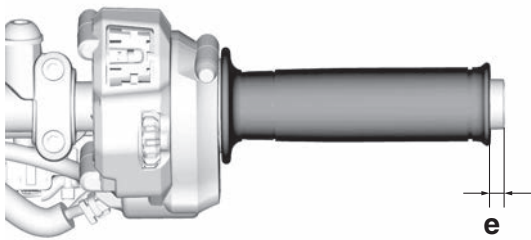
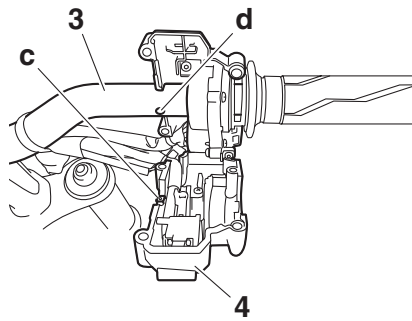
- Make sure that the throttle grip “1” turns smoothly.



- Install the handlebar switch (right, rear side) “4”.

TIP

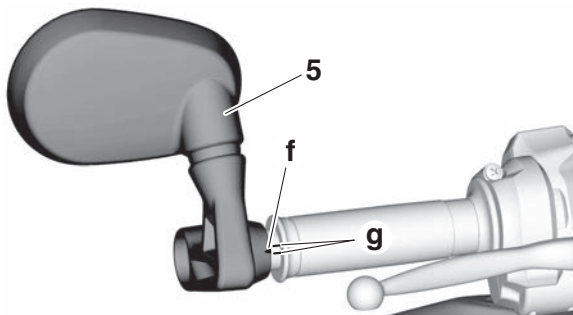
- Align the projection “c” on the handlebar switch (right, rear side) with the hole “d” in the handlebar “3”.
- There should be 4–6 mm (0.16–0.24 in) of clearance “e” between the throttle grip and the handlebar end.



d. Install the rearview mirror (right) "5".

TIP

When installing the rearview mirror, align the mark "f" on the rearview mirror with the between lines mark "g" on the handlebar, as shown in the figure.



5. Install:

- Front brake master cylinder assembly
Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER" on page 4-37.

6. Install:

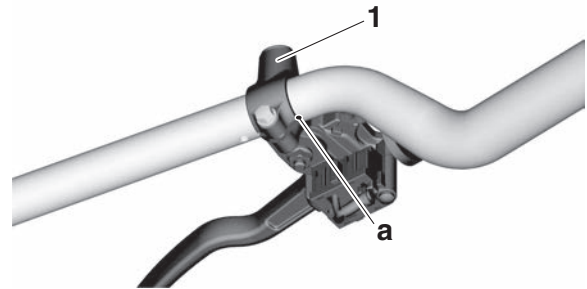
- Clutch lever holder "1"
- Clutch cable



Clutch lever holder pinch bolt
11 N·m (1.1 kgf·m, 8.1 lb·ft)

TIP

Align the center of slit on the clutch lever holder with the punch mark "a" on the handlebar.



7. Install:

- Handlebar grip
- Rearview mirror (left)



Rearview mirror bolt (left)
38 N·m (3.8 kgf·m, 28 lb·ft)

- Apply a thin coat of rubber adhesive onto the end of the handlebar (left).
- Slide the handlebar grip over the end of the handlebar (left).
- 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

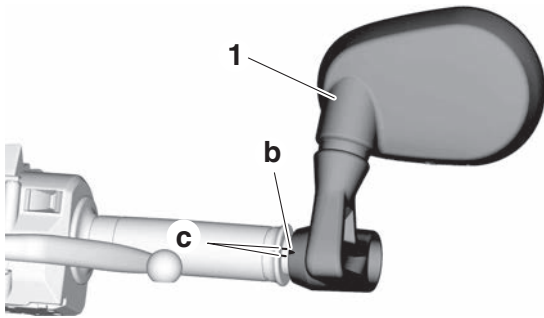
There should be 4–6 mm (0.16–0.24 in) of clearance "a" between the handlebar grip and the handlebar end.



d. Install the rearview mirror (left) "1".

TIP

When installing the rearview mirror, align the mark "b" on the rearview mirror with the between lines mark "c" on the handlebar, as shown in the figure.



8. Install:

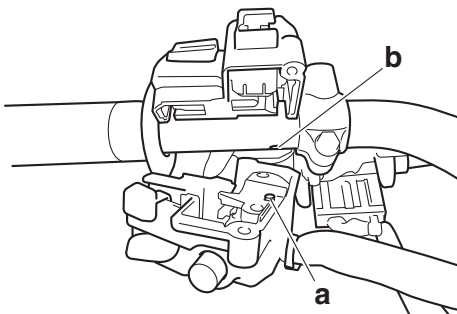
- Handlebar switch holder
- Handlebar switch screw (left)



Handlebar switch holder screw
3.5 N·m (0.35 kgf·m, 2.6 lb·ft)
Handlebar switch screw (handle-
bar switch (left))
2.0 N·m (0.20 kgf·m, 1.5 lb·ft)

TIP

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



9. Adjust:

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

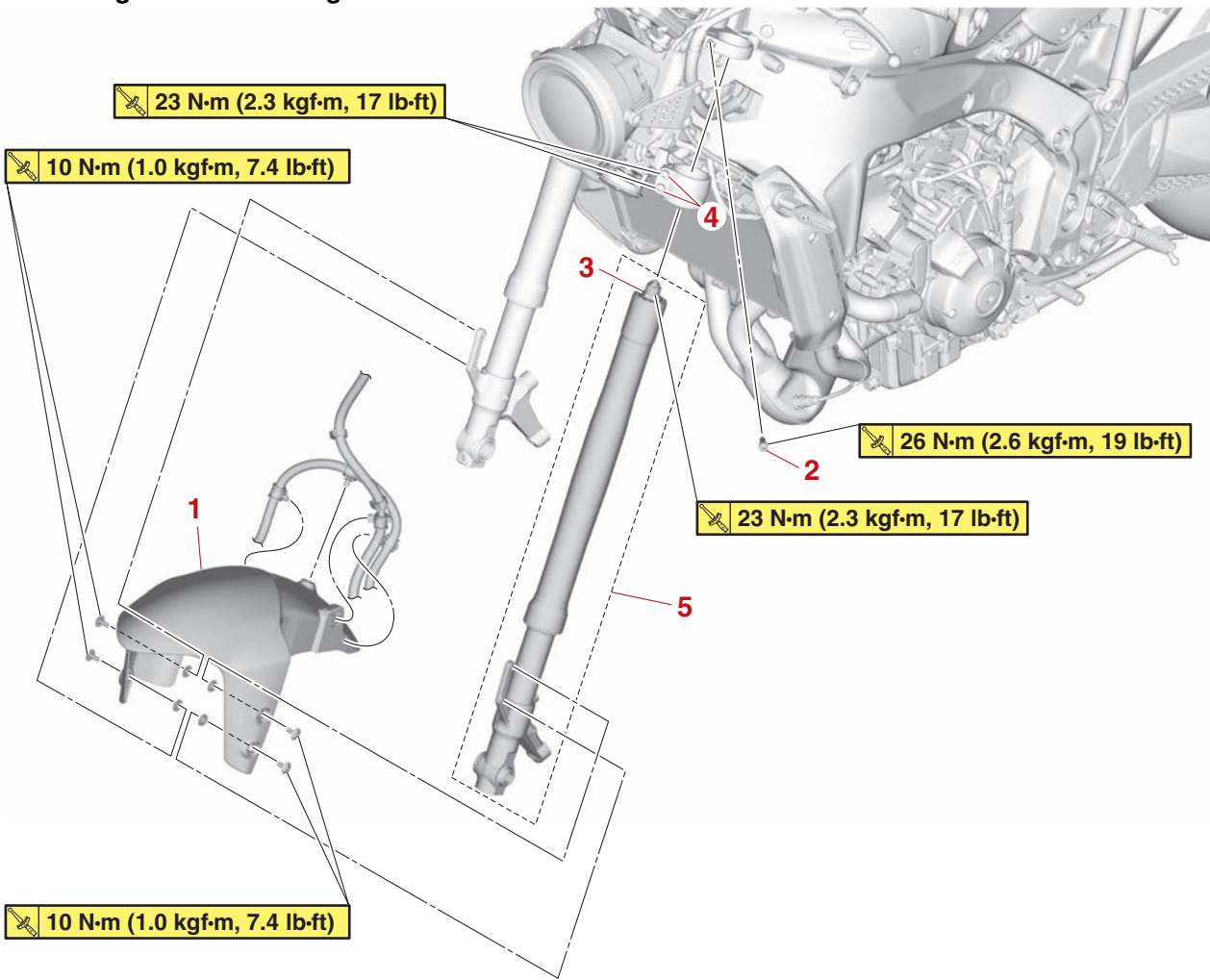


Clutch lever free play
10.0–15.0 mm (0.39–0.59 in)

EAS20034

FRONT FORK

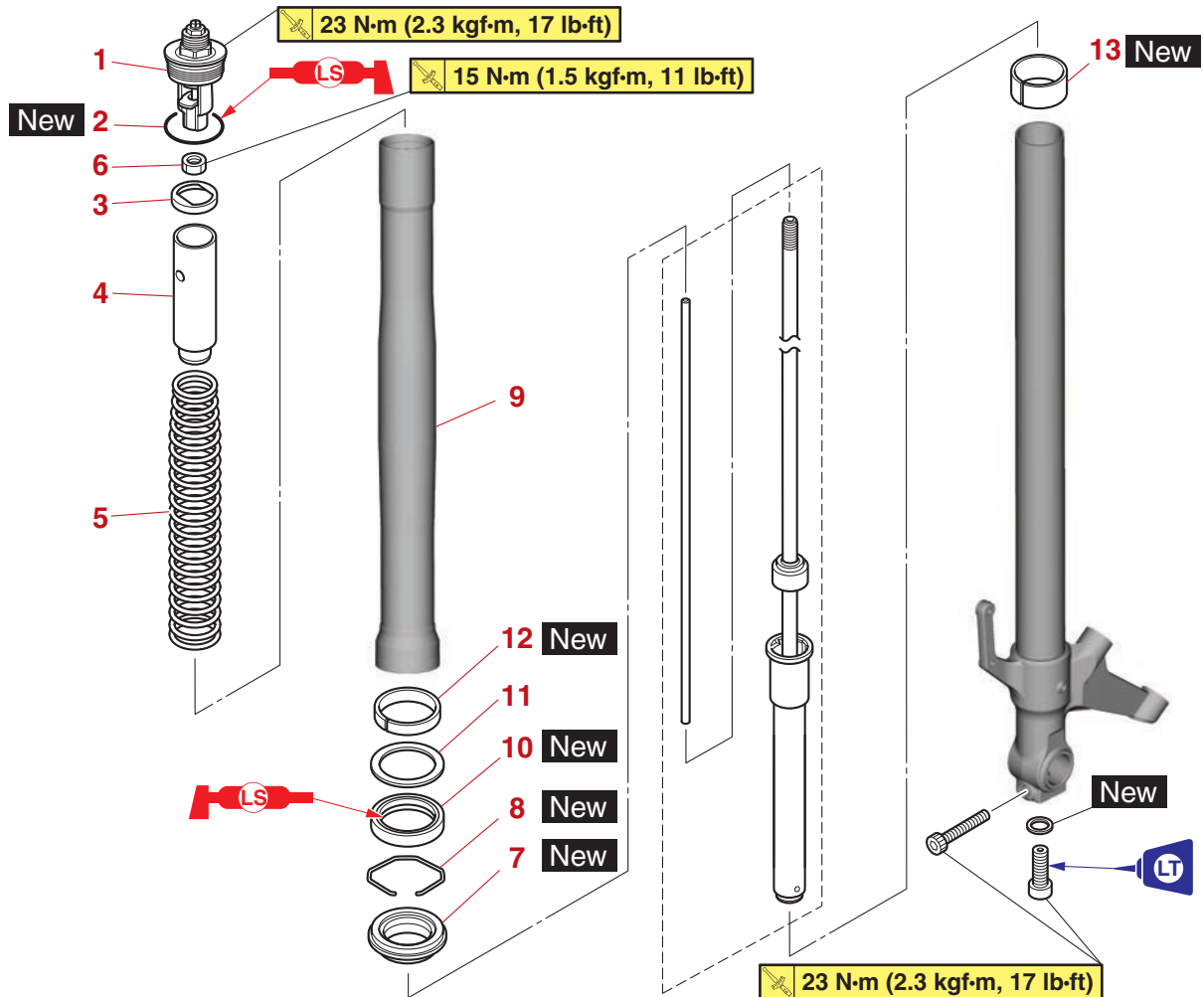
Removing the front fork legs



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 4-12.
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	

FRONT FORK

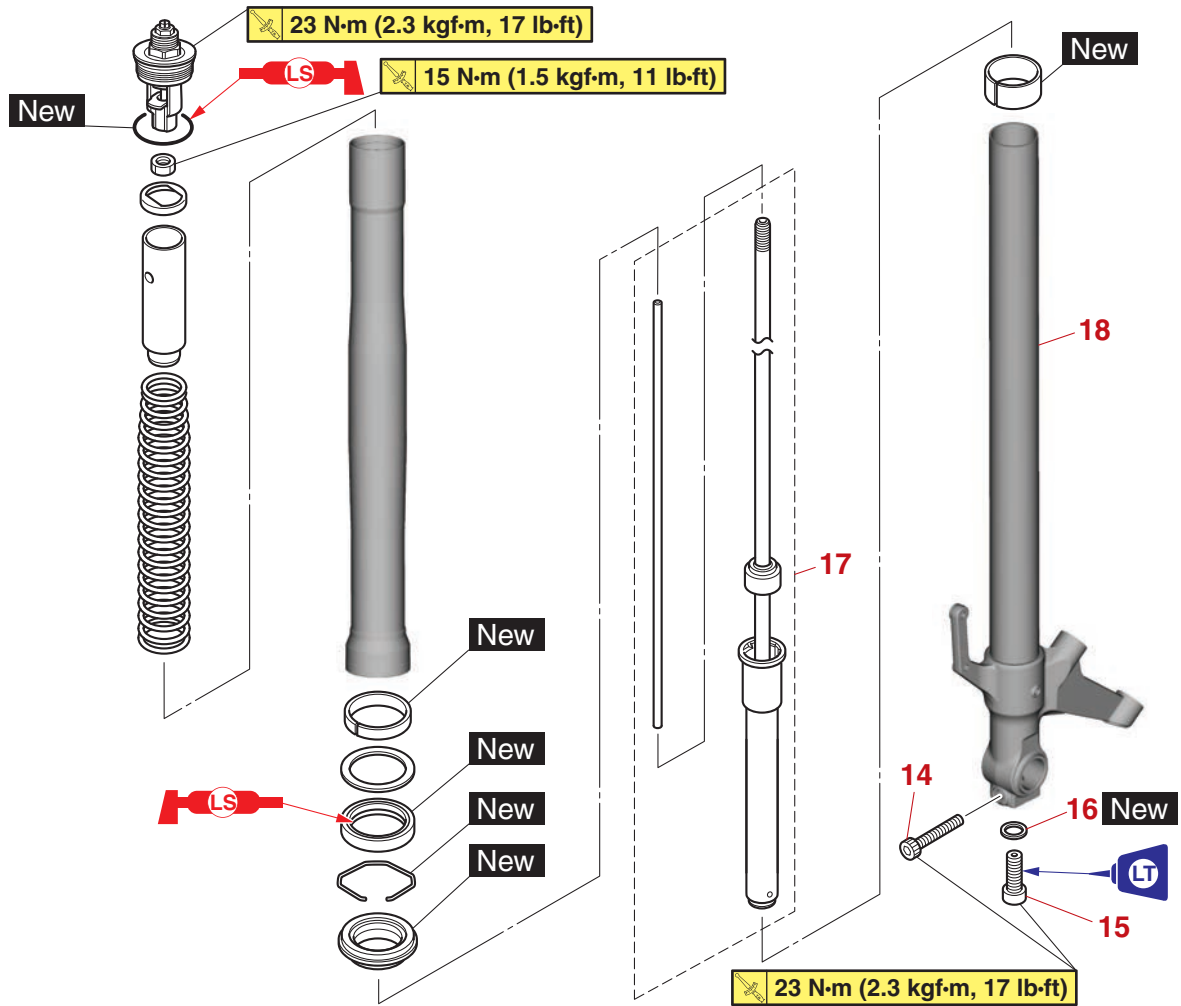
Disassembling the front fork leg



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	

FRONT FORK

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

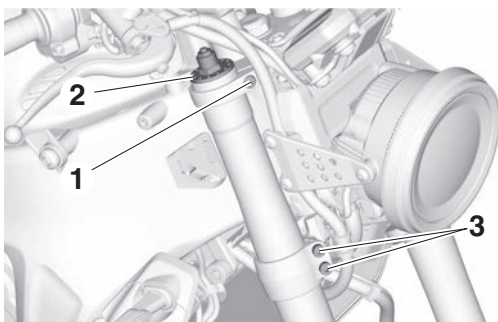
Place the vehicle on a maintenance stand so that the front wheel is elevated.

2. Remove:
 - Front brake caliper
Refer to "FRONT BRAKE" on page 4-27.
 - Front wheel
Refer to "FRONT WHEEL" on page 4-12.
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

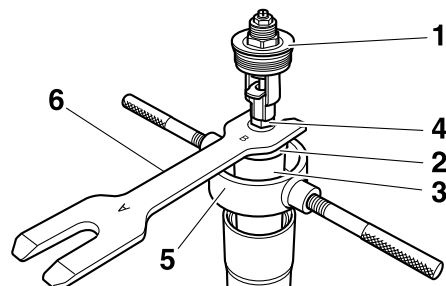
Fork spring compressor
YM-01441

Rod holder
90890-01434

Damper rod holder double ended
YM-01434

TIP

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

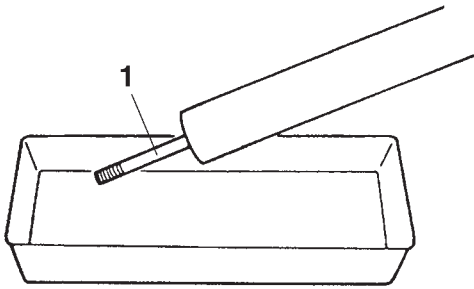


- c. Hold the cap bolt and loosen the locknut.
- d. Remove the cap bolt.
- e. Remove the rod holder and fork spring compressor.
- f. Remove the washer, spacer and locknut.

2. Drain:
 - Fork oil

TIP

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



G088919

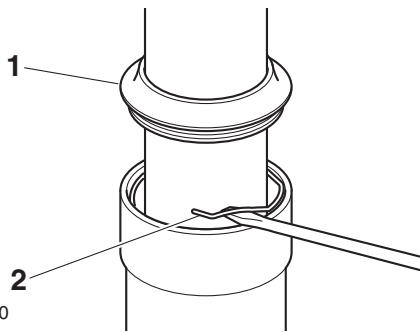
3. Remove:

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

ECA19100

NOTICE

Do not scratch the outer tube.



G088920

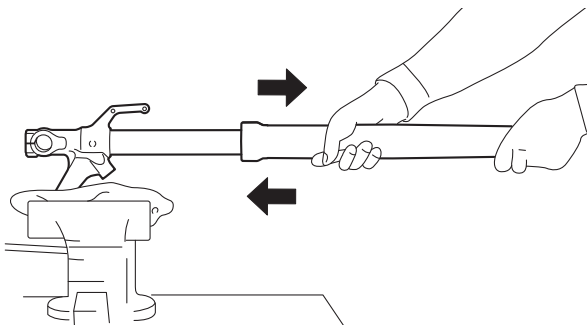
4. Remove:

- Outer tube
 - Hold the front fork leg horizontally.
 - Securely clamp the brake caliper bracket in a vise with soft jaws.
 - 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:

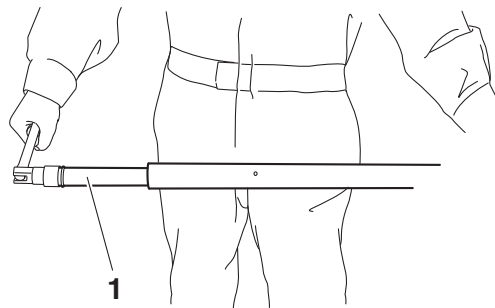
- Damper rod assembly bolt
- Damper rod assembly

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

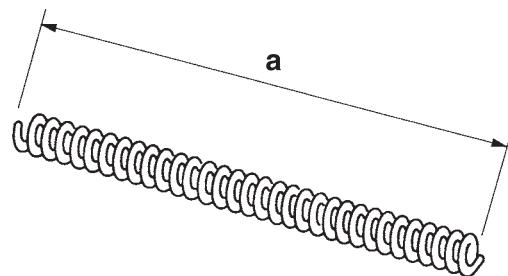
Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

2. Measure:

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



Fork spring free length limit
268.9 mm (10.59 in)



G088921

3. Check:

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

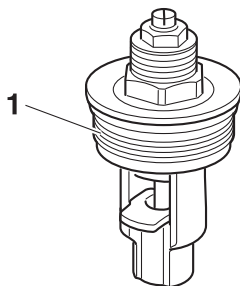
ECA19110

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.

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**)



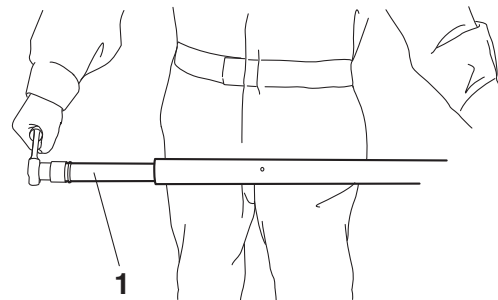
Front fork damper rod assembly bolt
23 N·m (2.3 kgf·m, 17 lb·ft)
LOCTITE®

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



FRONT FORK

3. Lubricate:
- Inner tube's outer surface

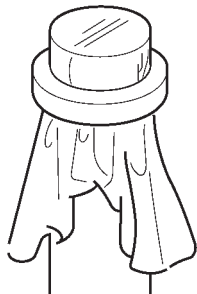
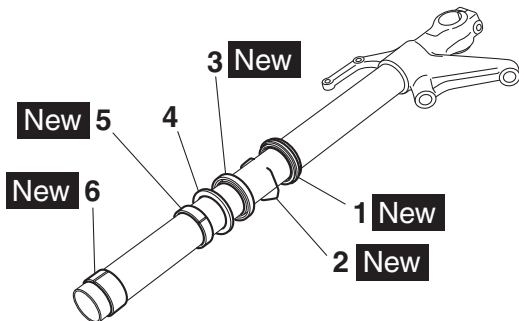


4. Install:
- Dust seal "1" **New**
 - Oil seal clip "2" **New**
 - Oil seal "3" **New**
 - Washer "4"
 - Outer tube bushing "5" **New**
 - Inner tube bushing "6" **New**

ECA19170

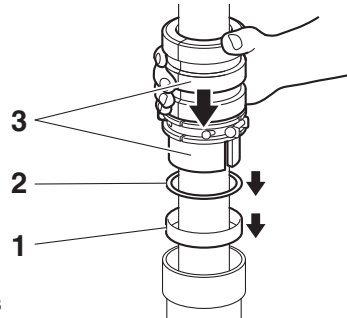
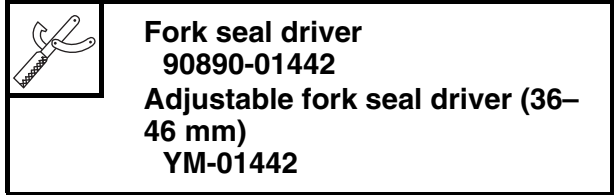
NOTICE
Make sure the numbered side of the oil seal faces bottom side.

- 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.



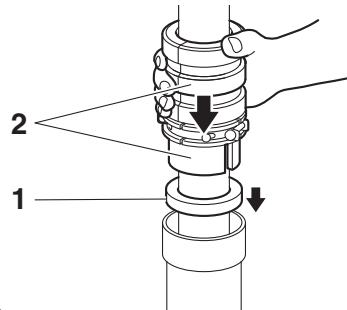
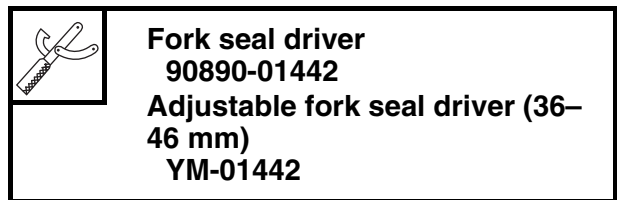
G088922

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



G088923

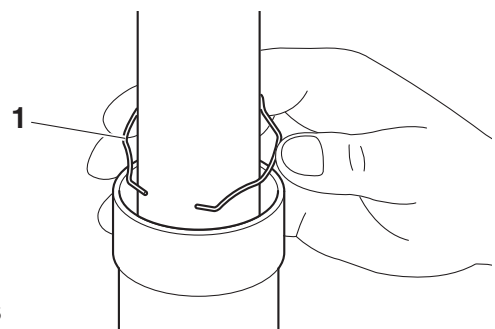
7. Install:
- Oil seal "1" (with the fork seal driver "2")



G088924

8. Install:
- Oil seal clip "1"


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



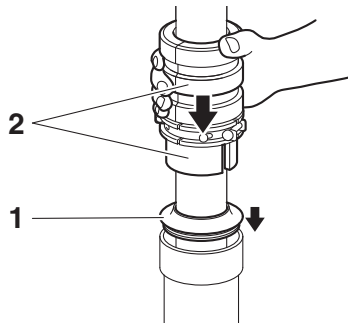
G088925

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



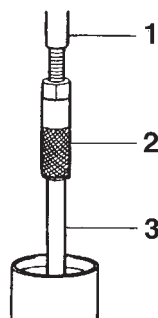
G088926

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 01
Quantity (left)
466.0 cm³ (15.76 US oz, 16.44 Imp.oz)
Quantity (right)
470.0 cm³ (15.89 US oz, 16.58 Imp.oz)

ECA14230

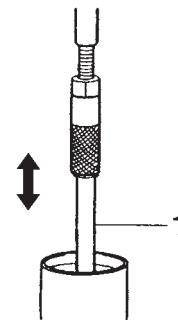
NOTICE

- 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.

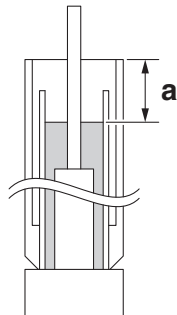
14. Measure:

- 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.

FRONT FORK



Level (left)
107 mm (4.2 in)
Level (right)
107 mm (4.2 in)



G088930

15. Install:

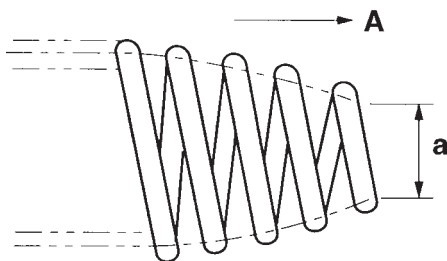
- Fork spring
- Spacer
- Locknut
- Damper adjusting rod (damper rod assembly)
- Washer
- Cap bolt

(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

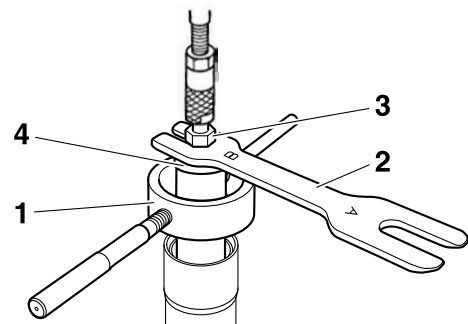
- c. Install the locknut all the way onto the damper rod assembly.
- d. Install the rod puller and rod puller attachment.
- e. Install the spacer and washer.
- f. Install the fork spring compressor.
- g. Press down on the spacer with the fork spring compressor "1".
- h. Pull up the rod puller and install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

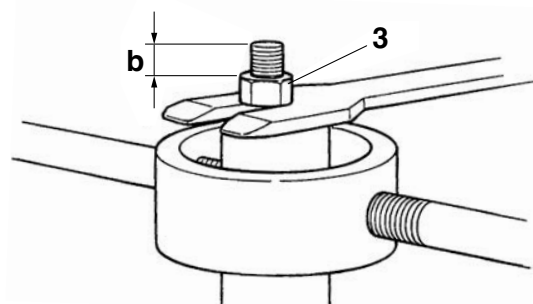
Use the side of the rod holder that is marked "B".



- i. Remove the rod puller and rod puller attachment.
- j. Position the locknut "3" as distance "b".




Distance "b"
12 mm (0.47 in)

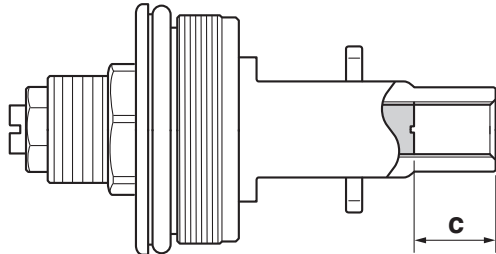


FRONT FORK

k. Set the cap bolt distance “c” to specification.



Distance “c”
13 mm (0.51 in)




l. Install the damper adjusting rod and cap bolt, and then finger tighten the cap bolt.

EWA13670

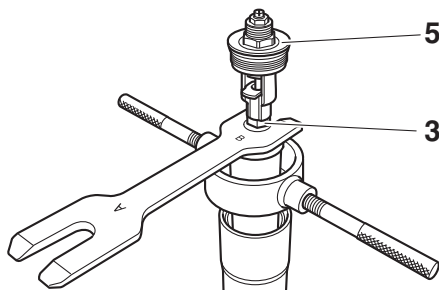
WARNING

Always use a new cap bolt O-ring.

m. 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)



n. 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”
211.5 mm (8.33 in)

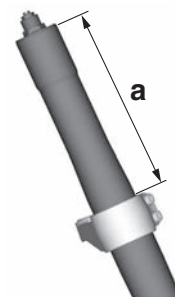
EWA13680

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
26 N·m (2.6 kgf·m, 19 lb·ft)



3. Check:

- Cable routing

TIP

Make sure the brake hoses, clutch cable, and handlebar switch leads are routed properly. Refer to “CABLE ROUTING” on page 2-13.

4. Adjust:

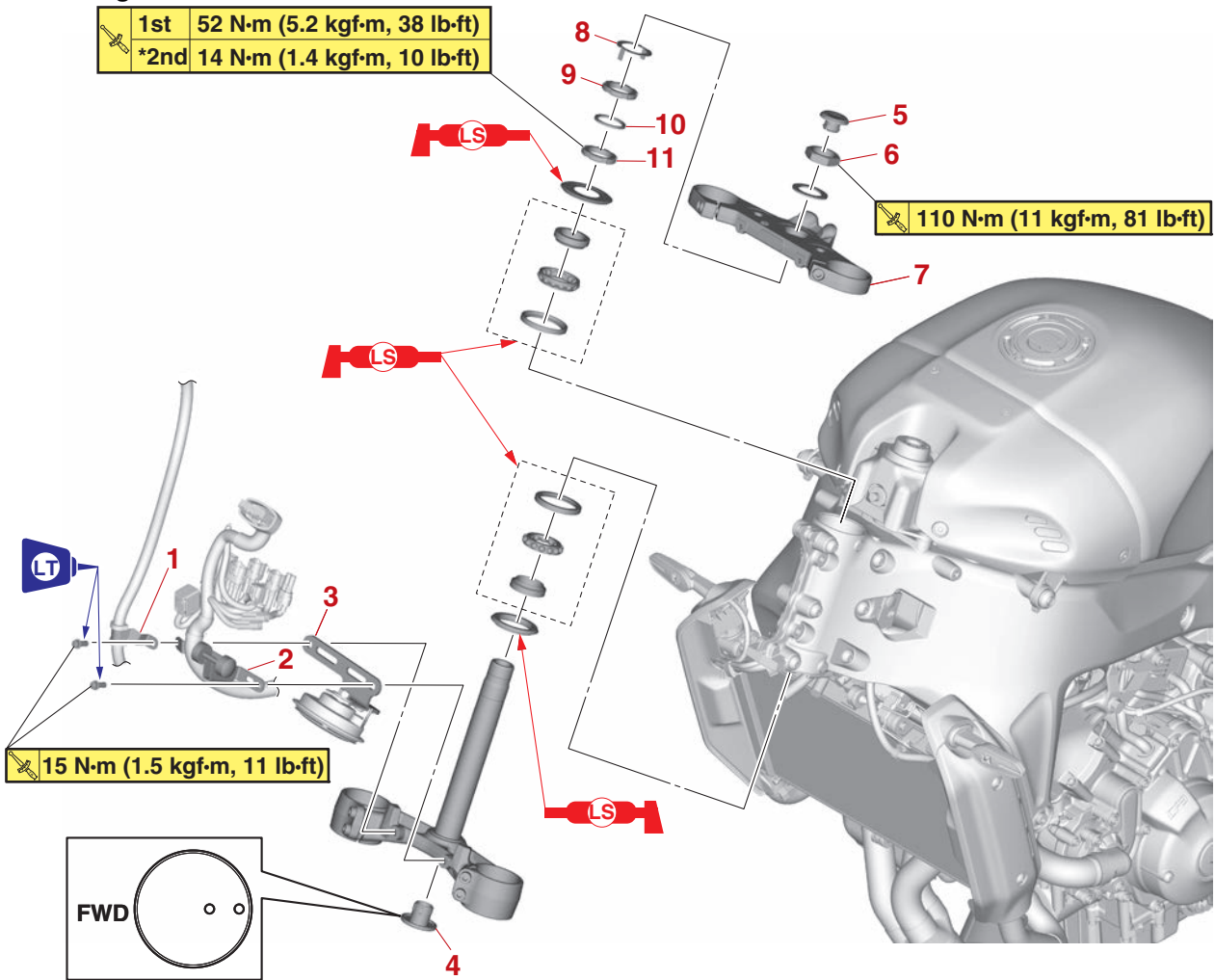
- Spring preload
- Rebound damping
- Compression damping

Refer to “ADJUSTING THE FRONT FORK LEGS” on page 3-21.

EAS20035

STEERING HEAD

Removing the lower bracket

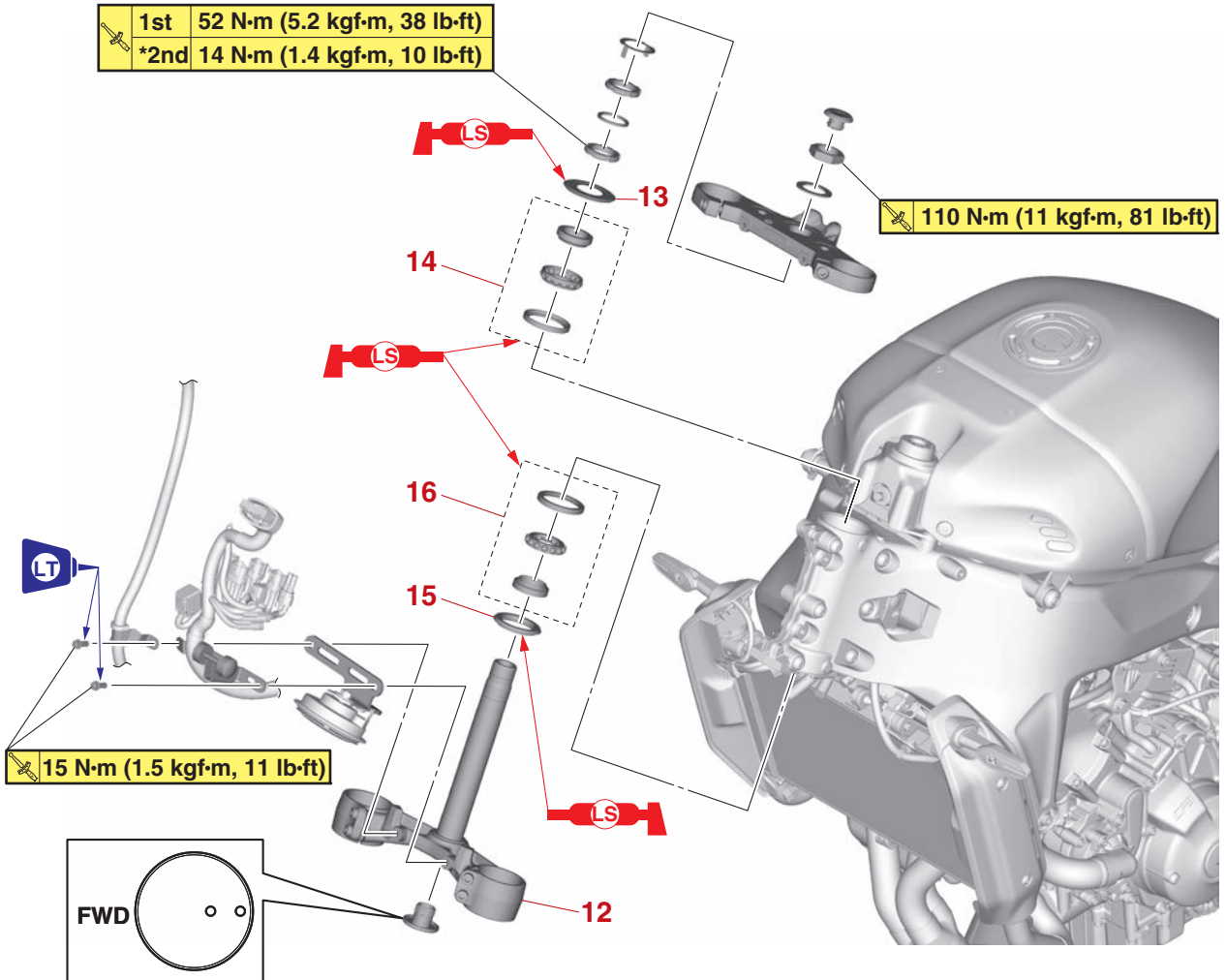


* Loosen the lower ring nut completely, and then tighten it to specification.

Order	Job/Parts to remove	Q'ty	Remarks
	Headlight bracket 2		Refer to "GENERAL CHASSIS (2)" on page 4-6.
	Handlebar		Refer to "HANDLEBAR" on page 4-60.
	Front fork legs		Refer to "FRONT FORK" on page 4-66.
1	Front brake hose bracket	1	
2	Headlight bracket	1	
3	Horn bracket	1	
4	Lower bracket cap	1	
5	Cap	1	
6	Steering stem nut	1	
7	Upper bracket	1	
8	Lock washer	1	
9	Upper ring nut	1	
10	Rubber washer	1	
11	Lower ring nut	1	

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
12	Lower bracket	1	
13	Bearing cover	1	
14	Upper bearing	1	
15	Lower bearing dust seal	1	
16	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

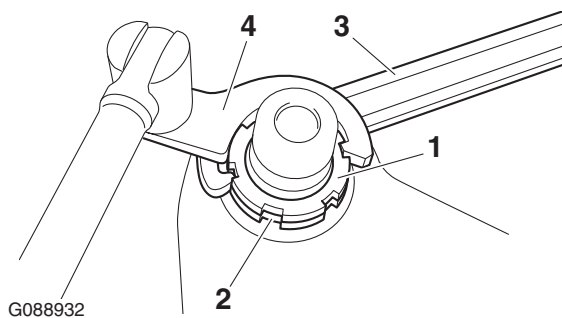
YU-01268

Steering nut wrench

90890-01403

Exhaust flange nut wrench

YU-A9472



EAS30214

CHECKING THE STEERING HEAD

1. Wash:

- Bearing
- Bearing race



Recommended cleaning solvent
Kerosene

2. Check:

- Bearing
- Bearing race

Damage/pitting → Replace the bearings and bearing races as a set.

3. Replace:

- Bearing
- Bearing race

a. Remove the bearing races from the steering head pipe "1" with a long rod "2" and hammer.

b. Remove the bearing race "3" from the lower bracket with a floor chisel "4" and hammer.

c. Install a new dust seal and new bearing races.

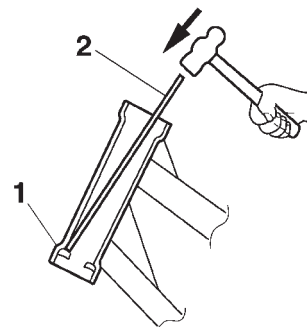
ECA14270

NOTICE

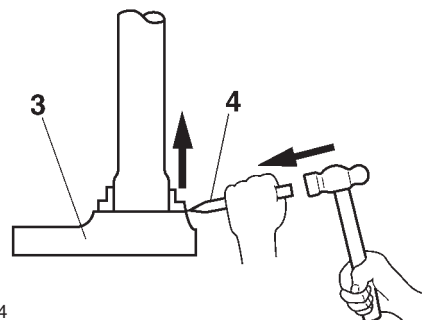
If the bearing race is not installed properly, the steering head pipe could be damaged.

TIP

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



G088933



G088934

4. Check:

- Upper bracket
- Lower bracket

(along with the steering stem)
Bends/cracks/damage → Replace.

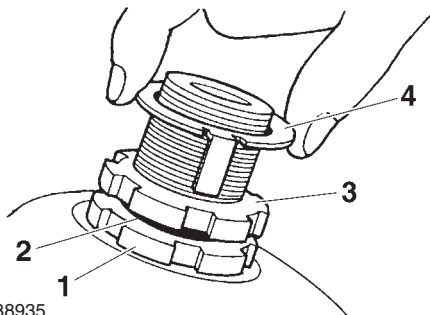
EAS30216

INSTALLING THE STEERING HEAD

1. Lubricate:
 - Upper bearing
 - Lower bearing



2. Install:
 - Lower ring nut "1"
 - Rubber washer "2"
 - Upper ring nut "3"
 - Lock washer "4"Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" on page 3-19.



G088935

3. Install:
 - Upper bracket
 - Steering stem nut

TIP

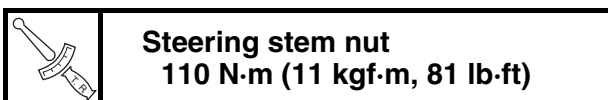
Temporarily tighten the steering stem nut.

4. Install:
 - Front fork legRefer to "FRONT FORK" on page 4-66.

TIP

Temporarily tighten the upper and lower bracket pinch bolts.

5. Tighten:
 - Steering stem nut



6. Tighten:
 - Lower bracket pinch bolt



- Upper bracket pinch bolt

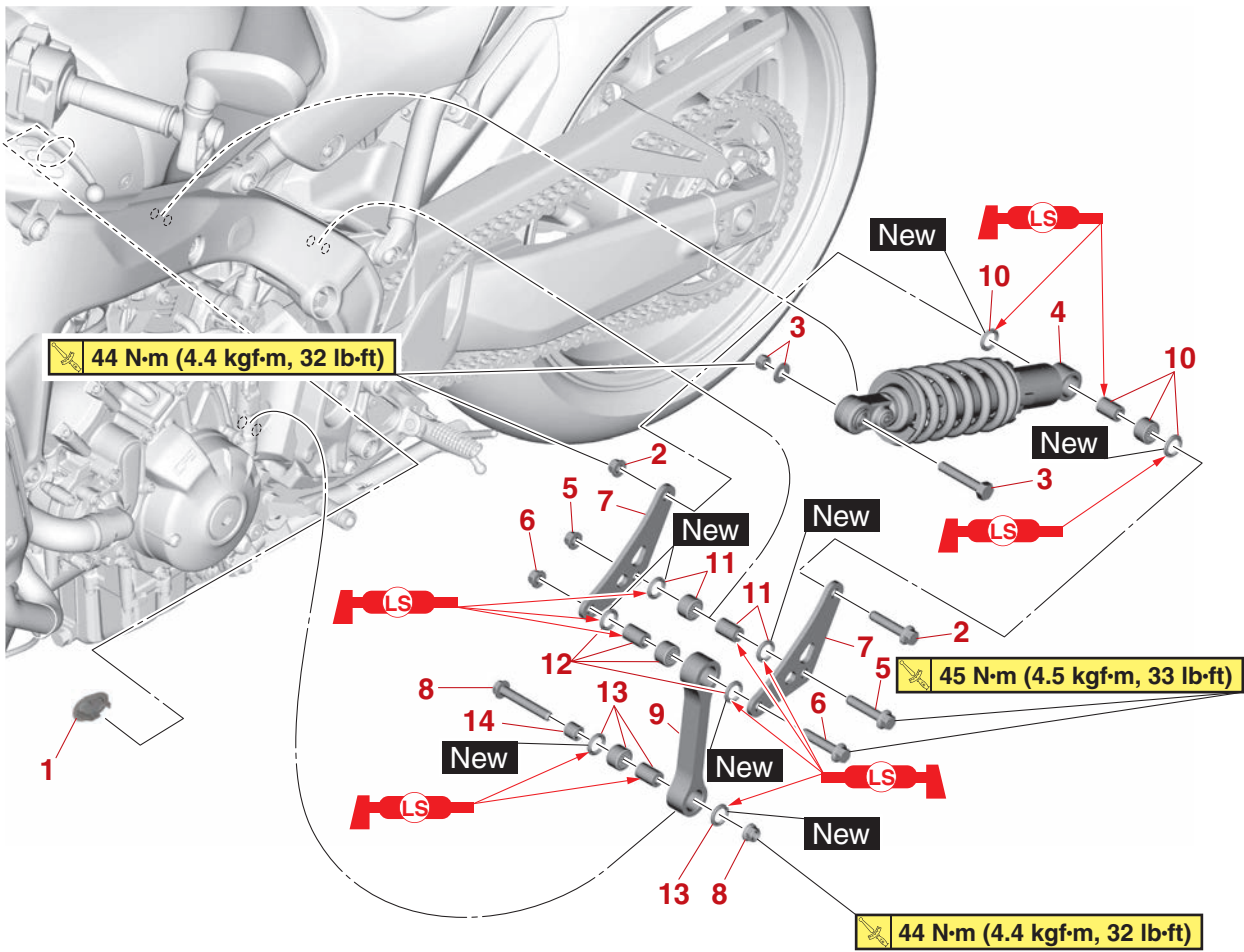


REAR SHOCK ABSORBER ASSEMBLY

EAS20036

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Cover	1	
2	Rear shock absorber assembly lower nut/Bolt	1/1	
3	Rear shock absorber assembly upper nut/Washer/Bolt	1/1/1	
4	Rear shock absorber assembly	1	
5	Relay arm nut/Bolt	1/1	
6	Connecting arm upper nut/Bolt	1/1	
7	Relay arm	2	
8	Connecting arm lower nut/Bolt	1/1	
9	Connecting arm	1	
10	Collar/Oil seal/Bearing	1/2/1	
11	Collar/Oil seal/Bearing	1/2/1	
12	Collar/Oil seal/Bearing	1/2/1	
13	Collar/Oil seal/Bearing	1/2/1	
14	Collar	1	

REAR SHOCK ABSORBER ASSEMBLY

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

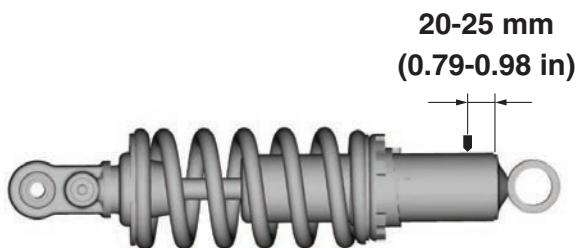
DISPOSING OF A REAR SHOCK ABSORBER

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

- Place the vehicle on a maintenance stand so that the rear wheel is elevated.
- When removing the bolt, hold the swingarm so that it does not drop down.

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
 - Bushing
Damage/wear → Replace the rear shock absorber assembly.
 - Bolt
Bends/damage/wear → Replace.

EAS30221

CHECKING THE CONNECTING ARM AND RELAY ARM

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

REAR SHOCK ABSORBER ASSEMBLY


EAS30222

INSTALLING THE RELAY ARM

- Lubricate:
 - Collar
 - Oil seal **New**

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


- Install:
 - Bearing "1" (to the connecting arm and swingarm)
 - Oil seal "2" **New** (connecting arm and swingarm)

	Installed depth "a" 4 mm (0.16 in) Installed depth "b" 0–1.0 mm (0–0.04 in)
---	--

TIP

- When installing the oil seals "2" to the relay arm, face the character stamp of the oil seals outside.
- Install the connecting arm upper bolt and relay arm bolt from the left.

- Tighten:
 - Connecting arm upper nut
 - Relay arm nut

	Connecting arm upper nut 44 N·m (4.4 kgf·m, 32 lb·ft) Relay arm nut 44 N·m (4.4 kgf·m, 32 lb·ft)
---	---

EAS30225


INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

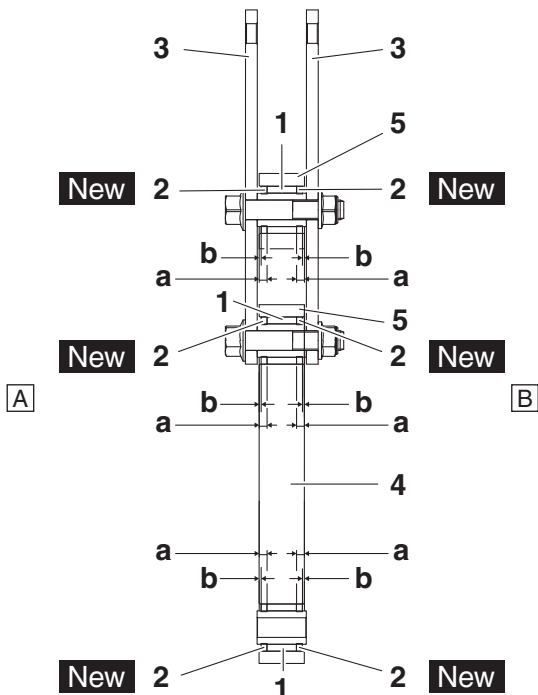
- Install:
 - Rear shock absorber assembly
 - Rear shock absorber assembly upper bolt
 - Rear shock absorber assembly upper nut
 - Rear shock absorber assembly lower bolt
 - Rear shock absorber assembly lower nut

TIP

- Install the rear shock absorber assembly upper bolt and rear shock absorber assembly lower bolt from the left.
- When installing the rear shock absorber assembly, lift up the swingarm.

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

	Rear shock absorber assembly upper nut 44 N·m (4.4 kgf·m, 32 lb·ft) Rear shock absorber assembly lower nut 44 N·m (4.4 kgf·m, 32 lb·ft)
---	--



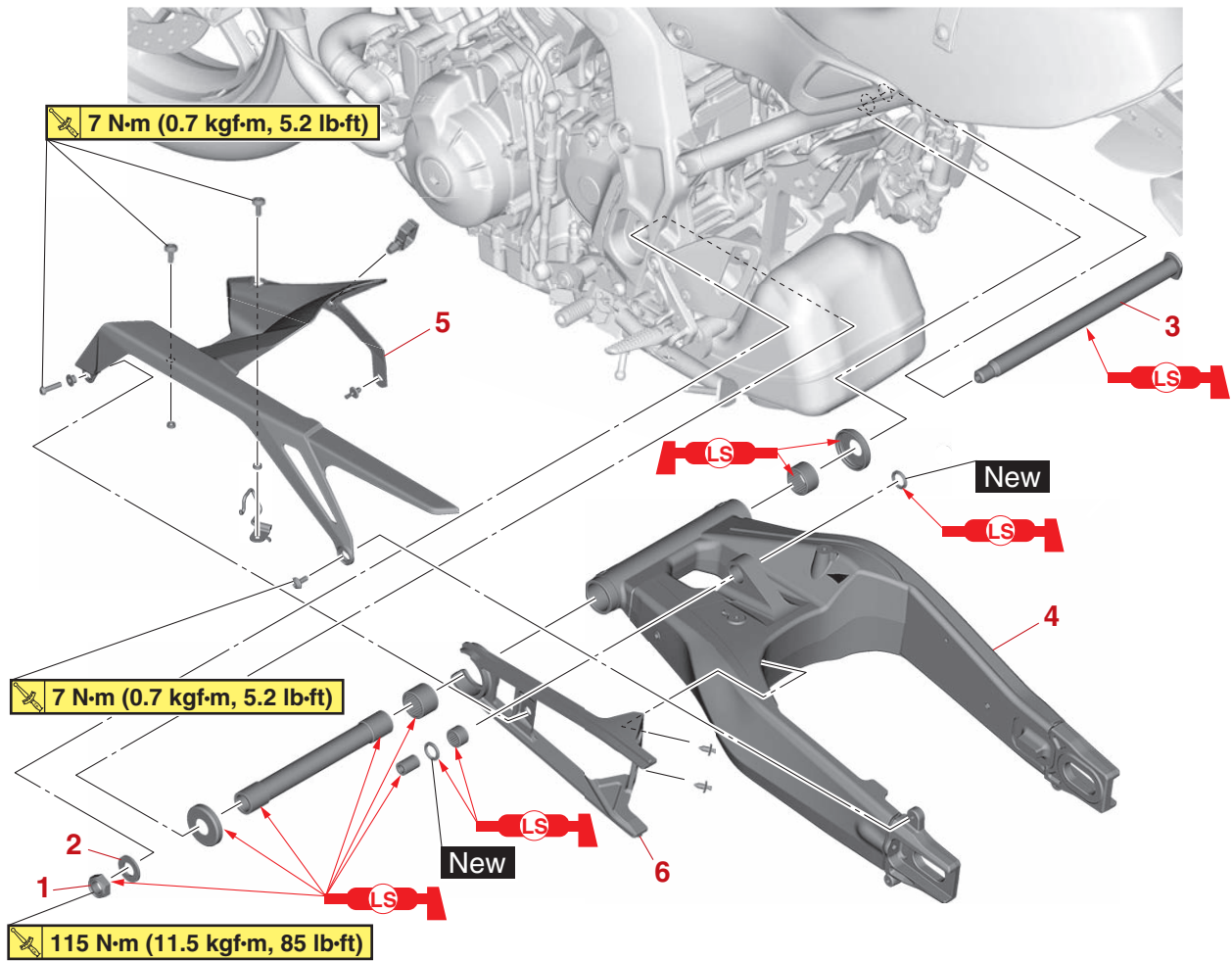
- Relay arm
- Connecting arm
- Swingarm

- Left side
- Right side

EAS20037

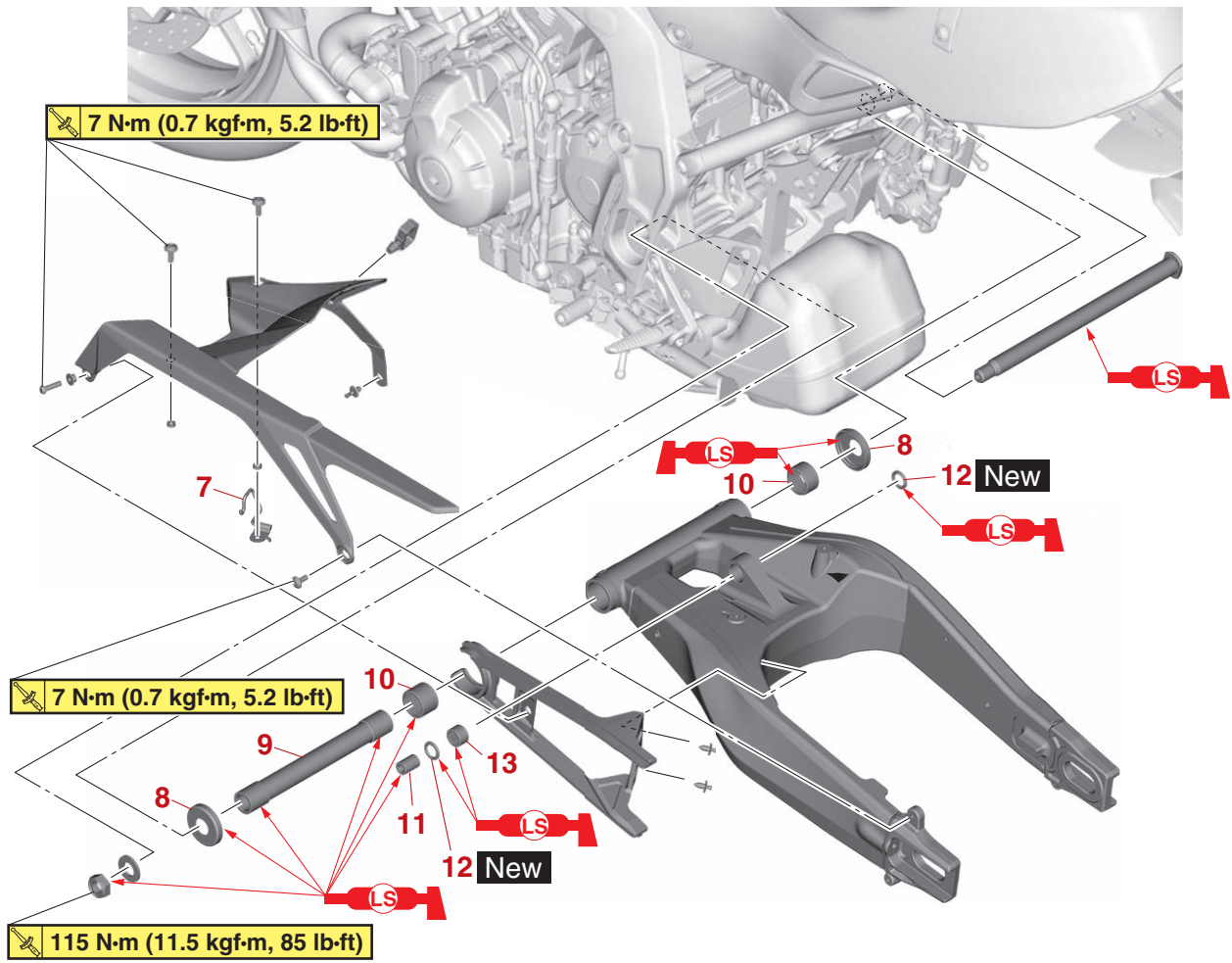
SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Rear brake caliper		Refer to "REAR BRAKE" on page 4-40.
	Rear wheel		Refer to "REAR WHEEL" on page 4-19.
	Relay arm nut/Bolt		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-81.
1	Pivot shaft nut	1	
2	Washer	1	
3	Pivot shaft	1	
4	Swingarm	1	
5	Rear fender	1	
6	Drive chain guide	1	

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
7	Cable holder	1	
8	Dust cover	2	
9	Collar	1	
10	Bearing	2	
11	Collar	1	
12	Oil seal	2	
13	Bearing	1	

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

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

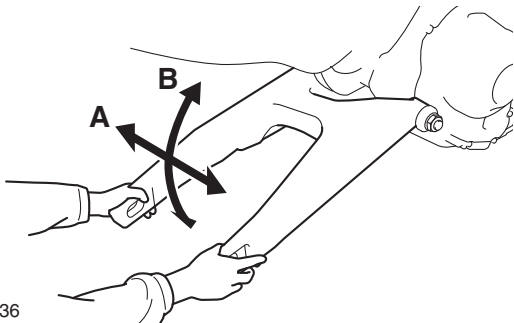
2. Measure:

- Swingarm side play
 - Swingarm vertical movement
- a. Measure the tightening torque of the pivot shaft nut.



Pivot shaft nut
115 N·m (11.5 kgf·m, 85 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, collar, 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:

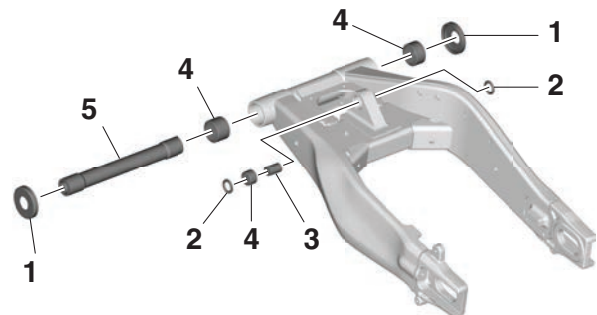
- Pivot shaft
- Dust cover
- Collar



Recommended cleaning solvent
Kerosene

4. Check:

- Dust cover "1"
- Oil seal "2"
- Damage/wear → Replace.
- Collar "3"
- Damage/scratches → Replace.
- Bearing "4"
- Damage/pitting → Replace.
- Collar "5"
- Damage/scratches → Replace.




EAS30228

INSTALLING THE SWINGARM

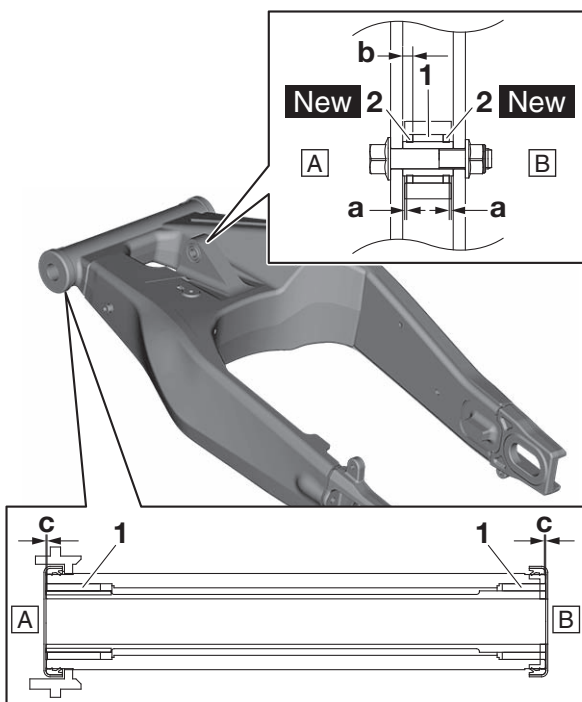
- Lubricate:
 - Dust cover
 - Pivot shaft
 - Bearing
 - Oil seal **New**
 - Collar

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

- Install:
 - Bearing "1"
(to the swingarm)
 - Oil seal "2" **New**
(to the swingarm)


	<p>Installed depth "a" 0–1.0 mm (0–0.039 in)</p> <p>Installed depth "b" 4 mm (0.157 in)</p> <p>Installed depth "c" 0.2–1.0 mm (0.008–0.039 in)</p>
---	---

TIP
When installing the oil seals to the swingarm, face the character stamp of the oil seals outside.




- A. Left side
B. Right side

- Install:
 - Swingarm
 - Pivot shaft


	Relay arm bolt 45 N·m (4.5 kgf·m, 33 lb·ft)
---	---

- Install:
 - Pivot shaft nut
 - Lubricate the pivot shaft nut mating surface with lithium-soap-based grease, and then tighten it to specification.

	Pivot shaft nut 115 N·m (11.5 kgf·m, 85 lb·ft)
---	--

TIP
Do not allow grease to contact the pivot shaft nut threads.

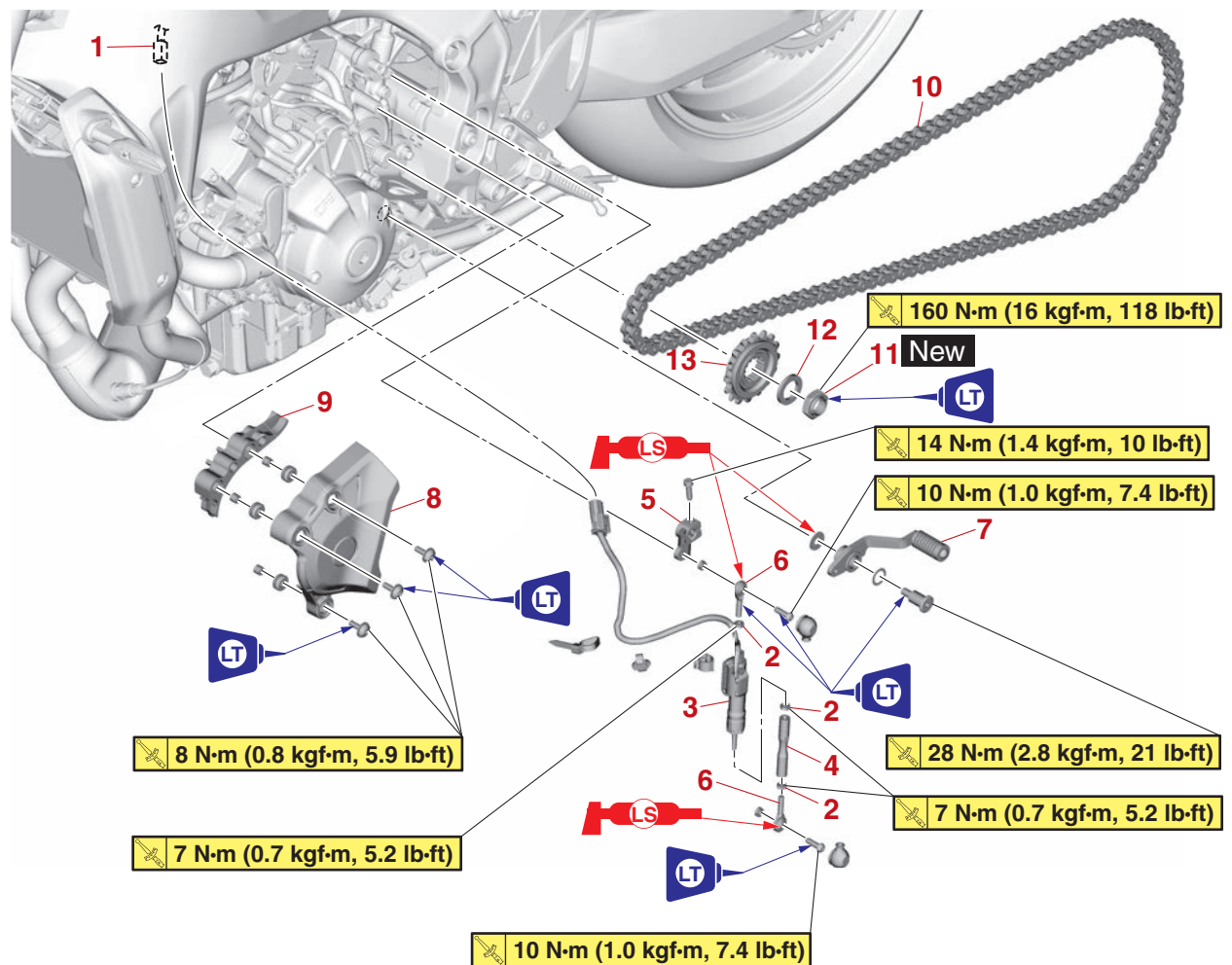
- Install:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-19.
- Adjust:
 - Drive chain slack
Refer to "DRIVE CHAIN SLACK" on page 3-18.

	<p>Drive chain slack (Maintenance Stand) 45.0–50.0 mm (1.77–1.97 in)</p> <p>Drive chain slack (Sidestand) 45.0–50.0 mm (1.77–1.97 in)</p> <p>Drive chain slack limit 55.0 mm (2.17 in)</p>
---	---

EAS20038

CHAIN DRIVE

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Shift sensor coupler	1	Disconnect.
2	Locknut	3	
3	Shift sensor	1	
4	Shift rod	1	
5	Shift arm	1	
6	Shift rod joint	2	
7	Shift pedal	1	
8	Drive sprocket cover	1	
9	Drive chain guide	1	
10	Drive chain	1	
11	Drive sprocket nut	1	
12	Washer	1	
13	Drive sprocket	1	

EAS30229

REMOVING THE DRIVE CHAIN

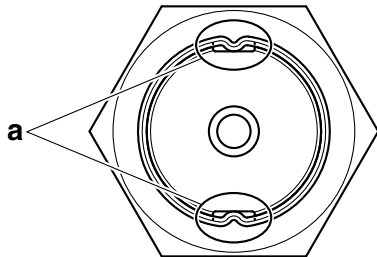
1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Straighten the drive sprocket nut ribs "a".



3. Loosen:

- Drive sprocket nut

TIP

Loosen the drive sprocket nut while pressing the brake pedal.

4. Remove:

- Drive chain

ECA17410

NOTICE

Be sure to put on safety goggles when working.

TIP

Cut the drive chain with the drive chain cut & rivet tool.



**Drive chain cut & rivet tool
90890-01550**

**Drive chain cut & rivet tool
YM-01550**

EAS30230

CHECKING THE DRIVE CHAIN

1. Measure:

- 15-link section length "c" of the drive chain
Out of specification → Replace the drive chain.



**15-link length limit
239.3 mm (9.42 in)**

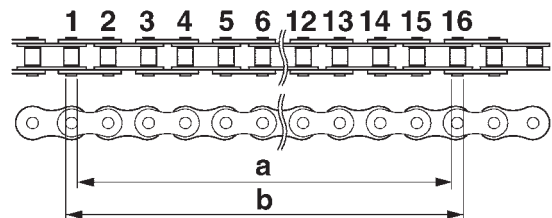
- a. Measure the length "a" between the inner sides of the pins and the length "b" between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.

- b. Calculate the 15-link section length "c" of the 15-link section of the drive chain using the following formula.

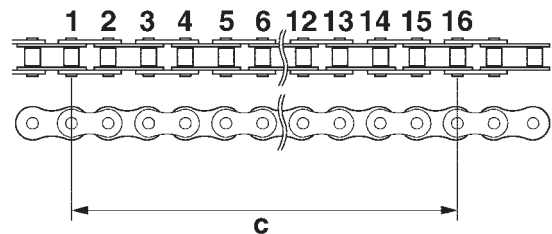
Drive chain 15-link section length "c" =
(length "a" between pin inner sides + length "b" between pin outer sides)/2

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.



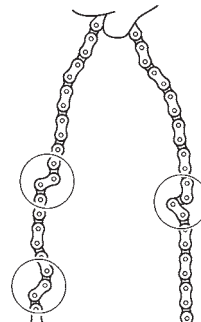
G088937



G088938

2. Check:

- Drive chain
Stiffness → Clean and lubricate or replace.



G088939

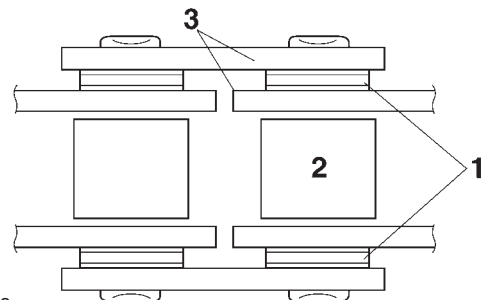
3. Clean:

- 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.

ECA19090

NOTICE

- **This vehicle 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.**



G088943

5. Lubricate:

- Drive chain



EAS30231

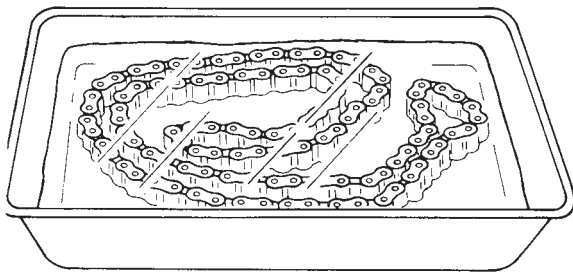
CHECKING THE DRIVE SPROCKET

1. Check:

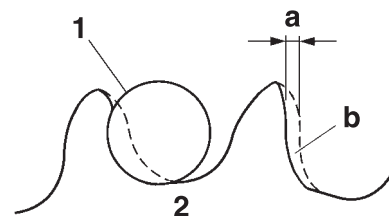
- Drive sprocket

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.



G088940



G088904

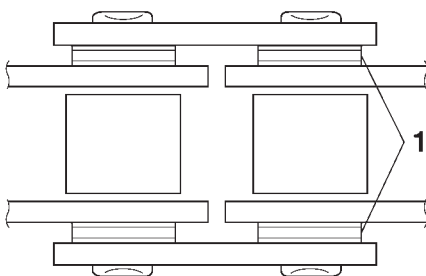
b. Correct

1. Drive chain roller
2. Drive sprocket

EAS30232

CHECKING THE REAR WHEEL SPROCKET

Refer to “CHECKING AND REPLACING THE REAR WHEEL SPROCKET” on page 4-23.



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.

EAS30233

CHECKING THE REAR WHEEL DRIVE HUB

Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-22.

EAS30234

INSTALLING THE DRIVE CHAIN

1. Install:

- Drive chain

ECA17410

NOTICE

Be sure to put on safety goggles when working.

TIP

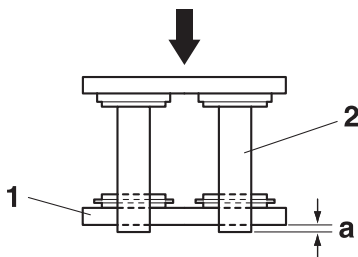
Install the drive chain joint with the drive chain cut & rivet tool.



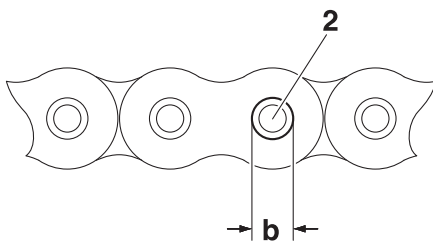
Drive chain cut & rivet tool
90890-01550

Drive chain cut & rivet tool
YM-01550

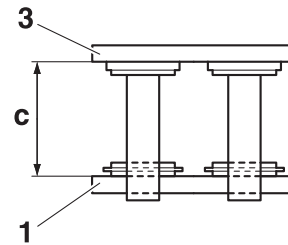
- a. When press fitting the connecting plate "1", make sure the space "a" between the end of the connecting pin "2" and the connecting plate is 1.2–1.4 mm (0.05–0.06 in).



- b. After riveting, make sure the diameter between the edges "b" of the connecting pin "2" is 5.7–6.0 mm (0.22–0.24 in).



- c. After riveting, make sure the space "c", which is inside of the connecting link "3" and inside of the connecting plate "1", is 14.35–14.55 mm (0.565–0.573 in).



2. Lubricate:

- Drive chain



Recommended lubricant
Chain lubricant suitable for O-ring chains

3. Install:

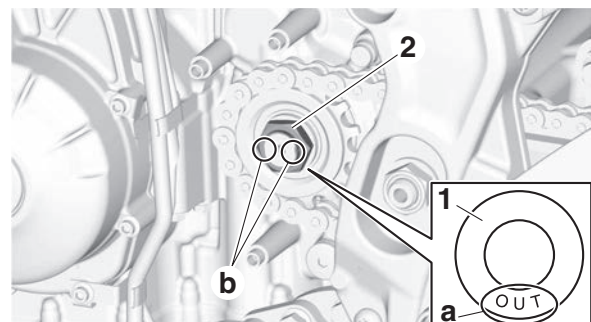
- Drive sprocket
- Washer "1"
- Drive sprocket nut "2" **New**

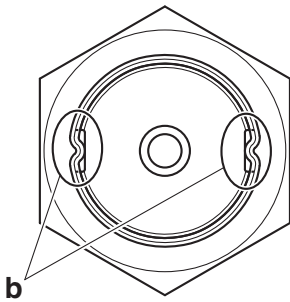


Drive sprocket nut
160 N·m (16 kgf·m, 118 lb·ft)
LOCTITE®

TIP

- Thoroughly clean all the drive sprocket nut seat and threads of drive axle.
- While applying the rear brake, tighten the drive sprocket nut.
- Install washer "1" with the "OUT" mark "a" facing out.
- Stake the drive sprocket nut "2" at cutouts "b" in the drive axle securely.




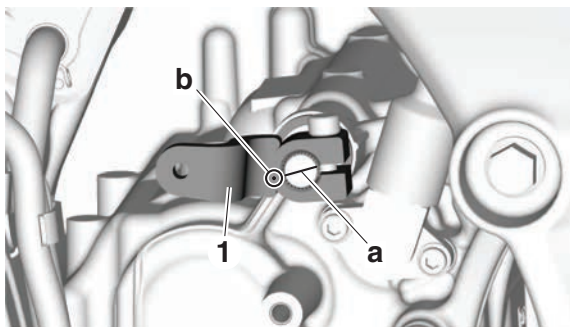


4. Install:
- Shift arm "1"

TIP

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


	<p>Shift arm bolt 14 N·m (1.4 kgf·m, 10 lb·ft)</p>
---	---

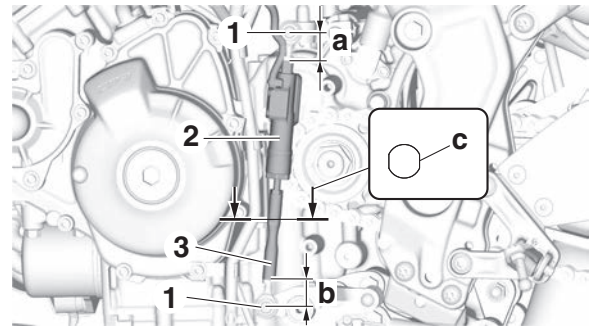


5. Install:
- Shift rod joint "1"
 - Shift sensor "2"
 - Shift rod "3"

TIP


- Install the shift rod joint and shift sensor in the direction shown in the illustration.
- The allowable twist of the shift rod joint and shift sensor is $\pm 5^\circ$.
- Install the shift rod so that the side "c" faces upward as shown in the illustration.

	<p>Shift rod joint bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®</p>
	<p>Shift sensor locknut 7 N·m (0.7 kgf·m, 5.2 lb·ft)</p>



- a. 24 mm (0.94 in)
- b. 24.4 mm (0.96 in)

6. Adjust:
- Installed shift rod length
Refer to "ADJUSTING THE SHIFT PEDAL" on page 4-93.
7. Adjust:
- Drive chain slack
Refer to "DRIVE CHAIN SLACK" on page 3-18.

	<p>Drive chain slack (Maintenance Stand) 45.0–50.0 mm (1.77–1.97 in) Drive chain slack (Sidestand) 45.0–50.0 mm (1.77–1.97 in) Drive chain slack limit 55.0 mm (2.17 in)</p>
--	---

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 swing-arm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

EAS31729

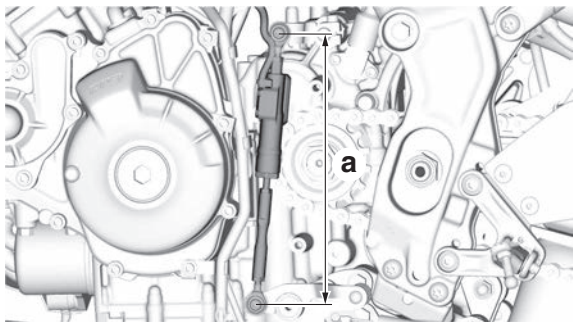
ADJUSTING THE SHIFT PEDAL

TIP

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

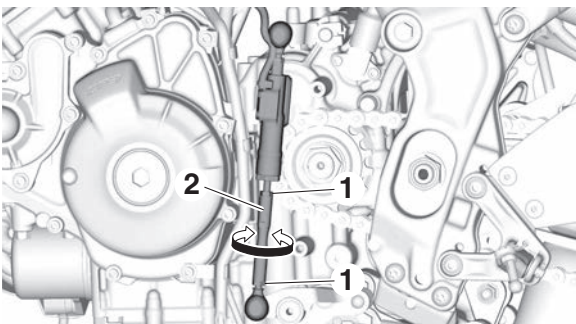
1. Measure:

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



2. Adjust:

- Installed shift rod length
 - a. Loosen both locknuts “1”.
 - b. Turn the shift rod “2” until the specified installed shift rod length is obtained.



- c. Tighten both locknuts.

TIP

Be sure to place the shift rod joints in parallel. The allowable twist of the shift rod joints is $\pm 5^\circ$.



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

ENGINE

LUBRICATION SYSTEM CHART AND DIAGRAMS.....	5-1
ENGINE OIL LUBRICATION CHART	5-1
LUBRICATION DIAGRAMS	5-2
ENGINE INSPECTION	5-7
MEASURE THE COMPRESSION PRESSURE.....	5-7
ENGINE REMOVAL	5-9
REMOVING THE ENGINE	5-14
INSTALLING THE ENGINE.....	5-14
CAMSHAFTS.....	5-16
REMOVING THE CAMSHAFTS.....	5-20
CHECKING THE CAMSHAFTS	5-21
CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET	5-22
CHECKING THE TIMING CHAIN GUIDES.....	5-22
CHECKING THE TIMING CHAIN TENSIONER.....	5-22
INSTALLING THE CAMSHAFTS	5-23
CYLINDER HEAD.....	5-27
REMOVING THE CYLINDER HEAD.....	5-28
CHECKING THE TIMING CHAIN GUIDE (EXHAUST SIDE)	5-28
CHECKING THE CYLINDER HEAD	5-28
INSTALLING THE CYLINDER HEAD	5-29
VALVES AND VALVE SPRINGS.....	5-30
REMOVING THE VALVES.....	5-32
CHECKING THE VALVES AND VALVE GUIDES	5-32
CHECKING THE VALVE SEATS	5-34
CHECKING THE VALVE SPRINGS.....	5-35
CHECKING THE VALVE LIFTERS	5-35
INSTALLING THE VALVES	5-35
GENERATOR AND STARTER CLUTCH.....	5-37
REMOVING THE GENERATOR.....	5-39
REMOVING THE STARTER CLUTCH	5-39
CHECKING THE STARTER CLUTCH	5-39
INSTALLING THE STARTER CLUTCH.....	5-40
INSTALLING THE GENERATOR.....	5-40
ELECTRIC STARTER.....	5-42
CHECKING THE STARTER MOTOR	5-44
ASSEMBLING THE STARTER MOTOR.....	5-44
INSTALLING THE STARTER MOTOR	5-45

CLUTCH	5-46
REMOVING THE CLUTCH	5-50
CHECKING THE FRICTION PLATES.....	5-51
CHECKING THE CLUTCH PLATES	5-51
CHECKING THE CLUTCH SPRINGS.....	5-52
CHECKING THE CLUTCH HOUSING	5-52
CHECKING THE CLUTCH BOSS.....	5-53
CHECKING THE PRESSURE PLATE	5-53
CHECKING THE PRIMARY DRIVE GEAR.....	5-53
CHECKING THE PRIMARY DRIVEN GEAR	5-53
CHECKING THE PULL LEVER SHAFT AND PULL ROD	5-53
INSTALLING THE CLUTCH.....	5-53
SHIFT SHAFT.....	5-56
CHECKING THE SHIFT SHAFT	5-57
CHECKING THE STOPPER LEVER	5-57
INSTALLING THE SHIFT SHAFT	5-57
OIL PUMP.....	5-58
CHECKING THE SPROCKET AND CHAIN.....	5-60
CHECKING THE OIL PUMP	5-60
CHECKING THE RELIEF VALVE	5-60
ASSEMBLING THE OIL PUMP.....	5-60
INSTALLING THE OIL PUMP	5-61
OIL PAN	5-62
REMOVING THE OIL PAN.....	5-63
CHECKING THE OIL STRAINER	5-63
INSTALLING THE OIL PAN	5-63
CRANKCASE	5-64
DISASSEMBLING THE CRANKCASE.....	5-66
CHECKING THE CRANKCASE	5-66
ASSEMBLING THE CRANKCASE.....	5-66
INSTALLING THE OIL PRESSURE SWITCH.....	5-68
INSTALLING THE GEAR POSITION SENSOR.....	5-69
CONNECTING RODS AND PISTONS	5-70
REMOVING THE CONNECTING RODS AND PISTONS	5-71
CHECKING THE CYLINDER AND PISTON	5-71
CHECKING THE PISTON RINGS.....	5-72
CHECKING THE PISTON PIN	5-73
CHECKING THE CONNECTING RODS.....	5-73
INSTALLING THE CONNECTING ROD AND PISTON	5-76

CRANKSHAFT AND BALANCER SHAFT	5-81
REMOVING THE CRANKSHAFT AND BALANCER SHAFT	5-82
CHECKING THE OIL NOZZLES	5-82
CHECKING THE CRANKSHAFT	5-82
CHECKING THE BALANCER SHAFT	5-84
INSTALLING THE CRANKSHAFT	5-86
INSTALLING THE BALANCER ASSEMBLY	5-86
TRANSMISSION.....	5-87
REMOVING THE TRANSMISSION	5-92
CHECKING THE SHIFT FORKS.....	5-92
CHECKING THE SHIFT DRUM ASSEMBLY	5-93
CHECKING THE TRANSMISSION	5-93
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE	5-94
INSTALLING THE TRANSMISSION	5-95

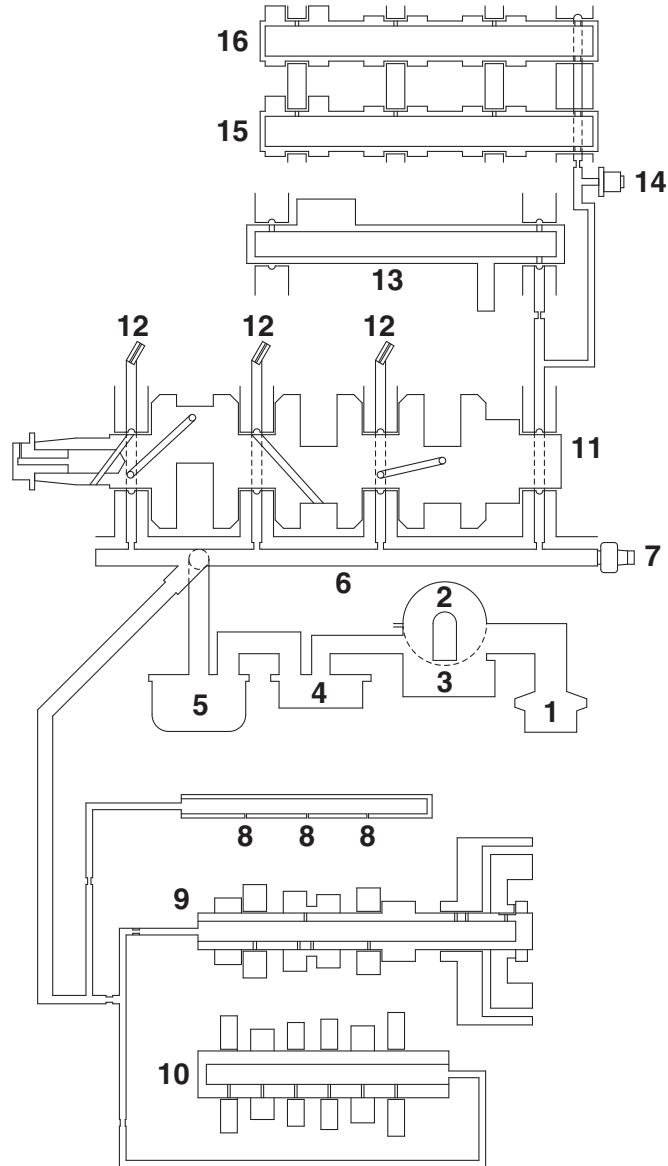
LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20298

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS32362

ENGINE OIL LUBRICATION CHART

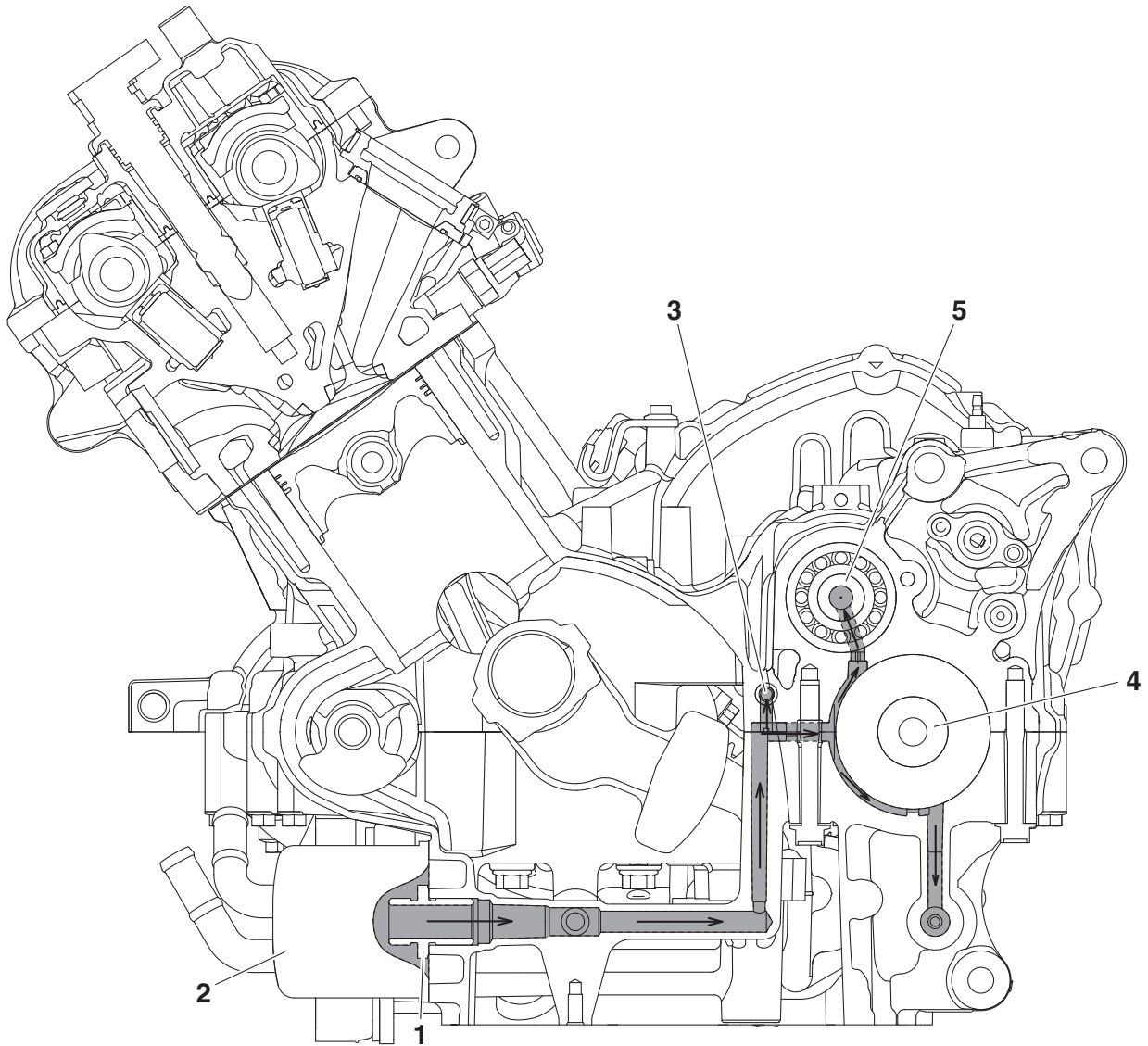


- | | |
|----------------------------|----------------------|
| 1. Oil strainer | 15. Intake camshaft |
| 2. Oil pump | 16. Exhaust camshaft |
| 3. Relief valve | |
| 4. Oil cooler | |
| 5. Oil filter cartridge | |
| 6. Main gallery | |
| 7. Oil pressure switch | |
| 8. Mission shower | |
| 9. Main axle | |
| 10. Drive axle | |
| 11. Crankshaft | |
| 12. Oil nozzle | |
| 13. Balancer shaft | |
| 14. Timing chain tensioner | |

LUBRICATION SYSTEM CHART AND DIAGRAMS

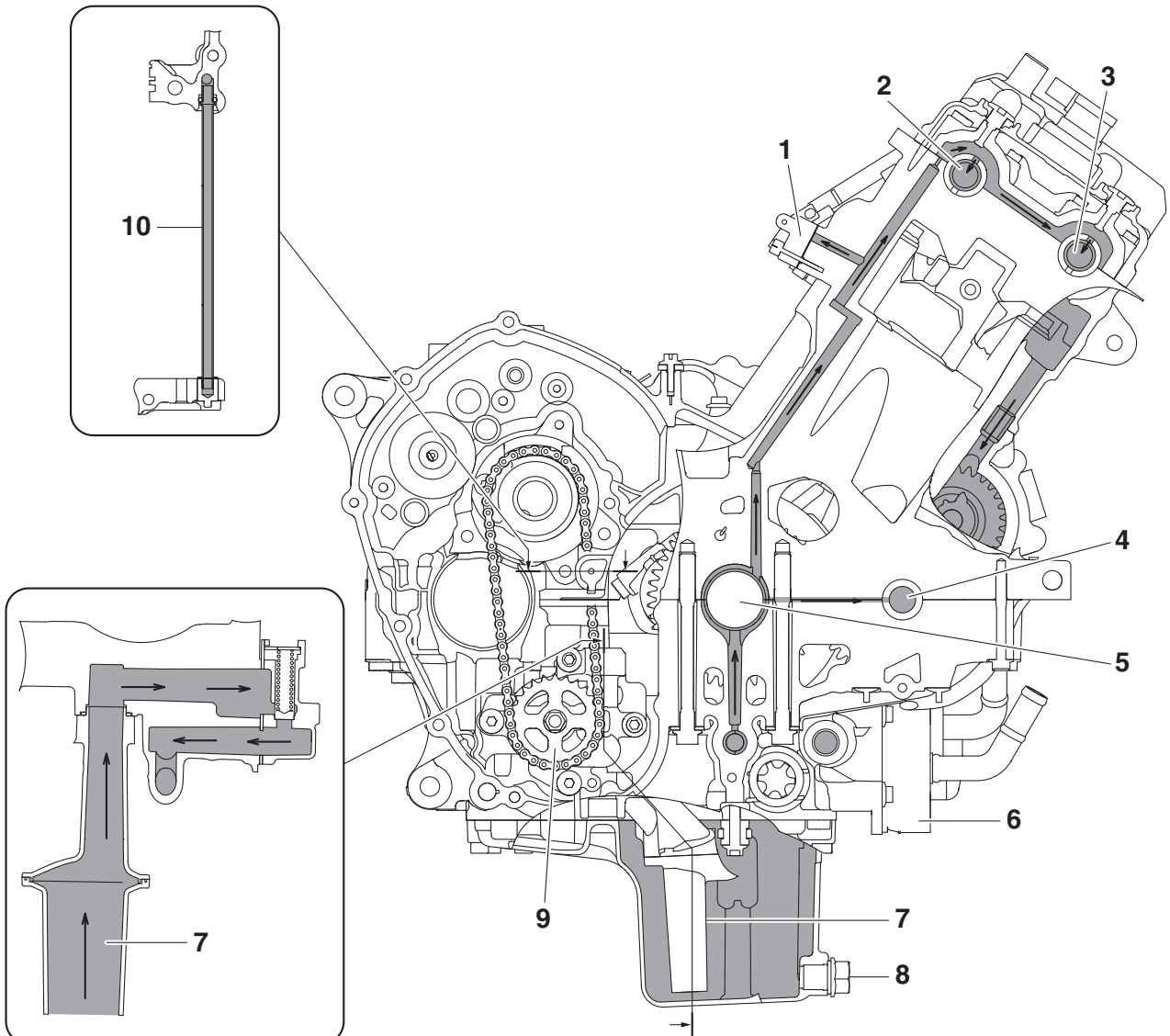
EAS32363

LUBRICATION DIAGRAMS



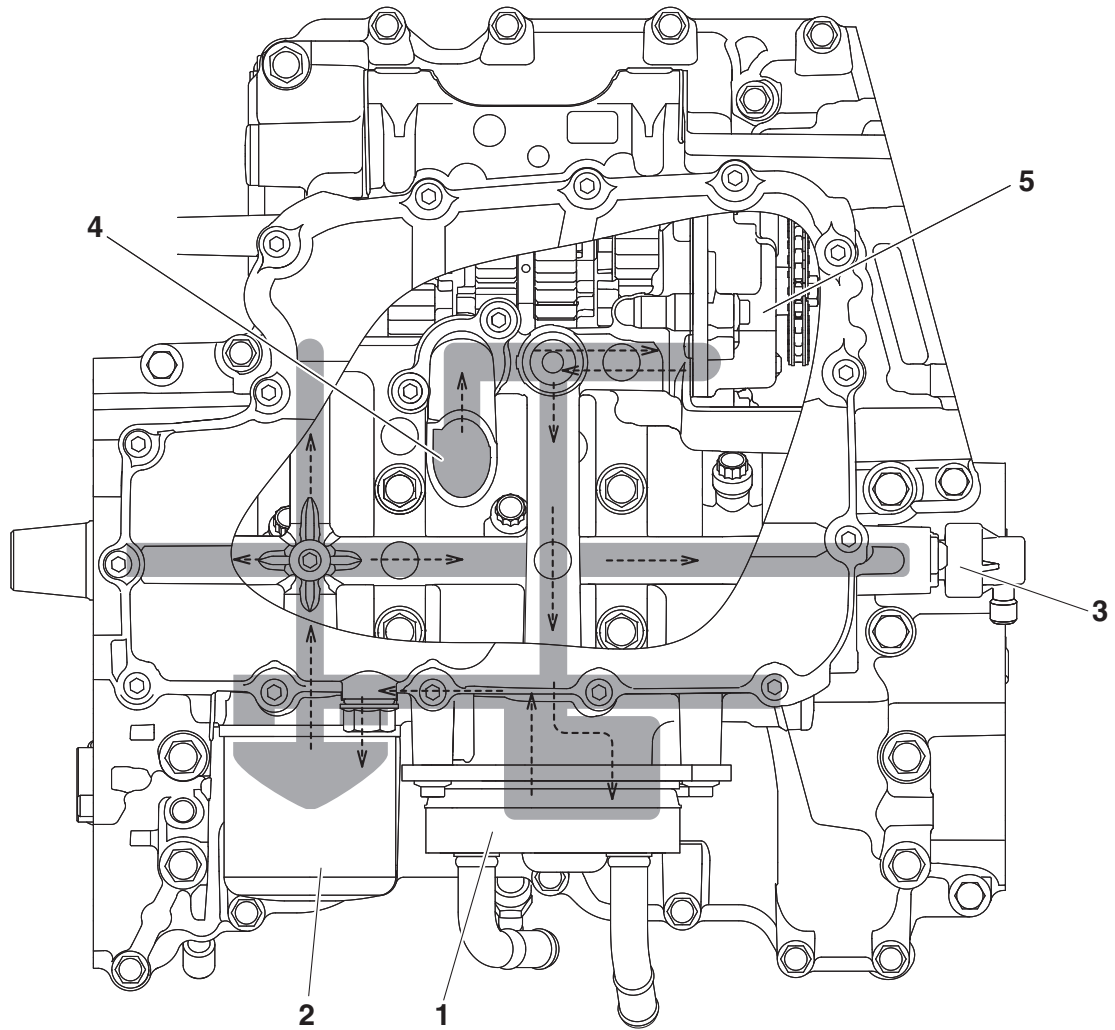
1. Oil filter cartridge union bolt
2. Oil filter cartridge
3. Oil delivery pipe
4. Drive axle
5. Main axle

LUBRICATION SYSTEM CHART AND DIAGRAMS



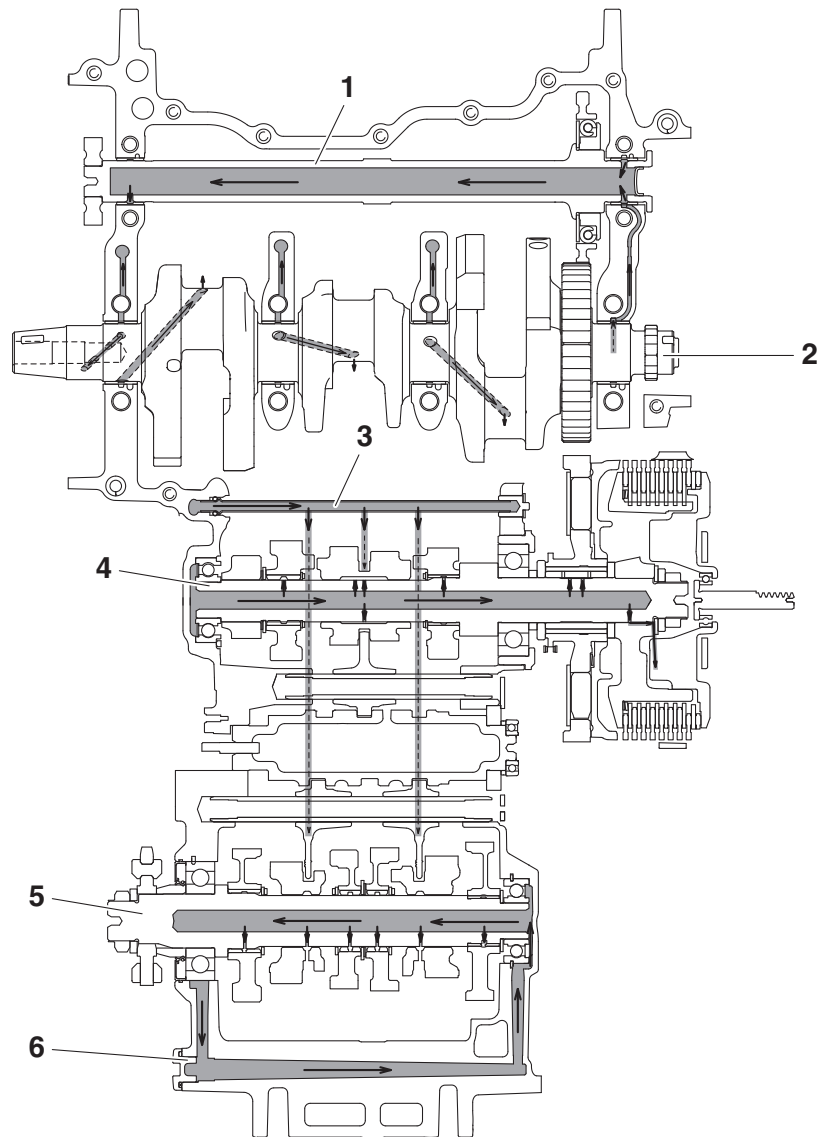
1. Timing chain tensioner
2. Intake camshaft
3. Exhaust camshaft
4. Balancer shaft
5. Crankshaft
6. Oil cooler
7. Oil strainer
8. Oil drain bolt
9. Oil pump driven sprocket
10. Oil delivery pipe

LUBRICATION SYSTEM CHART AND DIAGRAMS



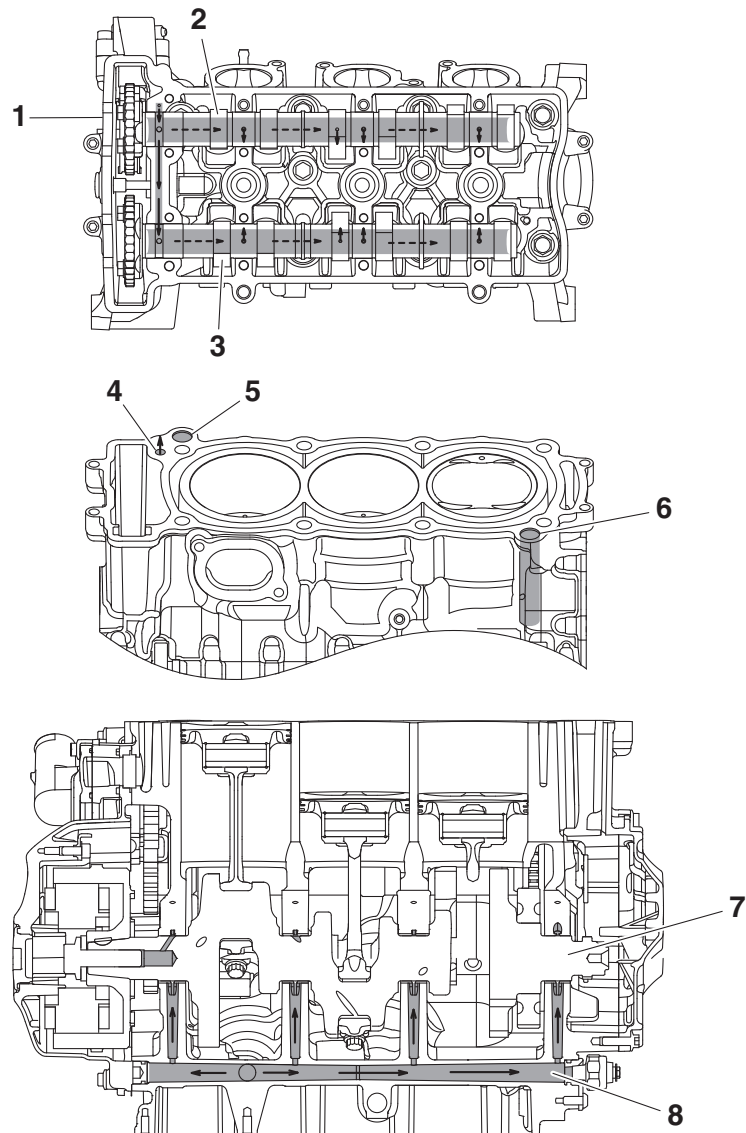
1. Oil cooler
2. Oil filter cartridge
3. Oil pressure switch
4. Oil strainer
5. Oil pump

LUBRICATION SYSTEM CHART AND DIAGRAMS



1. Balancer shaft
2. Crankshaft
3. Oil delivery pipe
4. Main axle
5. Drive axle
6. Oil gallery bolt

LUBRICATION SYSTEM CHART AND DIAGRAMS



1. Cylinder head
2. Intake camshaft
3. Exhaust camshaft
4. Oil passage to the cylinder head
5. Oil passage to the clutch chamber
6. Oil return passage from the cylinder head
7. Crankshaft
8. Main gallery

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:

- Rider seat
Refer to “GENERAL CHASSIS (1)” on page 4-1.
- Side cover
Refer to “GENERAL CHASSIS (1)” on page 4-1.
- Fuel tank cover
Refer to “GENERAL CHASSIS (4)” on page 4-10.
- Fuel tank
Refer to “FUEL TANK” on page 7-1.
- Air filter case
Refer to “GENERAL CHASSIS (5)” on page 4-11.
- Ignition coil
- Spark plug
Refer to “CAMSHAFTS” on page 5-16.

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.

4. Install:

- Compression gauge “1”
- Extension “2”



**Compression gauge
90890-03081**

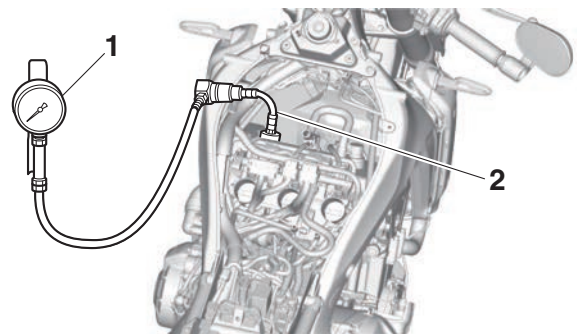
**Engine compression tester
YU-33223**

**Compression gauge extension
122mm**

90890-04136

**Compression gauge extension
122mm**

YM-04136



5. Measure:

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



**Compression pressure
1365–1758 kPa/600 r/min (13.7–
17.6 kgf/cm²/600 r/min, 194.3–
250.1 psi/600 r/min)**

- Set the main switch to “ON”.
- With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

EWA17100

WARNING

To prevent sparking the plug, remove all ignition coil couplers and fuel injector couplers before cranking the engine.

TIP

The difference in compression pressure between cylinders should not exceed 100 kPa (1 kg/cm², 15 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	Piston, valves, cylinder head gasket possibly defective → Repair.

6. Install:

- Spark plug

	<p>Spark plug 13 N·m (1.3 kgf·m, 9.6 lb-ft)</p>
---	--

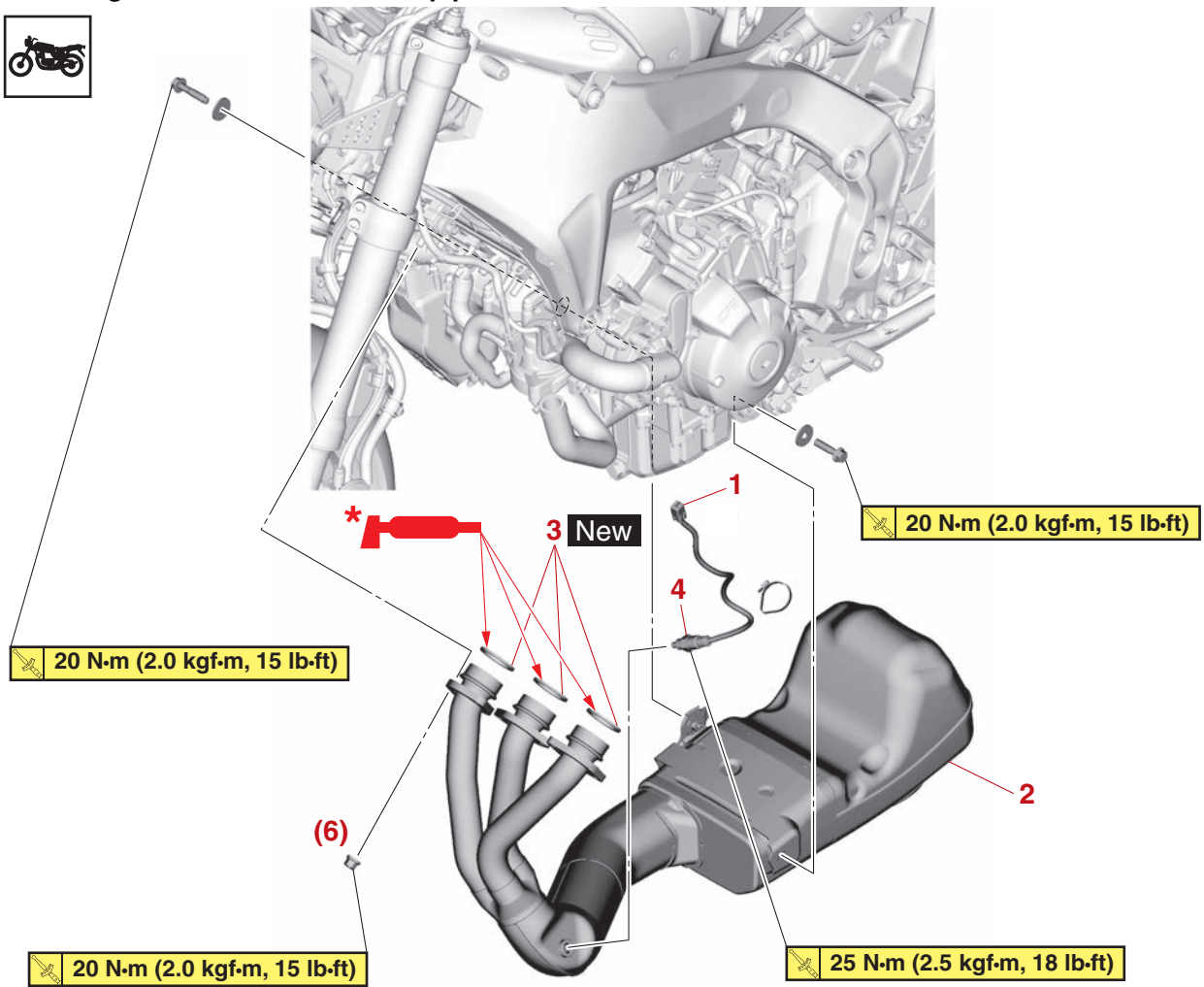
7. Install:

- Ignition coil
Refer to “CAMSHAFTS” on page 5-16.
- Air filter case
Refer to “GENERAL CHASSIS (5)” on page 4-11.
- Fuel tank
Refer to “FUEL TANK” on page 7-1.
- Fuel tank cover
Refer to “GENERAL CHASSIS (4)” on page 4-10.
- Side cover
Refer to “GENERAL CHASSIS (1)” on page 4-1.
- Rider seat
Refer to “GENERAL CHASSIS (1)” on page 4-1.

EAS20042

ENGINE REMOVAL

Removing the muffler and exhaust pipe

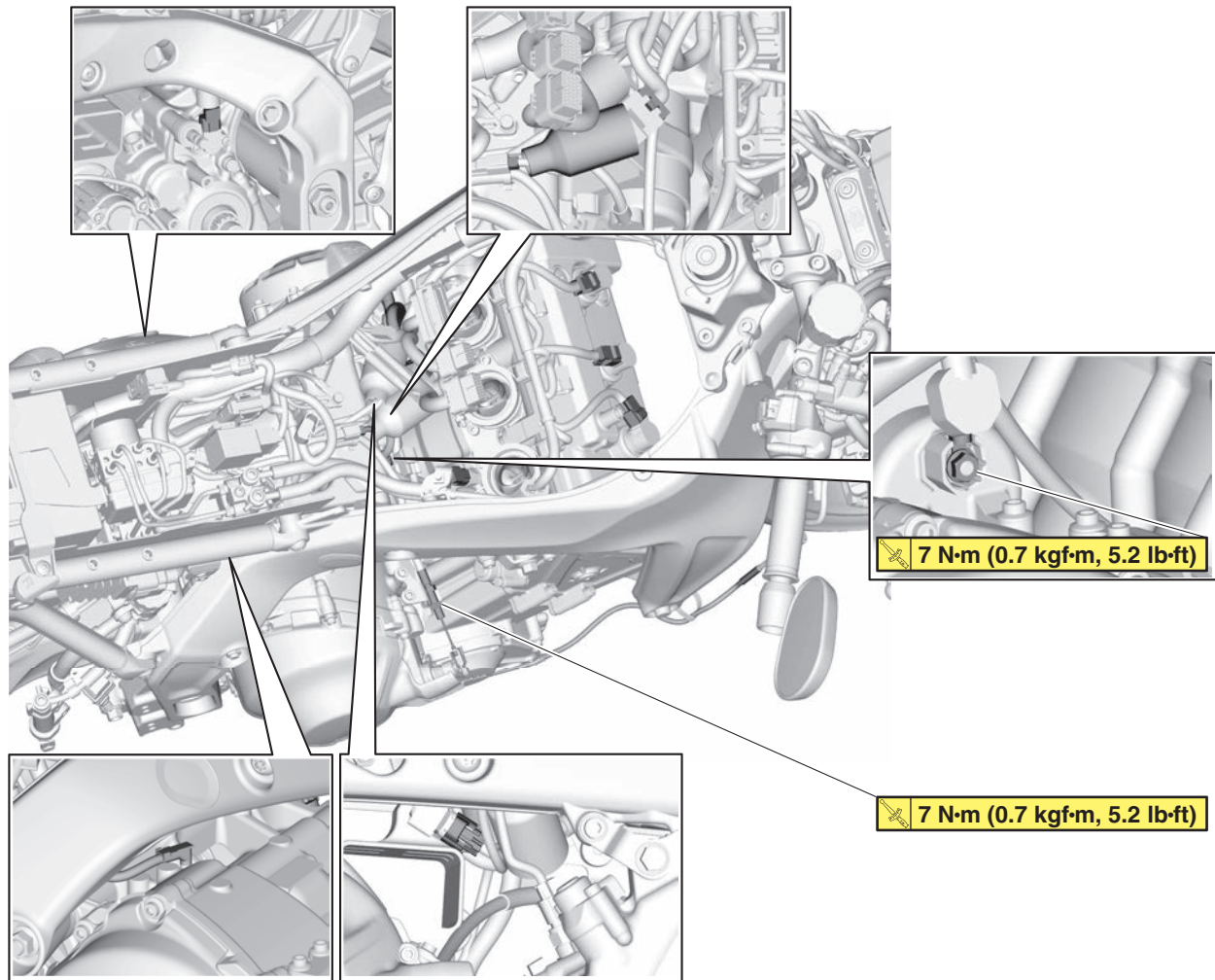


* YAMAHA GREASE "G"

Order	Job/Parts to remove	Q'ty	Remarks
	Radiator bracket		Refer to "RADIATOR" on page 6-3.
1	O ₂ sensor coupler	1	Disconnect.
2	Muffler assembly	1	
3	Exhaust gasket	3	
4	O ₂ sensor	1	Remove the O ₂ sensor only when necessary.

ENGINE REMOVAL

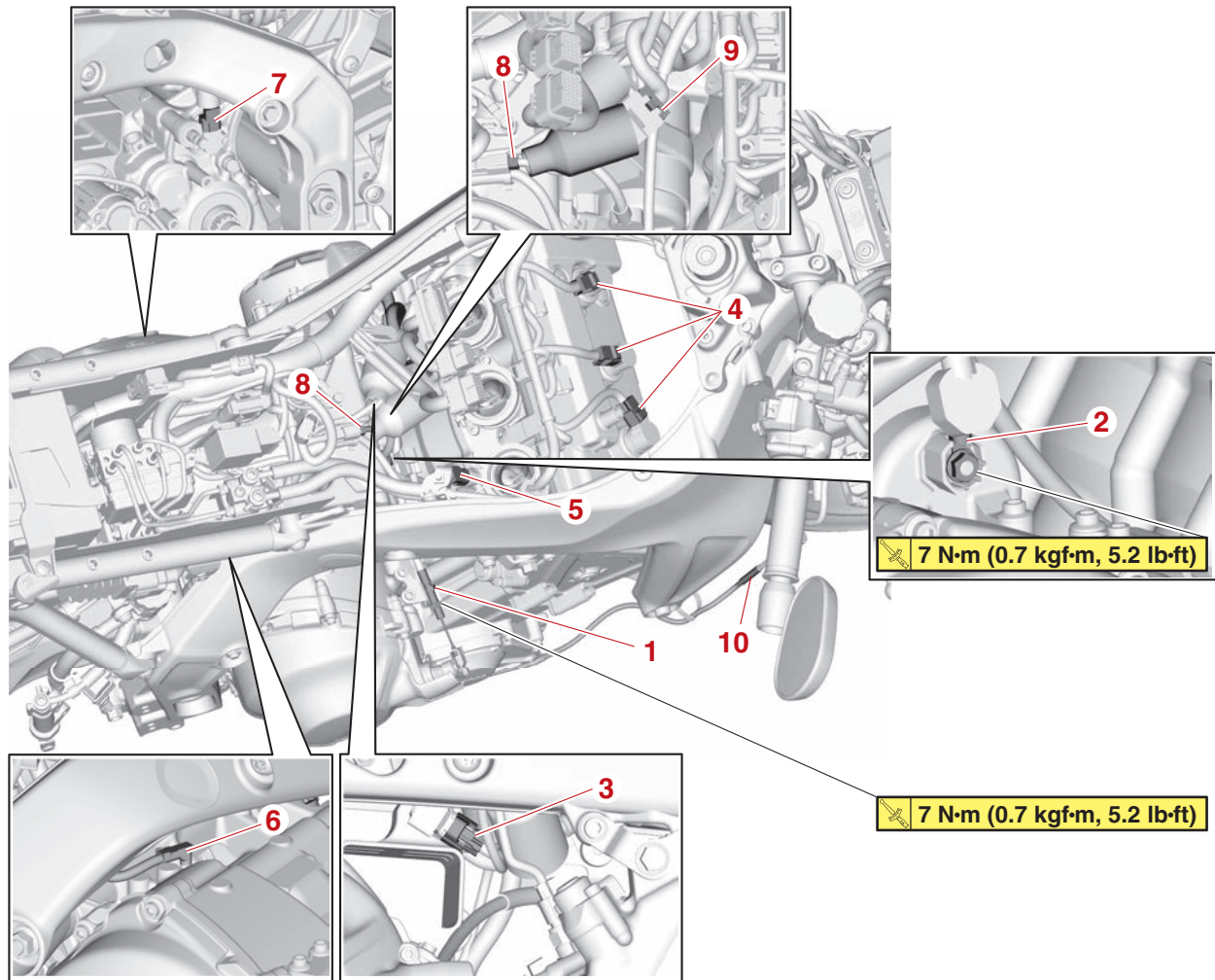
Disconnecting the leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Side cover		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "GENERAL CHASSIS (5)" on page 4-11.
	Canister		Refer to "FUEL TANK" on page 7-1.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-6.
	Front side panel		Refer to "GENERAL CHASSIS (3)" on page 4-8.
	Radiator		Refer to "RADIATOR" on page 6-3.

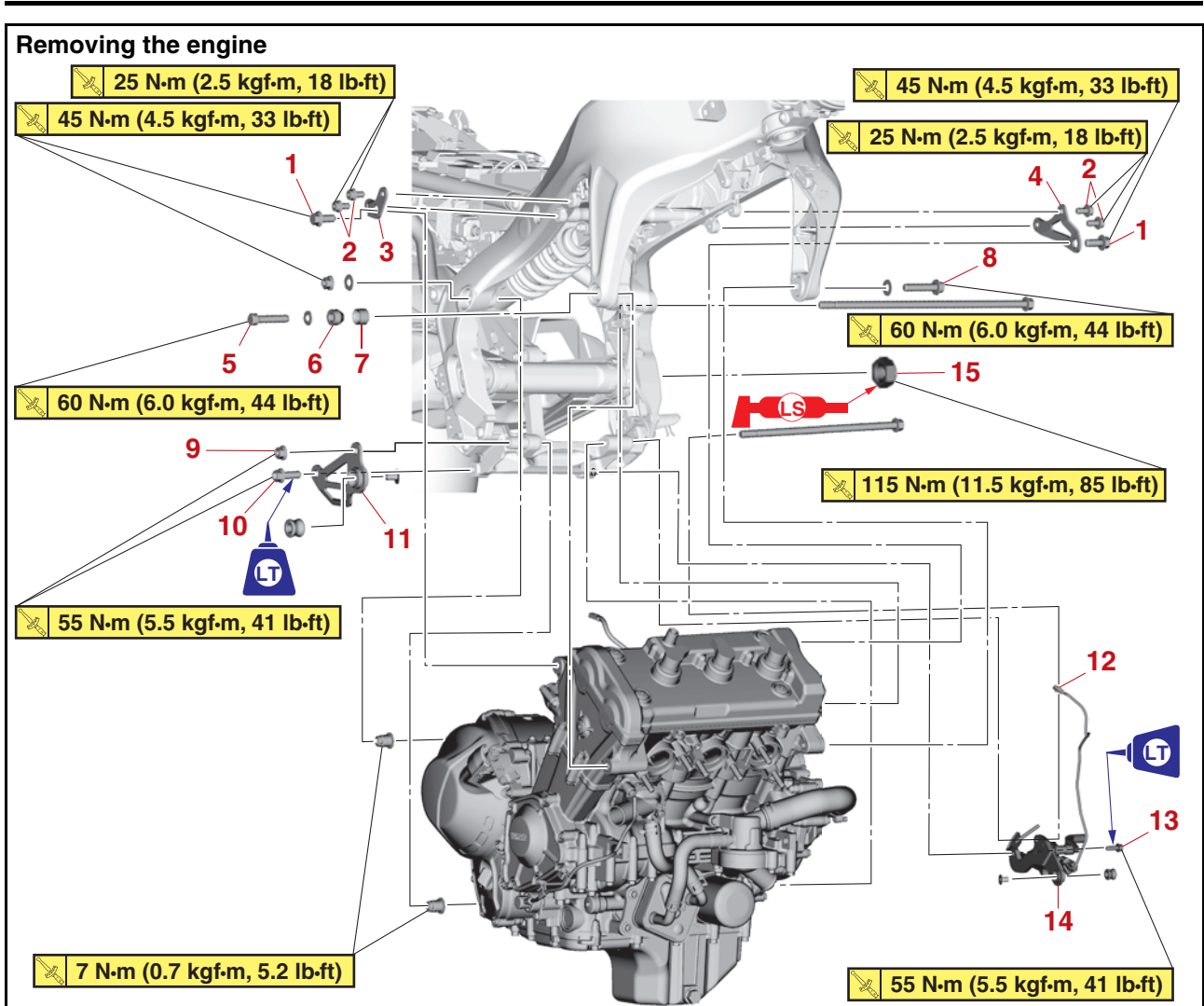
ENGINE REMOVAL

Disconnecting the leads and hoses



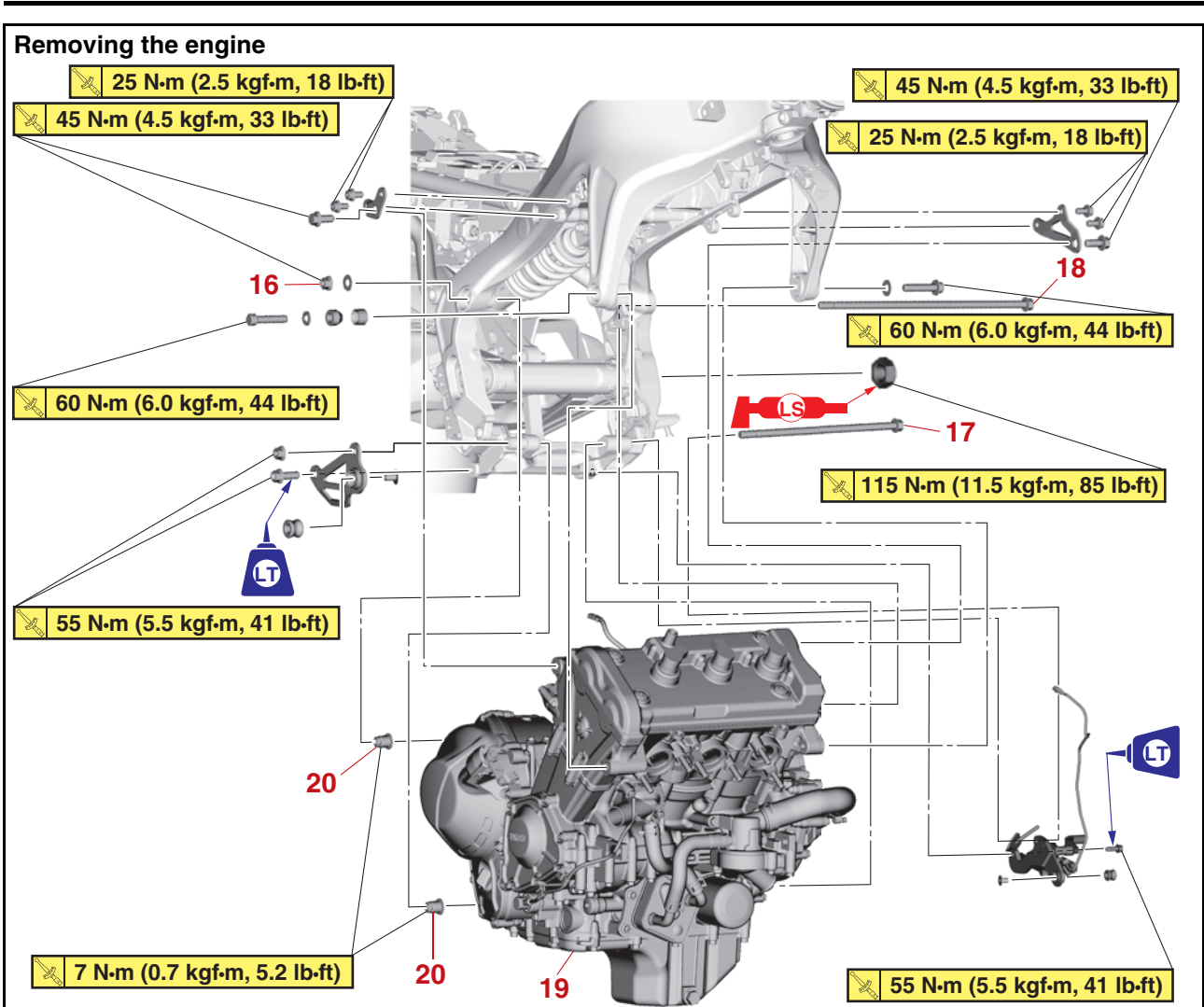
Order	Job/Parts to remove	Q'ty	Remarks
	Footrest assembly (right)		Refer to "REAR BRAKE" on page 4-40.
	Shift rod/Drive sprocket		Refer to "CHAIN DRIVE" on page 4-88.
1	Clutch cable	1	Disconnect.
2	Starter motor lead	1	Disconnect.
3	Purge cut valve solenoid coupler	1	Disconnect.
4	Ignition coil coupler	3	Disconnect.
5	Coolant temperature sensor coupler	1	Disconnect.
6	Neutral switch coupler	1	Disconnect.
7	Gear position sensor coupler	1	Disconnect.
8	Crankshaft position sensor coupler	1	Disconnect.
9	Stator coil coupler	1	Disconnect.
10	Oil pressure switch connector	1	Disconnect.

ENGINE REMOVAL



Order	Job/Parts to remove	Q'ty	Remarks
1	Engine mounting bolt (right front upper side)/ Engine mounting bolt (left front upper side)	1/1	
2	Engine bracket bolt (right)/Engine bracket bolt (left)	2/2	
3	Engine bracket (right)	1	
4	Engine bracket (left)	1	
5	Engine mounting bolt (right front lower side)	1	
6	Collar	1	
7	Collar	1	
8	Engine mounting bolt (left front lower side)	1	
9	Engine mounting nut (lower)	1	
10	Muffler bracket bolt	1	
11	Muffler bracket	1	
12	Sidestand switch coupler	1	Disconnect.
13	Muffler bracket bolt	1	
14	Muffler bracket	1	
15	Pivot shaft nut	1	Loosen.

ENGINE REMOVAL



Order	Job/Parts to remove	Q'ty	Remarks
16	Engine mounting nut (upper)	1	
17	Engine mounting bolt (rear lower side)	1	
18	Engine mounting bolt (rear upper side)	1	
19	Engine	1	
20	Engine mounting adjust bolt	2	

ENGINE REMOVAL

EAS30250

REMOVING THE ENGINE

1. Loosen:

- Engine mounting adjust bolt (rear)

TIP

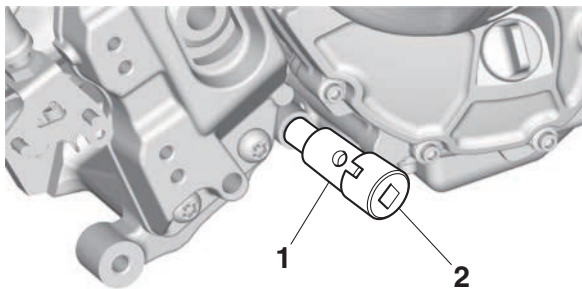
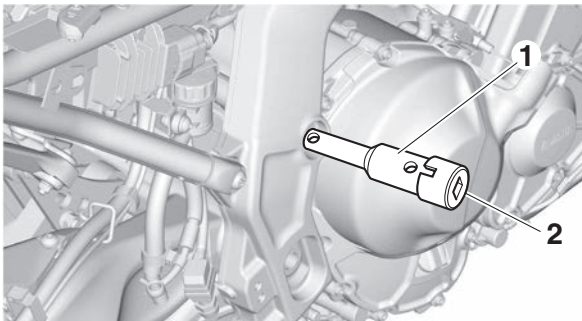
Loosen the engine mounting adjust bolts with the pivot shaft wrench "1" and pivot shaft wrench adapter "2".



Pivot shaft wrench
90890-01518

Frame spanner socket
YM-01518

Pivot shaft wrench adapter
90890-01476



EAS30251

INSTALLING THE ENGINE

1. Install:

- Engine mounting adjust bolt (lower) "1" (temporarily tighten)
- Engine mounting adjust bolt (upper) "2" (temporarily tighten)

2. Install:

- Muffler bracket "3"
- Muffler bracket bolt "4" (temporarily tighten)

3. Install:

- Engine

4. Install:

- Engine mounting bolt (rear lower side) "5"
- Engine mounting bolt (rear upper side) "6"

5. Install:

- Engine mounting bolt (left front lower side) "7" (temporarily tighten)

6. Install:

- Collar "8"
- Collar "9"
- Engine mounting bolt (right front lower side) "10" (temporarily tighten)

7. Tighten:

- Engine mounting adjust bolt (lower) "1"

TIP

- Tighten the engine mounting adjust bolt to specification with the pivot shaft wrench and pivot shaft wrench adapter.
- Make sure that the flange on the engine mounting adjust bolt contacts the engine.



Engine mounting adjust bolt (lower)

7 N·m (0.7 kgf·m, 5.2 lb·ft)



Pivot shaft wrench
90890-01518

Frame spanner socket
YM-01518

Pivot shaft wrench adapter
90890-01476

8. Install:

- Muffler bracket "11"
- Muffler bracket bolt "12" (temporarily tighten)

9. Tighten:

- Engine mounting nut (lower) "13"
- Muffler bracket bolt "4", "12"



Engine mounting nut (lower)
55 N·m (5.5 kgf·m, 41 lb·ft)

Muffler bracket bolt
55 N·m (5.5 kgf·m, 41 lb·ft)
LOCTITE®

ENGINE REMOVAL

10. Tighten:

- Engine mounting bolt (left front lower side) “7”
- Engine mounting bolt (right front lower side) “10”



Engine mounting bolt (left front lower side)
60 N·m (6.0 kgf·m, 44 lb·ft)
Engine mounting bolt (right front lower side)
60 N·m (6.0 kgf·m, 44 lb·ft)

11. Tighten:

- Pivot shaft nut “14”



Pivot shaft nut
115 N·m (11.5 kgf·m, 85 lb·ft)

12. Tighten:

- Engine mounting adjust bolt (upper) “2”

TIP

- Tighten the engine mounting adjust bolt to specification with the pivot shaft wrench and pivot shaft wrench adapter.
- Make sure that the flange on the engine mounting adjust bolt contacts the engine.



Engine mounting adjust bolt (upper)
7 N·m (0.7 kgf·m, 5.2 lb·ft)



Pivot shaft wrench
90890-01518
Frame spanner socket
YM-01518
Pivot shaft wrench adapter
90890-01476

13. Tighten:

- Engine mounting nut (upper) “15”



Engine mounting nut (upper)
45 N·m (4.5 kgf·m, 33 lb·ft)

14. Install:

- Engine bracket (left) “16”
- Engine bracket bolt (left) “17” (temporarily tighten)
- Engine mounting bolt (left front upper side) “18” (temporarily tighten)

15. Install:

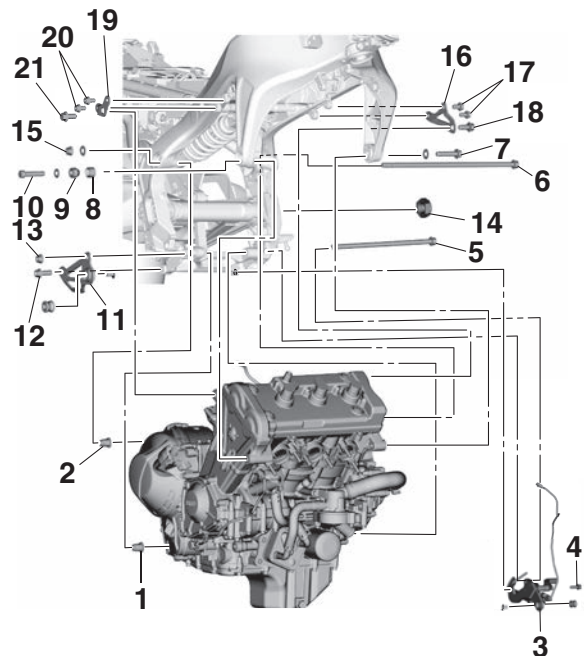
- Engine bracket (right) “19”
- Engine bracket bolt (right) “20” (temporarily tighten)
- Engine mounting bolt (right front upper side) “21” (temporarily tighten)

16. Tighten:

- Engine bracket bolt (left) “17”
- Engine mounting bolt (left front upper side) “18”
- Engine bracket bolt (right) “20”
- Engine mounting bolt (right front upper side) “21”



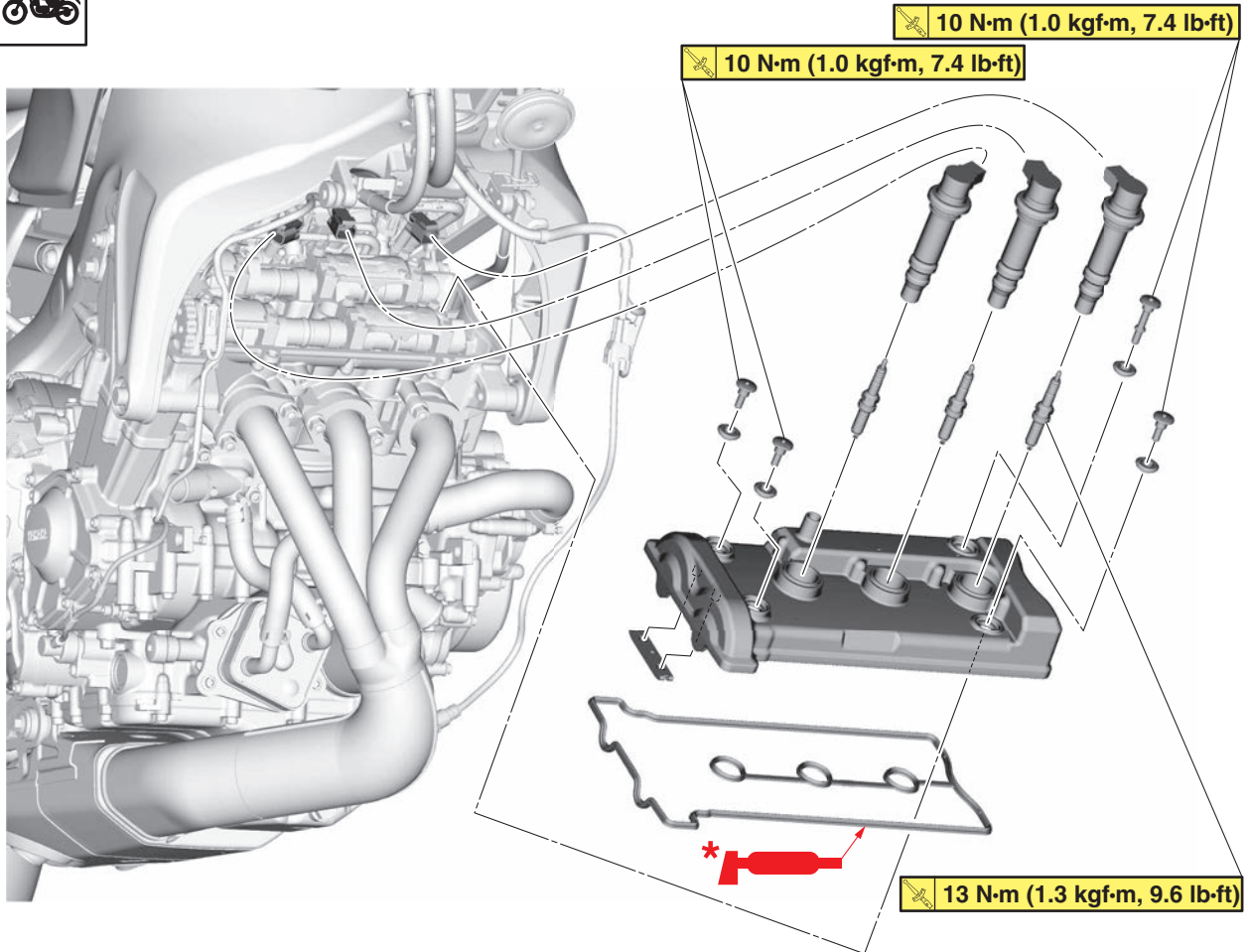
Engine bracket bolt (left)
25 N·m (2.5 kgf·m, 18 lb·ft)
Engine mounting bolt (left front upper side)
45 N·m (4.5 kgf·m, 33 lb·ft)
Engine bracket bolt (right)
25 N·m (2.5 kgf·m, 18 lb·ft)
Engine mounting bolt (right front upper side)
45 N·m (4.5 kgf·m, 33 lb·ft)



EAS20043

CAMSHAFTS

Removing the cylinder head cover

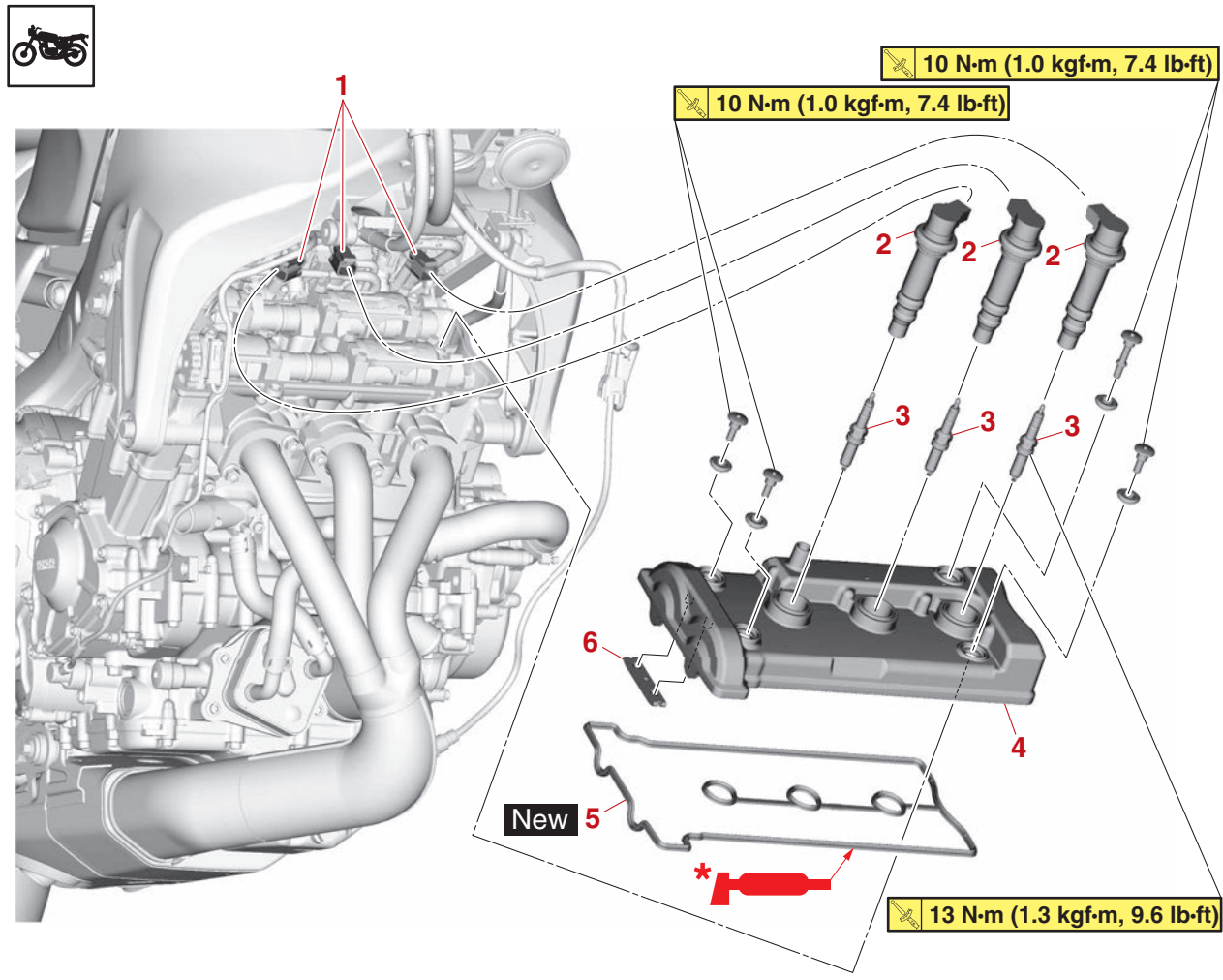


* Three Bond No. 1541C®

Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Side cover		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Air filter case		Refer to "GENERAL CHASSIS (5)" on page 4-11.
	Front side panel		Refer to "GENERAL CHASSIS (3)" on page 4-8.
	Radiator		Refer to "RADIATOR" on page 6-3.

CAMSHAFTS

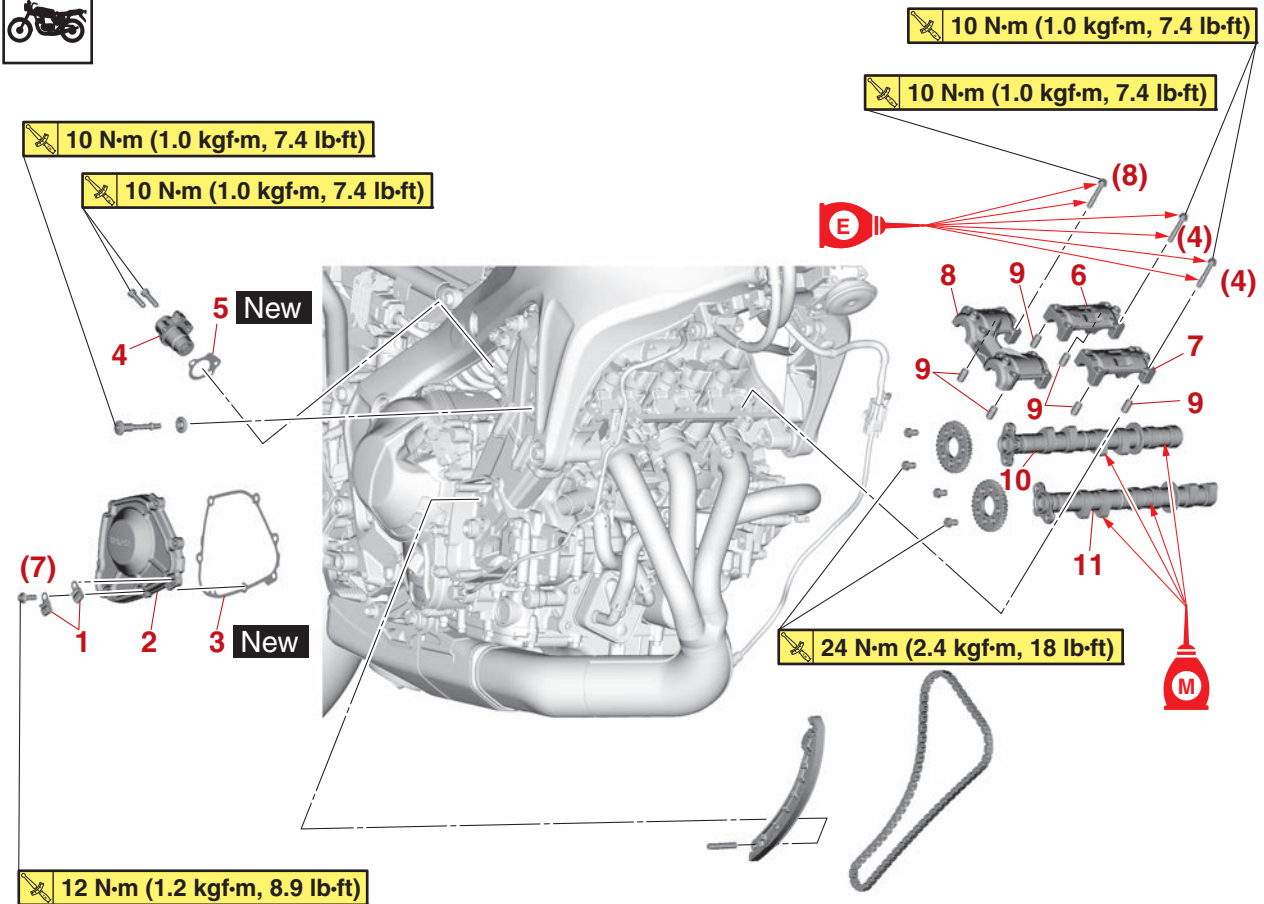
Removing the cylinder head cover



* Three Bond No. 1541C®

Order	Job/Parts to remove	Q'ty	Remarks
1	Ignition coil coupler	3	Disconnect.
2	Ignition coil	3	
3	Spark plug	3	
4	Cylinder head cover	1	
5	Cylinder head cover gasket	1	
6	Timing chain guide (top side)	1	

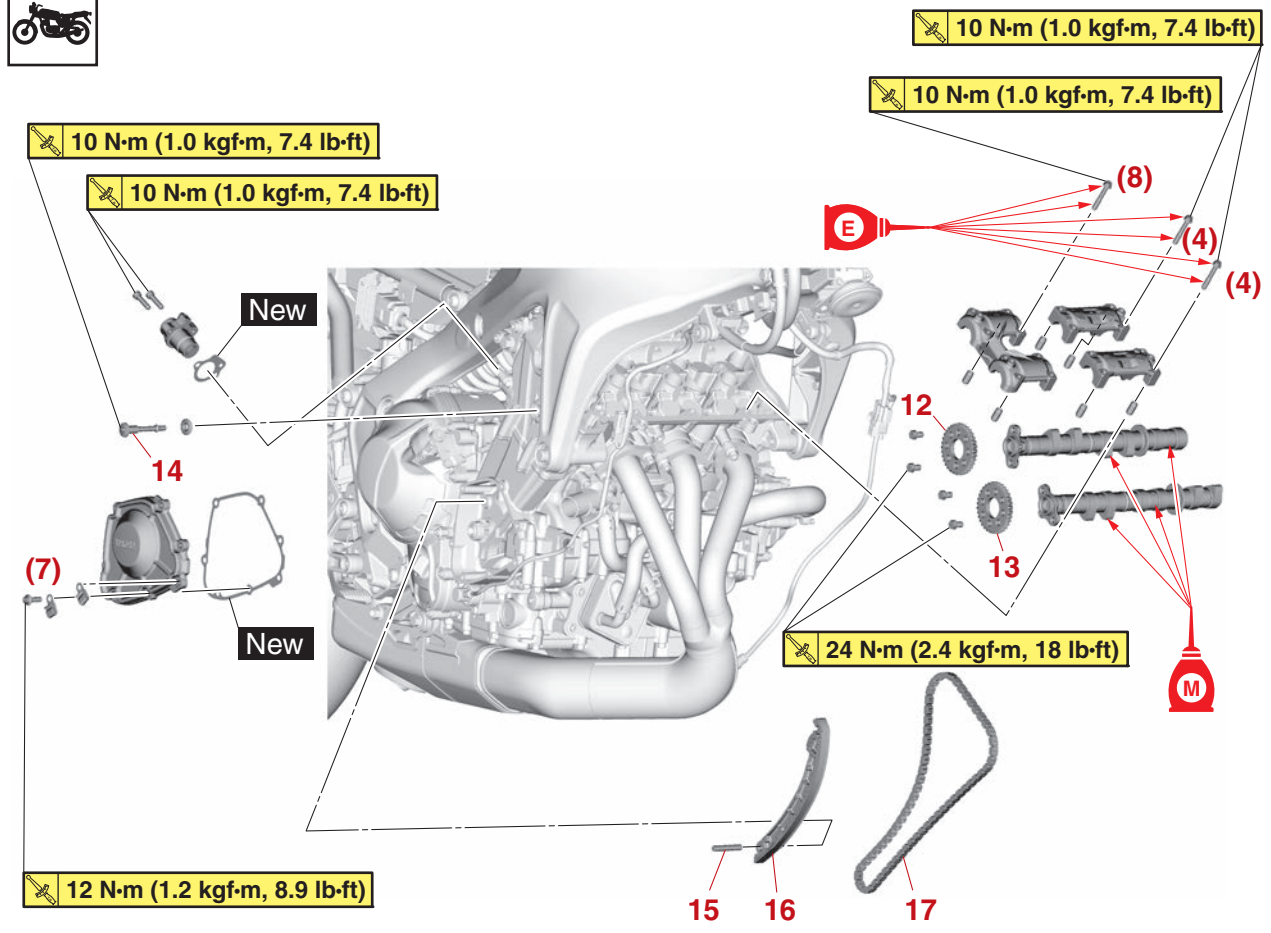
Removing the camshafts



Order	Job/Parts to remove	Q'ty	Remarks
	Crankshaft end cover/Timing mark accessing bolt		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-37.
1	Holder	2	
2	Timing chain cover	1	
3	Timing chain cover gasket	1	
4	Timing chain tensioner	1	
5	Timing chain tensioner gasket	1	
6	Intake camshaft cap	1	
7	Exhaust camshaft cap	1	
8	Camshaft cap	1	
9	Dowel pin	6	
10	Intake camshaft	1	
11	Exhaust camshaft	1	

CAMSHAFTS

Removing the camshafts

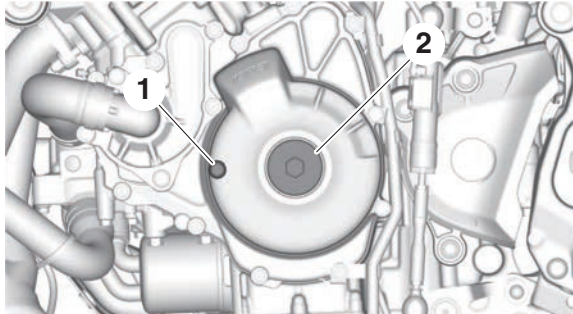


Order	Job/Parts to remove	Q'ty	Remarks
12	Intake camshaft sprocket	1	
13	Exhaust camshaft sprocket	1	
14	Timing chain bolt	1	
15	Dowel pin	1	
16	Timing chain guide (intake side)	1	
17	Timing chain	1	

EAS30256

REMOVING THE CAMSHAFTS

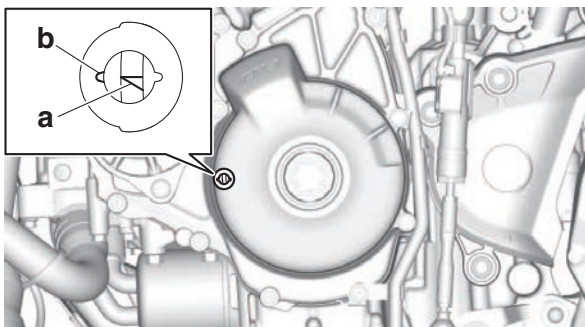
- Remove:
 - Timing mark accessing bolt "1"
 - Crankshaft end cover "2"



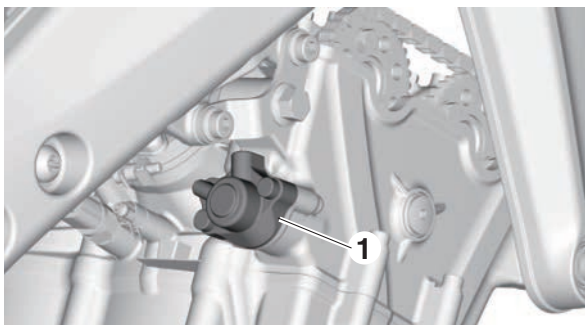
- Align:
 - Mark "a" on the generator rotor (with the generator rotor cover mark "b")
 - Turn the crankshaft counterclockwise.
 - When piston #1 is at BTDC125° on the compression stroke, align the BTDC125° mark "a" on the generator rotor with the generator rotor cover mark "b".

TIP

BTDC125° on the compression stroke can be found when the camshaft lobes are turned away from each other.



- Remove:
 - Timing chain tensioner "1"
 - Timing chain tensioner gasket



- Remove:
 - Camshaft cap
 - Intake camshaft cap
 - Exhaust camshaft cap

ECA13720

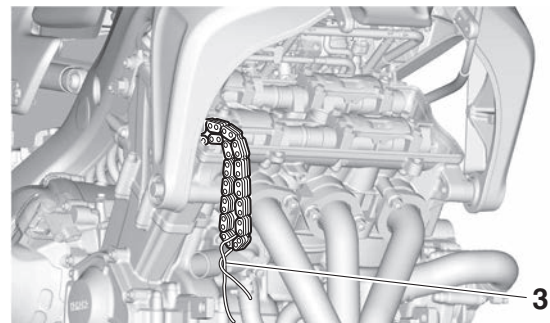
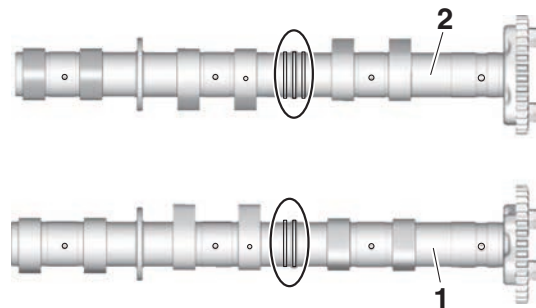
NOTICE

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.

- Remove:
 - Intake camshaft "1"
 - Exhaust camshaft "2"

TIP

To prevent the timing chain from falling into the crankcase, fasten it with a wire "3".



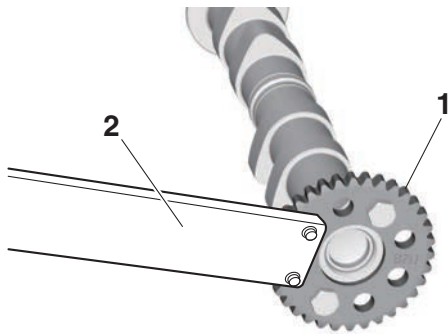
- Remove:
 - Camshaft sprocket "1"

TIP

Use the camshaft wrench "2" and loosen the camshaft sprocket bolt.



Camshaft wrench
90890-04162
Camshaft wrench
YM-04162



EAS30257

CHECKING THE CAMSHAFTS

1. Check:

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

2. Measure:

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



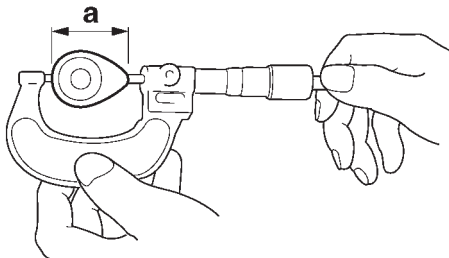
Camshaft lobe dimensions

Lobe height limit (Intake)

35.590 mm (1.4012 in)

Lobe height limit (Exhaust)

35.620 mm (1.4024 in)



G088946

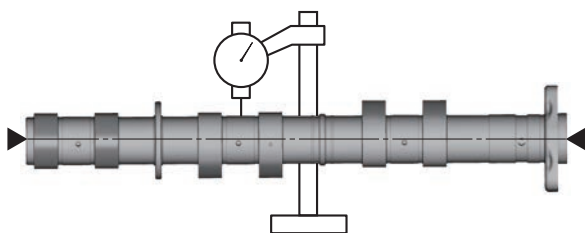
3. Measure:

- Camshaft runout
Out of specification → Replace.



Camshaft runout limit

0.030 mm (0.0012 in)



4. Measure:

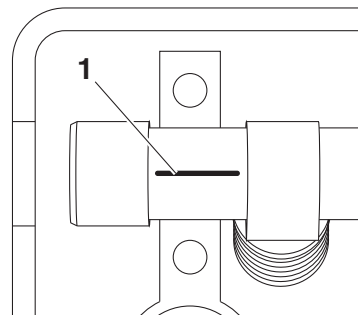
- Camshaft-journal-to-camshaft-cap clearance
Out of specification → Measure the camshaft journal diameter.



Camshaft-journal-to-camshaft-cap clearance limit

0.080 mm (0.0032 in)

- Install the camshaft into the cylinder head (without the camshaft caps).
- Position strip of Plastigauge® “1” onto the camshaft journal as shown.



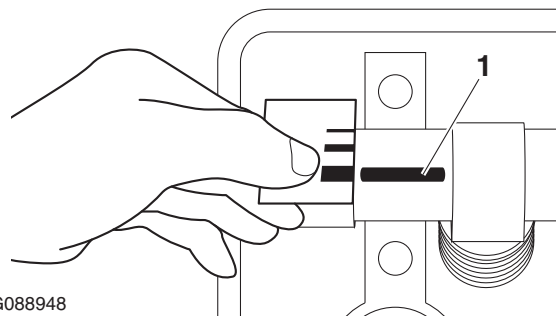
G088947

- Install the dowel pins and camshaft caps. Refer to “INSTALLING THE CAMSHAFTS” on page 5-23.

TIP

Do not turn the camshaft when measuring the camshaft journal-to-camshaft cap clearance with the Plastigauge®.

- Remove the camshaft caps, and then measure the width of the Plastigauge® “1”.



G088948

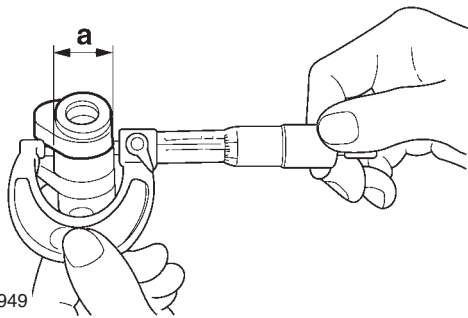
5. Measure:

- Camshaft journal diameter “a”
Out of specification → Replace the camshaft.
Within specification → Replace the cylinder head and the camshaft caps as a set.



Camshaft journal diameter

24.459–24.472 mm (0.9630–0.9635 in)



G088949

EAS30258

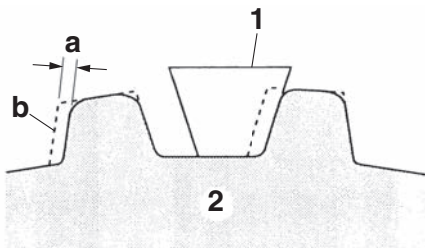
CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET

1. Check:

- Timing chain
Damage/stiffness → Replace the timing chain and camshaft and camshaft sprocket as a set.

2. Check:

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



G088950

- a. 1/4 tooth
 - b. Correct
1. Timing chain
 2. Camshaft sprocket

EAS30265

CHECKING THE TIMING CHAIN GUIDES

1. Check:

- Timing chain guide (intake side)
- Timing chain guide (top side)
Damage/wear → Replace the defective part(s).

EAS30266

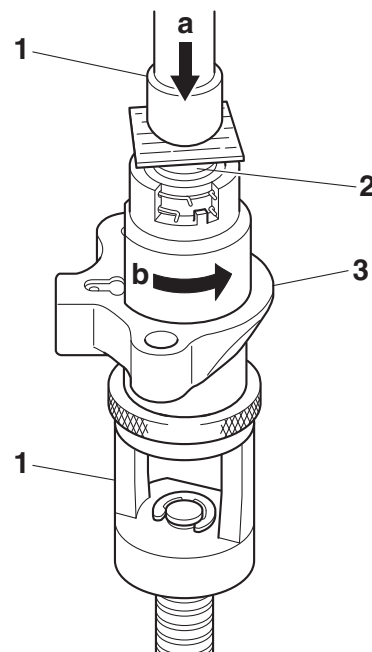
CHECKING THE TIMING CHAIN TENSIONER

1. Check:

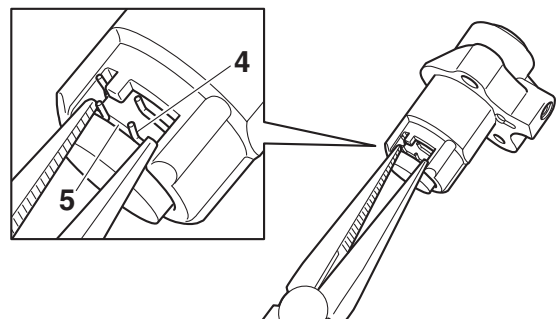
- Timing chain tensioner
Cracks/damage/rough movement → Replace.
- a. Using the valve spring compressor "1", push and insert timing chain tensioner rod "2" into the timing chain tensioner housing.

TIP

Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "3" in direction "b" until the circlip fits into the groove.

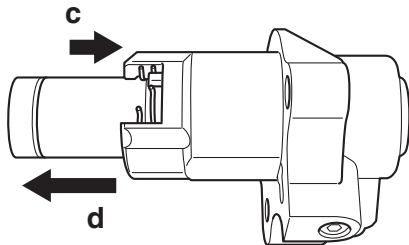


- b. Lock the timing chain tensioner rod by setting the circlip "4" to groove "5" while pushing the timing chain tensioner rod.



- c. Push the timing chain tensioner rod "c".
- d. If the circlip does not unlock even though you press the timing chain tensioner rod in the "c" direction, rotate the timing chain tensioner rod clockwise.

- e. Make sure that the timing chain tensioner rod comes out “d” of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

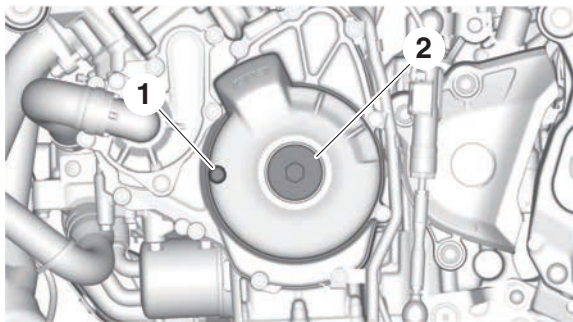


EAS30269

INSTALLING THE CAMSHAFTS

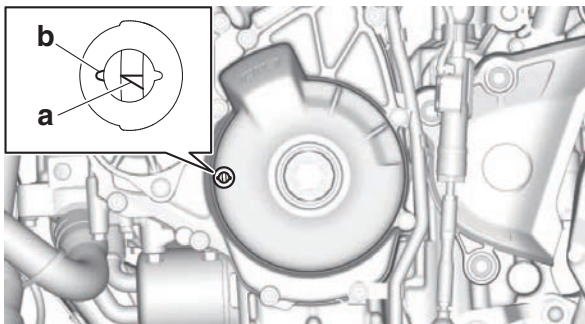
1. Remove:

- Timing mark accessing bolt “1”
- Crankshaft end cover “2”



2. Align:

- Mark “a” on the generator rotor (with the generator rotor cover mark “b”)
 - a. Turn the crankshaft counterclockwise.
 - b. When piston #1 is at BTDC125°, align the mark “a” on the generator rotor with the generator rotor cover mark “b”.



3. Install:

- Intake camshaft sprocket “1”
- Exhaust camshaft sprocket “2”



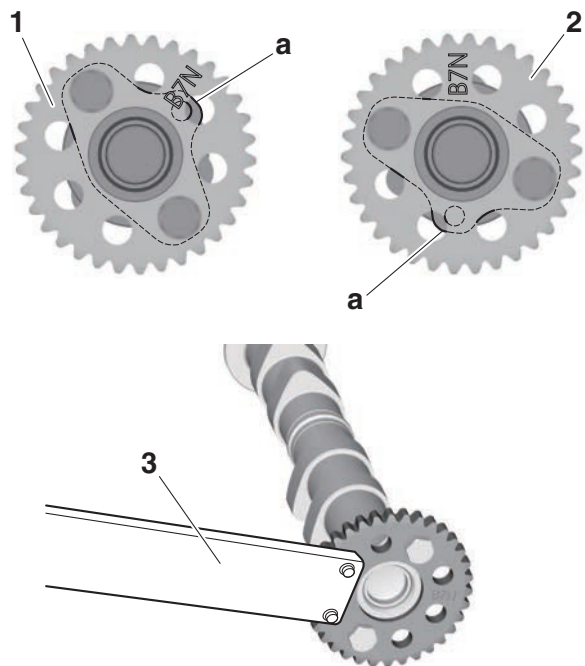
Camshaft sprocket bolt
24 N·m (2.4 kgf·m, 18 lb·ft)

TIP

- Install the camshaft projection “a” at the position shown in the illustration.
- Tighten the camshaft sprocket bolt with the camshaft wrench “3”.



Camshaft wrench
90890-04162
Camshaft wrench
YM-04162

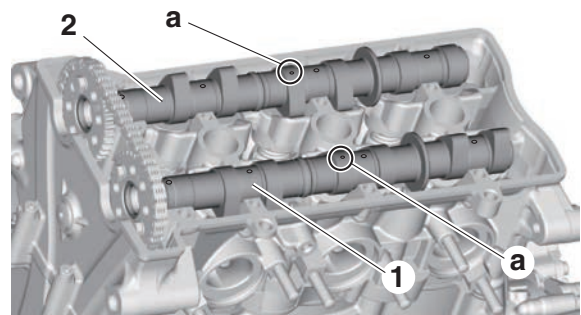


4. Install:

- Exhaust camshaft “1”
- Intake camshaft “2”

TIP

Make sure the punch mark “a” on each camshaft faces up.

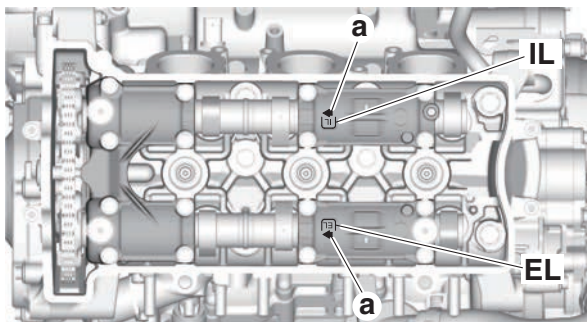


5. Install:

- Camshaft cap
- Intake camshaft cap
- Exhaust camshaft cap

TIP

- Make sure each camshaft cap is installed in its original place. Refer to the identification marks as follows:
 “IL”: Intake left side camshaft cap mark
 “EL”: Exhaust left side camshaft cap mark
- Make sure the arrow mark “a” on each camshaft points toward the right side of the engine.



6. Tighten:

- Camshaft cap bolt



Camshaft cap bolt
 10 N·m (1.0 kgf·m, 7.4 lb·ft)

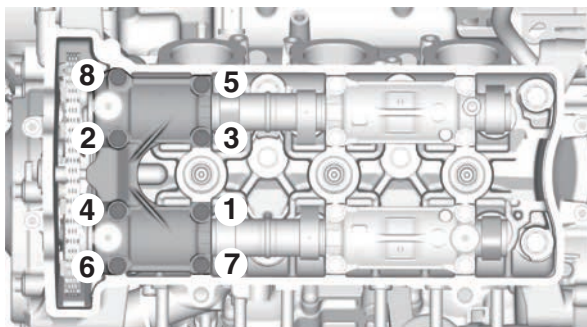
TIP

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

ECA17430

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.



7. Tighten:

- Camshaft cap bolt “1”



Camshaft cap bolt
 10 N·m (1.0 kgf·m, 7.4 lb·ft)

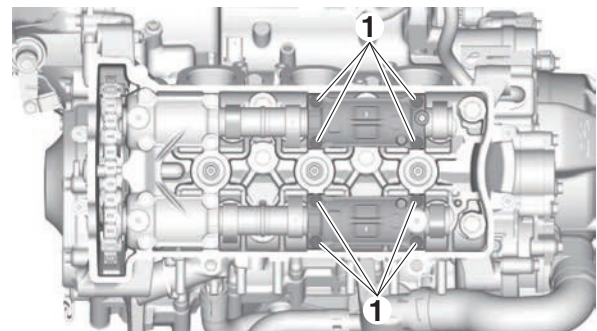
TIP

Tighten the camshaft cap bolts in stage and in a crisscross pattern, working from the inner caps out.

ECA17430

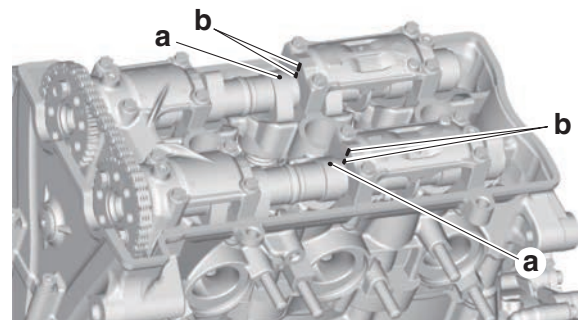
NOTICE

- 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.



8. Check:

- Camshaft punch mark “a”
 Make sure the camshaft punch mark “a” on the camshaft is aligned with the camshaft cap alignment mark “b”.

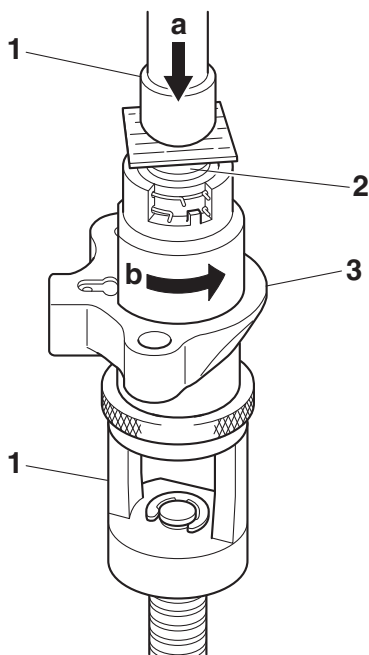


9. Install:

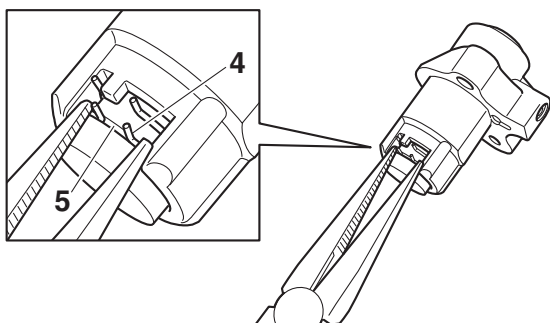
- Timing chain tensioner gasket **New**
 - Timing chain tensioner
- a. Using the valve spring compressor "1", push and insert timing chain tensioner rod "2" into the timing chain tensioner housing.

TIP

Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "3" in direction "b" until the circlip fits into the groove.




- b. Lock the timing chain tensioner rod by setting the circlip "4" into groove "5" while pushing the timing chain tensioner rod.



- c. Install the timing chain tensioner to the cylinder block.

TIP

Always use a new gasket.

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

- d. Turn the crankshaft clockwise several times to release the timing chain tensioner rod.

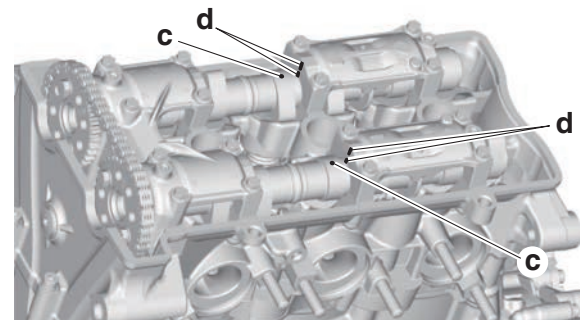
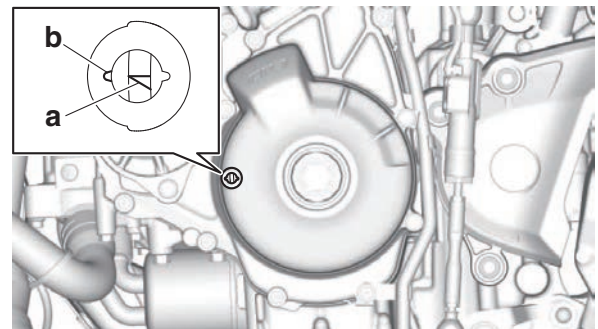
10. Turn:

- Crankshaft (several turns counterclockwise)

11. Confirm the timing chain tension properly.

12. Check:

- Mark "a"
Make sure the mark "a" on the generator rotor is aligned with the generator rotor cover mark "b".
- Camshaft punch mark "c"
Make sure the camshaft punch mark "c" on the camshaft is aligned with the camshaft cap alignment mark "d".
Out of alignment → Adjust.
Refer to the installation steps above.



13. Measure:


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

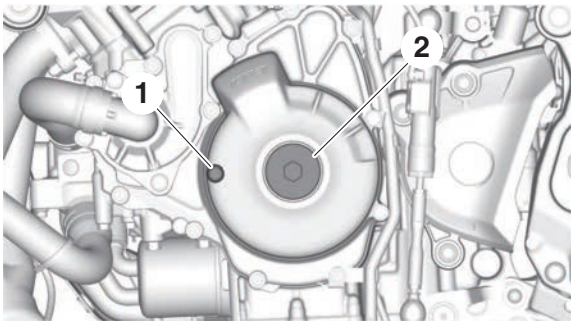
14. Install:

- Timing mark accessing bolt "1"

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

- Crankshaft end cover "2"

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



16. 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.

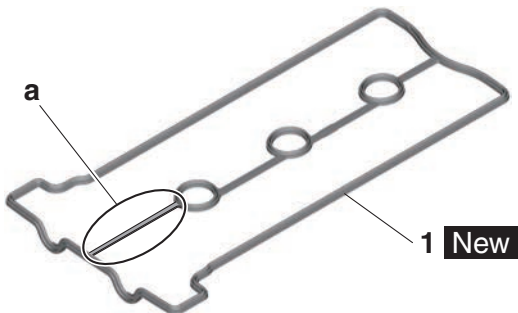
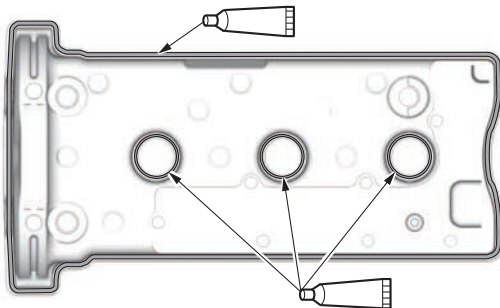
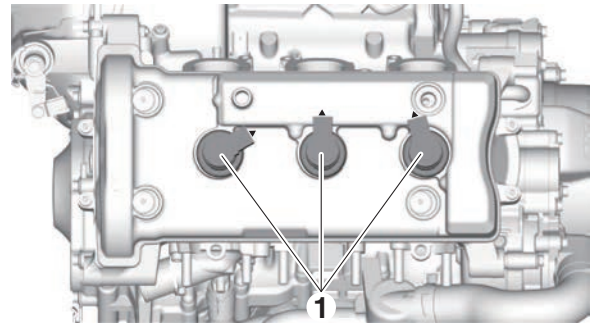
15. Install:
- Timing chain guide (top side)
 - Cylinder head cover gasket "1" **New**
 - Cylinder head cover



Cylinder head cover bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

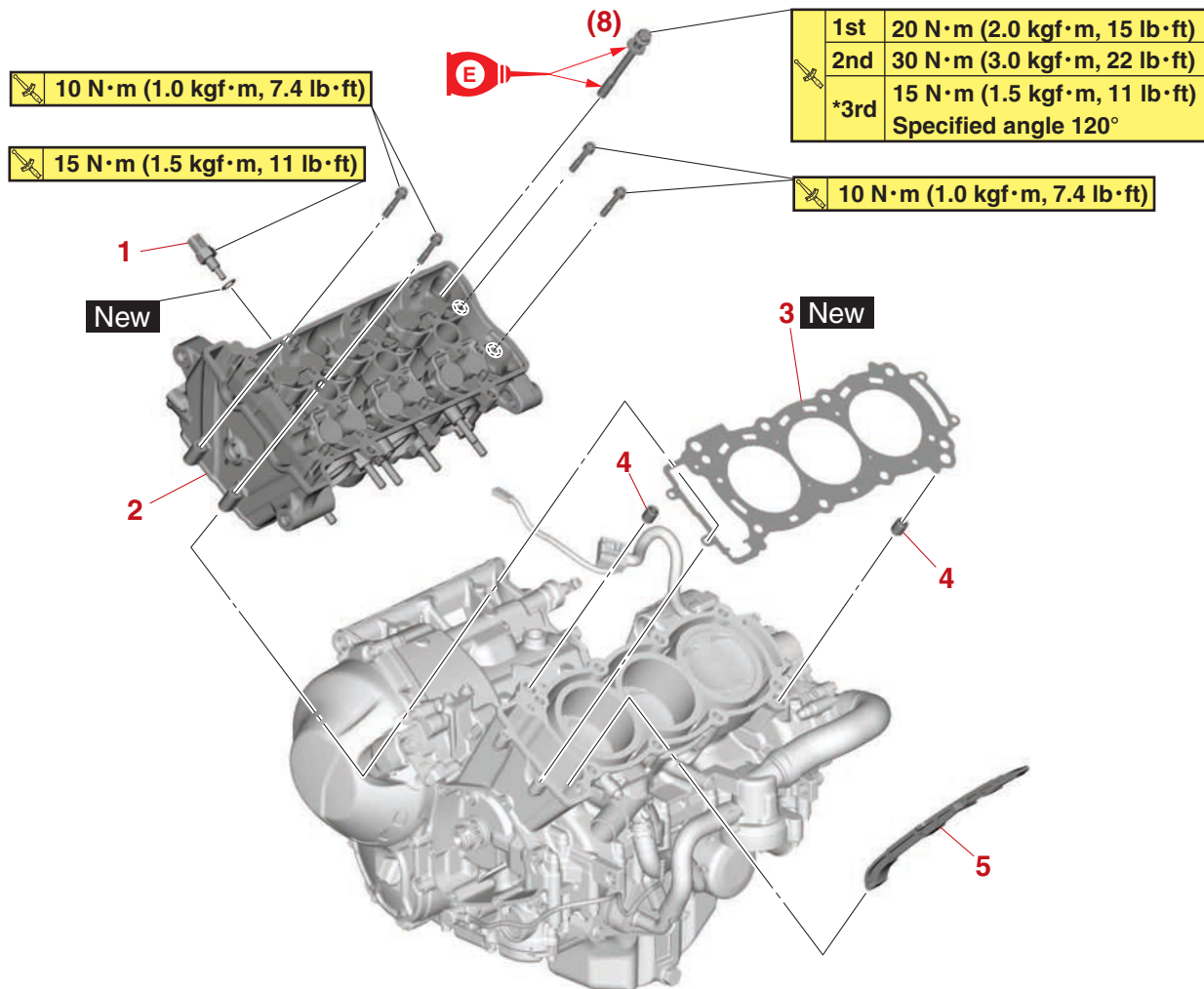
- Apply Three Bond No. 1541C® onto the mating surfaces of the cylinder head cover and cylinder head cover gasket.
- After installing the cylinder head cover gasket "1" to the cylinder head cover, cut off the "a" section.



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 and the specified angle.

Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-9.
	Intake camshaft		Refer to "CAMSHAFTS" on page 5-16.
	Exhaust camshaft		Refer to "CAMSHAFTS" on page 5-16.
	Timing chain		Refer to "CAMSHAFTS" on page 5-16.
1	Coolant temperature sensor	1	
2	Cylinder head	1	
3	Cylinder head gasket	1	
4	Dowel pin	2	
5	Timing chain guide (exhaust side)	1	

CYLINDER HEAD

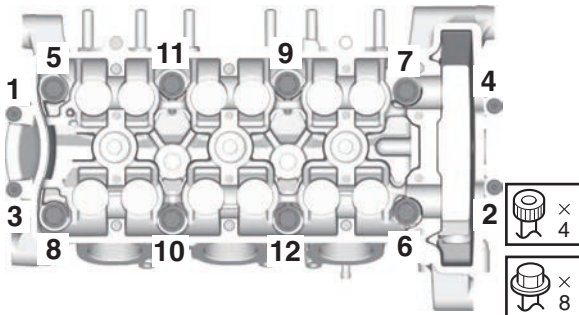
EAS30276

REMOVING THE CYLINDER HEAD

- Remove:
 - Intake camshaft
 - Exhaust camshaft
 Refer to "REMOVING THE CAMSHAFTS" on page 5-20.
- Remove:
 - Cylinder head bolt (M6) (×4)
 - Cylinder head bolt (M9) (×8)

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.



EAS30278

CHECKING THE TIMING CHAIN GUIDE (EXHAUST SIDE)

- Check:
 - Timing chain guide (exhaust side)
 Damage/wear → Replace.

EAS30277

CHECKING THE CYLINDER HEAD

- Eliminate:
 - Combustion chamber carbon deposits (with a rounded scraper)

TIP

Do not use a sharp instrument to avoid damaging or scratching:

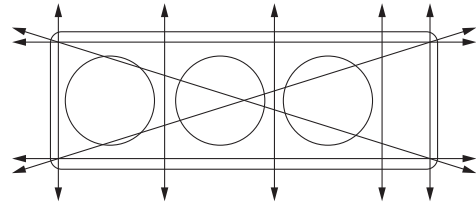
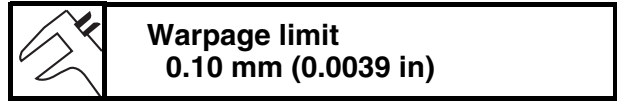
- Spark plug bore threads
- Valve seats

- Check:

- Cylinder head
- Damage/scratches → Replace.
- Cylinder head water jacket
- Mineral deposits/rust → Eliminate.

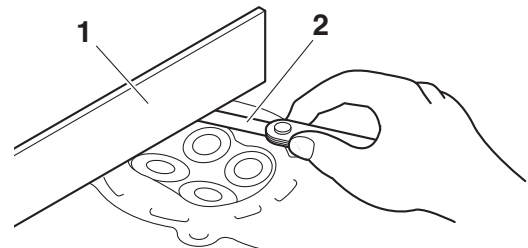
- Measure:

- Cylinder head warpage
- Out of specification → Resurface the cylinder head.



G088955

- Place a straightedge "1" and a thickness gauge "2" across the cylinder head.



G088957

- Measure the warpage.
- If the limit is exceeded, resurface the cylinder head as follows.
- Place a 400–600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

TIP

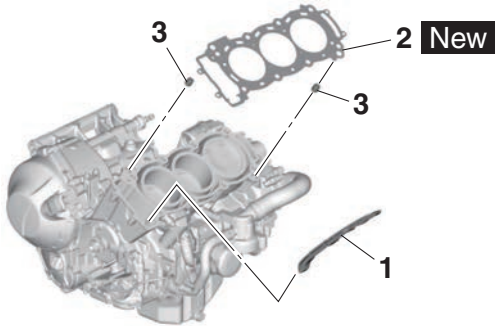
To ensure an even surface, rotate the cylinder head several times.

EAS30282

INSTALLING THE CYLINDER HEAD

1. Install:

- Timing chain guide (exhaust side) "1"
- Cylinder head gasket "2" **New**
- Dowel pin "3"



2. Install:

- Cylinder head
- Cylinder head bolt (M6) (×4)
- Cylinder head bolt (M9) (×8) **New**

TIP

- Pass the timing chain through the timing chain cavity.
- Lubricate the cylinder head bolt (M9) thread and mating surface with engine oil.

3. Tighten:

- Cylinder head bolt "1"–"8"
- Cylinder head bolt "9"–"12"



Cylinder head bolt "1"–"8"

1st: 20 N·m (2.0 kgf·m, 15 lb·ft)

2nd: 30 N·m (3.0 kgf·m, 22 lb·ft)

*3rd: 15 N·m (1.5 kgf·m, 11 lb·ft)

Specified angle 120°

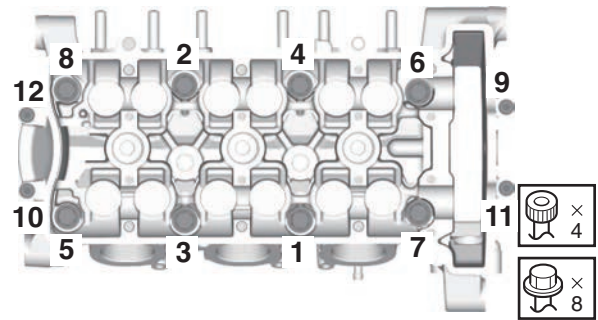
Cylinder head bolt "9"–"12"

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 specified torque and the specified angle.

TIP

Tighten the cylinder head bolts "1"–"8" in the tightening sequence as shown and torque them in 3 stages.



4. Install:

- Exhaust camshaft
- Intake camshaft

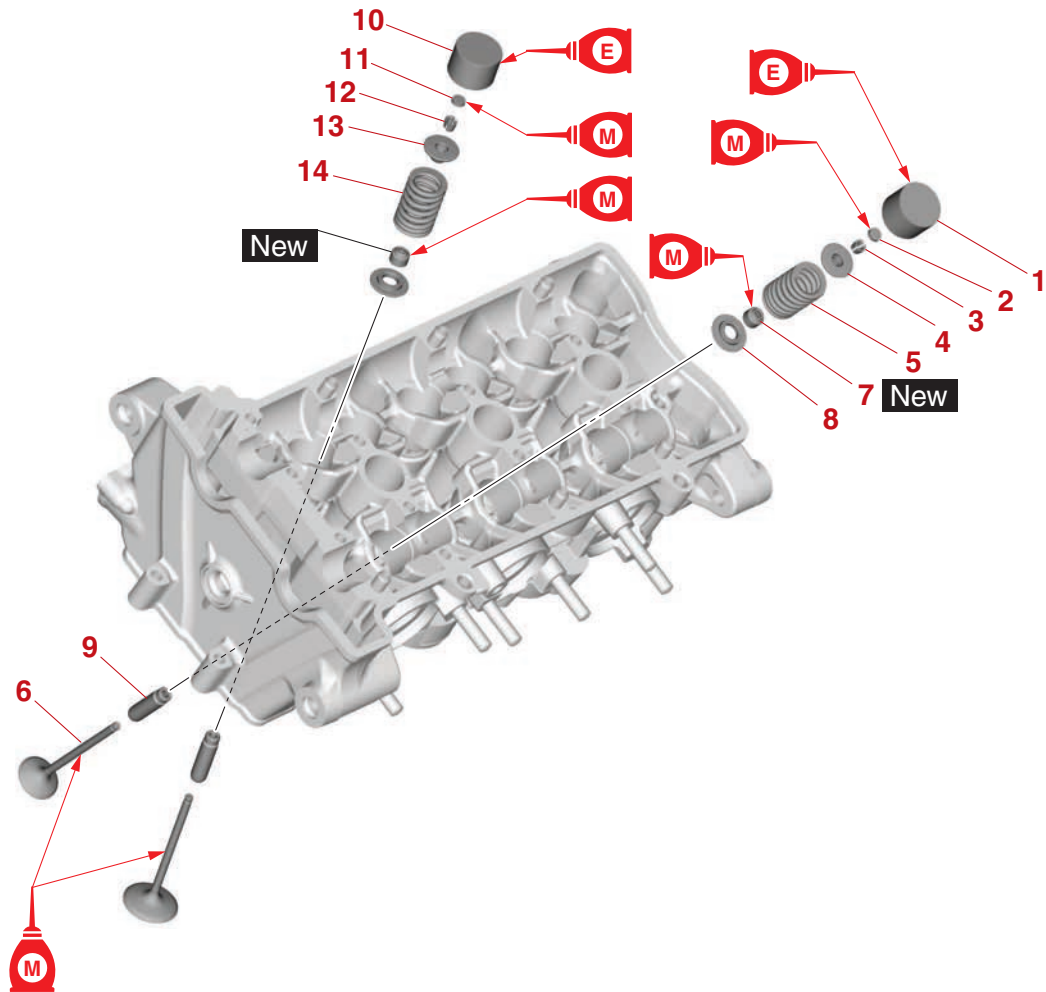
Refer to "INSTALLING THE CAMSHAFTS" on page 5-23.

VALVES AND VALVE SPRINGS

EAS20045

VALVES AND VALVE SPRINGS

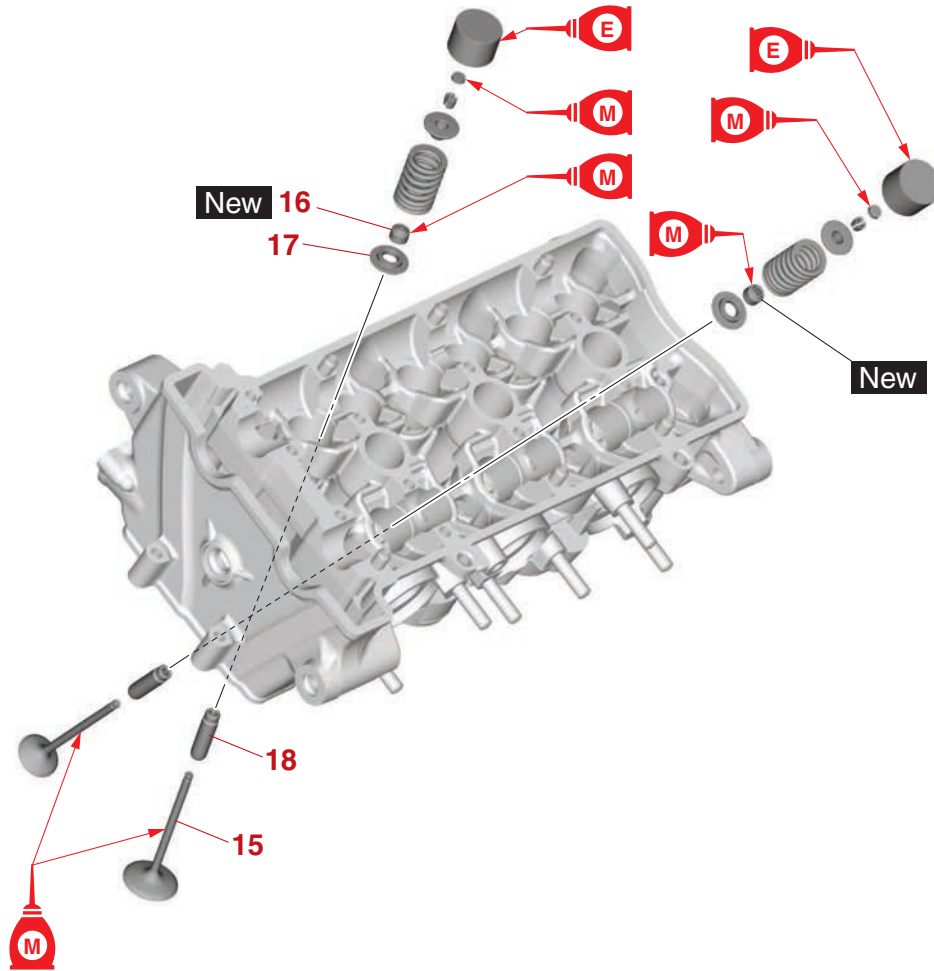
Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-27.
1	Intake valve lifter	6	
2	Intake valve pad	6	
3	Intake valve cotter	12	
4	Intake valve spring retainer	6	
5	Intake valve spring	6	
6	Intake valve	6	
7	Intake valve stem seal	6	
8	Intake valve spring seat	6	
9	Intake valve guide	6	
10	Exhaust valve lifter	6	
11	Exhaust valve pad	6	
12	Exhaust valve cotter	12	
13	Exhaust valve spring retainer	6	
14	Exhaust valve spring	6	

VALVES AND VALVE SPRINGS

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
15	Exhaust valve	6	
16	Exhaust valve stem seal	6	
17	Exhaust valve spring seat	6	
18	Exhaust valve guide	6	

VALVES AND VALVE SPRINGS

EAS30283

REMOVING THE VALVES

The following procedure applies to all of the valves and related components.

TIP

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

1. Remove:
 - Valve lifter
 - Valve pad

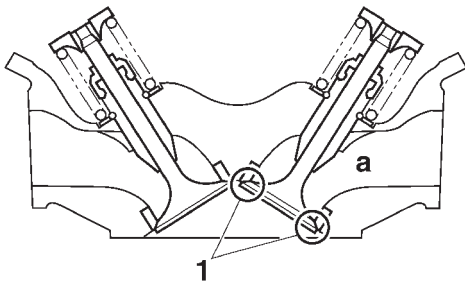
TIP

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 5-34.
 - 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 cottes by compressing the valve spring with the valve spring compressor “1” and the valve spring compressor attachment “2”.

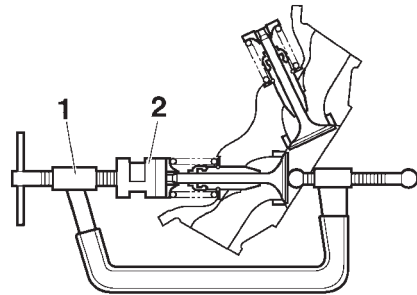


Valve spring compressor
90890-04200

Valve spring compressor
YM-04019

Valve spring compressor attachment (ø23)
90890-04179

Valve spring compressor adapter (ø23)
YM-04179



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”

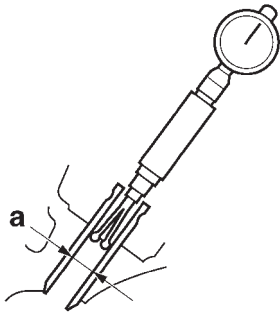


Valve-stem-to-valve-guide clearance limit (intake)
0.080 mm (0.0032 in)

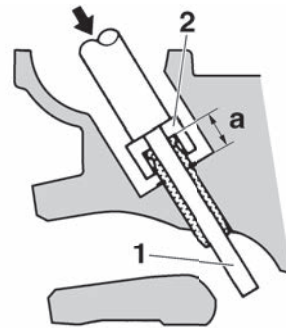
Valve-stem-to-valve-guide clearance limit (exhaust)
0.100 mm (0.0039 in)

VALVES AND VALVE SPRINGS

G088960



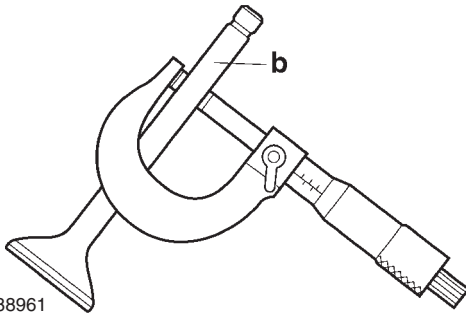
G088963



a. Valve guide position

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

G088961



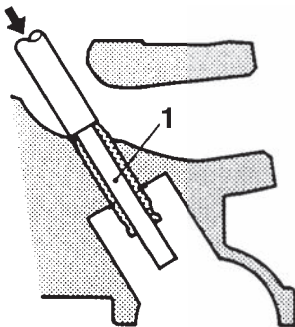
2. Replace:
• Valve guide

TIP

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

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

G088962



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

TIP

After replacing the valve guide, reface the valve seat.



Valve guide reamer (ø4.5)
90890-04116

Valve guide reamer (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



Valve guide position
13.3–13.7 mm (0.52–0.54 in)

3. Eliminate:

- Carbon deposits (from the valve face and valve seat)

4. Check:

- Valve face
Pitting/wear → Grind the valve face.
- Valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.

VALVES AND VALVE SPRINGS

5. Measure:

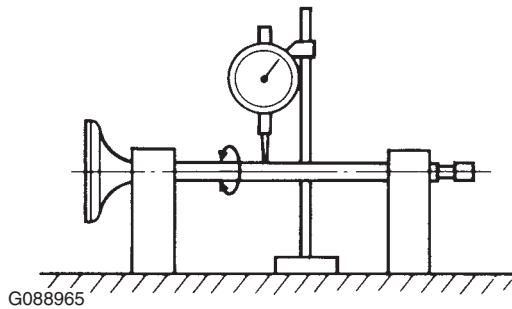
- Valve stem runout
Out of specification → Replace the valve.

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

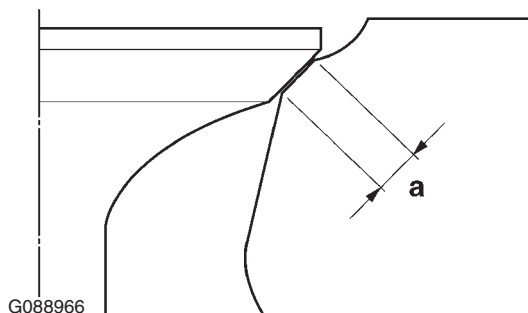
CHECKING THE VALVE SEATS

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

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

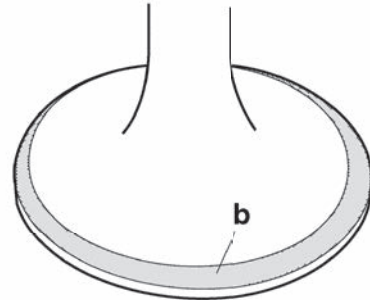


Valve seat contact width limit (in-take)
1.6 mm (0.06 in)
Valve seat contact width limit (exhaust)
1.8 mm (0.07 in)



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 contact width.

TIP

Where the valve seat and valve face contacted one another, the blue layout fluid will have been removed.

4. Lap:

- Valve face
- Valve seat

TIP

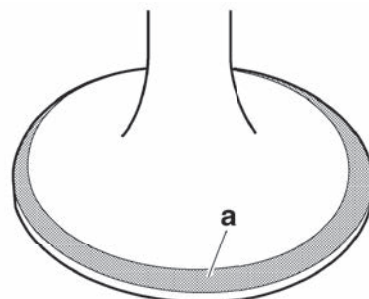
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.

- a. Apply a coarse lapping compound “a” to the valve face.

ECA13790

NOTICE

Do not let the lapping compound enter the gap between the valve stem and the valve guide.



G088968

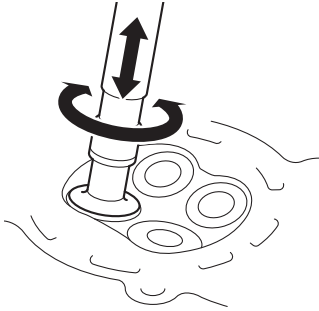
- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.

VALVES AND VALVE SPRINGS

- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

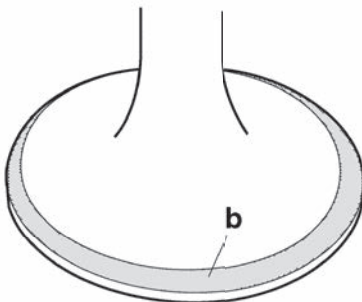
TIP

For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



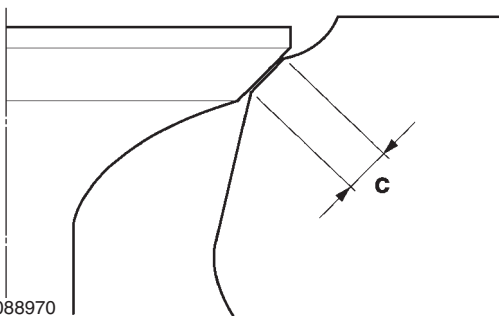
G088969

- 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 contact width “c” again. If the valve seat width is out of specification, reface and lap the valve seat.



G088970

EAS30286

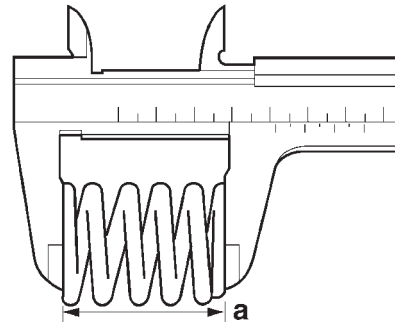
CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

- Measure:
 - Valve spring free length “a”
 Out of specification → Replace the valve spring.



Free length limit (intake)
 37.34 mm (1.47 in)
Free length limit (exhaust)
 39.31 mm (1.55 in)



G088971

EAS30287

CHECKING THE VALVE LIFTERS

The following procedure applies to all of the valve lifters.

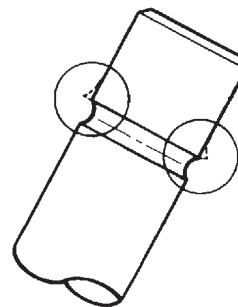
- Check:
 - Valve lifter
 Damage/scratches → Replace the valve lifters and cylinder head.

EAS30288

INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

- Deburr:
 - Valve stem end
 (with an oil stone)




G088972

VALVES AND VALVE SPRINGS

2. Lubricate:

- Valve stem
- Valve stem seal
(with the recommended lubricant)

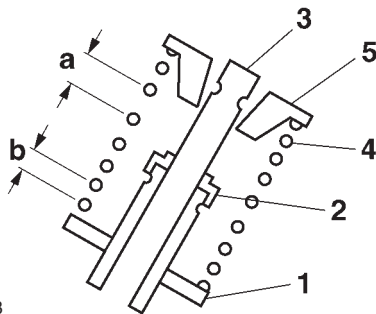
	Recommended lubricant Molybdenum disulfide oil
---	---

3. Install:

- Valve spring seat “1”
- Valve stem seal “2” **New**
- Valve “3”
- Valve spring “4”
- Valve spring retainer “5”
(into the cylinder head)

TIP

- Make sure each valve is installed in its original place.
- Install the valve springs with the larger pitch “a” facing up.



G088973


- b. Smaller pitch

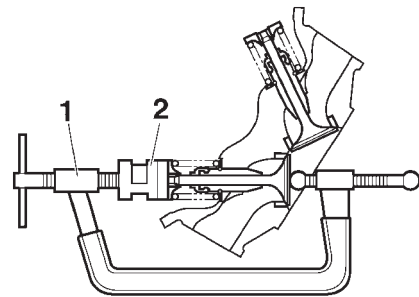
4. Install:

- Valve cotter

TIP

Install the valve coppers 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 attach- ment (ø23) 90890-04179 Valve spring compressor adapter (ø23) YM-04179
---	---



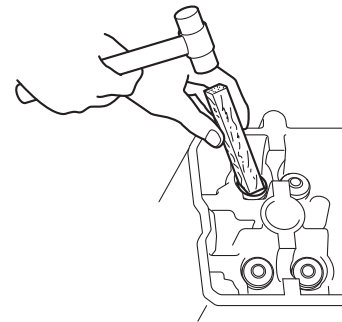
G088959

- To secure the valve coppers 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 pad
(with the recommended lubricant)

	Recommended lubricant Molybdenum disulfide oil
---	---

- Valve lifter
(with the recommended lubricant)

	Recommended lubricant Engine oil
---	---

7. Install:

- Valve pad
- Valve lifter

TIP

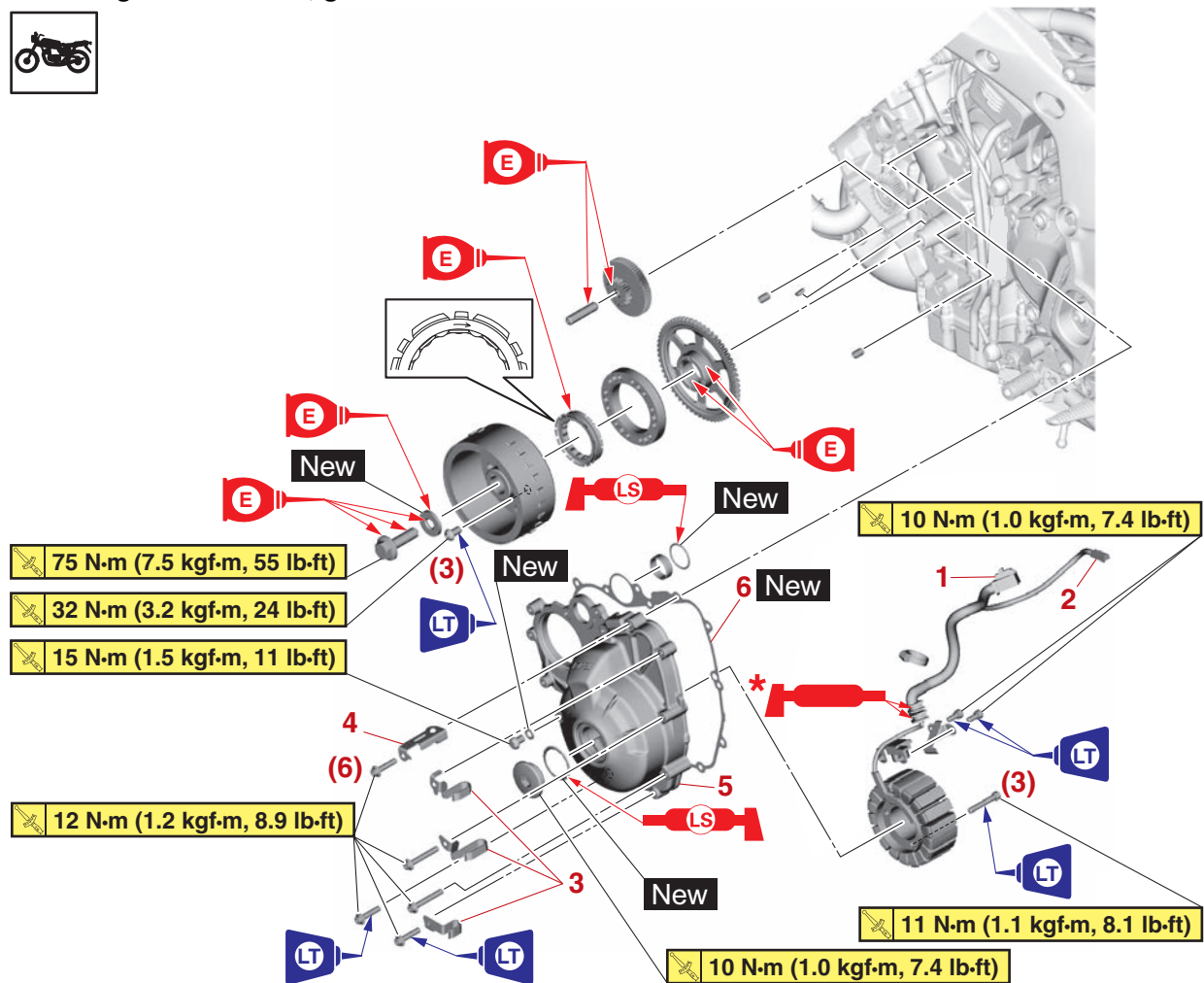
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in its original position.

GENERATOR AND STARTER CLUTCH

EAS20140

GENERATOR AND STARTER CLUTCH

Removing the stator coil, generator rotor and starter clutch

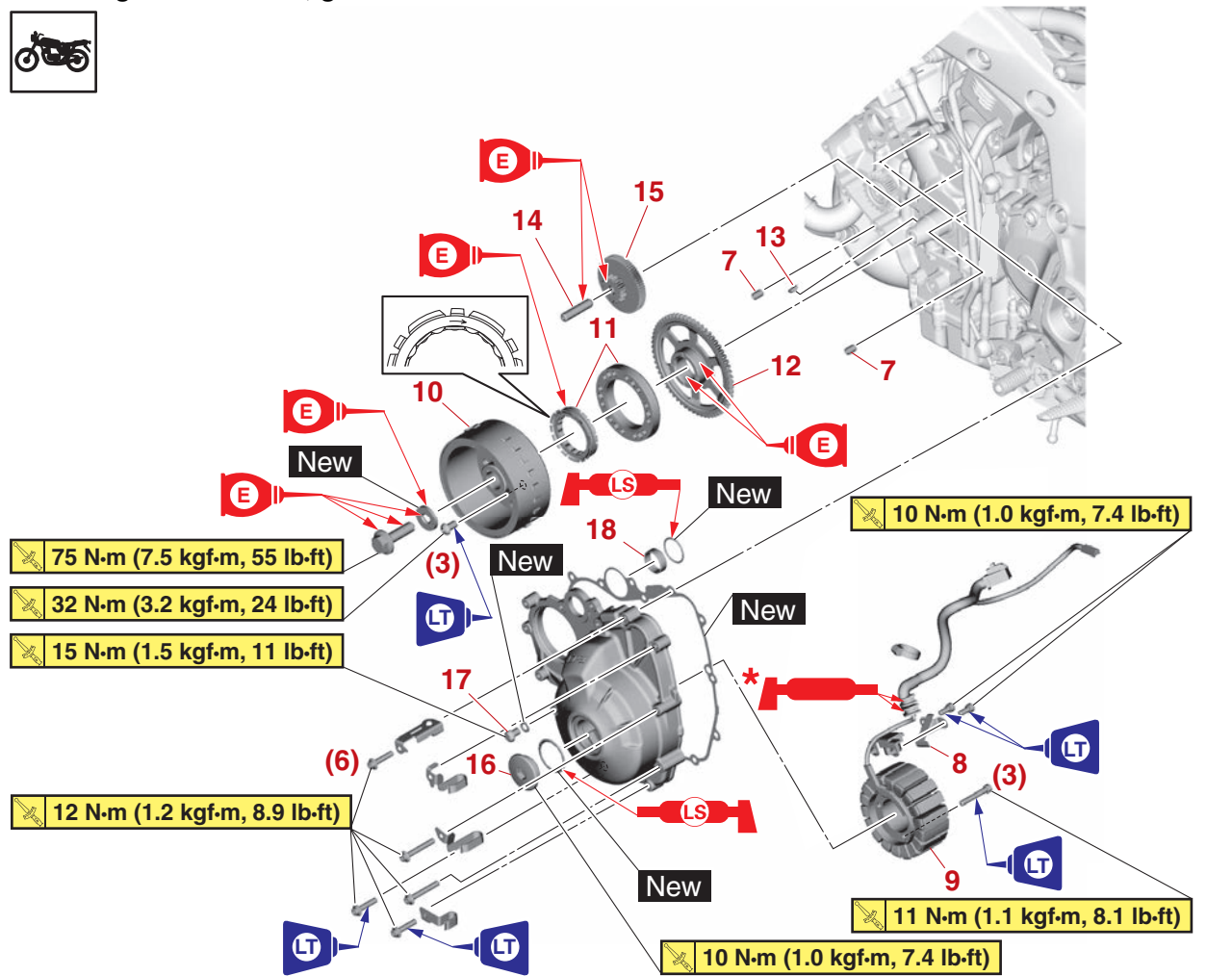


* YAMAHA bond No. 1215 (Three bond No. 1215©)

Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Side cover		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (4)" on page 4-10.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Water pump		Refer to "WATER PUMP" on page 6-11
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-25.
1	Stator coil coupler	1	Disconnect.
2	Crankshaft position sensor coupler	1	Disconnect.
3	Holder (fuel tank overflow hose)	3	
4	Bracket	1	
5	Generator cover	1	
6	Generator cover gasket	1	

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
7	Dowel pin	2	
8	Stator coil lead holder	1	
9	Stator coil assembly (stator coil/crankshaft position sensor)	1	
10	Generator rotor	1	
11	Starter clutch	1	
12	Starter clutch gear	1	
13	Woodruff key	1	
14	Starter clutch idle gear shaft	1	
15	Starter clutch idle gear	1	
16	Crankshaft end cover	1	
17	Timing mark accessing bolt	1	
18	Water pump outlet pipe	1	

GENERATOR AND STARTER CLUTCH

EAS30867

REMOVING THE GENERATOR

1. Remove:

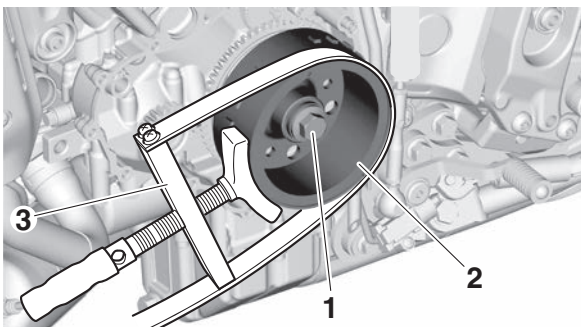
- Generator rotor bolt "1"
- Washer

TIP

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



Sheave holder
90890-01903
Primary clutch holder
YS-01880-A



2. Remove:

- Generator rotor "1"
(with the flywheel puller "2")
- Woodruff key

ECA13880

NOTICE

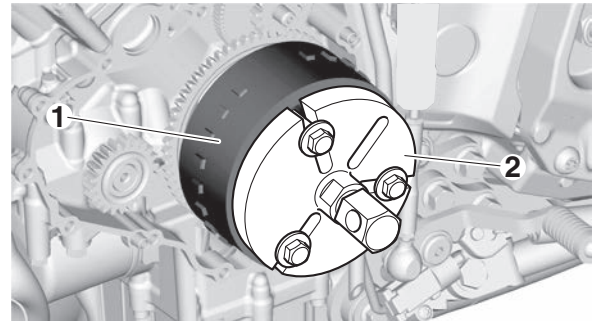
To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set center bolt and the crankshaft.

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:

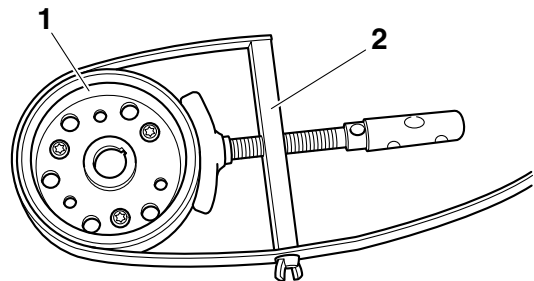
- Starter clutch bolt
- Starter clutch

TIP

While holding the generator rotor "1" with the sheave holder "2", loosen the starter clutch bolts.



Sheave holder
90890-01903
Primary clutch holder
YS-01880-A



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).

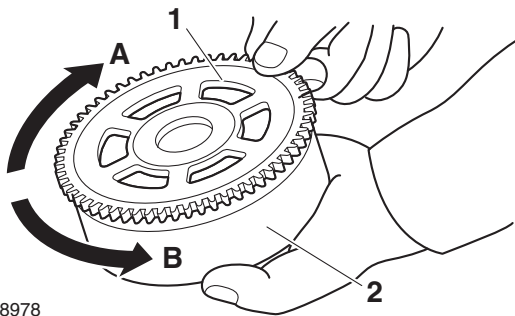
3. Check:

- Starter clutch gear contact surfaces
Damage/pitting/wear → Replace the starter clutch gear.

GENERATOR AND STARTER CLUTCH

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”



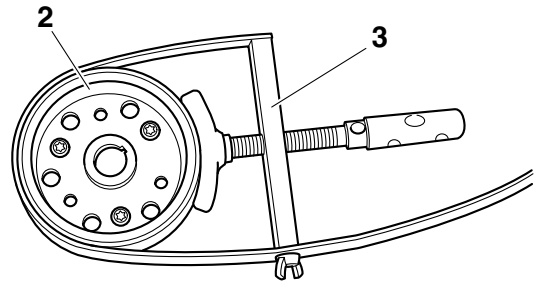
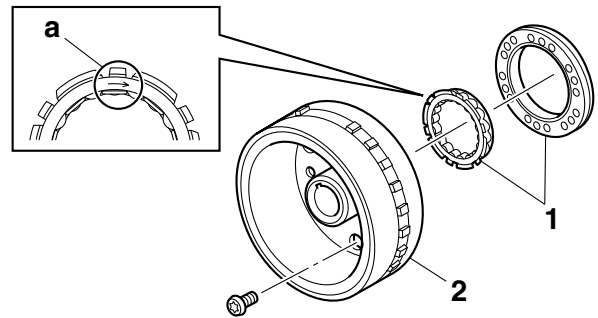
Starter clutch bolt
32 N·m (3.2 kgf·m, 24 lb·ft)
LOCTITE®

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 sheave holder “3”, tighten the starter clutch bolts.



Sheave holder
90890-01903
Primary clutch holder
YS-01880-A



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 washer with engine oil.
- Lubricate the generator rotor bolt threads and washer mating surfaces with engine oil.

2. Tighten:

- Generator rotor bolt “1”



Generator rotor bolt
75 N·m (7.5 kgf·m, 55 lb·ft)

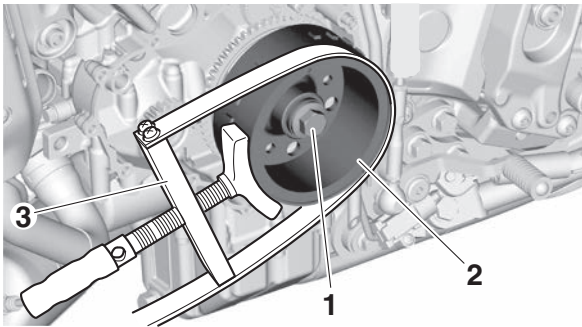
TIP

While holding the generator rotor “2” with the sheave holder “3”, tighten the generator rotor bolt.



Sheave holder
90890-01903
Primary clutch holder
YS-01880-A

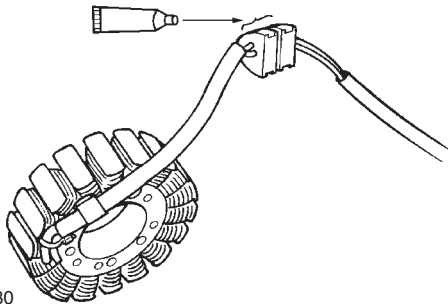
GENERATOR AND STARTER CLUTCH



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



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



G088980

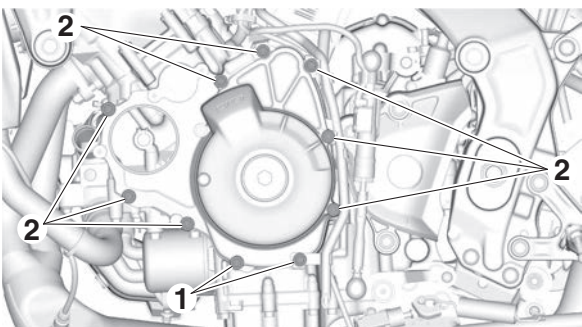
4. Install:
- Generator cover gasket **New**
 - Generator cover



Generator cover bolt "1"
12 N·m (1.2 kgf·m, 8.9 lb-ft)
LOCTITE®
Generator cover bolt "2"
12 N·m (1.2 kgf·m, 8.9 lb-ft)

TIP

Tighten the generator cover bolts in stages and in a crisscross pattern.



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

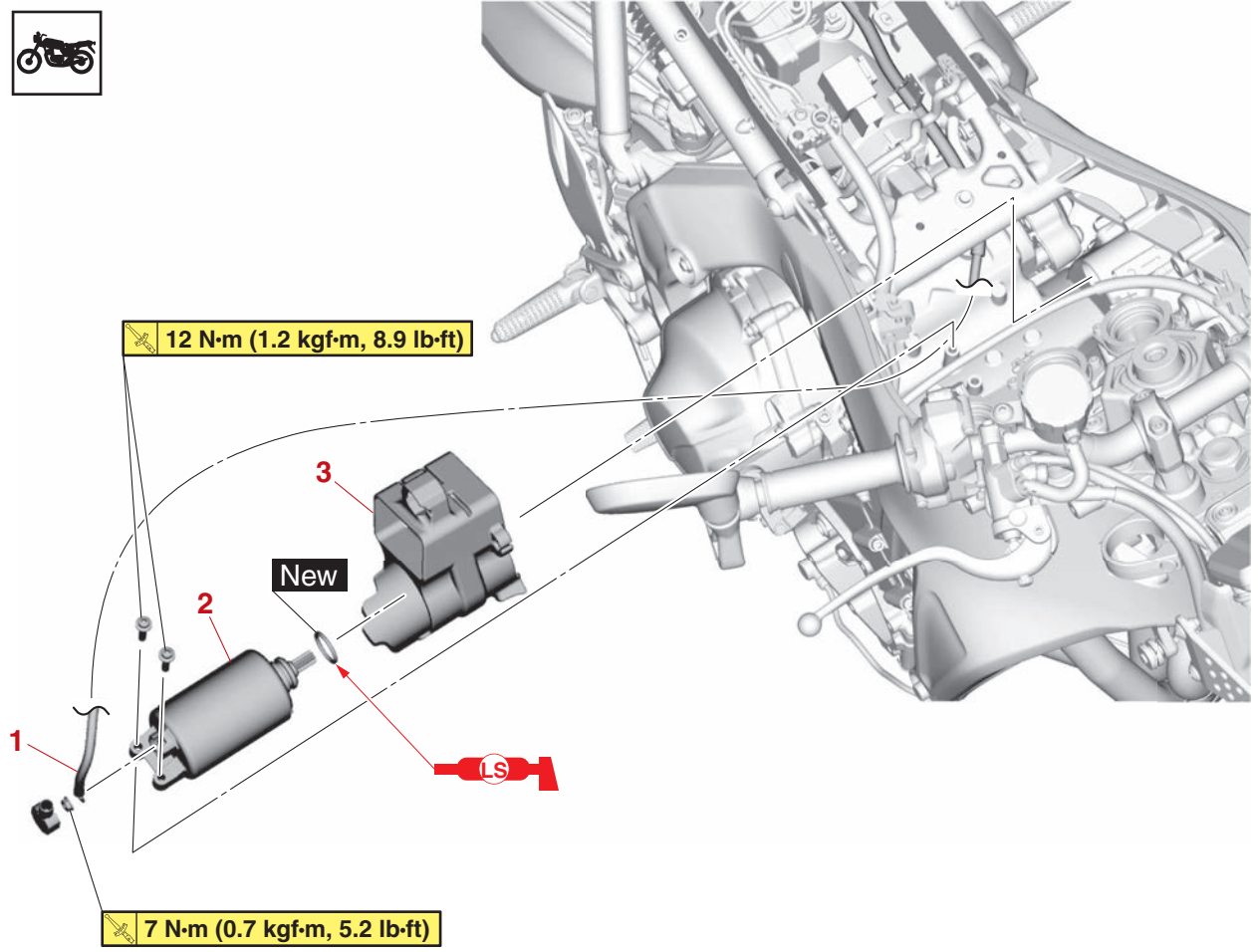
TIP

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

EAS20052

ELECTRIC STARTER

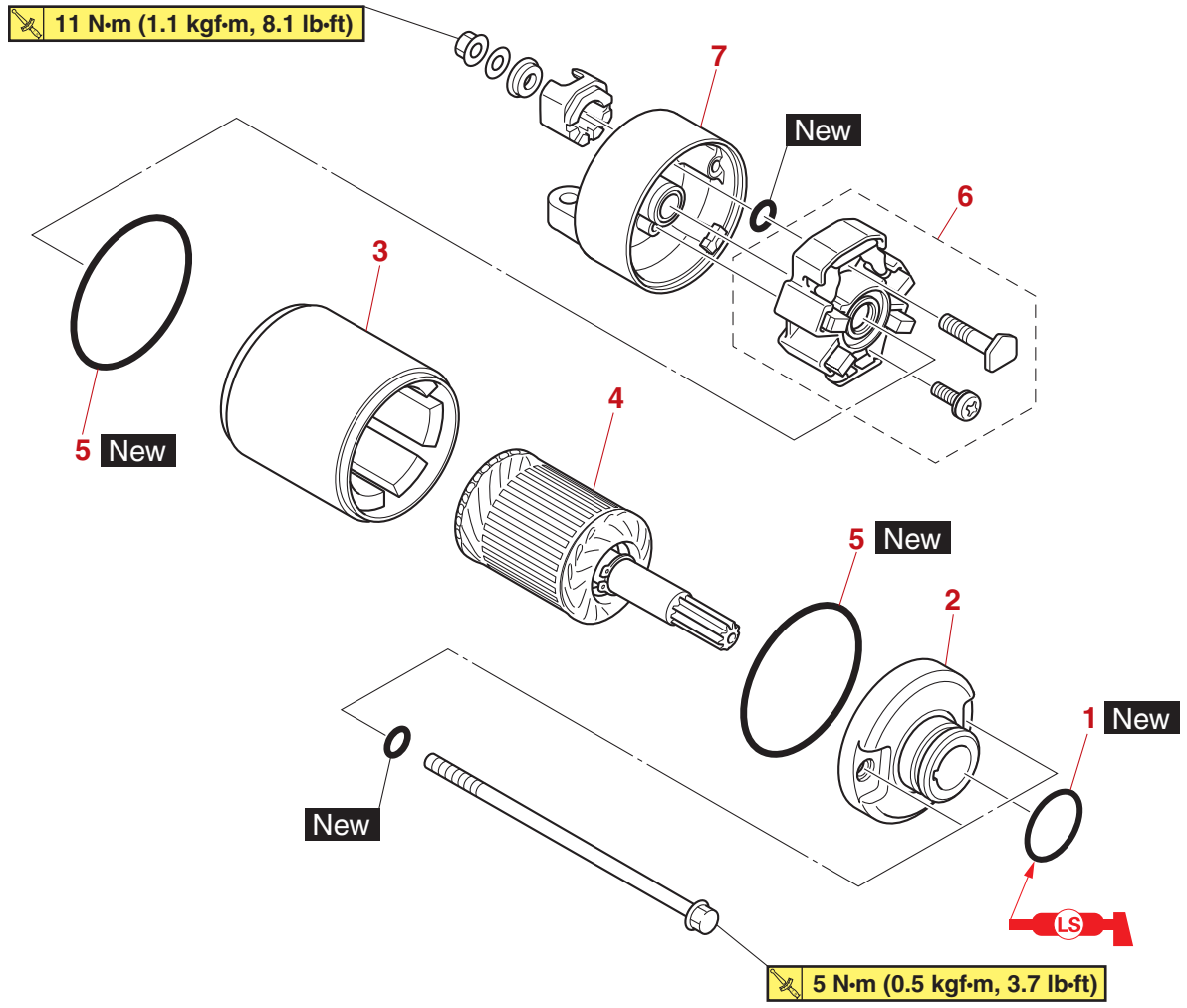
Removing the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
	Purge cut valve solenoid		Refer to "FUEL TANK" on page 7-1.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-6.
1	Starter motor lead	1	Disconnect.
2	Starter motor	1	
3	Canister holder	1	

ELECTRIC STARTER

Disassembling the starter motor

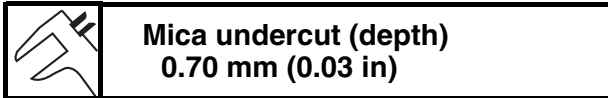


Order	Job/Parts to remove	Q'ty	Remarks
1	O-ring	1	
2	Starter motor front cover	1	
3	Starter motor yoke	1	
4	Armature assembly	1	
5	Gasket	2	
6	Brush holder set	1	
7	Starter motor rear cover	1	

EAS30325

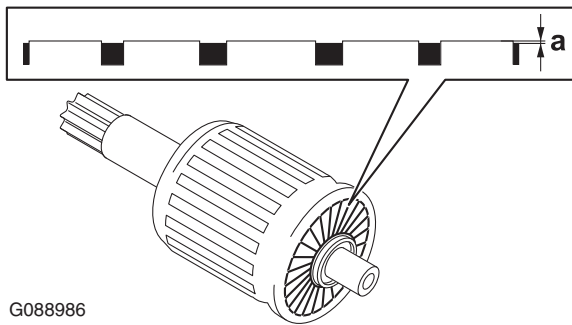
CHECKING THE STARTER MOTOR

1. Check:
 - Commutator
Dirt → Clean with 600 grit sandpaper.
2. Measure:
 - Mica undercut "a"
Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

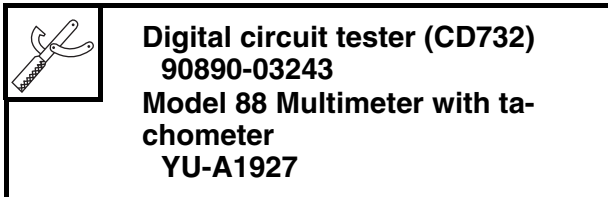


TIP

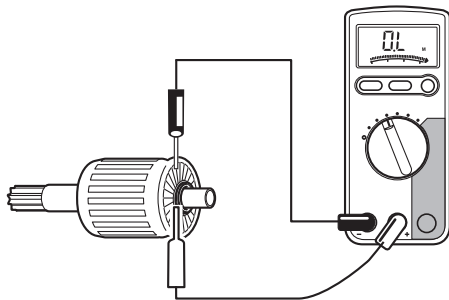
The mica of the commutator must be undercut to ensure proper operation of the commutator.



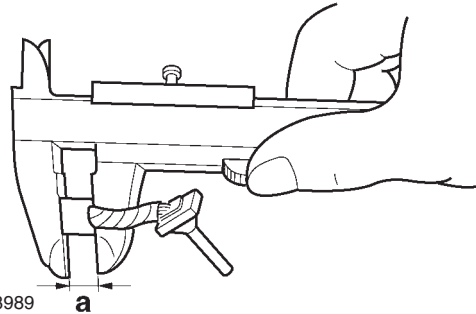
3. Check:
 - Armature assembly
 - a. Connect the digital circuit tester and check the continuity.



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



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



5. Check:
 - Gear teeth
Damage/wear → Replace the starter motor assembly.
6. Check:
 - Bearing
 - Oil seal
Damage/wear → Replace the starter motor assembly.

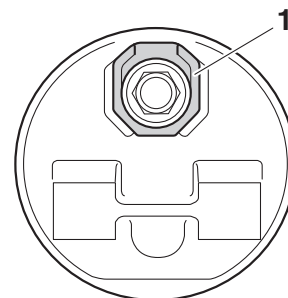
EAS30326

ASSEMBLING THE STARTER MOTOR

1. Install:
 - Brush holder set
 - Insulator "1"

TIP

Install the insulator as shown in the illustration.

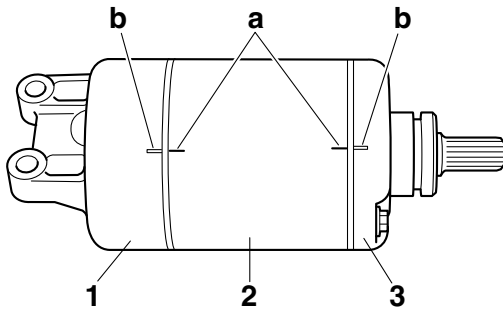


2. Install:

- Starter motor rear cover "1"
- Starter motor yoke "2"
- Starter motor front cover "3"

TIP

Align the match marks "a" on the starter motor yoke with the match marks "b" on the front and rear cover.



EAS30327

INSTALLING THE STARTER MOTOR

1. Install:

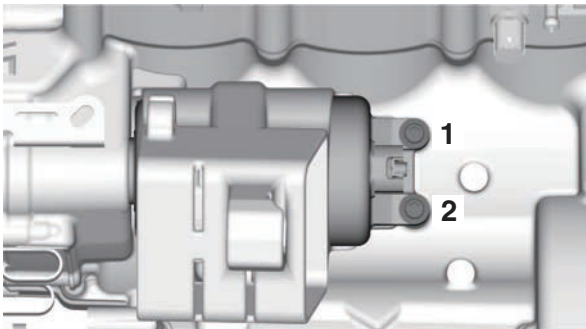
- Canister holder
- Starter motor
- Starter motor bolt

TIP

Tighten the starter motor bolts in the tightening sequence as shown.



Starter motor bolt
12 N·m (1.2 kgf·m, 8.9 lb·ft)



2. Connect:

- Starter motor lead

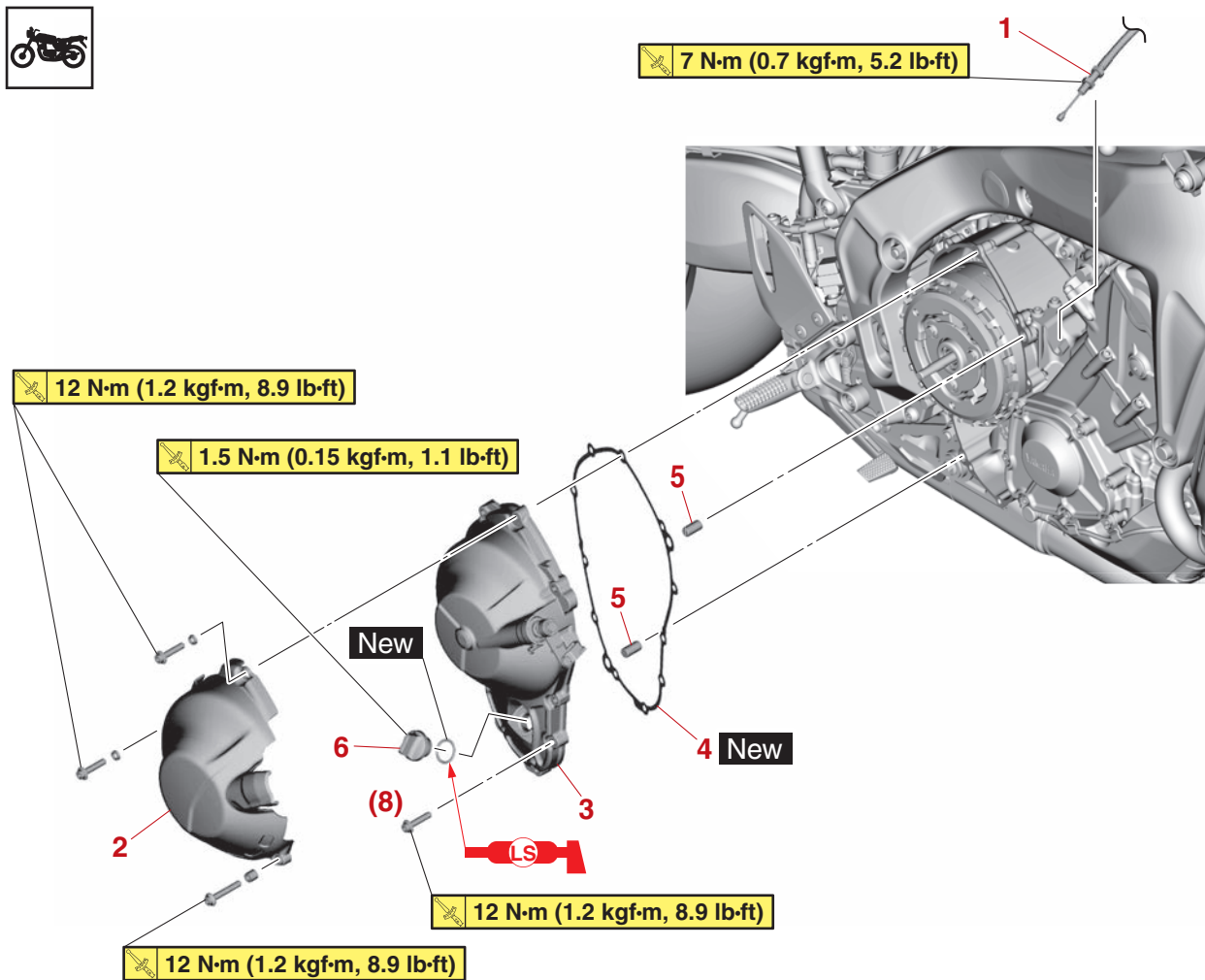


Starter motor lead nut
7 N·m (0.7 kgf·m, 5.2 lb·ft)

EAS20055

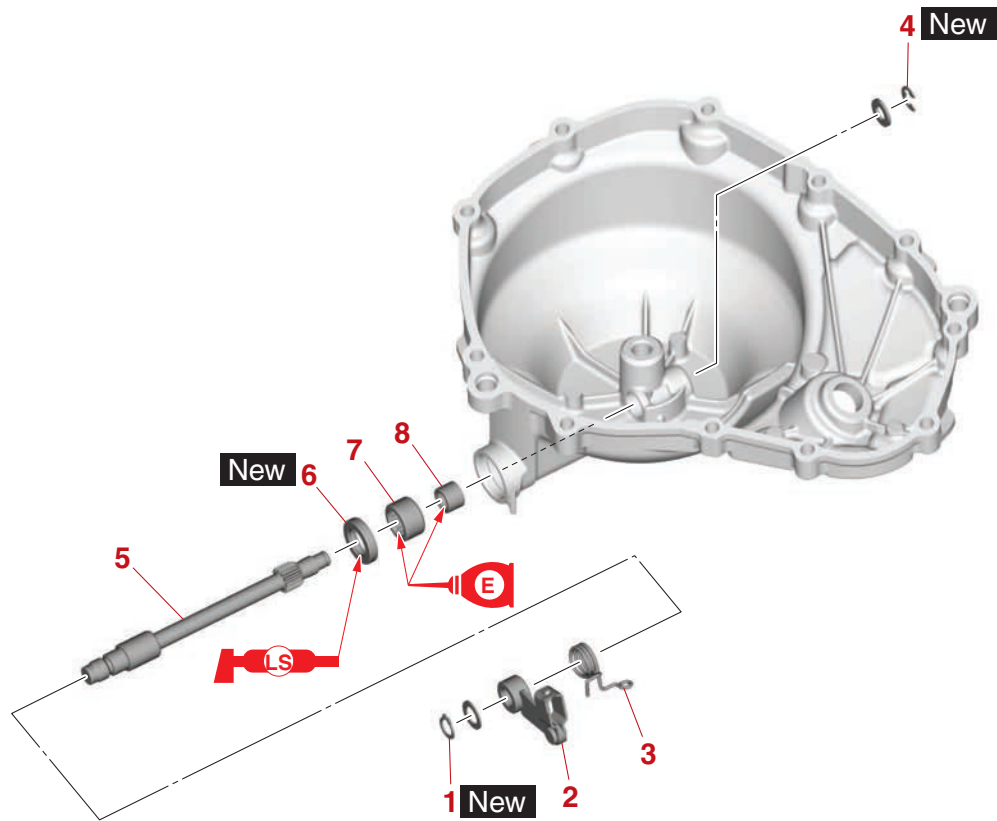
CLUTCH

Removing the clutch cover



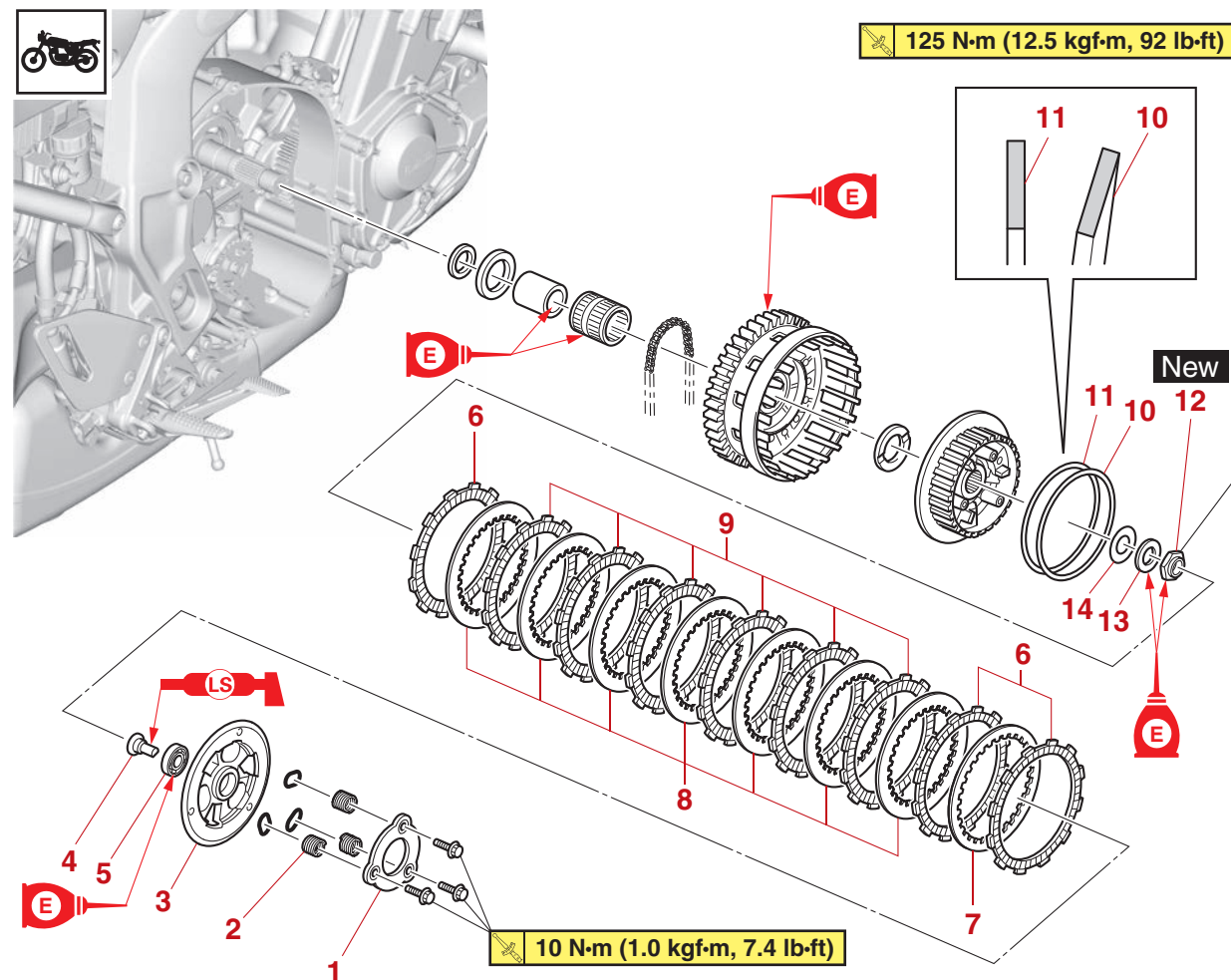
Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-25.
1	Clutch cable	1	Disconnect.
2	Cover	1	
3	Clutch cover	1	
4	Clutch cover gasket	1	
5	Dowel pin	2	
6	Oil filler cap	1	

Removing the pull lever shaft



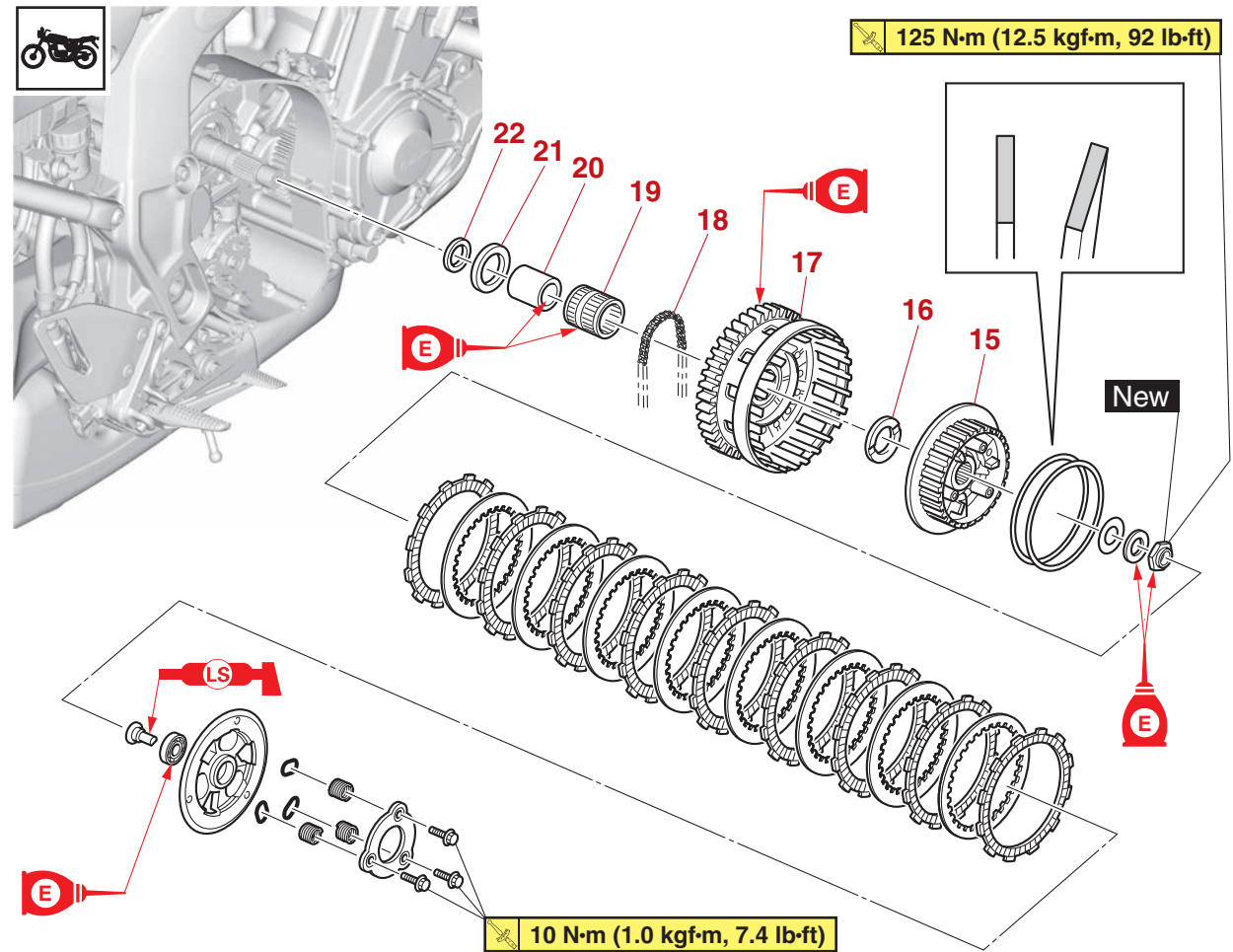
Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Pull lever	1	
3	Pull lever spring	1	
4	Circlip	1	
5	Pull lever shaft	1	
6	Oil seal	1	
7	Bearing	1	
8	Bearing	1	

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
	Oil pump driven sprocket		Refer to "OIL PUMP" on page 5-58.
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	Inside diameter: 116 mm (4.57 in)
8	Clutch plate 2	7	Inside diameter: 105 mm (4.13 in)
9	Friction plate 1	6	Inside diameter: 119 mm (4.69 in)
10	Clutch damper spring	1	
11	Clutch damper spring seat	1	
12	Clutch boss nut	1	
13	Conical spring washer	1	
14	Washer	1	

Removing the clutch



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

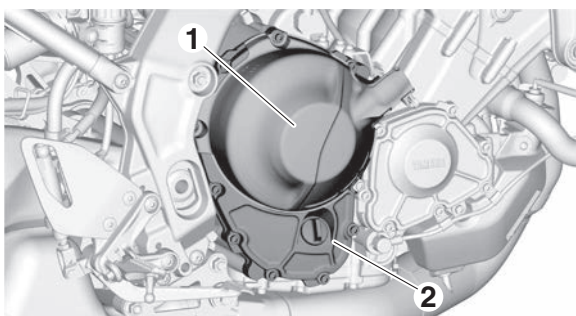
EAS30346

REMOVING THE CLUTCH

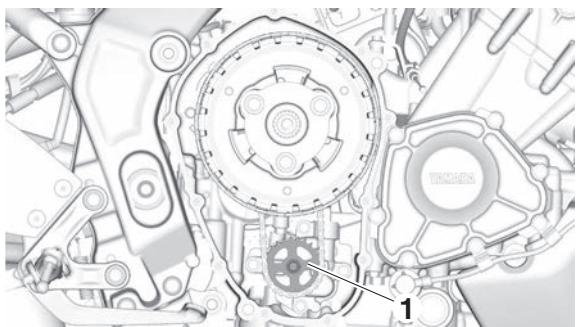
- Remove:
 - Cover "1"
 - Clutch cover "2"
 - Gasket

TIP

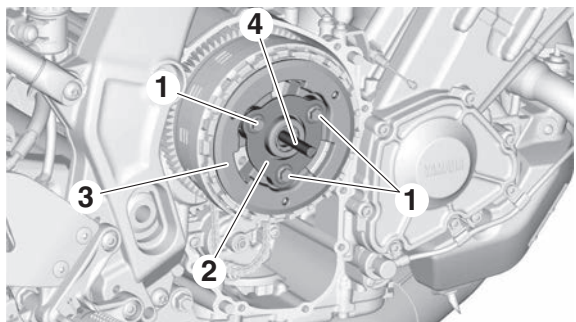
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



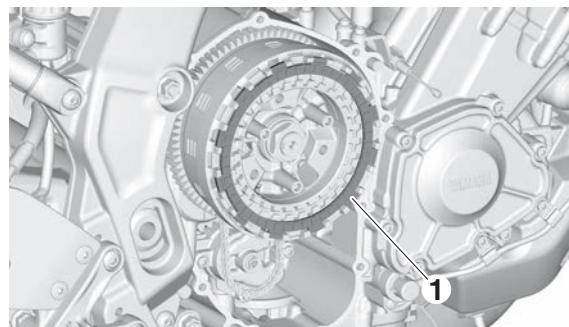
- Remove:
 - Oil pump driven sprocket "1"
 Refer to "OIL PUMP" on page 5-58.



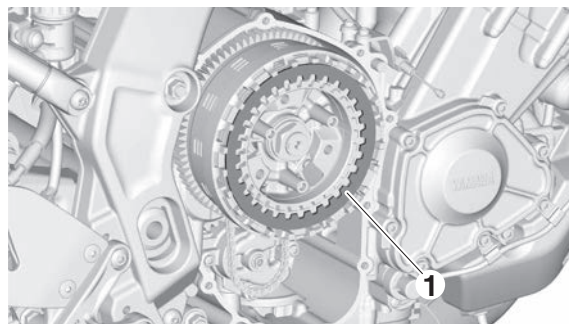
- Remove:
 - Clutch spring bolt "1"
 - Pressure plate 1 "2"
 - Clutch spring
 - Pressure plate 2 "3"
 - Pull rod "4"



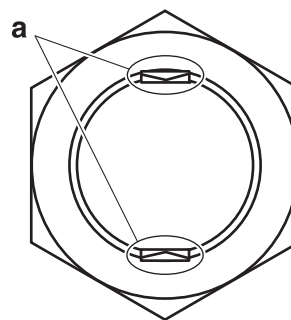
- Remove:
 - Friction plate 2 "1"



- Remove:
 - Clutch plate 1 "1"
 - Clutch plate 2
 - Friction plate 1
 - Clutch damper spring
 - Clutch damper spring seat



- Straighten the clutch boss nut rib "a".



G088992

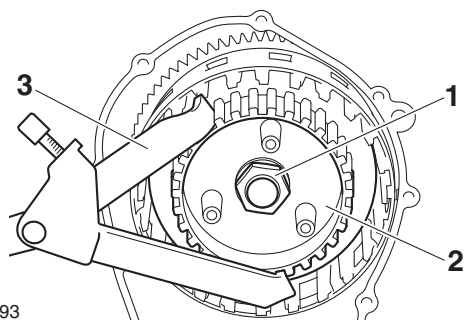
- Loosen:
 - Clutch boss nut "1"

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

8. Remove:
- Clutch boss nut
 - Conical spring washer
 - Washer
 - Clutch boss
 - Thrust plate
 - Clutch housing
 - Oil pump drive chain

EAS30348

CHECKING THE FRICTION PLATES

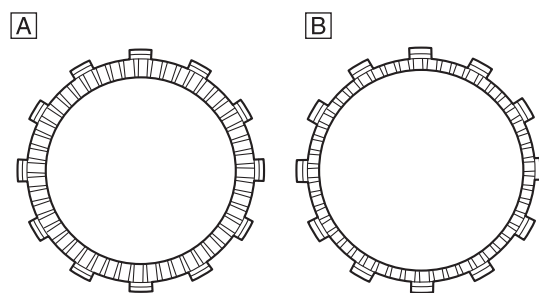
The following procedure applies to all of the friction plates.

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.

	<p>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)</p>
--	--



- 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 thickness
(with a surface plate and thickness gauge)
Out of specification → Replace the clutch plates as a set.

	<p>Thickness gauge 90890-03268 Feeler gauge set YU-26900-9</p>
--	--

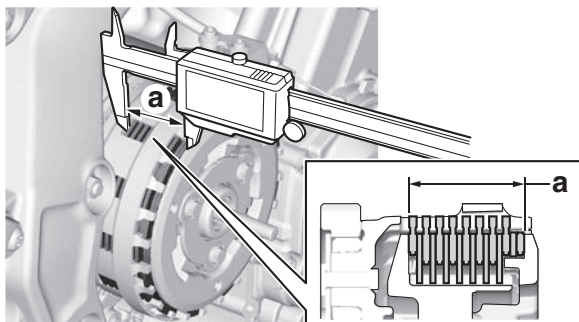
	<p>Clutch plate 1 thickness 2.18–2.42 mm (0.086–0.095 in) Warpage limit 0.10 mm (0.004 in) Clutch plate 2 thickness 1.90–2.10 mm (0.075–0.083 in) Warpage limit 0.10 mm (0.004 in)</p>
--	--

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

	<p>Assembly width 42.7–43.5 mm (1.68–1.71 in)</p>
--	--

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 9 friction plates and 8 clutch plates as shown.



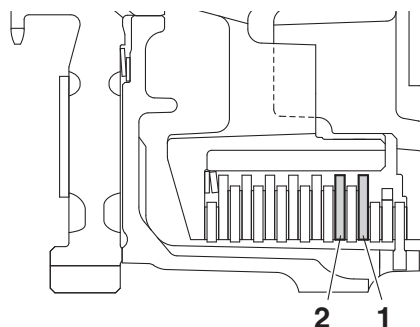
- Assembly width adjusted by clutch plate 2 "1" and "2".
- Select the clutch plate 2 from the following table.

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

Clutch plate 2 "2"		
BR9-16324-00	1.6 mm (0.063 in)	
5VY-16325-00	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.

- Check:
 - Clutch spring
Damage → Replace the clutch springs as a set.
- Measure:
 - Clutch spring free length
Out of specification → Replace the clutch springs as a set.



**Clutch spring free length limit
42.53 mm (1.67 in)**

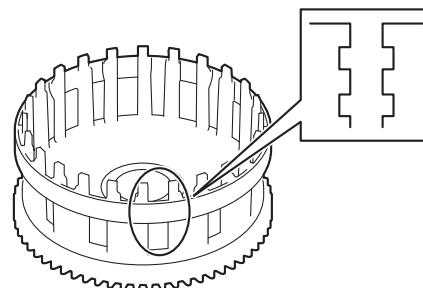
EAS30352

CHECKING THE CLUTCH HOUSING

- Check:
 - Clutch housing dogs
Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

TIP

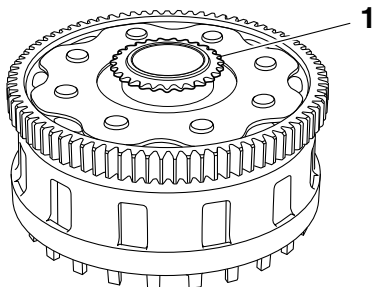
Pitting on the clutch housing dogs will cause erratic clutch operation.



G088994

2. Check:

- Oil pump drive sprocket “1”
Cracks/damage/wear → Replace the oil pump drive chain and clutch housing as a set.



3. Check:

- Bearing
Damage/wear → Replace the bearing and clutch housing.

EAS30353

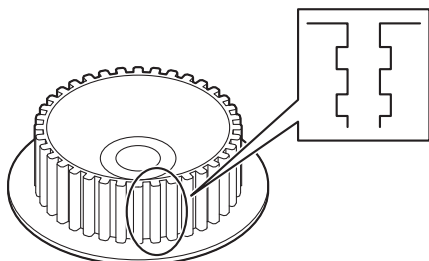
CHECKING THE CLUTCH BOSS

1. Check:

- Clutch boss splines
Damage/pitting/wear → Replace the clutch boss.

TIP

Pitting on the clutch boss splines will cause erratic clutch operation.



G088995

EAS30354

CHECKING THE PRESSURE PLATE

1. Check:

- Pressure plate 1
- Pressure plate 2
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

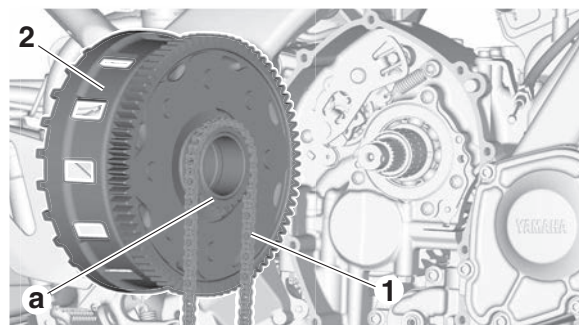
INSTALLING THE CLUTCH

1. Install:

- Oil pump drive chain “1”
- Clutch housing “2”

TIP

Install the oil pump drive chain onto the oil pump drive sprocket “a”.



2. Install:

- Thrust plate
- Clutch boss “1”
- Washer
- Conical spring washer “2”
- Clutch boss nut “3” **New**



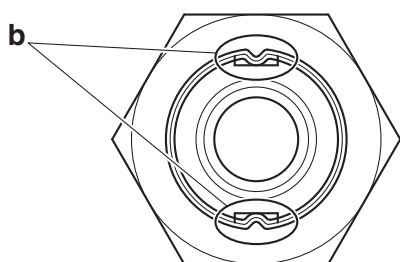
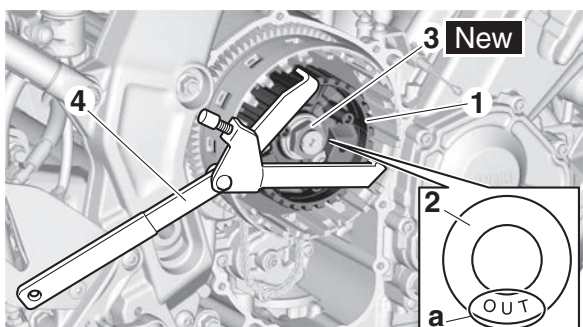
Clutch boss nut
125 N·m (12.5 kgf·m, 92 lb·ft)

TIP

- Install the conical spring washer on the main axle with the “OUT” mark “a” facing away from the vehicle.
- While holding the clutch boss “1” with the universal clutch holder “4”, tighten the clutch boss nut.
- Stake the clutch boss nut at cutouts “b” in the main axle.



Clutch holder
90890-04199
Universal clutch holder
YM-91042

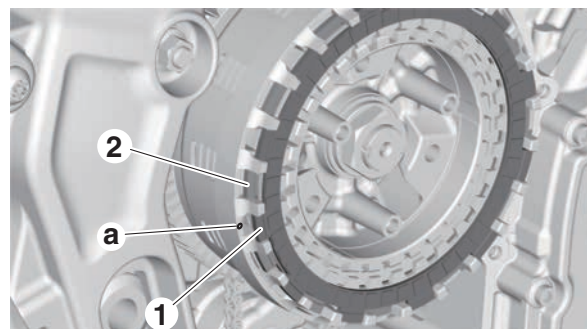


3. Install:

- Clutch damper spring seat
- Clutch damper spring
- Friction plate 2
- Clutch plate 2
- Friction plate 1
- Clutch plate 1

TIP

- 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:

- Pull rod
- Pressure plate 2
- Clutch spring
- Pressure plate 1
- Clutch spring bolt “1”



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

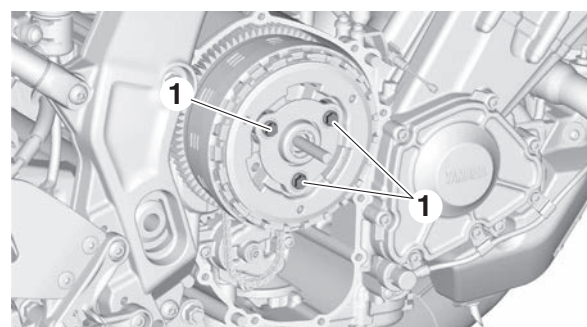
- Oil pump driven sprocket “2”

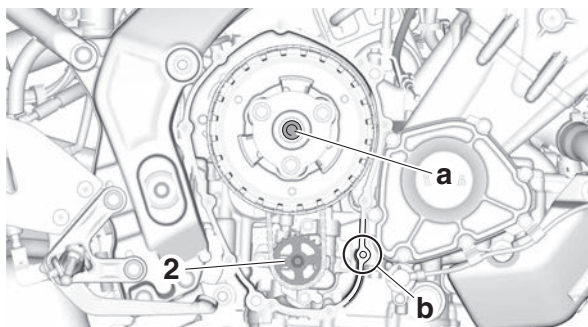


Oil pump driven sprocket bolt
15 N·m (1.5 kgf·m, 11 lb·ft)
LOCTITE®

TIP

- Tighten the clutch spring bolts in stages and in a crisscross pattern.
- Apply lithium-soap-based grease onto the pull rod.
- Position the pull rod so that the teeth “a” face towards the hole “b”. Then, install the clutch cover.





5. Install:
- Dowel pin
 - Clutch cover gasket **New**
 - Clutch cover
 - Cover



Clutch cover bolt
12 N·m (1.2 kgf·m, 8.9 lb·ft)

TIP

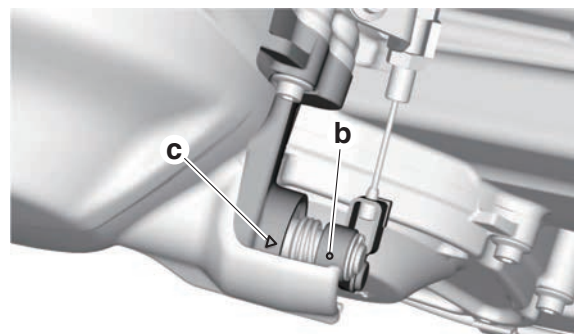
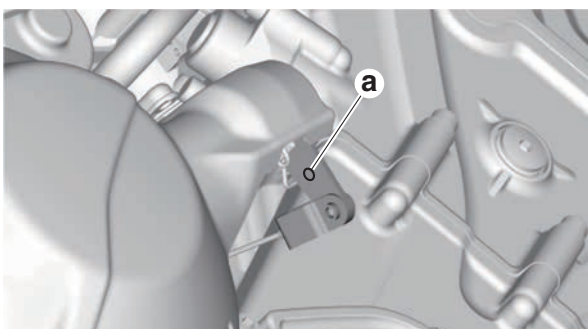
- Apply engine oil onto the bearing.
- Tighten the clutch cover bolts in stages and in a crisscross pattern.

6. Install:

- Pull lever

TIP

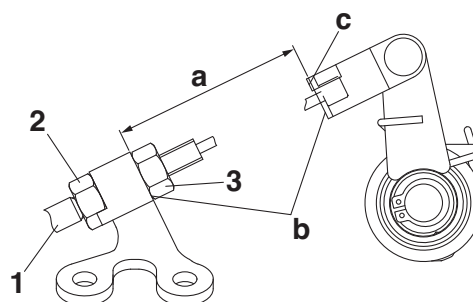
- Install the pull lever with the “O” mark “a” facing toward lower side.
- When installing the pull lever, push the pull lever and check that the punch mark “b” on the pull lever aligns with the mark “c” on the clutch cover. Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.



7. Connect:
- Clutch cable “1”

TIP

- For the clutch cable “1”, turn the nut “2” in fully and then adjust the length “a” by using the nut “3” so that the cable length is 47.1–54.8 mm (1.85–2.16 in).
- Measure the length while keeping the measuring surface “b” parallel.
- After installing the clutch cable, bend the projection “c” on the pull lever.



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

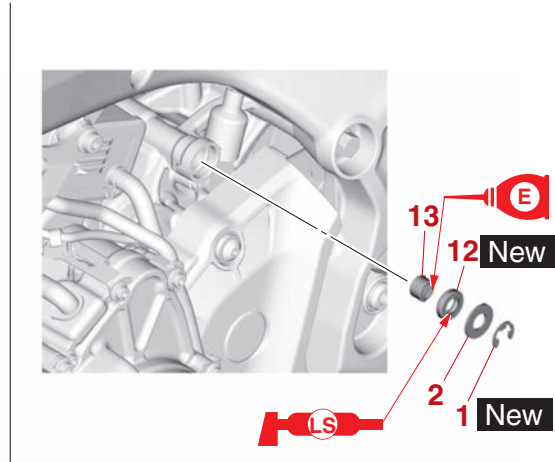
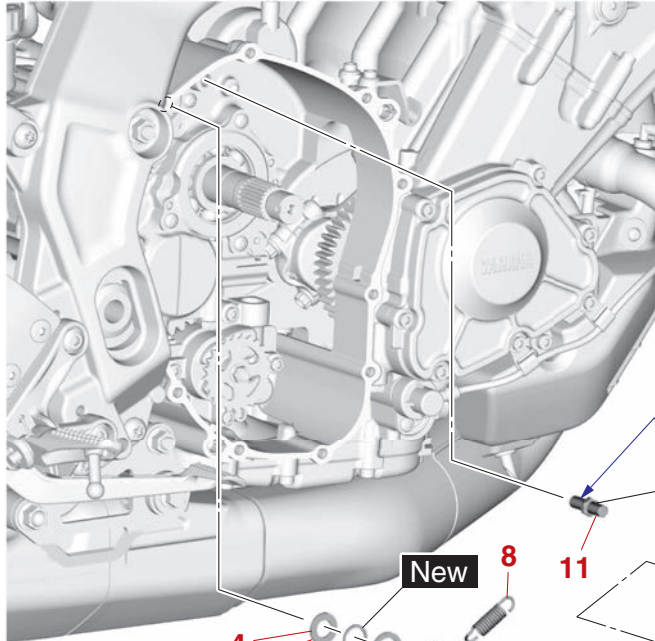


Clutch lever free play
10.0–15.0 mm (0.39–0.59 in)

EAS20057

SHIFT SHAFT

Removing the shift shaft and stopper lever



22 N·m (2.2 kgf·m, 16 lb·ft)

Order	Job/Parts to remove	Q'ty	Remarks
	Clutch assembly		Refer to "CLUTCH" on page 5-46.
	Shift arm		Refer to "CHAIN DRIVE" on page 4-88.
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	
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
Bends/damage/wear → Replace.
 - Shift shaft spring
 - Collar
Damage/wear → Replace.

EAS30378

CHECKING THE STOPPER LEVER

1. Check:
 - Stopper lever
Bends/damage → Replace.
Roller turns roughly → Replace the stopper lever.

EAS30381

INSTALLING THE SHIFT SHAFT

1. Install:
 - Shift shaft spring stopper "1"
 - Shift shaft assembly
 - Stopper lever spring "2"



Shift shaft spring stopper
22 N·m (2.2 kgf·m, 16 lb·ft)
LOCTITE®

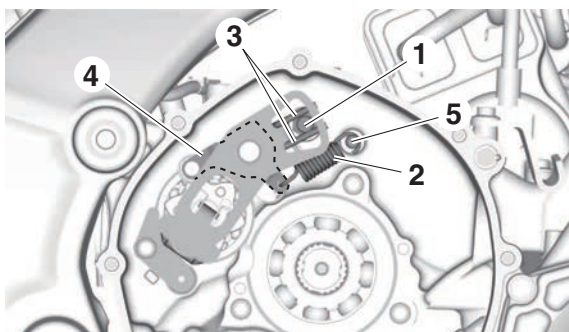
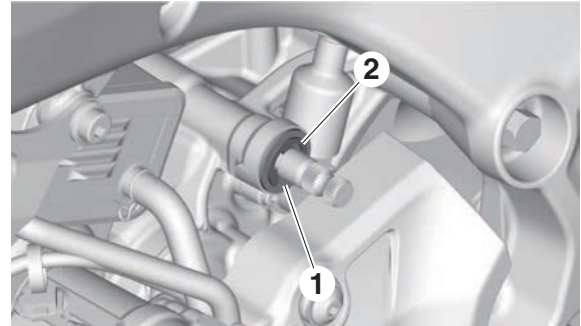
TIP

- Hook the end of the shift shaft spring "3" onto the shift shaft spring stopper "1".
- Hook the ends of the stopper lever spring "2" onto the stopper lever "4" and the crankcase boss "5".
- Mesh the stopper lever with the shift drum segment assembly.

2. Install:
 - Bearing
 - Oil seal **New**
 - Washer "1"
 - Circlip "2" **New**

TIP

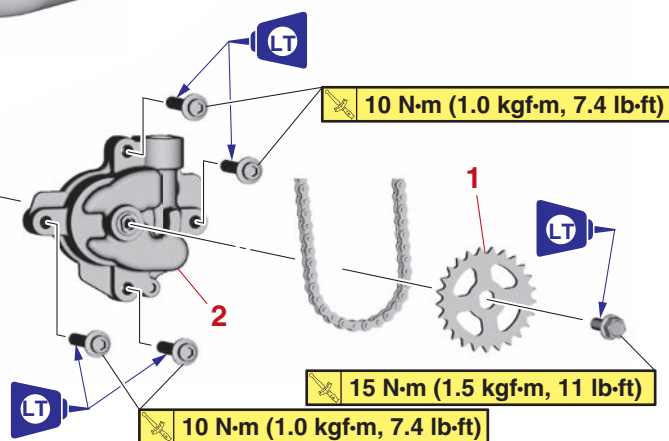
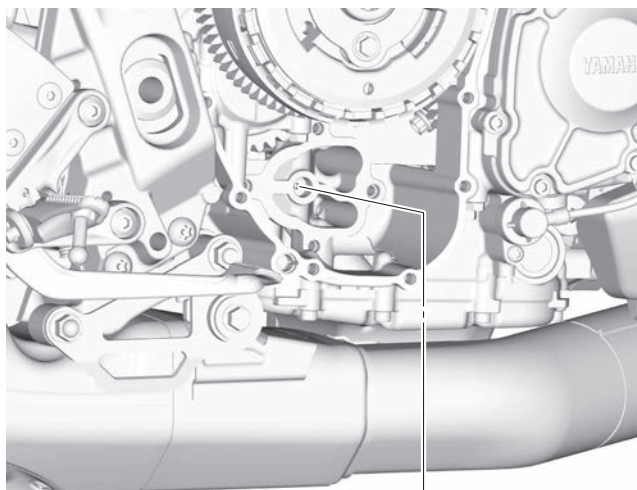
Lubricate the oil seal lips with lithium-soap-based grease.



EAS20054

OIL PUMP

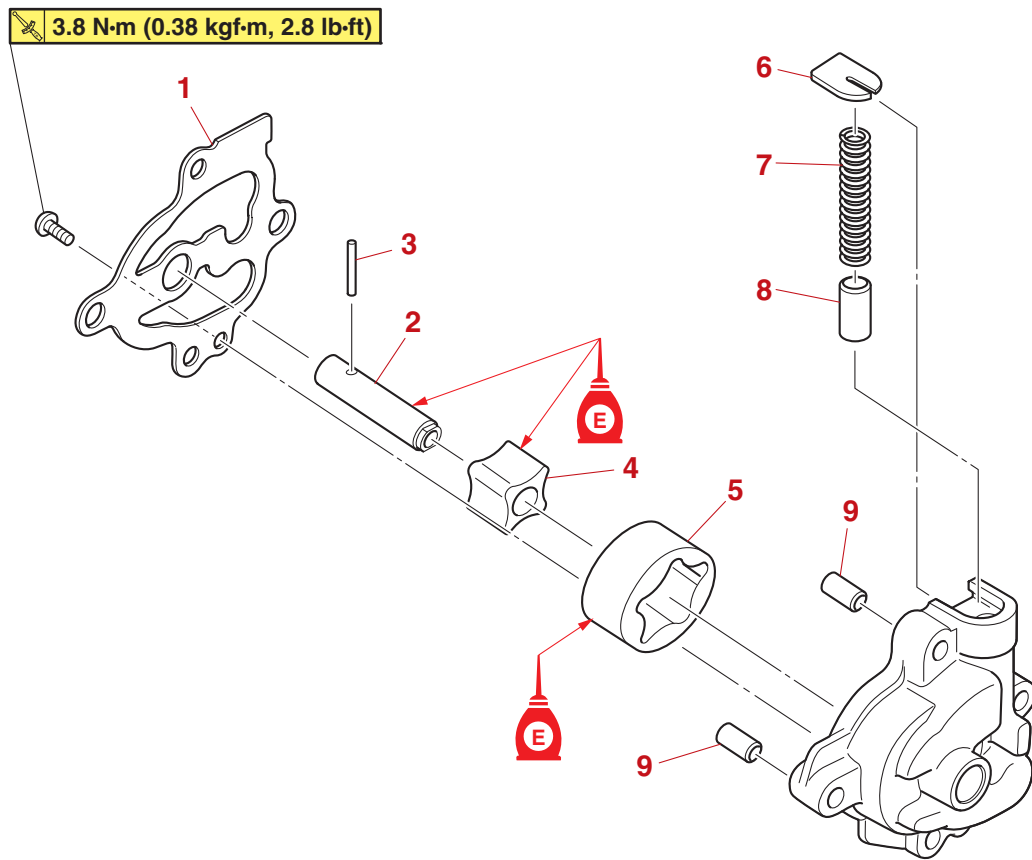
Removing the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch cover		Refer to "CLUTCH" on page 5-46.
1	Oil pump driven sprocket	1	
2	Oil pump assembly	1	

OIL PUMP

Disassembling the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump cover	1	
2	Oil pump shaft	1	
3	Pin	1	
4	Oil pump inner rotor	1	
5	Oil pump outer rotor	1	
6	Washer	1	
7	Spring	1	
8	Relief valve	1	
9	Dowel pin	2	

EAS30336

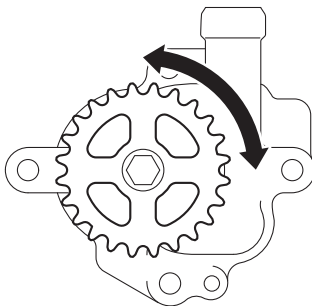
CHECKING THE SPROCKET AND CHAIN

1. Check:
 - Oil pump drive sprocket
Refer to “CHECKING THE CLUTCH HOUSING” on page 5-52.
2. Check:
 - Oil pump drive chain
Damage/stiffness → Replace the oil pump drive chain and oil pump drive sprocket (clutch housing) as a set.

EAS30337

CHECKING THE OIL PUMP

1. Check:
 - Oil pump driven sprocket
Cracks/damage/wear → Replace the oil pump drive chain and oil pump driven sprocket as a set.
 - Oil pump housing
 - Oil pump cover
 - Oil pump shaft
 - Oil pump inner rotor
 - Oil pump outer rotor
Cracks/damage/wear → Replace the oil pump assembly.
2. Check:
 - Oil pump operation
Rough movement → Replace the oil pump assembly.

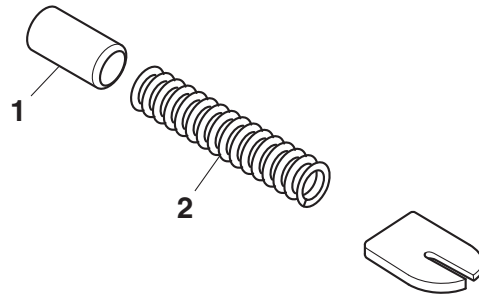


G088997

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
 - Oil pump shaft

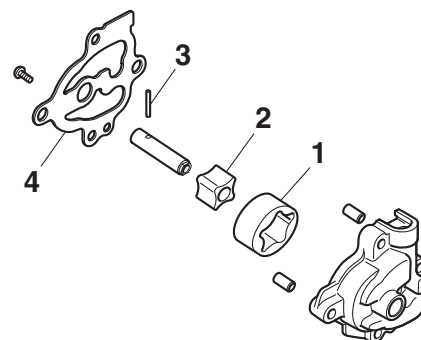
	Recommended lubricant Engine oil
---	---

2. Install:
 - Outer rotor “1”
 - Inner rotor “2”
 - Pin “3”
 - Oil pump cover “4”
 - Oil pump cover screw

	Oil pump cover screw 3.8 N·m (0.38 kgf·m, 2.8 lb·ft)
---	---

TIP

Align the pin “3” in the oil pump shaft with the groove in the inner rotor “2”.



3. Check:

- Oil pump operation
Refer to “CHECKING THE OIL PUMP” on page 5-60.

EAS30343

INSTALLING THE OIL PUMP

1. Install:

- Oil pump “1”
- Oil pump bolt “2”



Oil pump bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)
LOCTITE®

- Oil pump driven sprocket “3”



Oil pump driven sprocket bolt
15 N·m (1.5 kgf·m, 11 lb·ft)
LOCTITE®

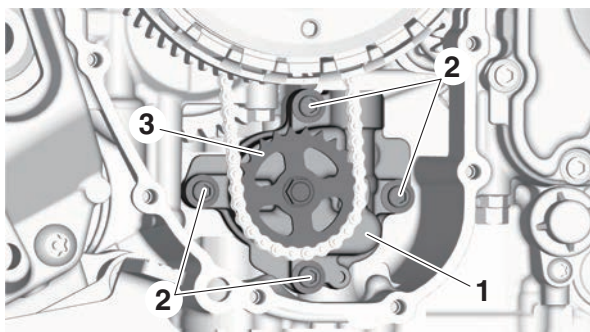
ECA20940

NOTICE

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

TIP

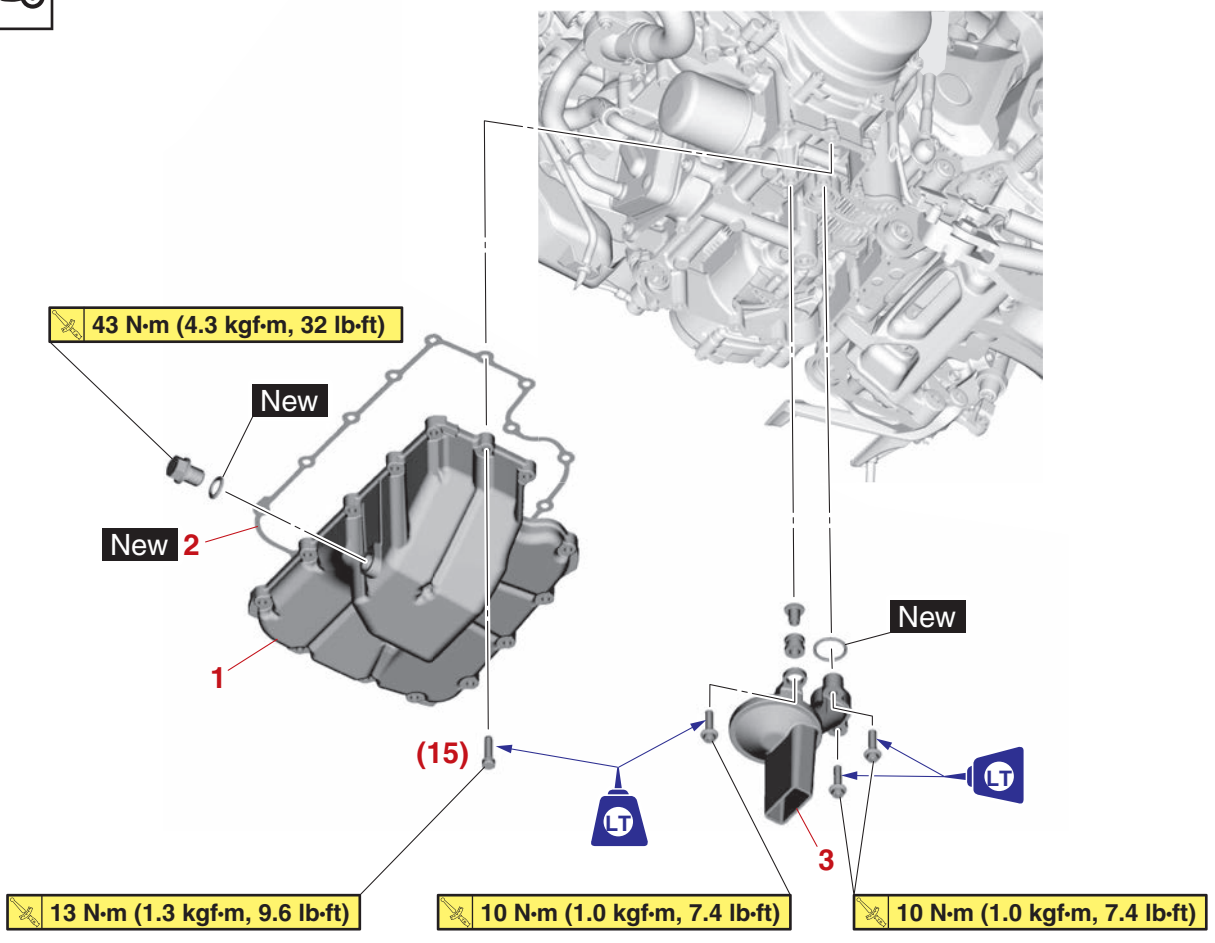
- 1RC mark of the oil pump driven sprocket is installed at oil pump side.
- Install the oil pump drive chain onto the oil pump driven sprocket.



EAS20177

OIL PAN

Removing the oil pan



Order	Job/Parts to remove	Q'ty	Remarks
	Muffler assembly		Refer to "ENGINE REMOVAL" on page 5-9.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-25.
1	Oil pan	1	
2	Oil pan gasket	1	
3	Oil strainer	1	

EAS31068

REMOVING THE OIL PAN

1. Remove:
 - Oil pan
 - 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.

EAS31069

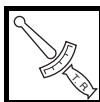
CHECKING THE OIL STRAINER

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
13 N·m (1.3 kgf·m, 9.6 lb·ft)
LOCTITE®

TIP

Tighten the oil pan bolts in stages and in a crisscross pattern.

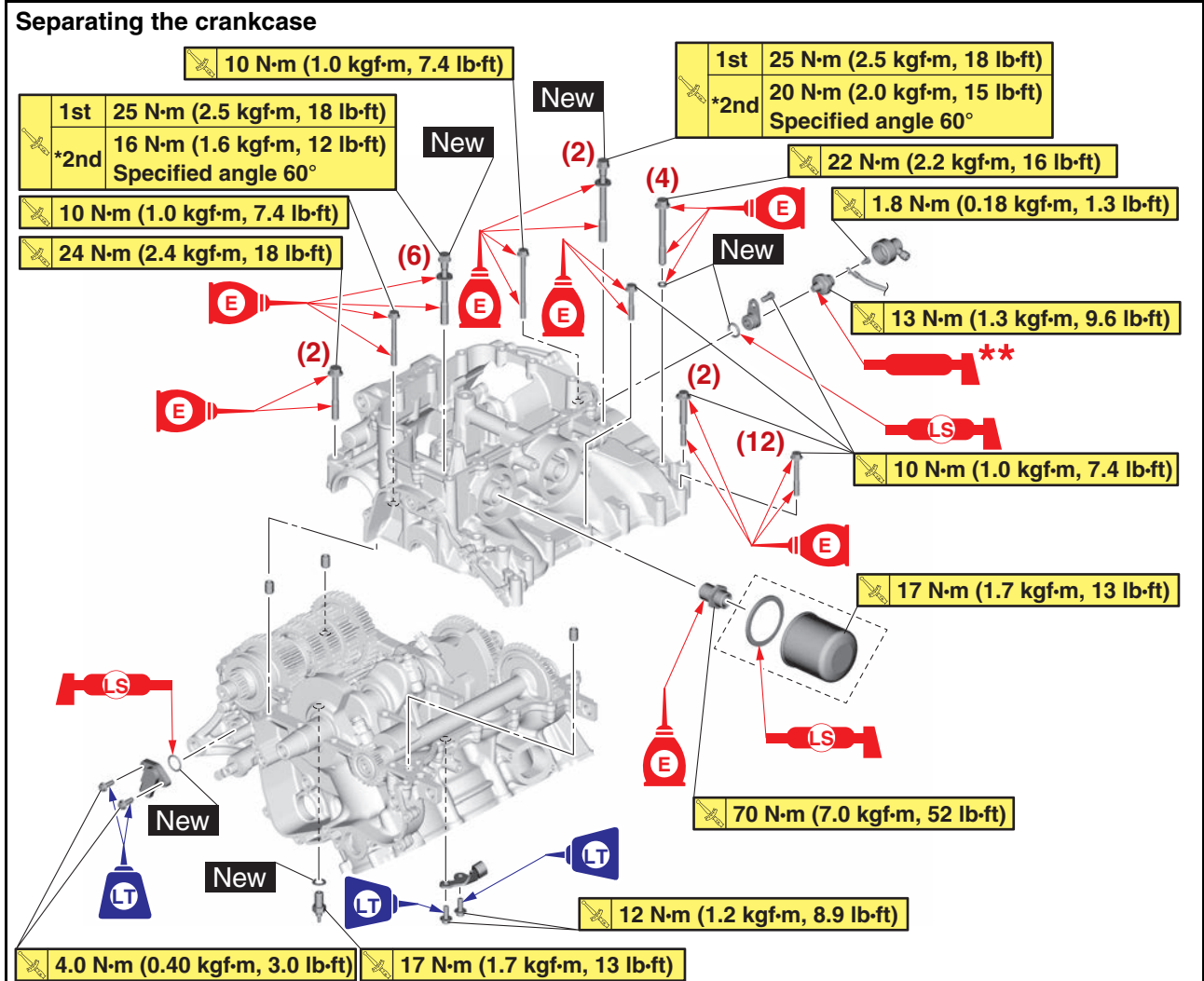
2. Install:
 - Gasket **New**
 - Engine oil drain bolt



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

EAS20059

CRANKCASE



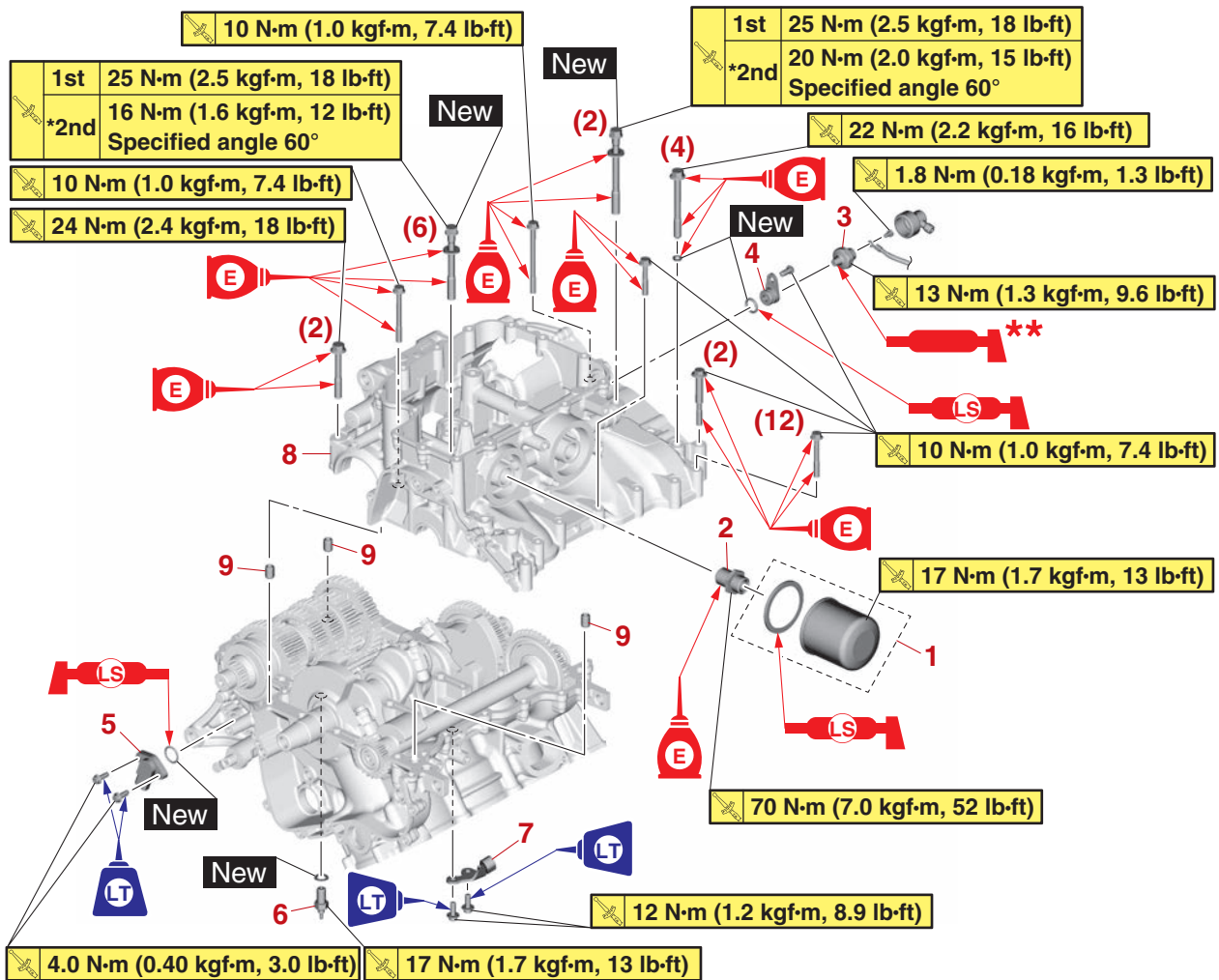
* Following the tightening order, loosen the bolt one by one, and then retighten it to the specific torque and the specified angle.

** YAMAHA Bond No. 1215B®

Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-9.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-27.
	Water pump		Refer to "WATER PUMP" on page 6-11.
	Oil cooler		Refer to "OIL COOLER" on page 6-7.
	Water jacket joint		Refer to "OIL COOLER" on page 6-7.
	Thermostat assembly		Refer to "THERMOSTAT" on page 6-9.
	Starter clutch		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-37.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-42.
	Clutch housing		Refer to "CLUTCH" on page 5-46.
	Oil strainer		Refer to "OIL PAN" on page 5-62.

CRANKCASE

Separating the crankcase



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

** YAMAHA Bond No. 1215B®

Order	Job/Parts to remove	Q'ty	Remarks
1	Oil filter cartridge	1	
2	Oil filter cartridge union bolt	1	
3	Oil pressure switch	1	
4	Oil pressure switch joint	1	
5	Gear position sensor	1	
6	Neutral switch	1	
7	Clutch cable holder	1	
8	Lower crankcase	1	
9	Dowel pin	3	

EAS30389

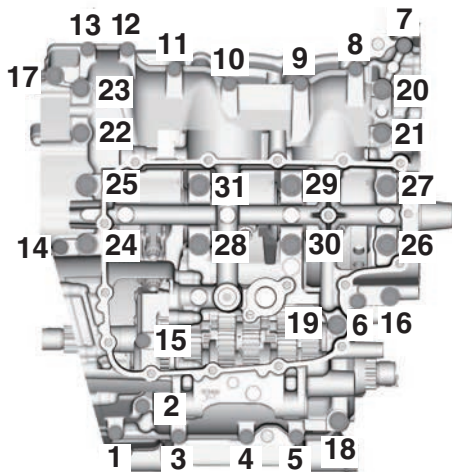
DISASSEMBLING THE CRANKCASE

1. Place the engine upside down.
2. Remove:

- Crankcase bolt (×31)

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 in the proper sequence as shown.
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.



3. Remove:
- Lower crankcase

ECA13900

NOTICE

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

4. Remove:
- Dowel pin
5. Remove:
- Crankshaft journal lower bearing
 - Balancer shaft journal bearing (from the lower crankcase)

TIP

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

EAS30390

CHECKING THE CRANKCASE

1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
 - Crankcase Cracks/damage → Replace.
 - Oil delivery passages Obstruction → Blow out with compressed air.

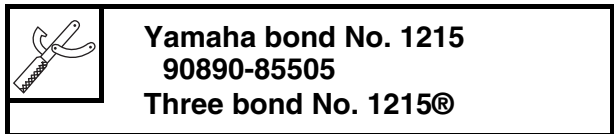
EAS30397

ASSEMBLING THE CRANKCASE

1. Lubricate:
 - Crankshaft journal bearing inner surface (with the recommended lubricant)

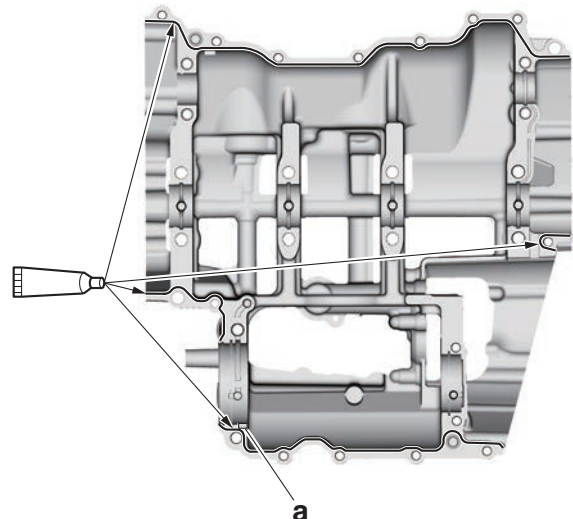


2. Apply:
 - Sealant (onto the crankcase mating surfaces)



TIP

- Do not allow any sealant to come into contact with the oil gallery or crankshaft journal bearings, or balancer shaft journal bearings.
- Make sure that the sealant does not get into the groove "a" in the crankcase.

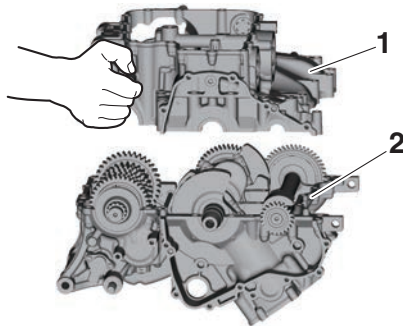


3. Install:
 - Dowel pin
4. Set the shift drum assembly and transmission gears in the neutral position.
5. Install:
 - Lower crankcase "1" (onto the upper crankcase "2")

ECA13980

NOTICE

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

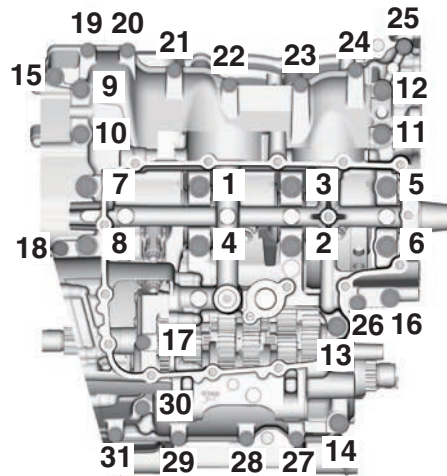


6. Install:
 - Crankcase bolt (×31)

TIP

- Lubricate the bolts "1"–"8" thread, mating surfaces and washers with engine oil.
- Lubricate the bolts "9"–"12" thread, mating surfaces and O-rings with engine oil.
- Lubricate the bolts "13"–"31" thread and mating surfaces with engine oil.

- M9 × 100 mm (3.94 in) bolt with washer: "7", "8" **New**
- M9 × 85 mm (3.35 in) bolt with washer: "1"–"6" **New**
- M8 × 78 mm (3.07 in) bolt with new O-ring: "9"–"12"
- M8 × 60 mm (2.36 in) bolt: "13", "14"
- M6 × 85 mm (3.35 in) bolt: "18"
- M6 × 65 mm (2.56 in) bolt: "15", "16"
- M6 × 65 mm (2.56 in) bolt: "26"
- M6 × 50 mm (1.97 in) bolt: "17", "19"–"21", "23"–"25", "27"–"31"
- M6 × 40 mm (1.57 in) bolt: "22"



7. Tighten:
 - Crankcase bolt "1"–"8"



Crankcase bolts "1"–"6"

1st: 25 N·m (2.5 kgf·m, 18 lb·ft)
*2nd: 16 N·m (1.6 kgf·m, 12 lb·ft)
Specified angle 60°

Crankcase bolts "7"–"8"

1st: 25 N·m (2.5 kgf·m, 18 lb·ft)
*2nd: 20 N·m (2.0 kgf·m, 15 lb·ft)
Specified angle 60°

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

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.

EAS31071

INSTALLING THE OIL PRESSURE SWITCH

1. Install:

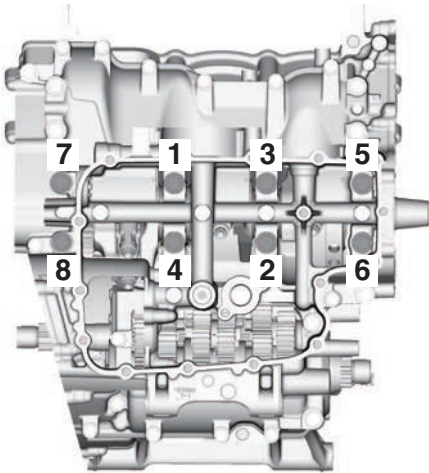
- Oil pressure switch “1”
- Oil pressure switch lead “2”



Oil pressure switch
13 N·m (1.3 kgf·m, 9.6 lb·ft)
Oil pressure switch lead bolt
1.8 N·m (0.18 kgf·m, 1.3 lb·ft)

TIP

- Apply Three Bond No. 1215B® to the threads “a” of the oil pressure switch. However, do not apply Three Bond No. 1215B® 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.



8. Tighten:

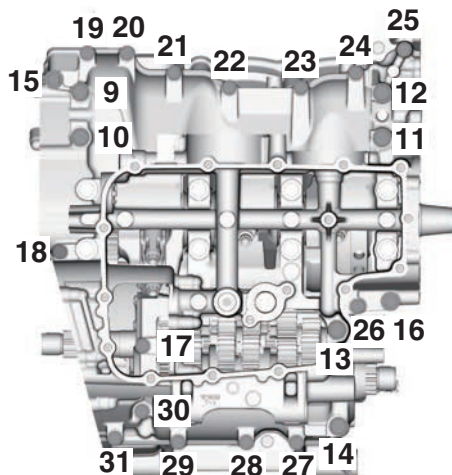
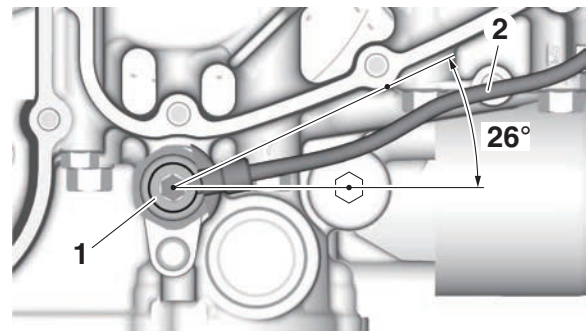
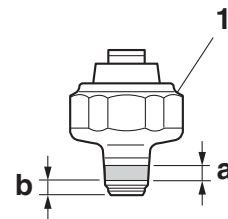
- Crankcase bolt “9”–“31”



Crankcase bolts “9”–“12”
22 N·m (2.2 kgf·m, 16 lb·ft)
Crankcase bolts “13”–“14”
24 N·m (2.4 kgf·m, 18 lb·ft)
Crankcase bolts “15”–“31”
10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

Tighten the bolts in the tightening sequence cast on the crankcase.



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:

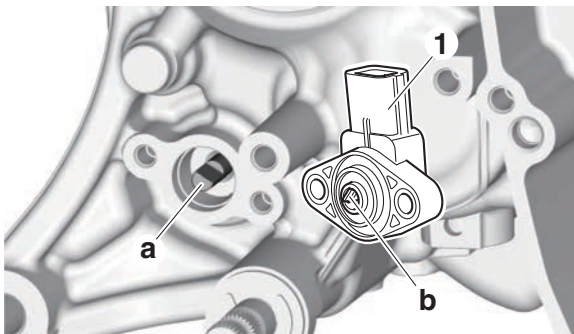
- O-ring **New**
- Gear position sensor "1"



Gear position sensor 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".

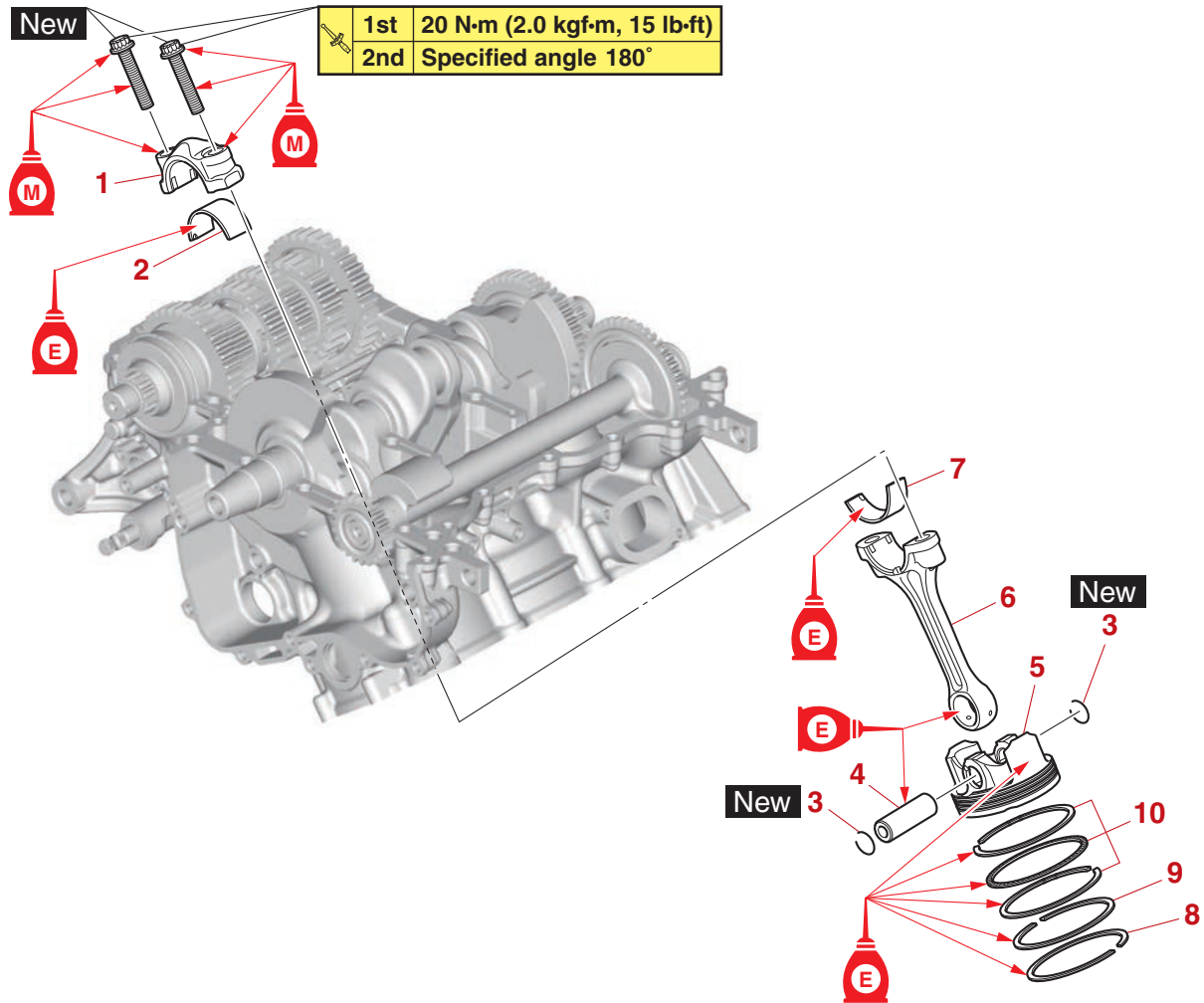


CONNECTING RODS AND PISTONS

EAS20132

CONNECTING RODS AND PISTONS

Removing the connecting rods and pistons



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Refer to "CRANKCASE" on page 5-64.
1	Connecting rod cap	3	
2	Big end lower bearing	3	
3	Piston pin clip	6	
4	Piston pin	3	
5	Piston	3	
6	Connecting rod	3	
7	Big end upper bearing	3	
8	Top ring	3	
9	2nd ring	3	
10	Oil ring	3	

CONNECTING RODS AND PISTONS

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 big end bearing 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"

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 deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set "3".



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

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 "C" with the cylinder bore gauge.

TIP

Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder.



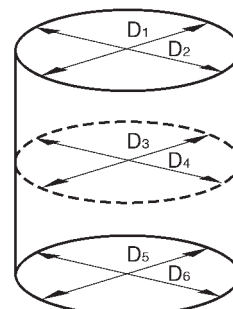
Bore

78.000–78.010 mm (3.0709–3.0713 in)

Wear limit

78.060 mm (3.0732 in)


"C" = maximum of $D_1, D_2, D_3, D_4, D_5, D_6$



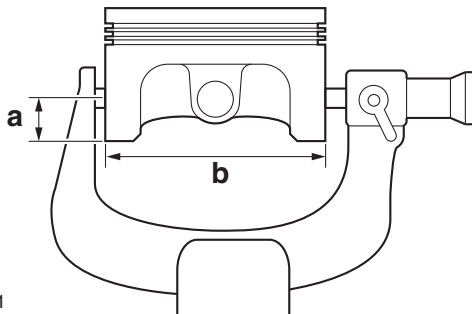
G089000

CONNECTING RODS AND PISTONS

- 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.




Piston Diameter
77.975–77.990 mm (3.0699–3.0705 in)



G089001

- a. 9.0 mm (0.35 in) from the bottom edge of the piston
- d. If out of specification, replace the piston and piston rings as a set.
- e. Calculate the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance = Cylinder bore “C” - Piston skirt diameter “b”



Piston-to-cylinder clearance
0.010–0.035 mm (0.0004–0.0014 in)

- 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.

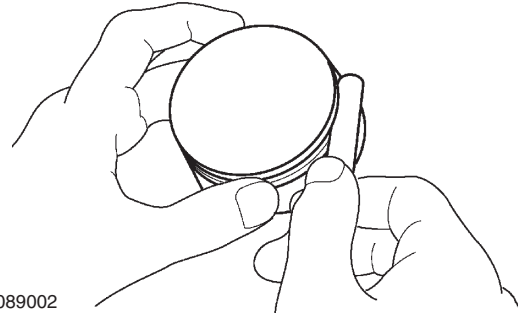
TIP

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, where cylinder wear is lowest.

3. Measure:

- Piston ring end gap
Out of specification → Replace the piston ring.

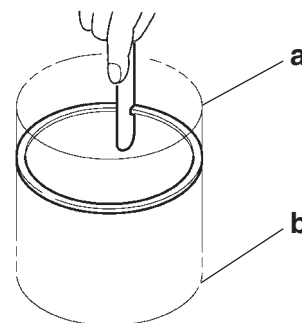
TIP

The oil ring expander spacer’s end gap cannot be measured. If the oil ring rail’s gap is excessive, replace all three piston rings.



Top ring
End gap limit
0.50 mm (0.0197 in)

2nd ring
End gap limit
1.15 mm (0.0453 in)



G089003

- a. Bottom of cylinder
- b. Upper of cylinder

CONNECTING RODS AND PISTONS

EAS30749

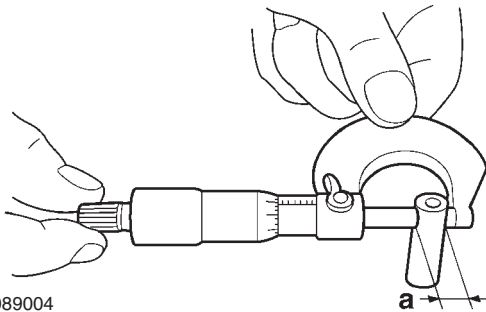
CHECKING THE PISTON PIN

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
16.970 mm (0.6681 in)

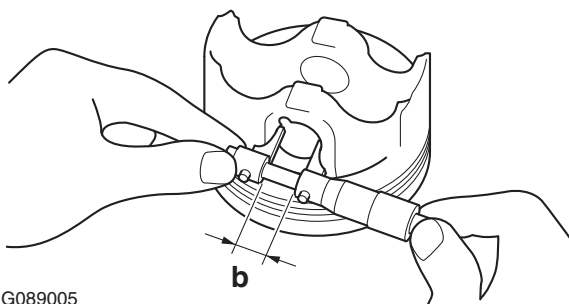


G089004

3. Measure:
 - Piston pin bore inside diameter “b”
Out of specification → Replace the piston.



Piston pin bore inside diameter limit
17.043 mm (0.6710 in)



G089005

EAS30750

CHECKING THE CONNECTING RODS

1. Measure:
 - Crankshaft-pin-to-big-end-bearing clearance
Out of specification → Replace the big end bearings.



Oil clearance
0.027–0.051 mm (0.0011–0.0020 in)

The following procedure applies to all of the connecting rods.

ECA13930

NOTICE

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

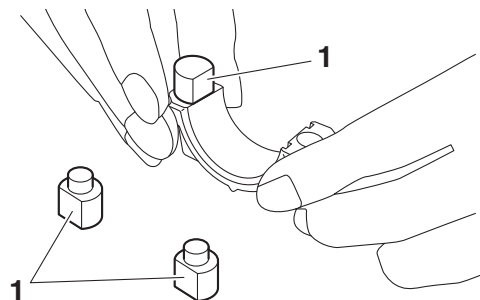
- a. Clean the big end bearings, crankshaft pins, and the inside of the connecting rods halves.
- b. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap with the connecting rod big end metal installer “1”.

TIP

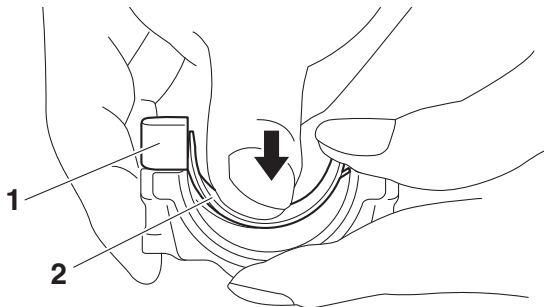
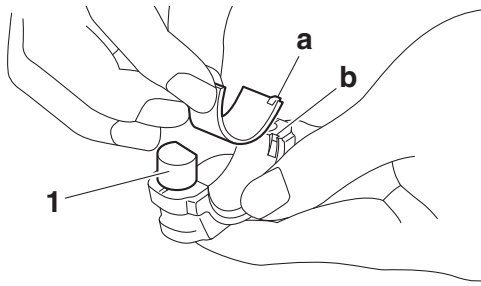
- From the 3 types, choose the connecting rod big end metal installer “1” that fits exactly, and install it to the connecting rod and connecting rod cap as shown in the illustration.
- Align the projections “a” on the big end bearings with the notches “b” in the connecting rod and connecting rod cap.
- Push the big end bearing “2” down and install it to the connecting rod and connecting rod cap.



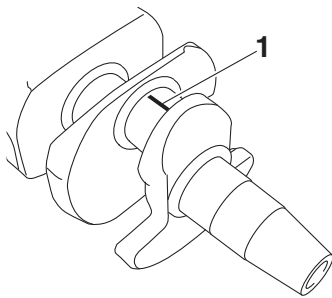
Connecting rod big end bearing installer
90890-04193
Connecting rod big end bearing installer
YM-04193



CONNECTING RODS AND PISTONS



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



G089008

d. Assemble the connecting rod halves.

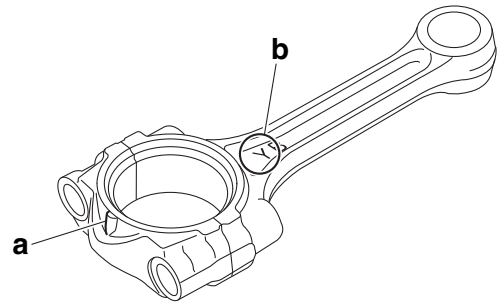
ECA18390

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.

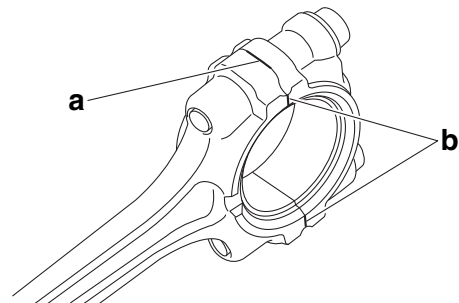
- Tighten the connecting rod bolt while checking that the sections shown “a” and “b” are flush with each other by touching the surface.



**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.



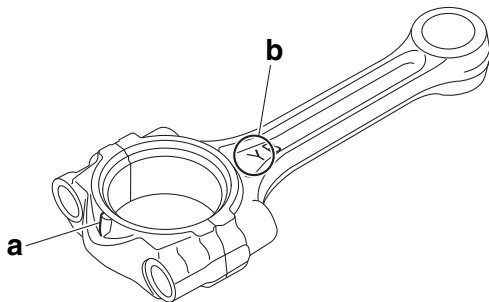
- Side machined face
- Thrusting faces

- 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.

CONNECTING RODS AND PISTONS

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.

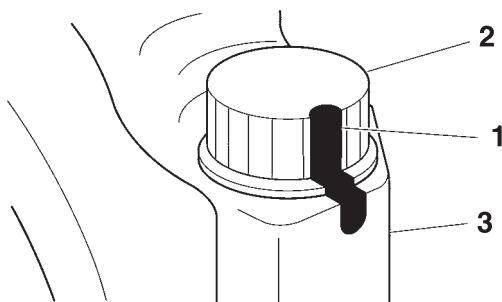


- g. Tighten the connecting rod bolts with a torque wrench.



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

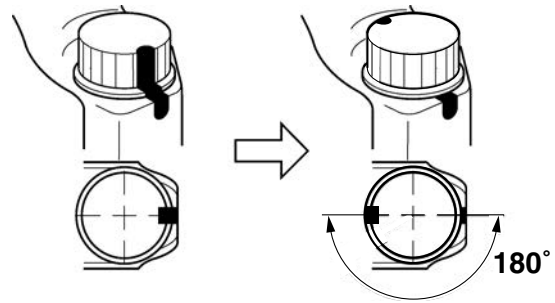
- h. Put a mark “1” on the corner of the connecting rod bolt “2” and the connecting rod cap “3”.



- i. Tighten the connecting rod bolts further to reach the specified angle 180°.



Connecting rod bolt (final)
Specified angle 180°



EWA16610

WARNING

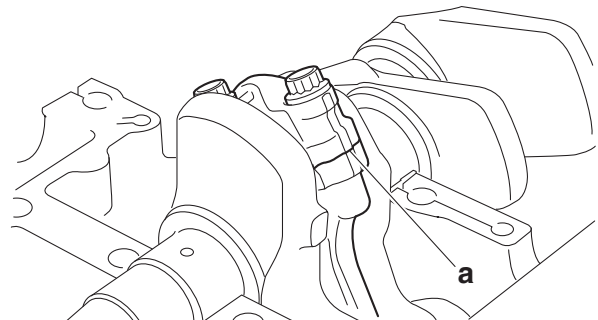
If the bolt is tightened more than the specified angle, do not loosen the bolt and then re-tighten it. Instead, replace the bolt with a new one and perform the procedure again.

ECA20890

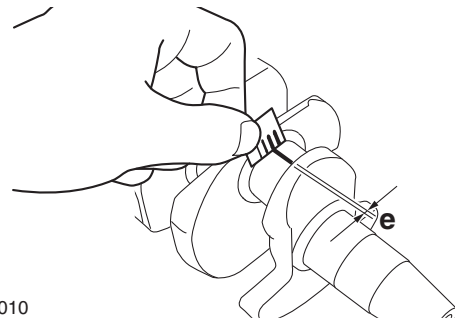
NOTICE

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 “e” on the crankshaft pin. If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.



G089010

CONNECTING RODS AND PISTONS

2. Select:

- Big end bearing (P₁–P₃)

TIP

- The numbers “A” stamped into the crankshaft web and the numbers “1” on the connecting rods are used to determine the replacement big end bearings sizes.
- “P₁”–“P₃” refer to the bearings shown in the crankshaft illustration.

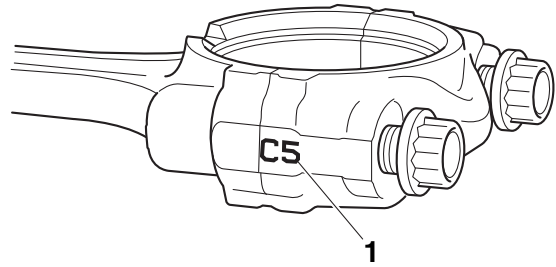
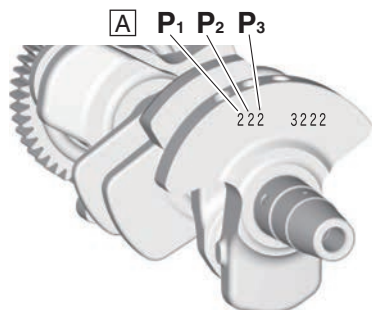
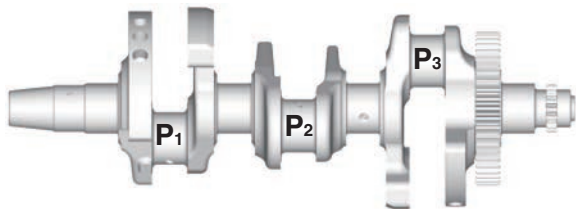
For example, if the connecting rod “P₁” and the crankshaft web “P₁” numbers are 5 and 2 respectively, then the bearing size for “P₁” is:

$$"P_1" \text{ (connecting rod)} - "P_1" \text{ (crankshaft)} = 5 - 2 = 3 \text{ (brown)}$$



Bearing color code

- Code 1**
Blue
- Code 2**
Black
- Code 3**
Brown
- Code 4**
Green



EAS30751

INSTALLING THE CONNECTING ROD AND PISTON

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

1. Install:

- Big end bearing
- Connecting rod cap (onto the connecting rod)

TIP

- Be sure to reinstall each big end bearing in its original place.
- From the 3 types, choose the connecting rod big end metal 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.



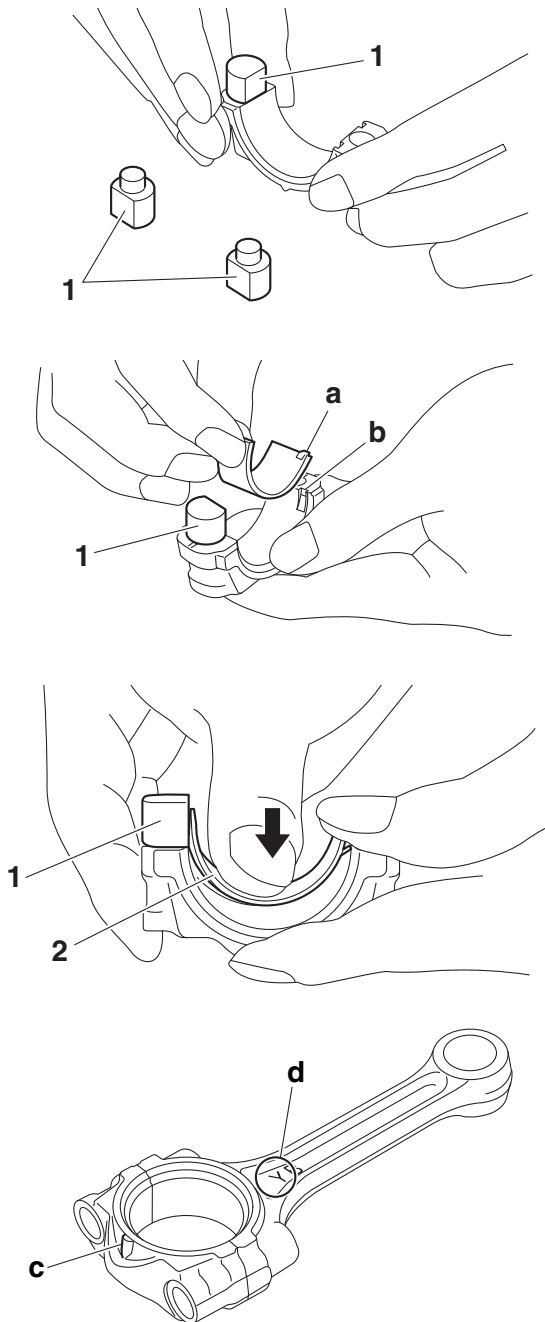
Connecting rod big end bearing installer

90890-04193

Connecting rod big end bearing installer

YM-04193

CONNECTING RODS AND PISTONS



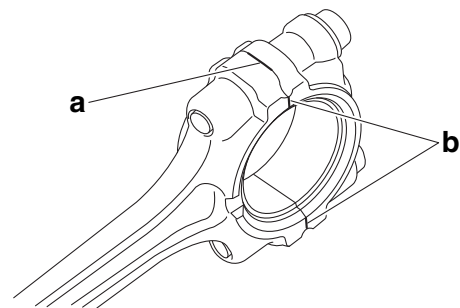
- a. Replace the connecting rod bolts with new ones.
- b. Clean the connecting rod bolts and lubricate the bolt threads and seats with molybdenum disulfide oil.
- c. After installing the big end bearing, assemble the connecting rod and connecting rod cap without installing them onto the crankshaft.
- 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.

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.

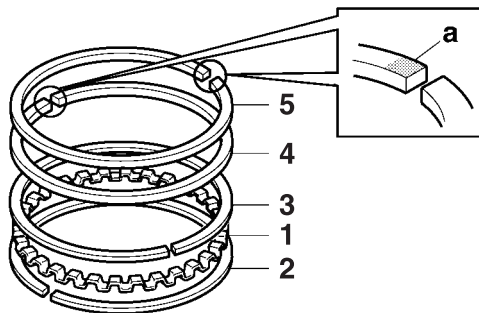
CONNECTING RODS AND PISTONS

3. Install:

- Oil ring expander "1"
- Lower oil ring rail "2"
- Upper oil ring rail "3"
- 2nd ring "4"
- Top ring "5"
(into the piston)

TIP

Be sure to install the piston rings so that the manufacturer's marks or numbers "a" face up.

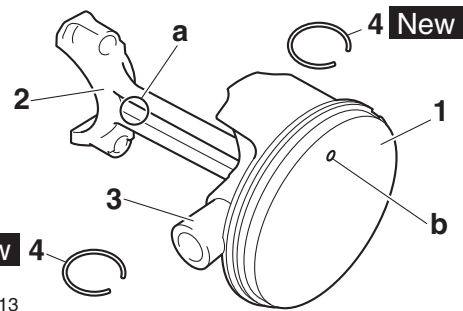


4. Install:

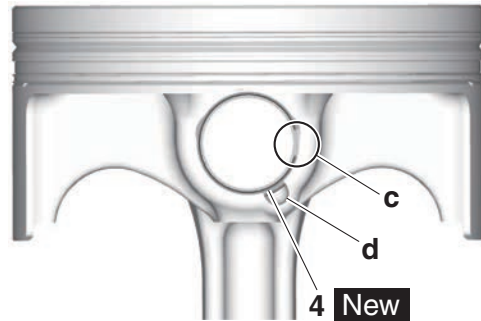
- Piston "1"
(onto the respective connecting rod "2")
- Piston pin "3"
- Piston pin clip "4" **New**

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.
- Make sure that the clip ends "c" are positioned away from the cutout "d" in the piston as shown in the illustration.
- Reinstall each piston into its original cylinder.



G089013



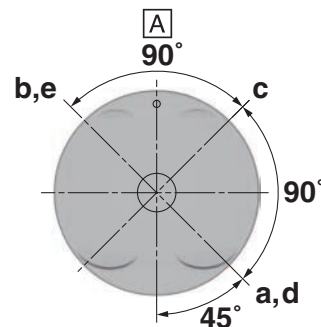
5. Lubricate:

- Piston
- Piston ring
- Cylinder
(with the recommended lubricant)



6. Offset:

- Piston ring end gap



- a. Top ring
- b. 2nd ring
- c. Upper oil ring rail
- d. Oil ring expander
- e. Lower oil ring rail
- A. Exhaust side

CONNECTING RODS AND PISTONS


7. Lubricate:

- Crankshaft pin
- Connecting rod big end bearing inner surface (with the recommended lubricant)

	Recommended lubricant Engine oil
---	---

8. Install:

- Piston assembly “1” (into the cylinder “2” and onto the crankshaft pin)

	Piston installing tool 90890-04161 Piston installing tool YM-04161
---	---

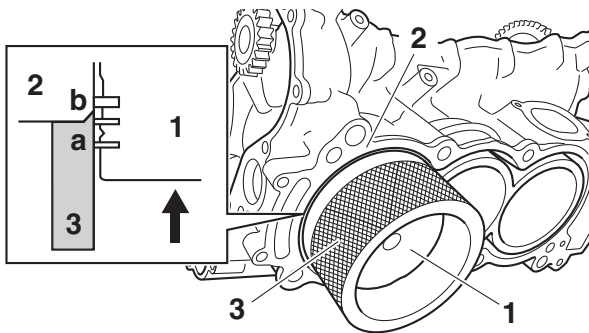
ECA21490

NOTICE

If the projection “a” of the piston installing tool damages, you cannot use it. Please handle with care.

TIP

Fit the projection “a” of the piston installing tool “3” and blunt-edged part “b” of the cylinder, fix the position of the piston installing tool, and then push the piston up to the cylinder.

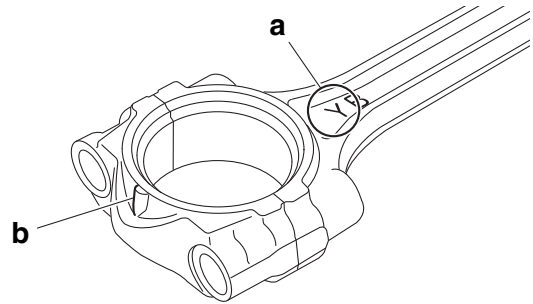


9. Install:

- Connecting rod cap
- Connecting rod bolt

TIP

- 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 bolt threads and seats.




10. Tighten:

- Connecting rod bolt

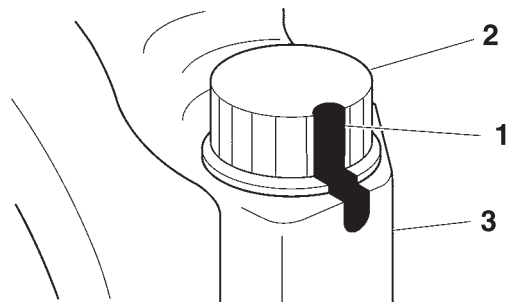
TIP

Tighten the connecting rod bolts using the following procedure.

- Tighten the connecting rod bolts with a torque wrench.

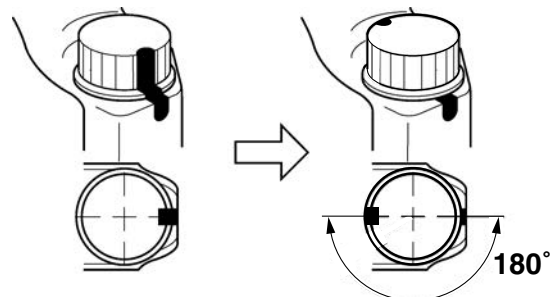
	Connecting rod bolt (1st) 20 N·m (2.0 kgf·m, 15 lb-ft)
---	---

- Put a mark “1” on the corner of the connecting rod bolt “2” and the connecting rod cap “3”.



- Tighten the connecting rod bolts further to reach the specified angle 180°.

	Connecting rod bolt (final) Specified angle 180°
---	---



CONNECTING RODS AND PISTONS

EWA16610

WARNING

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

ECA20890

NOTICE

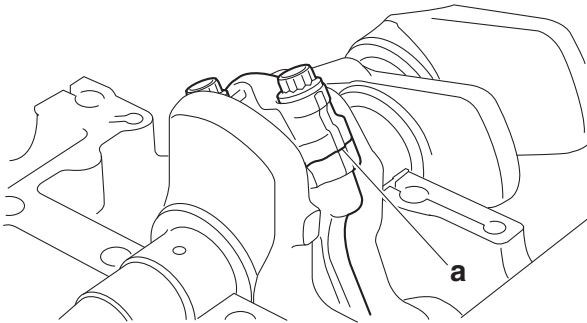
Do not use a torque wrench to tighten the bolt to the specified angle.

- 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.

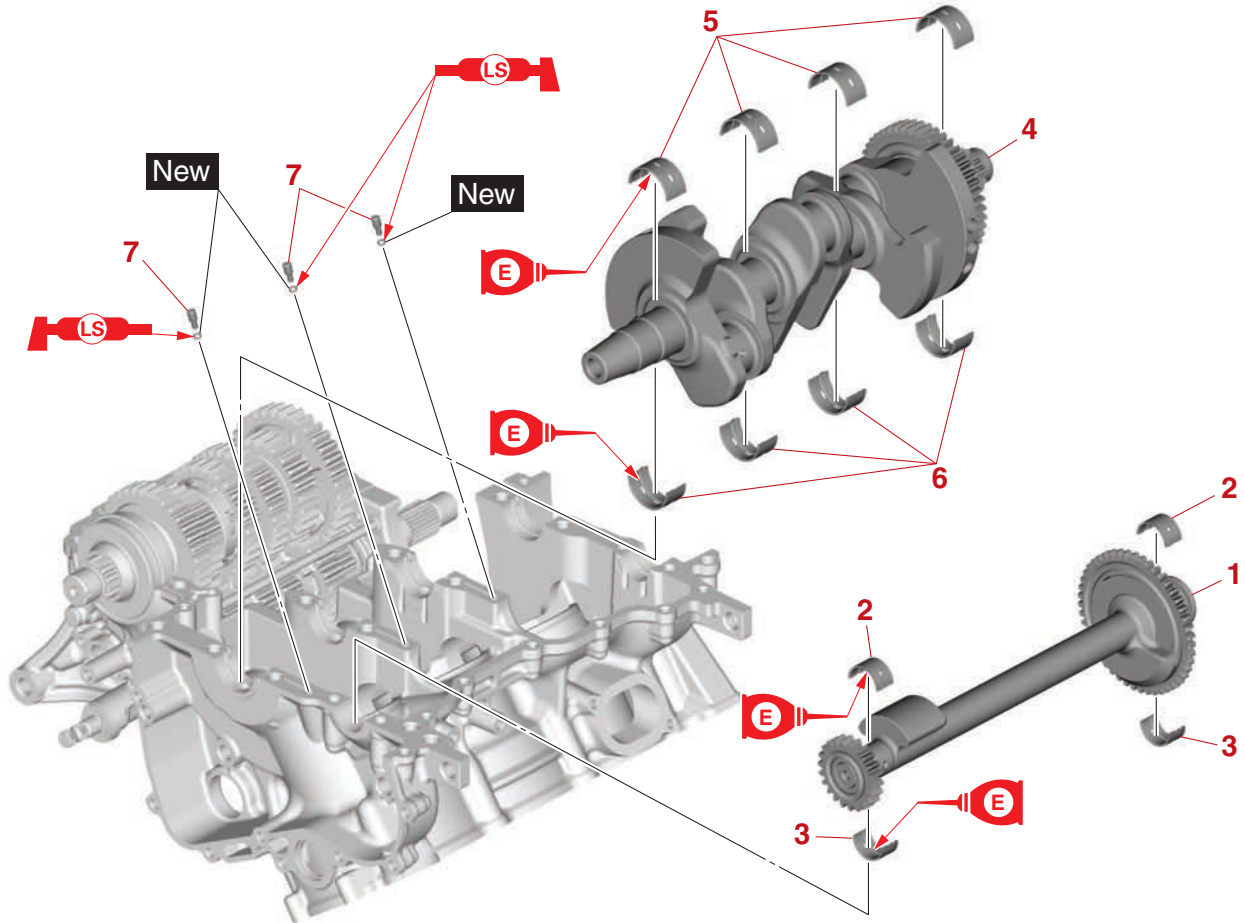


CRANKSHAFT AND BALANCER SHAFT

EAS20178

CRANKSHAFT AND BALANCER SHAFT

Removing the crankshaft and balancer shaft



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Refer to "CRANKCASE" on page 5-64.
	Connecting rod		Refer to "REMOVING THE CONNECTING RODS AND PISTONS" on page 5-71.
1	Balancer shaft	1	
2	Balancer shaft journal lower bearing	2	
3	Balancer shaft journal upper bearing	2	
4	Crankshaft	1	
5	Crankshaft journal lower bearing	4	
6	Crankshaft journal upper bearing	4	
7	Oil nozzle	3	

CRANKSHAFT AND BALANCER SHAFT

EAS31171

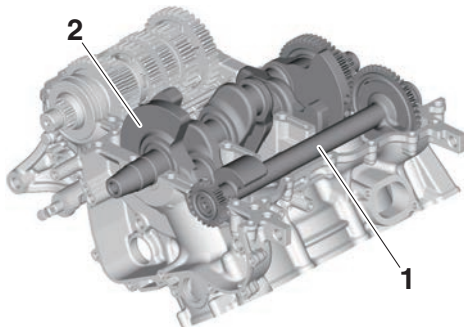
REMOVING THE CRANKSHAFT AND BALANCER SHAFT

1. Remove:

- Balancer shaft "1"
- Balancer shaft journal bearing
- Crankshaft assembly "2"
- Crankshaft journal bearing

TIP

Identify the position of each balancer shaft journal bearings and crankshaft journal bearings so that it can be reinstalled in its original place.



EAS31174

CHECKING THE OIL NOZZLES

The following procedure applies to all of the oil nozzles.

1. Check:

- Oil nozzle
Damage/wear → Replace the oil nozzle.
- Oil passage
Obstruction → Blow out with compressed air.

EAS31075

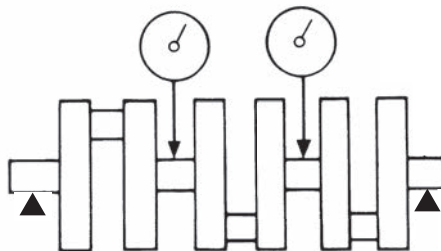
CHECKING THE CRANKSHAFT

1. Measure:

- Crankshaft runout
Out of specification → Replace the crankshaft.



Runout limit
0.030 mm (0.0012 in)



G089017

2. Check:

- Crankshaft journal surfaces
- Crankshaft pin surfaces
- Bearing surfaces
Scratches/wear → Replace the crankshaft.

3. Measure:

- Crankshaft-journal-to-crankshaft-journal-bearing clearance
Out of specification → Replace the crankshaft journal bearings.



Journal oil clearance
0.013–0.037 mm (0.0005–0.0015 in)

ECA13920

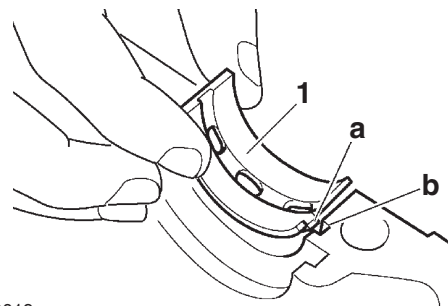
NOTICE

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.

- Clean the crankshaft journal bearings, crankshaft journals, and bearing portions of the crankcase.
- Place the upper crankcase upside down on a bench.
- Install the crankshaft journal upper bearings "1" and the crankshaft into the upper crankcase.

TIP

Align the projections "a" on the crankshaft journal upper bearings with the notches "b" in the upper crankcase.



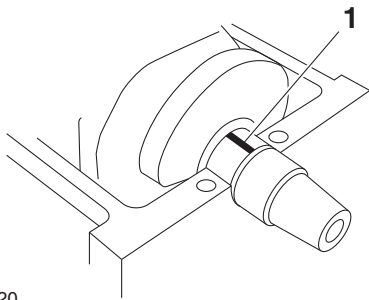
G089019

- Put a piece of Plastigauge® "1" on each crankshaft journal.

TIP

Do not put the Plastigauge® over the oil hole in the crankshaft journal.

CRANKSHAFT AND BALANCER SHAFT

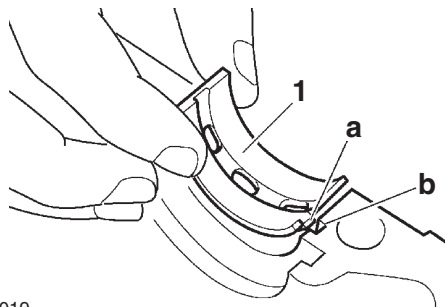


G089020

e. Install the crankshaft journal lower bearings “1” into the lower crankcase and assemble the crankcase halves.

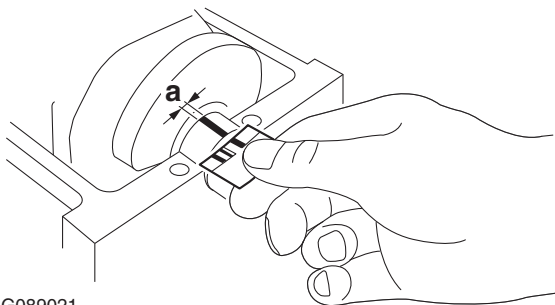
TIP

- Align the projections “a” of the crankshaft journal lower bearings with the notches “b” in the lower crankcase.
- Do not move the crankshaft until the clearance measurement has been completed.



G089019

- f. Tighten the bolts to specification in the tightening sequence cast on the crankcase. Refer to “CRANKCASE” on page 5-64.
- g. Remove the lower crankcase and the crankshaft journal lower bearings.
- h. 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

4. Select:

- Crankshaft journal bearing (J₁–J₄)

TIP

- The numbers “A” stamped into the crankshaft web and the numbers “B” stamped into the lower crankcase are used to determine the replacement crankshaft journal bearing sizes.
- “J₁”–“J₄” refer to the bearings shown in the crankshaft and lower crankcase illustration.

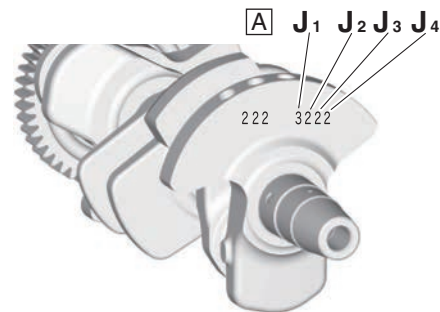
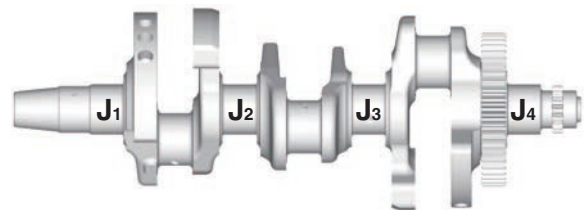
For example, if the crankcase “J₁” and crankshaft web “J₁” numbers are 7 and 2 respectively, then the bearing size for “J₁” is:

$$\begin{aligned}
 & \text{“J}_1\text{” (crankcase) - “J}_1\text{” (crankshaft web) - 1 = 7} \\
 & 7 - 2 - 1 = 4 \text{ (green)}
 \end{aligned}$$

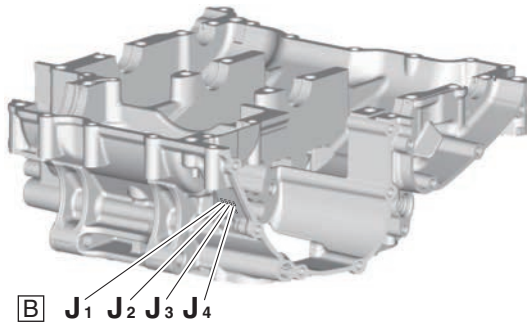


Bearing color code

- Code 0
White
- Code 1
Blue
- Code 2
Black
- Code 3
Brown
- Code 4
Green



CRANKSHAFT AND BALANCER SHAFT

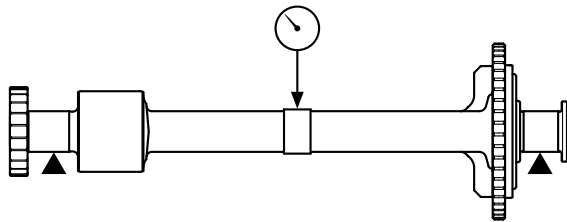
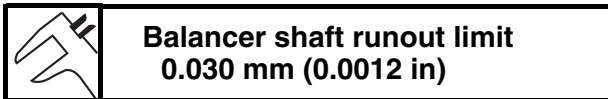


EAS31076

CHECKING THE BALANCER SHAFT

1. Measure:

- Balancer shaft runout
Out of specification → Replace the balancer shaft.



2. Check:

- Balancer shaft journal surfaces
- Bearing surfaces
Scratches/wear → Replace the balancer shaft.

3. Measure:

- Balancer shaft journal-to-balancer shaft bearing clearance
Out of specification → Replace the balancer shaft journal bearings.



ECA18400

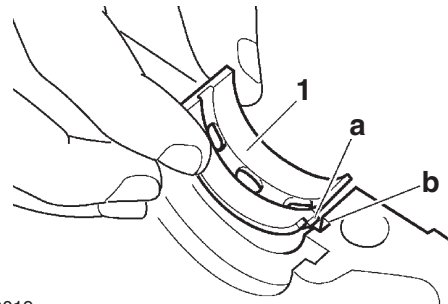
NOTICE

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.

- Clean the balancer shaft journal bearings, balancer shaft journals, and bearing portions of the crankcase.
- Place the upper crankcase upside down on a bench.
- Install the balancer shaft journal upper bearings “1” and the balancer shaft into the upper crankcase.

TIP

Align the projections “a” on the balancer shaft journal upper bearings with the notches “b” in the upper crankcase.

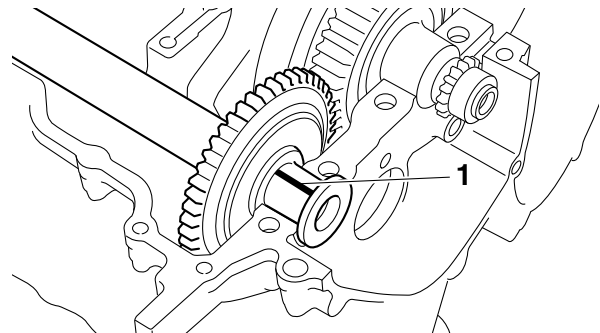


G089019

- Put a piece of Plastigauge® “1” on each balancer shaft journal.

TIP

Do not put the Plastigauge® over the oil hole in the balancer shaft journal.

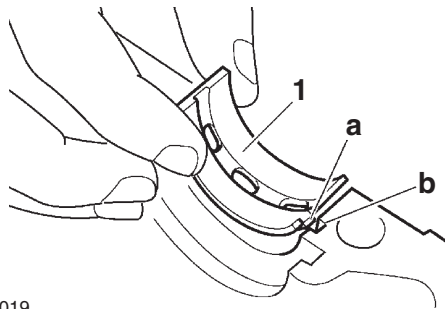


- Install the balancer shaft journal lower bearings “1” into the lower crankcase and assemble the crankcase halves.

TIP

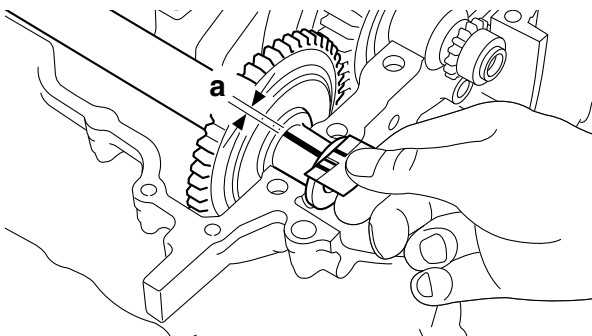
- Align the projections “a” of the balancer shaft journal lower bearings with the notches “b” in the crankcase.
- Do not move the balancer shaft until the clearance measurement has been completed.

CRANKSHAFT AND BALANCER SHAFT



G089019

- f. Tighten the bolts to specification in the tightening sequence cast on the crankcase. Refer to “CRANKCASE” on page 5-64.
- g. Remove the lower crankcase and the balancer shaft journal lower bearings.
- h. Measure the compressed Plastigauge® width “a” 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.



4. Select:

- Balancer shaft journal bearing (J₁-J₂)

TIP

- The numbers “A” stamped into the balancer shaft web and the numbers “B” stamped into the lower crankcase are used to determine the replacement balancer shaft journal bearing sizes.
- “J₁”-“J₂” refer to the bearings shown in the balancer shaft and lower crankcase illustration.

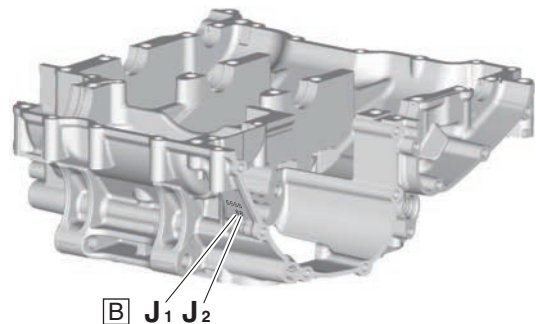
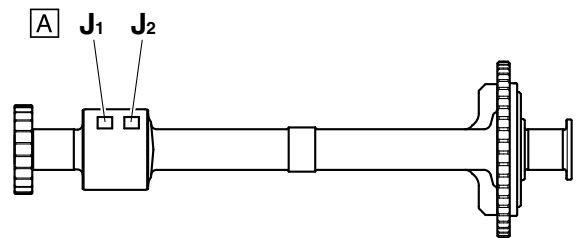
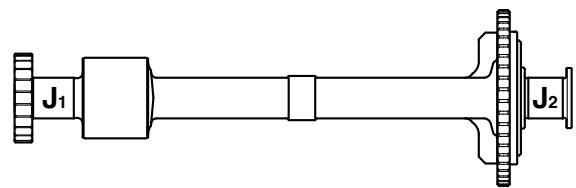
For example, if the crankcase “J₁” and balancer shaft web “J₁” numbers are 5 and 2 respectively, then the bearing size for “J₁” is:

$\text{“J}_1\text{” (crankcase) - “J}_1\text{” (balancer shaft web) = 5 - 2 = 3 (brown)}$



Bearing color code

- Code 1
Blue
- Code 2
Black
- Code 3
Brown
- Code 4
Green
- Code 5
Yellow



CRANKSHAFT AND BALANCER SHAFT

EAS31077

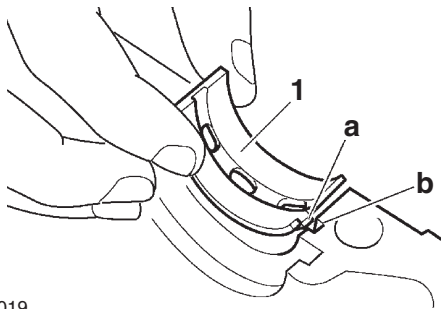
INSTALLING THE CRANKSHAFT

1. Install:

- Crankshaft journal upper bearing (into the upper crankcase)
- Crankshaft journal lower bearing (into the lower crankcase)
- Crankshaft

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

EAS31172

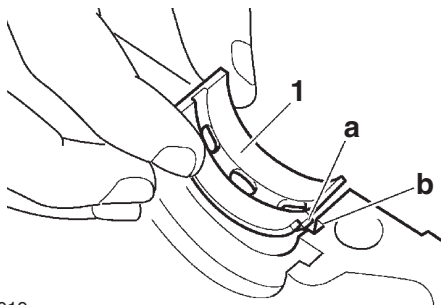
INSTALLING THE BALANCER ASSEMBLY

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 crankcases.
- Be sure to install each balancer shaft journal bearing in its original place.



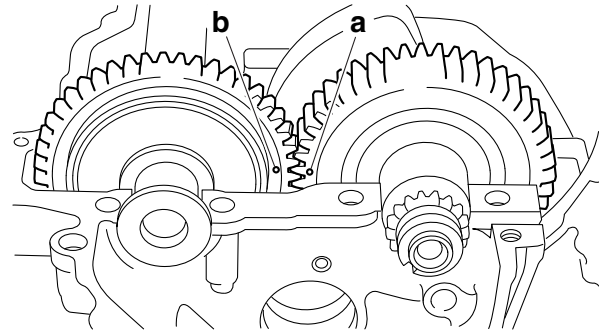
G089019

2. Install:

- Balancer shaft

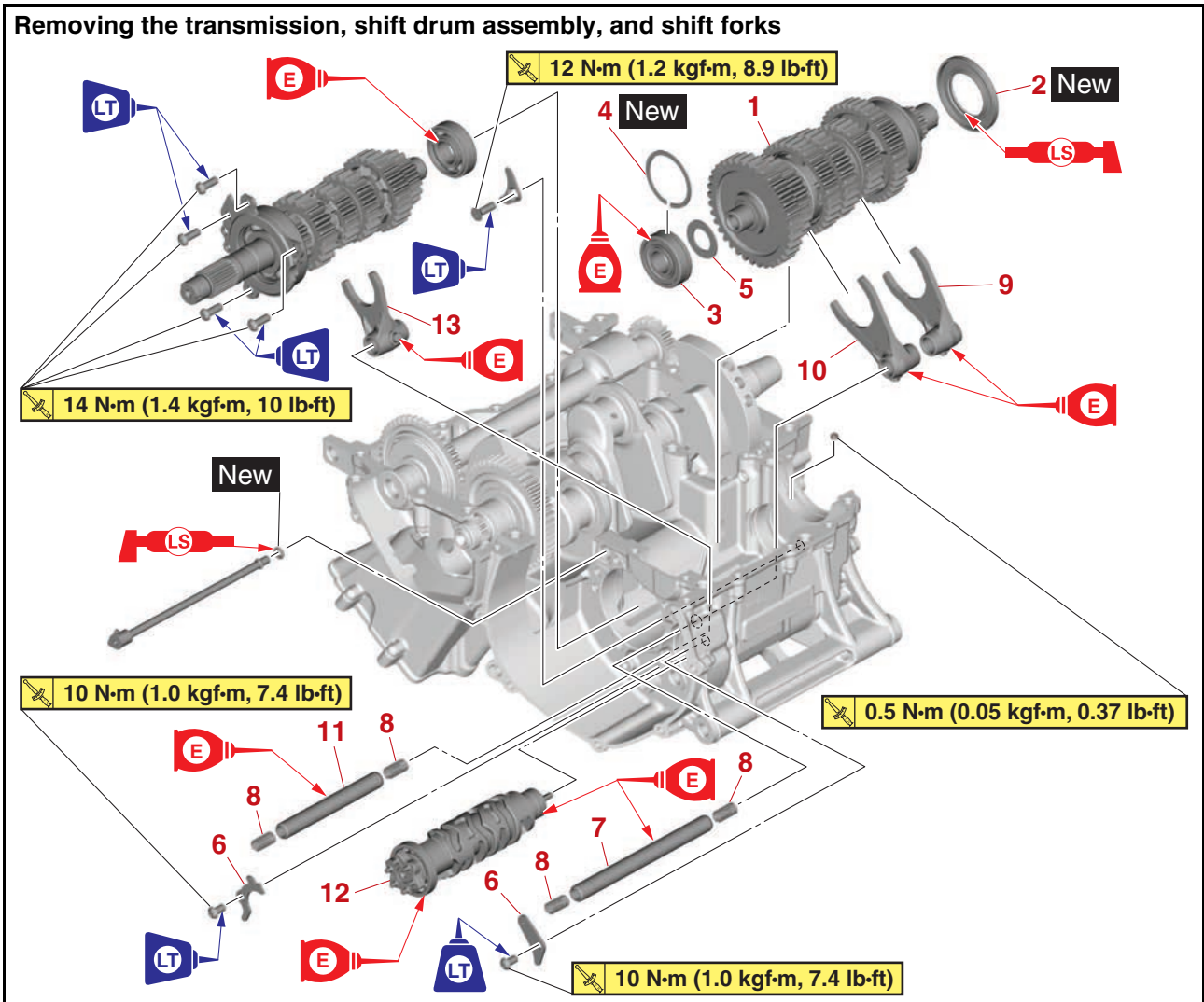
TIP

Install by aligning the crankshaft match mark “a” and the balancer shaft match mark “b”.



EAS20062

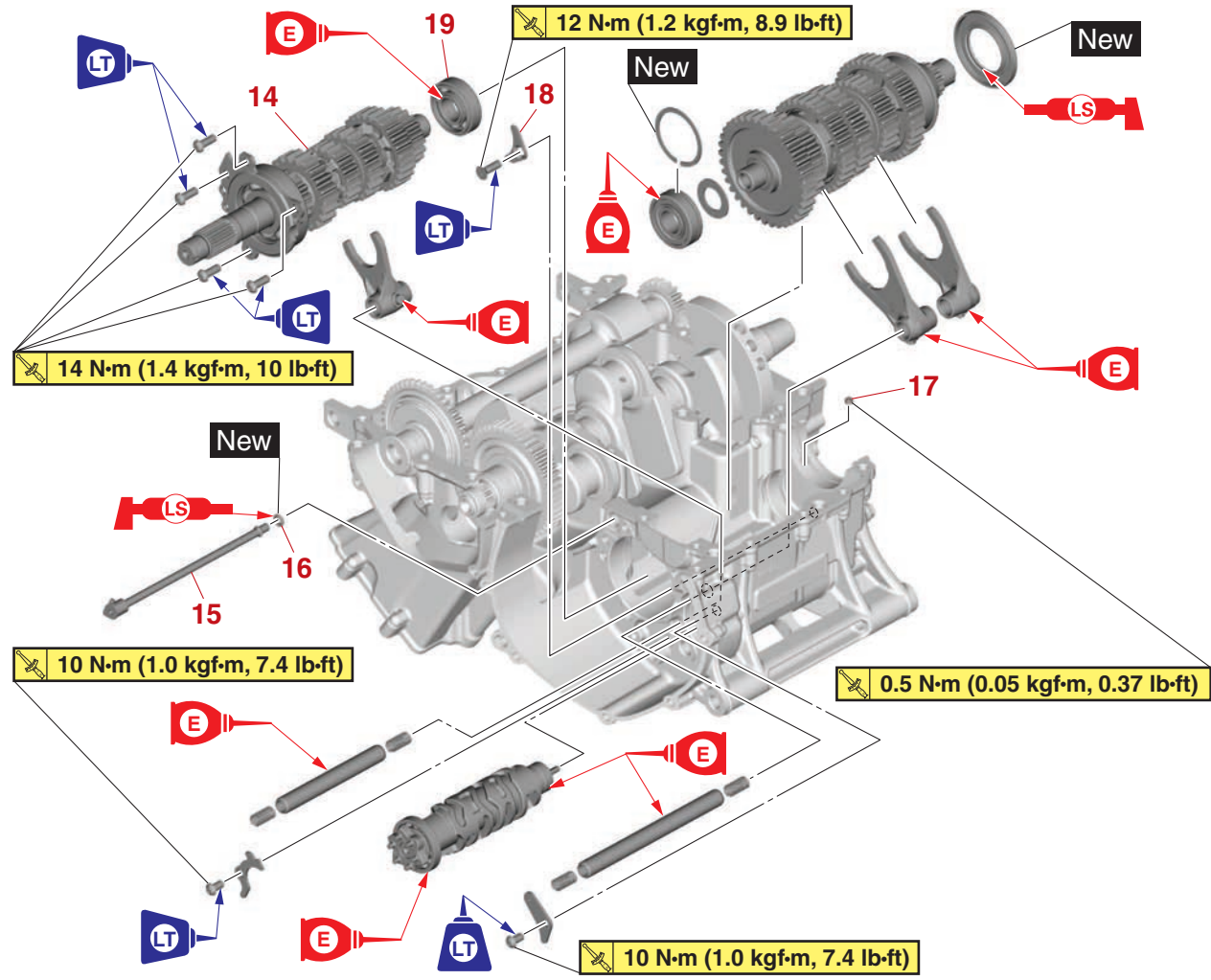
TRANSMISSION



Order	Job/Parts to remove	Q'ty	Remarks
	Lower crankcase		Refer to "CRANKCASE" on page 5-64.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-56.
1	Drive axle assembly	1	
2	Oil seal	1	
3	Bearing	1	
4	Circlip	1	
5	Washer	1	
6	Shift drum retainer	2	
7	Shift fork guide bar 2	1	
8	Spring	4	
9	Shift fork-L	1	
10	Shift fork-R	1	
11	Shift fork guide bar 1	1	
12	Shift drum assembly	1	
13	Shift fork-C	1	

TRANSMISSION

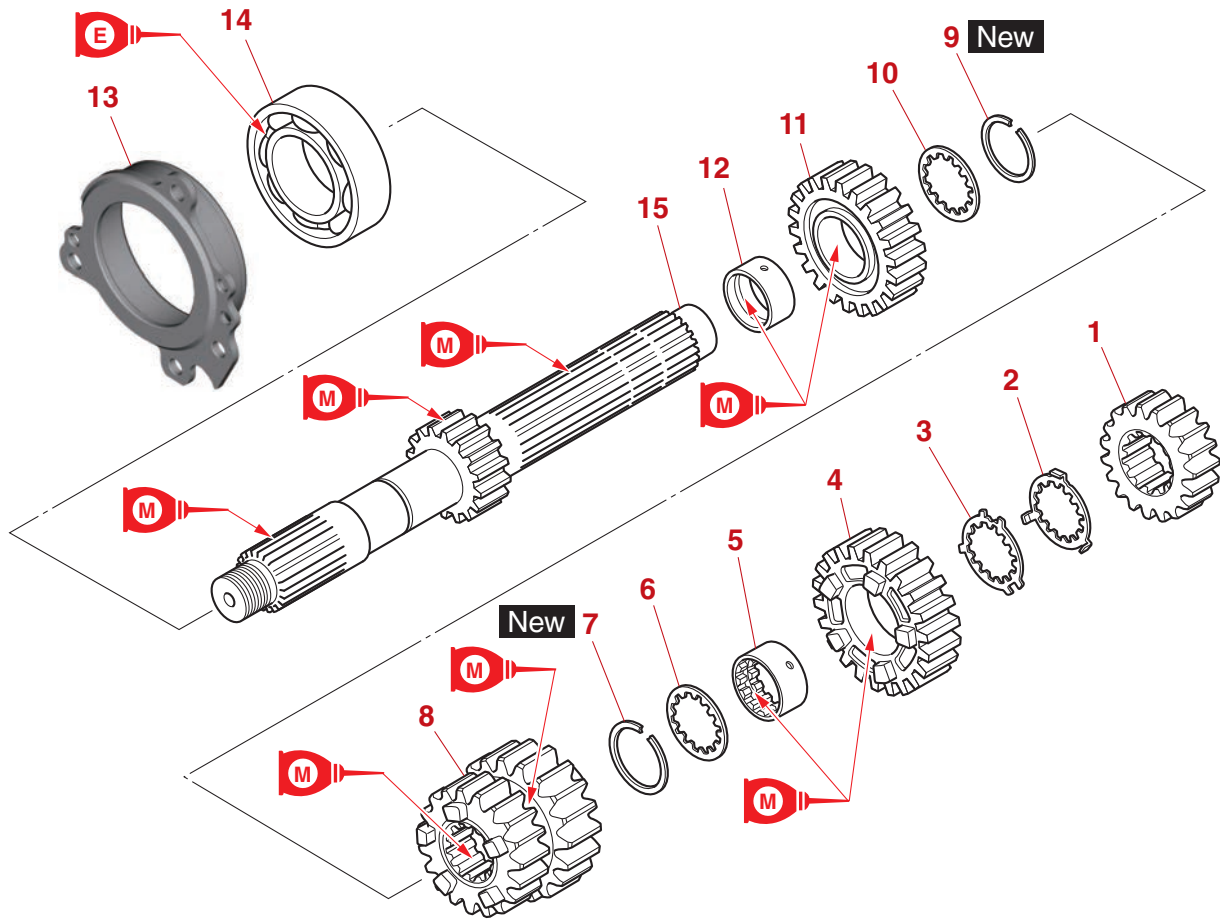
Removing the transmission, shift drum assembly, and shift forks



Order	Job/Parts to remove	Q'ty	Remarks
14	Main axle assembly	1	
15	Oil delivery pipe	1	
16	O-ring	1	
17	Oil nozzle	1	
18	Bearing cover plate	1	
19	Bearing	1	

TRANSMISSION

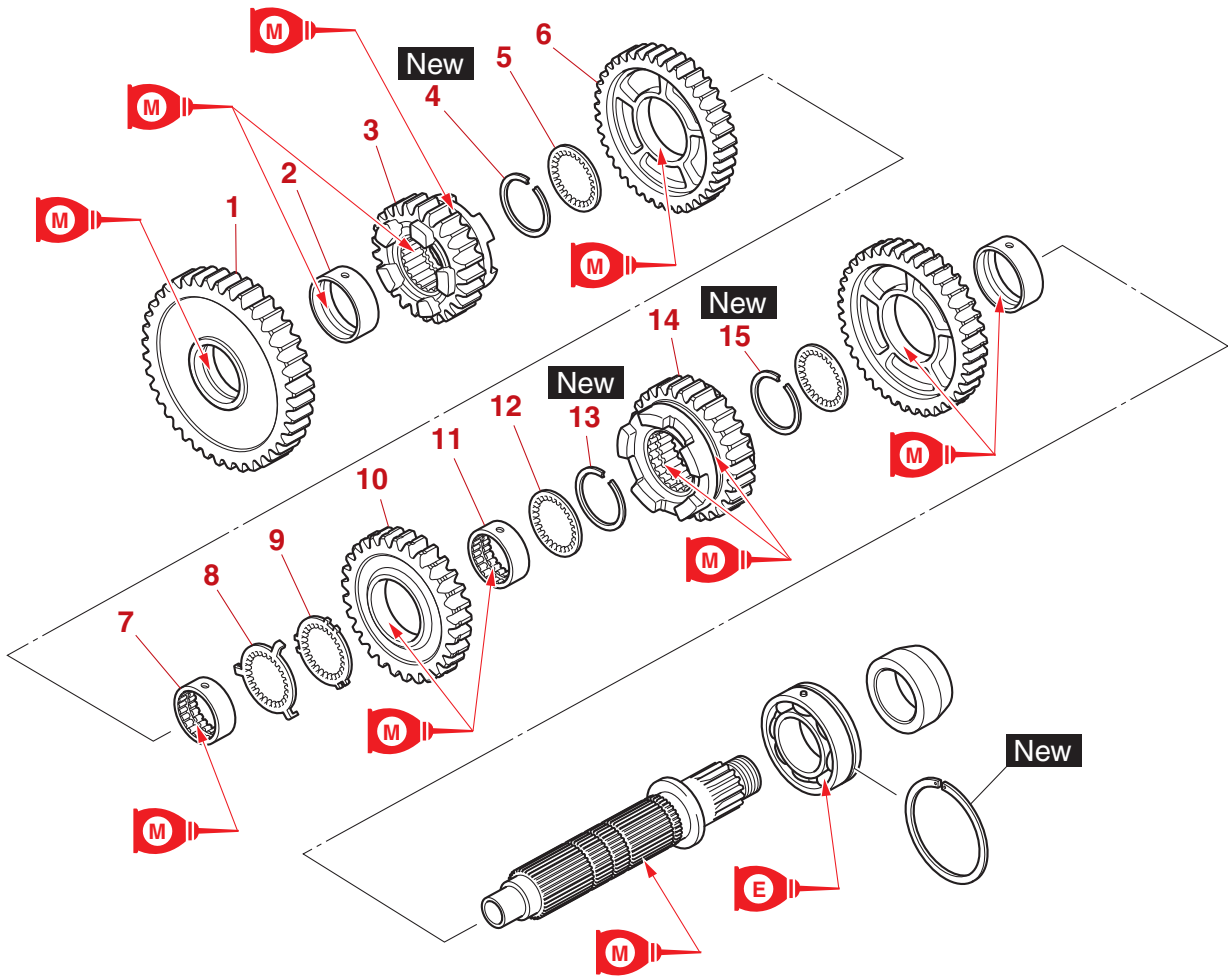
Disassembling the main axle assembly



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	Bearing housing	1	
14	Bearing	1	
15	Main axle	1	

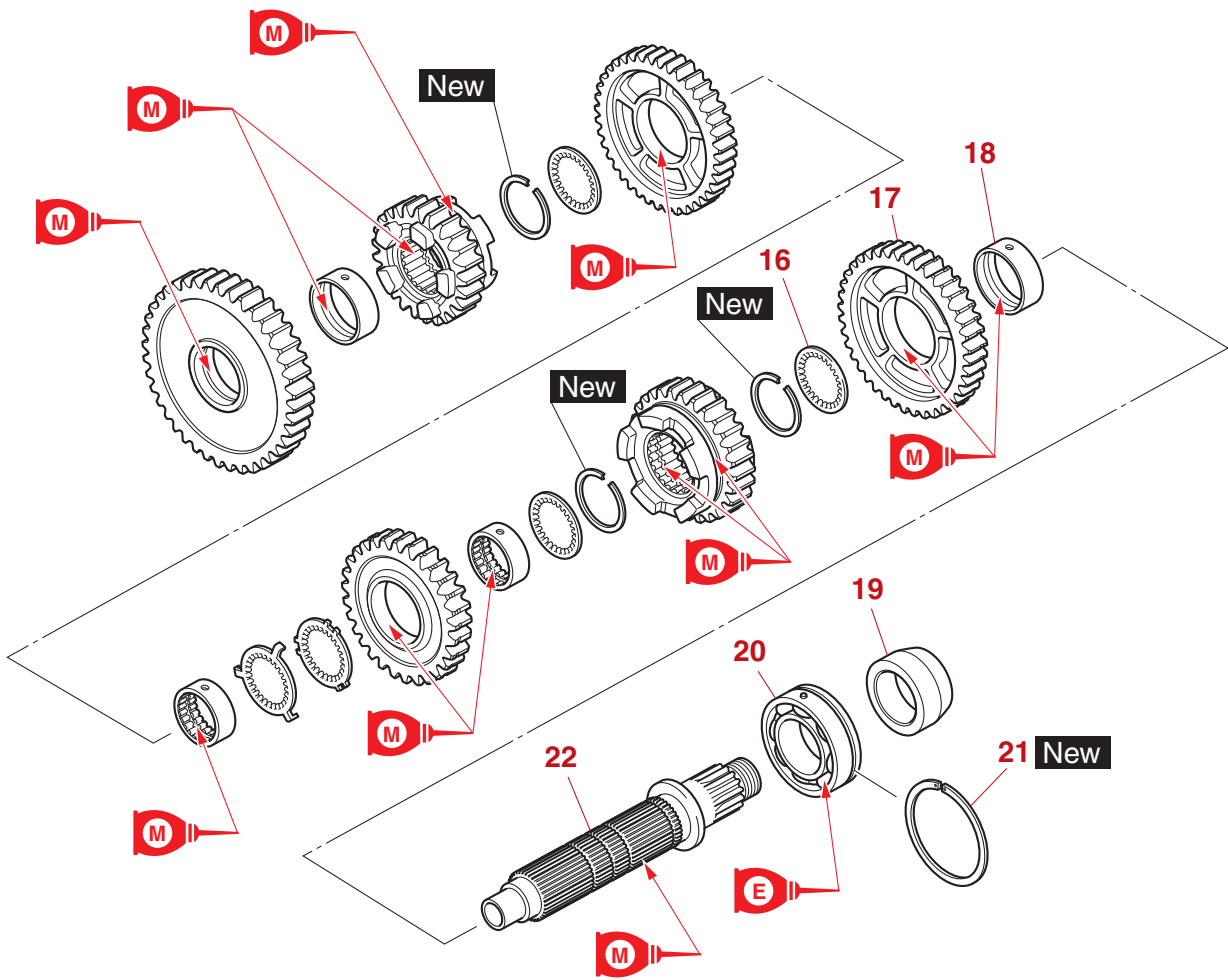
TRANSMISSION

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	
14	6th wheel gear	1	
15	Circlip	1	

Disassembling the drive axle assembly



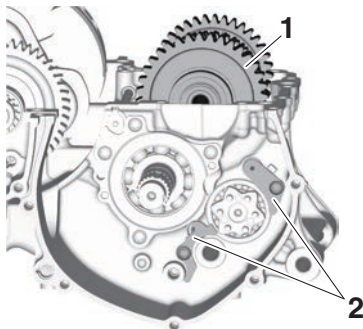
Order	Job/Parts to remove	Q'ty	Remarks
16	Washer	1	
17	2nd wheel gear	1	
18	Collar	1	
19	Collar	1	
20	Bearing	1	
21	Circlip	1	
22	Drive axle	1	

EAS30430

REMOVING THE TRANSMISSION

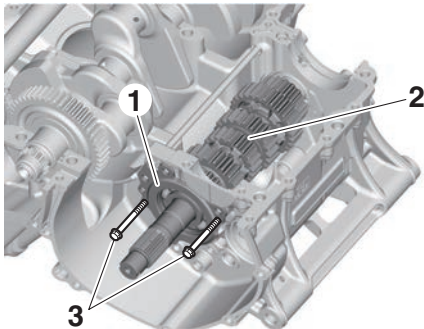
1. Remove:

- Drive axle assembly "1"
- Shift drum retainer "2"
- Shift fork guide bar 2
- Spring
- Shift fork-L
- Shift fork-R
- Shift fork guide bar 1
- Spring
- Shift drum assembly
- Shift fork-C



2. Remove:

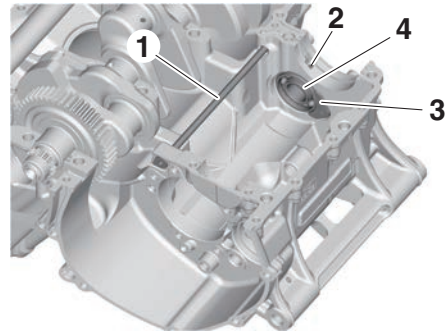
- Bearing housing "1"
 - Main axle assembly "2"
- a. Insert two bolts "3" of the proper size, as shown in the illustration, into the main axle assembly bearing housing.



- b. Tighten the bolts until they contact the crankcase surface.
- c. Continue tightening the bolts until the main axle assembly comes free from the upper crankcase.

3. Remove:

- Oil delivery pipe "1"
- Oil nozzle "2"
- Bearing cover plate "3"
- Bearing "4"



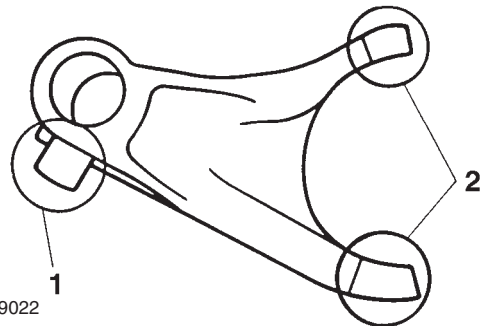
EAS30431

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 1
 - Shift fork guide bar 2
- Roll the shift fork guide bar on a flat surface.
Bends → Replace.

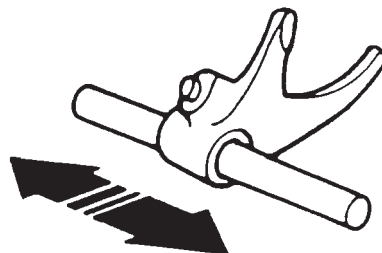
EWA12840

⚠ 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.



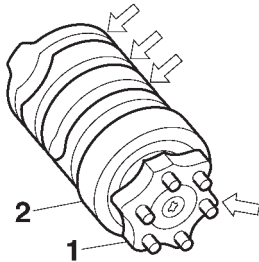
G089023

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.



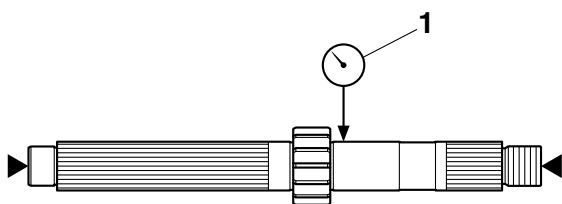
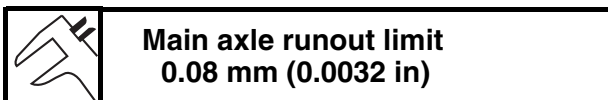
G089024

EAS30433

CHECKING THE TRANSMISSION

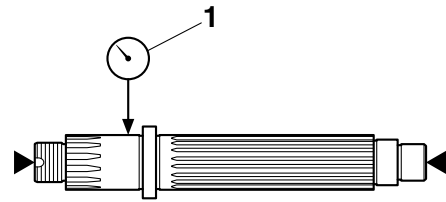
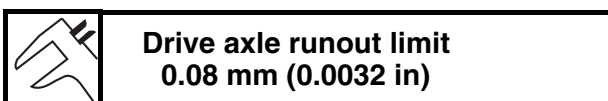
1. Measure:

- Main axle runout
(with a centering device and dial gauge “1”)
Out of specification → Replace the main axle.



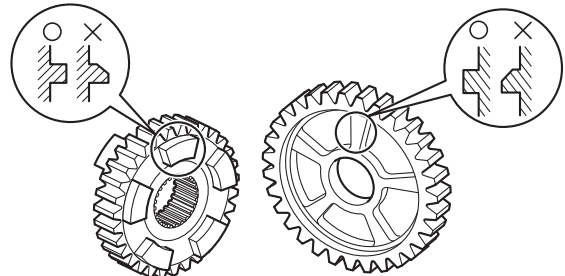
2. Measure:

- Drive axle runout
(with a centering device and dial gauge “1”)
Out of specification → Replace the drive axle.



3. Check:

- Transmission gear
Blue discoloration/pitting/wear → Replace the defective gear(s).
- Transmission gear dogs
Cracks/damage/rounded edges → Replace the defective gear(s).



G089025

4. Check:

- Transmission gear engagement
(each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.

5. Check:

- Transmission gear movement
Rough movement → Replace the defective part(s).

6. Check:

- Circlip
Bends/damage/looseness → Replace.

EAS30435

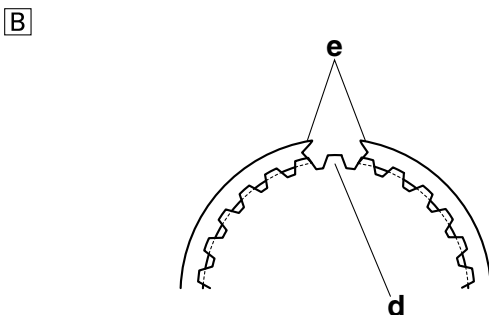
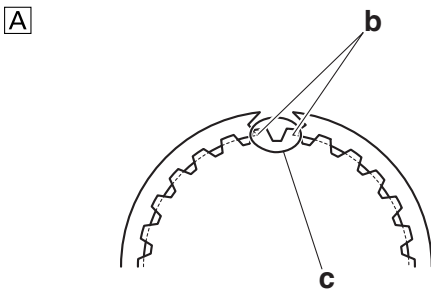
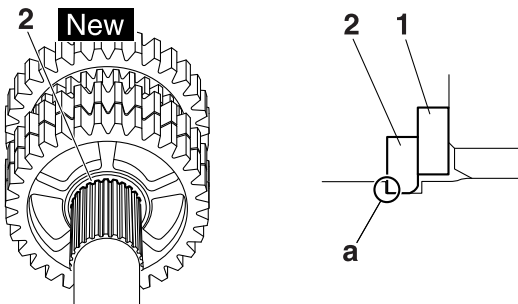
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

1. Install:

- Toothed washer "1"
- Circlip "2" **New**

TIP

- Be sure the circlip sharp-edged corner "a" is positioned opposite side to the toothed washer and gear.
- Align the opening between the ends "b" of the circlip with a groove "c" in the axle.
- Install the circlip so that a spline "d" is in the center of the gap between the circlip ends "e" as shown.



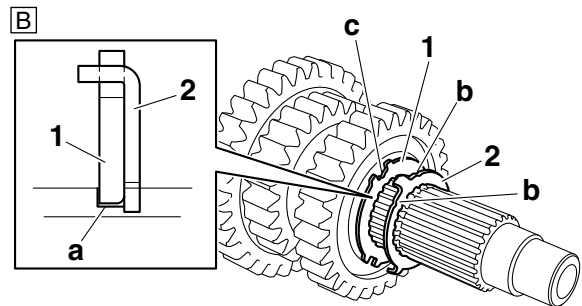
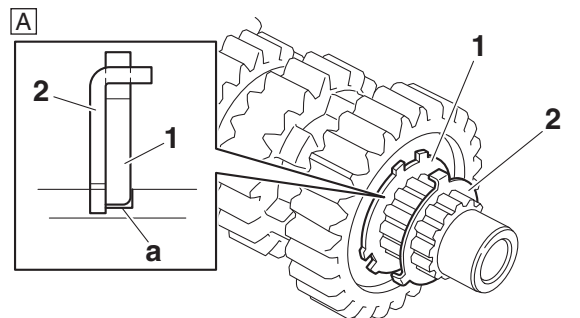
- A. Main axle
B. Drive axle

2. Install:

- Toothed lock washer retainer "1"
- Toothed lock washer "2"

TIP

- With the toothed lock washer retainer in the groove "a" in the axle, align the projection 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.



- A. Main axle
B. Drive axle

EAS30438

INSTALLING THE TRANSMISSION

1. Install:

- Bearing "1"
- Bearing cover plate "2"
- Oil nozzle "3"
- Oil delivery pipe "4"

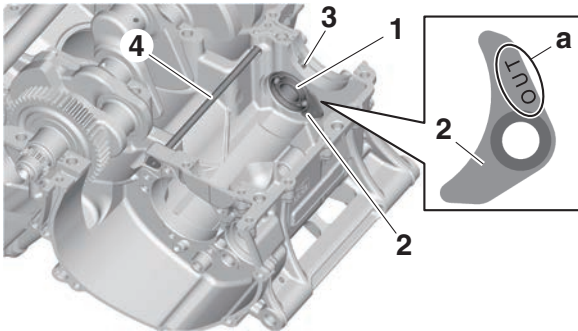
TIP

- Face the seal side of bearing to the outside.
- Install bearing cover plate "2" with the "OUT" mark "a" facing out.



Bearing cover plate screw
12 N·m (1.2 kgf·m, 8.9 lb·ft)
LOCTITE®

Oil nozzle
0.5 N·m (0.05 kgf·m, 0.37 lb·ft)

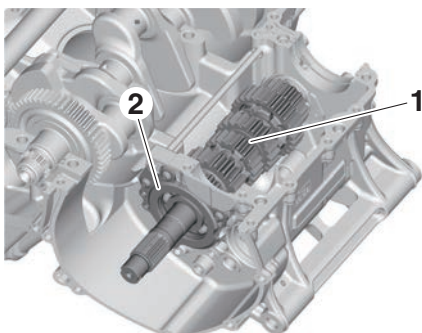


2. Install:

- Main axle assembly "1"
- Bearing housing "2"



Main axle bearing housing bolt
14 N·m (1.4 kgf·m, 10 lb·ft)
LOCTITE®

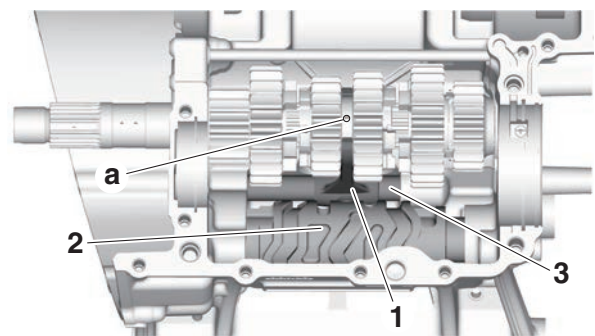


3. Install:

- Shift fork-C "1"
- Shift drum assembly "2"
- Spring
- Shift fork guide bar 1 "3"

TIP

- The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: "R", "C", "L".
- Carefully position the shift forks so that they are installed correctly into the transmission gears.
- Install shift fork-C into the groove "a" in the 3rd pinion gear on the main axle.



4. Install:

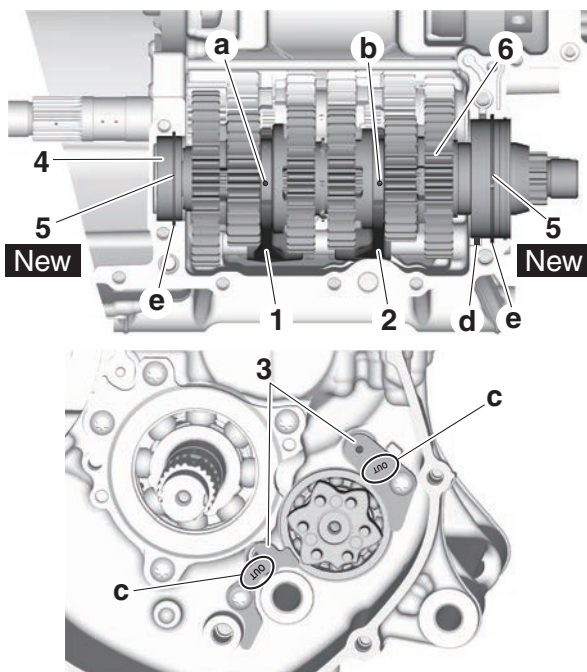
- Shift fork-R "1"
- Shift fork-L "2"
- Spring
- Shift fork guide bar 2
- Shift drum retainer "3"
- Bearing "4"
- Circlip "5" **New**
- Oil seal **New**
- Drive axle assembly "6"



Shift drum retainer bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)
LOCTITE®

TIP

- Install shift fork-R into the groove “a” in the 5th wheel gear and shift fork-L into the groove “b” in the 6th wheel gear on the drive axle.
- Face the seal side of bearing “4” to the outside.
- Install the shift drum retainer with its “OUT” mark “c” facing outward.
- Make sure that the projection “d” on the drive axle assembly is inserted into the slot in the crankcase.
- Make sure that the drive axle bearing circlips “5” is inserted into the grooves “e” in the upper crankcase.



5. Check:

- Transmission
Rough movement → Repair.

TIP

Oil each gear, shaft, and bearing thoroughly.

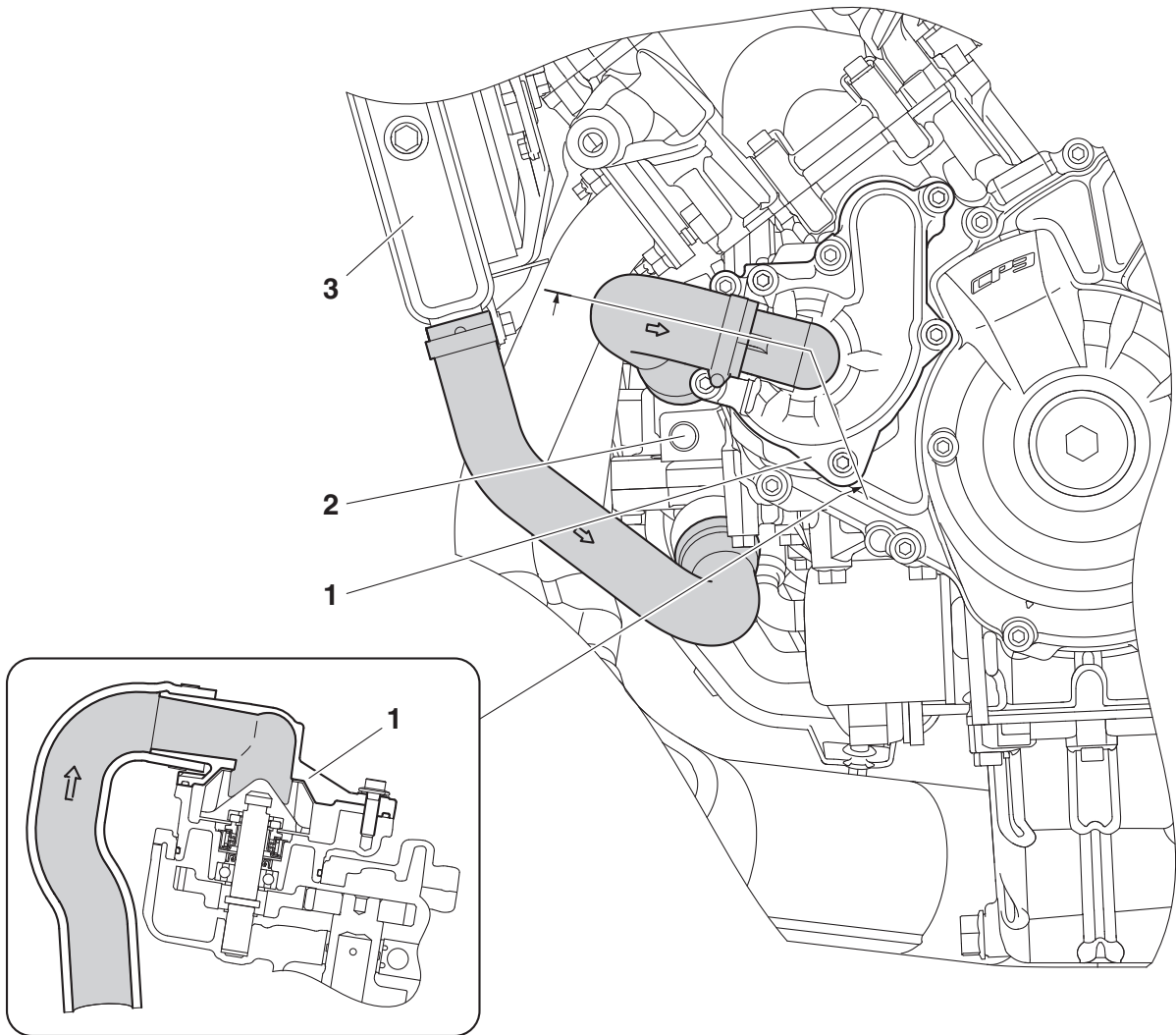
COOLING SYSTEM

COOLING SYSTEM DIAGRAMS	6-1
RADIATOR	6-3
CHECKING THE RADIATOR.....	6-5
INSTALLING THE RADIATOR.....	6-5
OIL COOLER	6-7
CHECKING THE OIL COOLER	6-8
INSTALLING THE OIL COOLER	6-8
THERMOSTAT	6-9
CHECKING THE THERMOSTAT.....	6-10
INSTALLING THE THERMOSTAT ASSEMBLY	6-10
WATER PUMP	6-11
DISASSEMBLING THE WATER PUMP.....	6-13
CHECKING THE WATER PUMP	6-13
ASSEMBLING THE WATER PUMP.....	6-13

COOLING SYSTEM DIAGRAMS

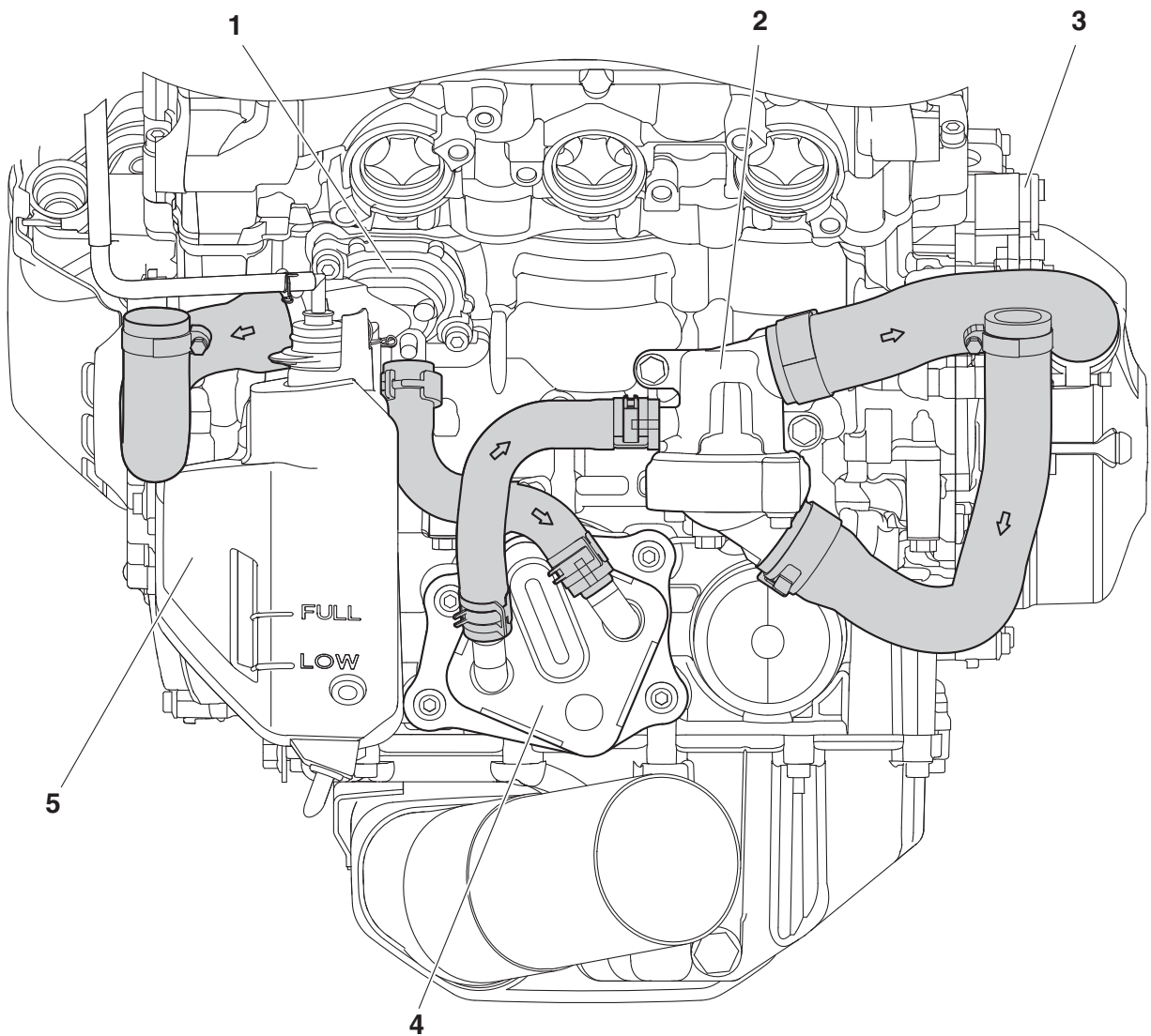
EAS20299

COOLING SYSTEM DIAGRAMS



1. Water pump
2. Thermostat
3. Radiator

COOLING SYSTEM DIAGRAMS

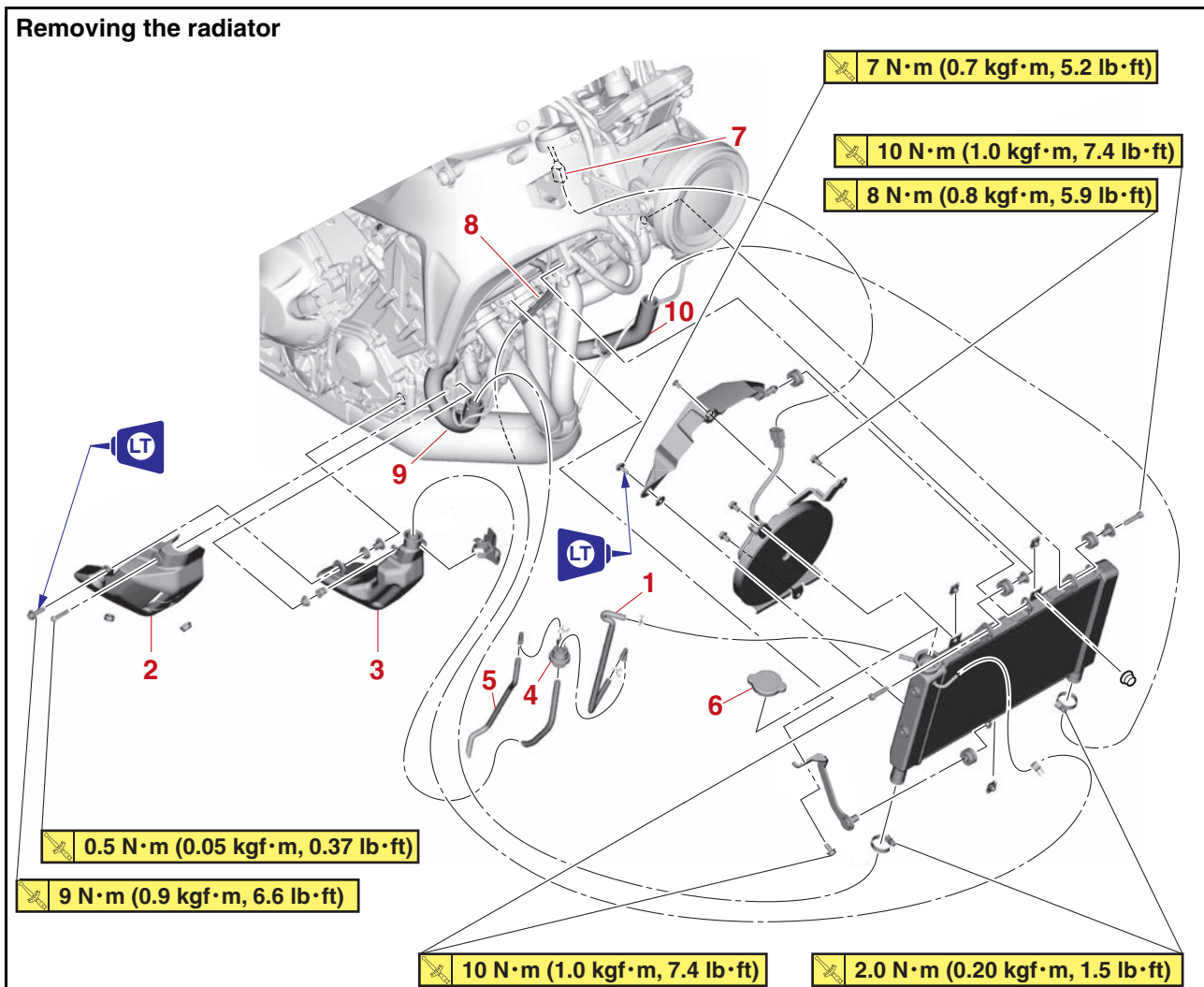


1. Water jacket joint
2. Thermostat
3. Water pump
4. Oil cooler
5. Coolant reservoir

EAS20063

RADIATOR

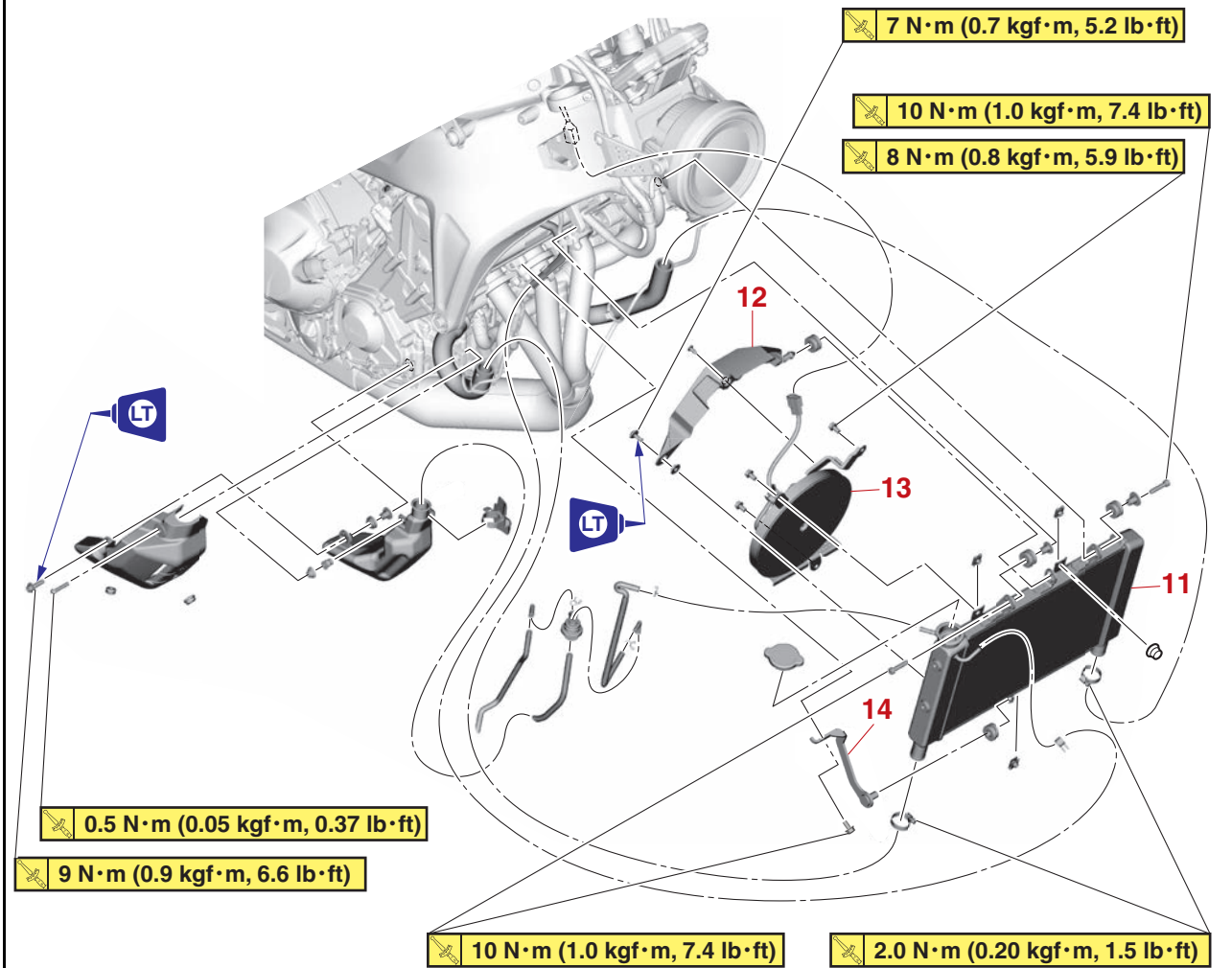
Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Air filter case		Refer to "GENERAL CHASSIS (5)" on page 4-11.
	Front side panel		Refer to "GENERAL CHASSIS (3)" on page 4-8.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-28.
1	Coolant reservoir hose	1	Disconnect.
2	Coolant reservoir cover	1	
3	Coolant reservoir	1	
4	Coolant reservoir cap	1	
5	Coolant reservoir breather hose	1	
6	Radiator cap	1	
7	Radiator fan motor coupler	1	Disconnect.
8	Radiator hose (cylinder head to radiator)	1	Disconnect.
9	Radiator inlet hose	1	Disconnect.
10	Radiator outlet hose	1	Disconnect.

RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
11	Radiator	1	
12	Radiator fan cover	1	
13	Radiator fan	1	
14	Radiator bracket	1	

EAS30439

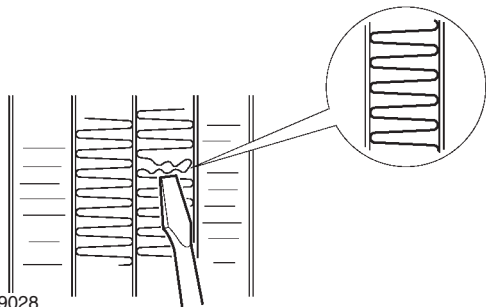
CHECKING THE RADIATOR

1. Check:

- Radiator fin
Obstruction → Clean.
Apply compressed air to the rear of the radiator.
- Damage → Repair or replace.

TIP

Straighten any flattened fins with a thin, flat-head screwdriver.



G089028

2. Check:

- Radiator hose
Cracks/damage → Replace.

3. Measure:

- Radiator cap valve 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”.

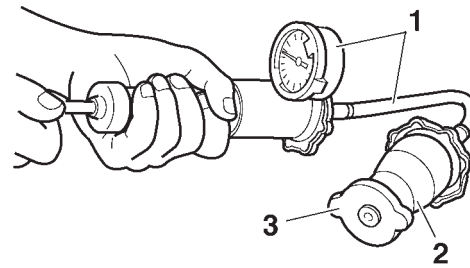


Radiator cap tester 90890-01325

Mityvac cooling system tester kit
YU-24460-A

Radiator cap tester adapter
90890-01352

Pressure tester adapter
YU-33984



G089029

- b. Apply specified pressure to the radiator cap and then, make sure to check the specified pressure for at least 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:

- All removed parts

2. Fill:

- Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-28.

3. Check:

- Cooling system
Leaks → Repair or replace any faulty part.
- a. Attach the radiator cap tester “1” and radiator cap tester adapter “2” to the radiator.

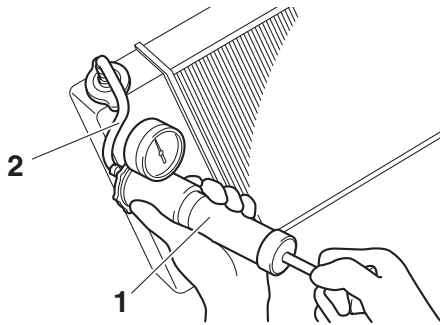


Radiator cap tester 90890-01325

Mityvac cooling system tester kit
YU-24460-A

Radiator cap tester adapter
90890-01352

Pressure tester adapter
YU-33984



G089031

b. Apply 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 → Repair.
- Radiator
- Radiator hose connections
Coolant leaks → Repair or replace.
- Radiator hose
Bulges → Replace.

EWA19090

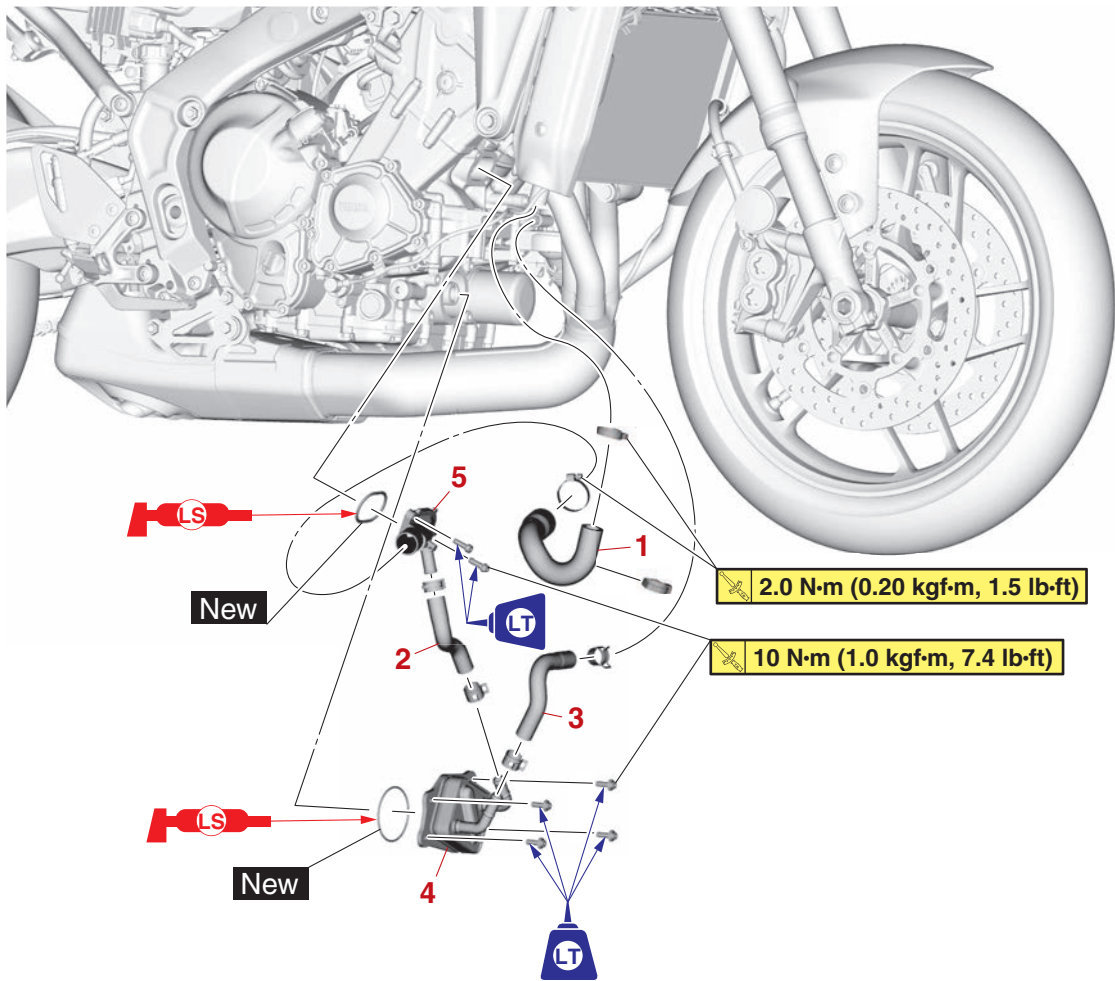
WARNING

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 reservoir		Refer to "RADIATOR" on page 6-3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-28.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-25.
1	Radiator inlet hose	1	
2	Oil cooler inlet hose	1	
3	Oil cooler outlet hose	1	
4	Oil cooler	1	
5	Water jacket joint	1	

EAS30441

CHECKING THE OIL COOLER

1. Check:
 - Oil cooler
Cracks/damage → Replace.
2. Check:
 - Oil cooler inlet hose
 - Oil cooler outlet hose
Cracks/damage/wear → Replace.

EAS30442

INSTALLING THE OIL COOLER

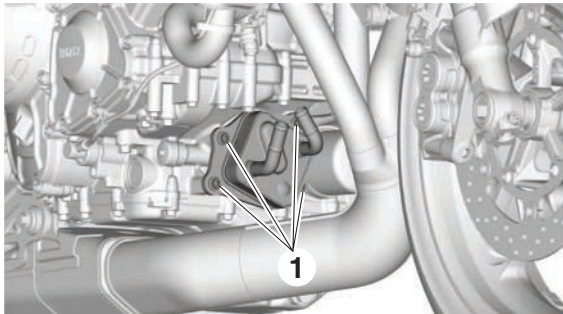
1. Clean:
 - Mating surfaces of the oil cooler and the crankcase
(with a cloth dampened with lacquer thinner)
2. Install:
 - O-ring **New**
 - Oil cooler
 - Oil cooler bolt “1”



Oil cooler bolt
10 N·m (1.0 kgf·m, 7.4 lb·ft)
LOCTITE®

TIP

- Before installing the oil cooler, apply lithium-soap-based grease to the O-ring.
- Make sure the O-ring is positioned properly.



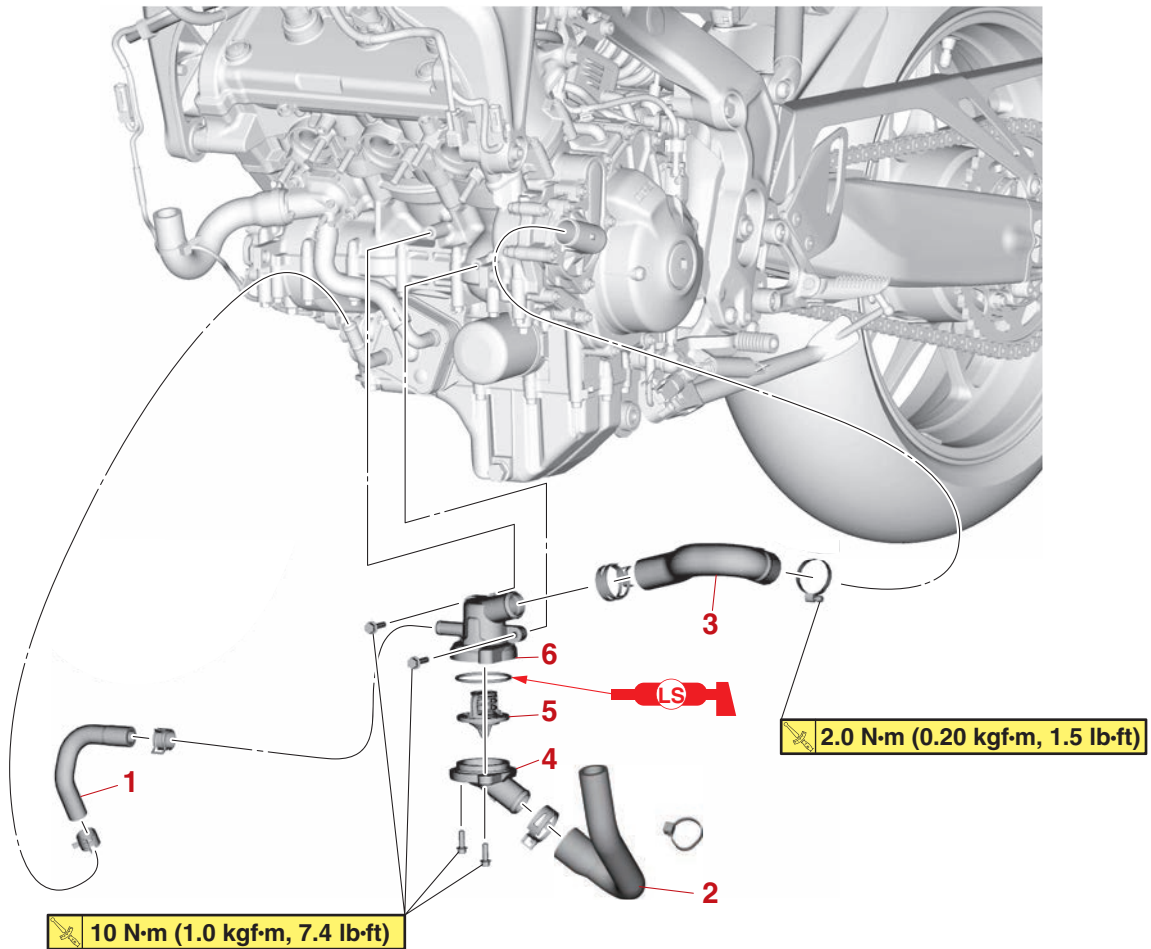
3. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-28.
 - Crankcase
(with the specified amount of the recommended engine oil)
Refer to “CHANGING THE ENGINE OIL” on page 3-25.

4. Check:
 - Cooling system
Leaks → Repair or replace any faulty part.
Refer to “INSTALLING THE RADIATOR” on page 6-5.
5. Measure:
 - Radiator cap valve opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to “CHECKING THE RADIATOR” on page 6-5.

EAS20065

THERMOSTAT

Removing the thermostat assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-28.
	Radiator		Refer to "RADIATOR" on page 6-3.
	Muffler assembly		Refer to "ENGINE REMOVAL" on page 5-9.
1	Oil cooler outlet hose	1	
2	Radiator outlet hose	1	
3	Water pump inlet hose	1	
4	Thermostat cover	1	
5	Thermostat	1	
6	Thermostat housing	1	

EAS30443

CHECKING THE THERMOSTAT

1. Check:

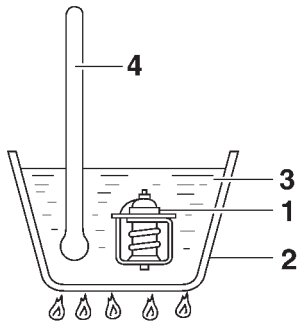
- Thermostat

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)

- Suspend the thermostat "1" in a container "2" filled with water.
- Slowly heat the water "3".
- Place a thermometer "4" in the water.
- While stirring the water, observe the thermostat and thermometer's indicated temperature.



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
- Thermostat housing

Cracks/damage → Replace.

EAS30445

INSTALLING THE THERMOSTAT ASSEMBLY

1. Install:

- Thermostat

2. Fill:

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

Refer to "CHANGING THE COOLANT" on page 3-28.

3. Check:

- Cooling system

Leaks → Repair or replace any faulty part.

Refer to "INSTALLING THE RADIATOR" on page 6-5.

4. Measure:

- Radiator cap valve opening pressure

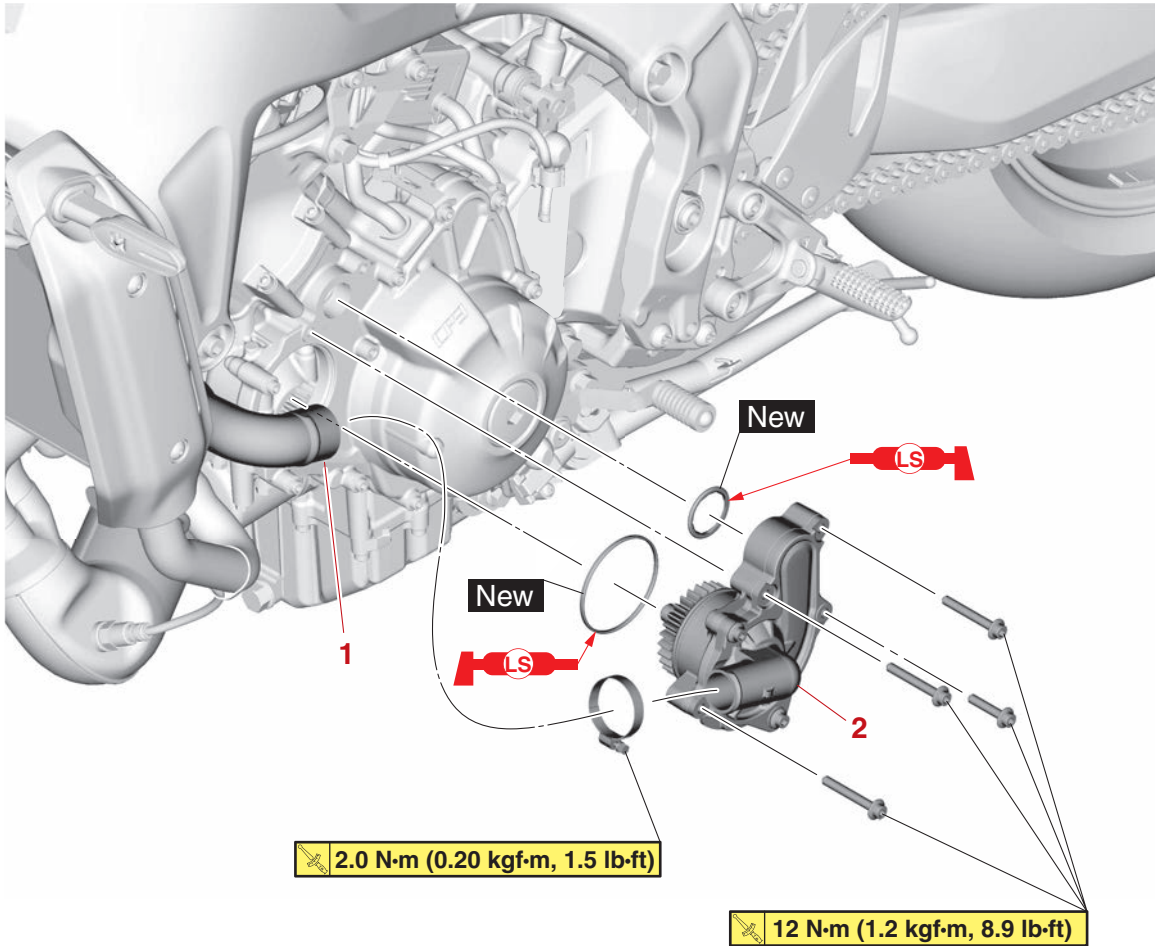
Below the specified pressure → Replace the radiator cap.

Refer to "CHECKING THE RADIATOR" on page 6-5.

EAS20066

WATER PUMP

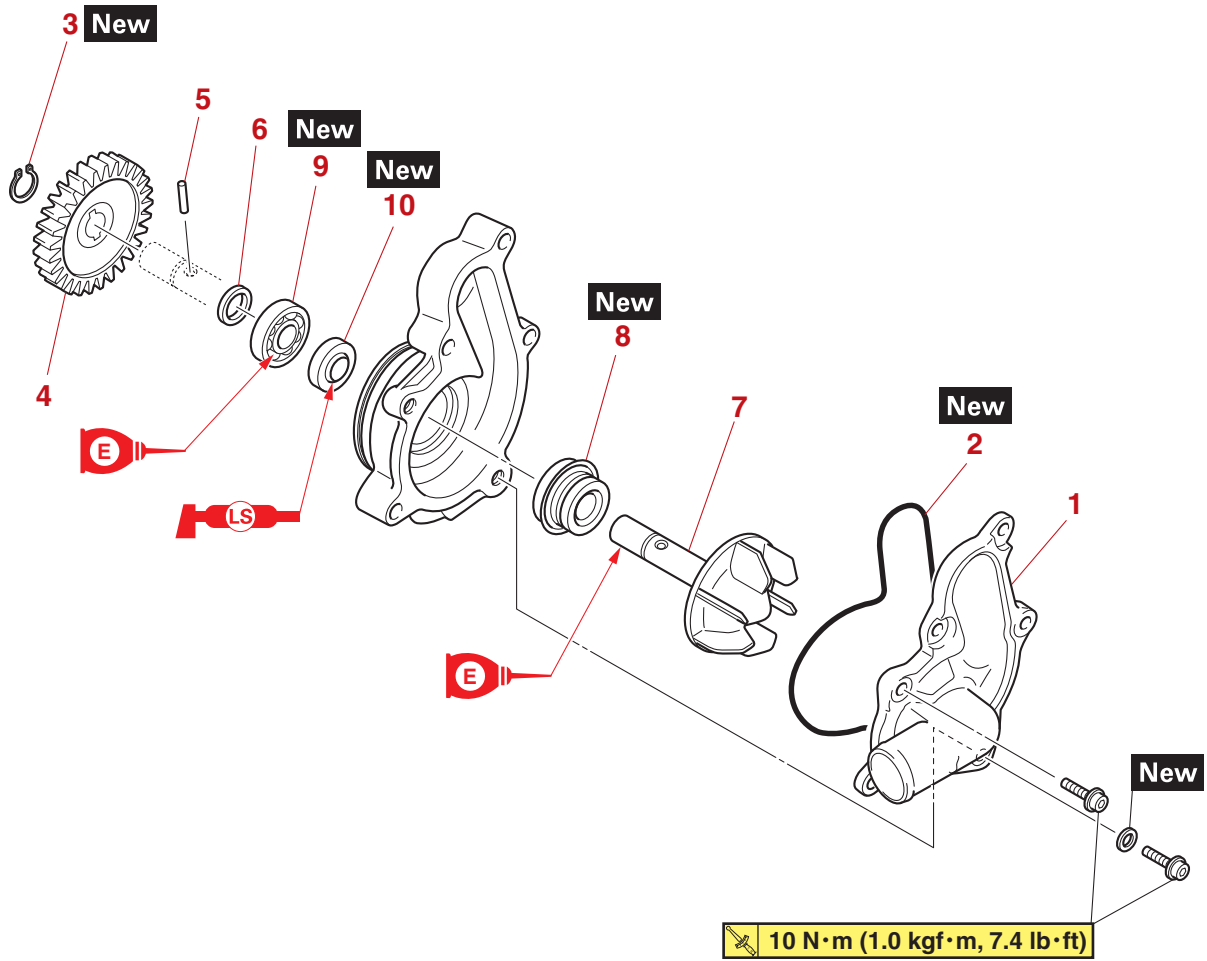
Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-28.
1	Water pump inlet hose	1	Disconnect.
2	Water pump assembly	1	

WATER PUMP

Disassembling the water pump



Order	Job/Parts to remove	Q'ty	Remarks
1	Water pump housing cover	1	
2	O-ring	1	
3	Circlip	1	
4	Water pump driven gear	1	
5	Pin	1	
6	Washer	1	
7	Impeller shaft	1	
8	Mechanical seal	1	
9	Bearing	1	
10	Oil seal	1	

EAS30446

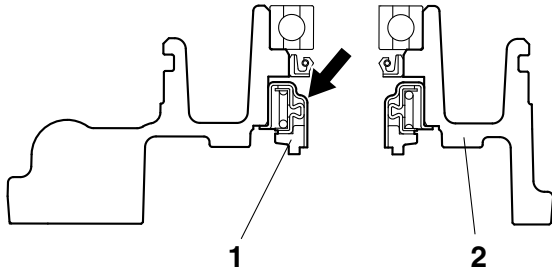
DISASSEMBLING THE WATER PUMP

1. Remove:

- Mechanical seal (housing side) "1"

TIP

Remove the mechanical seal (housing side) from the inside of the water pump housing "2".

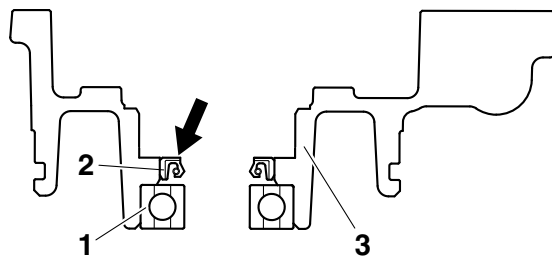


2. Remove:

- Bearing "1"
- Oil seal "2"

TIP

Remove the oil seal and bearing from the outside of the water pump housing "3".

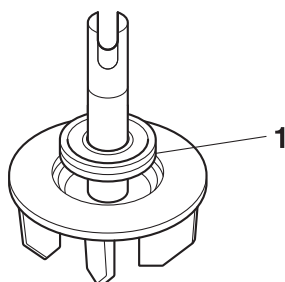


3. Remove:

- Mechanical seal (impeller side) "1" (from the impeller, with a thin, flat-head screwdriver)

TIP

Do not scratch the impeller shaft.



G089034

EAS30447

CHECKING THE WATER PUMP

1. Check:

- Water pump housing cover
Cracks/damage/wear → Replace.
- Impeller shaft
Cracks/damage/wear → Replace.
- Water pump housing
Cracks/damage/wear → Replace the water pump assembly.

2. Check:

- Bearing
Rough movement → Replace.

3. Check:

- Water pump inlet hose
Cracks/damage/wear → Replace.

EAS30448

ASSEMBLING THE WATER PUMP

1. Install:

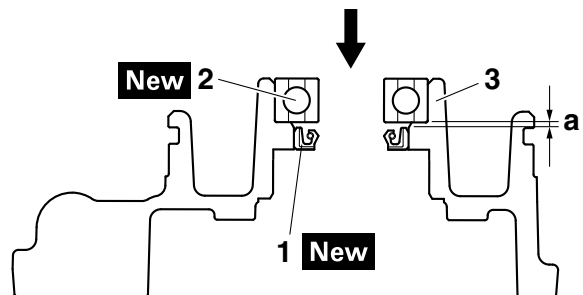
- Oil seal "1" **New**
- Bearing "2" **New**
(into the water pump housing "3")



Installed depth "a"
0.5–1.0 mm (0.02–0.04 in)

TIP

Install the oil seal with a socket that matches its outside diameter.



2. Install:

- Mechanical seal (housing side) "1" **New**

ECA20330

NOTICE

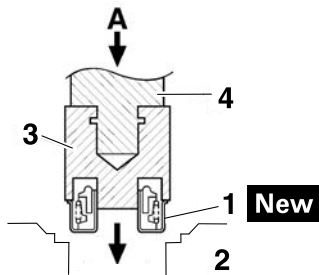
Never lubricate the mechanical seal (housing side) surface with oil or grease.

TIP

Use the special tools and a press to press the mechanical seal (housing side) straight in until it touches the water pump housing.



Mechanical seal installer
90890-04078
Water pump seal installer
YM-33221-A
Middle driven shaft bearing driver
90890-04058
Middle drive bearing installer 40
& 50 mm
YM-04058



2. Water pump housing
3. Mechanical seal installer
4. Middle driven shaft bearing driver

A. Push down

3. Install:

- Mechanical seal (impeller side) "1" **New**

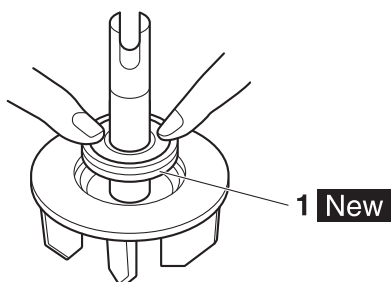
ECA20340

NOTICE

Make sure the mechanical seal (impeller side) is flush with the impeller.

TIP

- Before installing the mechanical seal (impeller side), apply tap water or coolant onto its outer surface.
- If the top of the mechanical seal is dirty, clean it.



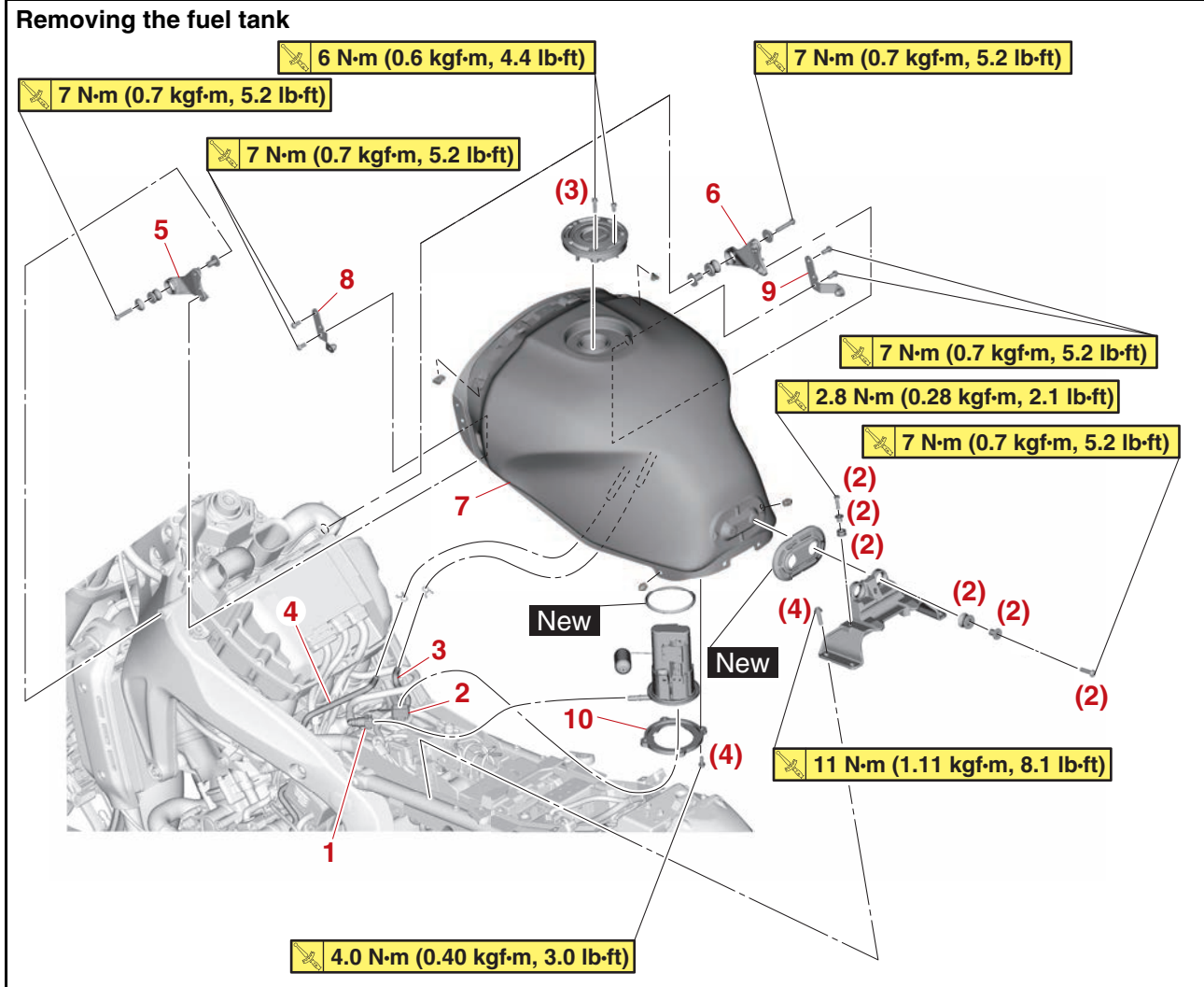
G089035

FUEL SYSTEM

FUEL TANK	7-1
REMOVING THE FUEL TANK	7-4
REMOVING THE FUEL PUMP	7-4
CHECKING THE FUEL PUMP BODY.....	7-4
CHECKING THE FUEL PUMP OPERATION.....	7-4
CHECKING THE PURGE CUT VALVE SOLENOID	7-5
INSTALLING THE FUEL PUMP.....	7-5
INSTALLING THE FUEL TANK.....	7-5
THROTTLE BODIES	7-6
CHECKING THE INJECTORS (BEFORE REMOVING)	7-8
REMOVING THE FUEL HOSE (FUEL RAIL SIDE)	7-8
REMOVING THE INJECTORS	7-8
CHECKING THE INJECTORS.....	7-8
CHECKING AND CLEANING THE THROTTLE BODIES.....	7-9
REPLACING THE THROTTLE BODIES	7-10
INSTALLING THE INJECTORS.....	7-10
CHECKING THE INJECTOR PRESSURE.....	7-11
CHECKING THE FUEL PRESSURE	7-11
INSTALLING THE FUEL HOSE (FUEL RAIL SIDE).....	7-12
ADJUSTING THE THROTTLE POSITION SENSOR.....	7-12

EAS20067

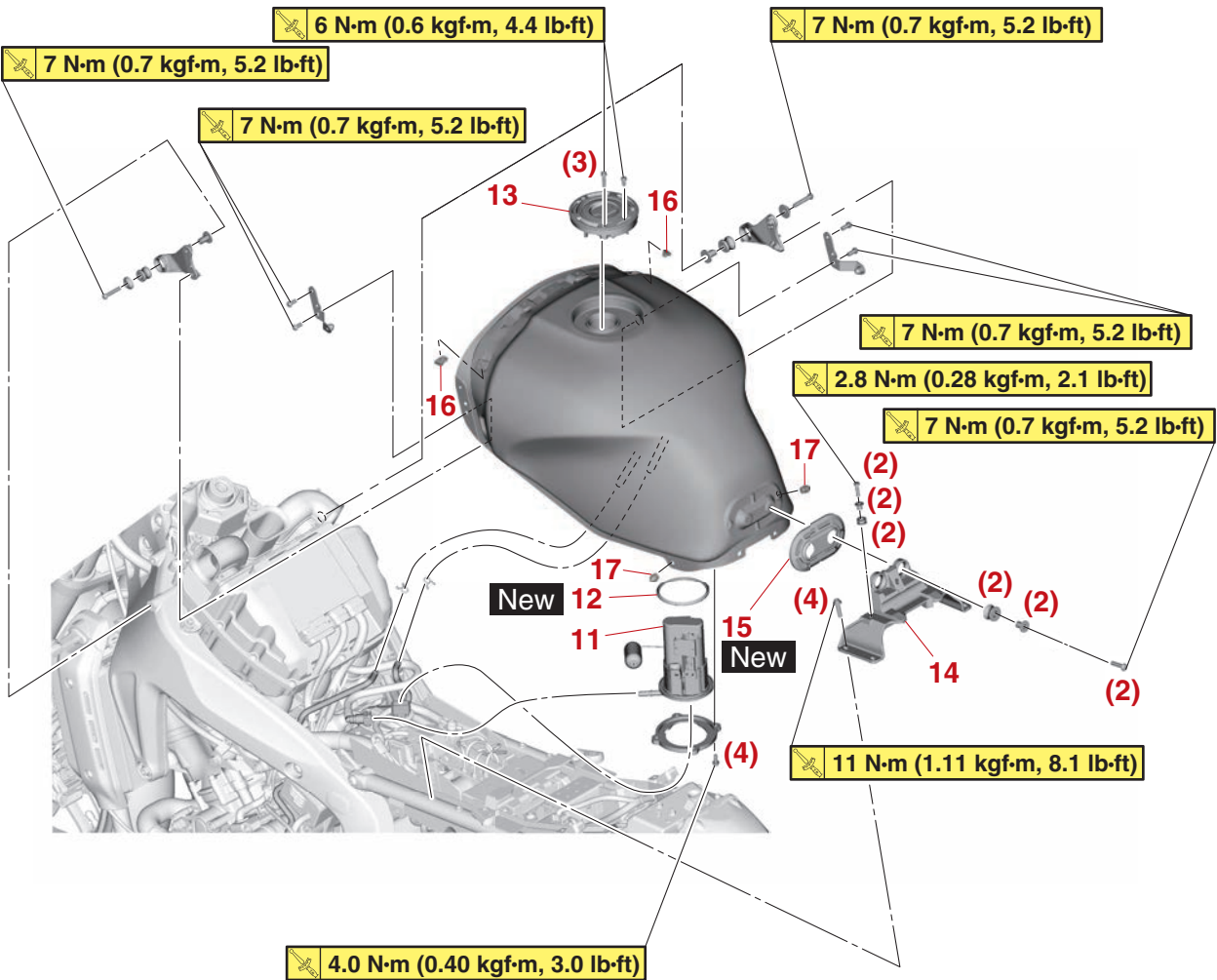
FUEL TANK



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Side cover		Refer to "GENERAL CHASSIS (1)" on page 4-1.
	Fuel tank cover		Refer to "GENERAL CHASSIS (4)" on page 4-10.
1	Fuel hose connector	1	Disconnect.
2	Fuel pump coupler	1	Disconnect.
3	Fuel tank breather hose	1	Disconnect.
4	Fuel tank drain hose	1	Disconnect.
5	Fuel tank bracket (left)	1	
6	Fuel tank bracket (right)	1	
7	Fuel tank	1	
8	Fitting plate (left)	1	
9	Fitting plate (right)	1	
10	Fuel pump bracket	1	

FUEL TANK

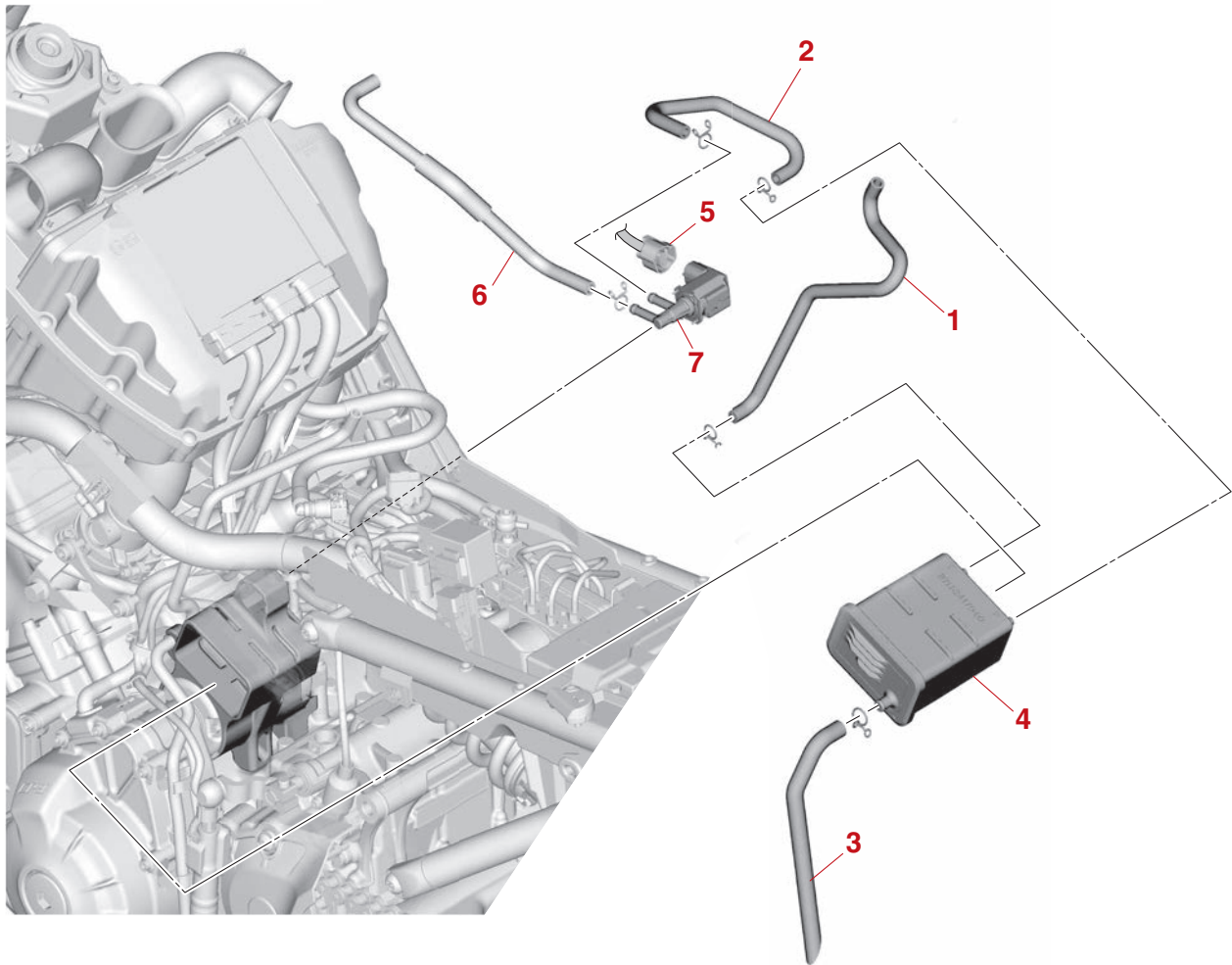
Removing the fuel tank



Order	Job/Parts to remove	Q'ty	Remarks
11	Fuel pump	1	
12	Fuel pump gasket	1	
13	Fuel tank cap	1	
14	Fuel tank bracket	1	
15	Fuel tank damper	1	
16	Damper	2	
17	Plug	2	

FUEL TANK

Removing the canister

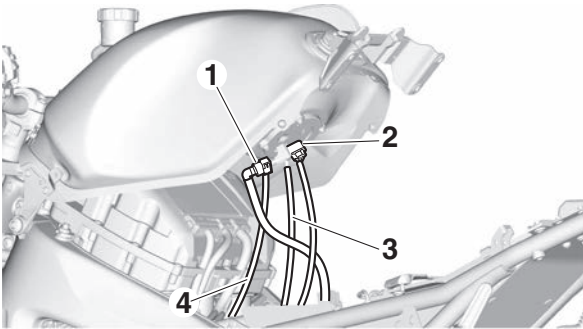


Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Fuel tank breather hose (fuel tank to canister)	1	
2	Canister purge hose (purge cut valve solenoid to canister)	1	
3	Canister breather hose	1	
4	Canister	1	
5	Purge cut valve solenoid coupler	1	Disconnect.
6	Canister purge hose (purge cut valve solenoid to hose joint)	1	
7	Purge cut valve solenoid	1	

EAS30450

REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
 - Rider seat
 - Side cover
 - Refer to “GENERAL CHASSIS (1)” on page 4-1.
 - Fuel tank cover
 - Refer to “GENERAL CHASSIS (4)” on page 4-10.
 - Fuel tank bracket bolt
3. Disconnect:
 - Fuel hose (fuel tank side) “1”
 - Fuel pump coupler “2”
 - Fuel tank breather hose “3”
 - Fuel tank drain 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.

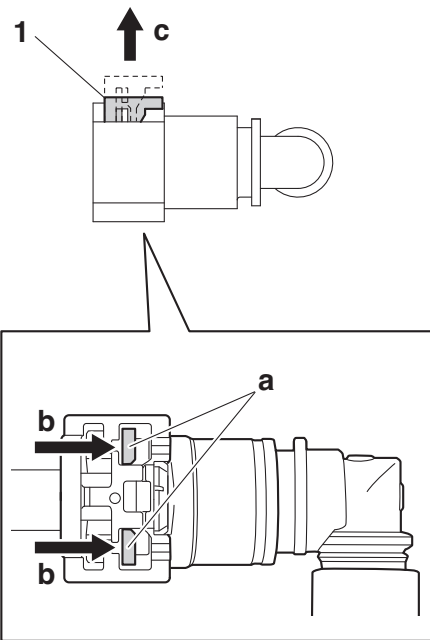
ECA17490

NOTICE

Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.

TIP

- While pushing the ends “a” of the fuel hose connector cover “1” in direction “b”, slide the fuel hose connector cover in direction “c”, and then remove the hose from the fuel pump.
- Before removing the hose, place a few rags in the area under where it will be removed.
- It is prohibited to wear the cotton work gloves or equivalent coverings.



4. Remove:
 - Fuel tank

TIP

Do not set the fuel tank down so that the installation surface of the fuel pump is directly under the tank. Be sure to lean the fuel tank in an upright position.

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 7-11.

EAS33542

CHECKING THE PURGE CUT VALVE SOLENOID

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” on page 8-50.

EAS30456

INSTALLING THE FUEL PUMP

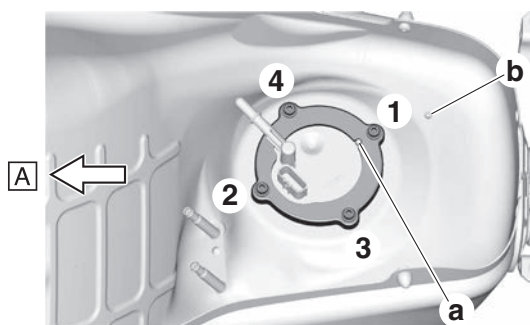
1. Install:
 - Fuel pump gasket **New**
 - Fuel pump
 - Fuel pump bracket
 - Fuel pump bolt



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.
- Install the fuel pump gasket so that the lip side turns to the inside of the fuel tank.
- Install the fuel pump as shown in the illustration.
- Install the fuel pump projection “a” toward the fuel tank slot “b”.
- Align the projection “a” on the fuel pump with the slot in the fuel pump bracket.
- Tighten the fuel pump bolts in the proper tightening sequence as shown.



A. Forward

EAS30457

INSTALLING THE FUEL TANK

1. Connect:
 - Fuel hose (fuel tank side)

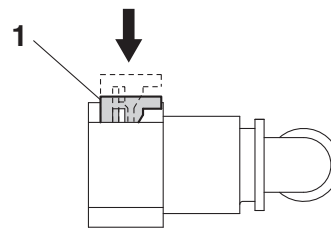
ECA17500

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 onto the fuel pump securely, and slide the fuel hose connector cover “1” in the direction shown in the illustration.
- It is prohibited to wear the cotton work gloves or equivalent coverings.

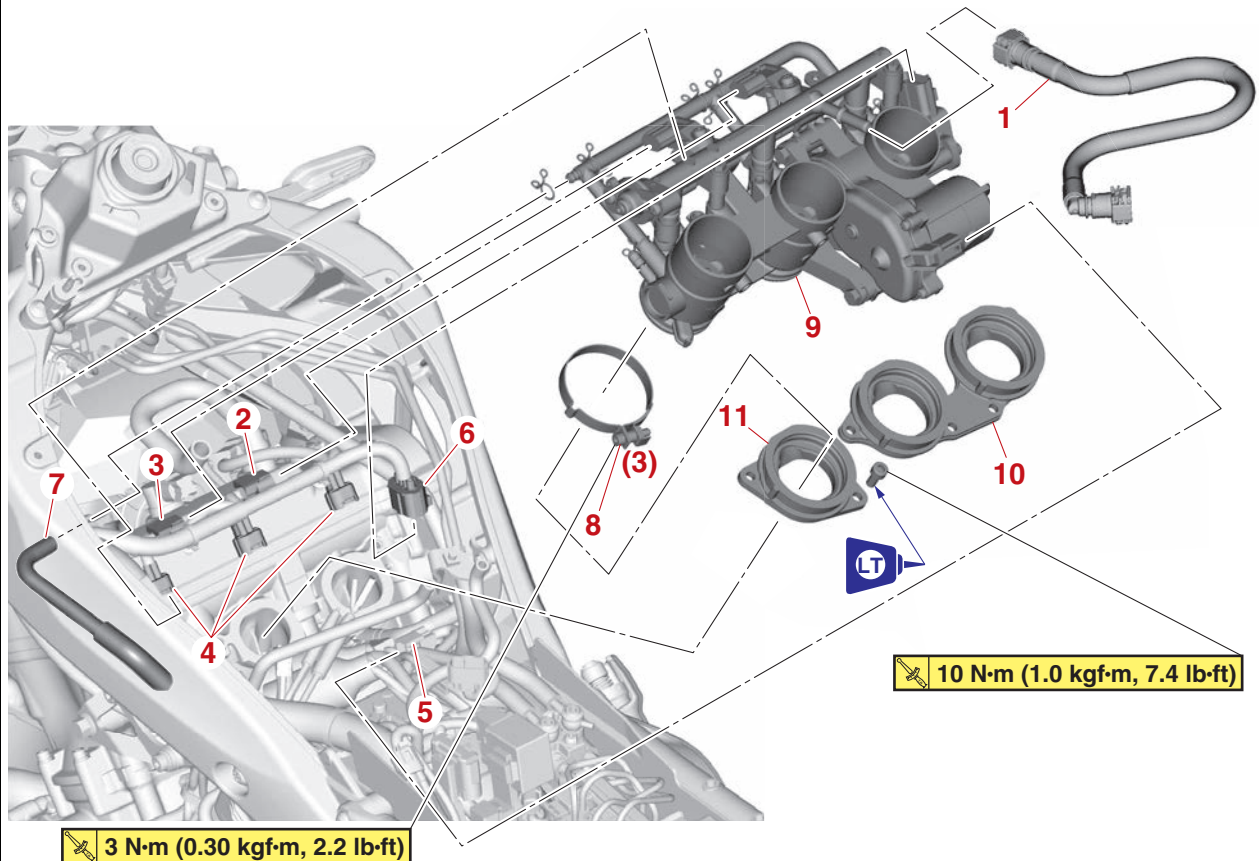


2. Connect:
 - Fuel tank drain hose
 - Fuel tank breather hose
 - Fuel pump coupler

EAS20070

THROTTLE BODIES

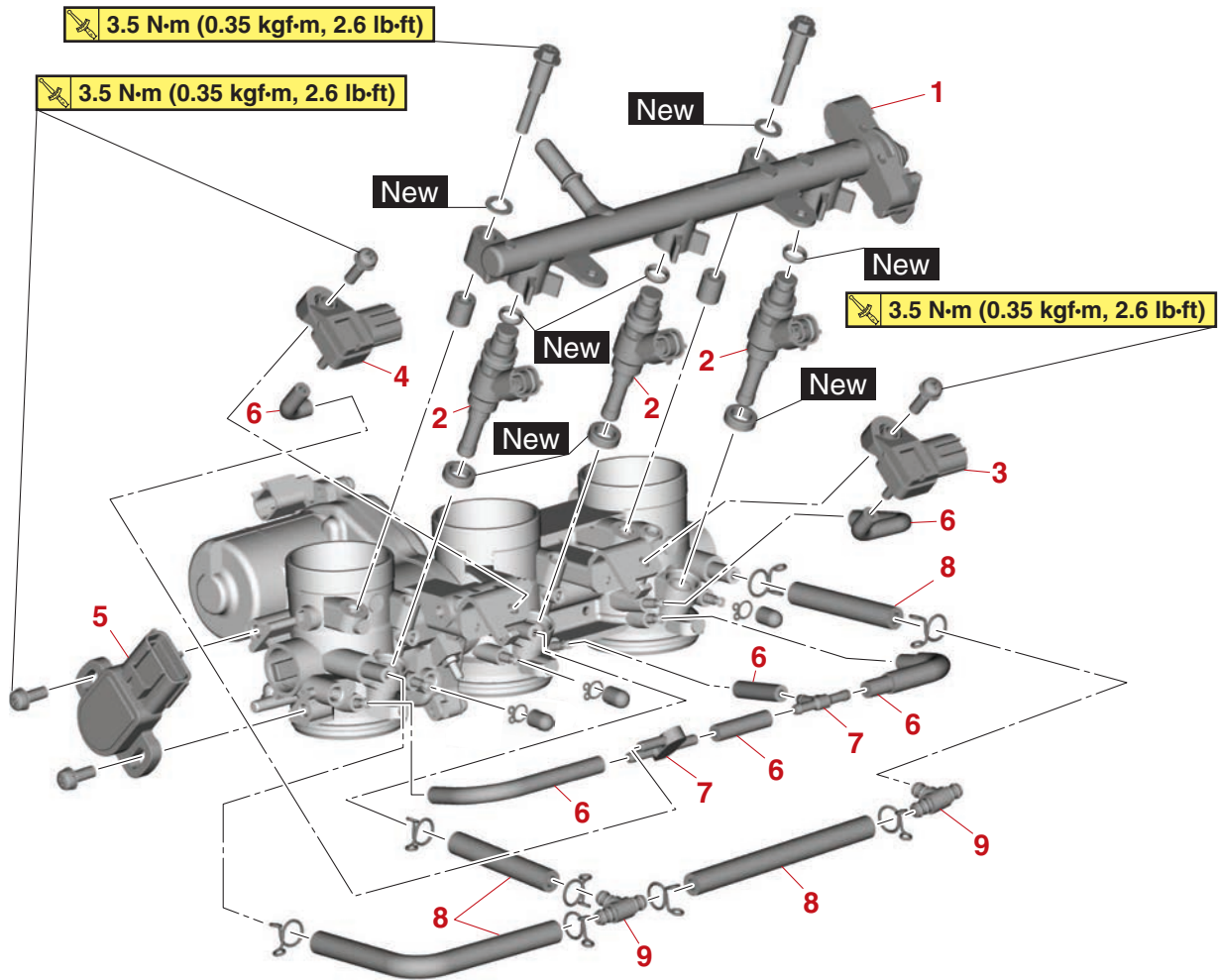
Removing the throttle bodies



Order	Job/Parts to remove	Q'ty	Remarks
	Air filter case		Refer to "GENERAL CHASSIS (5)" on page 4-11.
1	Fuel hose	1	
2	Intake air pressure sensor 1 coupler	1	Disconnect.
3	Intake air pressure sensor 2 coupler	1	Disconnect.
4	Injector coupler	3	Disconnect.
5	Throttle servo motor coupler	1	Disconnect.
6	Throttle position sensor coupler	1	Disconnect.
7	Canister purge hose (purge cut valve solenoid to hose joint)	1	Disconnect.
8	Throttle body joint clamp screw	3	Loosen.
9	Throttle body assembly	1	
10	Throttle body joint	1	
11	Throttle body joint	1	

THROTTLE BODIES

Removing the injectors



Order	Job/Parts to remove	Q'ty	Remarks
1	Fuel rail	1	
2	Injector	3	
3	Intake air pressure sensor 2	1	
4	Intake air pressure sensor 1	1	
5	Throttle position sensor	1	
6	Negative pressure hose	6	
7	Hose joint	2	
8	Canister purge hose	4	
9	Hose joint	2	

EAS30475

CHECKING THE INJECTORS (BEFORE REMOVING)

1. Check:
 - Injector
Use the diagnostic code numbers “36”–“38”. Refer to “DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE” on page 9-82.

EAS31158

REMOVING THE FUEL HOSE (FUEL RAIL SIDE)

1. Remove:
 - Rider seat
 - Side cover
Refer to “GENERAL CHASSIS (1)” on page 4-1.
 - Fuel tank cover
Refer to “GENERAL CHASSIS (4)” on page 4-10.
 - Fuel tank
Refer to “REMOVING THE FUEL TANK” on page 7-4.
2. Remove:
 - Fuel hose (fuel rail side)

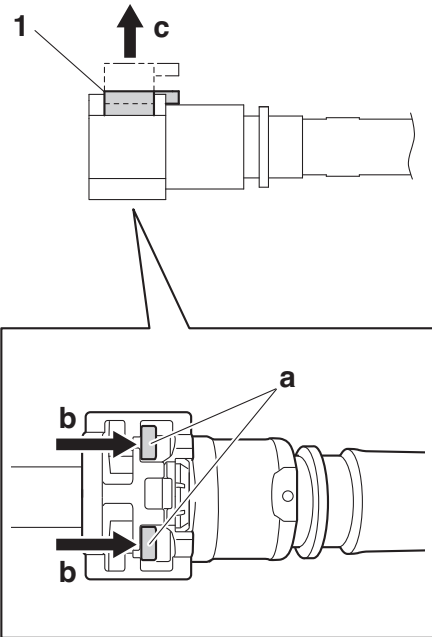
ECA17490

NOTICE

Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.

TIP

- While pushing the ends “a” of the fuel hose connector cover “1” in direction “b”, slide the fuel hose connector cover in direction “c”, and then remove the hose from the fuel pump.
- Before removing the hose, place a few rags in the area under where it will be removed.
- It is prohibited to wear the cotton work gloves or equivalent coverings.



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 8-49.

THROTTLE BODIES

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

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

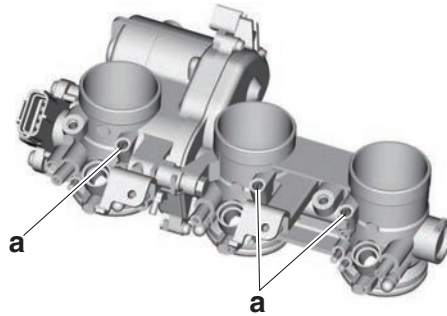
ECA21540

NOTICE

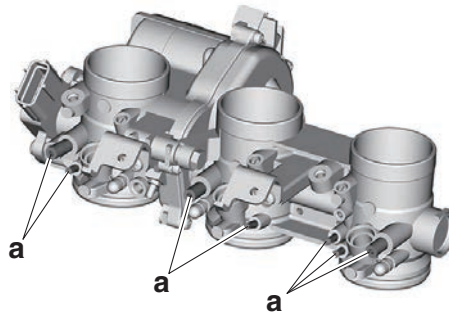
- Observe the following precautions; otherwise, the throttle bodies may not operate properly.
- Do not subject the throttle bodies to excessive force.
- Clean the throttle bodies in the recommended cleaning solvent.
- Do not use any caustic carburetor cleaning solution.
- Do not apply cleaning solvent 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

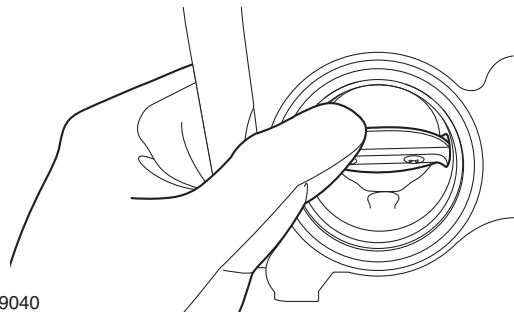
WARNING

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.



G089040

- 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.

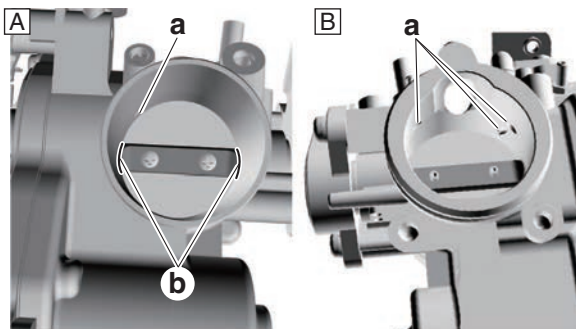
- Remove the carbon deposits from the inside of each throttle body in a downward direction, from the air filter case side of the throttle body to the engine side.

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.**

- 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.
- 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

- Install the throttle bodies.
- Reset:
 - ISC (idle speed control) learning values
Use the diagnostic code number "67".
Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-77.

- 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

- Remove the throttle bodies from the vehicle.
- Install a new throttle bodies to the vehicle.
- Reset:
 - ISC (idle speed control) learning values
Use the diagnostic code number "67".
Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-77.
 - A/F control learning value
Use the diagnostic code number "87".
Refer to "DIAGNOSTIC CODE: SENSOR OPERATION TABLE" on page 9-77.
- Adjust:
 - Throttle bodies synchronizing
Refer to "SYNCHRONIZING THE THROTTLE BODIES" on page 3-8.
- Place the vehicle on a maintenance stand so that the rear wheel is elevated.
- Check:
 - Engine idling speed
Start the engine, warm it up, and then measure the engine idling speed.

	<p>Engine idling speed 1200–1400 r/min</p>
--	--

EAS30480

INSTALLING THE 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.**

- Install a new seal onto the end of each injector.
- Install the injectors to the fuel rail, making sure to install them in the correct direction.
- Install the 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 injectors are installed.
Refer to “CHECKING THE INJECTOR PRESSURE” on page 7-11.

EAS30481

CHECKING THE INJECTOR PRESSURE

TIP

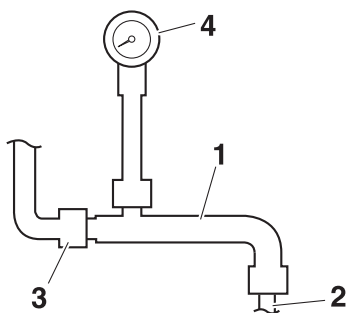
- After installing the injectors, perform the following steps to check the injector pressure.
- Do not allow any foreign materials to enter the fuel lines.

1. Check:

- Injector pressure
 - a. Connect the fuel injector pressure adapter “1” to the fuel rail joint “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 air pressure is reached.



Specified air pressure
490 kPa (5.0 kgf/cm², 71.1 psi)

ECA17600

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 at least one minute.
Pressure drops → Check the pressure gauge and adapter.
Check the seals and O-rings and then reinstall.
Out of specification → Replace the fuel injectors.

EAS30482

CHECKING THE FUEL PRESSURE

1. Check:

- Fuel pressure
 - a. Remove the rider seat, side cover and fuel tank cover.
Refer to “GENERAL CHASSIS (1)” on page 4-1.
Refer to “GENERAL CHASSIS (4)” on page 4-10.
 - b. Remove the fuel tank 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 7-4.

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.

ECA17490

NOTICE

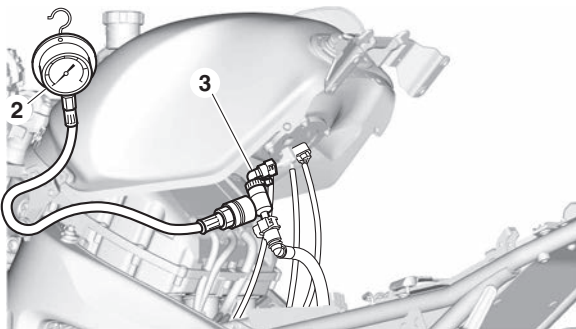
Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.



- d. Connect the pressure gauge “2” and fuel pressure adapter “3” to the fuel hose.



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 line 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)

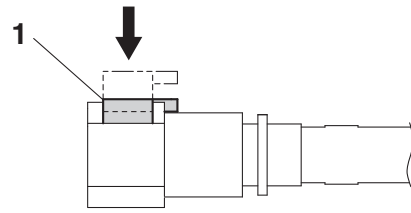
ECA17500

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 onto the fuel pump securely, and slide the fuel hose connector cover “1” in the direction shown in the illustration.
- It is prohibited to wear the cotton work gloves or equivalent coverings.



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
Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-77.

2. Adjust:

- Throttle position sensor angle

TIP

Before adjusting the throttle position sensor, the throttle bodies must be removed.

- Temporary tighten the throttle position sensor screws “1”.
- Check that the throttle valves are fully closed.
- Connect the throttle position sensor to the wire harness.
- Remove the protective cap, and then connect the YDT to coupler.



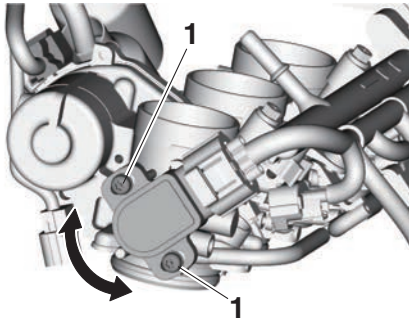
Yamaha diagnostic tool USB
90890-03267
Yamaha diagnostic tool (A/I)
90890-03264

TIP

- Yamaha diagnostic tool (A/I) (90890-03264) 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.

THROTTLE BODIES

- e. Diagnostic code number "01" is selected.
- f. Adjust the position of the throttle position sensor angle so that 11–21 can appear in the YDT screen.
- g. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws.



ELECTRICAL SYSTEM

IGNITION SYSTEM	8-1
CIRCUIT DIAGRAM	8-1
ENGINE STOPPING DUE TO SIDESTAND OPERATION	8-3
TROUBLESHOOTING	8-4
ELECTRIC STARTING SYSTEM	8-7
CIRCUIT DIAGRAM	8-7
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION	8-9
TROUBLESHOOTING	8-10
CHARGING SYSTEM	8-13
CIRCUIT DIAGRAM	8-13
TROUBLESHOOTING	8-15
LIGHTING SYSTEM	8-17
CIRCUIT DIAGRAM	8-17
TROUBLESHOOTING	8-19
SIGNALING SYSTEM	8-21
CIRCUIT DIAGRAM	8-21
TROUBLESHOOTING	8-23
COOLING SYSTEM	8-29
CIRCUIT DIAGRAM	8-29
TROUBLESHOOTING	8-31
FUEL PUMP SYSTEM	8-33
CIRCUIT DIAGRAM	8-33
TROUBLESHOOTING	8-35
ELECTRICAL COMPONENTS	8-37
CHECKING THE SWITCHES	8-39
CHECKING THE FUSES	8-40
REPLACING THE ECU (Engine Control Unit)	8-41
CHECKING AND CHARGING THE BATTERY	8-41
CHECKING THE RELAYS	8-42
CHECKING THE RELAY UNIT (DIODE)	8-43
CHECKING THE IGNITION COILS.....	8-44
CHECKING THE IGNITION SPARK GAP.....	8-44
CHECKING THE CRANKSHAFT POSITION SENSOR.....	8-45
CHECKING THE STARTER MOTOR OPERATION	8-45
CHECKING THE STATOR COIL	8-46
CHECKING THE RECTIFIER/REGULATOR	8-46
CHECKING THE HORN.....	8-46
CHECKING THE FUEL SENDER	8-46

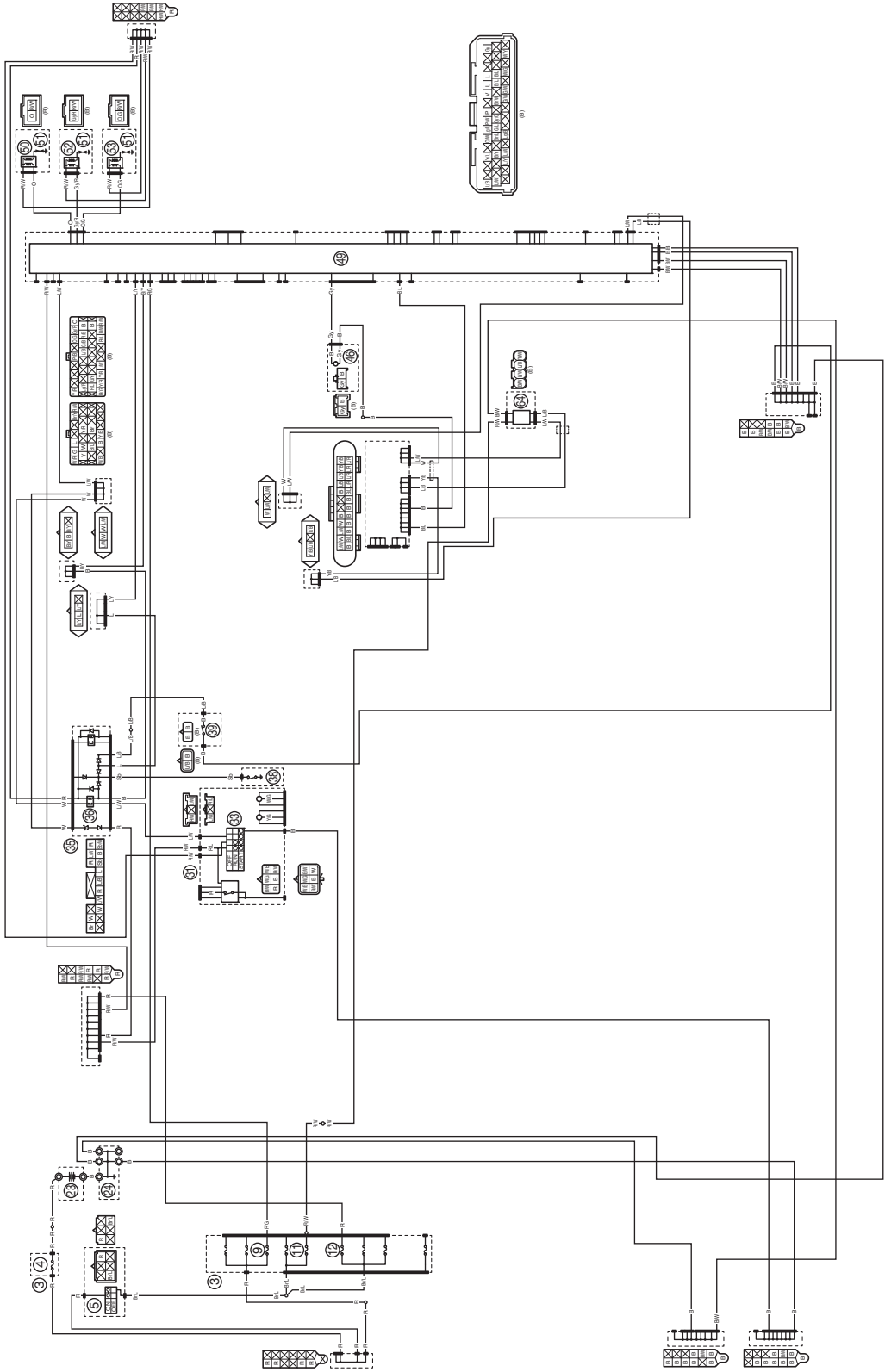
CHECKING THE FUEL LEVEL WARNING LIGHT	8-47
CHECKING THE RADIATOR FAN MOTOR	8-47
CHECKING THE COOLANT TEMPERATURE SENSOR.....	8-47
CHECKING THE THROTTLE SERVO MOTOR	8-48
CHECKING THE INTAKE AIR TEMPERATURE SENSOR.....	8-49
CHECKING THE FUEL INJECTORS.....	8-49
CHECKING THE PURGE CUT VALVE SOLENOID	8-50
CHECKING THE WHEEL SWITCH	8-50

EAS20072

IGNITION SYSTEM

EAS30490

CIRCUIT DIAGRAM



IGNITION SYSTEM

3. Fuse box
4. Main fuse
5. Main switch
9. Backup fuse 2
11. Ignition fuse 2
12. Ignition fuse
23. Battery
24. Engine ground
31. Handlebar switch (right)
33. Stop/run/start switch
35. Relay unit
36. Starting circuit cut-off relay
38. Neutral switch
39. Sidestand switch
46. Crankshaft position sensor
49. ECU (Engine Control Unit)
50. Ignition coil #1
51. Spark plug
52. Ignition coil #2
53. Ignition coil #3
64. IMU (Inertial Measurement Unit)

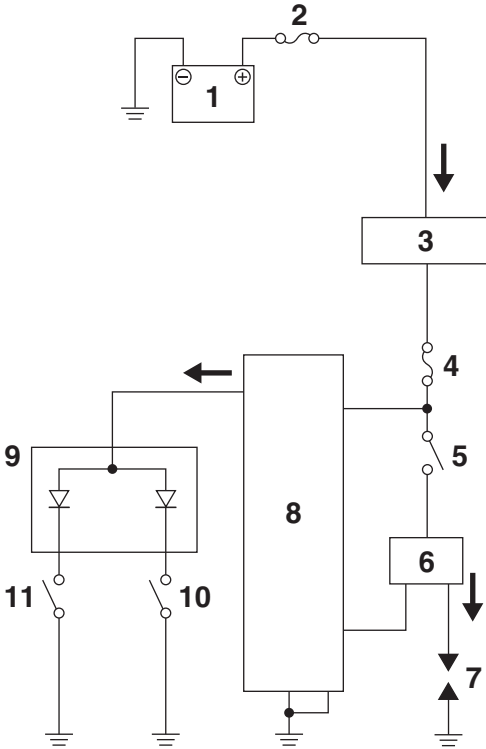
IGNITION SYSTEM

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. Ignition coil
7. Spark plug
8. ECU (Engine Control Unit)
9. Relay unit (diode)
10. Sidestand switch
11. Neutral switch

EAS30492

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank cover
3. Fuel tank
4. Air filter case

<p>1. Check the fuses. (Main, backup 2, ignition, and ignition 2) Refer to "CHECKING THE FUSES" on page 8-40.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the spark plugs. Refer to "CHECKING THE SPARK PLUGS" on page 3-5.</p>	NG→	<p>Re-gap or replace the spark plugs.</p>
OK↓		
<p>4. Check the ignition spark gap. Refer to "CHECKING THE IGNITION SPARK GAP" on page 8-44.</p>	OK→	<p>Ignition system is OK.</p>
NG↓		
<p>5. Check the ignition coils. Refer to "CHECKING THE IGNITION COILS" on page 8-44.</p>	NG→	<p>Replace the ignition coils.</p>
OK↓		
<p>6. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-45.</p>	NG→	<p>Replace the stator coil assembly.</p>
OK↓		
<p>7. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-39.</p>	NG→	<p>Replace the main switch/immobilizer unit.</p>
OK↓		

IGNITION SYSTEM

8. Check the stop/run/start switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the handlebar switch (right).
OK↓		
9. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the neutral switch.
OK↓		
10. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the sidestand switch.
OK↓		
11. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-43.	NG→	Replace the relay unit.
OK↓		
12. Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.	NG→	Properly connect or repair the ignition system's wiring.
OK↓		
Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.		

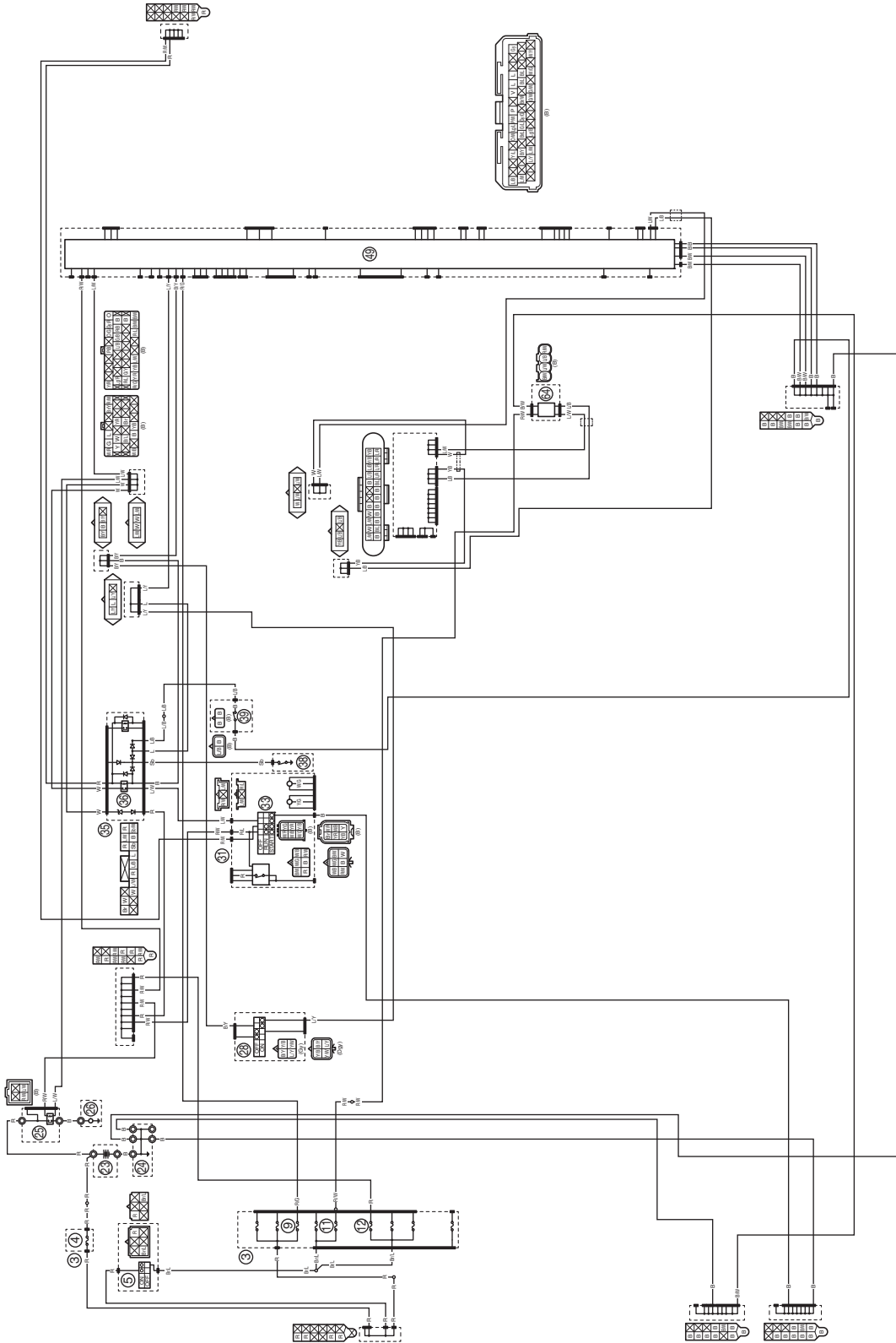
ELECTRIC STARTING SYSTEM

EAS20073

ELECTRIC STARTING SYSTEM

EAS30493

CIRCUIT DIAGRAM



ELECTRIC STARTING SYSTEM

- 3. Fuse box
- 4. Main fuse
- 5. Main switch
- 9. Backup fuse 2
- 11. Ignition fuse 2
- 12. Ignition fuse
- 23. Battery
- 24. Engine ground
- 25. Starter relay
- 26. Starter motor
- 28. Clutch switch
- 31. Handlebar switch (right)
- 33. Stop/run/start switch
- 35. Relay unit
- 36. Starting circuit cut-off relay
- 38. Neutral switch
- 39. Sidestand switch
- 49. ECU (Engine Control Unit)
- 64. IMU (Inertial Measurement Unit)

ELECTRIC STARTING SYSTEM

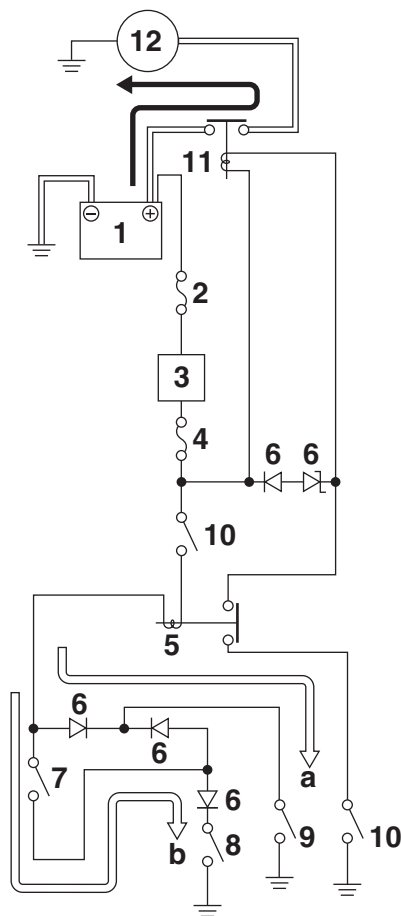
EAS30494

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 | 11. Starter relay |
| b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR | 12. Starter motor |
-
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

ELECTRIC STARTING SYSTEM

EAS30495

TROUBLESHOOTING

The starter motor fails to turn.

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank cover
3. Fuel tank
4. Air filter case
5. Canister

1. Check the fuses. (Main, backup 2, ignition, and ignition 2) Refer to "CHECKING THE FUSES" on page 8-40.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.	NG→	<ul style="list-style-type: none">• Clean the battery terminals.• Recharge or replace the battery.
OK↓		
3. Check the starter motor operation. Refer to "CHECKING THE STARTER MOTOR OPERATION" on page 8-45.	OK→	Starter motor is OK. Perform the electric starting system troubleshooting, starting with step (5).
NG↓		
4. Check the starter motor. Refer to "CHECKING THE STARTER MOTOR" on page 5-44.	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 8-42.	NG→	Replace the relay unit.
OK↓		
6. Check the relay unit (diode). Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-43.	NG→	Replace the relay unit.
OK↓		
7. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-42.	NG→	Replace the starter relay.
OK↓		

ELECTRIC STARTING SYSTEM

8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the main switch/immobilizer unit.
OK↓		
9. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the neutral switch.
OK↓		
10. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the sidestand switch.
OK↓		
11. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the clutch switch.
OK↓		
12. Check the stop/run/start switch. Refer to "CHECKING THE SWITCHES" on page 8-39.	NG→	Replace the handlebar switch (right).
OK↓		
13. Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-7.	NG→	Properly connect or repair the starting system's wiring.
OK↓		
Replace the ECU. Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.		

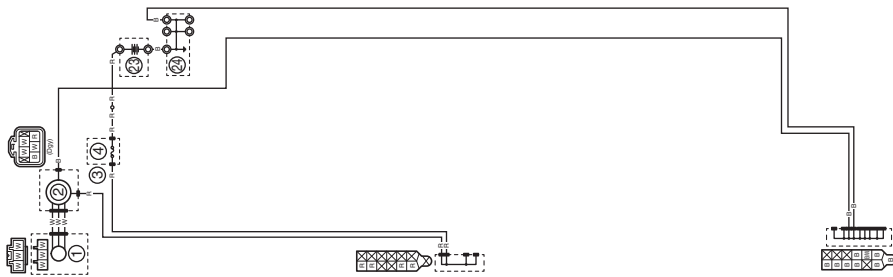
ELECTRIC STARTING SYSTEM

EAS20074

CHARGING SYSTEM

EAS30496

CIRCUIT DIAGRAM



CHARGING SYSTEM

1. AC magneto
2. Rectifier/regulator
3. Fuse box
4. Main fuse
23. Battery
24. Engine ground

EAS30497

TROUBLESHOOTING

The battery is not being charged.

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank cover
3. Fuel tank
4. Air filter case

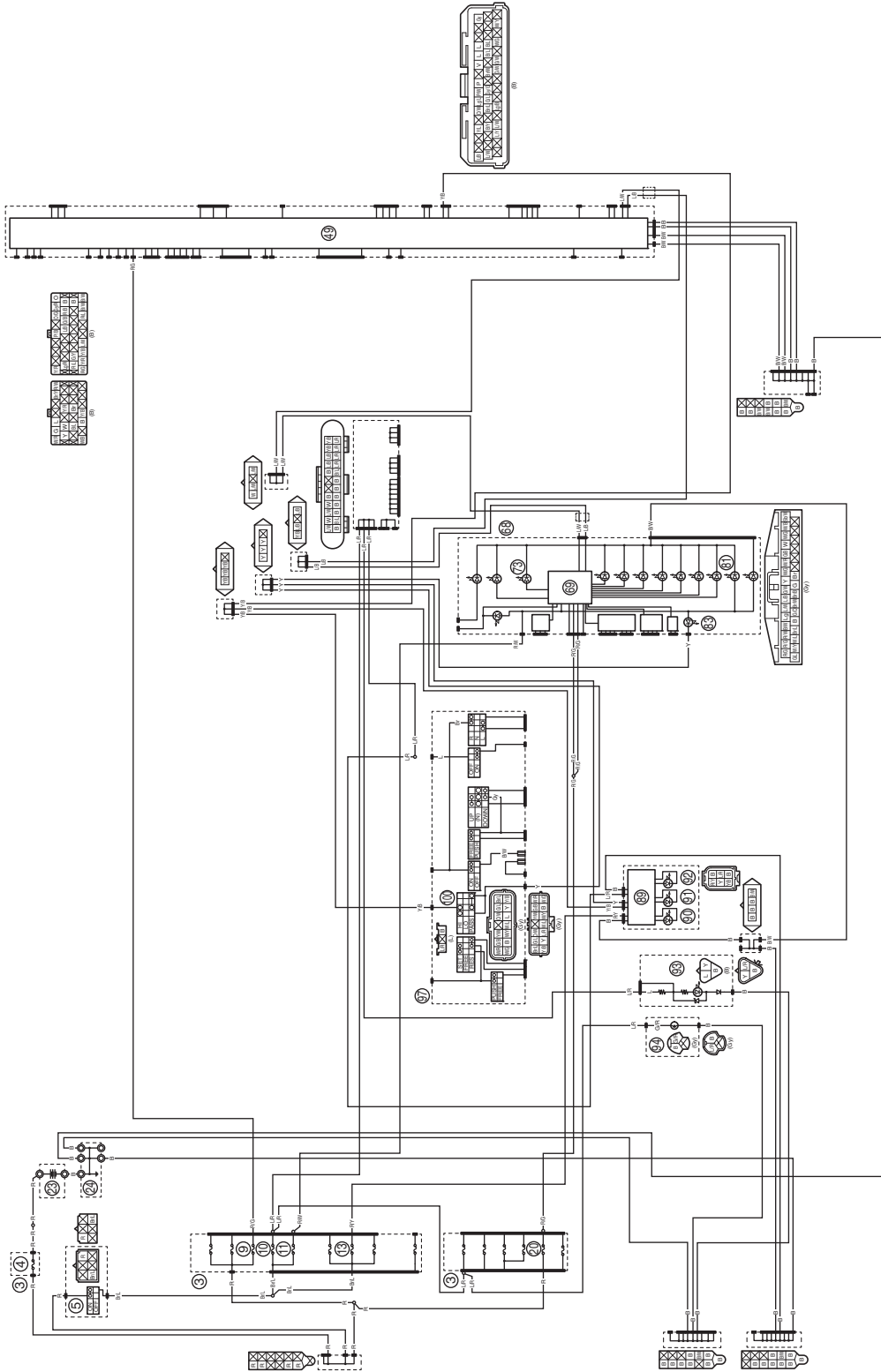
<p>1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 8-40.</p>	NG→	<p>Replace the fuse.</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 8-46.</p>	NG→	<p>Replace the stator coil assembly.</p>
OK↓		
<p>4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 8-46.</p>	NG→	<p>Replace the rectifier/regulator.</p>
OK↓		
<p>5. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-13.</p>	NG→	<p>Properly connect or repair the charging system's wiring.</p>
OK↓		
<p>The charging system circuit is OK.</p>		

EAS20075

LIGHTING SYSTEM

EAS30498

CIRCUIT DIAGRAM



- 3. Fuse box
- 4. Main fuse
- 5. Main switch
- 9. Backup fuse 2
- 10. Signaling system fuse
- 11. Ignition fuse 2
- 13. Headlight fuse
- 20. Backup fuse
- 23. Battery
- 24. Engine ground
- 49. ECU (Engine Control Unit)
- 68. Meter assembly
- 69. Multi-function meter
- 73. Auxiliary system warning light
- 81. Meter light
- 83. High beam indicator light
- 89. Headlight control unit
- 90. Headlight (low)
- 91. Headlight (high)
- 92. Auxiliary light
- 93. Tail/brake light
- 94. License plate light
- 97. Handlebar switch (left)
- 100. Dimmer/pass switch

EAS30499

TROUBLESHOOTING

Any of the following fail to light: headlight, auxiliary light, high beam indicator light, taillight, license light or meter light.

TIP

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank cover
3. Fuel tank
4. Air filter case
5. Headlight assembly

<p>1. Check the fuses. (Main, headlight, ignition 2, back-up, backup 2, and signaling system) Refer to "CHECKING THE FUSES" on page 8-40.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-39.</p>	NG→	<p>Replace the main switch/immobilizer unit.</p>
OK↓		
<p>4. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-39.</p>	NG→	<p>The dimmer switch is faulty. Replace the handlebar switch (left).</p>
OK↓		
<p>5. Check the pass switch. Refer to "CHECKING THE SWITCHES" on page 8-39.</p>	NG→	<p>The pass switch is faulty. Replace the handlebar switch (left).</p>
OK↓		
<p>6. Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-17.</p>	NG→	<p>Properly connect or repair the lighting system's wiring.</p>
OK↓		

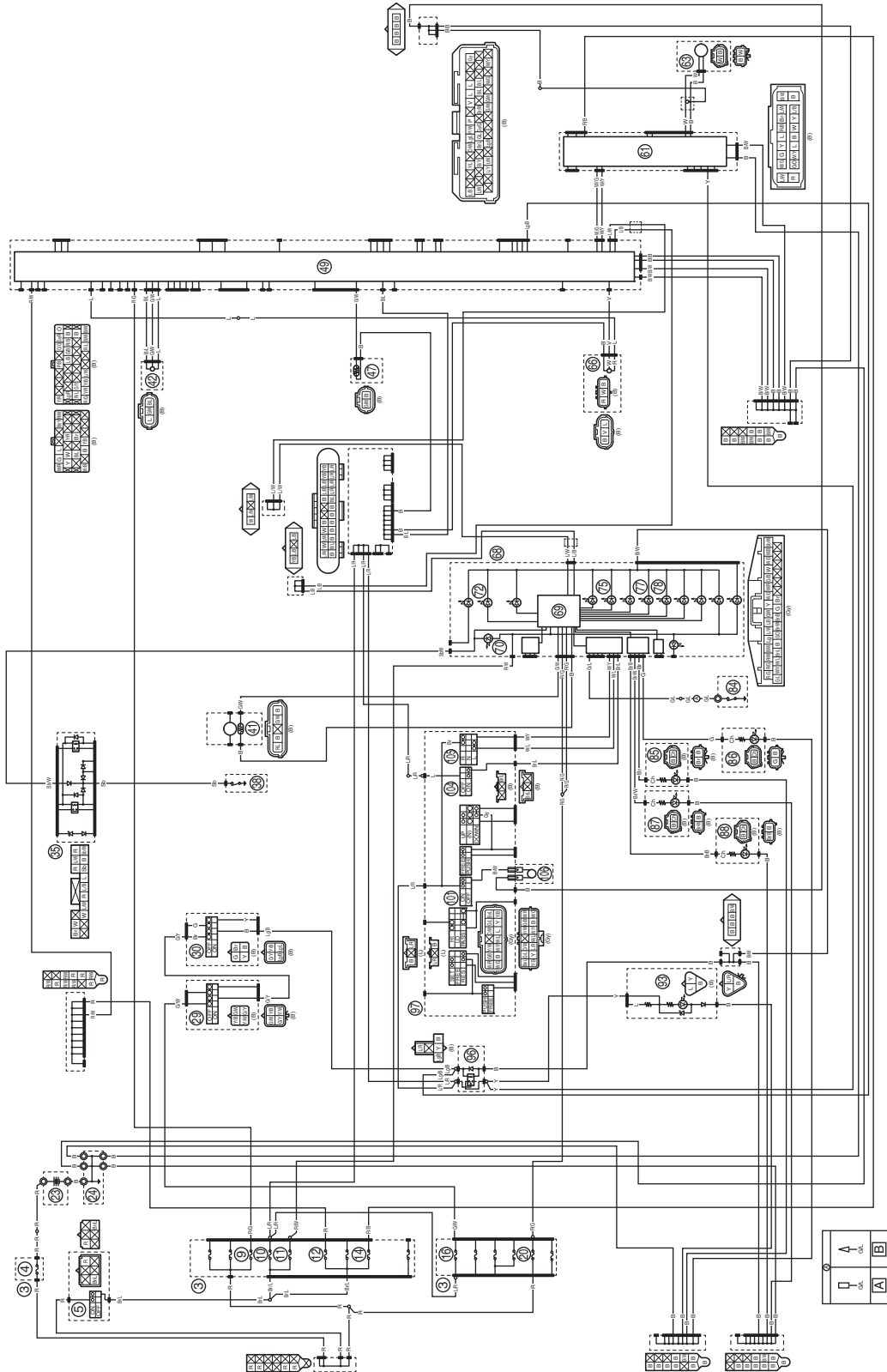
Replace the ECU, meter assembly, headlight assembly, tail/brake light or license plate light.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

EAS20076

SIGNALING SYSTEM

EAS30500

CIRCUIT DIAGRAM



3. Fuse box
4. Main fuse
5. Main switch
9. Backup fuse 2
10. Signaling system fuse
11. Ignition fuse 2
12. Ignition fuse
14. ABS ECU fuse
16. Brake light fuse
20. Backup fuse
23. Battery
24. Engine ground
29. Front brake light switch
30. Rear brake light switch
35. Relay unit
38. Neutral switch
41. Fuel sender
42. Gear position sensor
47. Coolant temperature sensor
49. ECU (Engine Control Unit)
61. Hydraulic unit assembly (ABS ECU)
63. Rear wheel sensor
66. Shift sensor
68. Meter assembly
69. Multi-function meter
70. Neutral indicator light
72. Oil pressure and coolant temperature warning light
75. Fuel level warning light
77. Left turn signal indicator light
78. Right turn signal indicator light
84. Oil pressure switch
85. Rear turn signal light (left)
86. Rear turn signal light (right)
87. Front turn signal light (right)
88. Front turn signal light (left)
93. Tail/brake light
96. Brake light relay
97. Handlebar switch (left)
101. Horn switch
104. Hazard switch
105. Turn signal switch
106. Horn

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.

TIP

- Before troubleshooting, remove the following part(s):
 1. Rider seat
 2. Fuel tank cover
 3. Fuel tank
 4. Air filter case

<p>1. Check the fuses. (Main, ignition, ignition 2, ABS ECU, signaling system, backup, backup 2, and brake light.) Refer to "CHECKING THE FUSES" on page 8-40.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-39.</p>	NG→	<p>Replace the main switch/immobilizer unit.</p>
OK↓		
<p>4. Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-21.</p>	NG→	<p>Properly connect or repair the signaling system's wiring.</p>
OK↓		
<p>Check the condition of each of the signaling system circuits. Refer to "Checking the signaling system" on page 8-24.</p>		

Checking the signaling system

The horn fails to sound.

1. Check the horn switch.
Refer to "CHECKING THE SWITCHES" on page 8-39.

NG→

Replace the handlebar switch (left).

OK↓

2. Check the horn.
Refer to "CHECKING THE HORN" on page 8-46.

NG→

Replace the horn.

OK↓

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The tail/brake light fails to come on.

1. Check the front brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-39.

NG→

Replace the front brake light switch.

OK↓

2. Check the rear brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-39.

NG→

Replace the rear brake light switch.

OK↓

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

The turn signal light, turn signal indicator light or both fail to blink.

1. Check the turn signal switch.
Refer to "CHECKING THE SWITCHES" on page 8-39.

NG→

Replace the handlebar switch (left).

OK↓

2. Check the hazard switch.
Refer to "CHECKING THE SWITCHES" on page 8-39.

NG→

Replace the handlebar switch (left).

SIGNALING SYSTEM

OK↓

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly or turn signal light.

The neutral indicator light fails to come on.

1. Check the neutral switch.
Refer to "CHECKING THE SWITCHES" on page 8-39.

NG→

Replace the neutral switch.

OK↓

2. Check the relay unit (diode).
Refer to "CHECKING THE RELAY UNIT (DIODE)" on page 8-43.

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 repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The oil pressure and coolant temperature warning light fails to come on, or the oil pressure warning icon 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 wiring harness.

OK↓

2. Disconnect the oil pressure switch lead from the oil pressure switch, and then check whether the oil pressure and coolant temperature warning light comes on when the lead is connected to the engine ground.

NG→

Replace the meter assembly.

OK↓

Replace the oil pressure switch.

SIGNALING SYSTEM

The oil pressure and coolant temperature warning light 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 wiring harness.

OK↓

2. Measure the engine oil pressure.
Refer to "MEASURING THE ENGINE OIL PRESSURE" on page 8-26.

NG→

Check the engine oil leakage, oil viscosity, oil seal, oil filter, or oil pump.

OK↓

Replace the oil pressure switch.

The fuel level warning light fails to come on.

1. Check the fuel sender.
Refer to "CHECKING THE FUEL SENDER" on page 8-46.

NG→

Replace the fuel pump assembly.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The oil pressure and coolant temperature warning light fails to come on.

1. Check the coolant temperature sensor.
Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-47.

NG→

Replace the coolant temperature sensor.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or replace the wiring harness.

OK↓

Replace the ECU or meter assembly.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

SIGNALING SYSTEM

Quick shift system does not operate.

1. Check that the Auxiliary system warning does not come on.

NG→

Repair the faulty parts.

OK↓

2. Check that the quick shift system is working under normal quick shift system operating conditions.

NG→

Check the quick shift system operating conditions explained in the owner's manual and operate the quick shift system accordingly.

OK↓

3. Make sure that the quick shift system is effective.
(Check whether the "QS ▲ ▼" icon is displayed at the top of the meter.)

NG→

Activate the quick shift system. (Set the quick shift system to a setting other than "OFF".)

OK↓

4. Are you operating while the "QS ▲ ▼" icon is lit?

NG→

Operate while the "QS ▲ ▼" icon is lit.

OK↓

5. Is the transmission gear display normal?

NG→

Repair the gear position sensor.

OK↓

6. Check the connection of the coupler between the gear position sensor and the ECU.

NG→

Connect the gear position sensor coupler.

OK↓

7. Are the clutch and neutral switches normal?

NG→

Repair the switch if it is not normal.

OK↓

8. Check the shift sensor value in the diagnostic mode.
2.5 V when the shift pedal is not being operated.
4.5 V when the shift pedal is pressed fully in.
0.5 V when the shift pedal is pushed fully up.

NG→

Replace the shift sensor.

OK↓

9. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-21.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the ECU.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

The speedometer fails to operate.

1. Check the rear wheel sensor.
Refer to "MAINTENANCE OF THE REAR WHEEL SENSOR AND SENSOR ROTOR" on page 4-24.

NG→

Replace the rear wheel sensor.

OK↓

2. Check the entire wheel sensor wiring.
Refer to TIP.

NG→

Properly connect or repair the wheel sensor wiring.

OK↓

Replace the hydraulic unit assembly (ABS ECU), ECU, meter assembly.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

TIP

Repair or replace if there is an open or short circuit.

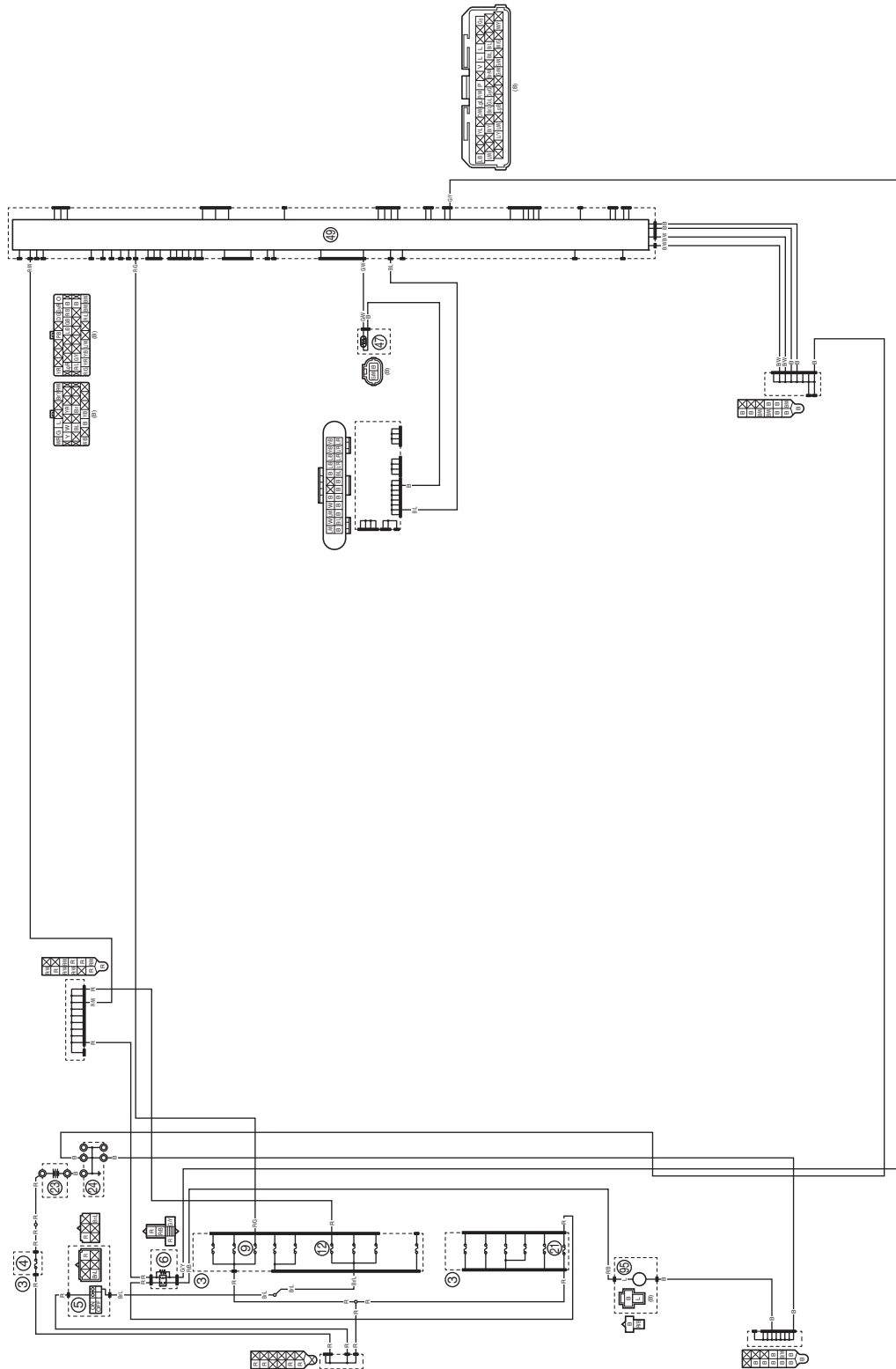
- Between rear wheel sensor coupler and ABS ECU coupler.
(white–white)
(black–black)
- Between ABS ECU coupler and ECU coupler.
(white/green–white/green)
(white/yellow–white/yellow)
- Between joint coupler and meter assembly coupler.
(blue/white–blue/white)
(blue/black–blue/black)

EAS20077

COOLING SYSTEM

EAS30502

CIRCUIT DIAGRAM



COOLING SYSTEM

- 3. Fuse box
- 4. Main fuse
- 5. Main switch
- 6. Radiator fan motor relay
- 9. Backup fuse 2
- 12. Ignition fuse
- 21. Radiator fan motor fuse
- 23. Battery
- 24. Engine ground
- 47. Coolant temperature sensor
- 49. ECU (Engine Control Unit)
- 95. Radiator fan motor

EAS30503

TROUBLESHOOTING

TIP

- Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank cover
3. Fuel tank
4. Air filter case

<p>1. Check the fuses. (Main, ignition, backup 2, and radiator fan motor) Refer to "CHECKING THE FUSES" on page 8-40.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-39.</p>	NG→	<p>Replace the main switch/immobilizer unit.</p>
OK↓		
<p>4. Check the radiator fan motor. Refer to "CHECKING THE RADIATOR FAN MOTOR" on page 8-47.</p>	NG→	<p>Replace the radiator fan motor(s).</p>
OK↓		
<p>5. Check the radiator fan motor relay. Refer to "CHECKING THE RELAYS" on page 8-42.</p>	NG→	<p>Replace the radiator fan motor relay.</p>
OK↓		
<p>6. Check the coolant temperature sensor. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-47.</p>	NG→	<p>Replace the coolant temperature sensor.</p>
OK↓		
<p>7. Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-29.</p>	NG→	<p>Properly connect or repair the cooling system's wiring.</p>
OK↓		

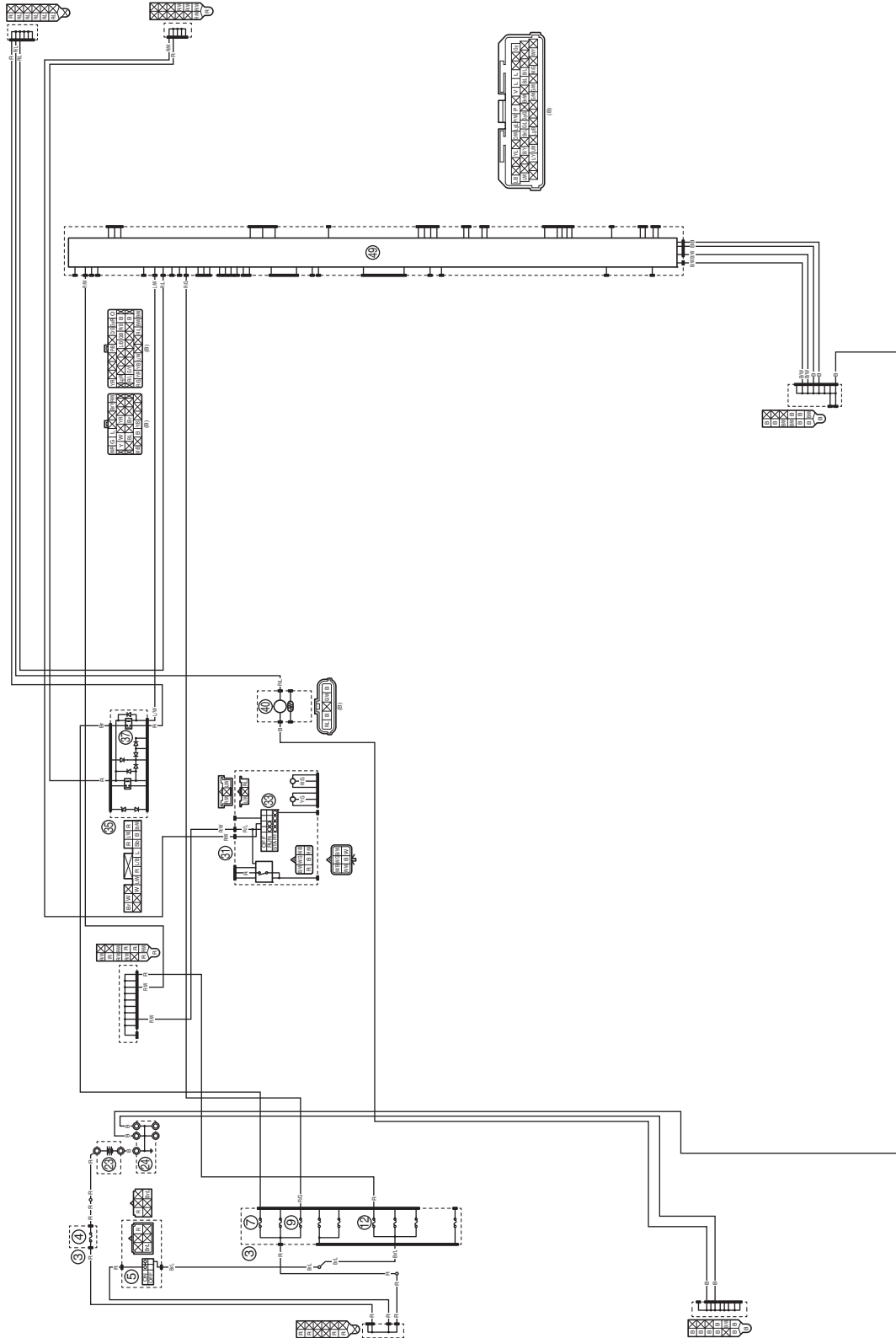
Replace the ECU.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

EAS20081

FUEL PUMP SYSTEM

EAS30513

CIRCUIT DIAGRAM



FUEL PUMP SYSTEM

- 3. Fuse box
- 4. Main fuse
- 5. Main switch
- 7. Fuel injection system fuse
- 9. Backup fuse 2
- 12. Ignition fuse
- 23. Battery
- 24. Engine ground
- 31. Handlebar switch (right)
- 33. Stop/run/start switch
- 35. Relay unit
- 37. Fuel pump relay
- 40. Fuel pump
- 49. ECU (Engine Control Unit)

EAS30514

TROUBLESHOOTING

If the fuel pump fails to operate.

TIP

• Before troubleshooting, remove the following part(s):

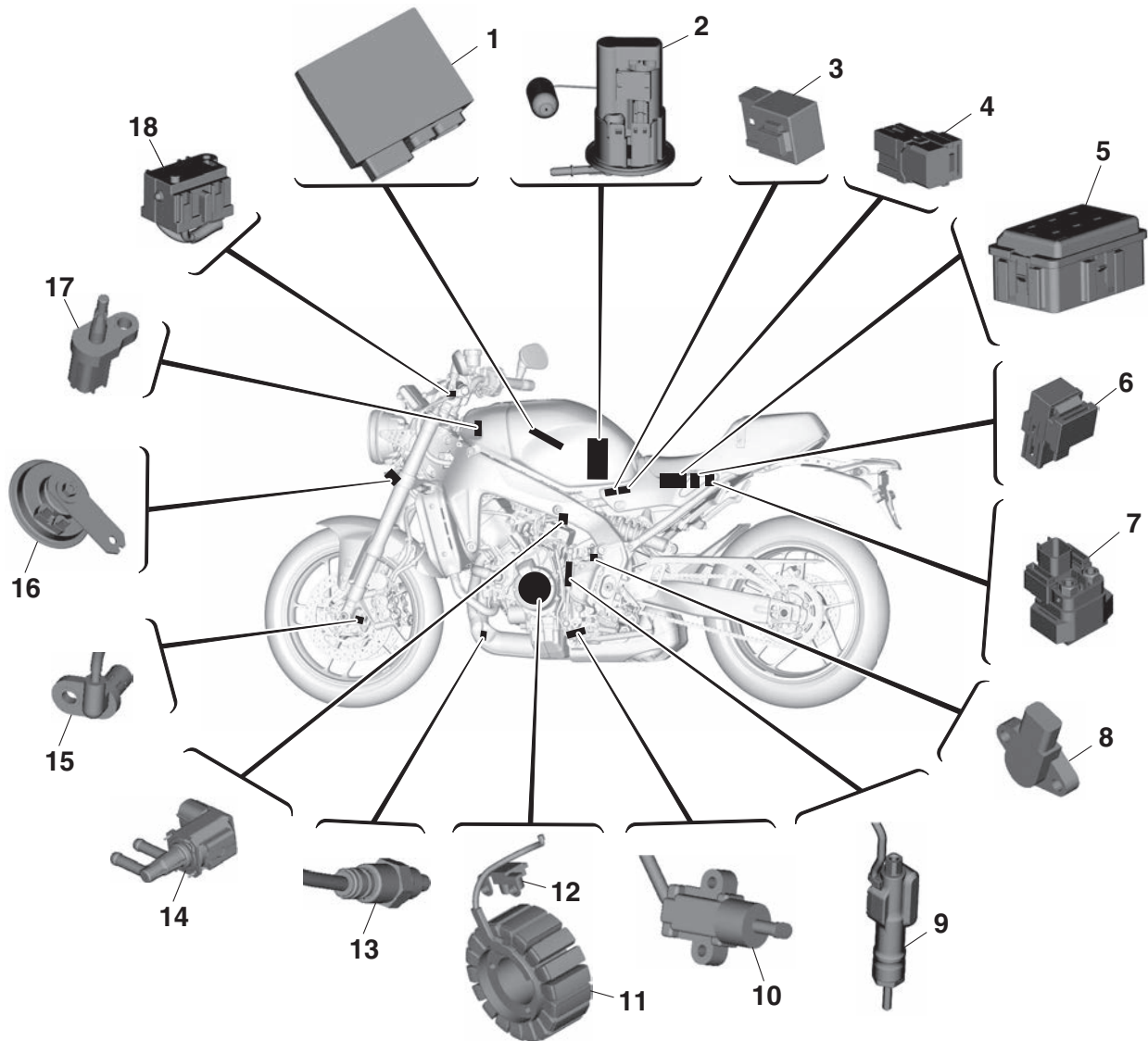
1. Rider seat
2. Fuel tank cover
3. Fuel tank

<p>1. Check the fuses. (Main, ignition, backup 2, and fuel injection system) Refer to "CHECKING THE FUSES" on page 8-40.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-39.</p>	NG→	<p>Replace the main switch/immobilizer unit.</p>
OK↓		
<p>4. Check the stop/run/start switch. Refer to "CHECKING THE SWITCHES" on page 8-39.</p>	NG→	<p>Replace the handlebar switch (right).</p>
OK↓		
<p>5. Check the relay unit (fuel pump relay). Refer to "CHECKING THE RELAYS" on page 8-42.</p>	NG→	<p>Replace the relay unit.</p>
OK↓		
<p>6. Check the fuel pump. Refer to "CHECKING THE FUEL PUMP OPERATION" on page 7-4.</p>	NG→	<p>Replace the fuel pump.</p>
OK↓		
<p>7. Check the entire fuel pump system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-33.</p>	NG→	<p>Properly connect or repair the fuel pump system's wiring.</p>
OK↓		

Replace the ECU.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

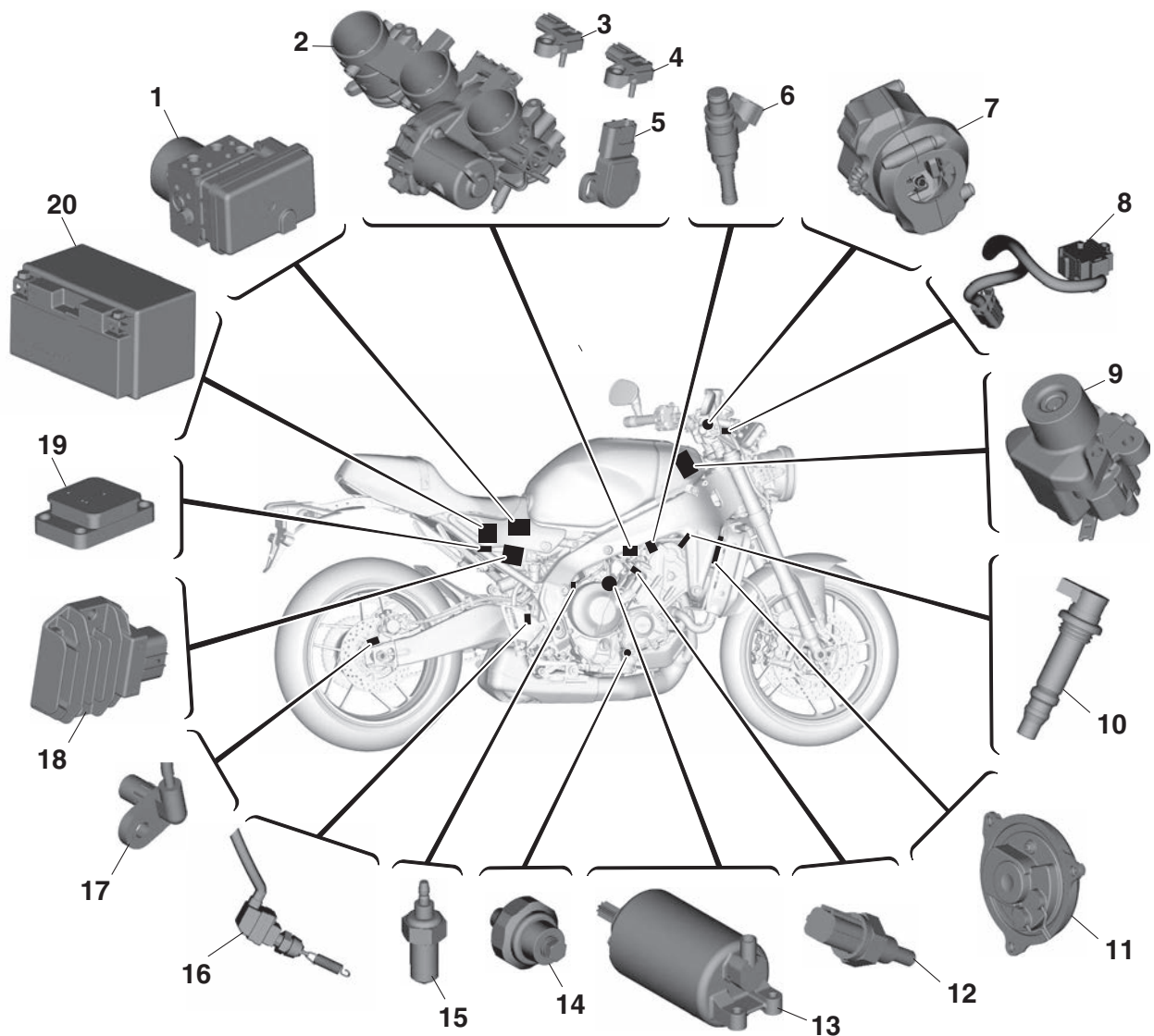
EAS20089

ELECTRICAL COMPONENTS



1. ECU (Engine Control Unit)
2. Fuel pump
3. Relay unit
4. Radiator fan motor relay
5. Fuse box
6. Brake light relay
7. Starter relay
8. Gear position sensor
9. Shift sensor
10. Sidestand switch
11. AC magneto
12. Crankshaft position sensor
13. O₂ sensor
14. Purge cut valve solenoid
15. Front wheel sensor
16. Horn
17. Intake air temperature sensor
18. Clutch switch

ELECTRICAL COMPONENTS



1. Hydraulic unit assembly (ABS ECU)
2. Throttle servo motor
3. Intake air pressure sensor 2
4. Intake air pressure sensor 1
5. Throttle position sensor
6. Injector
7. Accelerator position sensor
8. Front brake light switch
9. Main switch/Immobilizer unit
10. Ignition coil
11. Radiator fan motor
12. Coolant temperature sensor
13. Starter motor
14. Oil pressure switch
15. Neutral switch
16. Rear brake light switch
17. Rear wheel sensor
18. Rectifier/regulator
19. IMU (Inertial Measurement Unit)
20. Battery

ELECTRICAL COMPONENTS

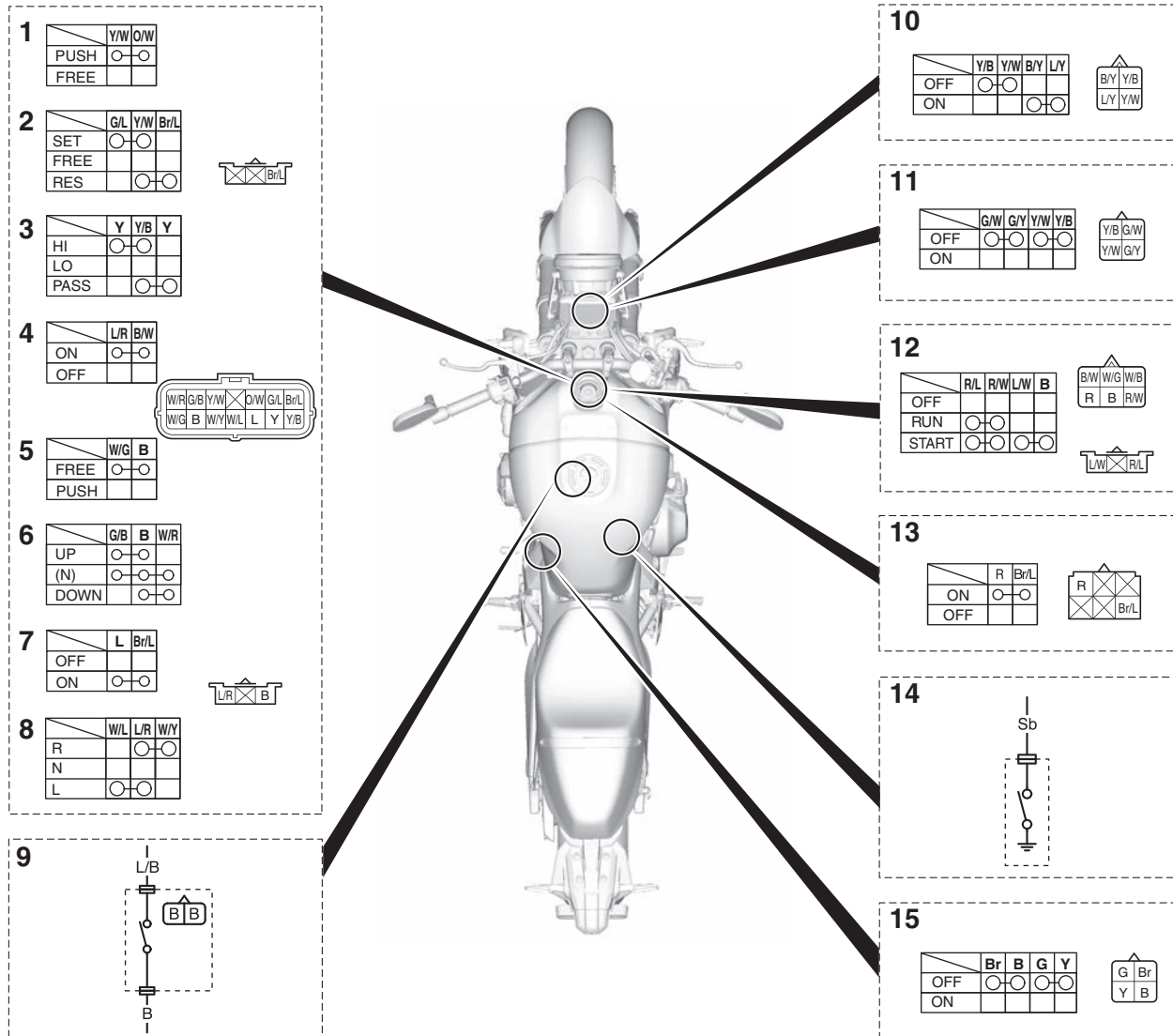
EAS30549

CHECKING THE SWITCHES

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

TIP

Refer to "CHECKING THE SWITCHES" in "BASIC INFORMATION" (separate volume).



1. Cruise control power switch
2. Cruise control setting switch
3. Dimmer/pass switch
4. Horn switch
5. Mode switch
6. Select switch
7. Hazard switch
8. Turn signal switch
9. Sidestand switch

14. Neutral switch
15. Rear brake light switch

EAS30551

CHECKING THE FUSES

The following procedure applies to all of the fuses.

ECA13680

NOTICE

To avoid a short circuit, always set the main switch to “OFF” when checking or replacing a fuse.

1. Remove:
 - 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.

TIP

Set the digital circuit tester selector to “Ω”.



**Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with ta-
chometer
YU-A1927**

- b. If the digital circuit tester indicates “O.L”, 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
Radiator fan motor	15 A	1
Brake light	2 A	1
Fuel injection system	7.5 A	1
Terminal 1	2 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 ECU	7.5 A	1
ABS solenoid	15 A	1
Cruise control	2 A	1
Spare fuse	30 A	1
Spare fuse	15 A	1
Spare fuse	10 A	1
Spare fuse	7.5 A	1
Spare fuse	2 A	1

EWA13310

WARNING

Never use a fuse with an amperage rating other than that specified. Improving 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.

ELECTRICAL COMPONENTS

4. Install:

- Fuse box cover
- Rider seat

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

ECA27250

NOTICE

- **Be careful not to lose or damage the fuse box cover. If the fuse box cover is lost or damaged, replace it with a new one.**
- **Be sure to install the fuse box cover. Water may get inside the fuse box and cause malfunction.**

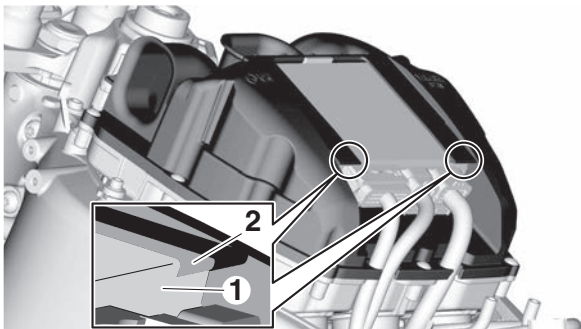
EAS31006

REPLACING THE ECU (Engine Control Unit)

1. Turn the main switch to “OFF”.
2. Replace the ECU (Engine Control Unit).

TIP

Fix the ECU “1” with the claw of air filter case cover “2” properly.



3. Clean the throttle bodies and reset the ISC (idle speed control) learning value.
Refer to “CHECKING AND CLEANING THE THROTTLE BODIES” on page 7-9.
4. Check:
 - Engine idling speed
Start the engine, warm it up, and then measure the engine idling speed.



Engine idling speed
1200–1400 r/min

EAS30552

CHECKING AND CHARGING THE BATTERY

TIP

Refer to “CHECKING AND CHARGING THE BATTERY” in “BASIC INFORMATION” (separate volume).

1. Remove:

- Rider seat
- Side cover (left and right)
- Bracket

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. Charge:

- Battery

6. Install:

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

7. Connect:

- Battery lead
(to the battery terminals)

ECA26980

NOTICE

First, connect the positive battery lead, and then the negative battery lead.

8. Check:

- Battery terminal
Dirt → Clean with a wire brush.
Loose connection → Connect properly.

9. Lubricate:

- Battery terminal



Recommended lubricant
Dielectric grease

10. Install:

- Bracket
- Side cover (left and right)
- Rider seat

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

EAS30553

CHECKING THE RELAYS

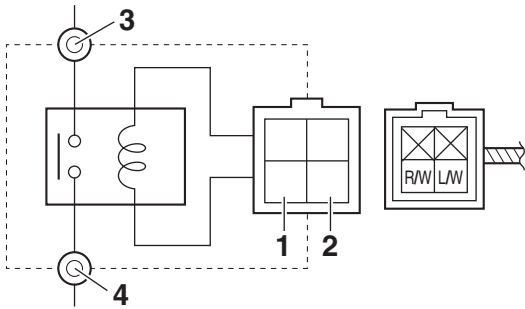
Check each switch for continuity with the digital circuit tester. If the continuity reading is incorrect, replace the relay.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

1. Disconnect the relay from the wire harness.
 2. Connect the digital circuit tester (Ω) and battery (12 V) to the relay terminal as shown. Check the relay operation.
- Out of specification → Replace.

Starter relay

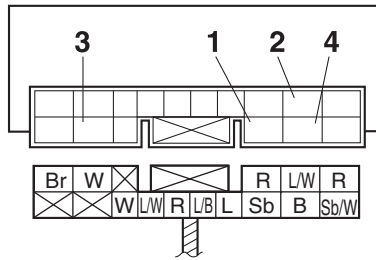


1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Relay operation
Continuity
(between “3” and “4”)

Relay unit (starting circuit cut-off relay)

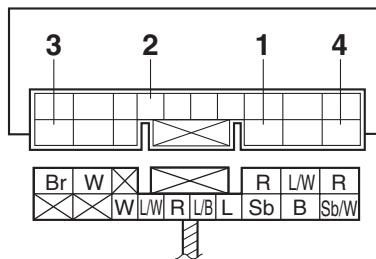


1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result
Continuity
(between “3” and “4”)

Relay unit (fuel pump relay)

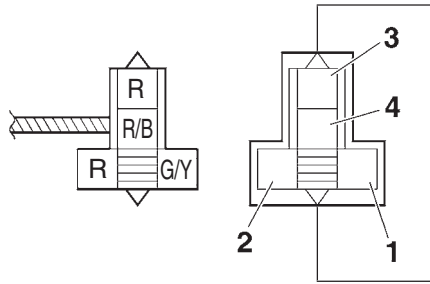


1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result
Continuity
(between “3” and “4”)

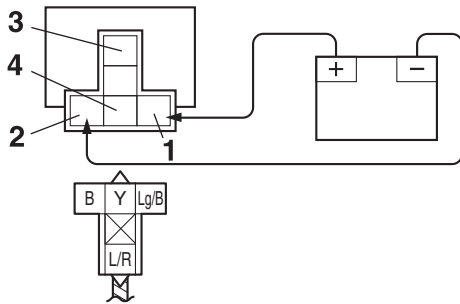
Radiator fan motor relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
Continuity
 (between "3" and "4")

Brake light relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

Result
No 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 ta-
chometer
YU-A1927

TIP

The digital circuit tester readings are shown in the following table.

No continuity
 Positive tester probe
 sky blue "1"
 Negative tester probe
 black "2"

Continuity
 Positive tester probe
 black "2"
 Negative tester probe
 sky blue "1"

No continuity
 Positive tester probe
 sky blue "1"
 Negative tester probe
 blue "3"

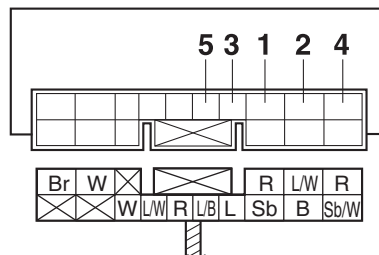
Continuity
 Positive tester probe
 blue "3"
 Negative tester probe
 sky blue "1"

No continuity
 Positive tester probe
 sky blue "1"
 Negative tester probe
 sky blue/white "4"

Continuity
 Positive tester probe
 sky blue/white "4"
 Negative tester probe
 sky blue "1"

No continuity
 Positive tester probe
 blue/black "5"
 Negative tester probe
 blue "3"

Continuity
 Positive tester probe
 blue "3"
 Negative tester probe
 blue/black "5"



ELECTRICAL COMPONENTS


- a. Disconnect the relay unit coupler from the wire harness.
- b. Connect the digital circuit tester (Ω) 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.

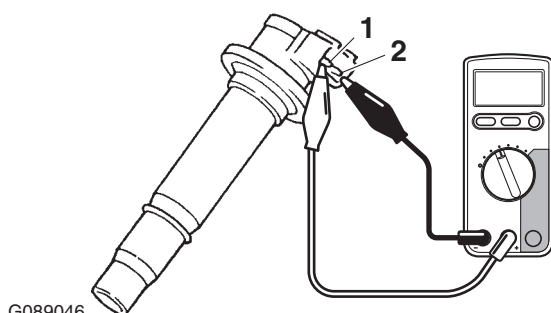
1. Check:
 - Primary coil resistance
Out of specification → Replace.

	Primary coil resistance 1.19–1.61 Ω
---	--

- a. Disconnect the ignition coil coupler from the ignition coil.
- b. Connect the digital circuit tester (Ω) to the ignition coil as shown.

	Digital circuit tester (CD732) 90890-03243 Model 88 Multimeter with tachometer YU-A1927
---	--


- Positive tester probe
Ignition coil terminal "1"
- Negative tester probe
Ignition coil terminal "2"




G089046

- c. Measure the primary coil resistance.

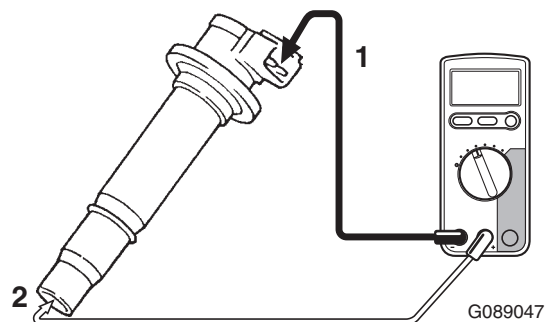
2. Check:
 - Secondary coil resistance
Out of specification → Replace.

	Secondary coil resistance 8.50–11.50 $k\Omega$
---	--

- a. Connect the digital circuit tester (Ω) 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"




G089047

- b. Measure the secondary coil resistance.

EAS30556

CHECKING THE IGNITION SPARK GAP

1. Check:
 - Ignition spark gap
Out of specification → Perform the ignition system troubleshooting, starting with step (5). Refer to "TROUBLESHOOTING" on page 8-4.

	Minimum ignition spark gap 6.0 mm (0.24 in)
---	---

TIP

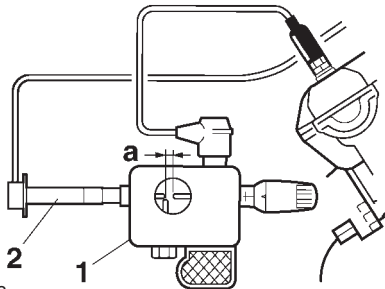
If the ignition spark gap is within specification, the ignition system circuit is operating normally.

- a. Remove the ignition coil from the spark plug.

b. Connect the ignition checker "1" as shown.



Ignition checker
90890-06754
Oppama pet-4000 spark checker
YM-34487



G089048

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 stop/run/start 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.



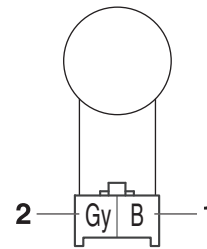
Crankshaft position sensor re-
sistance
228–342 Ω

a. Connect the digital circuit tester (Ω) to the crankshaft position sensor coupler as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with ta-
chometer
YU-A1927

- Positive tester probe
 black "1"
- Negative tester probe
 gray "2"



b. Measure the crankshaft position sensor re-
 sistance.

EAS30562

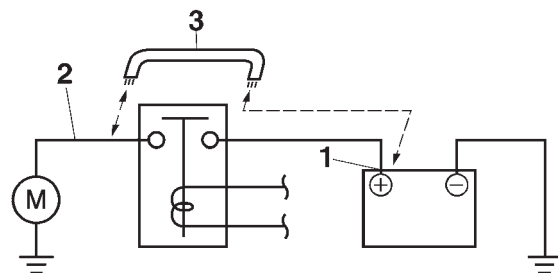
CHECKING THE STARTER MOTOR OPERATION

1. Check:
 - Starter motor operation
 Does not operate → Perform the electric starting system troubleshooting, starting with step (4).
 Refer to "TROUBLESHOOTING" on page 8-10.
- a. Connect the positive battery terminal "1" and starter motor lead "2" with a jumper lead "3".

EWA13810

⚠ WARNING

- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.**



G089054

b. Check the starter motor operation.

EAS30566

CHECKING THE STATOR COIL

1. Disconnect:
 - Stator coil coupler
(from the wire harness)
2. Check:
 - Stator coil resistance
Out of specification → Replace the stator coil.



Stator coil resistance
0.152–0.228 Ω

- a. Connect the digital circuit tester to the stator coil coupler as shown.

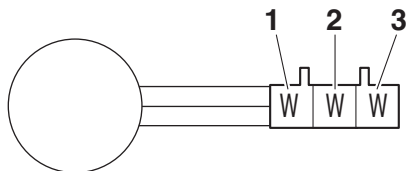


Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with ta-
chometer
YU-A1927

- Positive tester probe
white “1”
- Negative tester probe
white “2”

- Positive tester probe
white “1”
- Negative tester probe
white “3”

- Positive tester probe
white “2”
- Negative tester probe
white “3”



- b. Measure the stator coil resistance.

EAS30680

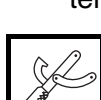
CHECKING THE RECTIFIER/REGULATOR

1. Check:
 - Battery charging voltage
Out of specification → Check the stator coil condition. If the stator coil does not have a problem, replace the rectifier/regulator. Refer to “CHECKING THE STATOR COIL” on page 8-46.



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 ta-
chometer
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 assembly.



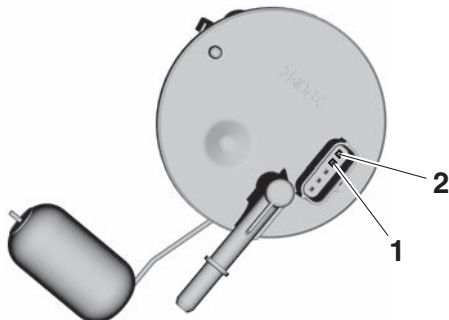
Sender unit resistance (full)
9.0–12.0 Ω
Sender unit resistance (empty)
213.0–219.0 Ω

- Connect the digital circuit tester (Ω) to the fuel sender terminals as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with ta-
chometer
YU-A1927

- Positive tester probe → Fuel sender terminal “1”
- Negative tester probe → Fuel sender terminal “2”



- Move the fuel sender float to maximum and minimum level position.

EAS30574

CHECKING THE FUEL LEVEL WARNING LIGHT

This model is equipped with a self-diagnosis device for the fuel level detection circuit.

1. Check:

- Fuel level warning light “1”
(Turn the main switch to “ON”.)
Warning light comes on for a few seconds, then goes off → Warning light is OK.
Warning light does not come on → Replace the meter assembly.
Warning light flashes eight times, then goes off for 3 seconds in a repeated cycle (malfunction detected in fuel sender) → Replace the fuel pump assembly.



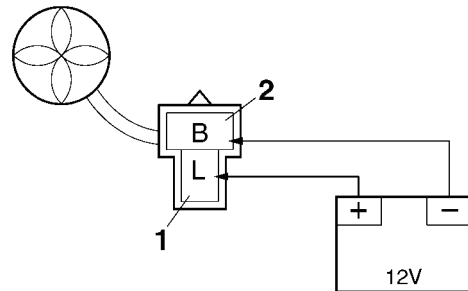
EAS30577

CHECKING THE RADIATOR FAN MOTOR

1. Check:

- Radiator fan motor
Faulty/rough movement → Replace.
- Disconnect the radiator fan motor coupler from the wire harness.
 - Connect the battery (DC 12 V) as shown.

- Positive tester probe blue “1”
- Negative tester probe black “2”



- Measure the radiator fan motor movement.

EAS30578

CHECKING THE COOLANT TEMPERATURE SENSOR

1. Remove:

- Coolant temperature sensor
Refer to “CYLINDER HEAD” on page 5-27.

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.

ELECTRICAL COMPONENTS

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)

- Connect the digital circuit tester (Ω) to the coolant temperature sensor as shown.



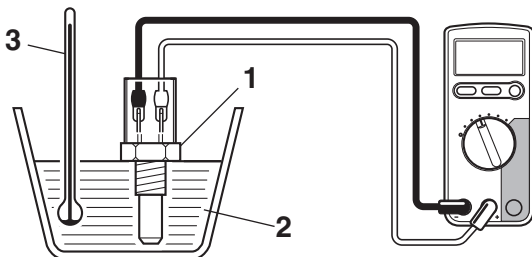
Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927

- Immerse the coolant temperature sensor “1” in a container filled with coolant “2”.

TIP

Make sure the coolant temperature sensor terminals do not get wet.

- Place a thermometer “3” in the coolant.



G089056

- Heat the coolant or let it cool down to the specified temperatures.
- 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:

- Air filter case
Refer to “GENERAL CHASSIS (5)” on page 4-11.

2. Check:

- Throttle valve operation
Throttle valves do not fully close → Replace the throttle bodies.
- Connect two C-size batteries to the throttle servo motor terminals “1” as shown.

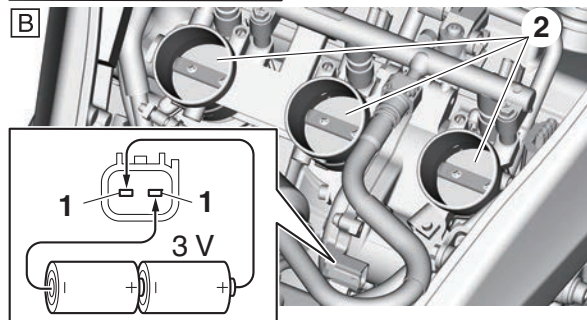
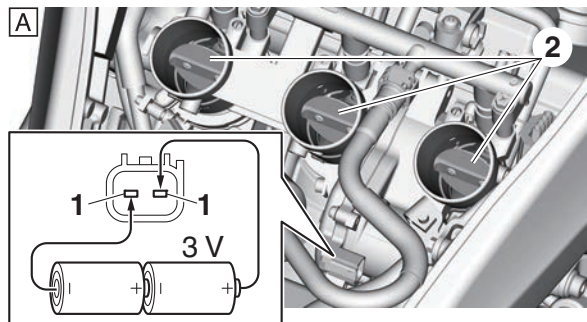
ECA17660

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. 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

289–391 Ω at 80 °C (289–391 Ω at 176 °F)

- Connect the digital circuit tester (Ω) to the intake air temperature sensor terminal as shown.



Digital circuit tester (CD732)

90890-03243

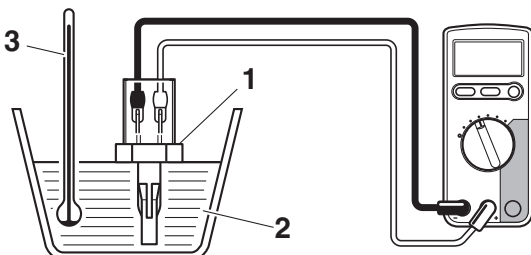
Model 88 Multimeter with tachometer
YU-A1927

- 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.

- Place a thermometer “3” in the water.



G089057

- Slowly heat the water, then let it cool down to the specified temperature.
- Measure the intake air temperature sensor resistance.

3. Install:

- Intake air temperature sensor

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 7-6.

2. Check:

- Fuel injector resistance

Out of specification → Replace the fuel injector.



Resistance

12.0 Ω

- Disconnect the fuel injector coupler from the fuel injector.
- Connect the digital circuit tester (Ω) to the fuel injector coupler as shown.

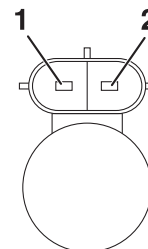


Digital circuit tester (CD732)

90890-03243

Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → Injector terminal “1”
- Negative tester probe → Injector terminal “2”



- Measure the fuel injector resistance.


ELECTRICAL COMPONENTS

EAS32604

CHECKING THE PURGE CUT VALVE SOLENOID


1. Check:

- Purge cut valve solenoid resistance
Out of specification → Replace.



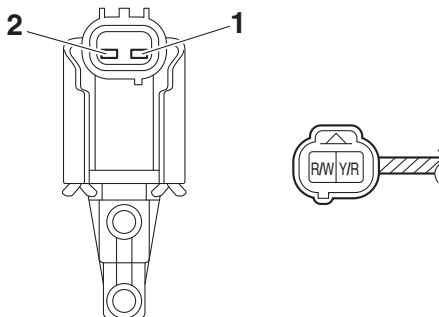
Solenoid resistance
22–26 Ω

- Disconnect the purge cut valve solenoid coupler from the wire harness.
- Connect the digital circuit tester to the purge cut valve solenoid terminals 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”




- Measure the purge cut valve solenoid resistance.

EAS31673

CHECKING THE WHEEL SWITCH

1. Check:


- Wheel switch “1” output voltage
Out of specification → Replace the right handlebar switch.
- Connect the digital circuit tester (DC V) to the handlebar switch coupler (right) as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927


- Positive tester probe
white/green “2”
- Negative tester probe
black/white “3”

- Turn the main switch to “ON”.
- When turning the wheel switch in direction “a” and “b”, check that the output voltage is within the specified values.



Output voltage reading cycle
More than 5 V to less than 0.5 V
then back to more than 5 V to
less than 0.5 V


- Connect the digital circuit tester (DC V) to the handlebar switch coupler (right) as shown.



Digital circuit tester (CD732)
90890-03243
Model 88 Multimeter with tachometer
YU-A1927


- Positive tester probe
white/black “4”
- Negative tester probe
black/white “3”

- When turning the wheel switch in direction “a”, check that the output voltage is within the specified values.

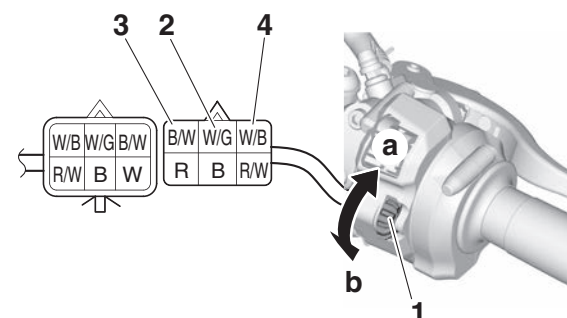


Output voltage
More than 5 V

- When turning the wheel switch in direction “b”, check that the output voltage is within the specified values.



Output voltage
Less than 0.5 V



SELF DIAGNOSTIC

SELF-DIAGNOSTIC FUNCTION	9-1
GLOSSARY	9-1
OUTLINE	9-1
CHECKING THE WARNING LIGHT	9-2
YDT	9-3
PARTS CONNECTED TO THE ECU	9-4
PARTS CONNECTED TO THE ABS ECU	9-4
PRECAUTIONS FOR ROAD TEST	9-4
COPE WITH THE MIL FLASHING	9-4
SYSTEM DIAGRAM	9-5
ECU CIRCUIT DIAGRAM.....	9-5
ECU COUPLER LAYOUT	9-8
FUEL INJECTION SYSTEM	9-12
CIRCUIT DIAGRAM	9-12
BASIC PROCESS FOR TROUBLESHOOTING	9-14
[A] THE MIL COMES ON/FLASHES AND ENGINE OPERATION IS NOT NORMAL.....	9-15
[B] THE MIL DOES NOT COME ON, BUT THE ENGINE OPERATION IS NOT NORMAL	9-15
IMMOBILIZER SYSTEM	9-16
CIRCUIT DIAGRAM	9-16
SYSTEM OUTLINE	9-18
PART REPLACEMENT AND KEY CODE REGISTRATION REQUIREMENTS.....	9-19
TROUBLESHOOTING	9-22
HOW TO CHECK DTC.....	9-23
CRUISE CONTROL SYSTEM	9-24
CIRCUIT DIAGRAM	9-24
CRUISE CONTROL CIRCUIT OPERATION.....	9-26
BASIC INSTRUCTIONS FOR TROUBLESHOOTING	9-27
BASIC PROCESS FOR TROUBLESHOOTING	9-28
[A] CHECKING THE CRUISE CONTROL SYSTEM INDICATOR LIGHT	9-29
[B-1] DIAGNOSIS USING THE DTC	9-29
[B-2] DIAGNOSIS USING THE MALFUNCTION HISTORY CODES.....	9-29
[B-3] MALFUNCTION HISTORY IS NOT DISPLAYED	9-29
[C-1] ERASING THE DTC	9-30
[C-2] FINAL CHECK	9-30

ABS (Anti-lock Brake System)	9-32
CIRCUIT DIAGRAM	9-32
ABS COMPONENTS CHART	9-34
ABS COUPLER LOCATION CHART	9-35
MAINTENANCE OF THE ABS ECU	9-36
ABS TROUBLESHOOTING OUTLINE.....	9-36
BASIC INSTRUCTIONS FOR TROUBLESHOOTING.....	9-37
[A] CHECKING THE ABS WARNING LIGHT	9-39
[A-1] ONLY THE ABS WARNING LIGHT FAILS TO COME ON.....	9-39
[A-2] ALL INDICATOR LIGHTS FAIL TO COME ON	9-39
[A-3] THE ABS WARNING LIGHT COMES ON	9-39
[A-4] ONLY THE ABS ECU FAILS TO COMMUNICATE	9-40
[A-5] ABS ECU AND FI ECU FAIL TO COMMUNICATE	9-40
[B-1] MALFUNCTION ARE CURRENTLY DETECTED	9-40
[B-2] DIAGNOSIS USING THE DTC	9-41
[B-3] DELETING THE DTC	9-41
[C-1] FINAL CHECK	9-41
SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE	9-43
DTC TABLE.....	9-43
SELF-DIAGNOSTIC FUNCTION TABLE	
(FOR FUEL INJECTION SYSTEM).....	9-51
SELF-DIAGNOSTIC FUNCTION TABLE	
(FOR IMMOBILIZER SYSTEM)	9-71
SELF-DIAGNOSTIC FUNCTION TABLE	
(FOR ABS (Anti-lock Brake System))	9-72
COMMUNICATION ERROR WITH THE METER	9-77
DIAGNOSTIC CODE: SENSOR OPERATION TABLE	9-77
DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE	9-82
EVENT CODE TABLE	9-84
30_EVENT	9-87
TROUBLESHOOTING	9-87
70_EVENT	9-89
TROUBLESHOOTING	9-89
C0520	9-90
TROUBLESHOOTING	9-90
P0030	9-94
TROUBLESHOOTING	9-94
P00D1, P2195	9-98
TROUBLESHOOTING	9-98

P0105	9-102
TROUBLESHOOTING	9-102
P0106	9-104
TROUBLESHOOTING	9-104
P0107, P0108	9-106
TROUBLESHOOTING	9-106
P0110	9-110
TROUBLESHOOTING	9-110
P0111	9-112
TROUBLESHOOTING	9-112
P0112, P0113	9-115
TROUBLESHOOTING	9-115
P0115	9-119
TROUBLESHOOTING	9-119
P0116	9-120
TROUBLESHOOTING	9-120
P0117, P0118	9-123
TROUBLESHOOTING	9-123
P0122, P0123, P0222, P0223	9-127
TROUBLESHOOTING	9-127
P0132	9-132
TROUBLESHOOTING	9-132
P0133	9-136
OUTLINE	9-136
FAIL-SAFE SYSTEM.....	9-137
TROUBLESHOOTING	9-137
P0134	9-138
TROUBLESHOOTING	9-138
P0201	9-140
TROUBLESHOOTING	9-140

P0202	9-143
TROUBLESHOOTING	9-143
P0203	9-146
TROUBLESHOOTING	9-146
P0300, P0301, P0302, P0303	9-149
OUTLINE	9-149
FAIL-SAFE SYSTEM.....	9-150
TROUBLESHOOTING	9-150
P0335	9-153
TROUBLESHOOTING	9-153
P0351	9-157
TROUBLESHOOTING	9-157
P0352	9-161
TROUBLESHOOTING	9-161
P0353	9-165
TROUBLESHOOTING	9-165
P0458	9-169
TROUBLESHOOTING	9-169
P0480	9-173
TROUBLESHOOTING	9-173
P0500, P1500	9-176
TROUBLESHOOTING	9-176
P0560, P0563	9-188
TROUBLESHOOTING	9-188
P0564	9-189
TROUBLESHOOTING	9-189
P056C	9-195
TROUBLESHOOTING	9-195
P0601	9-202
TROUBLESHOOTING	9-202

P0606	9-203
TROUBLESHOOTING	9-203
P062F	9-204
TROUBLESHOOTING	9-204
P0638	9-206
TROUBLESHOOTING	9-206
P0657	9-210
TROUBLESHOOTING	9-210
P0914	9-214
TROUBLESHOOTING	9-214
P0915	9-216
TROUBLESHOOTING	9-216
P0916, P0917	9-218
TROUBLESHOOTING	9-218
P1004	9-222
TROUBLESHOOTING	9-222
P1600	9-224
TROUBLESHOOTING	9-224
P1601	9-228
TROUBLESHOOTING	9-228
P1602	9-232
TROUBLESHOOTING	9-232
P1606, P1607	9-236
TROUBLESHOOTING	9-236
P1608	9-240
TROUBLESHOOTING	9-240
P1609	9-242
TROUBLESHOOTING	9-242

P1806, P1807	9-244
TROUBLESHOOTING	9-244
P2122, P2123, P2127, P2128, P2138	9-248
TROUBLESHOOTING	9-248
P2135	9-252
TROUBLESHOOTING	9-252
P2158	9-255
TROUBLESHOOTING	9-255
U0125	9-260
TROUBLESHOOTING	9-260
U0155 or Err	9-263
TROUBLESHOOTING	9-263
51_IMMOBILIZER	9-267
TROUBLESHOOTING	9-267
52_IMMOBILIZER	9-268
TROUBLESHOOTING	9-268
53_IMMOBILIZER	9-269
TROUBLESHOOTING	9-269
54_IMMOBILIZER	9-272
TROUBLESHOOTING	9-272
55_IMMOBILIZER	9-273
TROUBLESHOOTING	9-273
56_IMMOBILIZER	9-274
TROUBLESHOOTING	9-274
11_ABS	9-277
TROUBLESHOOTING	9-277
12_ABS	9-278
TROUBLESHOOTING	9-278

13, 26_ABS	9-279
TROUBLESHOOTING	9-279
14, 27_ABS	9-280
TROUBLESHOOTING	9-280
15_ABS	9-281
TROUBLESHOOTING	9-281
16_ABS	9-283
TROUBLESHOOTING	9-283
21_ABS	9-285
TROUBLESHOOTING	9-285
31_ABS	9-286
TROUBLESHOOTING	9-286
33_ABS	9-288
TROUBLESHOOTING	9-288
34_ABS	9-290
TROUBLESHOOTING	9-290
41_ABS	9-291
TROUBLESHOOTING	9-291
42_ABS	9-292
TROUBLESHOOTING	9-292
43, 45_ABS	9-293
TROUBLESHOOTING	9-293
44, 46_ABS	9-294
TROUBLESHOOTING	9-294
51_ABS	9-295
TROUBLESHOOTING	9-295
53_ABS	9-296
TROUBLESHOOTING	9-296

55_ABS	9-298
TROUBLESHOOTING	9-298
56_ABS	9-299
TROUBLESHOOTING	9-299
57_ABS	9-300
TROUBLESHOOTING	9-300
62_ABS	9-304
TROUBLESHOOTING	9-304
68_ABS	9-305
TROUBLESHOOTING	9-305
89_ABS	9-306
TROUBLESHOOTING	9-306
90_ABS	9-309
TROUBLESHOOTING	9-309
91_ABS	9-312
TROUBLESHOOTING	9-312

SELF-DIAGNOSTIC FUNCTION

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.
Pending DTC (Pending diagnostic trouble code)	Pending DTC is a code that is saved within a control unit's memory when the control unit detects an abnormal condition. If the abnormal condition continues, a malfunction may be determined.
Driving cycle	Driving cycle is the duration from the main switch being turned on, OBD requirements are met, and until the main switch is turned off.
FFD (Freeze frame data)	FFD is the data of all signal sensors saved at the moment a malfunction is determined.
Current malfunction	A DTC for an unrecovered, current malfunction.
Recovered malfunction	A DTC for a previously determined but now recovered malfunction.
Pending abnormality	Abnormal condition that is detected but not yet determined to be a malfunction.
Threshold	Threshold is a point set to detect if the output from sensors are abnormal or not.
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.

SELF-DIAGNOSTIC FUNCTION

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 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 O₂ 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*1
IMMOBILIZER SYSTEM	Immobilizer system indicator light “2”	About 0.15 seconds
ABS (Anti-lock Brake System)	ABS warning light “3”	*2
CRUISE CONTROL SYSTEM	MIL “1”	2.0 seconds

SELF-DIAGNOSTIC FUNCTION

TIP

- *1: If the MIL flashed, refer to “COPE WITH THE MIL FLASHING” on page 9-4.
 - *2: 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
90890-03267

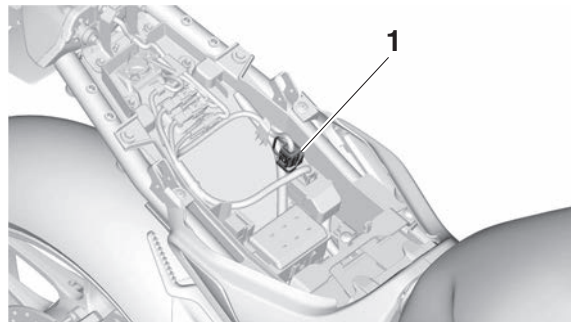
Yamaha diagnostic tool (A/I)
90890-03264

TIP

- Yamaha diagnostic tool (A/I) (90890-03264) 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”.



SELF-DIAGNOSTIC FUNCTION

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
- Injector #1
- Injector #2
- Injector #3
- Clutch switch
- Ignition coil #1
- Ignition coil #2
- Ignition coil #3
- Throttle position sensor
- Intake air pressure sensor 1
- Intake air pressure sensor 2
- Coolant temperature sensor
- Gear position sensor
- Shift sensor
- Intake air temperature sensor
- Fuel pump
- O₂ sensor
- Hydraulic unit assembly (ABS ECU)
- Throttle servo motor
- Relay unit
- Starter relay
- Purge cut valve solenoid
- Brake light relay
- Radiator fan motor relay
- Meter assembly
- Immobilizer unit
- Headlight control unit
- Handlebar switch (left and right)
- IMU (Inertial Measurement Unit)

EAS32918

PARTS CONNECTED TO THE ABS ECU

The following parts are connected to the hydraulic unit assembly (ABS ECU).

When checking for a power short circuit, the couplers must be disconnected from all of the following parts beforehand.

- Meter assembly
- IMU (Inertial Measurement Unit)
- ECU (Engine Control Unit)
- Front wheel sensor
- Rear wheel sensor
- Handlebar switch (left)
- Rear brake light switch
- Tail/brake light
- Brake light relay

EAS33137

PRECAUTIONS FOR ROAD TEST

EWA20860



When test riding the vehicle, always comply with local traffic regulations.

EAS33283

COPE WITH THE MIL FLASHING

With the vehicle is running, the MIL flashes by the process of the misfire (P0300/P0301/P0302/P0303) detection procedure but no DTC is sometimes stored. In this case, question the customer about the conditions when the problem occurred, and do the troubleshooting.

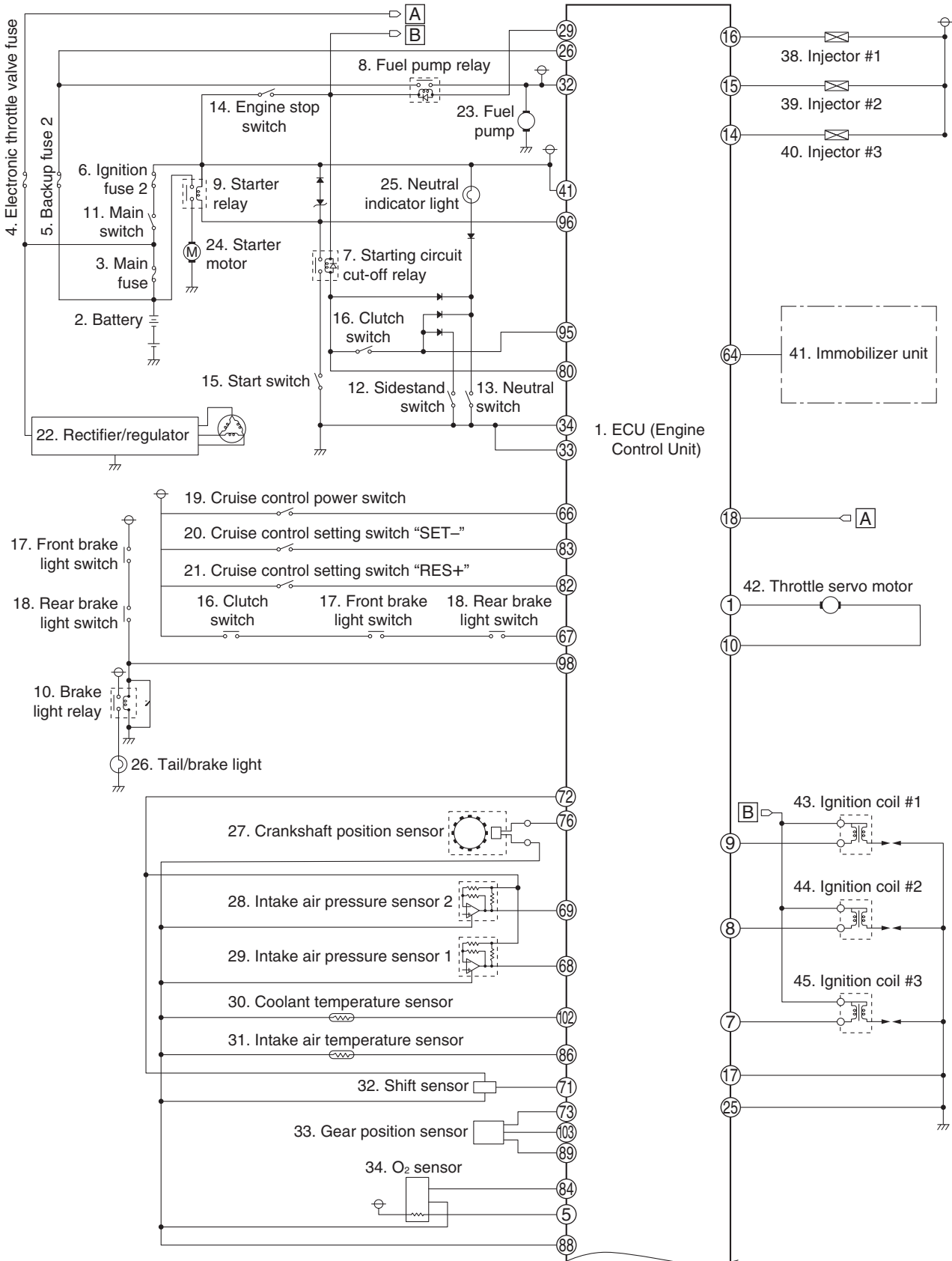
Refer to “P0300, P0301, P0302, P0303” on page 9-149.

EAS20387

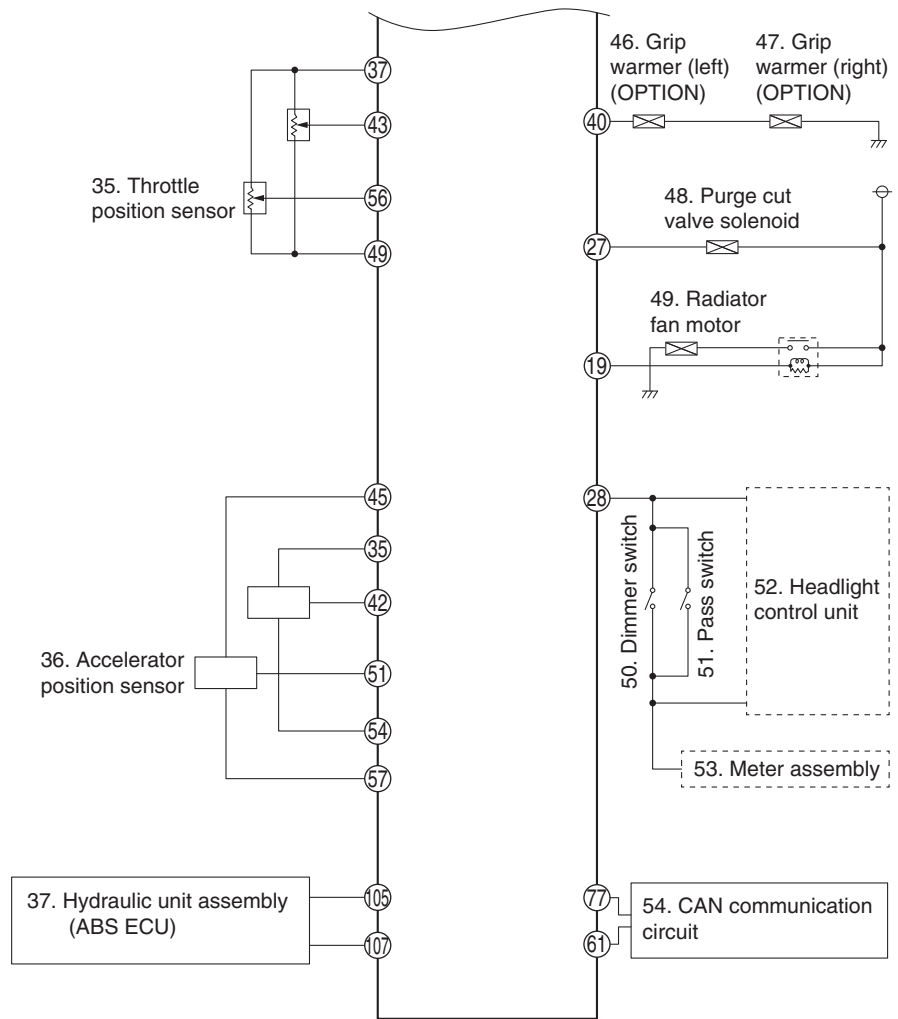
SYSTEM DIAGRAM

EAS32920

ECU CIRCUIT DIAGRAM



SYSTEM DIAGRAM



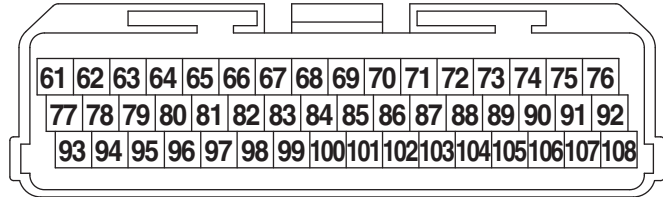
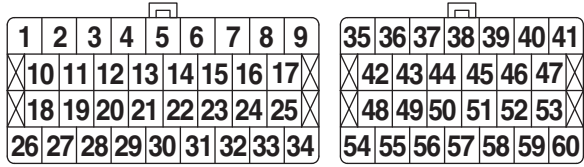
SYSTEM DIAGRAM

1. ECU (Engine Control Unit)
2. Battery
3. Main fuse
4. Electronic throttle valve fuse
5. Backup fuse 2
6. Ignition fuse 2
7. Starting circuit cut-off relay
8. Fuel pump relay
9. Starter relay
10. Brake light relay
11. Main switch
12. Sidestand switch
13. Neutral switch
14. Stop/run/start switch (stop switch)
15. Stop/run/start switch (start switch)
16. Clutch switch
17. Front brake light switch
18. Rear brake light switch
19. Cruise control power switch
20. Cruise control setting switch "SET-"
21. Cruise control setting switch "RES+"
22. Rectifier/regulator
23. Fuel pump
24. Starter motor
25. Neutral indicator light
26. Tail/brake light
27. Crankshaft position sensor
28. Intake air pressure sensor 2
29. Intake air pressure sensor 1
30. Coolant temperature sensor
31. Intake air temperature sensor
32. Shift sensor
33. Gear position sensor
34. O₂ sensor
35. Throttle position sensor
36. Accelerator position sensor
37. Hydraulic unit assembly (ABS ECU)
38. Injector #1
39. Injector #2
40. Injector #3
41. Immobilizer unit
42. Throttle servo motor
43. Ignition coil #1
44. Ignition coil #2
45. Ignition coil #3
46. Grip warmer (left) (OPTION)
47. Grip warmer (right) (OPTION)
48. Purge cut valve solenoid
49. Radiator fan motor
50. Dimmer switch
51. Pass switch
52. Headlight control unit
53. Meter assembly
54. CAN communication circuit

SYSTEM DIAGRAM

EAS33369

ECU COUPLER LAYOUT



No.	Connected parts	Wireharness color
1	Throttle servo motor	Y/R
2	—	—
3	—	—
4	—	—
5	O ₂ sensor	P/B
6	—	—
7	Ignition coil #3	O/G
8	Ignition coil #2	Gy/R
9	Ignition coil #1	O
10	Throttle servo motor	Lg/R
11	—	—
12	—	—
13	—	—
14	Injector #3	L/B
15	Injector #2	G/B
16	Injector #1	R/B
17	Ground	B
18	Electronic throttle valve fuse	R/L
19	Radiator fan motor relay	G/Y
20	—	—
21	—	—
22	—	—
23	—	—
24	—	—
25	Ground	B
26	Backup fuse 2	R/G
27	Purge cut valve solenoid	Y/R

No.	Connected parts	Wireharness color
28	Dimmer/pass switch, Headlight control unit	Y/B
29	Fuel pump relay	L/W
30	—	—
31	—	—
32	Fuel pump relay, Fuel pump	R/L
33	Ground	B/W
34	Ground	B/W
35	Accelerator position sensor	W/R
36	Hydraulic unit assembly (ABS ECU)	G
37	Throttle position sensor	L
38	—	—
39	—	—
40	Grip warmer (left) (OPTION), Grip warmer (right) (OPTION)	Br/Y
41	Ignition fuse 2	R/W
42	Accelerator position sensor	Y
43	Throttle position sensor	W
44	—	—
45	Accelerator position sensor	Y/R
46	—	—
47	—	—
48	—	—

SYSTEM DIAGRAM

No.	Connected parts	Wire harness color
49	Throttle position sensor	B/L
50	—	—
51	Accelerator position sensor	Br
52	—	—
53	—	—
54	Accelerator position sensor	W/B
55	—	—
56	Throttle position sensor	B
57	Accelerator position sensor	Y/B
58	—	—
59	—	—
60	—	—
61	CAN communication circuit	L/B
62	—	—
63	—	—
64	Immobilizer unit	Y/L
65	—	—
66	Cruise control power switch	O/W
67	Rear brake light switch	Lg/L
68	Intake air pressure sensor 1	P/W
69	Intake air pressure sensor 2	P
70	—	—
71	Shift sensor	V
72	Intake air pressure sensor 1, Intake air pressure sensor 2, Shift sensor	L
73	Gear position sensor	L
74	—	—
75	—	—
76	Crankshaft position sensor	Gy

No.	Connected parts	Wire harness color
77	CAN communication circuit	L/W
78	—	—
79	—	—
80	Starting circuit cut-off relay, Clutch switch	B/Y
81	—	—
82	Cruise control setting switch "RES+"	Br/L
83	Cruise control setting switch "SET-"	G/L
84	O ₂ sensor	Gy/G
85	—	—
86	Intake air temperature sensor	Br/W
87	—	—
88	Crankshaft position sensor, Intake air pressure sensor 1, Intake air pressure sensor 2, Coolant temperature sensor, Intake air temperature sensor, Shift sensor, O ₂ sensor	B/L
89	Gear position sensor	B/L
90	—	—
91	—	—
92	—	—
93	—	—
94	—	—
95	Clutch switch	L/Y
96	Starting circuit cut-off relay	L/W
97	—	—
98	Brake light relay, Rear brake light switch	Lg/B
99	—	—
100	—	—
101	—	—

SYSTEM DIAGRAM

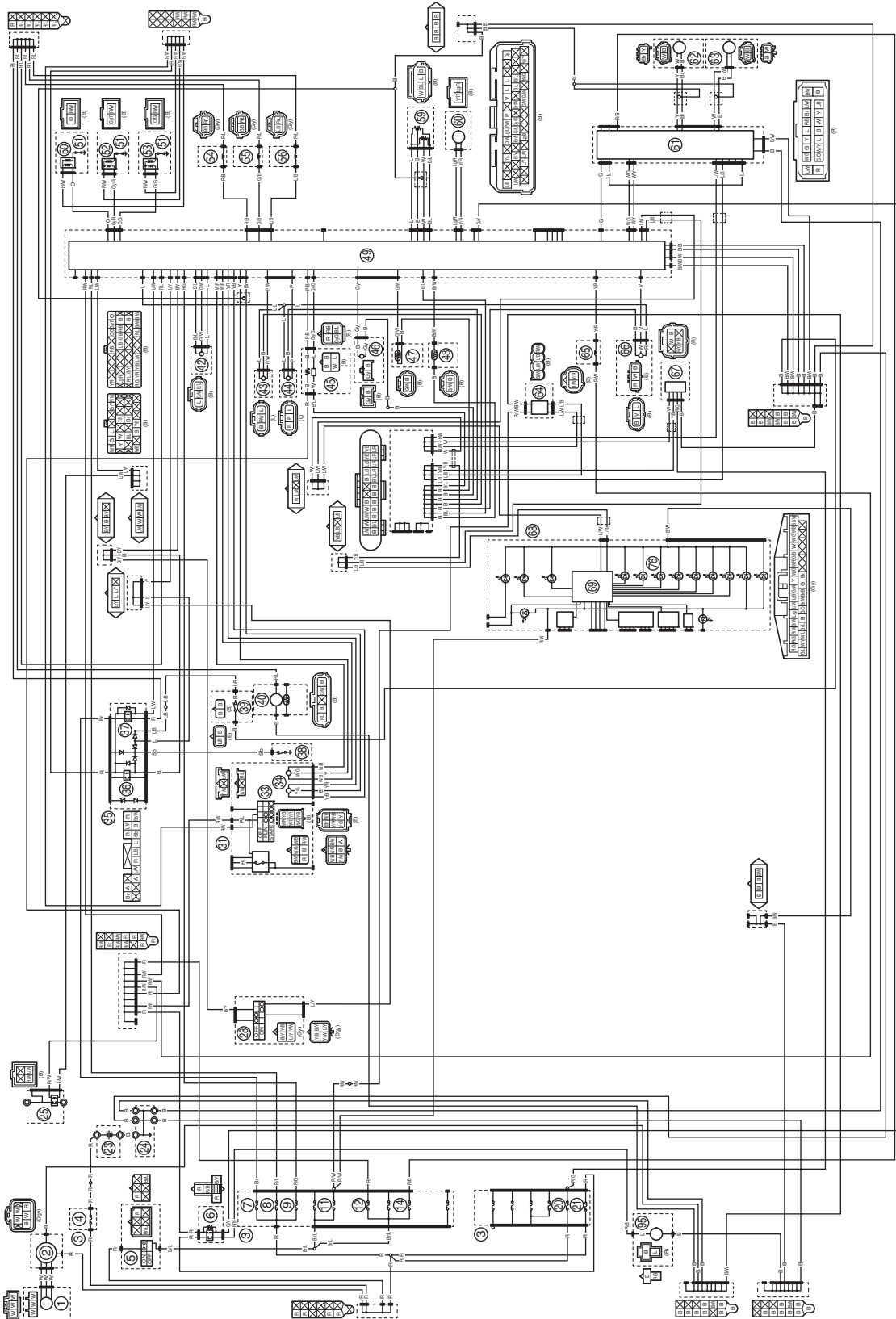
No.	Connected parts	Wire harness color
102	Coolant temperature sensor	G/W
103	Gear position sensor	G/W
104	—	—
105	Hydraulic unit assembly (ABS ECU)	W/G
106	—	—
107	Hydraulic unit assembly (ABS ECU)	W/Y
108	—	—

EAS20440

FUEL INJECTION SYSTEM

EAS32871

CIRCUIT DIAGRAM



FUEL INJECTION SYSTEM

1. AC magneto
2. Rectifier/regulator
3. Fuse box
4. Main fuse
5. Main switch
6. Radiator fan motor relay
7. Fuel injection system fuse
8. Electronic throttle valve fuse
9. Backup fuse 2
11. Ignition fuse 2
12. Ignition fuse
14. ABS ECU fuse
20. Backup fuse
21. Radiator fan motor fuse
23. Battery
24. Engine ground
25. Starter relay
28. Clutch switch
31. Handlebar switch (right)
33. Stop/run/start switch
34. Accelerator position sensor
35. Relay unit
36. Starting circuit cut-off relay
37. Fuel pump relay
38. Neutral switch
39. Sidestand switch
40. Fuel pump
42. Gear position sensor
43. Intake air pressure sensor 1
44. Intake air pressure sensor 2
45. O₂ sensor
46. Crankshaft position sensor
47. Coolant temperature sensor
48. Intake air temperature sensor
49. ECU (Engine Control Unit)
50. Ignition coil #1
51. Spark plug
52. Ignition coil #2
53. Ignition coil #3
54. Injector #1
55. Injector #2
56. Injector #3
59. Throttle position sensor
60. Throttle servo motor
61. Hydraulic unit assembly (ABS ECU)
62. Front wheel sensor
63. Rear wheel sensor
64. IMU (Inertial Measurement Unit)
65. Purge cut valve solenoid
66. Shift sensor
67. YDT coupler
68. Meter assembly
69. Multi-function meter
76. MIL (Malfunction indicator light)
95. Radiator fan motor

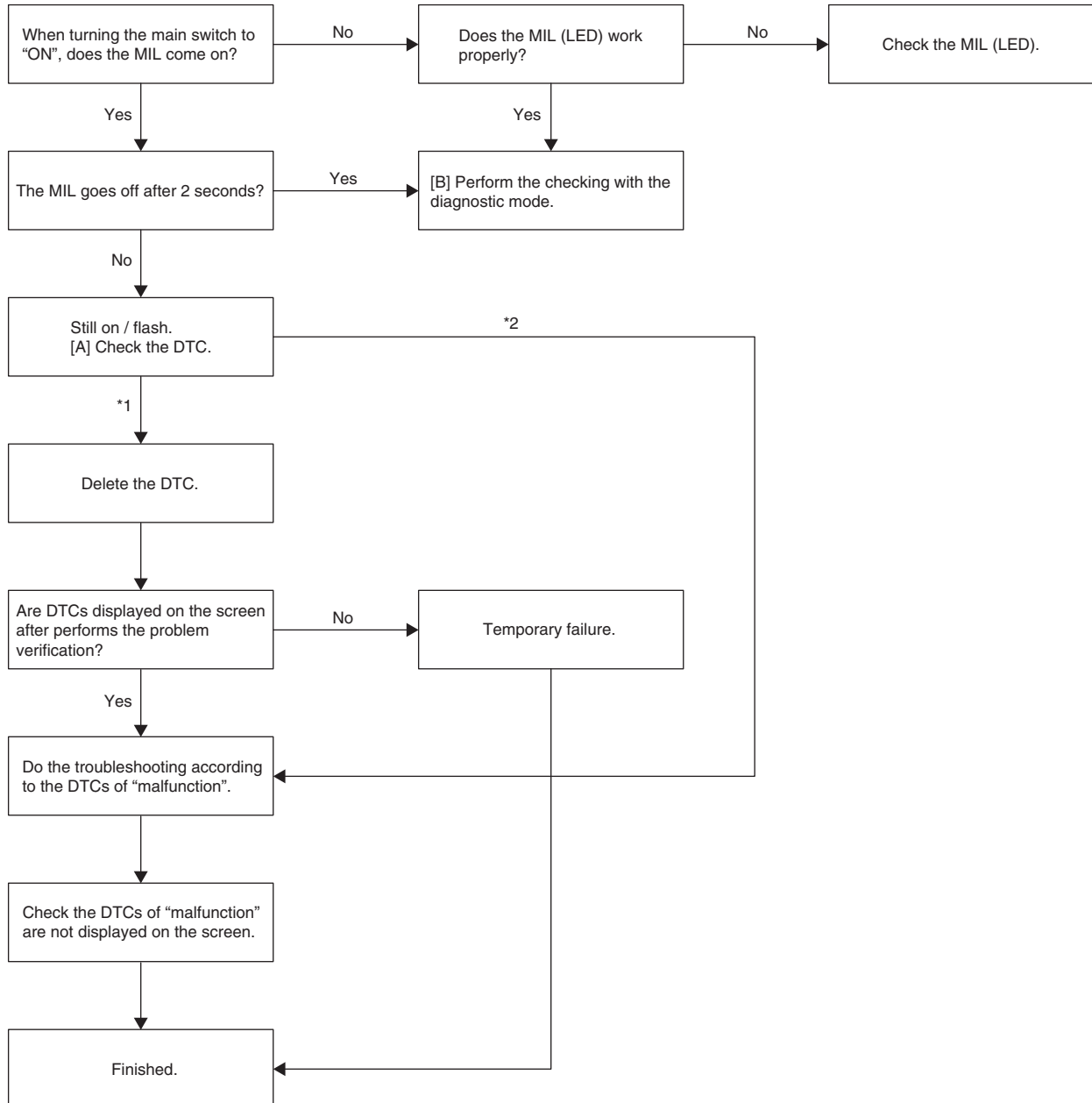
FUEL INJECTION SYSTEM

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.



*1. For P0133, P0300, P0301, P0302, P0303

*2. For except P0133, P0300, P0301, P0302, P0303

FUEL INJECTION SYSTEM

EAS33147

[A] THE MIL COMES ON/FLASHES AND ENGINE OPERATION IS NOT NORMAL

1. Check the DTC of “malfunction” using the YDT.
2. Delete the DTC using the YDT. (Only for *1)
3. Check and repair the malfunction according to applicable DTC troubleshooting.
4. 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 (4) 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 9-77 and “DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE” on page 9-82.

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
32: Cylinder-#3 ignition coil
36: Injector #1
37: Injector #2
38: Injector #3

If a malfunction is detected in the sensors or actuators, repair or replace all faulty parts.

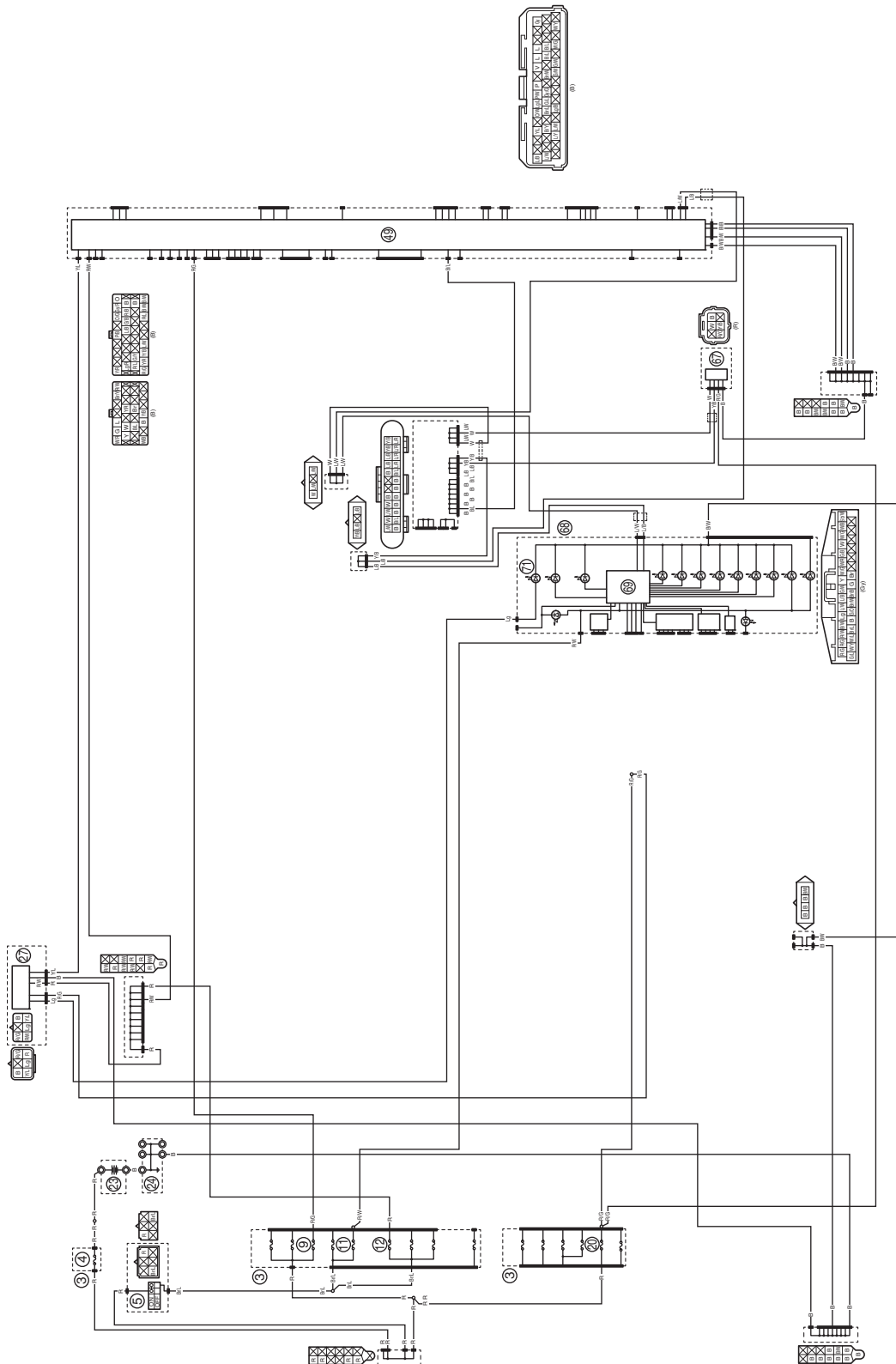
If no malfunction is detected in the sensors and actuators, check and repair the inner parts of the engine.

EAS20442

IMMOBILIZER SYSTEM

EAS32885

CIRCUIT DIAGRAM



IMMOBILIZER SYSTEM

- 3. Fuse box
- 4. Main fuse
- 5. Main switch
- 9. Backup fuse 2
- 11. Ignition fuse 2
- 12. Ignition fuse
- 20. Backup fuse
- 23. Battery
- 24. Engine ground
- 27. Immobilizer unit
- 49. ECU (Engine Control Unit)
- 67. YDT coupler
- 68. Meter assembly
- 69. Multi-function meter
- 71. Immobilizer system indicator light

EAS32886

SYSTEM OUTLINE

This vehicle is equipped with an immobilizer system to help prevent theft by re-registering codes in the standard keys. This system consists of the following:

- A code re-registering key (with a red bow)
- Two standard keys (with a black bow) that can be re-registered with new codes
- A transponder (installed in the red key bow)
- An immobilizer unit
- The ECU
- An immobilizer system indicator light

The key with the red bow is used to register codes in each standard key. Do not use the key with the red bow for driving. It should only be used for re-registering new codes in the standard keys. The immobilizer system cannot be operated with a new key until the key registered with a code. If you lose the code re-registering key, the ECU and main switch (equipped with the immobilizer unit) need to be replaced.

Therefore, always use a standard key for driving. (See NOTICE.)

TIP

Each standard key is registered during production, therefore re-registering at purchase is not necessary.

ECA14971

NOTICE

- **DO NOT LOSE THE CODE RE-REGISTERING KEY!** If the code re-registering key is lost, registering new codes in the standard keys is impossible. The standard keys can still be used to start the vehicle. However, if code re-registering is required (e.g., if a new standard key is made or all keys are lost) the entire immobilizer system must be replaced. Therefore, it is highly recommended to use either standard key for driving, and to keep the code re-registering key in a safe place.
 - Do not submerge the keys in water.
 - Do not expose the keys to excessively high temperatures.
 - Do not place the keys close to magnets (this includes, but is not limited to, products such as speakers, etc.).
 - Do not place heavy items on the keys.
 - Do not grind the keys or alter their shape.
 - Do not disassemble the key bows.
 - Do not put two keys of any immobilizer system on the same key ring.
 - Keep the standard keys as well as other immobilizer system keys away from the code re-registering key.
 - Keep other immobilizer system keys away from the main switch as they may cause signal interference.
-

IMMOBILIZER SYSTEM

EAS32887

PART REPLACEMENT AND KEY CODE REGISTRATION REQUIREMENTS

In the course of use, you may encounter the following cases where replacement of parts and registration of code re-registering/standard keys are required.

TIP

Each standard key is registered during production, therefore re-registering at purchase is not necessary.

	Parts to be replaced					Key registration requirement
	Main switch/ immobilizer unit		Standard key	ECU	Accesso- ry lock* and key	
	Main switch	Immobiliz- er unit				
Standard key is lost			√			New standard key
All keys have been lost (including code re-registering key)		√	√	√	√	Code re-registering key and standard keys
ECU is defective				√		Code re-registering key and standard keys
Immobilizer unit is defective		√				Code re-registering key and standard keys
Main switch is defective		√	√	√	√	Code re-registering key and standard keys
Accessory lock* is defective					√	Not required

* Accessory locks mean the seat lock and fuel tank cap.

Code re-registering key registration:

When the immobilizer unit or ECU is replaced, the code re-registering key must be registered to the unit.

To register a code re-registering key:

1. Turn the main switch to "ON" with the code re-registering key.

TIP

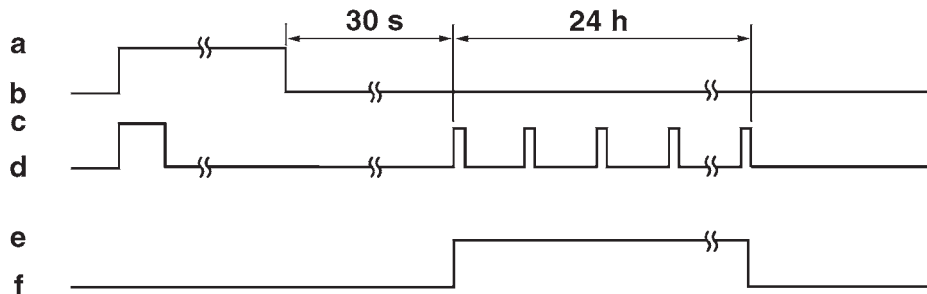
Check that the immobilizer system indicator light comes on for one second, then goes off. When the immobilizer system indicator light goes off, the code re-registering key has been registered.

2. Check that the engine can be started.
3. Register the standard key, following the instructions in the section below.

Standby mode:

To enable the immobilizer system, turn the ignition key to “OFF”. 30 seconds later, the indicator light will start flashing continuously in the standby flashing mode pattern for up to 24 hours. After that time, the indicator light will stop flashing, but the immobilizer system is still enabled.

Standby mode



- | | |
|----------------------|---------------------|
| a. Main switch “ON” | e. Standby mode on |
| b. Main switch “OFF” | f. Standby mode off |
| c. LED on | |
| d. LED off | |

Standard key registration:

Standard key registration is required when a standard key is lost and needs to be replaced, or when the code re-registering key is re-registered after the immobilizer unit or ECU are replaced.

TIP

Do not start the engine with a standard key that has not been registered. If the main switch is turned “ON” with a standard key that has not been registered, the immobilizer system indicator light flashes to indicate DTC “52”. (Refer to “SELF-DIAGNOSTIC FUNCTION TABLE (FOR IMMOBILIZER SYSTEM)” on page 9-71).

1. Check that the immobilizer system indicator light signals the standby mode.
2. Using the code re-registering key, turn the main switch to “ON”, then “OFF”, and then remove the key within 5 seconds.
3. Insert the first standard key to be registered into the main switch, then turn the key to “ON” within 5 seconds to activate the key registration mode.

TIP

The existing standard key code is erased from the memory when the key registration mode is activated. When the key registration mode is activated, the immobilizer system indicator light flashes rapidly.

4. While the indicator light is flashing, turn the main switch to “OFF”, remove the key, and within 5 seconds, insert the second standard key to be registered into the main switch.

TIP

If the immobilizer system indicator light stops flashing 5 seconds after the first standard key is registered, the registration mode is deactivated. If this occurs, the second standard key cannot be registered, and steps (2) to (4) need to be repeated to register both standard keys.

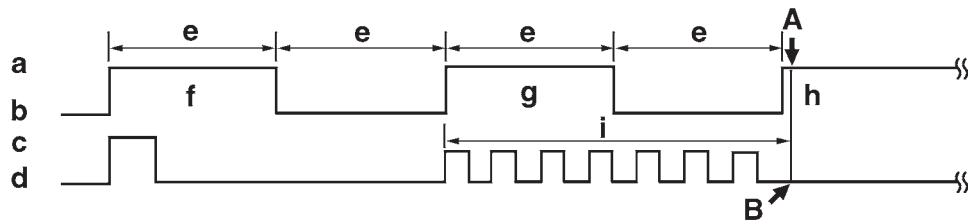
5. Turn the main switch to “ON”.

TIP

When the indicator light goes off, the registration is complete.

6. Check that the engine can be started with the two registered standard keys.

Standard key registration

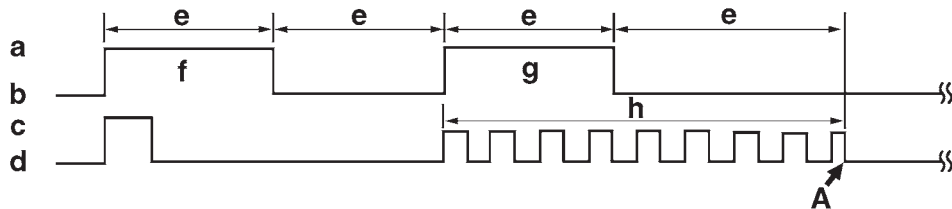


- a. Main switch "ON"
- b. Main switch "OFF"
- c. LED on
- d. LED off
- e. Less than 5.0 s
- f. Code re-registering key
- g. First standard key
- h. Second standard key
- i. Registration mode
- A. Registration of the second standard key is complete.
- B. Immobilizer system indicator light stops flashing when the registration of the second standard key is complete.

Voiding the standard key code:

If a standard key has been lost, it is possible to disable its use by re-registering the remaining standard key. Standard key registration erases the stored standard key code from the memory, thus disabling the lost standard key. To re-register, refer to "Standard key registration".

Standard key code voiding method



- a. Main switch "ON"
- b. Main switch "OFF"
- c. LED on
- d. LED off
- e. Less than 5.0 s
- f. Code re-registering key
- g. Remaining standard key
- h. Registration mode
- A. If the immobilizer system indicator light stops flashing 5 seconds after the first standard key is registered, the second standard key cannot be registered.

EAS32888

TROUBLESHOOTING

When the main switch is turned to "ON", the immobilizer system indicator light does not come on nor flashes.

1. Check the fuses.
(Main, ignition, ignition 2, backup, and backup 2)
Refer to "CHECKING THE FUSES" on page 8-40.

NG→

Replace the fuse(s).

OK↓

2. Check the battery.
Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.

NG→

- Clean the battery terminals.
- Recharge or replace the battery.

OK↓

3. Check the main switch.
Refer to "CHECKING THE SWITCHES" on page 8-39.

NG→

Replace the main switch/immobilizer unit.

OK↓

4. Check the entire immobilizer system wiring.
Refer to "CIRCUIT DIAGRAM" on page 9-16.

NG→

Properly connect or repair the immobilizer system wiring.

OK↓

- Check the condition of the each immobilizer system circuits.
- Refer to "SELF-DIAGNOSTIC FUNCTION TABLE (FOR IMMOBILIZER SYSTEM)" on page 9-71.

EAS32889

HOW TO CHECK DTC

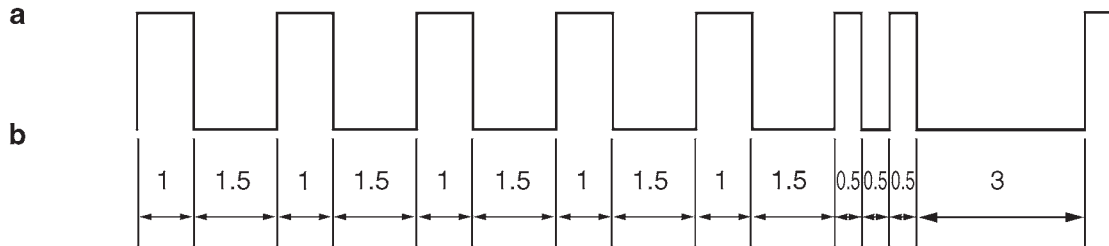
When a system malfunction occurs, the DTC is indicated in the meter display and the immobilizer system indicator light flashes at the same time. The pattern of flashing also shows the DTC.

Immobilizer system indicator light DTC indication

Digit of 10: Cycles of 1 sec. ON and 1.5 sec. OFF.

Digit of 1: Cycles of 0.5 sec. ON and 0.5 sec. OFF.

Example: DTC 52

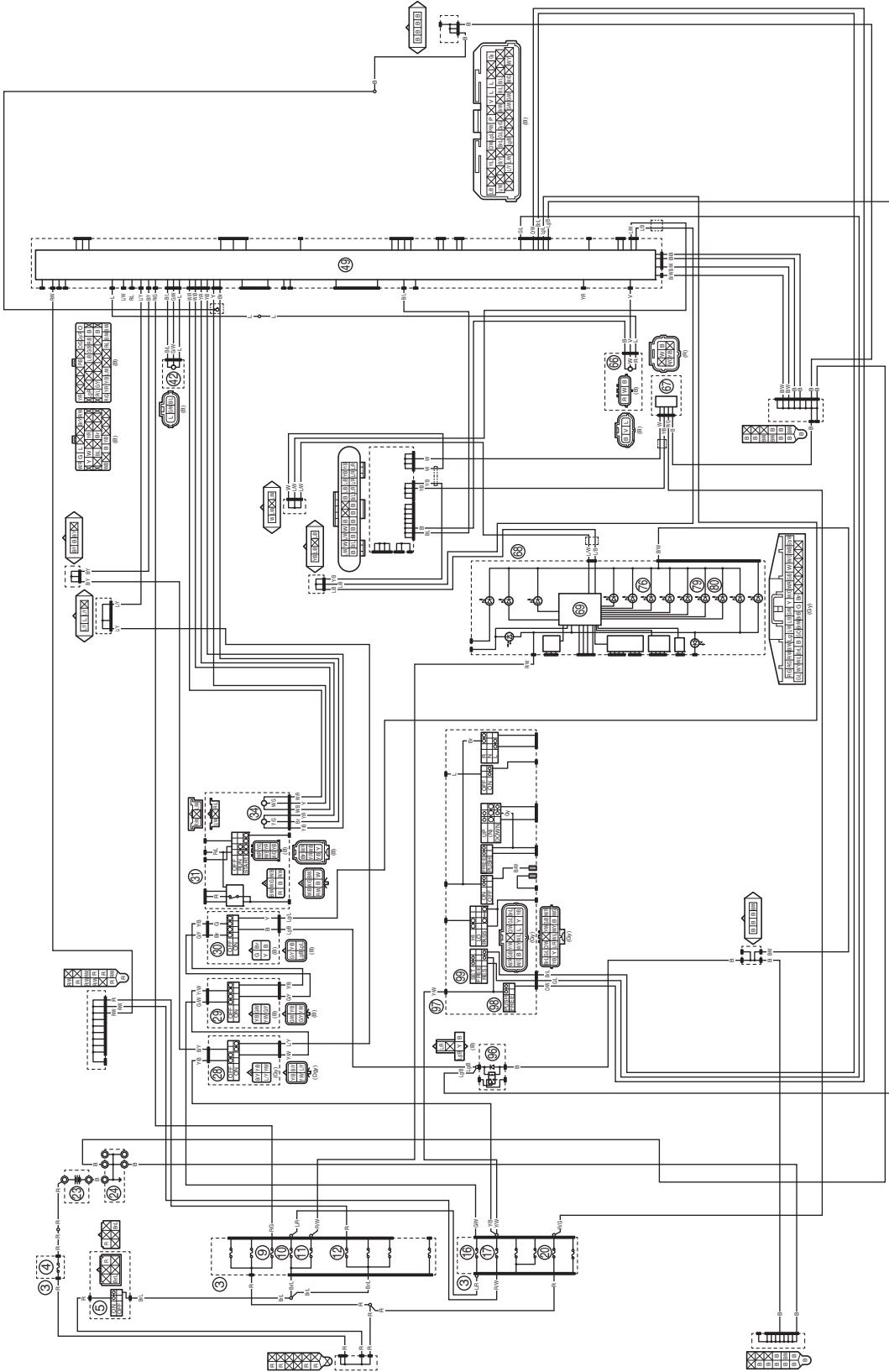


- a. Light on
- b. Light off

CRUISE CONTROL SYSTEM

EAS20441
CRUISE CONTROL SYSTEM

EAS32875
CIRCUIT DIAGRAM



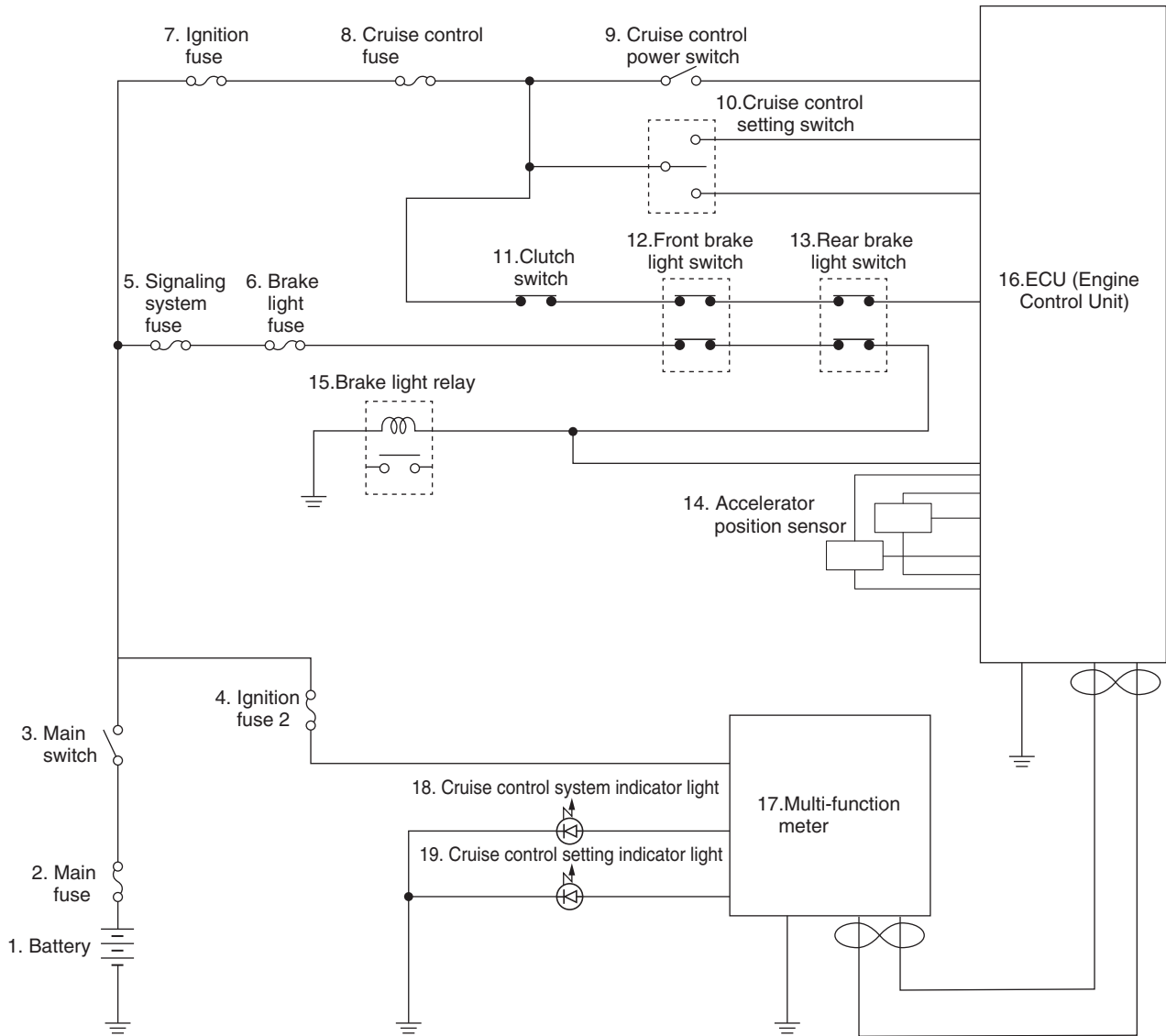
CRUISE CONTROL SYSTEM

3. Fuse box
4. Main fuse
5. Main switch
9. Backup fuse 2
10. Signaling system fuse
11. Ignition fuse 2
12. Ignition fuse
16. Brake light fuse
17. Cruise control fuse
20. Backup fuse
23. Battery
24. Engine ground
28. Clutch switch
29. Front brake light switch
30. Rear brake light switch
31. Handlebar switch (right)
34. Accelerator position sensor
42. Gear position sensor
49. ECU (Engine Control Unit)
66. Shift sensor
67. YDT coupler
68. Meter assembly
69. Multi-function meter
76. MIL (Malfunction indicator light)
79. Cruise control system indicator light
80. Cruise control setting indicator light
96. Brake light relay
97. Handlebar switch (left)
98. Cruise control power switch
99. Cruise control setting switch

CRUISE CONTROL SYSTEM

EAS32876

CRUISE CONTROL CIRCUIT OPERATION



- 1. Battery
- 2. Main fuse
- 3. Main switch
- 4. Ignition fuse 2
- 5. Signaling system fuse
- 6. Brake light fuse
- 7. Ignition fuse
- 8. Cruise control fuse
- 9. Cruise control power switch
- 10. Cruise control setting switch
- 11. Clutch switch
- 12. Front brake light switch
- 13. Rear brake light switch
- 14. Accelerator position sensor
- 15. Brake light relay
- 16. ECU (Engine Control Unit)
- 17. Multi-function meter

- 18. Cruise control system indicator light
- 19. Cruise control setting indicator light

CRUISE CONTROL SYSTEM

EAS32877

BASIC INSTRUCTIONS FOR TROUBLESHOOTING

1. Check the DTC of “malfunction” using the YDT.
2. Check and repair the malfunction according to applicable DTC troubleshooting.
3. Turn the main switch from “OFF” to “ON”, and then check the DTC of “malfunction” is not displayed.

TIP

- If another DTC is displayed, repeat steps (1) to (3) until no DTC is displayed.
 - Turning the main switch to “OFF” will not erase the malfunction history.
-

4. Do the final check.

EWA17420

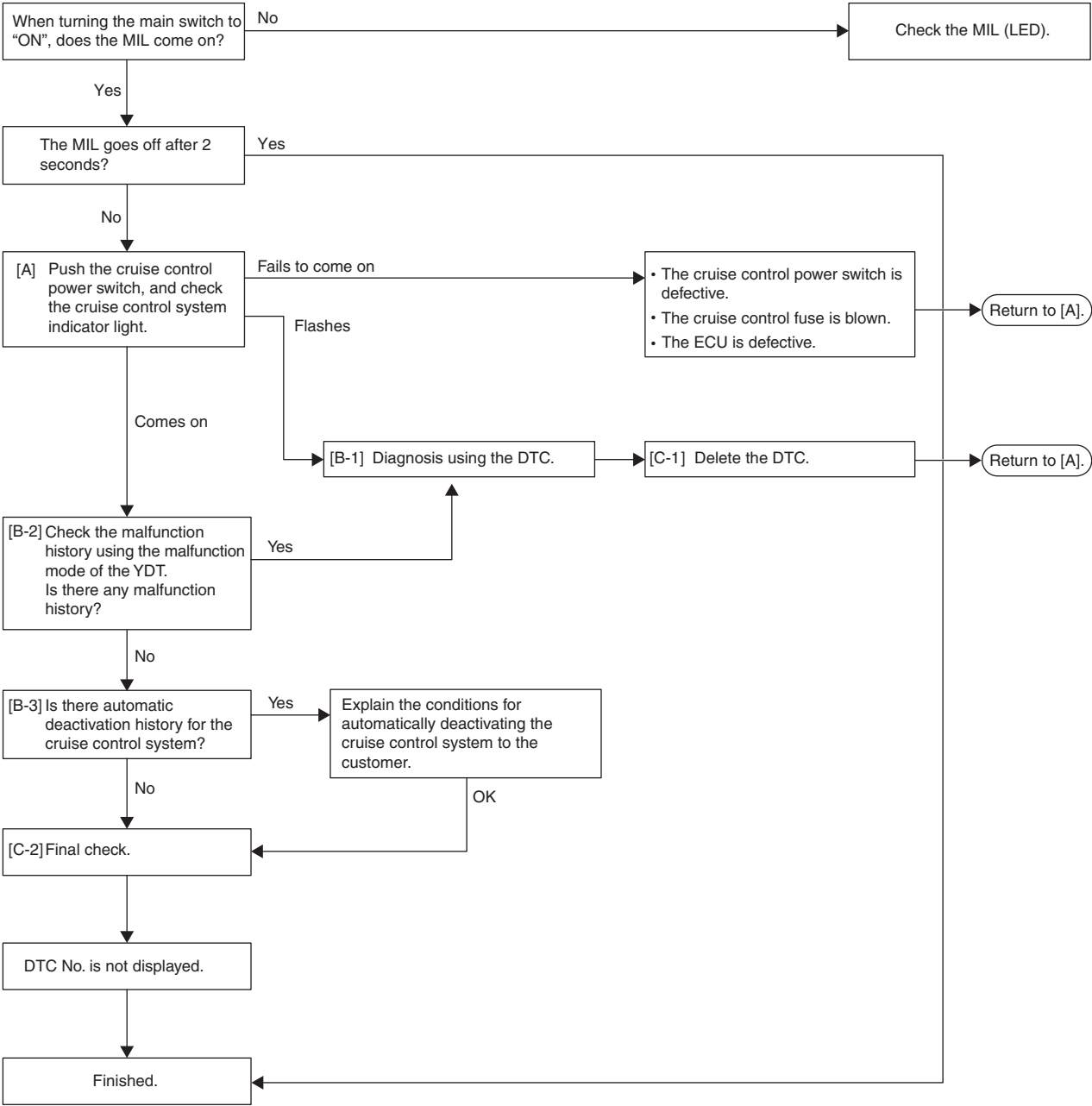
WARNING

- **Perform the troubleshooting [A]→[B]→[C] in order. Be sure to follow the order since a wrong diagnosis could result if the steps are followed in a different order or omitted.**
 - **Use sufficiently charged regular batteries only.**
-

CRUISE CONTROL SYSTEM

EAS32878

BASIC PROCESS FOR TROUBLESHOOTING



CRUISE CONTROL SYSTEM

EAS32879

[A] CHECKING THE CRUISE CONTROL SYSTEM INDICATOR LIGHT

Turn the main switch, and then push the cruise control power switch.

1. The cruise control system indicator light does not come on.
 - Check the control power switch for continuity. Refer to “CHECKING THE SWITCHES” on page 8-39. If there is no continuity, replace the handlebar switch (left).
 - Check the fuse for continuity. Refer to “CHECKING THE FUSES” on page 8-40. If the cruise control system fuse is blown, replace the fuse.
 - Check for continuity between the orange/white terminal of the handlebar switch coupler (left) and orange/white terminal of the ECU (engine control unit) coupler. If there is no continuity, the wire harness is defective. Replace the wire harness.
2. The cruise control system indicator light flashes. [B-1]
3. The cruise control system indicator light come on. [B-2]

EAS32880

[B-1] DIAGNOSIS USING THE DTC

1. Information for the DTCs from the cruise control system is contained in the following table. Refer to this table for troubleshooting.

DTC table

DTC No.	Symptom	Check point
P056C	Normal signal is not sent to ECU from the switch.	<ul style="list-style-type: none">• Wire harness (ECU coupler and front or rear brake light switch coupler)• Signaling system fuse and brake light fuses• Connection of the ECU coupler, clutch switch coupler, front brake light switch coupler, rear brake light switch coupler, brake light relay coupler and handlebar switch coupler (right)• Accelerator position sensor• Front brake light switch• Rear brake light switch
P0564	Normal signal is not sent to ECU from the switch.	<ul style="list-style-type: none">• Wire harness (ECU coupler and handlebar switch coupler (left))• Ignition fuse and cruise control fuse• Cruise control setting switch

EAS32881

[B-2] DIAGNOSIS USING THE MALFUNCTION HISTORY CODES

Check the malfunction history using the malfunction mode of the YDT.

- Malfunction history is displayed on the YDT. [B-1]
- Malfunction history is not displayed on the YDT. [B-3]

EAS32882

[B-3] MALFUNCTION HISTORY IS NOT DISPLAYED

Use the YDT to check whether automatic deactivation history for the cruise control system exists.


1. There is automatic deactivation history for the cruise control system.
 - Explain the conditions for automatically deactivating the cruise control system to the customer.
 - For information about the conditions for automatically deactivating the cruise control system. Refer to “Automatic deactivation of the cruise control system” on page 9-30.


TIP



If you do not have a YDT, the automatic deactivation history cannot be checked. Therefore, explain the automatic deactivation function of the cruise control system to the customer and explain that this is not a malfunction.

Automatic deactivation of the cruise control system

The cruise control system is electronically controlled and linked with other control systems. The cruise control system will automatically deactivate under the following conditions:

- The cruise control system is not able to maintain the set cruising speed (such as when going up a steep hill).
- Wheel slip or wheel spin is detected. (If the traction control system has not been turned off, the traction control system will work.)
- The start/engine stop switch is set to the “” position.
- The engine stalls.
- The sidestand is lowered.

When traveling with a set cruising speed, if the cruise control system is deactivated under the above conditions, the “” indicator light will turn off and the “SET” indicator light will flash for 4 seconds.

When not traveling with a set cruising speed, if the start/engine stop switch is set to the “” position, the engine stalls, or the sidestand is lowered, then the “” indicator light will go off (the “SET” indicator light will not flash).

If the cruise control system was automatically deactivated, please stop and confirm that your vehicle is in good operating condition before continuing on.

When traveling on roads with steep grades, the cruise control system may not be able to maintain the set cruising speed.

- When going uphill, the actual traveling speed may become lower than the set cruising speed. If this occurs, accelerate to the desired traveling speed using the throttle.
- When going downhill, the actual traveling speed may become higher than the set cruising speed. If this occurs, the setting switch cannot be used to adjust the set cruising speed. To reduce the traveling speed, apply the brakes. When the brakes are applied, the cruise control system will deactivate.

EAS32883

[C-1] ERASING THE DTC

1. Delete the DTC using the malfunction of the YDT, and check that the MIL goes off.

EAS32884

[C-2] FINAL CHECK

EWA17441



When maintenance or checks have been performed on components related to the cruise control system, be sure to perform a final check before delivering the vehicle to the customer.

1. Check the front brake lever and rear brake pedal operation.
2. Check the rear brake light switch.
Refer to “CHECKING THE SWITCHES” on page 8-39.
3. Execute the diagnostic mode (No. 82 and 83) to check the operation of the front brake light switch, rear brake light switch, and accelerator position sensor.
Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-77.
4. Execute the diagnostic mode (No. 80 and 81) to check the operation of the cruise control setting switch.
Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-77.
5. Delete the DTCs.
Refer to “DTC TABLE” on page 9-43.
6. Check the operation of the cruise control system.
Test ride the vehicle and confirm that the cruise control system is operating normally.

CRUISE CONTROL SYSTEM

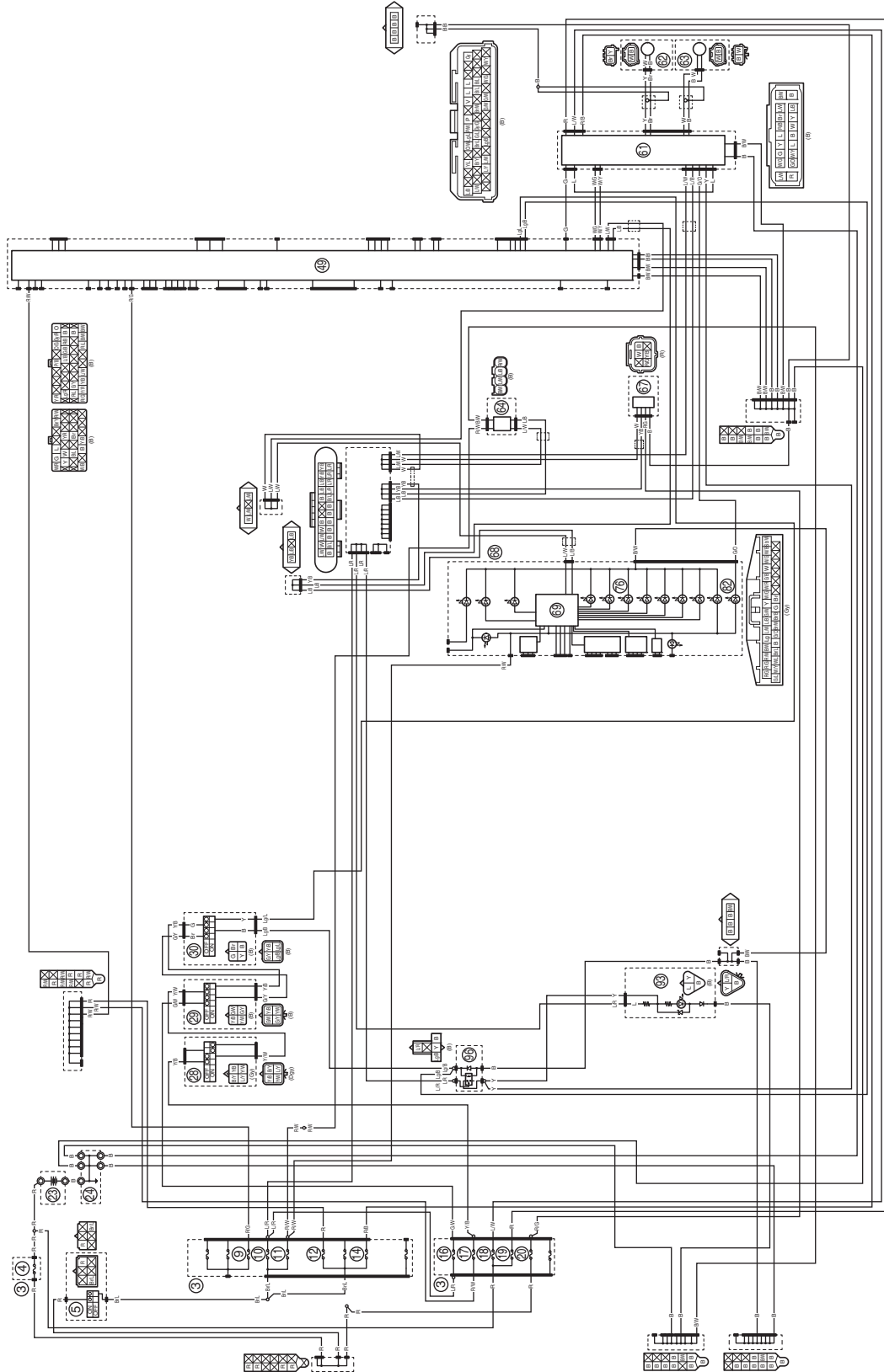
ABS (Anti-lock Brake System)

EAS20443

ABS (Anti-lock Brake System)

EAS32890

CIRCUIT DIAGRAM



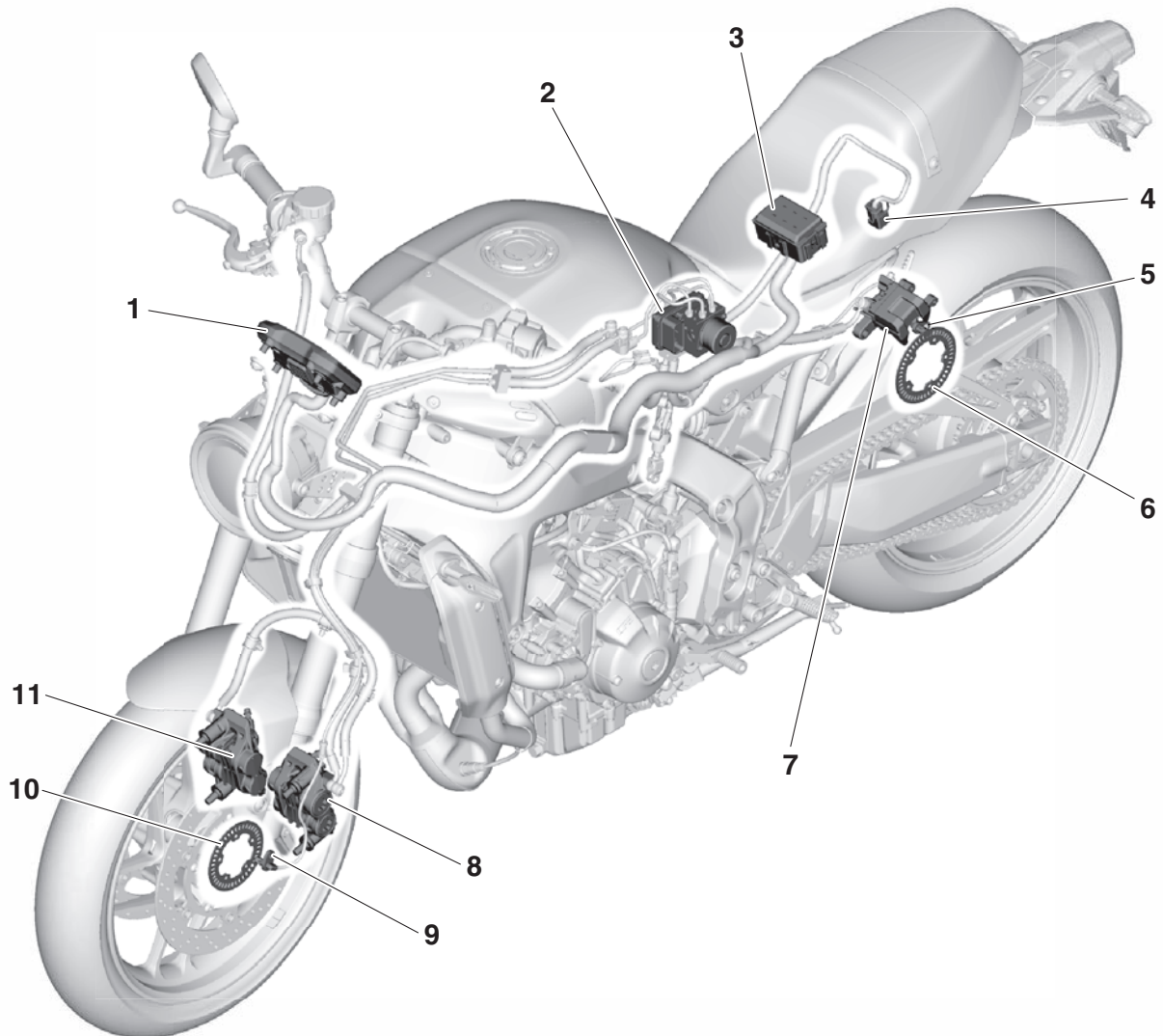
ABS (Anti-lock Brake System)

- 3. Fuse box
- 4. Main fuse
- 5. Main switch
- 9. Backup fuse 2
- 10. Signaling system fuse
- 11. Ignition fuse 2
- 12. Ignition fuse
- 14. ABS ECU fuse
- 16. Brake light fuse
- 17. Cruise control fuse
- 18. ABS solenoid fuse
- 19. ABS motor fuse
- 20. Backup fuse
- 23. Battery
- 24. Engine ground
- 28. Clutch switch
- 29. Front brake light switch
- 30. Rear brake light switch
- 49. ECU (Engine Control Unit)
- 61. Hydraulic unit assembly (ABS ECU)
- 62. Front wheel sensor
- 63. Rear wheel sensor
- 64. IMU (Inertial Measurement Unit)
- 67. YDT coupler
- 68. Meter assembly
- 69. Multi-function meter
- 76. MIL (Malfunction indicator light)
- 82. ABS warning light
- 93. Tail/brake light
- 96. Brake light relay

ABS (Anti-lock Brake System)

EAS32891

ABS COMPONENTS CHART

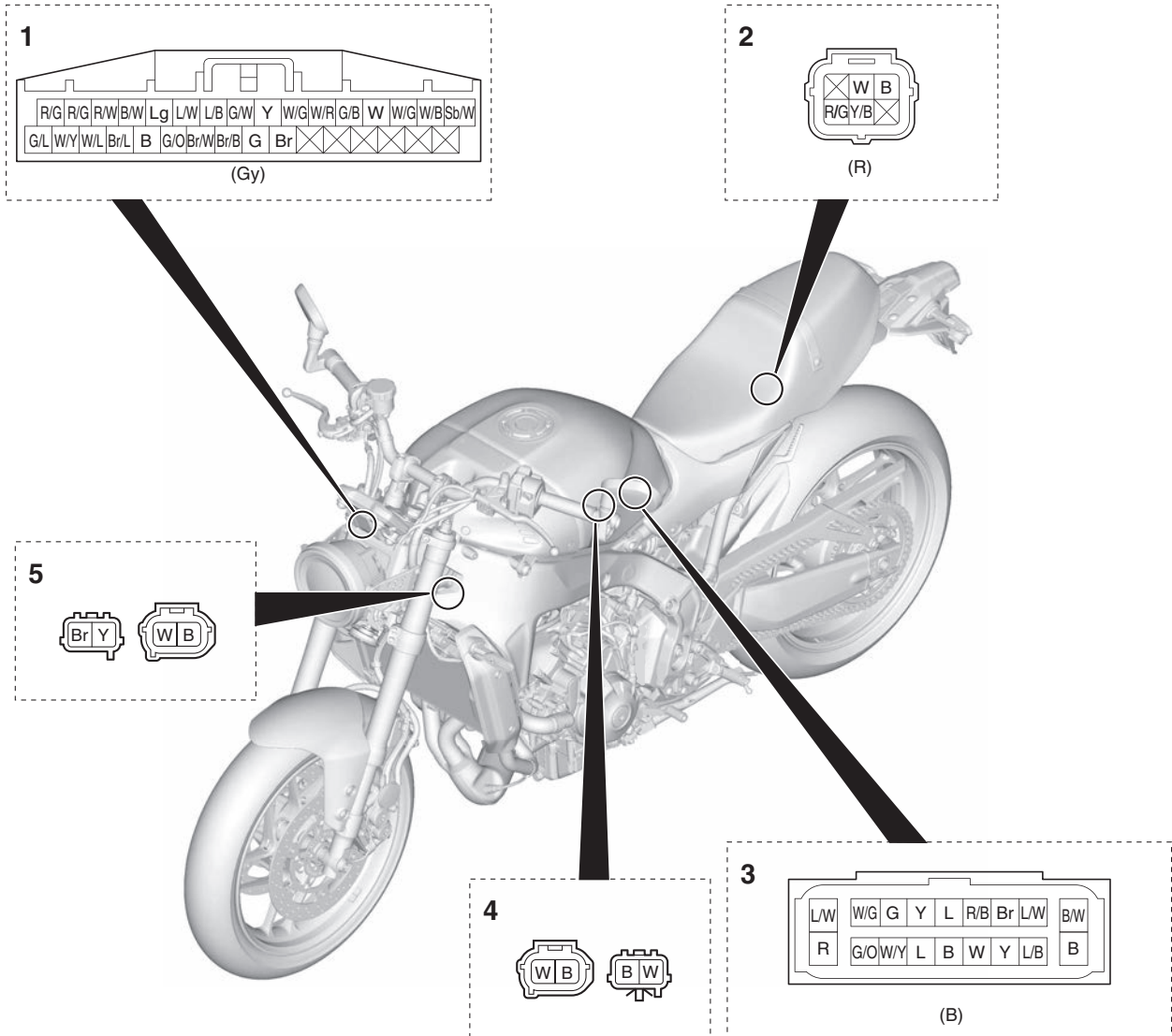


1. Meter assembly
2. Hydraulic unit assembly (ABS ECU)
3. Fuse box (ABS motor fuse, ABS ECU fuse, ABS solenoid fuse)
4. YDT coupler
5. Rear wheel sensor
6. Rear wheel sensor rotor
7. Rear brake caliper
8. Front brake caliper (left)
9. Front wheel sensor
10. Front wheel sensor rotor
11. Front brake caliper (right)

ABS (Anti-lock Brake System)

EAS32892

ABS COUPLER LOCATION CHART



1. Meter assembly coupler
2. YDT coupler
3. ABS ECU coupler
4. Rear wheel sensor coupler
5. Front wheel sensor coupler

ABS (Anti-lock Brake System)

EAS32893

MAINTENANCE OF THE ABS ECU

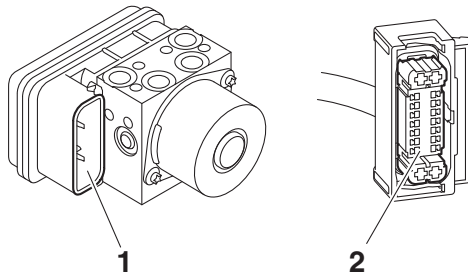
Checking the ABS ECU

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



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 9-41.

ABS operation when the ABS warning light comes on

1. The ABS warning light remains on → ABS operates as a normal brake system.
 - A malfunction was detected using the ABS self-diagnosis function.
 - The ABS self-diagnosis has not been completed.
The ABS self-diagnosis starts when the main switch is turned to “ON” and finishes when the vehicle has traveled at a speed of approximately 10 km/h (6 mi/h).
2. The ABS warning light comes on after the engine starts, and then goes off when the vehicle starts moving (traveling at a speed of approximately 10 km/h (6 mi/h)). → ABS operation is normal.
3. The ABS warning light flashes → ABS operation is normal.
 - Refer to “[C-1] FINAL CHECK” on page 9-41.

ABS (Anti-lock Brake System)

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 seat, and if the brake lever or brake pedal are even slightly applied, a vibration can be felt at the lever and pedal, but these do not indicate a malfunction.

Special precautions for handling and servicing a vehicle equipped with ABS

ECA17620

NOTICE

Care should be taken not to damage components by subjecting them to shocks or pulling on them with too much force since the ABS components are precisely adjusted.

- The ABS ECU and hydraulic unit are united assemblies and cannot be disassembled.
- The malfunction history is stored in the memory of the ABS ECU. Delete the DTC when the service is finished. (This is because the past DTC will be displayed again if another malfunction occurs.)

EAS32895

BASIC INSTRUCTIONS FOR TROUBLESHOOTING

1. Check the DTC of “malfunction” using the YDT.
2. Check and repair the malfunction according to applicable DTC troubleshooting.
3. Turn the main switch from “OFF” to “ON”, and then check the DTC of “malfunction” is not displayed.

TIP

- If another DTC is displayed, repeat steps (1) to (3) until no DTC is displayed.
 - Turning the main switch to “OFF” will not erase the malfunction history.
-

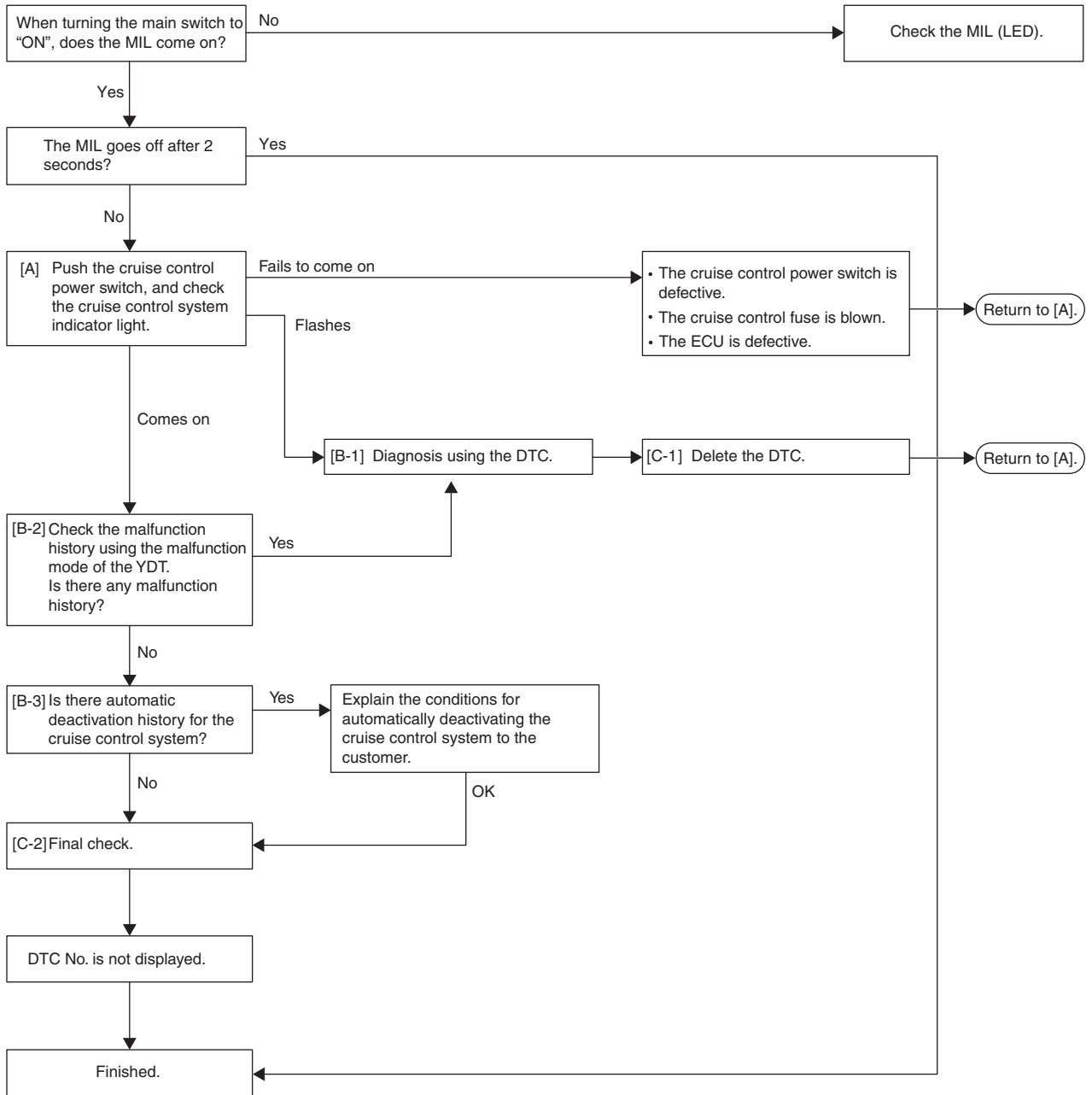
4. Do the final check.

EWA17420

WARNING

- **Perform the troubleshooting [A]→[B]→[C] in order. Be sure to follow the order since a wrong diagnosis could result if the steps are followed in a different order or omitted.**
 - **Use sufficiently charged regular batteries only.**
-

ABS (Anti-lock Brake System)



ABS (Anti-lock Brake System)

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/orange terminal of the ABS ECU coupler and green/orange 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 (ABS ECU).

EAS32899

[A-2] ALL INDICATOR LIGHTS FAIL TO COME ON

1. Main switch
 - Check the main switch for continuity.
Refer to "CHECKING THE SWITCHES" on page 8-39.
 - If there is no continuity, replace the main switch/immobilizer unit.
2. Battery
 - Check the condition of the battery.
Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-41.
 - If the battery is defective, clean the battery terminals and recharge it, or replace the battery.
3. Main fuse
 - Check the fuse for continuity.
Refer to "CHECKING THE FUSES" on page 8-40.
 - If the main fuse is blown, replace the fuse.
4. Circuit
 - Check the meter assembly circuit.
Refer to "CIRCUIT DIAGRAM" on page 9-32.
 - 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.)

ABS (Anti-lock Brake System)

EAS32901

[A-4] ONLY THE ABS ECU FAILS TO COMMUNICATE

1. ABS ECU fuse
 - Check the ABS ECU fuse for continuity.
Refer to “CHECKING THE FUSES” on page 8-40.
 - If the ABS ECU fuse is blown, replace the fuse.
2. ABS ECU coupler
 - Check that the ABS ECU coupler is connected properly.
For information about connecting the ABS ECU coupler properly, refer to “INSTALLING THE HYDRAULIC UNIT ASSEMBLY” on page 4-55.
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 red/black terminal of the ABS ECU coupler.
Check for continuity between black terminal of the ABS ECU coupler and the 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/white terminal of the ABS ECU coupler and blue/white 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 (ABS ECU).

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/white 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 DTC will be displayed on the computer screen.

- A DTC is displayed. [B-2]
- A DTC is not displayed. [C-1]

ABS (Anti-lock Brake System)

EAS32904

[B-2] DIAGNOSIS USING THE DTC

This model uses the YDT to identify malfunctions.

For information about using the YDT, refer to the operation manual that is included with the tool.



Yamaha diagnostic tool USB
90890-03267
Yamaha diagnostic tool (A/I)
90890-03264

TIP

- Yamaha diagnostic tool (A/I) (90890-03264) 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.

Details about the displayed DTCs are shown in the following chart. Refer to this chart and check the vehicle.

Once all the work is complete, delete the DTCs. [B-3]

TIP

Do the final check after terminating the connection with the YDT and turning the main switch off. [C-1]

EAS33339

[B-3] DELETING THE DTC

To delete the DTCs, use the YDT. For information about deleting the DTCs, refer to the operation manual of the YDT.

Check that all the displayed DTCs are deleted.



Yamaha diagnostic tool USB
90890-03267
Yamaha diagnostic tool (A/I)
90890-03264

TIP

- Yamaha diagnostic tool (A/I) (90890-03264) 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.

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.

ABS (Anti-lock Brake System)

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 3-13.
2. Check the wheel sensors for proper installation.
Refer to "INSTALLING THE FRONT WHEEL (FRONT BRAKE DISCS)" on page 4-17 and "INSTALLING THE REAR WHEEL (REAR BRAKE DISC)" on page 4-24.
3. Perform brake line routing confirmation.
Refer to "HYDRAULIC UNIT OPERATION TESTS" on page 4-56.
If it does not have reaction-force properly, the brake hose is not properly routed or connected.
4. Delete the DTCs.
Refer to "[B-3] DELETING THE DTC" on page 9-41.
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 9-39.
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/orange terminal of the ABS ECU coupler and green/orange terminal of the meter assembly coupler.
 - Malfunction in the meter assembly circuit.
 - Malfunction in the ABS warning light circuit in the hydraulic unit assembly (ABS ECU).

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS20551

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS33149

DTC TABLE

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"11_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 (ABS ECU) (defective solenoid drive circuit)	—	—	—
"30_EVENT"	Overturn is detected.	Unable	Unable	17
"31_ABS"	Hydraulic unit assembly (ABS ECU) (defective ABS solenoid power circuit)	—	—	—
"33_ABS"	Hydraulic unit assembly (ABS ECU) (abnormal ABS motor power supply)	—	—	—
"34_ABS"	Hydraulic unit assembly (ABS ECU) (short circuit in ABS motor power supply circuit)	—	—	—
"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)	—	—	—
"51_IMMobilizer"	Code cannot be transmitted between the key and immobilizer unit.	—	—	—
"52_IMMobilizer"	Code of immobilizer unit and key are not matched.	—	—	—
"53_ABS"	Vehicle system power supply (voltage of ABS ECU power supply is low)	—	—	—

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"53_IMMO-BILIZER"	Code cannot be transmitted between the ECU and immobilizer unit.	—	—	—
"54_IMMO-BILIZER"	Data of immobilizer and ECU are not matched.	—	—	—
"55_ABS"	Hydraulic unit assembly (ABS ECU) (defective ABS ECU)	—	—	—
"55_IMMO-BILIZER"	Key code registration malfunction.	—	—	—
"56_ABS"	Hydraulic unit assembly (ABS ECU) (abnormal internal circuit)	—	—	—
"56_IMMO-BILIZER"	Unidentified code is received.	—	—	—
"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 (ABS ECU) (defective front pressure sensor)	—	—	—
"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)	—
"89_ABS"	CAN communication (between meter assembly and hydraulic unit assembly (ABS ECU))	—	—	—
"90_ABS"	CAN communication (between ECU and hydraulic unit assembly (ABS ECU))	—	—	—
"91_ABS"	CAN communication (between IMU and hydraulic unit assembly (ABS ECU))	—	—	—
"C0520"	Abnormal IMU: Normal signal is not received from the IMU or failure signal is received from IMU.	Able/Unable (depending on the situation)	Able/Unable (depending on the situation)	—
"P0030"	O ₂ sensor heater: defective heater or heater driver ON/OFF command and error signal is mismatching.	Able	Able	—
"P00D1, P2195"	[P00D1] O ₂ sensor: heater performance is deteriorated. Normal signal is not received from the O ₂ sensor while driving the O ₂ sensor heater. [P2195] O ₂ sensor: open circuit is detected. Normal signal is not received from the O ₂ sensor.	Able	Able	—
"P0105"	Intake air pressure sensor 1: signal out of range. Normal signal is not received from the intake air pressure sensor 1 circuit.	Able	Able	03

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"P0106"	Intake air pressure sensor 1: clogging of hose or sensor installation improperly. Stable pressure is not supplied.	Able	Able	03
"P0107, P0108"	[P0107] Intake air pressure sensor 1: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor 1 circuit. [P0108] Intake air pressure sensor 1: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor 1 circuit.	Able	Able	03
"P0110"	Intake air temperature sensor: signal stuck. Normal signal is not received from the intake air temperature sensor circuit.	Able	Able	—
"P0111"	Intake air temperature sensor: signal out of range. Normal signal is not received from the intake air temperature sensor circuit.	Able	Able	05
"P0112, P0113"	[P0112] Intake air temperature sensor: short to ground circuit is detected. Normal signal is not received from the intake air temperature sensor circuit. [P0113] Intake air temperature sensor: open or short to power circuit is detected. Normal signal is not received from the intake air temperature sensor circuit.	Able	Able	05
"P0115"	Coolant temperature sensor: signal stuck. Normal signal is not received from the coolant temperature sensor circuit.	Able	Able	—
"P0116"	Coolant temperature sensor: signal out of range. Normal signal is not received from the coolant temperature sensor circuit.	Able	Able	06
"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

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"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"	O ₂ sensor: short to power circuit is detected. Normal signal is not received from the O ₂ sensor.	Able	Able	—
"P0133"	O ₂ sensor: deterioration is detected. O ₂ sensor output signal response speed is slow.	Able	Able	—
"P0134"	O ₂ sensor: signal stuck. O ₂ sensor signal value does not change.	Able	Able	—
"P0201"	Injector #1: malfunction in injector #1. Normal signal is not received from the injector circuit.	Able (depending on the number of faulty cylinder)	Able (depending on the number of faulty cylinder)	36
"P0202"	Injector #2: malfunction in injector #2. Normal signal is not received from the injector circuit.	Able (depending on the number of faulty cylinder)	Able (depending on the number of faulty cylinder)	37
"P0203"	Injector #3: malfunction in injector #3. Normal signal is not received from the injector circuit.	Able (depending on the number of faulty cylinder)	Able (depending on the number of faulty cylinder)	38

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"P0300, P0301, P0302, P0303"	[P0300] Misfire in multiple cylinders. Large difference value in angular velocity of crankshaft. [P0301] Misfire in cylinder #1. Large difference value in angular velocity of crankshaft. [P0302] Misfire in cylinder #2. Large difference value in angular velocity of crankshaft. [P0303] Misfire in cylinder #3. Large difference value in angular velocity of crankshaft.	Able/Unable (depending on the situation)	Able/Unable (depending on the situation)	—
"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.	Able (depending on the number of faulty cylinder)	Able (depending on the number of faulty cylinder)	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.	Able (depending on the number of faulty cylinder)	Able (depending on the number of faulty cylinder)	31
"P0353"	Cylinder-#3 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#3 ignition coil. Normal signal is not received from the ignition circuit.	Able (depending on the number of faulty cylinder)	Able (depending on the number of faulty cylinder)	32
"P0458"	Purge cut valve solenoid: open circuit is detected. PCV solenoid is not operated.	Able	Able	—
"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 hydraulic unit assembly (ABS ECU) 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

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"P0560, P0563"	[P0560] Battery charging voltage is abnormal. Poor charging performance (discharged condition). Vehicle system power voltage is abnormal. (Regulator is not operated properly or battery is not charged properly.) [P0563] Battery charging voltage is abnormal. Charging voltage is not within range (overcharged condition). Vehicle system power voltage is abnormal. (Regulator is not operated properly or battery is not charged properly.)	Able	Able	—
"P0564"	Cruise control setting switch "RES+": open or short circuit is detected. Normal signal is not sent to ECU. Cruise control setting switch "SET-": open or short circuit is detected. Normal signal is not sent to ECU.	Able	Able	80, 81
"P056C"	Front brake light switch: open or short circuit is detected. Normal signal is not sent to ECU. Rear brake light switch: open or short circuit is detected. Normal signal is not sent to ECU.	Able	Able	82, 83
"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)	Able/Unable (depending on the situation)	60
"P0638"	YCC-T drive system: malfunction detected.	Able/Unable (depending on the situation)	Able/Unable (depending on the situation)	—
"P0657"	Fuel system voltage: incorrect voltage supplied to the injector, fuel pump and relay unit.	Able	Able	09, 50
"P0914"	Gear position sensor: signal stuck and sensor signal does not change.	Able	Able	—
"P0915"	Gear position sensor: out of control signal range and normal signal is not received from the gear position sensor to ECU.	Able	Able	—

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

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	—
"P1004"	Intake air pressure sensor 1 and intake air pressure sensor 2: When the main switch is "ON", the standard voltage values of Intake air pressure sensor 1 and intake air pressure sensor 2 are large different.	Able	Able	03, 04
"P1600"	Lean angle sensor: open or short circuit is detected. Normal signal is not received from IMU or defective IMU.	Unable	Unable	17
"P1601"	Sidestand switch: open or short circuit in 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)	—
"P1606, P1607"	[P1606] Intake air pressure sensor 2: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor 2 circuit. [P1607] Intake air pressure sensor 2: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor 2 circuit.	Able	Able	04
"P1608"	Intake air pressure sensor 2: signal out of range. Normal signal is not received from the intake air pressure sensor 2 circuit.	Able	Able	04
"P1609"	Intake air pressure sensor 2: clogging of hose or sensor installation improperly. Stable pressure is not supplied.	Able	Able	04
"P1806, P1807"	[P1806] Shift sensor: open or short to ground circuit is detected. Normal signal is not received from the shift sensor to ECU. [P1807] Shift sensor: short to power circuit is detected. Normal signal is not received from the shift sensor to ECU.	Able	Able	95

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Symptom	Fail-safe system		Diagnostic code
		Starting the engine	Driving the vehicle	
"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
"U0125"	Signals cannot be transmitted between the ECU and the IMU.	Unable	Able/Unable (depending on the situation)	—
"U0155 or Err"	Multi-function meter: signals cannot be transmitted between the ECU and the multi-function meter.	Able	Able	—

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS33028

SELF-DIAGNOSTIC FUNCTION TABLE (FOR FUEL INJECTION SYSTEM)

TIP

For details of the DTC, refer to "BASIC PROCESS FOR TROUBLESHOOTING" on page 9-14.

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
30_EVEN T	Overturn is detected.	<ul style="list-style-type: none"> • The vehicle has overturned. • Installed condition of IMU. • Defective IMU. • Malfunction in ECU. 	—	—
70_EVEN T	Engine forcibly stops when the vehicle is left idling for a long period.	<ul style="list-style-type: none"> • Allow to idle for a long period of time. • Malfunction in ECU. 	—	—
C0520	Abnormal IMU: Normal signal is not received from the IMU or failure signal is received from IMU.	<ul style="list-style-type: none"> • Defective IMU coupler or ECU coupler. • Open or short circuit in wire harness between IMU and ECU. • Improperly installed IMU. • Malfunction in IMU. • Malfunction in ECU. 	Engine cannot be started (depending on the circumstances).	Engine cannot be started (depending on the circumstances). Cruise control fixed to OFF.
P0030	O ₂ sensor heater: defective heater or heater driver ON/OFF command and error signal is mismatching.	<ul style="list-style-type: none"> • Open circuit in wire harness. • Disconnected coupler. • Defective O₂ sensor heater controller (Malfunction in ECU). • Broken or disconnected lead in O₂ 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.) Cruise control fixed to OFF.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P00D1	O ₂ sensor: heater performance is deteriorated. Normal signal is not received from the O ₂ sensor while driving the O ₂ sensor heater.	<ul style="list-style-type: none"> • Improperly installed O₂ sensor. • Defective coupler between O₂ sensor and ECU. • Open or short circuit in wire harness between O₂ sensor and ECU. • Incorrect fuel pressure. • Defective O₂ sensor. • Malfunction in ECU. 	Increased exhaust emissions.	O ₂ feedback is not carried out. O ₂ learning is not carried out. Quick shift system is not carried out. Cruise control fixed to OFF.
P0105	Intake air pressure sensor 1: signal out of range. Normal signal is not received from the intake air pressure sensor 1 circuit.	<ul style="list-style-type: none"> • Defective coupler between intake air pressure sensor 1 and ECU. • Open or short circuit in wire harness between intake air pressure sensor 1 and ECU. • Poor circuit continuity in wire harness between intake air pressure sensor 1 and ECU. • Defective intake air pressure sensor 1. • Malfunction in ECU. 	Engine idling speed is unstable. Engine response is poor. Loss of engine power. Increased exhaust emissions.	Intake air pressure is fixed to 101.3 [kPa]. 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. 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. Cruise control fixed to OFF.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0106	Intake air pressure sensor 1: clogging of hose or sensor installation improperly. Stable pressure is not supplied.	<ul style="list-style-type: none"> • Intake air pressure sensor 1 hose is not installed. • Intake air pressure sensor 1 hose is not installed correctly (Detached, clogged, twisted or pinching). • Intake air pressure sensor 1 hole is clogged, or intake air pressure sensor 1 is not installed correctly. 	<p>Engine idling speed is high. Engine idling speed is unstable. Engine response is poor. Loss of engine power. Increased exhaust emissions.</p>	<p>Intake air pressure is fixed to 101.3 [kPa]. 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. O₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out. Quick shift system is not carried out. Cruise control fixed to OFF.</p>
P0107 P0108	<p>[P0107] Intake air pressure sensor 1: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor 1 circuit.</p> <p>[P0108] Intake air pressure sensor 1: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor 1 circuit.</p>	<p>[P0107] Low voltage of the intake air pressure sensor 1 circuit (0.5 V or less) [P0108] High voltage of the intake air pressure sensor 1 circuit (4.8 V or more)</p> <ul style="list-style-type: none"> • Defective coupler between intake air pressure sensor 1 and ECU. • Open or short circuit in wire harness between intake air pressure sensor 1 and ECU. • Poor circuit continuity in wire harness between intake air pressure sensor 1 and ECU. • Defective intake air pressure sensor 1. • Malfunction in ECU. 	<p>Engine idling speed is unstable. Engine response is poor. Loss of engine power. Increased exhaust emissions.</p>	<p>Intake air pressure is fixed to 101.3 [kPa]. 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. O₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out. Quick shift system is not carried out. Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0110	Intake air temperature sensor: signal stuck. Normal signal is not received from the intake air temperature sensor circuit.	<ul style="list-style-type: none"> • 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. Cruise control fixed to OFF.
P0111	Intake air temperature sensor: signal out of range. Normal signal is not received from the intake air temperature sensor circuit.	<ul style="list-style-type: none"> • 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. • Poor circuit continuity in wire harness between intake air temperature sensor and ECU. • 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. Cruise control fixed to OFF.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0112 P0113	<p>[P0112] Intake air temperature sensor: short to ground circuit is detected. Normal signal is not received from the intake air temperature sensor circuit.</p> <p>[P0113] Intake air temperature sensor: open or short to power circuit is detected. Normal signal is not received from the intake air temperature sensor circuit.</p>	<p>[P0112] Low voltage of the intake air temperature sensor circuit (0.1 V or less)</p> <p>[P0113] High voltage of the intake air temperature sensor circuit (4.8 V or more)</p> <ul style="list-style-type: none"> • Defective coupler between intake air temperature sensor and ECU. • Open or short circuit in wire harness between intake air temperature sensor and ECU. • Poor circuit continuity in wire harness between intake air temperature sensor and ECU. • Improperly installed intake air temperature sensor. • Defective intake air temperature sensor. • Malfunction in ECU. 	<p>Engine is difficult to start.</p> <p>Increased exhaust emissions.</p> <p>Engine idling speed is unstable.</p>	<p>The intake air temperature is fixed to 20 [°C].</p> <p>O₂ sensor heater driving is not carried out.</p> <p>O₂ feedback is not carried out.</p> <p>ISC feedback is not carried out.</p> <p>ISC learning is not carried out.</p> <p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>
P0115	<p>Coolant temperature sensor: signal stuck. Normal signal is not received from the coolant temperature sensor circuit.</p>	<ul style="list-style-type: none"> • Defective coolant temperature sensor. • Malfunction in ECU. 	<p>Engine is difficult to start.</p> <p>Increased exhaust emissions.</p> <p>Engine idling speed is unstable.</p>	<p>Radiator fan motor relay is ON only when the vehicle is traveling at low speeds.</p> <p>O₂ feedback is not carried out.</p> <p>ISC feedback is not carried out.</p> <p>ISC learning is not carried out.</p> <p>The coolant temperature is fixed to 60 [°C].</p> <p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0116	Coolant temperature sensor: signal out of range. Normal signal is not received from the coolant temperature sensor circuit.	<ul style="list-style-type: none"> • Defective coupler between coolant temperature sensor and ECU. • Open or short circuit in wire harness between coolant temperature sensor and ECU. • Poor circuit continuity in wire harness between coolant temperature sensor and ECU. • Improperly installed coolant temperature sensor. • Defective coolant temperature sensor. • Malfunction in ECU. 	<p>Engine is difficult to start. Increased exhaust emissions. Engine idling speed is unstable.</p>	<p>Radiator fan motor relay is ON only when the vehicle is traveling at low speeds. O₂ 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. Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0117 P0118	<p>[P0117] Coolant temperature sensor: short to ground circuit is detected. Normal signal is not received from the coolant temperature sensor circuit.</p> <p>[P0118] Coolant temperature sensor: open or short to power circuit is detected. Normal signal is not received from the coolant temperature sensor circuit.</p>	<p>[P0117] Low voltage of the coolant temperature sensor circuit (0.1 V or less)</p> <p>[P0118] High voltage of the coolant temperature sensor circuit (4.9 V or more)</p> <ul style="list-style-type: none"> • Defective coupler between coolant temperature sensor and ECU. • Open or short circuit in wire harness between coolant temperature sensor and ECU. • Poor circuit continuity in wire harness between coolant temperature sensor and ECU. • Improperly installed coolant temperature sensor. • Defective coolant temperature sensor. • Malfunction in ECU. 	<p>Engine is difficult to start.</p> <p>Increased exhaust emissions.</p> <p>Engine idling speed is unstable.</p>	<p>Radiator fan motor relay is ON only when the vehicle is traveling at low speeds.</p> <p>O₂ feedback is not carried out.</p> <p>ISC feedback is not carried out.</p> <p>ISC learning is not carried out.</p> <p>The coolant temperature is fixed to 60 [°C].</p> <p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0122 P0123 P0222 P0223 P2135	<p>[P0122] Throttle position sensor: short to ground circuit is detected. Normal signal is not received from the throttle position sensor circuit.</p> <p>[P0123] Throttle position sensor: open or short to power circuit is detected. Normal signal is not received from the throttle position sensor circuit.</p> <p>[P0222] Throttle position sensor: open or short to ground circuit is detected. Normal signal is not received from the throttle position sensor circuit.</p> <p>[P0223] Throttle position sensor: short to power circuit is detected. Normal signal is not received from the throttle position sensor circuit.</p> <p>[P2135] Throttle position sensor: output voltage deviation error. Normal signal is not received from the throttle position sensor circuit.</p>	<p>[P0122, P0222] Low voltage of the throttle position sensor circuit (0.25 V or less)</p> <p>[P0123, P0223] High voltage of the throttle position sensor circuit (4.75 V or more)</p> <p>[P2135] Difference in output voltage 1 and output voltage 2 of the throttle position sensor</p> <ul style="list-style-type: none"> • 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. 	<p>Engine idling speed is high.</p> <p>Engine idling speed is unstable.</p> <p>Engine response is poor.</p> <p>Loss of engine power.</p> <p>Deceleration is poor.</p> <p>Increased exhaust emissions.</p> <p>Vehicle cannot be driven.</p>	<p>Change in the throttle opening is 0 (transient control is not carried out).</p> <p>D–j is fixed.</p> <p>Throttle opening is fixed to 125 [°].</p> <p>O₂ feedback is not carried out.</p> <p>Fuel is not cut off due to the throttle opening.</p> <p>Output is restricted.</p> <p>ISC feedback is not carried out.</p> <p>ISC learning is not carried out.</p> <p>O₂ sensor heater driving is not carried out.</p> <p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

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.	<p>High voltage of the O₂ sensor circuit (4.8 V or more)</p> <ul style="list-style-type: none"> • Improperly installed O₂ sensor. • Defective coupler between O₂ sensor and ECU. • Open or short circuit in wire harness between O₂ sensor and ECU. • Incorrect fuel pressure. • Defective O₂ sensor. • Malfunction in ECU. 	Increased exhaust emissions.	<p>O₂ feedback is not carried out.</p> <p>O₂ feedback learning is not carried out.</p> <p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>
P0133	O ₂ sensor: deterioration is detected. O ₂ sensor output signal response speed is slow.	<ul style="list-style-type: none"> • Defective O₂ sensor. • Malfunction in fuel system. • Malfunction in exhaust system. 	Increased exhaust emissions.	Cruise control fixed to OFF.
P0134	O ₂ sensor: signal stuck. O ₂ sensor signal value does not change.	<ul style="list-style-type: none"> • Defective engine condition. • Improperly installed O₂ sensor. • Incorrect fuel pressure. • Defective O₂ sensor. • Malfunction in ECU. 	Increased exhaust emissions.	<p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>
P0201 P0202 P0203	<p>[P0201] Injector #1: malfunction in injector #1. Normal signal is not received from the injector circuit.</p> <p>[P0202] Injector #2: malfunction in injector #2. Normal signal is not received from the injector circuit.</p> <p>[P0203] Injector #3: malfunction in injector #3. Normal signal is not received from the injector circuit.</p>	<ul style="list-style-type: none"> • Defective coupler between injector and ECU. • Open or short circuit in wire harness between injector and ECU. • Defective injector. • Malfunction in ECU. • Improperly installed injector. 	<p>Loss of engine power.</p> <p>Engine is difficult to start.</p> <p>Engine cannot be started.</p> <p>Engine stops.</p> <p>Engine idling speed is unstable.</p> <p>Increased exhaust emissions.</p>	<p>O₂ feedback is not carried out.</p> <p>ISC feedback is not carried out.</p> <p>ISC learning is not carried out.</p> <p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0300	Misfire in multiple cylinders. Large difference value in angular velocity of crankshaft.	<ul style="list-style-type: none"> • Ignition system malfunction/abnormal • Fuel system malfunction/abnormal 	<p>Engine is difficult to start.</p> <p>Loss of engine power.</p> <p>Engine idling speed is unstable.</p> <p>Drivability is unstable.</p> <p>Increased exhaust emissions.</p>	—
P0301	Misfire in cylinder #1. Large difference value in angular velocity of crankshaft.	<ul style="list-style-type: none"> • Ignition system malfunction/abnormal • Fuel system malfunction/abnormal 	<p>Engine is difficult to start.</p> <p>Loss of engine power.</p> <p>Engine idling speed is unstable.</p> <p>Drivability is unstable.</p> <p>Increased exhaust emissions.</p>	—
P0302	Misfire in cylinder #2. Large difference value in angular velocity of crankshaft.	<ul style="list-style-type: none"> • Ignition system malfunction/abnormal • Fuel system malfunction/abnormal 	<p>Engine is difficult to start.</p> <p>Loss of engine power.</p> <p>Engine idling speed is unstable.</p> <p>Drivability is unstable.</p> <p>Increased exhaust emissions.</p>	—
P0303	Misfire in cylinder #3. Large difference value in angular velocity of crankshaft.	<ul style="list-style-type: none"> • Ignition system malfunction/abnormal • Fuel system malfunction/abnormal 	<p>Engine is difficult to start.</p> <p>Loss of engine power.</p> <p>Engine idling speed is unstable.</p> <p>Drivability is unstable.</p> <p>Increased exhaust emissions.</p>	—

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0335	Crankshaft position sensor: normal signals are not received from the crankshaft position sensor.	<ul style="list-style-type: none"> • Defective coupler between crankshaft position sensor and ECU. • Open or short circuit in wire harness between crankshaft position sensor and ECU. • Improperly installed crankshaft position sensor. • 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. Cruise control fixed to OFF.
P0351 P0352 P0353	<p>[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.</p> <p>[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.</p> <p>[P0353] Cylinder-#3 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#3 ignition coil. Normal signal is not received from the ignition circuit.</p>	<ul style="list-style-type: none"> • Defective coupler between ignition coil and ECU. • Open or short circuit in wire harness between ignition coil and ECU. • Improperly installed ignition coil. • Defective ignition coil. • Malfunction in ECU. 	<p>Engine stops.</p> <p>Loss of engine power.</p> <p>Engine is difficult to start.</p> <p>Engine cannot be started.</p> <p>Engine idling speed is unstable.</p> <p>Increased exhaust emissions.</p>	<p>O₂ feedback is not carried out.</p> <p>ISC feedback is not carried out.</p> <p>ISC learning is not carried out.</p> <p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>
P0458	Purge cut valve solenoid: open circuit is detected. PCV solenoid is not operated.	<ul style="list-style-type: none"> • 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.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0480	Radiator fan motor relay: open or short circuit is detected. Normal signal is not received from the radiator fan motor relay.	<ul style="list-style-type: none"> • 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. Cruise control fixed to OFF.
P0500	Rear wheel sensor: open or short circuit is detected. Normal signal is not received from the rear wheel sensor or hydraulic unit assembly (ABS ECU) to ECU.	<ul style="list-style-type: none"> • Open or short circuit in wire harness between rear wheel sensor and hydraulic unit assembly (ABS ECU). • Open or short circuit in wire harness between hydraulic unit assembly (ABS ECU) and ECU. • Defective rear wheel sensor. • 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. Cruise control fixed to OFF.
P0560	Battery charging voltage is abnormal. Poor charging performance (discharged condition). Vehicle system power voltage is abnormal. (Regulator is not operated properly or battery is not charged properly.)	<ul style="list-style-type: none"> • Battery discharging (disconnected lead in charging system). • Battery discharging (defective rectifier/regulator). 	Engine is difficult to start. Increased exhaust emissions. Battery performance has deteriorated or battery is defective.	O ₂ feedback is not carried out.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0563	Battery charging voltage is abnormal. Charging voltage is not within range (overcharged condition). Vehicle system power voltage is abnormal. (Regulator is not operated properly or battery is not charged properly.)	<ul style="list-style-type: none"> • Battery overcharging (defective rectifier/regulator). • Battery overcharging (disconnected lead in rectifier/regulator wire harness). 	Engine is difficult to start. Increased exhaust emissions. Battery performance has deteriorated or battery is defective.	O ₂ feedback is not carried out.
P0564	Cruise control setting switch "RES+": open or short circuit is detected. Normal signal is not sent to ECU. Cruise control setting switch "SET-": open or short circuit is detected. Normal signal is not sent to ECU.	<ul style="list-style-type: none"> • Open or short circuit in wire harness between cruise control setting switch and ECU. • Defective cruise control setting switch. • Malfunction in ECU. 	Cruise control cannot be used.	Cruise control fixed to OFF.
P056C	Front brake light switch: open or short circuit is detected. Normal signal is not sent to ECU. Rear brake light switch: open or short circuit is detected. Normal signal is not sent to ECU.	<ul style="list-style-type: none"> • Open or short circuit in wire harness between front brake light switch and ECU. • Open or short circuit in wire harness between rear brake light switch and ECU. • Defective front brake light switch or rear brake light switch. • Malfunction in ECU. 	Cruise control cannot be used.	Cruise control fixed to OFF.
P0601	ROM error. Internal malfunction in ECU. (When this malfunction is detected in the ECU, the DTC might not appear on the tool display.)	<ul style="list-style-type: none"> • Malfunction in ECU (ROM error). 	Engine cannot be started.	Engine cannot be started. Cruise control fixed to OFF.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0606	Processor error. Internal malfunction in ECU. (When this malfunction is detected in the ECU, the DTC might not appear on the tool display.)	<ul style="list-style-type: none"> • Malfunction in ECU (Processor error). 	<p>Engine cannot be started. Engine response is poor. Loss of engine power.</p>	<p>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. (Relay unit, headlight relay, and other relays are all turned OFF.) The CO adjustment mode and diagnostic mode cannot be activated. Output is restricted. Cruise control fixed to OFF.</p>
P062F	EEPROM DTC: an error is detected while reading or writing on EEPROM.	<ul style="list-style-type: none"> • CO adjustment value is not properly written. • ISC learning value is not properly written. • O₂ feedback learning value is not properly written. • OBD memory value is not properly written. • Malfunction in ECU. 	<p>Increased exhaust emissions. Engine cannot be started or is difficult to start. Engine idling speed is unstable. OBD memory value is not correct.</p>	<p>CO adjustment value for the faulty cylinder = 0 (default value) ISC learning values = Default values. OBD memory value is initialized. Initialization of O₂ feedback learning value. Cruise control fixed to OFF.</p>
P0638	YCC-T drive system: malfunction detected.	<ul style="list-style-type: none"> • 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. 	<p>Engine response is poor. Loss of engine power. Engine idling speed is unstable.</p>	<p>O₂ 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. Quick shift system is not carried out. Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P0657	Fuel system voltage: incorrect voltage supplied to the injector, fuel pump and relay unit.	<ul style="list-style-type: none"> • 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. Cruise control fixed to OFF.
P0914	Gear position sensor: signal stuck and sensor signal does not change.	<ul style="list-style-type: none"> • Improperly installed gear position sensor. • Defective gear position sensor. • Malfunction in ECU. 	Improper display for gear position. Engine response is poor.	Quick shift system is not carried out. Cruise control fixed to OFF.
P0915	Gear position sensor: out of control signal range and normal signal is not received from the gear position sensor to ECU.	<ul style="list-style-type: none"> • 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 gear position. Engine response is poor.	Maintains the gear position value at the previous value. Quick shift system is not carried out. Cruise control fixed to OFF.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

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) <ul style="list-style-type: none"> • Defective coupler between gear position sensor and ECU. • Open or power 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 gear position. Engine response is poor.	Maintains the gear position value at the previous value. Quick shift system is not carried out. Cruise control fixed to OFF.
P1004	Intake air pressure sensor 1 and intake air pressure sensor 2: When the main switch is "ON", the standard voltage values of Intake air pressure sensor 1 and intake air pressure sensor 2 are large different.	<ul style="list-style-type: none"> • Intake air pressure sensor 1 hose or intake air pressure sensor 2 hose is detached, clogged, twisted or bent. • Defective intake air pressure sensor 1 or intake air pressure sensor 2. • Malfunction in ECU. 	Engine is difficult to start. Engine idling speed is unstable. Increased exhaust emissions. Loss of engine power.	Intake air pressure is fixed to 101.3 [kPa]. Intake air pressure difference is fixed to 0 [kPa]. Atmospheric pressure is fixed to 101.3 [kPa]. α -N is fixed. Fuel is not cut off due to the intake air pressure difference. O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out. Cruise control fixed to OFF.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
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. Clutch switch: open or short circuit is detected. Normal signal is not received from the rear wheel sensor to ECU when the gear-in.	<ul style="list-style-type: none"> • Open or short circuit in wire harness between rear wheel sensor and hydraulic unit assembly (ABS ECU). • Open or short circuit in wire harness between hydraulic unit assembly (ABS ECU) and ECU. • Open or short circuit in wire harness between neutral switch and ECU. • Open or short circuit in wire harness between clutch switch and ECU. • Defective rear wheel sensor. • Defective neutral switch. • Defective clutch switch. • Improper adjustment of clutch lever. • Malfunction in ECU. 	Vehicle speed is not displayed on the meter. Indication of the neutral indicator light is incorrect. Engine idling speed is unstable. Traction control does not work.	Vehicle speed displayed on the meter = 0 [km/h] O2 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. Cruise control fixed to OFF.
P1600	Lean angle sensor: open or short circuit is detected. Normal signal is not received from IMU or defective IMU.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Malfunction in IMU. • Malfunction in ECU. 	Engine cannot be started.	Engine cannot be started. Cruise control fixed to OFF.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P1601	Sidestand switch: open or short circuit in wire harness of the ECU is detected. Normal signal is not received from the sidestand switch.	<ul style="list-style-type: none"> • 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). Cruise control fixed to OFF.
P1602	Malfunction in ECU internal circuit (malfunction of ECU power cut-off function).	<ul style="list-style-type: none"> • Open or short circuit in wire harness between ECU and battery. • Open or short circuit in wire harness between ECU and main switch. • Blown backup fuse 2. • Malfunction in ECU. 	<p>Engine idling speed is unstable. Engine idling speed is high. Increased exhaust emissions. Engine is difficult to start.</p>	<p>O₂ feedback learning is not carried out. O₂ feedback learning value is not written. Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P1606 P1607 P1608	[P1606] Intake air pressure sensor 2: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor 2 circuit. [P1607] Intake air pressure sensor 2: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor 2 circuit. [P1608] Intake air pressure sensor 2: signal out of range. Normal signal is not received from the intake air pressure sensor 2 circuit.	<ul style="list-style-type: none"> • Defective coupler between intake air pressure sensor 2 and ECU. • Open or short circuit in wire harness between intake air pressure sensor 2 and ECU. • Improperly installed intake air pressure sensor 2. • Defective intake air pressure sensor 2. • Malfunction in ECU. 	Engine is difficult to start. Increased exhaust emissions. Insufficient power at high altitudes. Engine idling speed is unstable.	α -N is fixed. Intake air pressure difference is fixed to 0 [kPa]. Atmospheric pressure is fixed to 101.3 [kPa]. Fuel is not cut off due to the intake air pressure difference. O ₂ feedback is not carried out. ISC feedback is not carried out. ISC learning is not carried out. Cruise control fixed to OFF.
P1609	Intake air pressure sensor 2: clogging of hose or sensor installation improperly. Stable pressure is not supplied.	<ul style="list-style-type: none"> • Intake air pressure sensor 2 hose is not installed. • Intake air pressure sensor 2 hose is not installed correctly (Detached, clogged, twisted or pinching). • Intake air pressure sensor 2 hole is clogged, or intake air pressure sensor is not installed correctly. 	Engine idling speed is high. Engine idling speed is unstable. Loss of engine power.	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. Atmospheric pressure is fixed to 101.3 [kPa]. O ₂ feedback is not carried out. Cruise control fixed to OFF.
P1806 P1807	[P1806] Shift sensor: open or short to ground circuit is detected. Normal signal is not received from the shift sensor to ECU. [P1807] Shift sensor: short to power circuit is detected. Normal signal is not received from the shift sensor to ECU.	<ul style="list-style-type: none"> • Defective coupler between shift sensor and ECU. • Open or power short circuit in wire harness between shift sensor and ECU. • Improperly installed shift sensor. • Defective shift sensor. • 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.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
P2122 P2123 P2127 P2128 P2138	<p>[P2122] Accelerator position sensor: open or short to ground circuit is detected. Normal signal is not received from the accelerator position sensor.</p> <p>[P2123] Accelerator position sensor: short to power circuit is detected. Normal signal is not received from the accelerator position sensor.</p> <p>[P2127] Accelerator position sensor: open or short to ground circuit is detected. Normal signal is not received from the accelerator position sensor.</p> <p>[P2128] Accelerator position sensor: short to power circuit is detected. Normal signal is not received from the accelerator position sensor.</p> <p>[P2138] Deviation error. Normal signal is not received from the accelerator position sensor.</p>	<p>[P2122, P2127] Low voltage of the accelerator position sensor circuit (0.25 V or less)</p> <p>[P2123, P2128] High voltage of the accelerator position sensor circuit (4.75 V or more)</p> <p>[P2138] Difference in output voltage 1 and output voltage 2 of the accelerator position sensor</p> <ul style="list-style-type: none"> • 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. 	<p>Engine response is poor.</p> <p>Loss of engine power.</p> <p>Engine idling speed is unstable.</p>	<p>No change in accelerator opening (transient control is not carried out).</p> <p>Accelerator opening is fixed to 0[°].</p> <p>O₂ feedback is not carried out.</p> <p>YCC-T evacuation is activated.</p> <p>Fuel cut is prohibited by accelerator opening.</p> <p>Output is restricted.</p> <p>ISC feedback is not carried out.</p> <p>ISC learning is not carried out.</p> <p>Quick shift system is not carried out.</p> <p>Cruise control fixed to OFF.</p>
P2158	<p>Front wheel sensor: normal signal is not received from the front wheel sensor.</p>	<ul style="list-style-type: none"> • Open or short circuit in wire harness between front wheel sensor and ECU. • Defective front wheel sensor. • Malfunction in ECU. 	<p>Traction control does not work.</p> <p>Stability control indicator light on the meter comes on.</p> <p>Traction control system switch is disabled. (Stability control indicator light on the meter goes OFF.)</p>	<p>Traction control does not work.</p> <p>Cruise control fixed to OFF.</p>

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
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). <ul style="list-style-type: none"> • Improperly installed O₂ sensor. • Defective coupler between O₂ sensor and ECU. • Open or short circuit in wire harness between O₂ sensor and ECU. • Incorrect fuel pressure. • Defective O₂ 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. Cruise control fixed to OFF.
U0125	Signals cannot be transmitted between the ECU and the IMU.	<ul style="list-style-type: none"> • Defective IMU coupler or ECU coupler. • Open or short circuit in wire harness between IMU and ECU. • Malfunction in IMU. • Malfunction in ECU. 	Engine cannot be started.	Engine cannot be started. Cruise control fixed to OFF.

EAS33029

SELF-DIAGNOSTIC FUNCTION TABLE (FOR IMMOBILIZER SYSTEM)

TIP

For details of the DTC, refer to “HOW TO CHECK DTC” on page 9-23.

DTC	Item
51	Immobilizer unit: Code cannot be transmitted between the key and immobilizer unit.
52	Immobilizer unit: Code of immobilizer unit and key are not matched.
53	Immobilizer unit: Code cannot be transmitted between the ECU and immobilizer unit.
54	Immobilizer unit: Data of immobilizer and ECU are not matched.
55	Immobilizer unit: Key code registration malfunction.
56	ECU: Unidentified code is received.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS33286

SELF-DIAGNOSTIC FUNCTION TABLE (FOR ABS (Anti-lock Brake System))

TIP

For details of the DTC, refer to "BASIC INSTRUCTIONS FOR TROUBLESHOOTING" on page 9-37.

DTC	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.)	<ul style="list-style-type: none"> • Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
12	Rear wheel sensor (intermittent pulses or no pulses)	Rear wheel sensor signal is not received properly. (Pulses are not received or are received intermittently while the vehicle is traveling.)	<ul style="list-style-type: none"> • Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
13* 26*	Front wheel sensor (abnormal pulse period)	Front wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	<ul style="list-style-type: none"> • Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor
14* 27*	Rear wheel sensor (abnormal pulse period)	Rear wheel sensor signal is not received properly. (The pulse period is abnormal while the vehicle is traveling.)	<ul style="list-style-type: none"> • Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Symptom	Check point
15	Front wheel sensor (open or short circuit)	Open or short circuit is detected in the front wheel sensor.	<ul style="list-style-type: none"> • Defective coupler between the front wheel sensor and the hydraulic unit assembly (ABS ECU) • Open or short circuit in the wire harness between the front wheel sensor and the hydraulic unit assembly (ABS ECU) • Defective front wheel sensor or hydraulic unit assembly (ABS ECU)
16	Rear wheel sensor (open or short circuit)	Open or short circuit is detected in the rear wheel sensor.	<ul style="list-style-type: none"> • Defective coupler between the rear wheel sensor and the hydraulic unit assembly (ABS ECU) • Open or short circuit in the wire harness between the rear wheel sensor and the hydraulic unit assembly (ABS ECU) • Defective rear wheel sensor or hydraulic unit assembly (ABS ECU)
21	Hydraulic unit assembly (ABS ECU) (defective solenoid drive circuit)	Solenoid drive circuit in the hydraulic unit assembly (ABS ECU) is open or short-circuited.	<ul style="list-style-type: none"> • Defective hydraulic unit assembly (ABS ECU)
31	Hydraulic unit assembly (ABS ECU) (defective ABS solenoid power circuit)	Power is not supplied to the solenoid circuit in the hydraulic unit assembly (ABS ECU).	<ul style="list-style-type: none"> • Blown ABS solenoid fuse • Defective coupler between the battery and the hydraulic unit assembly (ABS ECU) • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly (ABS ECU) • Defective hydraulic unit assembly (ABS ECU)

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Symptom	Check point
33	Hydraulic unit assembly (ABS ECU) (abnormal ABS motor power supply)	Power is not supplied to the motor circuit in the hydraulic unit assembly (ABS ECU).	<ul style="list-style-type: none"> • Blown ABS motor fuse • Defective coupler between the battery and the hydraulic unit assembly (ABS ECU) • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly (ABS ECU) • Defective hydraulic unit assembly (ABS ECU)
34	Hydraulic unit assembly (ABS ECU) (short circuit in ABS motor power supply circuit)	Short circuit is detected in the motor power supply circuit in the hydraulic unit assembly (ABS ECU).	<ul style="list-style-type: none"> • Defective hydraulic unit assembly (ABS ECU)
41	Front wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	<ul style="list-style-type: none"> • Pulses from the front wheel sensor are received intermittently while the vehicle is traveling. • Front wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure. 	<ul style="list-style-type: none"> • Incorrect installation of the front wheel sensor • Incorrect rotation of the front wheel • Front brake dragging • Defective hydraulic unit assembly (ABS ECU)
42	Rear wheel ABS (intermittent wheel speed pulses or incorrect depressurization)	<ul style="list-style-type: none"> • Pulses from the rear wheel sensor are received intermittently while the vehicle is traveling. • Rear wheel will not recover from the locking tendency even though the signal is transmitted from the ABS ECU to reduce the hydraulic pressure. 	<ul style="list-style-type: none"> • Incorrect installation of the rear wheel sensor • Incorrect rotation of the rear wheel • Rear brake dragging • Defective hydraulic unit assembly (ABS ECU)
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.)	<ul style="list-style-type: none"> • Foreign material adhered around the front wheel sensor • Incorrect installation of the front wheel • Defective sensor rotor or incorrect installation of the rotor • Defective front wheel sensor or incorrect installation of the sensor

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Symptom	Check point
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.)	<ul style="list-style-type: none"> • Foreign material adhered around the rear wheel sensor • Incorrect installation of the rear wheel • Defective sensor rotor or incorrect installation of the rotor • Defective rear wheel sensor or incorrect installation of the sensor
51	Vehicle system power supply (voltage of ABS ECU power supply is high)	Power voltage supplied to the ABS ECU in the hydraulic unit assembly (ABS ECU) is too high.	<ul style="list-style-type: none"> • Defective battery • Disconnected battery terminal • Defective charging system
53	Vehicle system power supply (voltage of ABS ECU power supply is low)	Power voltage supplied to the ABS ECU in the hydraulic unit assembly (ABS ECU) is too low.	<ul style="list-style-type: none"> • Defective battery • Defective coupler between the battery and the hydraulic unit assembly (ABS ECU) • Open or short circuit in the wire harness between the battery and the hydraulic unit assembly (ABS ECU) • Defective charging system
55	Hydraulic unit assembly (ABS ECU) (defective ABS ECU)	Abnormal data is detected in the hydraulic unit assembly (ABS ECU).	<ul style="list-style-type: none"> • Defective hydraulic unit assembly (ABS ECU)
56	Hydraulic unit assembly (ABS ECU) (abnormal internal circuit)	Abnormality detected in of hydraulic unit assembly (ABS ECU).	<ul style="list-style-type: none"> • Defective hydraulic unit assembly (ABS ECU)
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 (ABS ECU) is too low.	<ul style="list-style-type: none"> • Short-circuit in CAN communication line • Defective battery • Defective coupler between battery and hydraulic unit assembly (ABS ECU) • 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 (ABS ECU).	<ul style="list-style-type: none"> • Defective hydraulic unit assembly (ABS ECU)

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

DTC	Item	Symptom	Check point
68	Defective hydraulic unit assembly (ABS ECU) (defective front pressure sensor)	Abnormality detected in pressure sensor circuit at front caliper side of hydraulic unit assembly (ABS ECU).	In case of electrical interlocking brake <ul style="list-style-type: none"> • Defective front brake line • Defective hydraulic unit assembly (ABS ECU)
89	CAN communication (between meter assembly and hydraulic unit assembly (ABS ECU))	Transmitted data from the meter cannot be normally received.	<ul style="list-style-type: none"> • Defective coupler between meter assembly and hydraulic unit assembly (ABS ECU) • Harness is broken or short-circuit between meter assembly and hydraulic unit assembly (ABS ECU) • Defective meter assembly • Defective hydraulic unit assembly (ABS ECU)
90	CAN communication (between ECU and hydraulic unit assembly (ABS ECU))	Transmitted data from the FI ECU cannot be normally received.	<ul style="list-style-type: none"> • Defective coupler between FI ECU and hydraulic unit assembly (ABS ECU) • Harness is broken or short-circuit between FI ECU and hydraulic unit assembly (ABS ECU) • Defective FI ECU • Defective hydraulic unit assembly (ABS ECU)
91	CAN communication (between IMU and hydraulic unit assembly (ABS ECU))	Transmitted data from the IMU cannot be normally received.	<ul style="list-style-type: none"> • Defective coupler between IMU and hydraulic unit assembly (ABS ECU) • Harness is broken or short-circuit between IMU and hydraulic unit assembly (ABS ECU) • Defective IMU • Defective hydraulic unit assembly (ABS ECU)

* The DTC number varies according to the vehicle conditions.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE



EAS33030

COMMUNICATION ERROR WITH THE METER

DTC	Item	Probable cause of malfunction	Vehicle symptom	Fail-safe system operation
U0155 (YDT) Err (multi-function meter display)	[U0155 (FI)] Multi-function meter: signals cannot be transmitted between the ECU and the multi-function meter.	Communication between the ECU and the meter is not possible <ul style="list-style-type: none"> • Defective meter coupler and ECU coupler • Open or short circuit in the wire harness between the meter and the ECU • Defective meter • Defective ECU 	Defective meter display. Traction control does not work.	Map switching: Fixed state. Traction control does not work. Meter switch input: OFF is fixed. Quick shift system is not carried out. Cruise control fixed to OFF.

EAS33031

DIAGNOSTIC CODE: SENSOR OPERATION TABLE

Diagnostic code No.	Item	Tool display	Procedure
01	Throttle position sensor signal 1 <ul style="list-style-type: none"> • Fully closed position • Fully opened position 	0–125 11–21 96–107	Check the fully closed throttle valve. Check the fully opened throttle valve.
03	Intake air pressure	Displays the intake air pressure. 0–126 kPa When engine is stopped: Atmospheric pressure at the current altitude is indicated. At sea level (0m): Approx. 101 kPa Above sea level (3000 m): Approx. 70 kPa	Operate the throttle while pushing the “  ” side of the stop/run/start switch. (If the displayed value changes, the performance is OK.)
04	Intake air pressure 2	Displays the intake air pressure. 0–126 kPa When engine is stopped: Atmospheric pressure at the current altitude is indicated. At sea level (0m): Approx. 101 kPa Above sea level (3000 m): Approx. 70 kPa	Operate the throttle while pushing the “  ” side of the stop/run/start switch. (If the displayed value changes, the performance is OK.)

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Tool display	Procedure
05	Intake air temperature	Displays the intake air temperature. -30–120°C When engine is cold: Displays temperature closer to air temperature. When engine is hot: Air temperature + approx. 20°C	Compare the actually measured air temperature with the tool display value.
06	Coolant temperature	Displays the coolant temperature. -30–120°C When engine is cold: Displays temperature closer to air temperature. When engine is hot: Displays current coolant temperature.	Compare the actually measured coolant temperature with the tool display value.
07	Rear wheel vehicle speed pulses	Rear wheel speed pulse 0–999	Check that the number increases when the rear wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.
09	Fuel system voltage (battery voltage)	Displays the fuel system voltage. 0–18.7 V Standard voltage: Approx 12.0 V	Compare the actually measured battery voltage with the tool displayed value. (If the actually measured battery voltage is low, recharge the battery.)
13	Throttle position sensor signal 2 • Fully closed position • Fully opened position	0–125 9–23 93–109	Check the fully closed throttle valve. Check the fully opened throttle valve.
14	Accelerator position sensor signal 1 • Fully closed position • Fully opened position • Turn the throttle grip past the closed position in the deceleration direction.	0–125 14–18 82–92 7–12	Check with throttle grip fully closed position. Check with throttle grip fully opened position.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Tool display	Procedure
15	Accelerator position sensor signal 2 <ul style="list-style-type: none"> • Fully closed position • Fully opened position • Turn the throttle grip past the closed position in the deceleration direction. 	0–125 14–18 82–92 7–12	Check with throttle grip fully closed position. Check with throttle grip fully opened position.
16	Front wheel speed pulse	Front wheel speed pulse 0–999	Check that the number increases when the front wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.
17	Bank angle display	Displays the bank angle in increments of 5° 0–60° <ul style="list-style-type: none"> • 0–5° (vehicle is vertical) • Less than 30° (when the sidestand is used) 	Check that 0–5° is displayed when the vehicle is vertical and that the displayed value increases as the vehicle continues to incline.
20	Sidestand switch <ul style="list-style-type: none"> • Sidestand retracted • Sidestand extended 	ON OFF	Extend and retract the sidestand.
21	Neutral switch and clutch switch <ul style="list-style-type: none"> • Transmission is in neutral • Transmission is in gear and the clutch lever released • Clutch lever is squeezed with the transmission in gear and when the sidestand is retracted • Clutch lever is squeezed with the transmission in gear and when the sidestand is extended 	ON OFF ON OFF	Operate the transmission, clutch lever, and sidestand.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Tool display	Procedure
60	EEPROM DTC display <ul style="list-style-type: none"> • No history • History exists 	00 <ul style="list-style-type: none"> • No malfunctions detected (If the DTC P062F is indicated, the ECU is defective.) 01–03 (CO adjustment value) <ul style="list-style-type: none"> • (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 00–03 (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, push the “Operation” button 3 times within 5 seconds.
70	Programmed unit Ver. number	0–254 [-]	Check the programmed unit Ver. number
80	Cruise control setting switch “RES+” <ul style="list-style-type: none"> • Switch is pushed • Switch is released 	ON OFF	Push and release the “RES+” side of the cruise control setting switch.
81	Cruise control setting switch “SET-” <ul style="list-style-type: none"> • Switch is pushed • Switch is released 	ON OFF	Push and release the “SET-” side of the cruise control setting switch.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Tool display	Procedure
82	Cruise control cancel circuit <ul style="list-style-type: none"> • Clutch lever is squeezed • Clutch lever is released • Brake lever is squeezed • Brake lever is released • Brake pedal is depressed • Brake pedal is released 	ON OFF ON OFF ON OFF	Operate the clutch lever, brake lever and brake pedal.
83	Front brake light switch and rear brake light switch <ul style="list-style-type: none"> • Brake lever is squeezed • Brake lever is released • Brake pedal is depressed • Brake pedal is released 	ON OFF ON OFF	Operate the brake lever and brake pedal.
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, push the "Operation" button 3 times within 5 seconds.
95	Shift sensor <ul style="list-style-type: none"> • 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 low side voltage Changes to the high side voltage	Check the sensor condition by operating the shift pedal.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

EAS33032

DIAGNOSTIC CODE: ACTUATOR OPERATION TABLE

Diagnostic code No.	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.	Check that a spark is generated five times. <ul style="list-style-type: none"> • Connect an ignition checker. • Check the sparking performance on the spark plug.
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.	Check that a spark is generated five times. <ul style="list-style-type: none"> • Connect an ignition checker. • Check the sparking performance on the spark plug.
32	Cylinder-#3 ignition coil	Actuates the cylinder-#3 ignition coil five times at one-second intervals. The "check" indicator on the YDT screen comes on each time the ignition coil is actuated.	Check that a spark is generated five times. <ul style="list-style-type: none"> • Connect an ignition checker. • Check the sparking performance on the spark plug.
36	Injector #1	Actuates the injector #1 five times at one-second intervals. The "check" indicator on the YDT screen comes on each time the injector is actuated.	Disconnect the fuel pump coupler before doing this procedure. Check that injector #1 is actuated five times by listening for the operating sound.
37	Injector #2	Actuates the injector #2 five times at one-second intervals. The "check" indicator on the YDT screen comes on each time the injector is actuated.	Disconnect the fuel pump coupler before doing this procedure. Check that injector #2 is actuated five times by listening for the operating sound.
38	Injector #3	Actuates the injector #3 five times at one-second intervals. The "check" indicator on the YDT screen comes on each time the injector is actuated.	Disconnect the fuel pump coupler before doing this procedure. Check that injector #3 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 intake solenoid is actuated.	Check that the purge cut valve solenoid is actuated five times by listening for the operating sound.

SELF-DIAGNOSTIC FUNCTION AND DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	Actuation	Procedure
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-seconds 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 relay	Actuates the headlight relay five times at five-seconds intervals. The "check" indicator on the YDT screen comes on each time the headlight relay is actuated.	Check that the headlight relay comes on five times by listening for the operating sound.
57	Grip warmer (OPTION)	Energize (warm up) the grip warmers for 2 minutes.	Check that the grip warmer temperature by hand.

EVENT CODE TABLE

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 1	Brief abnormality detected in the intake air pressure sensor 1	Same as for DTC number P0107 and P0108	Perform the inspection items listed for DTC number P0107 and P0108.
193	Throttle position sensor	Brief abnormality detected in the throttle position sensor	Same as for DTC number P0122, P0123, P0222 and P0223	Perform the inspection items listed for DTC number P0122, P0123, P0222 and P0223.
195	Sidestand switch	Brief abnormality 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	Brief abnormality detected in the coolant temperature sensor	Same as for DTC number P0117 and P0118	Perform the inspection items listed for DTC number P0117 and P0118.
197	Intake air temperature sensor	Brief abnormality detected in the intake air temperature sensor	Same as for DTC number P0112 and P0113	Perform the inspection items listed for DTC number P0112 and P0113.
199	Intake air pressure sensor 2	Brief abnormality detected in the intake air pressure sensor 2	Same as for DTC No. P1606 and P1607	Perform the inspection items listed for DTC No. P1606 and P1607.
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.
220	Gear position sensor	Brief abnormality detected in the gear position sensor	Same as for DTC number P0916 and P0917	Perform the inspection items listed for DTC number P0916 and P0917.
240	O ₂ sensor (Stuck at the upper limit for adjustment)	During O ₂ feedback, the adjustment is maintained at the upper limit	<ul style="list-style-type: none"> • Open or short circuit in the wire harness between the sensor and ECU • Drop in fuel pressure • Clogged injector • Fault in sensor • Malfunction in ECU • Malfunction in the fuel injection system 	<ul style="list-style-type: none"> • If a DTC is occurring, respond to that first. * Rarely, Code 240 occurs even when the system is functioning properly.

EVENT CODE TABLE

No.	Item	Symptom	Possible causes	Note
241	O ₂ sensor (Stuck at the lower limit for adjustment)	During O ₂ feedback, the adjustment is maintained at the lower limit	<ul style="list-style-type: none"> • Open or short circuit in the wire harness between the sensor and ECU • Drop in fuel pressure • Clogged injector • Fault in sensor • Malfunction in ECU • Malfunction in the fuel injection system 	<ul style="list-style-type: none"> • If a DTC is occurring, respond to that first. * Rarely, Code 241 occurs even when the system is functioning properly.
242	ISC (Stuck at the upper limit for adjustment)	During idling, the adjustment is maintained at the upper limit	<ul style="list-style-type: none"> • Idling engine speed is slow • Clogged throttle body • Poorly adjusted clutch cable • Malfunction in the fuel injection system • Dirty or worn spark plug • Malfunction in the battery • Malfunction in ECU 	<ul style="list-style-type: none"> • Implement diagnosis mode D67, 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	<ul style="list-style-type: none"> • Idling engine speed is fast • Poorly adjusted clutch cable • Malfunction in the fuel injection system • Dirty or worn spark plug • Malfunction in the battery • Malfunction in ECU 	<ul style="list-style-type: none"> • If a DTC is occurring, respond to that first. * Rarely, Code 243 occurs even when the system is functioning properly.
244	Poor starting/inability to start	Poor starting/inability to start detected	<ul style="list-style-type: none"> • No gasoline • Malfunction in the fuel injection system • Dirty or worn spark plug • Malfunction in the battery • Malfunction in ECU 	<ul style="list-style-type: none"> • 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 detected	<ul style="list-style-type: none"> • No gasoline • Poorly adjusted clutch cable • Malfunction in the fuel injection system • Dirty or worn spark plug • Malfunction in the battery • Malfunction in ECU 	<ul style="list-style-type: none"> • If a DTC is occurring, respond to that first. * Rarely, Code 245 occurs even when the system is functioning properly.

EVENT CODE TABLE

No.	Item	Symptom	Possible causes	Note
246	Cruise control	Automatic turning off of the cruise control system detected	The cruise control system will automatically turn off under the following conditions: <ul style="list-style-type: none"> • Unable to maintain the set cruising speed when traveling up a steep slope • Wheel slip detected • Engine stalls • Sidestand is extended • Engine stop switch is set to the "⊗" position 	The automatic turning off of the cruise control system does not indicate a malfunction in the system.
251	Shift sensor	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.

Fail-safe system

- Unable to start engine
- Unable to drive vehicle

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 IMU.

- Check the installed direction and condition of the sensor.
Refer to "GENERAL CHASSIS (1)" on page 4-1.
- Check the grommet for cracks.

Is check result OK?**YES**

→ Go to step 3.

NO

- a. Fix the IMU 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 IMU.

- Execute the diagnostic mode. (Code 17)
- Check that 0°–5° 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 IMU.
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 8-41.

EAS20554

70_EVENT

EAS33034

TROUBLESHOOTING

Item

Engine forcibly stops when the vehicle is left idling for a long period.

Procedure

TIP

If another error code is displayed at the same time, check the other error 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 8-41.

EAS20560

C0520

EAS33319

TROUBLESHOOTING**Item**

Abnormal IMU: Normal signal is not received from the IMU or failure signal is received from IMU.

Fail-safe system

- Able/Unable to start engine (depending on the situation)
- Able/Unable to drive vehicle (depending on the situation)

Procedure

1. Connection of IMU 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**

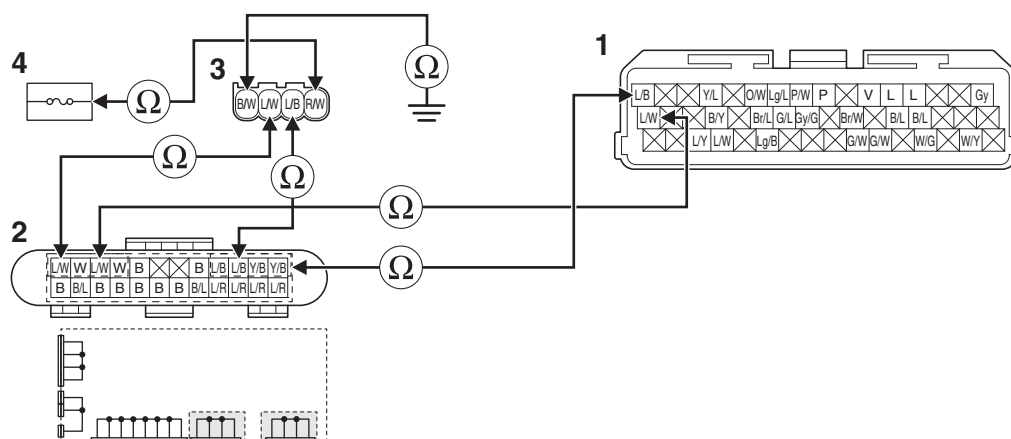
→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Wire harness continuity.
 - Disconnect the ECU coupler "1", IMU coupler "3" and ignition fuse 2 "4".
 - Remove the joint coupler cap "2".
 - Open circuit check

Between ECU coupler “1” and joint coupler “2”	blue/white–blue/white blue/black–blue/black
Between joint coupler “2” and IMU coupler “3”	blue/white–blue/white blue/black–blue/black
Between IMU coupler “3” and ground	black/white–ground
Between ignition fuse 2 holder “4” and IMU coupler “3”	red/white–red/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

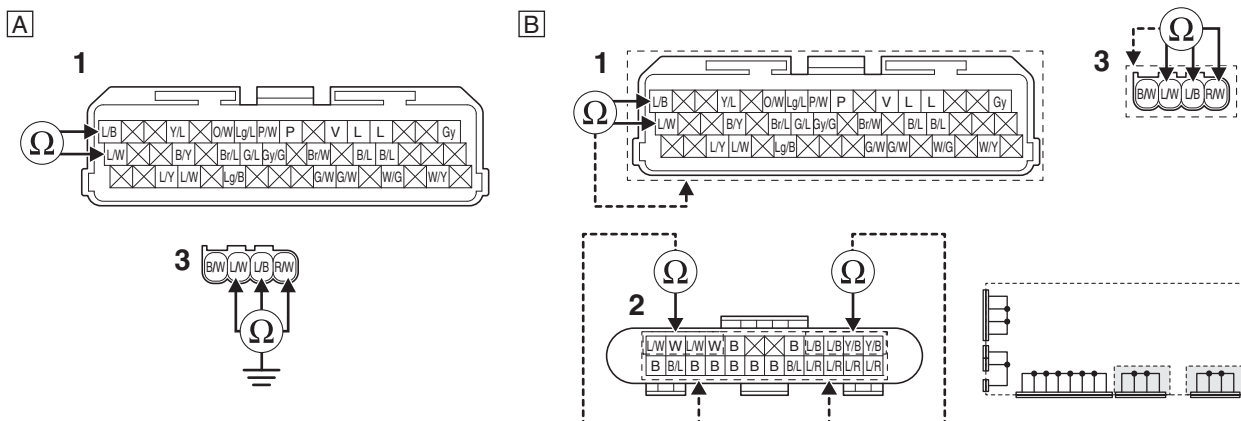
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between ECU coupler “1” and ground	blue/black–ground blue/white–ground
Between IMU coupler “3” and ground	blue/black–ground blue/white–ground red/white–ground

Lines short circuit check “B”

ECU coupler “1”	blue/black—any other coupler terminal blue/white—any other coupler terminal
IMU coupler “3”	blue/black—any other coupler terminal blue/white—any other coupler terminal red/white—any other coupler terminal
Joint coupler “2”	blue/black—any other coupler terminal blue/white—any other coupler terminal



Is resistance $\infty \Omega$?

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 IMU.

- Check the installed direction and condition of the sensor.
Refer to “GENERAL CHASSIS (1)” on page 4-1.
- Check the grommet for cracks.

Is check result OK?

YES

→ Go to step 5.

NO

a. Fix the IMU installation condition.

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 IMU.

- Replace the IMU.
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 ECU.

- Replace the ECU, and complete the service.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

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.

EAS20397

P0030

EAS33134

TROUBLESHOOTING**Item**

O₂ sensor heater: defective heater or heater driver ON/OFF command and error signal is mismatching.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure**TIP**

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P0112, P0113, P0122, P0123, P0222, P0223, P2135

1. Connection of O₂ sensor coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?**YES**

→ Go to step 2.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?**YES**

→ Go to step 6, and complete the service.

NO

→ Start the engine, and then check the DTC.

Is it in the "Recovered" condition?**YES**

→ Go to step 6, and complete the service.

NO

→ Go to step 2.

TIP

For this check, also set the stop/run/start switch to "ON".

2. Connection of ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?**YES**

→ Go to step 3.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Start the engine, and then check the DTC.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 3.

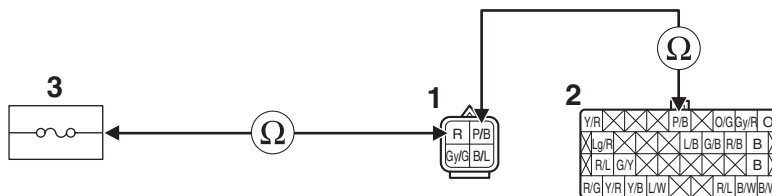
TIP

For this check, also set the stop/run/start switch to “ON”.

3. Wire harness continuity.

- Disconnect the O₂ sensor coupler “1”, ECU coupler “2” and ignition fuse “3”.
- Open circuit check

Between O ₂ sensor coupler “1” and ECU coupler “2”	pink/black–pink/black
Between O ₂ sensor coupler “1” and ignition fuse holder “3”	red–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 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 “ON”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

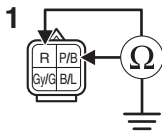
Ground short circuit check “A”

Between O ₂ sensor coupler “1” and ground	red–ground pink/black–ground
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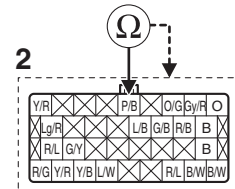
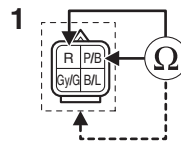
Lines short circuit check “B”

O ₂ sensor coupler “1”	red–any other coupler terminal pink/black–any other coupler terminal
ECU coupler “2”	pink/black–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Start the engine, and then check the DTC.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 4.

TIP

For this check, also set the stop/run/start switch to “ON”.

4. Defective O₂ sensor.

- Replace the O₂ sensor.
Refer to “ENGINE REMOVAL” on page 5-9.
- 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

→ 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 “ON”.

5. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

6. Delete the DTC and check that the MIL goes off.

- Confirm that the DTC has a condition of “Recovered” using the YDT, and then delete the DTC.

EAS20660

P00D1, P2195

EAS33115

TROUBLESHOOTING

Item

- [P00D1] O₂ sensor: heater performance is deteriorated. Normal signal is not received from the O₂ sensor while driving the O₂ sensor heater.
- [P2195] O₂ sensor: open circuit is detected. Normal signal is not received from the O₂ sensor.

Fail-safe system

- Able to start engine
- Able to drive vehicle

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 O₂ sensor.

- Check for looseness or pinching.

Is check result OK?

YES

→ Go to step 2.

NO

- Reinstall or replace the O₂ sensor.
Refer to "ENGINE REMOVAL" on page 5-9.
- Start the engine and let it idle for approximately 1 minute.
- Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 2.

2. Connection of O₂ 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

- Connect the coupler securely or replace the wire harness.
- Start the engine and let it idle for approximately 1 minute.
- Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 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

- Connect the coupler securely or replace the wire harness.
- Start the engine and let it idle for approximately 1 minute.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

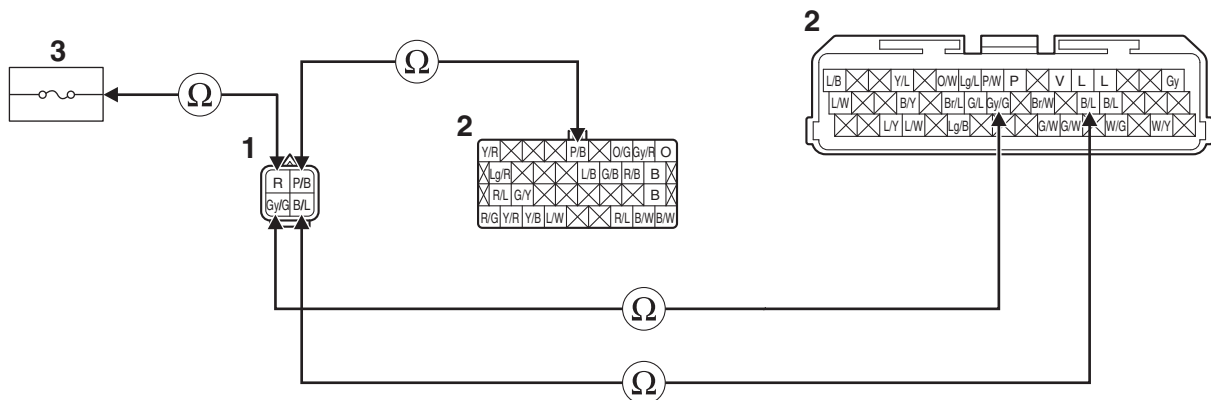
NO

→ Go to step 4.

4. Wire harness continuity.

- Disconnect the O₂ sensor coupler “1”, ECU coupler “2” and ignition fuse “3”.
- Open circuit check

Between O ₂ sensor coupler “1” and ECU coupler “2”	gray/green–gray/green pink/black–pink/black black/blue–black/blue
Between O ₂ sensor coupler “1” and ignition fuse holder “3”	red–red



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Start the engine and let it idle for approximately 1 minute.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

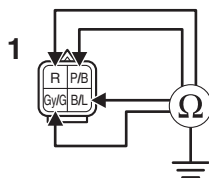
Ground short circuit check “A”

Between O ₂ sensor coupler “1” and ground	gray/green–ground pink/black–ground black/blue–ground red–ground
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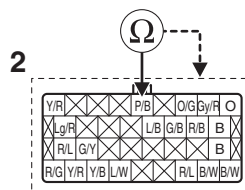
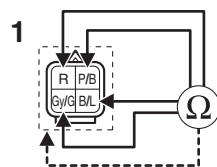
Lines short circuit check “B”

O ₂ sensor coupler “1”	gray/green–any other coupler terminal pink/black–any other coupler terminal black/blue–any other coupler terminal red–any other coupler terminal
ECU coupler “2”	gray/green–any other coupler terminal pink/black–any other coupler terminal black/blue–any other coupler terminal

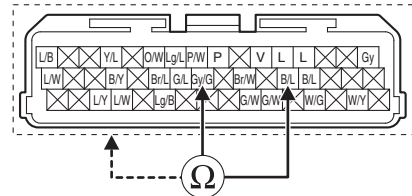
A



B



2



Is resistance ∞ Ω?

YES

→ Go to step 5.

NO

- Replace the wire harness.
- Start the engine and let it idle for approximately 1 minute.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 5.

5. Check fuel pressure.

- Check the fuel pressure.

Refer to “CHECKING THE FUEL PRESSURE” on page 7-11.

Is check result OK?

YES

→ Go to step 6.

NO

- Replace the fuel pump.
Refer to “REMOVING THE FUEL PUMP” on page 7-4.
- Start the engine and let it idle for approximately 1 minute.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 6.

6. Defective O₂ sensor.

- Replace the O₂ sensor.

Refer to “ENGINE REMOVAL” on page 5-9.

- Start the engine and let it idle for approximately 1 minute.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to step 7.

7. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

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.

EAS20420

P0105

EAS32838

TROUBLESHOOTING**Item**

Intake air pressure sensor 1: signal out of range. Normal signal is not received from the intake air pressure sensor 1 circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure**TIP**

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P0107, P0108

1. Connection of intake air pressure sensor 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 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 5, and complete the service.

NO

→ Go to step 2.

2. Defective intake air pressure sensor 1.

- Replace the intake air pressure sensor 1.
Refer to "THROTTLE BODIES" on page 7-6.
- 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 5, and complete the service.

NO

→ Go to step 3.

3. Defective wire harness.

- Replace the wire harness.
- 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 5, and complete the service.

NO

→ Go to step 4.

4. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

5. 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.

EAS20421

P0106

EAS32840

TROUBLESHOOTING

Item

Intake air pressure sensor 1: clogging of hose or sensor installation improperly. Stable pressure is not supplied.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P0105, P0107, P0108, P0122, P0123, P0222, P0223, P0335, P1004, P1606, P1607, P1608, P1609, P2135

1. Installed condition of intake air pressure sensor 1 hose.

- Check for detached, clogged, twisted or pinching.

Refer to “THROTTLE BODIES” on page 7-6.

Is check result OK?

YES

→ Go to step 2.

NO

- a. Repair or replace the intake air pressure sensor 1 hose.
Refer to “THROTTLE BODIES” on page 7-6.
- b. Start the engine and let it idle for approximately 5 seconds with the throttle fully closed, and then check 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. Defective intake air pressure sensor 1.

- Execute the diagnostic mode. (Code 03)
- When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated.

At sea level	101 kPa (757.6 mmHg, 29.8 inHg)
1000 m (3300 ft) above sea level	Approx. 90 kPa (675.1 mmHg, 26.6 inHg)
2000 m (6700 ft) above sea level	Approx. 80 kPa (600.0 mmHg, 23.6 inHg)
3000 m (9800 ft) above sea level	Approx. 70 kPa (525.0 mmHg, 20.7 inHg)

- When engine is cranking: Make sure that the indication value changes.

Is check result OK?

YES

→ Go to step 3, and complete the service.

NO

- a. Replace the intake air pressure sensor 1.
Refer to "THROTTLE BODIES" on page 7-6.
- b. Start the engine and let it idle for approximately 5 seconds with the throttle fully closed, and then check the DTC using the malfunction mode of the YDT.
- c. Confirm the "Recovered" condition, then go to step 3.

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.

EAS20567

P0107, P0108

EAS33047

TROUBLESHOOTING

Item

- [P0107] Intake air pressure sensor 1: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor 1 circuit.
- [P0108] Intake air pressure sensor 1: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor 1 circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Connection of intake air pressure sensor 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 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

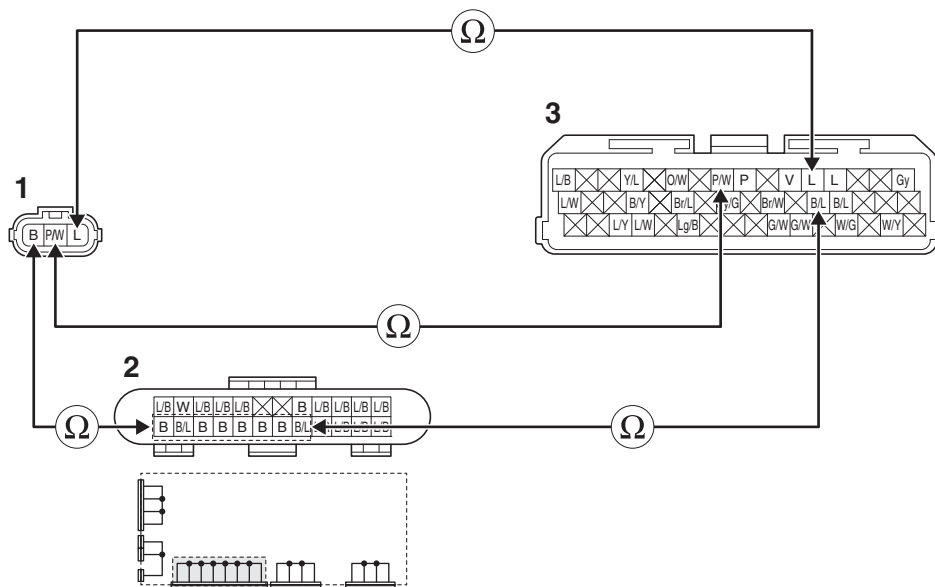
→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Wire harness continuity.
 - Disconnect the intake air pressure sensor 1 coupler "1" and ECU coupler "3".
 - Remove the joint coupler cap "2".
 - Open circuit check

Between ECU coupler "3" and joint coupler cap "2"	[P0108] black/blue–black/blue
Between ECU coupler "3" and intake air pressure sensor 1 coupler "1"	[P0108] blue–blue [P0107, P0108] pink/white–pink/white
Between intake air pressure sensor 1 coupler "1" and joint coupler "2"	[P0108] 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 7, and complete the service.

NO

→ Go to "Short circuit check".

- Short circuit check

TIP

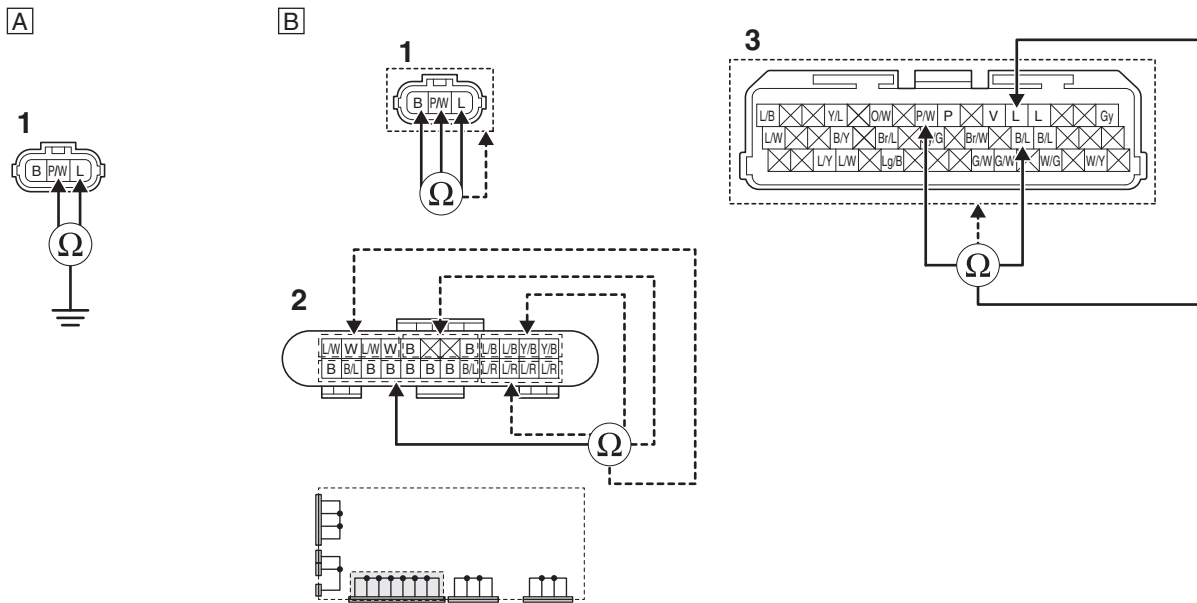
Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between intake air pressure sensor 1 coupler "1" and ground	blue–ground pink/white–ground
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Lines short circuit check “B”

ECU coupler “3”	[P0108] blue—any other coupler terminal [P0108] black/blue—any other coupler terminal [P0107, P0108] pink/white—any other coupler terminal
Intake air pressure sensor 1 coupler “1”	[P0108] blue—any other coupler terminal [P0108] black—any other coupler terminal [P0107, P0108] pink/white—any other coupler terminal
Joint coupler “2”	[P0108] black/blue—any other coupler terminal [P0108] black—any other coupler terminal



Is resistance $\infty \Omega$?

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 1.

- Check for looseness or pinching.

Refer to “THROTTLE BODIES” on page 7-6.

Is check result OK?

YES

→ Go to step 5.

NO

- a. Reinstall or replace 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 7, and complete the service.

NO

→ Go to step 5.

5. Defective intake air pressure sensor 1.

- 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 1.
Refer to “THROTTLE BODIES” on page 7-6.
- 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 8-41.

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.

EAS20426

P0110

EAS32845

TROUBLESHOOTING

Item

Intake air temperature sensor: signal stuck. Normal signal is not received from the intake air temperature sensor circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

- Perform this procedure when the engine is cold.
- If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.
- P0111, P0112, P0113, P0115, P0116, P0117, P0118, P0335, P0500, P2122, P2123, P2127, P2128, P2138

1. Installed condition of intake air temperature sensor.

- Check for looseness or pinching.
Refer to “GENERAL CHASSIS (5)” on page 4-11.
- Check the dirt around the intake air temperature sensor.

Is check result OK?

YES

→ Go to step 2.

NO

- a. Clean around the intake air temperature sensor, then reinstall it.
- b. Turn the main switch to “ON”, then heat the intake air temperature sensor using warm water or hot air.
- c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 4, and complete the service.

NO

→ Go to step 2.

2. Defective intake air temperature sensor.

- Measure and note the intake air temperature sensor resistance at ambient temperature.
- Heat the intake air temperature sensor using warm water or hot air, and measure the intake air temperature sensor resistance, then compare the noted resistance at ambient temperature.

Is the resistance change?

YES

→ Go to step 3.

NO

- a. Replace the intake air temperature sensor.
Refer to “GENERAL CHASSIS (5)” on page 4-11.
- b. Turn the main switch to “ON”, then heat the intake air temperature sensor using warm water or hot air.
- c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 4, and complete the service.

NO

→ Go to step 3.

3. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

4. 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.

EAS20425

P0111

EAS32844

TROUBLESHOOTING

Item

Intake air temperature sensor: signal out of range. Normal signal is not received from the intake air temperature sensor circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

- Perform this procedure when the engine is cold.
 - If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.
 - P0112, P0113
-

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. Execute the diagnostic mode. (Code 05)
 - When engine is cold: Displayed temperature is close to the ambient temperature.

Is check result OK?

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. Execute the diagnostic mode. (Code 05)
 - When engine is cold: Displayed temperature is close to the ambient temperature.

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Installed condition of intake air temperature sensor.

- Check for looseness or pinching.
Refer to “GENERAL CHASSIS (5)” on page 4-11.

Is check result OK?

YES

→ Go to step 4.

NO

- a. Reinstall or replace the sensor.
- b. Execute the diagnostic mode. (Code 05)
 - When engine is cold: Displayed temperature is close to the ambient temperature.

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Defective intake air temperature sensor.

- Check the intake air temperature sensor.
Refer to “CHECKING THE INTAKE AIR TEMPERATURE SENSOR” on page 8-49.

Intake air temperature sensor resistance	6.0 ± 0.6 kΩ at 0 °C (6.0 ± 0.6 kΩ at 32 °F)
	0.29–0.39 kΩ at 80 °C (0.29–0.39 kΩ at 176 °F)

Is check result OK?

YES

→ Go to step 5.

NO

- a. Replace the intake air temperature sensor.
Refer to “GENERAL CHASSIS (5)” on page 4-11.
- b. Execute the diagnostic mode. (Code 05)
- c. Submerge the intake air temperature sensor in a container filled with water at 0 °C (32 °F).
 - The displayed temperature is close to the 0 °C (32 °F)

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective wire harness.

- Replace the wire harness.
- Execute the diagnostic mode. (Code 05)
- Submerge the intake air temperature sensor in a container of 0 °C (32 °F) water.
- The displayed temperature is close to the 0 °C (32 °F)

Is check result OK?

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 8-41.

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 circuit.
- [P0113] Intake air temperature sensor: open or short to power circuit is detected. Normal signal is not received from the intake air temperature sensor circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

Perform this procedure when the engine is cold.

1. Connection of intake air temperature sensor coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 2.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 2.

2. Connection of ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 3.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

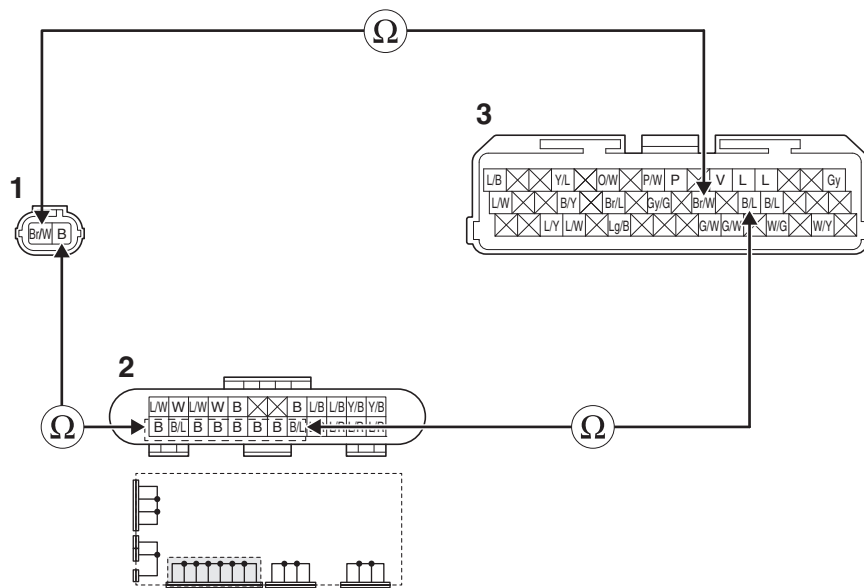
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the intake air temperature sensor coupler “1” and ECU coupler “3”.
- Remove the joint coupler cap “2”.
- Open circuit check

Between ECU coupler “3” and intake air temperature sensor coupler “1”	[P0112, P0113] brown/white–brown/white
Between ECU coupler “3” and joint coupler “2”	[P0113] black/blue–black/blue
Between intake air temperature sensor coupler “1” and joint coupler “2”	[P0113] black–black



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

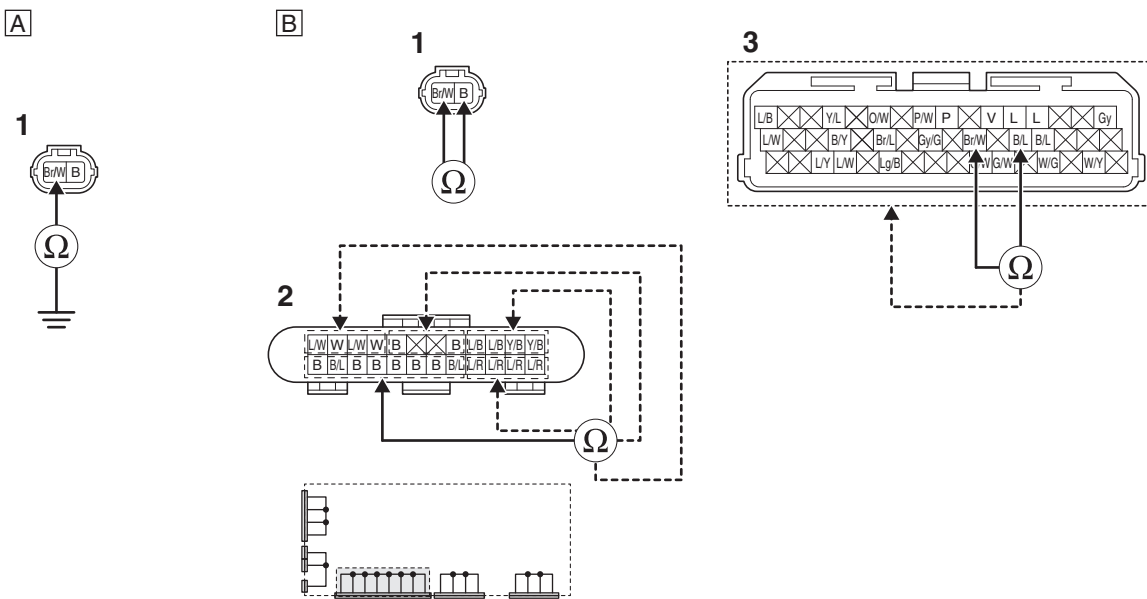
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check "A"

Between intake air temperature sensor coupler "1" and ground	[P0112, P0113] brown/white-ground
--	-----------------------------------

Lines short circuit check "B"

intake air temperature sensor coupler "1"	[P0112, P0113] brown/white-any other coupler terminal [P0113] black-any other coupler terminal
Joint coupler "2"	[P0113] black/blue-any other coupler terminal [P0113] black-any other coupler terminal
ECU coupler "3"	[P0112, P0113] brown/white-any other coupler terminal [P0113] black/blue-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 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 "GENERAL CHASSIS (5)" on page 4-11.

Is check result OK?

YES

→ Go to step 5.

NO

- a. Reinstall or replace 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 7, and complete the service.

NO

→ Go to step 5.

5. Defective intake air temperature sensor.

- Execute the diagnostic mode. (Code 05)
- When engine is cold: Displayed temperature is close to the ambient temperature.
- The displayed temperature is not close to the ambient temperature → Check the intake air temperature sensor.

Refer to “DIAGNOSTIC CODE: SENSOR OPERATION TABLE” on page 9-77.

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the intake air temperature sensor.
Refer to “GENERAL CHASSIS (5)” on page 4-11.
- 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 8-41.

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.

EAS20424

P0115

EAS32843

TROUBLESHOOTING

Item

Coolant temperature sensor: signal stuck. Normal signal is not received from the coolant temperature sensor circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

-
- Perform this procedure when the engine is cold.
 - If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.
 - P0116, P0117, P0118, P0335, P0500, P2122, P2123, P2127, P2128, P2138
-

1. Defective coolant temperature sensor.

- Measure and note the coolant temperature sensor resistance at ambient temperature.
- Start the engine and warm-up the vehicle.
- Measure the coolant temperature sensor resistance at engine warmed-up, then compare the noted resistance at ambient temperature.

Is the resistance change?

YES

→ Go to step 2.

NO

- a. Allow the engine to cool to ambient temperature, then replace the coolant temperature sensor. Refer to “CYLINDER HEAD” on page 5-27.
- b. Turn the main switch to “ON”, then start the engine and warm-up the vehicle.
- c. Check 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, and complete the service. Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

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.

EAS20423

P0116

EAS32842

TROUBLESHOOTING**Item**

Coolant temperature sensor: signal out of range. Normal signal is not received from the coolant temperature sensor circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure**TIP**

- Perform this procedure when the engine is cold.
- If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.
- P0117, P0118

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 wire harness.
- b. Execute the diagnostic mode. (Code 06)
 - When engine is cold: Displayed temperature is close to the ambient temperature.

Is check result OK?**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. Execute the diagnostic mode. (Code 06)
 - When engine is cold: Displayed temperature is close to the ambient temperature.

Is check result OK?**YES**

→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Installed condition of coolant temperature sensor.

- Check for looseness or pinching.
Refer to "CYLINDER HEAD" on page 5-27.

Is check result OK?

YES

→ Go to step 4.

NO

- a. Reinstall or replace the sensor.
- b. Execute the diagnostic mode. (Code 06)
 - When engine is cold: Displayed temperature is close to the ambient temperature.

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Defective coolant temperature sensor.

- Check the coolant temperature sensor resistance.
Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-47.

Coolant temperature sensor resistance	2.645 kΩ ± 5% at 20 °C (2.645 kΩ ± 5% at 68 °F)
	0.216 kΩ ± 2.5% at 100 °C (0.216 kΩ ± 2.5% at 212 °F)

Is check result OK?

YES

→ Go to step 5.

NO

- a. Replace the coolant temperature sensor.
Refer to "CYLINDER HEAD" on page 5-27.
- b. Execute the diagnostic mode. (Code 06)
 - When engine is cold: Displayed temperature is close to the ambient temperature.
- c. Submerge the coolant temperature sensor in a container filled with water at 20 °C (68 °F) and 100 °C (212 °F).
 - Displayed temperature is close to the 20 °C (68 °F) and 100 °C (212 °F).

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective wire harness.

- Replace the wire harness.
- Execute the diagnostic mode. (Code 06)
- When engine is cold: Displayed temperature is close to the ambient temperature.
- Submerge the coolant temperature sensor in a container filled with water at 20 °C (68 °F) and 100 °C (212 °F).
- Displayed temperature is close to the 20 °C (68 °F) and 100 °C (212 °F).

Is check result OK?

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 8-41.

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

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 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.

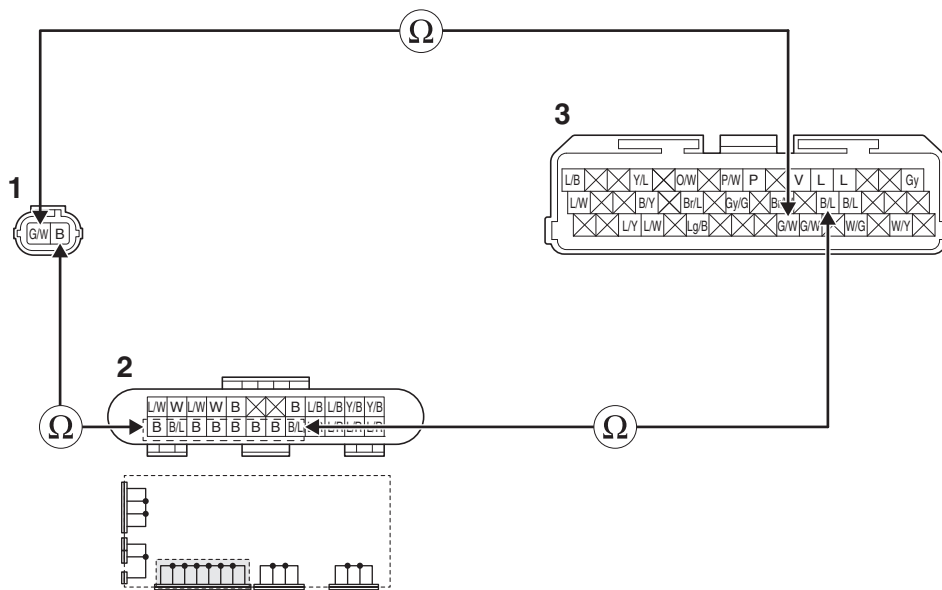
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the coolant temperature sensor coupler “1” and ECU coupler “3”.
- Remove the joint coupler cap “2”.
- Open circuit check

Between coolant temperature sensor coupler “1” and ECU coupler “3”	[P0117, P0118] green/white–green/white
Between coolant temperature sensor coupler “1” and joint coupler “2”	[P0118] black–black
Between joint coupler “2” and ECU coupler “3”	[P0118] black/blue–black/blue



Is resistance 0 Ω?

YES

→ Go to step “Short circuit check”.

NO

- Replace the wire harness.
- 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 “Short circuit check”.

- Short circuit check

TIP

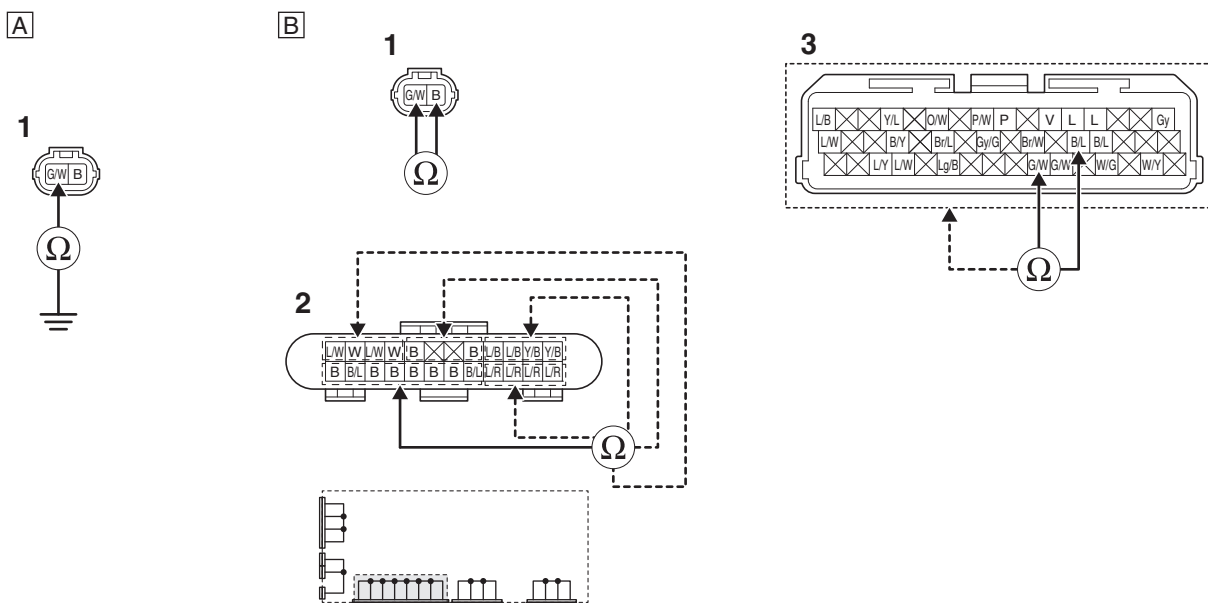
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check "A"

Between coolant temperature sensor coupler "1" and ground	[P0117, P0118] green/white-ground
---	-----------------------------------

Lines short circuit check "B"

Coolant temperature sensor coupler "1"	[P0117, P0118] green/white-any other coupler terminal [P0118] black-any other coupler terminal
Joint coupler "2"	[P0118] black/blue-any other coupler terminal [P0118] black-any other coupler terminal
ECU coupler "3"	[P0117, P0118] green/white-any other coupler terminal [P0118] black/blue-any other coupler terminal



Is resistance $\infty \Omega$?

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 coolant temperature sensor.

- Check for looseness or pinching.

Refer to "CYLINDER HEAD" on page 5-27.

Is check result OK?

YES

→ Go to step 5.

NO

- a. Reinstall or replace 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 7, and complete the service.

NO

→ Go to step 5.

5. Defective coolant temperature sensor.

- Execute the diagnostic mode. (Code 06)
- When engine is cold: Displayed temperature is close to the ambient temperature.
- The displayed temperature is not close to the ambient temperature → Check the coolant temperature sensor.

Refer to “CHECKING THE COOLANT TEMPERATURE SENSOR” on page 8-47.

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the coolant temperature sensor.
Refer to “CYLINDER HEAD” on page 5-27.
- 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 8-41.

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.

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)

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.

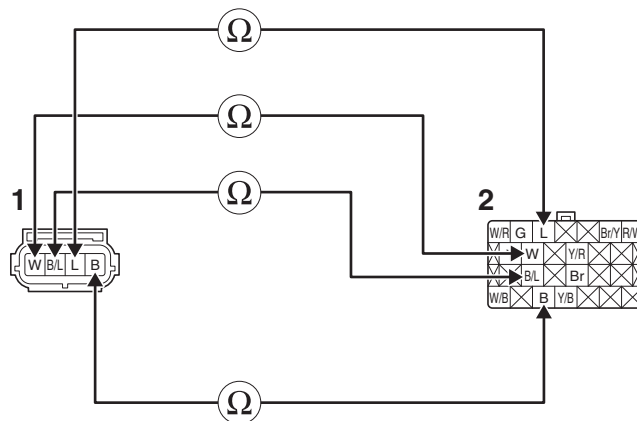
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the throttle position sensor coupler “1” and ECU coupler “2”.
- Open circuit check

Between throttle position sensor coupler “1” and ECU coupler “2”	[P0122, P0123, P0222, P0223] white–white [P0123, P0223] black/blue–black/blue [P0122, P0222] blue–blue [P0122, P0123, P0222, P0223] black–black
--	--



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 8, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
 Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

P0122, P0123, P0222, P0223

Ground short circuit check "A"

Between throttle position sensor coupler "1" and ground	[P0122, P0123, P0222, P0223] white-ground [P0122, P0222] blue-ground [P0122, P0123, P0222, P0223] black-ground
---	--

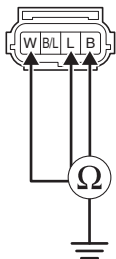
Lines short circuit check "B"

Throttle position sensor coupler "1"	[P0122, P0123, P0222, P0223] white-any other coupler terminal [P0123, P0223] black/blue-any other coupler terminal [P0122, P0222] blue-any other coupler terminal [P0122, P0123, P0222, P0223] black-any other coupler terminal
ECU coupler "2"	[P0122, P0123, P0222, P0223] white-any other coupler terminal [P0123, P0223] black/blue-any other coupler terminal [P0122, P0222] blue-any other coupler terminal [P0122, P0123, P0222, P0223] black-any other coupler terminal

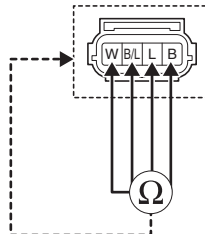
A

B

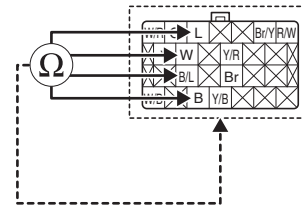
1



1



2



Is resistance $\infty \Omega$?

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 7-12.

Is check result OK?

YES

→ Go to step 5.

NO

- Reinstall or adjust the sensor.
- 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.
- Execute the diagnostic mode. (Code 01)

When the throttle valves are fully closed	11–21
When throttle valves are fully open	96–107

Is check result OK?

YES

→ Go to step 6.

NO

- Replace the throttle position sensor.
Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-12.
- 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.
- 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

- Replace the throttle position sensor.
Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-12.
- 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 8-41.

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

O₂ sensor: short to power circuit is detected. Normal signal is not received from the O₂ sensor.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Installed condition of O₂ sensor.
 - Check for looseness or pinching.
Refer to “ENGINE REMOVAL” on page 5-9.

Is check result OK?

YES

→ Go to step 2.

NO

- a. Reinstall or replace 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 7, and complete the service.

NO

→ Go to step 2.

2. Connection of O₂ 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.

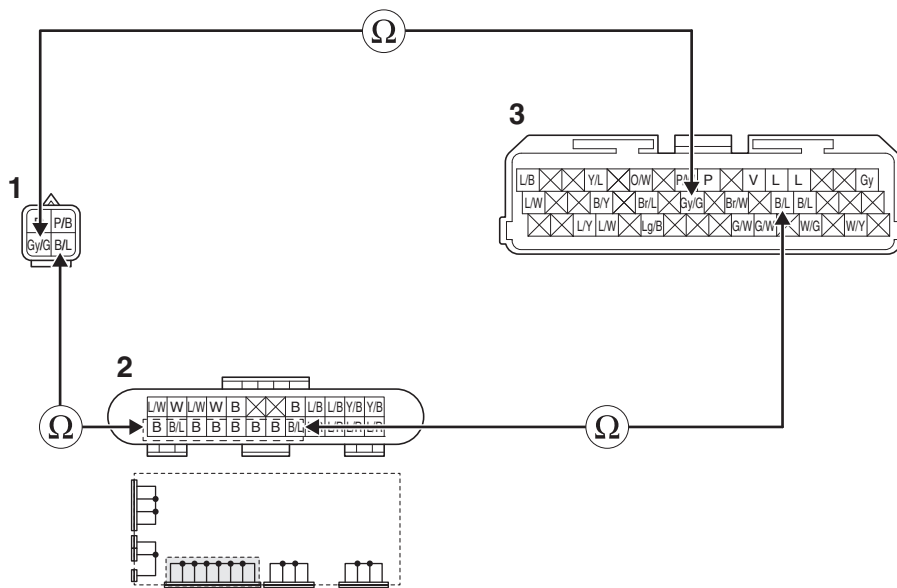
NO

→ Go to step 4.

4. Wire harness continuity.

- Disconnect the O₂ sensor coupler “1” and ECU coupler “3”.
- Remove the joint coupler cap “2”.
- Open circuit check

Between O ₂ sensor coupler “1” and ECU coupler “3”	gray/green–gray/green
Between O ₂ sensor coupler “1” and joint coupler “2”	black/blue–black/blue
Between joint coupler “2” and ECU coupler “3”	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

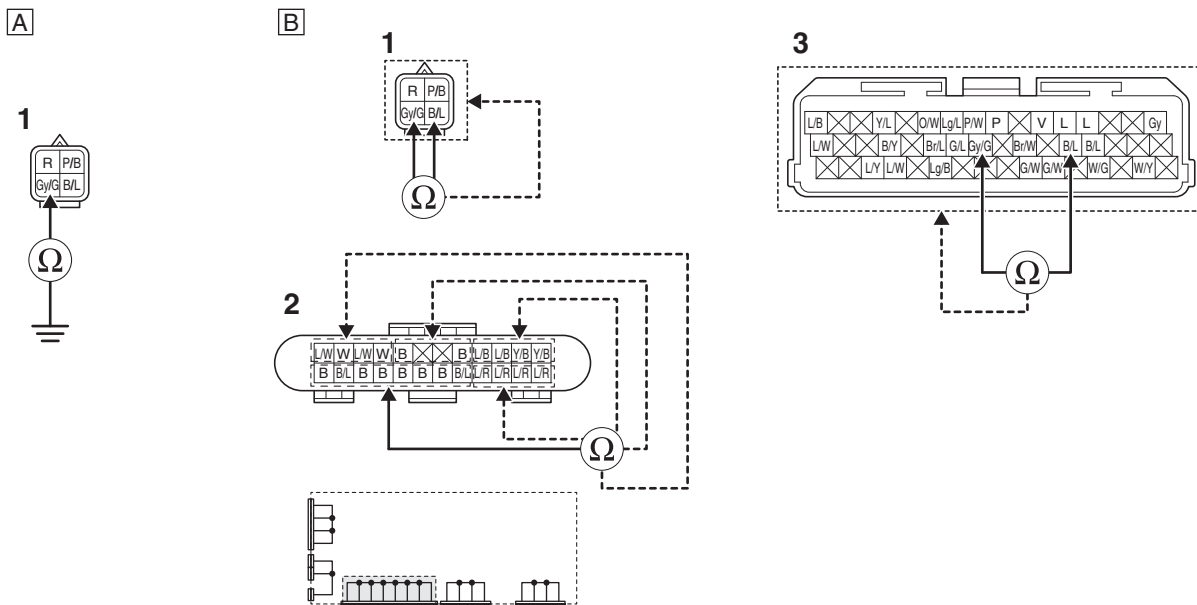
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between O ₂ sensor coupler “1” and ground	gray/green–ground
--	-------------------

Lines short circuit check “B”

O ₂ sensor coupler “1”	gray/green–any other coupler terminal black/blue–any other coupler terminal
Joint coupler “2”	black/blue–any other coupler terminal
ECU coupler “3”	gray/green–any other coupler terminal black/blue–any other coupler terminal



Is resistance $\infty \Omega$?

YES

→ Go to step 5.

NO

- Replace the wire harness.
- 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 O₂ sensor.
 - a. Replace the O₂ sensor.
Refer to “ENGINE REMOVAL” on page 5-9.
 - 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 8-41.
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.

EAS20767

P0133

- O₂ sensor: deterioration is detected. O₂ sensor output signal response speed is slow.

EAS33291

OUTLINE**Explanation of detection method**

The O₂ sensor detects the oxygen concentration in the exhaust gas, converts it into an electrical signal, and sends it to the ECU. The ECU determines whether there is any deterioration by comparing the output value from the O₂ sensor with a predetermined threshold value such as response time. When the ECU determines that there is an O₂ sensor deterioration, the DTC is stored in ECU and MIL comes on.

Frequency of detection	Once per driving cycle
Malfunction determination method	If an abnormality is detected in three consecutive driving cycles, the malfunction is confirmed and the MIL comes on.
Driving condition	Flat road, no overloading, and no acceleration or deceleration
Type of detection result	Complete, Incomplete

Requirement for detection

Duration	400 seconds or more
O ₂ feedback	Carried out
Vehicle speed	40–60 km/h (25–37 mph)
Gear position	No condition specified
Engine speed	No condition specified
Fuel correction value	The O ₂ feedback correction amount is within a certain range.

Related sensor for detection

O₂ sensor, intake air pressure sensor, coolant temperature sensor (or engine temperature sensor), front wheel sensor, rear wheel sensor, crankshaft position sensor, and throttle position sensor

Storing DTC

Once an abnormality has been detected, a pending DTC is stored in the memory of the ECU. Then, if the abnormality is detected in the next two driving cycles, the MIL comes on and the DTC and FFD are stored. If the vehicle is judged to be operating normally for three consecutive driving cycles, the MIL goes off. However, the DTC, pending DTC, and FFD will not be deleted even if a battery terminal is disconnected.

Reproduction test

Perform the test using the driving pattern according to the detection method.

EWA20860



When test riding the vehicle, always comply with local traffic regulations.

EAS33153

FAIL-SAFE SYSTEM

- Able to start engine
- Able to drive vehicle

EAS32813

TROUBLESHOOTING

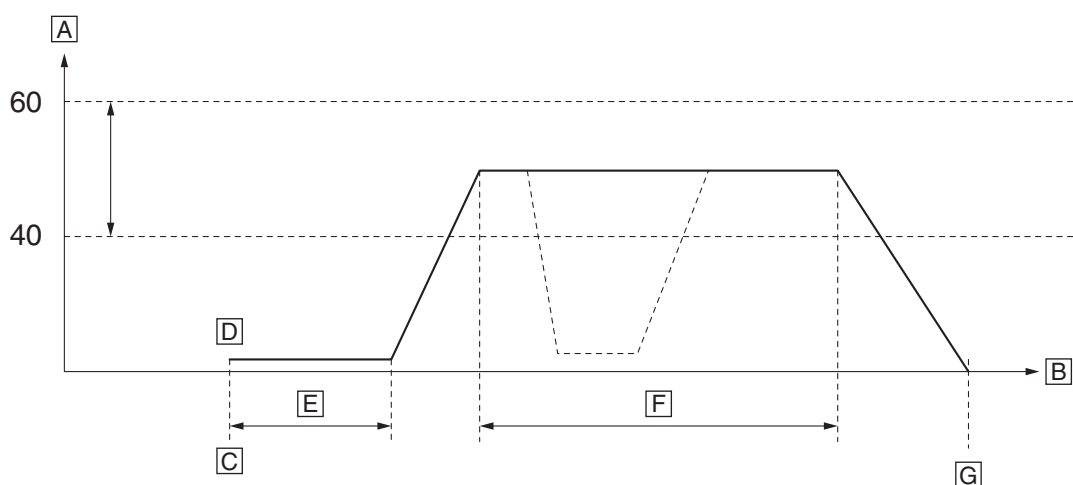
TIP

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- DTC except P0133

1. Connect the YDT to check and delete the DTC stored in the ECU.
2. Perform the reproduction test under the following conditions, then go to step 3.

Reproduction test conditions



- | | |
|---------------------|--------------------|
| A. Speed [km/h] | E. 5 min. |
| B. Time [min] | F. Total: 15 min. |
| C. Start the engine | G. Stop the engine |
| D. Idle (warm up) | |

3. Connect the YDT and check if the pending DTC is displayed.

Is pending DTC displayed?

Yes

→ Delete the pending DTC, then go to step 4.

No

→ Check the readiness status.

Readiness status is “Complete”.

→ Check the coupler between the ECU and O₂ sensor for any abnormality. If there is no abnormality, temporary connection failure is considered to be the cause, so finish the troubleshooting.

Readiness status is “Incomplete”

→ Reproduction test is required again because the reproduction is not completed.

Go to step 2.

4. Replace the O₂ sensor, then go to step 5.
5. Perform reproduction test and connect the YDT.
Check that the pending DTC is not detected and readiness status is “Complete”. Then complete the troubleshooting.

EAS20414

P0134

EAS32834

TROUBLESHOOTING**Item**

O₂ sensor: signal stuck. O₂ sensor signal value does not change.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure**TIP**

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

1. P0030
2. P00D1, P2195
3. P0105, P0106, P0107, P0108, P0110, P0111, P0112, P0113, P0115, P0116, P0117, P0118, P0122, P0123, P0132, P0201, P0202, P0203, P0222, P0223, P0335, P0351, P0352, P0353, P0480, P0500, P0560, P0563, P062F, P0606, P0638, P0657, P1004, P1500, P1600, P2122, P2123, P2127, P2128, P2135, P2138
4. P0300, P0301, P0302, P0303

1. Engine condition.

- Check the idling condition and check the engine sound while racing the engine.

Is check result OK?**YES**

→ Go to step 2.

NO

- a. Check the ignition spark gap.
Refer to "CHECKING THE IGNITION SPARK GAP" on page 8-44.
- b. Test ride the vehicle according to the test-ride conditions for the O₂ deterioration diagnosis.
Refer to step 2 in "TROUBLESHOOTING" on page 9-137.
At this time, do not check the malfunction diagnosis status (readiness).
- 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. Installed condition of O₂ sensor.

- Check for looseness or pinching.
Refer to "ENGINE REMOVAL" on page 5-9.

Is check result OK?**YES**

→ Go to step 3.

NO

- a. Reinstall or replace the O₂ sensor.
- b. Test ride the vehicle according to the test-ride conditions for the O₂ deterioration diagnosis.
Refer to step 2 in "TROUBLESHOOTING" on page 9-137.
At this time, do not check the malfunction diagnosis status (readiness).
- 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. Check fuel pressure.

- Check the fuel pressure.

Refer to “CHECKING THE FUEL PRESSURE” on page 7-11.

Is check result OK?

YES

→ Go to step 4.

NO

- Replace the fuel pump.
Refer to “REMOVING THE FUEL PUMP” on page 7-4.
- Test ride the vehicle according to the test-ride conditions for the O₂ deterioration diagnosis.
Refer to step 2 in “TROUBLESHOOTING” on page 9-137.
At this time, do not check the malfunction diagnosis status (readiness).
- 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 O₂ sensor.

- Replace the O₂ sensor.
Refer to “ENGINE REMOVAL” on page 5-9.
- Test ride the vehicle according to the test-ride conditions for the O₂ deterioration diagnosis.
Refer to step 2 in “TROUBLESHOOTING” on page 9-137.
At this time, do not check the malfunction diagnosis status (readiness).
- 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 8-41.

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.

EAS20574

P0201

EAS33054

TROUBLESHOOTING

Item

Injector #1: malfunction in injector #1. Normal signal is not received from the injector circuit.

Fail-safe system

- Able to start engine (depending on the number of faulty cylinder)
- Able to drive vehicle (depending on the number of faulty cylinder)

Procedure

1. Connection of 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 wire harness.
- b. Execute the diagnostic mode. (Code 36)

Is it hear operating sound?

YES

→ Go to step 6.

NO

→ Go to step 2.

2. Defective injector #1.

- Measure the injector resistance.
Refer to "CHECKING THE FUEL INJECTORS" on page 8-49.

Is check result OK?

YES

→ Go to step 3.

NO

- a. Replace the injector #1.
Refer to "THROTTLE BODIES" on page 7-6.
- b. Execute the diagnostic mode. (Code 36)

Is it hear operating sound?

YES

→ Go to step 6.

NO

→ Go to step 3.

3. Connection of ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Execute the diagnostic mode. (Code 36)

Is it hear operating sound?

YES

→ Go to step 6.

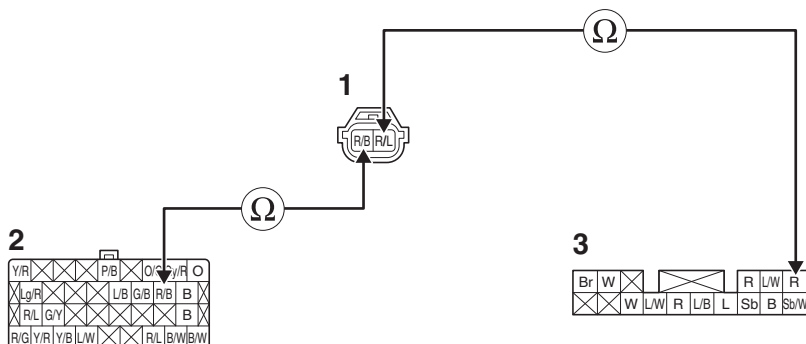
NO

→ Go to step 4.

4. Wire harness continuity.

- Disconnect the injector #1 coupler “1”, ECU coupler “2” and relay unit coupler “3”.
- Open circuit check

Between injector #1 coupler “1” and ECU coupler “2”	red/black–red/black
Between injector #1 coupler “1” and relay unit coupler “3”	red/blue–red



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 36)

Is it hear operating sound?

YES

→ Go to step 6.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
 Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between injector #1 coupler "1" and ground	red/black-ground red/blue-ground
--	-------------------------------------

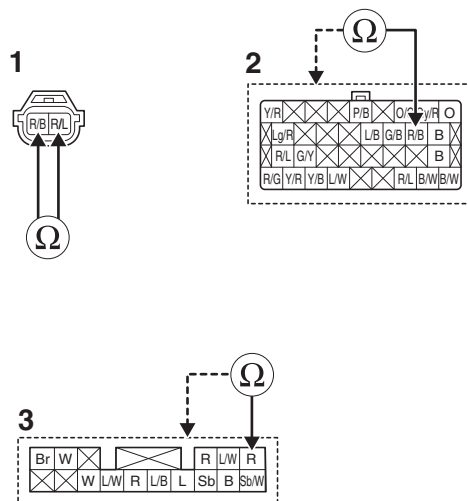
Lines short circuit check "B"

Injector #1 coupler "1"	red/black-any other coupler terminal red/blue-any other coupler terminal
ECU coupler "2"	red/black-any other coupler terminal
Relay unit coupler "3"	red-any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 5.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 36)

Is it hear operating sound?

YES

→ Go to step 6.

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 8-41.

6. 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**

Injector #2: malfunction in injector #2. Normal signal is not received from the injector circuit.

Fail-safe system

- Able to start engine (depending on the number of faulty cylinder)
- Able to drive vehicle (depending on the number of faulty cylinder)

Procedure

1. Connection of 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 wire harness.
- b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?**YES**

→ Go to step 6.

NO

→ Go to step 2.

2. Defective injector #2.

- Measure the injector resistance.
Refer to "CHECKING THE FUEL INJECTORS" on page 8-49.

Is check result OK?**YES**

→ Go to step 3.

NO

- a. Replace the injector #2.
Refer to "THROTTLE BODIES" on page 7-6.
- b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?**YES**

→ Go to step 6.

NO

→ Go to step 3.

3. Connection of ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?

YES

→ Go to step 6.

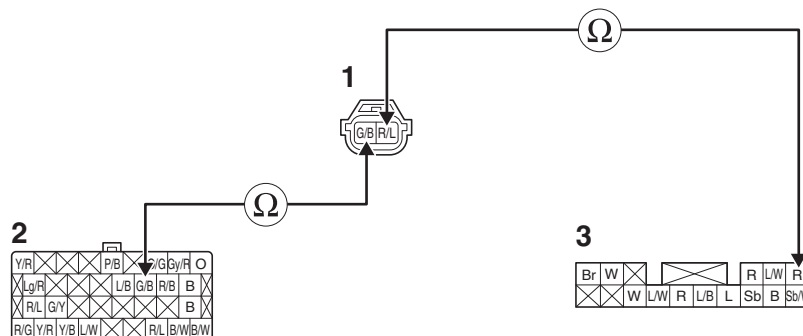
NO

→ Go to step 4.

4. Wire harness continuity.

- Disconnect the injector #2 coupler “1”, ECU coupler “2” and relay unit coupler “3”.
- Open circuit check

Between injector #2 coupler “1” and ECU coupler “2”	green/black–green/black
Between injector #2 coupler “1” and relay unit coupler “3”	red/blue–red



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?

YES

→ Go to step 6.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between injector #2 coupler "1" and ground	green/black-ground red/blue-ground
--	---------------------------------------

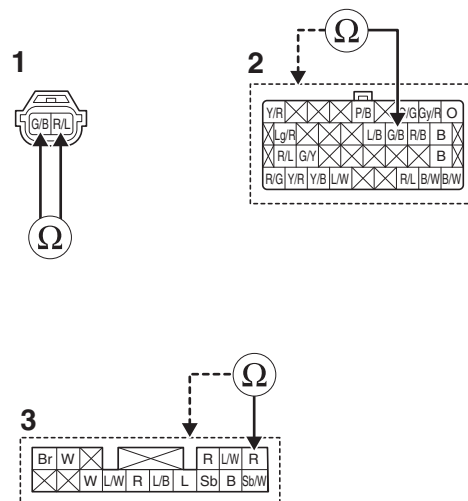
Lines short circuit check "B"

Injector #2 coupler "1"	green/black-any other coupler terminal red/blue-any other coupler terminal
ECU coupler "2"	green/black-any other coupler terminal
Relay unit coupler "3"	red-any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 5.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 37)

Is it hear operating sound?

YES

→ Go to step 6.

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 8-41.

6. 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.

EAS20576

P0203

EAS33056

TROUBLESHOOTING**Item**

Injector #3: malfunction in injector #3. Normal signal is not received from the injector circuit.

Fail-safe system

- Able to start engine (depending on the number of faulty cylinder)
- Able to drive vehicle (depending on the number of faulty cylinder)

Procedure

1. Connection of injector #3 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. Execute the diagnostic mode. (Code 38)

Is it hear operating sound?**YES**

→ Go to step 6.

NO

→ Go to step 2.

2. Defective injector #3.

- Measure the injector resistance.
Refer to "CHECKING THE FUEL INJECTORS" on page 8-49.

Is check result OK?**YES**

→ Go to step 3.

NO

- a. Replace the injector #3.
Refer to "THROTTLE BODIES" on page 7-6.
- b. Execute the diagnostic mode. (Code 38)

Is it hear operating sound?**YES**

→ Go to step 6.

NO

→ Go to step 3.

3. Connection of ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Execute the diagnostic mode. (Code 38)

Is it hear operating sound?

YES

→ Go to step 6.

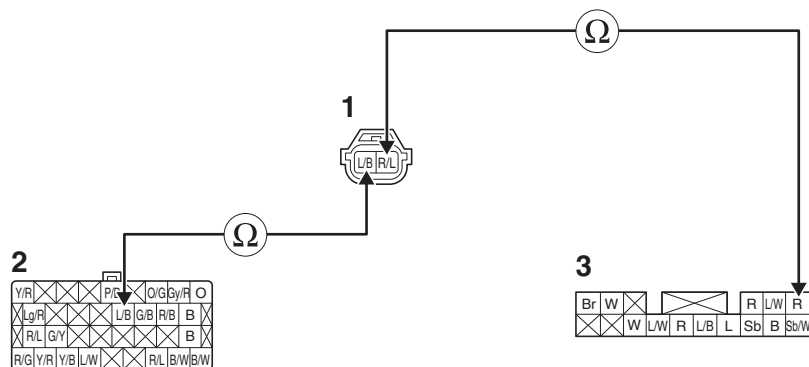
NO

→ Go to step 4.

4. Wire harness continuity.

- Disconnect the injector #3 coupler “1”, ECU coupler “2” and relay unit coupler “3”
- Open circuit check

Between injector #3 coupler “1” and ECU coupler “2”	blue/black–blue/black
Between injector #3 coupler “1” and relay unit coupler “3”	red/blue–red



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 38)

Is it hear operating sound?

YES

→ Go to step 6.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
 Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

Ground short circuit check "A"

Between injector #3 coupler "1" and ground	blue/black-ground red/blue-ground
--	--------------------------------------

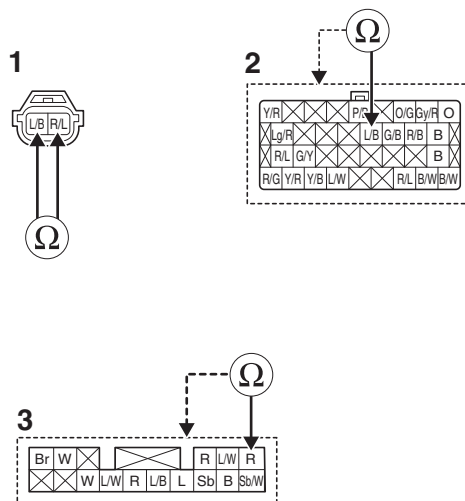
Lines short circuit check "B"

Injector #3 coupler "1"	blue/black-any other coupler terminal red/blue-any other coupler terminal
ECU coupler "2"	blue/black-any other coupler terminal
Relay unit coupler "3"	red-any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 5.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 38)

Is it hear operating sound?

YES

→ Go to step 6.

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 8-41.

6. 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.

EAS20773

P0300, P0301, P0302, P0303

- [P0300] Misfire in multiple cylinders. Large difference value in angular velocity of crankshaft.
- [P0301] Misfire in cylinder #1. Large difference value in angular velocity of crankshaft.
- [P0302] Misfire in cylinder #2. Large difference value in angular velocity of crankshaft.
- [P0303] Misfire in cylinder #3. Large difference value in angular velocity of crankshaft.

EAS33318

OUTLINE

Explanation of detection method

The ECU monitors the consistency of the crankshaft rotation by crankshaft position sensor, and if the angular velocity fluctuates irregularly, the ECU determines that there is a misfire. Two kinds of misfire judgment are performed according to the number of misfire occurrences and the threshold value.

* Catalyst damage

- The number of misfires per 200 revolutions of the crankshaft exceeds the threshold value, and it is detected that the exhaust gas damages the catalyst, the DTC is stored in the ECU and the MIL starts flashing.

* Exhaust gas deterioration

- The number of misfires per 1000 revolutions of the crankshaft exceeds the threshold value, and it is detected that the exhaust gas does not damage the catalyst but affect the exhaust gas emission level, the DTC is stored in the ECU and the MIL comes on.

Frequency of detection	Always
Time required for detection	Always
Malfunction determination method	<ul style="list-style-type: none"> • Catalyst damage When an abnormality is detected three times in one driving cycle, it is determined to be a pending abnormality and the MIL starts flashing. If this cycle occurs in three consecutive driving cycles, the malfunction is determined and the MIL comes on. • Exhaust gas deterioration If an abnormality is detected four times within one driving cycle, it is determined to be a pending abnormality. The MIL does not flash at this time. If this cycle occurs in three consecutive driving cycles, the malfunction is determined and the MIL comes on.
Driving condition	No excessive acceleration or deceleration
Type of detection result	Complete, Incomplete

Requirement for detection

Duration	Refer to the conversion table of steady driving time.
Engine starting time	No condition specified
O ₂ feedback	No condition specified
Vehicle speed	No condition specified
Gear position	No condition specified
Engine speed	2300–6500 r/min

Related sensors for detection

Intake air pressure sensor, coolant temperature sensor (or engine temperature sensor), front wheel sensor, rear wheel sensor, crankshaft position sensor, and throttle position sensor

Storing DTC

Once an abnormality has been detected, a pending DTC is stored in the memory of the ECU. Then, if the abnormality is detected in the next two driving cycles, the MIL comes on and the DTC and FFD are stored. If the vehicle is judged to be operating normally for three consecutive driving cycles, the MIL goes off. However, the DTC, pending DTC, and FFD will not be deleted even if a battery terminal is disconnected.

Reproduction test

Operate the vehicle according to the engine speed, vehicle speed, and gear position in the FFD. Confirm the operating time in the conversion table of steady driving time according to the engine speed in the FFD. Do not accelerate or decelerate excessively during the reproduction test. Continue to operate the vehicle even if the vehicle cannot be operated at a constant speed due to the operating environment.

EWA20860



When test riding the vehicle, always comply with local traffic regulations.

EAS33154

FAIL-SAFE SYSTEM

- Able/Unable to start engine (depending on the situation)
- Able/Unable to drive vehicle (depending on the situation)

EAS32820

TROUBLESHOOTING

TIP

- If more than one DTC is detected at the same time, perform troubleshooting of DTCs listed below first DTC except P0300, P0301, P0302, P0303
 - If more than one misfire DTC has been detected at the same time, open each FFD and check the total ECU energization time at the time of failure or event, and refer to the latest FFD.
 - How to identify the most recent FFD.
Total energization time of 00:25:30 is newer than 00:10:55 of FFD.
-

1. Connect the YDT and check the DTC stored in the ECU.

DTC is displayed

→ Check the engine speed, vehicle speed and gear position of FFD.
Delete DTC, then go to step 2.

Pending DTC is displayed

→ Confirm the engine speed, vehicle speed and gear position to the customer when the customer feels an abnormality.
Delete pending DTC, then go to step 2.

DTC and pending DTC are not displayed.

→ Confirm the engine speed, vehicle speed and gear position to the customer when the customer feels an abnormality
Go to step 2.

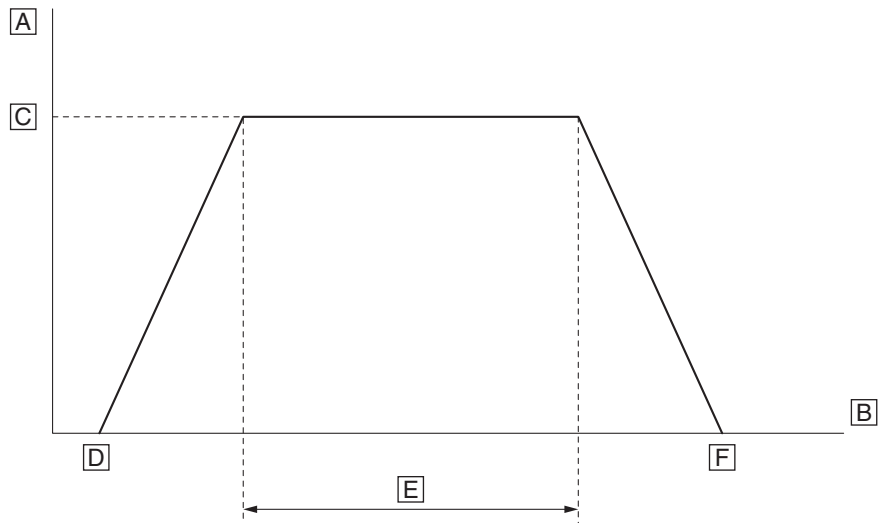
2. Perform the reproduction test under the following conditions, then go to step 3.

ECA26950

NOTICE

If the MIL flashes during the reproduction test, immediately decelerate or reduce the engine speed. Otherwise, the catalyst could be damaged.

Reproduction test condition



- A. Speed [km/h]
- B. Time [min]
- C. Vehicle speed of FFD
- D. Start the engine
- E. Steady driving time
- F. Stop the engine

Conversion table of steady driving time	
Engine speed (r/min)	Time (sec.)
2000	240
3000	160
4000	120
5000	96
6000	80
7000	70
8000	60
9000	54
10000	48

3. Connect the YDT and check if the pending DTC is displayed.

Is the pending DTC displayed?

Yes

→ Delete the pending DTC, then go to step 4.

No

→ Confirm the engine speed, vehicle speed and gear position to the customer when the customer feels an abnormality.

Go to step 2.

If the pending DTC is not displayed after several reproduction test, go to step 4.

4. Check the ignition system

Is the inspection result OK?

Yes

→ Go to step 5.

No

→ Repair or replace the defective part, then go to step 6.

5. Check the following parts. If defective, replace the parts and go to step 6.

- Intake air pressure sensor 1
- Intake air pressure sensor 2
- Coolant temperature sensor (or Engine temperature sensor)
- Front wheel sensor
- Rear wheel sensor
- Crankshaft position sensor
- Throttle position sensor
- Gear position sensor

6. Perform a reproduction test and connect the YDT.

Check that the pending DTC is not detected, then complete the troubleshooting.

EAS20578

P0335

EAS33058

TROUBLESHOOTING**Item**

Crankshaft position sensor: normal signals are not received from the crankshaft position sensor.

Fail-safe system

- Unable to start engine
- Unable to drive vehicle

Procedure

1. Connection of crankshaft position sensor coupler.
 - Check the locking condition of the coupler.
 - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?**YES**

→ Go to step 2.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Crank the engine, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?**YES**

→ Go to step 7, and complete the service.

NO

→ Go to step 2.

2. Connection of wire harness ECU coupler.
 - Check the locking condition of the coupler.
 - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?**YES**

→ Go to step 3.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Crank the engine, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?**YES**

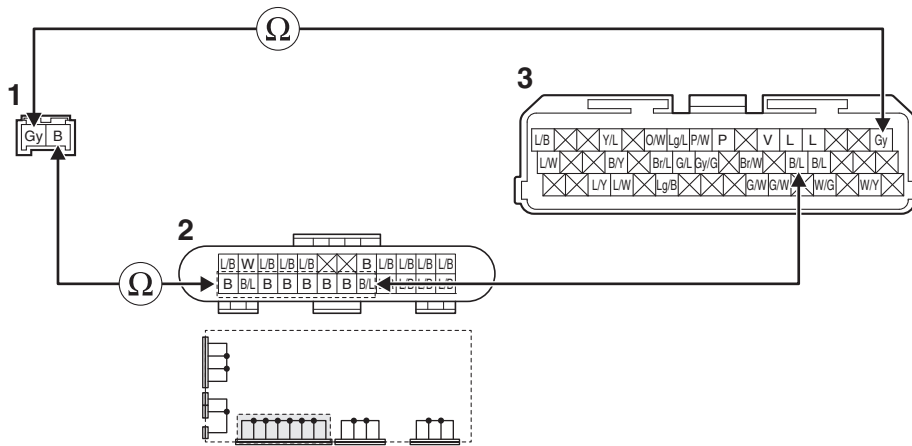
→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Wire harness continuity.
 - Disconnect the crankshaft position sensor coupler “1” and ECU coupler “3”.
 - Remove the joint coupler cap “2”.
 - Open circuit check

Between crankshaft position sensor coupler “1” and ECU coupler “3”	gray–gray
Between crankshaft position sensor coupler “1” and joint coupler “2”	black–black
Between joint coupler “2” and ECU coupler “3”	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

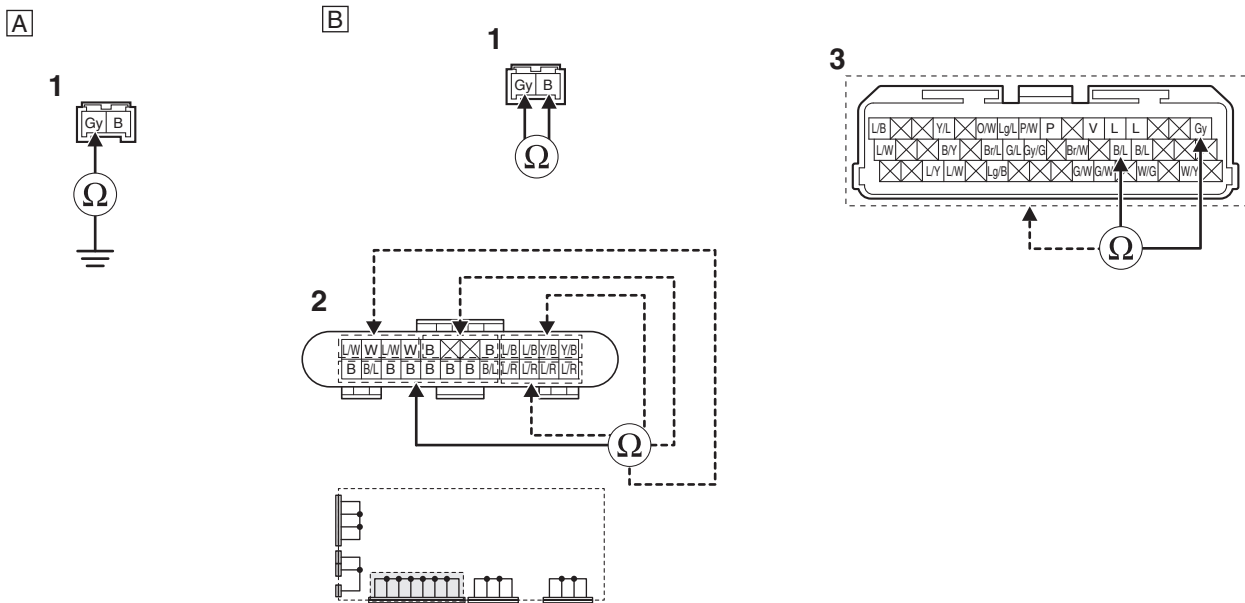
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between crankshaft position sensor coupler “1” and ground	gray–ground
---	-------------

Lines short circuit check “B”

Crankshaft position sensor coupler “1”	black/blue–any other coupler terminal gray–any other coupler terminal
Joint coupler “2”	black–any other coupler terminal black/blue–any other coupler terminal
ECU coupler “3”	black/blue–any other coupler terminal gray–any other coupler terminal



Is resistance $\infty \Omega$?

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 5-37.
- 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 sensor.
- 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 8-45.

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the stator coil assembly.
Refer to “GENERATOR AND STARTER CLUTCH” on page 5-37.
- 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 8-41.

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

- Able to start engine (depending on the number of faulty cylinder)
- Able to drive vehicle (depending on the number of faulty cylinder)

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.

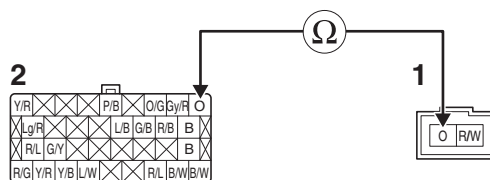
NO

→ 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–orange
---	---------------



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Start the engine and let it idle for approximately 5 seconds.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

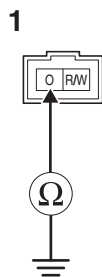
Ground short circuit check “A”

Between cylinder-#1 ignition coil coupler “1” and ground	orange–ground
--	---------------

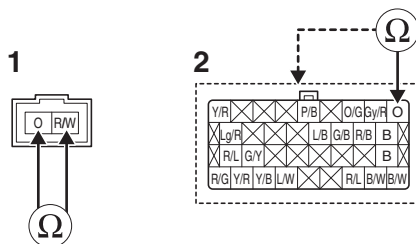
Lines short circuit check “B”

Cylinder-#1 ignition coil coupler “1”	orange–any other coupler terminal
ECU coupler “2”	orange–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

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 5-16.

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 8-44.

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the cylinder-#1 ignition coil.
Refer to “CAMSHAFTS” on page 5-16.
- b. Start the engine and let it idle for approximately 5 seconds.
- c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.

- Execute the diagnostic mode. (Code 30)
- Confirm that spark plug does not sparking.
- Replace the ECU, and complete the service.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

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

- Able to start engine (depending on the number of faulty cylinder)
- Able to drive vehicle (depending on the number of faulty cylinder)

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.

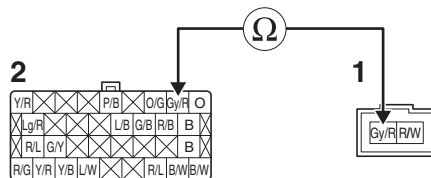
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the cylinder-#2 ignition coil coupler “1” and ECU coupler “2”.
- Open circuit check

Between cylinder-#2 ignition coil coupler “1” and ECU coupler “2”	gray/red–gray/red
---	-------------------



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Start the engine and let it idle for approximately 5 seconds.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

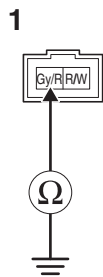
Ground short circuit check “A”

Between cylinder-#2 ignition coil coupler “1” and ground	gray/red–ground
--	-----------------

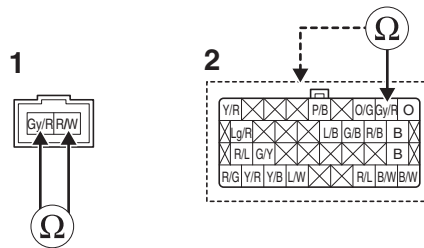
Lines short circuit check “B”

Cylinder-#2 ignition coil coupler “1”	gray/red–any other coupler terminal
ECU coupler “2”	gray/red–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

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 5-16.

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 8-44.

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the cylinder-#2 ignition coil.
Refer to "CAMSHAFTS" on page 5-16.
- b. Start the engine and let it idle for approximately 5 seconds.
- c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.

- Execute the diagnostic mode. (Code 31)
- Confirm that spark plug does not sparking.
- Replace the ECU, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

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.

EAS20582

P0353

EAS33062

TROUBLESHOOTING**Item**

Cylinder-#3 ignition coil: open or short circuit is detected in the primary lead of the cylinder-#3 ignition coil. Normal signal is not received from the ignition circuit.

Fail-safe system

- Able to start engine (depending on the number of faulty cylinder)
- Able to drive vehicle (depending on the number of faulty cylinder)

Procedure

1. Connection of cylinder-#3 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.

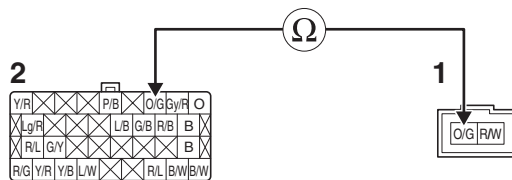
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the cylinder-#3 ignition coil coupler “1” and ECU coupler “2”.
- Open circuit check

Between cylinder-#3 ignition coil coupler “1” and ECU coupler “2”	orange/green–orange/green
---	---------------------------



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Start the engine and let it idle for approximately 5 seconds.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

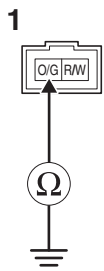
Ground short circuit check “A”

Between cylinder-#3 ignition coil coupler “1” and ground	orange/green–ground
--	---------------------

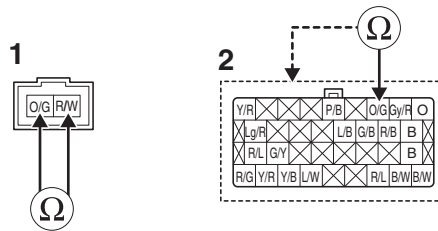
Lines short circuit check “B”

Cylinder-#3 ignition coil coupler “1”	orange/green–any other coupler terminal
ECU coupler “2”	orange/green–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

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-#3 ignition coil.

- Check for looseness or pinching.
Refer to “CAMSHAFTS” on page 5-16.

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-#3 ignition coil.

- Measure the primary coil resistance of the cylinder-#3 ignition coil.
Refer to “CHECKING THE IGNITION COILS” on page 8-44.

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the cylinder-#3 ignition coil.
Refer to "CAMSHAFTS" on page 5-16.
- b. Start the engine and let it idle for approximately 5 seconds.
- c. Check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.

- Execute the diagnostic mode. (Code 32)
- Confirm that spark plug does not sparking.
- Replace the ECU, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

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

EAS33528

TROUBLESHOOTING**Item**

Purge cut valve solenoid: open circuit is detected. PCV solenoid is not operated.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Connection of purge cut valve solenoid coupler.
 - Check the locking condition of the coupler.
 - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?**YES**

→ Go to step 2.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?**YES**

→ Go to step 7, and complete the service.

NO

→ Go to step 2.

2. Connection of ECU coupler.
 - Check the locking condition of the coupler.
 - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?**YES**

→ Go to step 3.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?**YES**

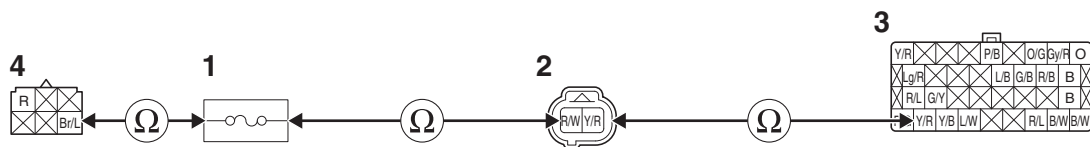
→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Wire harness continuity.
 - Disconnect the ignition fuse "1", purge cut valve solenoid coupler "2", ECU coupler "3" and main switch coupler "4".
 - Open circuit check

Between ignition fuse holder "1" and purge cut valve solenoid coupler "2"	red-red/white
Between purge cut valve solenoid coupler "2" and ECU coupler "3"	yellow/red-yellow/red
Between main switch coupler "4" and ignition fuse holder "1"	brown/blue-brown/blue



Is resistance 0 Ω?

YES

→ Go to "Short circuit check".

NO

- a. Replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to "Short circuit check".

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

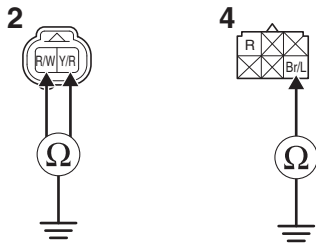
Ground short circuit check "A"

Between purge cut valve solenoid coupler "2" and ground	red/white-ground yellow/red-ground
Between main switch coupler "4" and ground	brown/blue-ground

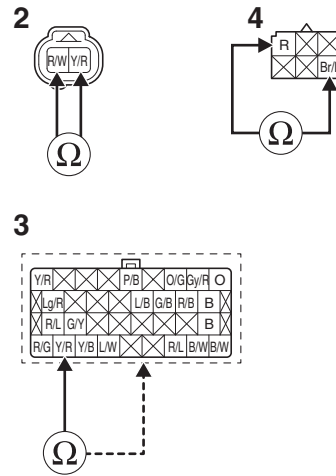
Lines short circuit check "B"

Purge cut valve solenoid coupler "2"	red/white-any other coupler terminal yellow/red-any other coupler terminal
ECU coupler "3"	yellow/red-any other coupler terminal
Main switch coupler "4"	brown/blue-any other coupler terminal

A



B



Is resistance $\infty \Omega$?

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.
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 5.

5. Defective purge cut valve solenoid.

- Execute the diagnostic mode. (Code 46)

Is it hear operating sound?

YES

→ Go to step 7, and complete the service.

NO

→ Check the purge cut valve solenoid.

Refer to "CHECKING THE PURGE CUT VALVE SOLENOID" on page 8-50.

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 8-41.

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.

EAS20585

P0480

EAS33065

TROUBLESHOOTING

Item

Radiator fan motor relay: open or short circuit is detected. Normal signal is not received from the radiator fan motor relay.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Connection of radiator fan motor relay coupler.
 - Check the locking condition of the coupler.
 - Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 2.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to step 2.

2. Connection of ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 3.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→ Go to step 6, and complete the service.

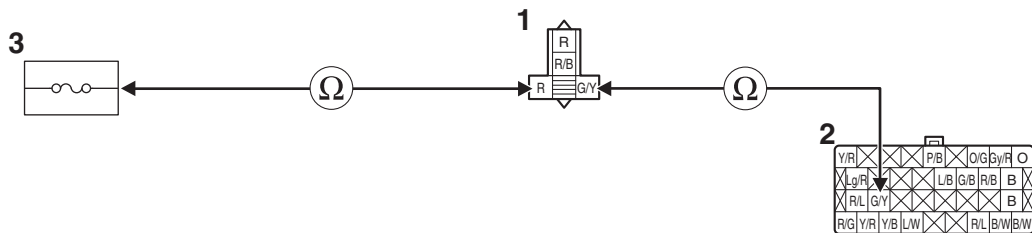
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the radiator fan motor relay “1”, ECU coupler “2” and ignition fuse “3”.
- Open circuit check

Between radiator fan motor relay “1” and ignition fuse holder “3”	red–red
Between radiator fan motor relay “1” and ECU coupler “2”	green/yellow–green/yellow



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

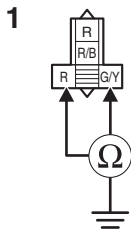
Ground short circuit check “A”

Between radiator fan motor relay “1” and ground	green/yellow–ground red–ground
---	-----------------------------------

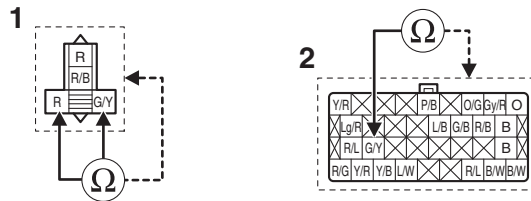
Lines short circuit check “B”

Radiator fan motor relay “1”	green/yellow–any other coupler terminal red–any other coupler terminal
ECU coupler “2”	green/yellow–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

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.
- 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 8-41.

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

EAS33303

TROUBLESHOOTING

Item

- [P0500] Rear wheel sensor: open or short circuit is detected. Normal signal is not received from the rear wheel sensor or hydraulic unit assembly (ABS ECU) 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

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. Execute the diagnostic mode. (Code 07)
 - b. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 20.

NO

→ Go to step 2.

TIP

Perform the procedure from step 2 to step 7 and step 20.

- DTC P1500 detected.
 - a. 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 b.

NO

→ Go to step 8.

TIP

Perform the procedure from step 8 to step 13 and step 20.

- b. 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 20.

NO

→ Go to step 15.

TIP

Perform the procedure from step 14 to step 20.

2. Connection of rear wheel sensor coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 3.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Execute the diagnostic mode. (Code 07)
- c. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 20.

NO

→ Go to step 3.

3. Connection of ABS ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Execute the diagnostic mode. (Code 07)
- c. Rotate the rear wheel by hand and check that the indicated value increases.

Is that value increased?

YES

→ Go to step 20.

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

- Connect the coupler securely or replace the wire harness.
- 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 20.

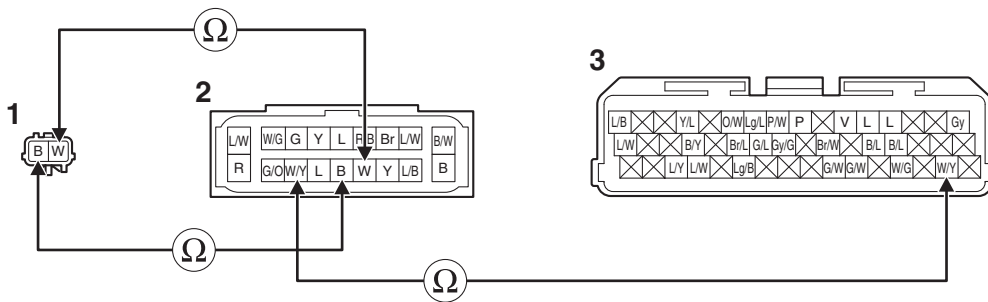
NO

→ Go to step 5.

5. Wire harness continuity.

- Disconnect the rear wheel sensor coupler “1”, ABS ECU coupler “2” and ECU coupler “3”.
- Open circuit check

Between rear wheel sensor coupler “1” and ABS ECU coupler “2”	black–black white–white
Between ABS ECU coupler “2” and ECU coupler “3”	white/yellow–white/yellow



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- 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 20.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4.

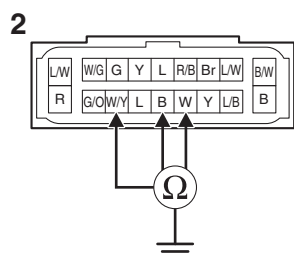
Ground short circuit check "A"

Between ABS ECU coupler "2" and ground	black-ground white-ground white/yellow-ground
--	---

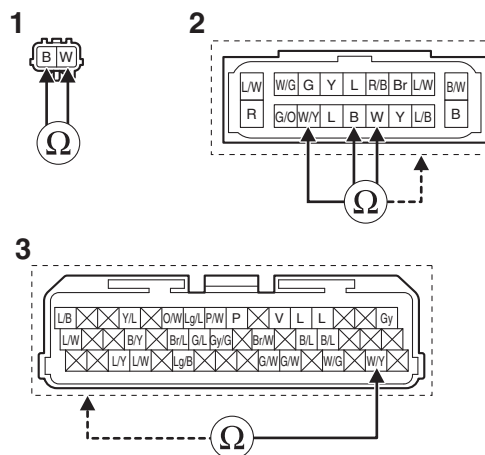
Lines short circuit check "B"

Rear wheel sensor coupler "1"	black-any other coupler terminal white-any other coupler terminal
ABS ECU coupler "2"	black-any other coupler terminal white-any other coupler terminal white/yellow-any other coupler terminal
ECU coupler "3"	white/yellow-any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 6.

NO

- Replace the wire harness.
- 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 20.

NO

→ Go to step 6.

6. Malfunction in ECU.

- Replace the ECU.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.
- 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 20.

NO

→ Go to step 7.

7. Malfunction in hydraulic unit assembly (ABS ECU).

- Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.
- Go to step 20, and complete the service.

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. 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 20.

NO

→ Go to step 9.

9. Connection of ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 10.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Execute the diagnostic mode. (Code 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 20.

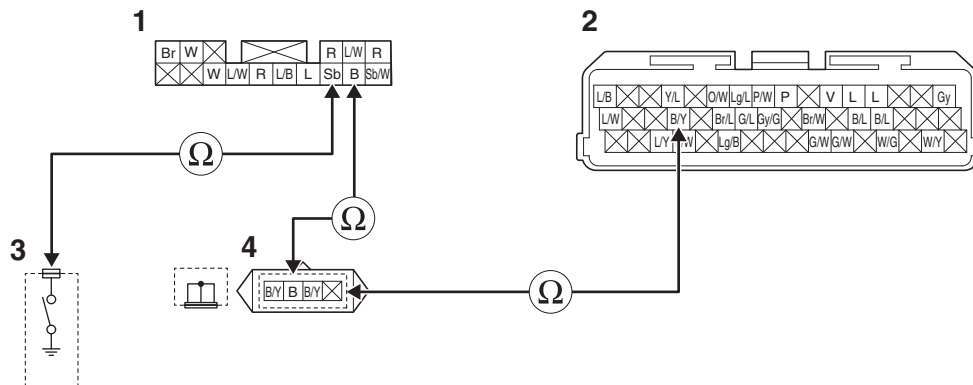
NO

→ Go to step 10.

10. Wire harness continuity.

- Disconnect the relay unit coupler “1”, ECU coupler “2” and neutral switch coupler “3”.
- Remove the joint coupler cap “4”.
- Open circuit check

Between relay unit coupler “1” and joint coupler “4”	black–black/yellow
Between joint coupler “4” and ECU coupler “2”	black/yellow–black/yellow
Between relay unit coupler “1” and neutral switch coupler “3”	sky blue–sky blue



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- 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 20.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

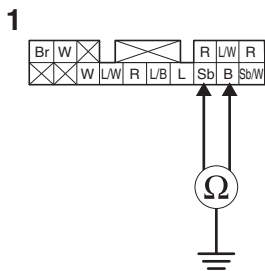
Ground short circuit check "A"

Between relay unit coupler "1" and ground	black-ground sky blue-ground
---	---------------------------------

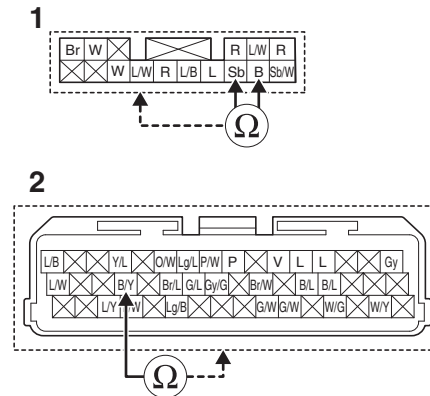
Lines short circuit check "B"

Relay unit coupler "1"	black-any other coupler terminal sky blue-any other coupler terminal
ECU coupler "2"	black/yellow-any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 11.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 20.

NO

→ Go to step 11.

11. Defective neutral switch.

- Check the neutral switch.
- Refer to "CHECKING THE SWITCHES" on page 8-39.

Is check result OK?

YES

→ Go to step 12.

NO

- a. Replace the neutral switch.
Refer to "CRANKCASE" on page 5-64.
- b. Execute the diagnostic mode. (Code 21)

When the transmission is in neutral	ON
When the transmission is in gear with the clutch lever released	OFF

Is it correct indication?

YES

→ Go to step 20.

NO

→ Go to step 12.

12. Faulty shift drum (neutral detection area).

- Check the shift drum.

Refer to “CHECKING THE SHIFT DRUM ASSEMBLY” on page 5-93.

Is check result OK?

YES

→ Go to step 13.

NO

→ Replace the shift drum and go to step 20.

Refer to “TRANSMISSION” on page 5-87.

13. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

14. Clutch lever adjustment.

- Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-12.
- Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 20.

NO

→ Go to step 15.

15. 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 16.

NO

- Connect the coupler securely or replace the wire harness.
- 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 20.

NO

→ Go to step 16.

16.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 17.

NO

- Connect the coupler securely or replace the wire harness.
- 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 20.

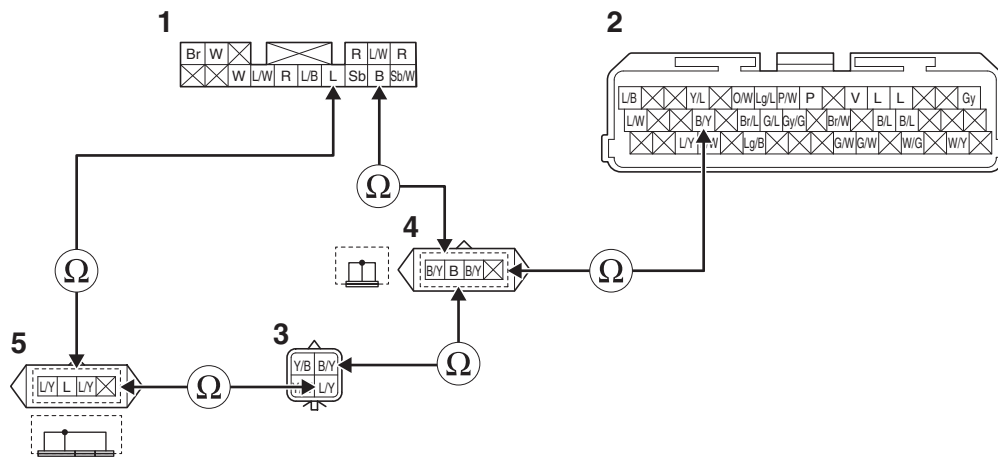
NO

→ Go to step 17.

17.Wire harness continuity.

- Disconnect the ECU coupler “2”, relay unit coupler “1” and clutch switch coupler “3”.
- Remove the joint coupler cap “4” and joint coupler cap “5”.
- Open circuit check

Between ECU coupler “2” and joint coupler “4”	black/yellow–black/yellow
Between relay unit coupler “1” and joint coupler “4”	black–black
Between clutch switch coupler “3” and joint coupler “4”	black/yellow–black/yellow
Between clutch switch coupler “3” and joint coupler “5”	blue/yellow–blue/yellow
Between relay unit coupler “1” and joint coupler “5”	blue–blue



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 20.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

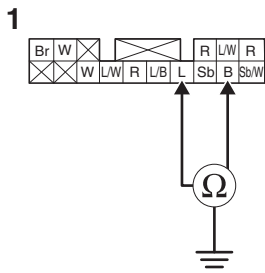
Ground short circuit check “A”

Between relay unit coupler “1” and ground	black–ground blue–ground
---	-----------------------------

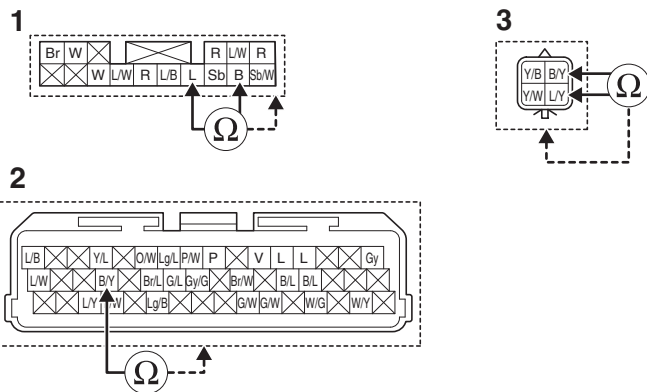
Lines short circuit check “B”

Relay unit coupler “1”	black–any other coupler terminal blue–any other coupler terminal
ECU coupler “2”	black/yellow–any other coupler terminal
Clutch switch coupler “3”	black/yellow–any other coupler terminal blue/yellow–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 18.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 20.

NO

→ Go to step 18.

18. Defective clutch switch.

- Check the clutch switch.

Refer to “CHECKING THE SWITCHES” on page 8-39.

Is check result OK?

YES

→ Go to step 19.

NO

- a. Replace the clutch switch.
Refer to “HANDLEBAR” on page 4-60.
- b. Execute the diagnostic mode. (Code 21)

When the clutch lever is released with the transmission in gear and when the sidestand is retracted	OFF
When the clutch lever is squeezed with the transmission in gear and when the sidestand is retracted	ON

Is it correct indication?

YES

→ Go to step 20.

NO

→ Go to step 19.

19. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

20. 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. Poor charging performance (discharged condition). Vehicle system power voltage is abnormal. (Regulator is not operated properly or battery is not charged properly.)
- [P0563] Battery charging voltage is abnormal. Charging voltage is not within range (overcharged condition). Vehicle system power voltage is abnormal. (Regulator is not operated properly or battery is not charged properly.)

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P0335
-

1. Malfunction in charging system.

- Check the charging system.
Refer to “CHARGING SYSTEM” on page 8-13.

Is check result OK?

YES

→ Repeat step 1.

NO

- Defective rectifier/regulator or AC magneto → Replace.
- Defective connection in the charging system circuit → Properly connect or replace the wire harness.
- Start the engine and let it idle for approximately 5 seconds.
- Check the 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.

EAS20594

P0564

EAS33074

TROUBLESHOOTING

Item

- Cruise control setting switch “RES+”: open or short circuit is detected. Normal signal is not sent to ECU.
- Cruise control setting switch “SET-”: open or short circuit is detected. Normal signal is not sent to ECU.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Connection of ECU coupler, handlebar switch coupler (left) and 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 2.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to “ON”, and then push the “RES+” side and “SET-” side of the cruise control setting switch.
- c. 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 2.

2. Locate the malfunction.

- a. Execute the diagnostic mode. (Code 80)

When the cruise control setting switch “RES+” is pushed	ON
When the cruise control setting switch is released	OFF

Is check result OK?

YES

→Go to step b.

NO

→Go to step 3.

TIP

Perform the procedure from step 3 to step 5, and from step 9 to step 10.

- b. Execute the diagnostic mode. (Code 81)

When the cruise control setting switch “SET-” is pushed	ON
When the cruise control setting switch is released	OFF

- c. Confirm that it is defective.
- d. Go to step 6.

TIP

Perform the procedure from step 6 to step 10.

3. Check the fuse.
- Check the ignition fuse and cruise control fuse.

Is check result OK?

YES

→Go to step 4.

NO

- a. Replace the fuse.
- b. Turn the main switch to “ON”.
- c. Push and release the “RES+” side of the cruise control setting switch, 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.

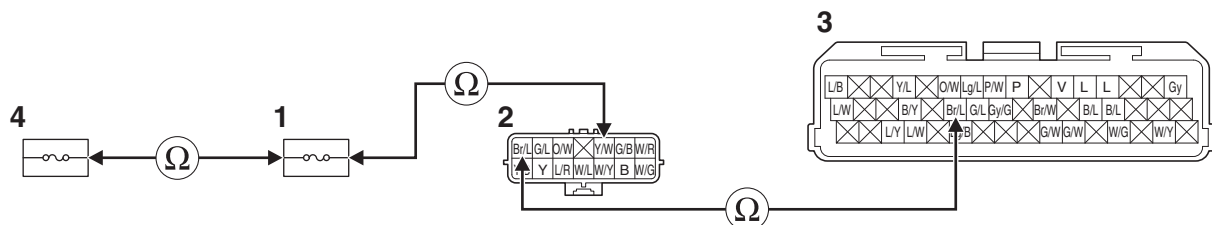
NO

→Go to step 4.

4. Wire harness continuity

- Disconnect the ignition fuse “4”, cruise control fuse “1”, handlebar switch coupler (left) “2” and ECU coupler “3”.
- Open circuit check

Between ignition fuse holder “4” and cruise control fuse holder “1”	red/white–red
Between cruise control fuse holder “1” and handlebar switch coupler (left) “2”	yellow/white–yellow/white
Between handlebar switch coupler (left) “2” and ECU coupler “3”	brown/blue–brown/blue



Is resistance 0 Ω?

YES

→Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”.
- Push and release the “RES+” side of the cruise control setting switch, 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 9-4.

Ground short circuit check “A”

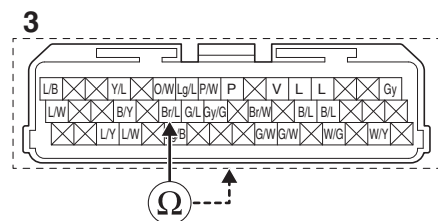
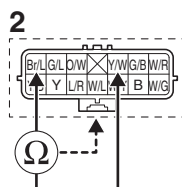
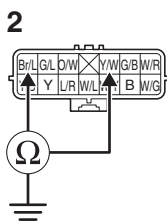
Between handlebar switch coupler (left) “2” and ground	brown/blue–ground yellow/white–ground
--	--

Lines short circuit check “B”

Handlebar switch coupler (left) “2”	brown/blue–any other coupler terminal yellow/white–any other coupler terminal
ECU coupler “3”	brown/blue–any other coupler terminal

A

B



Is resistance ∞ Ω?

YES

→Go to step 5.

NO

- Replace the wire harness.
- Turn the main switch to “ON”.
- Push and release the “RES+” side of the cruise control setting switch, 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. Defective cruise control setting switch.

- Replace the handlebar switch (left).
Refer to “HANDLEBAR” on page 4-60.
- Turn the main switch to “ON”.
- Push the “RES+” side and “SET-” side of the cruise control setting switch, 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.

6. Check the fuse. (main fuse, cruise control fuse)

Is check result OK?

YES

→Go to step 7.

NO

- a. Replace the fuse.
- b. Turn the main switch to “ON”.
- c. Push and release the “SET-” side of the cruise control setting switch, 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.

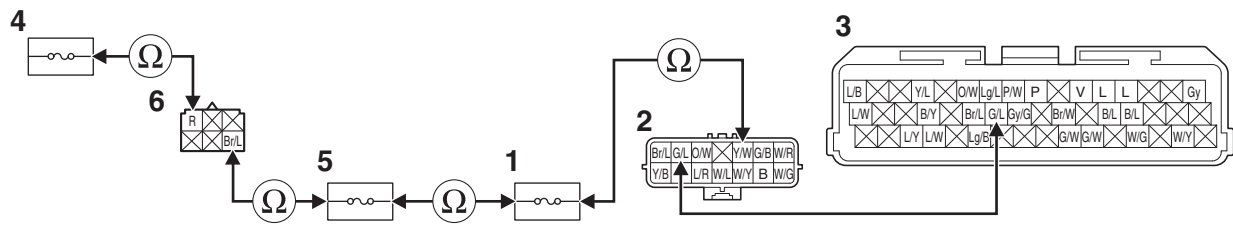
NO

→Go to step 7.

7. Wire harness continuity.

- Open circuit check
- Disconnect the main fuse “4”, ignition fuse “5”, main switch coupler “6”, cruise control fuse “1”, handlebar switch coupler (left) “2” and ECU coupler “3”.

Between main fuse holder “4” and main switch coupler “6”	red–red
Between main switch coupler “6” and ignition fuse holder “5”	brown/blue–brown/blue
Between ignition fuse holder “5” and cruise control fuse holder “1”	red–red/white
Between cruise control fuse holder “1” and handlebar switch coupler (left) “2”	yellow/white–yellow/white
Between handlebar switch coupler (left) “2” and ECU coupler “3”	green/blue–green/blue



Is resistance 0 Ω?

YES

→Go to “Short circuit check”.

NO

- a. Replace the wire harness.
- b. Turn the main switch to “ON”.
- c. Push and “SET-” side of the cruise control setting switch, 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 9-4.

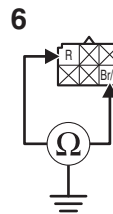
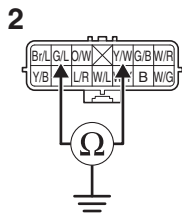
Ground short circuit check “A”

Between handlebar switch coupler (left) “2” and ground	green/blue–ground yellow/white–ground
Between main switch coupler “6” and ground	red–ground brown/blue–ground

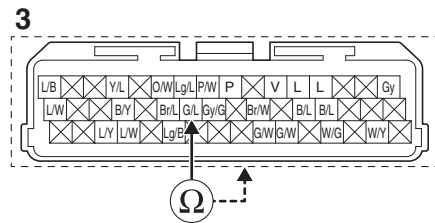
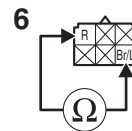
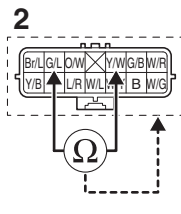
Lines short circuit check “B”

Handlebar switch coupler (left) “2”	green/blue–any other coupler terminal yellow/white–any other coupler terminal
ECU coupler “3”	green/blue–any other coupler terminal
Main switch coupler “6”	red–any other coupler terminal brown/blue–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→Go to step 8.

NO

- a. Replace the wire harness.
- b. Turn the main switch to “ON”.
- c. Push and “SET-” side of the cruise control setting switch, 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 8.

8. Defective cruise control setting switch.

- Replace the handlebar switch (left).
Refer to “HANDLEBAR” on page 4-60.
- Turn the main switch to “ON”.
- Push the “RES+” side and “SET-” side of the cruise control setting switch, 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, and complete the service.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

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.

EAS20595

P056C

EAS33075

TROUBLESHOOTING**Item**

- Front brake light switch: open or short circuit is detected. Normal signal is not sent to ECU.
- Rear brake light switch: open or short circuit is detected. Normal signal is not sent to ECU.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Locate the malfunction.

a. Execute the diagnostic mode. (Code 82, 83)

When the front brake is applied	ON
When the front brake is not applied	OFF

Is check result OK?**YES**

→Go to step b.

NO

→Go to step 2.

TIP

Perform the procedure from step 2 to step 5, and from step 10 to step 11.

b. Execute the diagnostic mode. (Code 82, 83)

When the rear brake is applied	ON
When the rear brake is not applied	OFF

c. Confirm that it is defective.

d. Go to step 6.

TIP

Perform the procedure from step 6 to step 11.

2. Connection of ECU coupler, front brake light switch coupler, brake light relay coupler and 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 3.

NO

a. Connect the coupler securely or replace the wire harness.

b. Turn the main switch to "ON".

c. Operate the front brake lever, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→Go to step 11, and complete the service.

NO

→Go to step 3.

3. Check the fuse. (signaling system fuse and brake light fuse)

Is check result OK?

YES

→Go to step 4.

NO

- a. Replace the fuse.
- b. Turn the main switch to “ON”.
- c. Operate the front brake lever, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→Go to step 11, and complete the service.

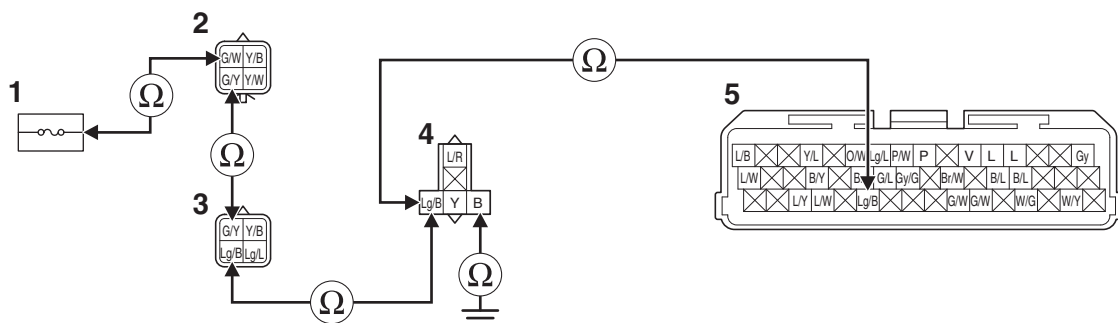
NO

→Go to step 4.

4. Wire harness continuity.

- Disconnect the brake light fuse “1”, front brake light switch coupler “2”, rear brake light switch coupler “3”, brake light relay coupler “4” and ECU coupler “5”.
- Open circuit check

Between brake light fuse holder “1” and front brake light switch coupler “2”	green/white–green/white
Between front brake light switch coupler “2” and rear brake light switch coupler “3”	green/yellow–green/yellow
Between rear brake light switch coupler “3” and brake light relay coupler “4”	light green/black–light green/black
Between brake light relay coupler “4” and ground	black–ground
Between brake light relay coupler “4” and ECU coupler “5”	light green/black–light green/black



Is resistance 0 Ω?

YES

→Go to “Short circuit check”.

NO

- a. Replace the wire harness.
- b. Turn the main switch to “ON”.
- c. Operate the front brake lever, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→Go to step 11, and complete the service.

NO

→Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

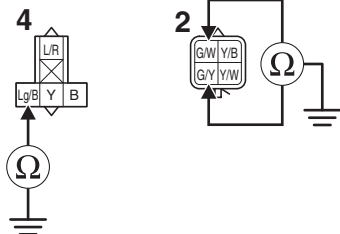
Ground short circuit check “A”

Between brake light relay coupler “4” and ground	light green/black–ground
Between front brake light switch coupler “2” and ground	green/white–ground green/yellow–ground

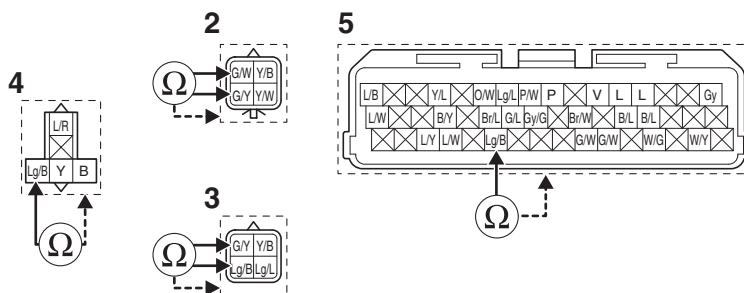
Lines short circuit check “B”

Brake light relay coupler “4”	light green/black–any other coupler terminal
Front brake light switch coupler “2”	green/white–any other coupler terminal green/yellow–any other coupler terminal
Rear brake light switch coupler “3”	green/yellow–any other coupler terminal light green/black–any other coupler terminal
ECU coupler “5”	light green/black–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→Go to step 5.

NO

- a. Replace the wire harness.
- b. Turn the main switch to "ON".
- c. Operate the front brake lever, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→Go to step 11, and complete the service.

NO

→Go to step 5.

5. Defective front brake light switch.

- Replace the front brake light switch.
Refer to "FRONT BRAKE" on page 4-27.
- Turn the main switch to "ON".
- Operate the front brake lever, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→Go to step 11, and complete the service.

NO

→Go to step 10.

6. Connection of wire harness ECU coupler, rear brake light switch coupler, brake light relay coupler and 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 7.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON".
- c. Operate the rear brake pedal, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→Go to step 11, and complete the service.

NO

→Go to step 7.

7. Check the fuse. (signaling system fuse and brake light fuse)

Is check result OK?

YES

→Go to step 8.

NO

- a. Replace the fuse.
- b. Turn the main switch to "ON".
- c. Operate the rear brake pedal, and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?

YES

→Go to step 11, and complete the service.

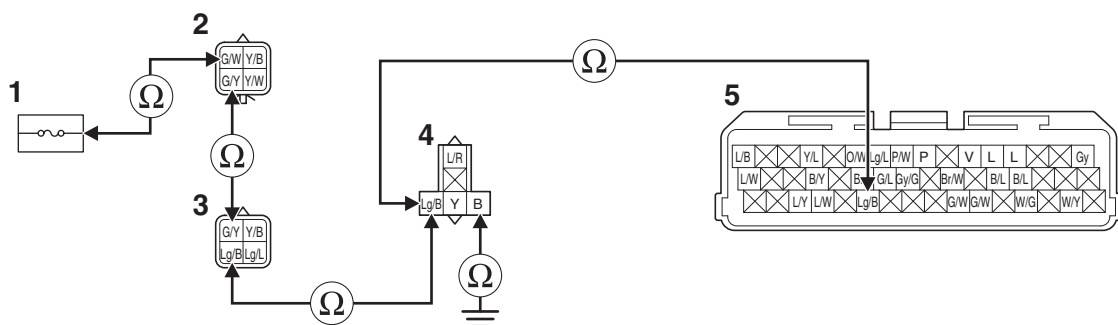
NO

→Go to step 8.

8. Wire harness continuity.

- Disconnect the brake light fuse "1", front brake light switch coupler "2", rear brake light switch coupler "3", brake light relay coupler "4" and ECU coupler "5".
- Open circuit check

Between brake light fuse holder "1" and front brake light switch coupler "2"	green/white–green/white
Between front brake light switch coupler "2" and rear brake light switch coupler "3"	green/yellow–green/yellow
Between rear brake light switch coupler "3" and brake light relay coupler "4"	light green/black–light green/black
Between brake light relay coupler "4" and ground	black–ground
Between brake light relay coupler "4" and ECU coupler "5"	light green/black–light green/black



Is resistance 0 Ω?

YES

→Go to "Short circuit check".

NO

- a. Replace the wire harness.
- b. Turn the main switch to "ON".
- c. Operate the rear brake pedal, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→Go to step 11, and complete the service.

NO

→Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

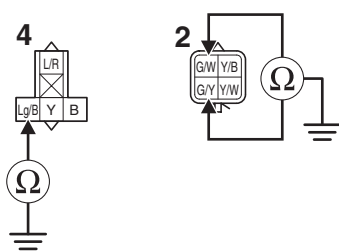
Ground short circuit check “A”

Between brake light relay coupler “4” and ground	light green/black–ground
Between front brake light switch coupler “2” and ground	green/white–ground green/yellow–ground

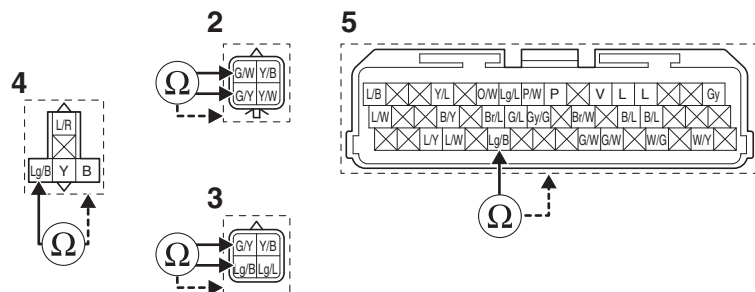
Lines short circuit check “B”

Brake light relay coupler “4”	light green/black–any other coupler terminal
Front brake light switch coupler “2”	green/white–any other coupler terminal green/yellow–any other coupler terminal
Rear brake light switch coupler “3”	green/yellow–any other coupler terminal light green/black–any other coupler terminal
ECU coupler “5”	light green/black–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→Go to step 9.

NO

- Replace the wire harness.
- Turn the main switch to “ON”.
- Operate the rear brake pedal, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→Go to step 11, and complete the service.

NO

→Go to step 9.

9. Defective rear brake light switch.

- Replace the rear brake light switch.

Refer to “REAR BRAKE” on page 4-40.

Is check result OK?

YES

→Go to step 10.

NO

a. Turn the main switch to “ON”.

b. Operate the rear brake pedal, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→Go to step 11, and complete the service.

NO

→Go to step 10.

10. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

11. 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 8-41.
- 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 (depending on the situation)
- Able/Unable to drive vehicle (depending on the situation)

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 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 8-41.
 - 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)
- Able/Unable to drive vehicle (depending on the situation)

Procedure

1. Locate the malfunction.
 - Execute the diagnostic mode (Code 60)
 - 00**
Go to step 6.
 - 01**
Go to step 2.
 - 02**
Go to step 3.
 - 03**
Go to step 4.
 - Except 00–03**
Go to step 5.
2. "01" is indicated in diagnostic mode (Code 60). EEPROM data error for adjustment of CO concentration of cylinder #1.
 - Change the CO concentration of cylinder #1, and rewrite in EEPROM.
Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-11.
 - After this adjustment is made, turn the main switch to "OFF".
 - 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

- a. Repeat step 1.
- b. If the same number is indicated, go to item 7.

3. "02" is indicated in diagnostic mode (Code 60). EEPROM data error for adjustment of CO concentration of cylinder #2.
 - Change the CO concentration of cylinder #2, and rewrite in EEPROM.
Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-11.
 - After this adjustment is made, turn the main switch to "OFF".
 - 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

- a. Repeat step 1.
- b. If the same number is indicated, go to item 6.

4. "03" is indicated in diagnostic mode (Code 60). EEPROM data error for adjustment of CO concentration of cylinder #3.

- Change the CO concentration of cylinder #3, and rewrite in EEPROM.
Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-11.
- After this adjustment is made, turn the main switch to "OFF".
- 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

- a. Repeat step 1.
- b. If the same number is indicated, go to item 6.

5. Except "00-03" is indicated in diagnostic mode (Code 60). EEPROM data error for corresponding learning/memory values.

- Turn the main switch to "OFF".
- 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

- a. Repeat step 1.
- b. If the same number is indicated, go to item 6.

6. Malfunction in ECU.

- Replace the ECU, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

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.

EAS20599

P0638

EAS33079

TROUBLESHOOTING

Item

YCC-T drive system: malfunction detected.

Fail-safe system

- Able/Unable to start engine (depending on the situation)
- Able/Unable to drive vehicle (depending on the situation)

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 fuse.
 - 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.

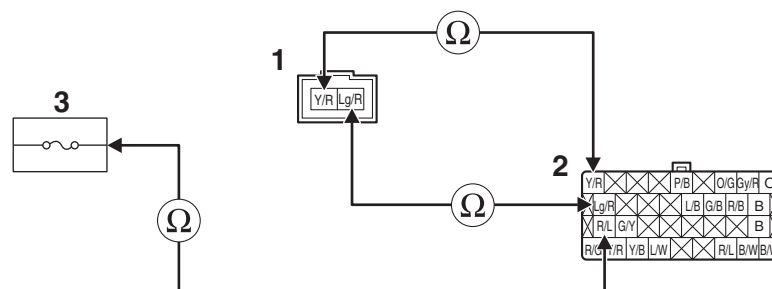
NO

→ 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/red–yellow/red light green/red–light green/red
Between ECU coupler “2” and electronic throttle valve fuse holder “3”	red/blue–red/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

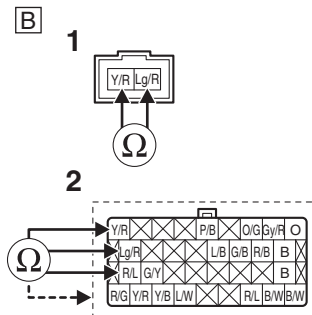
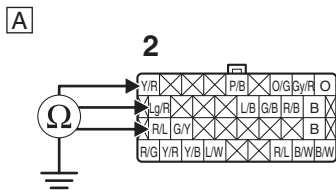
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between ECU coupler “2” and ground	yellow/red–ground light green/red–ground red/blue–ground
------------------------------------	--

Lines short circuit check “B”

Throttle servo motor coupler “1”	yellow/red–any other coupler terminal light green/red–any other coupler terminal
ECU coupler “2”	yellow/red–any other coupler terminal light green/red–any other coupler terminal red/blue–any other coupler terminal



Is resistance $\infty \Omega$?

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 8-48.

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the throttle bodies.
Refer to “REPLACING THE THROTTLE BODIES” on page 7-10.
- b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 6.

6. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

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: incorrect voltage supplied to the injector, fuel pump and relay unit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure**TIP**

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P0335

1. Connection of relay unit coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?**YES**

→ Go to step 2.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Start the engine and let it idle for approximately 5 seconds.
- c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?**YES**

→ Go to step 8, and complete the service.

NO

→ Go to step 2.

2. Connection of handlebar switch coupler (right).

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Refer to “HANDLEBAR” on page 4-60.

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 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

- Connect the coupler securely or replace the wire harness.
- Start the engine and let it idle for approximately 5 seconds.
- 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.

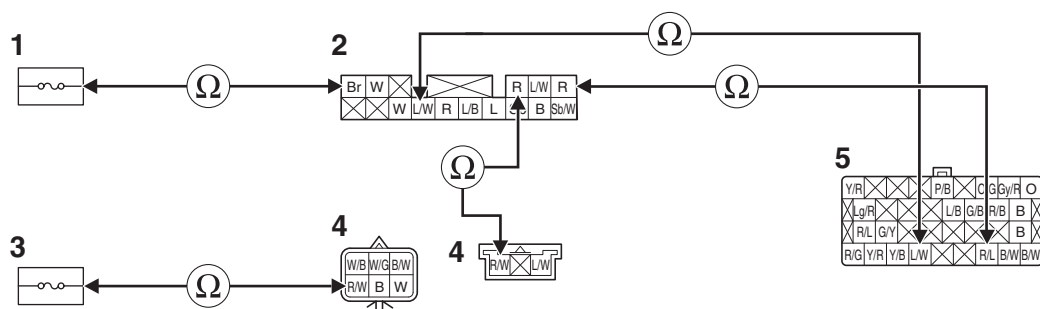
NO

→ Go to step 4.

4. Wire harness continuity.

- Disconnect the fuel injection system fuse “1”, relay unit coupler “2”, ignition fuse “3”, handlebar switch coupler (right) “4” and ECU coupler “5”.
- Open circuit check

Between fuel injection system fuse holder “1” and relay unit coupler “2”	brown–brown
Between ignition fuse holder “3” and handlebar switch coupler (right) “4”	red–red/white
Between handlebar switch coupler (right) “4” and relay unit coupler “2”	red/white–red
Between relay unit coupler “2” and ECU coupler “5”	red–red/blue blue/white–blue/white



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 8, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

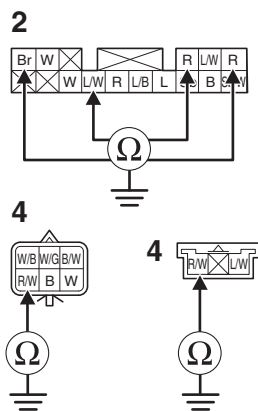
Ground short circuit check “A”

Between relay unit coupler “2” and ground	brown–ground blue/white–ground red–ground
Between handlebar switch coupler (right) “4” and ground	red/white–ground red/white–ground

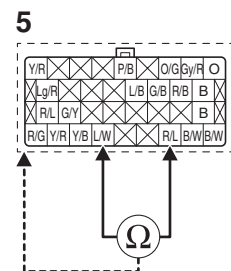
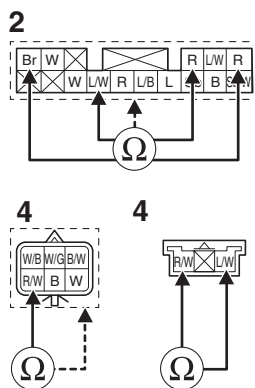
Lines short circuit check “B”

Relay unit coupler “2”	brown–any other coupler terminal blue/white–any other coupler terminal red–any other coupler terminal
Handlebar switch coupler (right) “4”	red/white–any other coupler terminal red/white–any other coupler terminal
ECU coupler “5”	red/blue–any other coupler terminal blue/white–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 5.

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 8, and complete the service.

NO

→ Go to step 5.

5. Defective relay unit.

- Execute the diagnostic mode. (Code 50)
- Check the operating sound of the relay.

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the relay unit.
- 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 8, and complete the service.

NO

→ Go to step 6.

6. Defective relay unit.

- Execute the diagnostic mode. (Code 09)

Is the fuel system voltage less than 3V?

YES

- a. Replace the relay unit.
- 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 8, and complete the service.

NO

→ Go to step 7.

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 8-41.

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.

EAS20417

P0914

EAS32837

TROUBLESHOOTING

Item

Gear position sensor: signal stuck and sensor signal does not change.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

- If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.
- P0335, P0500, P0915, P0916, P0917, P1500

1. Installed condition of gear position sensor.

- Check for looseness or pinching.
Refer to “CRANKCASE” on page 5-64.

Is check result OK?

YES

→ Go to step 2.

NO

- Reinstall or replace the sensor.
Refer to “CRANKCASE” on page 5-64.
- Make sure that the position of each gear is correctly displayed on the meter.

Is check result OK?

YES

→ Go to step 4, and complete the service.

NO

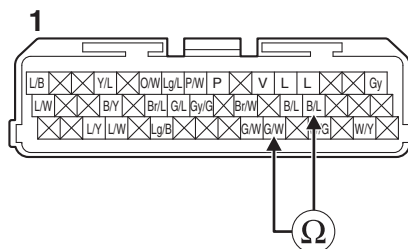
→ Go to step 2.

2. Defective gear position sensor.

- Disconnect the ECU coupler “1”.
- Measure the gear position sensor resistance.

ECU coupler “1”	green/white–black/blue
-----------------	------------------------

- Shift the transmission to each position.



Is the resistance change?

YES

→ Go to step 3.

NO

- a. Replace the gear position sensor.
Refer to "CRANKCASE" on page 5-64.
- b. Make sure that the position of each gear is correctly displayed on the meter.

Is check result OK?

YES

→ Go to step 4, and complete the service.

NO

→ Go to step 3.

3. Malfunction in ECU.

- Replace the ECU, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

4. 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.

EAS20416

P0915

EAS32836

TROUBLESHOOTING

Item

Gear position sensor: out of control signal range and normal signal is not received from the gear position sensor to ECU.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P0916, P0917
-

1. Installed condition of gear position sensor.

- Check for looseness or pinching.
Refer to "CRANKCASE" on page 5-64.

Is check result OK?

YES

→ Go to step 2.

NO

- Reinstall or replace the sensor.
Refer to "CRANKCASE" on page 5-64.
- Make sure that the position of each gear is correctly displayed on the meter.

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 2.

2. 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 3.

NO

- Connect the coupler securely or replace the wire harness.
- Make sure that the position of each gear is correctly displayed on the meter.

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Connection of ECU coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Make sure that the position of each gear is correctly displayed on the meter.

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Defective gear position sensor.

- Replace the gear position sensor.
Refer to "CRANKCASE" on page 5-64.
- Make sure that the position of each gear is correctly displayed on the meter.

Is check result OK?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective wire harness.

- Replace the wire harness.
- Make sure that the position of each gear is correctly displayed on the meter.

Is check result OK?

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 8-41.

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

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.

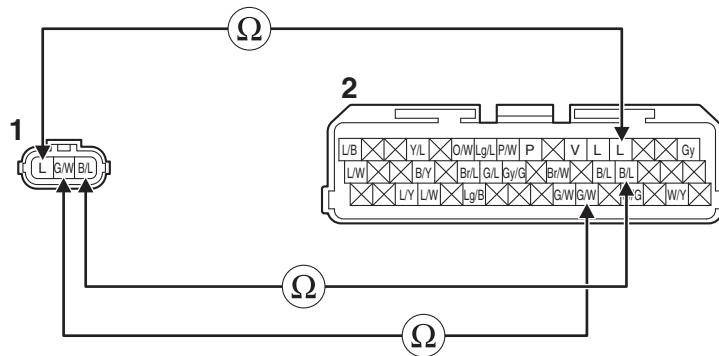
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the gear position sensor coupler “1” and ECU coupler “2”.
- Open circuit check

Between gear position sensor coupler “1” and ECU coupler “2”	black/blue–black/blue green/white–green/ white blue–blue
--	--



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

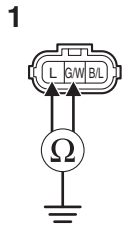
Ground short circuit check “A”

Between gear position sensor coupler “1” and ground	green/white–ground blue–ground
---	-----------------------------------

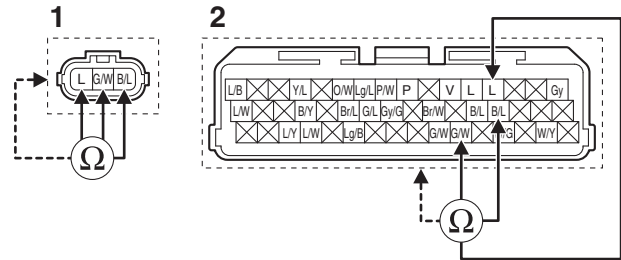
Lines short circuit check “B”

Gear position sensor coupler “1”	black/blue–any other coupler terminal green/white–any other coupler terminal blue–any other coupler terminal
ECU coupler “2”	black/blue–any other coupler terminal green/white–any other coupler terminal blue–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

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.
Refer to “CRANKCASE” on page 5-64.

Is check result OK?

YES

→ Go to step 5.

NO

- a. Reinstall or replace 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 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 5-64.
- 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 8-41.

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.

EAS20786

P1004

EAS33529

TROUBLESHOOTING

Item

Intake air pressure sensor 1 and intake air pressure sensor 2: When the main switch is “ON”, the standard voltage values of Intake air pressure sensor 1 and intake air pressure sensor 2 are large different.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P0105, P0106, P0108, P0335, P0606

1. Defective intake air pressure sensor 1.

- 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

Is check result OK?

YES

→ Go to step 2.

NO

- a. Replace the intake air pressure sensor 1.
Refer to “THROTTLE BODIES” on page 7-6.
- 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 4, and complete the service.

NO

→ Go to step 2.

2. Defective intake air pressure sensor 2.

- Execute the diagnostic mode. (Code 04)
- 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

Is check result OK?

YES

→ Go to step 3.

NO

- a. Replace the intake air pressure sensor 2.
Refer to “THROTTLE BODIES” on page 7-6.
- 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 4, and complete the service.

NO

→ Go to step 3.

3. Malfunction in ECU.

- Replace the ECU, and complete the service.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

4. 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.

EAS20613

P1600

EAS33093

TROUBLESHOOTING**Item**

Lean angle sensor: open or short circuit is detected. Normal signal is not received from IMU or defective IMU.

Fail-safe system

- Unable to start engine
- Unable to drive vehicle

Procedure**TIP**

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- U0125

1. Connection of IMU 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 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", 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 7, and complete the service.

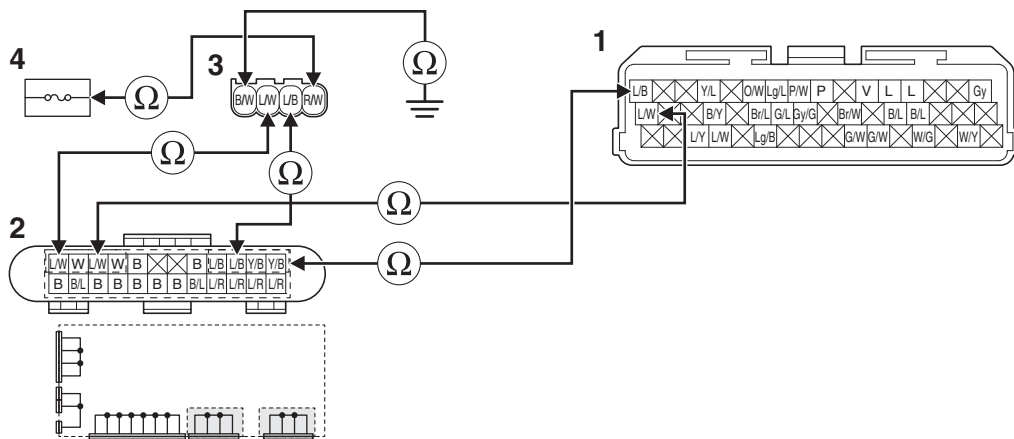
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the ECU coupler “1”, IMU coupler “3” and ignition fuse 2 “4”.
- Remove the joint coupler cap “2”.
- Open circuit check

Between ECU coupler “1” and joint coupler “2”	blue/white–blue/white blue/black–blue/black
Between joint coupler “2” and IMU coupler “3”	blue/white–blue/white blue/black–blue/black
Between IMU coupler “3” and ground	black/white–ground
Between ignition fuse 2 holder “4” and IMU coupler “3”	red/white–red/white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, then to “OFF”, and back to “ON”.
- 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

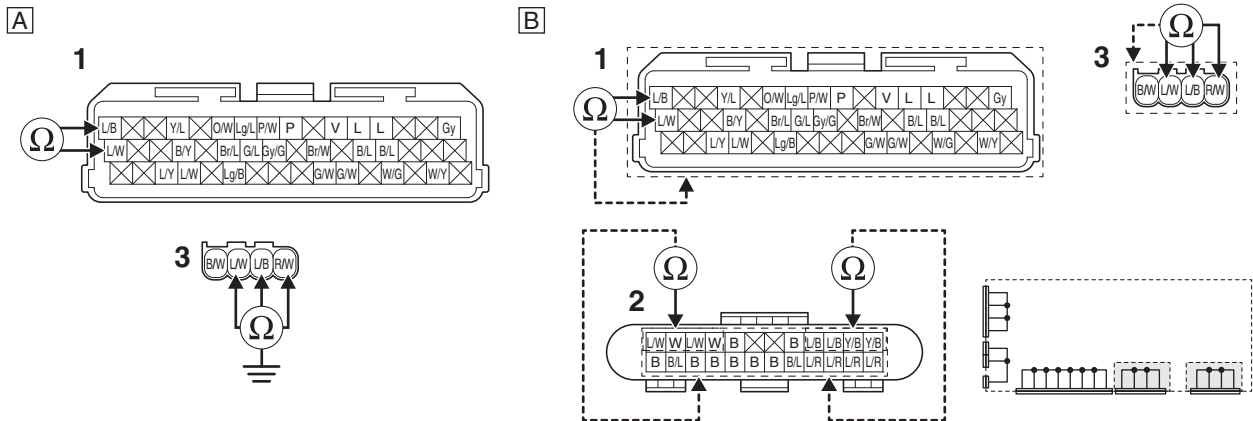
Disconnect the ECU and IMU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between ECU coupler “1” and ground	blue/white–ground blue/black–ground
Between IMU coupler “3” and ground	blue/white–ground blue/black–ground red/white–ground

Lines short circuit check “B”

ECU coupler “1”	blue/white–any other coupler terminal black/black–any other coupler terminal
Joint coupler “2”	blue/white–any other coupler terminal blue/black–any other coupler terminal
IMU coupler “3”	blue/white–any other coupler terminal blue/black–any other coupler terminal red/white–any other coupler terminal



Is resistance $\infty \Omega$?

YES

→ Go to step 4.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, then to “OFF”, and back to “ON”.
- 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 IMU.

- Check the installed direction and condition of the sensor.
Refer to “GENERAL CHASSIS (1)” on page 4-1.
- Check the grommet for cracks.

Is check result OK?

YES

→ Go to step 5.

NO

- a. Fix the IMU installation condition.
- b. Turn the main switch to “ON”.
- 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 IMU.

- Replace the IMU.
Refer to “GENERAL CHASSIS (1)” on page 4-1.
- Turn the main switch to “ON”, then to “OFF”, and back to “ON”.
- 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 8-41.

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 in 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

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.

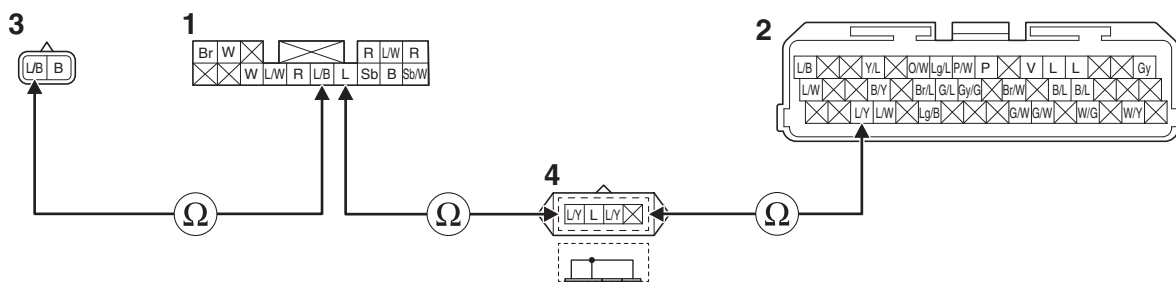
NO

→ Go to step 4.

4. Wire harness continuity.

- Disconnect the relay unit coupler “1”, ECU coupler “2” and sidestand switch coupler “3”.
- Remove the joint coupler cap “4”.
- Open circuit check

Between relay unit coupler “1” and joint coupler cap “4”	blue–blue
Between joint coupler “4” and ECU coupler “2”	blue/yellow–blue/yellow
Between relay unit coupler “1” and sidestand switch 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 extend and retract the sidestand.
- c. Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

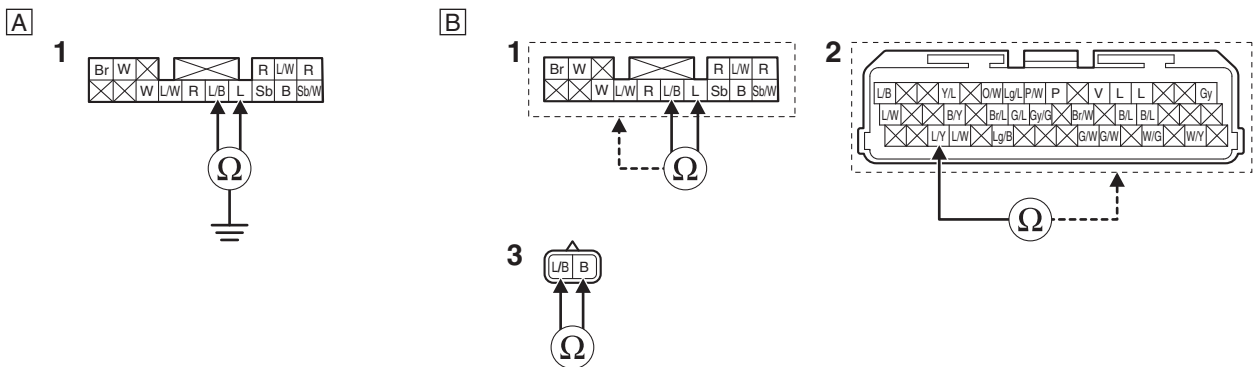
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between relay unit coupler “1” and ground	blue–ground blue/black–ground
---	----------------------------------

Lines short circuit check “B”

Relay unit coupler “1”	blue–any other coupler terminal blue/black–any other coupler terminal
ECU coupler “2”	blue/yellow–any other coupler terminal
Sidestand switch coupler “3”	blue/black–any other coupler terminal



Is resistance $\infty \Omega$?

YES

→ Go to step 5.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then extend and retract the sidestand.
- Check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective sidestand switch.

- Execute the diagnostic mode. (Code 20)
- Shift the transmission into gear.

Sidestand retracted	ON
Sidestand extended	OFF

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the sidestand switch.
- 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 8-41.

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 (depending on the situation)
- Able/Unable to drive vehicle (depending on the situation)

Procedure

1. Installed condition of battery leads.

- Check the installed condition of the battery and battery leads (loose bolts).

Is check result OK?**YES**

→ Go to step 2.

NO

- a. Reinstall or replace the battery leads.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?**YES**

→ Go to step 7, and complete the service.

NO

→ Go to step 2.

2. Connection of starter relay coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?**YES**

→ Go to step 3.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to "ON", and then check the DTC using the malfunction mode of the YDT.

Is it in the "Recovered" condition?**YES**

→ Go to step 7, and complete the service.

NO

→ Go to step 3.

3. Connection of main switch coupler.

- Check the locking condition of the coupler.
- Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

Is the coupler condition normal?

YES

→ Go to step 4.

NO

- a. Connect the coupler securely or replace the wire harness.
- b. Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 4.

4. Check the fuse.

- 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.

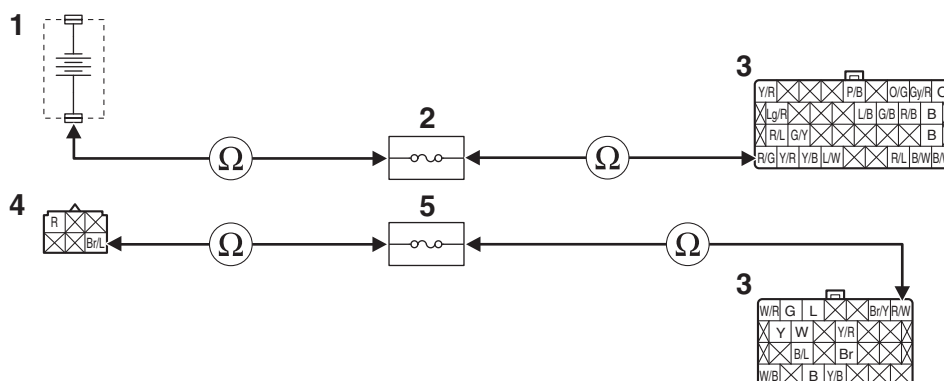
NO

→ Go to step 5.

5. Wire harness continuity.

- Disconnect the battery “1”, backup fuse 2 “2”, ECU coupler “3”, main switch coupler “4” and ignition fuse “5”.
- Open circuit check

Between battery “1” and backup fuse 2 holder “2”	red–red
Between backup fuse 2 holder “2” and ECU coupler “3”	red/green–red/green
Between main switch coupler “4” and ignition fuse holder “5”	brown/blue–brown/blue
Between ignition fuse holder “5” and ECU coupler “3”	red/white–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

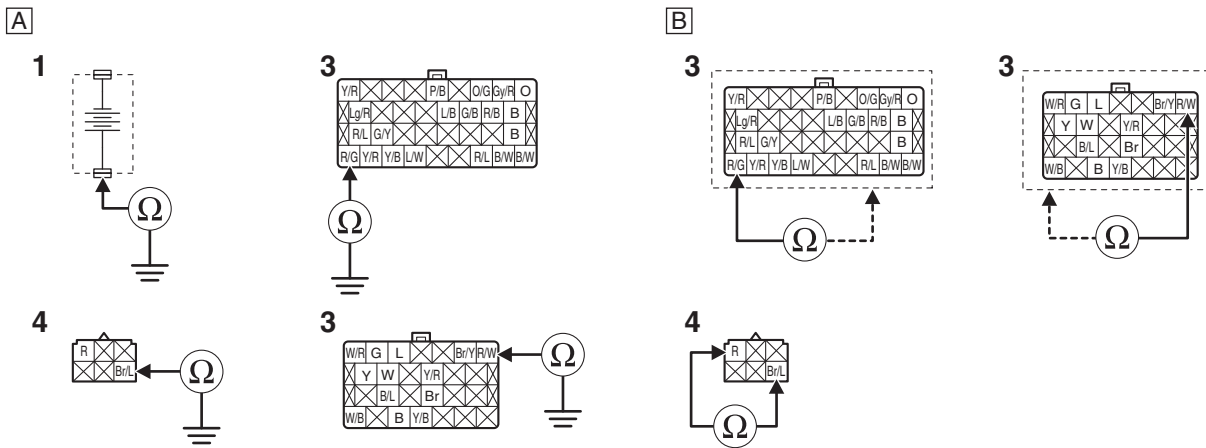
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between battery “1” and ground	red–ground
Between ECU coupler “3” and ground	red/green–ground red/white–ground
Between main switch coupler “4” and ground	brown/blue–ground

Lines short circuit check “B”

ECU coupler “3”	red/green–any other coupler terminal red/white–any other coupler terminal
Main switch coupler “4”	brown/blue–any other coupler terminal



Is resistance $\infty \Omega$?

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 8-41.

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.

EAS20787

P1606, P1607

EAS33530

TROUBLESHOOTING

Item

- [P1606] Intake air pressure sensor 2: short to ground circuit is detected. Normal signal is not received from the intake air pressure sensor 2 circuit.
- [P1607] Intake air pressure sensor 2: open or short to power circuit is detected. Normal signal is not received from the intake air pressure sensor 2 circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

1. Connection of intake air pressure sensor 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 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.

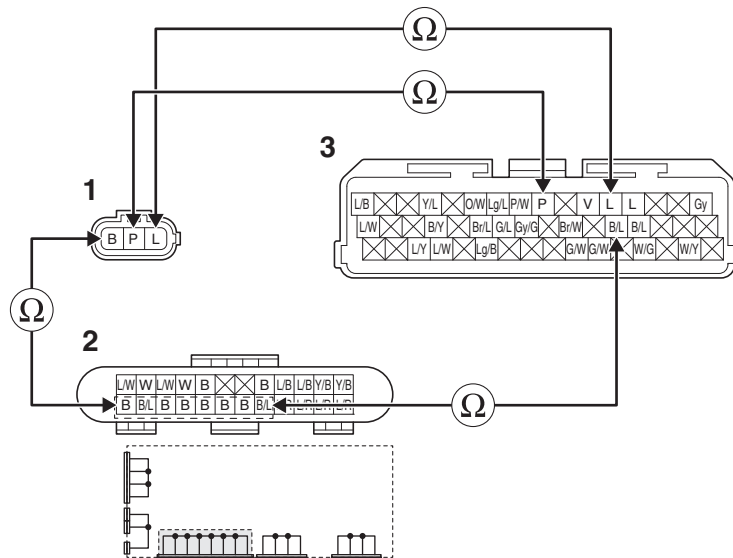
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the intake air pressure sensor 2 coupler “1” and ECU coupler “3”.
- Remove the joint coupler cap “2”.
- Open circuit check

Between ECU coupler “3” and joint coupler “2”	[P1607] black/blue–black/blue
Between ECU coupler “3” and intake air pressure sensor 2 coupler “1”	[P1607] blue–blue [P1606, P1607] pink–pink
Between intake air pressure sensor 2 coupler “1” and joint coupler “2”	[P1607] black–black



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- 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

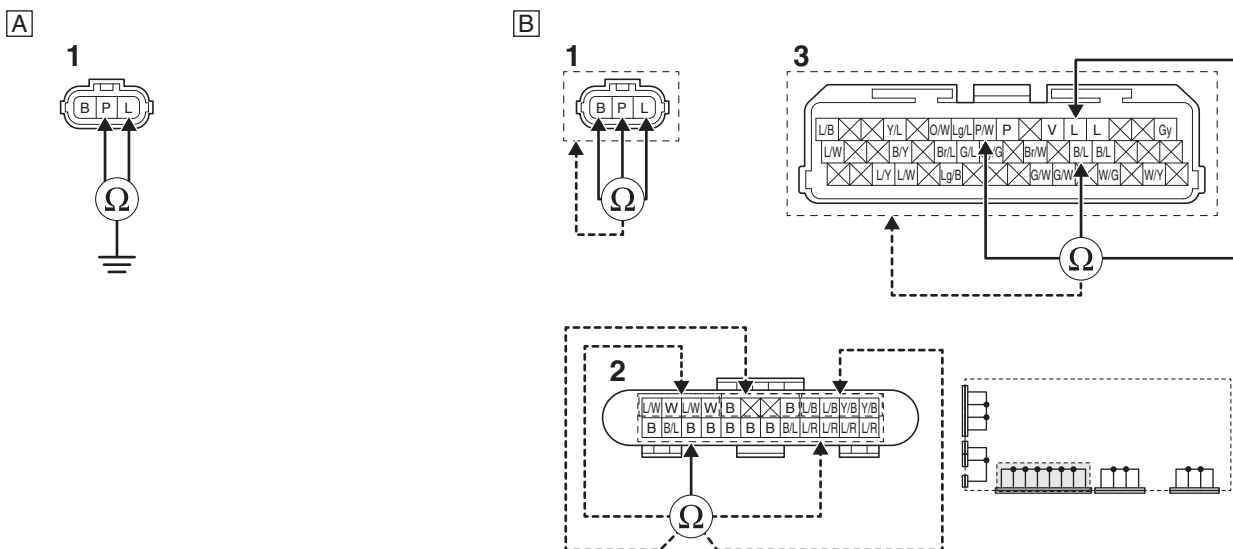
Disconnect the ECU related connectors before checking.
Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

Ground short circuit check "A"

Between intake air pressure sensor 2 coupler "1" and ground	[P1607] blue-ground [P1606, P1607] pink-ground
---	---

Lines short circuit check "B"

ECU coupler "3"	[P1607] blue-any other coupler terminal [P1607] black/blue-any other coupler terminal [P1606, P1607] pink-any other coupler terminal
Intake air pressure sensor 2 coupler "1"	[P1607] blue-any other coupler terminal [P1607] black-any other coupler terminal [P1606, P1607] pink-any other coupler terminal
Joint coupler "2"	[P1607] black/blue-any other coupler terminal [P1607] black-any other coupler terminal



Is resistance $\infty \Omega$?

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 2.

- Check for looseness or pinching.

Refer to "THROTTLE BODIES" on page 7-6.

Is check result OK?

YES

→ Go to step 5.

NO

- a. Reinstall or replace 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 7, and complete the service.

NO

→ Go to step 5.

5. Defective intake air pressure sensor 2.

- Execute the diagnostic mode. (Code 04)
- 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 2.
Refer to “THROTTLE BODIES” on page 7-6.
- 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 8-41.

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.

EAS20788

P1608

EAS33531

TROUBLESHOOTING**Item**

Intake air pressure sensor 2: signal out of range. Normal signal is not received from the intake air pressure sensor 2 circuit.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure**TIP**

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P1606, P1607

1. Connection of intake air pressure sensor 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 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 5, and complete the service.

NO

→ Go to step 2.

2. Defective intake air pressure sensor 2.

- Replace the intake air pressure sensor 2.
Refer to "THROTTLE BODIES" on page 7-6.
- 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 5, and complete the service.

NO

→ Go to step 3.

3. Defective wire harness.

- Replace the wire harness.
- 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 5, and complete the service.

NO

→ Go to step 4.

4. Malfunction in ECU.

- Replace the ECU, and complete the service.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

5. 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.

EAS20789

P1609

EAS33532

TROUBLESHOOTING

Item

Intake air pressure sensor 2: clogging of hose or sensor installation improperly. Stable pressure is not supplied.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P0122, P0123, P0222, P0223, P0335, P1606, P1607, P1608, P2135

1. Installed condition of intake air pressure sensor 2 hose.

- Check for detached, clogged, twisted or pinching.
Refer to “THROTTLE BODIES” on page 7-6.

Is check result OK?

YES

→ Go to step 2.

NO

- a. Repair or replace the intake air pressure sensor 2 hose.
Refer to “THROTTLE BODIES” on page 7-6.
- b. Start the engine and let it idle for approximately 5 seconds, and then check 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. Defective intake air pressure sensor 2.

- Execute the diagnostic mode. (Code 04)
- When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated.

At sea level	101 kPa (757.6 mmHg, 29.8 inHg)
1000 m (3300 ft) above sea level	Approx. 90 kPa (675.1 mmHg, 26.6 inHg)
2000 m (6700 ft) above sea level	Approx. 80 kPa (600.0 mmHg, 23.6 inHg)
3000 m (9800 ft) above sea level	Approx. 70 kPa (525.0 mmHg, 20.7 inHg)

- When engine is cranking: Make sure that the indication value changes.

Is check result OK?

YES

→ Go to step 3, and complete the service.

NO

- a. Replace the intake air pressure sensor.
Refer to “THROTTLE BODIES” on page 7-6
- b. Start the engine and let it idle for approximately 5 seconds with the throttle fully closed, and then check the DTC using the malfunction mode of the YDT.
- c. Confirm the “Recovered” condition, then go to step 3.

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.

EAS20623

P1806, P1807

EAS33103

TROUBLESHOOTING

Item

- [P1806] Shift sensor: open or short to ground circuit is detected. Normal signal is not received from the shift sensor to ECU.
- [P1807] Shift sensor: 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

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 condition of the auxiliary system warning.

Is the auxiliary system warning "OFF"?

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 condition of the auxiliary system warning.

Is the auxiliary system warning "OFF"?

YES

→ Go to step 7, and complete the service.

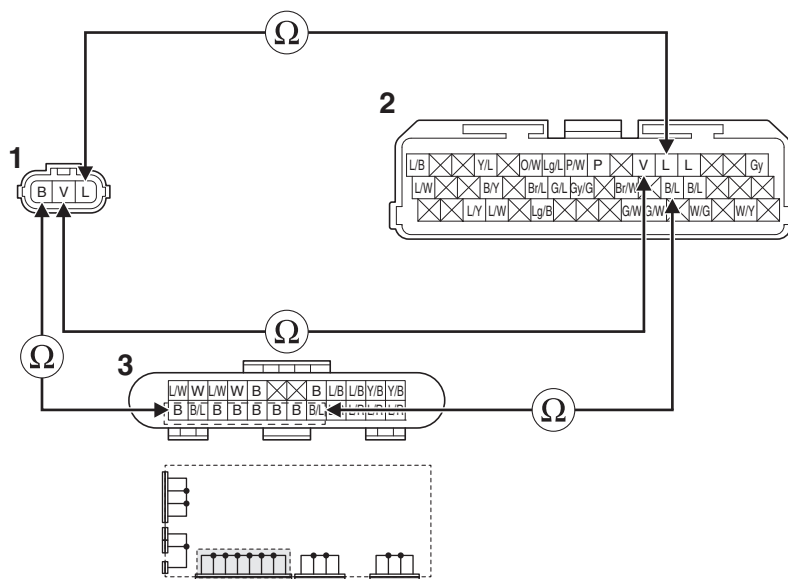
NO

→ Go to step 3.

3. Wire harness continuity

- Disconnect the shift sensor coupler “1” and ECU coupler “2”.
- Remove the joint coupler cap “3”.
- Open circuit check

Between shift sensor coupler “1” and ECU coupler “2”	blue–blue violet–violet
Between shift sensor coupler “1” and joint coupler “3”	black–black
Between joint coupler “3” and ECU coupler “2”	black/blue–black/blue



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then check the condition of the auxiliary system warning.

Is the auxiliary system warning “OFF”?

YES

→ Go to step 7, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

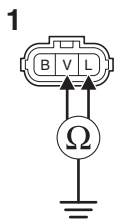
Ground short circuit check "A"

Between shift sensor coupler "1" and ground	violet-ground blue-ground
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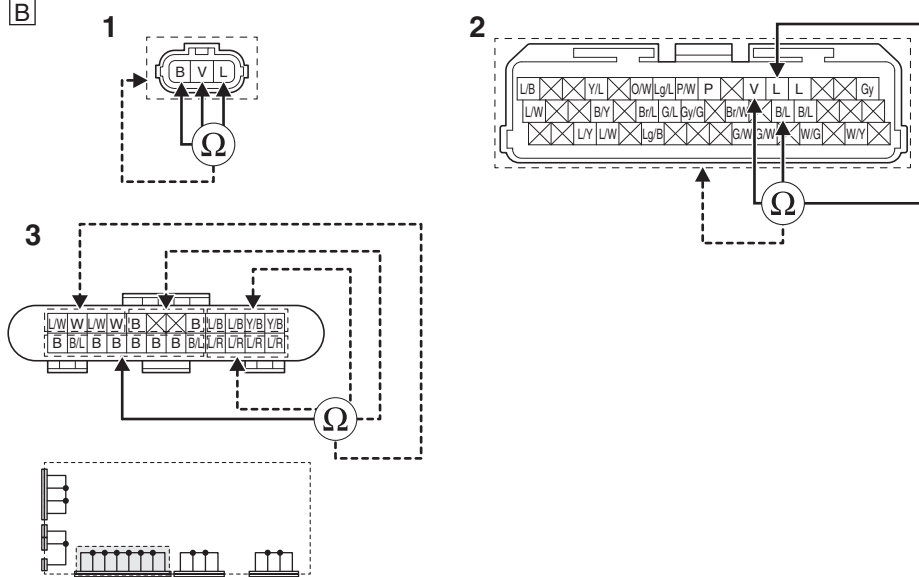
Lines short circuit check "B"

Shift sensor coupler "1"	black-any other coupler terminal violet-any other coupler terminal blue-any other coupler terminal
ECU coupler "2"	black/blue-any other coupler terminal violet-any other coupler terminal blue-any other coupler terminal
Joint coupler "3"	black/blue-any other coupler terminal black-any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 4.

NO

a. Replace the wire harness.

b. Turn the main switch to "ON", and then check the condition of the auxiliary system warning.

Is the auxiliary system warning "OFF"?

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.

Refer to "CHAIN DRIVE" on page 4-88.

Is check result OK?

YES

→ Go to step 5.

NO

- a. Reinstall or replace the sensor.
- b. Turn the main switch to “ON”, and then check the condition of the auxiliary system warning.

Is the auxiliary system warning “OFF”?

YES

→ Go to step 7, and complete the service.

NO

→ Go to step 5.

5. Defective shift sensor.

- 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 low side
Shift down weighting	Changes to the high side

Is check result OK?

YES

→ Go to step 6.

NO

- a. Replace the shift sensor.
Refer to “CHAIN DRIVE” on page 4-88.
- b. Turn the main switch to “ON”, and then check the condition of the auxiliary system warning.

Is the auxiliary system warning “OFF”?

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 8-41.

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)

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.

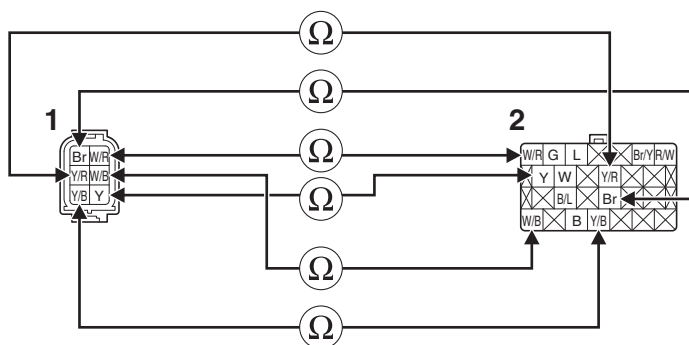
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the accelerator position sensor coupler “1” and ECU coupler “2”.
- 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, P2123, P2127, P2128, P2138] yellow–yellow [P2123, P2128] white/black–white/black [P2123, P2128] yellow/black–yellow/black [P2122, P2123, P2127, P2128, P2138] brown–brown
---	--



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

P2122, P2123, P2127, P2128, P2138

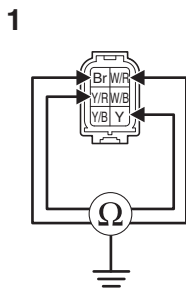
Ground short circuit check "A"

Between accelerator position sensor coupler "1" and ground	[P2122, P2123, P2127, P2128, P2138] brown-ground [P2122, P2127] white/red-ground [P2122, P2127] yellow/red-ground [P2122, P2123, P2127, P2128, P2138] yellow-ground
--	--

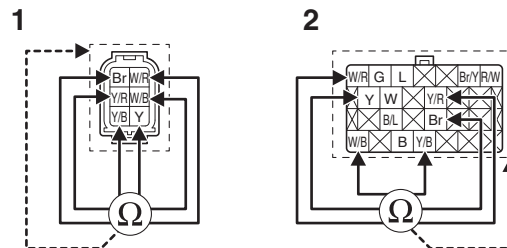
Lines short circuit check "B"

Accelerator position sensor coupler "1"	[P2122, P2123, P2127, P2128, P2138] brown-any other coupler terminal [P2122, P2127] white/red-any other coupler terminal [P2122, P2127] yellow/red-any other coupler terminal [P2122, P2123, P2127, P2128, P2138] yellow-any other coupler terminal [P2123, P2128] yellow/black-any other coupler terminal [P2123, P2128] white/black-any other coupler terminal
ECU coupler "2"	[P2122, P2123, P2127, P2128, P2138] brown-any other coupler terminal [P2122, P2127] white/red-any other coupler terminal [P2122, P2127] yellow/red-any other coupler terminal [P2122, P2123, P2127, P2128, P2138] yellow-any other coupler terminal [P2123, P2128] yellow/black-any other coupler terminal [P2123, P2128] white/black-any other coupler terminal

A



B



Is resistance $\infty \Omega$?

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.

- 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 4-60.

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 8-41.

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)

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

- Replace the throttle position sensor.
Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 7-12.
- 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

- Connect the coupler securely or replace the wire harness.
- 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 7-12.

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.
- Execute the diagnostic mode. (Code 01)

When the throttle valves are fully closed	11–21
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 7-12.
- 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.
- 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 7-12.
- 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 8-41.

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

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 9-37.

NO

→ Go to step 2.

2. Execute the diagnostic mode.
 - 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. Execute the diagnostic mode. (Code 16)
- c. 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. Execute the diagnostic mode. (Code 16)
- c. 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. Execute the diagnostic mode. (Code 16)
- c. 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.

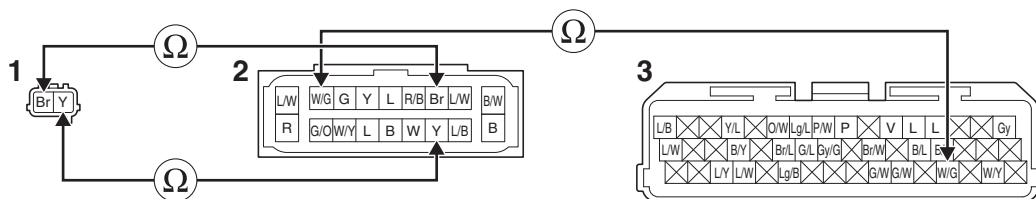
NO

→ 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”	brown–brown yellow–yellow
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. Execute the diagnostic mode. (Code 16)
- c. 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 9-4 and “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

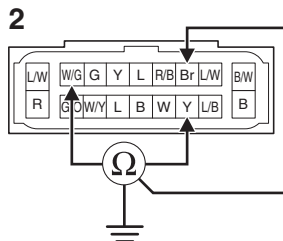
Ground short circuit check “A”

Between ABS ECU coupler “2” and ground	brown–ground yellow–ground white/green–ground
--	---

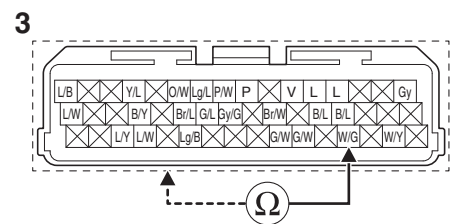
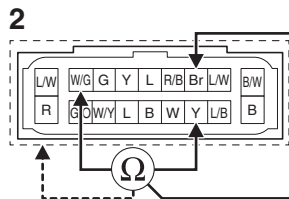
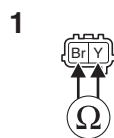
Lines short circuit check “B”

Front wheel sensor coupler “1”	brown–any other coupler terminal yellow–any other coupler terminal
ABS ECU coupler “2”	brown–any other coupler terminal yellow–any other coupler terminal white/green–any other coupler terminal
ECU coupler “3”	white/green–any other coupler terminal

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 7.

NO

- a. Replace the wire harness.
- b. Execute the diagnostic mode. (Code 16)
- c. 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 4-12.

Is check result OK?

YES

→ Go to step 8.

NO

- a. Reinstall or replace the front wheel sensor.
Refer to "FRONT WHEEL" on page 4-12.
- b. Execute the diagnostic mode. (Code 16)
- c. 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 8-41.
- 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 hydraulic unit assembly (ABS ECU).
Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.
- 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”.

EAS20775

U0125

EAS33127

TROUBLESHOOTING**Item**

Signals cannot be transmitted between the ECU and the IMU.

Fail-safe system

- Unable to start engine
- Able/Unable to drive vehicle (depending on the situation)

Procedure**TIP**

If more than one DTC is detected at the same time, perform troubleshooting of DTC listed below first.

- P1600

1. Connection of IMU 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.

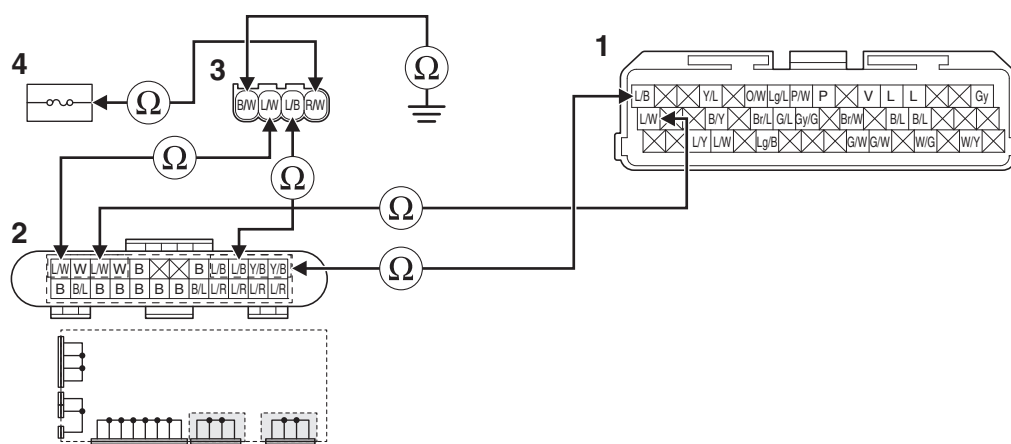
NO

→ Go to step 3.

3. Wire harness continuity.

- Disconnect the ECU coupler “1”, IMU coupler “3” and ignition fuse 2 “4”.
- Remove the joint coupler cap “2”.
- Open circuit check

Between ECU coupler “1” and joint coupler “2”	blue/white–blue/white blue/black–blue/black
Between joint coupler “2” and IMU coupler “3”	blue/white–blue/white blue/black–blue/black
Between IMU coupler “3” and ground	black/white–ground
Between ignition fuse 2 holder “4” and IMU coupler “3”	red/white–red/white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- 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 and IMU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between ECU coupler “1” and ground	blue/white–ground blue/black–ground
Between IMU coupler “3” and ground	blue/white–ground blue/black–ground red/white–ground

EAS20649

U0155 or Err

EAS33129

TROUBLESHOOTING

Item

Multi-function meter: signals cannot be transmitted between the ECU and the multi-function meter.

Fail-safe system

- Able to start engine
- Able to drive vehicle

Procedure

TIP

- “Err” is displayed on the clock display of the multi-function meter, but the MIL does not come on.
 - In the YDT, “U0155” is displayed.
-

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.

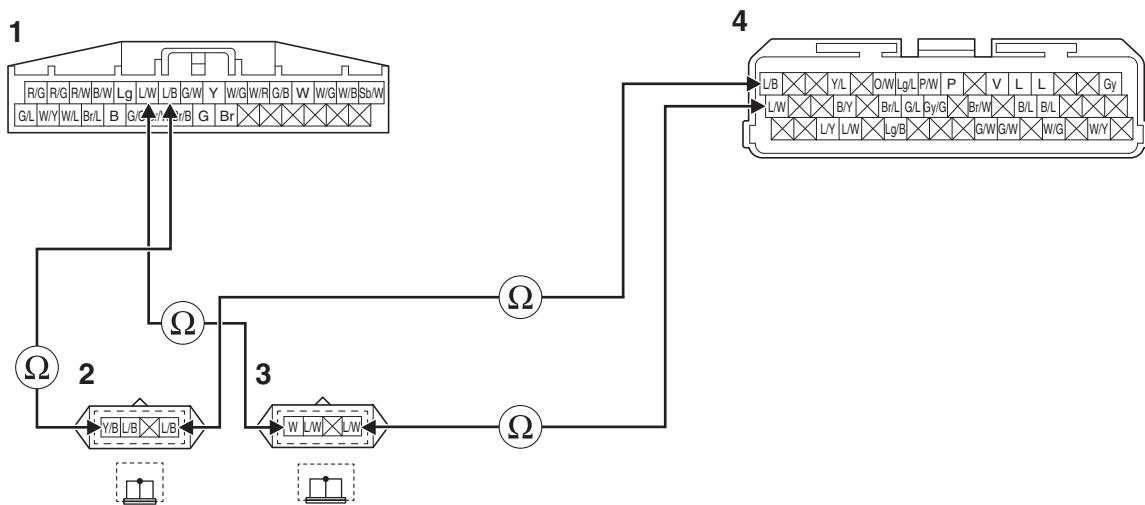
NO

→ 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 meter assembly coupler “1” and joint coupler “2”	blue/black–blue/black
Between meter assembly coupler “1” and joint coupler “3”	blue/white–blue/white
Between joint coupler “2” and ECU coupler “4”	blue/black–blue/black
Between joint coupler “3” and ECU coupler “4”	blue/white–blue/white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

- Replace the wire harness.
- Turn the main switch to “ON”, and then check the DTC using the malfunction mode of the YDT.

Is it in the “Recovered” condition?

YES

→ Go to step 6, and complete the service.

NO

→ Go to “Short circuit check”.

- Short circuit check

TIP

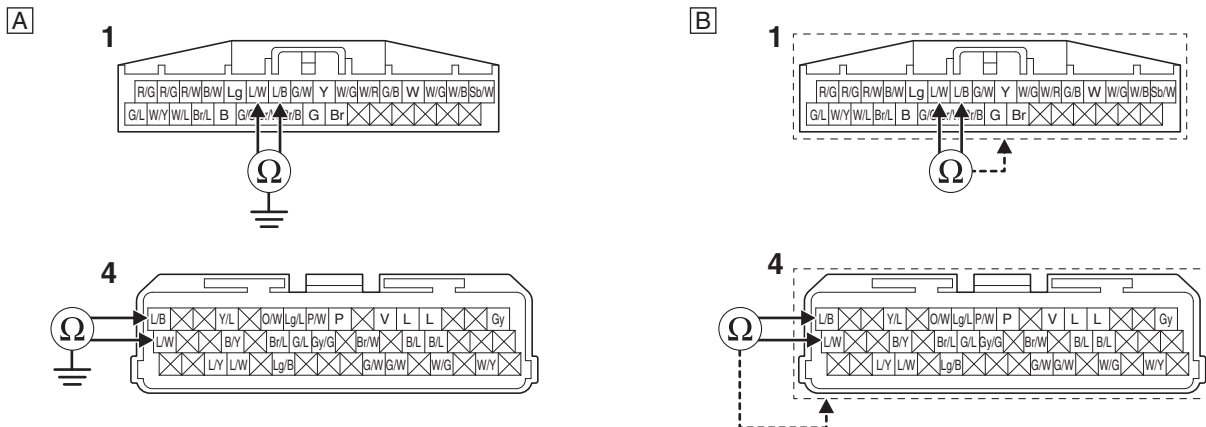
Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

Ground short circuit check “A”

Between meter assembly coupler “1” and ground	blue/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



Is resistance $\infty \Omega$?

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 (2)” on page 4-6.

- 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 8-41.
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.

EAS20680

51_IMMobilizer

EAS33309

TROUBLESHOOTING

Item

Code cannot be transmitted between the key and immobilizer unit.

Cause

- Radio wave interference caused by objects around the keys and antennas.
- Immobilizer unit malfunction.
- Key malfunction.

Procedure

TIP

When a system malfunction occurs, the immobilizer system indicator light will flash. The DTC can be identified by the flashing pattern. Refer to "HOW TO CHECK DTC" on page 9-23.

1. Keep magnets, metal objects, and other immobilizer system keys away from the keys and antennas.
 - Turn the main switch to "ON".

Is DTC displayed?

YES

→ Go to step 2.

NO

→ Service is completed.

2. Turn the main switch to "ON" with another key.

Is DTC displayed?

YES

→ Go to step 3.

NO

→ If the DTC is displayed due to a defective key, replace the key with a new one.

3. Replace the main switch/immobilizer unit, ECU and all key, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

EAS20679

52_IMMobilizer

EAS33308

TROUBLESHOOTING

Item

Code of immobilizer unit and key are not matched.

Cause

- Signal received from other transponder (failed to recognize code after ten consecutive attempts).
- Signal received from unregistered standard key.
- Immobilizer unit malfunction
- Key malfunction

Procedure

TIP

When a system malfunction occurs, the immobilizer system indicator light will flash. The DTC can be identified by the flashing pattern. Refer to "HOW TO CHECK DTC" on page 9-23.

1. Place the immobilizer unit at least 50 mm away from the transponder of other vehicles.
 - Turn the main switch to "ON".

Is DTC displayed?

YES

→ Go to step 2.

NO

→ Service is completed.

2. Register the standard key.
 - Turn the main switch to "ON".

Is DTC displayed?

YES

→ Go to step 3.

NO

→ Service is completed.

3. Turn the main switch to "ON" with another key.

Is DTC displayed?

YES

→ Go to step 4.

NO

→ If the DTC is displayed due to a defective key, replace the key with a new one.

4. Replace the main switch/immobilizer unit, ECU and all key, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

EAS20681

53_IMMobilizer

EAS33310

TROUBLESHOOTING**Item**

Code cannot be transmitted between the ECU and immobilizer unit.

Cause

- Disconnected lead/cable.
- Open or short circuit in wire harness between immobilizer unit and ECU.
- Immobilizer unit malfunction.
- ECU malfunction.

Procedure**TIP**

When a system malfunction occurs, the immobilizer system indicator light will flash. The DTC can be identified by the flashing pattern. Refer to "HOW TO CHECK DTC" on page 9-23.

1. Connection of immobilizer unit coupler and 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

→ Connect the coupler securely or replace the wire harness.

2. Turn the main switch to "ON".

Is DTC displayed?**YES**

→ Go to step 3.

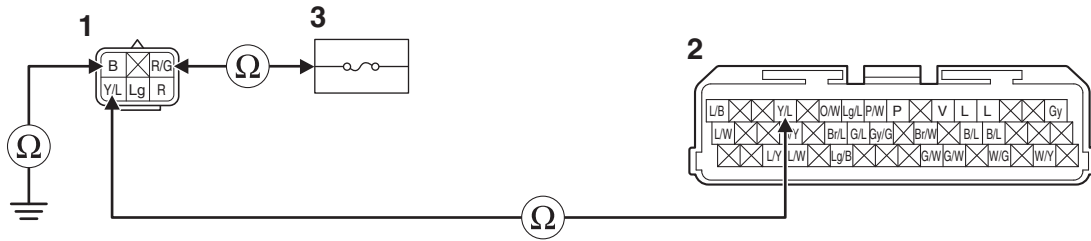
NO

→ Service is completed.

3. Wire harness continuity.

- Disconnect the immobilizer unit coupler "1", ECU coupler "2" and backup fuse 2 "3".
- Open circuit check

Between immobilizer unit coupler "1" and ECU coupler "2"	yellow/blue–yellow/blue
Between immobilizer unit coupler "1" and backup fuse 2 holder "3"	red/green–red/green
Between immobilizer unit coupler "1" and ground	black–ground



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

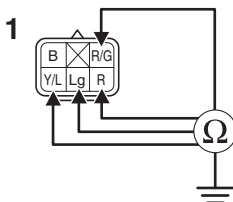
Ground short circuit check “A”

Between immobilizer unit coupler “1” and ground	yellow/blue–ground light green–any other coupler terminal red/green–any other coupler terminal red–any other coupler terminal
---	--

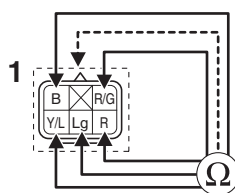
Lines short circuit check “B”

Immobilizer unit coupler “1”	yellow/blue–any other coupler terminal light green–any other coupler terminal red/green–any other coupler terminal red–any other coupler terminal black–any other coupler terminal
ECU coupler “2”	yellow/blue–any other coupler terminal

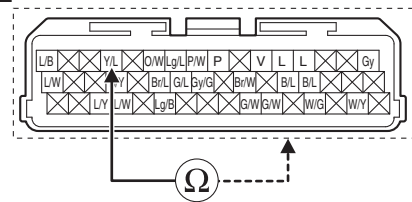
A



B



2



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Turn the main switch to "ON".

Is DTC displayed?

YES

→ Go to step 5.

NO

→ Service is completed.

5. Replace the main switch/immobilizer unit, ECU and all key, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

EAS20682

54_IMMobilizer

EAS33311

TROUBLESHOOTING

Item

Data of immobilizer and ECU are not matched.

Cause

- Disconnected lead/cable.
- Immobilizer unit malfunction.
- ECU failure. (The ECU or immobilizer unit was replaced with a used unit from another vehicle.)
- ECU malfunction.

Procedure

TIP

When a system malfunction occurs, the immobilizer system indicator light will flash. The DTC can be identified by the flashing pattern. Refer to "HOW TO CHECK DTC" on page 9-23.

1. Connection of Immobilizer unit coupler and 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

→ Connect the coupler securely or replace the wire harness.

2. Turn the main switch to "ON".

Is DTC displayed?

YES

→ Go to step 3.

NO

→ Service is completed.

3. Register the code re-registering key and standard keys.
 - Turn the main switch to "ON".

Is DTC displayed?

YES

→ Go to step 4.

NO

→ Service is completed.

4. Replace the main switch/immobilizer unit, ECU and all key, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

EAS20683

55_IMMobilizer

EAS33312

TROUBLESHOOTING

Item

Key code registration malfunction.

Cause

- Same standard key was attempted to be registered two consecutive times.

Procedure

TIP

When a system malfunction occurs, the immobilizer system indicator light will flash. The DTC can be identified by the flashing pattern. Refer to "HOW TO CHECK DTC" on page 9-23.

1. Register another standard key, and complete the service.

EAS20684

56_IMMobilizer

EAS33313

TROUBLESHOOTING**Item**

Unidentified code is received.

Cause

- Disconnected lead/cable.
- Open or short circuit in wire harness between immobilizer unit and ECU.
- Immobilizer unit malfunction.
- ECU malfunction.

Procedure**TIP**

When a system malfunction occurs, the immobilizer system indicator light will flash. The DTC can be identified by the flashing pattern. Refer to "HOW TO CHECK DTC" on page 9-23.

1. Connection of Immobilizer unit coupler and 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

→ Connect the coupler securely or replace the wire harness.

2. Turn the main switch to "ON".

Is DTC displayed?**YES**

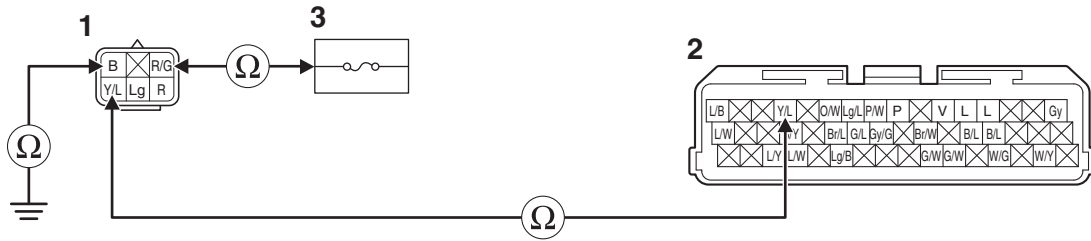
→ Go to step 3.

NO

→ Service is completed.

3. Wire harness continuity.
 - Disconnect the immobilizer unit coupler "1", ECU coupler "2" and backup fuse 2 "3".
 - Open circuit check

Between immobilizer unit coupler "1" and ECU coupler "2"	yellow/blue–yellow/blue
Between immobilizer unit coupler "1" and backup fuse 2 holder "3"	red/green–red/green
Between immobilizer unit coupler "1" and ground	black–ground



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ECU” on page 9-4.

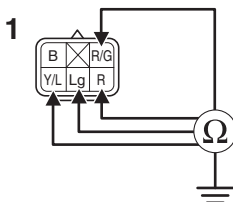
Ground short circuit check “A”

Between immobilizer unit coupler “1” and ground	yellow/blue–ground light green–any other coupler terminal red/green–any other coupler terminal red–any other coupler terminal
---	--

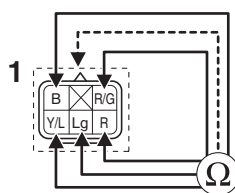
Lines short circuit check “B”

Immobilizer unit coupler “1”	yellow/blue–any other coupler terminal light green–any other coupler terminal red/green–any other coupler terminal red–any other coupler terminal black–any other coupler terminal
ECU coupler “2”	yellow/blue–any other coupler terminal

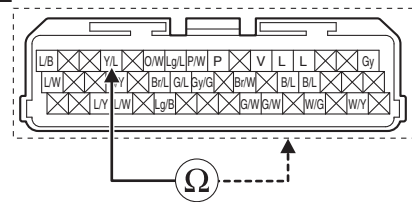
A



B



2



Is resistance ∞ Ω?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Turn the main switch to "ON".

Is DTC displayed?

YES

→ Go to step 5.

NO

→ Service is completed.

5. Replace the main switch/immobilizer unit, ECU and all key, and complete the service.
Refer to "REPLACING THE ECU (Engine Control Unit)" on page 8-41.

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 4-14.

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 4-16.

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 4-16.

Is check result OK?**YES**

→ Replace the hydraulic unit assembly (ABS ECU).

Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

NO

→ Repair or replace the wheel sensor.

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 4-22.

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 4-24.

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 4-24.

Is check result OK?**YES**→ Replace the hydraulic unit assembly (ABS ECU).
Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.**NO**

→ Repair or replace the wheel sensor.

EAS20687

13, 26_ABS

EAS33316

TROUBLESHOOTING**Item**

Front wheel sensor (abnormal pulse period)

Procedure**TIP**

- If the front brake ABS operates continuously for 20 seconds or more, DTC No. 26 will be recorded. If the front brake ABS operates continuously for 36 seconds or more, DTC 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 4-14.

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 FRONT WHEEL SENSOR AND SENSOR ROTOR" on page 4-16.

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 4-16.

Is check result OK?**YES**

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

NO

→ Repair or replace the wheel sensor.

EAS20688

14, 27_ABS

EAS33317

TROUBLESHOOTING**Item**

Rear wheel sensor (abnormal pulse period)

Procedure**TIP**

- If the rear brake ABS operates continuously for 20 seconds or more, DTC No. 27 will be recorded. If the rear brake ABS operates continuously for 36 seconds or more, DTC 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 4-22.

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 4-24.

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 4-24.

Is check result OK?**YES**

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

NO

→ Repair or replace the wheel sensor.

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 (ABS ECU)
 - 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.

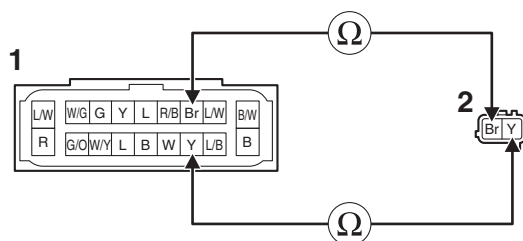
NO

→ 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"	brown–brown yellow–yellow
--	------------------------------

**Is resistance 0 Ω?****YES**

→ Go to "Short circuit check".

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ABS ECU" on page 9-4.

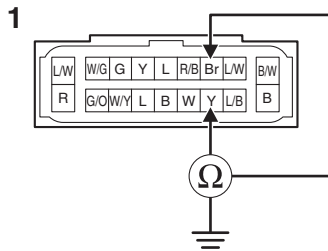
Ground short circuit check "A"

Between ABS ECU coupler "1" and ground	yellow-ground brown-ground
--	-------------------------------

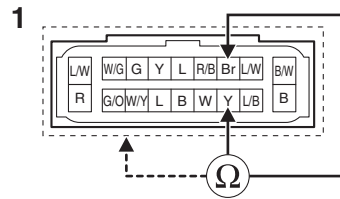
Lines short circuit check "B"

ABS ECU coupler "1"	yellow-any other coupler terminal brown-any other coupler terminal
---------------------	---

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 3.

NO

→ Replace the wire harness.

3. Defective front wheel sensor or hydraulic unit assembly (ABS ECU)

- If the above items were performed and no malfunctions were found, the front wheel sensor or hydraulic unit assembly (ABS ECU) is defective.
- Replace the front wheel sensor or hydraulic unit assembly (ABS ECU).
Refer to "FRONT WHEEL" on page 4-12 and "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

EAS20663

16_ABS

EAS33285

TROUBLESHOOTING**Item**

Rear wheel sensor (open or short circuit)

Procedure

- Defective coupler between the rear wheel sensor and the hydraulic unit assembly (ABS ECU)
 - Check the coupler for any pins that may be pulled out.
 - Check the locking condition of the coupler.

TIP

Turn the main switch to "OFF" before disconnecting or connecting a coupler.

Is check result OK?**YES**

→ Go to step 2.

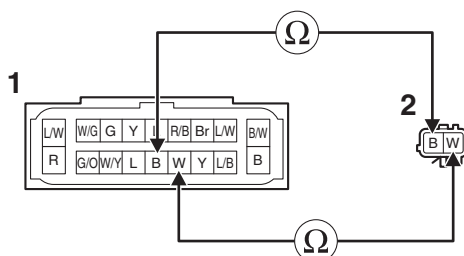
NO

→ If there is a malfunction, repair it and connect the coupler securely.

2. Wire harness continuity

- Disconnect the ABS ECU coupler "1" and rear wheel sensor coupler "2".
- Open circuit check

Between ABS ECU coupler "1" and rear wheel sensor coupler "2"	white–white black–black
---	----------------------------

**Is resistance 0 Ω?****YES**

→ Go to "Short circuit check".

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to "PARTS CONNECTED TO THE ABS ECU" on page 9-4.

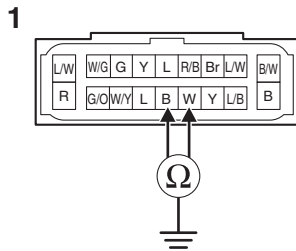
Ground short circuit check "A"

Between ABS ECU coupler "1" and ground	white-ground black-ground
--	------------------------------

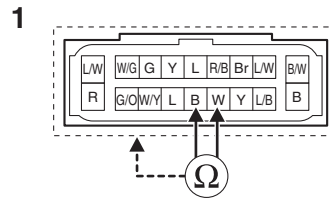
Lines short circuit check "B"

ABS ECU coupler "1"	white-any other coupler terminal black-any other coupler terminal
---------------------	--

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 3.

NO

→ Replace the wire harness.

3. Defective rear wheel sensor or hydraulic unit assembly (ABS ECU)

- If the above items were performed and no malfunctions were found, the rear wheel sensor or hydraulic unit assembly (ABS ECU) is defective.
- Replace the rear wheel sensor or hydraulic unit assembly (ABS ECU). Refer to "REAR WHEEL" on page 4-19 and "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

EAS20690

21_ABS

EAS33320

TROUBLESHOOTING

Item

Hydraulic unit assembly (ABS ECU) (defective solenoid drive circuit)

Procedure

1. Defective hydraulic unit assembly (ABS ECU)
 - Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20691

31_ABS

EAS33321

TROUBLESHOOTING

Hydraulic unit assembly (ABS ECU) (defective ABS solenoid power circuit)

Procedure

1. Blown ABS solenoid fuse
 - Check the ABS solenoid fuse.
 - Refer to “CHECKING THE FUSES” on page 8-40.

Is check result OK?**YES**

→ Go to step 2.

NO

→ Replace the fuse and check the wire harness.

2. Defective coupler between the battery and the hydraulic unit assembly (ABS ECU)
 - 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**

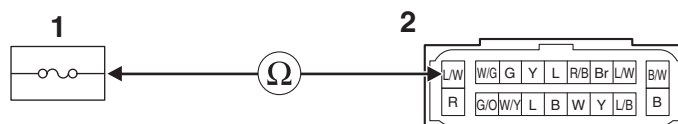
→ Go to step 3.

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 holder “1” and ABS ECU coupler “2”	blue/white–blue/white
--	-----------------------

**Is resistance 0 Ω?****YES**

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
 Refer to "PARTS CONNECTED TO THE ABS ECU" on page 9-4.

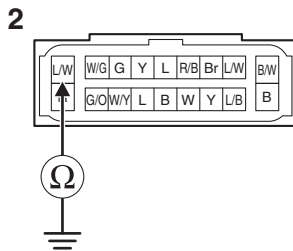
Ground short circuit check "A"

Between ABS ECU coupler "2" and ground	blue/white-ground
--	-------------------

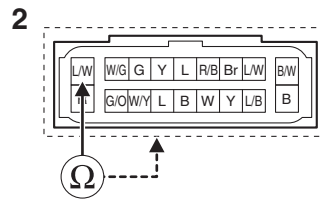
Lines short circuit check "B"

ABS ECU coupler "2"	blue/white-any other coupler terminal
---------------------	---------------------------------------

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Defective hydraulic unit assembly (ABS ECU)

- Replace the hydraulic unit assembly (ABS ECU).

Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

EAS20692

33_ABS

EAS33322

TROUBLESHOOTING**Item**

Hydraulic unit assembly (ABS ECU) (abnormal ABS motor power supply)

Procedure

1. Blown ABS motor fuse
 - Check the ABS motor fuse.
 - Refer to “CHECKING THE FUSES” on page 8-40.

Is check result OK?**YES**

→ Go to step 2.

NO

→ Replace the fuse and check the wire harness.

2. Defective coupler between the battery and the hydraulic unit assembly (ABS ECU)
 - 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**

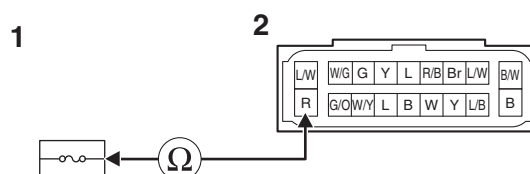
→ Go to step 3.

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 holder “1” and ABS ECU coupler “2”	red-red/white
---	---------------

**Is resistance 0 Ω?****YES**

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
 Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

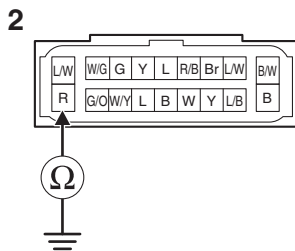
Ground short circuit check “A”

Between ABS ECU coupler “2” and ground	red-ground
--	------------

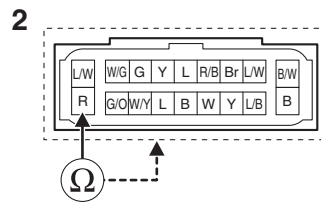
Lines short circuit check “B”

ABS ECU coupler “2”	red-any other coupler terminal
---------------------	--------------------------------

A



B



Is resistance $\infty \Omega$?

YES

→ Go to step 4.

NO

→ Replace the wire harness.

4. Defective hydraulic unit assembly (ABS ECU)

- Replace the hydraulic unit assembly (ABS ECU).
 Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20693

34_ABS

EAS33323

TROUBLESHOOTING

Item

Hydraulic unit assembly (ABS ECU) (short circuit in ABS motor power supply circuit)

Procedure

1. Defective hydraulic unit assembly (ABS ECU)
 - Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

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 4-16.

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 front wheel and make sure that it rotates smoothly.
Refer to “CHECKING THE FRONT WHEEL” on page 4-14 and “CHECKING THE FRONT BRAKE DISCS” on page 4-33.

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 4-33.

Is check result OK?**YES**

→ Go to step 4.

NO

→ Repair or replace the defective part.

4. Defective hydraulic unit assembly (ABS ECU)
 - Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

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 4-24.

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 rear wheel and make sure that it rotates smoothly.
Refer to “CHECKING THE REAR WHEEL” on page 4-22 and “CHECKING THE REAR BRAKE DISC” on page 4-46.

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 4-46.

Is check result OK?**YES**

→ Go to step 4.

NO

→ Repair or replace the defective part.

4. Defective hydraulic unit assembly (ABS ECU)

- Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20696

43, 45_ABS

EAS33330

TROUBLESHOOTING**Item**

Front wheel sensor (missing pulses)

Procedure**TIP**

After the DTC 45 is recorded, DTC 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 4-14.

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 4-16.

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 4-16.

Is check result OK?**YES**

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

NO

→ Repair or replace the wheel sensor.

EAS20697

44, 46_ABS

EAS33325

TROUBLESHOOTING**Item**

Rear wheel sensor (missing pulses)

Procedure**TIP**

After the DTC 46 is recorded, DTC 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 4-22.

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 4-24.

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 4-24.

Is check result OK?**YES**

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

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 8-41.
2. Disconnected battery terminal
 - Check the connection.

Is check result OK?**YES**

→ Go to step 3.

NO

→ Replace or reconnect the terminal.

3. Defective charging system
 - Check the charging system.
Refer to "CHARGING SYSTEM" on page 8-13.

Is check result OK?**YES**

→ Replace the hydraulic unit assembly (ABS ECU).
Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

NO

→ Confirm the cause of the problem and repair it, and check again.

EAS20699

53_ABS

EAS33327

TROUBLESHOOTING**Item**

Vehicle system power supply (voltage of ABS ECU power supply is low)

Procedure

1. Defective battery
 - Recharge or replace the battery, and check again.
Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-41.
2. Defective coupler between the battery and the hydraulic unit assembly (ABS ECU)
 - Check the coupler for any pins that may be pulled out.
 - Check the locking condition of the coupler.

TIP

Turn the main switch to “OFF” before disconnecting or connecting a coupler.

Is check result OK?**YES**

→ Go to step 3.

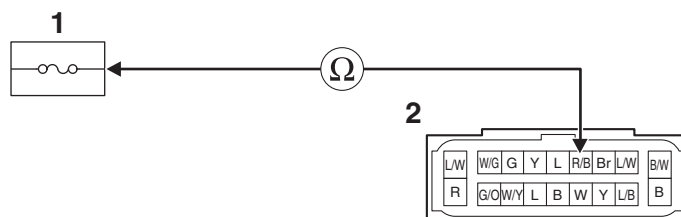
NO

→ If there is a malfunction, repair it and connect the coupler securely.

3. Wire harness continuity

- Disconnect the ABS ECU fuse “1” and ABS ECU coupler “2”.
- Open circuit check

Between ABS ECU fuse holder “1” and ABS ECU coupler “2”	red/black–red/black
---	---------------------

**Is resistance 0 Ω?****YES**

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

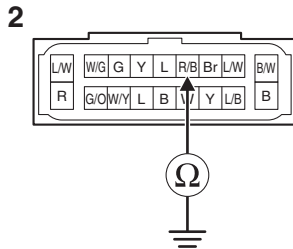
Ground short circuit check "A"

Between ABS ECU coupler "2" and ground	red/black-ground
--	------------------

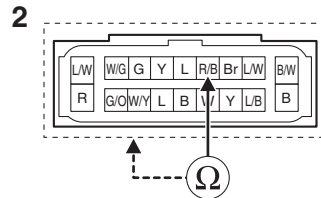
Lines short circuit check "B"

ABS ECU coupler "2"	red/black-any other coupler terminal
---------------------	--------------------------------------

A



B



Is resistance $\infty \Omega$?

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 4-52.

NO

→ Confirm the cause of the problem and repair it, and check again.

EAS20700

55_ABS

EAS33328

TROUBLESHOOTING

Item

Hydraulic unit assembly (ABS ECU) (defective ABS ECU)

Procedure

1. Defective hydraulic unit assembly (ABS ECU)
 - Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20701

56_ABS

EAS33329

TROUBLESHOOTING

Item

Hydraulic unit assembly (ABS ECU) (abnormal internal circuit)

Procedure

1. Defective hydraulic unit assembly (ABS ECU)
 - Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20666

57_ABS

EAS33292

TROUBLESHOOTING**Item**

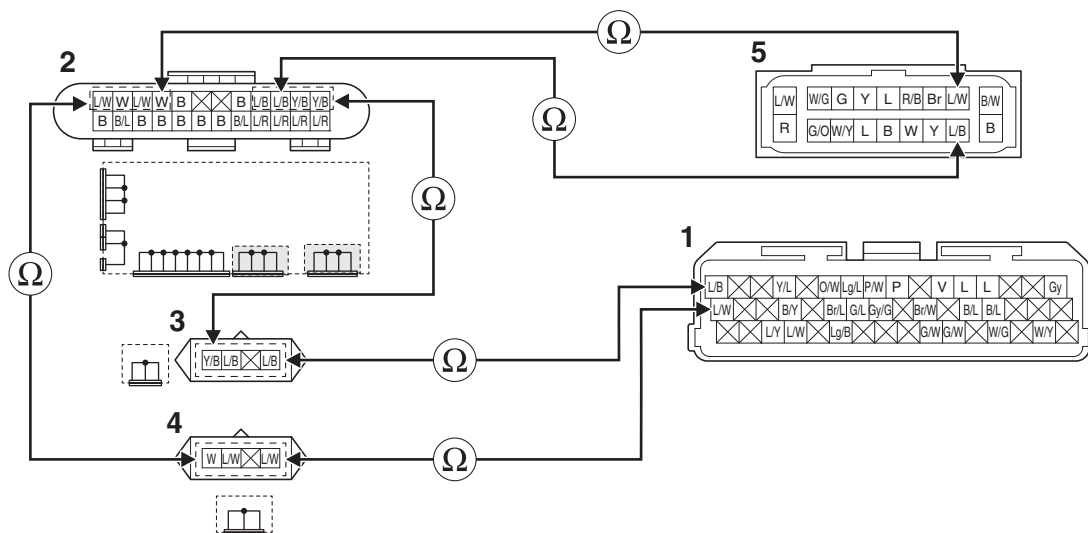
Vehicle CAN communication line or power source of vehicle system

Procedure

1. Wire harness continuity.

- Disconnect the ECU coupler "1" and ABS ECU coupler "5".
- Remove the joint coupler cap "2", joint coupler cap "3" and joint coupler cap "4".
- Open circuit check

Between ECM coupler "1" and joint coupler "3"	blue/black–blue/black
Between ECM coupler "1" and joint coupler "4"	blue/white–blue/white
Between joint coupler "2" and joint coupler "3"	yellow/black–yellow/black
Between joint coupler "2" and joint coupler "4"	white–white
Between joint coupler "2" and ABS ECU coupler "5"	blue/black–blue/black blue/white–blue/white

**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.

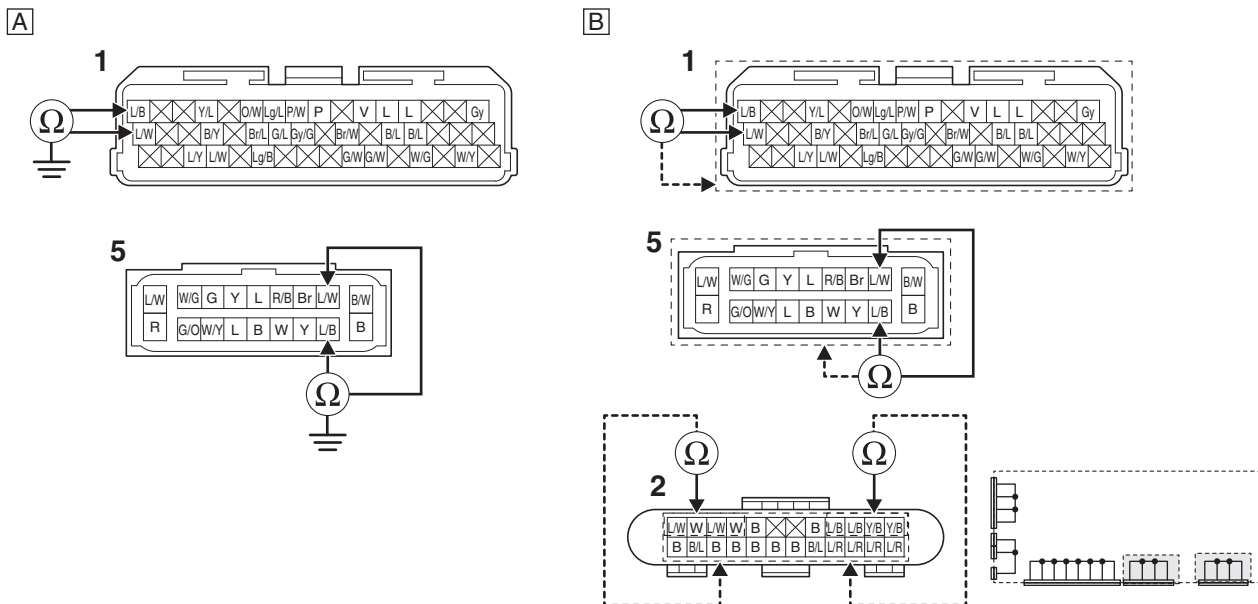
Refer to "PARTS CONNECTED TO THE ECU" on page 9-4 and "PARTS CONNECTED TO THE ABS ECU" on page 9-4.

Ground short circuit check "A"

Between ECU coupler "1" and ground	blue/white-ground blue/black-ground
Between ABS ECU coupler "5" and ground	blue/white-ground blue/black-ground

Lines short circuit check "B"

ECU coupler "1"	blue/white-any other coupler terminal blue/black-any other coupler terminal
Joint coupler "2"	yellow/black-any other coupler terminal white-any other coupler terminal
ABS ECU coupler "5"	blue/white-any other coupler terminal blue/black-any other coupler terminal



Is resistance $\infty \Omega$?

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 8-41.

3. Defective coupler between the battery and the ABS

- 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.

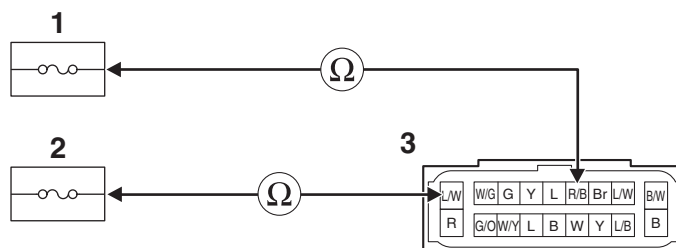
NO

→ If there is a malfunction, repair it and connect the coupler securely.

4. Wire harness continuity

- Disconnect the ABS ECU fuse “1”, ABS solenoid fuse “2” and ABS ECU coupler “3”.
- Open circuit check

Between ABS ECU fuse holder “1” and ABS ECU coupler “3”	red/black–red/black
Between ABS solenoid fuse holder “2” and ABS ECU coupler “3”	blue/white–blue/white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

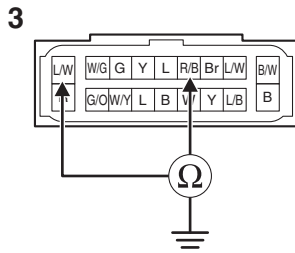
Ground short circuit check “A”

Between ABS ECU coupler “3” and ground	red/black–ground blue/white–ground
--	---------------------------------------

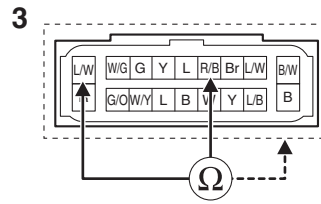
Lines short circuit check “B”

ABS ECU coupler “3”	red/black–any other coupler terminal blue/white–any other coupler terminal
---------------------	---

A



B



Is resistance $\infty \Omega$?

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 $\infty \Omega$?

YES

→ Replace the hydraulic unit assembly (ABS ECU).

Refer to "ABS (ANTI-LOCK BRAKE SYSTEM)" on page 4-52.

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 (ABS ECU)
 - Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20705

68_ABS

EAS33336

TROUBLESHOOTING**Item**

Defective hydraulic unit assembly (ABS ECU) (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 (ABS ECU)
 - Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20669

89_ABS

EAS33299

TRUBLESHOOTING

Item

CAN communication (between meter assembly and hydraulic unit assembly (ABS ECU))

Procedure

1. Defective coupler between the meter assembly and the hydraulic unit assembly (ABS ECU)
 - 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.

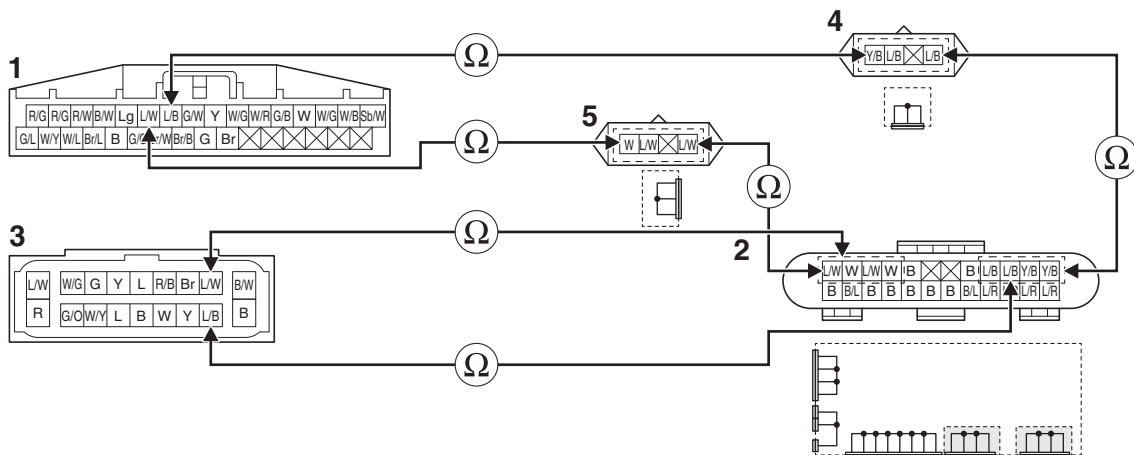
NO

→ If there is a malfunction, repair it and connect the coupler securely.

2. Wire harness continuity.

- Disconnect the meter assembly coupler “1” and ABS ECU coupler “3”.
- Remove the joint coupler cap “2”, joint coupler cap “4” and joint coupler cap “5”.
- Open circuit check

Between meter assembly coupler “1” and joint coupler “4”	blue/black–blue/black
Between meter assembly coupler “1” and joint coupler “5”	blue/white–blue/white
Between joint coupler “2” and joint coupler “4”	yellow/black–yellow/black
Between joint coupler “2” and joint coupler “5”	white–white
Between joint coupler “2” and ABS ECU coupler “3”	blue/black–blue/black blue/white–blue/white



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

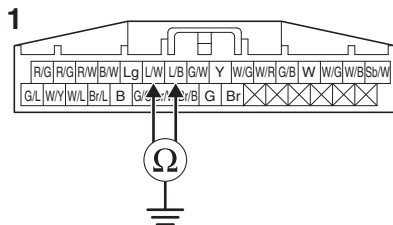
Ground short circuit check “A”

Between meter assembly coupler “1” and ground	blue/white–ground blue/black–ground
Between ABS ECU coupler “3” and ground	blue/white–ground blue/black–ground

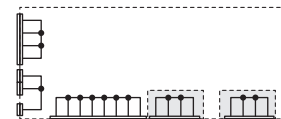
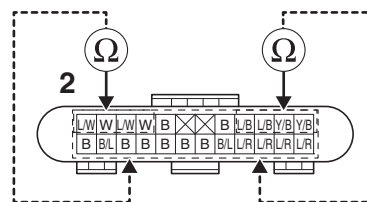
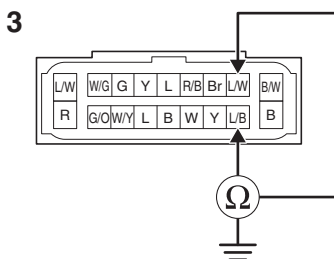
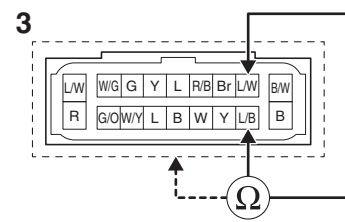
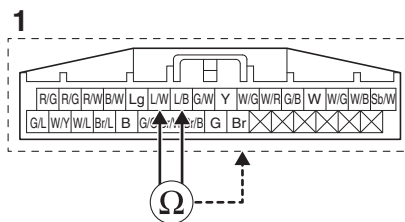
Lines short circuit check “B”

Meter assembly coupler “1”	blue/white–any other coupler terminal blue/black–any other coupler terminal
Joint coupler “2”	blue/white–any other coupler terminal blue/black–any other coupler terminal
ABS ECU coupler “3”	blue/white–any other coupler terminal blue/black–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 (ABS ECU)
 - Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20670

90_ABS

EAS33300

TROUBLESHOOTING

Item

CAN communication (between ECU and hydraulic unit assembly (ABS ECU))

Procedure

1. Defective coupler between the ECU and the hydraulic unit assembly (ABS ECU)
 - 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.

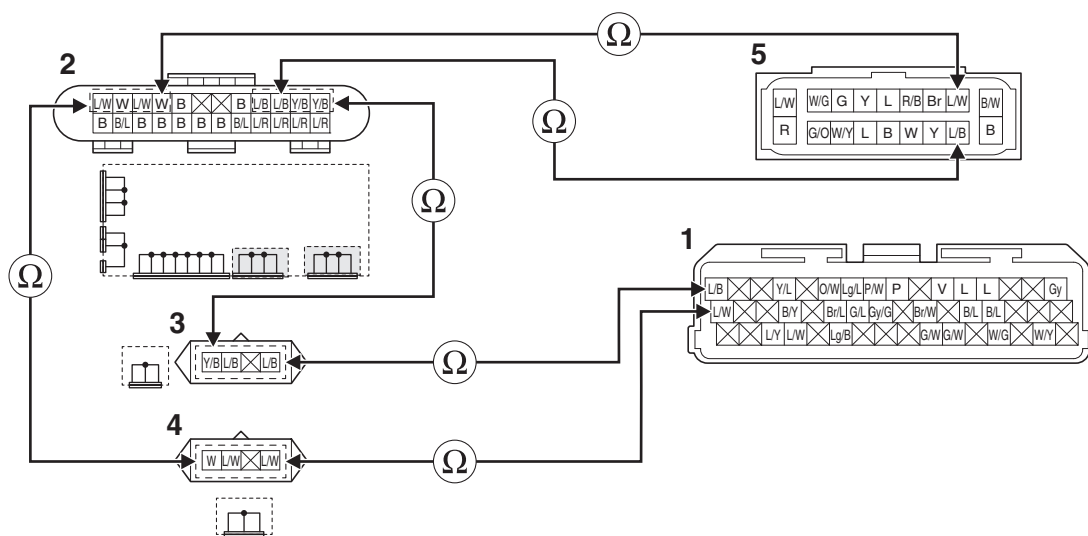
NO

→ 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 “5”.
- Remove the joint coupler cap “2”, joint coupler cap “3” and joint coupler cap “4”.
- Open circuit check

Between ECM coupler “1” and joint coupler “3”	blue/black–blue/black
Between ECM coupler “1” and joint coupler “4”	blue/white–blue/white
Between joint coupler “2” and joint coupler “3”	yellow/black–yellow/black
Between joint coupler “2” and joint coupler “4”	white–white
Between joint coupler “2” and ABS ECU coupler “5”	blue/black–blue/black blue/white–blue/white



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 9-4 and “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

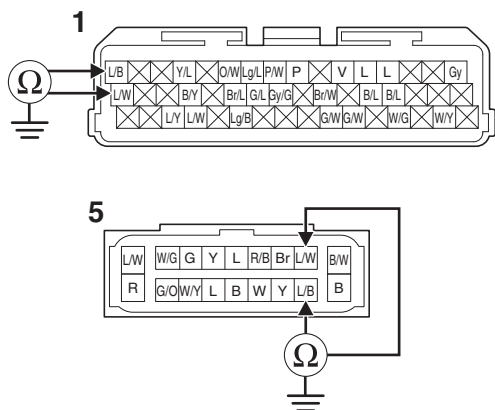
Ground short circuit check “A”

Between ECU coupler “1” and ground	blue/white–ground blue/black–ground
Between ABS ECU coupler “5” and ground	blue/white–ground blue/black–ground

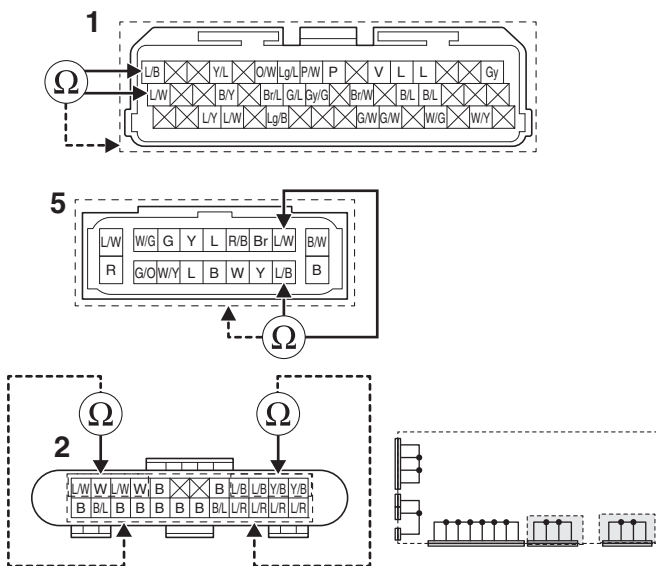
Lines short circuit check “B”

ECU coupler “1”	blue/white–any other coupler terminal blue/black–any other coupler terminal
Joint coupler “2”	yellow/black–any other coupler terminal white–any other coupler terminal
ABS ECU coupler “5”	blue/white–any other coupler terminal blue/black–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.

Refer to “REPLACING THE ECU (Engine Control Unit)” on page 8-41.

4. Defective hydraulic unit assembly (ABS ECU)

- Replace the hydraulic unit assembly (ABS ECU).

Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

EAS20671

91_ABS

EAS33301

TROUBLESHOOTING

Item

CAN communication (between IMU and hydraulic unit assembly (ABS ECU))

Procedure

- Defective coupler between the IMU and the hydraulic unit assembly (ABS ECU)
 - 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.

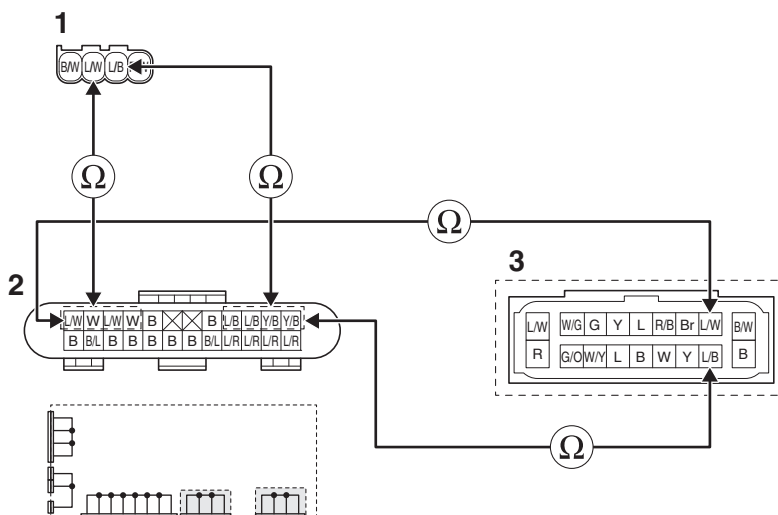
NO

→ If there is a malfunction, repair it and connect the coupler securely.

2. Wire harness continuity.

- Disconnect the IMU coupler "1" and ABS ECU coupler "3".
- Remove the joint coupler cap "2".
- Open circuit check

Between IMU coupler "1" and joint coupler "2"	blue/white–blue/white blue/black–blue/black
Between joint coupler "2" and ABS ECU coupler "3"	blue/white–blue/white blue/black–blue/black



Is resistance 0 Ω?

YES

→ Go to “Short circuit check”.

NO

→ Replace the wire harness.

- Short circuit check

TIP

Disconnect the ABS ECU related connectors before checking.
Refer to “PARTS CONNECTED TO THE ABS ECU” on page 9-4.

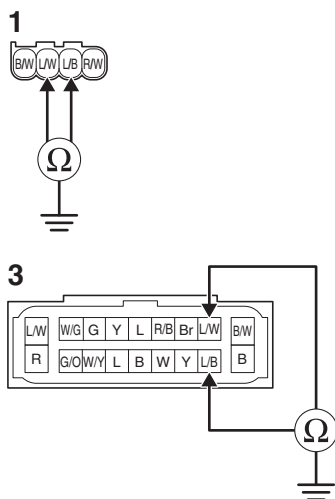
Ground short circuit check “A”

Between IMU coupler “1” and ground	blue/white–ground blue/black–ground
Between ABS ECU coupler “3” and ground	blue/white–ground blue/black–ground

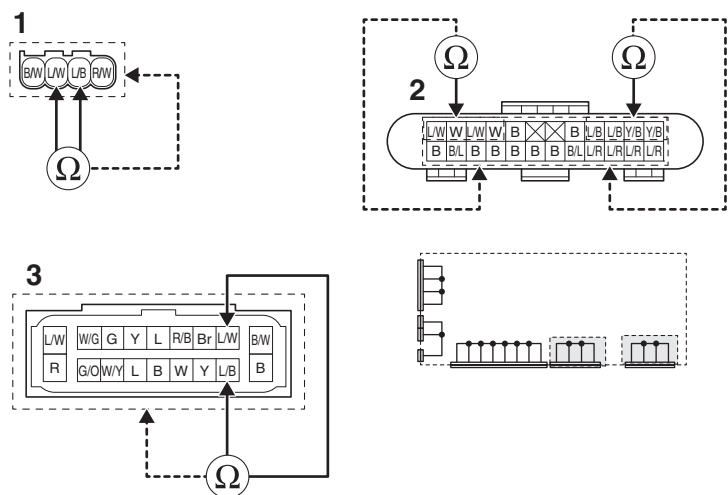
Lines short circuit check “B”

IMU coupler “1”	blue/white–any other coupler terminal blue/black–any other coupler terminal
Joint coupler “2”	blue/white–any other coupler terminal blue/black–any other coupler terminal
ABS ECU coupler “3”	blue/white–any other coupler terminal blue/black–any other coupler terminal

A



B



Is resistance ∞ Ω?

YES

→ Go to step 3.

NO

→ Replace the wire harness.

3. Defective IMU

- Replace the IMU, and check again.
Refer to “GENERAL CHASSIS (1)” on page 4-1.

4. Defective hydraulic unit assembly (ABS ECU)

- Replace the hydraulic unit assembly (ABS ECU).
Refer to “ABS (ANTI-LOCK BRAKE SYSTEM)” on page 4-52.

WIRING DIAGRAM

MTM890 2022

1. AC magneto
2. Rectifier/regulator
3. Fuse box
4. Main fuse
5. Main switch
6. Radiator fan motor relay
7. Fuel injection system fuse
8. Electronic throttle valve fuse
9. Backup fuse 2
10. Signaling system fuse
11. Ignition fuse 2
12. Ignition fuse
13. Headlight fuse
14. ABS ECU fuse
15. Terminal fuse 1
16. Brake light fuse
17. Cruise control fuse
18. ABS solenoid fuse
19. ABS motor fuse
20. Backup fuse
21. Radiator fan motor fuse
22. Auxiliary DC jack (OPTION)
23. Battery
24. Engine ground
25. Starter relay
26. Starter motor
27. Immobilizer unit
28. Clutch switch
29. Front brake light switch
30. Rear brake light switch
31. Handlebar switch (right)
32. Wheel switch
33. Stop/run/start switch
34. Accelerator position sensor
35. Relay unit
36. Starting circuit cut-off relay
37. Fuel pump relay
38. Neutral switch
39. Sidestand switch
40. Fuel pump
41. Fuel sender
42. Gear position sensor
43. Intake air pressure sensor 1
44. Intake air pressure sensor 2
45. O₂ sensor
46. Crankshaft position sensor
47. Coolant temperature sensor
48. Intake air temperature sensor
49. ECU (Engine Control Unit)
50. Ignition coil #1
51. Spark plug
52. Ignition coil #2
53. Ignition coil #3
54. Injector #1
55. Injector #2
56. Injector #3
57. Grip warmer (left) (OPTION)
58. Grip warmer (right) (OPTION)
59. Throttle position sensor
60. Throttle servo motor
61. Hydraulic unit assembly (ABS ECU)
62. Front wheel sensor
63. Rear wheel sensor
64. IMU (Inertial Measurement Unit)
65. Purge cut valve solenoid
66. Shift sensor
67. YDT coupler
68. Meter assembly
69. Multi-function meter
70. Neutral indicator light
71. Immobilizer system indicator light
72. Oil pressure and coolant temperature warning light
73. Auxiliary system warning light
74. Stability control indicator light
75. Fuel level warning light
76. MIL (Malfunction indicator light)
77. Left turn signal indicator light
78. Right turn signal indicator light
79. Cruise control system indicator light
80. Cruise control setting indicator light
81. Meter light
82. ABS warning light
83. High beam indicator light
84. Oil pressure switch
85. Rear turn signal light (left)
86. Rear turn signal light (right)
87. Front turn signal light (right)
88. Front turn signal light (left)
89. Headlight control unit
90. Headlight (low)
91. Headlight (high)
92. Auxiliary light
93. Tail/brake light
94. License plate light
95. Radiator fan motor
96. Brake light relay
97. Handlebar switch (left)
98. Cruise control power switch
99. Cruise control setting switch
100. Dimmer/pass switch
101. Horn switch
102. Mode switch
103. Select switch
104. Hazard switch
105. Turn signal switch
106. Horn

A. Wire harness

B. Sub-wire harness (oil pressure switch)

COLOR CODE

B	Black
Br	Brown
Dgy	Dark gray
G	Green
Gy	Gray
L	Blue
Lg	Light green
O	Orange
P	Pink
R	Red
Sb	Sky blue
V	Violet
W	White
Y	Yellow
B/L	Black/Blue
B/W	Black/White
B/Y	Black/Yellow
Br/B	Brown/Black
Br/L	Brown/Blue
Br/W	Brown/White
Br/Y	Brown/Yellow
G/B	Green/Black
G/L	Green/Blue
G/O	Green/Orange
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
Lg/B	Light green/Black
Lg/L	Light green/Blue
Lg/R	Light green/Red
O/G	Orange/Green
O/W	Orange/White
P/B	Pink/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
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/L	Yellow/Blue
Y/R	Yellow/Red
Y/W	Yellow/White



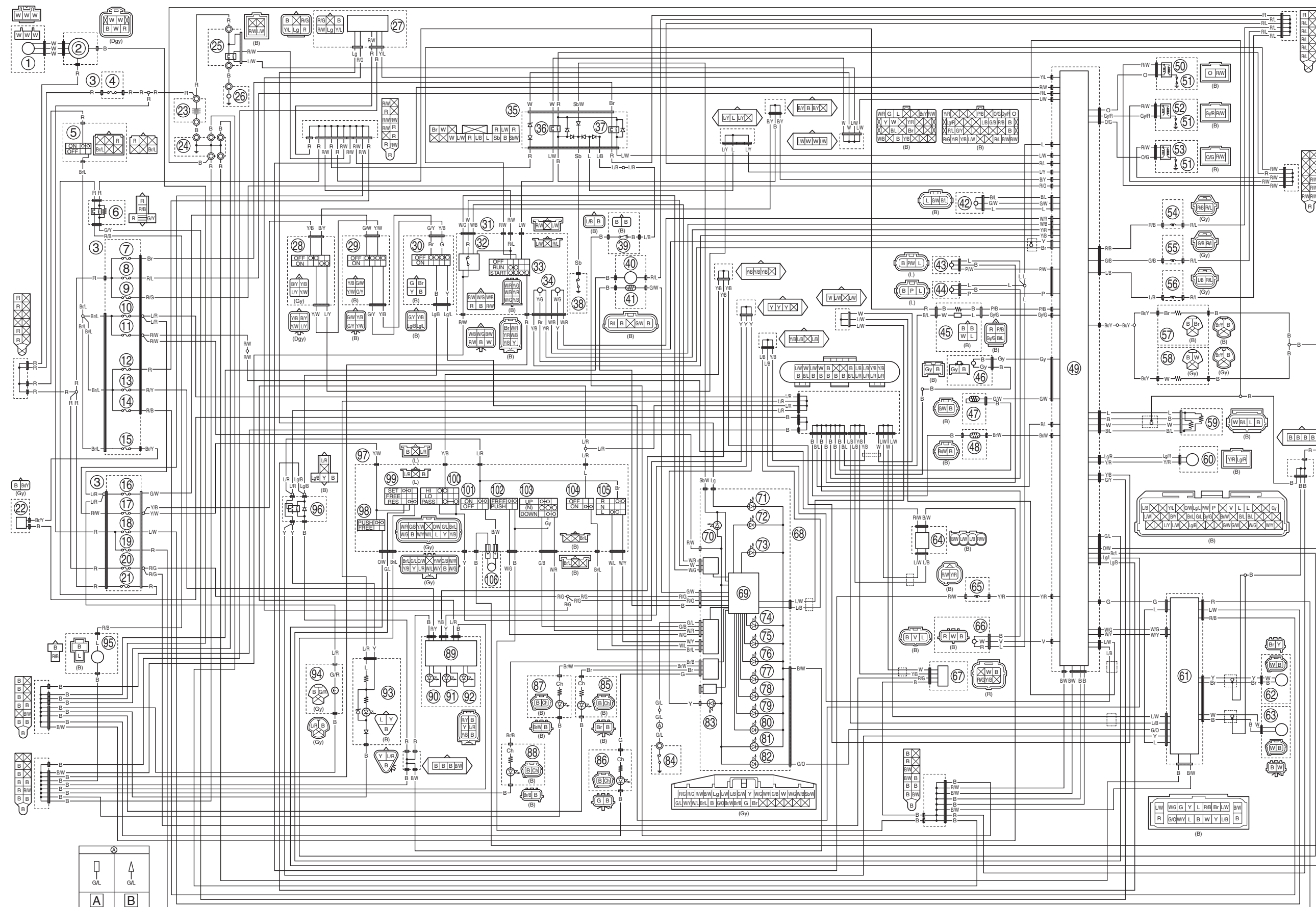
MTM890 2022
WIRING DIAGRAM

MTM890 2022
SCHEMA DE CÂBLAGE

MTM890 2022
SCHALTPLAN

MTM890 2022
SCHEMA ELETTRICO

MTM890 2022
DIAGRAMA ELÉCTRICO



MTM890 2022
WIRING DIAGRAM

MTM890 2022
SCHÉMA DE CÂBLAGE

MTM890 2022
SCHALTPLAN

MTM890 2022
SCHEMA ELETTRICO

MTM890 2022
DIAGRAMA ELÉCTRICO

