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SERVICE MANUAL

YZF-R125

R125



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EAS20060

**YZF-R125
SERVICE MANUAL
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EAS20070

NOTICE

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

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.

NOTE:

Designs and specifications are subject to change without notice.

EAS20080

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following.



The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Failure to follow WARNING instructions could result in severe injury or death to the vehicle operator, a bystander or a person checking or repairing the vehicle.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

NOTE:

A NOTE provides key information to make procedures easier or clearer.

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EAS20090

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.
- Jobs "7" requiring more information (such as special tools and technical data) are described sequentially.

1
↓
CLUTCH

SECTION 1
CLUTCH

Removing the clutch cover

3 →

4 →

5 →

6 →

Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 9-11.
	Right lower side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
1	Clutch cable	1	Disconnect.
2	Oil filter element cover	1	
3	Oil filter element	1	
4	Clutch cover	1	
5	Clutch cover gasket	1	
6	Dowel pin	2	
7	Oil seal	1	
			For installation, reverse the removal procedure.

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CLUTCH

REMOVING THE CLUTCH

1. Straighten the lock washer tab.
2. Loosen:
 - Clutch boss nut "1"

NOTE:
While holding the clutch boss "2" with the universal clutch holder "3", loosen the clutch boss nut.

Universal clutch holder
90890-04086
YM-91042

LABORING
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.

NOTE:
Measure the friction plate at four places.

Friction plate 1 thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.110 in)

Friction plate 2 thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.1102 in)

Friction plate 3 thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.1102 in)

A. Friction plate 1
B. Friction plate 2
C. Friction plate 3 (Green)
a. Green paint

LABORING
CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

1. Check:
 - Clutch plate
 - Damage → Replace the clutch plates as a set.
2. Measure:
 - Clutch plate warpage (with a surface plate and thickness gauge "1")
 - Out of specification → Replace the clutch plates as a set.

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

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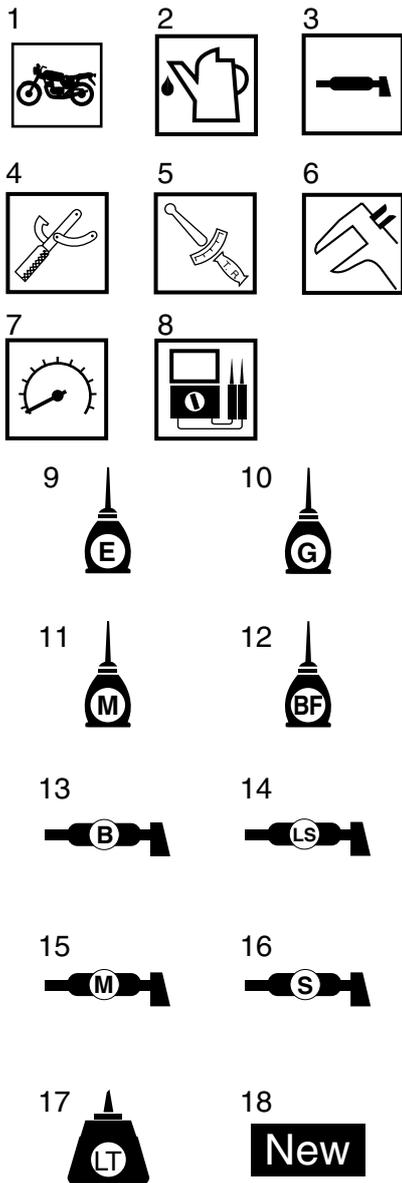
EAS20100

SYMBOLS

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

NOTE:

The following symbols are not relevant to every vehicle.



1. Serviceable with engine mounted
2. Filling fluid
3. Lubricant
4. Special tool
5. Tightening torque
6. Wear limit, clearance
7. Engine speed
8. Electrical data
9. Engine oil
10. Gear oil
11. Molybdenum disulfide oil
12. Brake fluid
13. Wheel bearing grease
14. Lithium-soap-based grease
15. Molybdenum disulfide grease
16. Silicone grease
17. Apply locking agent (LOCTITE®).
18. Replace the part with a new one.

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GENERAL INFORMATION

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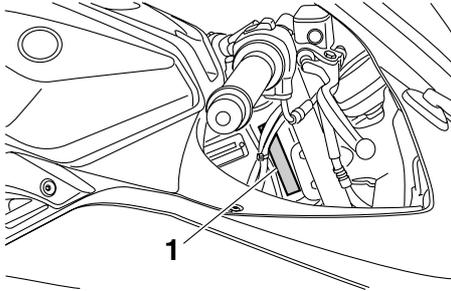
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IDENTIFICATION

EAS20140

VEHICLE IDENTIFICATION NUMBER

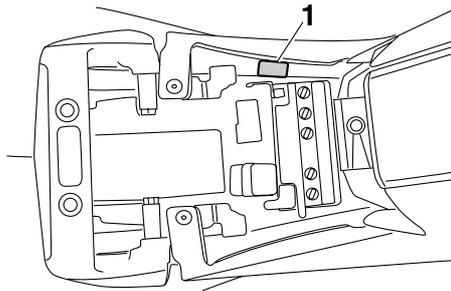
The vehicle identification number "1" is stamped into the right side of the steering head pipe.



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MODEL LABEL

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



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FEATURES

EAS5D71022

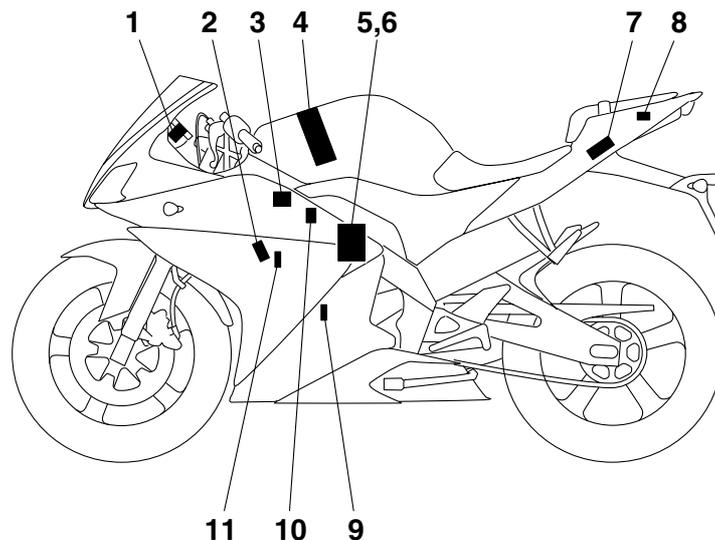
OUTLINE OF THE FI SYSTEM

The main function of a fuel supply system is to provide fuel to the combustion chamber at the optimum air-fuel ratio in accordance with the engine operating conditions and the atmospheric temperature. In the conventional carburetor system, the air-fuel ratio of the mixture that is supplied to the combustion chamber is created by the volume of the intake air and the fuel that is metered by the jet used in the respective carburetor.

Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operating under a heavy load. Carburetors that meter the fuel through the use of jets have been provided with various auxiliary devices, so that an optimum air-fuel ratio can be achieved to accommodate the constant changes in the operating conditions of the engine.

As the requirements for the engine to deliver more performance and cleaner exhaust gases increase, it becomes necessary to control the air-fuel ratio in a more precise and finely tuned manner. To accommodate this need, this model has adopted an electronically controlled fuel injection (FI) system, in place of the conventional carburetor system. This system can achieve an optimum air-fuel ratio required by the engine at all times by using a microprocessor that regulates the fuel injection volume according to the engine operating conditions detected by various sensors.

The adoption of the FI system has resulted in a highly precise fuel supply, improved engine response, better fuel economy, and reduced exhaust emissions.



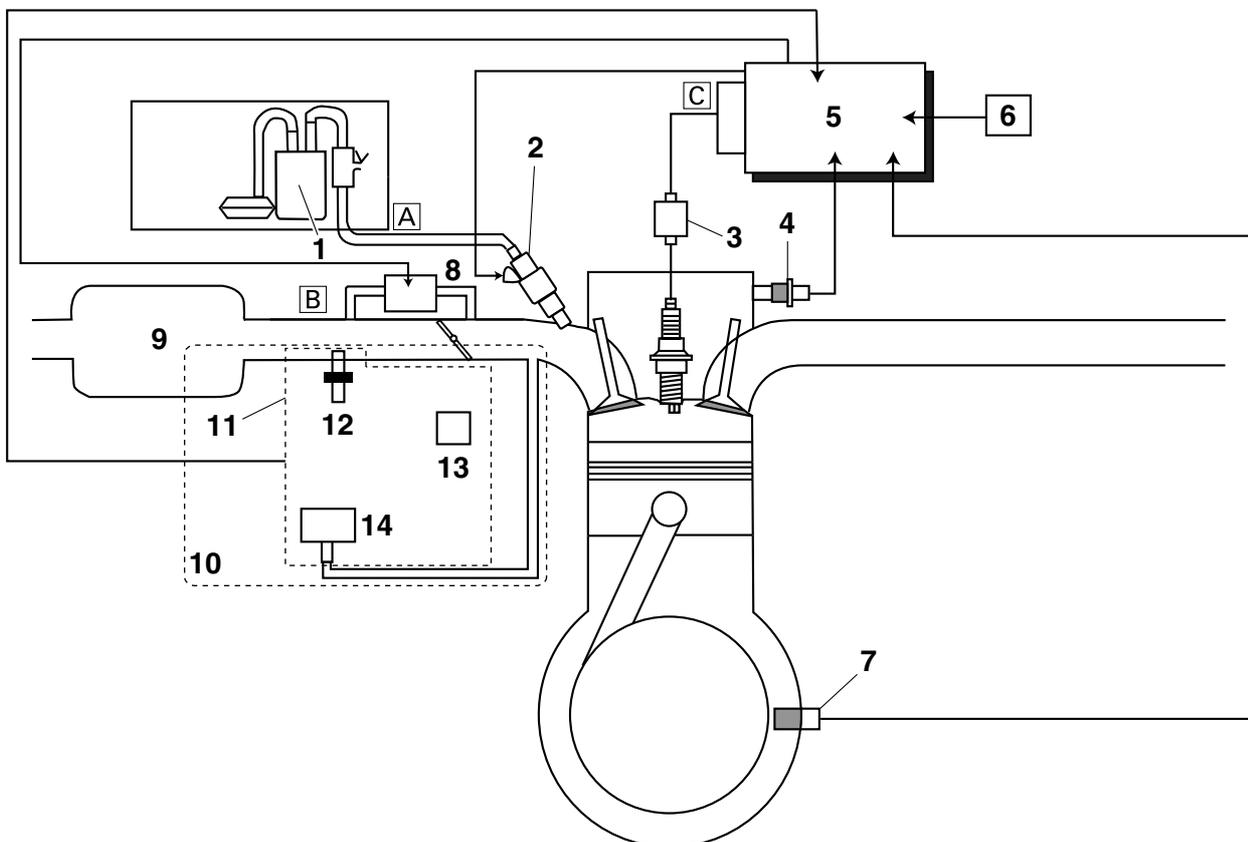
1. Engine trouble warning light
2. Spark plug
3. Ignition coil
4. Fuel pump
5. FID (fast idle solenoid)
6. Throttle body sensor assembly (consisting of throttle position sensor, intake air pressure sensor, intake air temperature sensor)
7. ECU (engine control unit)
8. Lean angle sensor
9. Crankshaft position sensor
10. Fuel injector
11. Coolant temperature sensor

EAS5D71023

FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the fuel injector at only 250 kPa (2.50 kg/cm², 36.3 psi). Accordingly, when the energizing signal from the ECU energizes the fuel injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remains open. Therefore, the longer the length of time the fuel injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the fuel injector is energized (injection duration), the lesser the volume of fuel that is supplied.

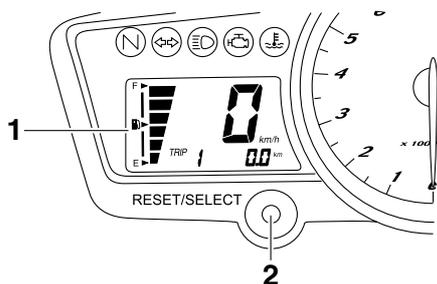
The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, crankshaft position sensor, intake air pressure sensor, intake air temperature sensor, lean angle sensor and coolant temperature sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions.



- | | |
|-------------------------------|-----------------------------------|
| 1. Fuel pump | 11. Throttle body sensor assembly |
| 2. Fuel injector | 12. Intake air temperature sensor |
| 3. Ignition coil | 13. Throttle position sensor |
| 4. Coolant temperature sensor | 14. Intake air pressure sensor |
| 5. ECU (engine control unit) | |
| 6. Lean angle sensor | A. Fuel system |
| 7. Crankshaft position sensor | B. Air system |
| 8. FID (fast idle solenoid) | C. Control system |
| 9. Air filter case | |
| 10. Throttle body | |

EAS5D71046

MULTI-FUNCTION DISPLAY



1. Multi-function display
2. "RESET/SELECT" button

The multi-function display is equipped with the following:

- a speedometer (which shows the riding speed)
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled since the fuel level warning light came on)
- a fuel meter

NOTE:

- Be sure to turn the key to "ON" before using the "RESET/ SELECT" button.
- For the U.K. only: To switch the speedometer and odometer/tripmeter displays between kilometers and miles, press the "RESET/SELECT" button for at least eight seconds.

Odometer and tripmeter modes

A brief push (less than one second) on the "RESET/SELECT" button switches the display between the odometer mode "ODO" and the tripmeter modes "TRIP 1" and "TRIP 2" in the following order:

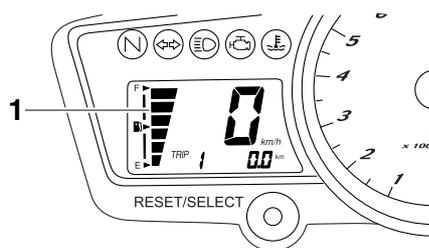
ODO → TRIP 1 → TRIP 2 → ODO

When approximately 1.6 L (0.42 US gal) (0.35 Imp.gal) of fuel remains in the fuel tank, the odometer display will automatically change to the fuel reserve tripmeter mode "F-TRIP" and start counting the distance traveled from that point, and the last segment of the fuel meter will start flashing. In that case, pushing the "RESET/SELECT" button switches the display between the various tripmeter and odometer modes in the following order:

F-TRIP → TRIP 1 → TRIP 2 → ODO → F-TRIP

To reset a tripmeter, select it by pushing the "RESET/SELECT" button briefly (less than one second), and then push the button for at least three seconds while the selected tripmeter is flashing. If you do not reset the fuel reserve tripmeter manually, it will reset itself automatically and the display will return to the prior mode after refueling and traveling 5 km (3 mi).

Fuel meter



1. Fuel meter

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

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IMPORTANT INFORMATION

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PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.



2. Use only the proper tools and cleaning equipment.

Refer to "SPECIAL TOOLS" on page 1-8.

3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.



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

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REPLACEMENT PARTS

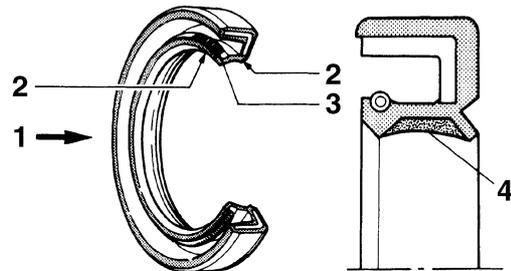
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS20210

GASKETS, OIL SEALS AND O-RINGS

1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.

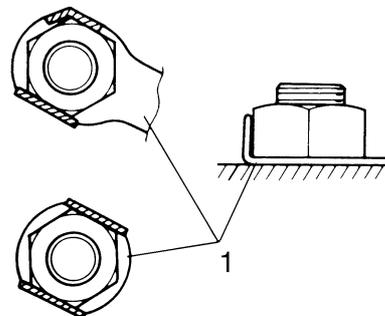


1. Oil
2. Lip
3. Spring
4. Grease

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LOCK WASHERS/PLATES AND COTTER PINS

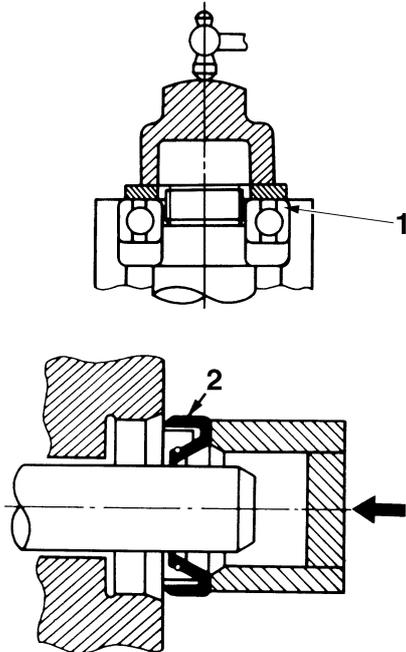
After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS20230

BEARINGS AND OIL SEALS

Install bearings "1" and oil seals "2" so that the manufacturer's marks or numbers are visible. When installing oil seals "1", lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.



ECA13300

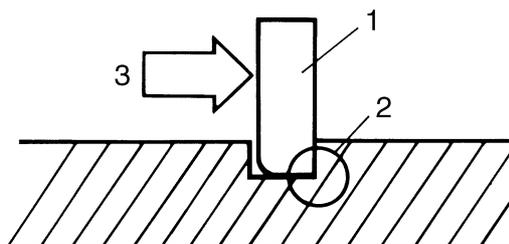
CAUTION:

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

EAS20240

CIRCLIPS

Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip "1", make sure the sharp-edged corner "2" is positioned opposite the thrust "3" that the circlip receives.



EAS20250

CHECKING THE CONNECTIONS

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

1. Disconnect:

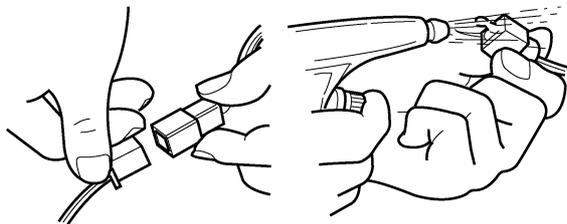
- Lead
- Coupler
- Connector

2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



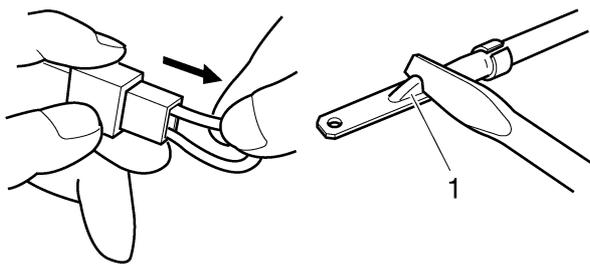
3. Check:

- All connections

Loose connection → Connect properly.

NOTE:

If the pin "1" on the terminal is flattened, bend it up.



4. Connect:

- Lead
- Coupler
- Connector

NOTE:

Make sure all connections are tight.

5. Check:

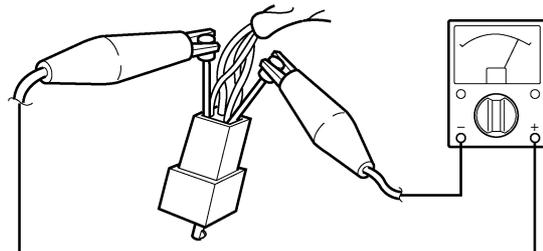
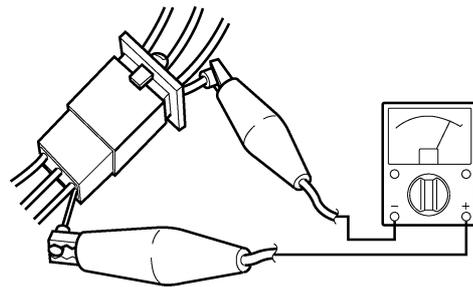
- Continuity
(with the pocket tester)



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

NOTE:

- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.



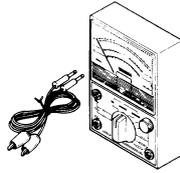
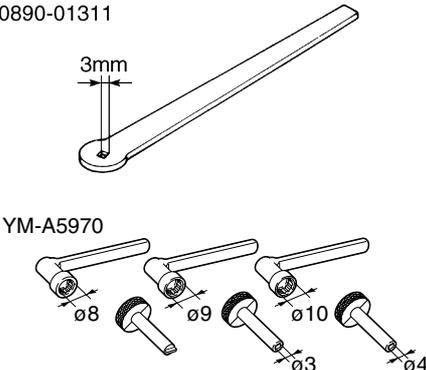
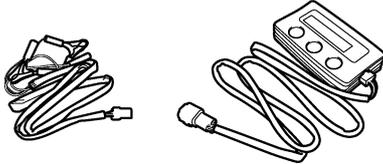
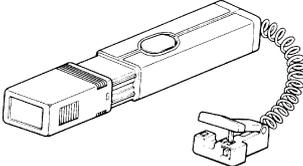
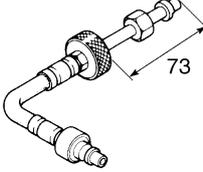
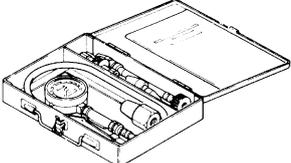
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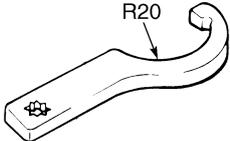
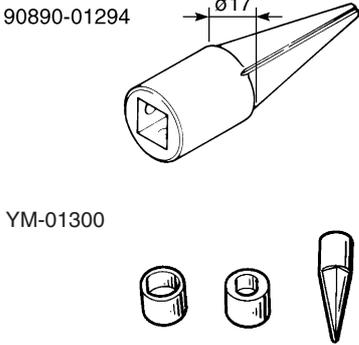
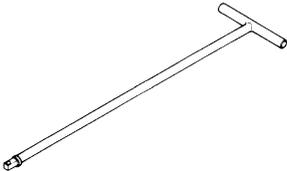
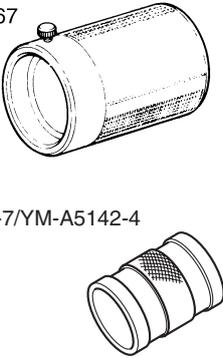
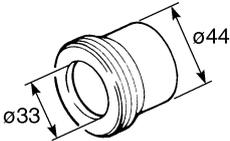
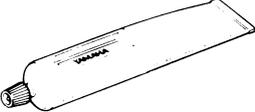
SPECIAL TOOLS

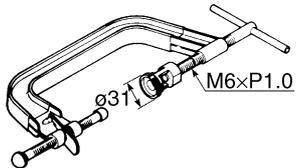
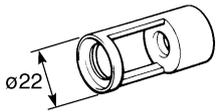
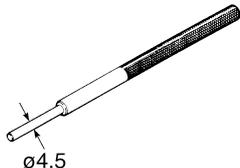
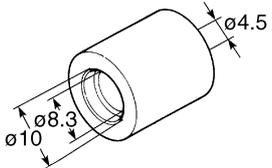
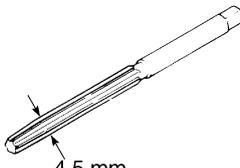
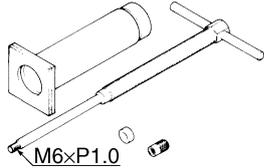
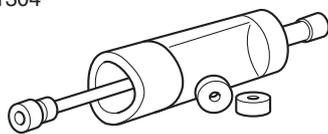
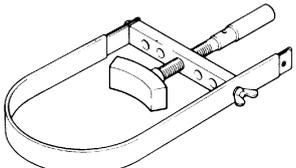
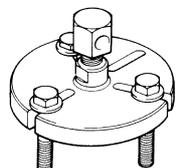
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

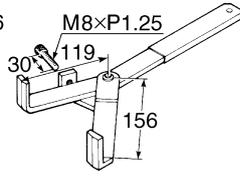
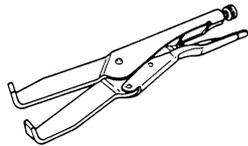
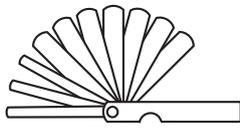
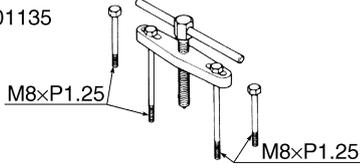
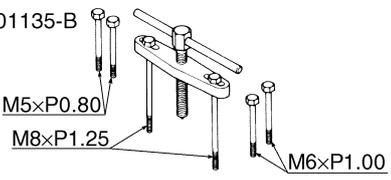
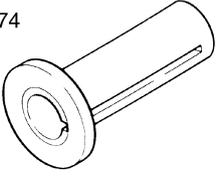
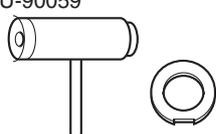
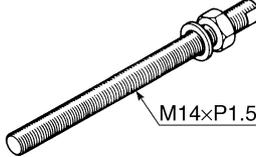
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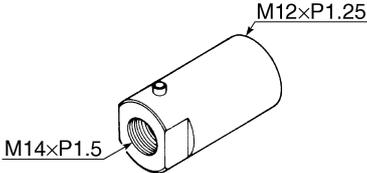
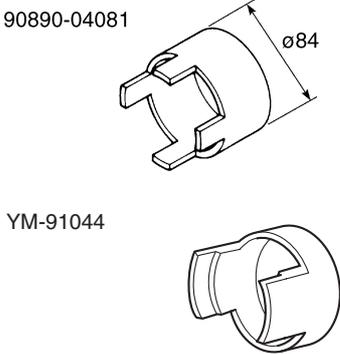
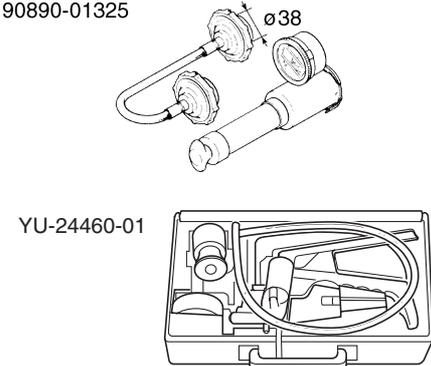
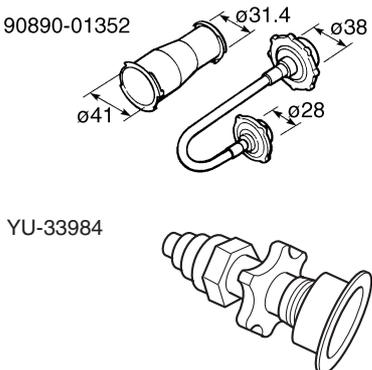
- For U.S.A. and Canada, use part number starting with "YM-", "YU-", or "ACC-".
- For others, use part number starting with "90890-".

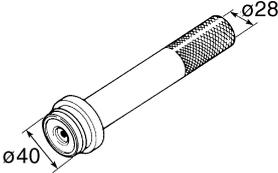
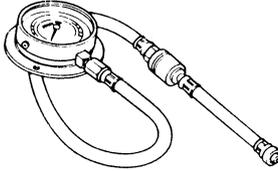
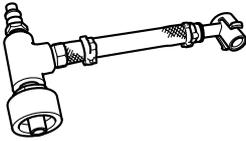
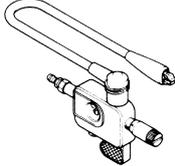
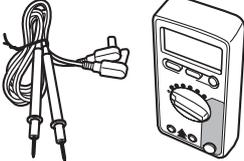
Tool name/Tool No.	Illustration	Reference pages
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-7, 5-36, 8-61, 8-62, 8-63, 8-66, 8-67, 8-68, 8-69, 8-70, 8-71, 8-72, 8-73, 8-74, 8-75
Tappet adjusting tool 90890-01311 Six piece tappet set YM-A5970		3-4
FI diagnostic tool 90890-03182		3-5, 8-35
Timing light 90890-03141 Inductive clamp timing light YU-03141		3-8
Extension 90890-04082		3-9
Compression gauge 90890-03081 Engine compression tester YU-33223		3-9

Tool name/Tool No.	Illustration	Reference pages
Steering nut wrench 90890-01403 Spanner wrench YU-33975		3-22, 4-54
Damper rod holder 90890-01294 Damping rod holder set YM-01300		4-48, 4-49
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-48, 4-49
Fork seal driver weight 90890-01367 Replacement hammer YM-A9409-7		4-49, 4-50
Fork seal driver attachment (ø33) 90890-01368 Replacement 33 mm YM-A9409-4		4-49
Yamaha bond No. 1215 90890-85505 (Three Bond No.1215®)		5-12, 5-33, 5-60

Tool name/Tool No.	Illustration	Reference pages
Valve spring compressor 90890-04019 YM-04019		5-18, 5-23
Valve spring compressor attachment 90890-04108 Valve spring compressor adapter 22 mm YM-04108		5-18, 5-23
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-19
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117		5-19
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5 mm) YM-04118		5-19
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304  YU-01304 	5-25
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-31, 5-32, 5-33
Flywheel puller 90890-01362 Heavy duty puller YU-33270-B		5-31

Tool name/Tool No.	Illustration	Reference pages
Universal clutch holder 90890-04086 YM-91042	90890-04086  YM-91042 	5-42, 5-44
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		5-42
Crankcase separating tool 90890-01135 Crankcase separator YU-01135-B	90890-01135  YU-01135-B 	5-62
Crankshaft installer pot 90890-01274 Installing pot YU-90058	90890-01274  YU-90058/YU-90059 	5-63
Crankshaft installer bolt 90890-01275 Bolt YU-90060		5-63

Tool name/Tool No.	Illustration	Reference pages
Adapter (M12) 90890-01278 Adapter #3 YU-90063		5-63
Spacer (crankshaft installer) 90890-04081 Pot spacer YM-91044		5-63
Radiator cap tester 90890-01325 Radiator pressure tester YU-24460-01		6-3
Radiator cap tester adapter 90890-01352 Radiator pressure tester adapter YU-33984		6-3
Mechanical seal installer 90890-04145		6-8

Tool name/Tool No.	Illustration	Reference pages
Middle driven shaft bearing driver 90890-04058 Bearing driver 40 mm YM-04058		6-8
Pressure gauge 90890-03153 YU-03153		7-3
Fuel pressure adapter 90890-03181		7-3
Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487		8-69
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		8-73

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EAS20280

GENERAL SPECIFICATIONS

Model

Model 5D71 (Europe)

Dimensions

Overall length	2015 mm (79.3 in)
Overall width	660 mm (26.0 in)
Overall height	1065 mm (41.9 in)
Seat height	818 mm (32.2 in)
Wheelbase	1355 mm (53.3 in)
Ground clearance	155 mm (6.10 in)
Minimum turning radius	3100 mm (122.0 in)

Weight

With oil and fuel	138.0 kg (304 lb)
Maximum load	185 kg (408 lb)

EAS20290

ENGINE SPECIFICATIONS

Engine

Engine type	Liquid cooled 4-stroke, SOHC
Displacement	124.7 cm ³
Cylinder arrangement	Forward-inclined single cylinder
Bore × stroke	52.0 × 58.6 mm (2.05 × 2.31 in)
Compression ratio	11.20 :1
Standard compression pressure (at sea level)	550 kPa/600 r/min (78.2 psi/600 r/min) (5.5 kgf/cm ² /600 r/min)
Minimum–maximum	480–620 kPa (68.3–88.2 psi) (4.8–6.2 kgf/cm ²)
Starting system	Electric starter

Fuel

Recommended fuel	Premium unleaded gasoline only
Fuel tank capacity	13.8 L (3.65 US gal) (3.04 Imp.gal)
Fuel reserve amount	1.6 L (0.42 US gal) (0.35 Imp.gal)

Engine oil

Lubrication system	Wet sump
Type	SAE 10W-30, SAE 10W-40, SAE 15W-40, SAE 20W-40 or SAE 20W-50
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Engine oil quantity	
Total amount	1.15 L (1.22 US qt) (1.01 Imp.qt)
Without oil filter element replacement	0.95 L (1.00 US qt) (0.84 Imp.qt)
With oil filter element replacement	1.00 L (1.06 US qt) (0.88 Imp.qt)

Oil filter

Oil filter type	Paper
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Oil pump

Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	Less than 0.15 mm (0.0059 in)
Limit	0.23 mm (0.0091 in)
Outer-rotor-to-oil-pump-housing clearance	0.13–0.18 mm (0.0051–0.0071 in)
Limit	0.25 mm (0.0098 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.06–0.11 mm (0.0024–0.0043 in)
Limit	0.18 mm (0.0071 in)
Relief valve operating pressure	39.2–78.4 kPa (5.7–11.4 psi) (0.39–0.78 kgf/cm ²)
Pressure check location	Check bolt on cylinder head body

Cooling system

Radiator capacity (including all routes)	1.00 L (1.06 US qt) (0.88 Imp.qt)
Coolant reservoir capacity (up to the maximum level mark)	0.25 L (0.26 US qt) (0.22 Imp.qt)
Radiator cap opening pressure	107.9 – 137.3 kPa (15.6–19.9 psi) (1.08–1.37 kgf/cm ²)

Thermostat

Model/manufacture	5YP/NIPPON THERMOSTAT
Valve opening temperature	80.5–83.5 °C (176.9–182.3 °F)
Valve full open temperature	95.0 °C (203.0 °F)
Valve lift (full open)	3.0 mm (0.12 in)

Radiator core

Width	198.0 mm (7.80 in)
Height	128.0 mm (5.04 in)
Depth	24.0 mm (0.94 in)

Water pump

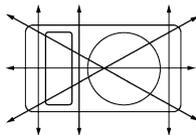
Water pump type	Single suction centrifugal pump
Reduction ratio	19/38 (0.500)

Spark plug (s)

Manufacturer/model	NGK/CR8E
Spark plug gap	0.7–0.8 mm (0.028–0.031 in)

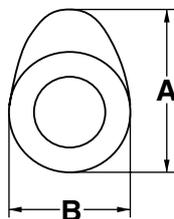
Cylinder head

Volume	9.90–10.50 cm ³ (0.60–0.64 cu.in)
Warping limit	0.03 mm (0.0012 in)



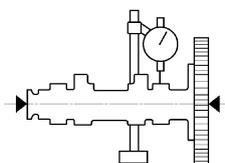
Camshaft

Drive system	Chain drive (left)
Camshaft lobe dimensions	
Intake A	30.225–30.325 mm (1.1900–1.1939 in)
Limit	30.125 mm (1.1860 in)
Intake B	25.127–25.227 mm (0.9893–0.9932 in)
Limit	25.027 mm (0.9853 in)
Exhaust A	30.232–30.332 mm (1.1902–1.1942 in)
Limit	30.132 mm (1.1863 in)
Exhaust B	25.065–25.165 mm (0.9868–0.9907 in)
Limit	24.965 mm (0.9829 in)



Camshaft runout limit

0.030 mm (0.0012 in)



Timing chain

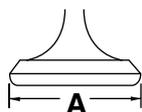
Model/number of links	DID SCR-0404SV/96
Tensioning system	Automatic

Rocker arm/rocker arm shaft

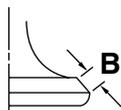
Rocker arm inside diameter	9.985–10.000 mm (0.3931–0.3937 in)
Limit	10.015 mm (0.3943 in)
Rocker arm shaft outside diameter	9.966–9.976 mm (0.3924–0.3928 in)
Limit	9.941 mm (0.3914 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.009–0.034 mm (0.0004–0.0013 in)
Limit	0.074 mm (0.0029 in)

Valve, valve seat, valve guide

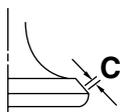
Valve clearance (cold)	
Intake	0.10–0.14 mm (0.0039–0.0055 in)
Exhaust	0.20–0.24 mm (0.0079–0.0094 in)
Valve dimensions	
Valve head diameter A (intake)	19.40–19.60 mm (0.7638–0.7717 in)
Valve head diameter A (exhaust)	16.90–17.10 mm (0.6654–0.6732 in)



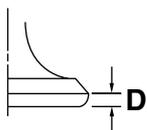
Valve face width B (intake)	1.538–2.138 mm (0.0606–0.0842 in)
Valve face width B (exhaust)	1.538–2.138 mm (0.0606–0.0842 in)



Valve seat width C (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)
Valve seat width C (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)

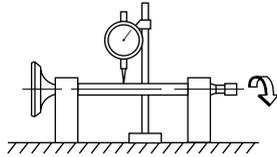


Limit	1.6 mm (0.06 in)
Valve margin thickness D (intake)	0.50–0.90 mm (0.0197–0.0354 in)
Valve margin thickness D (exhaust)	0.50–0.90 mm (0.0197–0.0354 in)



Valve stem diameter (intake)	4.475–4.490 mm (0.1762–0.1768 in)
Limit	4.445 mm (0.1750 in)
Valve stem diameter (exhaust)	4.460–4.475 mm (0.1756–0.1762 in)
Limit	4.430 mm (0.1744 in)
Valve guide inside diameter (intake)	4.500–4.512 mm (0.1772–0.1776 in)
Limit	4.550 mm (0.1791 in)
Valve guide inside diameter (exhaust)	4.500–4.512 mm (0.1772–0.1776 in)

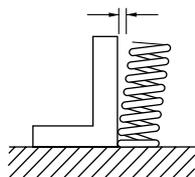
Limit	4.550 mm (0.1791 in)
Valve-stem-to-valve-guide clearance (intake)	0.010–0.037 mm (0.0004–0.0015 in)
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)	0.025–0.052 mm (0.0010–0.0020 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.010 mm (0.0004 in)



Cylinder head valve seat width (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)
Cylinder head valve seat width (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)
Limit	1.6 mm (0.06 in)

Valve spring

Free length (intake)	41.71 mm (1.64 in)
Limit	39.62 mm (1.56 in)
Free length (exhaust)	41.71 mm (1.64 in)
Limit	39.62 mm (1.56 in)
Installed length (intake)	35.30 mm (1.39 in)
Installed length (exhaust)	35.30 mm (1.39 in)
Spring rate K1 (intake)	23.54 N/mm (134.41 lb/in) (2.40 kgf/mm)
Spring rate K2 (intake)	36.58 N/mm (208.87 lb/in) (3.73 kgf/mm)
Spring rate K1 (exhaust)	23.54 N/mm (134.41 lb/in) (2.40 kgf/mm)
Spring rate K2 (exhaust)	36.58 N/mm (208.87 lb/in) (3.73 kgf/mm)
Installed compression spring force (intake)	140–162 N (31.47–36.42 lbf) (14.28–16.52 kgf)
Installed compression spring force (exhaust)	140–162 N (31.47–36.42 lbf) (14.28–16.52 kgf)
Spring tilt (intake)	2.5°/1.8 mm
Spring tilt (exhaust)	2.5°/1.8 mm



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

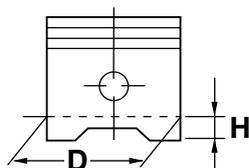
Cylinder

Bore	52.000–52.010 mm (2.0472–2.0476 in)
Wear limit	52.110 mm (2.0516 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.005 mm (0.0002 in)

Piston

Piston-to-cylinder clearance	0.015–0.048 mm (0.0006–0.0019 in)
Limit	0.15 mm (0.0059 in)
Diameter D	51.962–51.985 mm (2.0457–2.0466 in)

Height H 5.0 mm (0.20 in)

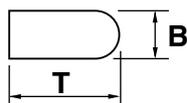


Offset 0.50 mm (0.0197 in)
 Offset direction Intake side
 Piston pin bore inside diameter 14.002–14.013 mm (0.5513–0.5517 in)
 Limit 14.043 mm (0.5529 in)
 Piston pin outside diameter 13.995–14.000 mm (0.5510–0.5512 in)
 Limit 13.975 mm (0.5502 in)
 Piston-pin-to-piston-pin-bore clearance 0.002–0.018 mm (0.0001–0.0007 in)
 Limit 0.068 mm (0.0027 in)

Piston ring

Top ring

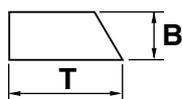
Ring type Barrel
 Dimensions (B × T) 0.80 × 1.90 mm (0.03 × 0.07 in)



End gap (installed) 0.10–0.25 mm (0.0039–0.0098 in)
 Limit 0.50 mm (0.0197 in)
 Ring side clearance 0.030–0.065 mm (0.0012–0.0026 in)
 Limit 0.100 mm (0.0039 in)

2nd ring

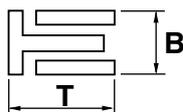
Ring type Taper
 Dimensions (B × T) 0.80 × 2.10 mm (0.03 × 0.08 in)



End gap (installed) 0.10–0.25 mm (0.0039–0.0098 in)
 Limit 0.60 mm (0.0236 in)
 Ring side clearance 0.020–0.055 mm (0.0008–0.0022 in)
 Limit 0.100 mm (0.0039 in)

Oil ring

Dimensions (B × T) 1.50 × 1.95 mm (0.06 × 0.08 in)

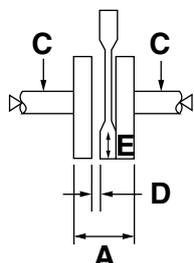


End gap (installed) 0.20–0.70 mm (0.0079–0.0276 in)
 Ring side clearance 0.040–0.160 mm (0.0016–0.0063 in)

Crankshaft

Width A 47.95–48.00 mm (1.888–1.890 in)

Runout limit C	0.030 mm (0.0012 in)
Big end side clearance D	0.110–0.410 mm (0.0043–0.0161 in)
Big end radial clearance E	0.004–0.014 mm (0.0002–0.0006 in)



Balancer

Balancer drive method	Gear
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Clutch

Clutch type	Wet, multiple-disc
Clutch release method	Inner push, cam push
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Friction plate 1 thickness	2.90–3.10 mm (0.114–0.122 in)
Wear limit	2.80 mm (0.1102 in)
Plate quantity	1 pc
Friction plate 3 thickness	2.90–3.10 mm (0.114–0.122 in)
Wear limit	2.80 mm (0.1102 in)
Plate quantity	3 pcs
Friction plate 2 thickness	2.90–3.10 mm (0.114–0.122 in)
Wear limit	2.80 mm (0.1102 in)
Plate quantity	1 pc
Clutch plate thickness	1.45–1.75 mm (0.057–0.069 in)
Plate quantity	4 pcs
Warping limit	0.20 mm (0.0079 in)
Clutch spring free length	38.71 mm (1.52 in)
Minimum length	36.77 mm (1.45 in)
Spring quantity	4 pcs
Push rod bending limit	0.500 mm (0.0197 in)

Transmission

Transmission type	Constant mesh 6-speed
Primary reduction system	Helical gear
Primary reduction ratio	73/24 (3.042)
Secondary reduction system	Chain drive
Secondary reduction ratio	48/14 (3.429)
Operation	Left foot operation
Gear ratio	
1st	34/12 (2.833)
2nd	30/16 (1.875)
3rd	30/22 (1.364)
4th	24/21 (1.143)
5th	22/23 (0.957)
6th	21/25 (0.840)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)

Shifting mechanism

Shift mechanism type	Shift drum and guide bar
Shift fork thickness	5.76–5.89 mm (0.227–0.232 in) × 1
Shift fork thickness	4.76–4.89 mm (0.187–0.193 in) × 2

Decompression device

Device type	Auto decomp
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Air filter

Air filter element	Dry element
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Fuel pump

Pump type	Electrical
Model/manufacture	5B2/BITRON
Output pressure	250.0 kPa (36.3 psi) (2.50 kgf/cm ²)

Fuel injector

Model/quantity	1100–87K00 / 1
Manufacturer	AISAN

Throttle body

Type/quantity	SE AC28–2/1
Manufacturer	MIKUNI
ID mark	5D71 00

Fuel injection sensor

Crankshaft position sensor resistance	248–372 Ω at 20 °C (68 °F)
Intake air pressure sensor output voltage	4.70–5.20 V
Intake air temperature sensor resistance	5.7–6.3 kΩ
Coolant temperature sensor resistance	2.32–2.59 kΩ at 20 °C (68 °F) 310–326 Ω at 80 °C (176 °F)

Idling condition

Engine idling speed	1300–1500 r/min
Water temperature	85.0–95.0°C (185.00–203.00 °F)
Oil temperature	55.0–65.0°C (131.00–149.00 °F)
Throttle cable free play	3.0–5.0 mm (0.12–0.20 in)

EAS20300

CHASSIS SPECIFICATIONS

Chassis

Frame type	Semi double cradle
Caster angle	24.20 °
Trail	86.1 mm (3.39 in)

Front wheel

Wheel type	Cast wheel
Rim size	17xMT2.75
Rim material	Aluminum
Wheel travel	130.0 mm (5.12 in)
Radial wheel runout limit	0.5 mm (0.02 in)
Lateral wheel runout limit	1.0 mm (0.04 in)
Wheel axle bending limit	0.25 mm (0.01 in)

Rear wheel

Wheel type	Cast wheel
Rim size	17 × MT3.75
Rim material	Aluminum
Wheel travel	125.0 mm (4.92 in)
Radial wheel runout limit	0.5 mm (0.02 in)
Lateral wheel runout limit	1.0 mm (0.04 in)
Wheel axle bending limit	0.25 mm (0.01 in)

Front tire

Type	Tubeless
Size	100/80-17 M/C 52H
Manufacturer/model	PIRELLI/SPORT DEMON
Manufacturer/model	MICHELIN/PILOT SPORTY
Wear limit (front)	1.6 mm (0.06 in)

Rear tire

Type	Tubeless
Size	130/70-17 M/C 62H
Manufacturer/model	PIRELLI/SPORT DEMON
Manufacturer/model	MICHELIN/PILOT SPORTY
Wear limit (rear)	1.6 mm (0.06 in)

Tire air pressure (measured on cold tires)

Loading condition	0-90 kg (0-198 lb)
Front	175 kPa (25 psi) (1.75 kgf/cm ²)
Rear	200 kPa (29 psi) (2.00 kgf/cm ²)
Loading condition	90-185 kg (198-408 lb)
Front	175 kPa (25 psi) (1.75 kgf/cm ²)
Rear	225 kPa (33 psi) (2.25 kgf/cm ²)

Front brake

Type	Single disc brake
Operation	Right hand operation
Front brake lever free play	2.0-5.0 mm (0.08-0.20 in)

Front disc brake

Disc outside diameter × thickness	292.0 × 4.0 mm (11.50 × 0.16 in)
Brake disc thickness limit	3.5 mm (0.14 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	4.5 mm (0.18 in)
Limit	0.8 mm (0.03 in)
Brake pad lining thickness (outer)	4.5 mm (0.18 in)
Limit	0.8 mm (0.03 in)
Master cylinder inside diameter	11.00 mm (0.43 in)
Caliper cylinder inside diameter	28.00 mm × 2 (1.10 in × 2)
Recommended fluid	DOT 4

Rear brake

Type	Single disc brake
Operation	Right foot operation
Brake pedal position	47.9 mm (1.89 in)
Brake pedal free play	3.5–4.5 mm (0.14–0.18 in)
Rear disc brake	
Disc outside diameter × thickness	230.0 × 4.0 mm (9.06 × 0.16 in)
Brake disc thickness limit	3.5 mm (0.14 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	5.5 mm (0.22 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	5.5 mm (0.22 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	32.00 mm × 1 (1.26 in × 1)
Recommended fluid	DOT 4

Steering

Steering bearing type	Ball and angular bearing
Center to lock angle (left)	29.5°
Center to lock angle (right)	29.5°

Front suspension

Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	130.5 mm (5.14 in)
Fork spring free length	415.0 mm (16.34 in)
Limit	406.7 mm (16.01 in)
Installed length	398.0 mm (15.67 in)
Spring rate K1	5.00 N/mm (28.55 lb/in) (0.51 kgf/mm)
Spring rate K2	7.00 N/mm (39.97 lb/in) (0.71 kgf/mm)
Spring stroke K1	0.0–88.0 mm (0.00–3.46 in)
Spring stroke K2	88.0–147.5 mm (3.46–5.81 in)
Inner tube outer diameter	33.0 mm (1.30 in)
Inner tube bending limit	0.1 mm (0.01 in)
Optional spring available	No
Recommended oil	Fork oil 10W or equivalent
Quantity	235.0 cm ³ (7.95 US oz) (8.29 Imp.oz)
Level	152.0 mm (5.98 in)

Rear suspension

Type	Swingarm (monocross)
Spring/shock absorber type	Coil spring/oil damper
Rear shock absorber assembly travel	54.0 mm (2.13 in)
Spring free length	162.0 mm (6.38 in)
Installed length	155.0 mm (6.10 in)
Spring rate K1	103.00 N/mm (588.13 lb/in) (10.50 kgf/mm)
Spring stroke K1	0.0–54.0 mm (0.00–2.13 in)
Optional spring available	No

Swingarm

Swingarm end free play limit (axial)	0 mm (0 in)
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Drive chain

Type/manufacturer	R428HBSOR/ROLON
Link quantity	131
Drive chain slack	30.0–40.0 mm (1.18–1.57 in)
15-link length limit	191.5 mm (7.54 in)

EAS20310

ELECTRICAL SPECIFICATIONS

Voltage

System voltage 12 V

Ignition system

Ignition system TCI (digital)
 Advancer type Throttle position sensor and electrical
 Ignition timing (B.T.D.C.) 5.0°/1400 r/min

Engine control unit

Model/manufacture 5D700/YAMAHA

Ignition coil

Model/manufacture 2JN/YAMAHA
 Minimum ignition spark gap 6.0 mm (0.24 in)
 Primary coil resistance 2.16–2.64 Ω at 20 °C (68 °F)
 Secondary coil resistance 8.64–12.96 kΩ at 20 °C (68 °F)

Spark plug cap

Material Resin
 Resistance 5.0 kΩ

AC magneto

Model/manufacture F5D7/YAMAHA
 Standard output 14.0 V, 20.8 A 5000 r/min
 Standard output 14.0 V, 235 W 5000 r/min
 Stator coil resistance 0.32–0.48 Ω at 20 °C (68 °F)

Rectifier/regulator

Regulator type Semi conductor-short circuit
 Model/manufacture SH650D-11/SHINDENGEN
 Regulated voltage (DC) 14.1–14.9 V
 Rectifier capacity (DC) 25.0 A
 Withstand voltage 200.0 V

Battery

Model 12N5.5–3B / YUASA
 Voltage, capacity 12 V, 5.5 Ah
 Specific gravity 1.280 at 20 °C (68 °F)

Headlight

Bulb type Halogen bulb

Bulb voltage, wattage × quantity

Headlight 12 V, 55.0 W × 2
 Auxiliary light 12 V, 5.0 W × 2
 Tail/brake light LED × 8
 Front turn signal light 12 V, 10.0 W × 2
 Rear turn signal light 12 V, 10.0 W × 2
 Meter lighting LED

Indicator light

Neutral indicator light	LED
Turn signal indicator light	LED
High beam indicator light	LED
Coolant temperature warning light	LED
Engine trouble warning light	LED

Electric starting system

System type	Constant mesh
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Starter motor

Model/manufacture	3C1/YAMAHA
Power output	0.20 kW
Armature coil resistance	0.0315–0.0385 Ω
Brush overall length	7.0 mm (0.28 in)
Limit	3.50 mm (0.14 in)
Brush spring force	3.92–5.88 N (14.11–21.17 oz) (400–600 gf)
Commutator diameter	17.6 mm (0.69 in)
Limit	16.6 mm (0.65 in)
Mica undercut (depth)	1.35 mm (0.05 in)

Starter relay

Model/manufacture	5TN / OMRON
Amperage	50.0 A

Horn

Horn type	Plane
Quantity	1 pc
Model/manufacture	YF-12/NIKKO
Maximum amperage	3.0 A
Coil resistance	1.15–1.25 Ω at 20 °C (68 °F)

Turn signal relay

Relay type	Full transistor
Model/manufacture	FE218BH/DENSO
Built-in, self-canceling device	No
Turn signal blinking frequency	75–95 cycles/min
Wattage	10 W \times 2.0 + 3.4 W

Fuel sender unit

Model/manufacture	5B2/BITRON
Sender unit resistance (full)	0.0–7.0 Ω
Sender unit resistance (empty)	90.0–103.0 Ω

Starting circuit cut-off relay

Model/manufacture	ACA121115-M02/MATSUSHITA
Coil resistance	80.0 Ω
Diode	Yes

Headlight relay

Model/manufacture	ACA33211 M05/MATSUSHITA
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ELECTRICAL SPECIFICATIONS

Radiator fan

Model/manufacture	SSW6101/PANASONIC
Running rpm	4800 r/min

Fan motor relay

Model/manufacture	ACM33211 M05/MATSUSHITA
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Fuses

Main fuse	20.0 A
Headlight fuse	15.0 A
Signaling system fuse	7.5 A
Ignition fuse	7.5 A
Radiator fan fuse	5.0 A
Spare fuse	20.0 A
Spare fuse	15.0 A
Spare fuse	7.5 A
Spare fuse	7.5 A

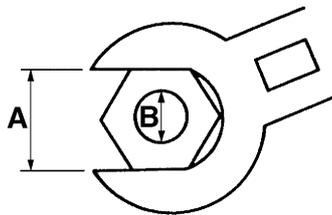
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TIGHTENING TORQUES

EAS20330

GENERAL TIGHTENING TORQUE SPECIFICATIONS

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



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

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

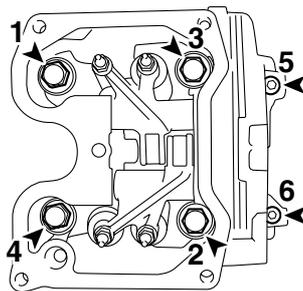
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ENGINE TIGHTENING TORQUES

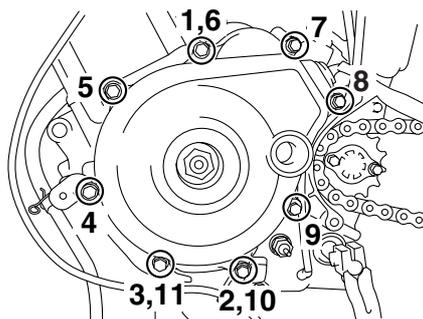
Item	Thread size	Q'ty	Tightening torque	Remarks
Cylinder head bolt	M8	4	22 Nm (2.2 m·kg, 16 ft·lb)	
Cylinder head bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Spark plug	M10	1	13 Nm (1.3 m·kg, 9.4 ft·lb)	
Cylinder head cover bolt	M6	5	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil check bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Exhaust pipe stud bolt	M8	2	15 Nm (1.5 m·kg, 11 ft·lb)	
Coolant drain bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Balancer driven gear nut	M10	1	50 Nm (5.0 m·kg, 36 ft·lb)	
Valve adjusting screw locknut	M5	4	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Camshaft sprocket bolt	M8	1	30 Nm (3.0 m·kg, 22 ft·lb)	
Camshaft retainer bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Timing chain guide (intake side) bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Timing chain tensioner bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	Yamaha bond No.1215 (Three Bond No.1215 ®)
Radiator bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Radiator fan bolt	M6	2	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Coolant reservoir bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Water pump assembly bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Water pump assembly bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Water pump housing cover bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Impeller shaft retainer bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Thermostat cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil pump assembly screw	M5	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Engine oil drain plug	M35	1	32 Nm (3.2 m·kg, 23 ft·lb)	
Oil filter element cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil filter element cover bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil baffle plate bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Intake manifold bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Fuel injector bolt	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Throttle body joint clamp screw	M4	2	2 Nm (0.2 m·kg, 1.4 ft·lb)	
Air filter case joint clamp screw	M4	1	2 Nm (0.2 m·kg, 1.4 ft·lb)	
Air filter case bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Air induction system reed valve bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Exhaust pipe nut	M8	2	20 Nm (2.0 m·kg, 14 ft·lb)	
Exhaust assembly bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Exhaust assembly bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Crankcase bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankcase bolt	M6	6	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankcase bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Generator cover bolt	M6	7	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Clutch cover bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Clutch cover bolt	M6	6	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Drive sprocket cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Starter clutch bolt	M6	3	14 Nm (1.4 m·kg, 10 ft·lb)	
Primary drive gear nut	M12	1	60 Nm (6.0 m·kg, 43 ft·lb)	
Clutch spring bolt	M6	4	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Short clutch push rod locknut	M6	1	8 Nm (0.8 m·kg, 5.8 ft·lb)	
Clutch boss nut	M14	1	70 Nm (7.0 m·kg, 50 ft·lb)	
Drive sprocket retainer bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankcase bearing retainer bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Shift drum segment screw	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Stopper lever bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Stator coil bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankshaft position sensor bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Generator rotor nut	M12	1	70 Nm (7.0 m·kg, 50 ft·lb)	
Neutral switch	M10	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Starter motor bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Starter motor bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Coolant temperature sensor	M12	1	18 Nm (1.8 m·kg, 13 ft·lb)	

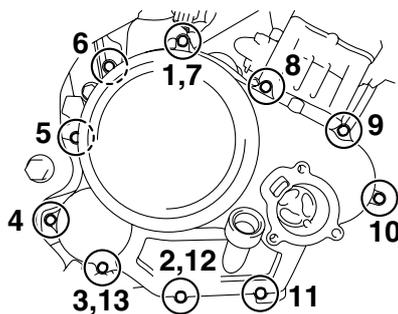
Cylinder head tightening sequence:



Generator cover tightening sequence:

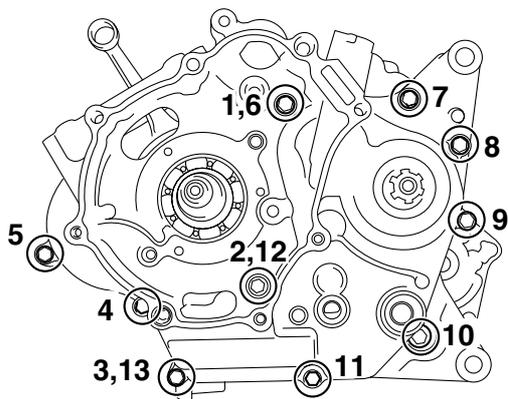


Clutch cover tightening sequence:

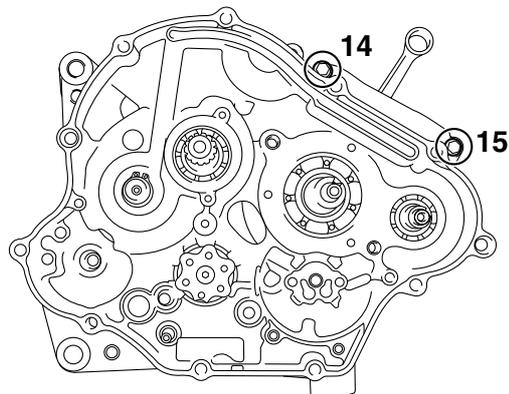


Crankcase tightening sequence:

A



B



- A. Left crankcase
- B. Right crankcase

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CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Upper bracket pinch bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Lower bracket pinch bolt	M10	2	28 Nm (2.8 m·kg, 20 ft·lb)	
Front brake pipe bracket bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Lower ring nut (initial tightening torque)	M25	1	48 Nm (4.8 m·kg, 35 ft·lb)	See NOTE.
Lower ring nut (final tightening torque)	M25	1	13 Nm (1.3 m·kg, 9.4 ft·lb)	See NOTE.
Steering stem nut	M22	1	110 Nm (11.0 m·kg, 80 ft·lb)	
Handlebar pinch bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Handlebar bolt	M6	2	9 Nm (0.9 m·kg, 6.5 ft·lb)	
Front brake master cylinder holder bolt	M6	2	9 Nm (0.9 m·kg, 6.5 ft·lb)	
Throttle cable locknut	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Front cowling assembly bolt	M8	1	23 Nm (2.3 m·kg, 17 ft·lb)	
Front cowling assembly nut	M8	1	23 Nm (2.3 m·kg, 17 ft·lb)	
Rearview mirror bolt	M6	4	9 Nm (0.9 m·kg, 6.5 ft·lb)	
Front fender bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Side panel upper bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Damper rod bolt	M10	2	28 Nm (2.8 m·kg, 20 ft·lb)	
Front fender stabilizer bolt	M6	4	9 Nm (0.9 m·kg, 6.5 ft·lb)	
Grip end	M16	2	26 Nm (2.6 m·kg, 19 ft·lb)	
Clutch lever holder bolt	M6	1	9 Nm (0.9 m·kg, 6.5 ft·lb)	
Engine mounting nut (front side)	M10	1	46 Nm (4.6 m·kg, 33 ft·lb)	
Engine mounting nut (rear upper side)	M10	1	46 Nm (4.6 m·kg, 33 ft·lb)	
Engine mounting nut (rear lower side)	M10	1	46 Nm (4.6 m·kg, 33 ft·lb)	
Pivot shaft nut	M12	1	81 Nm (8.1 m·kg, 59 ft·lb)	
Rear shock absorber assembly lower nut	M10	1	44 Nm (4.4 m·kg, 32 ft·lb)	
Connecting arm nut	M10	2	44 Nm (4.4 m·kg, 32 ft·lb)	
Relay arm nut	M10	1	44 Nm (4.4 m·kg, 32 ft·lb)	
Rear shock absorber assembly upper nut	M10	1	44 Nm (4.4 m·kg, 32 ft·lb)	
Rear fender bolt	M6	3	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive chain guard front bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive chain guard rear bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive chain guide bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive chain adjusting locknut	M8	2	16 Nm (1.6 m·kg, 11 ft·lb)	

Item	Thread size	Q'ty	Tightening torque	Remarks
Fuel tank front bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Fuel tank rear bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Mud guard bolt	M6	6	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Passenger seat front bolt	M6	1	30 Nm (3.0 m·kg, 22 ft·lb)	
Passenger seat rear bolt	M8	1	11 Nm (1.1 m·kg, 8.0 ft·lb)	
Front wheel axle	M14	1	59 Nm (5.9 m·kg, 43 ft·lb)	
Front wheel axle pinch bolt	M8	1	14 Nm (1.4 m·kg, 10 ft·lb)	
Rear wheel axle nut	M14	1	85 Nm (8.5 m·kg, 61 ft·lb)	
Front brake disc bolt	M6	5	18 Nm (1.8 m·kg, 13 ft·lb)	
Rear brake disc bolt	M6	5	18 Nm (1.8 m·kg, 13 ft·lb)	
Rear wheel sprocket self-locking nut	M8	6	43 Nm (4.3 m·kg, 31 ft·lb)	
Front brake caliper bolt	M8	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Brake hose union bolt	M10	3	30 Nm (3.0 m·kg, 22 ft·lb)	
Front brake caliper bleed screw	M10	1	14 Nm (1.4 m·kg, 10 ft·lb)	
Rear brake caliper bleed screw	M8	1	14 Nm (1.4 m·kg, 10 ft·lb)	
Rear brake pad retaining bolt	M10	2	18 Nm (1.8 m·kg, 13 ft·lb)	
Rear brake hose holder	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Rear brake light switch	M10	1	24 Nm (2.4 m·kg, 17 ft·lb)	
Front brake hose holder	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Speed sensor lead holder	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Shift arm bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Main switch bolt	M6	2	11 Nm (1.1 m·kg, 8.0 ft·lb)	
Sidestand nut	M10	1	56 Nm (5.6 m·kg, 40 ft·lb)	
Sidestand switch bolt	M6	2	4 Nm (0.4 m·kg, 2.9 ft·lb)	
Rear brake master cylinder bolt	M6	2	13 Nm (1.3 m·kg, 9.4 ft·lb)	
Rear brake master cylinder rod locknut	M8	1	17 Nm (1.7 m·kg, 12 ft·lb)	
Rider footrest bracket bolt	M8	4	30 Nm (3.0 m·kg, 22 ft·lb)	
Passenger footrest bracket bolt	M8	4	30 Nm (3.0 m·kg, 22 ft·lb)	
Ground lead bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	
License plate light assembly bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Rectifier/regulator bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
ECU bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Ignition coil bolt	M6	2	7 Nm (0.7 m·kg, 5.1 ft·lb)	
Horn bracket bolt	M6	1	7 Nm (0.7 m·kg, 5.1 ft·lb)	

NOTE:

- First, tighten the lower ring nut to approximately 48 Nm (4.8 m·kg, 35 ft·lb) with a torque wrench, then loosen the lower ring nut completely.

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- Retighten the lower ring nut to 13 Nm (1.3 m·kg, 9.4 ft·lb) with a torque wrench.
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LUBRICATION POINTS AND LUBRICANT TYPES

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LUBRICATION POINTS AND LUBRICANT TYPES

EAS20370

ENGINE

Lubrication point	Lubricant
Oil seal lips	
Bearings	
Cylinder head bolt seats, cylinder head bolt threads and washers	
Water pump assembly O-rings	
Cylinder head cover gasket	
Connecting rod big end	
Piston pin	
Cylinder inner surface, piston, ring grooves, and piston rings	
Balancer O-rings	
Camshaft lobes and rocker arm rollers	
Decompression cam	
Valve stems and valve stem seals	
Valve stem ends	
Rocker arm shafts	
Rocker arm inner surface	
Decompression arm pivoting point	
Engine oil drain plug O-ring	
Oil pump driven gear shaft	
Oil filter cover O-ring	
Intake manifold O-ring	
Fuel injector O-ring	
Timing mark accessing screw O-ring	
Crankshaft end accessing screw O-ring	
Engine oil filler cap O-ring	
Starter clutch gear thrust surfaces and washer	
Starter clutch rollers and starter clutch gear boss	
Starter motor O-ring	
Starter clutch idle gear shaft and starter clutch idle gear inner surface	
Starter clutch idle gear thrust surfaces and washer	
Clutch push lever	
Primary driven gear inner surface	
Long clutch push rod	
Short clutch push rod and ball	

LUBRICATION POINTS AND LUBRICANT TYPES

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Lubrication point	Lubricant
Clutch push rod ball	
Clutch boss nut seat and clutch boss nut thread	
Main axle and pinion gears	
Drive axle and wheel gears	
Shift drum assembly	
Shift forks and shift fork guide bar	
Shift shaft	
Crankshaft position sensor/stator assembly lead grommet	Yamaha bond No.1215 (Three Bond No.1215®)
Crankcase mating surfaces	Yamaha bond No.1215 (Three Bond No.1215®)
Timing chain tensioner bolt threads	Yamaha bond No.1215 (Three Bond No.1215®)

LUBRICATION POINTS AND LUBRICANT TYPES

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CHASSIS

Lubrication point	Lubricant
Front wheel oil seal lip	
Rear wheel oil seal lip	
Rear wheel drive hub oil seal lip	
Rear wheel and rear wheel drive hub mating surface	
Pivot shaft	
Pivot shaft bearing and spacer	
Pivot shaft dust cover inner surface	
Relay arm bearing, spacer and oil seal lips	
Swingarm bearing, spacer and oil seal lips	
Rear brake pedal pivoting point and metal-to-metal moving parts	
Steering bearings (upper and lower)	
Upper bearing cover seal lip and lower bearing dust seal lip	
Clutch lever pivoting point	
Clutch cable end	
Tube guide (throttle grip) inner surface and throttle cable	
Sidestand pivoting point and metal-to-metal moving parts	
Sidestand spring-to-hooks mating point	
Passenger footrest pivoting point	
Front wheel axle	
Brake lever pivoting point and metal-to-metal moving parts	

LUBRICATION SYSTEM CHART AND DIAGRAMS

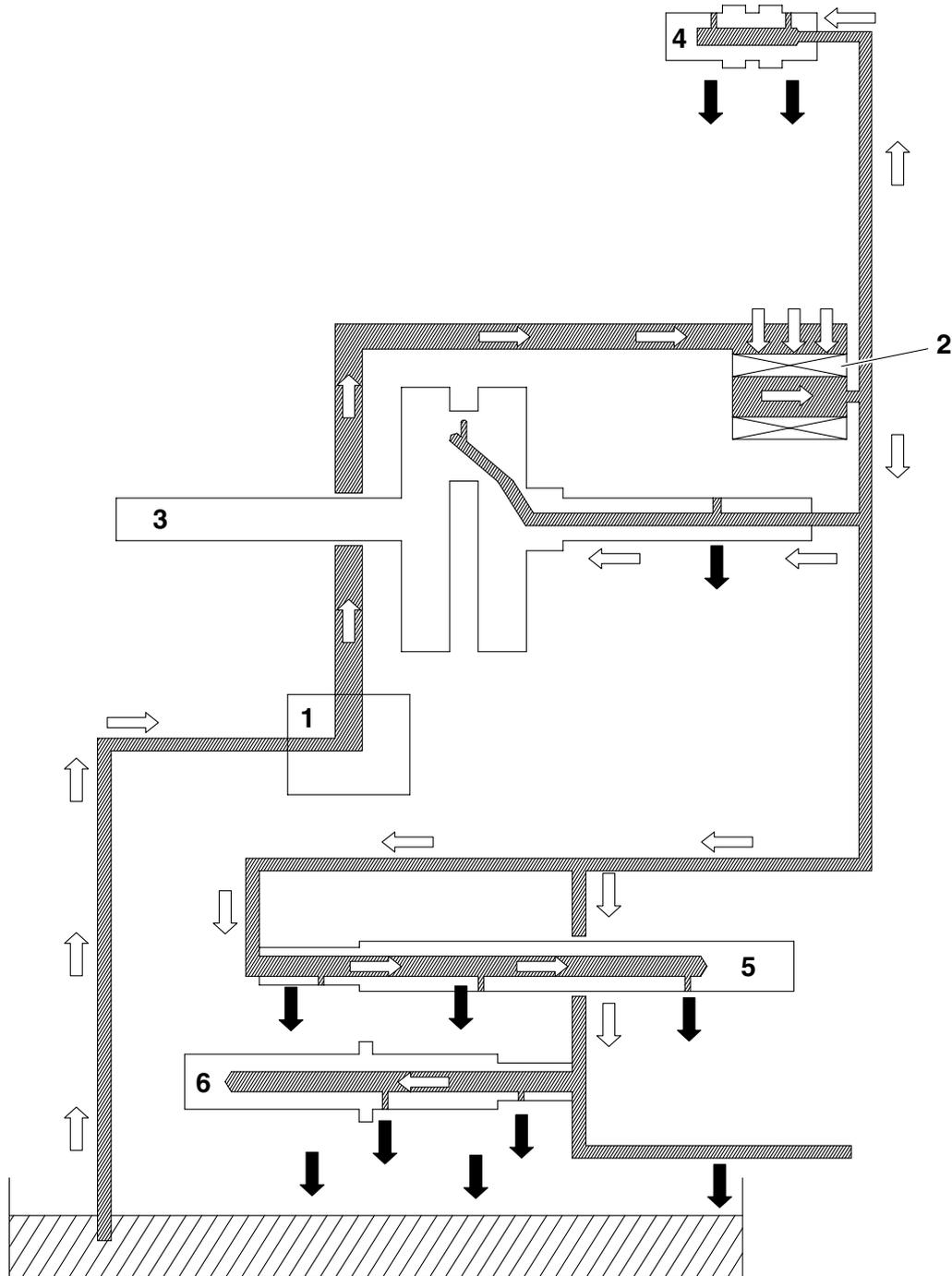
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EAS20390

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20400

ENGINE OIL LUBRICATION CHART



LUBRICATION SYSTEM CHART AND DIAGRAMS

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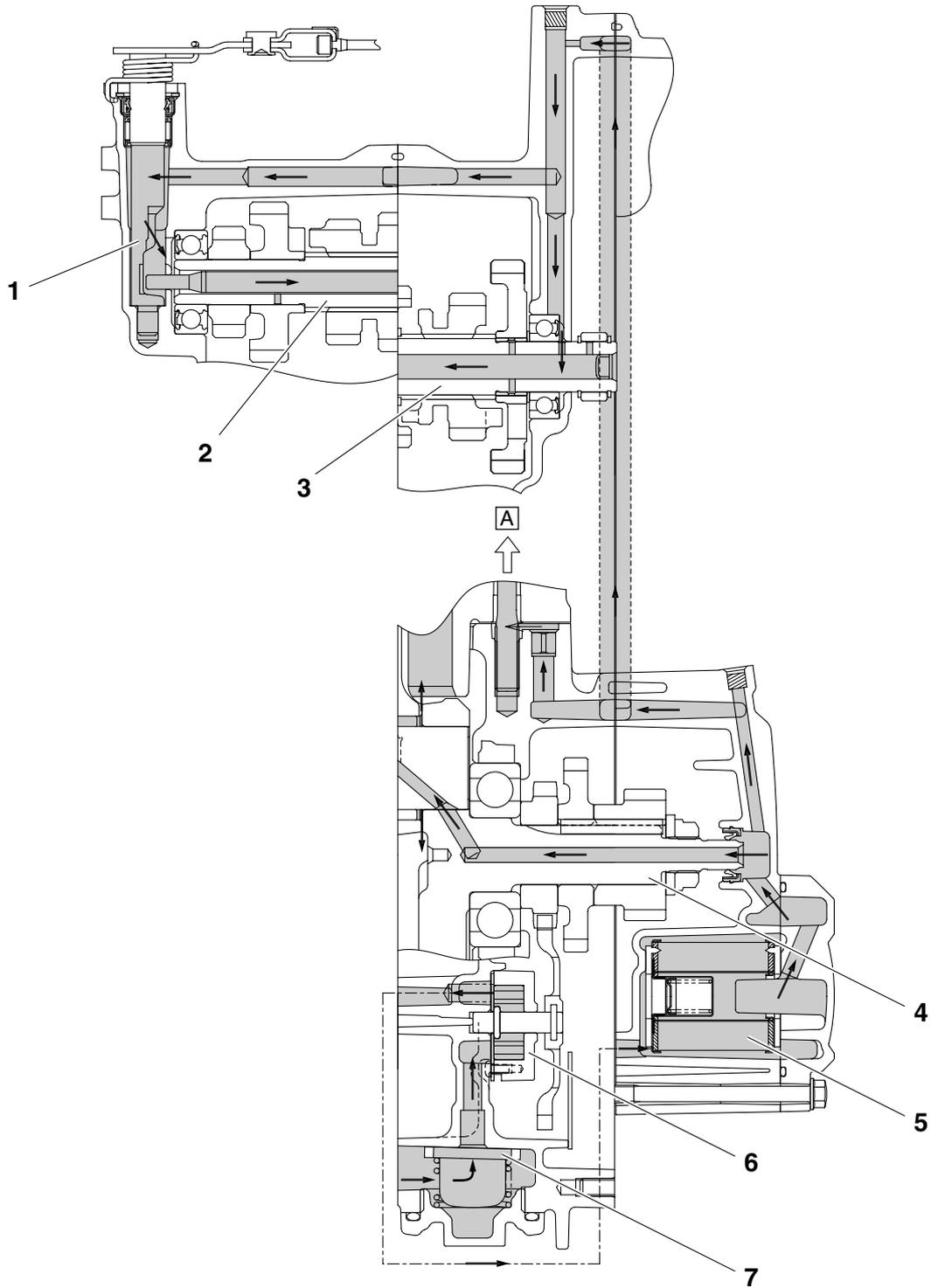
1. Oil pump
2. Oil filter element
3. Crankshaft
4. Camshaft
5. Main axle
6. Drive axle

LUBRICATION SYSTEM CHART AND DIAGRAMS

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EAS20410

LUBRICATION DIAGRAMS



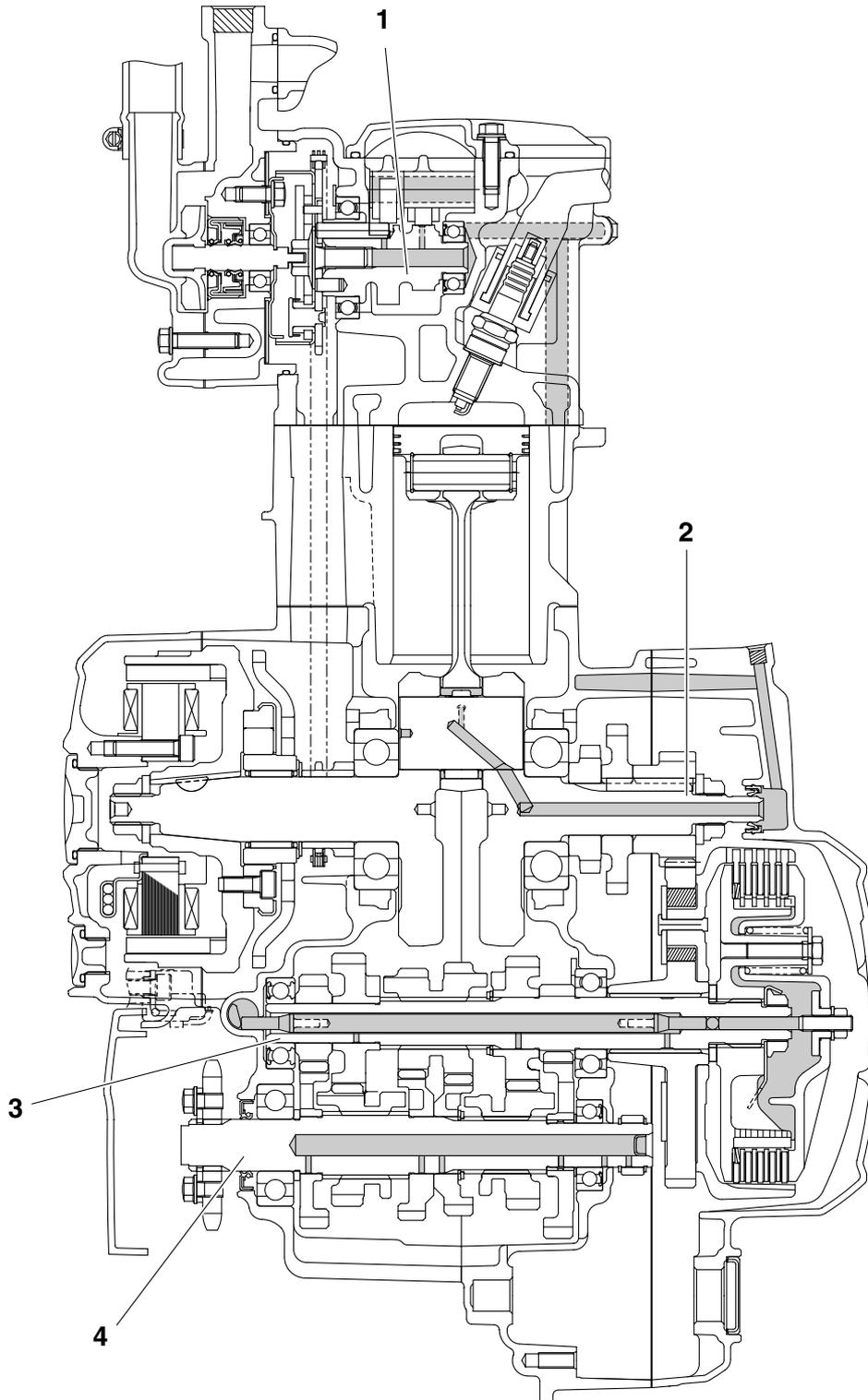
LUBRICATION SYSTEM CHART AND DIAGRAMS

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1. Clutch push lever
2. Main axle
3. Drive axle
4. Crankshaft
5. Oil filter
6. Oil pump assembly
7. Oil strainer
- A. To cylinder head

LUBRICATION SYSTEM CHART AND DIAGRAMS

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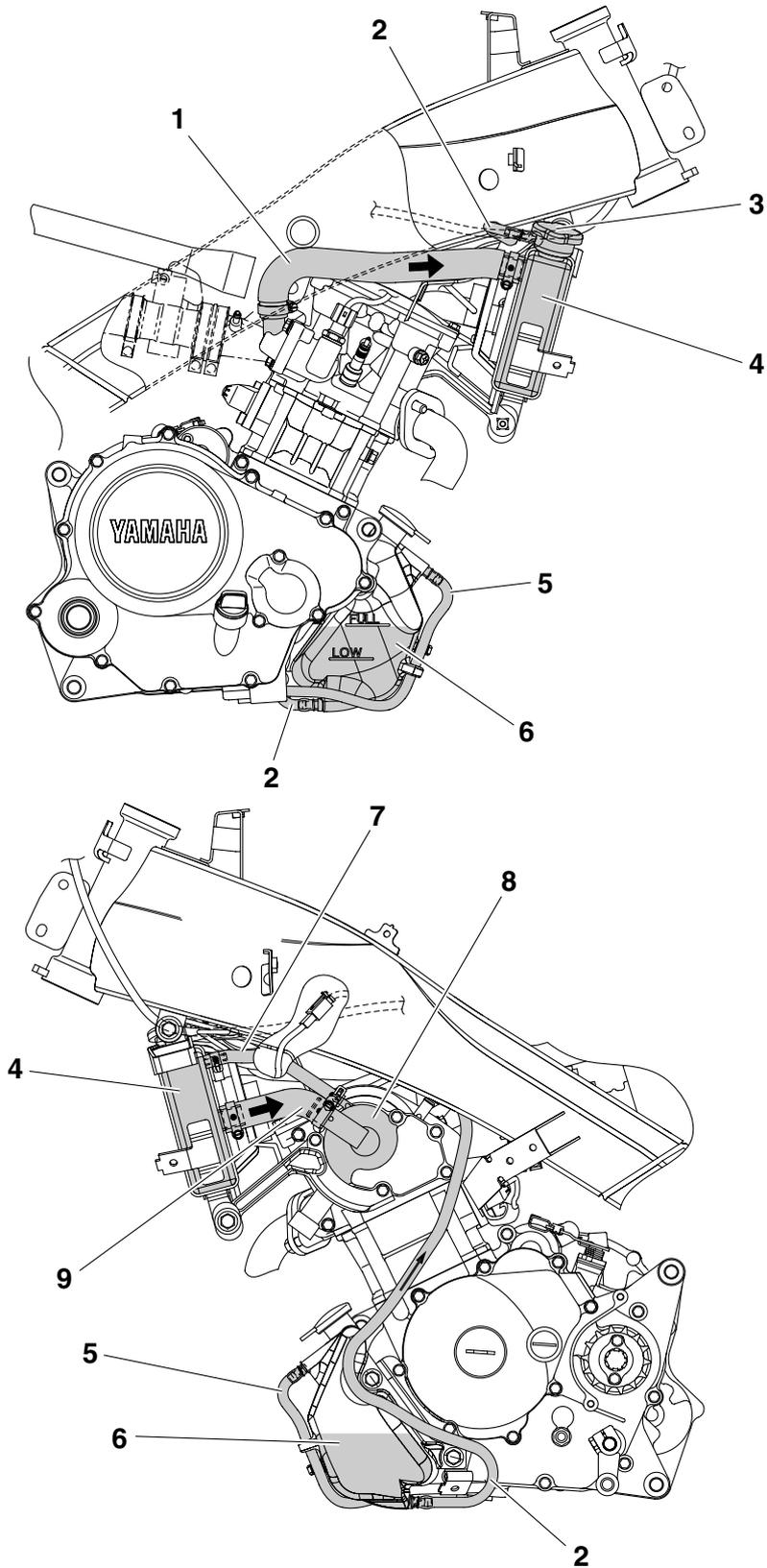
LUBRICATION SYSTEM CHART AND DIAGRAMS

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1. Camshaft
2. Crankshaft
3. Main axle
4. Drive axle

EAS20420

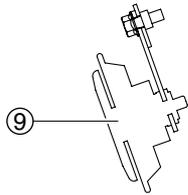
COOLING SYSTEM DIAGRAMS



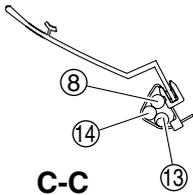
1. Radiator inlet hose
2. Coolant reservoir hose
3. Radiator cap
4. Radiator
5. Coolant reservoir breather hose
6. Coolant reservoir
7. Water pump breather hose
8. Water pump
9. Radiator outlet hose

EAS20430

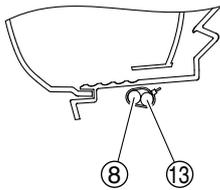
CABLE ROUTING



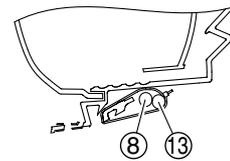
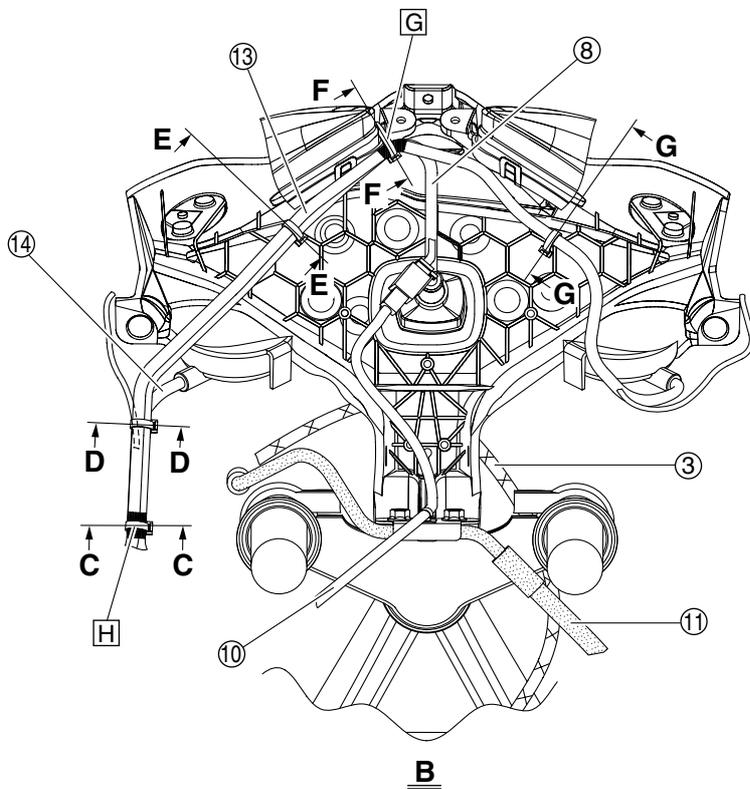
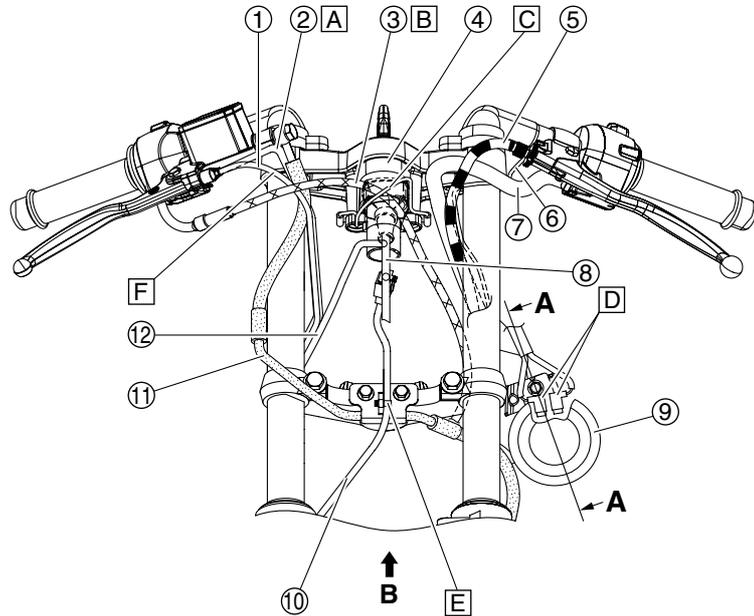
A-A



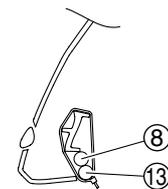
C-C



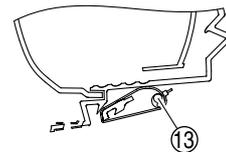
D-D



E-E

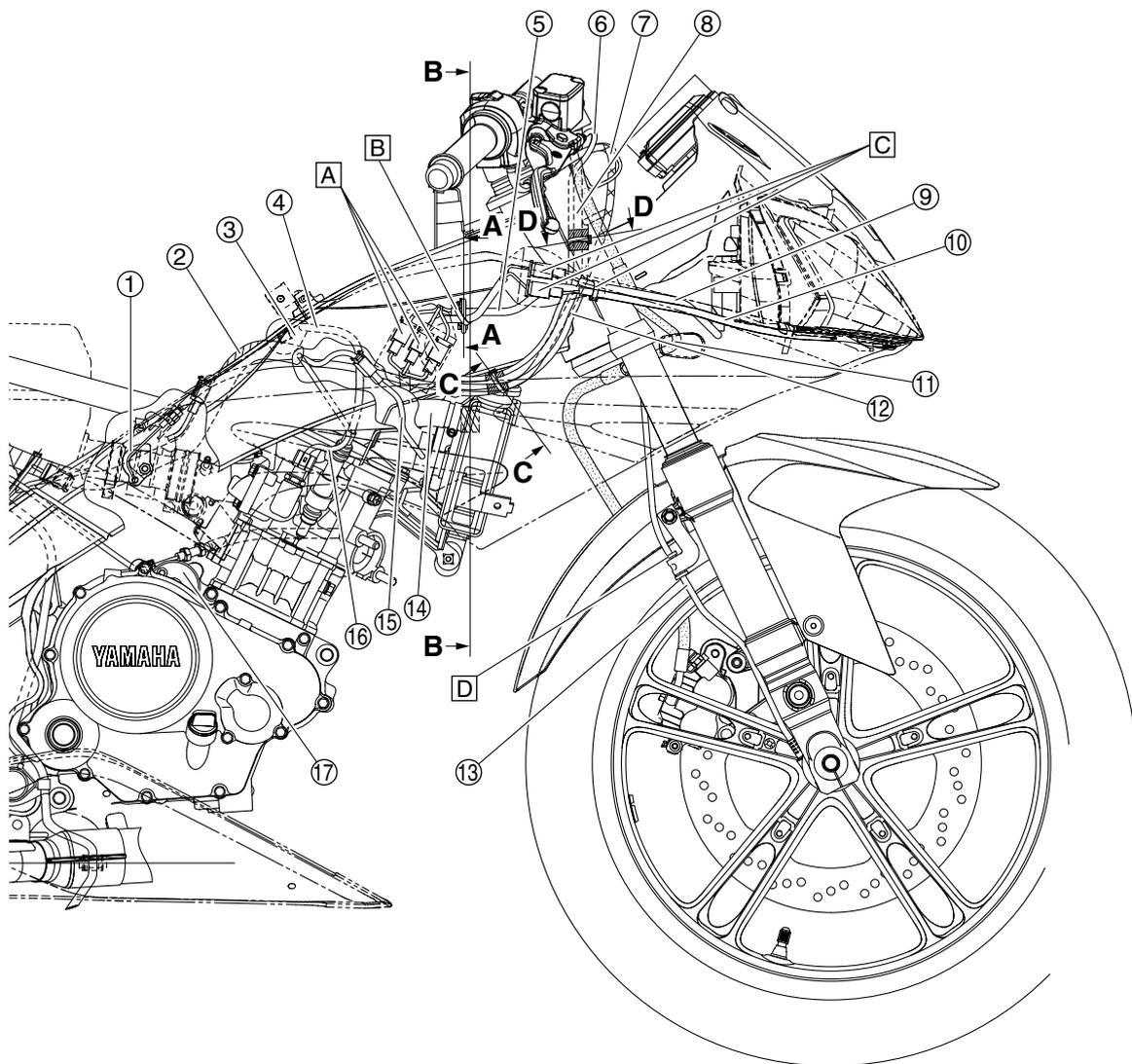
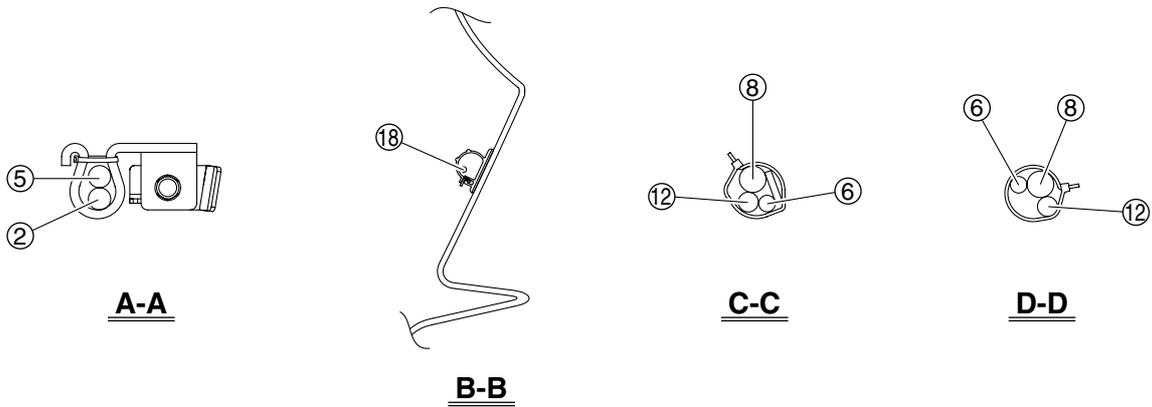


F-F

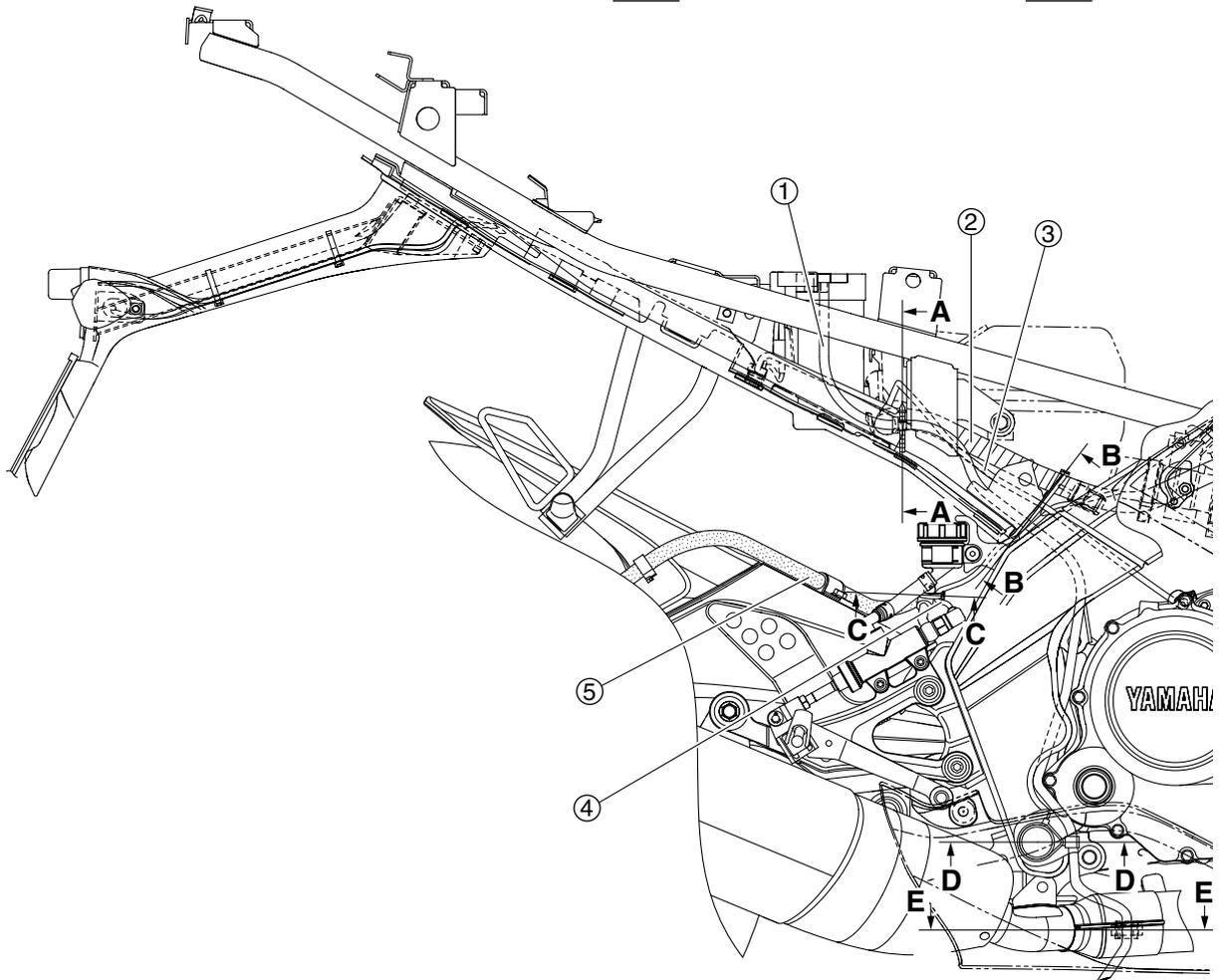
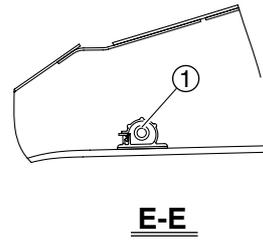
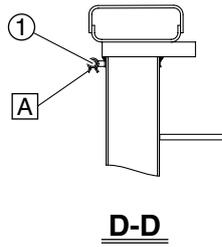
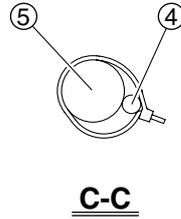
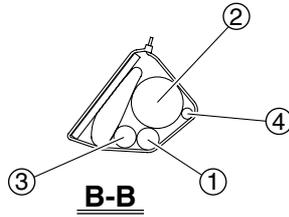
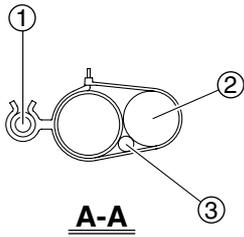


G-G

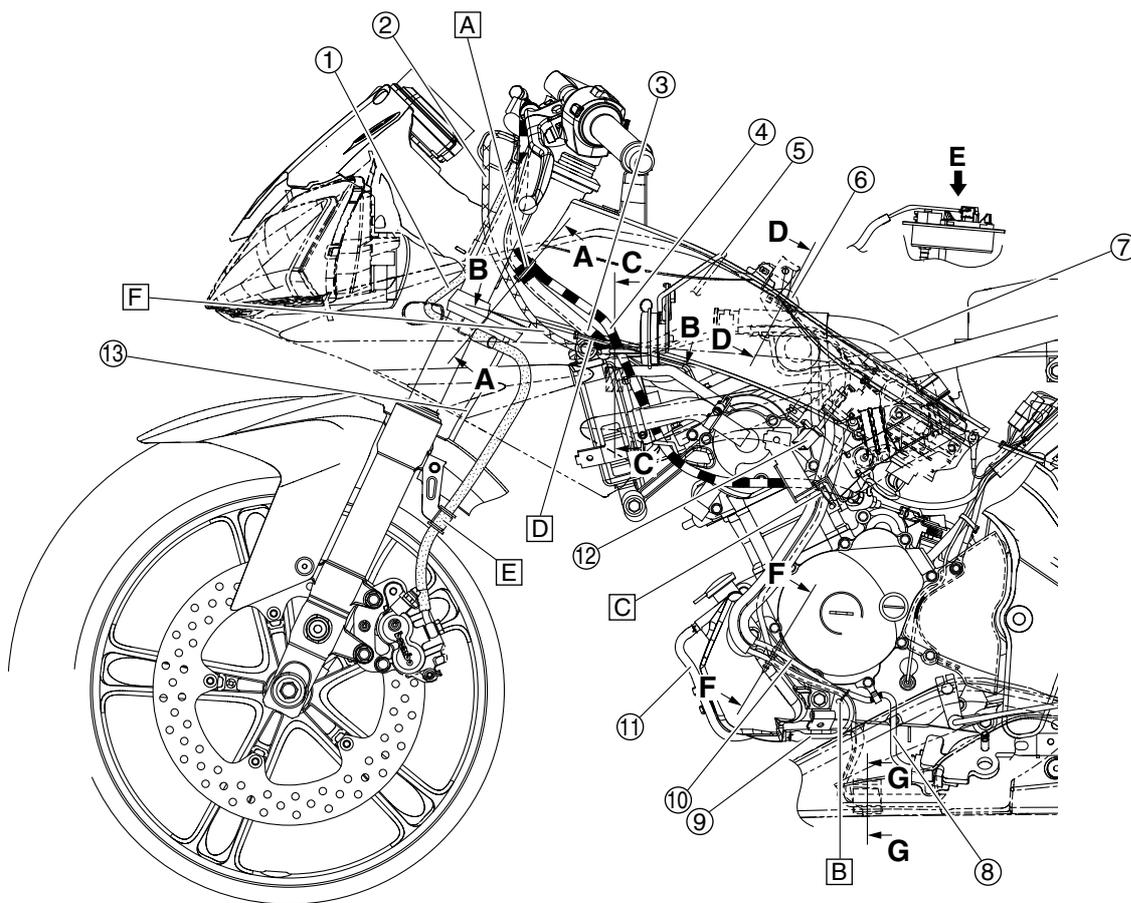
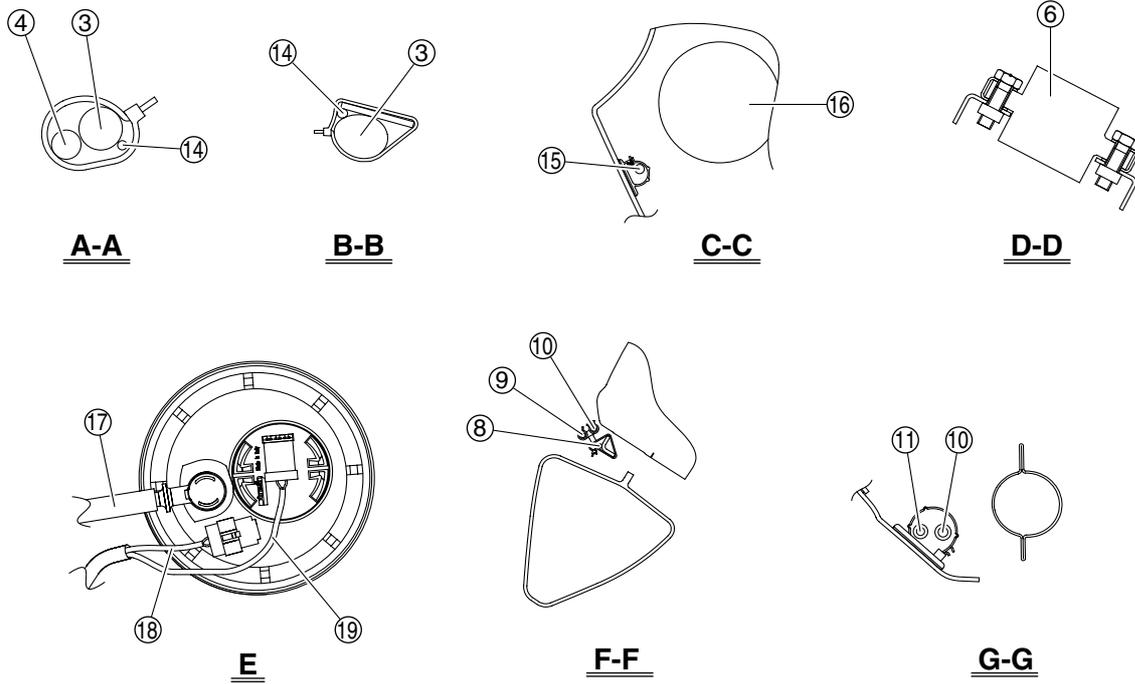
1. Front brake light switch lead
2. Right handlebar switch lead
3. Throttle cable
4. Main switch
5. Clutch cable
6. Clutch switch lead
7. Left handlebar switch lead
8. Sub-wire harness
9. Horn
10. Speed sensor lead
11. Front brake hose
12. Main switch lead
13. Left headlight assembly lead
14. Right headlight assembly lead
- A. Route the right handlebar switch lead to the rear the front brake hose.
- B. Route the throttle cable in front of the front brake light switch lead.
- C. Pass the throttle cable through the guide.
- D. Connect the horn connectors to the horn terminals as shown in the illustration.
- E. Secure the plastic locking tie by inserting the projection on the tie into the hole in the front brake pipe bracket, and then fasten the speed sensor lead with the tie.
- F. Pass the front brake light switch lead between the throttle cable and the front brake hose.
- G. Fasten the left headlight assembly lead and sub-wire harness to the right headlight body with a plastic locking tie as shown in the illustration, making sure to align the white tape on the lead and harness with the tie.
- H. Fasten the left headlight assembly lead, right headlight assembly lead, and sub-wire harness with a plastic locking tie, making sure to align the white tape on the leads and harness with the tie.



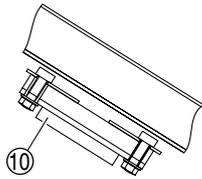
1. Throttle body
2. Wire harness
3. Ignition coil
4. Spark plug lead
5. Sub-wire harness
6. Front brake light switch lead
7. Throttle cable
8. Right handlebar switch lead
9. Right headlight assembly lead
10. Left headlight assembly lead
11. Front brake hose
12. Main switch lead
13. Speed sensor lead
14. Radiator inlet hose
15. Radiator fan motor lead
16. Wire harness (to coolant temperature sensor)
17. Starter motor
18. Front turn signal light lead
- A. Cover the sub-wire harness couplers with the coupler cover.
- B. Fasten the wire harness and sub-wire harness to the guide with a plastic locking tie.
- C. After connecting the wire harness to the left and right headlight assembly leads, cover the couplers with the coupler cover, and then fasten a plastic locking tie around the end of the cover as shown in the illustration.
- D. Fasten the grommet on the speed sensor lead with the holder.



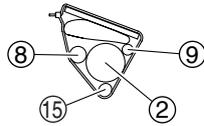
1. Battery breather hose
 2. Wire harness
 3. Starter motor lead
 4. Rear brake light switch lead
 5. Rear brake hose
- A. Fasten the battery breather hose with the holder.



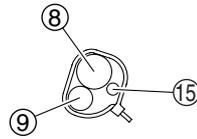
1. Front brake hose
2. Throttle cable
3. Left handlebar switch lead
4. Clutch cable
5. Wire harness (to horn)
6. Ignition coil
7. Air filter case silencer hose
8. Sidestand switch lead
9. Coolant reservoir hose
10. Fuel tank breather hose
11. Coolant reservoir breather hose
12. Front left turn signal light coupler
13. Speed sensor lead
14. Wire harness (to clutch switch)
15. Front left turn signal light lead
16. Horn
17. Fuel hose
18. Fuel pump lead
19. Fuel sender lead
- A. Fasten the left handlebar switch lead, wire harness (to clutch switch), and clutch cable with a plastic locking tie, making sure to align the white tape on the leads and cable with the tie.
- B. Fasten the sidestand switch lead, coolant reservoir hose, and fuel tank breather hose with the plastic clamp.
- C. Fasten the sidestand switch lead, coolant reservoir hose, and fuel tank breather hose to the left side cowling bracket with the plastic clamp.
- D. Fasten the wire harness (to clutch switch) and left handlebar switch lead to the left radiator bracket with a plastic locking tie, making sure to align the white tape on the harness and lead with the tie, and then route the harness and lead to the inside of the clutch cable guide.
- E. Fasten the grommet on the front brake hose with the holder.
- F. Route the throttle cable to the inside of the radiator bracket and pass the cable through the guide on the radiator cover.



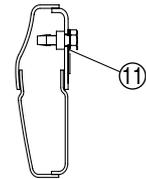
A-A



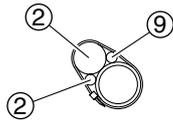
B-B



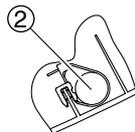
C-C



D-D



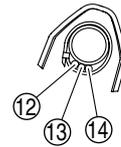
E-E



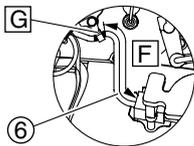
F-F



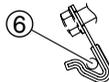
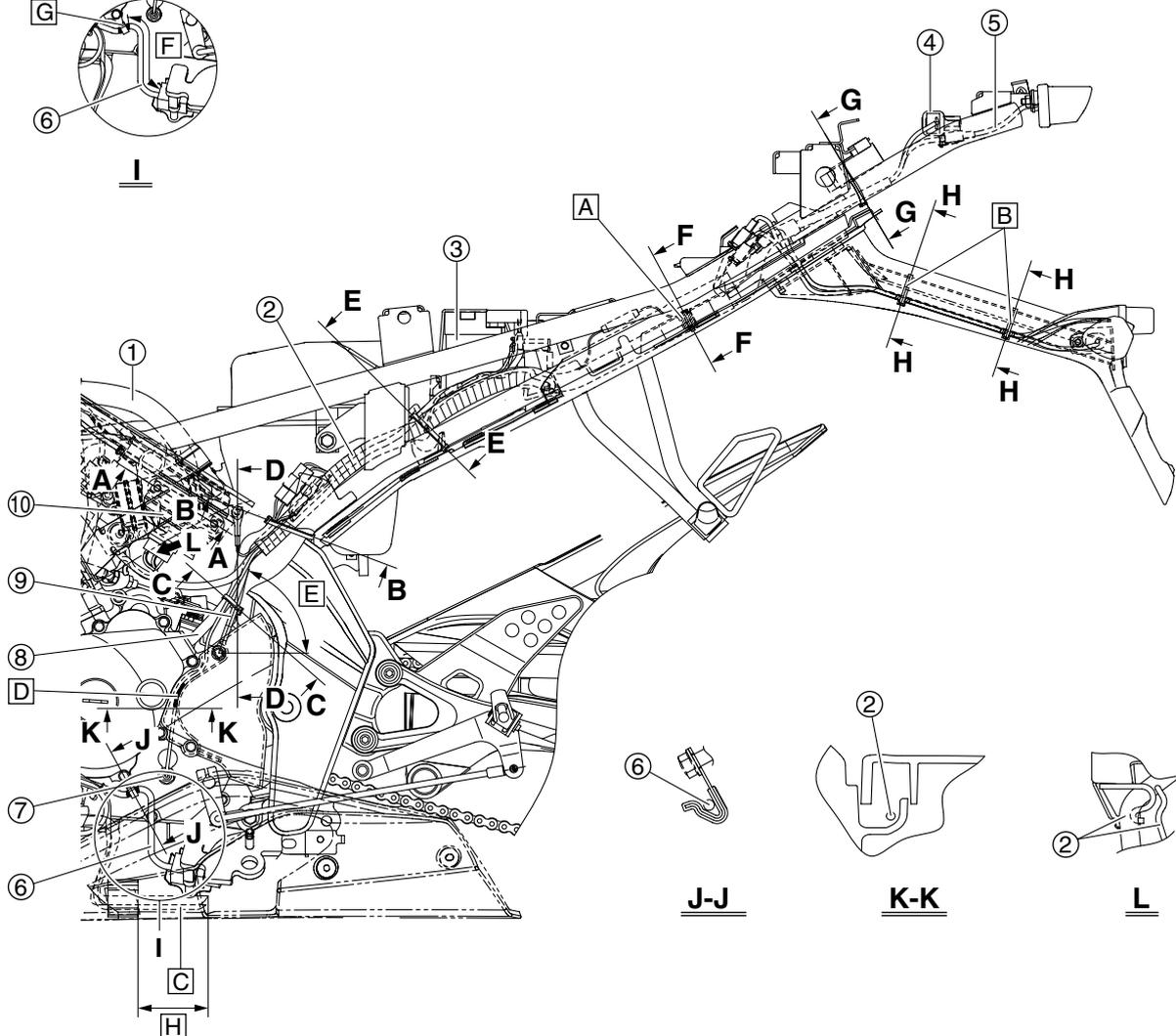
G-G



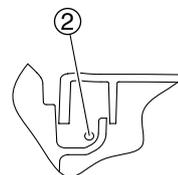
H-H



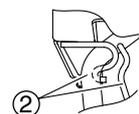
I



J-J

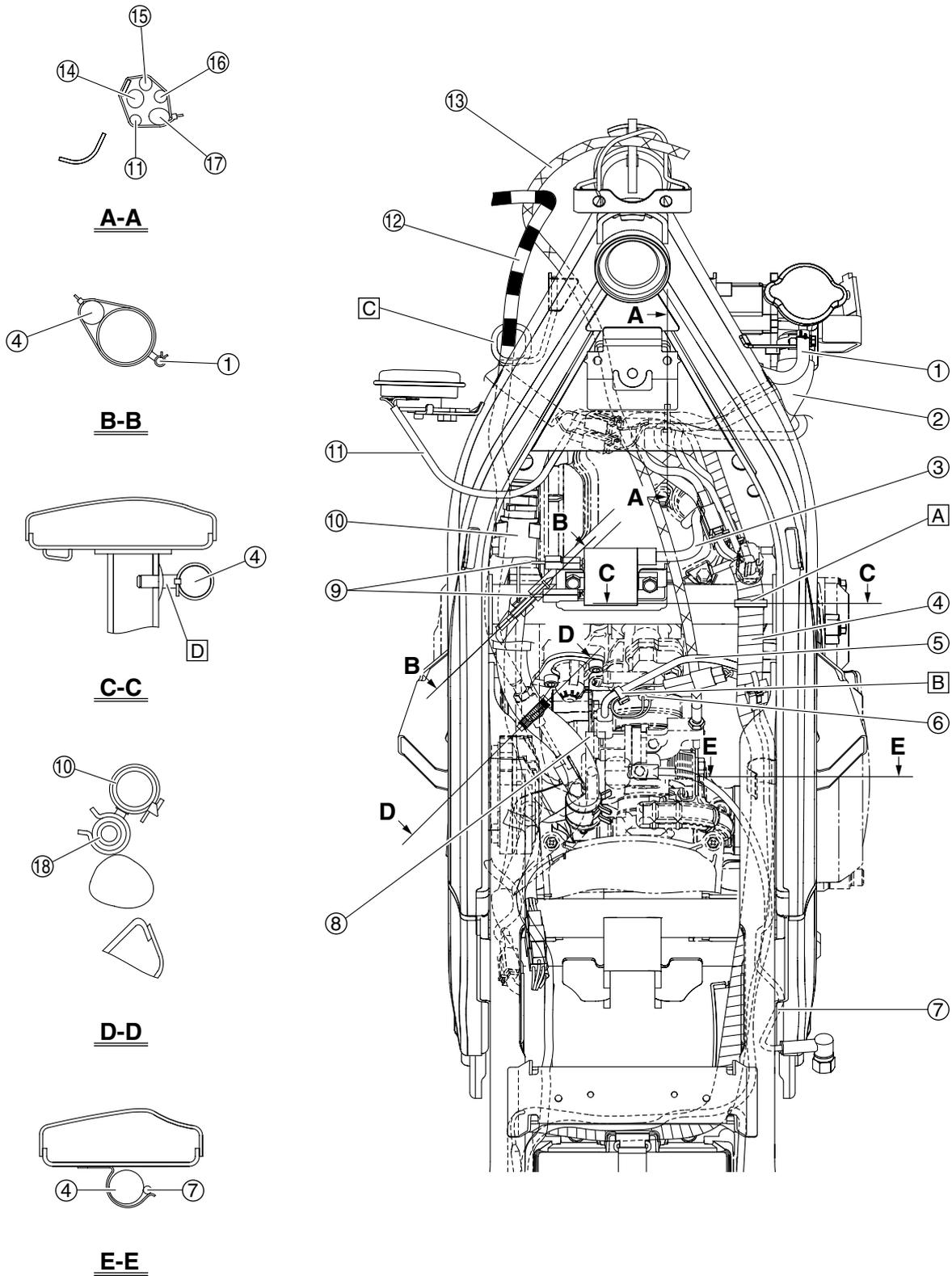


K-K

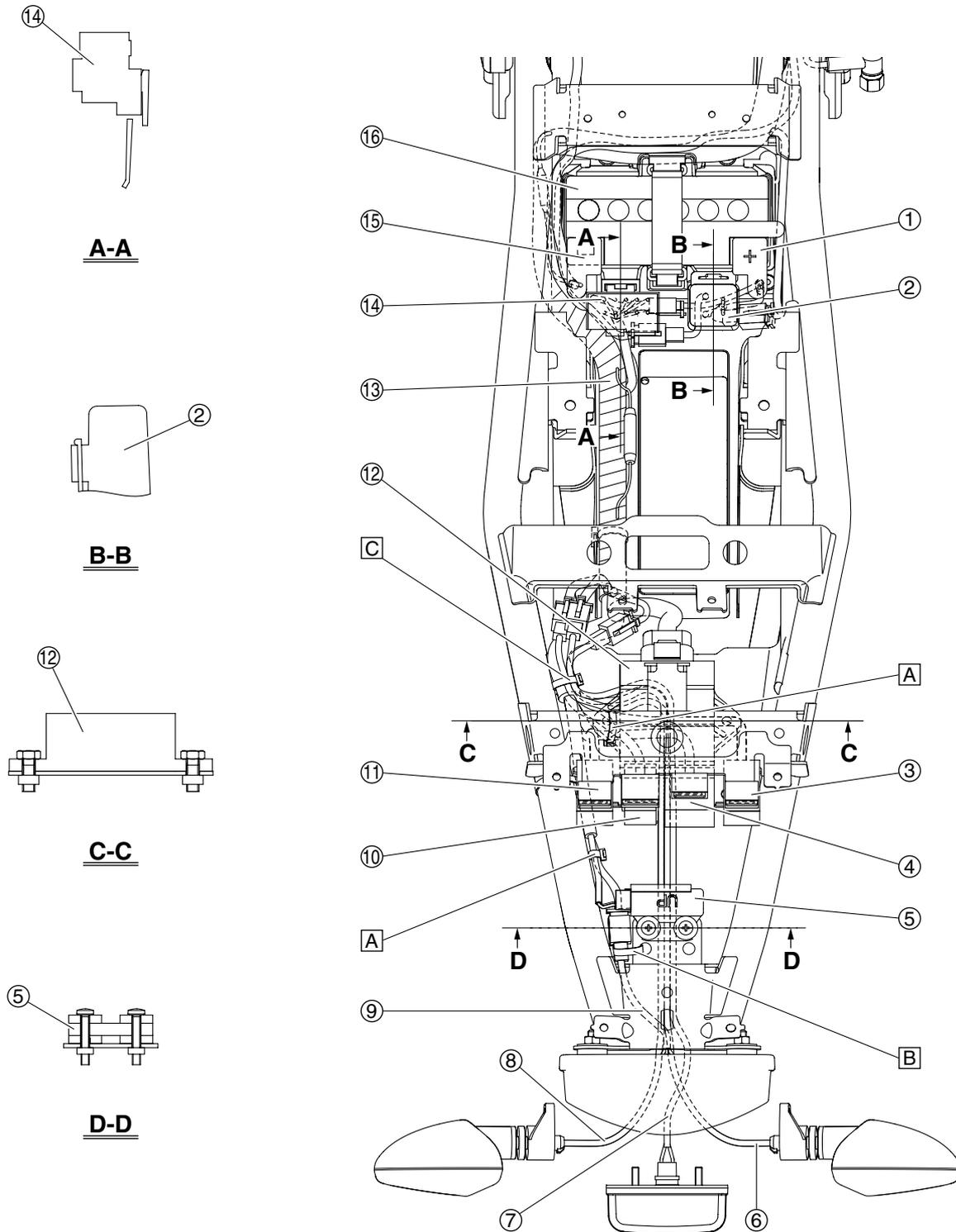


L

1. Air filter case silencer hose
2. Wire harness
3. Battery
4. Lean angle sensor
5. Tail/brake light lead
6. Sidestand switch lead
7. Neutral switch
8. Crankshaft position sensor/stator coil lead
9. Negative battery lead
10. Rectifier/regulator
11. Ground lead terminal
12. Rear right turn signal light lead
13. License plate light lead
14. Rear left turn signal light lead
15. Wire harness (to neutral switch)
 - A. Fasten the wire harness at the white tape with a plastic locking tie.
 - B. Fasten the license plate light lead, rear left turn signal light lead, and rear right turn signal light lead to the rear fender stay with plastic locking ties, making sure to align the white tape on the leads with the ties.
 - C. Route the fuel tank breather hose and coolant reservoir breather hose so that the end of each hose is positioned further rearward than the sidestand pivoting point as shown in the illustration.
 - D. Pass the wire harness (to neutral switch) through the guide on the left crankcase, making sure to align the white tape on the harness with the guide as shown in the illustration.
 - E. 50–90°
 - F. 100 mm (3.94 in)
 - G. Fasten the sidestand switch lead at the white tape with the holder.
 - H. 65 mm (2.56 in)



1. Coolant reservoir hose
 2. Radiator inlet hose
 3. Spark plug lead
 4. Wire harness
 5. FID (fast idle solenoid) lead
 6. Fuel injector lead
 7. Rear brake light switch lead
 8. Throttle body sensor assembly
 9. Ignition coil leads
 10. Air filter case silencer hose
 11. Wire harness (to horn)
 12. Clutch cable
 13. Throttle cable
 14. Wire harness (to left handlebar switch)
 15. Front brake light switch lead
 16. Right handlebar switch lead
 17. Main switch lead
 18. Cylinder head breather hose
- A. Fasten the wire harness with the plastic locking tie.
 - B. Fasten the fuel injector lead and FID (fast idle solenoid) lead with a plastic locking tie.
 - C. Pass the clutch cable through the guide.
 - D. Secure the plastic locking tie by inserting the projection on the tie into the hole in the frame.



1. Positive battery lead
 2. Starter relay
 3. Radiator fan motor relay
 4. Turn signal relay
 5. Lean angle sensor
 6. Rear right turn signal light lead
 7. License plate light lead
 8. Rear left turn signal light lead
 9. Tail/brake light lead
 10. Starting circuit cut-off relay
 11. Headlight relay
 12. ECU (engine control unit)
 13. Wire harness
 14. Fuse box
 15. Negative battery lead
 16. Battery
- A. Fasten the wire harness with a plastic locking tie.
 - B. Fasten the tail/brake light coupler to the frame with a plastic locking tie.
 - C. Fasten the license plate light lead, rear right turn signal light lead, rear left turn signal light lead, and wire harness with a plastic locking tie.

PERIODIC CHECKS AND ADJUSTMENTS

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PERIODIC MAINTENANCE

EAS20460

INTRODUCTION

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

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PERIODIC MAINTENANCE AND LUBRICATION CHART

NOTE:

- The annual checks must be performed every year, except if a kilometer-based maintenance, or for the UK, a mileage-based maintenance, is performed instead.
- From 30000 km (17500 mi), repeat the maintenance intervals starting from 6000 km (3500 mi).
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	6000 km (3500 mi)	12000 km (7000 mi)	18000 km (10500 mi)	24000 km (14000 mi)	
1	* Fuel line	<ul style="list-style-type: none"> • Check fuel hoses for cracks or damage. 		√	√	√	√	√
2	Spark plug	<ul style="list-style-type: none"> • Check condition. • Clean and regap. • Replace. 		√		√		
3	* Valves	<ul style="list-style-type: none"> • Check valve clearance. • Adjust. 		√	√	√	√	
4	* Air filter element	<ul style="list-style-type: none"> • Clean. • Replace. 		√		√		
5	* Battery	<ul style="list-style-type: none"> • Check electrolyte level and specific gravity. • Make sure that the breather hose is properly routed. 		√	√	√	√	√
6	Clutch	<ul style="list-style-type: none"> • Check operation. • Adjust. 	√	√	√	√	√	
7	* Front brake	<ul style="list-style-type: none"> • Check operation, fluid level and vehicle for fluid leakage. • Replace brake pads. 	√	√	√	√	√	√
			Whenever worn to the limit					
8	* Rear brake	<ul style="list-style-type: none"> • Check operation, fluid level and vehicle for fluid leakage. • Replace brake pads. 	√	√	√	√	√	√
			Whenever worn to the limit					
9	* Brake hoses	<ul style="list-style-type: none"> • Check for cracks or damage. • Replace. 		√	√	√	√	√
			Every 4 years					
10	* Wheels	<ul style="list-style-type: none"> • Check runout and for damage. 		√	√	√	√	
11	* Tires	<ul style="list-style-type: none"> • Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary. 		√	√	√	√	√
12	* Wheel bearings	<ul style="list-style-type: none"> • Check bearing for looseness or damage. 		√	√	√	√	
13	* Swingarm	<ul style="list-style-type: none"> • Check operation and for excessive play. • Lubricate with lithium-soap-based grease. 		√	√	√	√	
			Every 24000 km (14000 mi)					
14	Drive chain	<ul style="list-style-type: none"> • 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 or riding in the rain					

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK	
			1000 km (600 mi)	6000 km (3500 mi)	12000 km (7000 mi)	18000 km (10500 mi)	24000 km (14000 mi)		
15 *	Steering bearings	<ul style="list-style-type: none"> Check bearing play and steering for roughness. Lubricate with lithium-soap-based grease. 	√	√	√	√	√		
			Every 24000 km (14000 mi)						
16 *	Chassis fasteners	<ul style="list-style-type: none"> Make sure that all nuts, bolts and screws are properly tightened. 		√	√	√	√	√	
17	Sidestand	<ul style="list-style-type: none"> Check operation. Lubricate. 		√	√	√	√	√	
18 *	Sidestand switch	<ul style="list-style-type: none"> Check operation. 	√	√	√	√	√	√	
19 *	Front fork	<ul style="list-style-type: none"> Check operation and for oil leakage. 		√	√	√	√		
20 *	Shock absorber assembly	<ul style="list-style-type: none"> Check operation and shock absorber for oil leakage. 		√	√	√	√		
21 *	Rear suspension relay arm and connecting arm pivoting points	<ul style="list-style-type: none"> Check operation. 		√	√	√	√		
		<ul style="list-style-type: none"> Lubricate with lithium-soap-based grease. 			√		√		
22 *	Fuel injection	<ul style="list-style-type: none"> Adjust engine idling speed. 	√	√	√	√	√	√	
23	Engine oil	<ul style="list-style-type: none"> Change. 	√	2000 km (1200 mi) after the initial 1000 km (600 mi) and every 3000 km (1800 mi) thereafter					
		<ul style="list-style-type: none"> Check oil level and vehicle for oil leakage. 		Every 3000 km (1800 mi)					√
24	Engine oil filter element	<ul style="list-style-type: none"> Replace. 	√	√	√	√	√		
25 *	Cooling system	<ul style="list-style-type: none"> Check coolant level and vehicle for coolant leakage. 		√	√	√	√	√	
		<ul style="list-style-type: none"> Change. 		Every 3 years					
26 *	Front and rear brake switches	<ul style="list-style-type: none"> Check operation. 	√	√	√	√	√	√	
27	Moving parts and cables	<ul style="list-style-type: none"> Lubricate. 		√	√	√	√	√	
28 *	Throttle grip housing and cable	<ul style="list-style-type: none"> Check operation and free play. Adjust the throttle cable free play if necessary. Lubricate the throttle grip housing and cable. 		√	√	√	√	√	
29 *	Lights, signals and switches	<ul style="list-style-type: none"> Check operation. Adjust headlight beam. 	√	√	√	√	√	√	

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NOTE:

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
 - Regularly check and, if necessary, correct the brake fluid level.
 - Every two years change the brake fluid.
 - Replace the brake hoses every four years and if cracked or damaged.

EAS20471

ENGINE

EAS20520

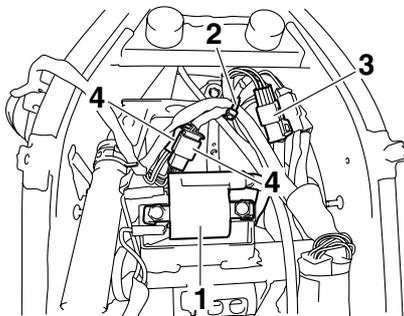
ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

NOTE:

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.

1. Remove:
 - Bottom cowling
Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
2. Disconnect:
 - Spark plug cap
3. Remove:
 - Spark plug
 - Ignition coil "1"
 - Plastic locking tie "2"
4. Disconnect:
 - Main switch coupler "3"
 - Left handlebar switch couplers "4"

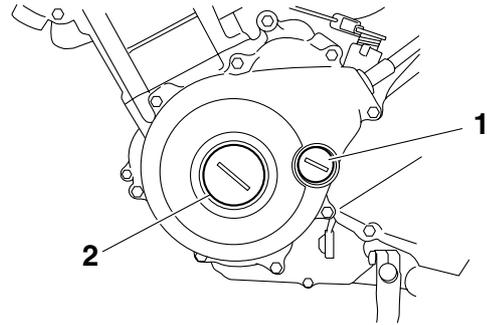


- Cylinder head cover
- Cylinder head cover gasket
Refer to "CYLINDER HEAD" on page 5-7.

NOTE:

When removing the cylinder head cover, lift it out from between the frame tubes.

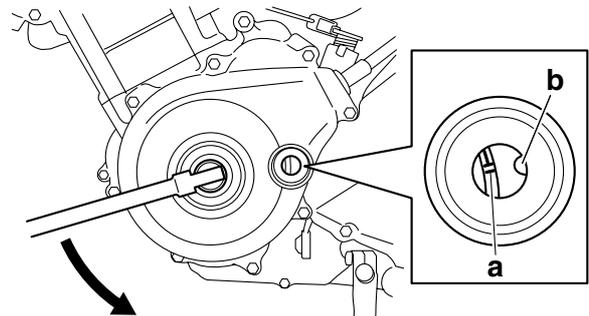
5. Remove:
 - Timing mark accessing screw "1"
 - Crankshaft end accessing screw "2"



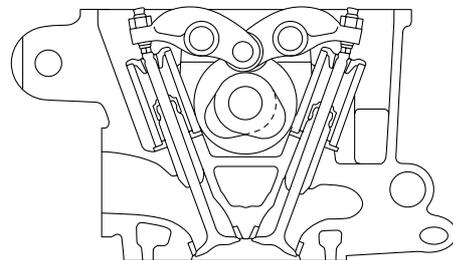
6. Measure:
 - Valve clearance
Out of specification → Adjust.

	Valve clearance (cold)
	Intake 0.10–0.14 mm (0.0039–0.0055 in)
	Exhaust 0.20–0.24 mm (0.0079–0.0094 in)

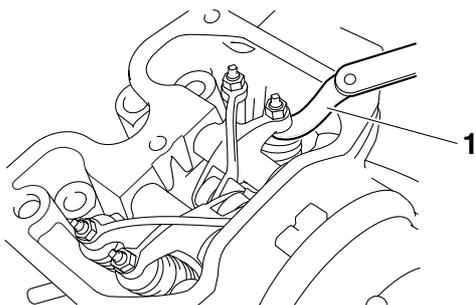
- Turn the crankshaft counterclockwise.
- Align the TDC mark "a" on the generator rotor with the stationary pointer "b" on the generator cover.



- Check that the cam lobes are positioned as shown in the illustration.



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

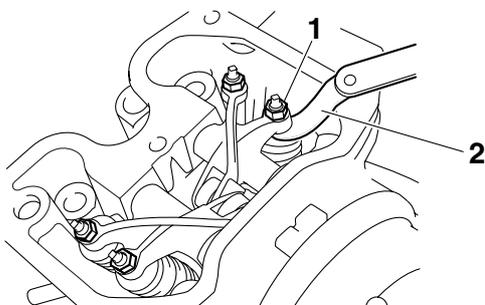


7. Adjust:

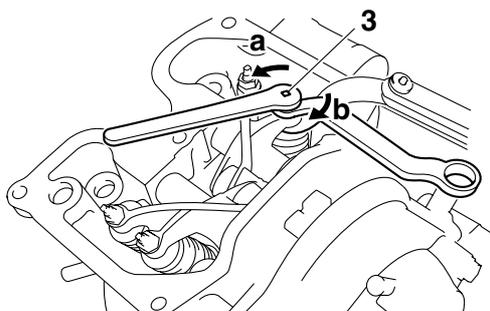
- Valve clearance



- Loosen the locknut "1".
- Insert a thickness gauge "2" between the end of the adjusting screw and the valve tip.



- Turn the adjusting screw "3" in direction "a" or "b" until the specified valve clearance is obtained.



Direction "a"
Valve clearance is increased.
Direction "b"
Valve clearance is decreased.



Tappet adjusting tool
90890-01311
Six piece tappet set
YM-A5970

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



Valve adjusting screw locknut
7 Nm (0.7 m·kg, 5.1 ft·lb)

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



- Install:
 - Crankshaft end accessing screw (along with the O-ring **New**)
 - Timing mark accessing screw (along with the O-ring **New**)
- Install:
 - Cylinder head cover gasket **New**
 - Cylinder head cover
 - Spark plug
 Refer to "CYLINDER HEAD" on page 5-7.
- Connect:
 - Left handlebar switch couplers "1"
 - Main switch coupler "2"
- Install:
 - Plastic locking tie "3" **New**

NOTE:

Fasten the wire harness (to horn), wire harness (to left handlebar switch), front brake light switch lead, right handlebar switch lead, and main switch lead to the frame with a plastic locking tie. Refer to "CABLE ROUTING" on page 2-33.

- Install:
 - Ignition coil "4"

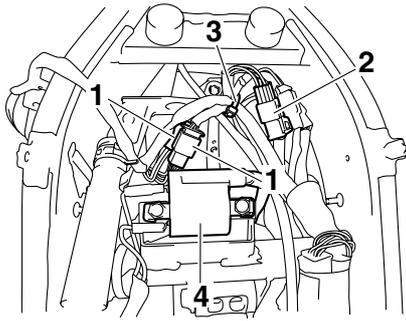


Ignition coil bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)

- Spark plug



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



13. Connect:
 - Spark plug cap
14. Install:
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
 - Bottom cowling
Refer to "GENERAL CHASSIS" on page 4-1.

EAS20600

ADJUSTING THE EXHAUST GAS VOLUME

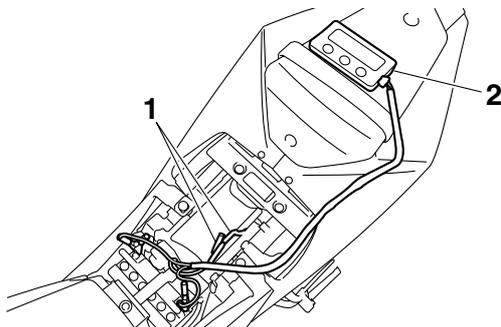
NOTE:

Be sure to set the CO density level to standard, and then adjust the exhaust gas volume.

1. Remove:
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.
2. Set the main switch to "OFF".
3. Disconnect:
 - Self-diagnosis signal connector "1"
4. Connect:
 - FI diagnostic tool "2"



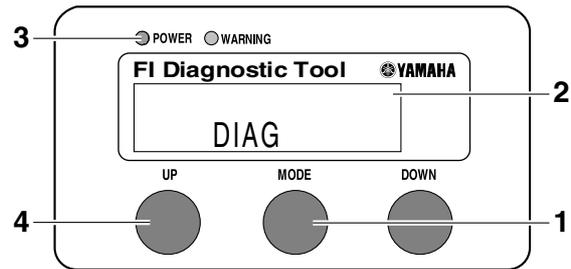
FI diagnostic tool
90890-03182



5. While pressing the "MODE" button "1", turn the main switch to "ON".

NOTE:

- "DIAG" appears on the LCD "2" of the FI diagnostic tool.
- "POWER" LED (Green) "3" comes on.

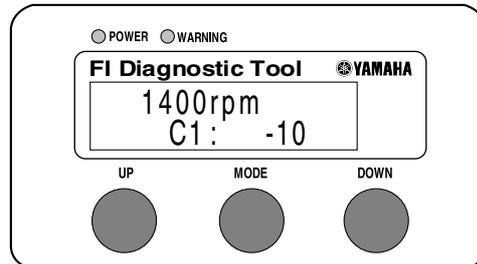


6. Press the "UP" button "4" to select the CO adjustment mode "CO" or the diagnostic mode "DIAG".
7. After selecting "CO", press the "MODE" button.
8. Check that "C1" appears on the LCD of the FI diagnostic tool, and then press the "MODE" button.
9. Start the engine.

ECA5D71023

CAUTION:

Perform the adjustment after the battery has been sufficiently charged.



10. Change the CO adjustment volume by pressing the "UP" and "DOWN" buttons.

NOTE:

The CO adjustment volume and engine idling speed appears on the LCD of the FI diagnostic tool.

- To decrease the CO adjustment volume, press the "DOWN" button.
- To increase the CO adjustment volume, press the "UP" button.

11. Release the "DOWN" and "UP" buttons to execute the selection.

12. Set the main switch to "OFF" to cancel the mode.

13. Disconnect:

- FI diagnostic tool

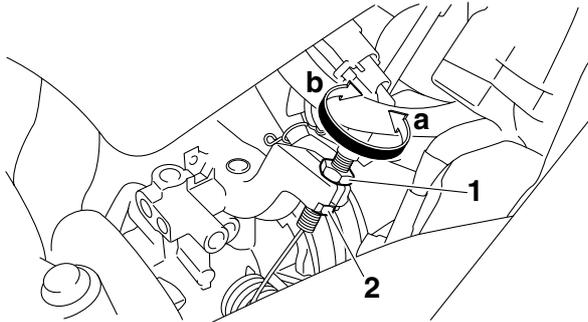
14. Connect:

- Self-diagnosis signal connector

Direction “a”
Throttle cable free play is increased.
Direction “b”
Throttle cable free play is decreased.

c. Tighten the locknut.

 **Throttle cable locknut**
7 Nm (0.7 m·kg, 5.1 ft·lb)



NOTE:

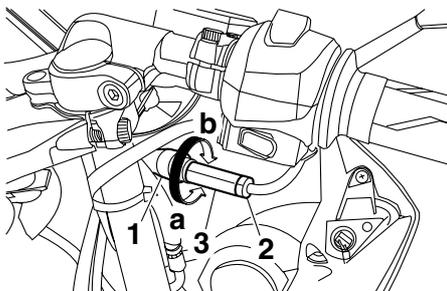
If the specified throttle cable free play cannot be obtained on the throttle body end of the cable, use the adjusting nut on the handlebar end.



Handlebar end

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

Direction “a”
Throttle cable free play is increased.
Direction “b”
Throttle cable free play is decreased.



- d. Tighten the locknut.
- e. Slide the rubber cover to its original position.

EWA12930

WARNING

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



4. Install:
 - Right side panel
 Refer to “GENERAL CHASSIS” on page 4-1.

EAS20690

CHECKING THE SPARK PLUG

1. Remove:
 - Right side cover
 Refer to “GENERAL CHASSIS” on page 4-1.
2. Disconnect:
 - Spark plug cap
3. Remove:
 - Spark plug

ECA13330

CAUTION:

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

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



Manufacturer/model
NGK/CR8E

5. Check:
 - Electrode “1”
Damage/wear → Replace the spark plug.
 - Insulator “2”
Abnormal color → Replace the spark plug.
Normal color is medium-to-light tan.
6. Clean:
 - Spark plug
(with a spark plug cleaner or wire brush)
7. Measure:
 - Spark plug gap “a”
(with a wire thickness gauge)
Out of specification → Regap.



Spark plug gap
0.7–0.8 mm (0.028–0.031 in)

Compression pressure (with oil applied into the cylinder)	
Reading	Diagnosis
Higher than without oil	Piston ring(s) wear or damage → Repair.
Same as without oil	Piston, valves, cylinder head gasket or piston possibly defective → Repair.



9. Remove:
- Extension
 - Compression gauge
10. Install:
- Spark plug

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

11. Connect:
- Spark plug cap
 - Coolant temperature sensor coupler
12. Install:
- Fuel tank
Refer to "FUEL TANK" on page 7-1.
13. Install:
- Right upper side cowling
 - Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS28920
CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

NOTE: _____

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

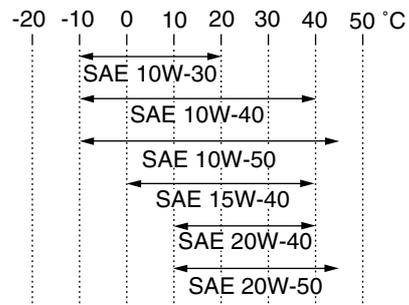
2. Start the engine, warm it up for several minutes, and then turn it off.

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.

NOTE: _____

- Before checking the engine oil level, wait a few minutes until the oil has settled.
- Do not screw the engine oil filler cap (dipstick) "1" in when checking the oil level.

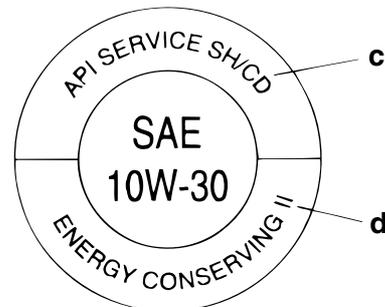
	<p>Type SAE 10W-30, SAE 10W-40, SAE 15W-40, SAE 20W-40 or SAE 20W-50</p> <p>Recommended engine oil grade API service SG type or higher, JASO standard MA</p>
---	--



ECA5D71027

CAUTION: _____

- 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" "c" or higher and do not use oils labeled "ENERGY CONSERVING II" "d".
- Do not allow foreign materials to enter the crankcase.



NOTE:

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



3. Remove:
 - Left lower side cowling
 Refer to "GENERAL CHASSIS" on page 4-1.

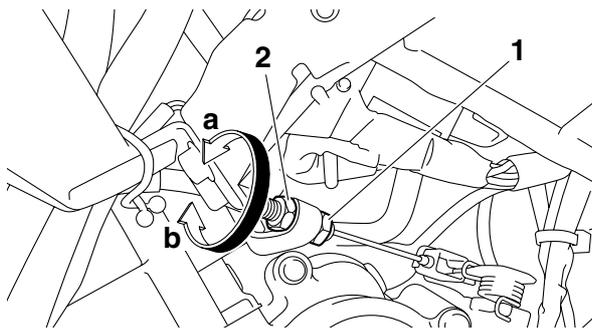


Engine end

- a. Loosen the locknut "1".
- b. Turn the adjusting nut "2" in direction "a" or "b" until the specified clutch cable free play is obtained.

Direction "a"
Clutch cable free play is increased.

Direction "b"
Clutch cable free play is decreased.



- c. Tighten the locknut.



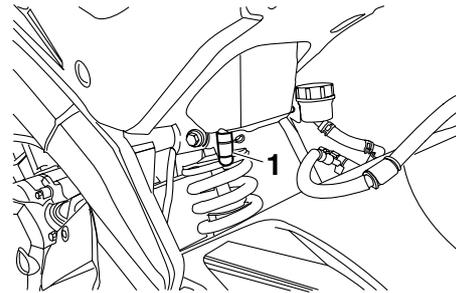
4. Install:
 - Left lower side cowling
 Refer to "GENERAL CHASSIS" on page 4-1.

EAS20921

CLEANING THE AIR FILTER ELEMENT

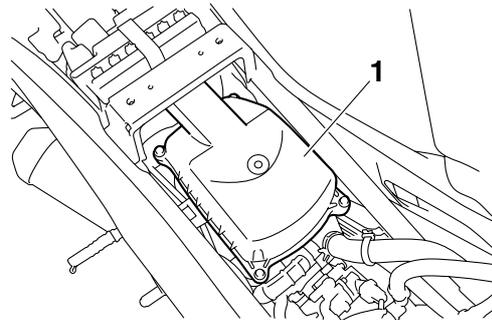
NOTE:

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

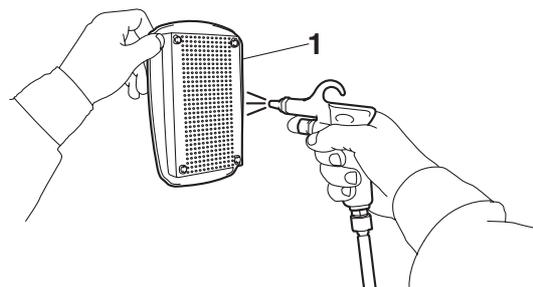


1. Remove:
 - Rider seat
 Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
 - Fuel tank
 Refer to "FUEL TANK" on page 7-1.

3. Remove:
 - Air filter case cover "1"
 - Air filter element



4. Clean:
 - Air filter element "1"
 Apply compressed air to the outer surface of the air filter element.



5. Check:
 - Air filter element
 Damage → Replace.
6. Install:
 - Air filter element
 - Air filter case cover (along with the gaskets)

ECA5D71025

CAUTION:

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

NOTE:

Make sure the air filter element is properly installed in the air filter case.

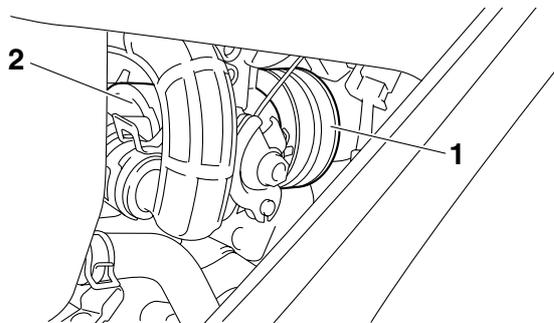
7. Install:

- Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Rider seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS5D71007

CHECKING THE THROTTLE BODY JOINT AND AIR FILTER CASE JOINT

1. Remove:
 - Right lower side cowling
 - Left lower side cowling
Refer to "GENERAL CHASSIS" on page 4-1.
2. Check:
 - Throttle body joint "1"
 - Air filter case joint "2"
Cracks/damage → Replace.



3. Install:

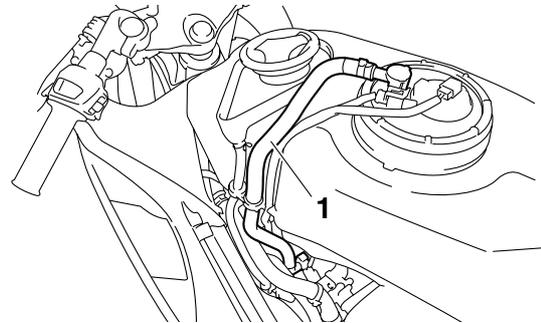
- Right lower side cowling
- Left lower side cowling
Refer to "GENERAL CHASSIS" on page 4-1.

EAS21030

CHECKING THE FUEL LINE

1. Remove:
 - Left side panel
Refer to "GENERAL CHASSIS" on page 4-1.

2. Lift the fuel tank. (Do not disconnect the fuel hose, drain hose, and couplers.)
3. Check:
 - Fuel hose "1"
Cracks/damage → Replace.
Loose connection → Connect properly.



4. Install:

- Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Left side panel
Refer to "GENERAL CHASSIS" on page 4-1.

EAS21050

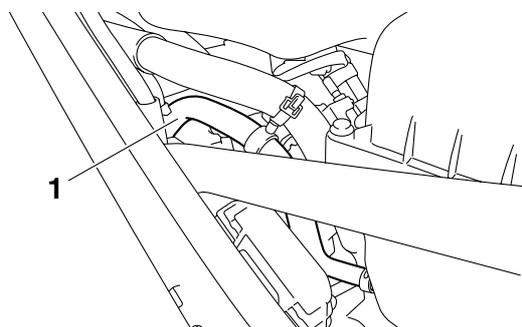
CHECKING THE CYLINDER HEAD BREATHER HOSE

1. Remove:
 - Left side panel
Refer to "GENERAL CHASSIS" on page 4-1.
2. Check:
 - Cylinder head breather hose "1"
Cracks/damage → Replace.
Loose connection → Connect properly.

ECA14920

CAUTION:

Make sure the cylinder head breather hose is routed correctly.



3. Install:

- Left side panel
Refer to "GENERAL CHASSIS" on page 4-1.

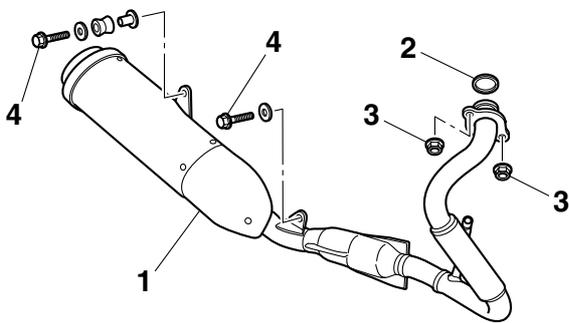
EAS21080

CHECKING THE EXHAUST SYSTEM

1. Check:
 - Exhaust assembly "1"
Cracks/damage → Replace.
 - Exhaust pipe gasket "2"
Exhaust gas leaks → Replace.
2. Check:
 - Tightening torques of the exhaust pipe nuts "3" and exhaust assembly bolts "4"



Exhaust pipe nut
20 Nm (2.0 m·kg, 14 ft·lb)
Exhaust assembly bolt
20 Nm (2.0 m·kg, 14 ft·lb)



EAS21110

CHECKING THE COOLANT LEVEL

1. Stand the vehicle on a level surface.

NOTE:

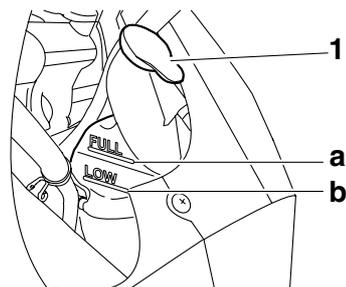
- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.

2. Check:

- Coolant level
The coolant level should be between the maximum level mark "a" and minimum level mark "b".
Below the minimum level mark → Add the recommended coolant to the proper level.

NOTE:

To access the coolant reservoir cap "1", remove the right side cover. Refer to "GENERAL CHASSIS" on page 4-1.



ECA5D71035

CAUTION:

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

3. Start the engine, warm it up for several minutes, and then turn it off.
4. Check:
 - Coolant level

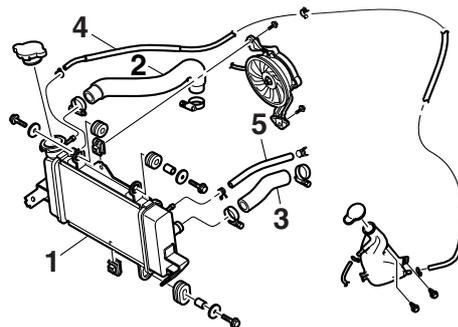
NOTE:

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

EAS21120

CHECKING THE COOLING SYSTEM

1. Remove:
 - Side covers
 - Upper side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.
2. Check:
 - Radiator "1"
 - Radiator inlet hose "2"
 - Radiator outlet hose "3"
 - Coolant reservoir hose "4"
 - Water pump breather hose "5"
Cracks/damage → Replace.
Refer to "RADIATOR" on page 6-1.



3. Install:

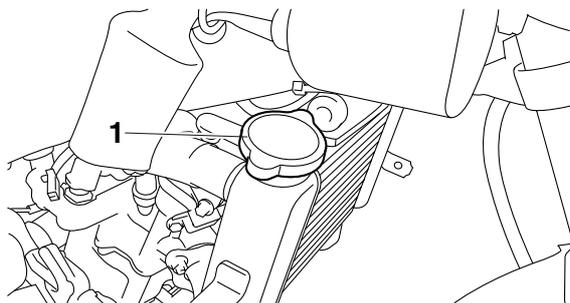
- Upper side cowlings
- Side covers
Refer to "GENERAL CHASSIS" on page 4-1.

EAS21130

CHANGING THE COOLANT

1. Remove:
 - Lower side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.

2. Remove:
 - Radiator cap "1"



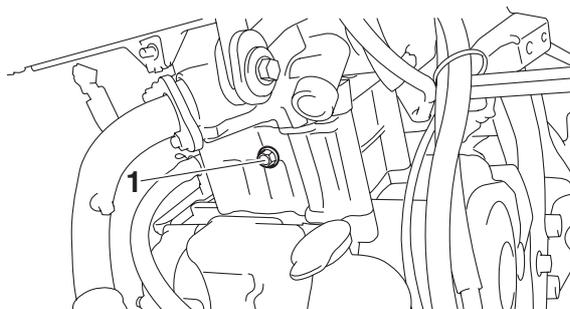
EWA13030

WARNING

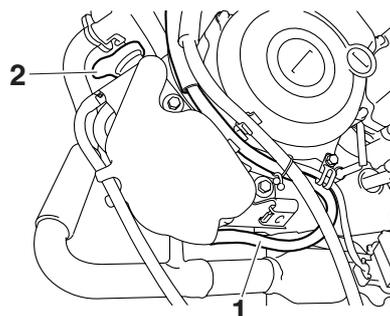
A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:

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

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



4. Drain:
 - Coolant
(from the engine and radiator)
5. Disconnect:
 - Coolant reservoir hose "1"
6. Remove:
 - Coolant reservoir cap "2"



7. Drain:
 - Coolant
(from the coolant reservoir)
8. Connect:
 - Coolant reservoir hose
9. Install:
 - Coolant drain bolt
(along with the copper washer **New**)



Coolant drain bolt
7 Nm (0.7 m·Kg, 5.1 ft·lb)

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



Recommended antifreeze
High-quality ethylene glycol anti-freeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze:water)
Radiator capacity (including all routes)
1.00 L (1.06 US qt) (0.88 Imp.qt)
Coolant reservoir capacity (up to the maximum level mark)
0.25 L (0.26 US qt) (0.22 Imp.qt)

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

EWA13040

WARNING

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

ECA5D71036

CAUTION: _____

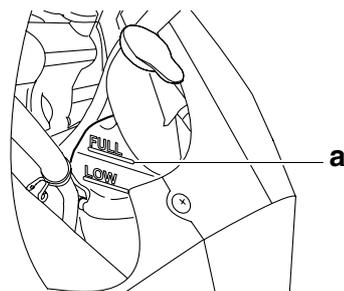
- Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant, check and, if necessary, correct the antifreeze concentration of the coolant.
- Use only distilled water. However, if distilled water is not available, soft water may be used.
- If coolant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

11. Install:

- Radiator cap

12. Fill:

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



13. Install:

- Coolant reservoir cap

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

15. Check:

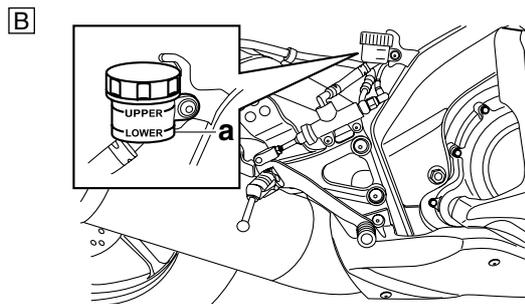
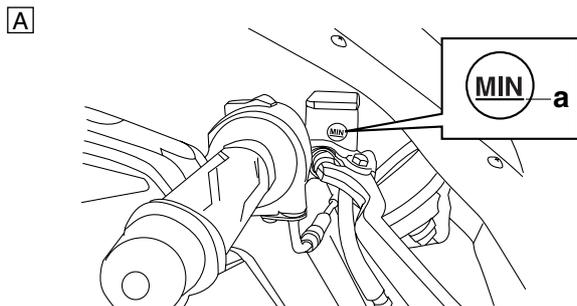
- Coolant level
Refer to "CHECKING THE COOLANT LEVEL" on page 3-15.

NOTE: _____

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

16. Install:

- Lower side cowlings
Refer to "GENERAL CHASSIS" on page 4-1.



- A. Front brake
B. Rear brake

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

CAUTION:

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

NOTE:

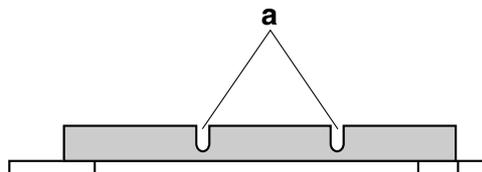
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

EAS21250

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
 - Front brake pad
Wear indicator grooves “a” have almost disappeared → Replace the brake pads as a set.
Refer to “FRONT BRAKE” on page 4-17.

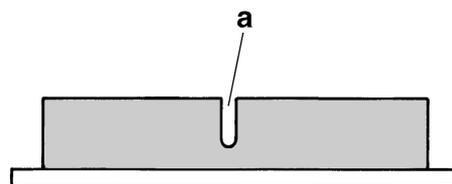


EAS21260

CHECKING THE REAR BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.
2. Check:
 - Rear brake pad
Wear indicator groove “a” has almost disappeared → Replace the brake pads as a set.
Refer to “REAR BRAKE” on page 4-28.



EAS21270

CHECKING THE FRONT BRAKE HOSE

1. Check:
 - Brake hose “1”
Cracks/damage/wear → Replace.
2. Check:
 - Brake hose holder “2”
Loose connection → Tighten the holder bolt.

- f. Fully pull the brake lever or fully press down the brake pedal and hold it in position.
- g. Loosen the bleed screw.

NOTE:

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

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



Front brake caliper bleed screw
14 Nm (1.4 m·kg, 10 ft·lb)
Rear brake caliper bleed screw
14 Nm (1.4 m·kg, 10 ft·lb)

- k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-18.

EWA13110

WARNING

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



EAS21390

ADJUSTING THE DRIVE CHAIN SLACK

NOTE:

The drive chain slack must be checked at the tightest point on the chain.

ECA13550

CAUTION:

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.

1. Stand the vehicle on a level surface.

EWA13120

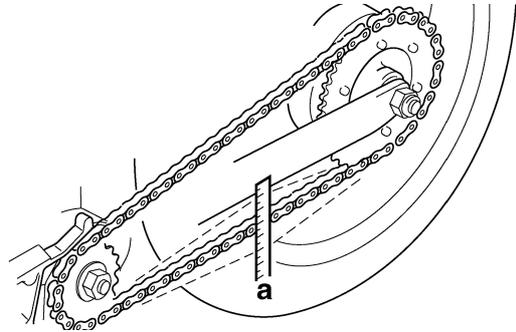
WARNING

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

NOTE:

Both wheels should be on the ground without a rider on the vehicle.

2. Turn the rear wheel several times and find the tightest position on the drive chain.
3. Check:
 - Drive chain slack "a"
Out of specification → Adjust.



Drive chain slack
30.0–40.0 mm (1.18–1.57 in)

NOTE:

Measure the drive chain slack halfway between the drive axle and the rear wheel axle.

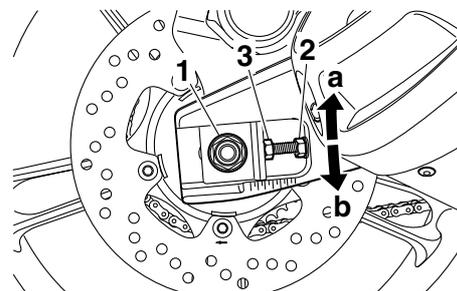
4. Adjust:

- Drive chain slack



- a. Loosen the wheel axle nut "1".
- b. Loosen both locknuts "2".
- c. Turn both adjusting bolts "3" in direction "a" or "b" until the specified drive chain slack is obtained.

Direction "a"
Drive chain is tightened.
Direction "b"
Drive chain is loosened.



NOTE:

- To maintain the proper wheel alignment, adjust both sides evenly.
- Push the rear wheel forward to make sure there is no clearance between the drive chain pullers and the ends of the adjusting bolts.

d. Tighten the wheel axle nut to specification.



Wheel axle nut
85 Nm (8.5 m·kg, 61 ft·lb)

e. Tighten the locknuts to specification.



Drive chain adjusting locknut
16 Nm (1.6 m·kg, 11 ft·lb)

EAS21440

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
Engine oil or chain lubricant
suitable for O-ring chains

EAS21510

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.

NOTE:

Place the vehicle on a suitable 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.
Binding/looseness → Adjust the steering head.

3. Remove:

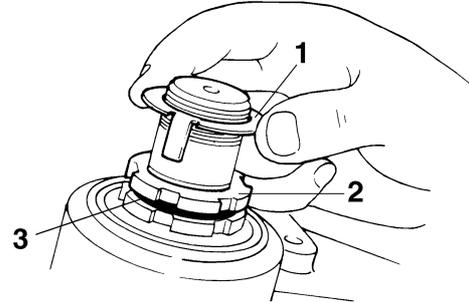
- Upper bracket
Refer to "STEERING HEAD" on page 4-52.

4. Adjust:

- Steering head



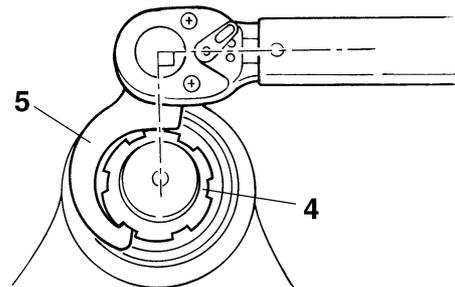
a. Remove the lock washer "1", the upper ring nut "2", and the rubber washer "3".



b. Tighten the lower ring nut "4" with a steering nut wrench "5".

NOTE:

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



Steering nut wrench
90890-01403
Spanner wrench
YU-33975



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

c. Loosen the lower ring nut "4" completely, and then tighten it to specification with a steering nut wrench.

EWA13140



WARNING

Do not overtighten the lower ring nut.



Lower ring nut (final tightening torque)
13 Nm (1.3 m·kg, 9.4 ft·lb)

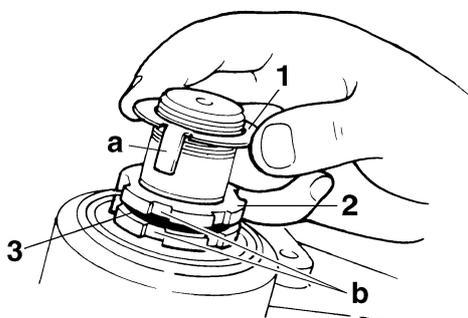
- d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.

Refer to "STEERING HEAD" on page 4-52.

- e. Install the rubber washer "3".
 f. Install the upper ring nut "2".
 g. Finger tighten the upper ring nut "2", and 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.

NOTE:

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



5. Install:
- Upper bracket
- Refer to "STEERING HEAD" on page 4-52.

EAS21530

CHECKING THE FRONT FORK

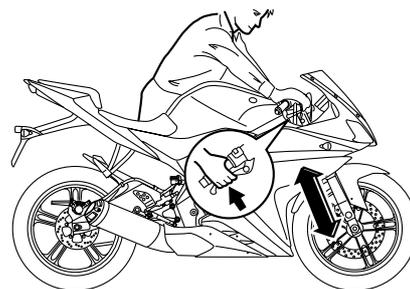
1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Check:
- Inner tube
Damage/scratches → Replace.
 - Oil seal
Oil leakage → Replace.
3. Hold the vehicle upright and apply the front brake.
4. Check:
- Front fork operation
Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
Rough movement → Repair.
Refer to "FRONT FORK" on page 4-44.

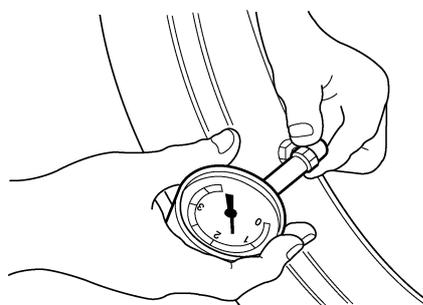


EAS21650

CHECKING THE TIRES

The following procedure applies to both of the tires.

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



EWA5D71015

WARNING

- The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.
- The tire pressure must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.
- Operation of an overloaded vehicle could cause tire damage, an accident or an injury. **NEVER OVERLOAD THE VEHICLE.**



Tire air pressure (measured on cold tires)

Loading condition

0–90 kg (0–198 lb)

Front

175 kPa (25 psi) (1.75 kgf/cm²)

Rear

200 kPa (29 psi) (2.00 kgf/cm²)

Loading condition

90–185 kg (198–408 lb)

Front

175 kPa (25 psi) (1.75 kgf/cm²)

Rear

225 kPa (33 psi) (2.25 kgf/cm²)

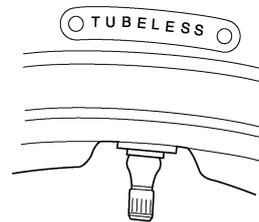
Maximum load

185 kg (408 lb)

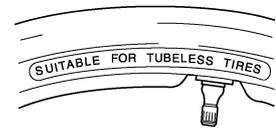
* Total weight of rider, passenger, cargo and accessories

- When using a tube tire, be sure to install the correct tube.
- Always replace a new tube tire and a new tube as a set.
- To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.
- Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.

A



B



- A. Tire
- B. Wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

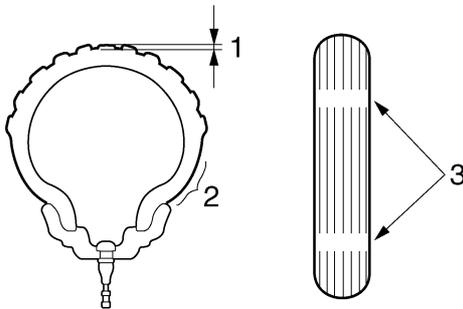
EWA13190

WARNING

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

2. Check:

- Tire surfaces
Damage/wear → Replace the tire.



1. Tire tread depth
2. Side wall
3. Wear indicator



Wear limit (front)
1.6 mm (0.06 in)
Wear limit (rear)
1.6 mm (0.06 in)

EWA14080

WARNING

- Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.



Front tire

Size

100/80–17 M/C 52H

Manufacturer/model

PIRELLI/SPORT DEMON

Manufacturer/model

MICHELIN/PILOT SPORTY



Rear tire

Size

130/70-17 M/C 62H

Manufacturer/model

PIRELLI/SPORT DEMON

Manufacturer/model

MICHELIN/PILOT SPORTY

EWA13210



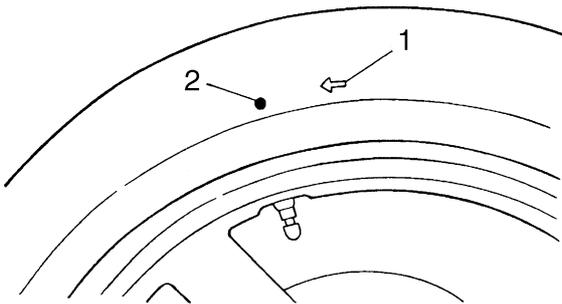
WARNING

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.

NOTE:

For tires with a direction of rotation mark "1":

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark "2" with the valve installation point.



EAS21670

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

1. Check:

- Wheel

Damage/out-of-round → Replace.

EWA13260



WARNING

Never attempt to make any repairs to the wheel.

NOTE:

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

EAS21690

CHECKING AND LUBRICATING THE CABLES

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

EWA13270



WARNING

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

1. Check:

- Outer cable
Damage → Replace.

2. Check:

- Cable operation
Rough movement → Lubricate.



Recommended lubricant

Engine oil or a suitable cable lubricant

NOTE:

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

EAS5D71038

LUBRICATING THE CLUTCH LEVER

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



Recommended lubricant

Lithium-soap-based grease

EAS5D71039

LUBRICATING THE BRAKE LEVER

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



Recommended lubricant

Silicone grease

EAS21710

LUBRICATING THE PEDALS

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



Recommended lubricant

Lithium-soap-based grease

EAS21720

LUBRICATING THE SIDESTAND

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



Recommended lubricant

Lithium-soap-based grease

EAS21740

LUBRICATING THE REAR SUSPENSION

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

	<p>Recommended lubricant Lithium-soap-based grease</p>
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EAS21750

ELECTRICAL SYSTEM

EAS21760

CHECKING AND CHARGING THE BATTERY

Refer to "ELECTRICAL COMPONENTS" on page 8-57.

EAS21770

CHECKING THE FUSES

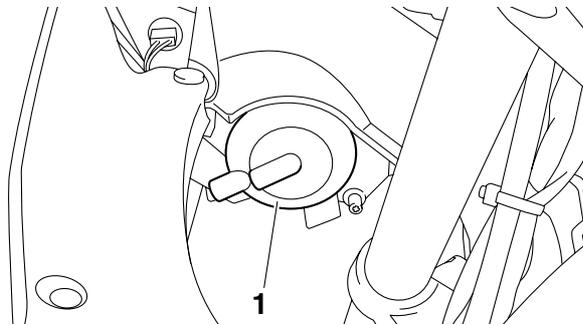
Refer to "ELECTRICAL COMPONENTS" on page 8-57.

EAS21790

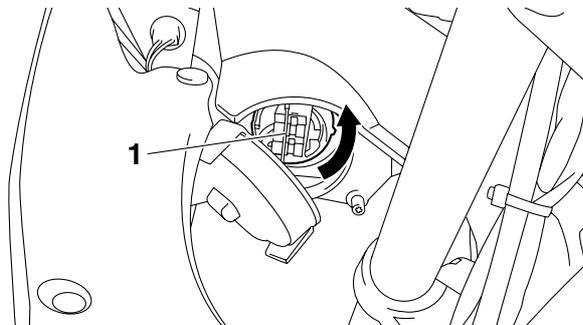
REPLACING THE HEADLIGHT BULBS

The following procedure applies to the low beam headlight bulb.

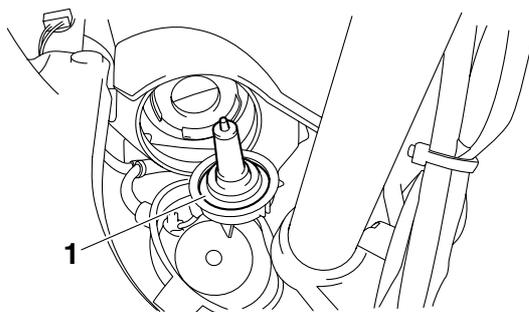
1. Remove:
 - Headlight bulb cover "1"



2. Remove:
 - Headlight bulb holder "1"



3. Remove:
 - Headlight bulb "1"



EWA13320

⚠ WARNING

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

4. Install:
 - Headlight bulb **New**
Secure the new headlight bulb with the headlight bulb holder.

ECA13690

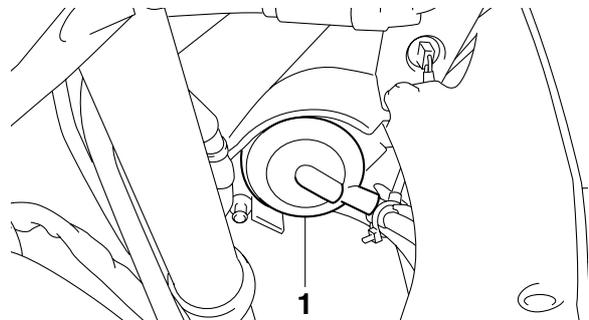
CAUTION:

Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

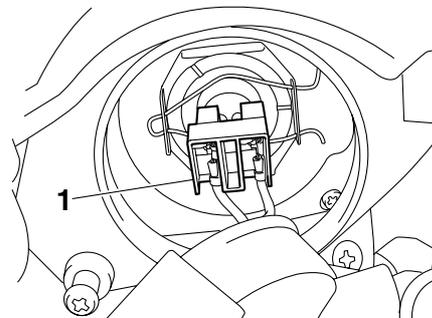
5. Install:
 - Headlight bulb holder
6. Install:
 - Headlight bulb cover

The following procedure applies to the high beam headlight bulb.

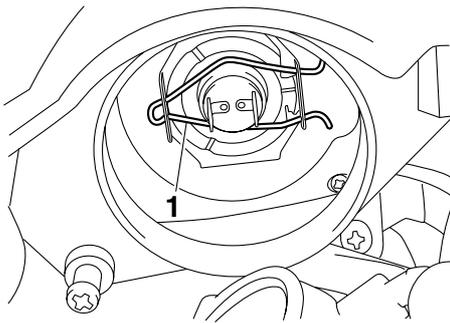
1. Remove:
 - Headlight bulb cover "1"



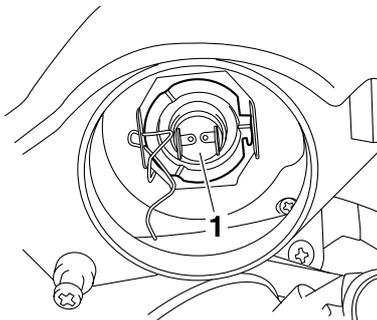
2. Disconnect:
 - Headlight coupler "1"



3. Remove:
 - Headlight bulb holder "1"



4. Remove:
- Headlight bulb "1"



EWA13320

WARNING

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

5. Install:
- Headlight bulb **New**
Secure the new headlight bulb with the headlight bulb holder.

ECA13690

CAUTION:

Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

6. Install:
- Headlight bulb holder
7. Connect:
- Headlight coupler
8. Install:
- Headlight bulb cover

EAS21810

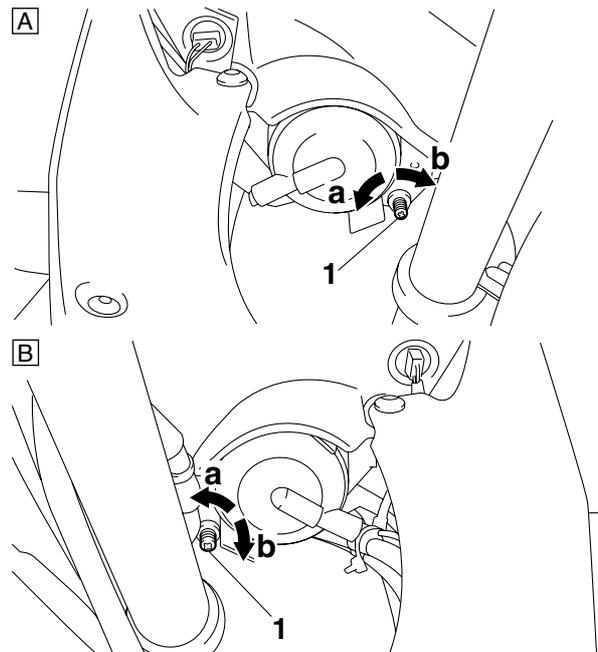
ADJUSTING THE HEADLIGHT BEAMS

The following procedure applies to both of the headlights.

1. Adjust:
- Headlight beam (vertically)

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

Direction "a"
Headlight beam is lowered.
Direction "b"
Headlight beam is raised.



- A. Left headlight
B. Right headlight

CHASSIS

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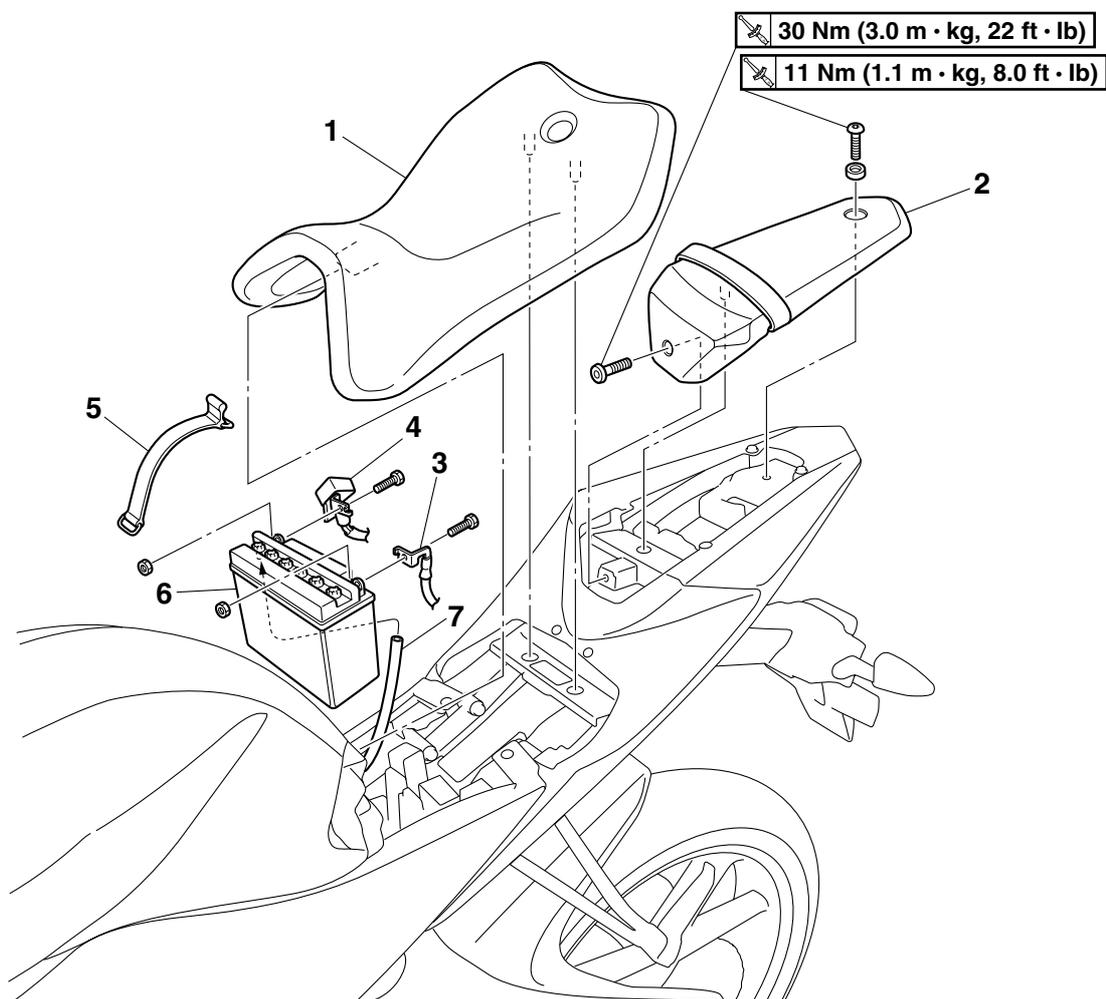
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EAS21830

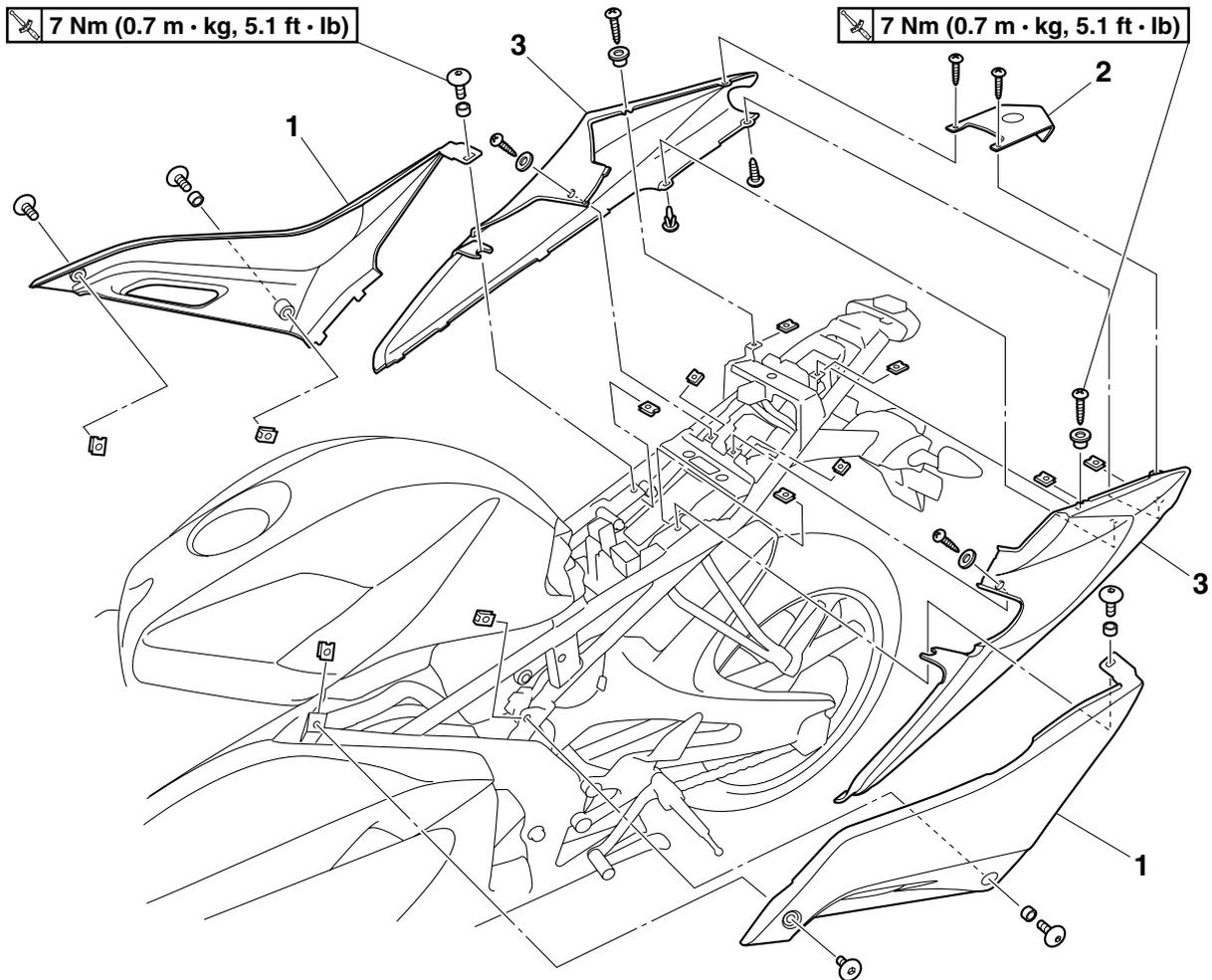
GENERAL CHASSIS

Removing the seats and battery



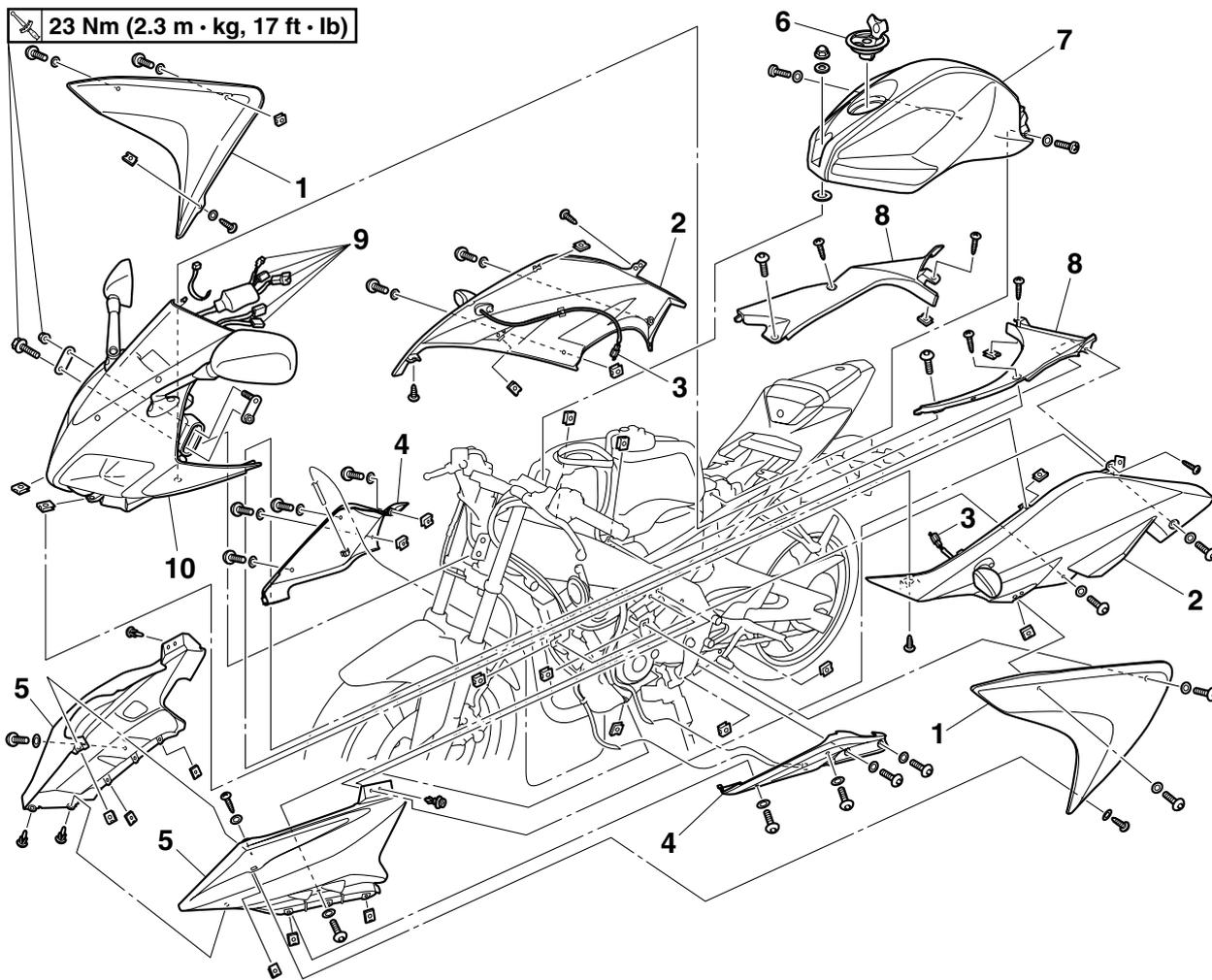
Order	Job/Parts to remove	Q'ty	Remarks
1	Rider seat	1	
2	Passenger seat	1	
3	Negative battery lead	1	Disconnect.
4	Positive battery lead	1	Disconnect.
5	Battery band	1	
6	Battery	1	
7	Battery breather hose	1	Disconnect.
			For installation, reverse the removal procedure.

Removing the rear side cowlings



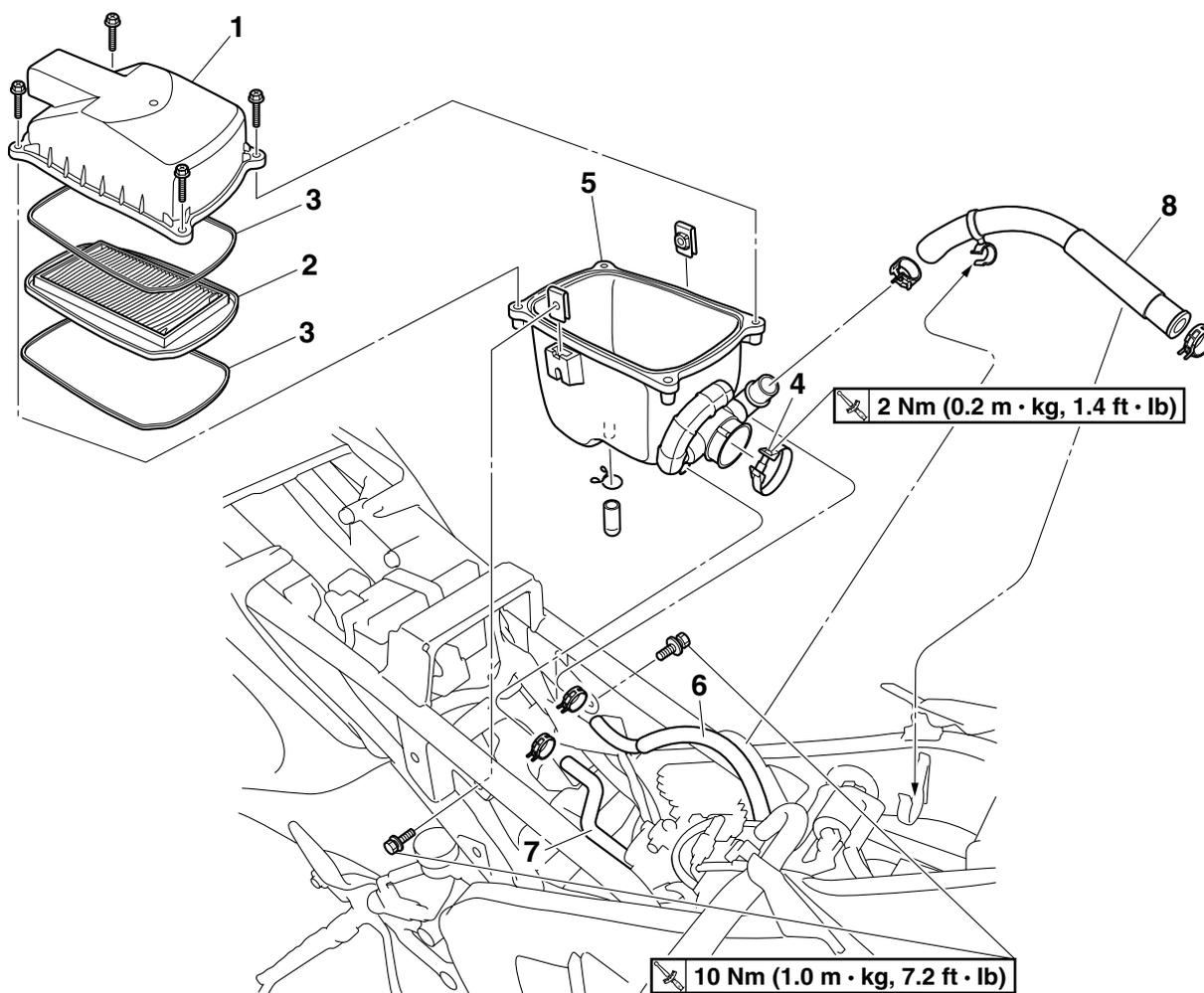
Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Passenger seat		Refer to "GENERAL CHASSIS" on page 4-1.
1	Side panel	2	
2	Rear panel	1	
3	Rear side cowling	2	
			For installation, reverse the removal procedure.

Removing the side cowlings and front cowling assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Side panels		Refer to "GENERAL CHASSIS" on page 4-1.
1	Side cover	2	
2	Upper side cowling	2	
3	Front turn signal light coupler	2	
4	Bottom cowling	2	
5	Lower side cowling	2	
6	Fuel tank cap	1	
7	Fuel tank cover	1	
8	Front panel	2	
9	Sub-wire harness coupler	5	
10	Front cowling assembly	1	
			For installation, reverse the removal procedure.

Removing the air filter case



Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Air filter case cover	1	
2	Air filter element	1	
3	Air filter case seal	2	
4	Air filter case joint clamp screw	1	Loosen.
5	Air filter case	1	
6	Cylinder head breather hose	1	Disconnect.
7	Air induction system hose (air filter case to reed valve assembly)	1	Disconnect.
8	Air filter case silencer hose	1	
			For installation, reverse the removal procedure.

EAS5D71027

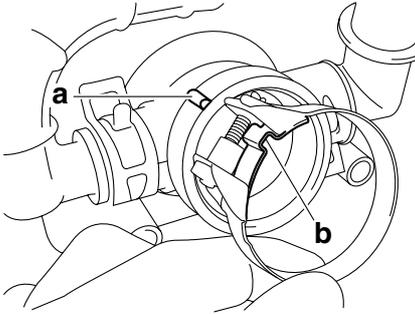
INSTALLING THE AIR FILTER CASE

1. Install:

- Air filter case joint clamp

NOTE: _____

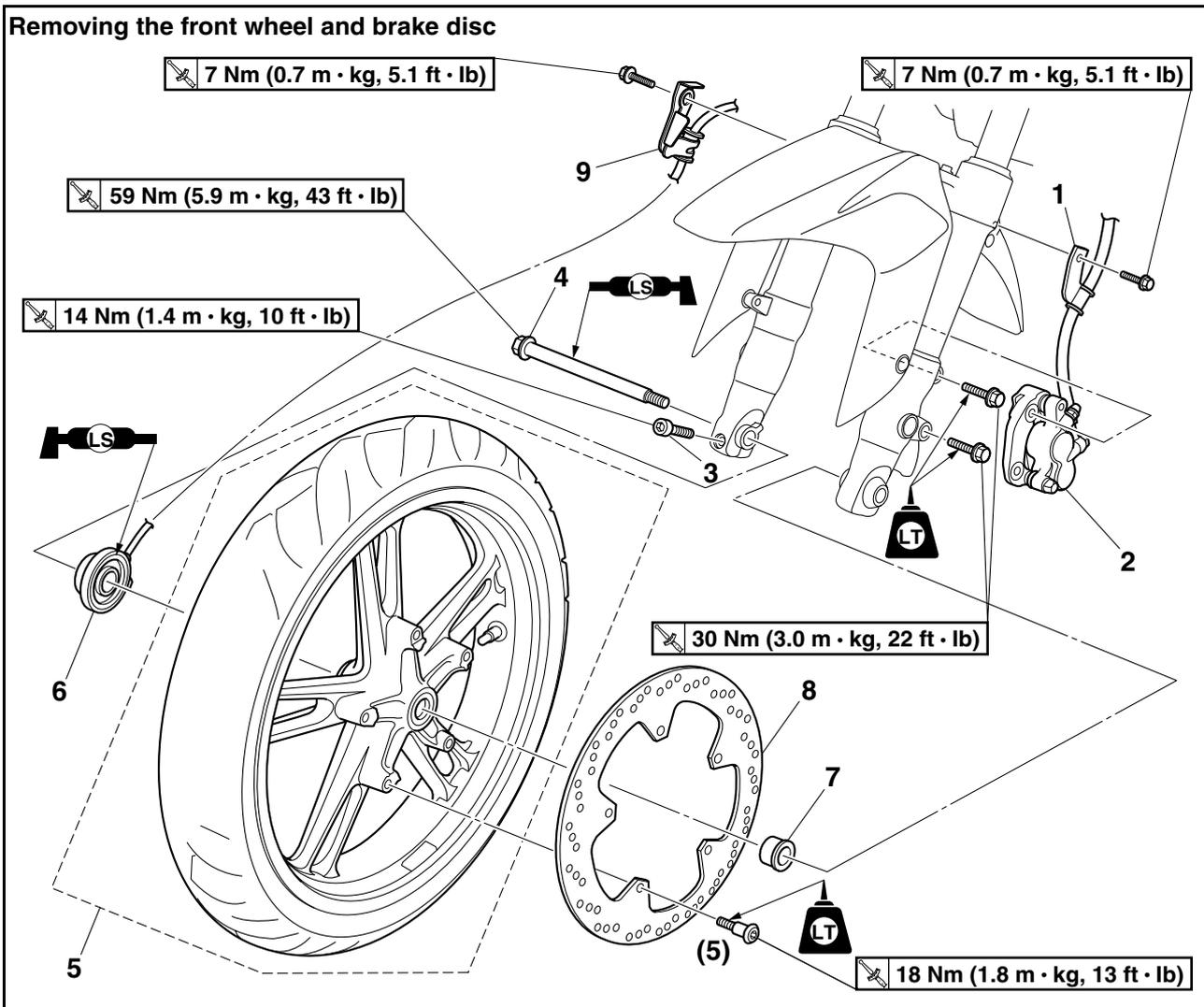
Align the projection "a" on the air filter case with the slot "b" in the air filter case joint clamp.



EAS21870

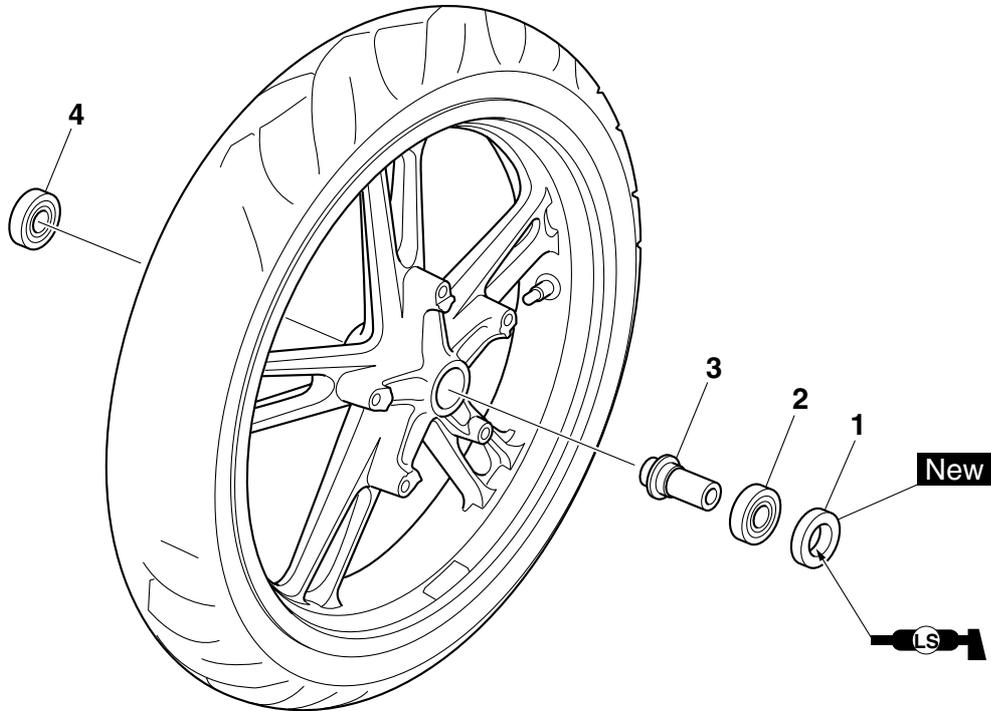
FRONT WHEEL

Removing the front wheel and brake disc



Order	Job/Parts to remove	Q'ty	Remarks
			NOTE: Place the vehicle on a suitable stand so that the front wheel is elevated.
1	Front brake hose holder	1	
2	Front brake caliper	1	
3	Front wheel axle pinch bolt	1	
4	Front wheel axle	1	
5	Front wheel	1	
6	Speed sensor	1	
7	Collar	1	
8	Front brake disc	1	
9	Speed sensor lead holder	1	
			For installation, reverse the removal procedure.

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	1	
2	Bearing	1	
3	Spacer	1	
4	Bearing	1	
			For assembly, reverse the disassembly procedure.

EAS21890

REMOVING THE FRONT WHEEL (DISC)

1. Stand the vehicle on a level surface.

EWA13120

⚠ WARNING

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

2. Elevate:
 - Front wheel

NOTE:

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

3. Remove:
 - Front brake caliper

NOTE:

Do not squeeze the brake lever when removing the front brake caliper.

EAS21910

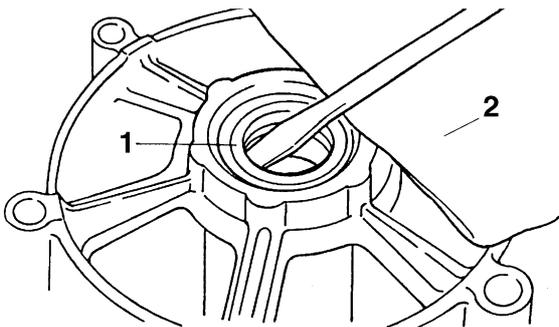
DISASSEMBLING THE FRONT WHEEL

1. Remove:
 - Oil seal
 - Wheel bearings

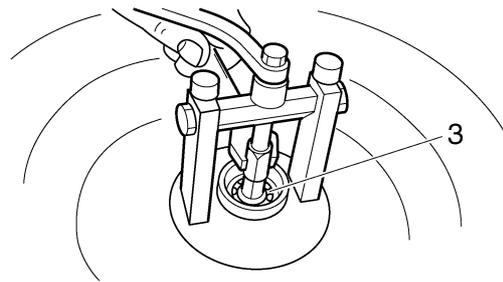
- a. Clean the surface of the front wheel hub.
- b. Remove the oil seal "1" with a flat-head screwdriver.

NOTE:

To prevent damaging the wheel, place a rag "2" between the screwdriver and the wheel surface.



- c. Remove the wheel bearings "3" with a general bearing puller.



EAS21920

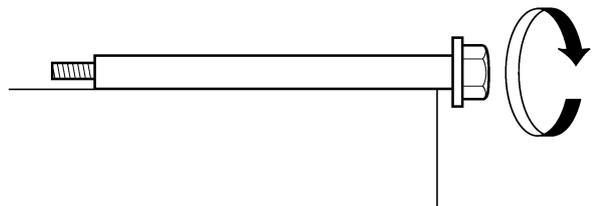
CHECKING THE FRONT WHEEL

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

EWA13460

⚠ WARNING

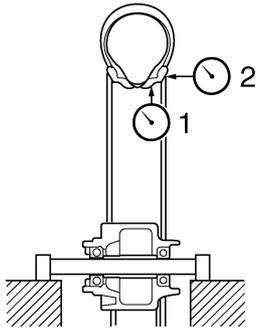
Do not attempt to straighten a bent wheel axle.



2. Check:
 - Tire
 - Front wheel
 - Damage/wear → Replace.
 - Refer to "CHECKING THE TIRES" on page 3-23 and "CHECKING THE WHEELS" on page 3-25.
3. Measure:
 - Radial wheel runout "1"
 - Lateral wheel runout "2"
 - Over the specified limits → Replace.

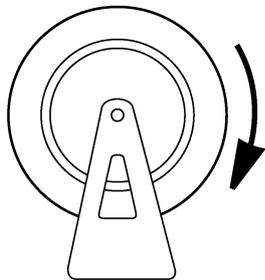


Radial wheel runout limit
0.5 mm (0.02 in)
Lateral wheel runout limit
1.0 mm (0.04 in)



4. Check:

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



EAS21960

ASSEMBLING THE FRONT WHEEL

1. Install:

- Wheel bearings **New**
- Oil seal **New**

a. Install the new wheel bearings and oil seal in the reverse order of disassembly.

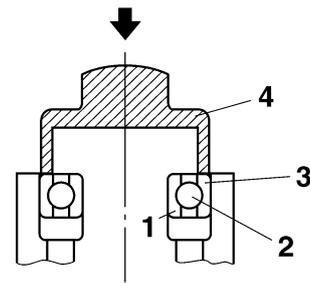
ECA5D71009

CAUTION:

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

NOTE:

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



EAS21970

ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:

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

1. Remove:

- Balancing weight(s)

2. Find:

- Front wheel's heavy spot

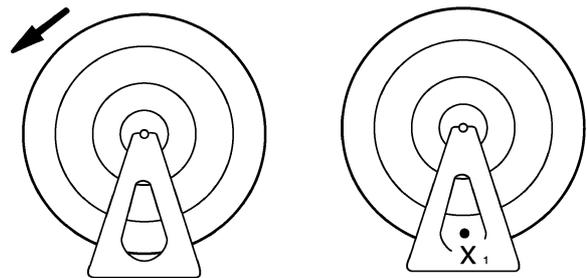
NOTE:

Place the front wheel on a suitable balancing stand.



a. Spin the front wheel.

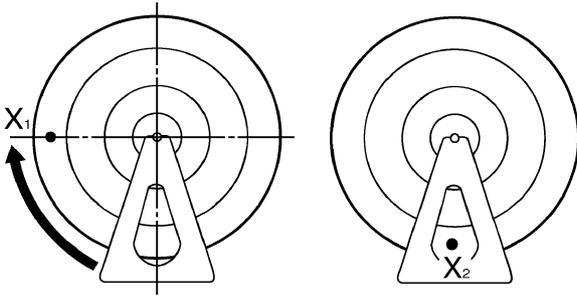
- b. When the front wheel stops, put an "X₁" mark at the bottom of the wheel.



- c. Turn the front wheel 90° so that the "X₁" mark is positioned as shown.

d. Release the front wheel.

- e. When the wheel stops, put an "X₂" mark at the bottom of the wheel.

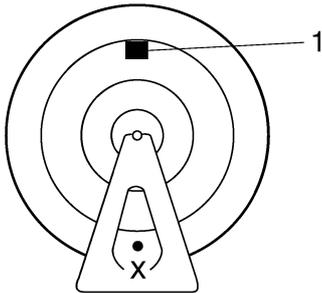


- f. Repeat steps (c) through (e) several times until all the marks come to rest at the same spot.
- g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

3. Adjust:

- Front wheel static balance

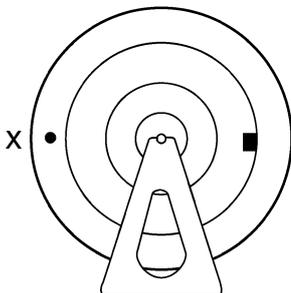
- a. Install a balancing weight "1" onto the rim exactly opposite the heavy spot "X".



NOTE:

Start with the lightest weight.

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

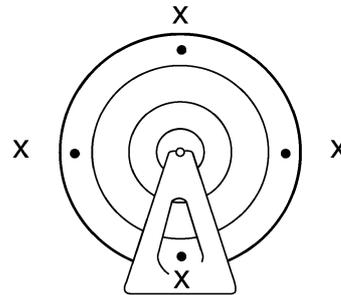


- c. If the heavy spot does not stay in that position, install a heavier weight.
- d. Repeat steps (b) and (c) until the front wheel is balanced.

4. Check:

- Front wheel static balance

- a. Turn the front wheel and make sure it stays at each position shown.



- b. If the front wheel does not remain stationary at all of the positions, rebalance it.

EAS21990

INSTALLING THE FRONT WHEEL (DISC)

1. Install:

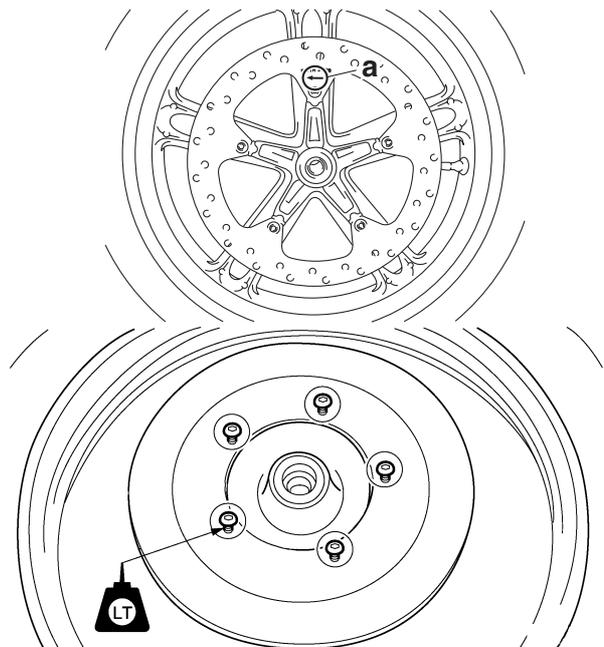
- Front brake disc



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

NOTE:

- Be sure to install the front brake disc with the arrow mark "a" on the disc facing out.
- Tighten the brake disc bolts in stages and in a crisscross pattern.



2. Check:

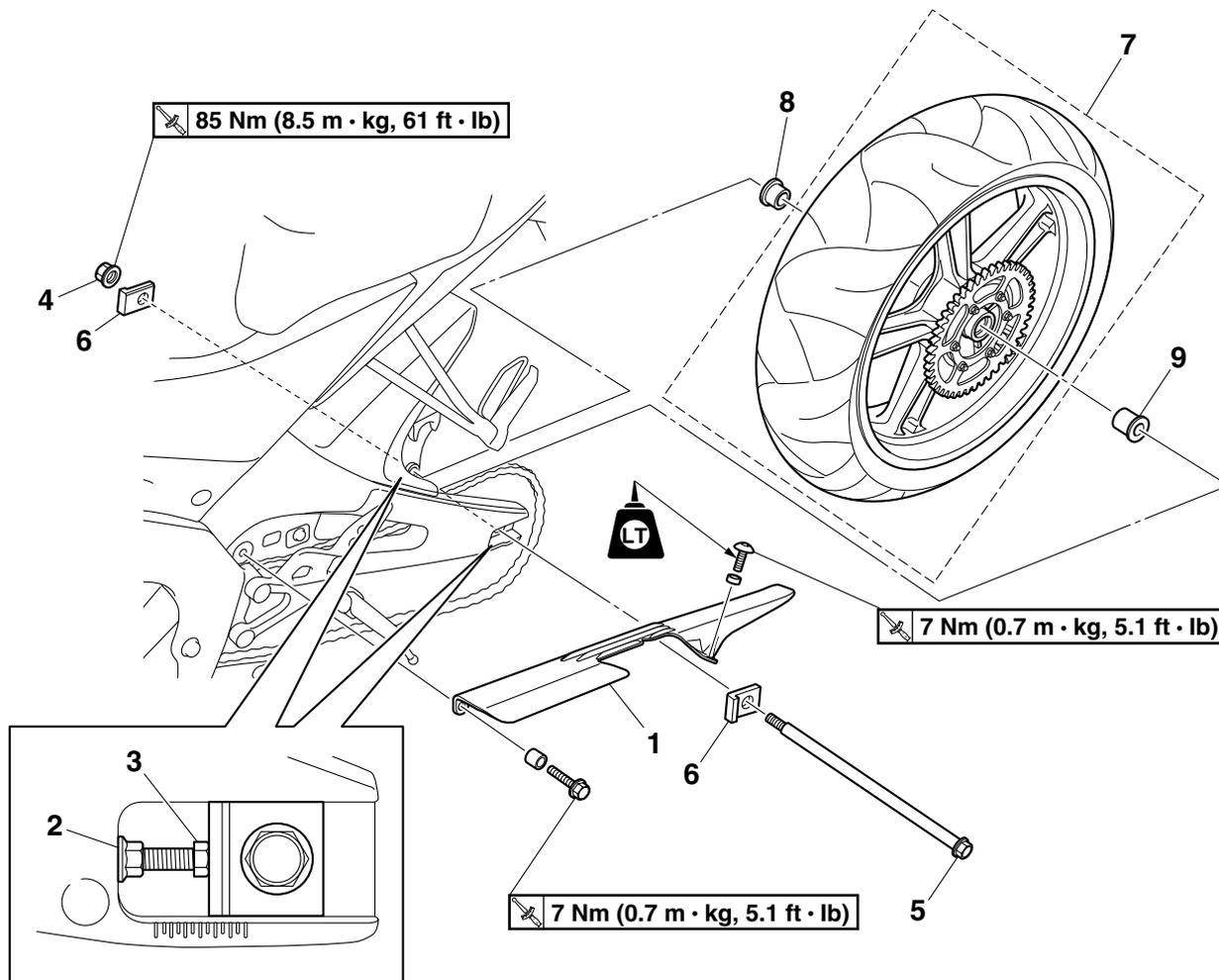
- Front brake disc

Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-21.

EAS22020

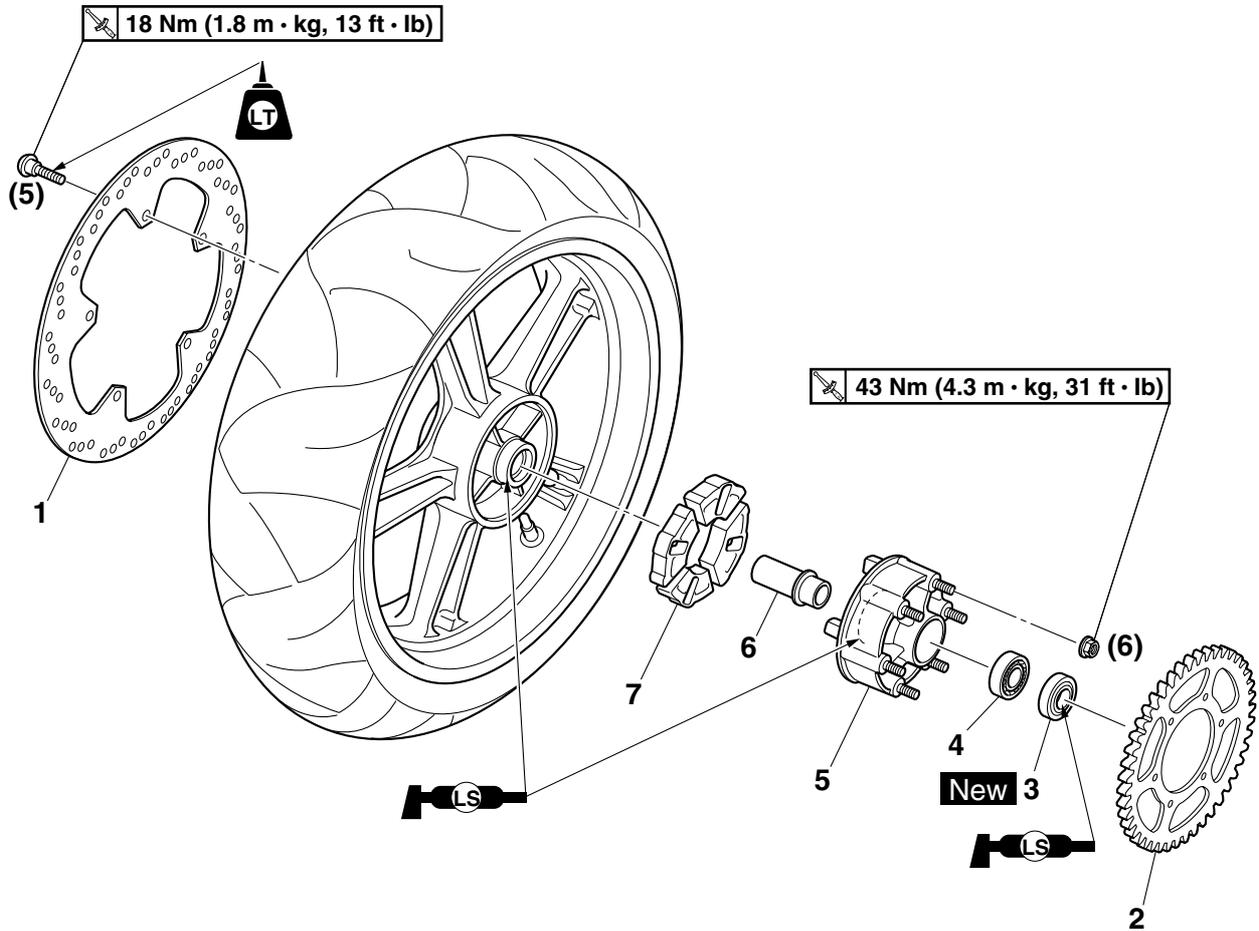
REAR WHEEL

Removing the rear wheel



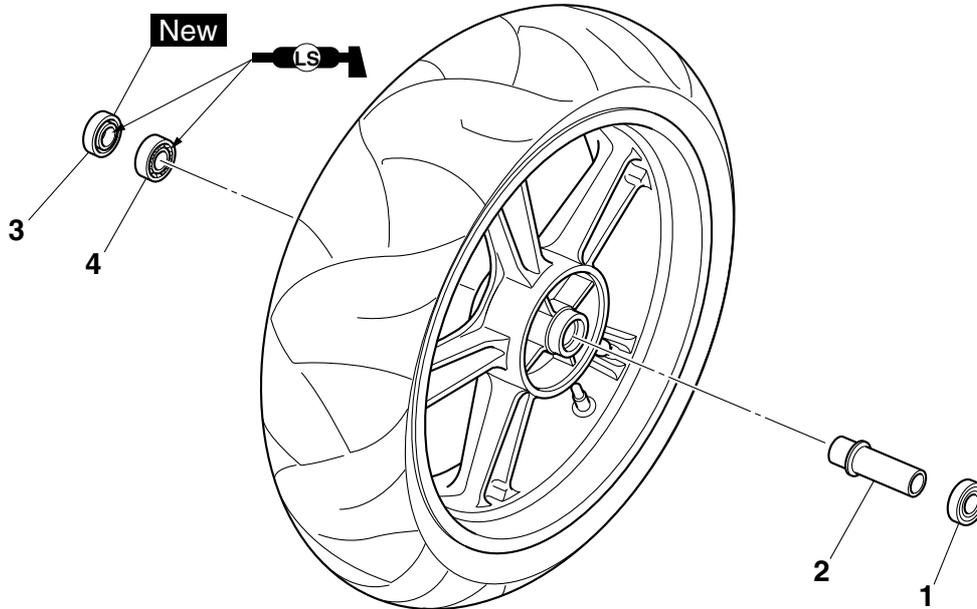
Order	Job/Parts to remove	Q'ty	Remarks
			NOTE: _____ Place the vehicle on a suitable stand so that the rear wheel is elevated. _____
1	Drive chain guard	1	
2	Drive chain adjusting locknut	2	Loosen.
3	Drive chain adjusting bolt	2	Loosen.
4	Rear wheel axle nut	1	
5	Rear wheel axle	1	
6	Drive chain puller	2	
7	Rear wheel	1	
8	Collar	1	
9	Collar	1	
			For installation, reverse the removal procedure.

Removing the brake disc and rear wheel sprocket



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

Disassembling the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Bearing	1	
2	Spacer	1	
3	Oil seal	1	
4	Bearing	1	
			For assembly, reverse the disassembly procedure.

EAS22040

REMOVING THE REAR WHEEL (DISC)

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Elevate:
 - Rear wheel

NOTE:

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

3. Remove:
 - Rear brake caliper

NOTE:

Do not depress the brake pedal when removing the rear wheel.

4. Loosen:
 - Drive chain adjusting locknut
 - Drive chain adjusting bolt

5. Remove:
 - Rear wheel axle nut
 - Rear wheel axle
 - Drive chain pullers
 - Collars
 - Rear wheel

NOTE:

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

EAS22080

DISASSEMBLING THE REAR WHEEL

1. Remove:
 - Oil seals
 - Wheel bearings

Refer to "DISASSEMBLING THE FRONT WHEEL" on page 4-8.

EAS22090

CHECKING THE REAR WHEEL

1. Check:
 - Rear wheel axle
 - Rear wheel
 - Wheel bearings
 - Oil seals

Refer to "CHECKING THE FRONT WHEEL" on page 4-8.
2. Check:
 - Tire
 - Rear wheel

Damage/wear → Replace.

Refer to "CHECKING THE TIRES" on page 3-23 and "CHECKING THE WHEELS" on page 3-25.

3. Measure:
 - Radial wheel runout
 - Lateral wheel runout

Refer to "CHECKING THE FRONT WHEEL" on page 4-8.



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

EAS5D71042

CHECKING THE REAR BRAKE CALIPER BRACKET

1. Check:
 - Rear brake caliper bracket

Cracks/damage → Replace.

EAS22110

CHECKING THE REAR WHEEL DRIVE HUB

1. Check:
 - Rear wheel drive hub

Cracks/damage → Replace.

 - Rear wheel drive hub dampers

Damage/wear → Replace.

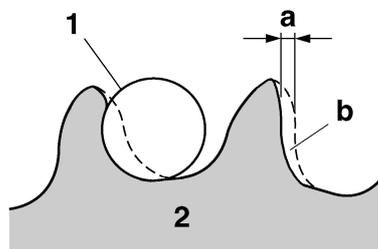
EAS22120

CHECKING AND REPLACING THE REAR WHEEL SPROCKET

1. Check:
 - Rear wheel sprocket

More than 1/4 tooth "a" wear → Replace the rear wheel sprocket.

Bent teeth → Replace the rear wheel sprocket.



- b. Correct
1. Drive chain roller
 2. Rear wheel sprocket

2. Replace:
 - Rear wheel sprocket

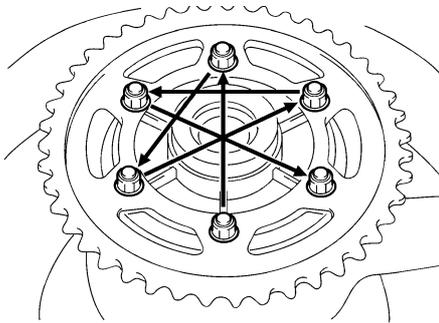
- a. Remove the self-locking nuts and the rear wheel sprocket.
- b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
- c. Install the new rear wheel sprocket.



Rear wheel sprocket self-locking nut
43 Nm (4.3 m·kg, 31 ft·lb)

NOTE:

Tighten the self-locking nuts in stages and in a crisscross pattern.



EAS22140

ASSEMBLING THE REAR WHEEL

1. Install:

- Wheel bearings **New**
- Oil seals **New**

Refer to "ASSEMBLING THE FRONT WHEEL" on page 4-9.

EAS22150

ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:

- 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 4-9.

EAS22160

INSTALLING THE REAR WHEEL (DISC)

1. Install:

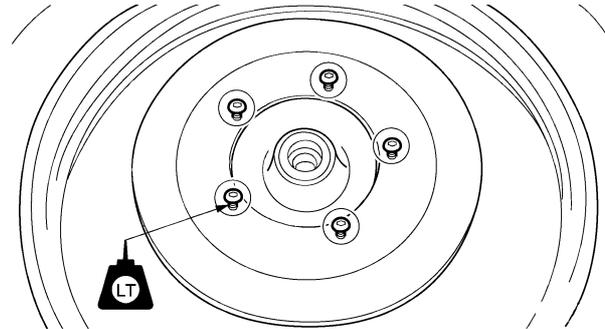
- Rear brake disc



Rear brake disc bolt
18 Nm (1.8 m·kg, 13 ft·lb)
LOCTITE®

NOTE:

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 4-33.

3. Lubricate:

- Rear wheel axle
- Contact surface of rear wheel hub and rear wheel
- Wheel bearings
- Oil seal lips



Recommended lubricant
Lithium-soap-based grease

4. Adjust:

- Drive chain slack
Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-21.

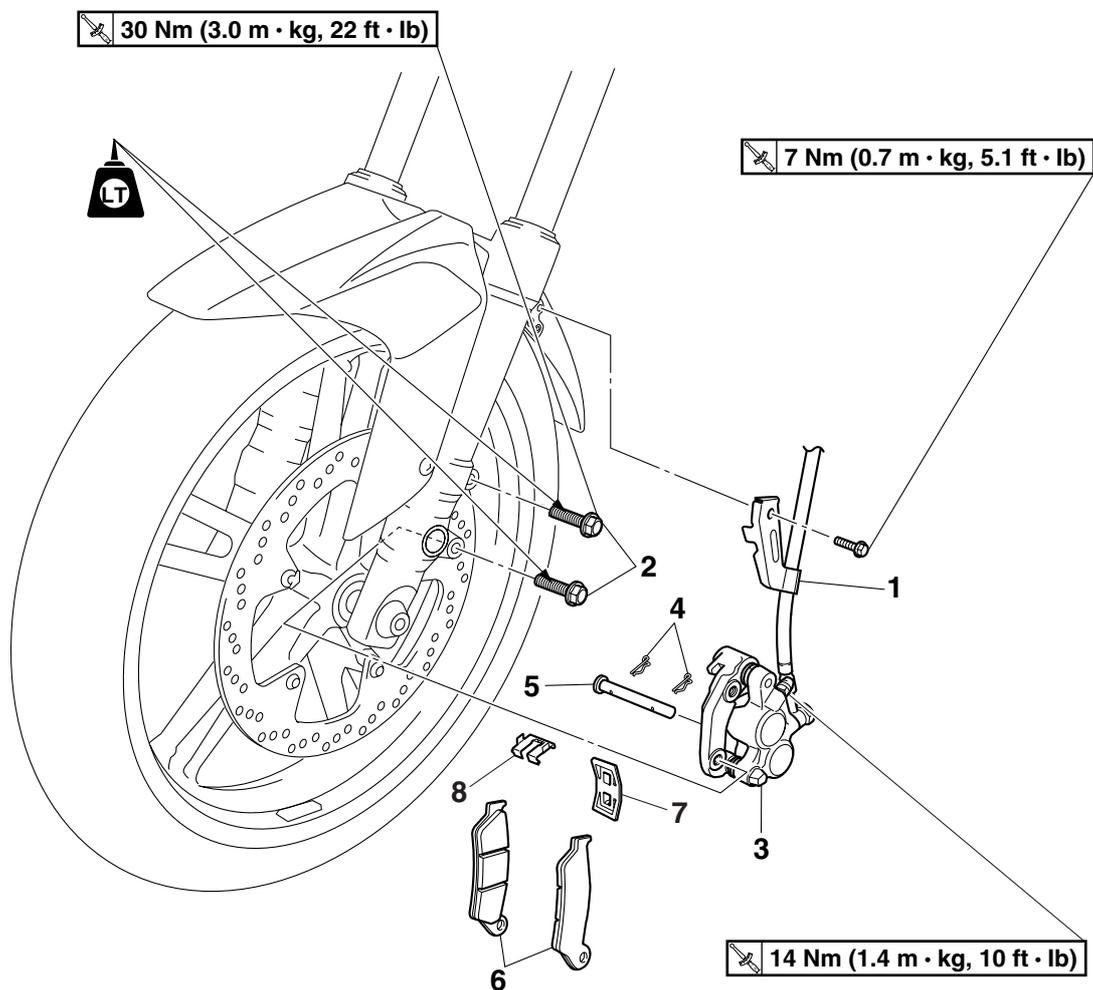


Drive chain slack
30.0–40.0 mm (1.18–1.57 in)

EAS22210

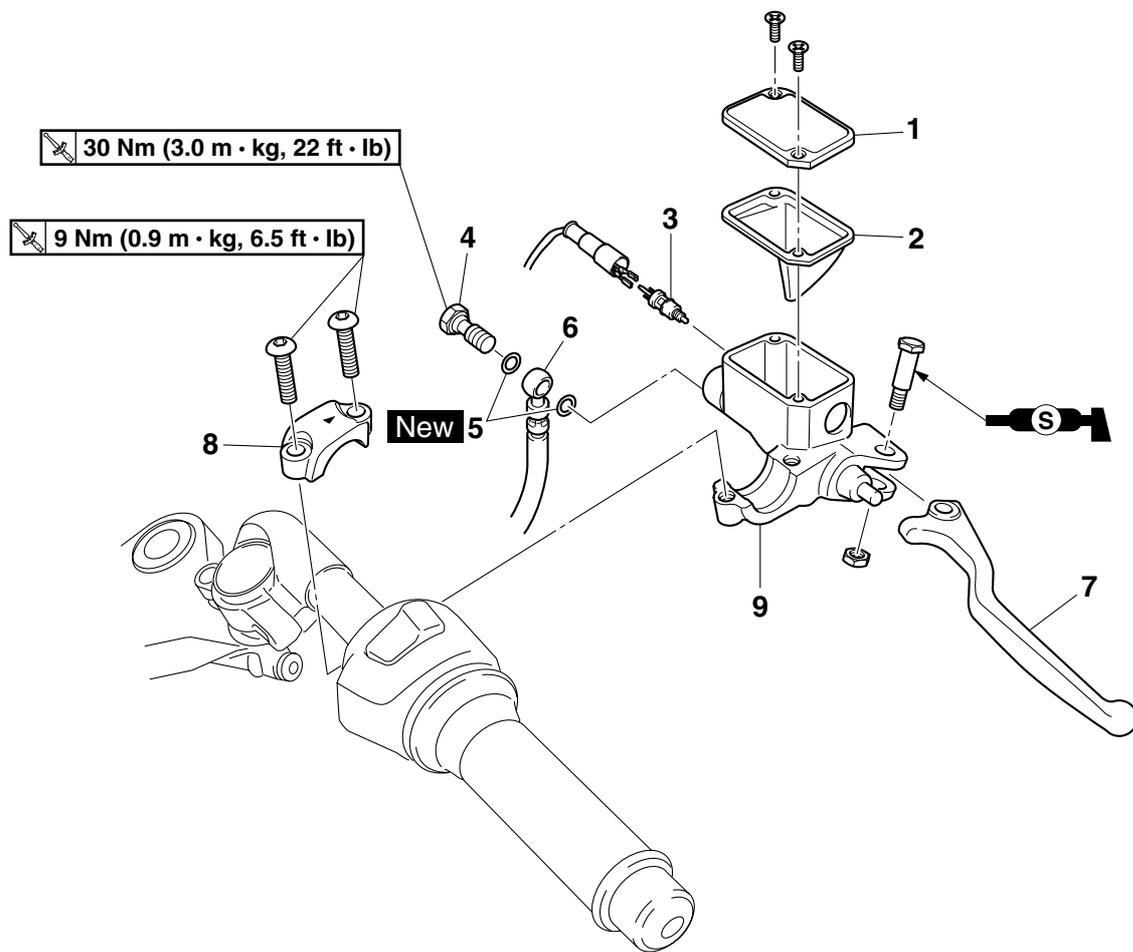
FRONT BRAKE

Removing the front brake pads



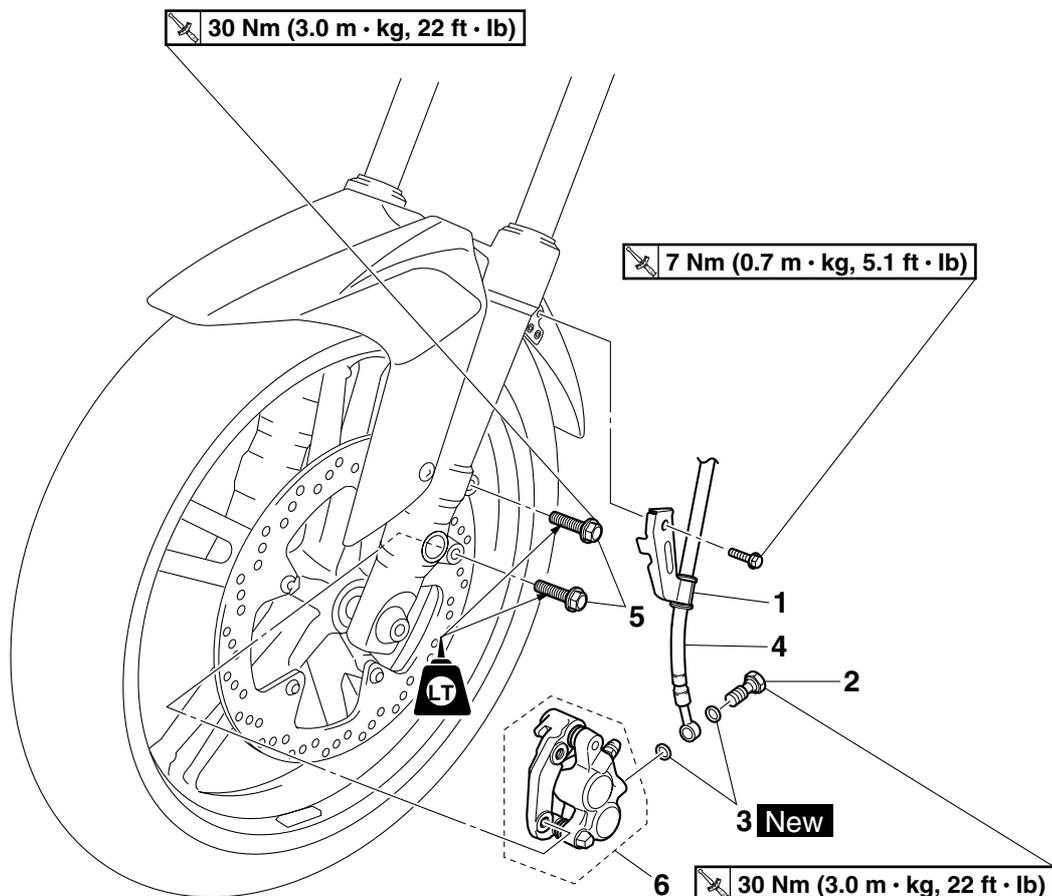
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake hose holder	1	
2	Front brake caliper bolt	2	
3	Front brake caliper	1	
4	Brake pad clip	2	
5	Brake pad pin	1	
6	Front brake pad	2	
7	Brake pad spring	1	
8	Brake pad support	1	
			For installation, reverse the removal procedure.

Removing the front brake master cylinder



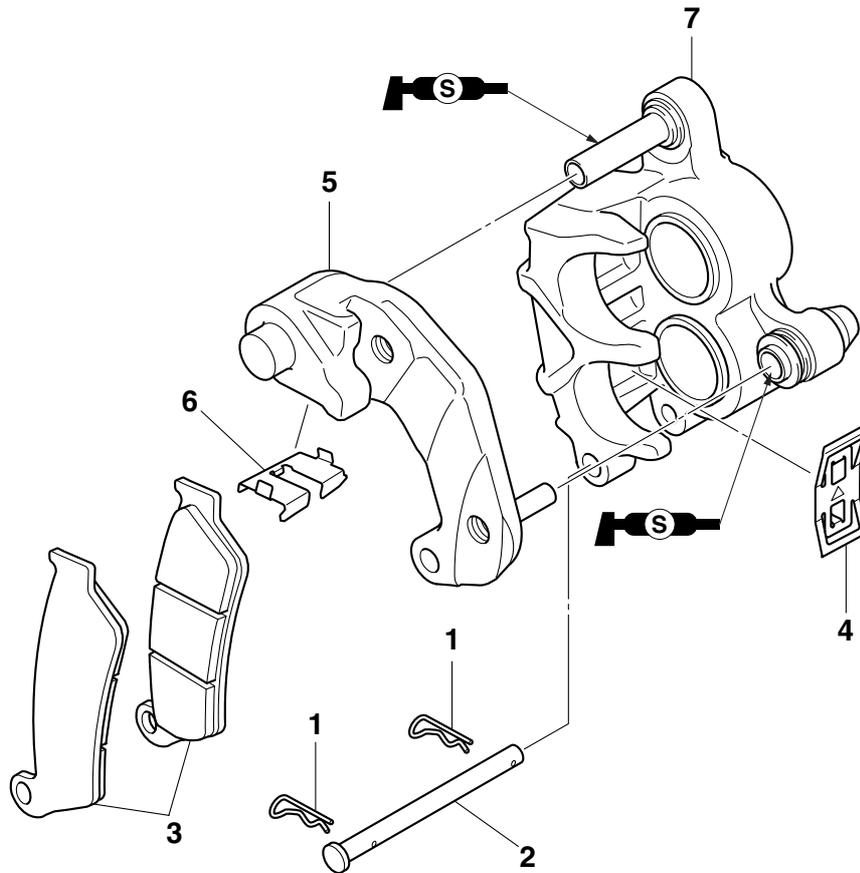
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.
1	Brake master cylinder reservoir cap	1	
2	Brake master cylinder reservoir diaphragm	1	
3	Front brake light switch	1	
4	Brake hose union bolt	1	
5	Copper washer	2	
6	Front brake hose	1	
7	Brake lever	1	
8	Front brake master cylinder holder	1	
9	Front brake master cylinder	1	
			For installation, reverse the removal procedure.

Removing the front brake caliper

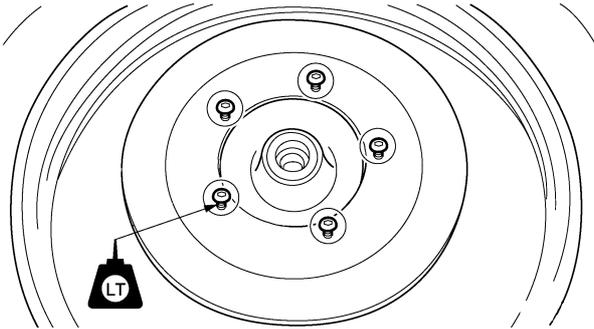


Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.
1	Brake hose holder	1	
2	Brake hose union bolt	1	
3	Copper washer	2	
4	Front brake hose	1	
5	Front brake caliper bolt	2	
6	Front brake caliper	1	
			For installation, reverse the removal procedure.

Disassembling the front brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad	2	
4	Brake pad spring	1	
5	Brake caliper bracket	1	
6	Brake pad support	1	
7	Brake caliper body	1	
			For assembly, reverse the disassembly procedure.



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



6. Install:
 - Front wheel
 Refer to "FRONT WHEEL" on page 4-6.

EAS22270

REPLACING THE FRONT BRAKE PADS

NOTE: _____

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

1. Measure:
 - Brake pad wear limit "a"
 Out of specification → Replace the brake pads as a set.

	Brake pad lining thickness (inner)
	4.5 mm (0.18 in)
	Limit
	0.8 mm (0.03 in)
	Brake pad lining thickness (outer)
	4.5 mm (0.18 in)
	Limit
	0.8 mm (0.03 in)



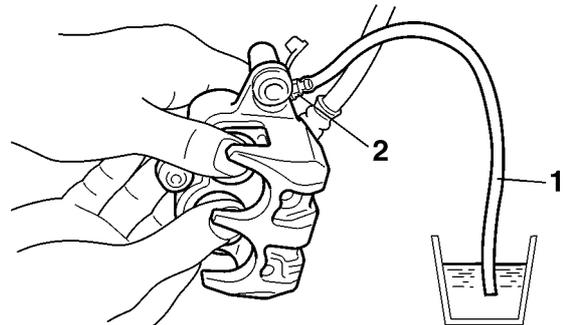
2. Install:
 - Brake pad support **New**
 - Brake pad spring **New**
 - Brake pads **New**

NOTE: _____

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



- a. Connect a clear plastic hose "1" tightly to the bleed screw "2". Put the other end of the hose into an open container.



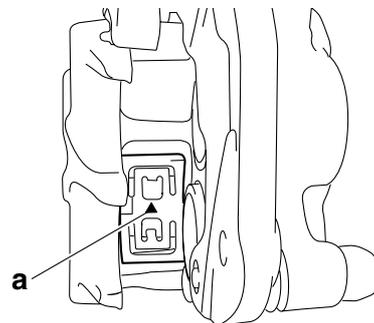
- b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your fingers.
- c. Tighten the bleed screw.

	Front brake caliper bleed screw 14 Nm (1.4 m·kg, 10 ft·lb)
---	---

- d. Install new brake pad support, a new brake pad spring and new brake pads.

NOTE: _____

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



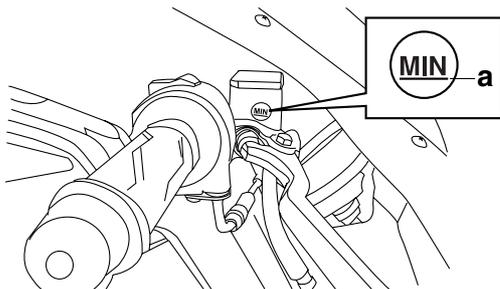
3. Install:
 - Brake pad pin
 - Brake pad clips
 - Front brake caliper



Front brake caliper bolt
30 Nm (3.0 m·kg, 22 ft·lb)
LOCTITE®

4. Check:

- Brake fluid level
 Below the minimum level mark “a” → Add the recommended brake fluid to the proper level. Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-18.



5. Check:

- Brake lever operation
 Soft or spongy feeling → Bleed the brake system. Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-20.

EAS22290

REMOVING THE FRONT BRAKE CALIPER

NOTE:

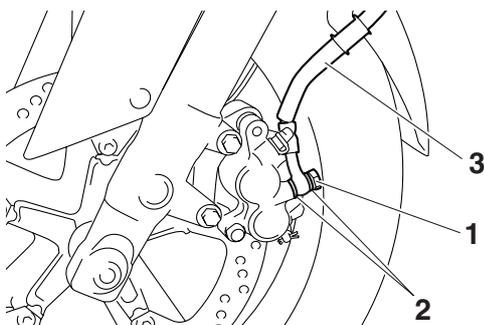
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:

- Brake hose union bolt “1”
- Copper washers “2”
- Brake hose “3”

NOTE:

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



EAS22380

CHECKING THE FRONT BRAKE CALIPER

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

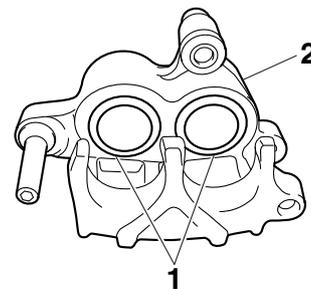
1. Check:

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

EWA5D71012

WARNING

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



2. Check:

- Brake caliper bracket
 Cracks/damage → Replace.

EAS22400

ASSEMBLING THE FRONT BRAKE CALIPER

EWA5D71013

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 dust seals and piston seals to swell and distort.

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



Recommended fluid
DOT 4

EAS22420

INSTALLING THE FRONT BRAKE CALIPER

1. Install:
 - Brake caliper "1"
 - (temporarily)
 - Copper washers "2" **New**
 - Brake hose "3"
 - Brake hose union bolt "4"



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

EWA13530

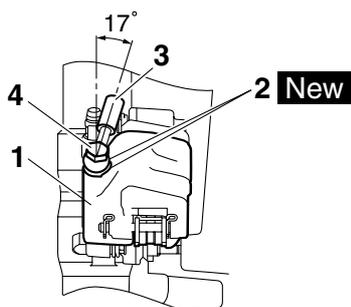
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-33.

ECA5D71029

CAUTION:

- Install the brake hose at a 17° angle to the front brake caliper as shown in the illustration.
- While holding the brake hose, tighten the union bolt.



2. Remove:
 - Brake caliper
3. Install:
 - Brake pad spring
 - Brake pads
 - Brake caliper
 - Brake hose holder



Front brake caliper bolt
30 Nm (3.0 m·kg, 22 ft·lb)
LOCTITE®
Front brake hose holder
7 Nm (0.7 m·kg, 5.1 ft·lb)

Refer to "REPLACING THE FRONT BRAKE PADS" on page 4-22.

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



Recommended fluid
DOT 4

EWA5D71020

WARNING

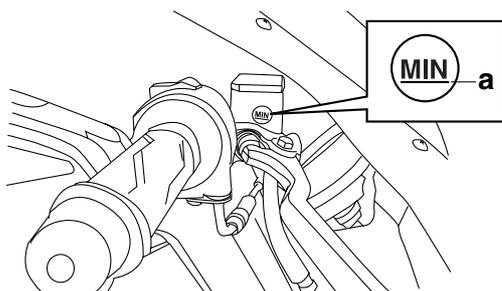
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

CAUTION:

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

5. Bleed:
 - Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.
6. Check:
 - Brake fluid level
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-18.



7. Check:
- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-20.

EAS22490

REMOVING THE FRONT BRAKE MASTER CYLINDER

NOTE:

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

1. Disconnect:
 - Front brake light switch
2. Remove:
 - Brake hose union bolt
 - Copper washers
 - Brake hose

NOTE:

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

EAS22500

CHECKING THE FRONT BRAKE MASTER CYLINDER

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

3. Check:
 - Brake hose
Cracks/damage/wear → Replace.

EAS22520

ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

EWA13520

WARNING

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



**Recommended fluid
DOT 4**

EAS22530

INSTALLING THE FRONT BRAKE MASTER CYLINDER

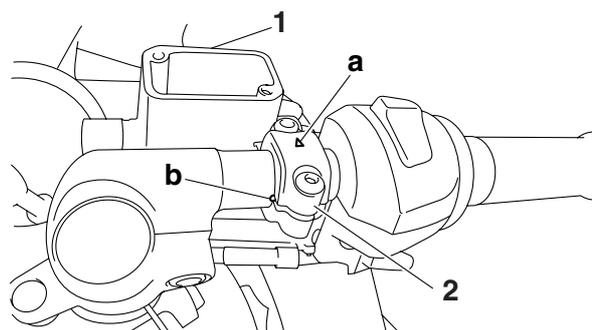
1. Install:
 - Brake master cylinder “1”
 - Brake master cylinder holder “2”

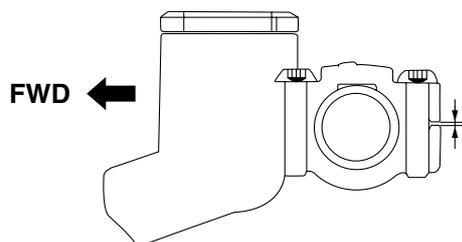


**Front brake master cylinder holder bolt
9 Nm (0.9 m·kg, 6.5 ft·lb)**

NOTE:

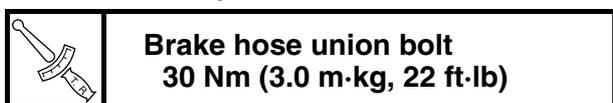
- Install the brake master cylinder holder with the arrow mark “a” pointing forward.
- Align the end of the brake master cylinder holder with the punch mark “b” on the handlebar.
- First, tighten the front bolt, then the rear bolt.





2. Install:

- Copper washers "1" **New**
- Brake hose "2"
- Brake hose union bolt "3"
- Front brake light switch



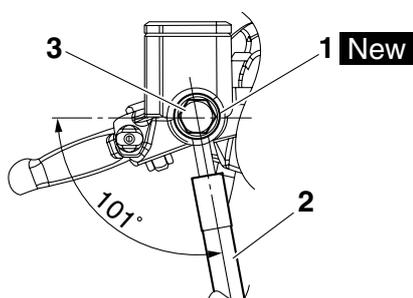
EWA13530

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-33.

NOTE:

- Install the brake hose at an 101° angle to the front brake master cylinder as shown in the illustration.
- While holding the brake hose, tighten the brake hose union bolt as shown.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.



3. Install:

- Front brake light switch

NOTE:

Before fully installing the front brake light switch, be sure to completely install the rubber cover over the switch. Also, be sure not to twist the front brake light switch lead when screwing in the switch.

4. Fill:

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



EWA13540

WARNING

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

ECA13540

CAUTION:

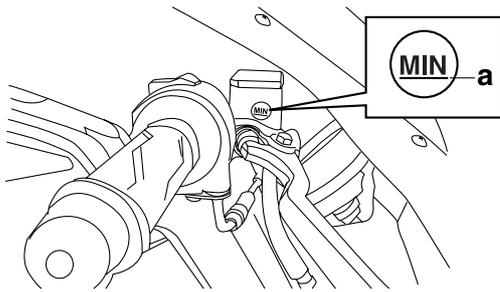
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:

- Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.

6. Check:

- Brake fluid level
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-18.



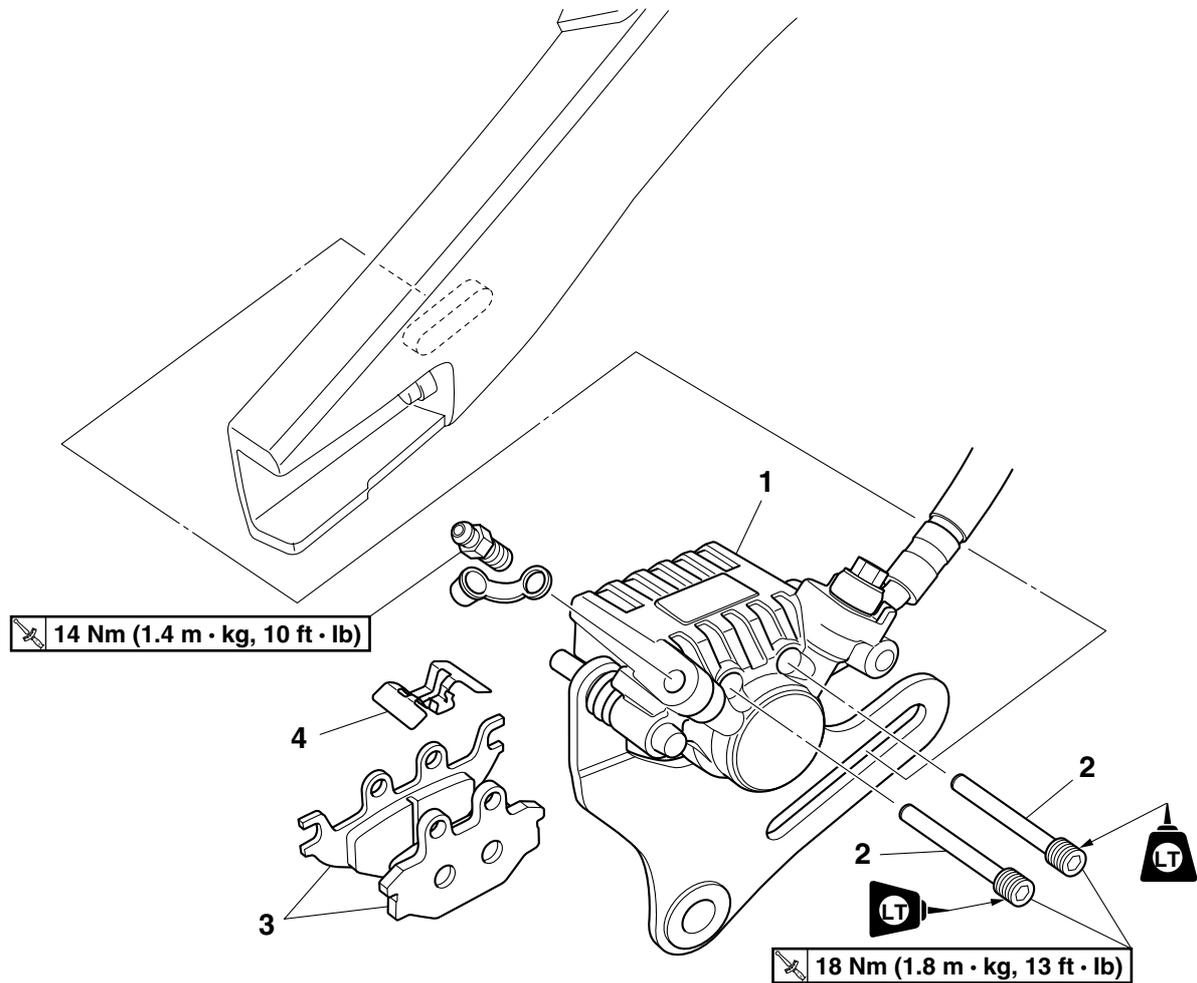
7. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-20.

EAS22550

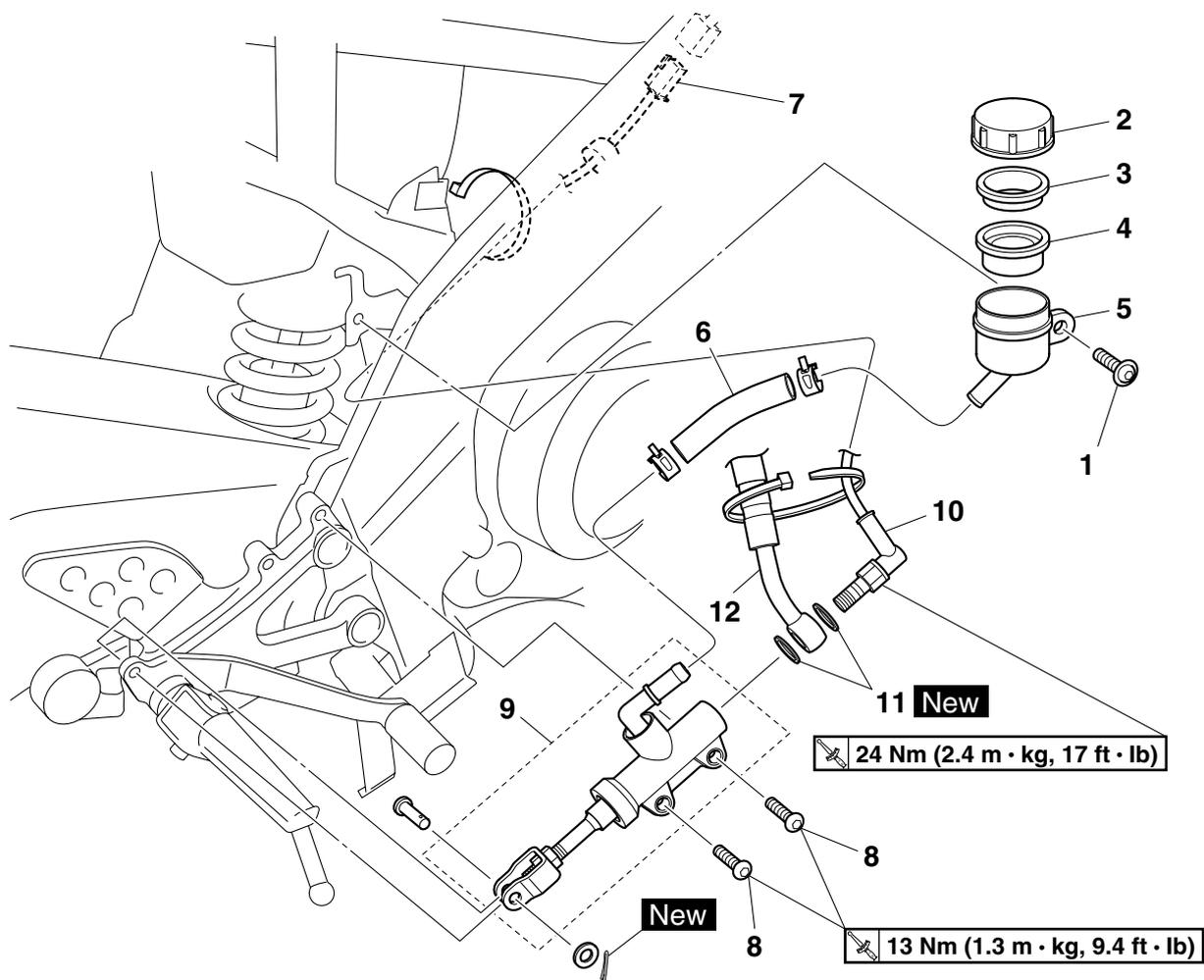
REAR BRAKE

Removing the rear brake pads



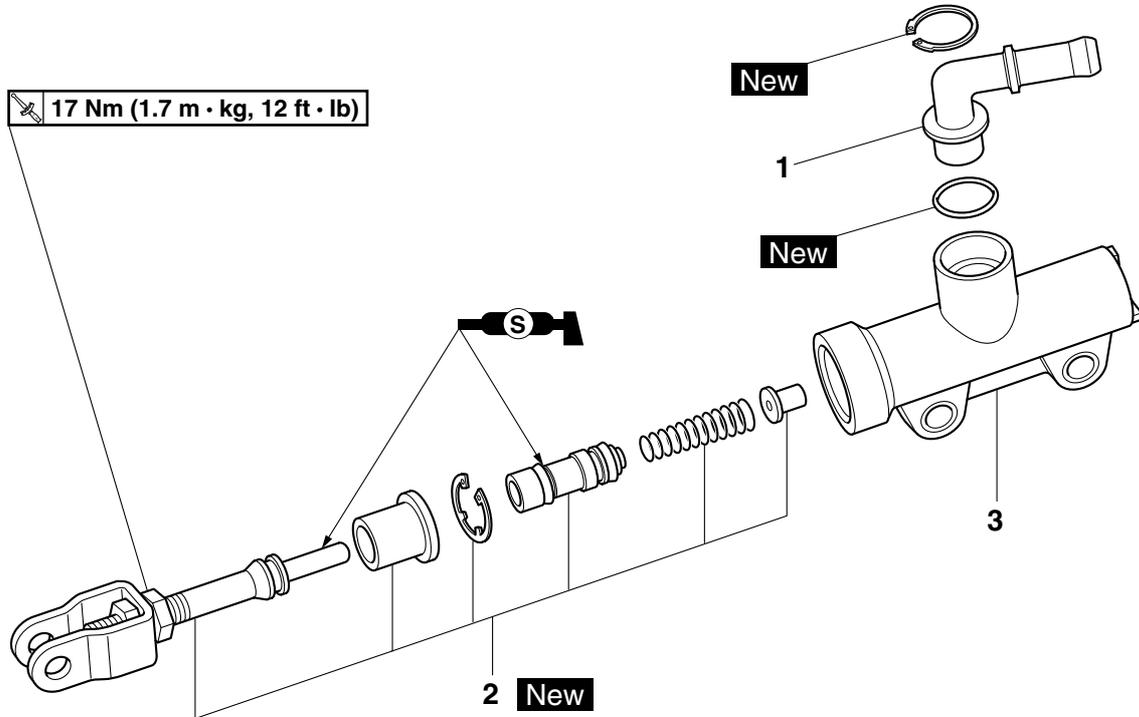
Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-12.
1	Rear brake caliper	1	
2	Brake pad retaining bolt	2	
3	Rear brake pad	2	
4	Brake pad spring	1	
			For installation, reverse the removal procedure.

Removing the rear brake master cylinder



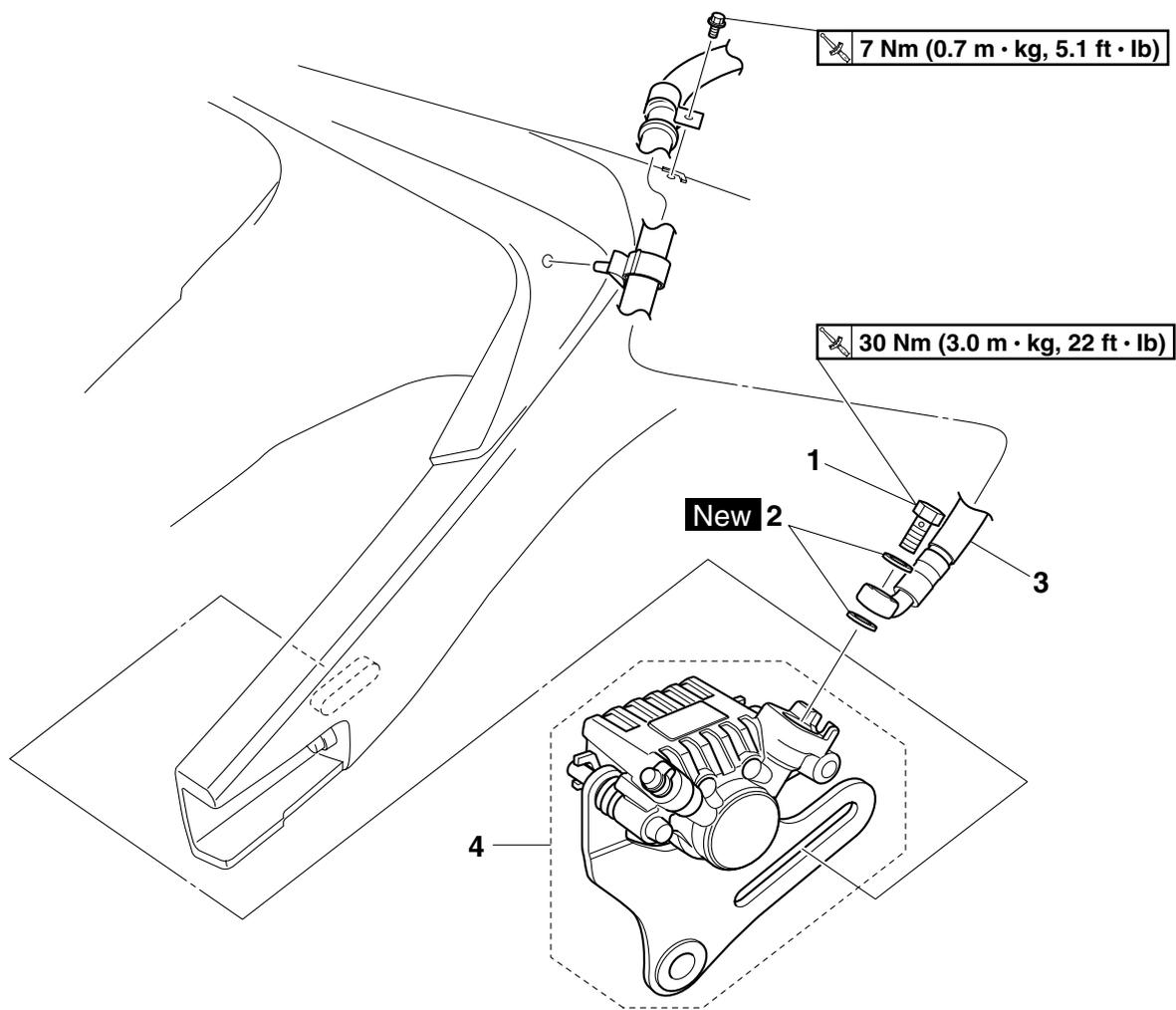
Order	Job/Parts to remove	Q'ty	Remarks
	Right side panel		Refer to "GENERAL CHASSIS" on page 4-1.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.
1	Brake fluid reservoir bolt	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Rear brake light switch coupler	1	Disconnect.
8	Rear brake master cylinder bolt	2	
9	Rear brake master cylinder	1	
10	Rear brake light switch	1	
11	Copper washer	2	
12	Rear brake hose	1	
			For installation, reverse the removal procedure.

Disassembling the rear brake master cylinder



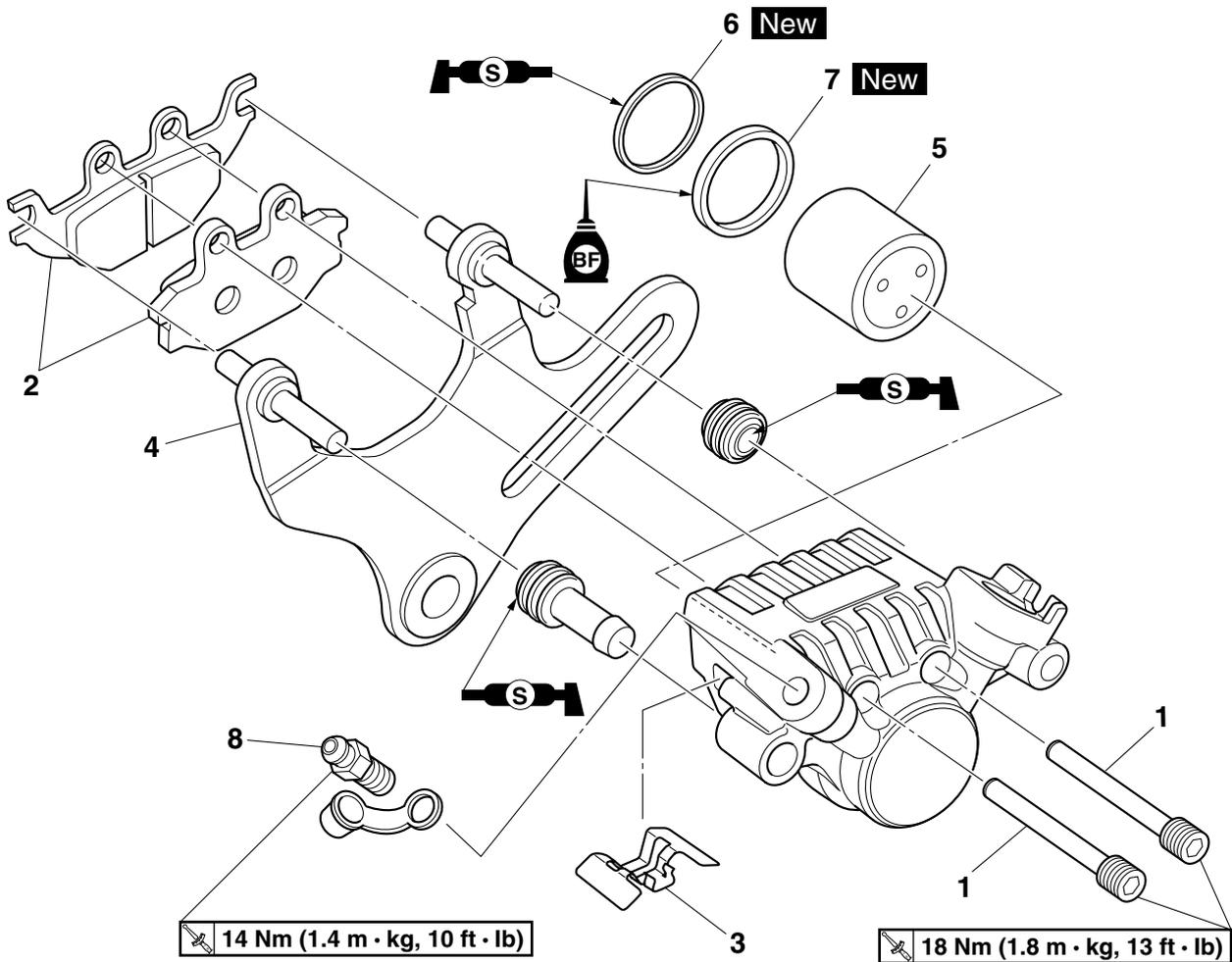
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake hose joint	1	
2	Brake master cylinder kit	1	
3	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.

Removing the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.
	Rear wheel		Refer to "REAR WHEEL" on page 4-12.
1	Rear brake hose union bolt	1	
2	Copper washer	2	
3	Rear brake hose	1	
4	Rear brake caliper	1	
			For installation, reverse the removal procedure.

Disassembling the rear brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad retaining bolt	2	
2	Rear brake pad	2	
3	Brake pad spring	1	
4	Brake caliper bracket	1	
5	Brake caliper piston	1	
6	Brake caliper piston dust seal	1	
7	Brake caliper piston seal	1	
8	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS22560

INTRODUCTION

EWA14100



WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.
- **FIRST AID FOR BRAKE FLUID ENTERING THE EYES:**
- Flush with water for 15 minutes and get immediate medical attention.

EAS22570

CHECKING THE REAR BRAKE DISC

1. Remove:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-12.
2. Check:
 - Brake disc
Damage/galling → Replace.
3. Measure:
 - Brake disc deflection
Out of specification → Correct the brake disc deflection or replace the brake disc.
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-21.



Brake disc deflection limit
0.15 mm (0.0059 in)

4. Measure:
 - Brake disc thickness
Measure the brake disc thickness at a few different locations.
Out of specification → Replace.
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-21.



Brake disc thickness limit
3.5 mm (0.14 in)

5. Adjust:
 - Brake disc deflection
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-21.



Rear brake disc bolt
18 Nm (1.8 m·kg, 13 ft·lb)
LOCTITE®

6. Install:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-12.

EAS22580

REPLACING THE REAR BRAKE PADS

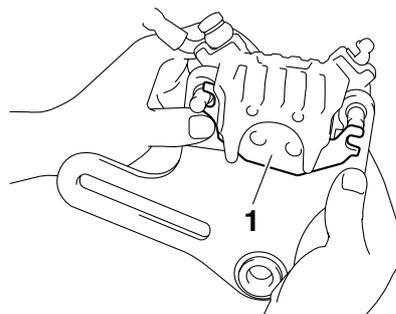
NOTE:

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

1. Remove:
 - Brake pads
 - Brake pad spring

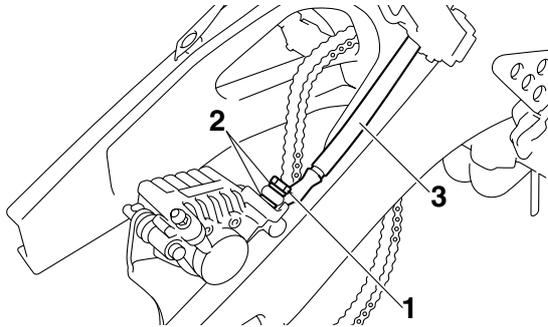
NOTE:

To remove the inner brake pad "1", push down on the brake caliper bracket so that there is space to remove the brake pad.



2. Measure:
 - Brake pad wear limit "a"
Out of specification → Replace the brake pads as a set.

- Remove:
 - Union bolt "1"
 - Copper washers "2"
 - Brake hose "3"



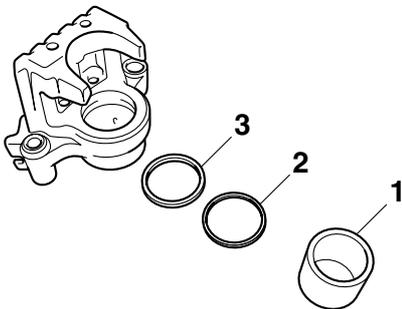
NOTE:

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

EAS22600

DISASSEMBLING THE REAR BRAKE CALIPER

- Remove:
 - Brake caliper piston "1"
 - Brake caliper piston dust seal "2"
 - Brake caliper piston seal "3"

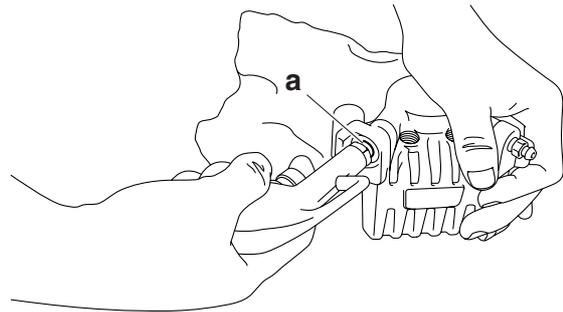


- Blow compressed air into the brake hose joint opening "a" to force out the piston from the brake caliper.

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.



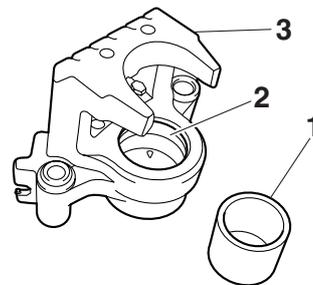
- Remove the brake caliper piston seal and dust seal.

EAS22640

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

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



EWA5D71012

WARNING

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

2. Check:

- Brake caliper bracket
Cracks/damage → Replace.

EAS22650

ASSEMBLING THE REAR BRAKE CALIPER

EWA5D71017

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 piston seal to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston dust seal and piston seal.



Recommended fluid
DOT 4

EAS22670

INSTALLING THE REAR BRAKE CALIPER

1. Install:

- Brake caliper "1"
- Copper washers **New**
- Brake hose "2"
- Union bolt "3"



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

EWA13530

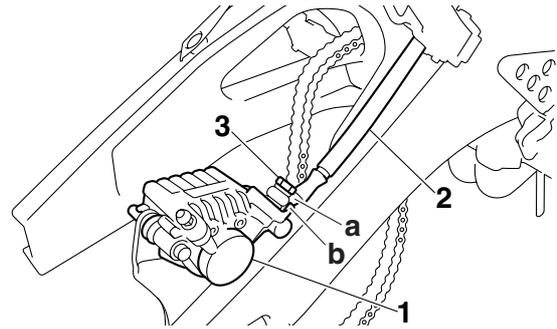
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-33.

ECA5D71030

CAUTION:

When installing the brake hose onto the brake caliper, be sure to position the brake pipe "a" into the slot "b" in the brake caliper.



2. Install:

- Brake pad spring
 - Brake pads
 - Brake pad retaining bolts
 - Rear brake caliper
- Refer to "REPLACING THE REAR BRAKE PADS" on page 4-33.



Rear brake pad retaining bolt
18 Nm (1.8 m·kg, 13 ft·lb)
LOCTITE®

3. Install:

- Rear wheel
- Refer to "REAR WHEEL" on page 4-12.

4. Fill:

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



Recommended fluid
DOT 4

EWA13090

WARNING

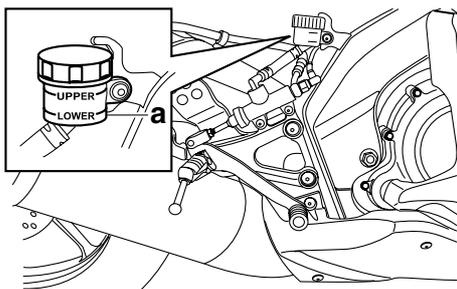
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake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

ECA13540

CAUTION:

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

5. Bleed:
 - Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.
6. Check:
 - Brake fluid level
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-18.



7. Check:
 - Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.

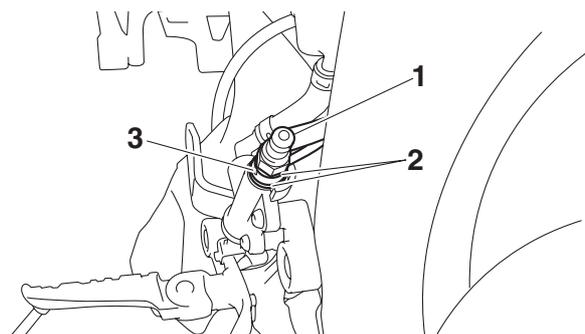
EAS22700

REMOVING THE REAR BRAKE MASTER CYLINDER

NOTE:

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

1. Disconnect:
 - Rear brake light switch coupler
2. Loosen:
 - Rear brake light switch "1"
3. Remove:
 - Rear brake master cylinder bolts
 - Rear brake master cylinder
4. Remove:
 - Rear brake light switch "1"
 - Copper washers "2"
 - Brake hose "3"



NOTE:

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

EAS22720

CHECKING THE REAR BRAKE MASTER CYLINDER

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

EAS22730

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

EWA13520

⚠ WARNING

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



Recommended fluid
DOT 4

EAS22740

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:

- Copper washers "1" **New**
- Brake hose "2"
- Rear brake light switch "3"



Rear brake light switch
24 Nm (2.4 m·kg, 17 ft·lb)

EWA13530

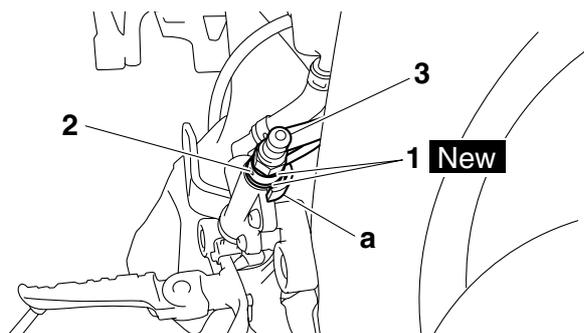
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-33.

ECA14160

CAUTION:

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 recommended brake fluid)



Recommended fluid
DOT 4

EWA13090

WARNING

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

ECA13540

CAUTION:

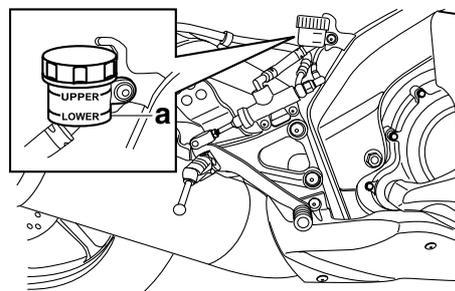
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

3. Bleed:

- Brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.

4. Check:

- Brake fluid level
Below the minimum level mark "a" → Add the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-18.



5. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-20.

6. Adjust:

- Brake pedal position
Refer to "ADJUSTING THE REAR DISC BRAKE" on page 3-18.

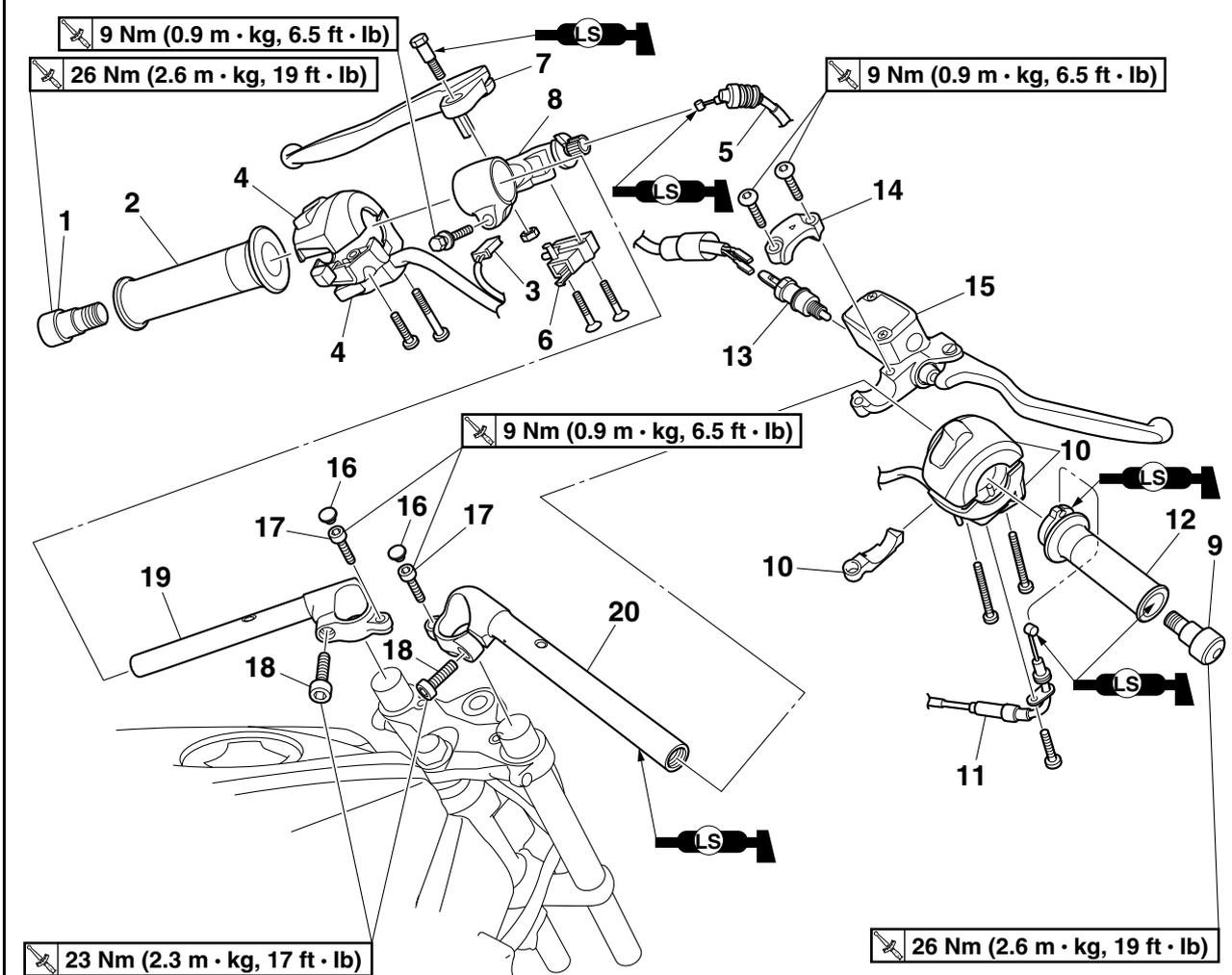


Brake pedal position
47.9 mm (1.89 in)

EAS22850

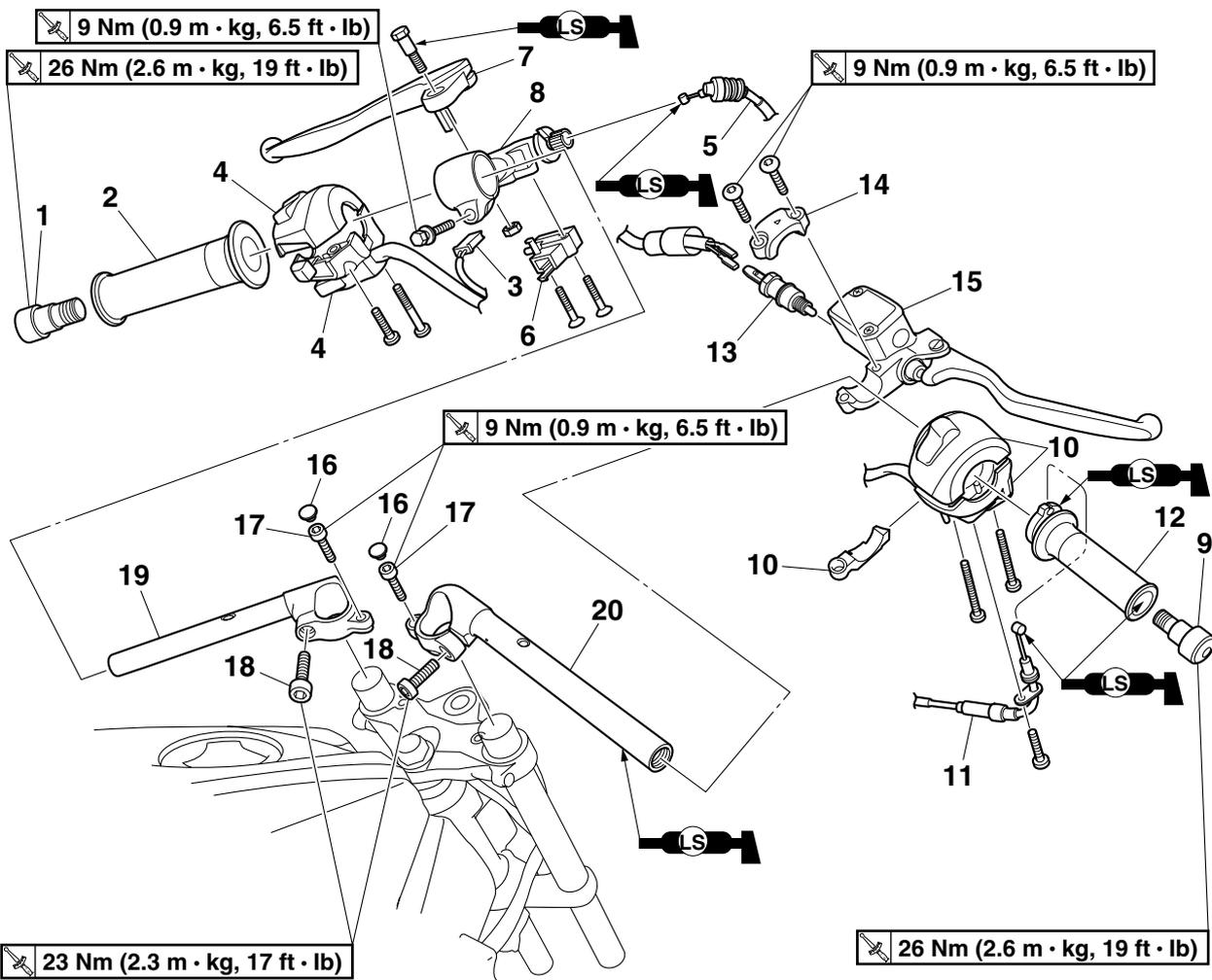
HANDLEBARS

Removing the handlebars



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

Removing the handlebars



Order	Job/Parts to remove	Q'ty	Remarks
17	Handlebar bolt	2	
18	Handlebar pinch bolt	2	
19	Left handlebar	1	
20	Right handlebar	1	
			For installation, reverse the removal procedure.

EAS22870

REMOVING THE HANDLEBARS

1. Stand the vehicle on a level surface.

EWA13120

WARNING

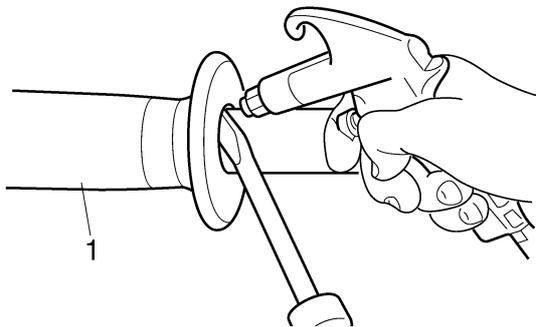
Securely support the vehicle so that there is no danger of it falling over.

2. Remove:

- Handlebar grip "1"

NOTE:

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



EAS22890

CHECKING THE HANDLEBARS

1. Check:

- Left handlebar
 - Right handlebar
- Bends/cracks/damage → Replace.

EWA13690

WARNING

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

EAS22900

INSTALLING THE HANDLEBARS

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Install:

- Front brake master cylinder "1"
- Front brake master cylinder holder "2"
- Front brake light switch

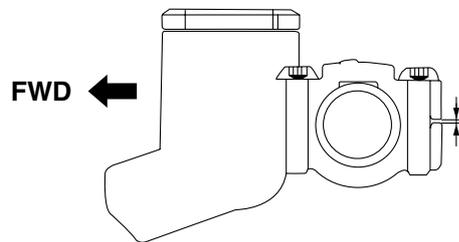
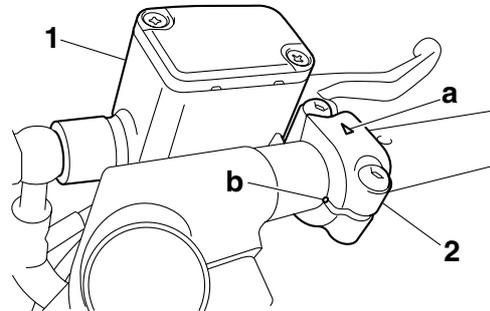


Front brake master cylinder holder bolt
9 Nm (0.9 m·kg, 6.5 ft·lb)

NOTE:

- Install the brake master cylinder holder with the arrow mark "a" pointing forward.

- Align the mating surfaces of the brake master cylinder holder with the punch mark "b" on the handlebar.
- First, tighten the front bolt, then the rear bolt.



3. Install:

- Front brake light switch

NOTE:

Before fully installing the front brake light switch, be sure to completely install the rubber cover over the switch. Also, be sure not to twist the front brake light switch lead when screwing in the switch.

4. Install:

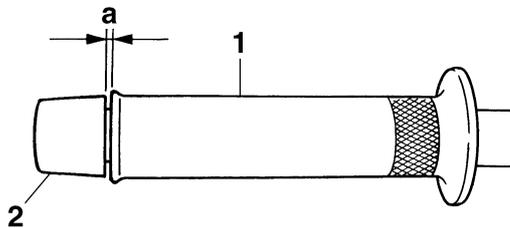
- Throttle grip "1"
- Throttle cable
- Right handlebar switch "2"

NOTE:

- Be sure to position the washer between the throttle grip and the right handlebar switch.
- Lubricate the end of the throttle cable and the inside of the throttle grip with a thin coat of the lithium-soap-based grease, and then install the throttle grip onto the right handlebar.
- Route the throttle cable through the slot in the throttle grip, and then install the cable.
- Align the projection "a" on the right handlebar switch with the hole "b" on the right handlebar.

NOTE: _____

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



12. Check:

- Cable routing

NOTE: _____

Make sure the main switch lead, brake hose, throttle cable, clutch cable, and handlebar switch leads are routed properly. Refer to “CABLE ROUTING” on page 2-33.

13. Adjust:

- Clutch lever free play
Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” on page 3-12.

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

14. Adjust:

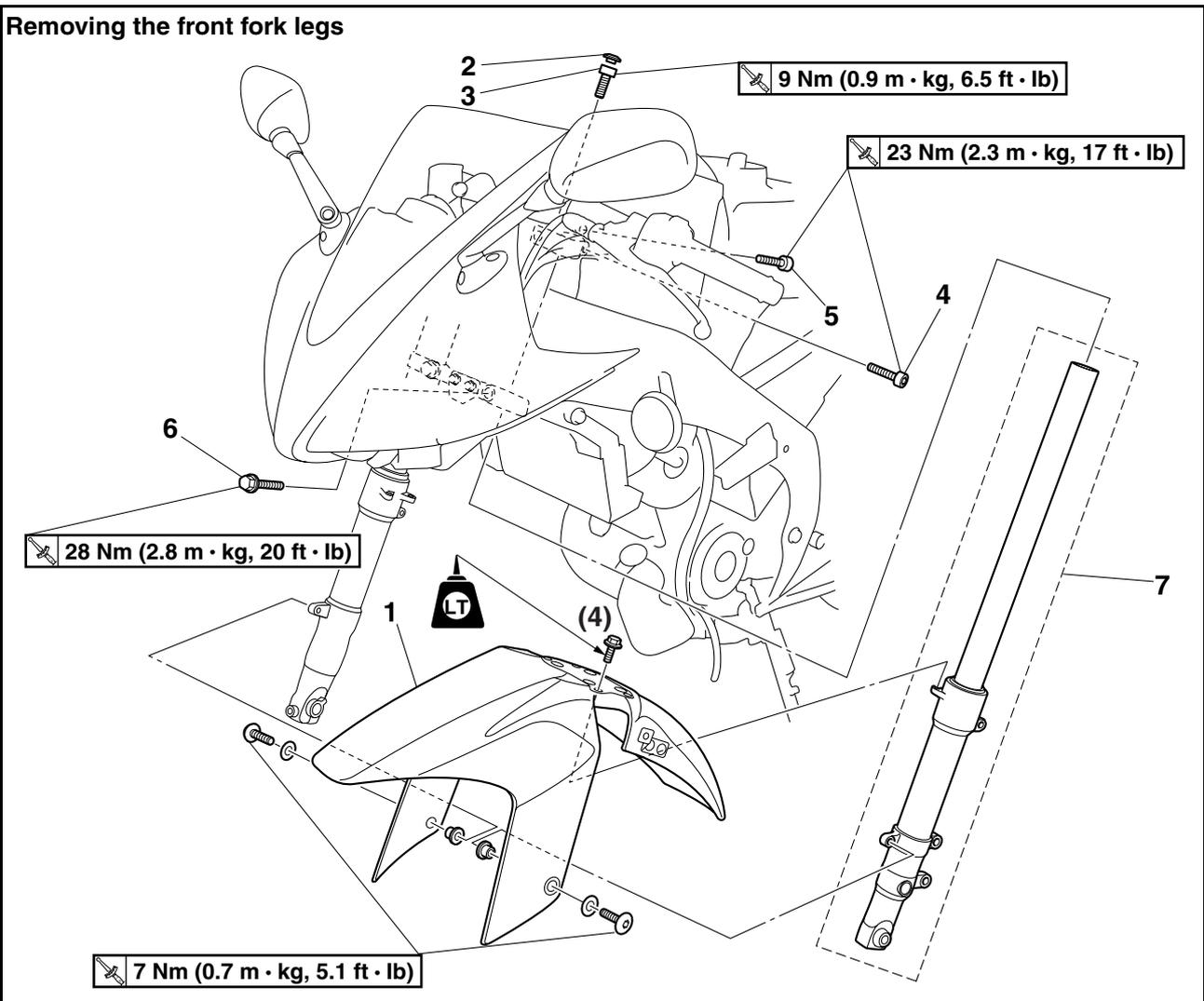
- Throttle cable free play
Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 3-6.

	Throttle cable free play 3.0–5.0 mm (0.12–0.20 in)
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EAS22950

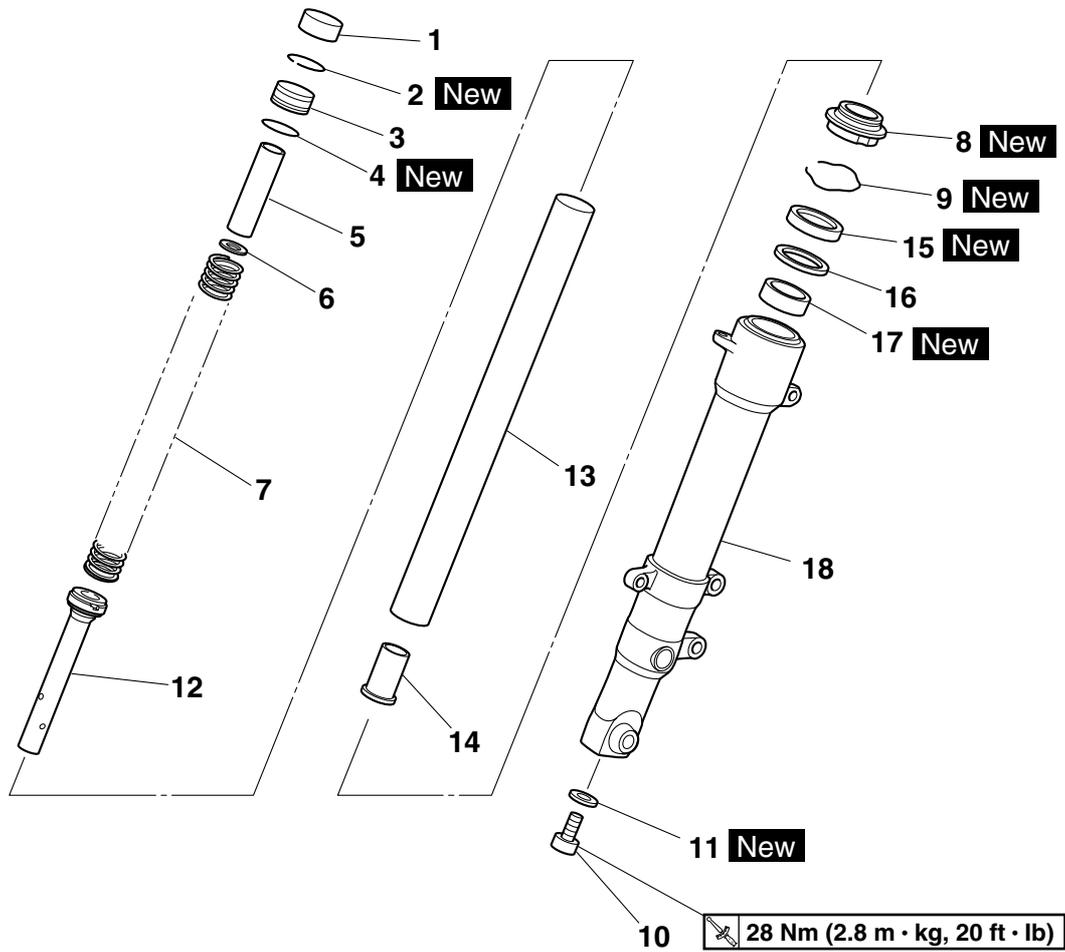
FRONT FORK

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 4-6.
1	Front fender	1	
2	Plug	1	
3	Handlebar bolt	1	Loosen.
4	Handlebar pinch bolt	1	Loosen.
5	Upper bracket pinch bolt	1	Loosen.
6	Lower bracket pinch bolt	1	Loosen.
7	Front fork leg	1	
			For installation, reverse the removal procedure.

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
17	Outer tube bushing	1	
18	Outer tube	1	
			For assembly, reverse the disassembly procedure.

EAS22960

REMOVING THE FRONT FORK LEGS

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

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

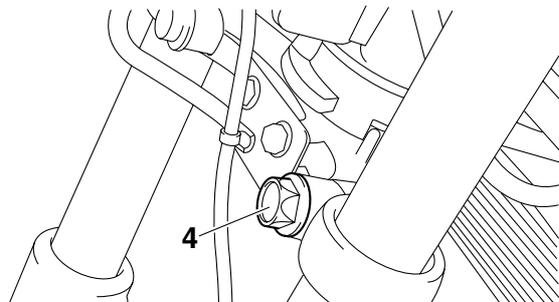
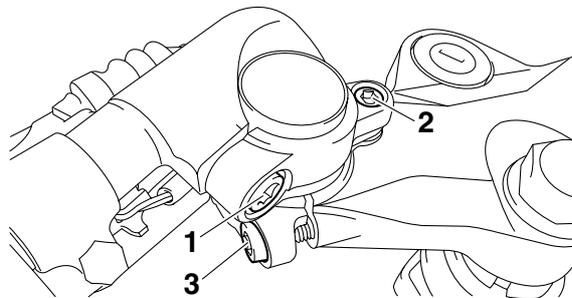
2. Loosen:

- Handlebar pinch bolt "1"
- Handlebar bolt "2"
- Upper bracket pinch bolt "3"
- Lower bracket pinch bolt "4"

EWA13640

WARNING

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



3. Remove:

- Front fork leg

EAS22980

DISASSEMBLING THE FRONT FORK LEGS

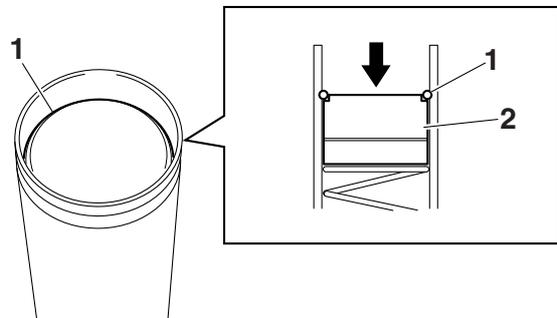
The following procedure applies to both of the front fork legs.

1. Remove:

- Rubber cap
- Clip "1"
- Front fork cap "2" (with O-ring)
- Fork spring

NOTE:

Push the front fork cap in the direction of the arrow shown in the illustration to remove the clip.

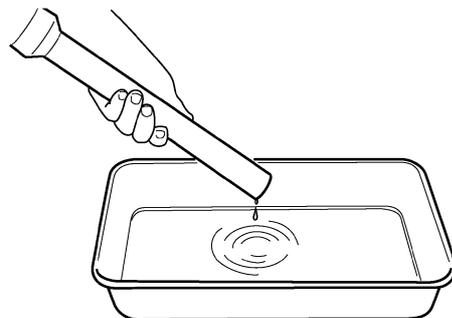


2. Drain:

- Fork oil

NOTE:

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



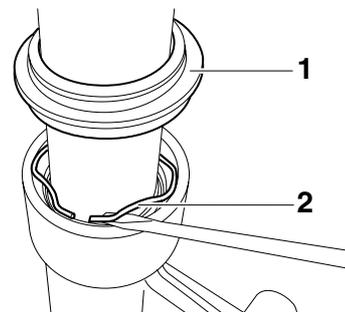
3. Remove:

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

ECA14180

CAUTION:

Do not scratch the inner tube.



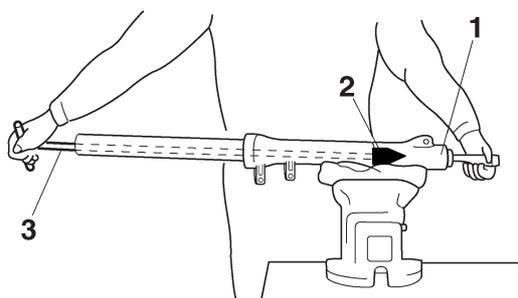
4. Remove:

- Damper rod bolt "1"
- Damper rod

NOTE:

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

	Damper rod holder 90890-01294
	Damping rod holder set YM-01300
	T-handle 90890-01326
	T-handle 3/8" drive 60 cm long YM-01326



EAS23010

CHECKING THE FRONT FORK LEGS

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

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

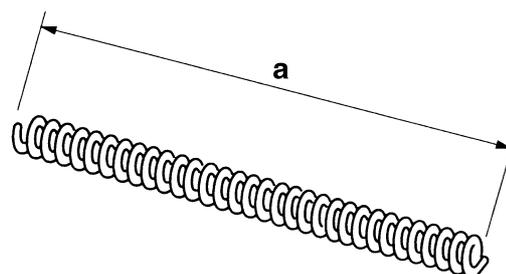
EWA13650

WARNING

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

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

	Fork spring free length 415.0 mm (16.34 in)
	Limit 406.7 mm (16.01 in)



3. Check:
 - Damper rod
Damage/wear → Replace.
Obstruction → Blow out all of the oil passages with compressed air.
 - Oil flow stopper
Damage → Replace.

ECA5D71037

CAUTION:

When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.

EAS23030

ASSEMBLING THE FRONT FORK LEGS

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

EWA13660

WARNING

- Make sure the oil levels in both front fork legs are equal.
- Uneven oil levels can result in poor handling and a loss of stability.

NOTE:

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

1. Install:
 - Damper rod

ECA5D71038

CAUTION:

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

2. Lubricate:
 - Inner tube's outer surface

	Recommended oil Fork oil 10W or equivalent
---	--

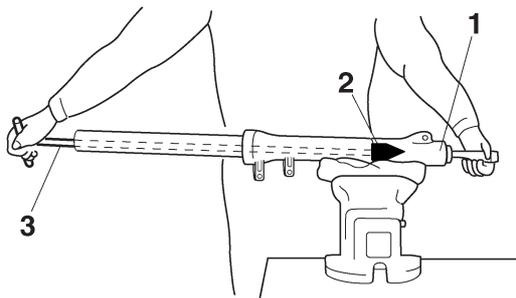
3. Tighten:
- Damper rod bolt "1"

	Damper rod bolt 28 Nm (2.8 m·kg, 20 ft·lb)
---	--

NOTE: _____

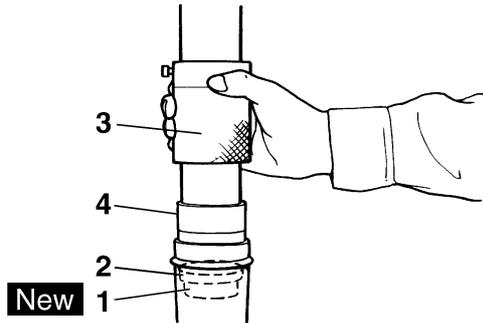
While holding the damper rod with the damper rod holder "2" and T-handle "3", tighten the damper rod bolt.

	Damper rod holder 90890-01294 Damping rod holder set YM-01300 T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326
---	---



4. Install:
- Outer tube bushing "1" **New**
 - Washer "2"
- (with the fork seal driver weight "3" and fork seal driver attachment "4")

	Fork seal driver weight 90890-01367 Replacement hammer YM-A9409-7 Fork seal driver attachment (ø33) 90890-01368 Replacement 33 mm YM-A9409-4
---	---



5. Install:
- Oil seal "1" **New**
 (with the fork seal driver weight "2" and fork seal driver attachment "3")

	Fork seal driver weight 90890-01367 Replacement hammer YM-A9409-7 Fork seal driver attachment (ø33) 90890-01368 Replacement 33 mm YM-A9409-4
---	---

ECA14220

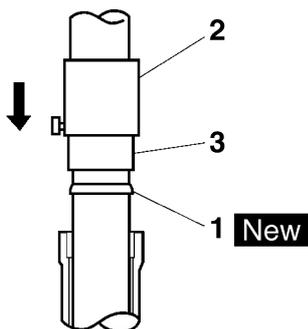
CAUTION: _____

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

NOTE: _____

- 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.





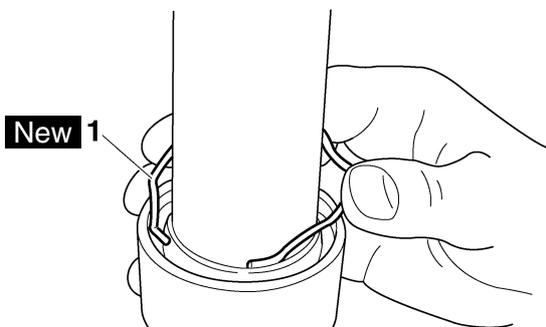
I2311304

6. Install:

- Oil seal clip "1" **New**

NOTE:

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

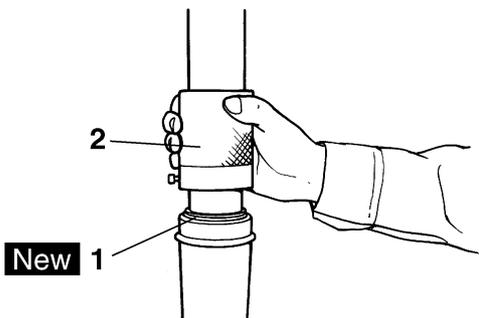


7. Install:

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



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



8. Fill:

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



Recommended oil
Fork oil 10W or equivalent
Quantity
235.0 cm³ (7.95 US oz) (8.29 Imp.oz)

ECA14230

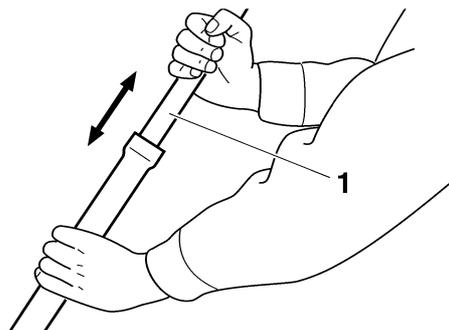
CAUTION:

- 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.

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

NOTE:

Be sure to stroke the inner tube slowly because the fork oil may spurt out.



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

NOTE:

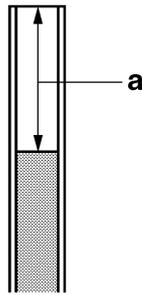
Be sure to bleed the front fork leg of any residual air.

11. Measure:

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



Level
152.0 mm (5.98 in)

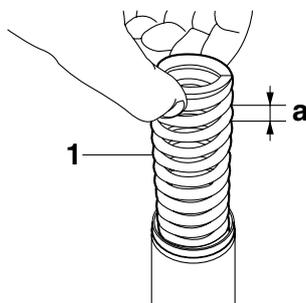


12. Install:

- Fork spring "1"

NOTE:

Install the spring with the smaller pitch "a" facing up.



13. Install:

- O-ring **New**
(to front fork cap)
- Front fork cap
- Clip **New**

NOTE:

- Before installing the front fork cap, lubricate its O-ring with grease.
- Insert the front fork cap into the inner tube, and then install the clip, making sure that the cap is securely held in place with the clip.

EAS23050

INSTALLING THE FRONT FORK LEGS

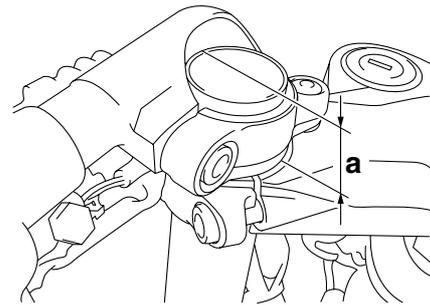
The following procedure applies to both of the front fork legs.

1. Install:

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

NOTE:

Make sure the inner tube end position "a" is 24.5 mm (0.96 in) from the top of the upper bracket.



2. Tighten:

- Lower bracket pinch bolt "1"



Lower bracket pinch bolt
28 Nm (2.8 m·kg, 20 ft·lb)

- Upper bracket pinch bolt "2"



Upper bracket pinch bolt
23 Nm (2.3 m·kg, 17 ft·lb)

- Handlebar bolt "3"



Handlebar bolt
9 Nm (0.9 m·kg, 6.5 ft·lb)

- Handlebar pinch bolt "4"

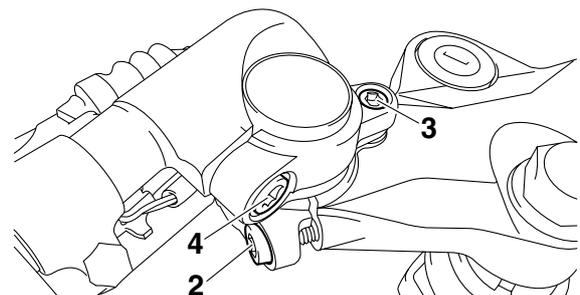
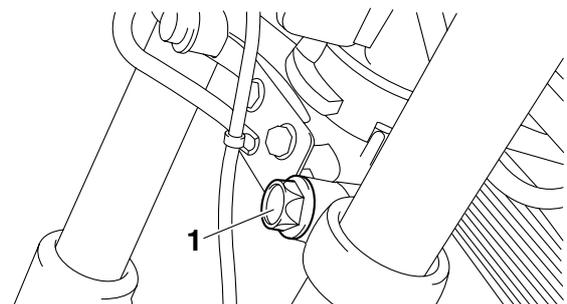


Handlebar pinch bolt
23 Nm (2.3 m·kg, 17 ft·lb)

EWA5D71018

WARNING

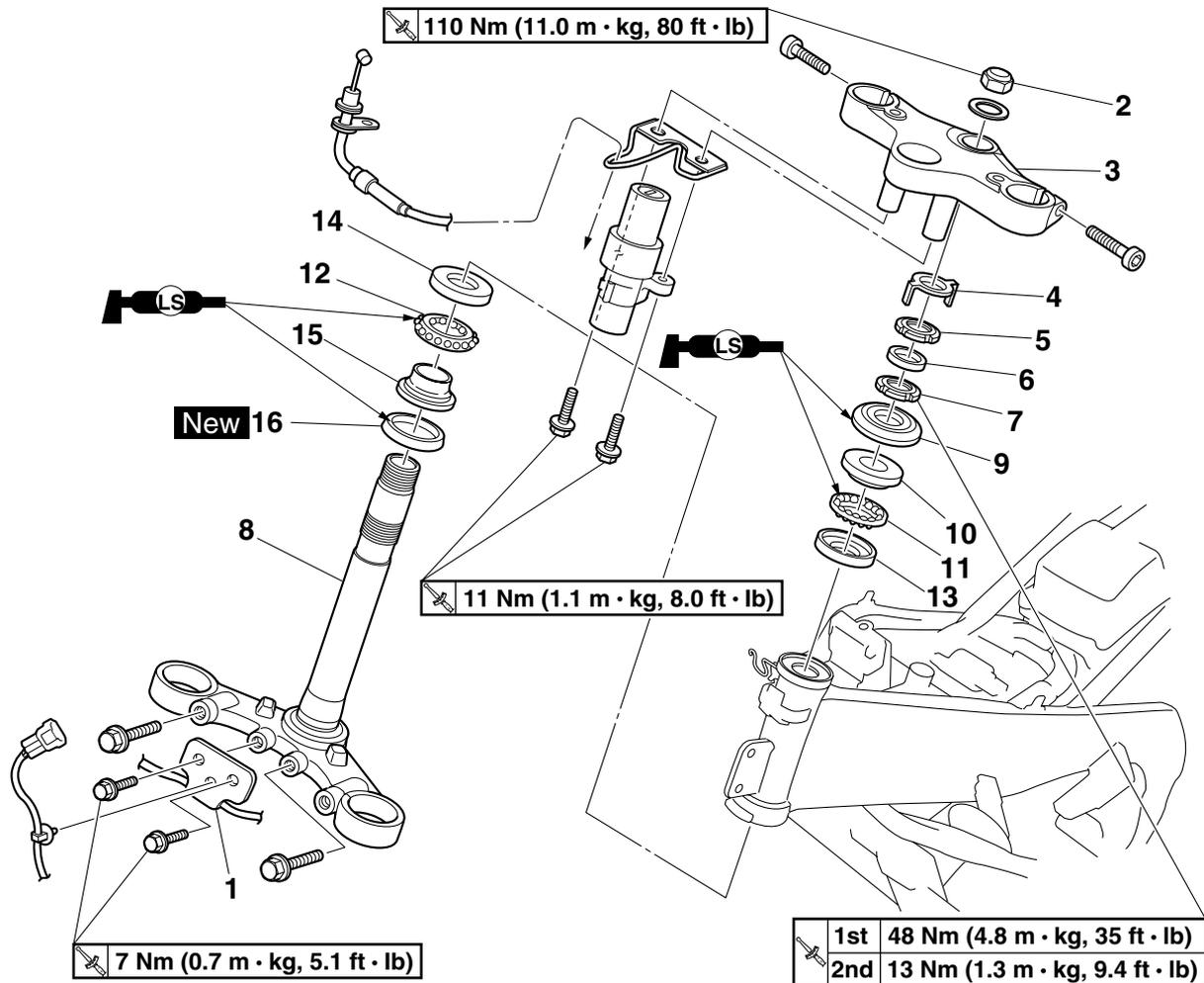
Make sure the brake hose, clutch cable, and leads are routed properly.



EAS23090

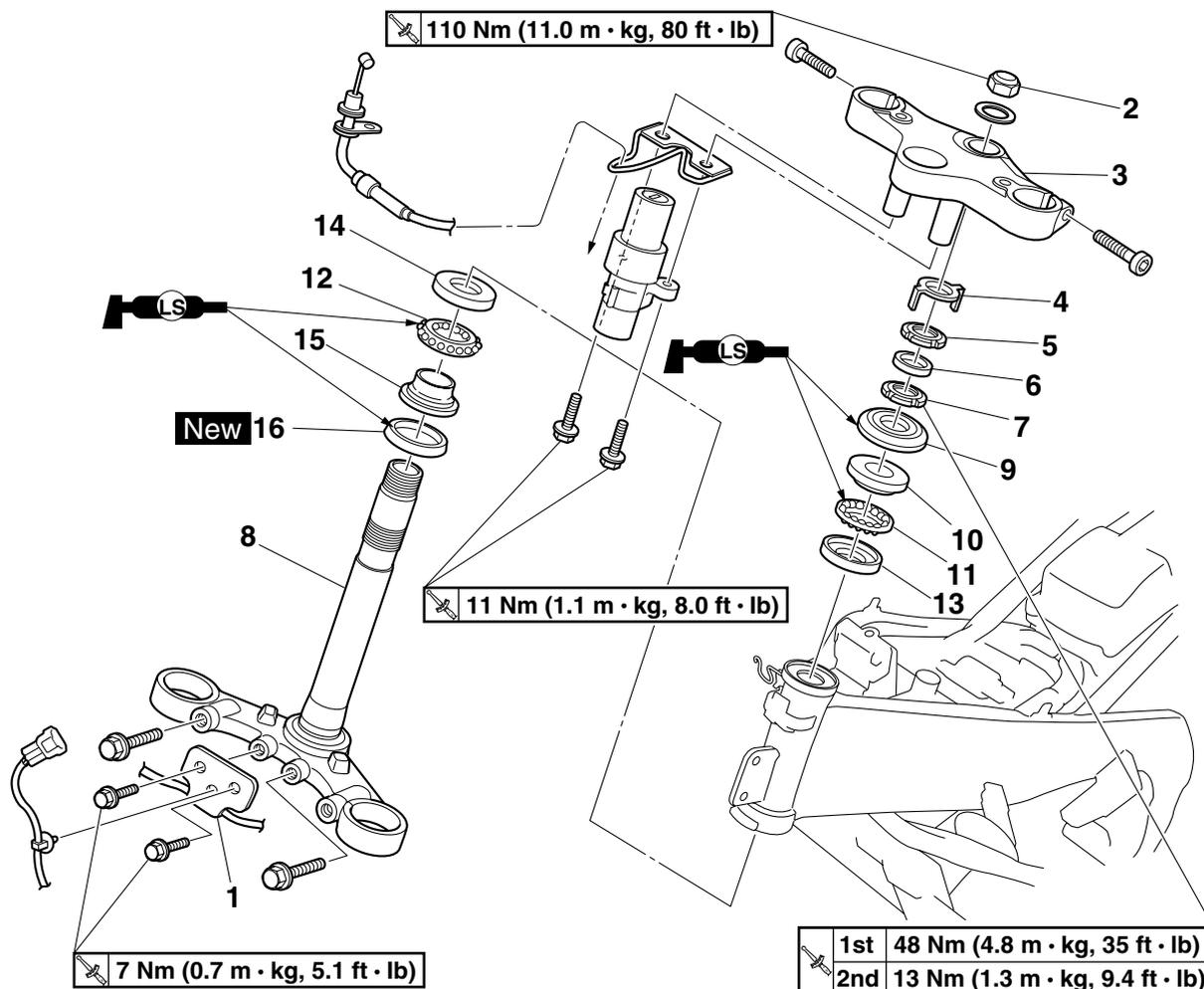
STEERING HEAD

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
	Front cowling assembly		Refer to "GENERAL CHASSIS" on page 4-1.
	Front fork legs		Refer to "FRONT FORK" on page 4-44.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Front brake pipe bracket	1	
2	Steering stem nut	1	
3	Upper bracket	1	
4	Lock washer	1	
5	Upper ring nut	1	
6	Rubber washer	1	
7	Lower ring nut	1	
8	Lower bracket	1	
9	Bearing cover	1	
10	Upper bearing inner race	1	
11	Upper bearing	1	
12	Lower bearing	1	

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
13	Upper bearing outer race	1	
14	Lower bearing outer race	1	
15	Lower bearing inner race	1	
16	Dust seal	1	
			For installation, reverse the removal procedure.

EAS23110

REMOVING THE LOWER BRACKET

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Remove:

- Upper ring nut
- Rubber washer
- Lower ring nut "1"
- Lower bracket

NOTE:

Remove the lower ring nut with the steering nut wrench "2".

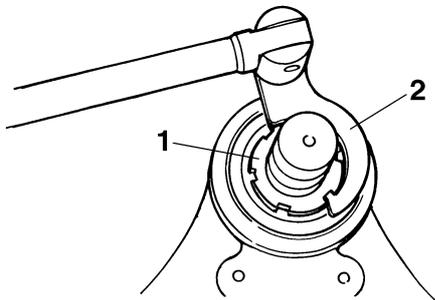


Steering nut wrench
90890-01403
Spanner wrench
YU-33975

EWA13730

WARNING

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



EAS23130

CHECKING THE STEERING HEAD

1. Wash:

- Bearings
- Bearing races



Recommended cleaning solvent
Kerosene

2. Check:

- Bearings
 - Bearing races
- Damage/pitting → Replace.

3. Replace:

- Bearings
- Bearing races

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

b. Remove the bearing race from the lower bracket with a floor chisel "2" and hammer.

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

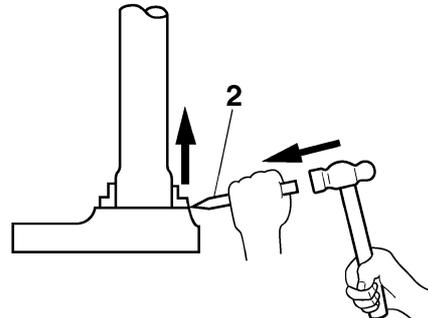
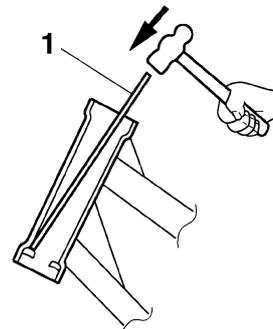
ECA5D71039

CAUTION:

If the bearing races are not installed properly, the steering head pipe could be damaged.

NOTE:

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



4. Check:

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

EAS23140

INSTALLING THE STEERING HEAD

1. Lubricate:

- Upper bearing
- Lower bearing
- Bearing races



Recommended lubricant
Lithium-soap-based grease

2. Install:

- Lower ring nut
- Rubber washer

- Upper ring nut
 - Lock washer
- Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" on page 3-22.

3. Install:

- Upper bracket
- Steering stem nut

NOTE: _____

Temporarily tighten the steering stem nut.

4. Install:

- Front fork legs
- Refer to "FRONT FORK" on page 4-44.

NOTE: _____

Temporarily tighten the upper and lower bracket pinch bolts.

5. Tighten:

- Steering stem nut



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

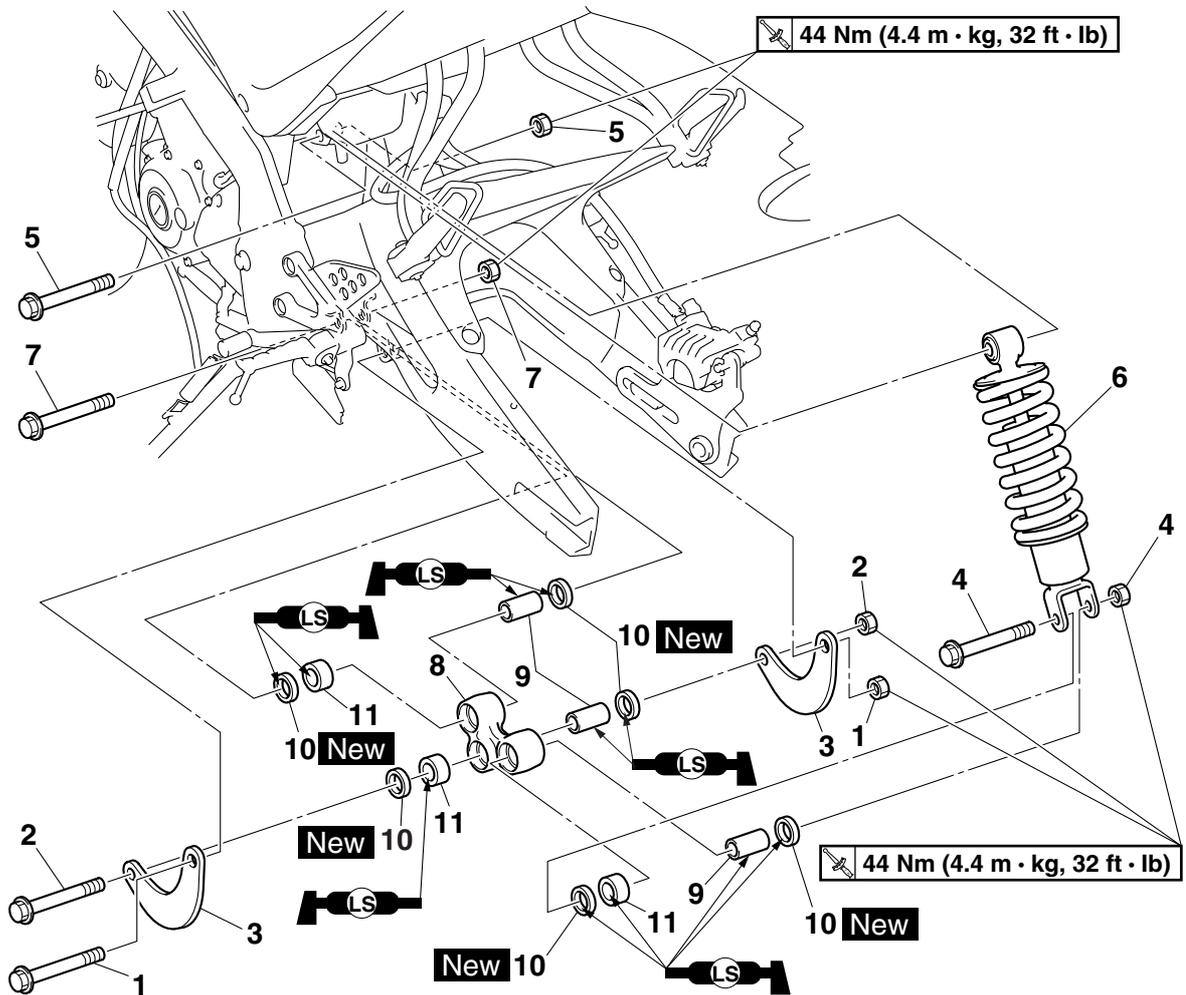
REAR SHOCK ABSORBER ASSEMBLY

YamahaR125.COM

EAS23160

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Bottom cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Rear wheel		Refer to "REAR WHEEL" on page 4-12.
1	Connecting arm nut/rear bolt	1/1	M10 × 55 mm
2	Connecting arm nut/front bolt	1/1	M10 × 58 mm
3	Connecting arm	2	
4	Rear shock absorber assembly lower nut/bolt	1/1	
5	Rear shock absorber assembly upper nut/bolt	1/1	
6	Rear shock absorber assembly	1	
7	Relay arm nut/bolt	1/1	
8	Relay arm	1	
9	Spacer	3	
10	Oil seal	6	
11	Bearing	3	
			For installation, reverse the removal procedure.

REAR SHOCK ABSORBER ASSEMBLY

YamahaR125.COM

EAS23230

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

EWA13120



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

NOTE:

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

EAS23240

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:
 - Rear shock absorber rod
Bends/damage → Replace the rear shock absorber assembly.
 - Rear shock absorber
Oil leaks → Replace the rear shock absorber assembly.
 - Spring
Damage/wear → Replace the rear shock absorber assembly.
 - Bushing
Damage/wear → Replace the rear shock absorber assembly.
 - Bolts
Bends/damage/wear → Replace.

EAS23260

CHECKING THE CONNECTING ARMS AND RELAY ARM

1. Check:
 - Connecting arms
 - Relay arm
Damage/wear → Replace.
2. Check:
 - Bearings
 - Oil seals
Damage/pitting → Replace.
3. Check:
 - Spacers
Damage/scratches → Replace.

EAS23270

INSTALLING THE RELAY ARM

1. Lubricate:
 - Spacers
 - Bearings
 - Oil seals
 - Bolts (unthreaded shaft portion only)

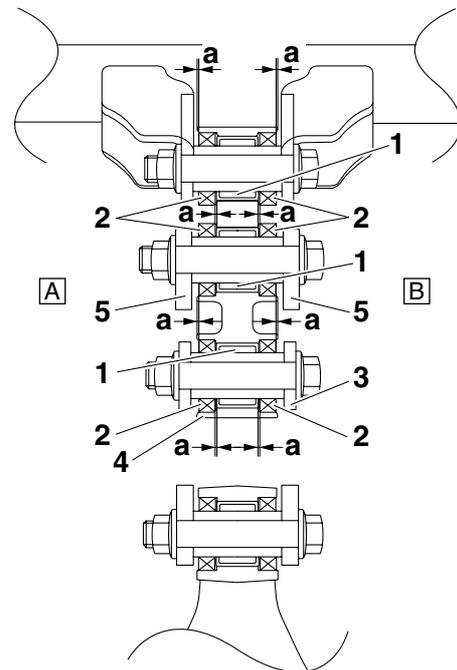


Recommended lubricant
Lithium-soap-based grease

2. Install:
 - Bearing "1"
(to the relay arm)
 - Oil seal "2"
(to the relay arm)



Oil seal installed depth "a"
0.5 mm (0.02 in)



3. Rear shock absorber assembly
4. Relay arm
5. Connecting arm
- A. Left side
- B. Right side

EAS23310

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

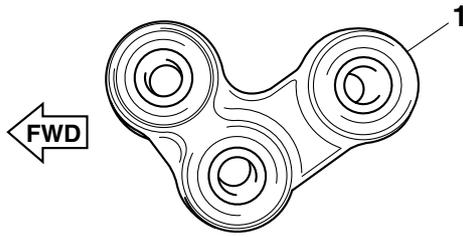
1. Install:
 - Rear shock absorber assembly
 - Relay arm "1"

NOTE:

Install the relay arm as shown in the illustration.

REAR SHOCK ABSORBER ASSEMBLY

YamahaR125.COM



2. Tighten:

- Rear shock absorber assembly upper nut



**Rear shock absorber assembly
upper nut**
44 Nm (4.4 m·kg, 32 ft·lb)

- Relay arm nut



Relay arm nut
44 Nm (4.4 m·kg, 32 ft·lb)

- Rear shock absorber assembly lower nut



**Rear shock absorber assembly
lower nut**
44 Nm (4.4 m·kg, 32 ft·lb)

3. Install:

- Connecting arms

NOTE:

When installing the connecting arms, lift up the swingarm.

4. Tighten:

- Connecting arm nuts

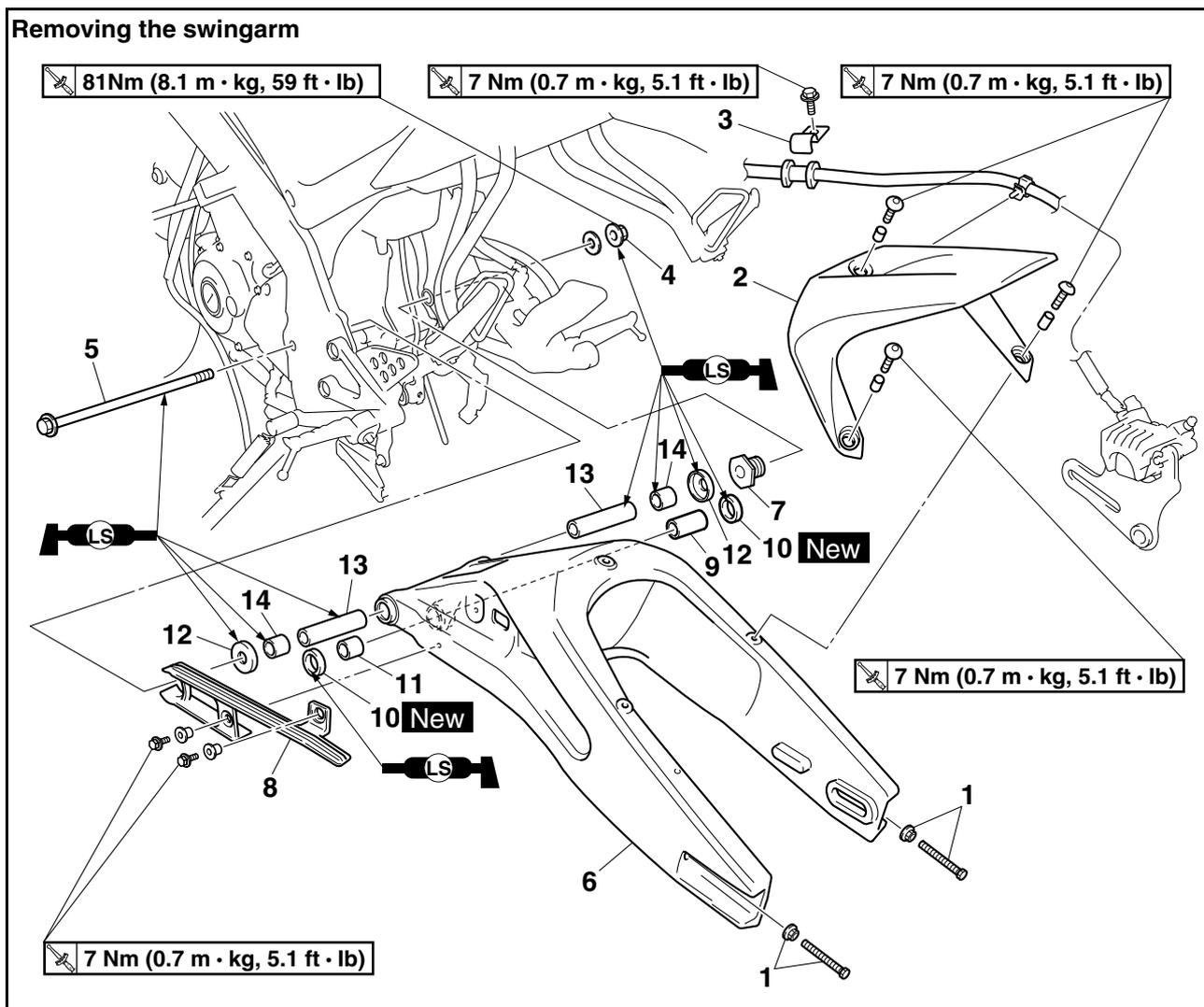


Connecting arm nut
44 Nm (4.4 m·kg, 32 ft·lb)

EAS23330

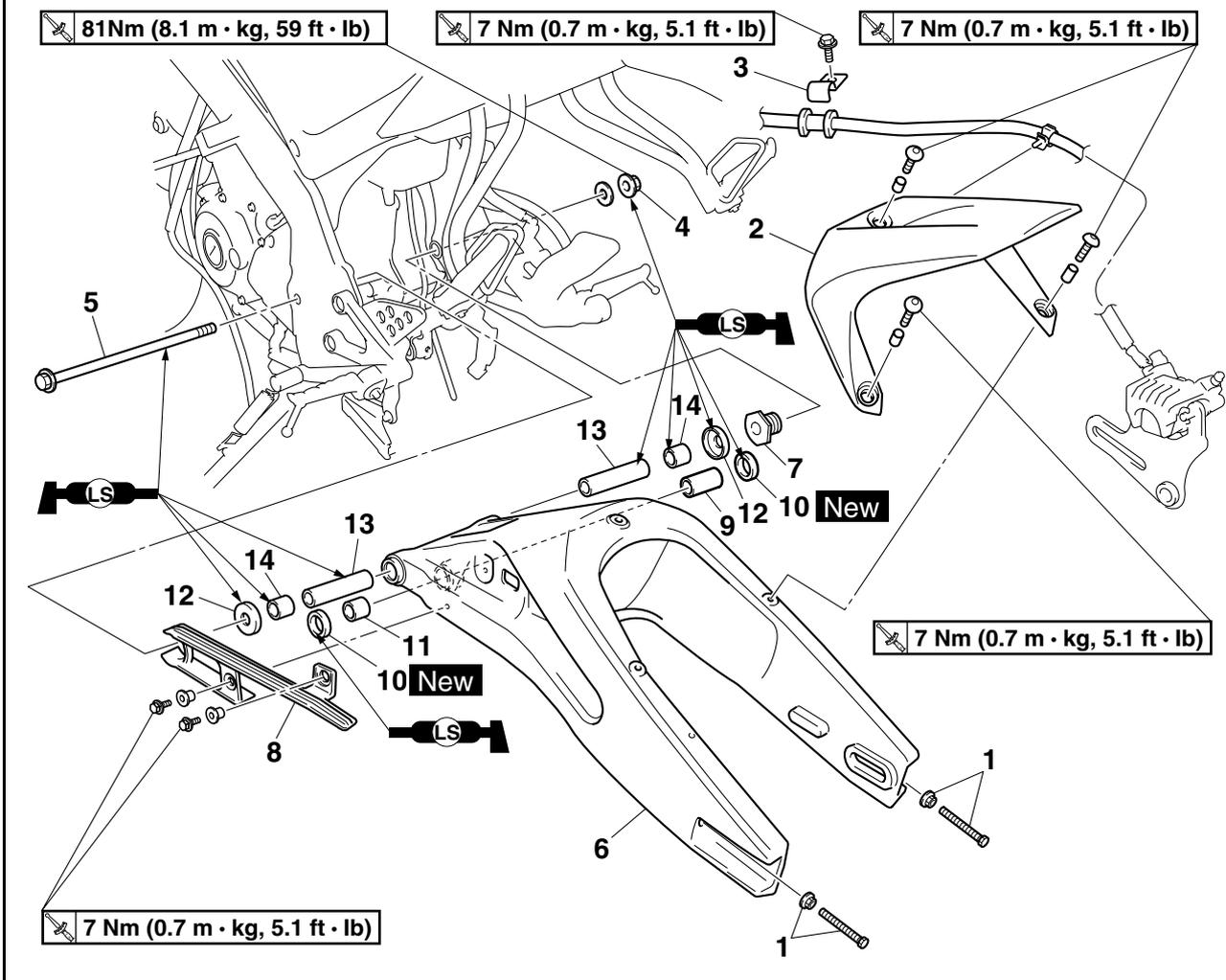
SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
	Rear wheel		Refer to "REAR WHEEL" on page 4-12.
	Rear shock absorber assembly/Relay arm		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-56.
	Drive chain		Refer to "CHAIN DRIVE" on page 4-63.
1	Drive chain adjusting bolt/locknut	2/2	
2	Rear fender	1	
3	Rear brake hose holder	1	
4	Pivot shaft nut	1	
5	Pivot shaft	1	
6	Swingarm	1	
7	Swingarm adjusting collar	1	
8	Drive chain guide	1	
9	Spacer	1	
10	Oil seal	2	
11	Bearing	1	

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
12	Dust cover	2	
13	Spacer	2	
14	Bearing	2	
			For installation, reverse the removal procedure.

EAS23350

REMOVING THE SWINGARM

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

NOTE:

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

2. Measure:

- Swingarm side play
- Swingarm vertical movement

a. Measure the tightening torque of the pivot shaft nut.



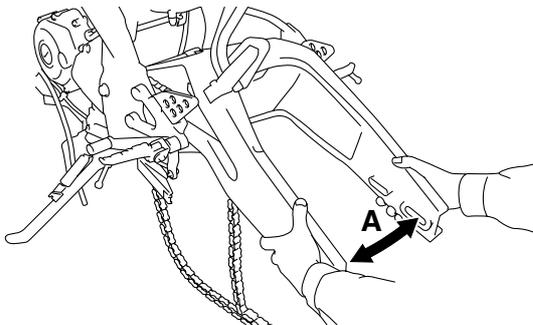
Pivot shaft nut
81 Nm (8.1 m·kg, 59 ft·lb)

b. Measure the swingarm side play "A" by moving the swingarm from side to side.

c. If the swingarm side play is out of specification, check the spacers, bearings, and dust covers.



Swingarm end free play limit (axial)
0 mm (0 in)



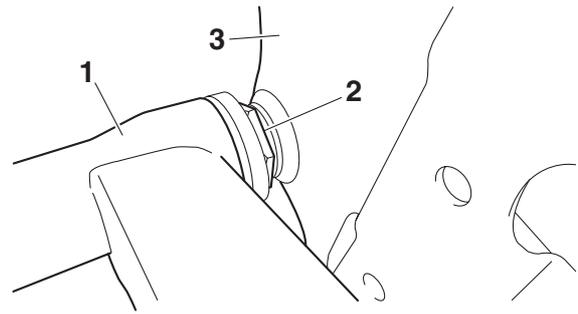
3. Remove:

- Pivot shaft nut
- Pivot shaft
- Swingarm "1"
- Swingarm adjusting collar "2"

a. Loosen the pivot shaft nut.

b. Fully turn in the swingarm adjusting collar so that it contacts the frame "3".

c. Remove the pivot shaft nut, washer, pivot shaft and swingarm.



EAS23360

CHECKING THE SWINGARM

1. Check:

- Swingarm
Bends/cracks/damage → Replace.

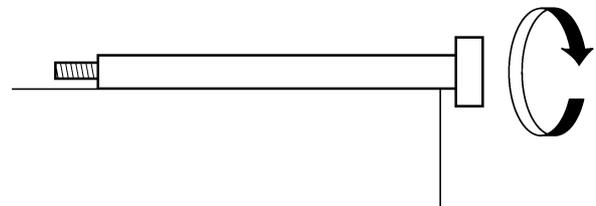
2. Check:

- Pivot shaft
Roll the pivot shaft on a flat surface.
Bends → Replace.

EWA13770

WARNING

Do not attempt to straighten a bent pivot shaft.



3. Wash:

- Pivot shaft
- Washer
- Swingarm adjusting collar
- Dust covers
- Spacers
- Bearings



Recommended cleaning solvent
Kerosene

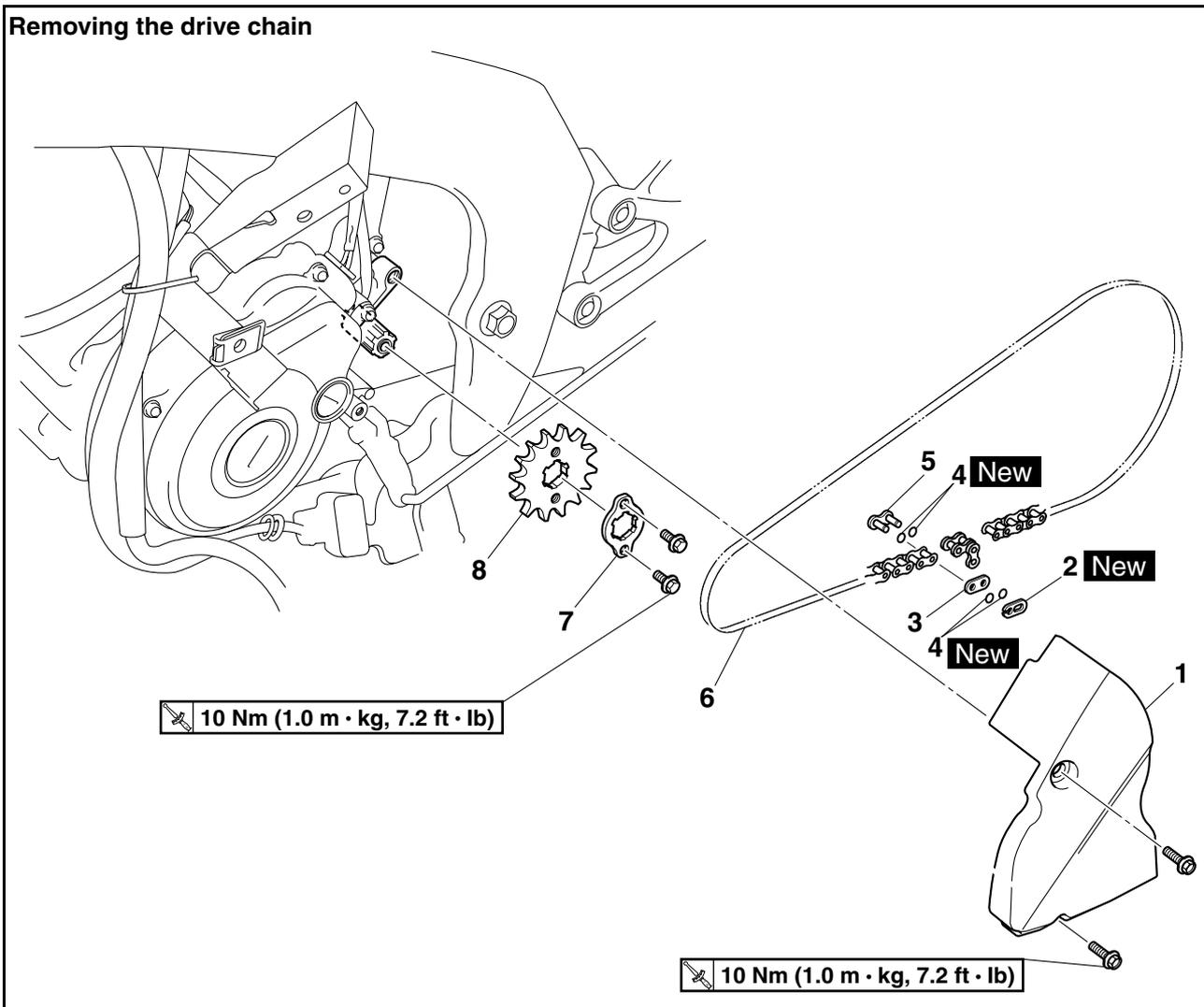
4. Check:

- Washer
- Swingarm adjusting collar
- Dust covers
- Spacers
- Oil seals
Damage/wear → Replace.

EAS23400

CHAIN DRIVE

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Bottom cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Rear wheel		Refer to "REAR WHEEL" on page 4-12.
1	Drive sprocket cover	1	
2	Master link clip	1	
3	Master link plate	1	
4	O-ring	4	
5	Master link	1	
6	Drive chain	1	
7	Drive sprocket retainer	1	
8	Drive sprocket	1	
			For installation, reverse the removal procedure.

EAS23420

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.

NOTE:

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

EAS23441

CHECKING THE DRIVE CHAIN

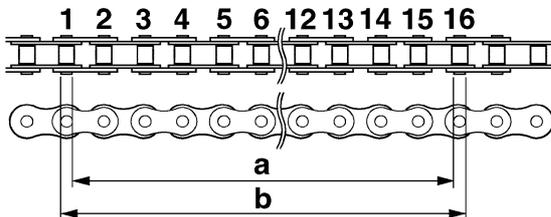
1. Measure:

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



15-link length limit
191.5 mm (7.54 in)

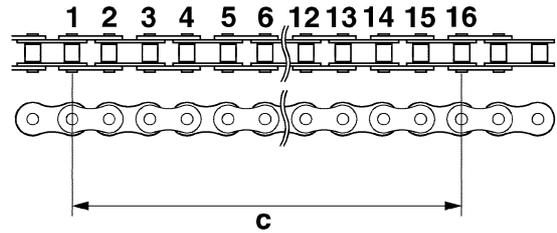
- a. Measure the length "a" between the inner sides of the pins and the length "b" between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.



- b. Calculate the 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

NOTE:

- 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.



2. Clean:

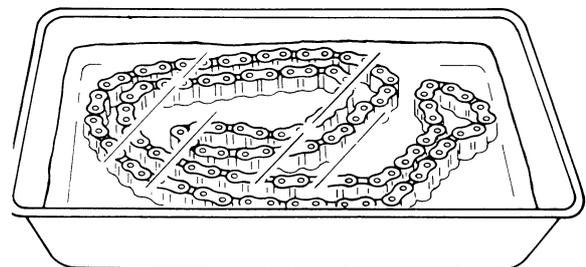
- Drive chain

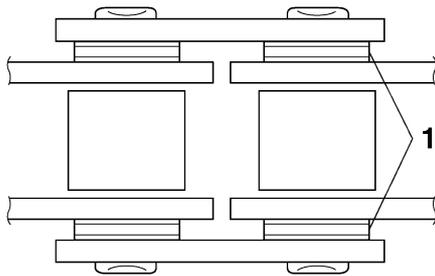
- a. Wipe the drive chain with a clean cloth.
- b. Put the drive chain in kerosene and remove any remaining dirt.
- c. Remove the drive chain from the kerosene and completely dry it.

ECA14290

CAUTION:

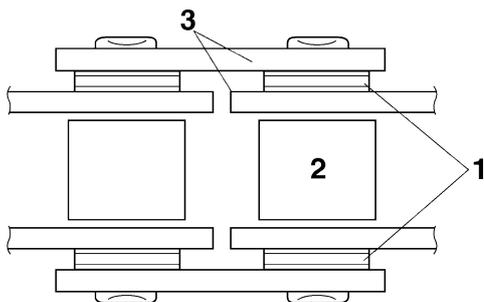
- This motorcycle has a drive chain with small rubber O-rings "1" between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzene), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water into the drive chain's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





3. Check:

- O-rings "1"
Damage → Replace the drive chain.
- Drive chain rollers "2"
Damage/wear → Replace the drive chain.
- Drive chain side plates "3"
Damage/wear → Replace the drive chain.
Cracks → Replace the drive chain.



4. Lubricate:

- Drive chain

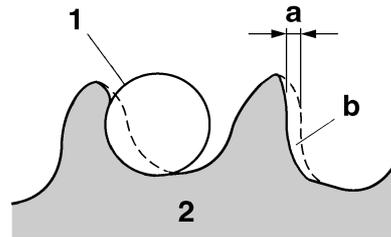
Recommended lubricant
Engine oil or chain lubricant
suitable for O-ring chains

EAS23460

CHECKING THE DRIVE SPROCKET

1. Check:

- Drive sprocket
More than 1/4 tooth "a" wear → Replace the drive chain sprockets as a set.
Bent teeth → Replace the drive chain sprockets as a set.



b. Correct

1. Drive chain roller
2. Drive chain sprocket

EAS23470

CHECKING THE REAR WHEEL SPROCKET

Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-15.

EAS23480

CHECKING THE REAR WHEEL DRIVE HUB

Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-15.

EAS23490

INSTALLING THE DRIVE CHAIN

1. Lubricate:

- Drive chain
- Master link **New**

Recommended lubricant
Engine oil or chain lubricant
suitable for O-ring chains

2. Install:

- Drive sprocket
- Drive sprocket retainer bolts

Drive sprocket retainer bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)

3. Install:

- Master link
- O-rings
- Master link plate
- Master link clip "1" **New**

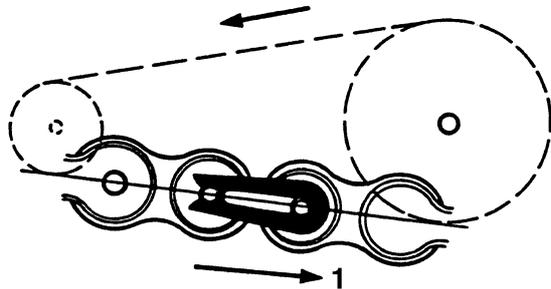
ECA14310

CAUTION:

- The closed end of the master link clip must face in the direction of drive chain rotation.
- Never install a new drive chain onto worn drive chain sprockets; this will dramatically shorten the drive chain's life.

NOTE: _____

Install the master link plate with its manufacturer mark facing outward.



4. Install:

- Drive sprocket cover

NOTE: _____

Be sure not to pinch the neutral switch lead when installing the drive sprocket cover.

5. Install:

- Rear wheel
Refer to "REAR WHEEL" on page 4-12.

6. Adjust:

- Drive chain slack
Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-21.



Drive chain slack
30.0–40.0 mm (1.18–1.57 in)

ECA13550

CAUTION: _____

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.

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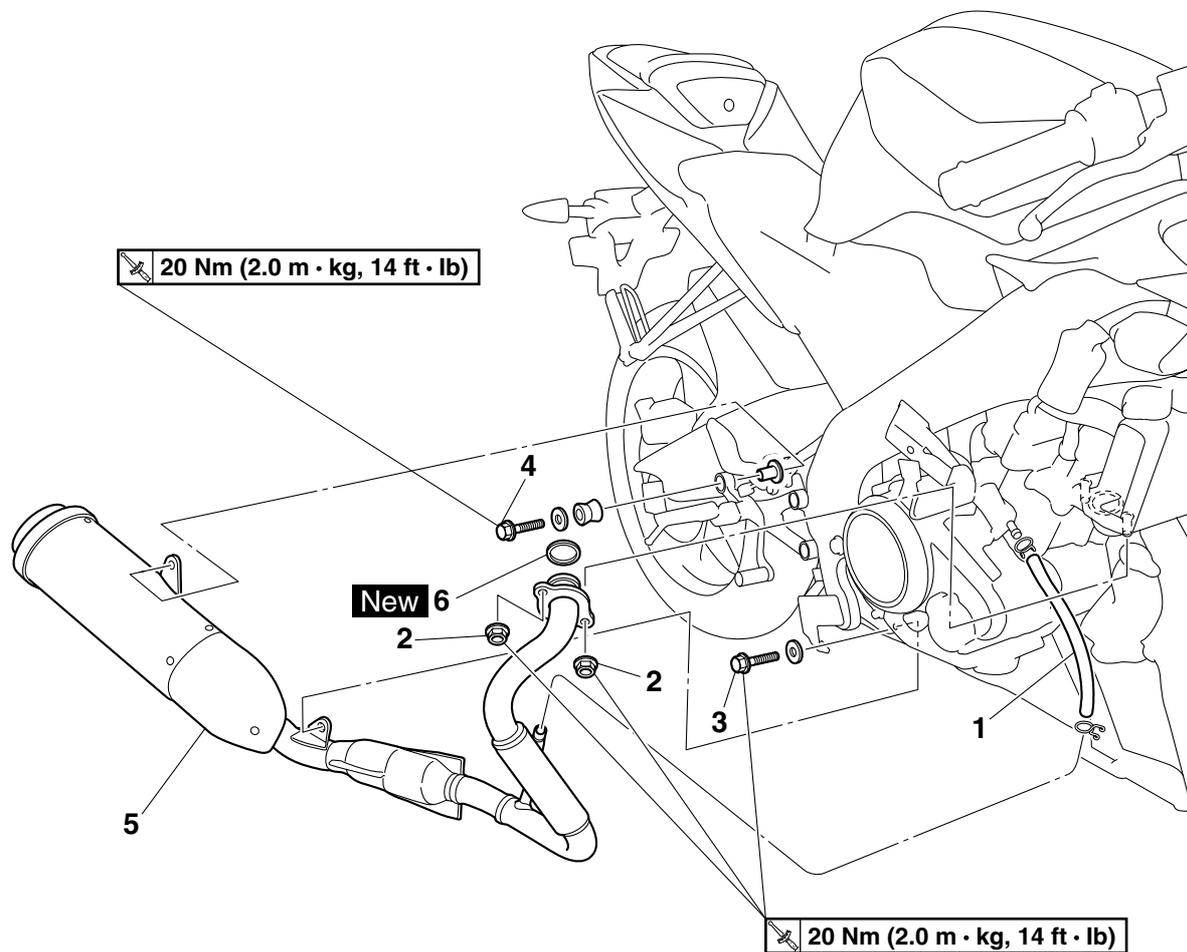
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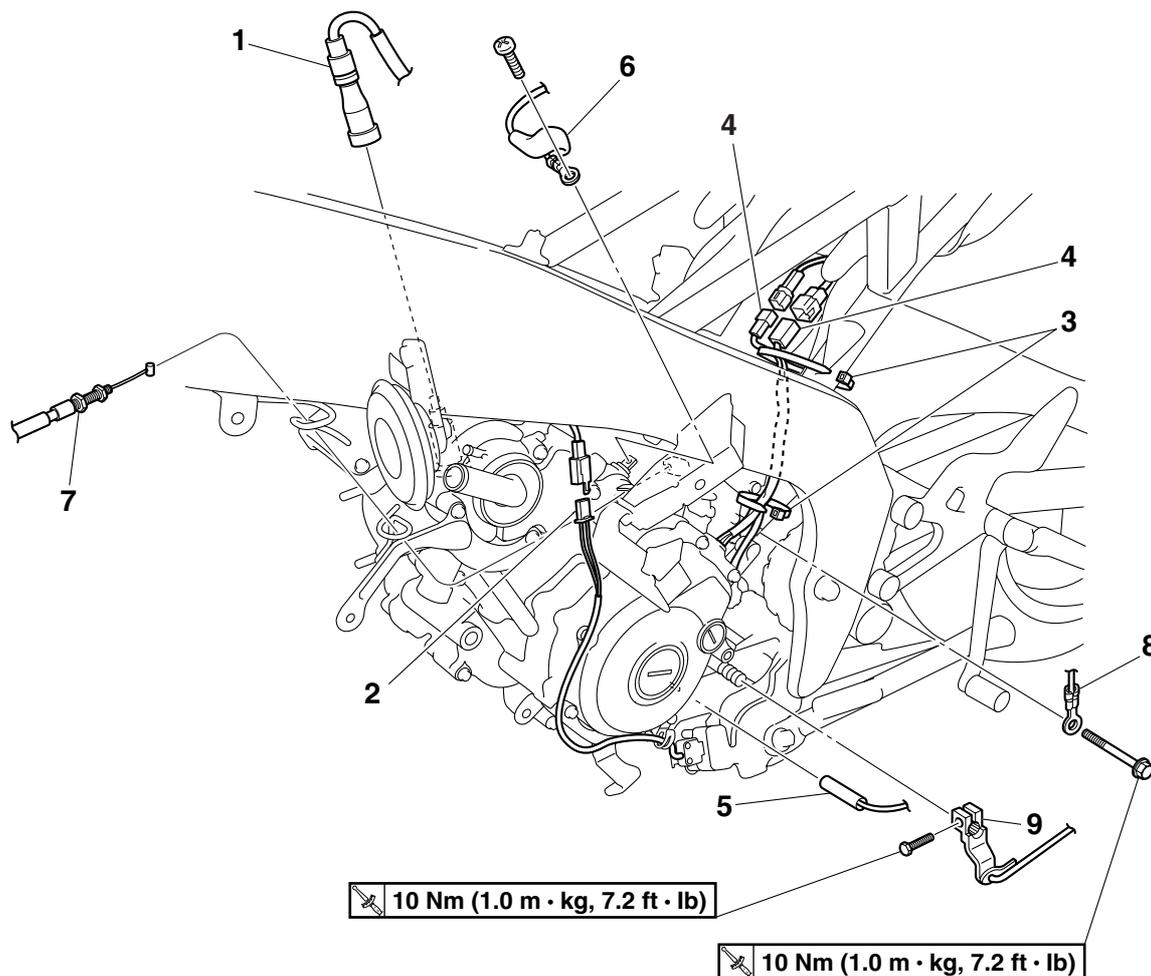
ENGINE REMOVAL

Removing the exhaust assembly



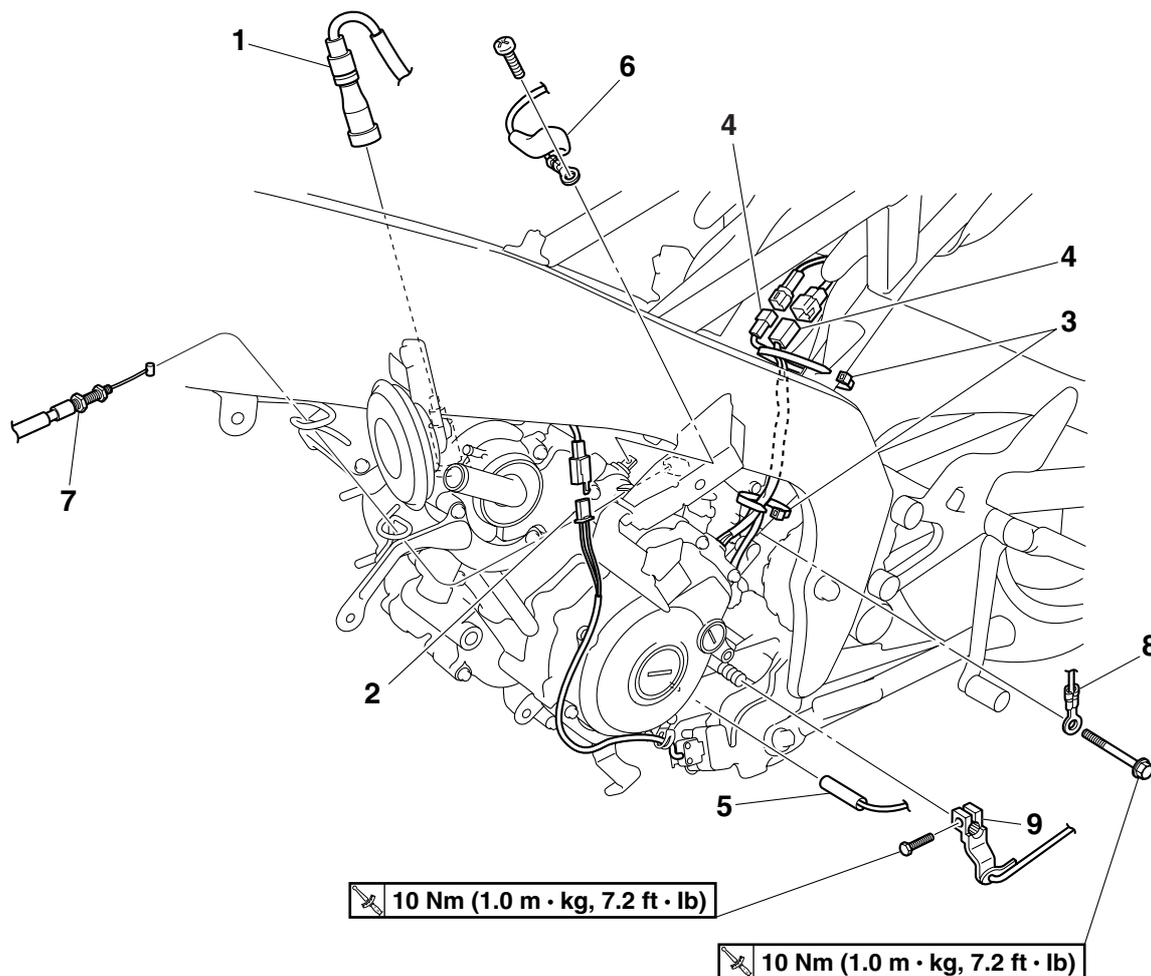
Order	Job/Parts to remove	Q'ty	Remarks
	Right bottom cowling		Refer to "GENERAL CHASSIS" on page 4-1.
1	Air induction system hose (reed valve assembly to exhaust pipe)	1	Disconnect.
2	Exhaust pipe nut	2	
3	Exhaust assembly bolt	1	M8 × 20 mm
4	Exhaust assembly bolt	1	M8 × 35 mm
5	Exhaust assembly	1	
6	Exhaust pipe gasket	1	
			For installation, reverse the removal procedure.

Disconnecting the leads and couplers



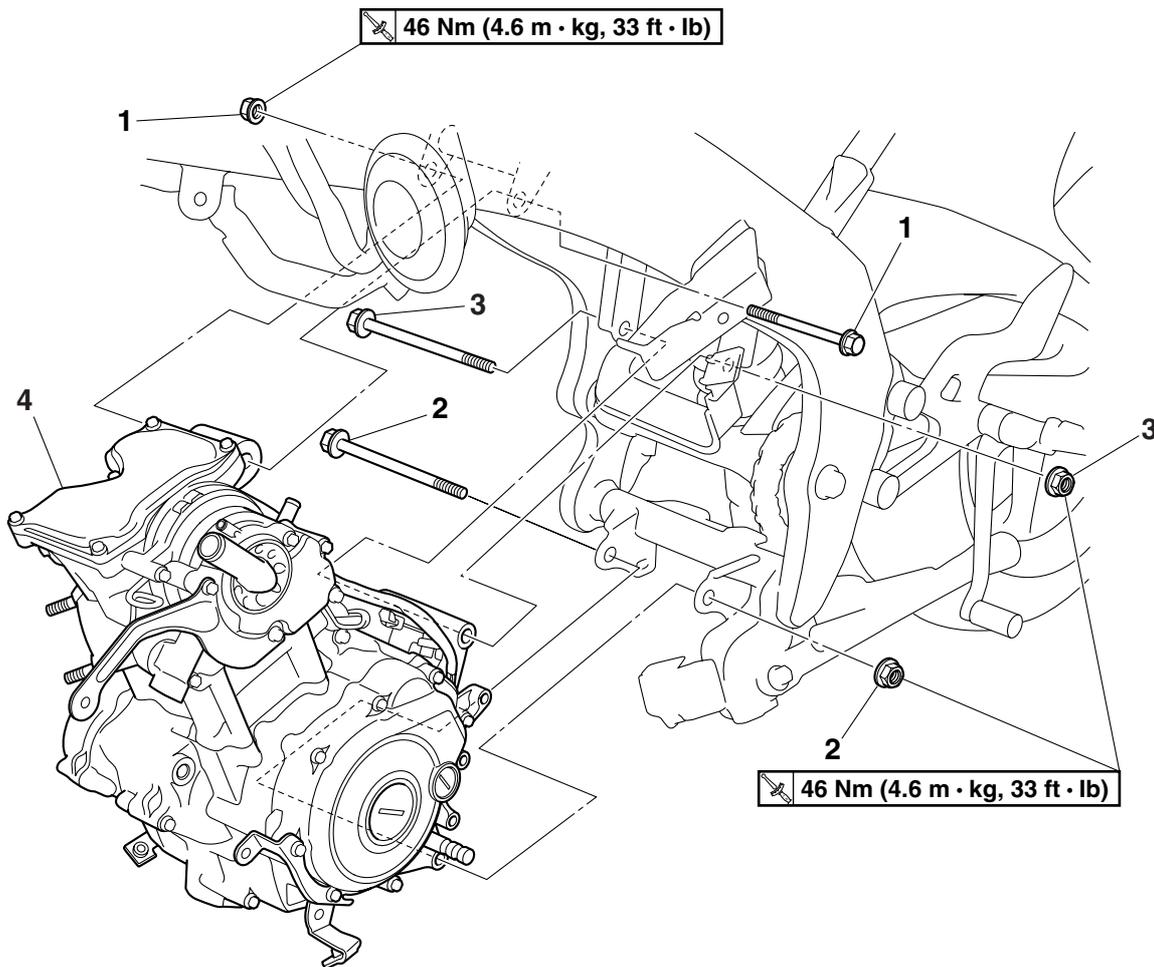
Order	Job/Parts to remove	Q'ty	Remarks
			ECA5D71020 CAUTION: _____ First, disconnect the negative battery lead, then the positive battery lead.
	Negative battery lead/Positive battery lead		Refer to "CHECKING AND CHARGING THE BATTERY" on page 3-27.
	Seat/Bottom cowlings/Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-11.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-15.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Throttle body/Intake manifold		Refer to "THROTTLE BODY" on page 7-4.
	Coolant reservoir/Water pump breather hose/Radiator outlet hose/Radiator		Refer to "RADIATOR" on page 6-1.
	Coolant temperature sensor/Thermostat/Radiator inlet hose		Refer to "THERMOSTAT" on page 6-4.
	Cylinder head breather hose		Refer to "WATER PUMP" on page 6-6.

Disconnecting the leads and couplers



Order	Job/Parts to remove	Q'ty	Remarks
	Air induction system reed valve assembly		Refer to "AIR INDUCTION SYSTEM" on page 7-9.
	Drive sprocket cover/Drive sprocket		Refer to "CHAIN DRIVE" on page 4-63.
1	Spark plug cap	1	Disconnect.
2	Sidestand switch lead	1	Disconnect.
3	Plastic locking tie	2	
4	Stator coil coupler/Crankshaft position sensor coupler	1/1	Disconnect.
5	Neutral switch connector	1	Disconnect.
6	Starter motor lead	1	Disconnect.
7	Clutch cable	1	Disconnect.
8	Negative battery lead	1	Disconnect.
9	Shift arm	1	
			For installation, reverse the removal procedure.

Removing the engine



Order	Job/Parts to remove	Q'ty	Remarks
			NOTE: _____ Place a suitable stand under the engine.
1	Engine mounting bolt/nut (front side)	1/1	
2	Engine mounting bolt/nut (rear lower side)	1/1	
3	Engine mounting bolt/nut (rear upper side)	1/1	
4	Engine	1	
			For installation, reverse the removal procedure.

EAS23720

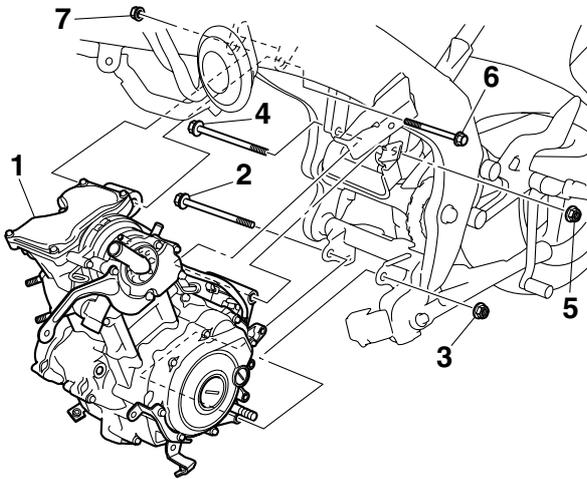
INSTALLING THE ENGINE

1. Install:

- Engine "1"
- Engine mounting bolt (rear lower side) "2"
- Engine mounting nut (rear lower side) "3"
- Engine mounting bolt (rear upper side) "4"
- Engine mounting nut (rear upper side) "5"
- Engine mounting bolt (front side) "6"
- Engine mounting nut (front side) "7"

NOTE:

Do not fully tighten the bolts and nuts.



2. Tighten:

- Engine mounting nut (rear upper side)

	Engine mounting nut (rear upper side) 46 Nm (4.6 m·kg, 33 ft·lb)
---	--

- Engine mounting nut (rear lower side)

	Engine mounting nut (rear lower side) 46 Nm (4.6 m·kg, 33 ft·lb)
---	--

- Engine mounting nut (front side)

	Engine mounting nut (front side) 46 Nm (4.6 m·kg, 33 ft·lb)
---	---

EAS5D71030

INSTALLING THE SHIFT ARM

1. Install:

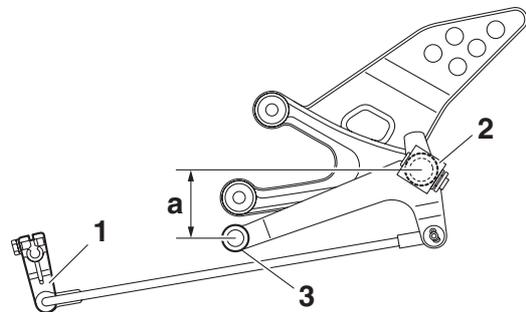
- Shift arm "1"

NOTE:

Make sure that the distance "a" between the center of the left rider footrest "2" and the center of the shift pedal "3" is within specification.

	Shift pedal position "a" 52.2 mm (2.06 in)
---	--

	Shift arm bolt 10 Nm (1.0 m·kg, 7.2 ft·lb)
---	--



EAS5D71045

INSTALLING THE EXHAUST ASSEMBLY

1. Install:

- Exhaust assembly "1"
- Exhaust pipe nuts "2"
- Exhaust assembly bolts "3" "4"

NOTE:

Do not fully tighten the nuts and bolts.

2. Tighten:

- Exhaust pipe nuts "2"

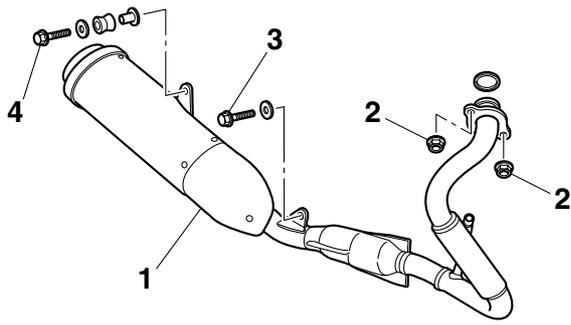
	Exhaust pipe nut 20 Nm (2.0 m·kg, 14 ft·lb)
---	---

- Exhaust assembly bolt "4"

	Exhaust assembly bolt 20 Nm (2.0 m·kg, 14 ft·lb)
---	--

- Exhaust assembly bolt "3"

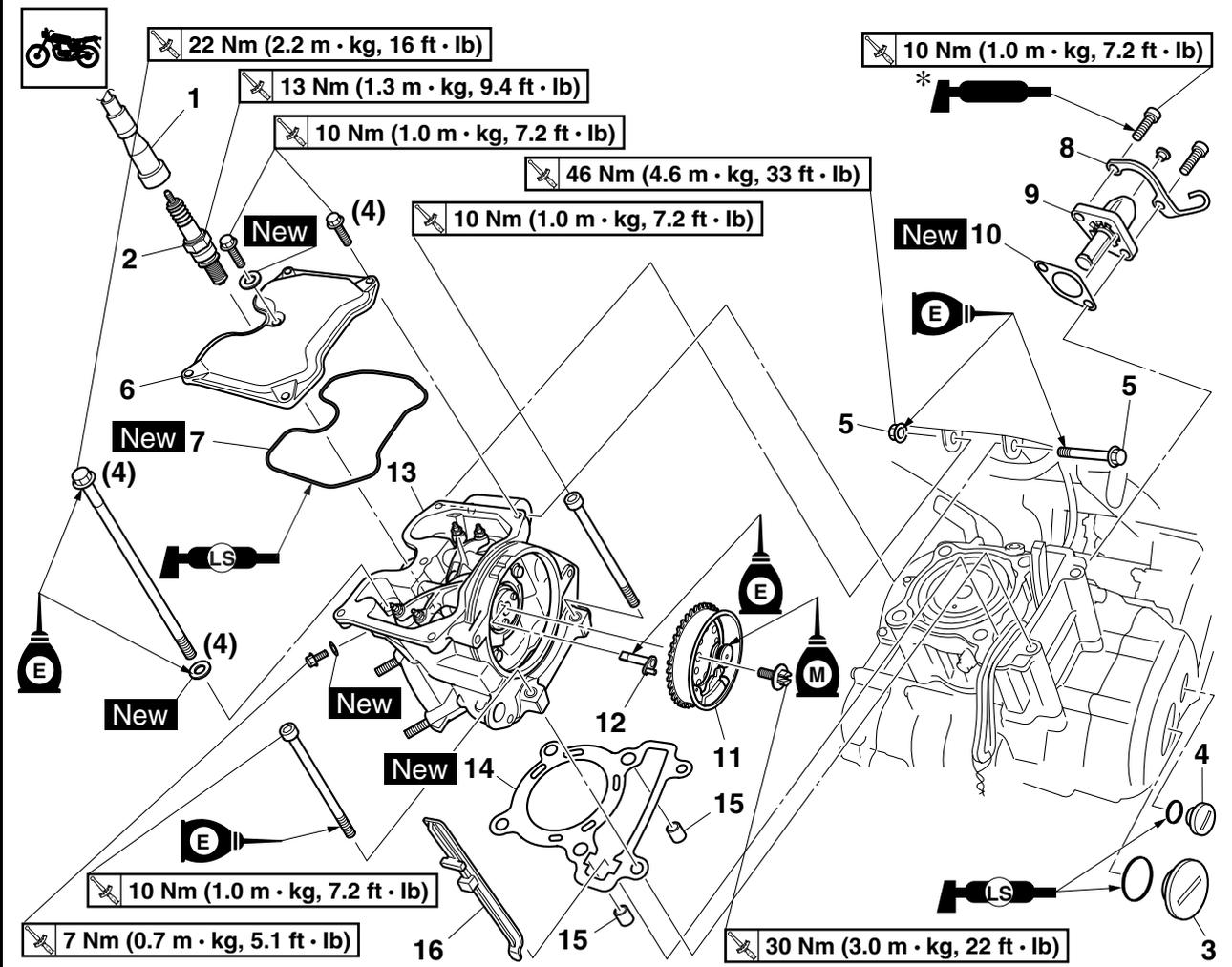
	Exhaust assembly bolt 20 Nm (2.0 m·kg, 14 ft·lb)
---	--



EAS24100

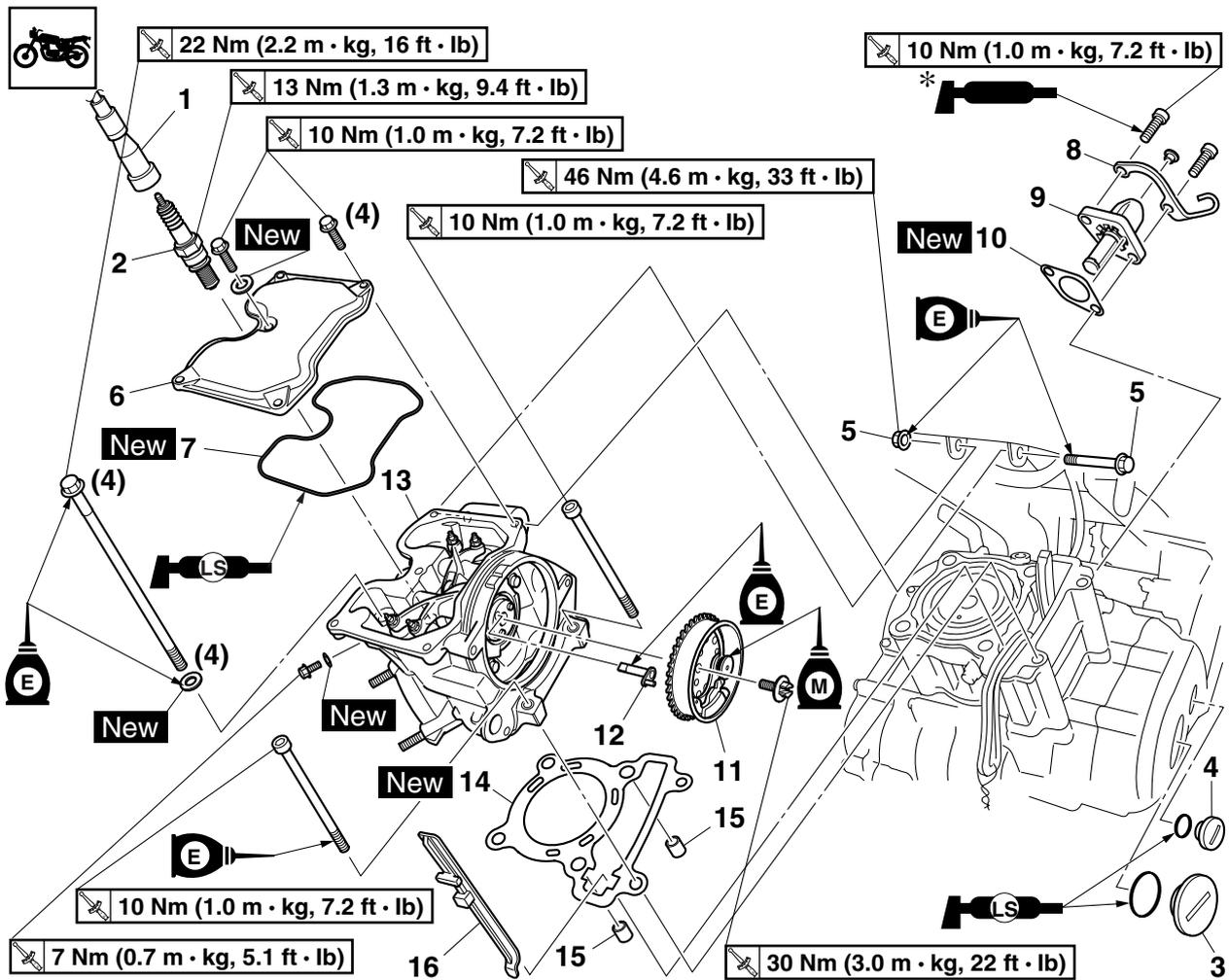
CYLINDER HEAD

Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
	Seat/Bottom cowlings/Air filter case		Refer to "GENERAL CHASSIS" on page 4-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-15.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
	Clutch cable		Disconnect. Refer to "CLUTCH" on page 5-38.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Throttle body/Intake manifold		Refer to "THROTTLE BODY" on page 7-4.
	Radiator/Coolant reservoir hose		Refer to "RADIATOR" on page 6-1.
	Thermostat/Coolant temperature sensor		Refer to "THERMOSTAT" on page 6-4.
	Water pump		Refer to "WATER PUMP" on page 6-6.
1	Spark plug cap	1	Disconnect.
2	Spark plug	1	
3	Crankshaft end accessing screw	1	
4	Timing mark accessing screw	1	

Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
5	Engine mounting bolt/nut (front side)	1/1	
6	Cylinder head cover	1	
7	Cylinder head cover gasket	1	
8	Clutch cable holder	1	
9	Timing chain tensioner	1	
10	Timing chain tensioner gasket	1	
11	Camshaft sprocket	1	
12	Decompression cam	1	
13	Cylinder head	1	
14	Cylinder head gasket	1	
15	Dowel pin	2	
16	Timing chain guide (exhaust side)	1	
			For installation, reverse the removal procedure.

* Yamaha bond No. 1215 (Three Bond No. 1215®)

EAS24130

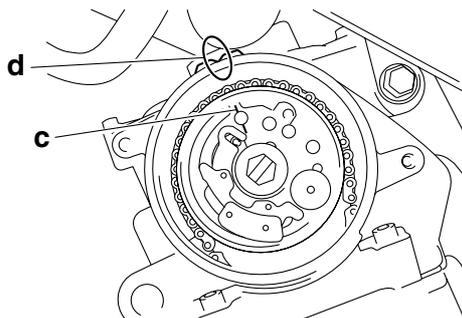
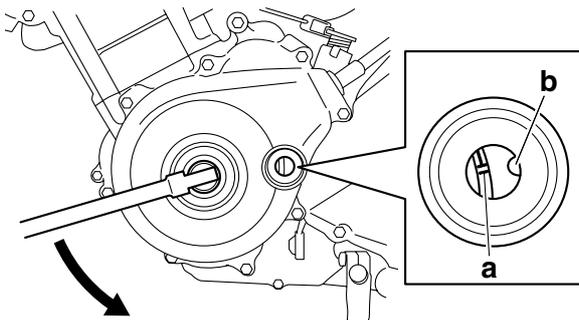
REMOVING THE CYLINDER HEAD

1. Align:

- "I" mark "a" on the generator rotor (with the stationary pointer "b" on the generator cover)



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

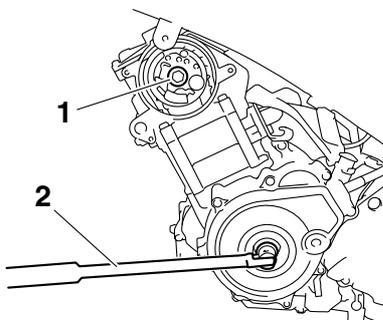


2. Loosen:

- Camshaft sprocket bolt "1"

NOTE:

While holding the generator rotor nut with a wrench "2", loosen the camshaft sprocket bolt.

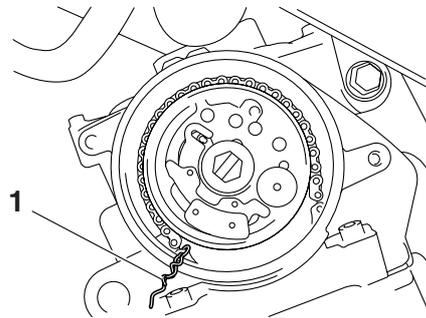


3. Remove:

- Camshaft sprocket

NOTE:

To prevent the timing chain from falling into the crankcase, fasten it with a wire "1".

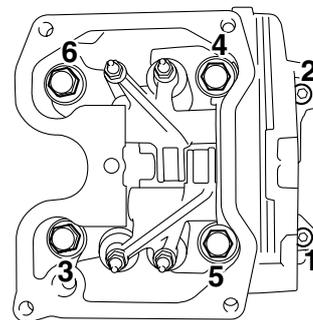


4. Remove:

- Cylinder head

NOTE:

- 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 bolts 1, 2, 4, and 6, and then remove the cylinder head with bolts 3 and 5 installed in the bolt holes.



EAS24160

CHECKING THE CYLINDER HEAD

1. Eliminate:

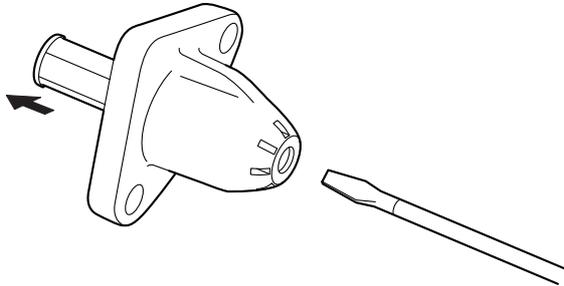
- Combustion chamber carbon deposits (with a rounded scraper)

NOTE:

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

- Spark plug bore threads
- Valve seats

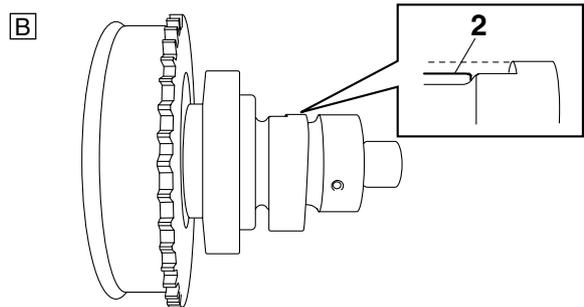
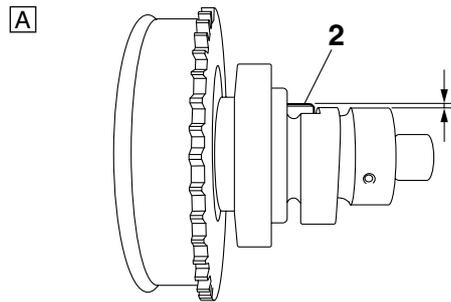
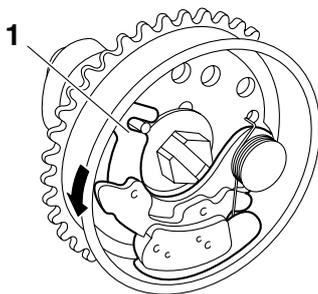
- c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.



EAS5D71009

CHECKING THE DECOMPRESSION SYSTEM

1. Check:
 - Decompression system
-
- a. Check the decompression system with the camshaft sprocket and the decompression cam installed to the camshaft.
 - b. Check that the decompression lever "1" moves smoothly.
 - c. Without operating the decompression lever, check that the decompression cam "2" projects from the camshaft (exhaust cam) as shown in the illustration "A".
 - d. Move the decompression lever "1" in the direction of the arrow shown and check that the decompression cam does not project from the camshaft (exhaust cam) as shown in the illustration "B".



EAS24230

INSTALLING THE CYLINDER HEAD

1. Install:
 - Cylinder head

NOTE:

Pass the timing chain through the timing chain cavity.

2. Tighten:
 - Cylinder head bolts "1"



Cylinder head bolt
22 Nm (2.2 m·kg, 16 ft·lb)

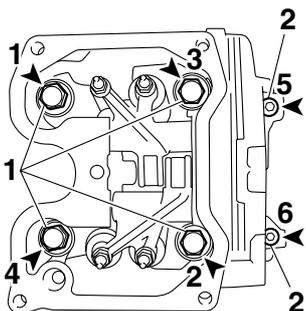
- Cylinder head bolts "2"



Cylinder head bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)

NOTE:

- Lubricate the cylinder head bolts and washers with engine oil.
- Tighten the cylinder head bolts in the proper tightening sequence as shown and torque them in two stages.

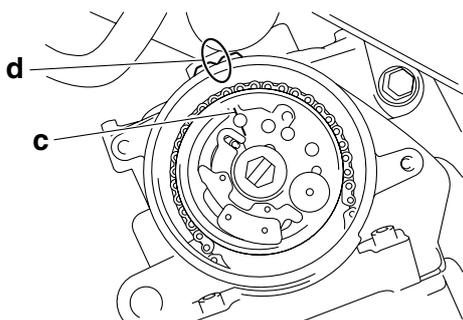
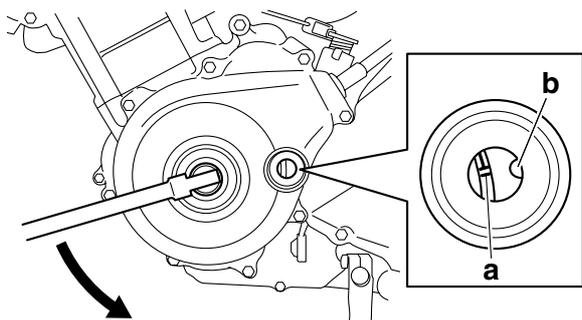


3. Install:

- Camshaft sprocket



- Turn the crankshaft counterclockwise.
- Align the "I" mark "a" on the generator rotor with the stationary pointer "b" on the generator cover.
- Align the "I" mark "c" on the camshaft sprocket with the stationary pointer "d" on the cylinder head.
- Install the timing chain onto the camshaft sprocket, and then install the camshaft sprocket onto the camshaft.



NOTE:

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

ECA5D71012

CAUTION:

Do not turn the crankshaft when installing the camshaft(s) to avoid damage or improper valve timing.

- While holding the camshaft, temporarily tighten the camshaft sprocket bolt.
- Remove the wire from the timing chain.



4. Install:

- Timing chain tensioner gasket **New**
- Timing chain tensioner

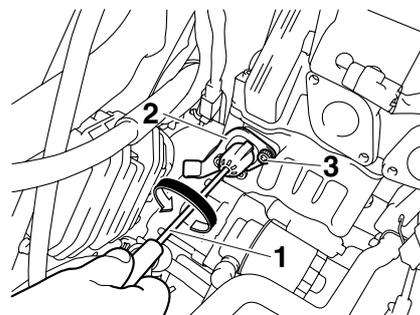
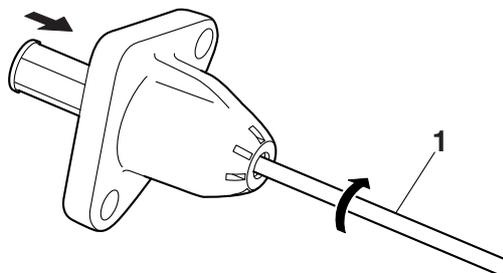


- Apply sealant to the timing chain tensioner bolt threads.

	<p>Yamaha bond No. 1215 90890-85505 (Three Bond No.1215®)</p>
--	--

- While lightly pressing the timing chain tensioner rod by hand, turn the tensioner rod fully clockwise with a thin screwdriver "1".
- With the timing chain tensioner rod turned all the way into the timing chain tensioner housing (with the thin screwdriver still installed), install the gasket and the timing chain tensioner "2" onto the cylinder block.
- Tighten the timing chain tensioner bolts "3" to the specified torque.

	<p>Timing chain tensioner bolt 10 Nm (1.0 m·kg, 7.2 ft·lb)</p>
--	---



- Remove the screwdriver, make sure the timing chain tensioner rod releases.



5. Turn:

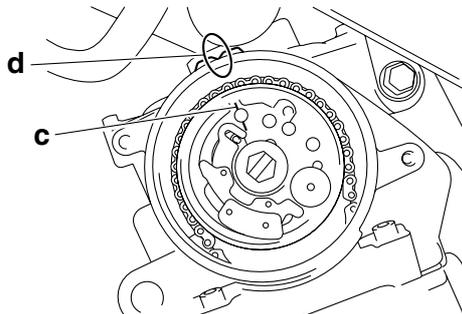
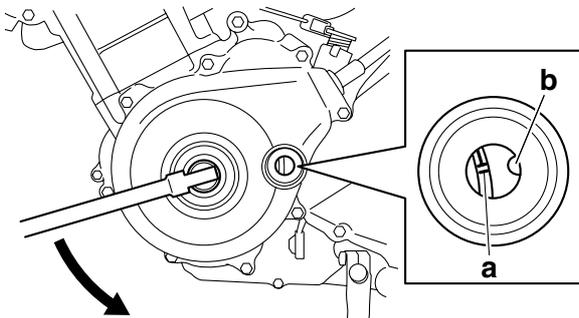
- Crankshaft
(several turns counterclockwise)

6. Check:

- "I" mark "a"
Align the "I" mark on the generator rotor with the stationary pointer "b" on the generator cover.
- "I" mark "c"
Align the "I" mark on the camshaft sprocket with the stationary pointer "d" on the cylinder head.

Out of alignment → Correct.

Refer to the installation steps above.



7. Tighten:

- Camshaft sprocket bolt



ECA5D71013

CAUTION:

Be sure to tighten the camshaft sprocket bolt to the specified torque to avoid the possibility of the bolt coming loose and damaging the engine.

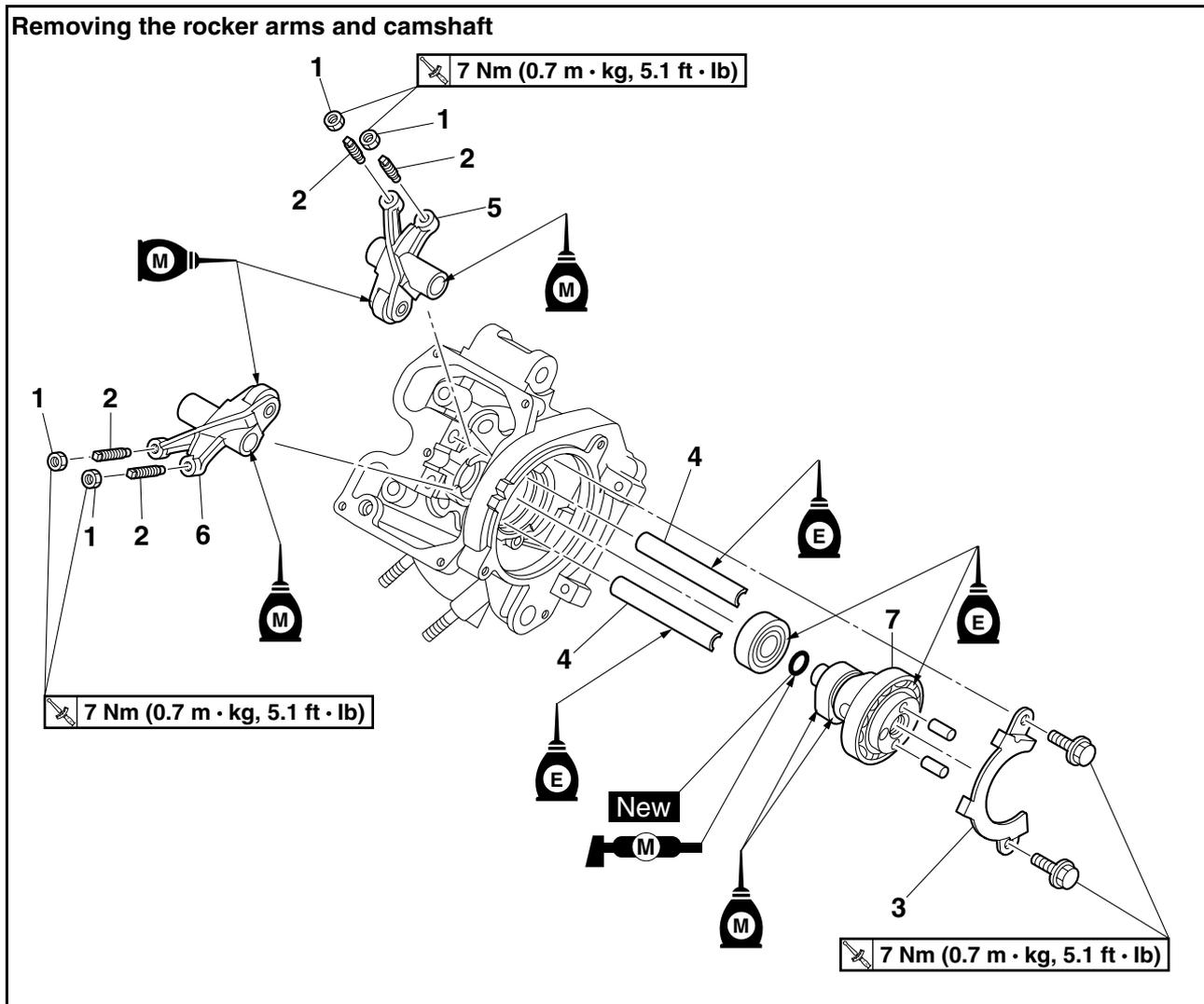
8. Measure:

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

EAS23730

CAMSHAFT

Removing the rocker arms and camshaft



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-7.
1	Locknut	4	
2	Adjusting screw	4	
3	Camshaft retainer	1	
4	Rocker arm shaft	2	
5	Intake rocker arm	1	
6	Exhaust rocker arm	1	
7	Camshaft	1	
			For installation, reverse the removal procedure.

EAS23840

CHECKING THE CAMSHAFT

- Check:
 - Camshaft lobes
Blue discoloration/pitting/scratches → Replace the camshaft.
- Measure:
 - Camshaft lobe dimensions "a" and "b"
Out of specification → Replace the camshaft.



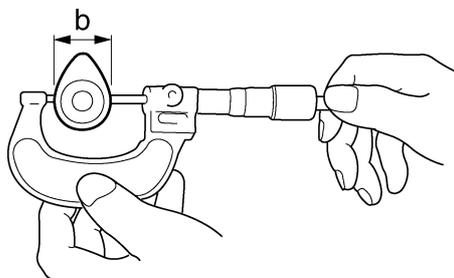
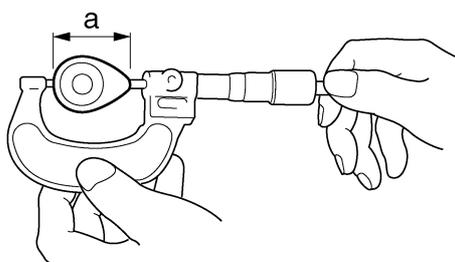
Camshaft lobe dimensions

Intake A
30.225–30.325 mm (1.1900–1.1939 in)
Limit
30.125 mm (1.1860 in)

Intake B
25.127–25.227 mm (0.9893–0.9932 in)
Limit
25.027 mm (0.9853 in)

Exhaust A
30.232–30.332 mm (1.1902–1.1942 in)
Limit
30.132 mm (1.1863 in)

Exhaust B
25.065–25.165 mm (0.9868–0.9907 in)
Limit
24.965 mm (0.9829 in)



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

EAS23880

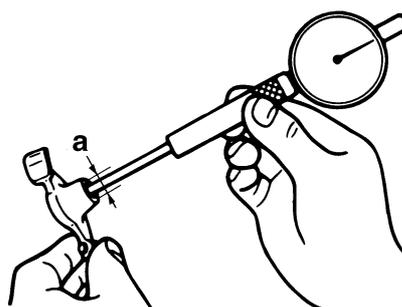
CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

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

- Check:
 - Rocker arm
Damage/wear → Replace.
- Check:
 - Rocker arm shaft
Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.
- Measure:
 - Rocker arm inside diameter "a"
Out of specification → Replace.



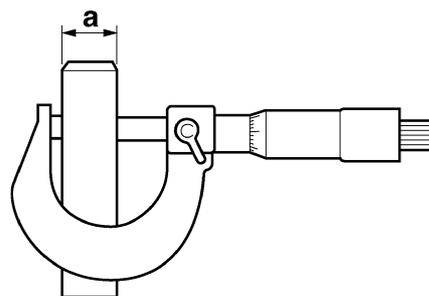
Rocker arm inside diameter
9.985–10.000 mm (0.3931–0.3937 in)
Limit
10.015 mm (0.3943 in)



- Measure:
 - Rocker arm shaft outside diameter "a"
Out of specification → Replace.



Rocker arm shaft outside diameter
9.966–9.976 mm (0.3924–0.3928 in)
Limit
9.941 mm (0.3914 in)



5. Calculate:
- Rocker-arm-to-rocker-arm-shaft clearance

NOTE: _____

Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

Out of specification → Replace the defective part(s).

	Rocker-arm-to-rocker-arm-shaft clearance
	0.009–0.034 mm (0.0004–0.0013 in)
	Limit 0.074 mm (0.0029 in)

EAS24040

INSTALLING THE CAMSHAFT AND ROCKER ARMS

1. Lubricate:
- Rocker arms
 - Rocker arm shafts

	Recommended lubricant
	Rocker arm inner surface
	Molybdenum disulfide oil
	Rocker arm shaft Engine oil

2. Lubricate:
- Camshaft

	Recommended lubricant
	Camshaft
	Molybdenum disulfide oil
	Camshaft bearing Engine oil

3. Install:
- Camshaft “1”

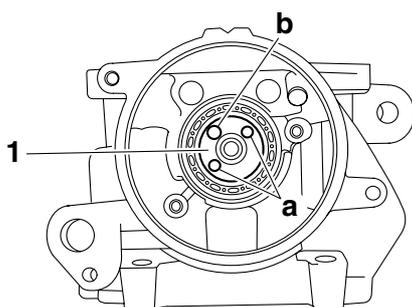
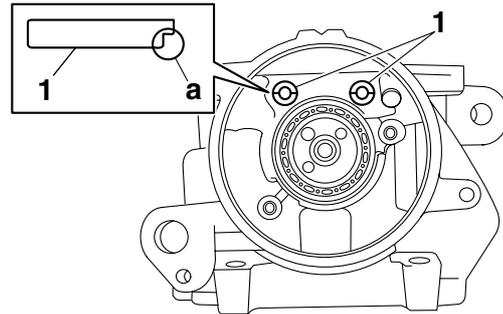
NOTE: _____

Make sure that the camshaft projections “a” and hole “b” are positioned as shown in the illustration.

4. Install:
- Rocker arms
 - Rocker arm shafts “1”

NOTE: _____

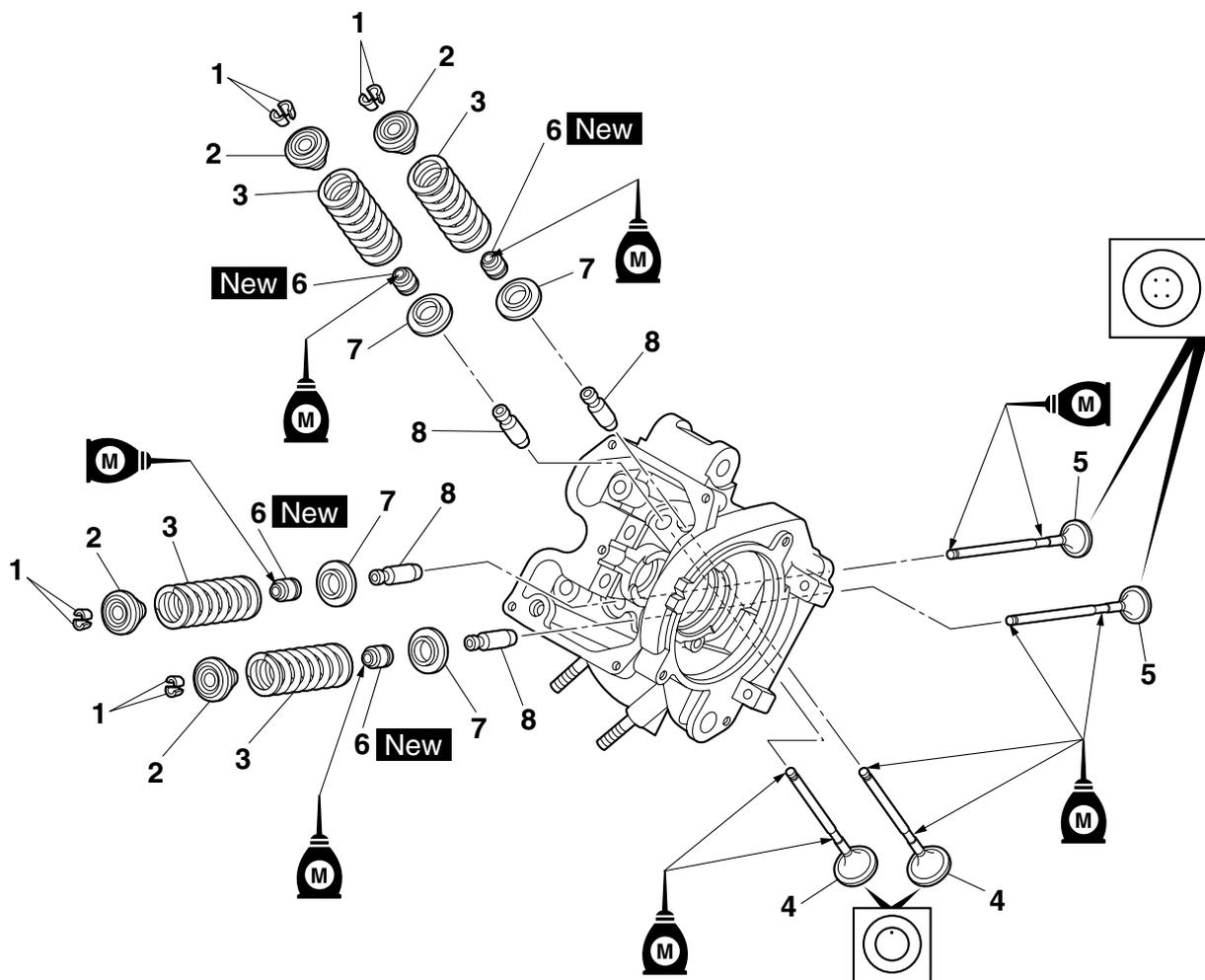
- Make sure that the cutout “a” in each rocker arm shaft is facing downward as shown in the illustration.
- Make sure the rocker arm shafts (intake and exhaust) are completely pushed into the cylinder head.



EAS24270

VALVES AND VALVE SPRINGS

Removing the valves and valve springs

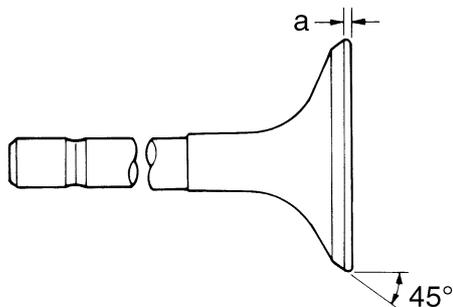


Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-7.
	Rocker arms/Camshaft		Refer to "CAMSHAFT" on page 5-14.
1	Valve cotter	8	
2	Upper spring seat	4	
3	Valve spring	4	
4	Intake valve	2	
5	Exhaust valve	2	
6	Valve stem seal	4	
7	Lower spring seat	4	
8	Valve guide	4	
			For installation, reverse the removal procedure.

3. Eliminate:
 - Carbon deposits
(from the valve face and valve seat)
4. Check:
 - Valve face
Pitting/wear → Grind the valve face.
 - Valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
 - Valve margin thickness D “a”
Out of specification → Replace the valve.



Valve margin thickness D (intake)
0.50–0.90 mm (0.0197–0.0354 in)
Valve margin thickness D (exhaust)
0.50–0.90 mm (0.0197–0.0354 in)



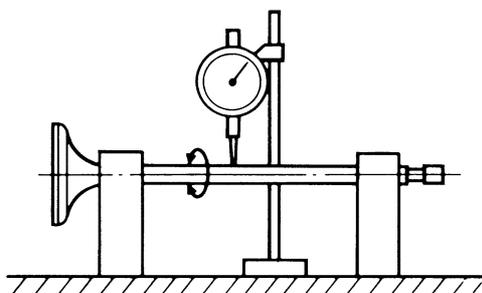
6. Measure:
 - Valve stem runout
Out of specification → Replace the valve.

NOTE: _____

- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the valve stem seal.



Valve stem runout
0.010 mm (0.0004 in)



EAS24300

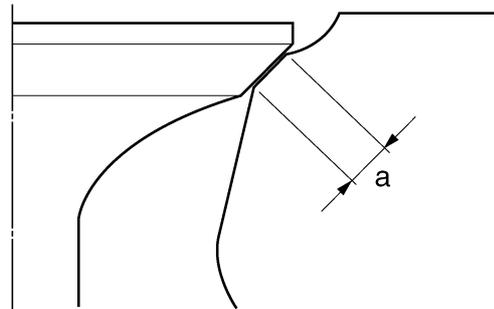
CHECKING THE VALVE SEATS

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

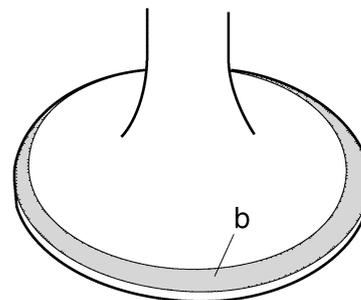
1. Eliminate:
 - Carbon deposits
(from the valve face and valve seat)
2. Check:
 - Valve seat
Pitting/wear → Replace the cylinder head.
3. Measure:
 - Valve seat width C “a”
Out of specification → Replace the cylinder head.



Valve seat width C (intake)
0.90–1.10 mm (0.0354–0.0433 in)
Valve seat width C (exhaust)
0.90–1.10 mm (0.0354–0.0433 in)



- a. Apply Mechanic’s blueing dye (Dykem) “b” onto the valve face.



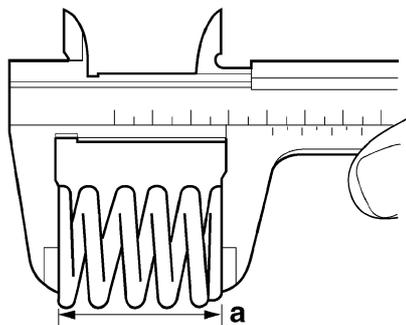
- b. Install the valve into the cylinder head.
- c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- d. Measure the valve seat width.

NOTE: _____

Where the valve seat and valve face contacted one another, the blueing will have been removed.



Free length (intake)
41.71 mm (1.64 in)
Limit
39.62 mm (1.56 in)
Free length (exhaust)
41.71 mm (1.64 in)
Limit
39.62 mm (1.56 in)

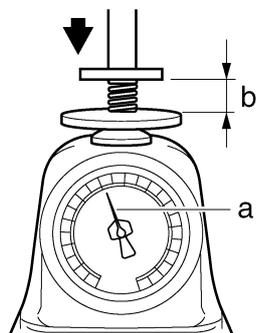


2. Measure:

- Compressed valve spring force "a"
Out of specification → Replace the valve spring.



Installed compression spring force (intake)
140–162 N (31.47–36.42 lbf)
(14.28–16.52 kgf)
Installed compression spring force (exhaust)
140–162 N (31.47–36.42 lbf)
(14.28–16.52 kgf)
Installed length (intake)
35.30 mm (1.39 in)
Installed length (exhaust)
35.30 mm (1.39 in)



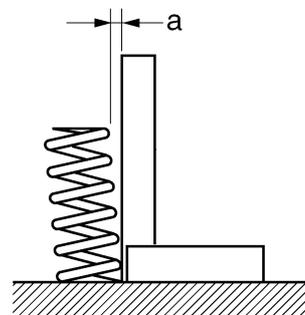
b. Installed length

3. Measure:

- Valve spring tilt "a"
Out of specification → Replace the valve spring.



Spring tilt (intake)
2.5°/1.8 mm
Spring tilt (exhaust)
2.5°/1.8 mm



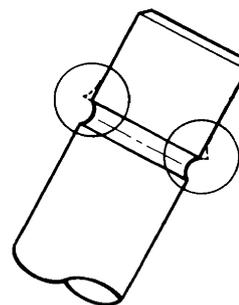
EAS24340

INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

1. Deburr:

- Valve stem end
(with an oil stone)

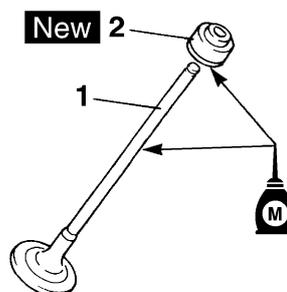


2. Lubricate:

- Valve stem "1"
- Valve stem seal "2" **New**
(with the recommended lubricant)



Recommended lubricant
Molybdenum disulfide oil



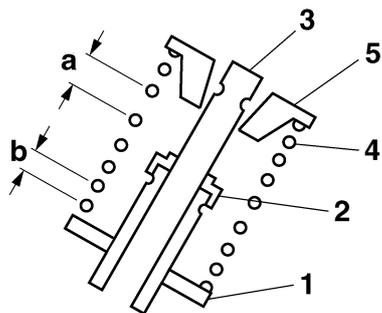
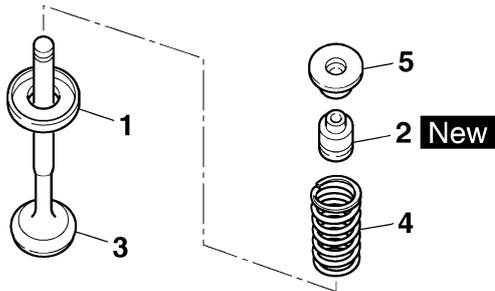
3. Install:

- Lower spring seat "1"
- Valve stem seal "2" **New**

- Valve "3"
- Valve spring "4"
- Upper spring seat "5"
(into the cylinder head)

NOTE:

- Make sure each valve is installed in its original place.
- Install the valve springs with the larger pitch "a" facing up.



b. Smaller pitch

4. Install:

- Valve cotters "1"

NOTE:

Install the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment "2".



Valve spring compressor

90890-04019

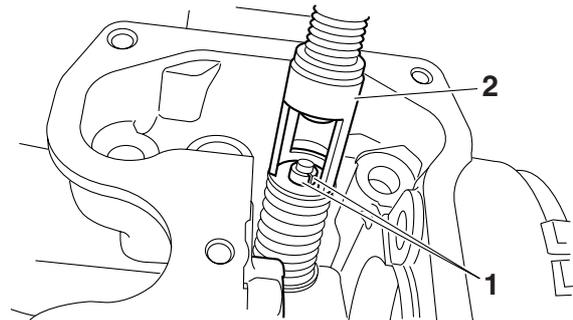
YM-04019

Valve spring compressor attachment

90890-04108

Valve spring compressor adapter 22 mm

YM-04108

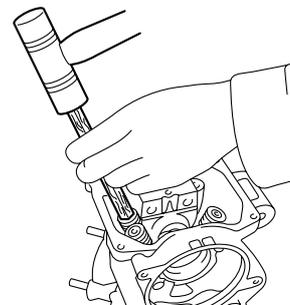


5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

CAUTION:

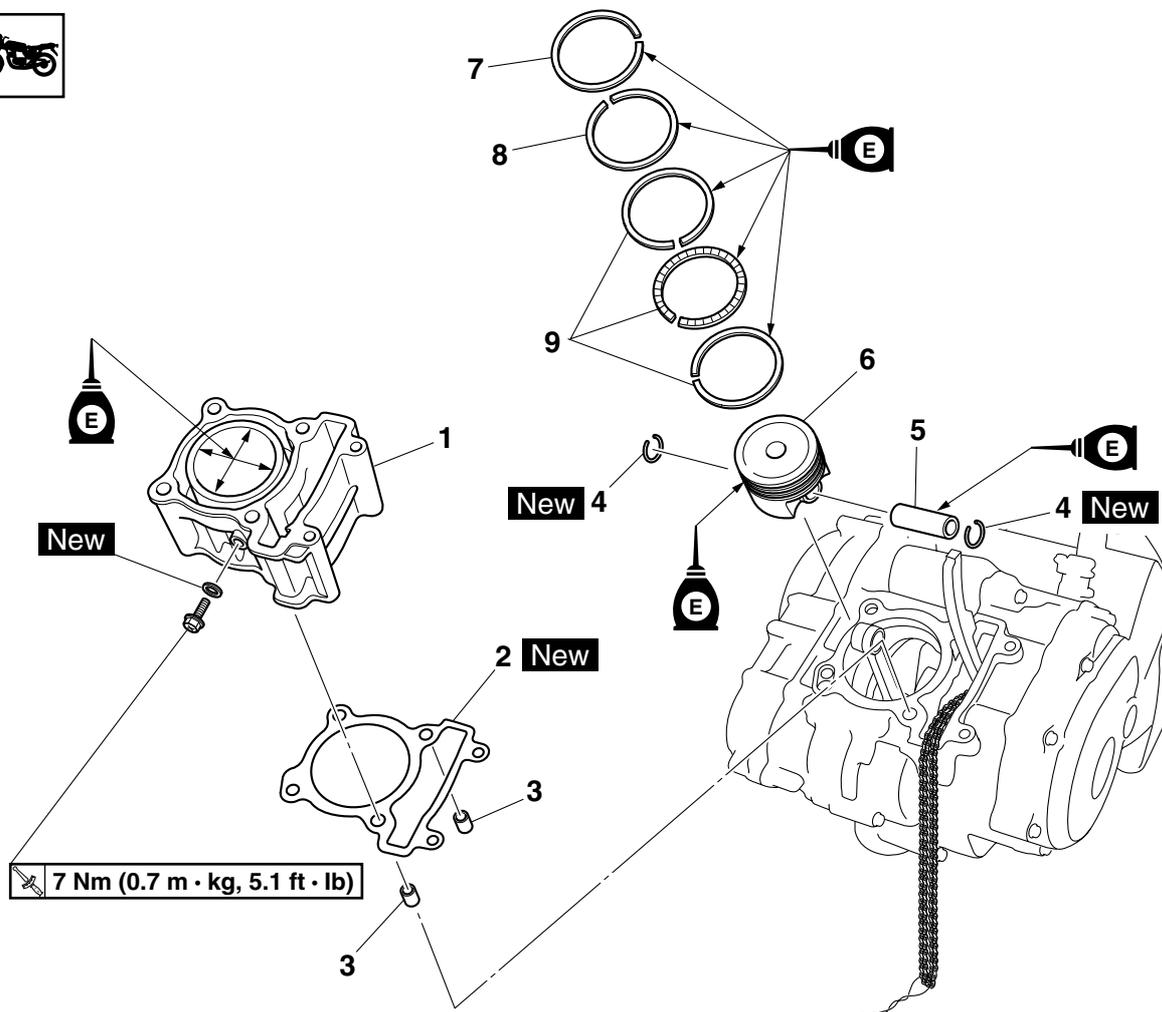
Hitting the valve tip with excessive force could damage the valve.



EAS24350

CYLINDER AND PISTON

Removing the cylinder and piston



Order	Job/Parts to remove	Q'ty	Remarks
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-7.
1	Cylinder	1	
2	Cylinder gasket	1	
3	Dowel pin	2	
4	Piston pin clip	2	
5	Piston pin	1	
6	Piston	1	
7	Top ring	1	
8	2nd ring	1	
9	Oil ring	1	
			For installation, reverse the removal procedure.

EAS24380

REMOVING THE PISTON

1. Remove:

- Piston pin clips "1"
- Piston pin "2"
- Piston "3"

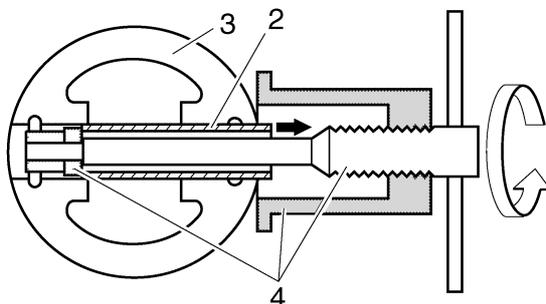
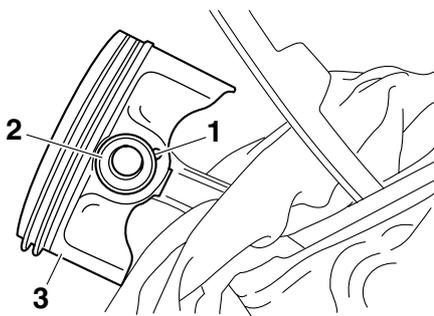
ECA13810

CAUTION:

Do not use a hammer to drive the piston pin out.

NOTE:

- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set "4".

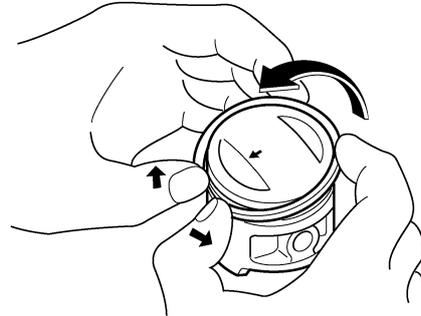


2. Remove:

- Top ring
- 2nd ring
- Oil ring

NOTE:

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.



EAS24390

CHECKING THE CYLINDER AND PISTON

1. Check:

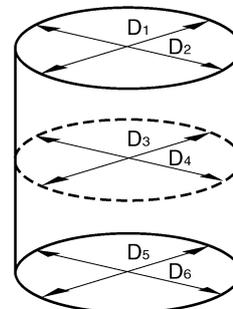
- Piston wall
- Cylinder wall

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.



NOTE:

Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.



Bore

52.000–52.010 mm (2.0472–2.0476 in)

Taper limit

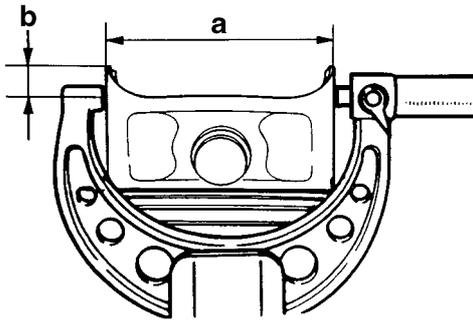
0.050 mm (0.0020 in)

Out of round limit

0.005 mm (0.0002 in)

"C" = maximum of D ₁ -D ₂
"T" = maximum of D ₁ or D ₂ - maximum of D ₅ or D ₆
"R" = maximum of D ₁ , D ₃ or D ₅ - minimum of D ₂ , D ₄ or D ₆

- b. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.
- c. Measure piston skirt diameter D "a" with the micrometer.



b. 5.0 mm (0.20 in) from the bottom edge of the piston

	Piston Diameter D 51.962–51.985 mm (2.0457–2.0466 in)
---	---

- d. If out of specification, replace the piston and piston rings as a set.
- e. Calculate the piston-to-cylinder clearance with the following formula.

<ul style="list-style-type: none"> • Piston-to-cylinder clearance = Cylinder bore "C" - Piston skirt diameter "D"
--

	Piston-to-cylinder clearance 0.015–0.048 mm (0.0006–0.0019 in) Limit 0.15 mm (0.0059 in)
---	---

- f. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.



EAS24430

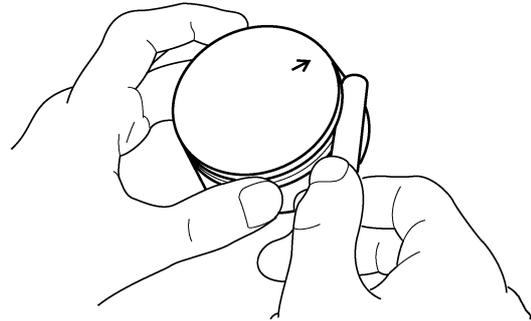
CHECKING THE PISTON RINGS

- 1. Measure:
 - Piston ring side clearance
 - Out of specification → Replace the piston and piston rings as a set.

NOTE:

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

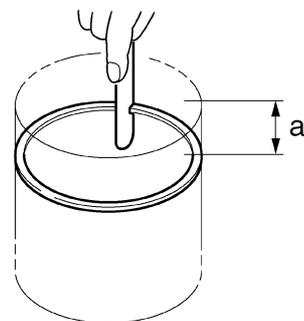
	Piston ring
	Top ring
	Ring side clearance 0.030–0.065 mm (0.0012–0.0026 in) Limit 0.100 mm (0.0039 in)
	2nd ring
	Ring side clearance 0.020–0.055 mm (0.0008–0.0022 in) Limit 0.100 mm (0.0039 in)



- 2. Install:
 - Piston ring (into the cylinder)

NOTE:

Level the piston ring into the cylinder with the piston crown.



a. 40 mm (1.57 in)

3. Measure:

- Piston ring end gap
Out of specification → Replace the piston ring.

NOTE: _____

The oil ring expander spacer end gap cannot be measured. If the oil ring rail gap is excessive, replace all three piston rings.



Piston ring
Top ring
 End gap (installed)
 0.10–0.25 mm (0.0039–0.0098 in)
 Limit
 0.50 mm (0.0197 in)
2nd ring
 End gap (installed)
 0.10–0.25 mm (0.0039–0.0098 in)
 Limit
 0.60 mm (0.0236 in)
Oil ring
 End gap (installed)
 0.20–0.70 mm (0.0079–0.0276 in)

EAS24440

CHECKING THE PISTON PIN

1. Check:

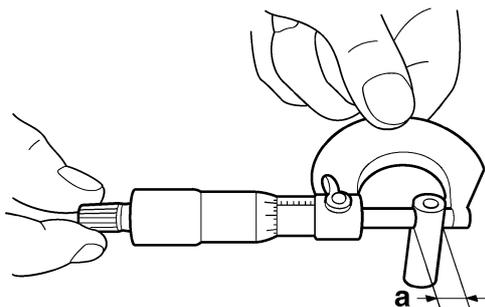
- Piston pin
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.

2. Measure:

- Piston pin outside diameter “a”
Out of specification → Replace the piston pin.



Piston pin outside diameter
 13.995–14.000 mm (0.5510–0.5512 in)
 Limit
 13.975 mm (0.5502 in)

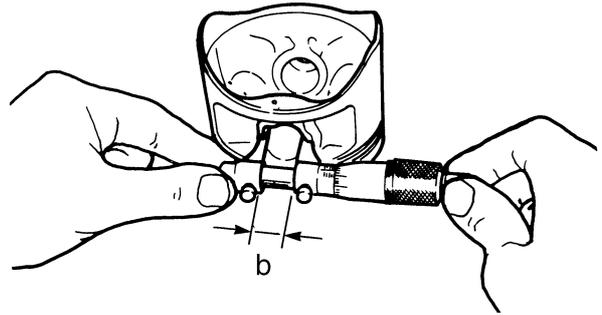


3. Measure:

- Piston pin bore diameter “b”
Out of specification → Replace the piston.



Piston pin bore inside diameter
 14.002–14.013 mm (0.5513–0.5517 in)
 Limit
 14.043 mm (0.5529 in)



4. Calculate:

- Piston-pin-to-piston-pin-bore clearance
Out of specification → Replace the piston pin and piston as a set.

• Piston-pin-to-piston-pin-bore clearance =
 Piston pin bore diameter “b” -
 Piston pin outside diameter “a”



Piston-pin-to-piston-pin-bore clearance
 0.002–0.018 mm (0.0001–0.0007 in)
 Limit
 0.068 mm (0.0027 in)

EAS24450

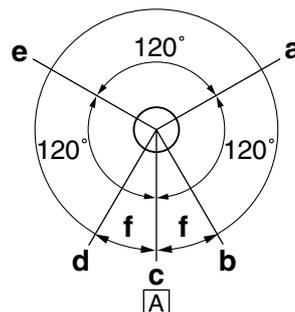
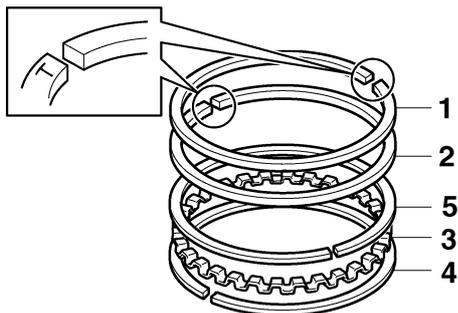
INSTALLING THE PISTON AND CYLINDER

1. Install:

- Top ring “1”
- 2nd ring “2”
- Oil ring expander “3”
- Lower oil ring rail “4”
- Upper oil ring rail “5”

NOTE: _____

Be sure to install the piston rings so that the manufacturer marks or numbers face up.



2. Install:

- Piston "1"
- Piston pin "2"
- Piston pin clips "3" **New**

NOTE:

- Apply engine oil to the piston pin.
- Make sure the arrow mark "a" on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clips, cover the crankcase opening with a clean rag to prevent the clips from falling into the crankcase.

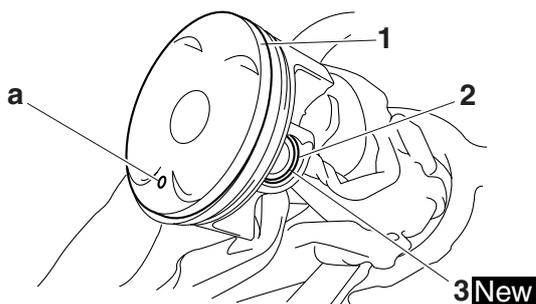
- a. Top ring
- b. Upper oil ring rail
- c. Oil ring expander
- d. Lower oil ring rail
- e. 2nd ring
- f. 20 mm (0.79 in)
- A. Intake side

5. Install:

- Dowel pins
- Cylinder head gasket **New**
- Cylinder "1"

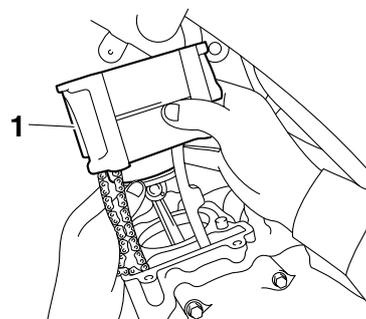
NOTE:

- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (intake side) through the timing chain cavity.



3. Lubricate:

- Piston
- Piston rings
- Cylinder
(with the recommended lubricant)



4. Offset:

- Piston ring end gaps

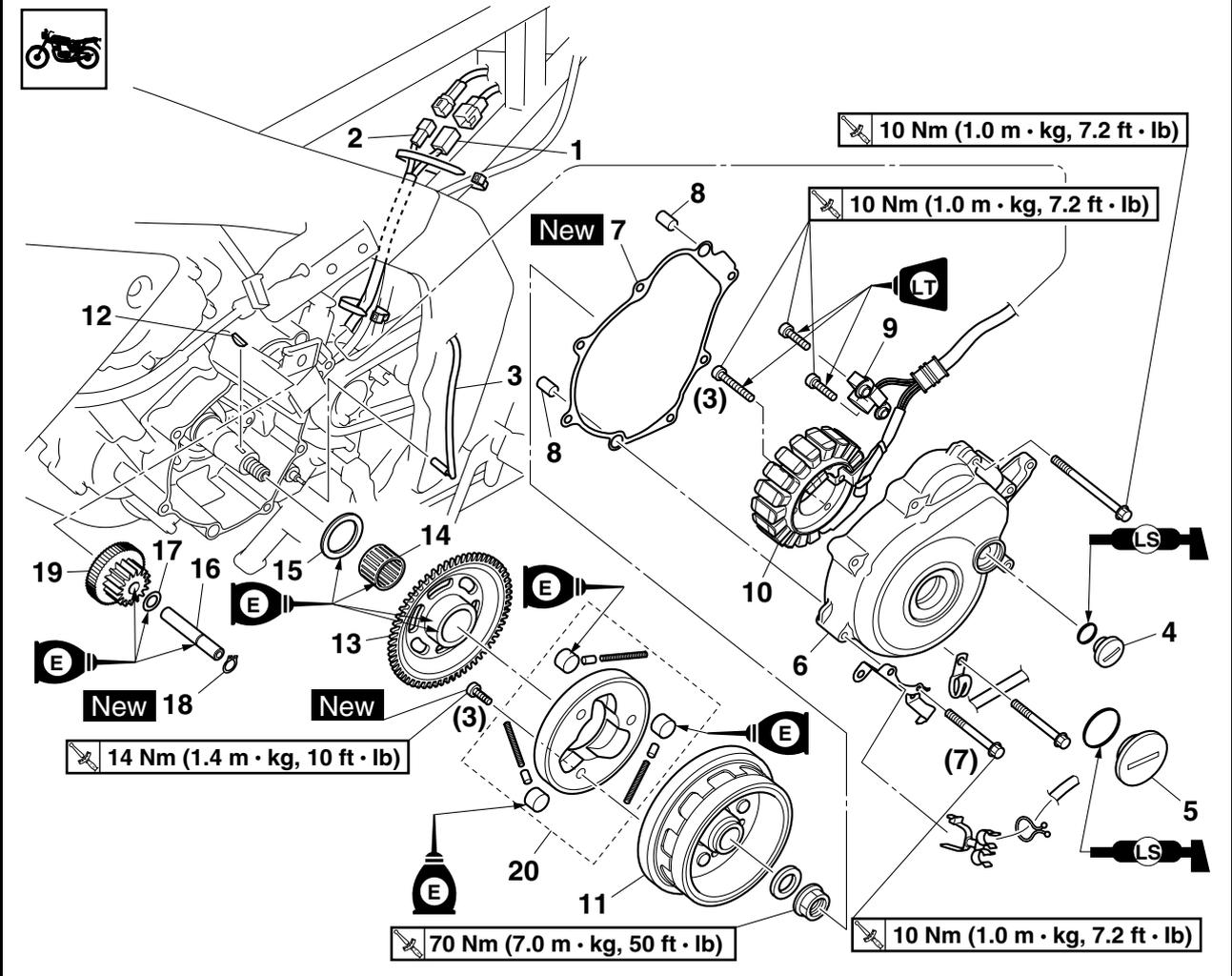
GENERATOR AND STARTER CLUTCH

YamahaR125.COM

EAS5D71010

GENERATOR AND STARTER CLUTCH

Removing the generator and starter clutch

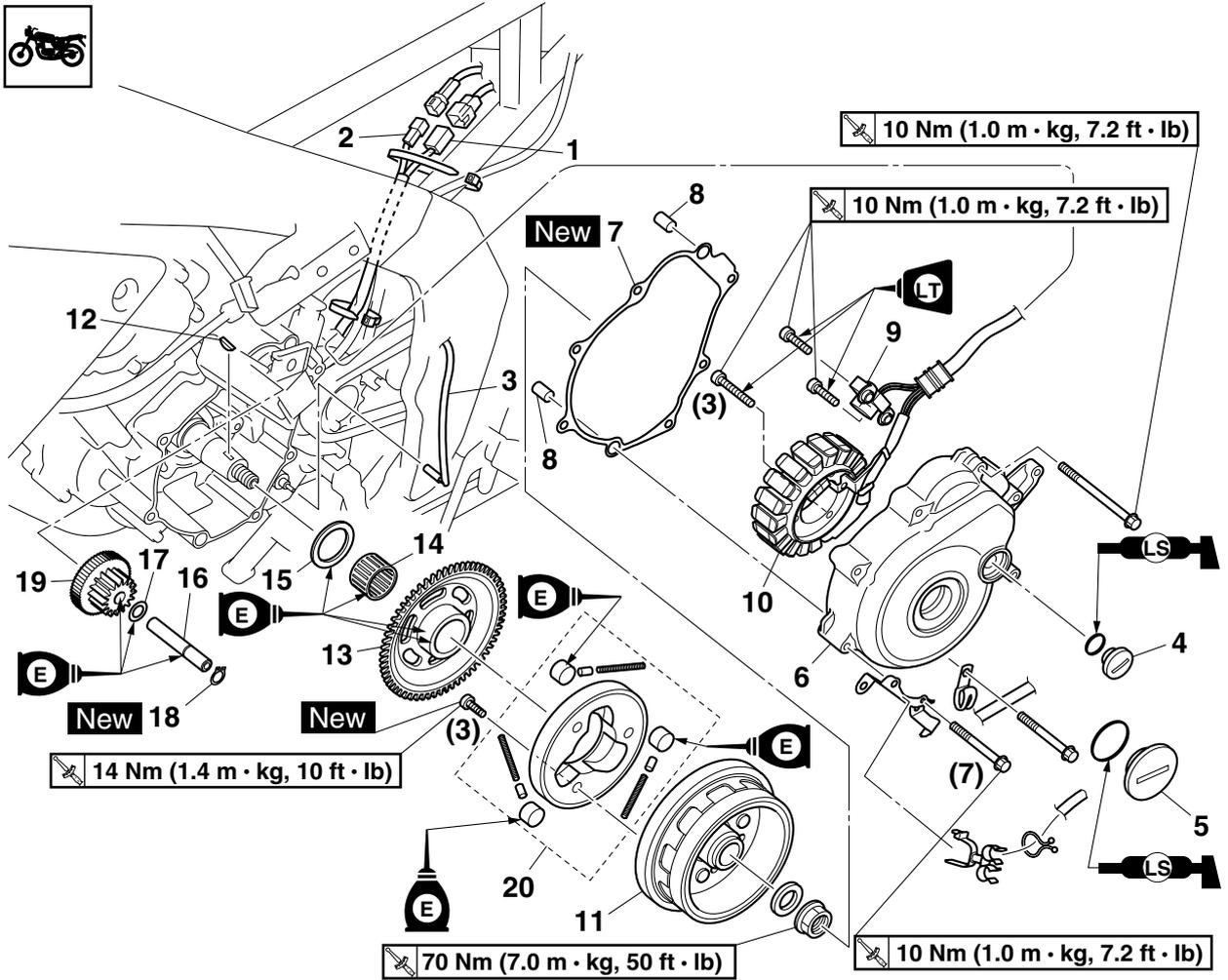


Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-11.
	Left lower side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Drive sprocket cover		Refer to "CHAIN DRIVE" on page 4-63.
1	Stator coil coupler	1	Disconnect.
2	Crankshaft position sensor coupler	1	Disconnect.
3	Neutral switch lead connector	1	Disconnect.
4	Timing mark accessing screw	1	
5	Crankshaft end accessing screw	1	
6	Generator cover	1	
7	Generator cover gasket	1	
8	Dowel pin	2	
9	Crankshaft position sensor	1	
10	Stator coil	1	
11	Generator rotor	1	

GENERATOR AND STARTER CLUTCH

YamahaR125.COM

Removing the generator and starter clutch



Order	Job/Parts to remove	Q'ty	Remarks
12	Woodruff key	1	
13	Starter clutch gear	1	
14	Bearing	1	
15	Washer	1	
16	Starter clutch idle gear shaft	1	
17	Washer	1	
18	Circlip	1	
19	Starter clutch idle gear	1	
20	Starter clutch assembly	1	
			For installation, reverse the removal procedure.

YamahaR125.COM GENERATOR AND STARTER CLUTCH

EAS24490

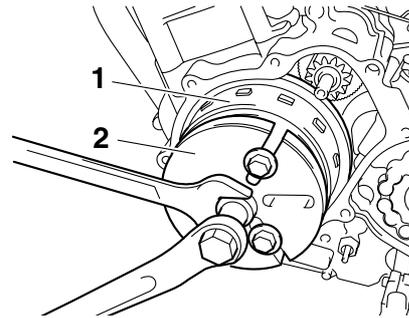
REMOVING THE GENERATOR

1. Remove:

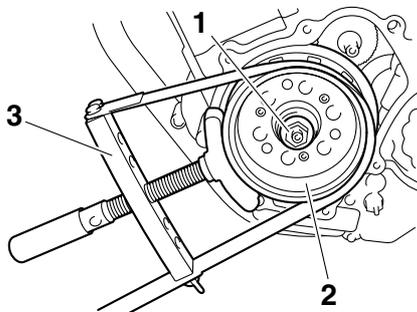
- Generator rotor nut "1"
- Washer

NOTE:

- While holding the generator rotor "2" with the sheave holder "3", loosen the generator rotor nut.
- Do not allow the sheave holder to touch the projection on the generator rotor.



	Sheave holder 90890-01701 Primary clutch holder YS-01880-A
---	---



2. Remove:

- Generator rotor "1"
(with the flywheel puller "2")
- Woodruff key

ECA13880

CAUTION:

To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set center bolt and the crankshaft.

NOTE:

Make sure the flywheel puller is centered over the generator rotor.

	Flywheel puller 90890-01362 Heavy duty puller YU-33270-B
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EAS24560

REMOVING THE STARTER CLUTCH

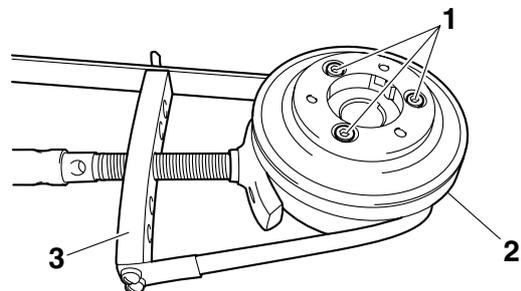
1. Remove:

- Starter clutch bolts "1"

NOTE:

- While holding the generator rotor "2" with the sheave holder "3", remove the starter clutch bolts.
- Do not allow the sheave holder to touch the projection on the generator rotor.

	Sheave holder 90890-01701 Primary clutch holder YS-01880-A
--	---



EAS24570

CHECKING THE STARTER CLUTCH

1. Check:

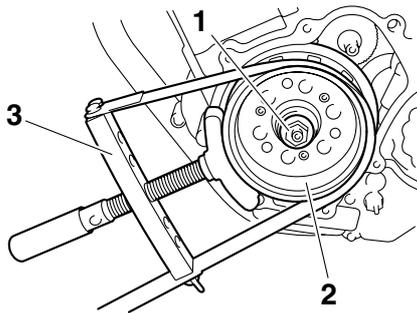
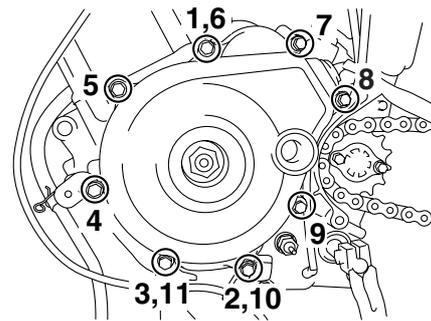
- Starter clutch rollers "1"
 - Starter clutch spring caps "2"
 - Starter clutch springs "3"
- Damage/wear → Replace the starter clutch assembly.

GENERATOR AND STARTER CLUTCH

YamahaR125.COM

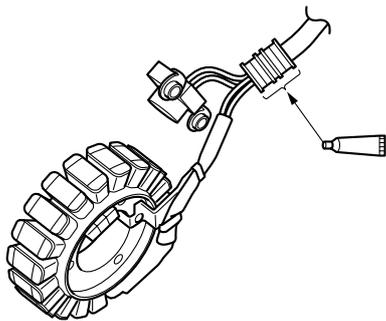
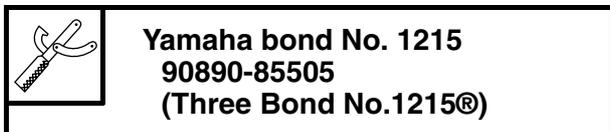
NOTE:

- While holding the generator rotor “2” with the sheave holder “3”, tighten the generator rotor nut.
- Do not allow the sheave holder to touch the projection on the generator rotor.



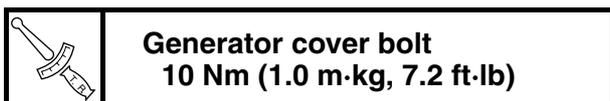
3. Apply:

- Sealant
(onto the crankshaft position sensor/stator assembly lead grommet)



4. Install:

- Generator cover



NOTE:

Tighten the generator cover bolts in the proper tightening sequence as shown.

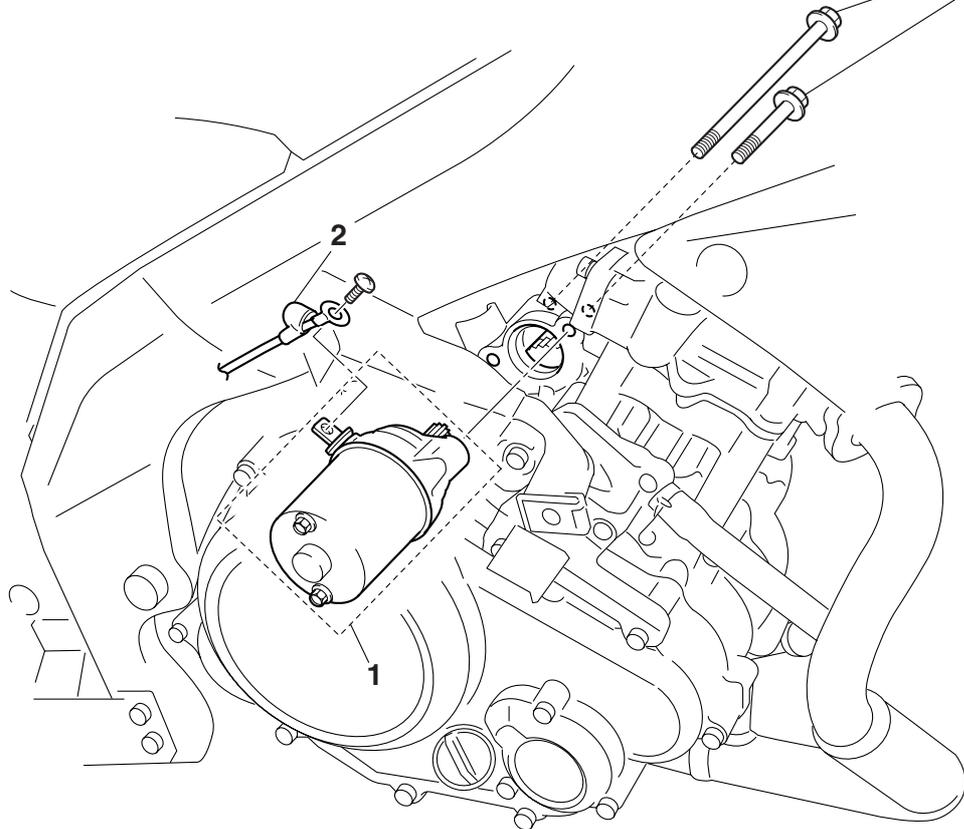
EAS24780

ELECTRIC STARTER

Removing the starter motor

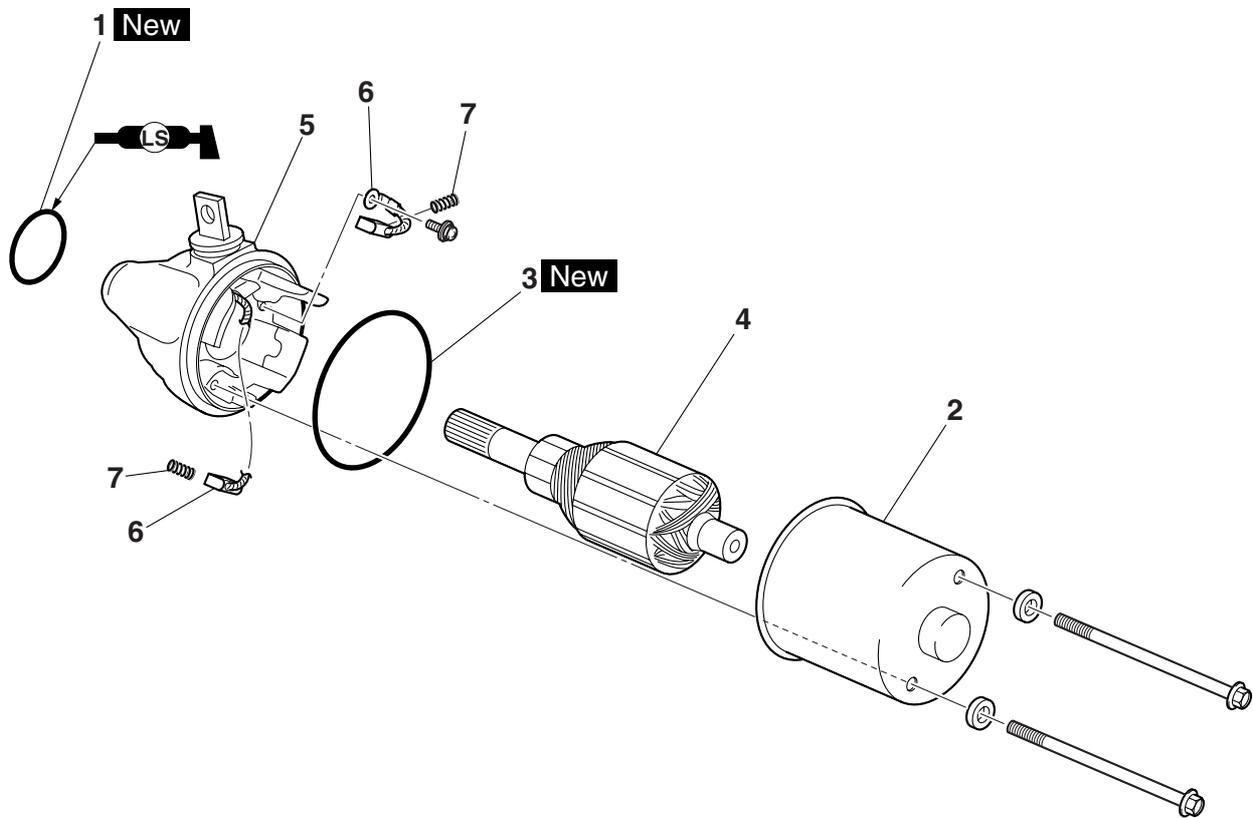


10 Nm (1.0 m · kg, 7.2 ft · lb)



Order	Job/Parts to remove	Q'ty	Remarks
	Lower side cowlings		Refer to "GENERAL CHASSIS" on page 4-1.
1	Starter motor	1	
2	Starter motor lead	1	Disconnect.
			For installation, reverse the removal procedure.

Disassembling the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
1	O-ring	1	
2	Starter motor yoke	1	
3	O-ring	1	
4	Commutator	1	
5	Starter motor front cover/brush holder set	1	
6	Brush	2	
7	Brush spring	2	
			For assembly, reverse the disassembly procedure.

7. Check:
 - Gear teeth
Damage/wear → Replace the gear.
8. Check:
 - Bearing
 - Oil seal
Damage/wear → Replace the starter motor front cover/brush holder set.

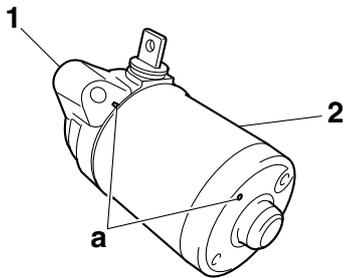
EAS24800

ASSEMBLING THE STARTER MOTOR

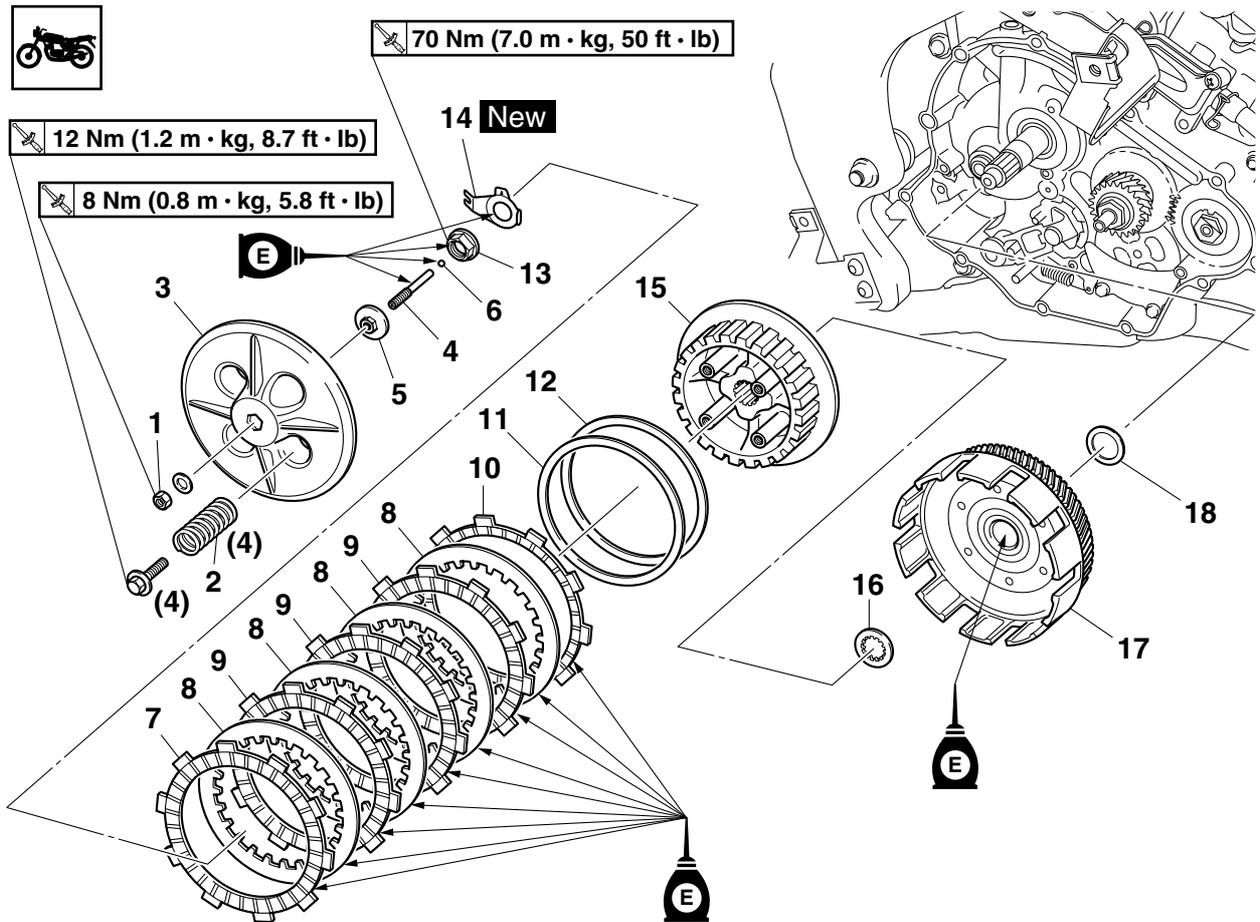
1. Install:
 - Starter motor front cover/brush holder set "1"
 - Starter motor yoke "2"

NOTE: _____

Align the marks "a" on the starter motor yoke and starter motor front cover/brush holder set.

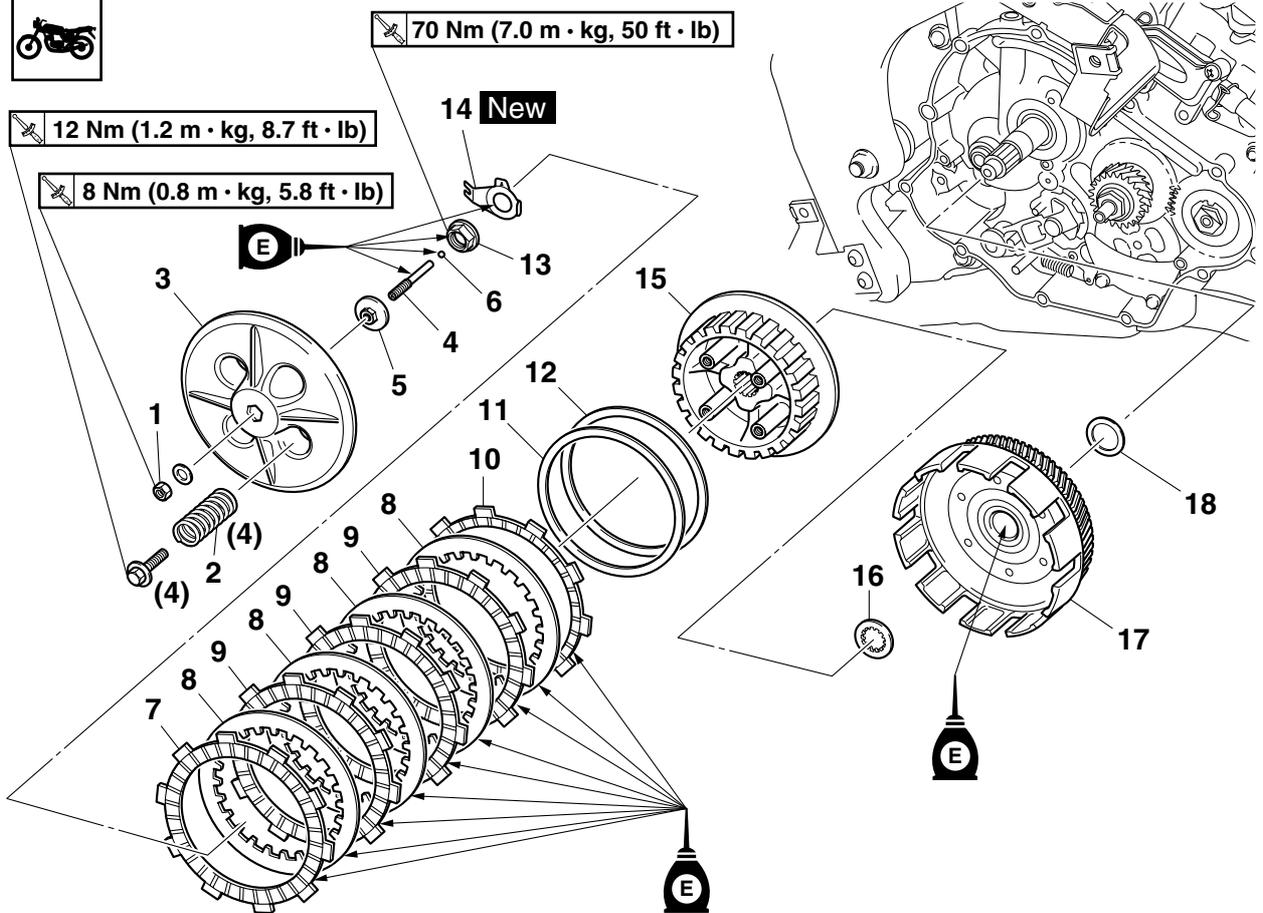


Removing the clutch



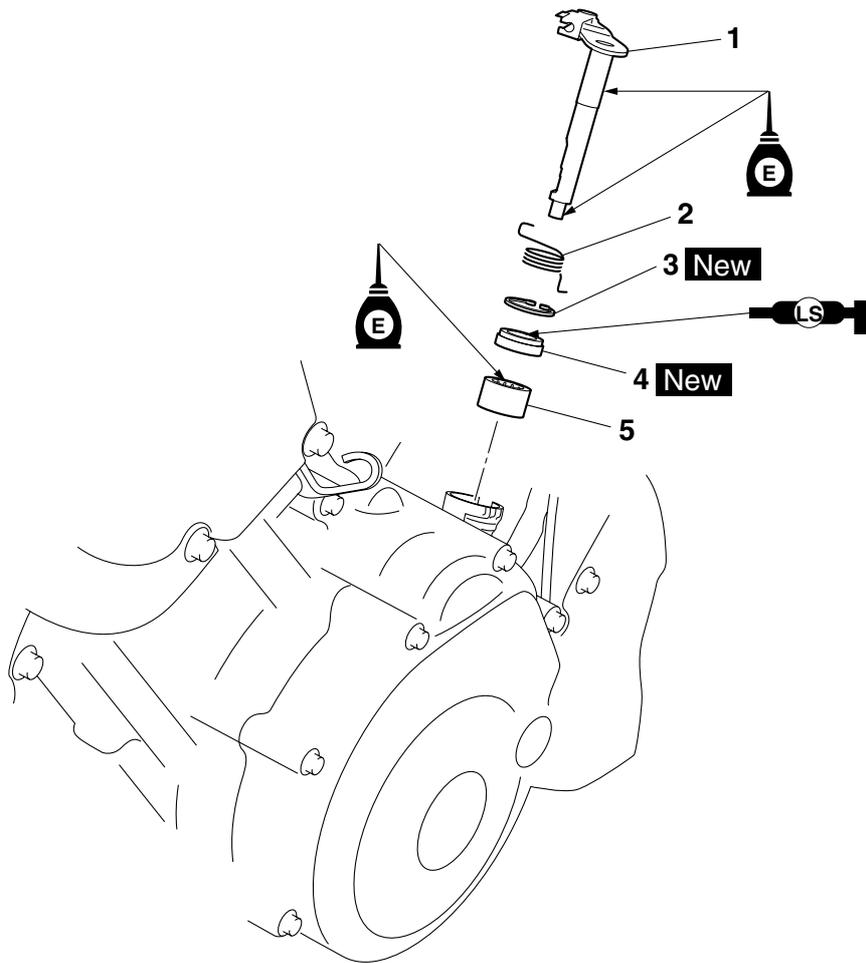
Order	Job/Parts to remove	Q'ty	Remarks
1	Locknut	1	
2	Clutch spring	4	
3	Pressure plate	1	
4	Short clutch push rod	1	
5	Clutch push rod holder	1	
6	Ball	1	
7	Friction plate 1	1	
8	Clutch plate	4	
9	Friction plate 3 (Green)	3	
10	Friction plate 2	1	
11	Clutch damper spring	1	
12	Clutch damper spring seat	1	
13	Clutch boss nut	1	
14	Lock washer	1	
15	Clutch boss	1	
16	Thrust washer	1	
17	Clutch housing	1	

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
18	Conical spring washer	1	
			For installation, reverse the removal procedure.

Removing the push lever



Order	Job/Parts to remove	Q'ty	Remarks
1	Clutch push lever	1	
2	Clutch push lever spring	1	
3	Circlip	1	
4	Oil seal	1	
5	Bearing	1	
			For installation, reverse the removal procedure.

EAS25070

REMOVING THE CLUTCH

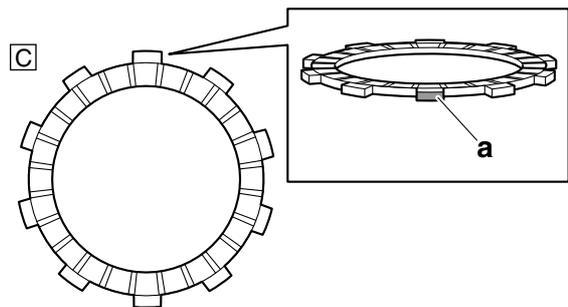
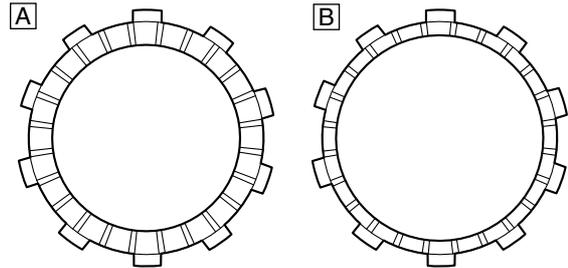
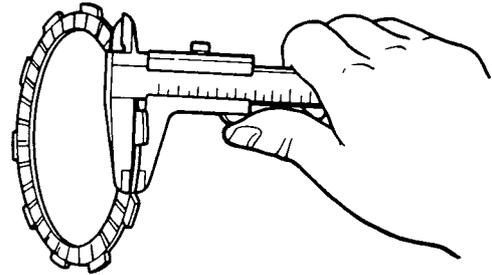
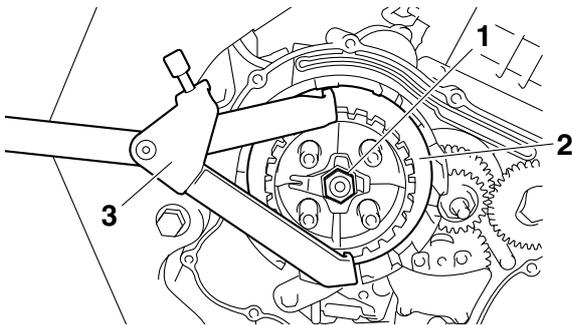
1. Straighten the lock washer tab.
2. Loosen:
 - Clutch boss nut "1"

NOTE:

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



Universal clutch holder
90890-04086
YM-91042



- A. Friction plate 1
- B. Friction plate 2
- C. Friction plate 3 (Green)
- a. Green paint

EAS25100

CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

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

NOTE:

Measure the friction plate at four places.



Friction plate 1 thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.110 in)
Friction plate 2 thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.1102 in)
Friction plate 3 thickness
2.90–3.10 mm (0.114–0.122 in)
Wear limit
2.80 mm (0.1102 in)

EAS25110

CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

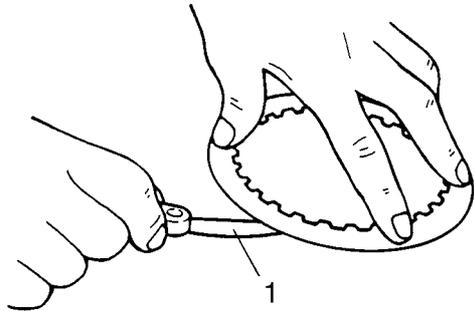
1. Check:
 - Clutch plate
 Damage → Replace the clutch plates as a set.
2. Measure:
 - Clutch plate warpage
 (with a surface plate and thickness gauge "1")
 Out of specification → Replace the clutch plates as a set.



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



Clutch plate thickness
 1.45–1.75 mm (0.057–0.069 in)
Warpage limit
 0.20 mm (0.0079 in)



EAS25140

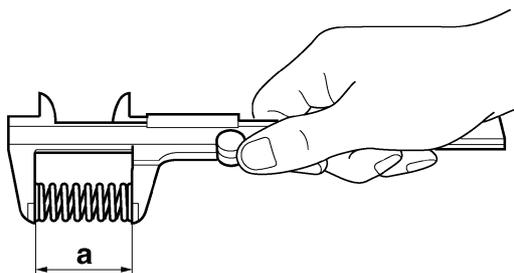
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

1. Check:
 - Clutch spring
 Damage → Replace the clutch springs as a set.
2. Measure:
 - Clutch spring free length “a”
 Out of specification → Replace the clutch springs as a set.



Clutch spring free length
 38.71 mm (1.52 in)
Minimum length
 36.77 mm (1.45 in)

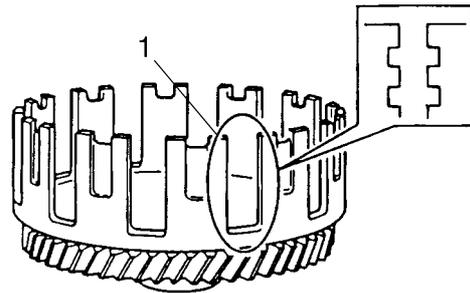


EAS25150

CHECKING THE CLUTCH HOUSING

1. Check:
 - Clutch housing dogs “1”
 Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

NOTE:
 Pitting on the clutch housing dogs will cause erratic clutch operation.



2. Check:
 - Bearing
 Damage/wear → Replace the bearing and clutch housing.

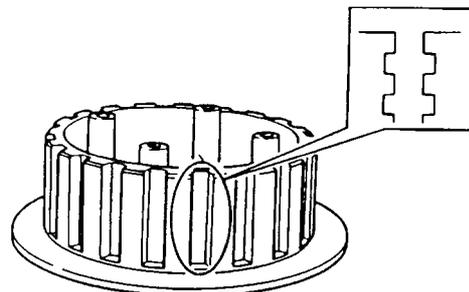
EAS25160

CHECKING THE CLUTCH BOSS

1. Check:
 - Clutch boss splines
 Damage/pitting/wear → Replace the clutch boss.

NOTE:

Pitting on the clutch boss splines will cause erratic clutch operation.



EAS25170

CHECKING THE PRESSURE PLATE

1. Check:
 - Pressure plate
 Cracks/damage → Replace.

EAS5D71013

CHECKING THE CLUTCH PUSH LEVER AND SHORT CLUTCH PUSH ROD

1. Check:
 - Clutch push lever
 - Short clutch push rod
 Damage/wear → Replace the defective part(s).

EAS25200

CHECKING THE PRIMARY DRIVE GEAR

1. Remove:
 - Primary drive gear
 Refer to “BALANCER GEAR” on page 5-53.

2. Check:

- Primary drive gear
Damage/wear → Replace the primary drive gear and clutch housing as a set.
Excessive noise during operation → Replace the primary drive gear and clutch housing as a set.

3. Install:

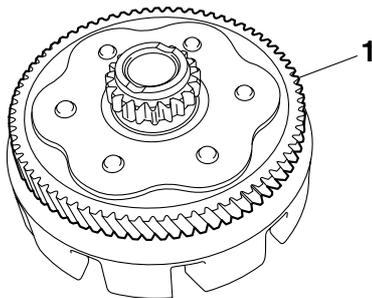
- Primary drive gear
Refer to "BALANCER GEAR" on page 5-53.

EAS25210

CHECKING THE PRIMARY DRIVEN GEAR

1. Check:

- Primary driven gear "1"
Damage/wear → Replace the primary drive gear and clutch housing as a set.
Excessive noise during operation → Replace the primary drive gear and clutch housing as a set.



EAS25240

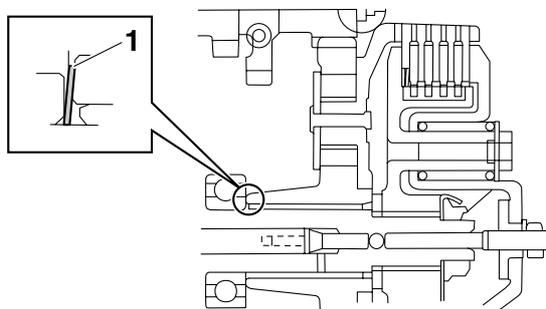
INSTALLING THE CLUTCH

1. Install:

- Conical spring washer "1"

NOTE:

Install the conical spring washer as shown in the illustration.

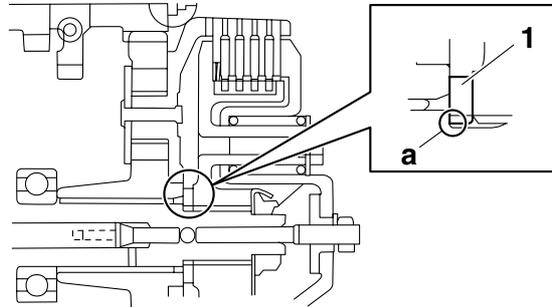


2. Install:

- Clutch housing
- Thrust washer "1"

NOTE:

Be sure to install the thrust washer so that its sharp edge "a" is facing away from the clutch boss.

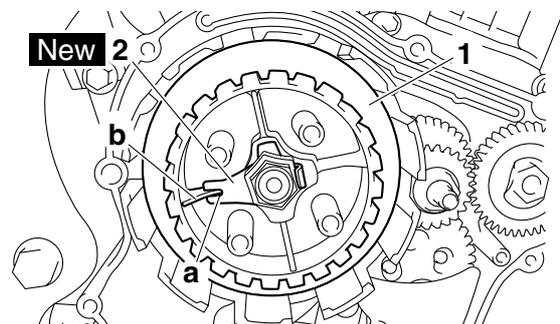


3. Install:

- Clutch boss "1"
- Lock washer "2" **New**
- Clutch boss nut

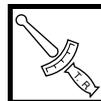
NOTE:

- Lubricate the clutch boss nut threads and lock washer mating surfaces with engine oil.
- Align the notch "a" in the lock washer with a rib "b" on the clutch boss.



4. Tighten:

- Clutch boss nut "1"



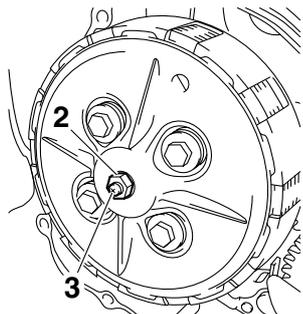
Clutch boss nut
70 Nm (7.0 m·kg, 50 ft·lb)

NOTE:

While holding the clutch boss "2" with the universal clutch holder "3", tighten the clutch boss nut.

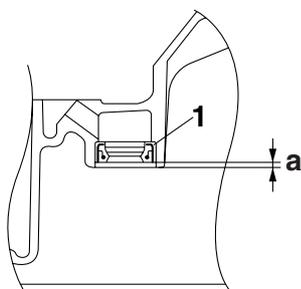


Universal clutch holder
90890-04086
YM-91042



10. Install:
- Oil seal "1"

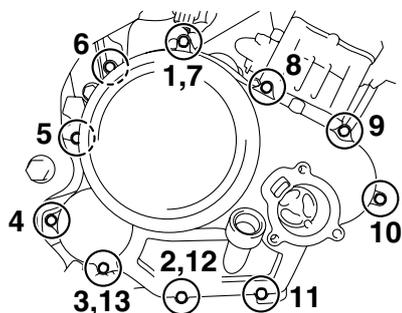
	<p>Installed depth of oil seal "a" 1.4–1.9 mm (0.055–0.075 in)</p>
--	---



11. Install:
- Clutch cover

	<p>Clutch cover bolt 10 Nm (1.0 m·kg, 7.2 ft·lb)</p>
--	---

NOTE: _____
Tighten the clutch cover bolts in the proper tightening sequence as shown.

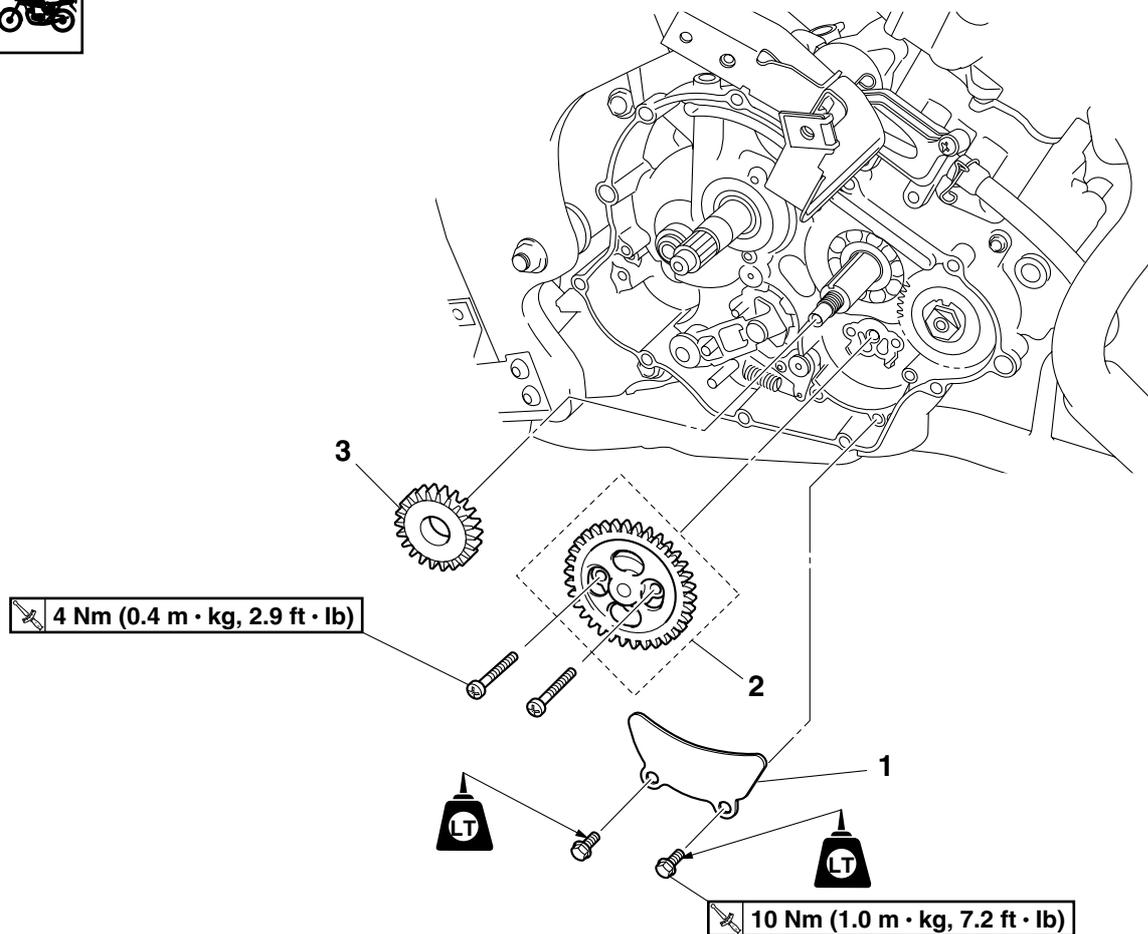


12. Adjust:
- Clutch cable free play
Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" on page 3-12.

EAS24911

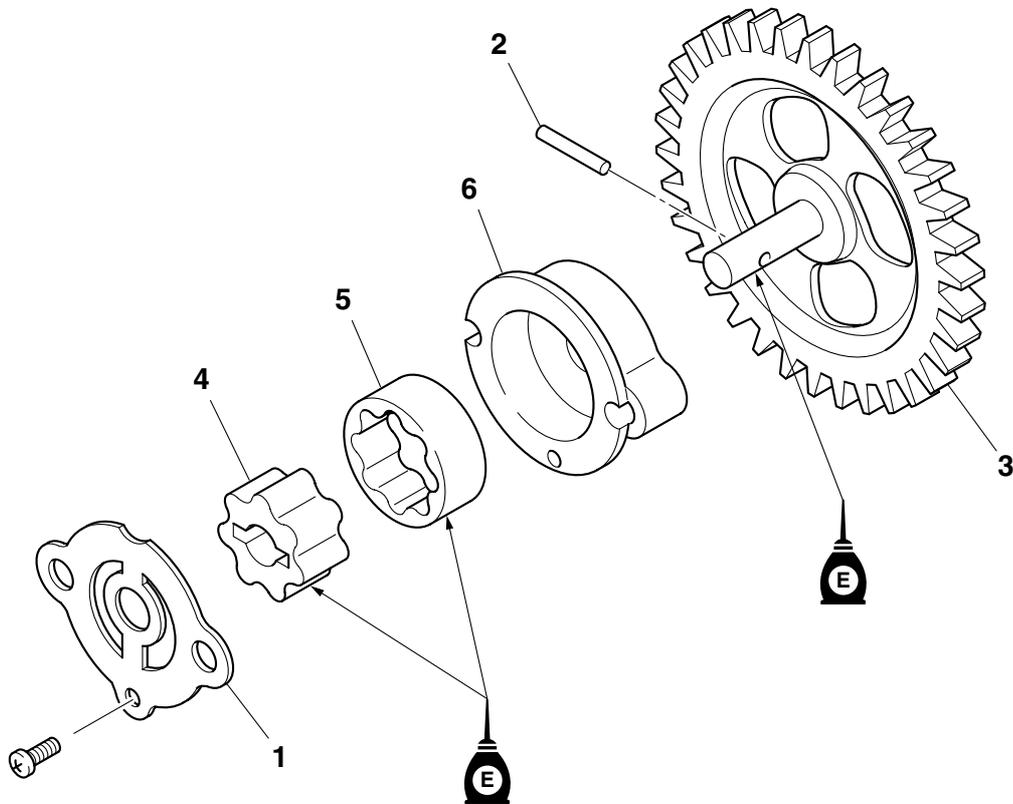
OIL PUMP

Removing the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch housing		Refer to "CLUTCH" on page 5-38.
	Balancer drive gear		Refer to "BALANCER GEAR" on page 5-53.
1	Oil baffle plate	1	
2	Oil pump assembly	1	
3	Oil pump drive gear	1	
			For installation, reverse the removal procedure.

Disassembling the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump housing cover	1	
2	Pin	1	
3	Oil pump driven gear	1	
4	Oil pump inner rotor	1	
5	Oil pump outer rotor	1	
6	Oil pump housing	1	
			For assembly, reverse the disassembly procedure.

EAS24960

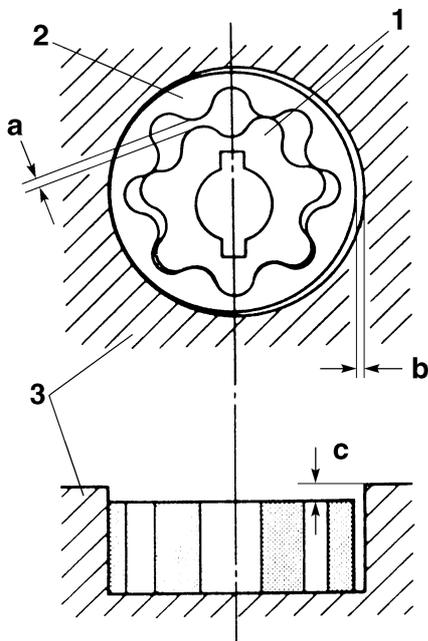
CHECKING THE OIL PUMP

1. Check:

- Oil pump drive gear
 - Oil pump driven gear
 - Oil pump housing
 - Oil pump housing cover
- Cracks/damage/wear → Replace the defective part(s).

2. Measure:

- Inner-rotor-to-outer-rotor-tip clearance “a”
 - Outer-rotor-to-oil-pump-housing clearance “b”
 - Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance “c”
- Out of specification → Replace the oil pump.



1. Inner rotor
2. Outer rotor
3. Oil pump housing



Inner-rotor-to-outer-rotor-tip clearance

Less than 0.15 mm (0.0059 in)

Limit

0.23 mm (0.0091 in)

Outer-rotor-to-oil-pump-housing clearance

0.13–0.18 mm (0.0051–0.0071 in)

Limit

0.25 mm (0.0098 in)

Oil-pump-housing-to-inner-and-outer-rotor clearance

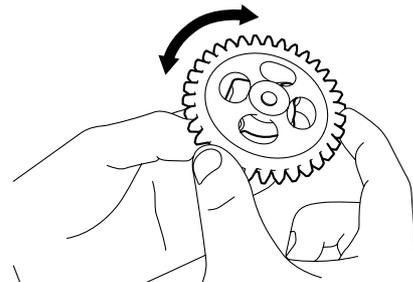
0.06–0.11 mm (0.0024–0.0043 in)

Limit

0.18 mm (0.0071 in)

3. Check:

- Oil pump operation
- Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



EAS25000

ASSEMBLING THE OIL PUMP

1. Lubricate:

- Oil pump inner rotor
 - Oil pump outer rotor
 - Oil pump driven gear
- (with the recommended lubricant)



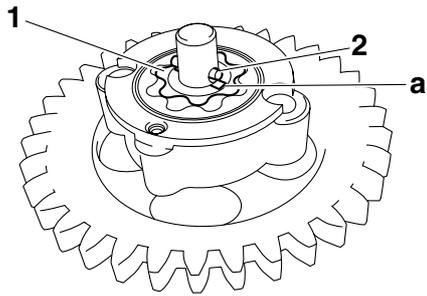
Recommended lubricant
Engine oil

2. Install:

- Oil pump outer rotor
- Oil pump inner rotor “1”
- Oil pump driven gear
- Pin “2”

NOTE:

When installing the inner rotor, align the pin “2” in the oil pump shaft with the groove “a” in the inner rotor “1”.



3. Check:

- Oil pump operation
Refer to "CHECKING THE OIL PUMP" on page 5-49.

EAS25020

INSTALLING THE OIL PUMP

1. Install:

- Oil pump assembly



Oil pump assembly screw
4 Nm (0.4 m·kg, 2.9 ft·lb)

ECA5D71021

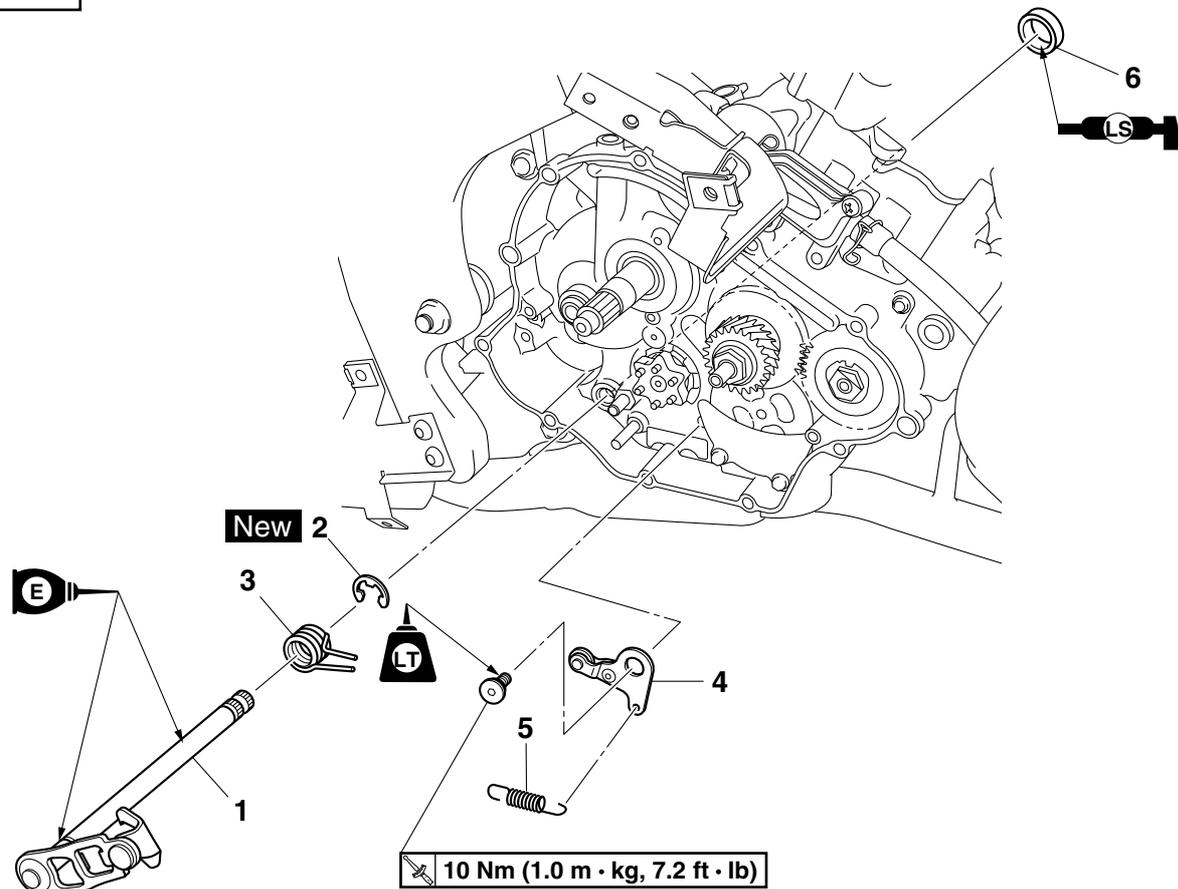
CAUTION:

After tightening the screws, make sure the oil pump turns smoothly.

EAS25410

SHIFT SHAFT

Removing the shift shaft and stopper lever

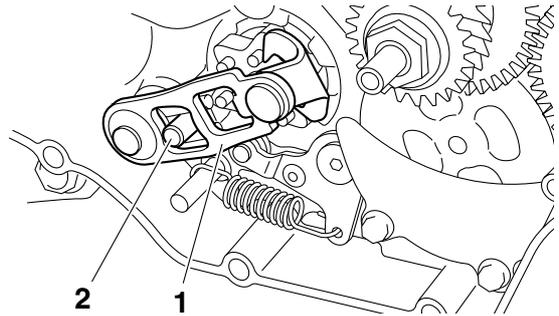


Order	Job/Parts to remove	Q'ty	Remarks
	Clutch housing		Refer to "CLUTCH" on page 5-38.
	Shift arm		Refer to "ENGINE REMOVAL" on page 5-1.
1	Shift shaft	1	
2	Circlip	1	
3	Shift shaft spring	1	
4	Stopper lever	1	
5	Stopper lever spring	1	
6	Oil seal	1	
			For installation, reverse the removal procedure.

EAS25420

CHECKING THE SHIFT SHAFT

1. Check:
 - Shift shaft
Bends/damage/wear → Replace.
 - Shift shaft spring
Damage/wear → Replace.



EAS25430

CHECKING THE STOPPER LEVER

1. Check:
 - Stopper lever
Bends/damage → Replace.
Roller turns roughly → Replace the stopper lever.
 - Stopper lever spring
Damage/wear → Replace.

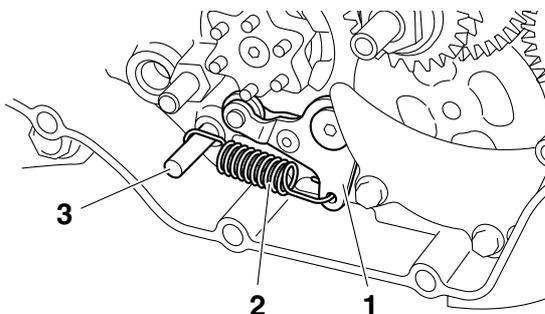
EAS25450

INSTALLING THE SHIFT SHAFT

1. Install:
 - Stopper lever "1"
 - Stopper lever spring "2"

NOTE:

- Install the stopper lever spring as shown in the illustration.
- Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss "3".
- Mesh the stopper lever with the shift drum segment assembly.



2. Install:
 - Shift shaft "1"

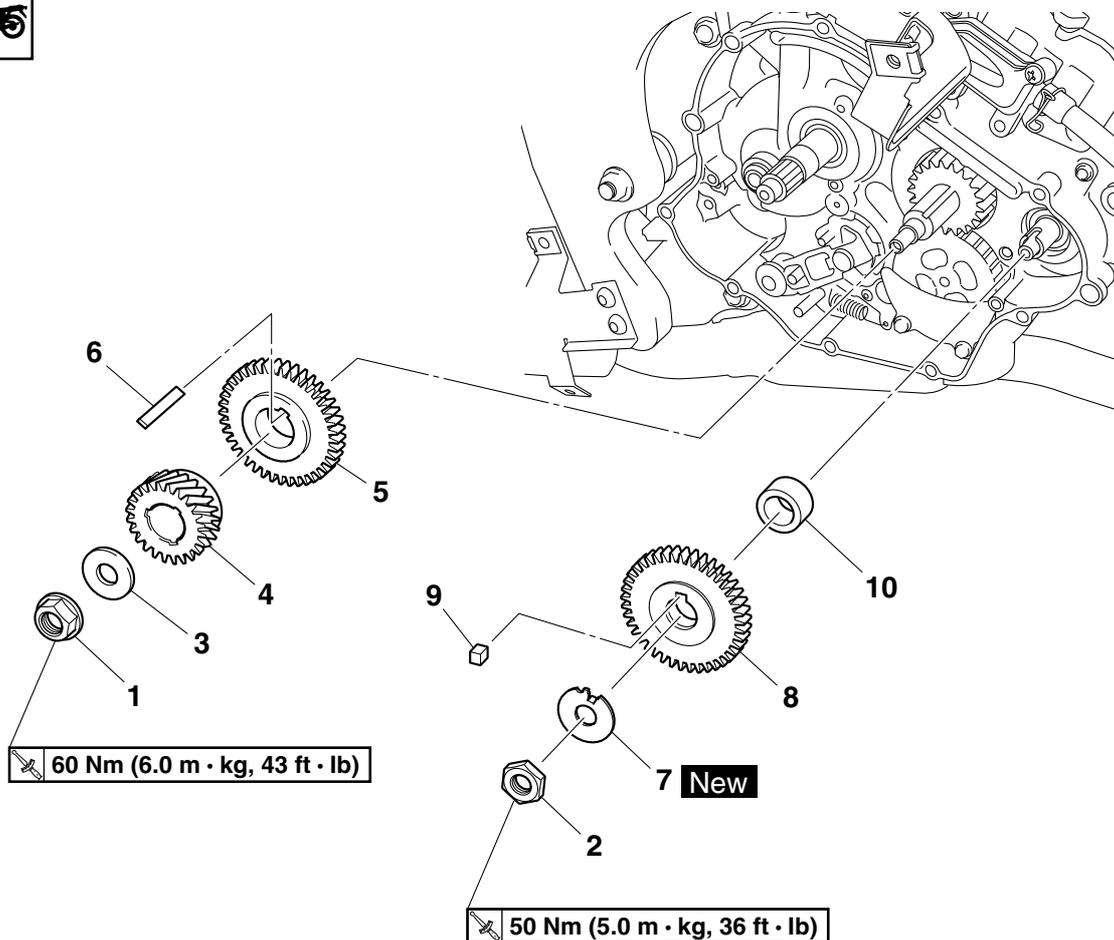
NOTE:

Hook the end of the shift shaft spring onto the shift shaft spring stopper "2".

EAS5D71017

BALANCER GEAR

Removing the primary drive gear and balancer gears



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch housing		Refer to "CLUTCH" on page 5-38.
1	Primary drive gear nut	1	
2	Balancer driven gear nut	1	
3	Washer	1	
4	Primary drive gear	1	
5	Balancer drive gear	1	
6	Straight key	1	
7	Lock washer	1	
8	Balancer driven gear	1	
9	Straight key	1	
10	Spacer	1	
			For installation, reverse the removal procedure.

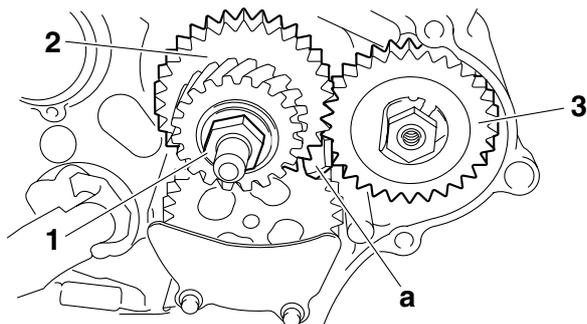
EAS5D71018

REMOVING THE PRIMARY DRIVE GEAR AND BALANCER GEARS

- Loosen:
 - Primary drive gear nut "1"

NOTE:

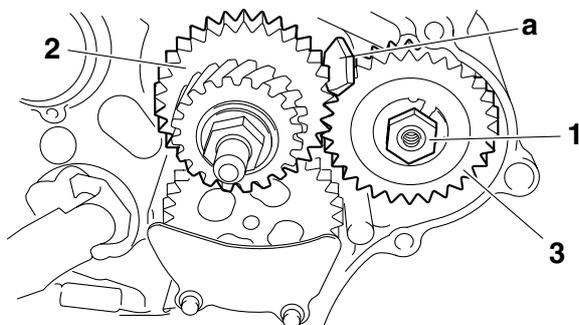
Place the aluminum plate "a" between the balancer drive gear "2" and the balancer driven gear "3", and then loosen the primary drive gear nut.



- Straighten the lock washer tab.
- Loosen:
 - Balancer driven gear nut "1"

NOTE:

Place the aluminum plate "a" between the balancer drive gear "2" and the balancer driven gear "3", and then loosen the balancer driven gear nut.



EAS5D71019

CHECKING THE BALANCER GEARS AND PRIMARY DRIVE GEAR

- Check:
 - Balancer drive gear
 - Balancer driven gear
 Cracks/damage/wear → Replace.
- Check:
 - Primary drive gear
 Refer to "CHECKING THE PRIMARY DRIVE GEAR" on page 5-43.

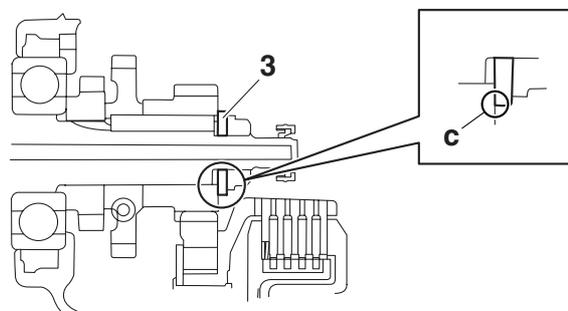
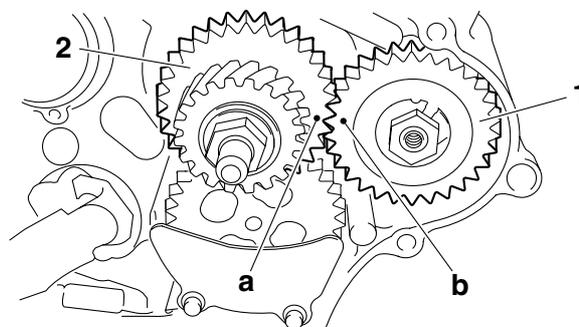
EAS5D71021

INSTALLING THE PRIMARY DRIVE GEAR AND BALANCER GEARS

- Install:
 - Balancer driven gear "1"
 - Lock washer **New**
 - Balancer drive gear "2"
 - Primary drive gear
 - Washer "3"
 - Balancer driven gear nut
 - Primary drive gear nut

NOTE:

- Align the punch mark "a" in the balancer drive gear "2" with the punch mark "b" in the balancer driven gear "1".
- Be sure to install the washer so that its sharp edge "c" is facing the primary drive gear.



- Tighten:
 - Balancer driven gear nut "1"
 - Primary drive gear nut "2"

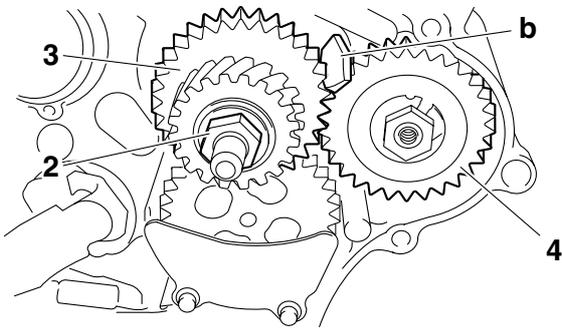
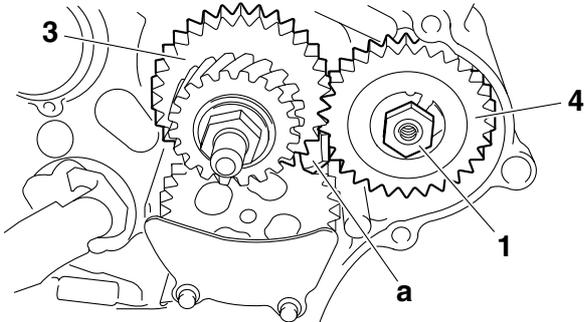


Balancer driven gear nut
50 Nm (5.0 m·kg, 36 ft·lb)
Primary drive gear nut
60 Nm (6.0 m·kg, 43 ft·lb)

NOTE:

- Place the aluminum plate "a" between the balancer drive gear "3" and the balancer driven gear "4", and then tighten the balancer driven gear nut.

- Place the aluminum plate “b” between the balancer drive gear “3” and the balancer driven gear “4”, and then tighten the primary drive gear nut.

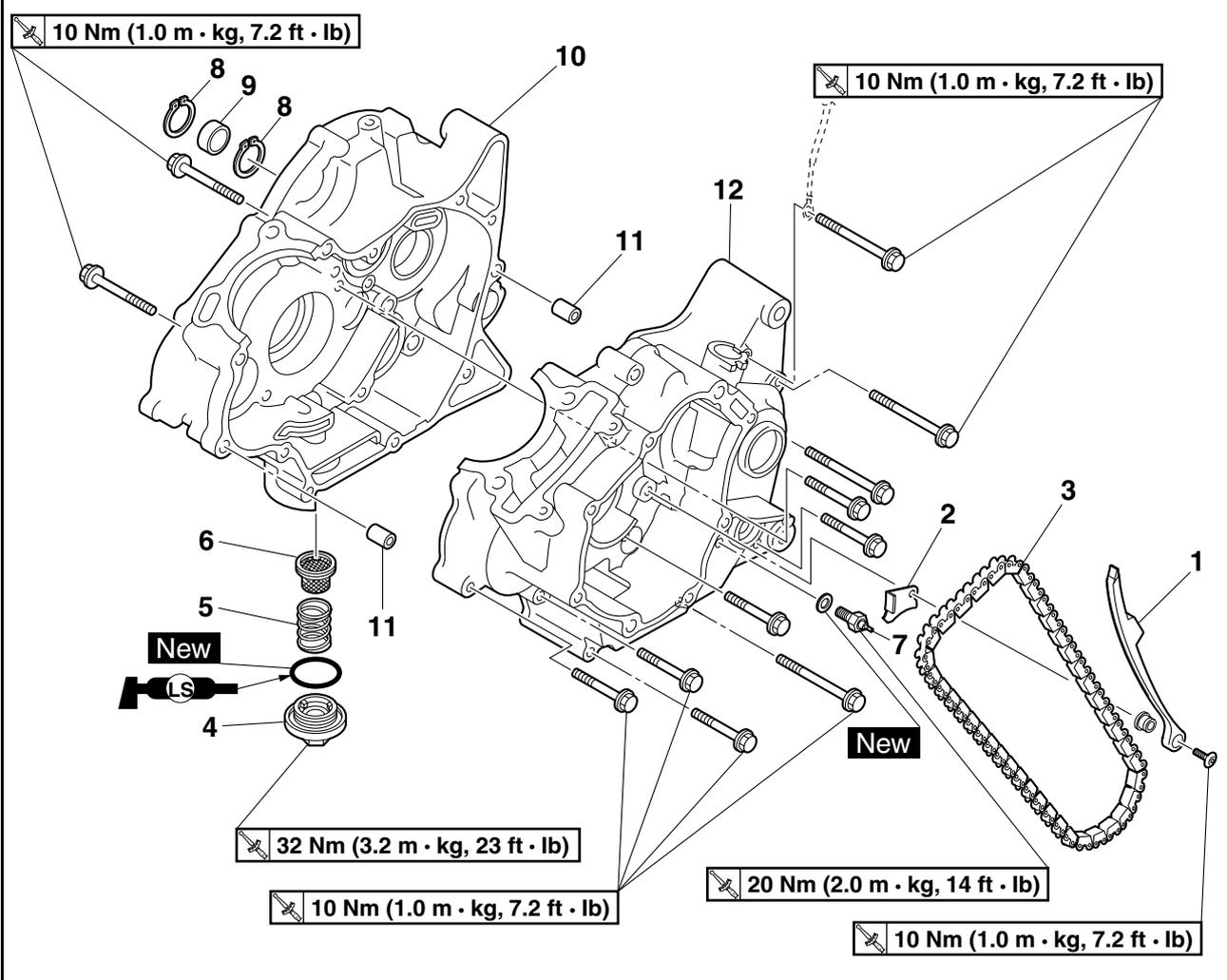


3. Bend the lock washer tab along a flat side of the nut.

EAS25540

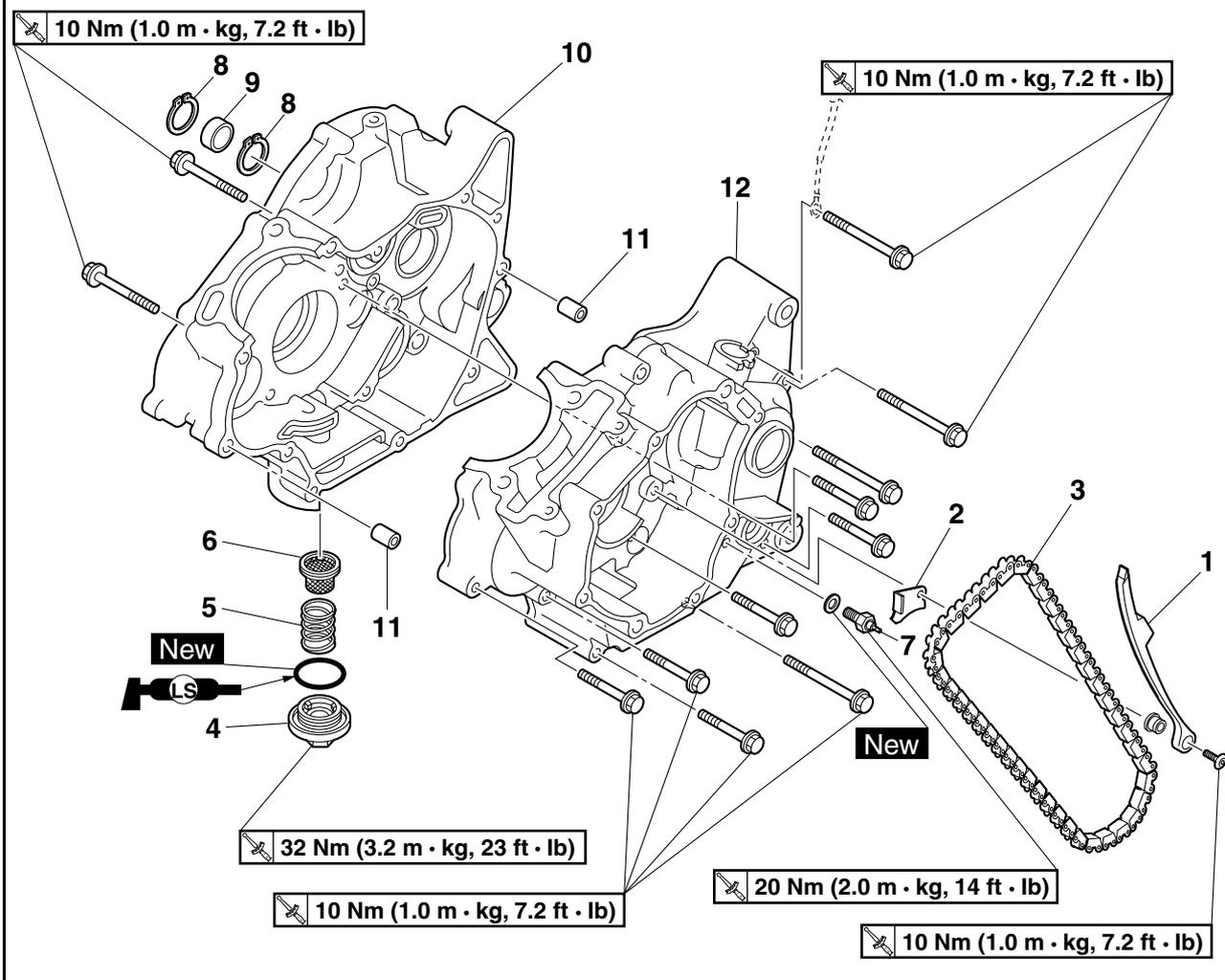
CRANKCASE

Separating the crankcase



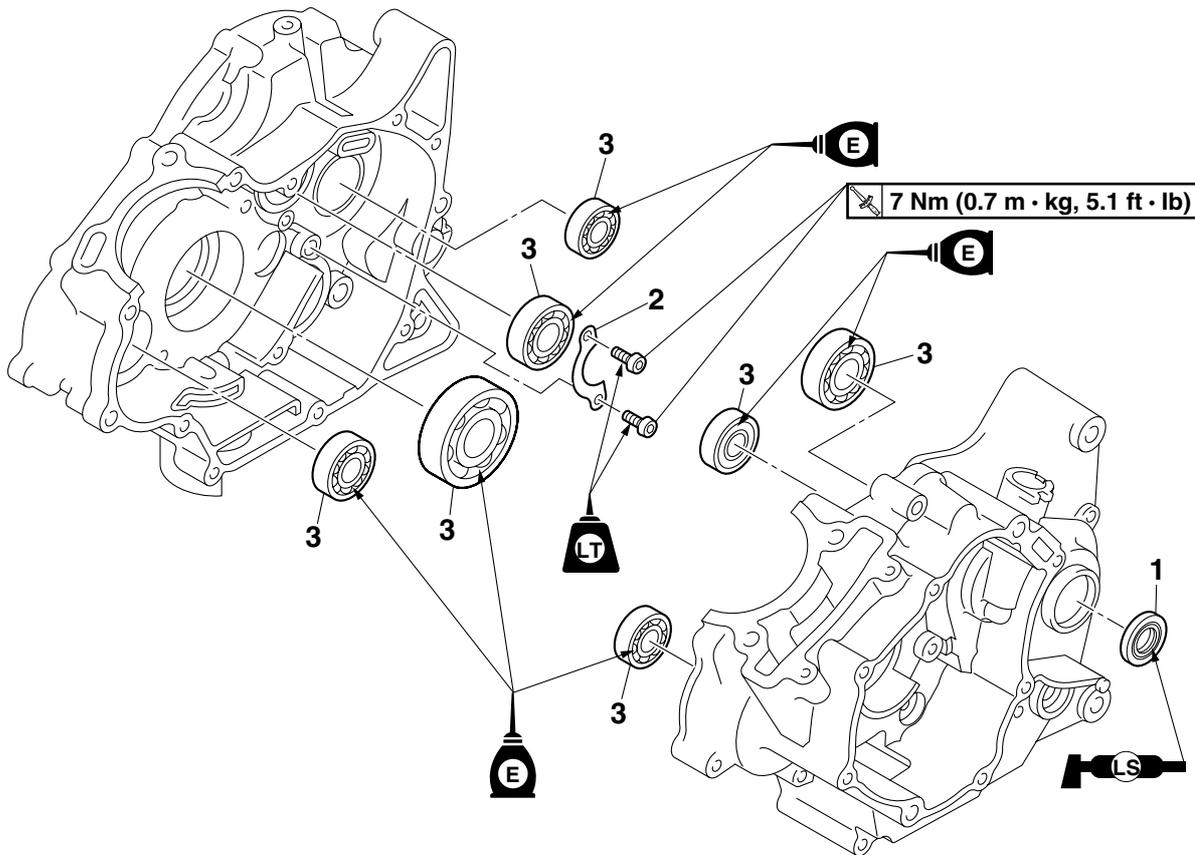
Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-1.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-7.
	Cylinder/Piston		Refer to "CYLINDER AND PISTON" on page 5-24.
	Clutch housing		Refer to "CLUTCH" on page 5-38.
	Oil pump assembly		Refer to "OIL PUMP" on page 5-47.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-51.
	Starter motor		Refer to "ELECTRIC STARTER" on page 5-34.
	Balancer gears		Refer to "BALANCER GEAR" on page 5-53.
	Generator rotor		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-29.
1	Timing chain guide (intake side)	1	
2	Chain cover	1	
3	Timing chain	1	
4	Engine oil drain plug	1	
5	Spring	1	

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
6	Engine oil strainer	1	
7	Neutral switch	1	
8	Circlip	2	
9	Spacer	1	
10	Right crankcase	1	
11	Dowel pin	2	
12	Left crankcase	1	
			For installation, reverse the removal procedure.

Removing the oil seal and bearings



Order	Job/Parts to remove	Q'ty	Remarks
	Crankshaft/Balancer		Refer to "CRANKSHAFT" on page 5-61.
	Transmission		Refer to "TRANSMISSION" on page 5-64.
1	Oil seal	1	
2	Bearing retainer	1	
3	Bearing	7	
			For installation, reverse the removal procedure.

EAS5D71032

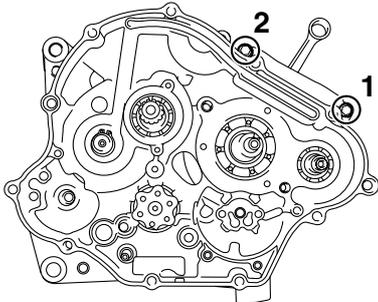
SEPARATING THE CRANKCASE

- Remove:
 - Crankcase bolts

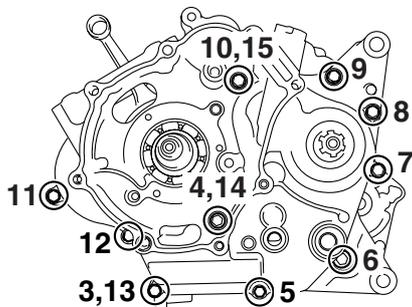
NOTE:

Loosen each bolt 1/4 of a turn at a time, in stages and in the proper sequence as shown.

A



B

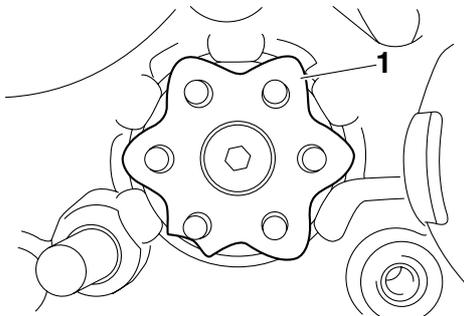


- A. Right crankcase
B. Left crankcase

- Turn:
 - Shift drum segment

NOTE:

Turn the shift drum segment "1" to the position shown in the illustration. In this position, the shift drum segment teeth will not contact the crankcase during crankcase separation.



- Remove:
 - Right crankcase

ECA13900

CAUTION:

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

EAS25580

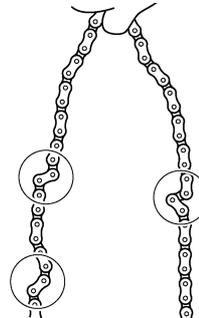
CHECKING THE CRANKCASE

- Thoroughly wash the crankcase halves in a mild solvent.
- Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
- Check:
 - Crankcase
Cracks/damage → Replace.
 - Oil delivery passages
Obstruction → Blow out with compressed air.

EAS5D71033

CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDE

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



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

EAS5D71034

CHECKING THE OIL STRAINER

- Check:
 - Oil strainer
Damage → Replace.
Contaminants → Clean with solvent.

EAS5D71014

CHECKING THE BEARINGS AND OIL SEAL

- Check:
 - Bearings
Clean and lubricate the bearings, and then rotate the inner race with your finger.
Rough movement → Replace.

- Oil seal
Damage/wear → Replace.

EAS5D71015

INSTALLING THE BEARING RETAINER

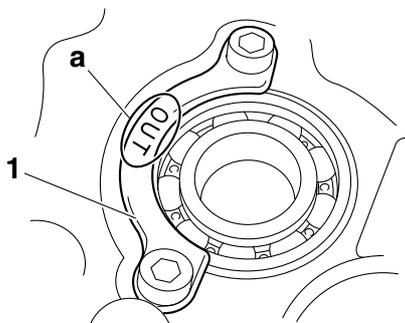
1. Install:
 - Bearing retainer "1"

NOTE:

- Install the bearing retainer "1" with its "OUT" mark "a" facing outward.
- Apply locking agent (LOCTITE®) to the threads of the bearing retainer bolt.



Bearing retainer bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)
LOCTITE®



EAS25700

ASSEMBLING THE CRANKCASE

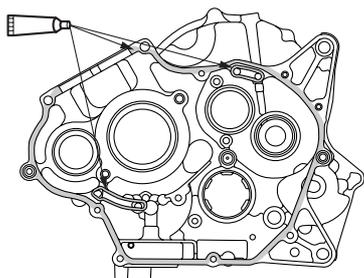
1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
2. Apply:
 - Sealant
(onto the crankcase mating surfaces)



Yamaha bond No. 1215
90890-85505
(Three Bond No.1215®)

NOTE:

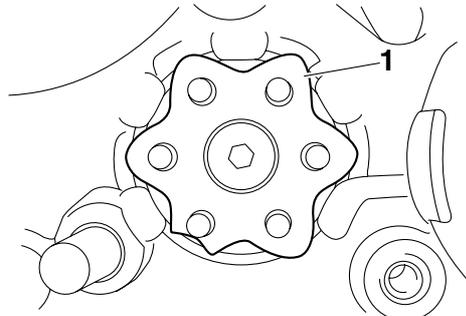
Do not allow any sealant to come into contact with the oil gallery.



3. Install:
 - Right crankcase

NOTE:

Turn the shift drum segment "1" to the position shown in the illustration. In this position, the shift drum segment teeth will not contact the crankcase during crankcase installation.



4. Install:
 - Crankcase bolts



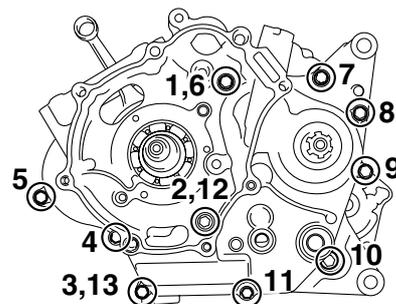
Crankcase bolt
10 Nm (1.0 m·kg, 7.2 ft·lb)

NOTE:

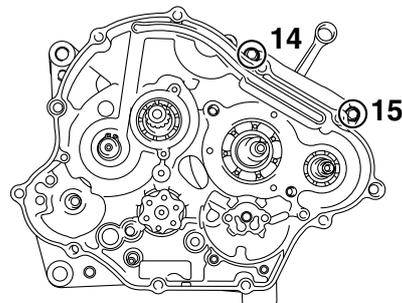
Tighten each bolt 1/4 of a turn at a time, in stages and in the proper sequence as shown.

- M6 × 70 mm : "7-9", "11"
- M6 × 55 mm : "14", "15"
- M6 × 45 mm : "1-5", "10"

A



B

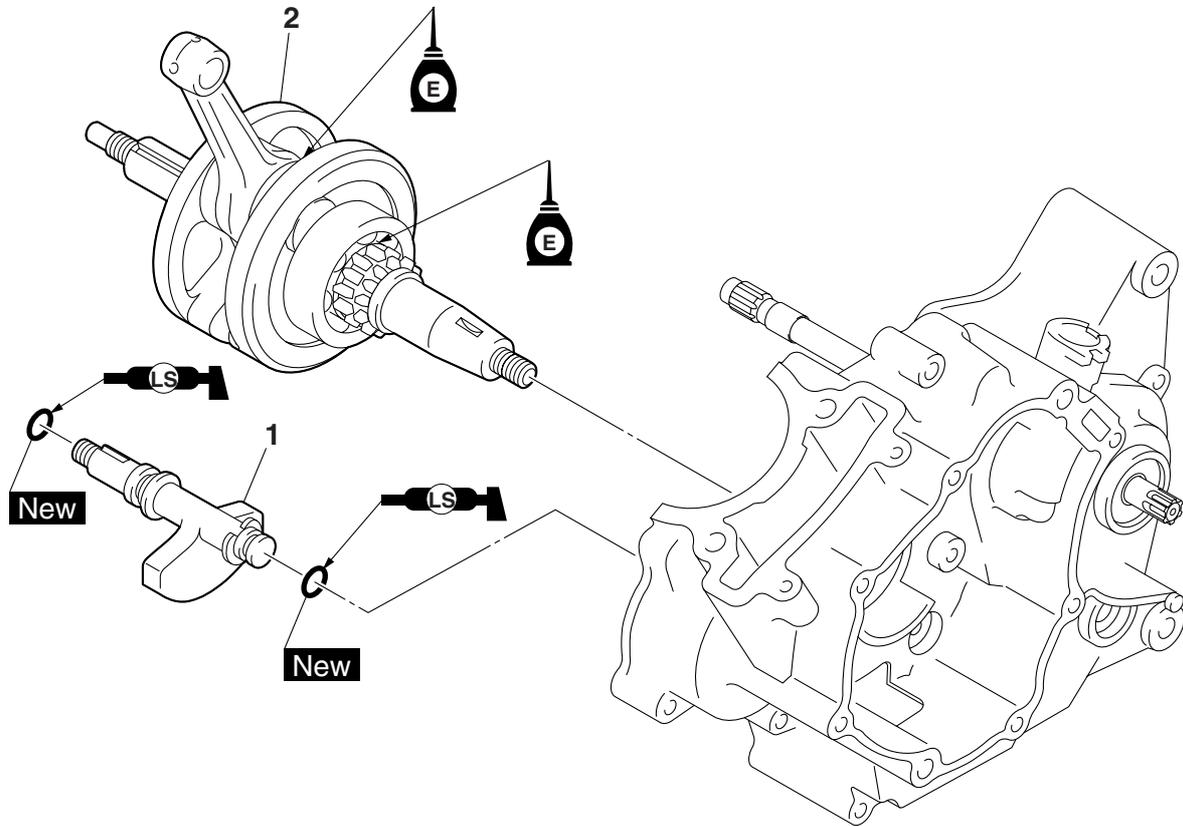


- A. Left crankcase
- B. Right crankcase

EAS25960

CRANKSHAFT

Removing the crankshaft and balancer



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-56.
1	Balancer	1	
2	Crankshaft	1	
			For installation, reverse the removal procedure.

EAS5D71016

REMOVING THE CRANKSHAFT

- Remove:
 - Crankshaft "1"

NOTE:

- Remove the crankshaft with the crankcase separating tool "2".
- Make sure the crankcase separating tool is centered over the crankshaft.

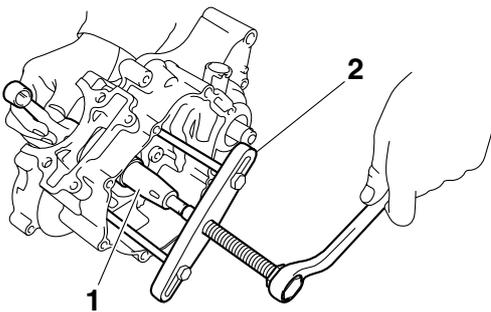
ECA5D71022

CAUTION:

- To protect the end of the crankshaft, place an appropriate sized socket between the crankcase separating tool bolt and the crankshaft.
- Do not tap on the crankshaft.



Crankcase separating tool
90890-01135
Crankcase separator
YU-01135-B



EAS5D71035

CHECKING THE CRANKSHAFT

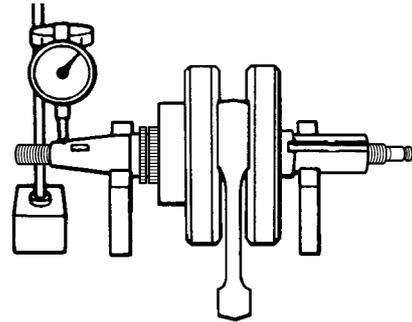
- Measure:
 - Crankshaft runout
Out of specification → Replace the crankshaft, bearing or both.

NOTE:

Turn the crankshaft slowly.



Runout limit C
0.030 mm (0.0012 in)



- Measure:
 - Big end side clearance
Out of specification → Replace the crankshaft.



Big end side clearance D
0.110–0.410 mm (0.0043–0.0161 in)

- Measure:
 - Crankshaft width
Out of specification → Replace the crankshaft.



Width A
47.95–48.00 mm (1.888–1.890 in)

- Check:
 - Crankshaft sprocket
Damage/wear → Replace the crankshaft.
 - Bearing
Cracks/damage/wear → Replace the crankshaft.
- Check:
 - Crankshaft journal
Scratches/wear → Replace the crankshaft.
 - Crankshaft journal oil passage
Obstruction → Blow out with compressed air.

EAS5D71036

INSTALLING THE CRANKSHAFT

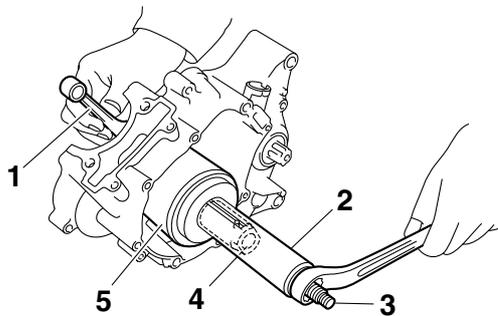
- Install:
 - Crankshaft "1"

NOTE:

Install the crankshaft with the crankshaft installer pot "2", crankshaft installer bolt "3", adapter (M12) "4" and spacer (crankshaft installer) "5".



Crankshaft installer pot
90890-01274
Installing pot
YU-90058
Crankshaft installer bolt
90890-01275
Bolt
YU-90060
Adapter (M12)
90890-01278
Adapter #3
YU-90063
Spacer (crankshaft installer)
90890-04081
Pot spacer
YM-91044



ECA13970

CAUTION:

To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

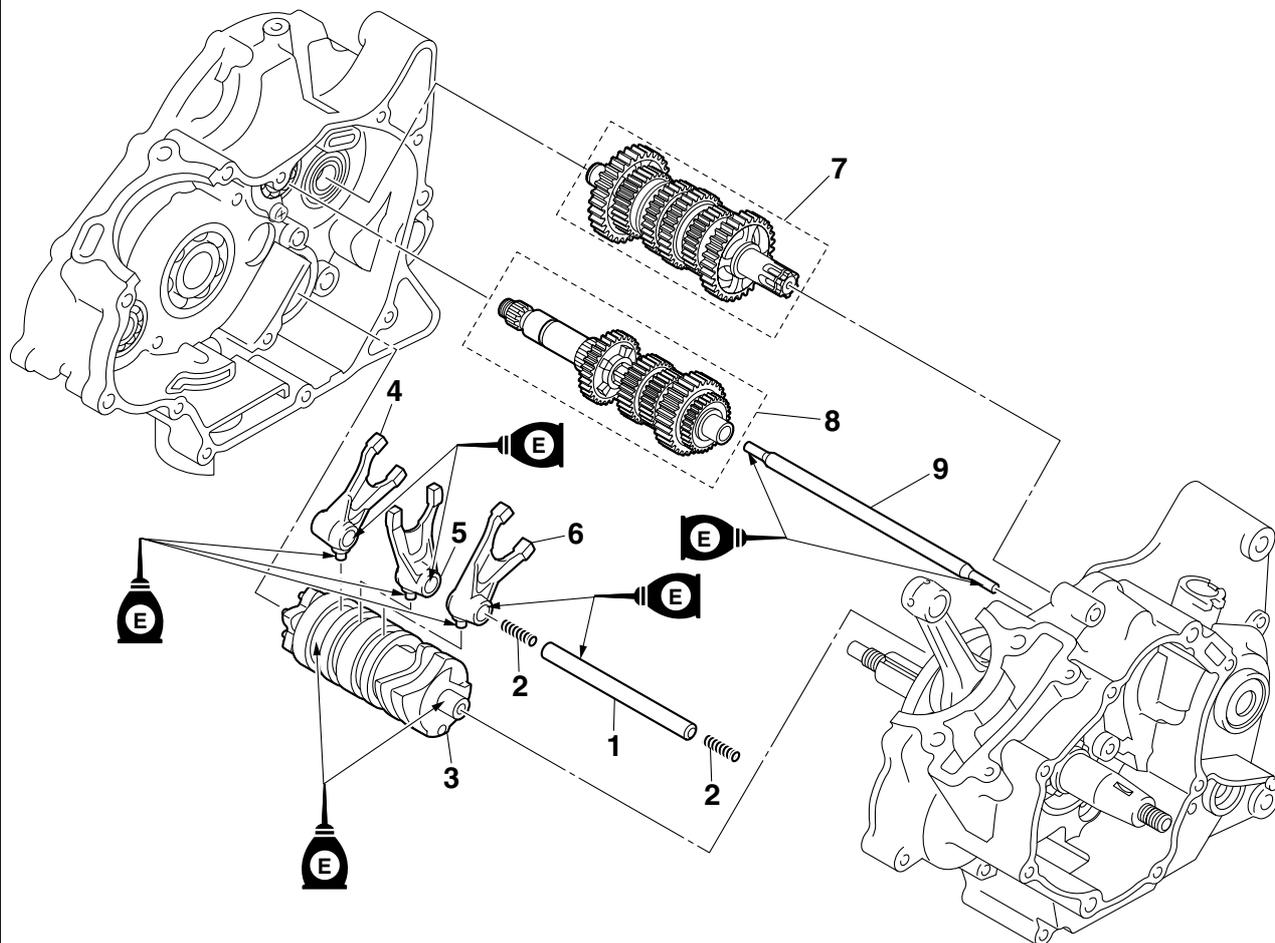
NOTE:

Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer bolt until the crankshaft bottoms against the bearing.

EAS26241

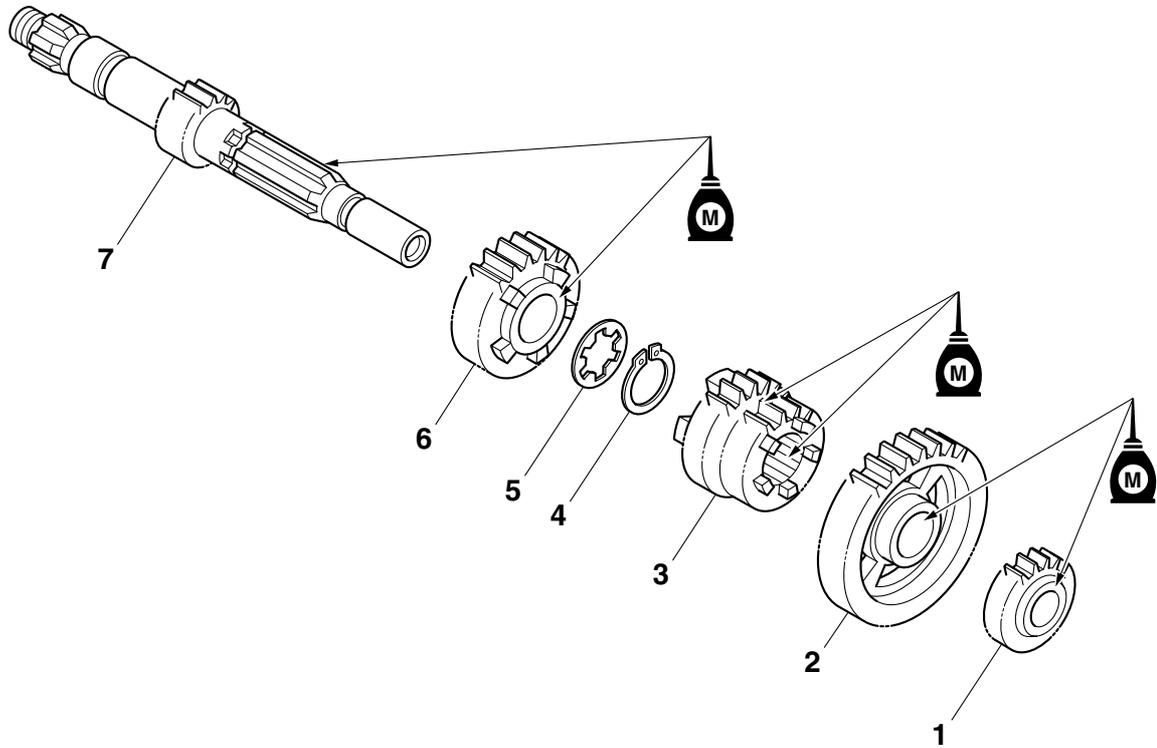
TRANSMISSION

Removing the transmission, shift drum assembly, and shift forks



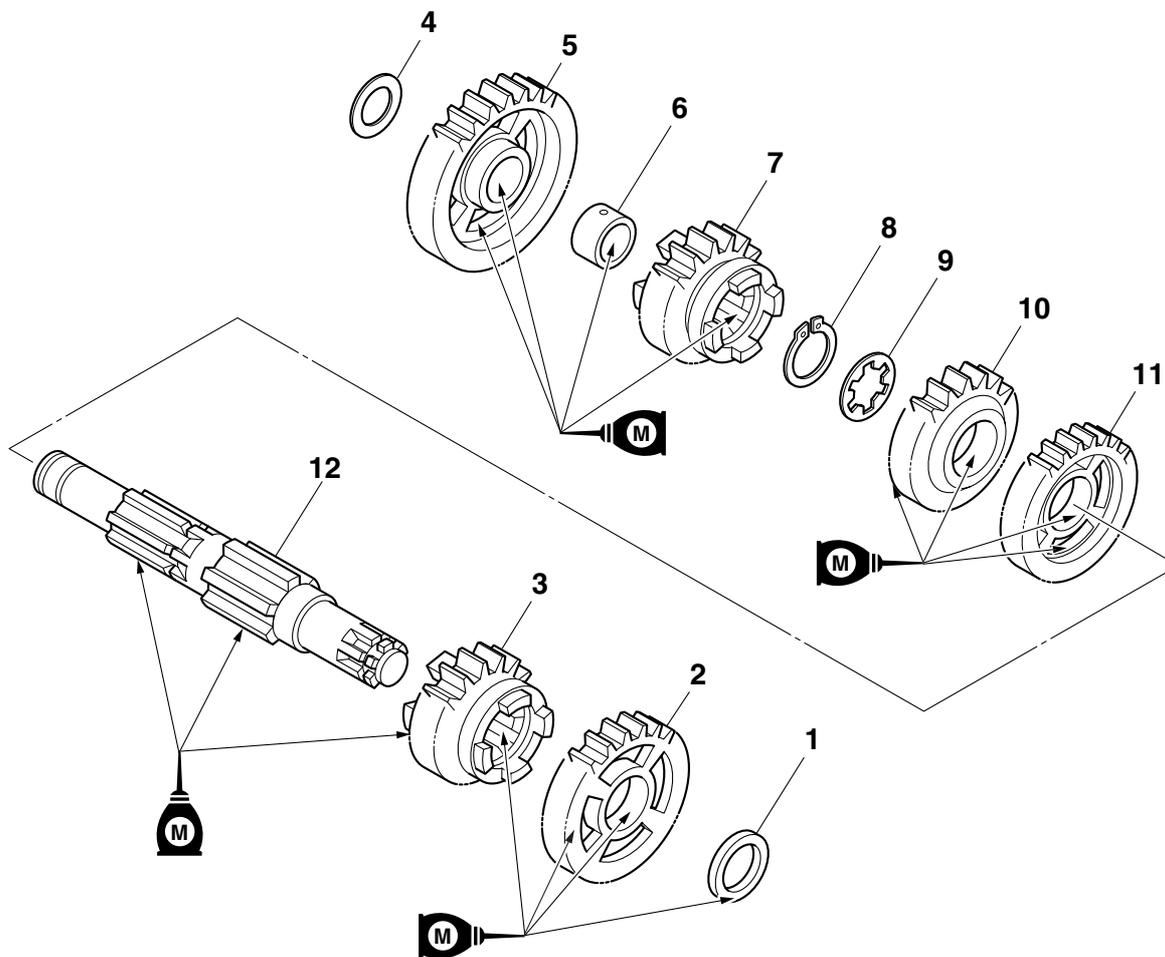
Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase		Separate. Refer to "CRANKCASE" on page 5-56.
1	Shift fork guide bar	1	
2	Spring	2	
3	Shift drum assembly	1	
4	Shift fork-R	1	
5	Shift fork-C	1	
6	Shift fork-L	1	
7	Drive axle assembly	1	
8	Main axle assembly	1	
9	Long clutch push rod	1	
			For installation, reverse the removal procedure.

Disassembling the main axle



Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	
2	6th pinion gear	1	
3	3rd/4th pinion gear	1	
4	Circlip	1	
5	Toothed washer	1	
6	5th pinion gear	1	
7	Main axle/1st pinion gear	1	
			For assembly, reverse the disassembly procedure.

Disassembling the drive axle



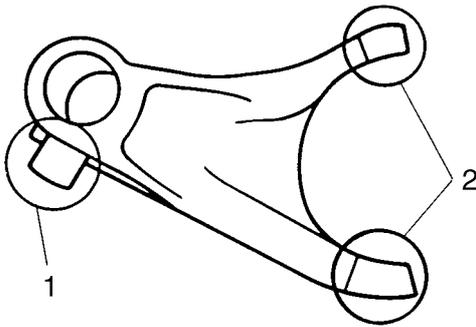
Order	Job/Parts to remove	Q'ty	Remarks
1	Washer	1	
2	2nd wheel gear	1	
3	6th wheel gear	1	
4	Washer	1	
5	1st wheel gear	1	
6	Spacer	1	
7	5th wheel gear	1	
8	Circlip	1	
9	Toothed washer	1	
10	4th wheel gear	1	
11	3rd wheel gear	1	
12	Drive axle	1	
			For assembly, reverse the disassembly procedure.

EAS26260

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.

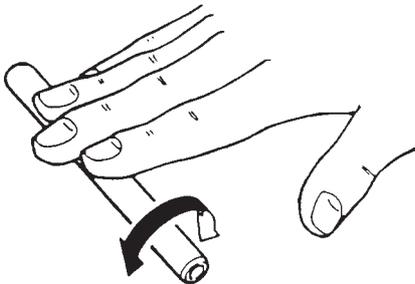


2. Check:
 - Shift fork guide bar
 Roll the shift fork guide bar on a flat surface.
 Bends → Replace.

EWA12840

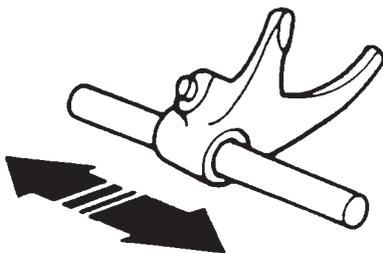
⚠ WARNING

Do not attempt to straighten a bent shift fork guide bar.



319-010

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.

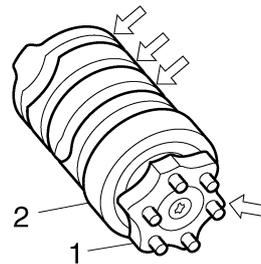


319-011

EAS26270

CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:
 - Shift drum groove
Damage/scratches/wear → Replace the shift drum assembly.
 - Shift drum segment "1"
 - Shift drum bearing "2"
 Damage/wear → Replace the shift drum assembly.
 Damage/pitting → Replace the shift drum assembly.



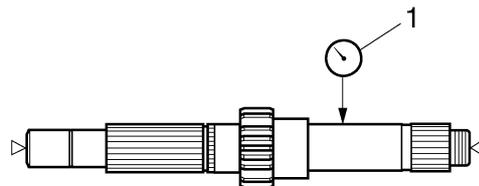
EAS26290

CHECKING THE TRANSMISSION

1. Measure:
 - Main axle runout
(with a centering device and dial gauge "1")
 Out of specification → Replace the main axle.



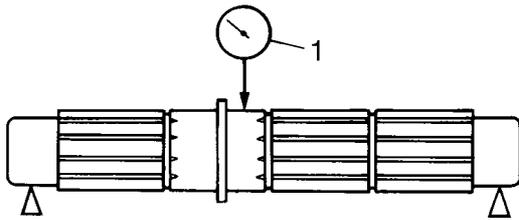
**Main axle runout limit
0.08 mm (0.0032 in)**



2. Measure:
 - Drive axle runout
(with a centering device and dial gauge "1")
 Out of specification → Replace the drive axle.

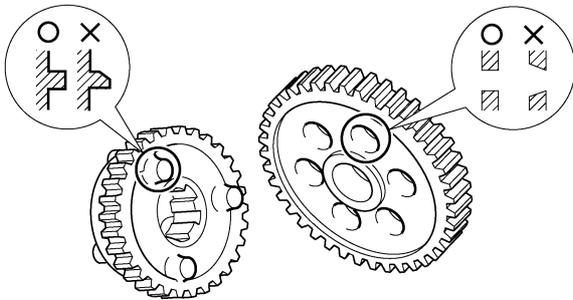


**Drive axle runout limit
0.08 mm (0.0032 in)**



3. Check:

- Transmission gears
Blue discoloration/pitting/wear → Replace the defective gear(s).
- Transmission gear dogs
Cracks/damage/rounded edges → Replace the defective gear(s).



4. Check:

- Transmission gear engagement (each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.

5. Check:

- Transmission gear movement
Rough movement → Replace the defective part(s).

EAS25190

CHECKING THE CLUTCH PUSH RODS

1. Check:

- Long clutch push rod
Cracks/damage/wear → Replace the long clutch push rod.

2. Measure:

- Push rod bending limit
Out of specification → Replace the long clutch push rod.



Push rod bending limit
0.500 mm (0.0197 in)

EAS29020

ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

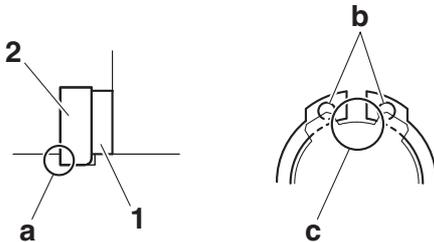
1. Install:

- Toothed washer "1"
- Circlip "2" **New**

NOTE:

- Be sure to install the circlip so that its sharp edge "a" is facing away from the toothed washer and gear.
- Be sure the circlip ends "b" are positioned at the axle spline groove "c".

New 2



2. Install:

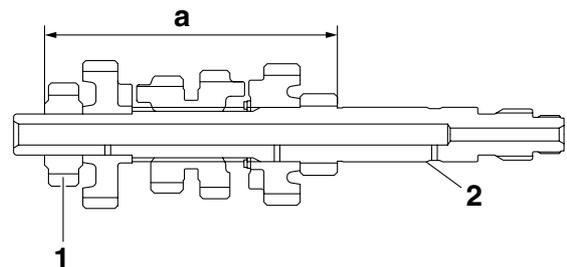
- 2nd pinion gear "1"

NOTE:

Press the 2nd pinion gear into the main axle "2", as shown in the illustration.



Installed depth "a"
106.85–107.05 mm (4.207–4.215 in)



EAS26320

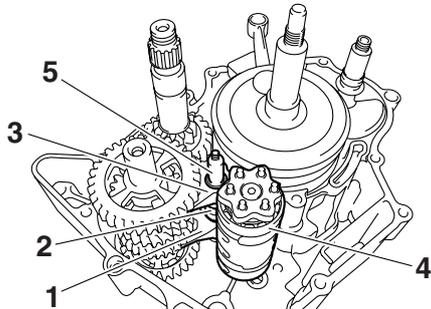
INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

1. Install:

- Shift fork-L "1"
- Shift fork-C "2"
- Shift fork-R "3"
- Shift drum assembly "4"
- Springs
- Shift fork guide bar "5"

NOTE: _____

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".

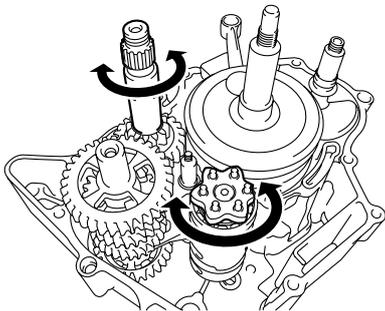


2. Check:

- Transmission
Rough movement → Repair.

NOTE: _____

- Apply engine oil to each gear and bearing thoroughly.
 - Before assembling the crankcase, make sure that the transmission is in neutral and that the gears turn freely.
-



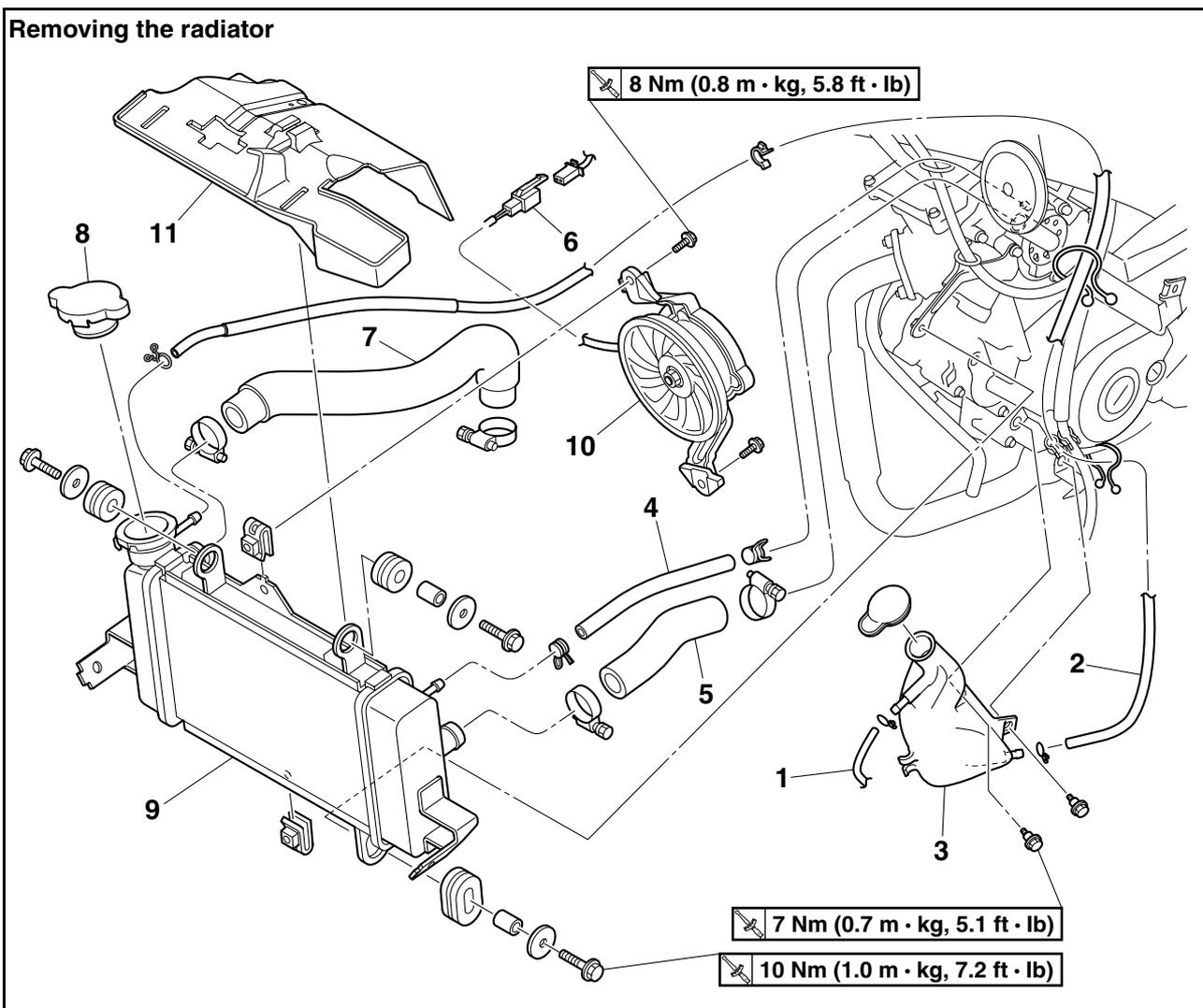
COOLING SYSTEM

RADIATOR	6-1
CHECKING THE RADIATOR.....	6-3
INSTALLING THE RADIATOR.....	6-3
THERMOSTAT	6-4
CHECKING THE THERMOSTAT.....	6-5
INSTALLING THE THERMOSTAT.....	6-5
WATER PUMP	6-6
DISASSEMBLING THE WATER PUMP.....	6-8
CHECKING THE WATER PUMP	6-8
ASSEMBLING THE WATER PUMP.....	6-8
INSTALLING THE WATER PUMP	6-9

EAS26380

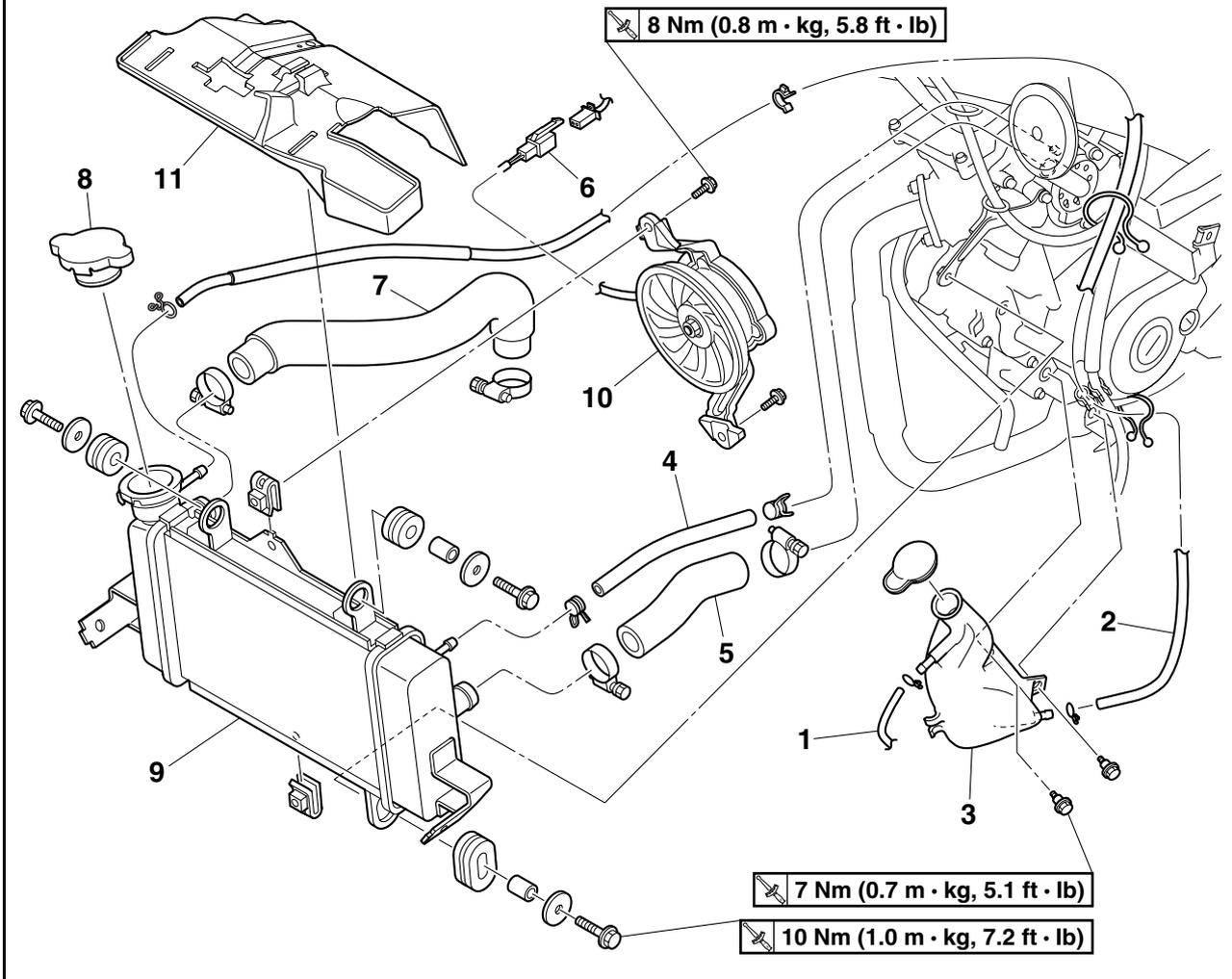
RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-15.
	Rider seat/Bottom cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Coolant reservoir breather hose	1	
2	Coolant reservoir hose	1	
3	Coolant reservoir	1	
4	Water pump breather hose	1	
5	Radiator outlet hose	1	
6	Radiator fan coupler	1	Disconnect.
7	Radiator inlet hose	1	Disconnect.
8	Radiator cap	1	
9	Radiator	1	
10	Radiator fan	1	

Removing the radiator

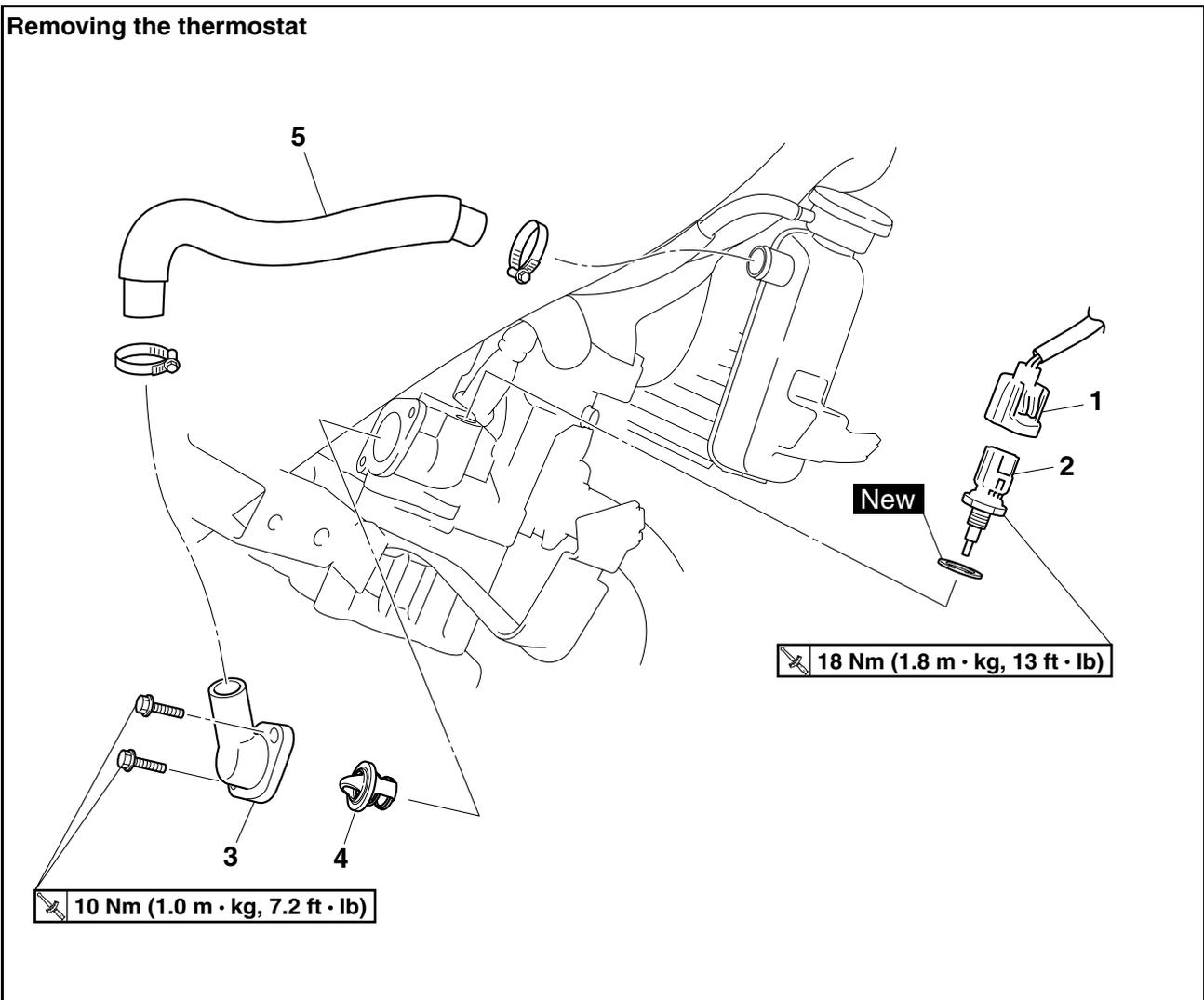


Order	Job/Parts to remove	Q'ty	Remarks
11	Radiator cover	1	
			For installation, reverse the removal procedure.

EAS26440

THERMOSTAT

Removing the thermostat

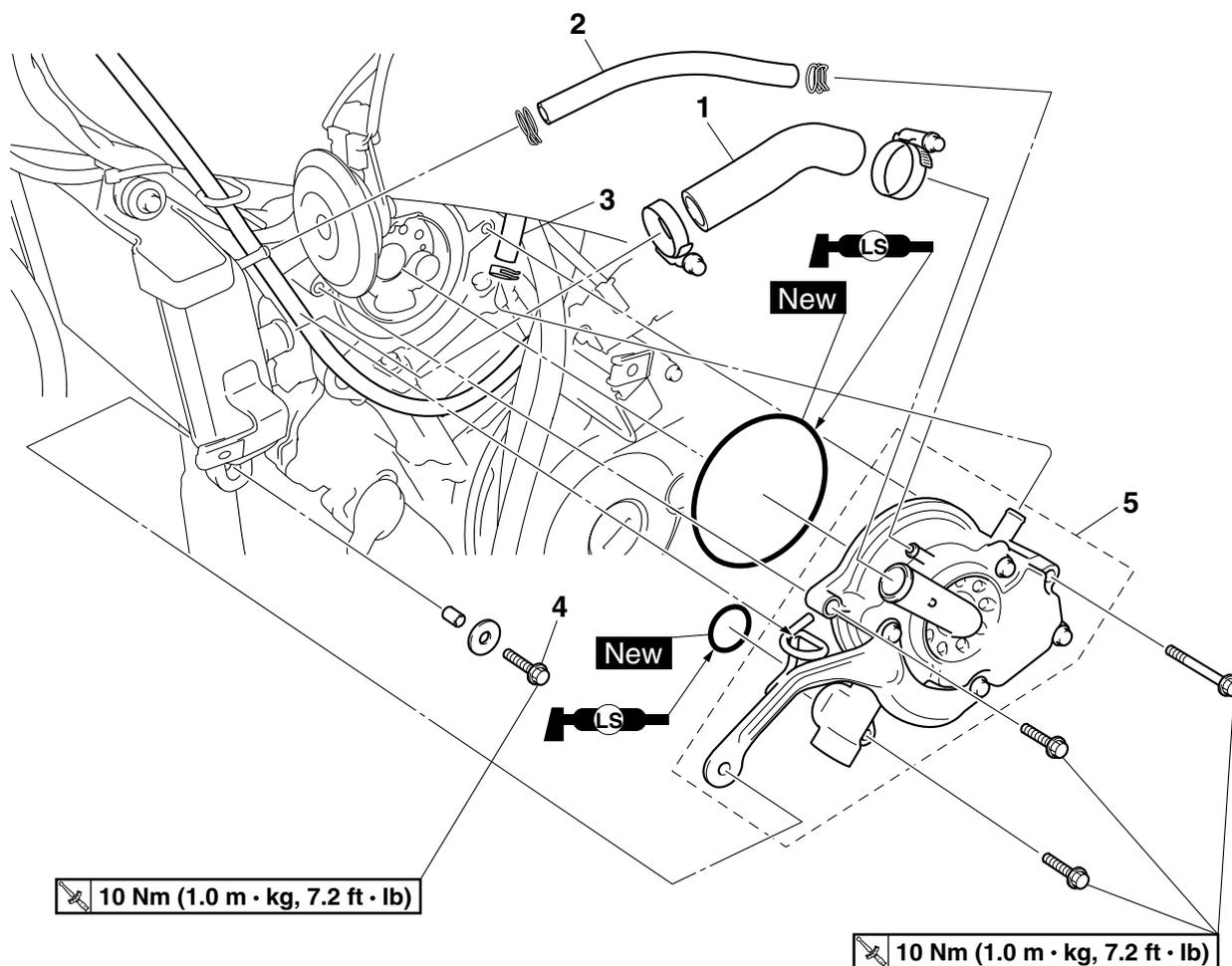


Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-15.
	Rider seat/Right upper side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Coolant temperature sensor coupler	1	Disconnect.
2	Coolant temperature sensor	1	
3	Thermostat cover	1	
4	Thermostat	1	
5	Radiator inlet hose	1	
			For installation, reverse the removal procedure.

EAS26500

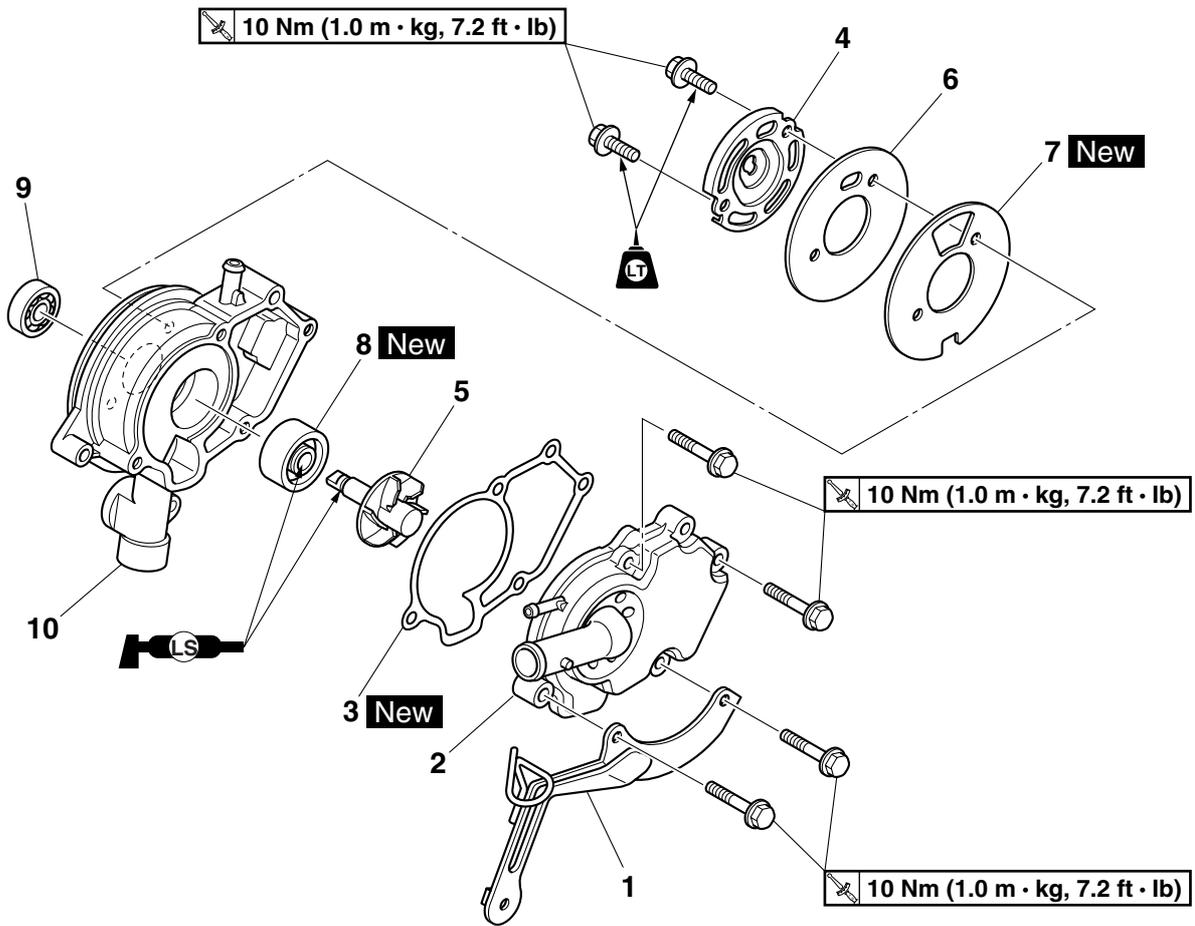
WATER PUMP

Removing the water pump



Order	Job/Parts to remove	Q'ty	Remarks
			It is not necessary to remove the water pump unless the coolant level is extremely low or the coolant contains engine oil.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-15.
	Left upper side cowling		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Radiator outlet hose	1	
2	Water pump breather hose	1	
3	Cylinder head breather hose	1	Disconnect.
4	Radiator bolt	1	
5	Water pump assembly	1	
			For installation, reverse the removal procedure.

Disassembling the water pump



Order	Job/Parts to remove	Q'ty	Remarks
1	Radiator bracket	1	
2	Water pump housing cover	1	
3	Water pump housing cover gasket	1	
4	Impeller shaft retainer	1	
5	Impeller shaft	1	
6	Water pump housing plate	1	
7	Water pump housing gasket	1	
8	Water pump seal	1	
9	Bearing	1	
10	Water pump housing	1	
			For assembly, reverse the disassembly procedure.

EAS26510

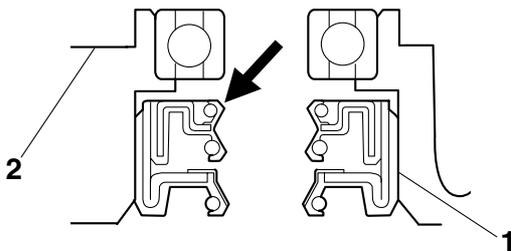
DISASSEMBLING THE WATER PUMP

1. Remove:

- Water pump seal "1"

NOTE:

Remove the water pump seal from the inside of the water pump housing "2".

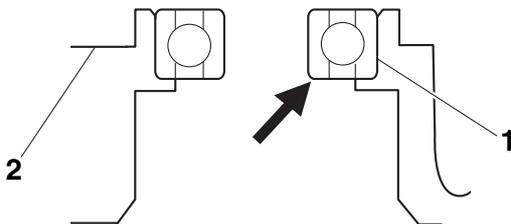


2. Remove:

- Bearing "1"

NOTE:

Remove the bearing from the outside of the water pump housing "2".



ECA14080

CAUTION:

Never lubricate the water pump seal surface with oil or grease.

NOTE:

- Install the water pump seal with the special tools.
- Install the water pump seal with the special tools to the specified depth as shown in the illustration.



Mechanical seal installer

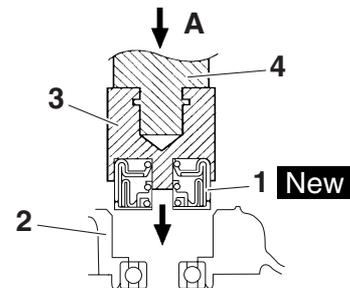
90890-04145

Middle driven shaft bearing driver

90890-04058

Bearing driver 40 mm

YM-04058



A. Push down

3. Mechanical seal installer

4. Middle driven shaft bearing driver

EAS26530

CHECKING THE WATER PUMP

1. Check:

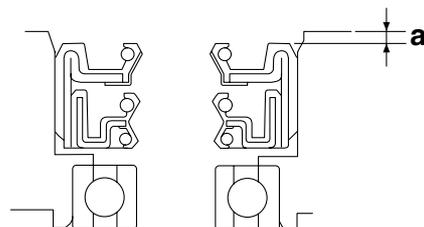
- Water pump housing cover
- Water pump housing
Cracks/damage → Replace.
- Impeller shaft
Cracks/damage/wear → Replace.
- Bearing
Rough movement → Replace.
- Radiator outlet hose
Cracks/damage → Replace.

EAS26560

ASSEMBLING THE WATER PUMP

1. Install:

- Water pump seal "1" **New**
(into the water pump housing "2")



a. 0–0.5 mm (0–0.02 in)

2. Lubricate:

- Water pump seal lip



Recommended lubricant

Lithium-soap-based grease

3. Install:

- Water pump housing gasket "1" **New**

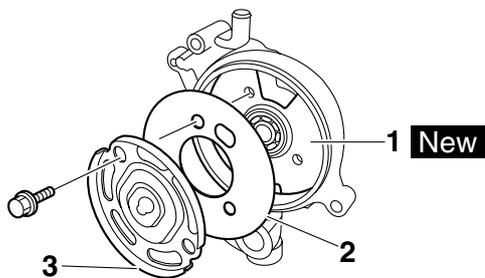
- Water pump housing plate “2”
- Impeller shaft
- Impeller shaft retainer “3”



NOTE:

- Before installing the impeller shaft retainer, lubricate the slit on the impeller shaft end with a thin coat of lithium-soap-based grease.
- Install the water pump housing gasket, water pump housing plate, and impeller shaft retainer as shown in the illustration.
- After installation, check that the impeller shaft rotates smoothly.

- Refer to “CHANGING THE COOLANT” on page 3-15.
3. Check:
 - Cooling system
Leaks → Repair or replace the faulty part.
 4. Measure:
 - Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to “CHECKING THE RADIATOR” on page 6-3.



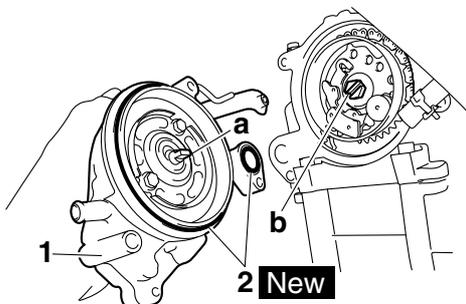
EAS26580

INSTALLING THE WATER PUMP

1. Install:
 - Water pump assembly “1”
 - O-rings “2” **New**

NOTE:

- Align the projection “a” on the impeller shaft with the slit “b” on the camshaft sprocket bolt.
- Lubricate the O-rings with a thin coat of lithium-soap-based grease.



2. Fill:
 - Cooling system
(with the specified amount of the recommended coolant)

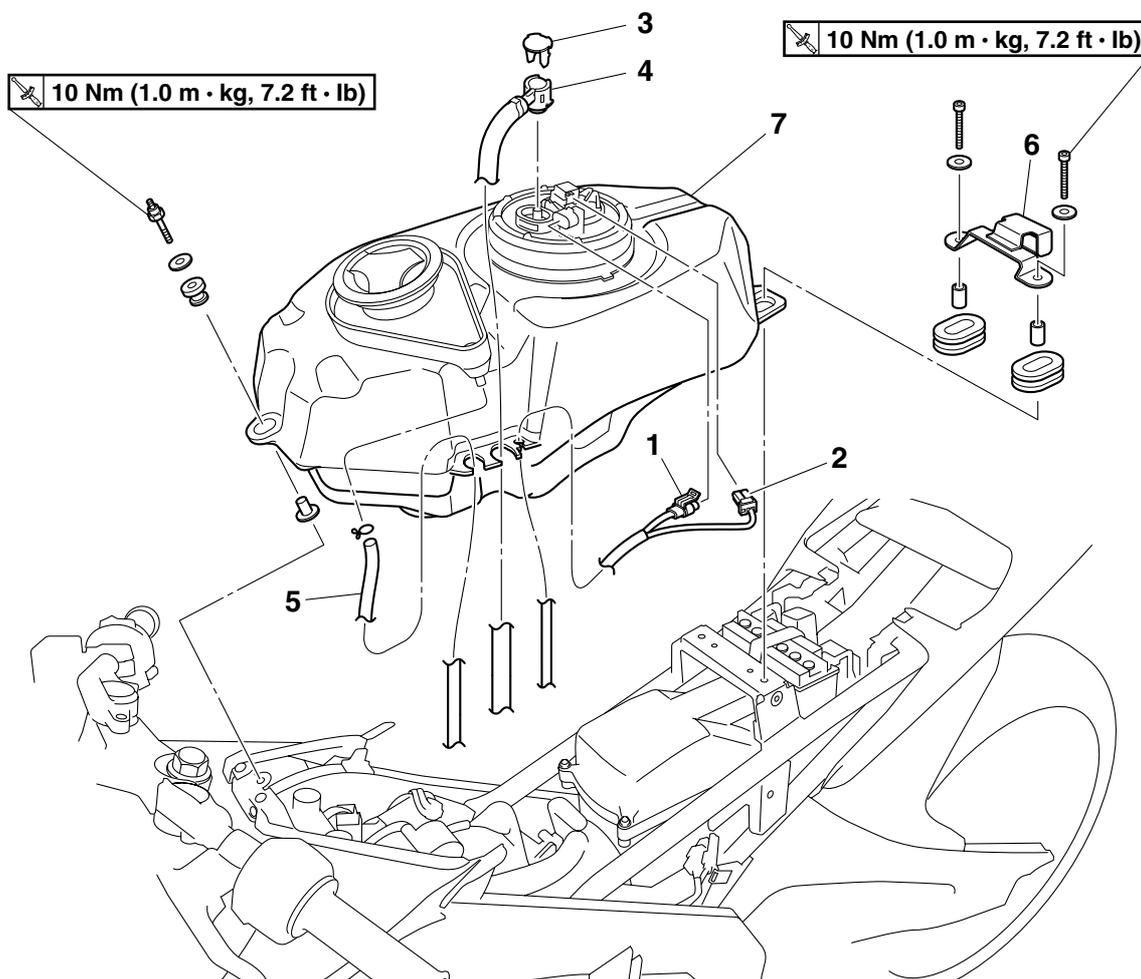
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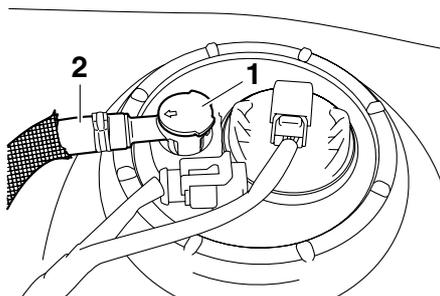
EAS26620

FUEL TANK

Removing the fuel tank

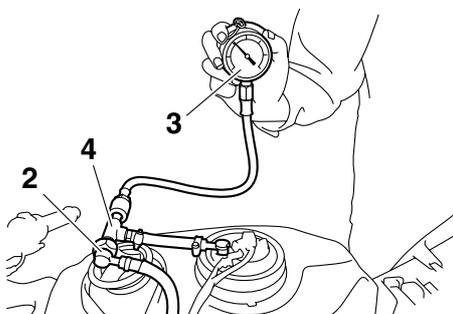


Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Fuel pump coupler	1	Disconnect.
2	Fuel sender coupler	1	Disconnect.
3	Fuel hose connector cover	1	
4	Fuel hose	1	Disconnect.
5	Fuel overflow hose	1	
6	Bracket	1	
7	Fuel tank	1	
			For installation, reverse the removal procedure.



- b. Connect the pressure gauge "3" and fuel pressure adapter "4".

	Pressure gauge 90890-03153 YU-03153
	Fuel pressure adapter 90890-03181



- c. Start the engine.
- d. Measure the fuel pressure.

	Output pressure 250.0 kPa (36.3 psi) (2.50 kgf/cm ²)
---	---

Faulty → Replace the fuel tank (with fuel pump).

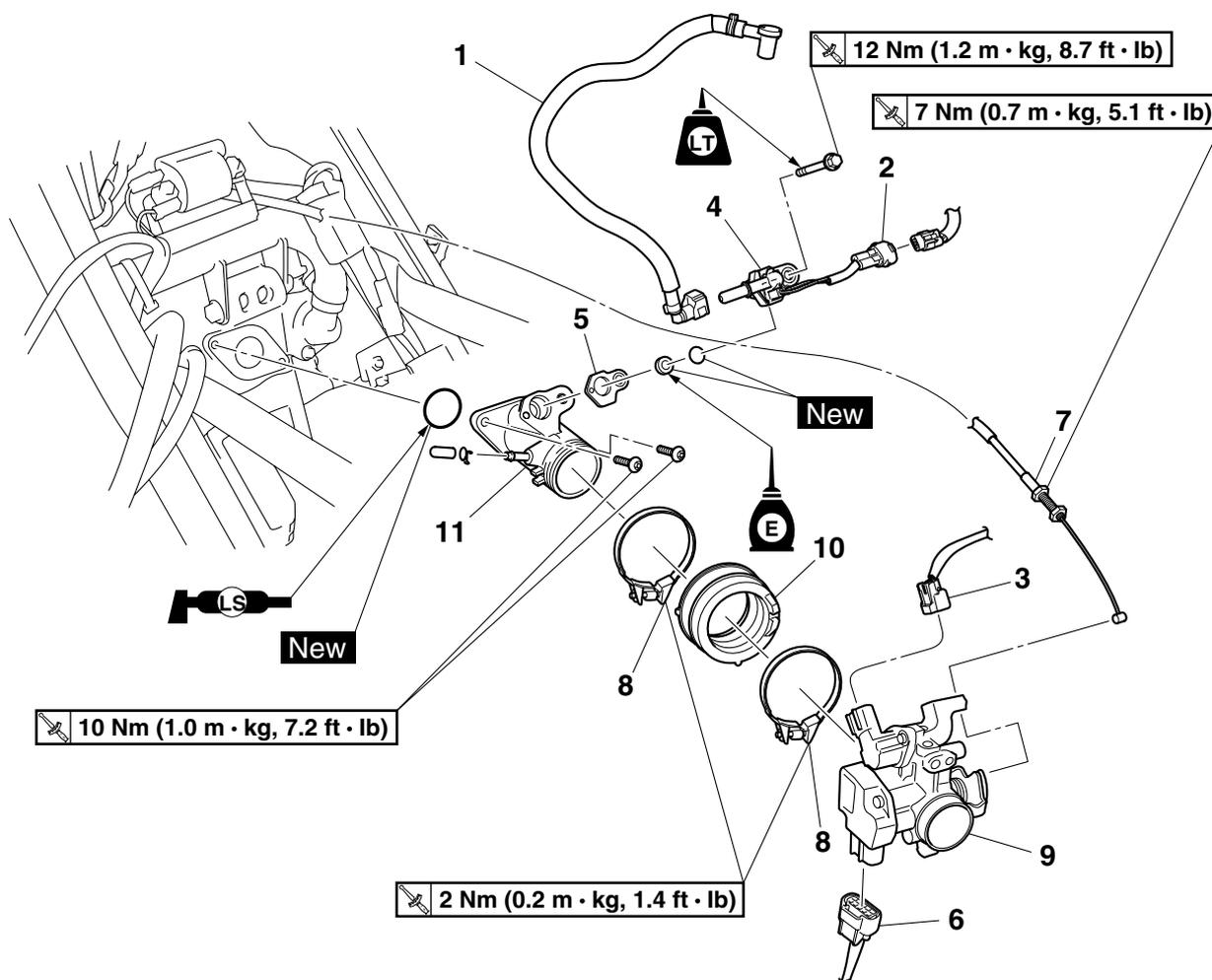
- e. Connect the fuel hose and install the fuel hose connector cover.
Refer to "INSTALLING THE FUEL HOSE" on page 7-2.



EAS26970

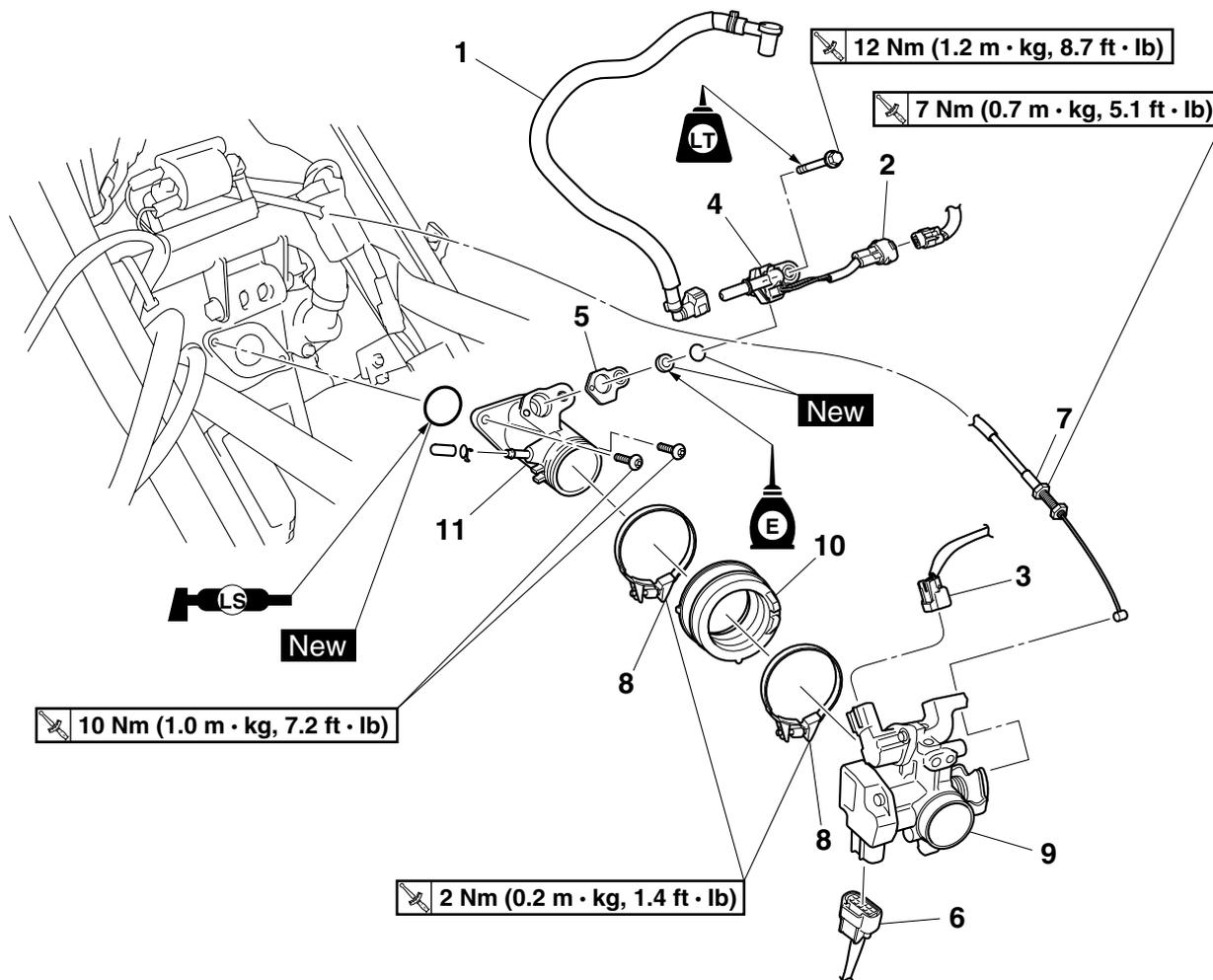
THROTTLE BODY

Removing the throttle body



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" on page 4-1.
1	Fuel hose	1	
2	Fuel injector coupler	1	Disconnect.
3	FID (fast idle solenoid) coupler	1	Disconnect.
4	Fuel injector	1	
5	Fuel injector gasket	1	
6	Throttle body sensor assembly coupler	1	Disconnect.
7	Throttle cable	1	Disconnect.
8	Throttle body joint clamp screw	2	Loosen.
9	Throttle body	1	ECA5D71015 CAUTION: _____ The throttle body should not be disassembled.
10	Throttle body joint	1	

Removing the throttle body



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

EAS5D71025

REMOVING THE THROTTLE BODY

1. Extract the fuel in the fuel tank through the fuel tank filler hole with a pump.
2. Disconnect:
 - Fuel hose

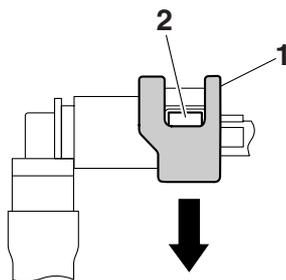
EWA5D71003

WARNING

Cover the fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

NOTE:

- To remove the fuel hose from the fuel injector, slide the fuel hose connector cover "1" on the end of the hose in the direction of the arrow shown, press the two buttons "2" on the sides of the connector, and then remove the hose.
- Remove the fuel hose manually without using any tools.
- Before removing the hose, place a few rags in the area under where it will be removed.

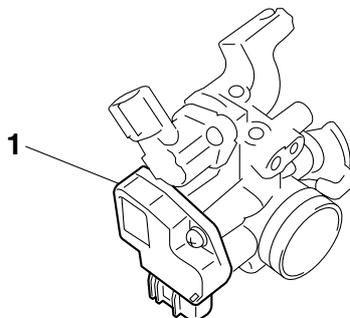


3. Remove:
 - Throttle body

ECA5D71016

CAUTION:

Do not remove the throttle body sensor assembly "1" from the throttle body.



EAS5D71028

CHECKING THE FUEL INJECTOR

1. Check:
 - Fuel injector
Damage → Replace.

EAS26990

CHECKING THE THROTTLE BODY

1. Check:
 - Throttle body
Cracks/damage → Replace the throttle body.
2. Check:
 - Fuel passages
Obstruction → Clean.



- a. Wash the throttle body in a petroleum-based solvent.
Do not use any caustic carburetor cleaning solution.
- b. Blow out all of the passages with compressed air.



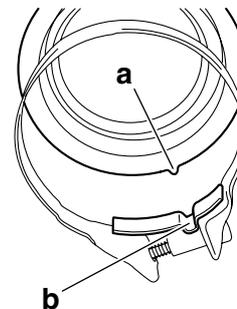
EAS5D71006

INSTALLING THE THROTTLE BODY

1. Install:
 - Throttle body joint clamps

NOTE:

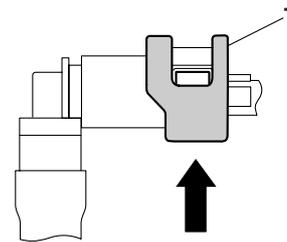
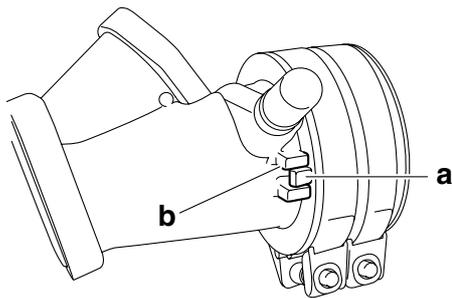
Align the projections "a" on the throttle body joint with the slot "b" in each throttle body joint clamp.



2. Install:
 - Throttle body joint

NOTE:

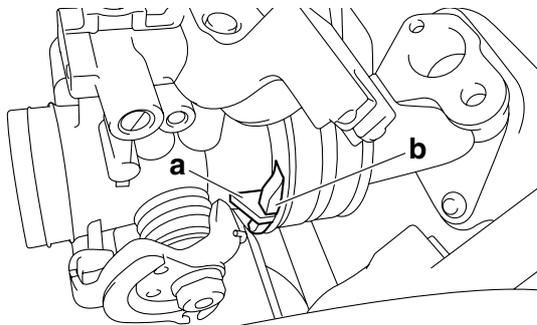
Align the projection "a" on the throttle body joint with the slot "b" in the intake manifold.



3. Install:
- Throttle body

NOTE:

Align the projection "a" on the throttle body with the slot "b" in the throttle body joint.



4. Adjust:
- Throttle cable free play
Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" on page 3-6.
5. Connect:
- Fuel hose

ECA5D71005

CAUTION:

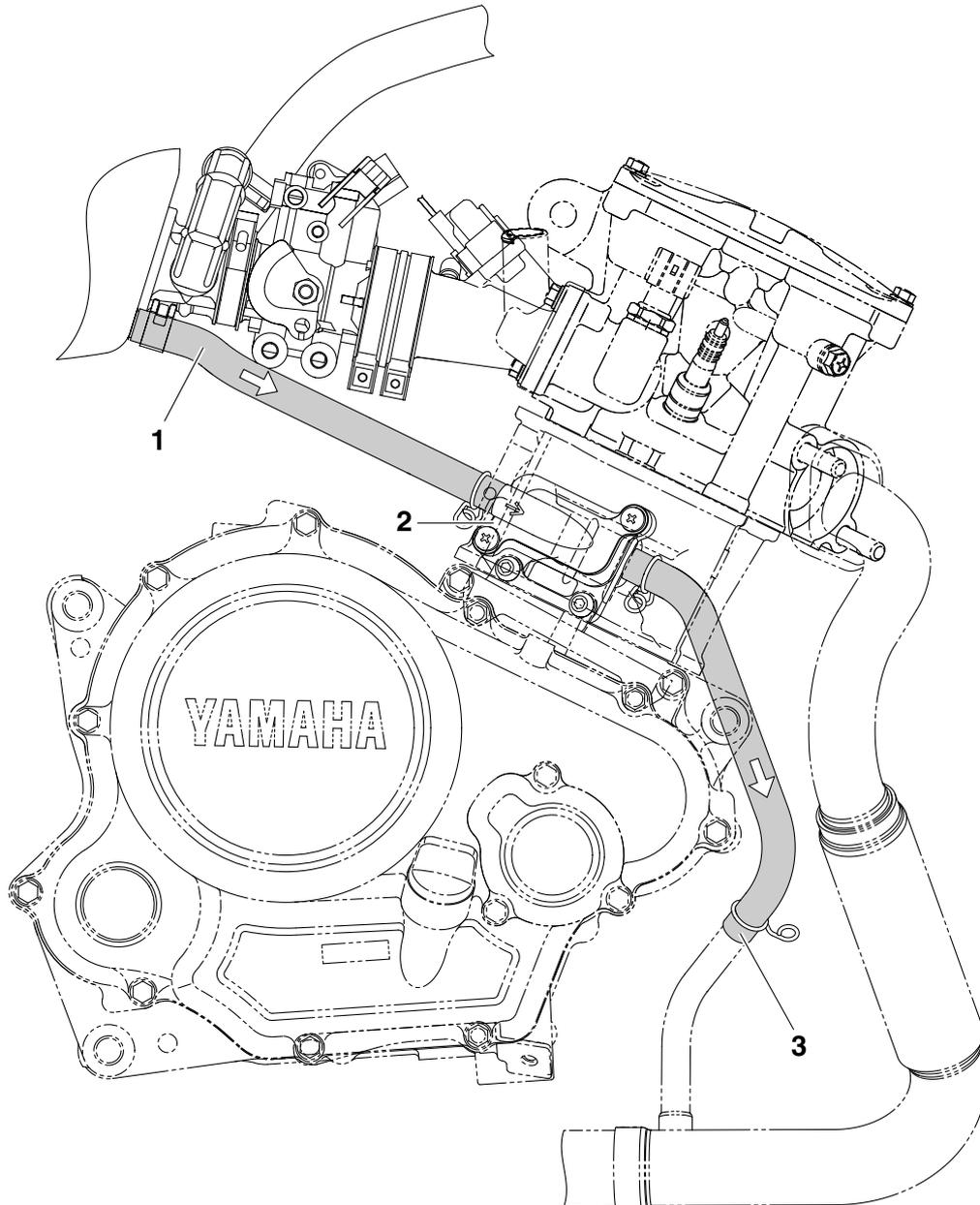
When installing the fuel hose, make sure that it is securely connected, and that the fuel hose connector cover on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.

NOTE:

- Install the fuel hose securely onto the fuel pump until a distinct "click" is heard.
- To install the fuel hose onto the fuel pump, slide the fuel hose connector cover "1" on the end of the hose in the direction of the arrow shown.

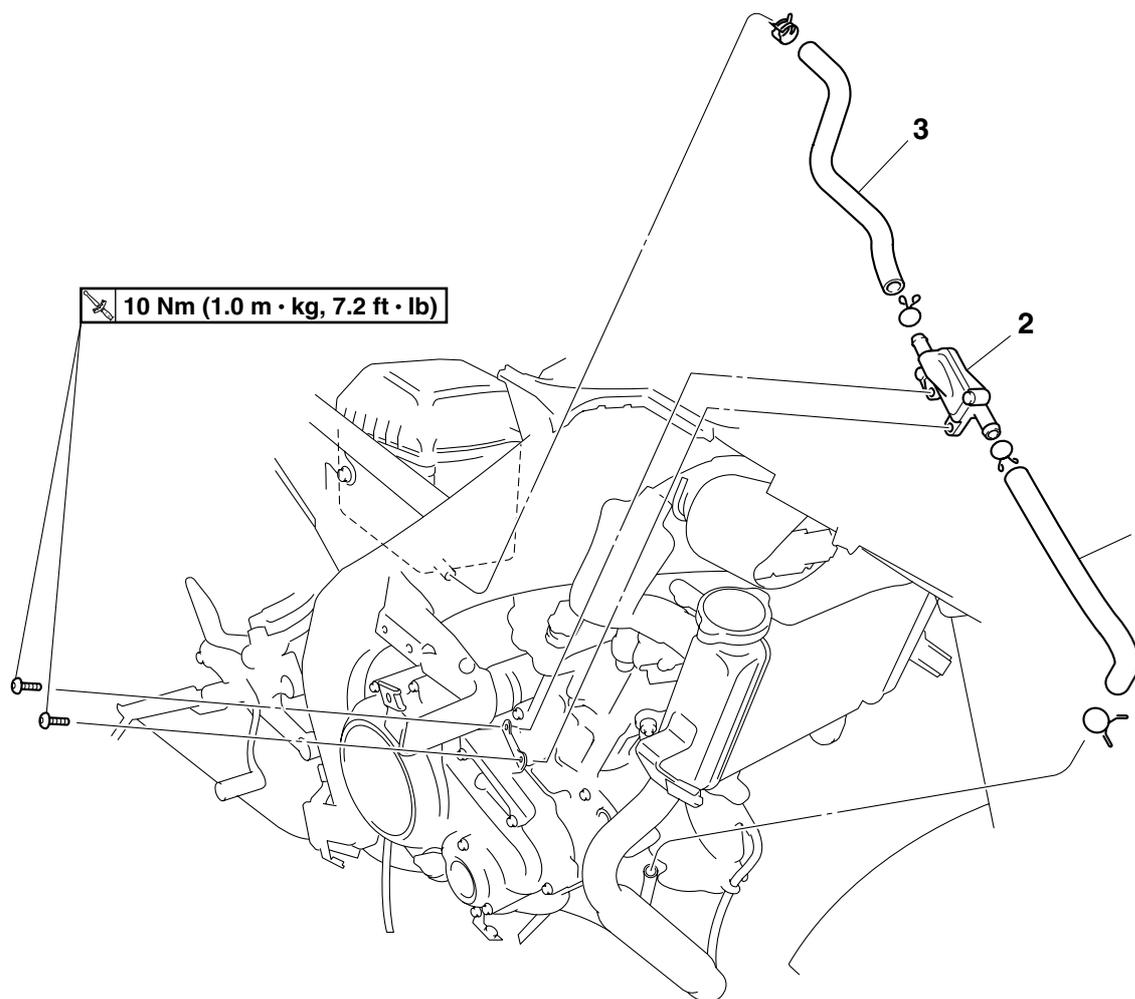
EAS27040

AIR INDUCTION SYSTEM



1. Air induction system hose (air filter case to reed valve assembly)
2. Air induction system reed valve assembly
3. Air induction system hose (reed valve assembly to exhaust pipe)

Removing the air induction system reed valve assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Rider seat/Right side cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Air induction system hose (reed valve assembly to exhaust pipe)	1	
2	Air induction system reed valve assembly	1	
3	Air induction system hose (air filter case to reed valve assembly)	1	
			For installation, reverse the removal procedure.

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- 2. Crankshaft position sensor
- 4. Main fuse
- 5. Main switch
- 8. Sidestand switch
- 9. Battery
- 17.Engine stop switch
- 23.Lean angle sensor
- 25.ECU (engine control unit)
- 26.Ignition coil
- 27.Spark plug
- 64.Ignition fuse

EAS27120

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

NOTE:

• Before troubleshooting, remove the following part(s):

1. Seats
2. Fuel tank
3. Right side cover
4. Left side panel
5. Left upper side cowling

<p>1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-63.</p>	<p>NG →</p>	<p>Replace the fuse(s).</p>
OK ↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-64.</p>	<p>NG →</p>	<ul style="list-style-type: none"> • Refill battery fluid. • Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
<p>3. Check the spark plug. Refer to "CHECKING THE SPARK PLUG" on page 3-7.</p>	<p>NG →</p>	<p>Re-gap or replace the spark plug.</p>
OK ↓		
<p>4. Check the ignition spark gap. Refer to "CHECKING THE IGNITION SPARK GAP" on page 8-69.</p>	<p>OK →</p>	<p>Ignition system is OK.</p>
NG ↓		
<p>5. Check the spark plug cap. Refer to "CHECKING THE SPARK PLUG CAP" on page 8-68.</p>	<p>NG →</p>	<p>Replace the spark plug cap.</p>
OK ↓		
<p>6. Check the ignition coil. Refer to "CHECKING THE IGNITION COIL" on page 8-68.</p>	<p>NG →</p>	<p>Replace the ignition coil.</p>
OK ↓		
<p>7. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-69.</p>	<p>NG →</p>	<p>Replace the crankshaft position sensor/stator assembly.</p>
OK ↓		

<p>8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>Replace the main switch.</p>
OK ↓		
<p>9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>The engine stop switch is faulty. Replace the right handlebar switch.</p>
OK ↓		
<p>10. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>Replace the sidestand switch.</p>
OK ↓		
<p>11. Check the lean angle sensor. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-69.</p>	NG →	<p>Replace the lean angle sensor.</p>
OK ↓		
<p>12. Check the entire ignition system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-1.</p>	NG →	<p>Properly connect or repair the ignition system wiring.</p>
OK ↓		
<p>Replace the ECU.</p>		

4. Main fuse
5. Main switch
7. Clutch switch
8. Sidestand switch
9. Battery
10. Starter relay
11. Starter motor
12. Starting circuit cut-off relay
13. Diode
14. Neutral switch
16. Start switch
17. Engine stop switch
64. Ignition fuse

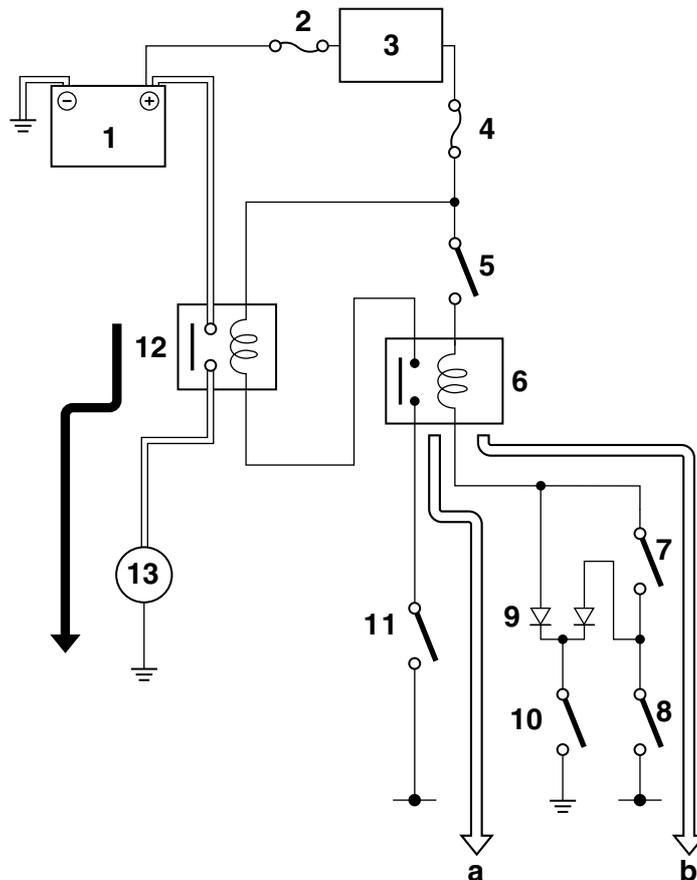
EAS27180

STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the engine stop switch is set to “○” and the main switch is set to “ON” (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cut-off relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met, the starting circuit cut-off relay is closed and the engine can be started by pressing the start switch “⊗”.



- a. WHEN THE TRANSMISSION IS IN NEUTRAL
- b. WHEN CLUTCH LEVER IS PULLED TO THE HANDLEBAR AND THE SIDESTAND IS UP
 1. Battery
 2. Main fuse
 3. Main switch
 4. Ignition fuse
 5. Engine stop switch
 6. Starting circuit cut-off relay
 7. Clutch switch
 8. Sidestand switch
 9. Diode
 10. Neutral switch
 11. Start switch
 12. Starter relay
 13. Starter motor

EAS27190

TROUBLESHOOTING

The starter motor fails to turn.

NOTE:

• Before troubleshooting, remove the following part(s):

1. Seats
2. Fuel tank
3. Left lower side cowling
4. Left upper side cowling

<p>1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-63.</p>	<p>NG →</p>	<p>Replace the fuse(s).</p>
OK ↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-64.</p>	<p>NG →</p>	<ul style="list-style-type: none"> • Refill battery fluid. • Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
<p>3. Check the starter motor operation. Refer to "CHECKING THE STARTER MOTOR OPERATION" on page 8-70.</p>	<p>OK →</p>	<p>Starter motor is OK. Perform the electric starting system troubleshooting, starting with step 5.</p>
NG ↓		
<p>4. Check the starter motor. Refer to "CHECKING THE STARTER MOTOR" on page 5-36.</p>	<p>NG →</p>	<p>Repair or replace the starter motor.</p>
OK ↓		
<p>5. Check the starting circuit cut-off relay. Refer to "CHECKING THE RELAYS" on page 8-66.</p>	<p>NG →</p>	<p>Replace the starting circuit cut-off relay.</p>
OK ↓		
<p>6. Check the diode. Refer to "CHECKING THE DIODE" on page 8-67.</p>	<p>NG →</p>	<p>Replace the diode.</p>
OK ↓		
<p>7. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-66.</p>	<p>NG →</p>	<p>Replace the starter relay.</p>
OK ↓		

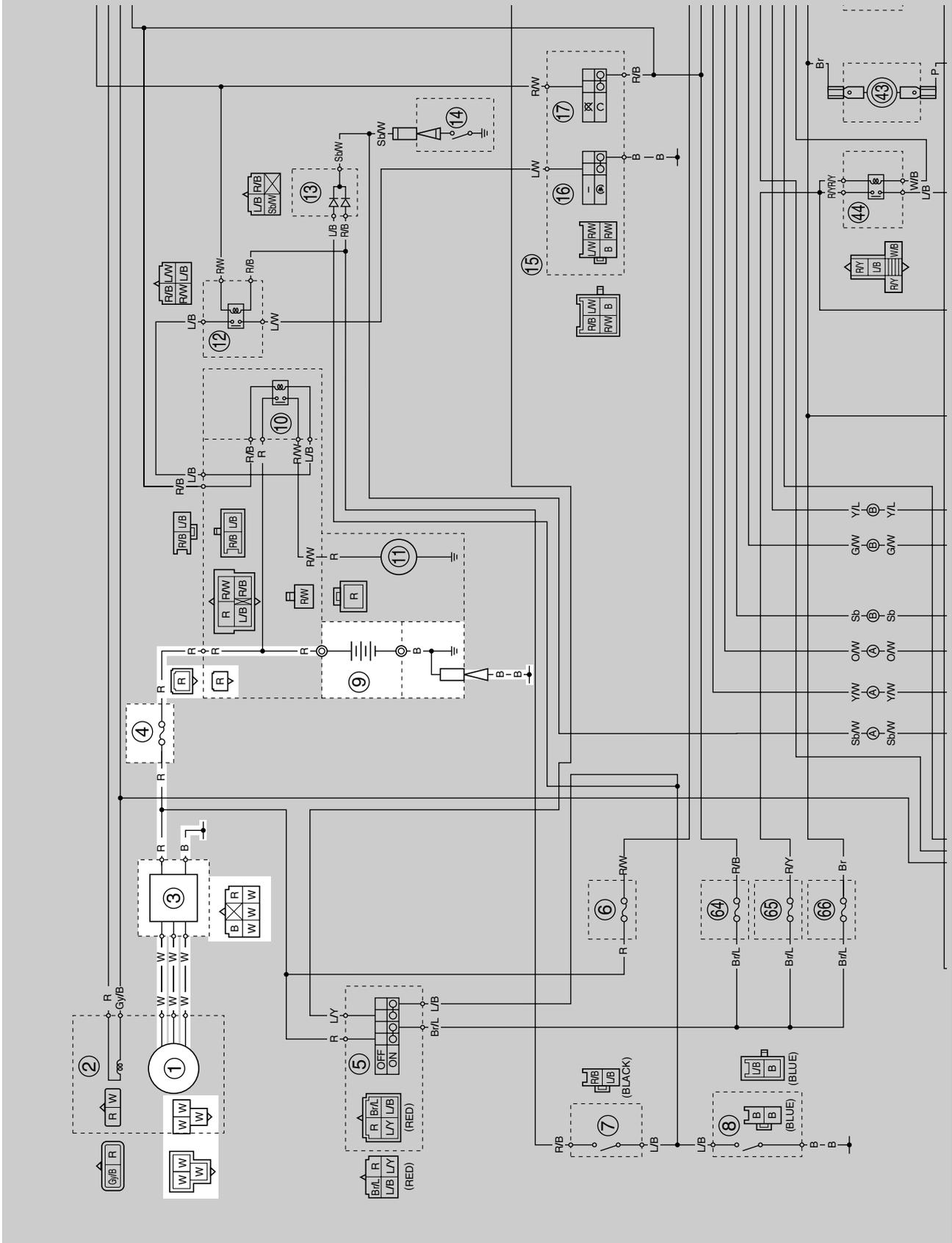
<p>8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>Replace the main switch.</p>
OK ↓		
<p>9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>The engine stop switch is faulty. Replace the right handlebar switch.</p>
OK ↓		
<p>10. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>Replace the neutral switch.</p>
OK ↓		
<p>11. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>Replace the sidestand switch.</p>
OK ↓		
<p>12. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>Replace the clutch switch.</p>
OK ↓		
<p>13. Check the start switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>The start switch is faulty. Replace the right handlebar switch.</p>
OK ↓		
<p>14. Check the entire starting system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-5.</p>	NG →	<p>Properly connect or repair the starting system wiring.</p>
OK ↓		
<p>The starting system circuit is OK.</p>		

EAS27200

CHARGING SYSTEM

EAS27210

CIRCUIT DIAGRAM



1. AC magneto
3. Rectifier/regulator
4. Main fuse
9. Battery

EAS27230

TROUBLESHOOTING

The battery is not being charged.

NOTE:

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Left side panel
3. Left lower side cowling

<p>1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 8-63.</p>	<p>NG →</p>	<p>Replace the fuse.</p>
<p>OK ↓</p>		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-64.</p>	<p>NG →</p>	<ul style="list-style-type: none"> • Refill battery fluid. • Clean the battery terminals. • Recharge or replace the battery.
<p>OK ↓</p>		
<p>3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 8-70.</p>	<p>NG →</p>	<p>Replace the crankshaft position sensor/stator assembly.</p>
<p>OK ↓</p>		
<p>4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 8-71.</p>	<p>NG →</p>	<p>Replace the rectifier/regulator.</p>
<p>OK ↓</p>		
<p>5. Check the entire charging system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-11.</p>	<p>NG →</p>	<p>Properly connect or repair the charging system wiring.</p>
<p>OK ↓</p>		
<p>The charging system circuit is OK.</p>		

- 4. Main fuse
- 5. Main switch
- 9. Battery
- 25. ECU (engine control unit)
- 36. License plate light
- 37. Tail/brake light
- 44. Headlight relay
- 46. Pass switch
- 47. Dimmer switch
- 51. Headlight (low beam)
- 52. Auxiliary light
- 54. Headlight (high beam)
- 58. Meter light
- 60. High beam indicator light
- 64. Ignition fuse
- 65. Headlight fuse
- 66. Signaling system fuse

EAS27260

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, license plate light, auxiliary light or meter light.

NOTE:

• Before troubleshooting, remove the following part(s):

1. Seats
2. Fuel tank

<p>1. Check the condition of each bulb and bulb socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-62.</p>	NG →	<p>Replace the bulb(s) and bulb socket(s).</p>
OK ↓		
<p>2. Check the fuses. (Main, ignition, headlight, and signaling system) Refer to "CHECKING THE FUSES" on page 8-63.</p>	NG →	<p>Replace the fuse(s).</p>
OK ↓		
<p>3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-64.</p>	NG →	<ul style="list-style-type: none"> • Refill battery fluid. • Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
<p>4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>Replace the main switch.</p>
OK ↓		
<p>5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>The dimmer switch is faulty. Replace the left handlebar switch.</p>
OK ↓		
<p>6. Check the pass switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>The pass switch is faulty. Replace the left handlebar switch.</p>
OK ↓		
<p>7. Check the headlight relay. Refer to "CHECKING THE RELAYS" on page 8-66.</p>	NG →	<p>Replace the headlight relay.</p>
OK ↓		

8. Check the entire lighting system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-15.

NG →

Properly connect or repair the lighting system wiring.

OK ↓

Replace the ECU or meter assembly.

- 4. Main fuse
- 5. Main switch
- 9. Battery
- 14. Neutral switch
- 25. ECU (engine control unit)
- 31. Fuel sender
- 34. Rear brake light switch
- 35. Front brake light switch
- 37. Tail/brake light
- 38. Rear right turn signal light
- 39. Rear left turn signal light
- 40. Front right turn signal light
- 41. Front left turn signal light
- 42. Turn signal relay
- 43. Horn
- 48. Horn switch
- 49. Turn signal switch
- 56. Multi-function meter
- 57. Tachometer
- 61. Turn signal indicator light
- 62. Neutral indicator light
- 64. Ignition fuse
- 66. Signaling system fuse
- 67. Speed sensor

EAS27290

TROUBLESHOOTING

- Any of the following fail to light: turn signal lights, brake light or indicator lights.
- The horn fails to sound.
- The fuel gauge fails to operate.
- The speedometer fails to operate.

NOTE:

- Before troubleshooting, remove the following part(s):

1. Seats
2. Fuel tank
3. Left upper side cowling
4. Right side panel
5. Left lower side cowling

<p>1. Check the fuses. (Main, ignition, and signaling system) Refer to "CHECKING THE FUSES" on page 8-63.</p>	NG →	<p>Replace the fuse(s).</p>
OK ↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-64.</p>	NG →	<ul style="list-style-type: none"> • Refill battery fluid. • Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>Replace the main switch.</p>
OK ↓		
<p>4. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-19.</p>	NG →	<p>Properly connect or repair the signaling system wiring.</p>
OK ↓		
<p>Check the condition of each of the signaling system circuits. Refer to "Checking the signaling system".</p>		

Checking the signaling system

The horn fails to sound.

<p>1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	NG →	<p>The horn switch is faulty. Replace the left handlebar switch.</p>
OK ↓		

2. Check the horn.
Refer to "CHECKING THE HORN" on page 8-71.

NG →

Replace the horn.

OK ↓

3. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or repair the signaling system 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 8-59.

NG →

Replace the front brake light switch.

OK ↓

2. Check the rear brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-59.

NG →

Replace the rear brake light switch.

OK ↓

3. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or repair the signaling system wiring.

OK ↓

Replace the tail/brake light assembly.

The turn signal light, turn signal indicator light or both fail to blink.

1. Check the turn signal light bulb and socket.
Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-62.

NG →

Replace the turn signal light bulb, socket or both.

OK ↓

2. Check the turn signal switch.
Refer to "CHECKING THE SWITCHES" on page 8-59.

NG →

The turn signal switch is faulty. Replace the left handlebar switch.

OK ↓

3. Check the turn signal relay.
Refer to "CHECKING THE TURN SIGNAL RELAY" on page 8-66.

NG →

Replace the turn signal relay.

OK ↓

4. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or repair the signaling system wiring.

OK ↓

Replace the meter assembly.

The neutral indicator light fails to come on.

1. Check the neutral switch.
Refer to "CHECKING THE SWITCHES" on page 8-59.

NG →

Replace the neutral switch.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or repair the signaling system wiring.

OK ↓

Replace the meter assembly.

The fuel gauge fails to operate.

1. Check the fuel sender.
Refer to "CHECKING THE FUEL SENDER" on page 8-72.

NG →

Replace the fuel sender.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or repair the signaling system wiring.

OK ↓

Replace the meter assembly.

The speedometer fails to operate.

1. Check the speed sensor.
Refer to "CHECKING THE SPEED SENSOR" on page 8-72.

NG →

Replace the speed sensor.

OK ↓

2. Check the entire signaling system wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG →

Properly connect or repair the signaling system wiring.

OK ↓

Replace the ECU or meter assembly.

- 4. Main fuse
- 5. Main switch
- 6. Radiator fan motor fuse
- 9. Battery
- 22. Coolant temperature sensor
- 25. ECU (engine control unit)
- 32. Radiator fan motor relay
- 33. Radiator fan motor
- 59. Coolant temperature warning light
- 64. Ignition fuse
- 66. Signaling system fuse

EAS27320

TROUBLESHOOTING

NOTE:

• Before troubleshooting, remove the following part(s):

1. Rider seat
2. Fuel tank
3. Right upper side cowling
4. Passenger seat

<p>1. Check the fuses. (Main, ignition, and signaling system) Refer to "CHECKING THE FUSES" on page 8-63.</p>	<p>NG →</p>	<p>Replace the fuse(s).</p>
OK ↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-64.</p>	<p>NG →</p>	<ul style="list-style-type: none"> • Refill battery fluid. • Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	<p>NG →</p>	<p>Replace the main switch.</p>
OK ↓		
<p>4. Check the radiator fan motor. Refer to "CHECKING THE RADIATOR FAN MOTOR" on page 8-72.</p>	<p>NG →</p>	<p>Replace the radiator fan motor.</p>
OK ↓		
<p>5. Check the radiator fan motor relay. Refer to "CHECKING THE RELAYS" on page 8-66.</p>	<p>NG →</p>	<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 8-73.</p>	<p>NG →</p>	<p>Replace the coolant temperature sensor.</p>
OK ↓		
<p>7. Check the entire cooling system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-25.</p>	<p>NG →</p>	<p>Properly connect or repair the cooling system wiring.</p>
OK ↓		
<p>Replace the ECU or meter assembly.</p>		

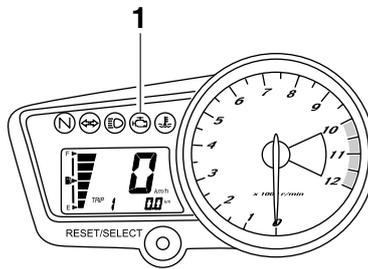
2. Crankshaft position sensor
4. Main fuse
5. Main switch
6. Radiator fan motor fuse
8. Sidestand switch
9. Battery
17. Engine stop switch
19. Intake air pressure sensor
20. Intake air temperature sensor
21. Throttle position sensor
22. Coolant temperature sensor
23. Lean angle sensor
24. Self-diagnosis signal connector
25. ECU (engine control unit)
26. Ignition coil
27. Spark plug
28. FID (fast idle solenoid)
29. Fuel injector
30. Fuel pump
32. Radiator fan motor relay
33. Radiator fan motor
63. Engine trouble warning light
64. Ignition fuse
66. Signaling system fuse
67. Speed sensor

EAS27350

ECU SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning, the engine trouble warning light flashes when the start switch is being pushed to start the engine.
- If a malfunction is detected in the system by the self-diagnostic function, the ECU provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating the engine trouble warning light.
- After the engine has been stopped, the lowest fault code number is indicated by the engine trouble warning light (or displayed on the FI diagnostic tool). It remains stored in the memory of the ECU until it is deleted.



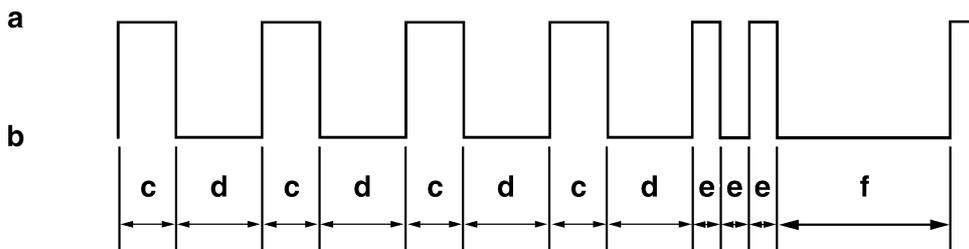
1. Engine trouble warning light

Engine trouble warning light fault code 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: 42



- Light on
- Light off
- 1
- 1.5
- 0.5
- 3

Engine trouble warning light indication and fuel injection system operation

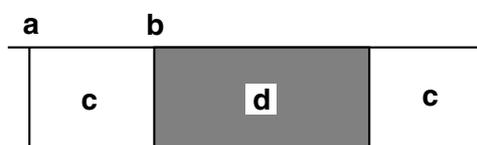
Warning light indication	ECU operation	Fuel injection operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Cannot be operated
Remains on	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	Can or cannot be operated depending on the fault code

* The warning light flashes when any one of the conditions listed below is present and the start switch is pushed:

- | | | | |
|-----|---|-----|---|
| 19: | Blue/yellow ECU lead (broken or disconnected) | 39: | Fuel injector (open or short circuit) |
| 30: | Lean angle sensor (latch up detected) | 41: | Lean angle sensor (open or short circuit) |
| 33: | Faulty ignition | 50: | ECU internal malfunction (memory check error) |

Checking the engine trouble warning light

The engine trouble warning light comes on for 3 seconds after the main switch has been set to "ON". If the warning light does not come on under these conditions, the warning light (LED) may be defective.



- | | |
|-------------------------------------|--|
| a. Main switch "OFF" | d. Engine trouble warning light on for 3 seconds |
| b. Main switch "ON" | |
| c. Engine trouble warning light off | |

EAS5D71008

SELF-DIAGNOSTIC FUNCTION TABLE

If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue to operate or stop operating, depending on the conditions.

Self-Diagnostic Function table

Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
12	Crankshaft position sensor	No normal signals are received from the crankshaft position sensor.	Unable	Unable
13	Intake air pressure sensor (open or short circuit)	Intake air pressure sensor: open or short circuit detected.	Able	Able
14	Intake air pressure sensor (system)	Intake air pressure sensor: system malfunction (clogged hole).	Able	Able
15	Throttle position sensor (open or short circuit)	Throttle position sensor: open or short circuit detected.	Able	Able
16	Throttle position sensor (stuck)	Throttle position sensor is stuck	Able	Able
19	Blue/yellow ECU lead (broken or disconnected)	A break or disconnection of the blue/yellow lead of the ECU is detected.	Unable	Unable
21	Coolant temperature sensor	Coolant temperature sensor: open or short circuit detected.	Able	Able
22	Intake air temperature sensor (open or short circuit)	Intake air temperature sensor: open or short circuit detected.	Able	Able
30	Lean angle sensor (latch up detected)	No normal signal is received from the lean angle sensor.	Unable	Unable
33	Ignition coil (open circuit)	Primary lead of the ignition coil: open circuit detected.	Unable	Unable
39	Fuel injector	Fuel injector: open or short circuit detected.	Unable	Unable
41	Lean angle sensor (open or short circuit)	Lean angle sensor: open or short circuit detected.	Unable	Unable
42	Speed sensor	No normal signals are received from the speed sensor.	Able	Able
44	EEPROM	Error is detected while reading from or writing on EEPROM.	Able	Able
46	Vehicle system power supply (Monitoring voltage)	Malfunction in the charging system.	Able	Able
50	ECU internal malfunction (memory check error)	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	Unable	Unable
—	Start unable warning	Engine trouble warning light flashes when the start switch is turned ON.	Unable	Unable

EAS27431

DIAGNOSTIC MODE

It is possible to monitor the sensor output data or check the activation of actuators with the FI diagnostic tool connected to the vehicle and set to the normal mode or the diagnostic monitoring mode.

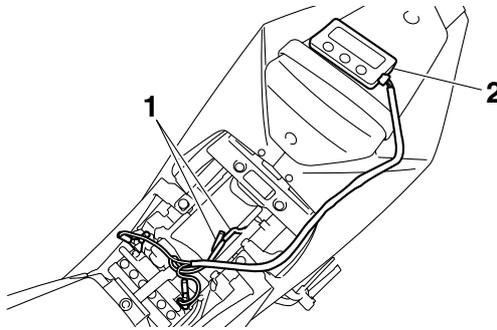


Setting the normal mode

NOTE:

The engine speed, coolant temperature, and fault code, if detected, can be displayed on the LCD of the FI diagnostic tool when the tool is connected to the vehicle and is set to the normal mode.

1. Set the main switch to "OFF" and the engine stop switch to "○".
2. Disconnect the self-diagnosis signal connector "1", and then connect the FI diagnostic tool "2" as shown.
3. Set the main switch to "ON" and start the engine.



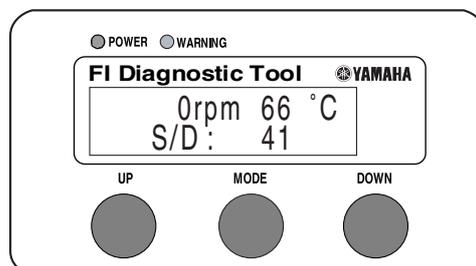
NOTE:

- The coolant temperature and engine speed appear on the LCD of the FI diagnostic tool.
- "POWER" LED (green) comes on.
- If a malfunction is detected in the system, the "WARNING" LED (orange) comes on.

4. Stop the engine.

NOTE:

If a malfunction is detected in the system, the fault code appears on the LCD of the FI diagnostic tool and the "WARNING" LED (orange) comes on.



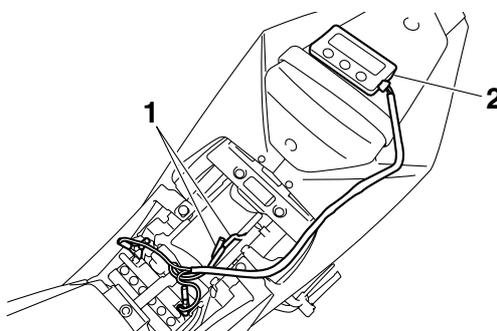
5. Set the main switch to "OFF" to cancel the normal mode.
6. Disconnect the FI diagnostic tool and connect the self-diagnosis signal connector.

Setting the diagnostic mode

1. Set the main switch to "OFF" and the engine stop switch to "○".
2. Disconnect the self-diagnosis signal connector "1", and then connect the FI diagnostic tool "2" as shown.
3. Disconnect the fuel pump coupler.
4. While pressing the "MODE" button, set the main switch to "ON".

NOTE:

- "DIAG" appears on the LCD of the FI diagnostic tool.
 - "POWER" LED (Green) comes on.
5. Press the "UP" button to select the CO adjustment mode "CO" or the diagnostic mode "DIAG".
 6. After selecting "DIAG", press the "MODE" button.
 7. Select the diagnostic code number corresponding to the fault code number by pressing the "UP" and "DOWN" buttons.

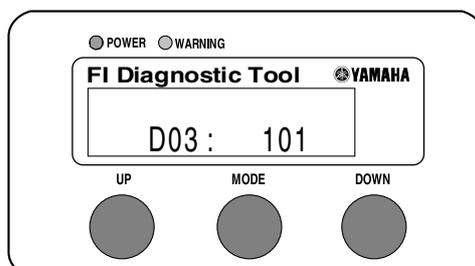


NOTE:

- The diagnostic code number appears on the LCD (01-70).
- To decrease the selected diagnostic code number, press the "DOWN" button. Press the "DOWN" button for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the "UP" button. Press the "UP" button for 1 second or longer to automatically increase the diagnostic code numbers.

8. Verify the operation of the sensor or actuator.

- Sensor operation
The data representing the operating conditions of the sensor appear on the LCD.
- Actuator operation
Press the "MODE" button.



9. Set the main switch to "OFF" to cancel the diagnostic mode.
10. Disconnect the FI diagnostic tool and connect the self-diagnosis signal connector.

Diagnostic code table

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
12	No normal signals are received from the crankshaft position sensor.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective crankshaft position sensor. • Malfunction in AC magneto rotor. • Improperly installed sensor. • Malfunction in ECU. 	—
13	Intake air pressure sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective intake air pressure sensor. • Malfunction in ECU. 	03
14	Intake air pressure sensor: system malfunction (clogged hole).	<ul style="list-style-type: none"> • Intake air pressure sensor hole is clogged. • Malfunction in ECU. 	03
15	Throttle position sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective throttle position sensor. • Malfunction in ECU. 	01
16	Stuck throttle position sensor is detected.	<ul style="list-style-type: none"> • Stuck throttle position sensor. • Malfunction in ECU. 	01
19	A break or disconnection of the blue/yellow lead of the ECU is detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness (ECU coupler). • Malfunction in ECU. 	20
21	Coolant temperature sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective coolant temperature sensor. • Malfunction in ECU. • Improperly installed coolant temperature sensor. 	06
22	Intake air temperature sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective air temperature sensor. • Malfunction in ECU. 	05
30	No normal signal is received from the lean angle sensor.	<ul style="list-style-type: none"> • Overturned. • Malfunction in ECU. • Defective lean angle sensor. • Improperly installed lean angle sensor. 	08
33	Primary lead of the ignition coil: open circuit detected.	<ul style="list-style-type: none"> • Open circuit in wire harness. • Malfunction in ignition coil. • Malfunction in a component of ignition cut-off circuit system. • Malfunction in ECU. 	30
39	Fuel injector: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective fuel injector. • Improperly installed fuel injector. • Malfunction in ECU. 	36
41	Lean angle sensor: open or short circuit detected.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective lean angle sensor. • Malfunction in ECU. 	08

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code No.
42	No normal signals are received from the speed sensor.	<ul style="list-style-type: none"> • Open or short circuit in wire harness. • Defective speed sensor. • Malfunction in vehicle speed sensor detected. • Malfunction in ECU. 	07
44	Error is detected while reading or writing on EEPROM.	<ul style="list-style-type: none"> • Malfunction in ECU. (The CO adjustment value is not properly written on or read from the internal memory.) 	60
46	Power supply to the fuel injection system is not normal.	<ul style="list-style-type: none"> • Malfunction in the charging system. Refer to "CHARGING SYSTEM" on page 8-11. 	—
50	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the LCD of the FI diagnostic tool.)	<ul style="list-style-type: none"> • Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.) 	—

Sensor operation table

Diagnostic code No.	Item	FI diagnostic tool display	Checking method
01	Throttle angle <ul style="list-style-type: none"> • Fully closed position • Fully open position 	14–20 97–107	Check for changes in displayed values while opening and closing the throttle.
03	Intake air pressure	Displays the intake air pressure.	Set the engine stop switch to "○", then operate the throttle while pushing the start switch "⊗". (If the display value changes, the performance is OK.)
05	Intake air temperature	Displays the intake air temperature.	Compare the actually measured air temperature with the display value.
06	Coolant temperature	Displays the coolant temperature.	Compare the actually measured coolant temperature with the meter display value.
07	Vehicle 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.

Diagnostic code No.	Item	FI diagnostic tool display	Checking method
08	Lean angle sensor <ul style="list-style-type: none"> • Upright • Overturned 	0.4–1.4 3.7–4.4	Remove the lean angle sensor and incline it more than 65 degrees.
09	Fuel system voltage (battery voltage)	0–18.7 Approximately 12.0	Compare with the actually measured battery voltage. (If the battery voltage is lower, perform recharging.)
20	Sidestand switch <ul style="list-style-type: none"> • Stand retracted • Stand extended 	ON OFF	Extend and retract the side-stand.
60	EEPROM fault code display <ul style="list-style-type: none"> • No history • History exists 	00 01: CO adjustment value is detected.	—
61	Malfunction history code display <ul style="list-style-type: none"> • No history • History exists 	00 Fault codes 12–50 <ul style="list-style-type: none"> • (If more than one code number is detected, the display alternates every two seconds to show all the detected code numbers. When all code numbers are shown, the display repeats the same process.) 	—
62	Malfunction history code erasure <ul style="list-style-type: none"> • No history • History exists 	00 Up to 16 fault codes	— To erase the history, press the “MODE” button of the FI diagnostic tool.
70	Control number	00–254	—

Actuator operation table

Diagnostic code No.	Item	Actuation	Checking method
30	Ignition coil	When the "MODE" button is pressed, the ignition coil is actuated five times at one-second intervals. Illuminates the "WARNING" LED on the FI diagnostic tool.	Check the spark five times. • Connect an ignition checker.
36	Fuel injector	When the "MODE" button is pressed, the fuel injector is actuated five times at one-second intervals. Illuminates the "WARNING" LED on the FI diagnostic tool.	Check the operating sound of the injector five times.
51	Radiator fan motor relay	Actuates the radiator fan motor relay for five cycles every five seconds (on 2 seconds, off 3 seconds). Illuminates the engine trouble warning light.	Check the operating sound of the radiator fan motor relay five times.
52	Headlight relay	Actuates the headlight relay for five cycles of five seconds. (ON 2 seconds, OFF 3 seconds) Illuminates the "WARNING" LED on the FI diagnostic tool, the engine trouble warning light and headlight.	Check the operating sound of the headlight relay five times.
54	FID (fast idle solenoid)	When the "MODE" button is pressed, the FID (fast idle solenoid) is actuated five times at one-second intervals. Illuminates the "WARNING" LED on the FI diagnostic tool.	Check the operating sound of the FID five times.

Communication error with the FI diagnostic tool

LCD Display	Symptom	Probable cause of malfunction
Waiting for connection....	No signals are received from the ECU.	<ul style="list-style-type: none"> • Improper connection in connecting lead. • The main switch is set to "OFF". • Malfunction in the FI diagnostic tool. • Malfunction in the ECU.
ERROR 4	Commands from the FI diagnostic tool are not accepted by the ECU.	<ul style="list-style-type: none"> • Set the main switch to "OFF" once, and then set the FI diagnostic tool to the CO adjustment mode or diagnostic mode. • Vehicle battery is insufficiently charged. • Malfunction in the FI diagnostic tool. • Malfunction in the ECU.

EAS27471

TROUBLESHOOTING DETAILS

This section describes the measures per fault code number displayed on the FI diagnostic tool. Check and service the items or components that are the probable cause of the malfunction following the order given.

After the check and service of the malfunctioning part have been completed, reset the FI diagnostic tool display according to the reinstatement method.

Fault code No.:

Fault code number displayed on the FI diagnostic tool when the engine failed to work normally. Refer to "Diagnostic code table".

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "Sensor operation table" and "Actuator operation table".

Fault code No.	12	Symptom	No normal signals are received from the crankshaft position sensor.	
Diagnostic code No.	—	—	—	
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Installed condition of crankshaft position sensor.	Check for looseness or pinching.	Cranking the engine.	
2	Connections <ul style="list-style-type: none"> • Crankshaft position sensor coupler • Main wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 		
3	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between the crankshaft position sensor coupler and ECU coupler. (red–red) (gray/black–gray/black) 		
4	Defective crankshaft position sensor.	<ul style="list-style-type: none"> • Replace if defective. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-69. 		

Fault code No.	13	Symptom	Intake air pressure sensor: open or short circuit detected.	
Diagnostic code No.	03	Intake air pressure sensor		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connections <ul style="list-style-type: none"> • Throttle body sensor assembly coupler • Main wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Setting the main switch to "ON".	
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between throttle body sensor assembly coupler and ECU coupler (gray/red–gray/red) (pink/white–pink/white) (gray/black–gray/black) 		
3	Defective intake air pressure sensor.	<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.03) • Replace the throttle body if defective. Refer to "CHECKING THE THROTTLE BODY SENSOR ASSEMBLY" on page 8-73. <small>ECA5D71011</small> CAUTION: _____ Do not remove the throttle body sensor assembly from the throttle body. _____		

Fault code No.	14	Symptom	Intake air pressure sensor: system malfunction (clogged hole).	
Diagnostic code No.	03	Intake air pressure sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connections <ul style="list-style-type: none"> • Throttle body sensor assembly coupler • Main wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Starting the engine and operating it at idle.
2	Defective intake air pressure sensor.		<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.03) • Replace the throttle body if defective. Refer to "CHECKING THE THROTTLE BODY SENSOR ASSEMBLY" on page 8-73. <small>ECA5D71011</small> CAUTION: _____ Do not remove the throttle body sensor assembly from the throttle body. _____	

Fault code No.	15	Symptom	Throttle position sensor: open or short circuit detected.	
Diagnostic code No.	01	Throttle position sensor		
Order	Item/components and probable cause	Check or maintenance job		Reinstatement method
1	Connections <ul style="list-style-type: none"> • Throttle body sensor assembly coupler • Main wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 		Setting the main switch to "ON".
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between throttle body sensor assembly coupler and ECU coupler. (gray/red–gray/red) (gray/black–gray/black) (yellow–yellow) 		
3	Throttle position sensor lead wire open circuit output voltage check.	<ul style="list-style-type: none"> • Check for open circuit and replace the throttle body. (gray/red–gray/black) 		
		Open circuit item	Output voltage	
		Ground wire open circuit	5 V	
		Output wire open circuit	0 V	
		Power supply wire open circuit	0 V	
4	Defective throttle position sensor.	<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.01) • Replace the throttle body if defective. <p>Refer to "CHECKING THE THROTTLE BODY SENSOR ASSEMBLY" on page 8-73.</p> <p><small>ECA5D71011</small></p> <p>CAUTION: _____</p> <p>Do not remove the throttle body sensor assembly from the throttle body.</p> <p>_____</p>		

Fault code No.	16	Symptom	Throttle position sensor is stuck.	
Diagnostic code No.	01	Throttle position sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Defective throttle position sensor.		<ul style="list-style-type: none"> Execute the diagnostic mode. (Code No.01) Replace the throttle body if defective. Refer to "CHECKING THE THROTTLE BODY SENSOR ASSEMBLY" on page 8-73. <small>ECA5D71011</small> CAUTION: _____ Do not remove the throttle body sensor assembly from the throttle body.	Starting the engine, operating it at idle, then by racing it.

Fault code No.	19	Symptom	A break or disconnection of the blue/yellow lead of the ECU is detected.	
Diagnostic code No.	20	Sidestand switch		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connections <ul style="list-style-type: none"> Wire harness ECU coupler 		<ul style="list-style-type: none"> Execute the diagnostic mode. (Code No.20) Check the coupler for any pins that may have pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect the coupler securely. 	Reconnect the wiring and retract the side-stand.
2	Open or short circuit in wire harness.		<ul style="list-style-type: none"> Repair or replace if there is an open or short circuit. Between ECU and blue/yellow lead. 	
3	Defective sidestand switch.		<ul style="list-style-type: none"> Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-59.	

Fault code No.	21	Symptom	Coolant temperature sensor: open or short circuit detected.	
Diagnostic code No.	06	Coolant temperature sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Installed condition of coolant temperature sensor		Check the installed area for looseness or pinching.	Setting the main switch to "ON".
2	Connected state of connector • Coolant temperature sensor coupler • Main wire harness ECU coupler		<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect it securely. 	
3	Open or short circuit in wire harness.		<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between coolant temperature sensor coupler and ECU coupler. (gray/black–gray/black) (green/red–green/red) 	
4	Defective coolant temperature sensor.		<ul style="list-style-type: none"> • Execute the diagnostic monitoring mode. (Code No.06) • Replace if defective. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-73. 	

Fault code No.	22	Symptom	Intake air temperature sensor: open or short circuit detected.	
Diagnostic code No.	05	Intake air temperature sensor		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connections <ul style="list-style-type: none"> • Throttle body sensor assembly coupler • Main wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the couplers for any pins that may have pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely. 	Setting the main switch to "ON".	
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between throttle body sensor assembly coupler and ECU coupler. (brown/white–brown/white) (gray/black–gray/black) 		
3	Defective intake air temperature sensor.	<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.05) • Replace the throttle body if defective. Refer to "CHECKING THE THROTTLE BODY SENSOR ASSEMBLY" on page 8-73. <small>ECA5D71011</small> CAUTION: _____ Do not remove the throttle body sensor assembly from the throttle body. _____		

Fault code No.	30	Symptom	No normal signal is received from the lean angle sensor.	
Diagnostic code No.	08	Lean angle sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	The vehicle has overturned.		Raise the vehicle upright.	Setting the main switch to "ON" (however, the engine cannot be restarted unless the main switch is first set to "OFF").
2	Installed condition of the lean angle sensor.		Check for looseness or pinching.	
3	Connections <ul style="list-style-type: none"> • Lean angle sensor coupler • Main wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	
4	Defective lean angle sensor.		<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.08) • Replace if defective. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-69. 	

Fault code No.	33	Symptom	Primary lead of the ignition coil: open circuit detected.	
Diagnostic code No.	30	Ignition coil		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connections <ul style="list-style-type: none"> • Ignition coil connector (primary coil side) • Main wire harness ECU coupler 		<ul style="list-style-type: none"> • Check the connector and coupler for any pins that may have pulled out. • Check the locking condition of the connector and coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Starting the engine and operating it at idle.
2	Open or short circuit in wire harness and/or sub lead.		<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between ignition coil connector and ECU coupler/main wire harness. (red/white-red/white) (orange-orange) 	
3	Defective ignition coil.		<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.30) • Test the primary and secondary coils for continuity. • Replace if defective. Refer to "CHECKING THE IGNITION COIL" on page 8-68. 	

Fault code No.	39	Symptom	Fuel injector: open or short circuit detected.	
Diagnostic code No.	36	Fuel injector		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connections <ul style="list-style-type: none"> • Fuel injector coupler • Main wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the couplers for any pins that may have pulled out. • Check the locking condition of the couplers. • If there is a malfunction, repair it and connect the coupler securely. 	Cranking the engine.	
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between fuel injector coupler and ECU coupler. (red/white–red/white) (orange/black–orange/black) 		
3	Defective fuel injector.	<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.36) • Replace if defective. Refer to “CHECKING THE FUEL INJECTOR” on page 7-6. 		

Fault code No.	41	Symptom	Lean angle sensor: open or short circuit detected.	
Diagnostic code No.	08	Lean angle sensor		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connections <ul style="list-style-type: none"> • Lean angle sensor coupler • Main wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Setting the main switch to “ON”.	
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between lean angle sensor coupler and ECU coupler. (gray/red–gray/red) (yellow/green–yellow/green) (gray/black–gray/black) 		
3	Defective lean angle sensor.	<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.08) • Replace if defective. Refer to “CHECKING THE LEAN ANGLE SENSOR” on page 8-69. 		

Fault code No.	42	Symptom	No normal signals are received from the speed sensor.	
Diagnostic code No.	07	Speed sensor		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connections <ul style="list-style-type: none"> • Speed sensor coupler • Wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Start the engine, and input the vehicle speed signals by operating the vehicle at 20 to 30 km/h.	
2	Open or short circuit in wire harness and/or sub-wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between speed sensor coupler and ECU coupler. (gray-gray) (gray/black-gray/black) (gray/red-gray/red) 		
3	Defective speed sensor.	<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.07) • Replace if defective. Refer to "CHECKING THE SPEED SENSOR" on page 8-72. 		

Fault code No.	44	Symptom	Error is detected while reading from or writing on EEPROM.	
Diagnostic code No.	60	EEPROM fault code display		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Malfunction in ECU.	<ul style="list-style-type: none"> • Execute the diagnostic mode. (Code No.60). • 01 is displayed. Readjust CO. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-5. • Replace ECU if defective. <p>NOTE: _____ Do not perform replacing ECU with the main switch set to "ON". _____</p>	Setting the main switch to "ON".	

Fault code No.	46	Symptom	Power supply to the fuel injection system is not normal.	
Diagnostic code No.	—	—	—	
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connections <ul style="list-style-type: none"> • Main wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may have pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely. 	Starting the engine and operating it at idle.	
2	Faulty battery.	<ul style="list-style-type: none"> • Replace or charge the battery. Refer to “CHECKING AND CHARGING THE BATTERY” on page 8-64. 		
3	Malfunction in rectifier/regulator	<ul style="list-style-type: none"> • Replace if defective. Refer to “CHARGING SYSTEM” on page 8-11. 		
4	Open or short circuit in wire harness.	Repair or replace if there is an open or short circuit. <ul style="list-style-type: none"> • Between battery and main switch coupler (red–red) • Between main switch coupler and fuse box coupler. (brown/blue–brown/blue) • Between fuse box coupler and ECU coupler. (red/black–red/black) 		

Fault code No.	50	Symptom	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the LCD of the FI diagnostic tool.)	
Diagnostic code No.	—	—	—	
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Malfunction in ECU.	Replace the ECU. NOTE: _____ Do not perform this procedure with the main switch set to “ON”. _____	Setting the main switch to “ON”.	

- 4. Main fuse
- 5. Main switch
- 9. Battery
- 17.Engine stop switch
- 25.ECU (engine control unit)
- 30.Fuel pump
- 64.Ignition fuse

EAS27570

TROUBLESHOOTING

If the fuel pump fails to operate.

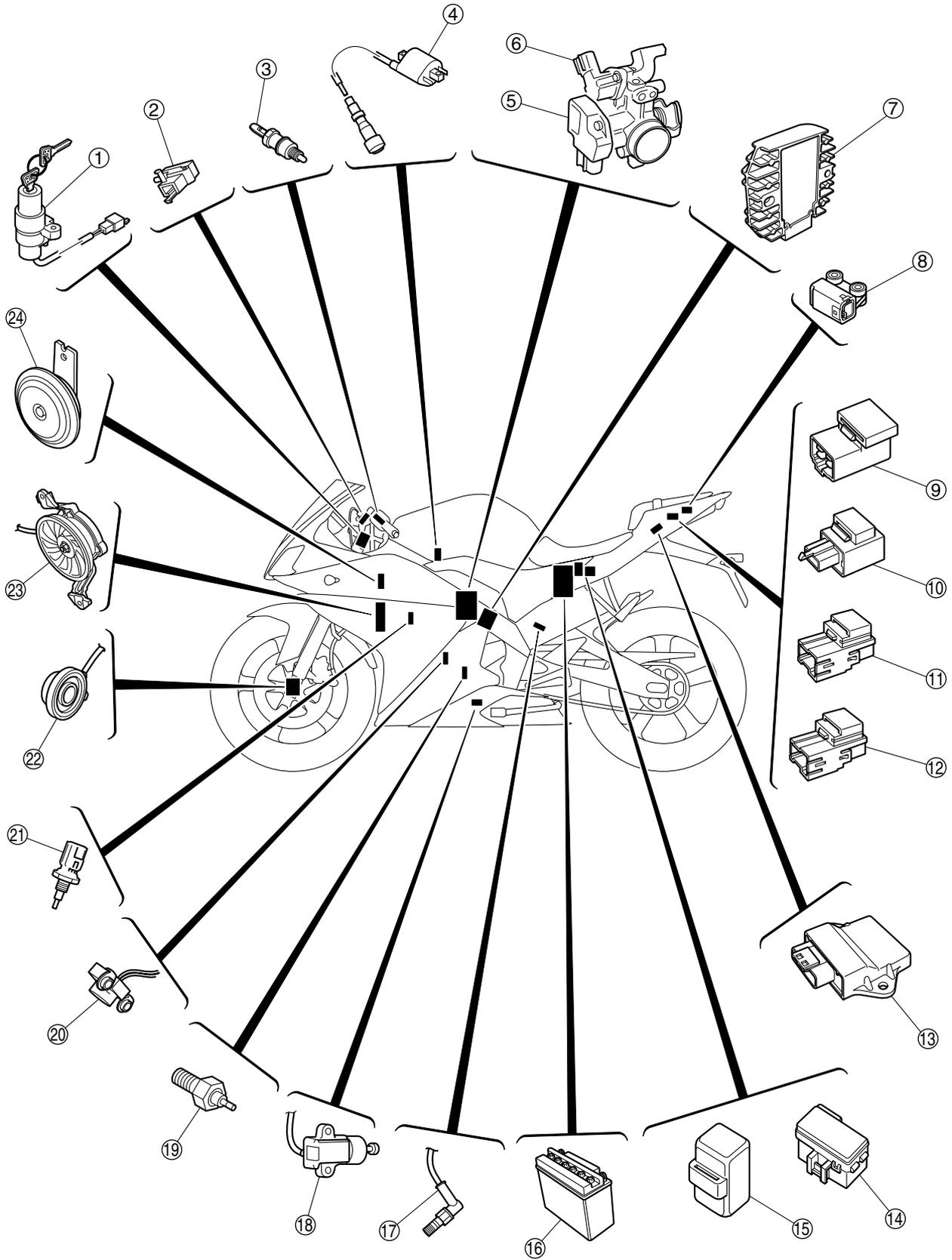
NOTE:

- Before troubleshooting, remove the following part(s):
1. Rider seat
 2. Fuel tank

<p>1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-63.</p>	<p>NG →</p>	<p>Replace the fuse(s).</p>
OK ↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-64.</p>	<p>NG →</p>	<ul style="list-style-type: none"> • Refill battery fluid. • Clean the battery terminals. • Recharge or replace the battery.
OK ↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	<p>NG →</p>	<p>Replace the main switch.</p>
OK ↓		
<p>4. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-59.</p>	<p>NG →</p>	<p>The engine stop switch is faulty. Replace the right handlebar switch.</p>
OK ↓		
<p>5. Check the fuel pump operation. Refer to "CHECKING THE FUEL PRESSURE" on page 7-2.</p>	<p>NG →</p>	<p>Replace the fuel tank (with fuel pump).</p>
OK ↓		
<p>6. Check the entire fuel pump system wiring. Refer to "CIRCUIT DIAGRAM" on page 8-53.</p>	<p>NG →</p>	<p>Properly connect or repair the fuel pump system wiring.</p>
OK ↓		
<p>Replace the ECU.</p>		

EAS27971

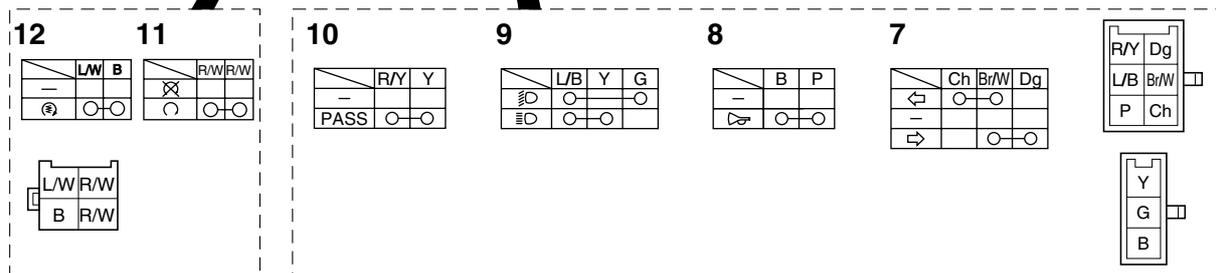
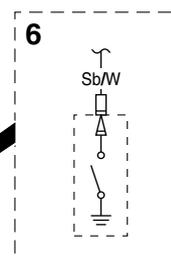
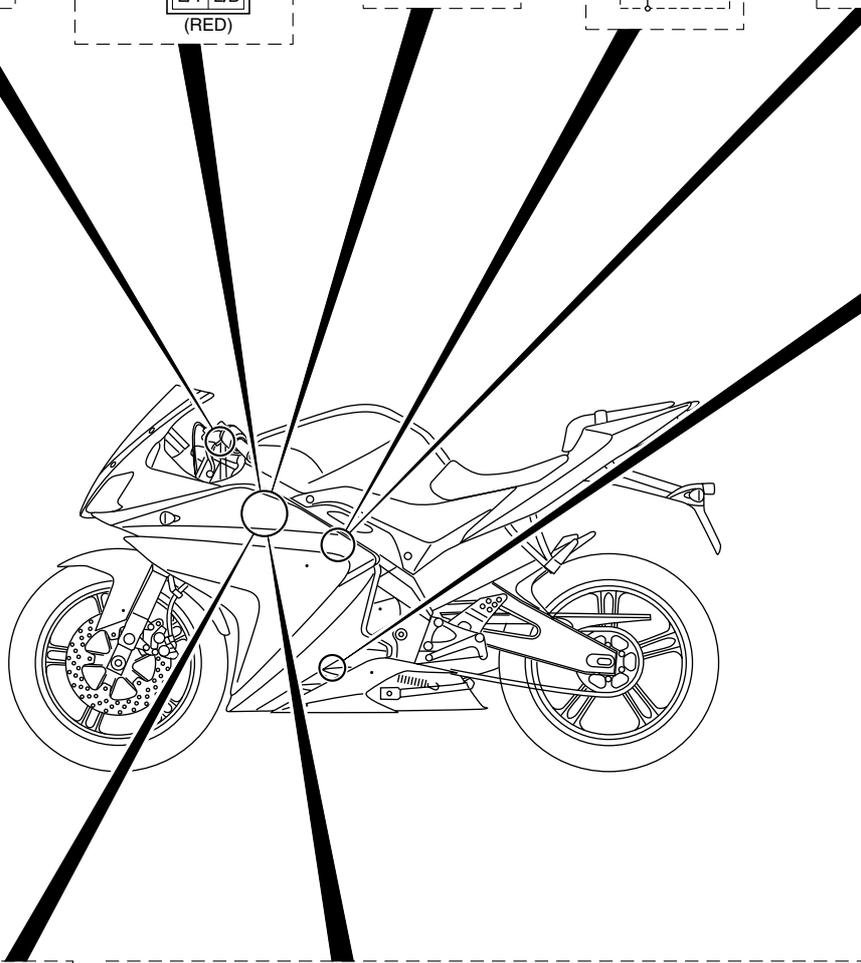
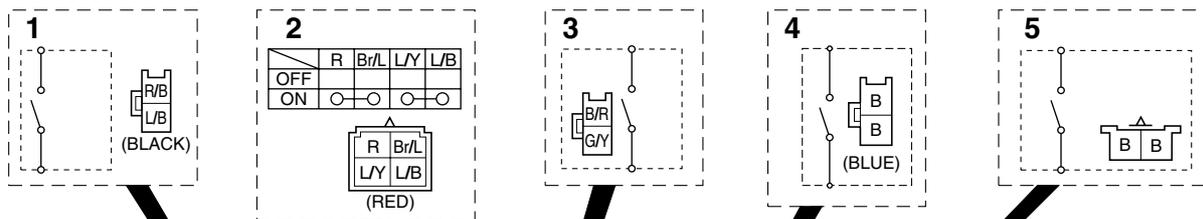
ELECTRICAL COMPONENTS



1. Main switch
2. Clutch switch
3. Front brake light switch
4. Ignition coil
5. Throttle body sensor assembly (intake air pressure sensor, intake air temperature sensor, throttle position sensor)
6. FID (fast idle solenoid)
7. Rectifier/regulator
8. Lean angle sensor
9. Starting circuit cut-off relay
10. Turn signal relay
11. Radiator fan motor relay
12. Headlight relay
13. ECU (engine control unit)
14. Fuse box
15. Starter relay
16. Battery
17. Rear brake light switch
18. Sidestand switch
19. Neutral switch
20. Crankshaft position sensor
21. Coolant temperature sensor
22. Speed sensor
23. Radiator fan
24. Horn

EAS27980

CHECKING THE SWITCHES



1. Clutch switch
2. Main switch
3. Front brake light switch
4. Sidestand switch
5. Rear brake light switch
6. Neutral switch
7. Turn signal switch
8. Horn switch
9. Dimmer switch
10. Pass switch
11. Engine stop switch
12. Start switch

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and, if necessary, replace the switch.

ECA14370

CAUTION:

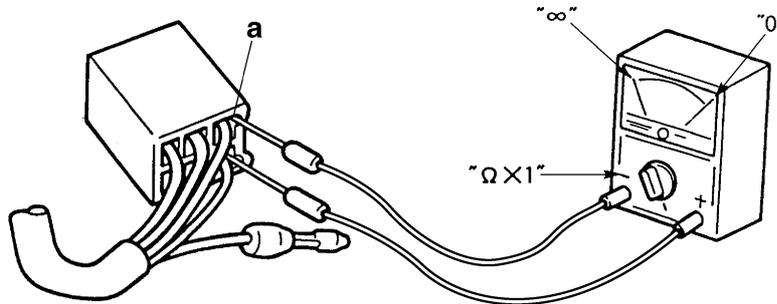
Never insert the tester probes into the coupler terminal slots "a". Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

NOTE:

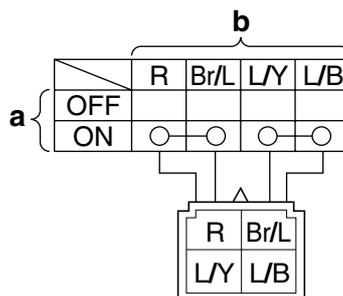
- Before checking for continuity, set the pocket tester to "0" and to the " $\Omega \times 1$ " range.
- When checking for continuity, switch back and forth between the switch positions a few times.



The switches and their terminal connections are illustrated as in the following example of the main switch.

The switch positions "a" are shown in the far left column and the switch lead colors "b" are shown in the top row.

The continuity (i. e., a closed circuit) between switch terminals at a given switch position is indicated by "○—○". There is continuity between red and brown/blue, and blue/yellow and blue/black when the switch is set to "ON".



EAS28010

CHECKING AND CHARGING THE BATTERY

EWA13290

⚠ WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.
- KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.
- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

- Skin — Wash with water.
- Eyes — Flush with water for 15 minutes and get immediate medical attention.

INTERNAL

- Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.

1. Remove:

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

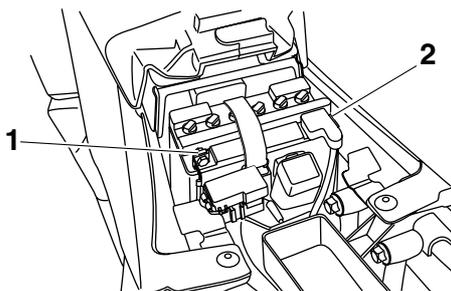
2. Disconnect:

- Battery leads
(from the battery terminals)

ECA5D71041

CAUTION:

First, disconnect the negative battery lead "1", then the positive battery lead "2".



3. Remove:

- Battery

4. Check:

- Electrolyte level

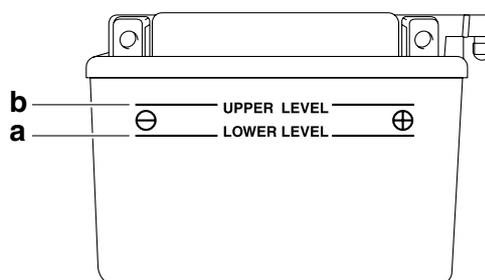
The electrolyte level should be between the minimum level mark "a" and the maximum level mark "b".

Below the minimum level mark → Add distilled water to the proper level.

ECA13610

CAUTION:

Add only distilled water. Tap water contains minerals which are harmful to the battery.



5. Check:

- Specific gravity

Less than 1.280 → Recharge the battery.



Specific gravity
1.280 at 20 °C (68 °F)

6. Charge:

- Battery

Battery charging amperage and time
5.5 amps/10 hrs

EWA13300

⚠ WARNING

Do not quick charge a battery.

ECA13620

CAUTION:

- Loosen the battery sealing caps.
- Make sure the battery breather hose and battery vent are free of obstructions.
- To ensure maximum performance, always charge a new battery before using it.
- Do not use a high-rate battery charger. They force a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.

- When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative lead from the battery terminal.)
- To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
- Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
- If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!

NOTE:

Replace the battery whenever:

- battery voltage does not rise to specification or bubbles fail to rise during charging,
- sulphation of one or more battery cells occurs (as indicated by the battery plates turning white or material accumulating in the bottom of the battery cell),
- specific gravity readings after a long, slow charge indicate that one battery cell's charge is lower than the rest,
- warpage or buckling of the battery plates or insulators is evident.

7. Check:

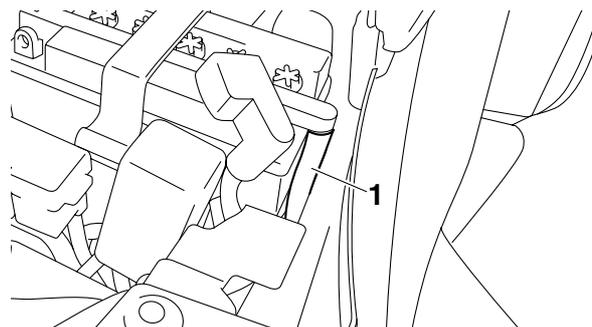
- Battery breather hose and battery vent
Obstruction → Clean.
Damage → Replace.

8. Install:

- Battery

9. Connect:

- Battery breather hose "1"



ECA5D71034

CAUTION:

- When checking the battery, make sure the battery breather hose is properly installed and routed correctly. If the battery breather hose is positioned so as to allow electrolyte or hydrogen gas from the battery to contact the frame, the vehicle and its finish may be damaged.
- Make sure the battery breather hose is properly routed away from the drive chain and from below the swingarm.

10. Check:

- Battery terminals
Dirt → Clean with a wire brush.
Loose connection → Connect properly.

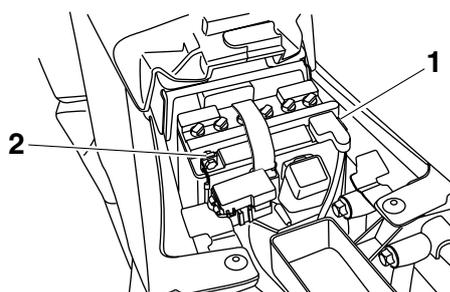
11. Connect:

- Battery leads
(to the battery terminals)

ECA5D71042

CAUTION:

First, connect the positive battery lead "1", then the negative battery lead "2".



12. Lubricate:

- Battery terminals



13. Install:

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

EAS28040

CHECKING THE RELAYS

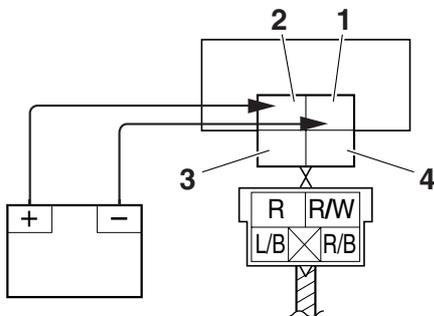
Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

1. Disconnect the relay from the wire harness.
2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown. Check the relay operation. Out of specification → Replace.

Starter relay

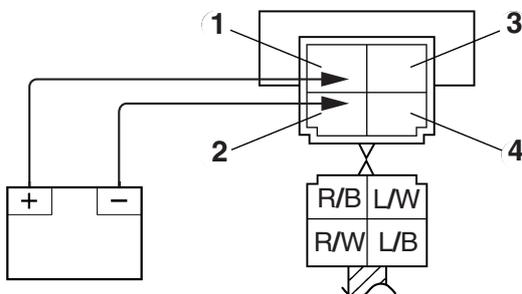


1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

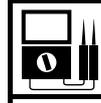


Result
Continuity
(between "3" and "4")

Starting circuit cut-off relay

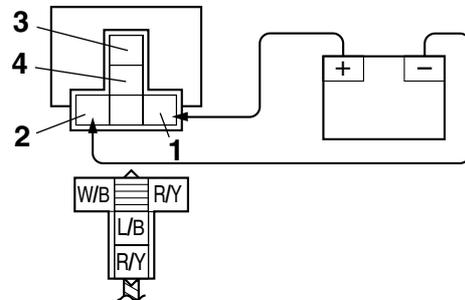


1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

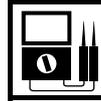


Result
Continuity
(between "3" and "4")

Headlight relay

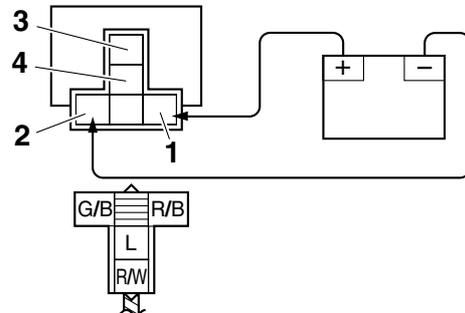


1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe

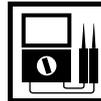


Result
Continuity
(between "3" and "4")

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")

EAS5D71001

CHECKING THE TURN SIGNAL RELAY

1. Check:

- Turn signal relay input voltage
Out of specification → The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.



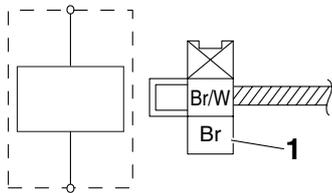
Turn signal relay input voltage
DC 12 V

a. Connect the pocket tester (DC 20 V) to the turn signal relay terminal as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → brown “1”
- Negative tester probe → ground



b. Set the main switch to “ON”.
c. Measure the turn signal relay input voltage.

2. Check:

- Turn signal relay output voltage
Out of specification → Replace.



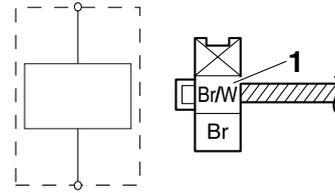
Turn signal relay output voltage
DC 12 V

a. Connect the pocket tester (DC 20 V) to the turn signal relay terminal as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → brown/white “1”
- Negative tester probe → ground



b. Set the main switch to “ON”.
c. Measure the turn signal relay output voltage.

EAS28050

CHECKING THE DIODE

1. Check:

- Diode
Out of specification → Replace.



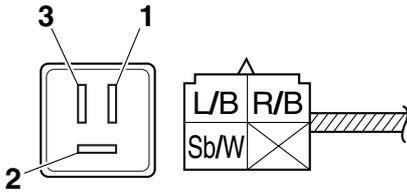
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

NOTE:

The pocket tester or the analog pocket tester readings are shown in the following table.



Continuity
Positive tester probe → blue/black “1”
Negative tester probe → sky blue/white “2”
No continuity
Positive tester probe → sky blue/white “2”
Negative tester probe → blue/black “1”
Continuity
Positive tester probe → red/black “3”
Negative tester probe → sky blue/white “2”
No continuity
Positive tester probe → sky blue/white “2”
Negative tester probe → red/black “3”



- a. Disconnect the diode from the wire harness.
- b. Connect the pocket tester ($\Omega \times 1$) to the diode terminals as shown.
- c. Check the diode for continuity.
- d. Check the diode for no continuity.

EAS28060

CHECKING THE SPARK PLUG CAP

1. Check:
 - Spark plug cap resistance
 Out of specification → Replace.

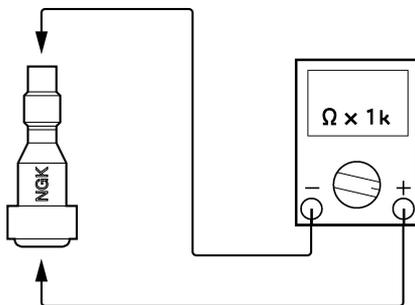


Resistance
5.0 k Ω

- a. Remove the spark plug cap from the spark plug lead.
- b. Connect the pocket tester ($\Omega \times 1k$) to the spark plug cap as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C



- c. Measure the spark plug cap resistance.

EAS28090

CHECKING THE IGNITION COIL

1. Check:
 - Primary coil resistance
 Out of specification → Replace.



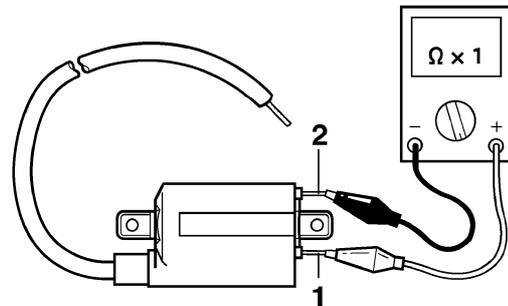
Primary coil resistance
2.16–2.64 Ω at 20 °C (68 °F)

- a. Disconnect the ignition coil connectors from the ignition coil terminals.
- b. Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → red/white "1"
- Negative tester probe → orange "2"



- c. Measure the primary coil resistance.

2. Check:
 - Secondary coil resistance
 Out of specification → Replace.



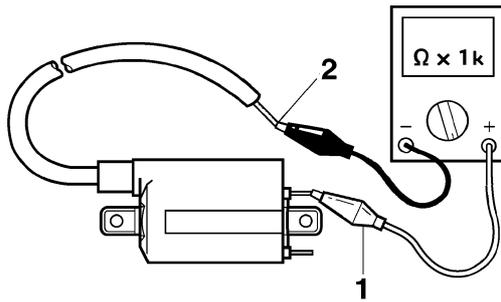
Secondary coil resistance
8.64–12.96 k Ω at 20 °C (68 °F)

- a. Disconnect the spark plug cap from the ignition coil.
- b. Connect the pocket tester ($\Omega \times 1k$) to the ignition coil as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → orange "1"
- Negative tester probe → spark plug lead "2"



c. Measure the secondary coil resistance.



EAS28930

CHECKING THE IGNITION SPARK GAP

1. Check:

- Ignition spark gap
Out of specification → Perform the ignition system troubleshooting, starting with step 5. Refer to “TROUBLESHOOTING” on page 8-3.



Minimum ignition spark gap
6.0 mm (0.24 in)

NOTE:

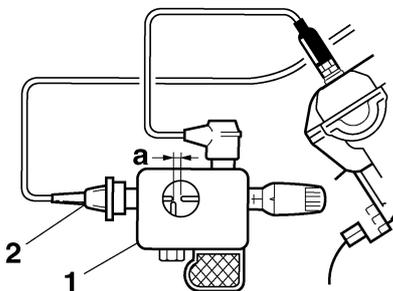
If the ignition spark gap is within specification, the ignition system circuit is operating normally.



- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker “1” as shown.



Ignition checker
90890-06754
Opama pet-4000 spark checker
YM-34487



2. Spark plug cap

- Set the main switch to “ON” and the engine stop switch to “○”.
- Measure the ignition spark gap “a”.

- Crank the engine by pushing the start switch “⊞” and gradually increase the spark gap until a misfire occurs.



EAS28120

CHECKING THE CRANKSHAFT POSITION SENSOR

1. Disconnect:

- Crankshaft position sensor coupler (from the wire harness)

2. Check:

- Crankshaft position sensor resistance
Out of specification → Replace the crankshaft position sensor/stator assembly.



Crankshaft position sensor resistance
248–372 Ω at 20 °C (68 °F)

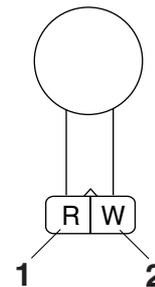


- Connect the pocket tester (Ω × 100) to the crankshaft position sensor coupler as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → red “1”
- Negative tester probe → white “2”



- Measure the crankshaft position sensor resistance.



EAS28130

CHECKING THE LEAN ANGLE SENSOR

1. Remove:

- Lean angle sensor

2. Check:

- Lean angle sensor output voltage
Out of specification → Replace.



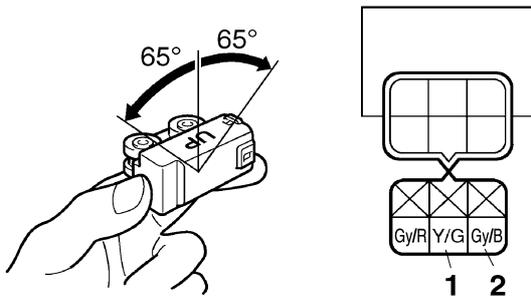
Lean angle sensor output voltage
 Less than 65°: 0.4–1.4 V
 More than 65°: 3.7–4.4 V

- a. Connect the lean angle sensor to the wire harness.
- b. Connect the pocket tester (DC 20 V) to the lean angle sensor coupler as shown.



Pocket tester
 90890-03112
Analog pocket tester
 YU-03112-C

- Positive tester probe → yellow/green "1"
- Negative tester probe → gray/black "2"



- c. Set the main switch to "ON".
- d. Tilt the lean angle sensor to 65°.
- e. Measure the lean angle sensor output voltage.

EAS28940

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 8-9.

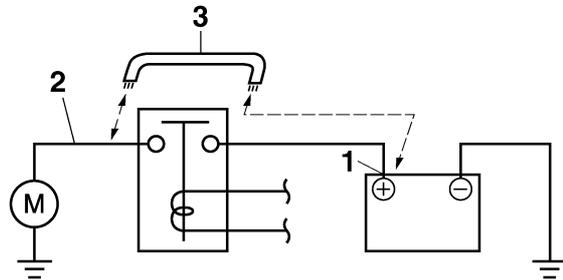
- a. Connect the positive battery terminal "1" and starter motor lead "2" with a jumper lead "3".

EWA13810

WARNING

- A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.

- This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.



- b. Check the starter motor operation.

EAS28150

CHECKING THE STATOR COIL

1. Disconnect:
 - Stator coil coupler (from the wire harness)
2. Check:
 - Stator coil resistance
 Out of specification → Replace the crankshaft position sensor/stator assembly.



Stator coil resistance
 0.32–0.48 Ω at 20 °C (68 °F)

- a. Connect the pocket tester (Ω × 1) to the stator coil coupler as shown.

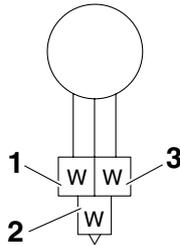


Pocket tester
 90890-03112
Analog pocket tester
 YU-03112-C

- Positive tester probe → white "1"
- Negative tester probe → white "2"

- Positive tester probe → white "1"
- Negative tester probe → white "3"

- Positive tester probe → white "2"
- Negative tester probe → white "3"



b. Measure the stator coil resistance.



EAS28170

CHECKING THE RECTIFIER/REGULATOR

1. Check:

- Rectifier/regulator output voltage
Out of specification → Replace the rectifier/regulator.



Rectifier/regulator output voltage
14 V at 5000 r/min

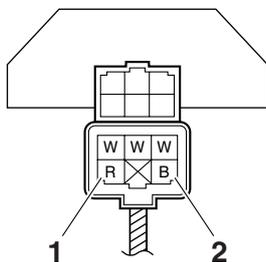


- Set the engine tachometer to the spark plug lead.
- Connect the pocket tester (DC 20 V) to the rectifier/regulator coupler as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → red "1"
- Negative tester probe → black "2"



- Start the engine and let it run at approximately 5000 r/min.
- Measure the charging voltage.



EAS28180

CHECKING THE HORN

1. Check:

- Horn resistance
Out of specification → Replace.



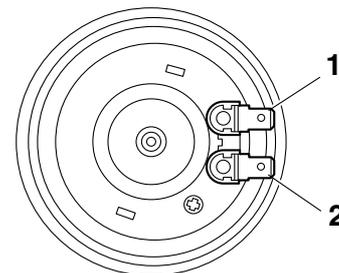
Coil resistance
1.15–1.25 Ω at 20 °C (68 °F)

- Disconnect the horn connectors from the horn terminals.
- Connect the pocket tester ($\Omega \times 1$) to the horn terminals.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → horn terminal "1"
- Negative tester probe → horn terminal "2"



c. Measure the horn resistance.

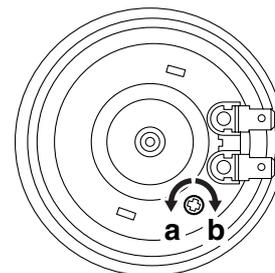


2. Check:

- Horn sound
Faulty sound → Adjust or replace.



- Connect a battery (12 V) to the horn.
- Turn the adjusting screw in direction "a" or "b" until the specified horn sound is obtained.



EAS28220

CHECKING THE FUEL SENDER

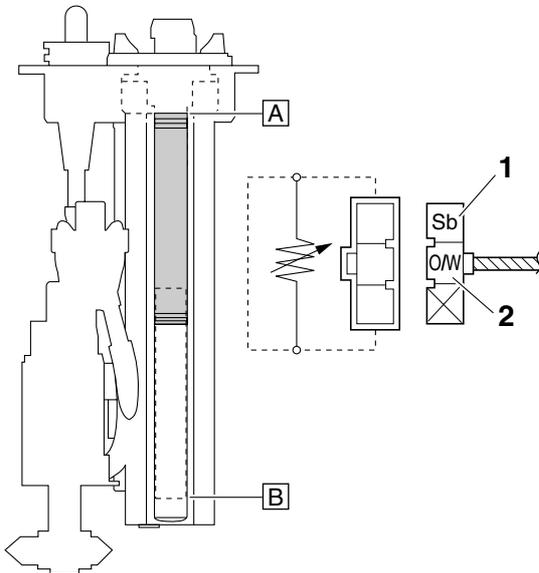
1. Drain the fuel from the fuel tank.
2. Check:
 - Fuel sender resistance
Out of specification → Replace the fuel sender.

	Sender unit resistance (full) 0.0–7.0 Ω
	Sender unit resistance (empty) 90.0–103.0 Ω

- a. Connect the pocket tester ($\Omega \times 10$) to the fuel sender coupler as shown.

	Pocket tester 90890-03112
	Analog pocket tester YU-03112-C

- Positive tester probe → sky blue “1”
- Negative tester probe → orange/white “2”



- A. Full fuel tank position
B. Empty fuel tank position

- b. Measure the fuel sender resistance.



EAS28240

CHECKING THE SPEED SENSOR

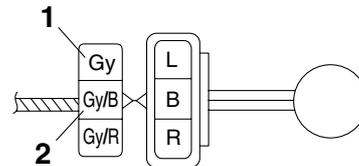
1. Check:
 - Speed sensor output voltage
Out of specification → Replace.

	Output voltage reading cycle 0 V to 5.0 V to 0 V to 5.0 V
---	---

- a. Connect the pocket tester (DC 20 V) to the speed sensor coupler (wire harness end) as shown.

	Pocket tester 90890-03112
	Analog pocket tester YU-03112-C

- Positive tester probe
gray “1”
- Negative tester probe
gray/black “2”



- b. Set the main switch to “ON”.
- c. Elevate the front wheel and slowly rotate it.
- d. Measure the voltage of gray and gray/black. With each full rotation of the front wheel, the voltage reading should cycle from 0 V to 5.0 V to 0 V to 5.0 V.



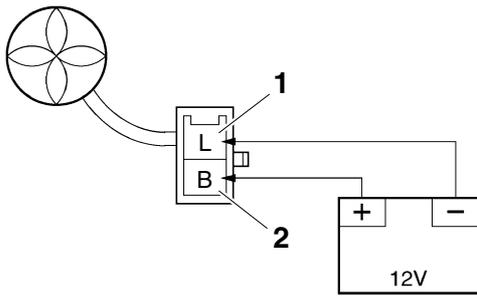
EAS28250

CHECKING THE RADIATOR FAN MOTOR

1. Check:
 - Radiator fan motor
Faulty/rough movement → Replace.

- a. Disconnect the radiator fan motor coupler from the wire harness.
- b. Connect the battery (DC 12 V) as shown.

	• Positive tester probe → blue “1”
	• Negative tester probe → black “2”



c. Measure the radiator fan motor movement.



EAS28260

CHECKING THE COOLANT TEMPERATURE SENSOR

1. Remove:

- Coolant temperature sensor

EWA14130

WARNING

- Handle the coolant temperature sensor with special care.
- Never subject the coolant temperature sensor to strong shocks. If the coolant temperature sensor is dropped, replace it.

2. Check:

- Coolant temperature sensor resistance
Out of specification → Replace.



Coolant temperature sensor resistance
2.32–2.59 k Ω at 20 °C (68 °F)
310–326 Ω at 80 °C (176 °F)

a. Connect the pocket tester ($\Omega \times 100$) to the coolant temperature sensor terminals as shown.



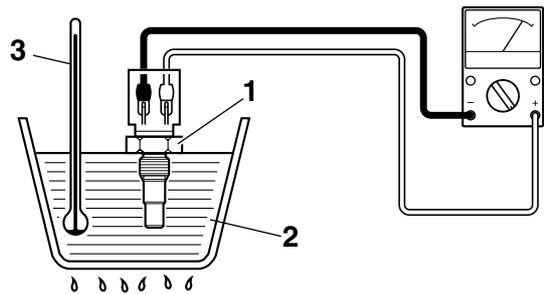
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

b. Immerse the coolant temperature sensor “1” in a container filled with coolant “2”.

NOTE:

Make sure the coolant temperature sensor terminals do not get wet.

c. Place a thermometer “3” in the coolant.



d. Slowly heat the coolant, and then let it cool down to the specified temperature.

e. Check the coolant temperature sensor resistance.

3. Install:

- Coolant temperature sensor



Coolant temperature sensor
18 Nm (1.8 m·kg, 13 ft·lb)

EAS5D71029

CHECKING THE THROTTLE BODY SENSOR ASSEMBLY

EWA5D71011

WARNING

- Do not remove the throttle body sensor assembly.
- Handle the throttle body sensor assembly with special care.
- Never subject the throttle body sensor assembly to strong shocks. If the throttle body sensor assembly is dropped, replace it.

Throttle position sensor

1. Check:

- Throttle position sensor

a. Connect the digital circuit tester to the terminals of the throttle body sensor assembly coupler as shown.



Digital circuit tester
90890-03174
Model 88 Multimeter with tachometer
YU-A1927

- Positive tester probe → gray/red terminal “1”
- Negative tester probe → gray/black terminal “2”

- b. Measure the throttle position sensor input voltage.
Out of specification → Replace or repair the wire harness.



Throttle position sensor input voltage
5 V

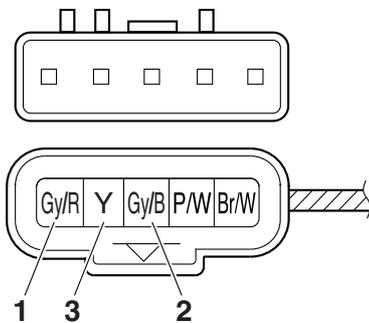
- c. Connect the digital circuit tester to the terminals of the throttle body sensor assembly coupler as shown.

- Positive tester probe → yellow terminal “3”
- Negative tester probe → gray/black terminal “2”

- d. While slowly opening the throttle, check that the throttle position sensor output voltage is increased.
Voltage does not change or it changes abruptly → Replace the throttle body.
Out of specification (closed position) → Replace the throttle body.



Throttle position sensor output voltage (closed position)
0.63–0.73 V



Intake air pressure sensor

1. Check:
- Intake air pressure sensor output voltage
Out of specification → Replace the throttle body.



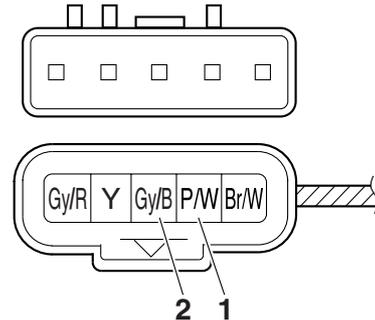
Intake air pressure sensor output voltage
4.70–5.20 V

- a. Connect the pocket tester (DC 20 V) to the throttle body sensor assembly coupler as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → pink/white “1”
 - Negative tester probe → gray/black “2”



- b. Set the main switch to “ON”.
c. Measure the intake air pressure sensor output voltage.



Intake air temperature sensor

1. Check:
- Intake air temperature sensor resistance
Out of specification → Replace the throttle body.



Intake air temperature sensor resistance
5.7–6.3 k Ω

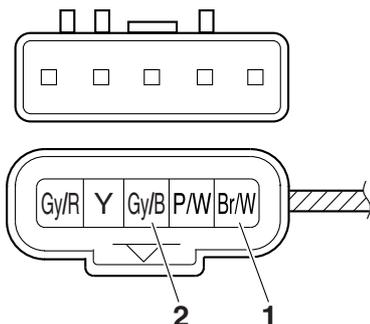


- a. Connect the pocket tester ($\Omega \times 1k$) to the throttle body sensor assembly coupler as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → brown/white “1”
 - Negative tester probe → gray/black “2”



b. Measure the intake air temperature sensor resistance.



EAS5D71002

CHECKING THE FID (FAST IDLE SOLENOID)

1. Disconnect:
 - FID (fast idle solenoid) coupler
2. Check:
 - FID (fast idle solenoid) resistance



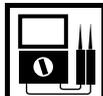
- a. Disconnect the FID (fast idle solenoid) coupler from the FID.
- b. Connect the pocket tester ($\Omega \times 10$) to the terminals of the FID (fast idle solenoid).

- Positive tester probe → red/black terminal “1”
- Negative tester probe → yellow/red terminal “2”

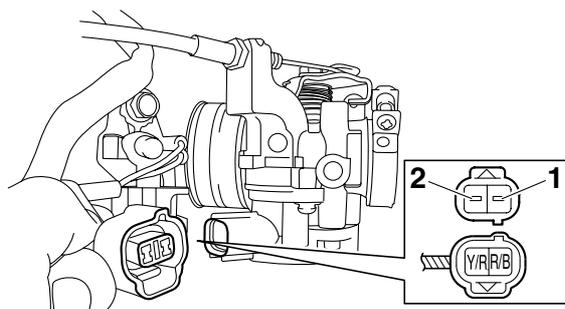


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- c. Measure the FID (fast idle solenoid) resistance.
 Out of specification → Replace the throttle body assembly.



FID (fast idle solenoid) resistance
31.5–38.5 Ω



TROUBLESHOOTING

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POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE	9-2
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SHIFT PEDAL DOES NOT MOVE	9-2
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POOR BRAKING PERFORMANCE.....	9-3
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EAS28450

TROUBLESHOOTING

EAS28460

GENERAL INFORMATION

NOTE:

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

EAS28470

STARTING FAILURES

Engine

1. Cylinder and cylinder head
 - Loose spark plug
 - Loose cylinder head or cylinder
 - Damaged cylinder head gasket
 - Damaged cylinder gasket
 - Worn or damaged cylinder
 - Incorrect valve clearance
 - Improperly sealed valve
 - Incorrect valve-to-valve-seat contact
 - Incorrect valve timing
 - Faulty valve spring
 - Seized valve
2. Piston and piston ring(s)
 - Improperly installed piston ring
 - Damaged, worn or fatigued piston ring
 - Seized piston ring
 - Seized or damaged piston
3. Air filter
 - Improperly installed air filter
 - Clogged air filter element
4. Crankcase and crankshaft
 - Improperly assembled crankcase
 - Seized crankshaft

Fuel system

1. Fuel tank
 - Empty fuel tank
 - Clogged fuel filter
 - Deteriorated or contaminated fuel
2. Fuel pump
 - Faulty fuel pump
3. Throttle body
 - Deteriorated or contaminated fuel
 - Sucked-in air

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Fuse(s)
 - Blown, damaged or incorrect fuse
 - Improperly installed fuse
3. Spark plug
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug
 - Worn or damaged electrode
 - Worn or damaged insulator
 - Faulty spark plug cap
4. Ignition coil
 - Cracked or broken ignition coil body
 - Broken or shorted primary or secondary coils
 - Faulty spark plug lead
5. Ignition system
 - Faulty ECU
 - Faulty crankshaft position sensor
 - Broken generator rotor woodruff key
6. Switches and wiring
 - Faulty main switch
 - Faulty engine stop switch
 - Broken or shorted wiring
 - Faulty neutral switch
 - Faulty start switch
 - Faulty sidestand switch
 - Faulty clutch switch
 - Improperly grounded circuit
 - Loose connections
7. Starting system
 - Faulty starter motor
 - Faulty starter relay
 - Faulty starting circuit cut-off relay
 - Faulty starter clutch

EAS28490

INCORRECT ENGINE IDLING SPEED

Engine

1. Cylinder and cylinder head
 - Incorrect valve clearance
 - Damaged valve train components
2. Air filter
 - Clogged air filter element

Fuel system

1. Throttle body
 - Damaged or loose throttle body joint
 - Improperly adjusted engine idling speed (idle adjusting screw)
 - Improper throttle cable free play

- Flooded throttle body
- Faulty air induction system

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Spark plug
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug
 - Worn or damaged electrode
 - Worn or damaged insulator
 - Faulty spark plug cap
3. Ignition coil
 - Broken or shorted primary or secondary coils
 - Faulty spark plug lead
 - Cracked or broken ignition coil
4. Ignition system
 - Faulty ECU
 - Faulty crankshaft position sensor
 - Broken generator rotor woodruff key

EAS28510

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING FAILURES" on page 9-1.

Engine

1. Air filter
 - Clogged air filter element

Fuel system

1. Fuel pump
 - Faulty fuel pump

EAS28530

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to "Clutch drags".

EAS28540

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear

- Foreign object between transmission gears
- Improperly assembled transmission

EAS28550

JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

EAS28560

FAULTY CLUTCH

Clutch slips

1. Clutch
 - Improperly assembled clutch
 - Improperly adjusted clutch cable
 - Loose or fatigued clutch spring
 - Worn friction plate
 - Worn clutch plate
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (low)
 - Deteriorated oil

Clutch drags

1. Clutch
 - Unevenly tensioned clutch springs
 - Warped pressure plate
 - Bent clutch plate
 - Swollen friction plate
 - Bent clutch push rod
 - Broken clutch boss
 - Burnt primary driven gear bushing
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (high)
 - Deteriorated oil

EAS28600

OVERHEATING

Engine

1. Clogged coolant passages
 - Cylinder head and piston
 - Heavy carbon buildup

2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity
 - Inferior oil quality

Cooling system

1. Coolant
 - Low coolant level
2. Radiator
 - Damaged or leaking radiator
 - Faulty radiator cap
 - Bent or damaged radiator fin
3. Water pump
 - Damaged or faulty water pump
 - Thermostat
 - Thermostat stays closed
 - Hose(s) and pipe(s)
 - Damaged hose
 - Improperly connected hose
 - Damaged pipe
 - Improperly connected pipe

Fuel system

1. Throttle body
 - Damaged or loose throttle body joint
2. Air filter
 - Clogged air filter element

Chassis

1. Brake(s)
 - Dragging brake

Electrical system

1. Spark plug
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
2. Ignition system
 - Faulty ECU

EAS28610

OVERCOOLING

Cooling system

1. Thermostat
 - Thermostat stays open

EAS28620

POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt

- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EAS28660

FAULTY FRONT FORK LEGS

Leaking oil

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged front fork cap O-ring

Malfunction

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS28680

UNSTABLE HANDLING

Handlebars

- Bent or improperly installed right handlebar
 - Bent or improperly installed left handlebar
1. Steering head components
 - Improperly installed upper bracket
 - Improperly installed lower bracket (improperly tightened ring nut)
 - Bent steering stem
 - Damaged ball bearing or bearing race
 2. Front fork leg(s)
 - Uneven oil levels (both front fork legs)
 - Unevenly tensioned fork spring (both front fork legs)
 - Broken fork spring
 - Bent or damaged inner tube
 - Bent or damaged outer tube
 3. Swingarm
 - Worn bearing
 - Bent or damaged swingarm

Rear shock absorber assembly

- Faulty rear shock absorber spring
- Leaking oil

Tire(s)

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

EAS26710

FAULTY LIGHTING OR SIGNALING SYSTEM

Headlight does not come on

- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

Headlight bulb burnt out

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Faulty light switch
- Headlight bulb life expired

Tail/brake light does not come on

- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light LED

Turn signal does not come on

- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

Turn signal blinks slowly

- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

Turn signal remains lit

- Faulty turn signal relay
- Burnt-out turn signal bulb

Turn signal blinks quickly

- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

Horn does not sound

- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

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EAS28740

WIRING DIAGRAM

YZF-R125 2008

1. AC magneto
2. Crankshaft position sensor
3. Rectifier/regulator
4. Main fuse
5. Main switch
6. Radiator fan motor fuse
7. Clutch switch
8. Sidestand switch
9. Battery
10. Starter relay
11. Starter motor
12. Starting circuit cut-off relay
13. Diode
14. Neutral switch
15. Right handlebar switch
16. Start switch
17. Engine stop switch
18. Throttle body sensor assembly
19. Intake air pressure sensor
20. Intake air temperature sensor
21. Throttle position sensor
22. Coolant temperature sensor
23. Lean angle sensor
24. Self-diagnosis signal connector
25. ECU (engine control unit)
26. Ignition coil
27. Spark plug
28. FID (fast idle solenoid)
29. Fuel injector
30. Fuel pump
31. Fuel sender
32. Radiator fan motor relay
33. Radiator fan motor
34. Rear brake light switch
35. Front brake light switch
36. License plate light
37. Tail/brake light
38. Rear right turn signal light
39. Rear left turn signal light
40. Front right turn signal light
41. Front left turn signal light
42. Turn signal relay
43. Horn
44. Headlight relay
45. Left handlebar switch
46. Pass switch
47. Dimmer switch
48. Horn switch
49. Turn signal switch
50. Right headlight assembly
51. Headlight (low beam)
52. Auxiliary light
53. Left Headlight assembly
54. Headlight (high beam)
55. Meter assembly
56. Multi-function meter
57. Tachometer

58. Meter light
59. Coolant temperature warning light
60. High beam indicator light
61. Turn signal indicator light
62. Neutral indicator light
63. Engine trouble warning light
64. Ignition fuse
65. Headlight fuse
66. Signaling system fuse
67. Speed sensor

EAS28750

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
Gy	Gray
L	Blue
O	Orange
P	Pink
R	Red
Sb	Sky blue
W	White
Y	Yellow
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/L	Brown/Blue
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/B	Gray/Black
Gy/R	Gray/Red
L/B	Blue/Black
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
O/W	Orange/White
P/W	Pink/White
R/B	Red/Black
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red
Y/W	Yellow/White

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WIRING DIAGRAM

SCHEMA DE CÂBLAGE

YZF-R125
SCHALTPLAN

YZF-R125
SCHEMA ELETTRICO

YZF-R125
DIAGRAMA ELÉCTRICO

O	W/B	X	R/B	B	Gy/B	Gy/R	R	Y/G	Y	P/W
O/B	Y/R	Y/B	G/W	Y/L	G/B	Y/W	L/Y	Gy	Br/W	G/R

