



YAMAHA

2008

SERVICE MANUAL

WR250RX(C)

WR250XX(C)

WR250R

WR250X

EAS20050

**WR250RX(C)/WR250XX(C)
SERVICE MANUAL**

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EAS20070

NOTICE

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

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

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

NOTE:

- This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.
- Designs and specifications are subject to change without notice.

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.

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 is shown at the top of each page “1”.
- Sub-section titles appear in smaller print than the section title “2”.
- To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section “3”.
- Numbers are given in the order of the jobs in the exploded diagram. A number indicates a disassembly step “4”.
- Symbols indicate parts to be lubricated or replaced “5”.
- Refer to “SYMBOLS”.
- A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc “6”.
- Jobs requiring more information (such as special tools and technical data) are described sequentially “7”.

1 CLUTCH

3 Removing the push lever shaft

4

5

6

Order	Job/Parts to remove	Qty	Remarks
	Drive sprocket cover		Refer to "ENGINE REMOVAL" on page 5-1.
	Clutch		Refer to "CLUTCH" on page 5-24.
1	Clutch cable	1	
2	Clutch cable holder	1	
3	Push lever shaft	1	
4	Push lever spring	1	
5	Oil seal	1	
6	Bearing	1	
			For installation, reverse the removal procedure.

5-37

CLUTCH

REMOVING THE CLUTCH
 You need not drain the coolant and engine oil if you do not service the primary drive gear. You can reach the clutch housing removal step by simply removing the cover and clutch cover.

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

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

Universal clutch holder
 90890-04086
 YM-91042

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 thickness
 2.90-3.10 mm (0.114-0.122 in)
 Limit
 2.80 mm

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.

Warpage limit
 0.10 mm (0.0039 in)

CHECKING THE FRICTION PLATES
 The following procedure applies to all of the friction plates.

1. Check:
 - Friction plate

5-38

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

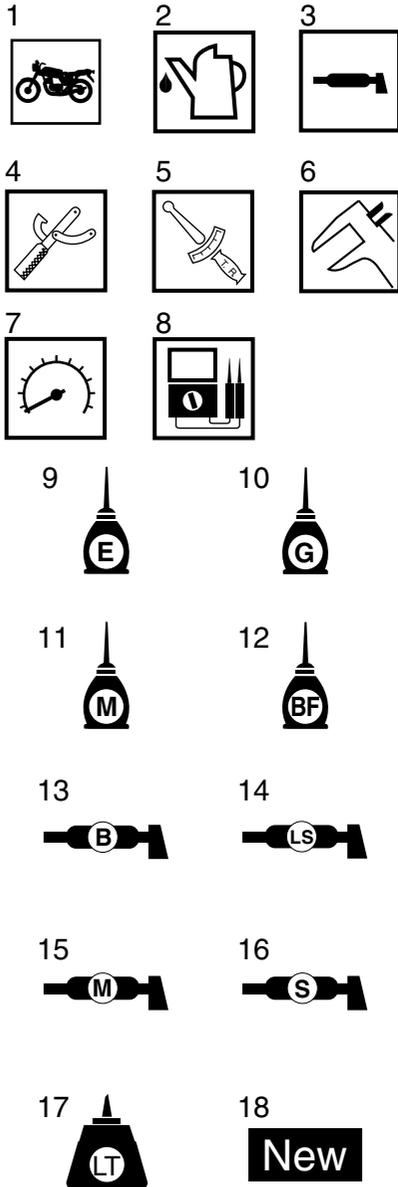


TABLE OF CONTENTS

GENERAL INFORMATION

1

SPECIFICATIONS

2

**PERIODIC CHECKS AND
ADJUSTMENTS**

3

CHASSIS

4

ENGINE

5

COOLING SYSTEM

6

FUEL SYSTEM

7

ELECTRICAL SYSTEM

8

TROUBLESHOOTING

9



GENERAL INFORMATION

IDENTIFICATION	1-1
VEHICLE IDENTIFICATION NUMBER.....	1-1
MODEL LABEL	1-1
FEATURES	1-2
OUTLINE OF THE FI SYSTEM.....	1-2
FI SYSTEM	1-3
MULTI-FUNCTION DISPLAY.....	1-4
IMPORTANT INFORMATION	1-8
PREPARATION FOR REMOVAL AND DISASSEMBLY	1-8
REPLACEMENT PARTS	1-8
GASKETS, OIL SEALS AND O-RINGS	1-8
LOCK WASHERS/PLATES AND COTTER PINS.....	1-8
BEARINGS AND OIL SEALS.....	1-8
CIRCLIPS.....	1-9
CHECKING THE CONNECTIONS.....	1-10
SPECIAL TOOLS.....	1-11

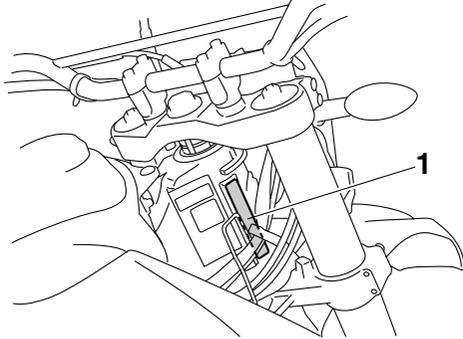
EAS20130

IDENTIFICATION

EAS20140

VEHICLE IDENTIFICATION NUMBER

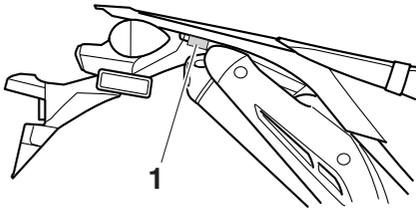
The vehicle identification number "1" is stamped into the right side of the steering head pipe.



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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

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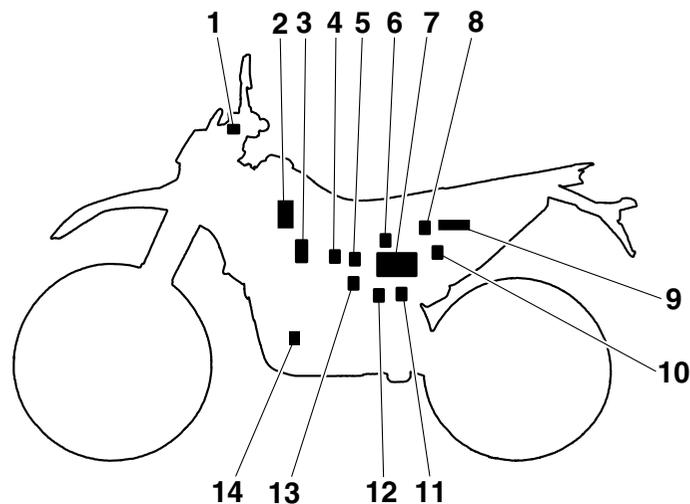
OUTLINE OF THE FI SYSTEM

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.

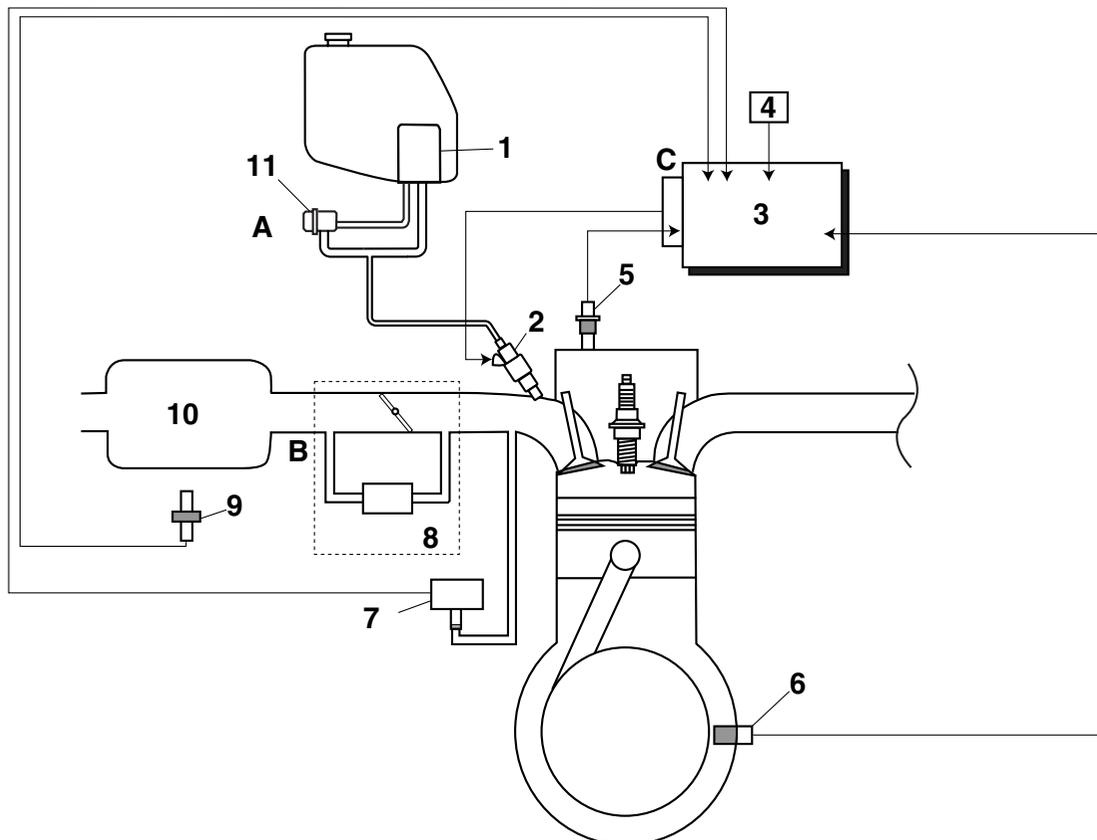


- | | |
|---------------------------------|-----------------------------------|
| 1. Engine trouble warning light | 10. Intake air temperature sensor |
| 2. Fuel pump | 11. EXUP servomotor |
| 3. Ignition coil | 12. Speed sensor |
| 4. Fuel injector | 13. Coolant temperature sensor |
| 5. Throttle position sensor | 14. Crankshaft position sensor |
| 6. Intake air pressure sensor 1 | |
| 7. Battery | |
| 8. Lean angle sensor | |
| 9. ECU | |

EAS32D1018

FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator is installed in the fuel rail, and maintains the fuel pressure that is applied to the fuel injector at 245–255 kPa (34.8–36.3 psi) (2.45–2.55 kg/cm²). The fuel injector is operated due to signals from the ECU, and injects fuel into the intake manifold. Since fuel is supplied only for the duration of injection, good fuel economy is obtained. 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 temperature 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 | A. Fuel system |
| 2. Injector | B. Intake system |
| 3. ECU | C. Control system |
| 4. Throttle position sensor | |
| 5. Coolant temperature sensor | |
| 6. Crankshaft position sensor | |
| 7. Intake air pressure sensor | |
| 8. Throttle bodies | |
| 9. Intake air temperature sensor | |
| 10. Air filter case | |
| 11. Pulsation damper | |

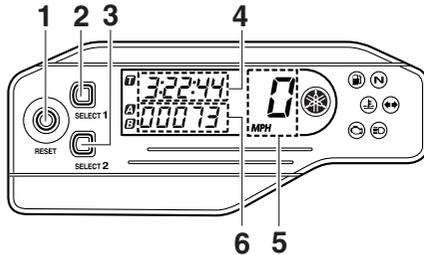
EAS32D1004

MULTI-FUNCTION DISPLAY

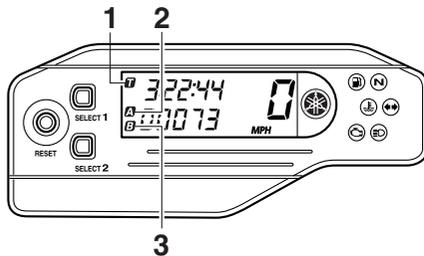
EWA32D1008

WARNING

Be sure to stop the vehicle before making any setting changes to the multi-function display.



1. "RESET" button
2. "SELECT 1" button
3. "SELECT 2" button
4. Clock/stopwatch
5. Speedometer
6. Odometer/tripmeter/fuel reserve tripmeter



1. Stopwatch indicator "I"
2. Tripmeter A indicator "A"/Distance-compensation tripmeter "A"
3. Tripmeter B indicator "B"

NOTE:

- The multi-function display can be set to the basic mode or the measurement mode.
- Tripmeter A will automatically reset to zero when changing from the basic mode to the measurement mode or vice versa.

Basic mode:

- 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 clock
- a self-diagnosis device

Measurement mode:

- a speedometer (which shows the riding speed)
- a distance-compensation tripmeter (which shows the accumulated distance traveled since set to zero and which can be calibrated to provide a more accurate tripmeter reading)
- a stopwatch (which shows the time that has been accumulated since the start of stopwatch measurement)
- a self-diagnosis device

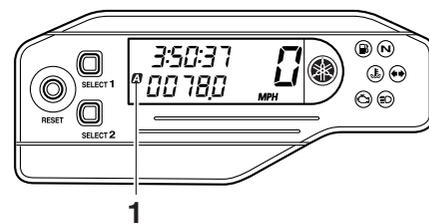
NOTE:

- Be sure to turn the key to "ON" before using the "SELECT 1", "SELECT 2" and "RESET" buttons.
- When the key is turned to "ON", all of the display segments of the multi-function display will appear and then disappear, in order to test the electrical circuit.
- To switch the speedometer and odometer/tripmeter displays between kilometers and miles, press the "SELECT 2" button until the display changes after the main switch is turned to "ON".

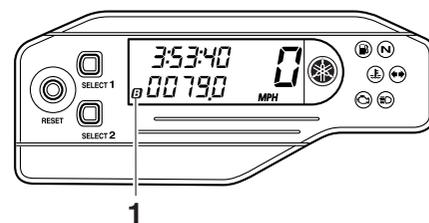
Basic mode

Odometer and tripmeter modes

Push the "SELECT 2" button to switch the display between the odometer mode and the tripmeter modes A and B in the following order: odometer → tripmeter A → tripmeter B → odometer



1. Tripmeter A indicator "A"



1. Tripmeter B indicator "B"

NOTE:

Indicator “**A**” comes on when tripmeter A is selected, and indicator “**B**” comes on when tripmeter B is selected.

If the fuel level warning light comes on, the display will automatically change to the fuel reserve tripmeter mode “F” and start counting the distance traveled from that point. In this case, push the “SELECT 2” button to switch the display between the various tripmeter and odometer modes in the following order:

fuel reserve tripmeter “F” → odometer → tripmeter A → tripmeter B → fuel reserve tripmeter “F”

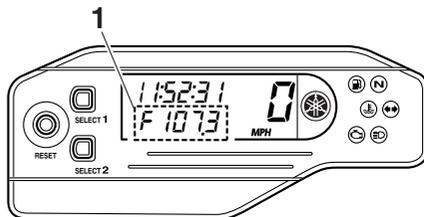
NOTE:

The fuel level warning light may not function accurately while riding off road as the fuel level reading changes due to the movement and inclination of the vehicle.

If the fuel level warning light comes on while riding in the measurement mode, change to the basic mode and push the “SELECT 2” button to display the fuel reserve tripmeter.

NOTE:

To change from the measurement mode to the basic mode, the stopwatch and the distance-compensation tripmeter must be stopped.



1. Fuel reserve tripmeter “F”

To reset a tripmeter, select it by pushing the “SELECT 2” button, and then push the “RESET” button for at least one second. 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).

Clock

Turn the key to “ON”.

NOTE:

When setting the clock, push the “SELECT 1” button to increase the digits or “SELECT 2” button to decrease the digits. Pushing and holding either button will increase or decrease the digits

continuously until the button is released.

To set the clock

1. Push the “SELECT 1” button for at least two seconds.
2. When the hour digits start flashing, push either select button to set the hours.
3. Push the “RESET” button, and the minute digits will start flashing.
4. Push either select button to set the minutes.
5. Push the “RESET” button, and the second digits will start flashing.
6. Push either select button to set the second digits to zero.
7. Push the “RESET” button for at least two seconds, and then release it to start the clock.

NOTE:

If the “RESET” button is not pushed within 30 seconds, the clock will not be set and will return to the prior time.

Changing from the basic mode to the measurement mode

With the odometer selected, push the “SELECT 1” button and “SELECT 2” button together for at least two seconds to change to the measurement mode.

Changing from the measurement mode to the basic mode

NOTE:

The stopwatch must be stopped before changing to the basic mode.

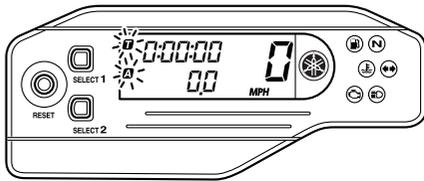
1. Check that the stopwatch is not in operation. If the stopwatch is in operation, stop it by pushing the “SELECT 1” button and “SELECT 2” button together.
2. Push the “SELECT 1” button and “SELECT 2” button together for at least two seconds to change to the basic mode.

Measurement mode (for the stopwatch)

When the measurement mode is selected, the stopwatch is displayed and it can be started manually or automatically.

Manual start

The manual start is the default setting for the stopwatch. The stopwatch indicator “**I**” and the distance-compensation tripmeter indicator “**A**” will start flashing.



1. Push the “RESET” button to start the stopwatch.
2. Push the “SELECT 1” button and “SELECT 2” button together to stop the stopwatch.
3. To resume stopwatch counting, push the “SELECT 1” button and “SELECT 2” button together.

To reset the stopwatch to zero, see “Resetting the distance-compensation tripmeter or the distance-compensation tripmeter in combination with the stopwatch”.

NOTE:

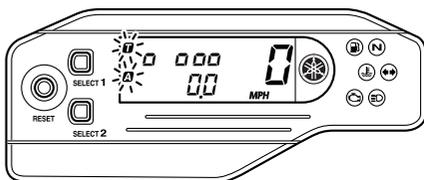
The stopwatch will continue counting when the vehicle is stopped. To stop and/or resume counting, repeat steps 2 and 3.

Auto start

1. Push the “SELECT 1” button for at least two seconds to set the auto start.

NOTE:

When the stopwatch is set to auto start, the stopwatch indicator “**0**” and the distance-compensation tripmeter indicator “**A**” will start flashing, and the digits in the display will start scrolling from left to right.



2. When the vehicle starts moving, the stopwatch will start counting.
3. Push the “SELECT 1” button and “SELECT 2” button together to stop the stopwatch.
4. To resume counting, push the “SELECT 1” button and “SELECT 2” button together again.

NOTE:

The stopwatch will continue counting when the vehicle is stopped. To stop and/or resume

counting, repeat steps 3 and 4.

Measurement mode (for calibrating the distance-compensation tripmeter’s reading)

The distance-compensation tripmeter is a feature intended to provide a more accurate tripmeter reading for enduro riding. Calibrating this meter in accordance with the distances specified on the enduro course map will help familiarize the rider with the course. In addition, calibrating the meter may also be necessary when using tire, wheel, chain sprocket sizes, etc. other than specified.

Calibrate the distance-compensation tripmeter as follows.

To increase the reading, push the “SELECT 1” button. To decrease the reading, push the “SELECT 2” button. Pushing and holding either button will increase or decrease the reading continuously until the button is released.

NOTE:

Calibrating the reading of the distance-compensation tripmeter is possible regardless of the stopwatch operation.

Resetting the distance-compensation tripmeter or the distance-compensation tripmeter in combination with the stopwatch

NOTE:

Resetting can be made only to the distance-compensation tripmeter or to the distance-compensation tripmeter in combination with the stopwatch.

Resetting the distance-compensation tripmeter

1. Check that the stopwatch measurement is in operation.
2. Reset the distance-compensation tripmeter to zero by pushing the “RESET” button for at least two seconds.

Resetting the distance-compensation tripmeter in combination with the stopwatch

1. Stop the stopwatch.
2. Reset the distance-compensation tripmeter and the stopwatch to zero by pushing the “RESET” button for at least two seconds.

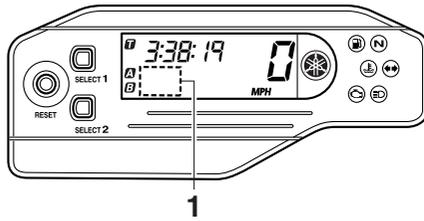
Self-diagnosis device

This model is equipped with a self-diagnosis device for various electrical circuits.

If any of those circuits are defective, the engine trouble warning light will come on, and then the display will indicate a two-digit error code.

If the display indicates any error codes, note the code number, and then check the fuel injection

system. Refer to “FUEL INJECTION SYSTEM” on page 8-29.



1. Error code display

ECA32D1007

CAUTION:

If the display indicates an error code, the vehicle should be checked as soon as possible in order to avoid engine damage.

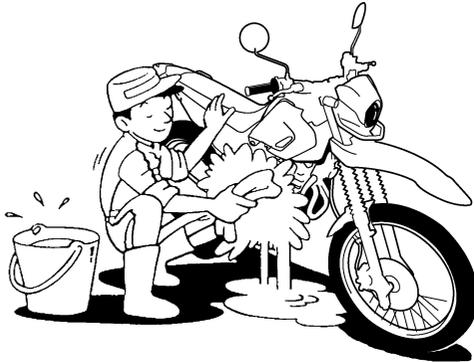
EAS20180

IMPORTANT INFORMATION

EAS20190

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 1-11.
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.

EAS20200

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

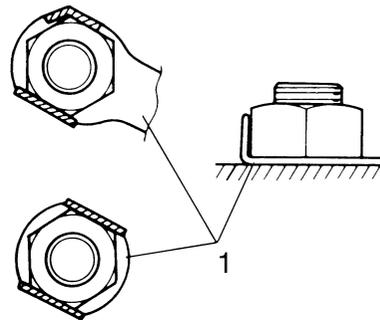
GASKETS, OIL SEALS AND O-RINGS

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.

EAS20220

LOCK WASHERS/PLATES AND COTTER PINS

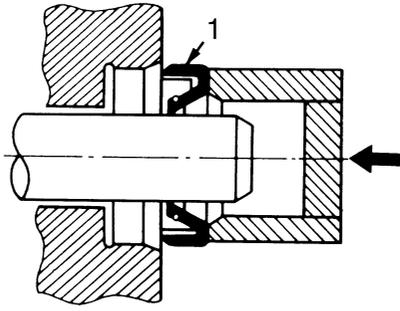
After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS20230

BEARINGS AND OIL SEALS

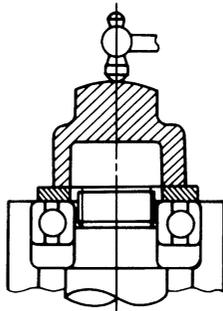
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals "1", lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.



ECA13300

CAUTION:

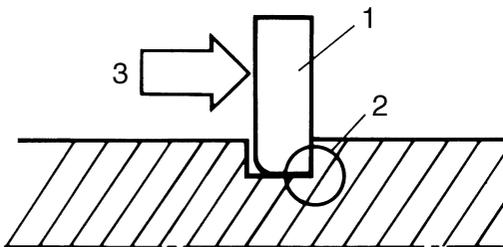
Do not spin the bearing with compressed air because this will damage the bearing surfaces.



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.



CHECKING THE CONNECTIONS

EAS20250

CHECKING THE CONNECTIONS

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

1. Disconnect:

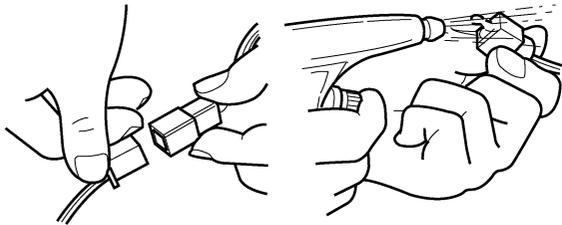
- Lead
- Coupler
- Connector

2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.

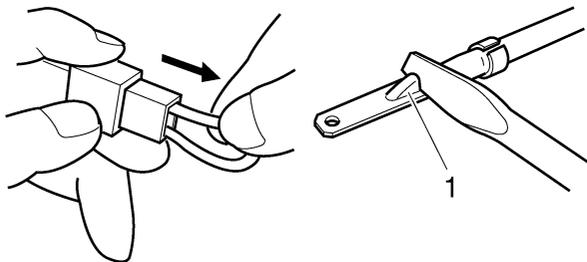


3. Check:

- 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:

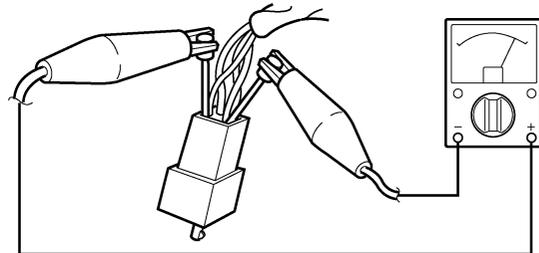
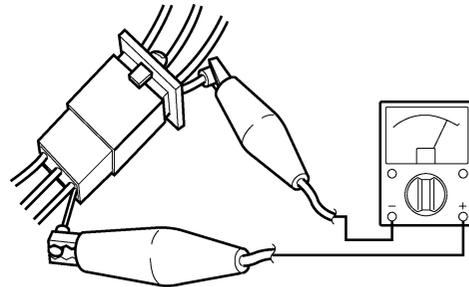
- Continuity
(with the pocket tester)



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

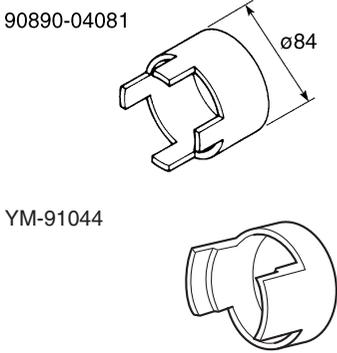
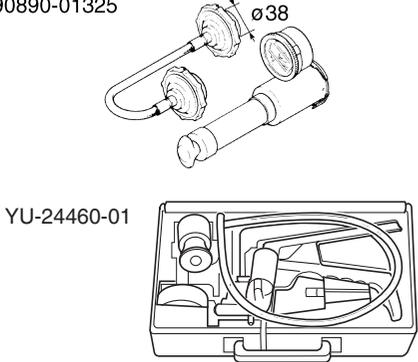
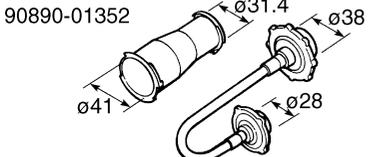
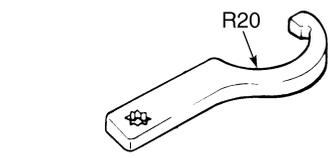
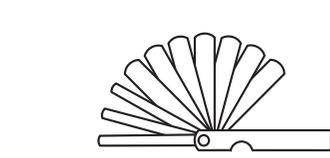
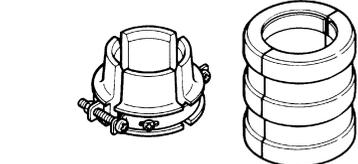
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

NOTE:

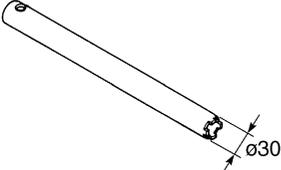
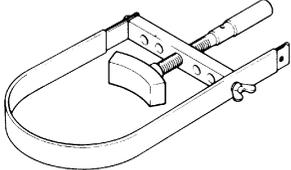
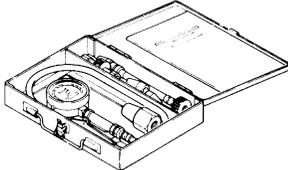
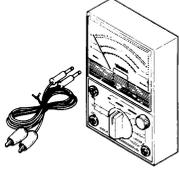
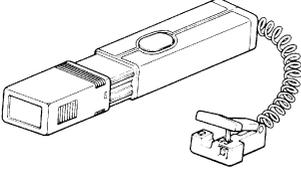
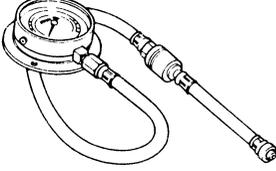
For U.S.A. and Canada, use part number starting with "YM-", "YU-", or "ACC-".
For others, use part number starting with "90890-".

Tool name/Tool No.	Illustration	Reference pages
Crankcase separating tool 90890-01135 Crankcase separator YU-01135-B		5-62
Ring nut wrench 90890-01268 Spanner wrench YU-01268		4-51
Crankshaft installer pot 90890-01274 Installing pot YU-90058		5-63
Crankshaft installer bolt 90890-01275 Bolt YU-90060		5-63
Adapter (M12) 90890-01278 Adapter #3 YU-90063		5-63

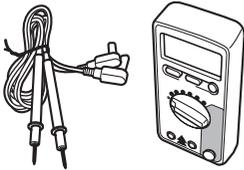
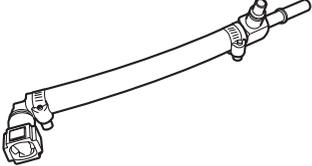
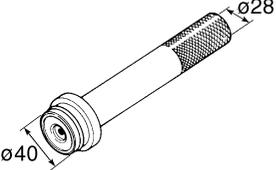
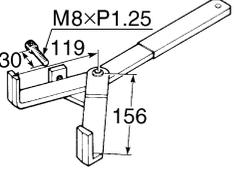
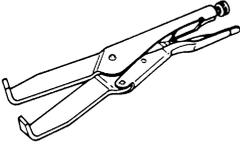
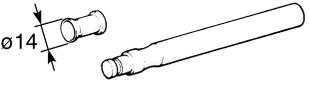
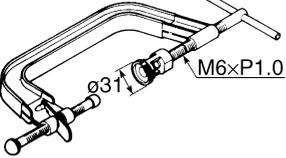
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Spacer (crankshaft installer) 90890-04081 Pot spacer YM-91044		5-63
Radiator cap tester 90890-01325 Radiator pressure tester YU-24460-01		6-2
Radiator cap tester adapter 90890-01352 Radiator pressure tester adapter YU-33984		6-2
Steering nut wrench 90890-01403 Spanner wrench YU-33975		3-25
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-4
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-45

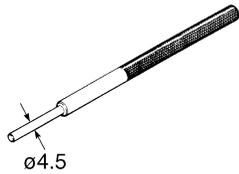
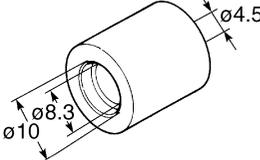
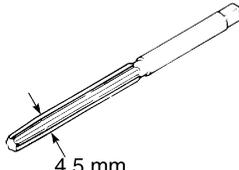
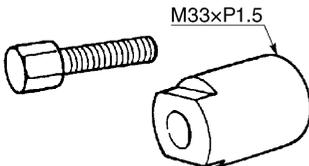
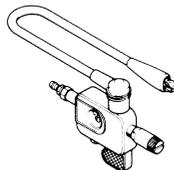
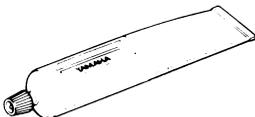
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Damper rod holder 90890-01454		4-42, 4-44
Spoke nipple wrench (8-9) 90890-01522 YM-01522		3-31
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-53, 5-54
Compression gauge 90890-03081 Engine compression tester YU-33223		3-9
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-10, 5-32, 8-65, 8-66, 8-67, 8-71, 8-72, 8-73, 8-74, 8-75, 8-76, 8-77, 8-78, 8-79, 8-81
Timing light 90890-03141 Inductive clamp timing light YU-03141		3-9
Pressure gauge 90890-03153 YU-03153		7-6
Vacuum/pressure pump gauge set 90890-06756 Mityvac brake bleeding tool YS-42423		7-6

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		7-7, 8-80, 8-81
Fuel pressure adapter 90890-03176 YM-03176		7-6
Middle driven shaft bearing driver 90890-04058 Bearing driver 40 mm YM-04058		6-7
Mechanical seal installer 90890-04145		6-7
Universal clutch holder 90890-04086 YM-91042	 	5-38, 5-40
Valve lapper 90890-04101 Valve lapping tool YM-A8998		3-5
Valve spring compressor 90890-04019 YM-04019		5-18, 5-23

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Valve guide remover ($\phi 4.5$) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-20
Valve guide installer (4.5 ϕ) 90890-04117 YM-04117		5-20
Valve guide reamer (4.5 ϕ) 90890-04118 YM-04118		5-20
Rotor puller 90890-04142 YM-04142		5-53
Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487		8-74
Digital tachometer 90890-06760 YU-39951-B		3-6, 3-9
Yamaha bond No. 1215 (Three Bond No.1215®) 90890-85505		5-60

SPECIFICATIONS

GENERAL SPECIFICATIONS	2-1
ENGINE SPECIFICATIONS	2-2
CHASSIS SPECIFICATIONS.....	2-9
ELECTRICAL SPECIFICATIONS.....	2-12
TIGHTENING TORQUES.....	2-15
GENERAL TIGHTENING TORQUE SPECIFICATIONS.....	2-15
ENGINE TIGHTENING TORQUES.....	2-15
CHASSIS TIGHTENING TORQUES.....	2-17
LUBRICATION POINTS AND LUBRICANT TYPES	2-21
ENGINE.....	2-21
CHASSIS.....	2-22
LUBRICATION SYSTEM CHART AND DIAGRAMS	2-25
LUBRICATION DIAGRAMS	2-25
COOLING SYSTEM DIAGRAMS.....	2-29
CABLE ROUTING.....	2-31
Front rear brake hose	2-39
Throttle body.....	2-41
Canister (for California).....	2-43

GENERAL SPECIFICATIONS

EAS20280

GENERAL SPECIFICATIONS

Model

Model	WR250R 32C1 (U49) WR250R 32C3 (CAL) WR250X 32C2 (U49) WR250X 32C4 (CAL)
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Dimensions

Overall length	WR250R 2175 mm (85.6 in) WR250X 2110 mm (83.1 in)
Overall width	810 mm (31.9 in)
Overall height	WR250R 1230 mm (48.4 in) WR250X 1190 mm (46.9 in)
Seat height	WR250R 930 mm (36.6 in) WR250X 895 mm (35.2 in)
Wheelbase	WR250R 1420 mm (55.9 in) WR250X 1425 mm (56.1 in)
Ground clearance	WR250R 295 mm (11.61 in) (CAL) WR250R 300 mm (11.81 in) (U49) WR250X 260 mm (10.24 in) (CAL) WR250X 265 mm (10.43 in) (U49)
Minimum turning radius	2300 mm (90.6 in)

Weight

With oil and fuel	WR250R 134.0 kg (295 lb) (U49) WR250R 135.0 kg (298 lb) (CAL) WR250X 136.0 kg (300 lb) (U49) WR250X 137.0 kg (302 lb) (CAL)
Maximum load	185 kg (408 lb)

ENGINE SPECIFICATIONS

EAS20290

ENGINE SPECIFICATIONS

Engine

Engine type	Liquid cooled 4-stroke, DOHC
Displacement	250.0 cm ³
Cylinder arrangement	Forward-inclined single cylinder
Bore × stroke	77.0 × 53.6 mm (3.03 × 2.11 in)
Compression ratio	11.80 :1
Starting system	Electric starter

Fuel

Recommended fuel	Premium unleaded gasoline only
Fuel tank capacity	WR250R 7.2 L (1.90 US gal) (1.58 Imp.gal) (CAL) WR250R 7.6 L (2.01 US gal) (1.67 Imp.gal) (U49) WR250X 7.2 L (1.90 US gal) (1.58 Imp.gal) (CAL) WR250X 7.6 L (2.01 US gal) (1.67 Imp.gal) (U49)
Fuel reserve amount	2.1 L (0.55 US gal) (0.46 Imp.gal)

Engine oil

Lubrication system	Wet sump
Type	YAMALUBE 4, SAE 10W-30 or SAE 20W-40
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Engine oil quantity	
Total amount	1.50 L (1.59 US qt) (1.32 Imp.qt)
Without oil filter element replacement	1.30 L (1.37 US qt) (1.14 Imp.qt)
With oil filter element replacement	1.40 L (1.48 US qt) (1.23 Imp.qt)
Oil filter type	Paper

Oil pump

Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	Less than 0.120 mm (0.0047 in)
Limit	0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.090–0.160 mm (0.0035–0.0063 in)
Limit	0.230 mm (0.0091 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.030-0.100 mm (0.0012-0.0039 in)
Limit	0.17 mm (0.0067 in)
Bypass valve opening pressure	500.0–600.0 kPa (72.5–87.0 psi) (5.00–6.00 kgf/cm ²)

Cooling system

Radiator capacity (including all routes)	0.90 L (0.95 US qt) (0.79 Imp.qt)
Radiator capacity	0.32 L (0.34 US qt) (0.28 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	108.0–137.4 kPa (15.7–19.9 psi) (1.08–1.37 kgf/cm ²)
Radiator core	
Width	121.4 mm (4.78 in)
Height	246.0 mm (9.69 in)
Depth	28.0 mm (1.10 in)

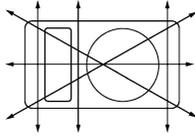
ENGINE SPECIFICATIONS

Spark plug (s)

Manufacturer/model	NGK/CR9EK
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)

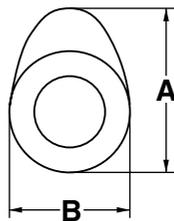
Cylinder head

Volume	15.36 cm ³ (0.94 cu.in)
Warpage limit	0.05 mm (0.0020 in)



Camshaft

Drive system	Chain drive (left)
Camshaft cap inside diameter	22.000–22.021 mm (0.8661–0.8670 in)
Camshaft journal diameter	21.959–21.972 mm (0.8645–0.8650 in)
Camshaft-journal-to-camshaft-cap clearance	0.028–0.062 mm (0.0011–0.0024 in)
Limit	0.08 mm (0.0031 in)
Camshaft lobe dimensions	
Intake A	34.550–34.650 mm (1.3602–1.3642 in)
Limit	35.450 mm (1.3957 in)
Intake B	25.953–26.053 mm (1.0218–1.0257 in)
Limit	25.853 mm (1.0178 in)
Exhaust A	34.850–34.950 mm (1.3720–1.3760 in)
Limit	34.750 mm (1.3681 in)
Exhaust B	25.986–26.086 mm (1.0231–1.0270 in)
Limit	25.886 mm (1.0191 in)



Camshaft runout limit	0.015 mm (0.0006 in)
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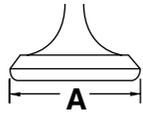
Timing chain

Model/number of links	98XRH2010-118M
Tensioning system	Automatic

Valve, valve seat, valve guide

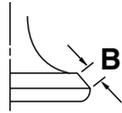
Valve clearance (cold)	
Intake	0.13–0.20 mm (0.0051–0.0079 in)
Exhaust	0.23–0.30 mm (0.0091–0.0118 in)
Valve dimensions	
Valve head diameter A (intake)	29.90–30.10 mm (1.1772–1.1850 in)
Valve head diameter A (exhaust)	24.40–24.60 mm (0.9606–0.9685 in)

ENGINE SPECIFICATIONS



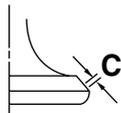
Valve face width B (intake)
Valve face width B (exhaust)

1.840 mm (0.0724 in)
2.260 mm (0.0890 in)



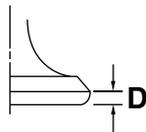
Valve seat width C (intake)
Valve seat width C (exhaust)

0.90–1.10 mm (0.0354–0.0433 in)
0.90–1.10 mm (0.0354–0.0433 in)



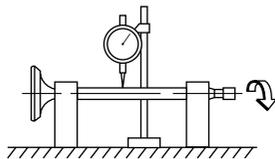
Valve margin thickness D (intake)
Limit
Valve margin thickness D (exhaust)
Limit

1.15–1.45 mm (0.0453–0.0571 in)
1.00 mm (0.04 in)
0.85–1.15 mm (0.0335–0.0453 in)
0.70 mm (0.03 in)



Valve stem diameter (intake)
Valve stem diameter (exhaust)
Valve guide inside diameter (intake)
Valve guide inside diameter (exhaust)
Valve-stem-to-valve-guide clearance (intake)
Limit
Valve-stem-to-valve-guide clearance (exhaust)
Limit
Valve stem runout

4.475–4.490 mm (0.1762–0.1768 in)
4.460–4.475 mm (0.1756–0.1762 in)
4.500–4.512 mm (0.1772–0.1776 in)
4.500–4.512 mm (0.1772–0.1776 in)
0.010–0.037 mm (0.0004–0.0015 in)
0.080 mm (0.0032 in)
0.025–0.052 mm (0.0010–0.0020 in)
0.100 mm (0.0039 in)
0.010 mm (0.0004 in)



Cylinder head valve seat width (intake)
Cylinder head valve seat width (exhaust)

0.90–1.10 mm (0.0354–0.0433 in)
0.90–1.10 mm (0.0354–0.0433 in)

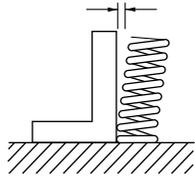
Valve spring

Free length (intake)
Limit
Free length (exhaust)
Limit
Installed length (intake)
Installed length (exhaust)
Spring rate K1 (intake)

36.03 mm (1.42 in)
34.23 mm (1.35 in)
36.03 mm (1.42 in)
34.23 mm (1.35 in)
31.00 mm (1.22 in)
31.00 mm (1.22 in)
31.47 N/mm (179.69 lb/in) (3.21 kgf/mm)

ENGINE SPECIFICATIONS

Spring rate K2 (intake)	40.90 N/mm (233.54 lb/in) (4.17 kgf/mm)
Spring rate K1 (exhaust)	31.47 N/mm (179.69 lb/in) (3.21 kgf/mm)
Spring rate K2 (exhaust)	40.90 N/mm (233.54 lb/in) (4.17 kgf/mm)
Installed compression spring force (intake)	147.00–169.00 N (33.05–37.99 lbf) (14.99–17.23 kgf)
Installed compression spring force (exhaust)	147.00–169.00 N (33.05–37.99 lbf) (14.99–17.23 kgf)
Spring tilt (intake)	2.5 °/1.6 mm
Spring tilt (exhaust)	2.5 °/1.6 mm



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

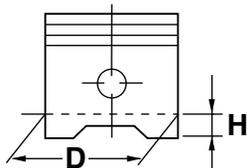


Cylinder

Bore	77.000–77.010 mm (3.0315–3.0319 in)
Wear limit	77.100 mm (3.0354 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.050 mm (0.0020 in)

Piston

Piston-to-cylinder clearance	0.010–0.035 mm (0.0004–0.0014 in)
Limit	0.10 mm (0.0039 in)
Diameter D	76.975–76.990 mm (3.0305–3.0311 in)
Height H	12.0 mm (0.47 in)



Offset	0.50 mm (0.0197 in)
Offset direction	Intake side
Piston pin bore inside diameter	17.002–17.013 mm (0.6694–0.6698 in)
Limit	17.043 mm (0.6710 in)
Piston pin outside diameter	16.991–17.000 mm (0.6689–0.6693 in)
Limit	16.971 mm (0.6681 in)
Piston-pin-to-piston- pin-bore clearance	0.002–0.022 mm (0.0001–0.0009 in)

ENGINE SPECIFICATIONS

Piston ring

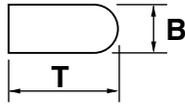
Top ring

Ring type

Barrel

Dimensions (B × T)

0.90 × 2.75 mm (0.04 × 0.11 in)



End gap (installed)

0.15–0.25 mm (0.0059–0.0098 in)

Limit

0.50 mm (0.0197 in)

Ring side clearance

0.030–0.065 mm (0.0012–0.0026 in)

Limit

0.115 mm (0.0045 in)

2nd ring

Ring type

Taper

Dimensions (B × T)

0.80 × 2.75 mm (0.03 × 0.11 in)



End gap (installed)

0.30–0.45 mm (0.0118–0.0177 in)

Limit

0.80 mm (0.0315 in)

Ring side clearance

0.020–0.055 mm (0.0008–0.0022 in)

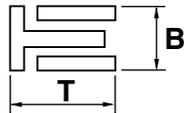
Limit

0.115 mm (0.0045 in)

Oil ring

Dimensions (B × T)

1.50 × 2.25 mm (0.06 × 0.09 in)



End gap (installed)

0.10–0.40 mm (0.0039–0.0157 in)

Crankshaft

Width A

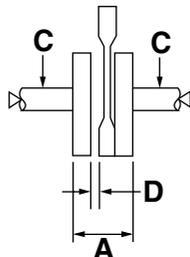
61.95–62.00 mm (2.439–2.441 in)

Runout limit C

0.030 mm (0.0012 in)

Big end side clearance D

0.350–0.650 mm (0.0138–0.0256 in)



Balancer

Balancer drive method

Gear

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)

ENGINE SPECIFICATIONS

Friction plate thickness	2.90–3.10 mm (0.114–0.122 in)
Wear limit	2.80 mm (0.1102 in)
Plate quantity	7 pcs
Clutch plate thickness	1.50–1.70 mm (0.059–0.067 in)
Plate quantity	6 pcs
Warpage limit	0.10 mm (0.0039 in)
Clutch spring free length	41.20 mm (1.62 in)
Minimum length	39.14 mm (1.54 in)
Spring quantity	5 pcs
Push rod bending limit	0.100 mm (0.0039 in)

Transmission

Transmission type	Constant mesh 6-speed
Primary reduction system	Spur gear
Primary reduction ratio	78/25 (3.120)
Secondary reduction system	Chain drive
Secondary reduction ratio	WR250R 43/13 (3.307) WR250X 42/13 (3.231)
Operation	Left foot operation
Gear ratio	
1st	37/14 (2.642)
2nd	29/16 (1.813)
3rd	29/22 (1.318)
4th	26/25 (1.040)
5th	24/27 (0.888)
6th	22/28 (0.786)

Shifting mechanism

Shift mechanism type	Shift drum and guide bar
Shift fork guide bar bending limit	0.050 mm (0.0020 in)
Shift fork thickness	4.85 mm (0.1909 in)

Decompression device

Device type	Auto decomp
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Air filter

Air filter element	Wet element
Air filter oil grade	Foam air-filter oil or engine oil

Throttle body

Type/quantity	38EIS/1
Manufacturer	MIKUNI
ID mark	WR250R 32C3 00 (CAL) WR250R 3D71 10 (U49) WR250X 32C3 00 (CAL) WR250X 3D71 10 (U49)

Fuel injection sensor

Crankshaft position sensor	248–278 Ω
Intake air pressure sensor output voltage	3.75–4.25 V
Coolant temperature sensor resistance	2320–2590 Ω @20 °C (68°F) 310–326 Ω @80 °C (176 °F)

Idling condition

Engine idling speed	1450–1650 r/min
Intake vacuum	28.3 kPa (8.4 inHg) (212 mmHg)
Water temperature	80 °C (176 °F)

ENGINE SPECIFICATIONS

Oil temperature

60.0 °C (140.00 °F)

Throttle cable free play

3.0–5.0 mm (0.12–0.20 in)

CHASSIS SPECIFICATIONS

EAS20300

CHASSIS SPECIFICATIONS

Chassis

Frame type	Semi double cradle
Caster angle	WR250R 26.67 ° WR250X 25.33 °
Trail	WR250R 111.0 mm (4.37 in) WR250X 76.0 mm (2.99 in)

Front wheel

Wheel type	Spoke wheel
Rim size	WR250R 21x1.60 WR250X 17M/C x MT3.00
Rim material	Aluminum
Wheel travel	270.0 mm (10.63 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Wheel axle bending limit	0.50 mm (0.02 in)

Rear wheel

Wheel type	Spoke wheel
Rim size	WR250R 18x2.15 WR250X 17M/C x MT4.00
Rim material	Aluminum
Wheel travel	WR250R 270.0 mm (10.63 in) WR250X 265.0 mm (10.43 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Wheel axle bending limit	0.50 mm (0.02 in)

Front tire

Type	With tube
Size	WR250R 80/100-21M/C 51P WR250X 110/70R17M/C 54H
Manufacturer/model	WR250R BRIDGESTONE/TW-301 F WR250X BRIDGESTONE/BT090F RADIAL G

Rear tire

Type	With tube
Size	WR250R 120/80-18M/C 62P WR250X 140/70R17M/C 66H
Manufacturer/model	WR250R BRIDGESTONE/TW-302 F WR250X BRIDGESTONE/BT090R RADIAL G

Tire air pressure (measured on cold tires)

Loading condition	0–90 kg (0–198 lb)
Front	WR250R 125 kPa (18 psi) (1.25 kgf/cm ²) WR250X 200 kPa (29 psi) (2.00 kgf/cm ²)
Rear	WR250R 175 kPa (25 psi) (1.75 kgf/cm ²) WR250X 200 kPa (29 psi) (2.00 kgf/cm ²)
Loading condition	90–185 kg (198–408 lb)
Front	WR250R 150 kPa (22 psi) (1.50 kgf/cm ²) WR250X 200 kPa (29 psi) (2.00 kgf/cm ²)
Rear	WR250R 200 kPa (29 psi) (2.00 kgf/cm ²) WR250X 225 kPa (33 psi) (2.25 kgf/cm ²)

CHASSIS SPECIFICATIONS

Front brake

Type	Single disc brake
Operation	Right hand operation
Front brake lever free play	5.0–8.0 mm (0.20–0.31 in)
Front disc brake	
Disc outside diameter × thickness	WR250R 250.0 × 3.5 mm (9.84 × 0.14 in) WR250X 298.0 × 4.0 mm (11.73 × 0.16 in)
Brake disc thickness limit	WR250R 3.0 mm (0.12 in) WR250X 3.5 mm (0.14 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	WR250R 4.8 mm (0.19 in) WR250X 4.0 mm (0.16 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	WR250R 4.8 mm (0.19 in) WR250X 4.0 mm (0.16 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	WR250R 11.00 mm (0.43 in) WR250X 12.70 mm (0.50 in)
Caliper cylinder inside diameter	27.00 mm × 2 (1.06 in × 2)
Recommended fluid	DOT 4

Rear brake

Type	Single disc brake
Operation	Right foot operation
Brake pedal position	11.5 mm (0.45 in)
Rear disc brake	
Disc outside diameter × thickness	230.0 × 4.5 mm (9.06 × 0.18 in)
Brake disc thickness limit	4.0 mm (0.16 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	6.4 mm (0.25 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	6.4 mm (0.25 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	11.0 mm (0.43 in)
Caliper cylinder inside diameter	25.40 mm × 1 (1.00 in × 1)
Recommended fluid	DOT 4

Steering

Steering bearing type	Taper roller bearing
Center to lock angle (left)	44.0 °
Center to lock angle (right)	44.0 °

Front suspension

Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	270.0 mm (10.63 in)
Fork spring free length	450.0 mm (17.72 in)
Limit	441.0 mm (17.36 in)
Installed length	439.2 mm (17.29 in)
Spring rate K1	4.60 N/mm (26.27 lb/in) (0.47 kgf/mm)
Spring stroke K1	0.0–270.0 mm (0.00–10.63 in)
Inner tube outer diameter	46.0 mm (1.81 in)
Inner tube bending limit	0.2 mm (0.01 in)
Optional spring available	No

CHASSIS SPECIFICATIONS

Recommended oil	Suspension oil 01
Quantity	613.0 cm ³ (20.73 US oz) (21.62 Imp.oz)
Level	105.0 mm (4.13 in)
Rebound damping adjusting positions	
Minimum	12
Standard	10
Maximum	1
Compression damping adjusting positions	
Minimum	19
Standard	10
Maximum	1

Rear suspension

Type	Swingarm (link suspension)
Spring/shock absorber type	Coil spring/gas-oil damper
Rear shock absorber assembly travel	95.0 mm (3.74 in)
Spring free length	220.0 mm (8.66 in)
Installed length	211.5 mm (8.33 in)
Spring rate K1	80.00 N/mm (456.80 lb/in) (8.16 kgf/mm)
Spring stroke K1	0.0–95.0 mm (0.00–3.74 in)
Optional spring available	No
Enclosed gas/air pressure (STD)	1200 kPa (170.7 psi) (12.0 kgf/cm ²)
Spring preload adjusting positions	
Minimum	216.0 mm (8.50 in)
Standard	211.5 mm (8.33 in)
Maximum	206.0 mm (8.11 in)
Rebound damping adjusting positions	
Minimum	25
Standard	WR250R 12 WR250X 13
Maximum	3
Compression damping adjusting positions	
Minimum	12
Standard	WR250R 10 WR250X 7
Maximum	1

Swingarm

Swingarm end free play limit (radial)	1.0 mm (0.04 in)
Swingarm end free play limit (axial)	1.0 mm (0.04 in)

Drive chain

Type/manufacturer	520V/DAIDO
Link quantity	108
Drive chain slack	WR250R 38.0–48.0 mm (1.50–1.89 in) WR250X 40.0–50.0 mm (1.57–1.97 in)
15-link length limit	239.3 mm (9.42 in)

ELECTRICAL SPECIFICATIONS

EAS20310

ELECTRICAL SPECIFICATIONS

Voltage

System voltage 12 V

Ignition system

Ignition system TCI (digital)
Advancer type Digital
Ignition timing (B.T.D.C.) 10.0 °

Engine control unit

Model/manufacturer TBDF88/DENSO

Ignition coil

Model/manufacturer F6T558/MITSUBISHI
Primary coil resistance 1.19–1.61 Ω
Secondary coil resistance 8.50–11.50 kΩ

AC magneto

Model/manufacturer F3D7/YAMAHA
Standard output 14.0 V, 350 W@5000 r/min
Stator coil resistance 0.168–0.252 Ω (W-W)
Rectifier/regulator
Regulator type Semi conductor-short circuit
Model/manufacturer SH678-11/SHINDENGEN
No load regulated voltage 14.1–14.9 V
Rectifier capacity (DC) 35.0 A
Withstand voltage 200.0 V

Battery

Model YTZ7S
Voltage, capacity 12 V, 6.0 Ah
Specific gravity 1.310
Manufacturer GS YUASA
Ten hour rate amperage 0.60 A

Headlight

Bulb type Halogen bulb

Bulb voltage, wattage × quantity

Headlight 12 V, 60 W/55.0 W
Tail/brake light LED
Front turn signal/position light 12 V, 21.0 W/5.0 W × 2
Rear turn signal light 12 V, 21.0 W × 2
License plate light 12 V, 5.0 W

Indicator light

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

Electric starting system

System type Constant mesh

ELECTRICAL SPECIFICATIONS

Starter motor

Model/manufacturer	SM-14/MITSUBA
Power output	0.50 kW
Armature coil resistance	0.0040–0.0050 Ω
Brush overall length	10.0 mm (0.39 in)
Limit	3.50 mm (0.14 in)
Brush spring force	7.16–9.52 N (25.77–34.27 oz) (730–971 gf)
Commutator diameter	28.0 mm (1.10 in)
Limit	27.0 mm (1.06 in)
Mica undercut (depth)	0.70 mm (0.03 in)

Starter relay

Model/manufacturer	A3943-072/JIDECO
Amperage	180.0 A
Coil resistance	4.18–4.62 Ω

Horn

Horn type	Plane
Quantity	1 pcs
Model/manufacturer	HF-12/NIKKO
Maximum amperage	3.0 A
Coil resistance	1.01–1.11 Ω
Performance	108–116 dB/2m

Turn signal relay

Relay type	Full transistor
Model/manufacturer	FE246BH/DENSO
Built-in, self-canceling device	No
Turn signal blinking frequency	75–95 cycles/min

Starting circuit cut-off relay

Model/manufacturer	G8R-30Y-V4/OMRON
Coil resistance	162.0–198.0 Ω

Headlight relay

Model/manufacturer	ACM33211 M04/MATSUSHITA
Coil resistance	86.40–105.60 Ω

Sidestand relay

Model/manufacturer	G8R-30Y-V4/OMRON
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Fuel pump relay

Model/manufacturer	G8R-30Y-V4/OMRON
Coil resistance	162–198 Ω

Fan motor relay

Model/manufacturer	ACM33211 M04/MATSUSHITA
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Fuses

Main fuse	30.0 A
Headlight fuse	15.0 A
Signaling system fuse	10.0 A
Ignition fuse	7.5 A
Radiator fan fuse	7.5 A
Fuel injection system fuse	7.5 A
Backup fuse	7.5 A
Spare fuse	30.0 A

ELECTRICAL SPECIFICATIONS

Spare fuse	15.0 A
Spare fuse	10.0 A
Spare fuse	7.5 A

TIGHTENING TORQUES

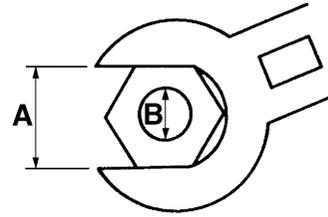
EAS20320

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

EAS20340

ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Camshaft cap bolt	M6	8	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Cylinder head straight screw plug	M12	1	28 Nm (2.8 m•kg, 20 ft•lb)	
Cylinder head stud bolt (exhaust pipe bolt)	M8	2	15 Nm (1.5 m•kg, 11 ft•lb)	
Spark plug	M10	1	13 Nm (1.3 m•kg, 9.4 ft•lb)	
Cylinder head bolt	M10	4	40 Nm (4.0 m•kg, 29 ft•lb)	
Cylinder head cover bolt	M6	2	12 Nm (1.2 m•kg, 8.7 ft•lb)	
Cylinder head bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Oil check bolt	M8	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Cylinder head cover bolt (small head)	M6	5	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Balancer weight screw	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Balancer gear nut	M14	1	50 Nm (5.0 m•kg, 36 ft•lb)	lock washer use
Rotor nut	M12	1	65 Nm (6.5 m•kg, 47 ft•lb)	
Cam sprocket bolt	M7	4	24 Nm (2.4 m•kg, 17 ft•lb)	
Timing chain tensioner bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Timing chain guide bolt	M6	4	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Plate (impeller shaft side)	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Oil filter element cover bolt	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Oil pump bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Oil pump cover bolt	–	1	2 Nm (0.2 m•kg, 1.4 ft•lb)	
Oil strainer housing bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Delivery pipe bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Throttle body joint clamp screw	M5	2	3 Nm (0.3 m•kg, 2.2 ft•lb)	
Air filter clamp screw	M4	1	2 Nm (0.2 m•kg, 1.4 ft•lb)	
Exhaust pipe nut	M8	2	20 Nm (2.0 m•kg, 14 ft•lb)	
Muffler and exhaust pipe	M8	1	20 Nm (2.0 m•kg, 14 ft•lb)	
Muffler bolt	M10	2	42 Nm (4.2 m•kg, 30 ft•lb)	
Muffler protector bolt	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Spark arrester bolt	M6	3	12 Nm (1.2 m•kg, 8.7 ft•lb)	
EXUP cable pulley double-nut	M6	2	6 Nm (0.6 m•kg, 4.3 ft•lb)	
EXUP pully bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
EXUP servo motor bolt	M6	2	6 Nm (0.6 m•kg, 4.3 ft•lb)	
EXUP servo motor cover bolt	M5	2	2 Nm (0.2 m•kg, 1.4 ft•lb)	
Bearing cover plate bolt	M6	6	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Crankcase bolts	M6	12	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Crankcase and holder screw	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Timing mark accessing screw	M14	1	2 Nm (0.2 m•kg, 1.4 ft•lb)	
Crankshaft end cover	M32	1	2 Nm (0.2 m•kg, 1.4 ft•lb)	
Crankcase cover bolt (left)	M6	11	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Crankcase cover bolt (right)	M6	12	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Engine oil drain bolt	M12	1	20 Nm (2.0 m•kg, 14 ft•lb)	
Crankcase and nozzle bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Primary drive gear nut	M16	1	80 Nm (8.0 m•kg, 58 ft•lb)	Lock washer use
Clutch spring bolts	M6	5	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Locknut (push lever adjusting screw)	M6	1	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Clutch boss nut	M16	1	75 Nm (7.5 m•kg, 54 ft•lb)	Lock washer use

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Drive sprocket nut	M18	1	95 Nm (9.5 m•kg, 69 ft•lb)	Stake the nut
Stopper screw (stopper lever)	M8	1	22 Nm (2.2 m•kg, 16 ft•lb)	
Shift pedal bolt	M8	1	18 Nm (1.8 m•kg, 13 ft•lb)	
Stator assembly 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)	
Neutral switch	M5	2	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Thermosensor bolt	M12	1	18 Nm (1.8 m•kg, 13 ft•lb)	
Drive sprocket cover bolt	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Right side cover bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Side cover stay bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Cylinder bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Water pump housing cover bolt	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Coolant drain bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Clutch cable holder bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Speed sensor bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Radiator hose clamp screw	—	6	2 Nm (0.2 m•kg, 1.4 ft•lb)	
Radiator fan bolt	M6	3	8 Nm (0.8 m•kg, 5.8 ft•lb)	
Radiator	M6	1/1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Radiator cover 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)	
Seat guide screw	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Throttle position sensor screw	M5	2	3.5 Nm (0.35 m•kg, 2.5 ft•lb)	
Air induction system pipe bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Wire harness holder bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	

EAS20350

CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Engine mounting nut (front upper)	M10	1	67 Nm (6.7 m•kg, 48 ft•lb)	
Engine mounting nut (front, front lower)	M10	1/1	56 Nm (5.6 m•kg, 41 ft•lb)	
Down tube nut	M12	3	113 Nm (11.3 m•kg, 82 ft•lb)	
Main frame and rear frame	M10	4	56 Nm (5.6 m•kg, 41 ft•lb)	
Engine protector bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Drive chain tensioner bolt	M8	2	23 Nm (2.3 m•kg, 17 ft•lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Taillight cover bolt	M6	4	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Helmet hanger screw	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Front fender bolt	M6	4	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Sidescraper screw	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Sidescraper stay bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Horn bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Air scoop stay bolt	M8	2	16 Nm (1.6 m•kg, 12 ft•lb)	
Air scoop bolt	M6	4	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Air scoop and right air panel	M6	2	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Rectifier/regulator bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Recovery tank screw	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Starter motor leads nut	M6	2	5 Nm (0.5 m•kg, 3.6 ft•lb)	
Starter motor bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Pivot shaft nut	M16	1	85 Nm (8.5 m•kg, 62 ft•lb)	
Rear shock absorber locknut	—	1	42 Nm (4.2 m•kg, 30 ft•lb)	
Rear shock absorber nut (upper)	M10	1	40 Nm (4.0 m•kg, 29 ft•lb)	
Rear shock absorber nut (lower)	M10	1	53 Nm (5.3 m•kg, 38 ft•lb)	
Frame and connecting rod nut	M14	1	80 Nm (8.0 m•kg, 58 ft•lb)	
Connecting rod and relay arm nut	M14	1	80 Nm (8.0 m•kg, 58 ft•lb)	
Relay arm and swing arm nut	M14	1	70 Nm (7.0 m•kg, 51 ft•lb)	
Chain case bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Chain cover bolt	M6	3	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Sidestand nut	M10	1	64 Nm (6.4 m•kg, 46 ft•lb)	
Sidestand switch screw	M5	2	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Steering stem nut	M24	1	120 Nm (12.0 m•kg, 87 ft•lb)	
Lower ring nut	M28	1	—	See NOTE
Upper bracket pinch bolt	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Lower bracket pinch bolt	M8	4	20 Nm (2.0 m•kg, 14 ft•lb)	
Fuel tank bolt	M6	4	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Fuel tank bracket bolt	M6	3	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Fuel pump bolt	M5	6	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Meter nut	M5	3	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Meter bracket nut	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Handlebar upper holder bolt	M8	4	28 Nm (2.8 m•kg, 20 ft•lb)	
Handlebar lower holder nut	M12	2	40 Nm (4.0 m•kg, 29 ft•lb)	
Front fork cap bolt	M48	2	30 Nm (30. m•kg, 22 ft•lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Front fork base valve	M22	2	55 Nm (5.5 m•kg, 40 ft•lb)	
Front fork axle nut	M16	1	63 Nm (6.3 m•kg, 46 ft•lb)	
Front wheel axle pinch bolt	M8	4	23 Nm (2.3 m•kg, 17 ft•lb)	
Front brake disc bolt (WR250R)	M6	6	12 Nm (1.2 m•kg, 8.7 ft•lb)	
Front brake disc bolt (WR250X)	M8	6	23 Nm (2.3 m•kg, 17 ft•lb)	
Spoke (front, rear)	BC4	72	3 Nm (0.3 m•kg, 2.2 ft•lb)	
Rear wheel axle nut	M20	1	125 Nm (12.5 m•kg, 90 ft•lb)	
Rear brake disc bolt	M6	6	12 Nm (1.2 m•kg, 8.7 ft•lb)	
Rear wheel sprocket nut	M8	6	35 Nm (3.5 m•kg, 25 ft•lb)	
Front brake caliper bolt	M8	2	23 Nm (2.3 m•kg, 17 ft•lb)	
Union bolt	M10	4	30 Nm (3.0 m•kg, 22 ft•lb)	
Bleed screw	M7	2	6 Nm (0.6 m•kg, 4.3 ft•lb)	
Front caliper support bolt	M8	2	17 Nm (1.7 m•kg, 12 ft•lb)	
Front caliper pin plug	M8	1	2.5 Nm (0.25 m•kg, 1.8 ft•lb)	WR250X only
Front master cylinder holder bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Front brake lever nut	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rear master cylinder bolt	M6	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Rear caliper protector bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rear brake caliper support bolt	M8	2	17 Nm (1.7 m•kg, 12 ft•lb)	
Rear master cylinder bracket bolt	M8	2	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Passenger footrest bolt (left)	M8	1	23 Nm (2.3 m•kg, 17 ft•lb)	
Passenger footrest bolt (right)	M8	1	30 Nm (3.0 m•kg, 22 ft•lb)	
Drive chain tensioner bolt (upper, lower)	M8	2	23 Nm (2.3 m•kg, 17 ft•lb)	
Drive chain adjuster locknut	M8	1	16 Nm (1.6 m•kg, 12 ft•lb)	
Front fork protector bolt	M6	6	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Seat bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Front brake lever adjusting locknut	M6	1	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Front brake master cylinder cap	M4	2	4 Nm (0.4 m•kg, 2.9 ft•lb)	
Front brake hose holder bolt	M6	1	10 Nm (1.0 m•kg, 7.2 ft•lb)	
Rear brake caliper pin plug	M10	1	2.5 Nm (0.25 m•kg, 1.8 ft•lb)	
Rear brake master cylinder lock nut	M6	1	12 Nm (1.2 m•kg, 8.7 ft•lb)	
Clutch lever holder bolt	M5	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Brake hose holder nut	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Damper rod nut	M10	2	15 Nm (1.5 m•kg, 11 ft•lb)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Headlight unit bolt	M6	2	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Rear brake hose holder screw	M5	5	2 Nm (0.2 m•kg, 1.4 ft•lb)	
Front drive chain guide bolt	M6	1	7 Nm (0.7 m•kg, 5.1 ft•lb)	
Delivery pipe screw	M6	2	5 Nm (0.5 m•kg, 3.6 ft•lb)	
Canister cover bolt	M6	4	7 Nm (0.7 m•kg, 5.1 ft•lb)	

NOTE:

- Tighten the lower ring nut with the 38 Nm (3.8 m•kg, 27 ft•lb) torque.
- Turn the front fork to the left and right. The rotation motion must be smooth.
- Fully loosen the lower ring nut, and retighten it with the 7 Nm (0.7 m•kg, 5.1 ft•lb) torque.

LUBRICATION POINTS AND LUBRICANT TYPES

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LUBRICATION POINTS AND LUBRICANT TYPES

EAS20370

ENGINE

Lubrication points	Lubrication types
Oil seal lips	
O-rings	
Bearings	
Camshaft cap bolt head	
Cylinder head bolt threads	
Camshaft profile, journal	
Decompression system moving parts	
Valve stem, stem end	
Valve lifter surface	
Crank assembly (crankshaft pin surface)	
Both sliding surfaces of connecting rod big end	
Piston pin surface	
Piston surface	
Cylinder body inner surface	
Impeller shaft	
Oil pump assembly shaft	
Oil pump assembly drain port	
Idle gear inner diameter and end, idle gear shaft and end	
Throttle body joint	
Rotor boss end surface	
Thrust gear surface	
Starter clutch assembly	
Rotor assembly	
Shaft surface (crankcase bearings)	
Idle gear-2 inner surface, thrust surfaces	
Damper assembly shaft, thrust surfaces	

LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication points	Lubrication types
Push rod 1 surface, end	
Ball (push rod)	
Primary driven gear assembly, inner surface	
Push lever assembly end	
Transmission gears (wheel and pinion)	
Main axle and drive axle	
Shift drum	
Shift fork and shift fork guide bars	
Shift shaft	
Shift shaft washer, spacer inner surface	
Cylinder head cover gasket	Yamaha bond No. 1215 (Three Bond No. 1215®)
Cylinder head semicircular surface	Yamaha bond No. 1215 (Three Bond No. 1215®)
Crankcase mating surface	Yamaha bond No. 1215 (Three Bond No. 1215®)
Stator assembly lead grommet	Yamaha bond No. 1215 (Three Bond No. 1215®)

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CHASSIS

Lubrication points	Lubrication types
Upper bearings and oil seal lip (steering head)	
Lower bearings and oil seal lip (steering head)	
Handle lower holder threads	
Front wheel oil seal (left/right)	
Rear wheel oil seal (left/right)	
Brake pedal bolt, boss	
Throttle cable end and throttle grip	
Throttle cable housing inner surface	
Throttle cable	

LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication points	Lubrication types
Brake lever bolt	
Brake lever and front brake master cylinder	
Adjusting screw (brake lever)	
Rear brake master cylinder push rod (boot mount groove)	
Brake caliper piston seal	
Brake caliper dust seal	
Brake caliper support bolt	
Brake pad support bolt	
Clutch lever cable	
Clutch lever bolt	
Clutch lever	
Pivot shaft	
Swing arm bearing, collar, spacer, and oil seal	
Relay arm bearing, collar, and oil seal	
Connecting rod bearing, collar and oil seal	
Connecting rod bolt	
Rear shock absorber assembly lower bolt	
Rear wheel axle	
Sidestand switch	
Sidestand bracket and sidestand	
Sidestand spring and link	
Sidestand bolt collar	
Drive chain tensioner roller collar (upper)	

LUBRICATION POINTS AND LUBRICANT TYPES

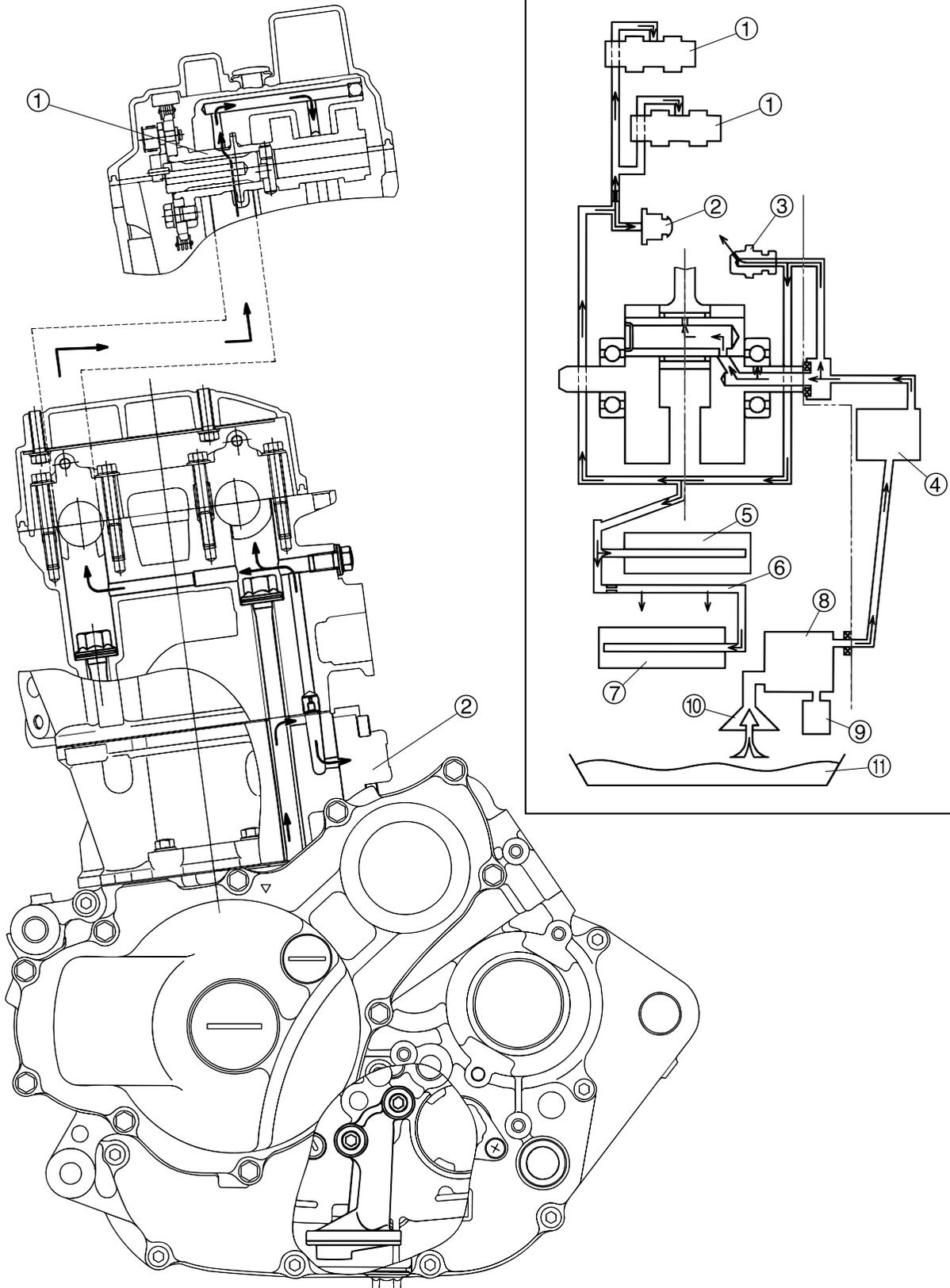
LUBRICATION SYSTEM CHART AND DIAGRAMS

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LUBRICATION SYSTEM CHART AND DIAGRAMS

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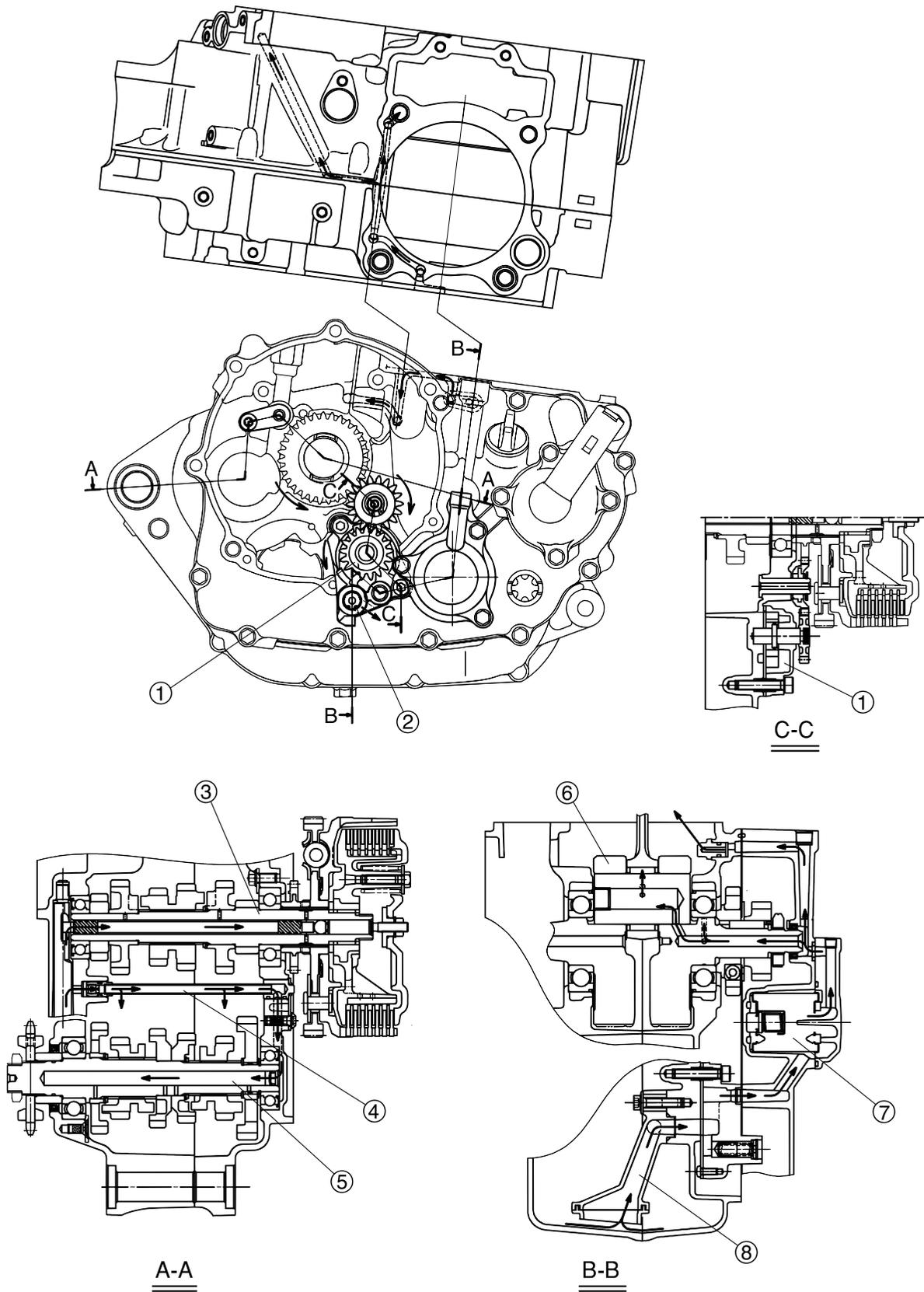
LUBRICATION DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Camshaft
2. Timing chain tensioner
3. Piston cooler
4. Oil filter
5. Main axle
6. Delivery pipe
7. Drive axle
8. Oil pump
9. Relief valve
10. Oil strainer
11. Oil pan

LUBRICATION SYSTEM CHART AND DIAGRAMS



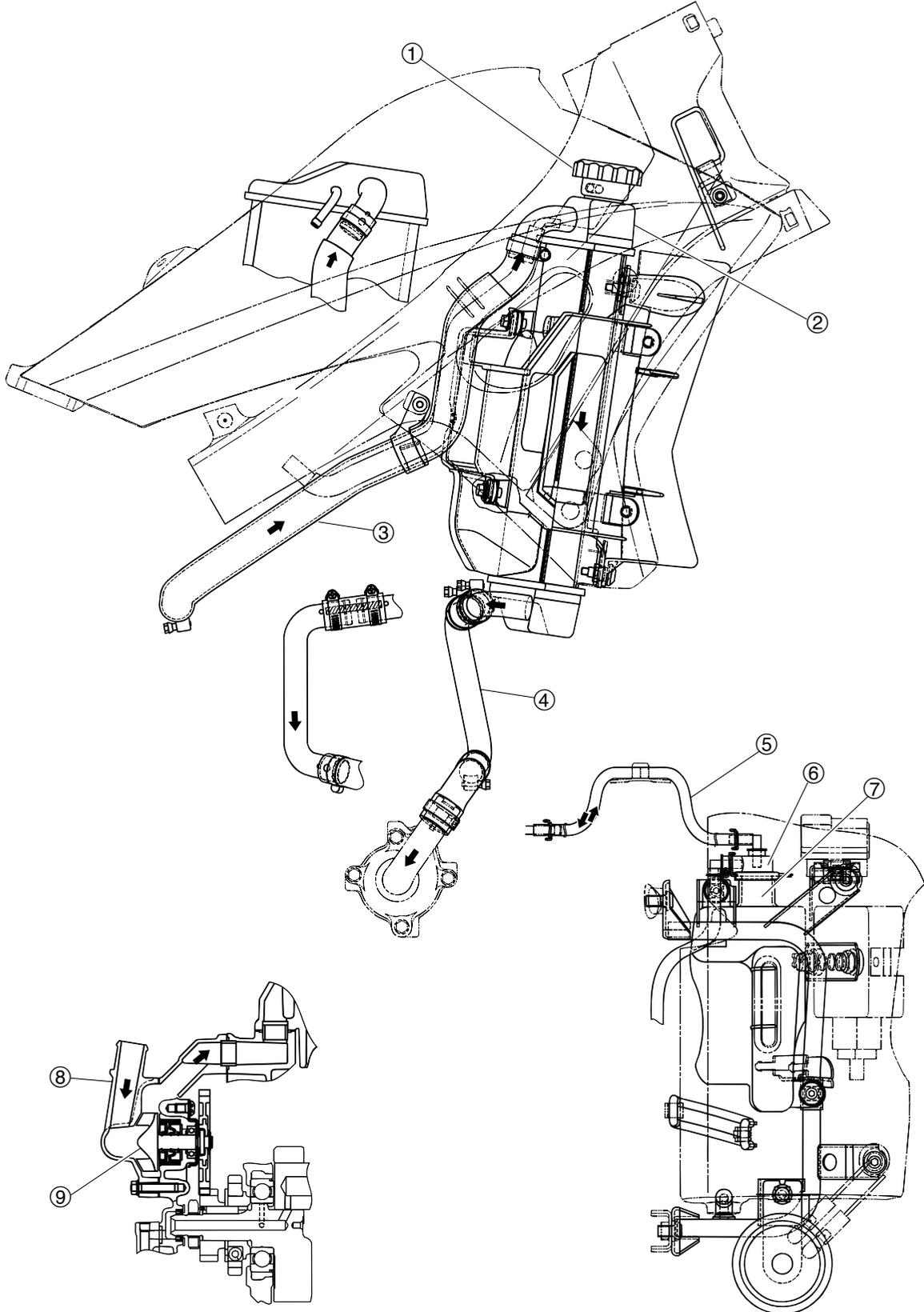
LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil pump assembly
2. Relief valve
3. Main axle
4. Delivery pipe
5. Drive axle
6. Crankshaft
7. Oil filter
8. Oil strainer

COOLING SYSTEM DIAGRAMS

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COOLING SYSTEM DIAGRAMS

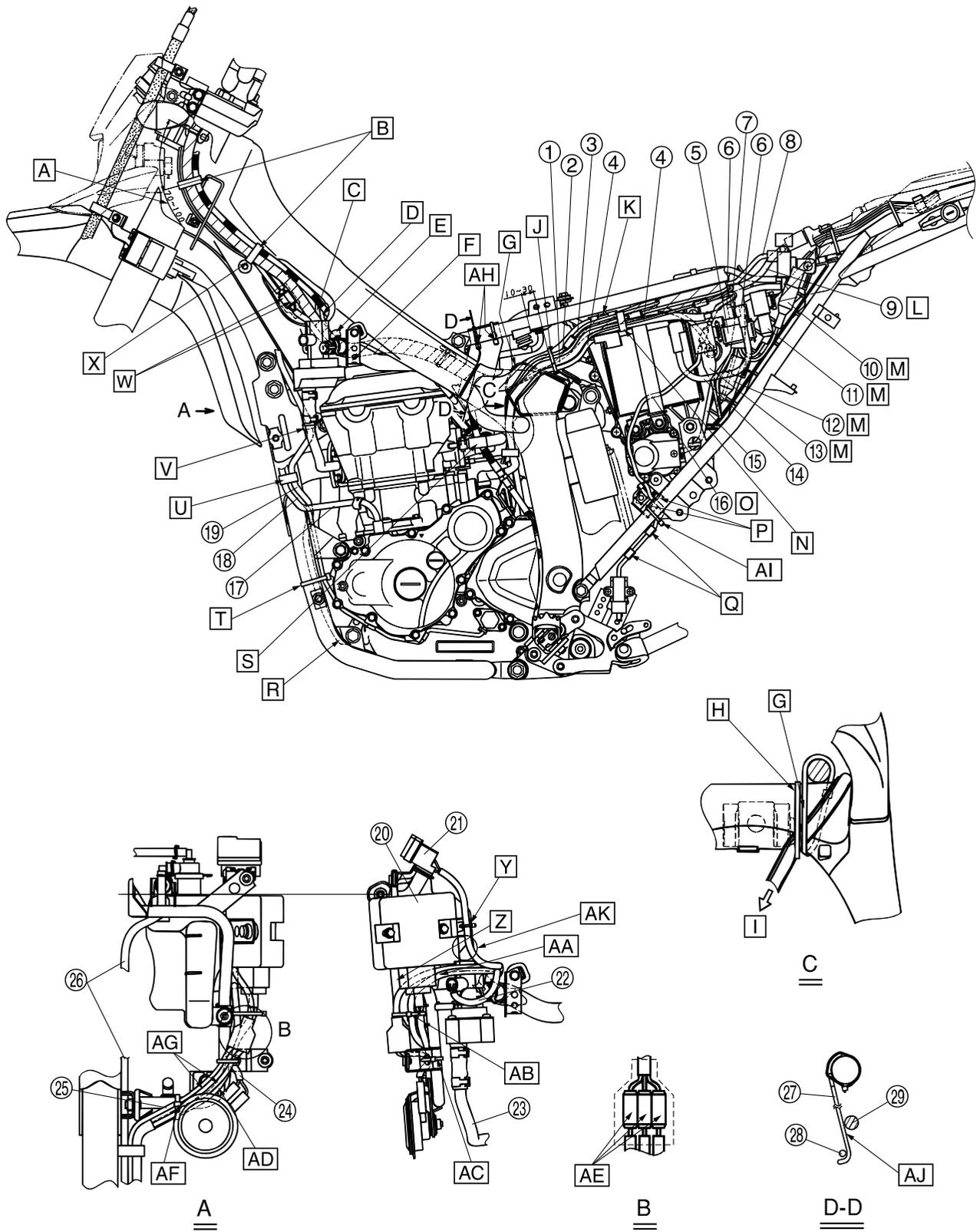


COOLING SYSTEM DIAGRAMS

1. Radiator cap
2. Radiator
3. Radiator inlet hose
4. Radiator outlet hose
5. Recovery tank hose
6. Cap
7. Side cover stay
8. Water pump housing cover
9. Impeller shaft

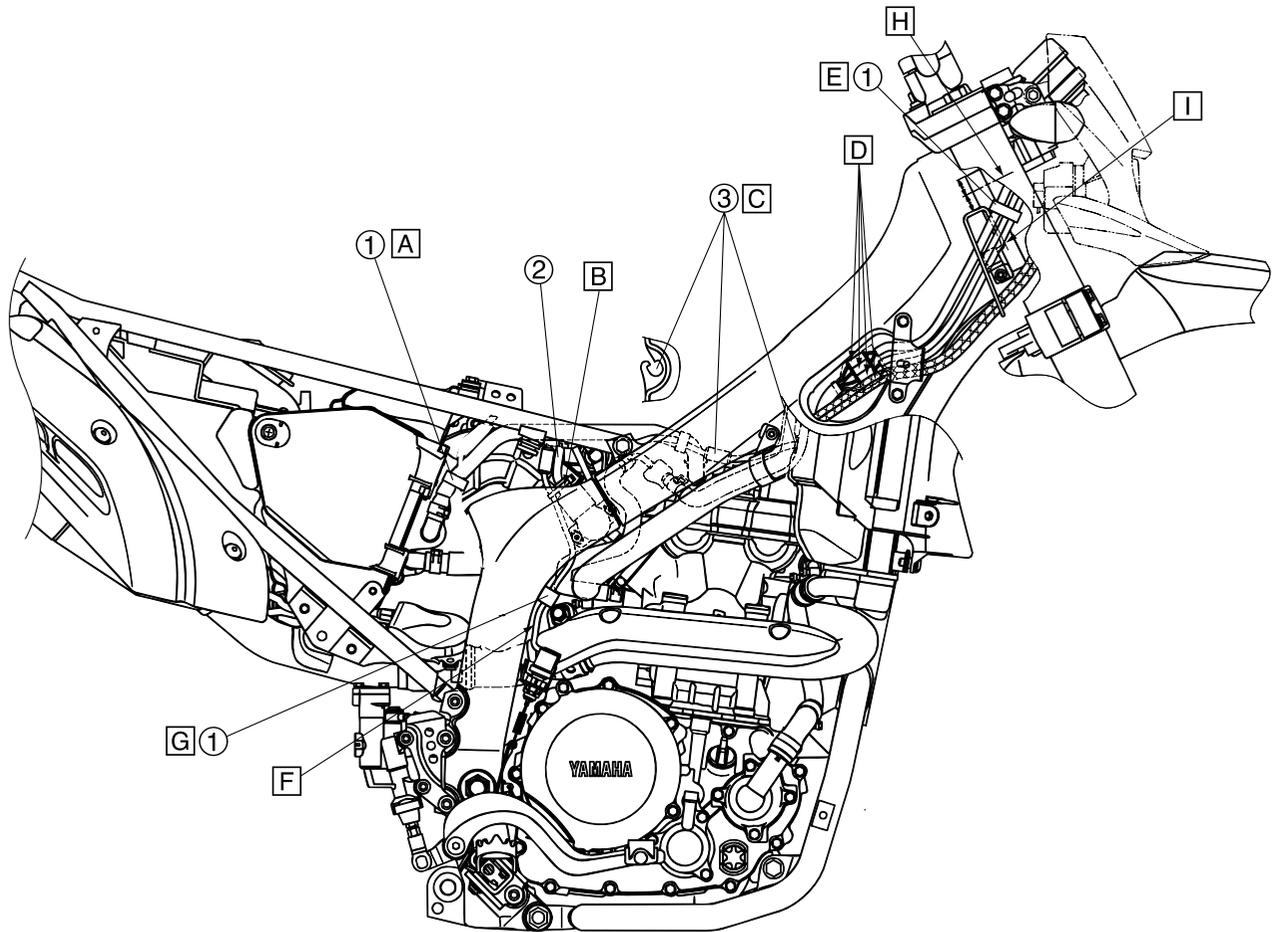
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CABLE ROUTING



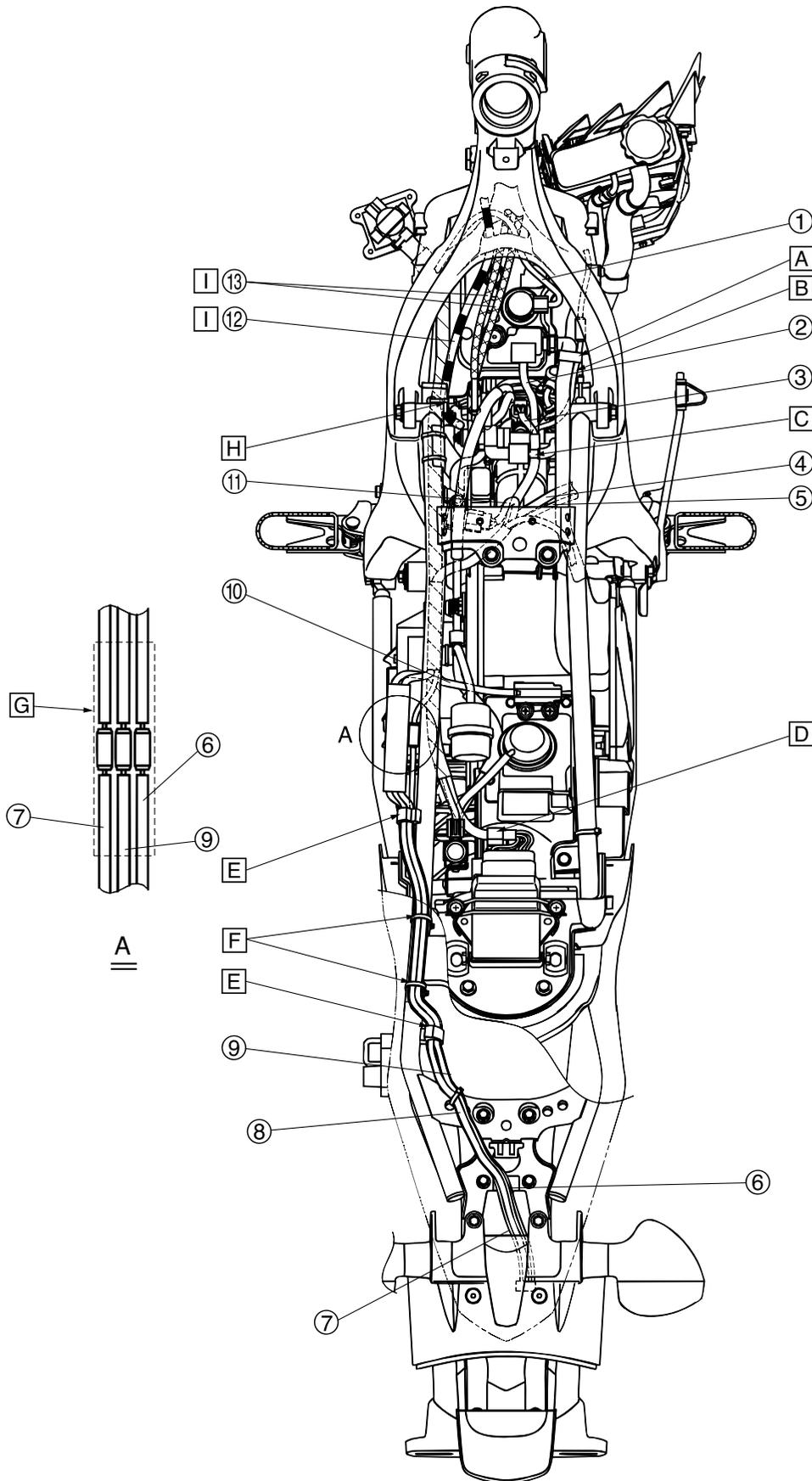
1. Starter motor lead
 2. Coolant temperature sensor lead
 3. Speed sensor lead
 4. Negative battery lead
 5. Starter relay
 6. Starter relay probe
 7. Starter relay lead
 8. Intake solenoid lead
 9. ECU lead
 10. Headlight relay
 11. Turn signal relay
 12. Radiator fan motor relay
 13. Relay unit
 14. Positive battery lead
 15. EXUP servo motor lead
 16. Sidestand switch lead
 17. AC magneto lead
 18. Neutral switch lead
 19. Recovery tank hose
 20. Rectifier/regulator
 21. Fuse box
 22. Air cut-off valve lead
 23. Air induction system pipe
 24. Horn lead
 25. Neutral switch lead
 26. Recovery tank hose
 27. Cover
 28. Clutch cable
 29. Wire harness
- A. Dimensions of wire harness fastening.
 - B. Fasten the wire harness, clutch cable, clutch switch lead, and left handlebar switch lead using a cable tie. Place the clutch cable at the top position. The others can be in any position.
 - C. Route the wire harness under the clutch cable, above the throttle cable, and along the right side of vehicle.
 - D. Pass the ignition lead under the clutch cable, above the throttle cable, and through the hole inside of frame tank rail.
 - E. Wire harness branch (at left side of vehicle) connected to the fuse box, AC magneto and others.
 - F. Securely insert the wire harness clamp into the T-stud of cable holder.
 - G. Fasten the wire harness, starter motor lead, negative battery lead, coolant temperature sensor lead, and speed sensor lead to the frame with a cable tie.
 - H. Fasten the starter motor lead, negative battery lead, coolant temperature sensor lead, and speed sensor lead to the frame with a cable tie. Fasten them to the outside of RCU mounting boss (left).
 - I. To engine.
 - J. Fasten the wire harness, starter motor lead, negative battery lead, coolant temperature sensor lead, and speed sensor lead using a cable tie.
 - K. Securely insert the wire harness clamp into the T-stud of the rear frame.
 - L. Pass the ECU lead between the intake solenoid hose and connector.
 - M. Wrap the connectors with a cover for protection.
 - N. Fasten the starter motor lead, negative battery lead, coolant temperature sensor lead, and speed sensor lead using a cable tie. Fasten them between the battery band and battery terminals, and face their cable lock inward.
 - O. Route the sidestand switch lead to the inside of battery band.
 - P. Fasten the rear frame and sidestand switch lead using a cable tie.
 - Q. Fasten the rear frame, sidestand switch lead using a cable tie. They must be fixed to the T-stud of the rear frame. Any locking position can be used.
 - R. Position the recovery tank hose end between the engine bracket and down tube.
 - S. Pass the clutch cable through the inside of FID hose.
 - T. Fasten the neutral switch lead, and recovery tank hose to the down tube with a cable tie. An excess must face inward.
 - U. Fasten the AC magneto lead, neutral switch lead, and recovery tank hose to the down tube with a cable tie. They must be fixed to the T-stud of down tube. Any locking position can be used.
 - V. Fasten the recovery tank hose to the down tube with clamps. They must be fixed to the T-stud of down tube. Any locking position can be used.
 - W. After cable connection, place the connectors in the cover, and mount them in a hole of the frame.
 - X. Clamp the wire harness, clutch cable and clutch switch lead (6-pin natural color) at the top of sidecover stay mount boss.
 - Y. Fix the fuse box lead to the side cover stay.
 - Z. Pass the AC magneto lead and neutral switch lead through the behind of rectifier regulator.
 - AA. Pass the horn lead through the behind of rectifier regulator.
 - AB. Fasten the magneto lead, horn lead, and the top of cover (for AC magneto lead and neutral switch lead) using a cable tie. An excess must face inward. (The bare conductors of lead can be clamped.)
 - AC. Fasten the sidecover stay, AC magneto lead, neutral switch lead, and horn lead using a cable tie. An excess must face forward.
 - AD. The AC magneto lead and neutral switch lead must not contact with the horn.
 - AE. After connecting the AC magneto lead and neutral switch lead, place their connectors in the cover.
 - AF. Fasten the sidecover stay, AC magneto lead, and neutral switch lead using a cable tie.
 - AG. Rotate the AC magneto lead to the cover.
 - AH. Fasten the rear frame cover using a cable tie. The clamp lock must face downwards.
 - AI. Fasten the sidestand switch lead to the rear frame with a cable tie. Pass the lead through the hole of rear frame bracket, and direct the clamp lock to the inside of the frame.
 - AJ. Install the cover between of the wire harness (inside) and clutch cable (outside).
 - AK. Do not route the AC magneto lead, neutral switch lead, horn lead and air induction lead above the air cut-off valve assembly.

CABLE ROUTING



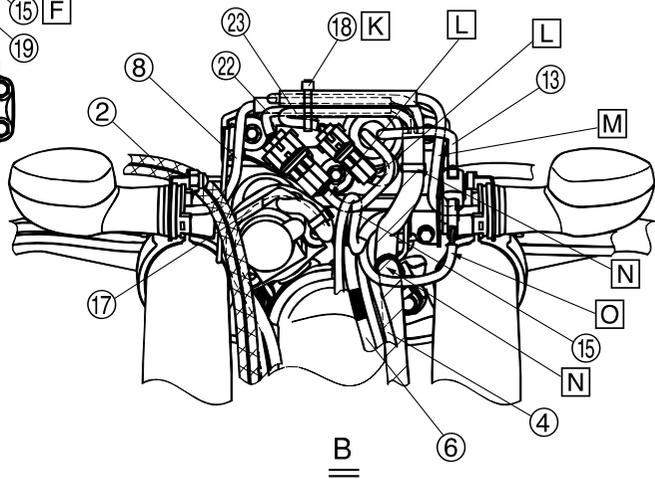
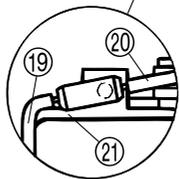
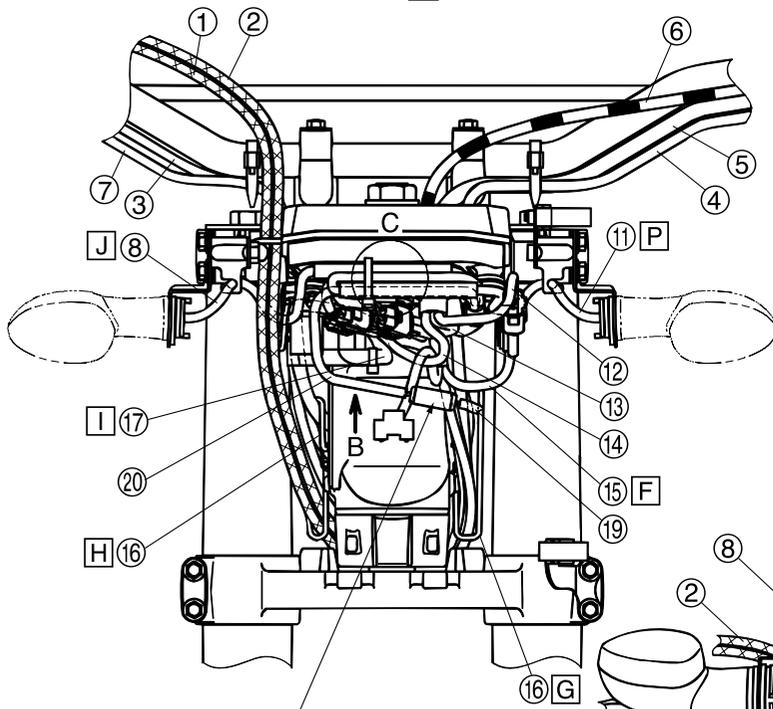
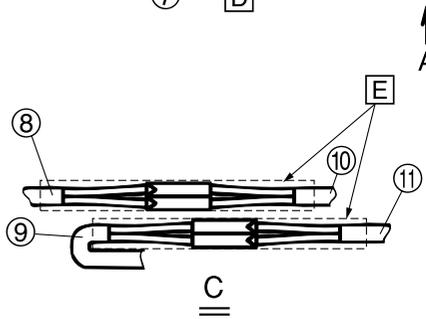
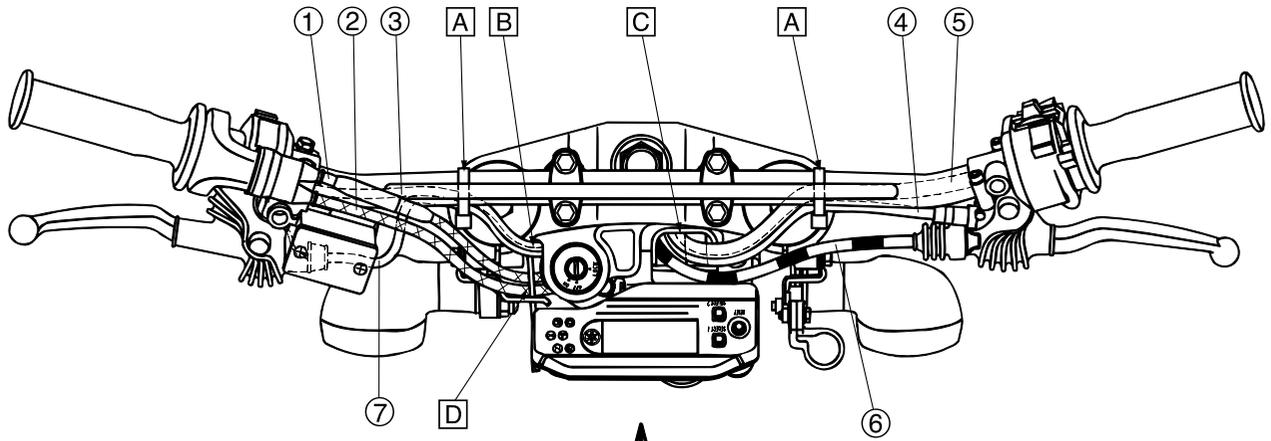
1. Clamp
 2. Throttle position sensor lead
 3. Fan motor lead
- A. Fasten the breather hose using a clamp.
 - B. Fasten the throttle position sensor connector cover and the rear brake switch lead using a cable tie.
 - C. Insert the fan motor lead into the concave section of guide air, and pass them backward through the hole.
 - D. After connecting the main switch lead, front brake switch lead, and handlebar right lead, and place their connectors in the cover.
 - E. Fasten the main switch lead, front brake switch lead, and handlebar switch right lead using a clamp. They must be placed between the front edge of the cable guide and below the "H", within the range of the handlebar turns from straight ahead to the fully left.
 - F. Slightly pull out the end of rear brake switch lead backward.
 - G. Fasten the rear brake switch lead to the frame with a clamp. The clamp must be securely inserted into the frame hole. Any locking position can be used.
 - H. The position is a between the halfway from the cable guide and the upperend of the frame number.
 - I. Front edge of the cable guide

CABLE ROUTING



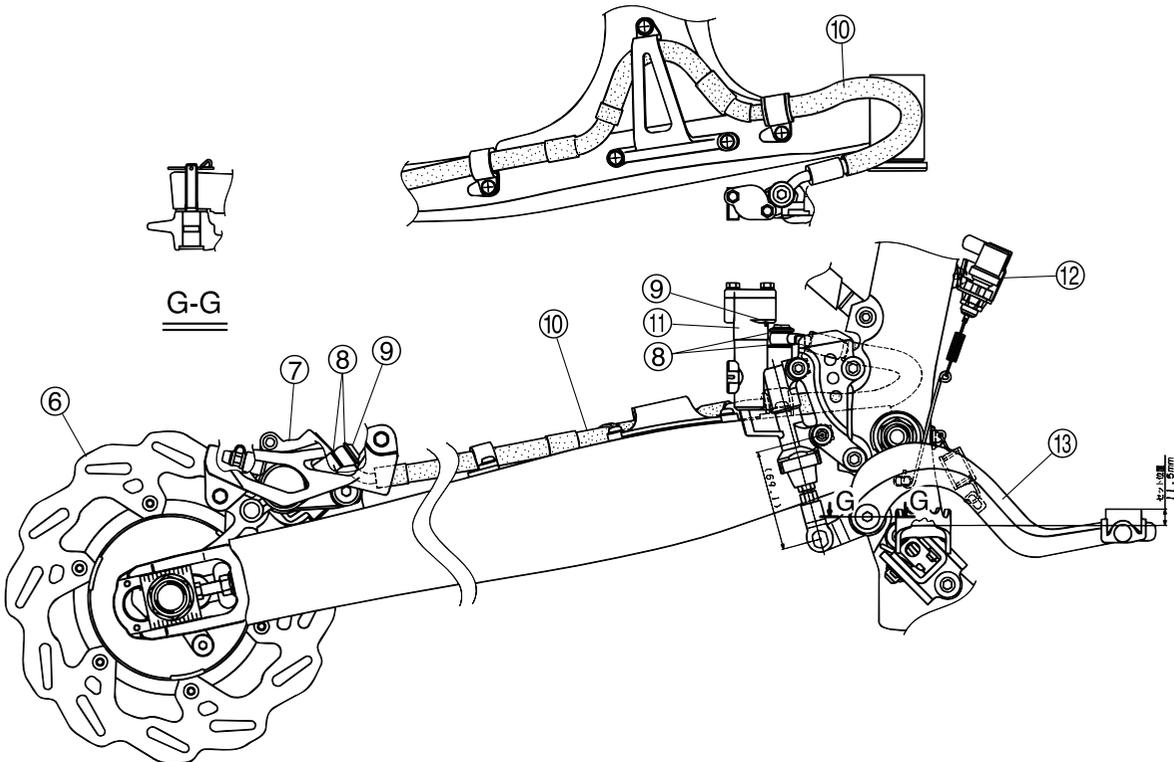
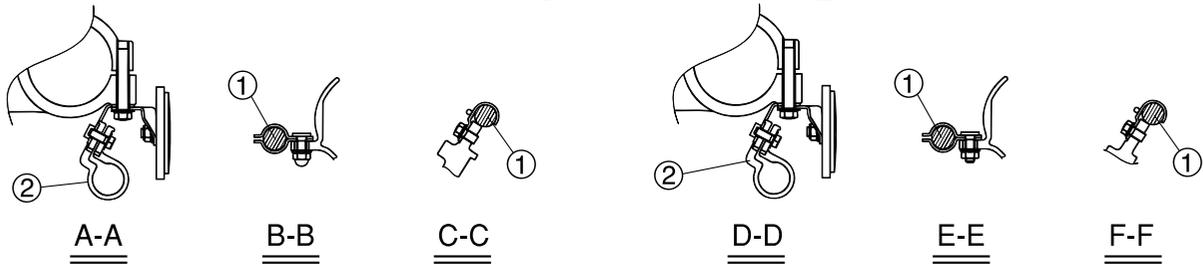
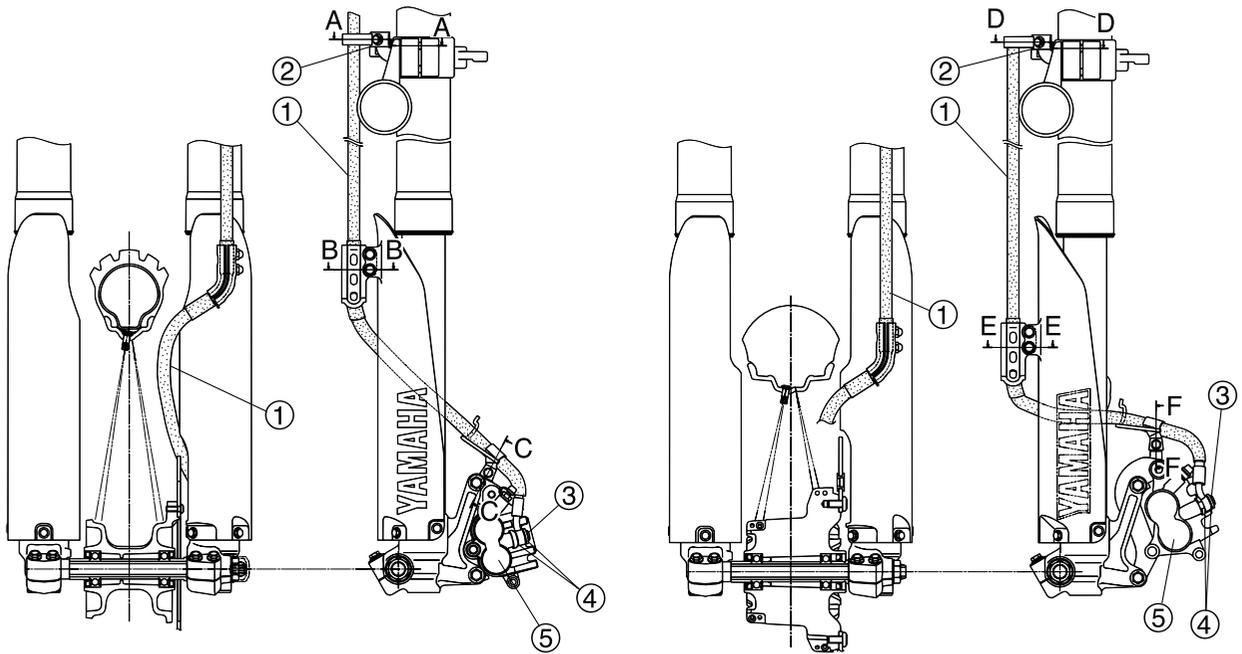
1. Ignition coil lead
 2. Fuel pump lead
 3. Injector lead
 4. Throttle position sensor lead
 5. Rear brake switch lead
 6. Right rear turn signal light lead
 7. License plate light lead
 8. Taillight lead
 9. Left rear turn signal light lead
 10. Lean angle sensor lead
 11. Intake air pressure sensor lead
 12. Clutch cable
 13. Throttle cable
-
- A. Fasten the radiator fan motor lead and breather hose using a clamp. The rightmost end of breather hose must be secured (to the front as much as possible).
 - B. Pass the radiator fan motor lead under the breather hose, and pull them out.
 - C. Pass the injector lead between the fuel pipe.
 - D. Fasten the ECU lead using a clamp.
 - E. Fasten the right and rear left turn signal light lead, license plate light lead, and taillight lead to the rear frame with a clamp.
 - F. Fasten the right and left rear turn signal light lead, license plate light lead, and taillight lead to the rear frame with a cable tie.
 - G. After connection of lead, place the connector in the cover so that bare conductors are not exposed.
 - H. Fasten the frame cover, wire harness, and clutch cables to the frame with a cable tie.
 - I. A silicone hydrate can be applied when passing the clutch cable or throttle cable through the internal hole of frame tank rails.

CABLE ROUTING



1. Throttle cable (accelerator)
 2. Throttle cable (decelerator)
 3. Right handlebar switch lead
 4. Clutch switch lead
 5. Left handlebar switch lead
 6. Clutch cable
 7. Front brake switch lead
 8. Left front turn signal light lead
 9. Wire harness (brown connector)
 10. Wire harness (green connector)
 11. Left front turn signal light lead
 12. Meter lead (3-pin black coupler)
 13. Meter lead (4-pin natural color coupler)
 14. Meter lead (3-pin natural color coupler)
 15. Left handlebar switch lead (headlight lead)
 16. Cable guide
 17. Main switch lead
 18. Clamp
 19. Auxiliary light lead
 20. Wire harness (2-pin natural color coupler)
 21. Stopper (headlight stay)
 22. Wire harness (3-pin natural color coupler)
 23. Wire harness (4-pin natural color coupler)
- A. Clamp near the end of bent handlebar section using a clamp.
 - B. Route the handlebar switch right lead and front brake switch lead through the side of main switch, and extend to the side of head pipe.
 - C. Place the clutch cable in the right position. The others can be in any position.
 - D. Pass the throttle cable between the cable guides of right turn signal light stay and meter stay.
 - E. Place the lead in the hose so that bare conductors are not exposed.
 - F. Pass the left handlebar switch lead above the meter lead (3-pin natural color coupler) as shown, and connect them to the headlight assembly.
 - G. Pass the wire harness, clutch cable, clutch switch lead and handlebar switch left lead through the wire guide. Route the clutch cable in the top position. The others can be in any position.
 - H. Pass the throttle cable, front brake switch lead, right handlebar switch lead, and main switch lead through the wire guide. Place the throttle cable in the top position. The others can be in any position.
 - I. Route the main switch lead upward to the side of head pipe. Do not route the main switch lead to the outside of meter stay cable guide.
 - J. Pass the right front turn signal light lead through headlight cowling stay as shown, and then through the inside of meter stay cable guide from behind the throttle cable, and connect them inside of the meter.
 - K. Fasten the right and left front turn signal light lead and wire harnesses using a cable tie. Insert the cable tie into the meter stay, and face the lock downward. Cut and remove an excess if any.
 - L. Insert the meter lead (3-pin natural color coupler) under the meter stay, and connect them.
 - M. Route the left front turn signal light lead above the meter lead from behind the handlebar switch left lead, and connect them at the meter position.
 - N. Insert the wire harness clamps by inserting the two harness clamps into the hole of the meter stay.
 - O. Install the left handlebar switch lead by inserting them into the space at the side of meter stay.
 - P. Pass the front left turn signal light lead through headlight cowling stay as shown, and then through the above of meter lead (3-pin black) from behind the handlebar switch lead (3-pin black), and connect them inside of the meter.

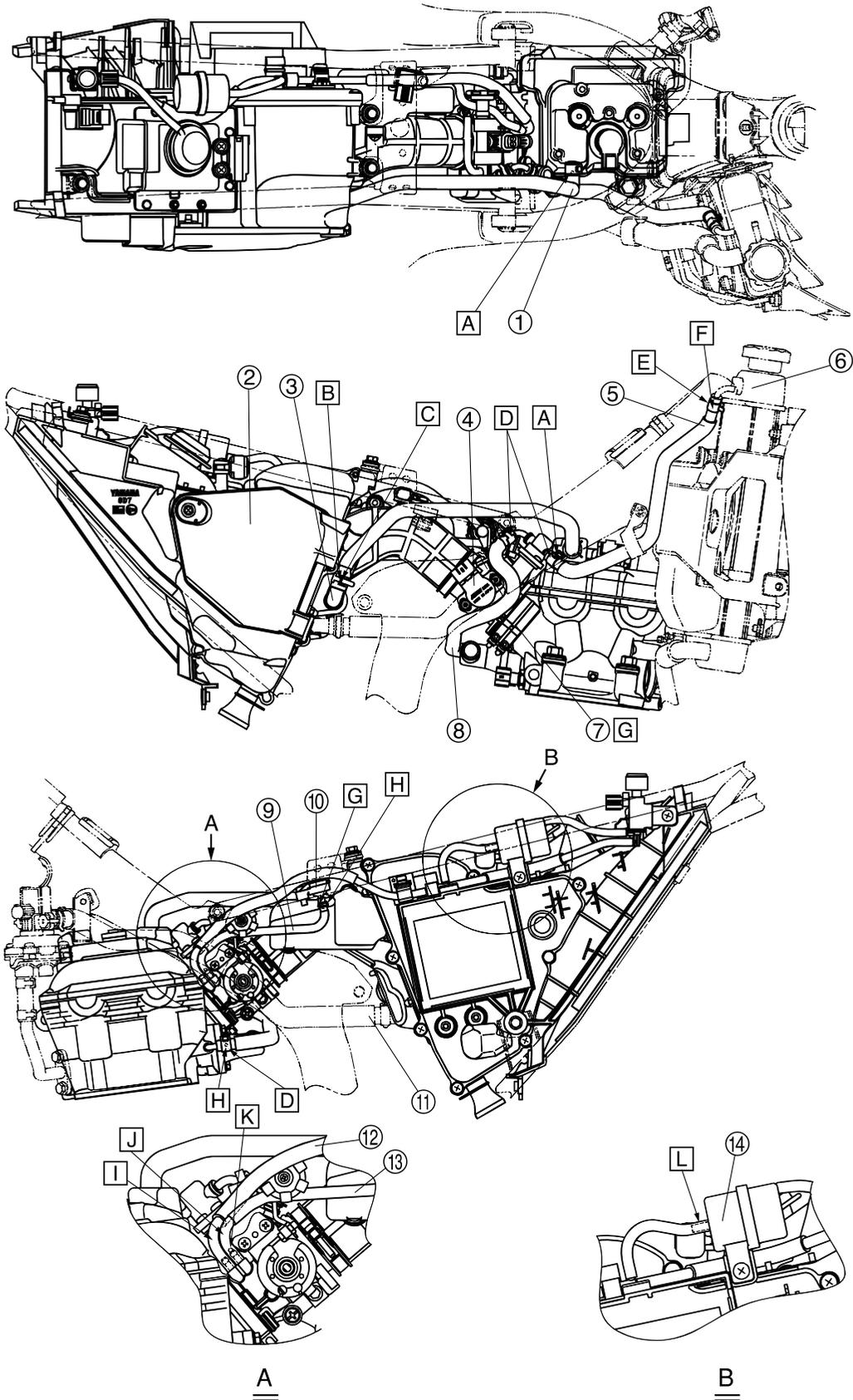
Front rear brake hose



Front rear brake hose

1. Front brake hose
2. Hose guide
3. Union bolt
4. Copper washer
5. Front brake caliper assembly
6. Rear brake disc
7. Rear brake caliper assembly
8. Copper washer
9. Union bolt
10. Rear brake hose
11. Rear brake master cylinder
12. Rear brake switch
13. Brake pedal

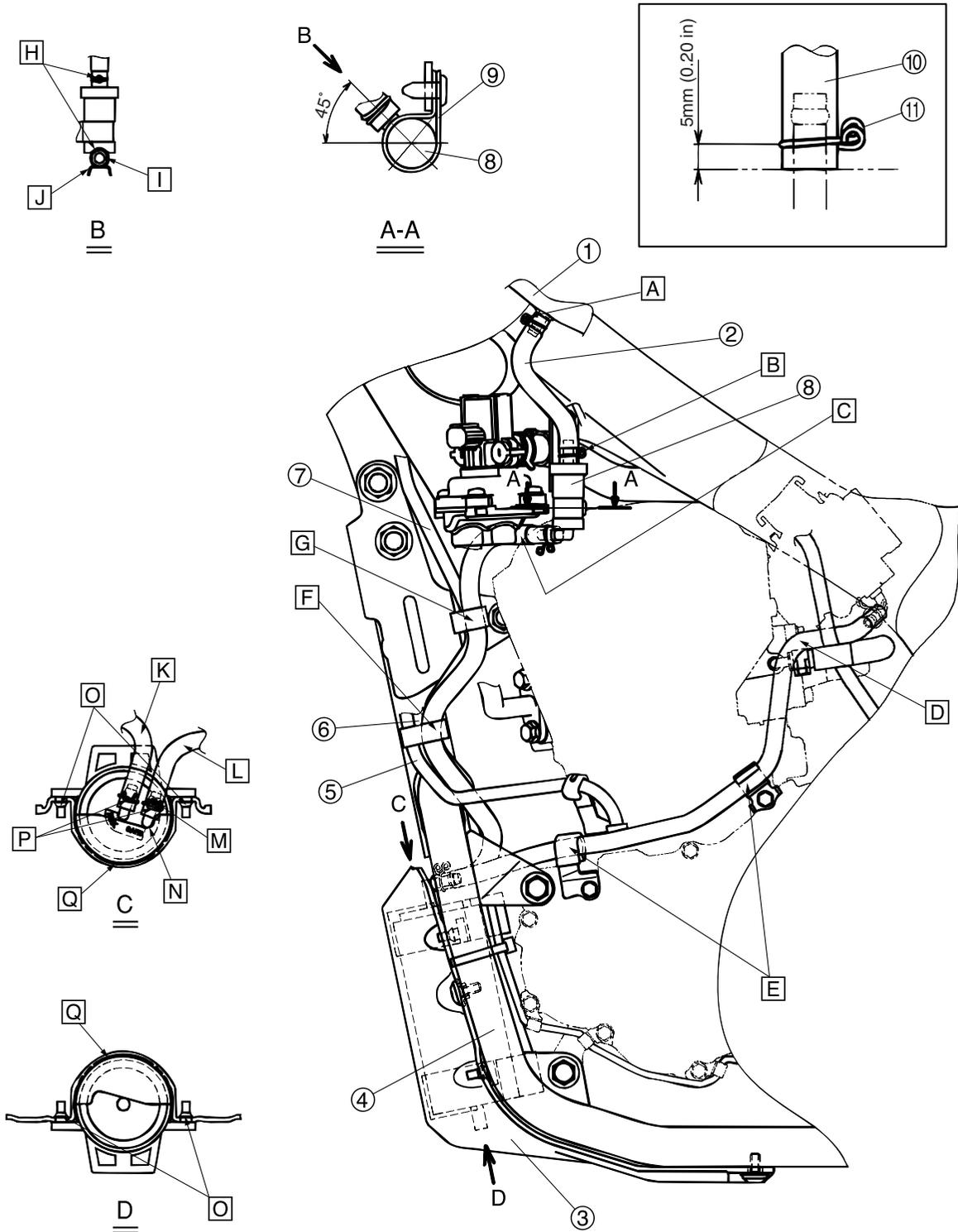
Throttle body



1. Breather hose
 2. Air filter case assembly
 3. Pipe
 4. Throttle body assembly
 5. Radiator inlet hose
 6. Radiator
 7. Throttle body joint
 8. FID hose
 9. Vacuum hose
 10. Pressure sensor
 11. Bend hose
 12. ITS boost hose
 13. Air induction system hose
 14. Surge tank
-
- A. Face the white paint upward of the vehicle.
 - B. Face the white paint mark to the right side of vehicle.
 - C. Face the clip holder to the right front of vehicle.
 - D. Face the clip holder upward of the vehicle.
 - E. Face the white paint mark backward of the vehicle.
 - F. Face the clip holder to the front side of vehicle.
 - G. Align the throttle body joint with the hose clamp.
 - H. Face the white paint mark to the left side of vehicle.
 - I. Insert the IST boost hose into position until it is stopped.
 - J. Install the vacuum hose to the air-filter case until it is stopped.
 - K. Face the yellow paint mark to the left of vehicle.
 - L. Connect the tank surge hose until it is stopped.

Canister (for California)

Canister (for California)



Canister (for California)

1. Fuel tank
2. Hose (Fuel tank–roll over valve)
3. Canister cover
4. Canister
5. A.C. magneto lead
6. Neutral switch lead
7. Recovery tank hose
8. Roll over valve
9. Holder
10. Hose
11. Clip
 - A. Face the clip end forward of the vehicle.
 - B. Face the clip end backward of the vehicle.
 - C. Pass the hose (roll over valve–canister) between the engine head and air cut-off valve assembly.
 - D. Route the hose (canister–throttle body) to the up side of the FID hose, and then route it to the inside the clutch wire.
 - E. Hold the hose (canister–throttle body) through the 2 clamps securely.
 - F. Fasten the A.C. magneto lead, neutral switch lead, recovery tank hose, and the hose (roll over valve–canister) using the clamp. Install the clamp to T stud of the down tube securely.
 - G. Fasten the recovery tank hose and the hose (roll over–canister). Install the clamp to T stud of the down tube. Face the lock part forward of the vehicle.
 - H. Align the paint mark with the projection of the bottom of the roll over valve.
 - I. Face the paint leftward of the vehicle.
 - J. Face the clip end downward of the vehicle.
 - K. From the roll over valve.
 - L. To the throttle body.
 - M. Face the paint upward of the vehicle.
 - N. Align the slot of the damper with the pipe of the throttle body side.
 - O. Insert the projection of the canister damper to the hole of canister cover.
 - P. Face the clip end upward of the vehicle.
 - Q. When the canister cover install, you may spread the soapy water to the damper as shown. However, do not spread the soapy water to the projection of the damper and the hole of the canister cover.

PERIODIC CHECKS AND ADJUSTMENTS

PERIODIC MAINTENANCE	3-1
INTRODUCTION.....	3-1
Periodic maintenance chart for the emission control system	3-1
ENGINE	3-4
ADJUSTING THE VALVE CLEARANCE	3-4
ADJUSTING THE ENGINE IDLING SPEED.....	3-6
ADJUSTING THE THROTTLE CABLE FREE PLAY	3-6
CHECKING THE SPARK PLUG	3-8
CHECKING THE IGNITION TIMING.....	3-8
MEASURING THE COMPRESSION PRESSURE.....	3-9
CHECKING THE ENGINE OIL LEVEL	3-10
CHANGING THE ENGINE OIL	3-11
ADJUSTING THE CLUTCH CABLE FREE PLAY.....	3-12
CLEANING THE AIR FILTER ELEMENT	3-13
CHECKING THE THROTTLE BODY JOINT.....	3-14
CHECKING THE FUEL LINE	3-14
CHECKING THE CYLINDER HEAD BREATHER HOSE	3-15
CHECKING THE EXHAUST SYSTEM	3-15
ADJUSTING THE EXUP CABLES.....	3-15
CLEANING THE SPARK ARRESTER.....	3-16
CHECKING THE CANISTER (FOR CALIFORNIA ONLY).....	3-17
CHECKING THE COOLANT LEVEL.....	3-17
CHECKING THE COOLING SYSTEM.....	3-17
CHANGING THE COOLANT	3-18
CHASSIS	3-20
ADJUSTING THE FRONT DISC BRAKE.....	3-20
ADJUSTING THE REAR DISC BRAKE	3-20
CHECKING THE BRAKE FLUID LEVEL	3-21
CHECKING THE FRONT BRAKE PADS.....	3-21
CHECKING THE REAR BRAKE PADS	3-22
CHECKING THE FRONT BRAKE HOSE	3-22
CHECKING THE REAR BRAKE HOSE.....	3-22
ADJUSTING THE REAR BRAKE LIGHT SWITCH.....	3-22
BLEEDING THE HYDRAULIC BRAKE SYSTEM	3-23
ADJUSTING THE DRIVE CHAIN SLACK.....	3-24
LUBRICATING THE DRIVE CHAIN.....	3-24
CHECKING AND ADJUSTING THE STEERING HEAD.....	3-25
CHECKING THE FRONT FORK.....	3-26
ADJUSTING THE FRONT FORK LEGS.....	3-26
AIR BLEEDING FROM FRONT FORK	3-27
ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY.....	3-27
CHECKING THE TIRES.....	3-29
CHECKING THE WHEELS	3-31
CHECKING AND TIGHTENING THE SPOKES.....	3-31
CHECKING AND LUBRICATING THE CABLES	3-31
LUBRICATING THE LEVERS.....	3-31
LUBRICATING THE PEDAL	3-32
LUBRICATING THE SIDESTAND	3-32

ELECTRICAL SYSTEM	3-33
CHECKING AND CHARGING THE BATTERY	3-33
CHECKING THE FUSES	3-33
REPLACING THE HEADLIGHT BULB	3-33
ADJUSTING THE HEADLIGHT BEAM	3-33

PERIODIC MAINTENANCE

EAS20450

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.

EAS17580

Periodic maintenance chart for the emission control system

No.	ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
			600 mi (1000 km) or 1 month	4000 mi (6000 km) or 6 months	7000 mi (11000 km) or 12 months	10000 mi (16000 km) or 18 months	13000 mi (21000 km) or 24 months	16000 mi (26000 km) or 30 months	
1 *	Fuel line	<ul style="list-style-type: none"> ● Check fuel hoses for cracks or damage. ● Replace if necessary. 		√	√	√	√	√	
2	Spark plug	<ul style="list-style-type: none"> ● Check condition. ● Adjust gap and clean. ● Replace at 7000 mi (11000 km) or 12 months and thereafter every 6000 mi (10000 km) or 12 months. 		√	Replace.	√	Replace.	√	
3	Spark arrester	<ul style="list-style-type: none"> ● Clean. 		√	√	√	√	√	
4 *	Valve clearance	<ul style="list-style-type: none"> ● Check and adjust valve clearance when engine is cold. 	Every 26600 mi (42000 km)						
5 *	Crankcase breather system	<ul style="list-style-type: none"> ● Check breather hose for cracks or damage. ● Replace if necessary. 		√	√	√	√	√	
6 *	Exhaust system	<ul style="list-style-type: none"> ● Check for leakage. ● Tighten if necessary. ● Replace gasket(s) if necessary. 		√	√	√	√	√	
7 *	Evaporative emission control system (For California only)	<ul style="list-style-type: none"> ● Check control system for damage. ● Replace if necessary. 			√		√		
8 *	Air induction system	<ul style="list-style-type: none"> ● Check the air cut-off valve, reed valve, and hose for damage. ● Replace any damaged parts. 			√		√		

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

General maintenance and lubrication chart

EAS32164

General maintenance and lubrication chart

No.	ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
			600 mi (1000 km) or 1 month	4000 mi (6000 km) or 6 months	7000 mi (11000 km) or 12 months	10000 mi (16000 km) or 18 months	13000 mi (21000 km) or 24 months	16000 mi (26000 km) or 30 months	
1 *	Air filter element	<ul style="list-style-type: none"> ● Clean with solvent. ● Replace if necessary. 		√	√	√	√	√	√
2 *	Clutch	<ul style="list-style-type: none"> ● Check operation. ● Adjust or replace cable. 	√	√	√	√	√	√	√
3 *	Front brake	<ul style="list-style-type: none"> ● Check operation, fluid level, and for fluid leakage. ● Adjust brake lever free play and replace brake pads if necessary. 	√	√	√	√	√	√	√
4 *	Rear brake	<ul style="list-style-type: none"> ● Check operation, fluid level, and for fluid leakage. ● Replace brake pads if necessary. 	√	√	√	√	√	√	√
5 *	Brake hose	<ul style="list-style-type: none"> ● Check for cracks or damage. 		√	√	√	√	√	√
		<ul style="list-style-type: none"> ● Replace. 	Every 4 years						
6 *	Wheels	<ul style="list-style-type: none"> ● Check runout, spoke tightness and for damage. ● Tighten spokes if necessary. 		√	√	√	√	√	√
7 *	Tires	<ul style="list-style-type: none"> ● Check tread depth and for damage. ● Replace if necessary. ● Check air pressure. ● Correct if necessary. 		√	√	√	√	√	√
8 *	Wheel bearings	<ul style="list-style-type: none"> ● Check bearings for smooth operation. ● Replace if necessary. 		√	√	√	√	√	√
9 *	Swingarm pivot bearings	<ul style="list-style-type: none"> ● Check bearing assemblies for looseness. 		√	√	√	√	√	√
10	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 300 mi (500 km) and after washing the motorcycle or riding in the rain						
11 *	Steering bearings	<ul style="list-style-type: none"> ● Check bearing assemblies for looseness. ● Moderately repack with lithium-soap-based grease. 	√	√	√	√	Repack.	√	
12 *	Chassis fasteners	<ul style="list-style-type: none"> ● Check all chassis fitting and fasteners. ● Correct if necessary. 		√	√	√	√	√	
13	Brake lever pivot shaft	<ul style="list-style-type: none"> ● Apply silicone grease lightly. 		√	√	√	√	√	
14	Brake pedal pivot shaft	<ul style="list-style-type: none"> ● Apply lithium-soap-based grease lightly. 		√	√	√	√	√	
15	Clutch lever pivot shaft	<ul style="list-style-type: none"> ● Apply lithium-soap-based grease lightly. 		√	√	√	√	√	

No.	ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
			600 mi (1000 km) or 1 month	4000 mi (6000 km) or 6 months	7000 mi (11000 km) or 12 months	10000 mi (16000 km) or 18 months	13000 mi (21000 km) or 24 months	16000 mi (26000 km) or 30 months	
16	Sidestand pivot	<ul style="list-style-type: none"> ● Check operation. ● Apply lithium-soap-based grease lightly. 		√	√	√	√	√	√
17*	Sidestand switch	<ul style="list-style-type: none"> ● Check operation and replace if necessary. 	√	√	√	√	√	√	√
18*	Front fork	<ul style="list-style-type: none"> ● Check operation and for oil leakage. ● Replace if necessary. 		√	√	√	√	√	√
19*	Shock absorber assembly	<ul style="list-style-type: none"> ● Check operation and for oil leakage. ● Replace if necessary. 		√	√	√	√	√	√
20*	Rear suspension link pivots	<ul style="list-style-type: none"> ● Check operation. ● Correct if necessary. 			√		√		
21	Engine oil	<ul style="list-style-type: none"> ● Change (warm engine before draining). 	√	√	√	√	√	√	√
22	Engine oil filter element	<ul style="list-style-type: none"> ● Replace. 	√		√		√		
23*	Cooling system	<ul style="list-style-type: none"> ● Check hoses for cracks or damage. ● Replace if necessary. 		√	√	√	√	√	√
		<ul style="list-style-type: none"> ● Change with ethylene glycol anti-freeze coolant every 24 months. 					Change.		
24*	Front and rear brake switches	<ul style="list-style-type: none"> ● Check operation. 	√	√	√	√	√	√	√
25*	Control cables	<ul style="list-style-type: none"> ● Apply Yamaha chain and cable lube or engine oil SAE 10W-30 thoroughly. 	√	√	√	√	√	√	√
26*	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. 		√	√	√	√	√	√
27*	Lights, signals and switches	<ul style="list-style-type: none"> ● Check operation. ● Adjust headlight beam. 	√	√	√	√	√	√	√

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

NOTE:

From 19000 mi (31000 km) or 36 months, repeat the maintenance intervals starting from 7000 mi (11000 km) or 12 months.

NOTE:

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
 - After disassembling the brake master cylinders and calipers, always change the fluid. Regularly check the brake fluid levels and fill the reservoirs as required.
 - Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
 - Replace the brake hoses every four years and if cracked or damaged.

EAS20471

ENGINE

EAS20520

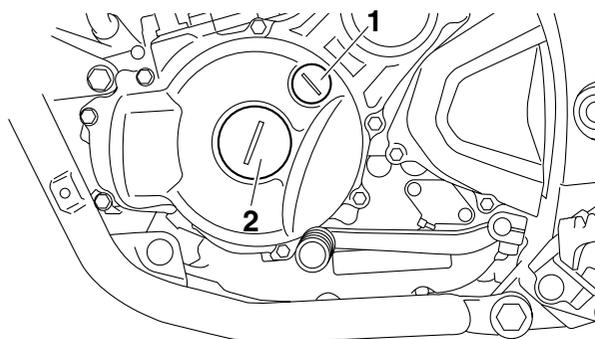
ADJUSTING THE VALVE CLEARANCE

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:
 - Seat
 - Side cover (left/right)
 - Air scoop (left/right)
Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank
Refer to "FUEL TANK" on page 7-1.
2. Drain:
 - Coolant
Refer to "CHANGING THE COOLANT" on page 3-20.
3. Remove:
 - Throttle cable
 - Clutch cable
Refer to "CAMSHAFT" on page 5-6.
4. Remove:
 - Ignition coil assembly
 - Spark plug
Refer to "CAMSHAFT" on page 5-6.
5. Remove:
 - Throttle bodies
Refer to "THROTTLE BODIES" on page 7-4.
 - Air vent hose (Air induction)
 - Cylinder head cover
Refer to "CAMSHAFT" on page 5-6.
6. Remove:
 - Timing mark accessing screw "1"
 - Crankshaft end cover "2"



7. Measure:
 - Valve clearance

Out of specification → Adjust.



Valve clearance (cold)

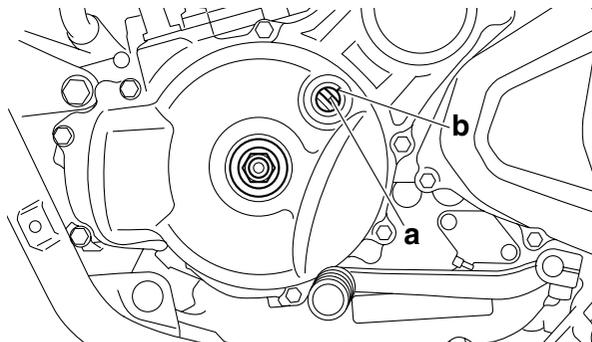
Intake

0.13–0.20 mm (0.0051–0.0079 in)

Exhaust

0.23–0.30 mm (0.0091–0.0118 in)

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



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

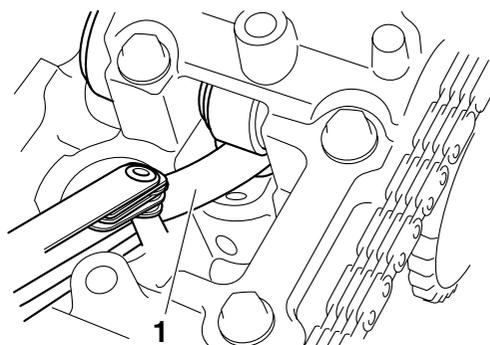


Special thickness gauge

90890-03180

Feeler gauge set

YU-26900-9



8. Adjust:
 - Valve clearance

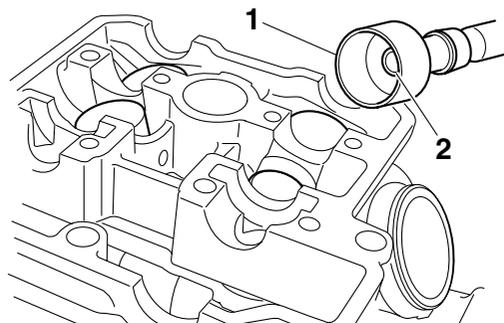
- a. Remove:
 - Cam chain tensioner
 - Camshaft cap
 - Intake camshaft
 - Exhaust camshaft

NOTE:

- Refer to "CAMSHAFT" on page 5-6.

- Before removing the cam chain and camshaft, connect the cam chain using a wire so that it does not drop in the crankcase.

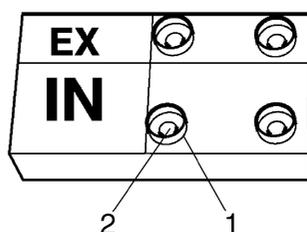
- b. Remove the valve lifter “1” and the valve pad “2” with a hand valve lapper.



	<p>Valve lapper 90890-04101 Valve lapping tool YM-A8998</p>
--	--

NOTE:

- Cover the timing chain opening with a rag to prevent the valve pad from falling into the crankcase.
- Make a note of the position of each valve lifter “1” and valve pad “2” so that they can be installed in the correct place.



11172202

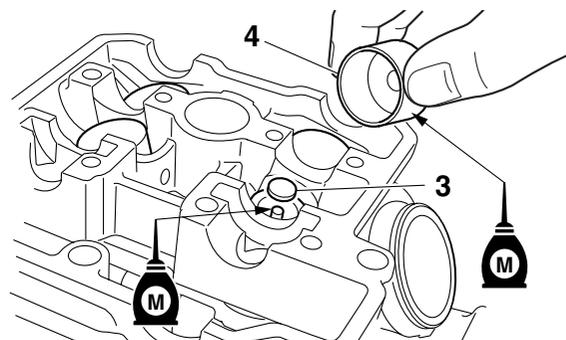
- c. Select the proper valve pad from the following table.

Valve pad range	Nos. 120–240
Valve pad thickness	120–240 mm (4.72–9.45 in)
Available valve pads	25 thicknesses in 0.05 mm (0.002 in) increments

NOTE:

- The thickness of each valve pad is marked in hundredths of millimeters on the side that touches the valve lifter.
- Since valve pads of various sizes are originally installed, the valve pad number must be rounded in order to reach the closest equivalent to the original.
- Remember that the replacement valve pad number is a rough value. Repeat the above procedure until you have the standard valve clearance.

- d. Install the new valve pad “3” and the valve lifter “4”.



NOTE:

- When installing the valve pad, direct the pad having a number on it toward the lifter.
- Lubricate the valve pad with molybdenum disulfide grease.
- Lubricate the valve lifter with molybdenum disulfide oil.
- The valve lifter must turn smoothly when rotated by hand.
- Install the valve lifter and the valve pad in the correct place.

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

	<p>Camshaft cap bolt 10 Nm (1.0 m•kg, 7.2 ft•lb)</p>
--	---

NOTE:

- Refer to "CAMSHAFT" on page 5-6.
- Lubricate the camshaft bearings, camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshaft sprocket marks with the edge of the cylinder head.
- Turn the crankshaft counterclockwise several full turns to seat the parts.

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



9. Install:
- All removed parts

NOTE:

For installation, reverse the removal procedure. Note the following points.

10. Fill the coolant as specification, and then check the coolant level.

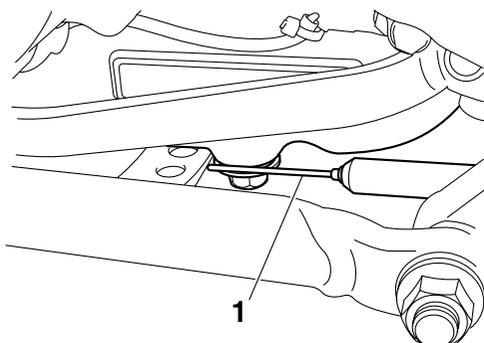
EAS20590

ADJUSTING THE ENGINE IDLING SPEED

NOTE:

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

1. Start the engine and let it warm up until it reaches the specified temperature.
2. Use a temperature probe tester "1" and contact it to the drain bolt thread.



	Oil temperature 60.0 °C (140.00 °F)
--	---

3. Install:
- Digital tachometer
(Red/black ignition coil leads)



Digital tachometer
90890-06760
YU-39951-B

4. Measure:
- Engine idling speed
Out of specification → Adjust.

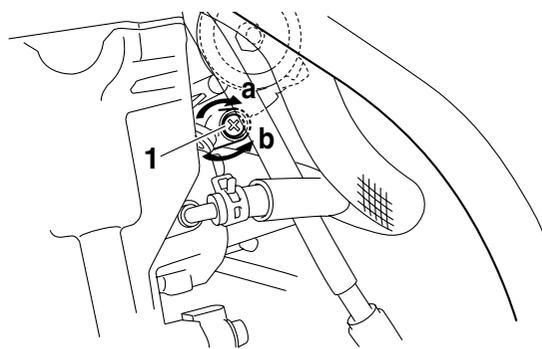


Engine idling speed
1450–1650 r/min

5. Adjust:
- Engine idling speed



- a. Adjust the engine idling speed by turning the adjust screw "1" in direction "a" or "b".



Direction "a"	Engine idling speed → Decrease
Direction "b"	Engine idling speed → Increase



6. Adjust:
- Throttle cable free play
Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" on page 3-8.



Throttle cable free play
3.0–5.0 mm

- Throttle cable free play (Cable free play at surface of throttle grip flange)
3–5 mm

EAS20640

ADJUSTING THE THROTTLE CABLE FREE PLAY

NOTE:

Prior to adjusting the throttle cable free play, the engine idling speed should be adjusted properly.

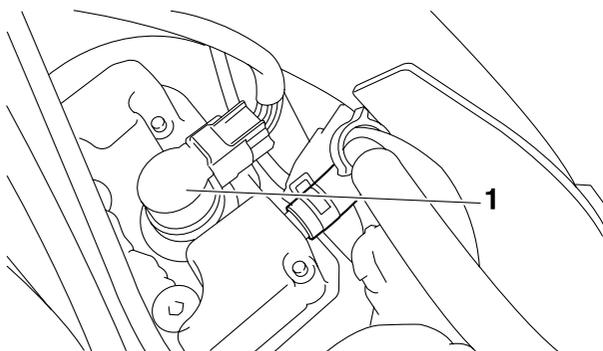
1. Check:
- Throttle cable free play "a"
Out of specification → Adjust.

- Seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS20690

CHECKING THE SPARK PLUG

1. Remove:
 - Seat
 - Side cover (left/right)
 - Air scoop (left/right)
Refer to “GENERAL CHASSIS” on page 4-1.
 - Fuel tank
Refer to “GENERAL CHASSIS” on page 4-1.
2. Remove:
 - Ignition coil assembly “1”
 - Spark plug
Refer to “CAMSHAFT” on page 5-6.



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.

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

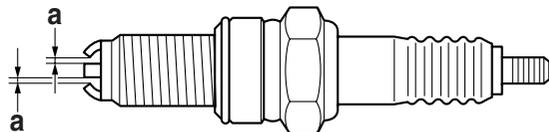


Manufacturer/model
NGK/CR9EK

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



Spark plug gap
0.6–0.7 mm (0.024–0.028 in)



7. Install:
 - Spark plug



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

NOTE:

Before installing the spark plug, clean the spark plug and gasket surface.

8. Connect:
 - Ignition coil assembly
 - Ignition coil assembly lead

NOTE:

Apply silicone hydrate to the sealing point of the ignition coil, and install the ignition coil assembly by positioning its connector to the right.

9. Install:
 - Fuel tank
Refer to “GENERAL CHASSIS” on page 4-1.
 - Air scoop (left/right)
 - Side cover (left/right)
Refer to “GENERAL CHASSIS” on page 4-1.

EAS20700

CHECKING THE IGNITION TIMING

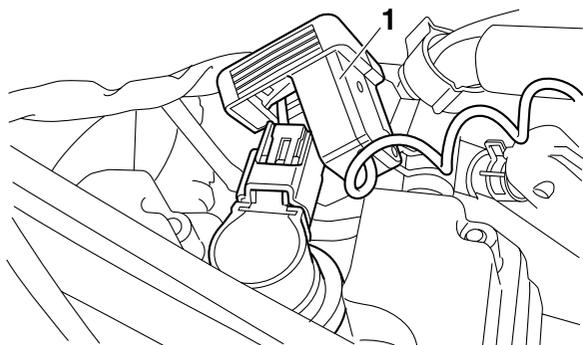
NOTE:

Prior to checking the ignition timing, check the wiring connections of the entire ignition system. Make sure all connections are tight and free of corrosion.

1. Remove:
 - Timing mark accessing screw
 - Seat
 - Side cover (left/right)
 - Air scoop (left/right)
Refer to “GENERAL CHASSIS” on page 4-1.
2. Connect:
 - Timing light “1”
 - Digital tachometer

(Red/black ignition coil leads)

	Timing light 90890-03141 Inductive clamp timing light YU-03141 Digital tachometer 90890-06760 YU-39951-B
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3. Check:
- Ignition timing

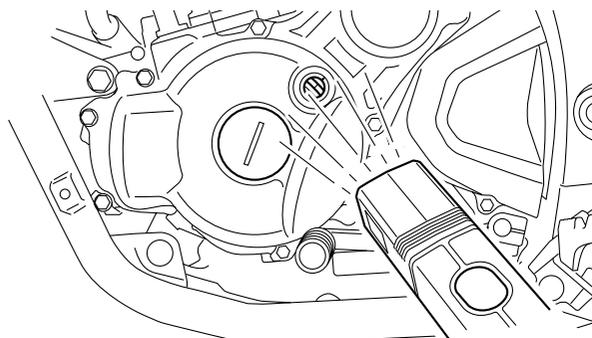


- a. Start the engine, warm it up for several minutes, and then let it run at the specified engine idling speed.

	Oil temperature 55–65°C
---	--

	Engine idling speed 1450–1650 r/min
---	--

- b. Check the firing range as shown.
 Incorrect firing range → Check the ignition system.



NOTE: _____
 The ignition timing is not adjustable.



4. Remove:
- Timing light

- Digital tachometer
5. Install:
- Air scoop (left/right)
 - Side cover (left/right)
 - Seat
 Refer to “GENERAL CHASSIS” on page 4-1.
 - Timing mark accessing screw

EAS20710

MEASURING THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

NOTE: _____
 Insufficient compression pressure will result in a loss of performance.

1. Measure:
 - Valve clearance
 Out of specification → Adjust.
 Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-5.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
 - Seat
 - Side cover (left/right)
 - Air scoop (left/right)
 Refer to “GENERAL CHASSIS” on page 4-1.
 - Fuel tank
 Refer to “FUEL TANK” on page 7-1.
4. Disconnect:
 - Ignition coil assembly coupler
5. Remove:
 - Ignition coil assembly
 - Spark plug

ECA13340

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

6. Install:
 - Compression gauge “1”

	Compression gauge 90890-03081 Engine compression tester YU-33223
---	---

ter element cover.



Oil filter element cover bolt (M10)
10 Nm (1.0 m•kg, 7.2 ft•lb)



6. Check:
- Engine oil drain bolt gasket
 - Oil filter element drain bolt gasket
- Damage → Replace.

7. Install:
- Engine oil drain bolt (along with the gasket)



Engine oil drain bolt
20 Nm (2.0 m•kg, 14 ft•lb)

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



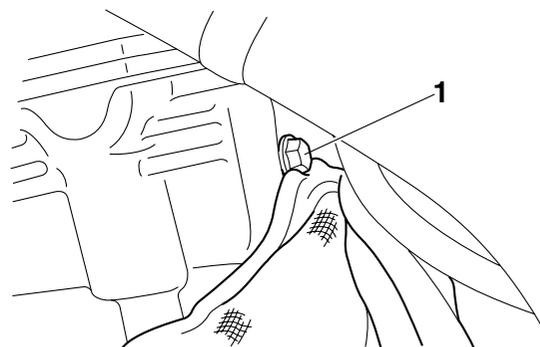
Engine oil quantity

Total amount
1.50 L (1.59 US qt) (1.32 Imp.qt)
Without oil filter element replacement
1.30 L (1.37 US qt) (1.14 Imp.qt)
With oil filter element replacement
1.40 L (1.48 US qt) (1.23 Imp.qt)

9. Install:
- Engine oil filler cap
10. Start the engine, warm it up for several minutes, and then turn it off.
11. Check:
- Engine (for engine oil leaks)
12. Check:
- Engine oil level
Refer to “CHECKING THE ENGINE OIL LEVEL” on page 3-12.
13. Check:
- Engine oil pressure



- a. Slightly loosen the oil check bolt “1”.



- b. Start the engine and keep it idling until engine oil starts to seep from the oil check bolt. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
- c. Check the engine oil passages, the oil filter cartridge and the oil pump for damage or leakage. Refer to “OIL PUMP AND BALANCER GEAR” on page 5-45.
- d. Start the engine after solving the problem (s) and check the engine oil pressure again.
- e. Tighten the oil check bolt to specification.



Oil check bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)



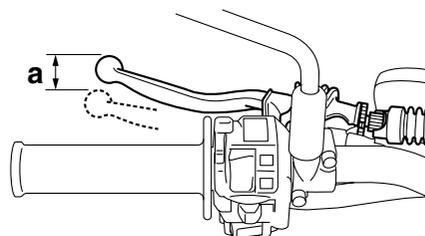
EAS20870

ADJUSTING THE CLUTCH CABLE FREE PLAY

1. Check:
- Clutch cable free play “a”
Out of specification → Adjust.



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



2. Adjust:
- Clutch cable free play



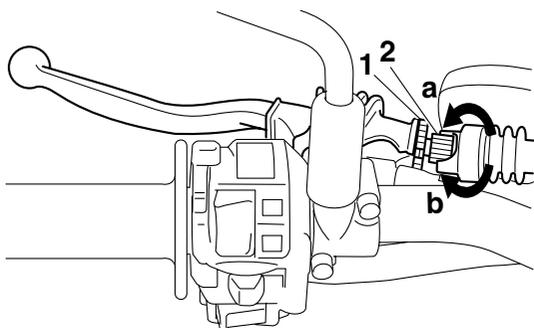
Handlebar side

- a. Loosen the locknut “1”.
- b. Turn the adjusting bolt “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 “1”.



NOTE:

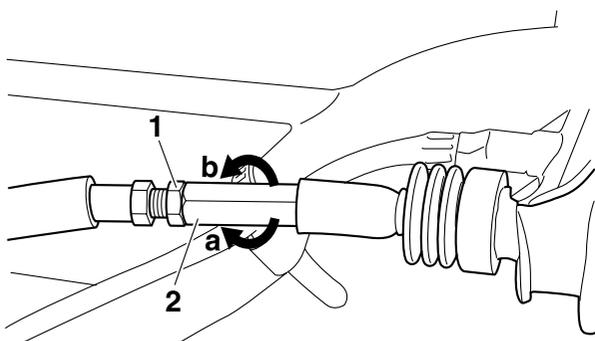
If the specified clutch cable free play cannot be obtained on the handlebar side of the cable, use the adjusting nut on the clutch cable side.

Clutch cable side

- a. Slide the clutch cable cover.
- b. Loosen the locknuts “1”.
- c. Turn the adjusting bolt “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.

- d. Tighten the locknut “1”.
- e. Return the clutch cable cover to its original position.



EAS20941

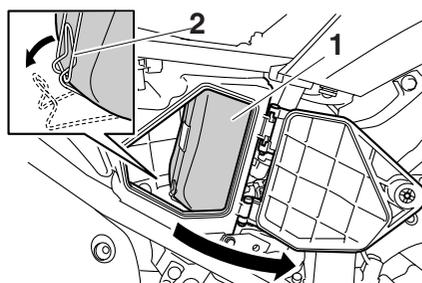
CLEANING THE AIR FILTER ELEMENT

1. Remove:
 - Air filter check hose

NOTE:

On the bottom of the air filter case is a check hose. If dust or water or both collects in this hose, replace the air filter element, clean the air filter case and air filter check hose.

2. Remove:
 - Right side cover
Refer to “GENERAL CHASSIS” on page 4-1.
3. Open the air filter case cover by removing its screws.
4. Remove the air filter element assembly “1” by removing the clip “2”.
5. Remove:
 - Air filter element
Remove the air filter element from the air filter element frame.



6. Clean:
 - Air filter element
(with solvent)

EWA13020

WARNING

Never use low flash point solvents, such as gasoline, to clean the air filter element. Such solvents may cause a fire or an explosion.

NOTE:

After cleaning, gently squeeze the air filter element to remove the excess solvent.

ECA13430

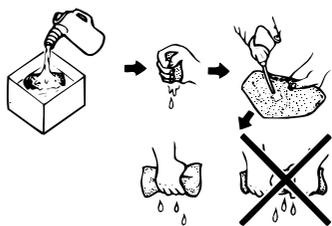
CAUTION:

Do not twist the air filter element when squeezing it.

7. Check:
 - Air filter element
Damage → Replace.
8. Apply the recommended oil to the entire surface of the air filter element and squeeze out the excess oil. The air filter element should be wet but not dripping.



Recommended oil
Foam air filter oil or engine oil



9. Install:

- Air filter element frame

ECA14401

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

10. Install:

- Air filter element assembly

11. Install:

- Air filter cover

12. Install:

- Side cover (right)

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

EAS21020

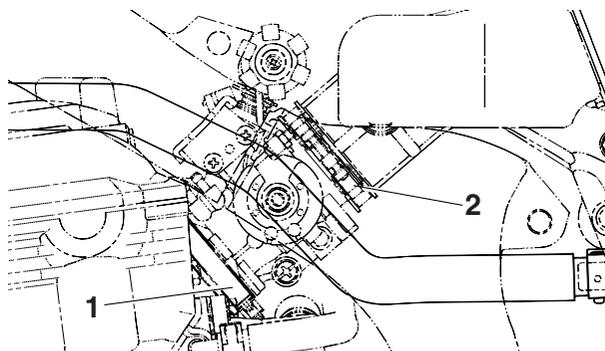
CHECKING THE THROTTLE BODY JOINT

1. Remove:

- Seat
- Side cover (left/right)
- Air scoop (left/right)
Refer to "GENERAL CHASSIS" on page 4-1.
- Fuel tank
Refer to "FUEL TANK" on page 7-1.

2. Check:

- Throttle body joint "1"
Cracks/damage → Replace.
- Insulator manifold "2"
Cracks/damage → Replace.



3. Install:

- Fuel tank
Refer to "FUEL TANK" on page 7-1.
- Air scoop (left/right)
- Side cover (left/right)
- Seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS21030

CHECKING THE FUEL LINE

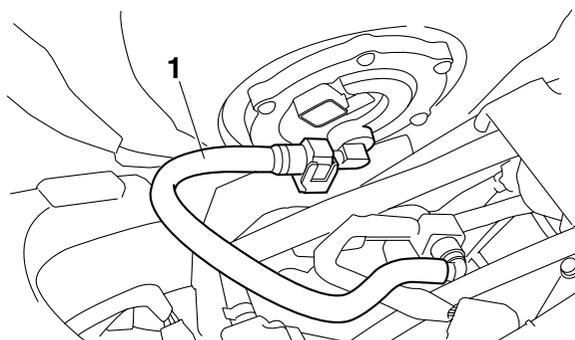
The following procedure applies to all of the fuel, vacuum and breather hoses.

1. Remove:

- Seat
- Side cover (left/right)
- Air scoop (left/right)
Refer to "GENERAL CHASSIS" on page 4-1.
- Fuel tank
Refer to "FUEL TANK" on page 7-1.

2. Check:

- Fuel hose "1"
Cracks/damage → Replace.
Loose connection → Connect properly.



3. Fuel tank

- Fuel tank
Refer to "GENERAL CHASSIS" on page 4-1.
- Air scoop (left/right)
- Side cover (left/right)
- Seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS21050

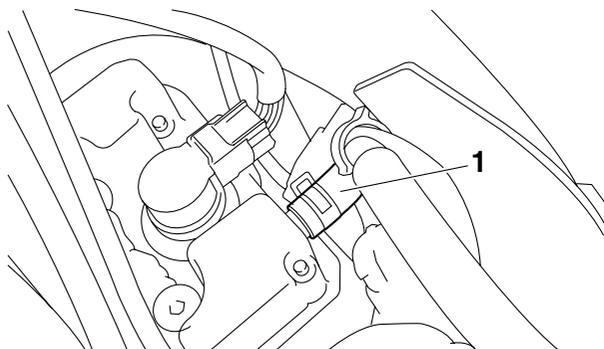
CHECKING THE CYLINDER HEAD BREATHER HOSE

1. Remove:
 - Seat
 - Side cover (left/right)
 - Air scoop (left/right)
 - Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank
 - Refer to "FUEL TANK" on page 7-1.
2. Check:
 - Cylinder head breather hose "1"
 - Cracks/damage → Replace.
 - Loose connection → Connect properly.

ECA14920

CAUTION:

Make sure the cylinder head breather hose is routed correctly.



3. Install:
 - Fuel tank
 - Refer to "FUEL TANK" on page 7-1.
 - Air scoop (left/right)
 - Side cover (left/right)
 - Seat
 - Refer to "GENERAL CHASSIS" on page 4-1.

EAS21080

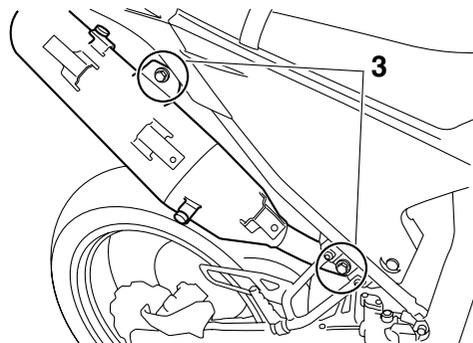
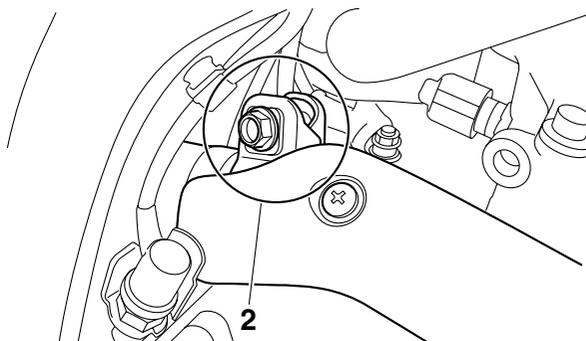
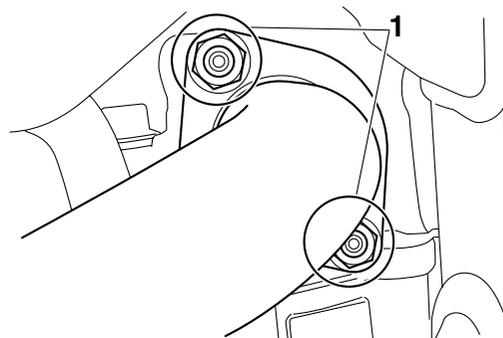
CHECKING THE EXHAUST SYSTEM

The following procedure applies to all of the exhaust pipes and gaskets.

1. Remove:
 - Muffler protector
2. Check:
 - Exhaust pipe
 - Muffler
 - Cracks/damage → Replace.
 - Gasket
 - Exhaust gas leaks → Replace.
3. Check:
 - Tightening torque



Exhaust pipe nut "1"
20 Nm (2.0 m•kg, 14 ft•lb)
Exhaust pipe and muffler bolt "2"
20 Nm (2.0 m•kg, 14 ft•lb)
Muffler and muffler bracket bolt
"3"
42 Nm (4.2 m•kg, 30 ft•lb)



4. Install:
 - Muffler protector

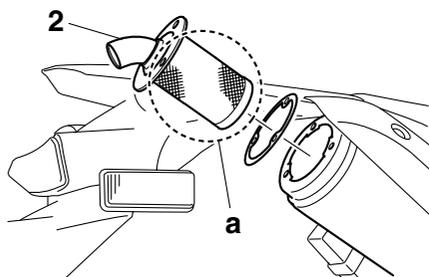
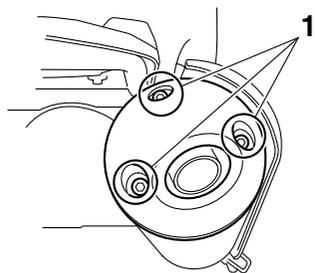


Muffler protector bolt
7 Nm (0.7 m•kg, 5.1 ft•lb)

EAS21100

ADJUSTING THE EXUP CABLES

1. Remove:
 - Side cover (left/right)
 - Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
 - EXUP valve pulley cover "1"



- d. Insert the tailpipe into the muffler and align the bolt holes.
- e. Insert the bolt and tighten it.



Spark arrester bolt
12 Nm (1.2 m•kg, 8.7 ft•lb)
(Apply the molybdenum-disulfide grease)



EAS21090

CHECKING THE CANISTER (FOR CALIFORNIA ONLY)

1. Remove:
 - Canister cover
Refer to “CANISTER (FOR CALIFORNIA)” on page 7-13.
2. Check:
 - Canister
 - Hose
Cracks/damage → Replace.
3. Install:
 - Canister cover



Canister cover bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

EAS21110

CHECKING THE COOLANT LEVEL

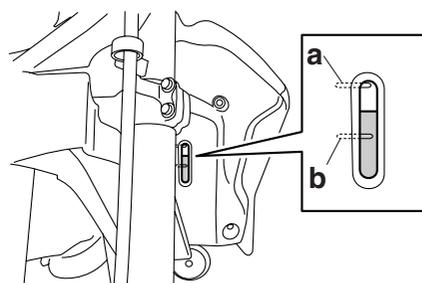
1. Stand the vehicle on a level surface.

NOTE:

- Place the vehicle on a suitable stand.

- Make sure the vehicle is upright.

2. Remove:
 - Seat
 - Air scoop
Refer to “GENERAL CHASSIS” on page 4-1.
3. Check:
 - Coolant level
The coolant level should be between the maximum level mark “a” and minimum level mark “b”.
Below the minimum level mark → Add the recommended coolant to the proper level.



ECA13470

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.

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

NOTE:

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

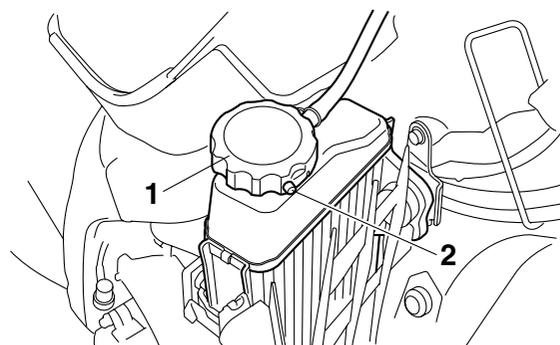
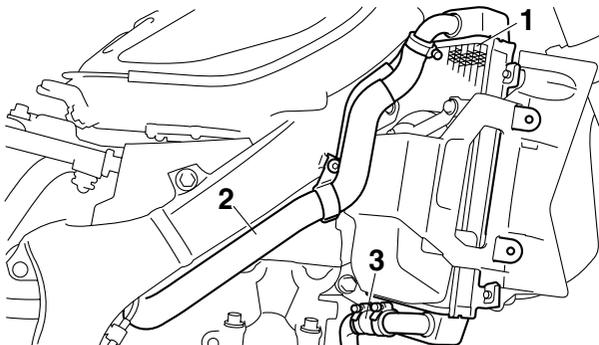
6. Install:
 - Air scoop (left)
 - Seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS21120

CHECKING THE COOLING SYSTEM

1. Remove:
 - Seat
 - Air scoop (left/right)
Refer to “GENERAL CHASSIS” on page 4-1.
 - Fuel tank
Refer to “FUEL TANK” on page 7-1.
2. Check:
 - Radiator “1”

- Radiator inlet hose “2”
 - Radiator outlet hose “3”
- Cracks/damage → Replace.
Refer to “RADIATOR” on page 6-1, “THERMOSTAT” on page 6-4 and “WATER PUMP” on page 6-6.



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. Install:

- Fuel tank
Refer to “FUEL TANK” on page 7-1.
- Fuel tank (left/right)
- Seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS21130

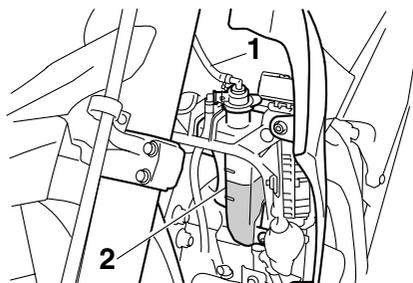
CHANGING THE COOLANT

1. Remove:

- Seat
- Air scoop (left/right)
Refer to “GENERAL CHASSIS” on page 4-1.

2. Remove:

- Coolant reservoir hose “1”
- Recovery tank “2”



3. Drain:

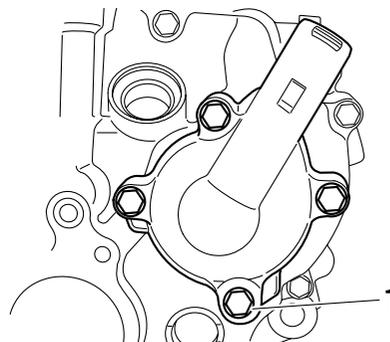
- Coolant
(from the recovery)

4. Remove:

- Radiator cap “1”
Remove the radiator cap by removing lock screw “2”.

5. Remove:

- Coolant drain bolt (water pump) “1”
(along with the copper washer)



6. Drain:

- Coolant
(from the engine and radiator)

7. Install:

- Copper washer **New**
- Coolant drain bolt (water pump)



Coolant drain bolt (engine)
10 Nm (1.0 m•kg, 7.2 ft•lb)

8. Install:

- Reservoir tank

9. Connect:

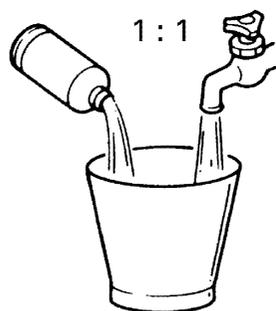
- Coolant reservoir hose

10.Fill:

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



Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1:1 (antifreeze:water)
Radiator capacity (including all routes)
0.90 L (0.95 US qt) (0.79 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.

ECA13480

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 wa-

ter.

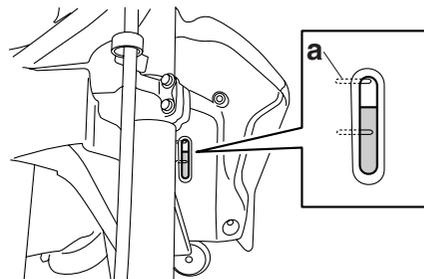
- **Do not mix different types of antifreeze.**

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 stop it.

15.Check:

- Coolant level
Refer to "CHECKING THE COOLANT LEVEL" on page 3-19.

NOTE:

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

16.Install:

- Air scoop (left/right)
- Seat
Refer to "GENERAL CHASSIS" on page 4-1.

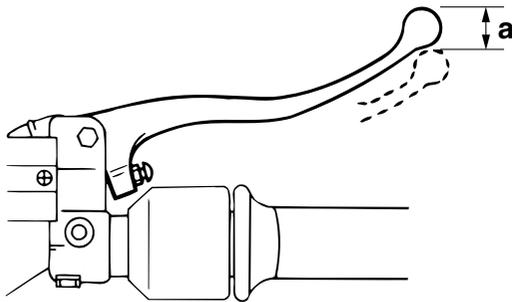
EAS21140

CHASSIS

EAS21170

ADJUSTING THE FRONT DISC BRAKE

1. Check:
 - Brake lever free play “a”
Out of specification → Adjust.



	Front brake lever free play 5.0–8.0 mm (0.20–0.31 in)
--	---

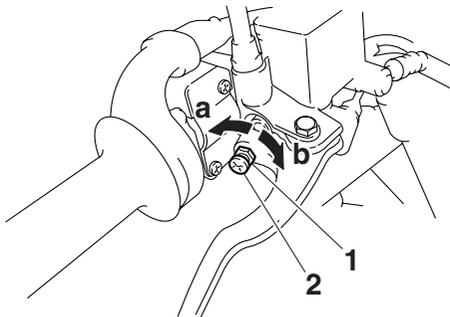
2. Adjust:
 - Brake lever free play



- a. Loosen the locknut “1”.
- b. Turn the adjusting bolt “2” in direction “a” or “b” until the specified brake lever free play is obtained.

Direction “a” Brake lever free play is increased. Direction “b” Brake lever free play is decreased.
--

- c. Tighten the locknut “1”.



EWA13050

WARNING

A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will consid-

erably reduce braking performance.

ECA13490

CAUTION:

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

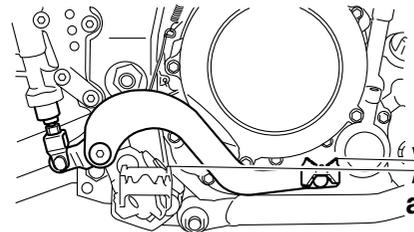


EAS21200

ADJUSTING THE REAR DISC BRAKE

1. Check:
 - Brake pedal position “a”
(distance “a” from the top of the rider footrest to the top of the brake pedal)
Out of specification → Adjust.

	Brake pedal position 11.5 mm (0.45 in)
--	--

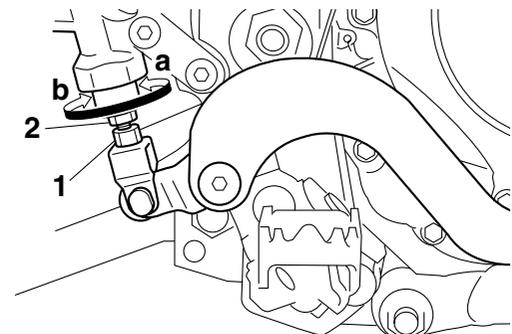


2. Adjust:
 - Brake pedal position



- a. Loosen the locknut “1”.
- b. Turn the adjusting bolt “2” in direction “a” or “b” until the specified brake pedal position is obtained.

Direction “a” Brake pedal is raised. Direction “b” Brake pedal is lowered.



- c. Tighten the locknut “1” to specification.



Locknut
12 Nm (1.2 m•kg, 8.7 ft•lb)

EWA13050

WARNING

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

ECA13510

CAUTION:

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



3. Adjust:

- Rear brake light switch
Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH” on page 3-24.

EAS21240

CHECKING THE BRAKE FLUID LEVEL

1. Stand the vehicle on a level surface.

NOTE:

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

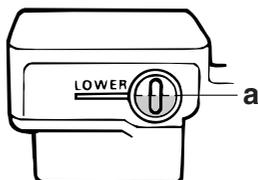
2. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the recommended brake fluid to the proper level.

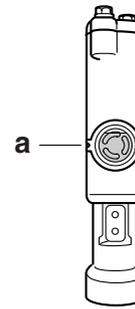


Recommended fluid
DOT 4

A



B



- 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:

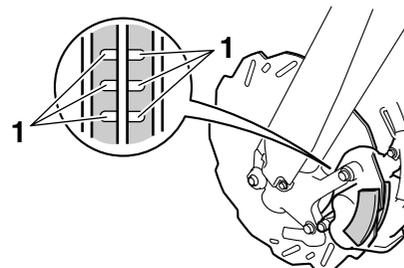
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

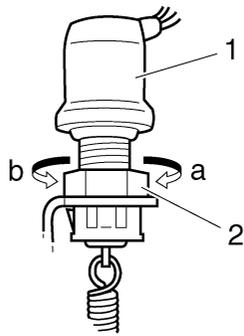
EAS21250

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 groove “1” almost disappeared → Replace the brake pads as a set.
Refer to “FRONT BRAKE” on page 4-11.





EAS21350

BLEEDING THE HYDRAULIC BRAKE SYSTEM

EWA13100



WARNING

Bleed the hydraulic brake system whenever:

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

1. Remove:

- Brake master cylinder reservoir cap

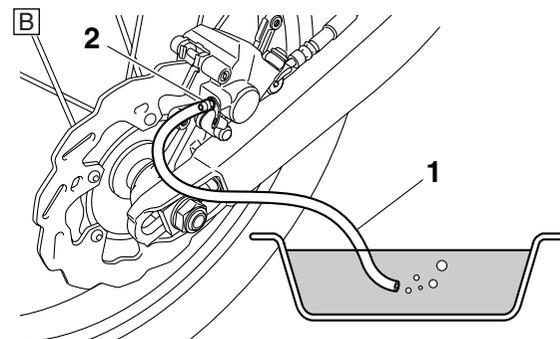
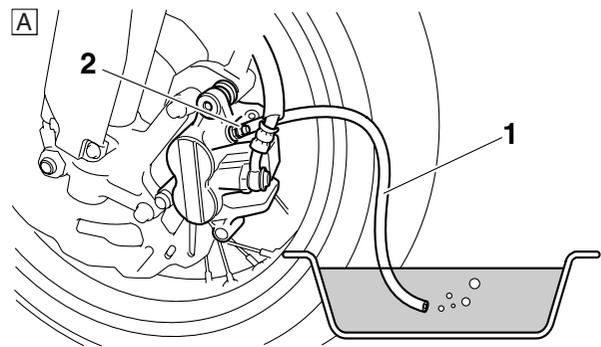
NOTE:

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

2. Bleed:

- Hydraulic brake system

- a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
- b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
- c. Connect a clear plastic hose "1" tightly to the bleed screw "2", and place an oil pan under the vinyl hose end on one side.



A. Front

B. Rear

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



- k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-23.

EWA13110



WARNING

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



EAS21420

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.

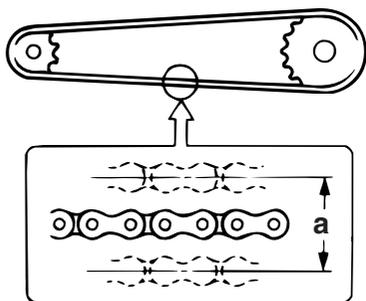
NOTE:

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

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

NOTE:

Measure the drive chain slack in an intermediate position between the chain tensioner and the chain support bolt.



Drive chain slack
WR250R
38.0–48.0 mm
WR250X
40.0–50.0 mm

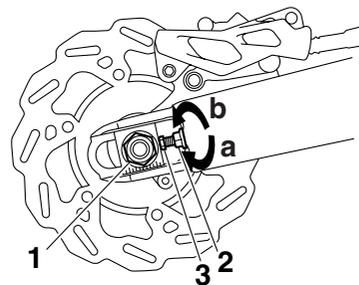
4. Adjust:
 - Drive chain slack



- a. Loosen the wheel axle nut "1".
- b. Loosen both locknuts "2".
- c. Turn the drive chain puller "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 swingarm end plates and the ends of the swingarm.

- d. Tighten the locknut.

	Locknut 16 Nm (1.6 m•kg, 12 ft•lb)
--	---

- e. Tighten the wheel axle nut.

	Wheel axle nut 125 Nm (12.5 m•kg, 90 ft•lb)
--	--



EAS21440

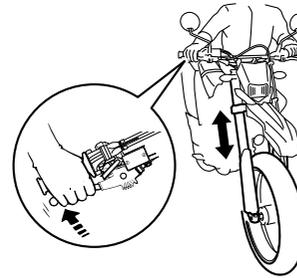
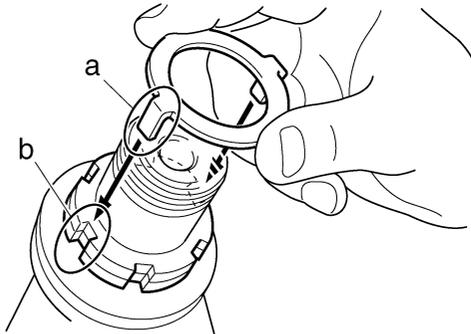
LUBRICATING THE DRIVE CHAIN

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

hold the lower ring nut and tighten the upper ring nut until their slots are aligned.

NOTE:

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



EAS21580

ADJUSTING THE FRONT FORK LEGS

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

EWA32D1006

WARNING

- Always adjust the left and right front forks evenly. If this is not done, the vehicle will have poor stability.
- Securely support the vehicle so that there is no danger of it falling over.

Rebound damping

ECA13590

CAUTION:

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
 - Rebound damping

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

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

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



Rebound damping

Maximum (hard)

1 click(s) out*

Standard

10 click(s) out*

Minimum (soft)

12 click(s) out*

* With the adjusting screw fully turned in



5. Install:

- Upper bracket
Refer to “STEERING HEAD” on page 4-49.
- Handlebar
Refer to “HANDLEBAR” on page 4-34.

EAS21530

CHECKING THE FRONT FORK

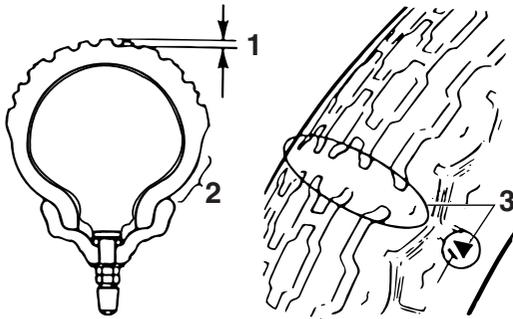
1. Stand the vehicle on a level surface.

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 4-39.



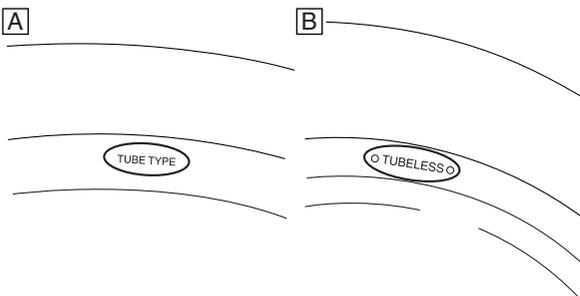
1. Tire tread depth
2. Side wall
3. Wear indicator

	Wear limit (front)
	0.8 mm (0.03 in)
	Wear limit (rear)
	0.8 mm (0.03 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.
- 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. Tube wheel
- B. Tubeless wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

EWA14090

WARNING

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

	Front tire
	Size
	WR250R 80/100-21M/C 51P
	WR250X 110/70R17M/C 54H
	Manufacturer/model
	WR250R BRIDGESTONE/
	TW-301 F
	WR250X BRIDGESTONE/
	BT090F RADIAL G

	Rear tire
	Size
	WR250R 120/80-18M/C 62P
	WR250X 140/70R17M/C 66H
	Manufacturer/model
	WR250R BRIDGESTONE/
	TW-302 F
	WR250X BRIDGESTONE/
	BT090R RADIAL G

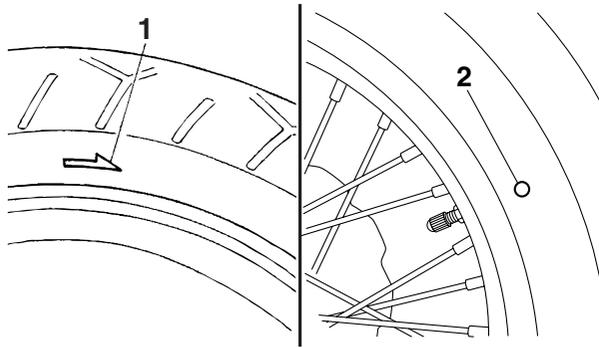
EWA13210

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.

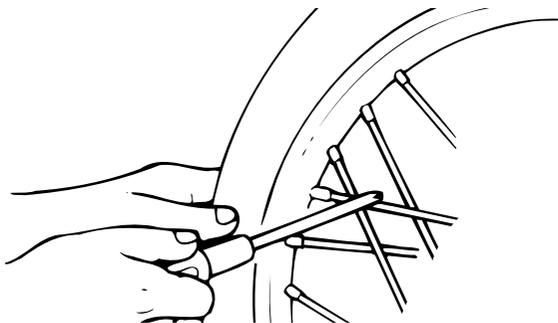
EAS21680

CHECKING AND TIGHTENING THE SPOKES

The following procedure applies to all of the spokes.

1. Check:

- Spoke
Bends/damage → Replace.
Loose → Tighten.
Tap the spokes with a screwdriver.

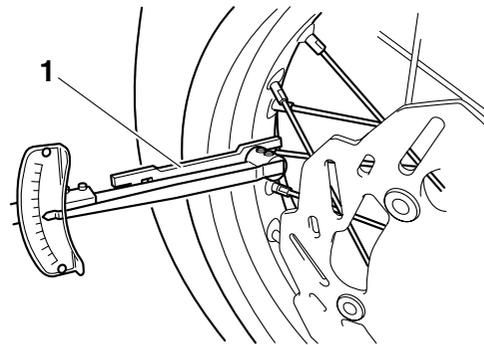


NOTE:

A tight spoke will emit a clear, ringing tone; a loose spoke will sound flat.

2. Tighten: (front/rear)

- Spoke
(with a spoke nipple wrench “1”)



Spoke nipple wrench (8–9)
90890-01522
YM-01522



Spoke (front/rear)
3 Nm (0.3 m•kg, 2.2 ft•lb)

NOTE:

Be sure to tighten the spokes before and after break-in.

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.

EAS21700

LUBRICATING THE LEVERS

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

	Brake lever Silicone grease Clutch lever Lithium-soap-based grease
---	---

EAS21710

LUBRICATING THE PEDAL

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

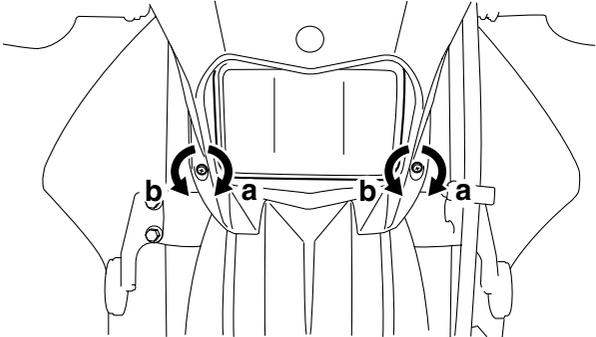
	Recommended lubricant Lithium-soap-based grease
---	--

EAS21720

LUBRICATING THE SIDESTAND

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

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



CHASSIS

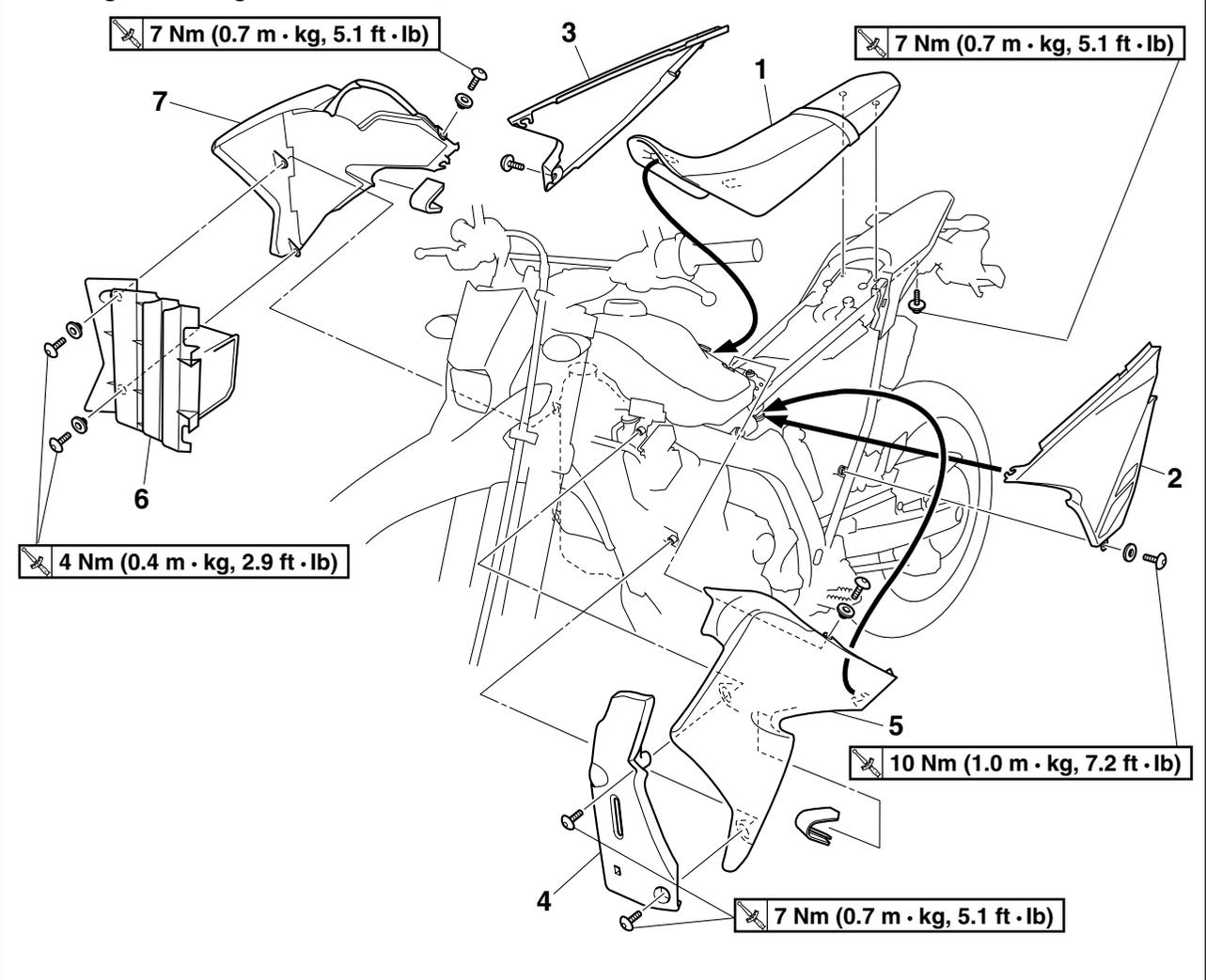
GENERAL CHASSIS	4-1
FRONT WHEEL	4-2
REMOVING THE FRONT WHEEL	4-4
CHECKING THE FRONT WHEEL	4-4
DISASSEMBLING THE FRONT WHEEL.....	4-5
ASSEMBLING THE FRONT WHEEL.....	4-5
INSTALLING THE FRONT WHEEL (DISC)	4-5
REAR WHEEL.....	4-7
REMOVING THE REAR WHEEL.....	4-9
DISASSEMBLING THE REAR WHEEL	4-9
CHECKING THE REAR WHEEL	4-9
CHECKING AND REPLACING THE REAR WHEEL SPROCKET	4-9
ASSEMBLING THE REAR WHEEL	4-10
INSTALLING THE REAR WHEEL (DISC)	4-10
FRONT BRAKE.....	4-11
INTRODUCTION.....	4-16
CHECKING THE FRONT BRAKE DISC	4-16
REPLACING THE FRONT BRAKE PADS	4-17
REMOVING THE FRONT BRAKE CALIPER.....	4-18
DISASSEMBLING THE FRONT BRAKE CALIPER.....	4-18
CHECKING THE FRONT BRAKE CALIPER	4-18
ASSEMBLING THE FRONT BRAKE CALIPER.....	4-19
INSTALLING THE FRONT BRAKE CALIPER	4-19
REMOVING THE FRONT BRAKE MASTER CYLINDER.....	4-20
CHECKING THE FRONT BRAKE MASTER CYLINDER	4-20
ASSEMBLING THE FRONT BRAKE MASTER CYLINDER	4-21
INSTALLING THE FRONT BRAKE MASTER CYLINDER	4-21
REAR BRAKE.....	4-23
INTRODUCTION.....	4-28
CHECKING THE REAR BRAKE DISC	4-28
REPLACING THE REAR BRAKE PADS	4-28
REMOVING THE REAR BRAKE CALIPER.....	4-29
DISASSEMBLING THE REAR BRAKE CALIPER	4-29
CHECKING THE REAR BRAKE CALIPER.....	4-30
ASSEMBLING THE REAR BRAKE CALIPER	4-30
INSTALLING THE REAR BRAKE CALIPER.....	4-30
REMOVING THE REAR BRAKE MASTER CYLINDER	4-31
CHECKING THE REAR BRAKE MASTER CYLINDER.....	4-31
ASSEMBLING THE REAR BRAKE MASTER CYLINDER	4-32
INSTALLING THE REAR BRAKE MASTER CYLINDER.....	4-32
HANDLEBAR.....	4-34
REMOVING THE HANDLEBARS	4-36
CHECKING THE HANDLEBAR	4-36
INSTALLING THE HANDLEBAR	4-36

FRONT FORK	4-39
REMOVING THE FRONT FORK LEGS.....	4-42
DISASSEMBLING THE FRONT FORK LEGS.....	4-42
CHECKING THE FRONT FORK LEGS	4-43
ASSEMBLING THE FRONT FORK LEGS.....	4-43
INSTALLING THE FRONT FORK LEGS	4-47
STEERING HEAD	4-49
REMOVING THE LOWER BRACKET	4-51
CHECKING THE STEERING HEAD.....	4-51
INSTALLING THE STEERING HEAD.....	4-51
REAR SHOCK ABSORBER ASSEMBLY	4-53
HANDLING THE REAR SHOCK ABSORBER.....	4-54
DISPOSING OF A REAR SHOCK ABSORBER	4-54
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY	4-54
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY	4-54
CHECKING THE CONNECTING ARM AND RELAY ARM.....	4-54
INSTALLING THE RELAY ARM	4-55
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY	4-55
SWINGARM	4-56
REMOVING THE SWINGARM	4-57
CHECKING THE SWINGARM.....	4-57
INSTALLING THE SWINGARM.....	4-57
CHAIN DRIVE	4-59
REMOVING THE DRIVE CHAIN	4-60
CHECKING THE DRIVE CHAIN.....	4-60
CHECKING THE DRIVE SPROCKET	4-61
CHECKING THE REAR WHEEL SPROCKET.....	4-61
INSTALLING THE DRIVE CHAIN.....	4-61

EAS21830

GENERAL CHASSIS

Removing the cowling



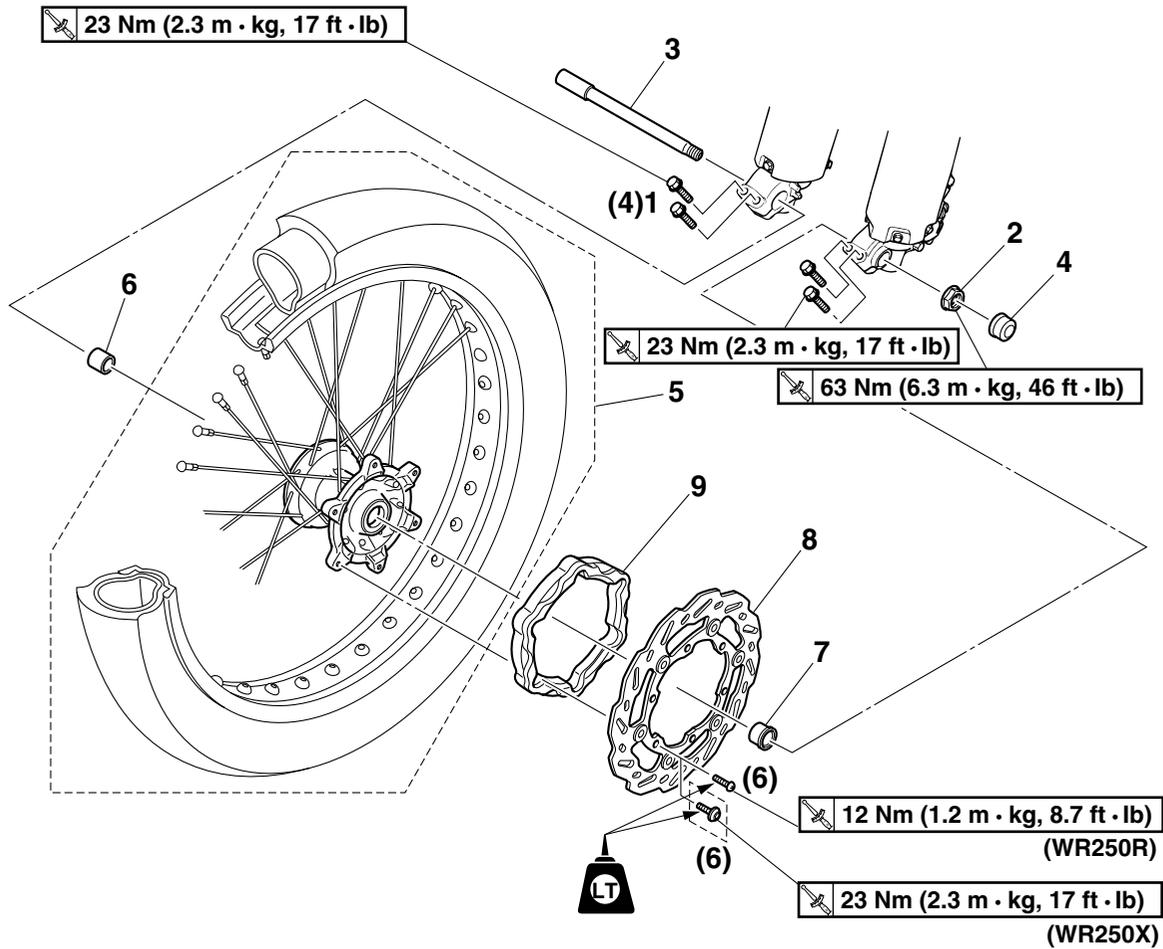
Order	Job/Parts to remove	Q'ty	Remarks
1	Seat	1	
2	Left side cover	1	
3	Right side cover	1	
4	Left air panel	1	
5	Left air scoop	1	
6	Right air panel	1	
7	Right air scoop	1	
			For installation, reverse the removal procedure.

FRONT WHEEL

EAS21870

FRONT WHEEL

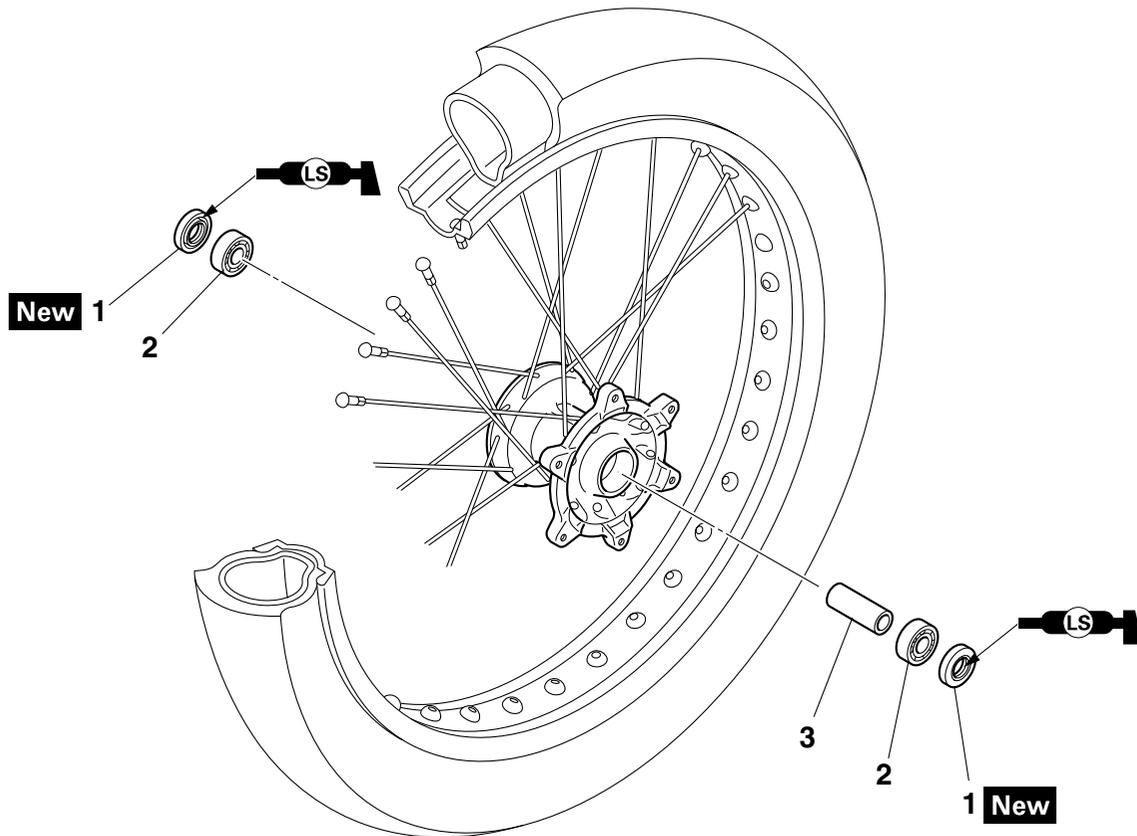
Removing the front wheel and brake discs



Order	Job/Parts to remove	Q'ty	Remarks
			Use a suitable stand to raise the front wheel off the ground.
1	Front wheel axle pinch bolt	4	Loosen.
2	Front wheel axle nut	1	
3	Front wheel axle	1	
4	Cap	1	For Europe
5	Front wheel assembly	1	
6	Collar	1	
7	Collar	1	
8	Front brake disc	1	
9	Wheel ring	1	Only WR250R
			For installation, reverse the removal procedure.

FRONT WHEEL

Disassembling the front wheel



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

EAS21890

REMOVING THE FRONT WHEEL

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. Remove:

- Front wheel

NOTE:

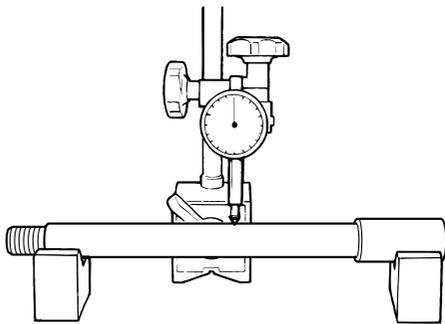
Place the vehicle on a suitable stand so that the front wheel is elevated.

EAS21930

CHECKING THE FRONT WHEEL

1. Check:

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



EWA13460

WARNING

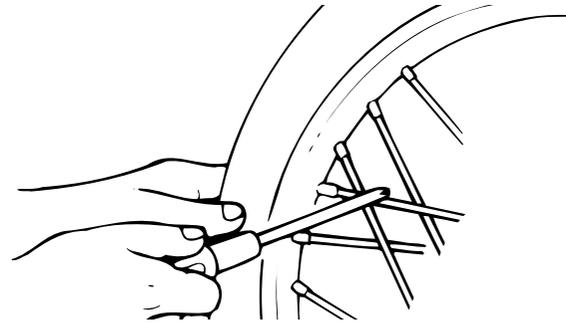
Do not attempt to straighten a bent wheel axle.

2. Check:

- Tire
- Front wheel
 - Damage/wear → Replace.
 - Refer to “CHECKING THE TIRES” on page 1-31 and “CHECKING THE WHEELS” on page 1-33.

3. Check:

- Spokes
 - Bends/damage → Replace.
 - Loose → Tighten.
 - Tap the spokes with a screwdriver.



NOTE:

A tight spoke will emit a clear, ringing tone, a loose spoke will sound flat.

4. Tighten:

- Spokes
 - Refer to “CHECKING AND TIGHTENING THE SPOKES” on page 1-33.

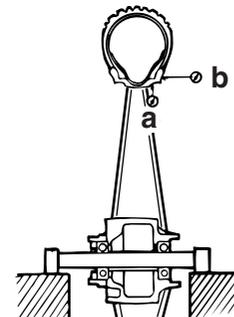
	Spoke 3 Nm (0.3 m•kg, 2.2 ft•lb)
---	---

NOTE:

After tightening the spokes, measure the front wheel runout.

5. Measure:

- Front wheel radial runout “a”
- Front wheel lateral runout “b”
 - Over the specified limits → Replace.



	Radial wheel runout limit 2.0 mm (0.08 in) Lateral wheel runout limit 2.0 mm (0.08 in)
---	---

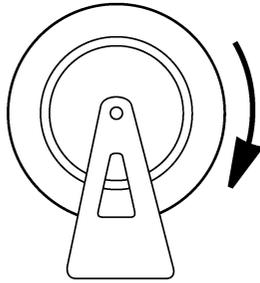
6. Check:

- Collars
 - Damage/wear → Replace.

7. Check:

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

FRONT WHEEL



EAS21910

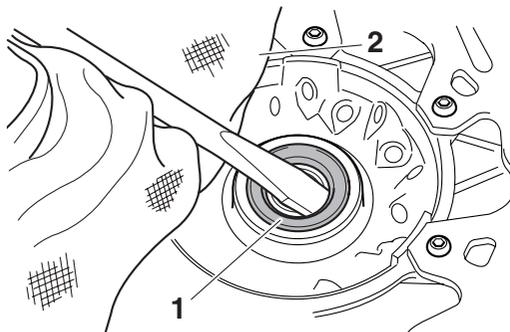
DISASSEMBLING THE FRONT WHEEL

1. Remove:
 - Oil seals
 - Wheel bearings

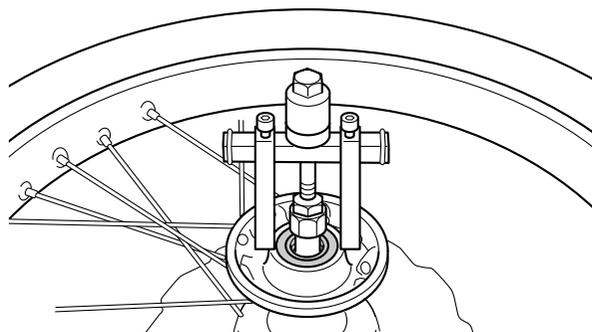
-
- a. Clean the outside of the front wheel hub.
 - b. Remove the oil seals "1" with a flat-head screwdriver.

NOTE:

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



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



EAS21960

ASSEMBLING THE FRONT WHEEL

1. Install:
 - Wheel bearings

- Oil seals **New**

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

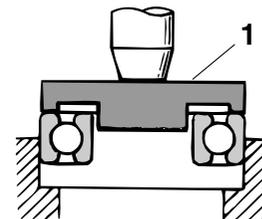
ECA14130

CAUTION:

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

NOTE:

Use a socket "1" that matches the diameter of the wheel bearing outer race and oil seal.



EAS22000

INSTALLING THE FRONT WHEEL (DISC)

The following procedure applies to both of the brake discs.

1. Lubricate:
 - Wheel axle
 - Oil seal lips

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

2. Tighten:
 - Wheel axle nut "1"
 - Wheel axle pinch bolt

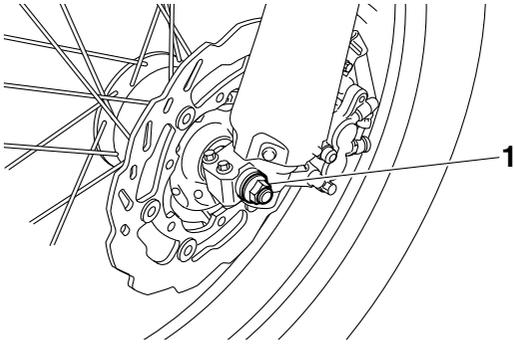
ECA14140

CAUTION:

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

	Wheel axle nut 63 Nm (6.3 m•kg, 46 ft•lb) Wheel axle pinch bolt 23 Nm (2.3 m•kg, 17 ft•lb)
--	---

FRONT WHEEL

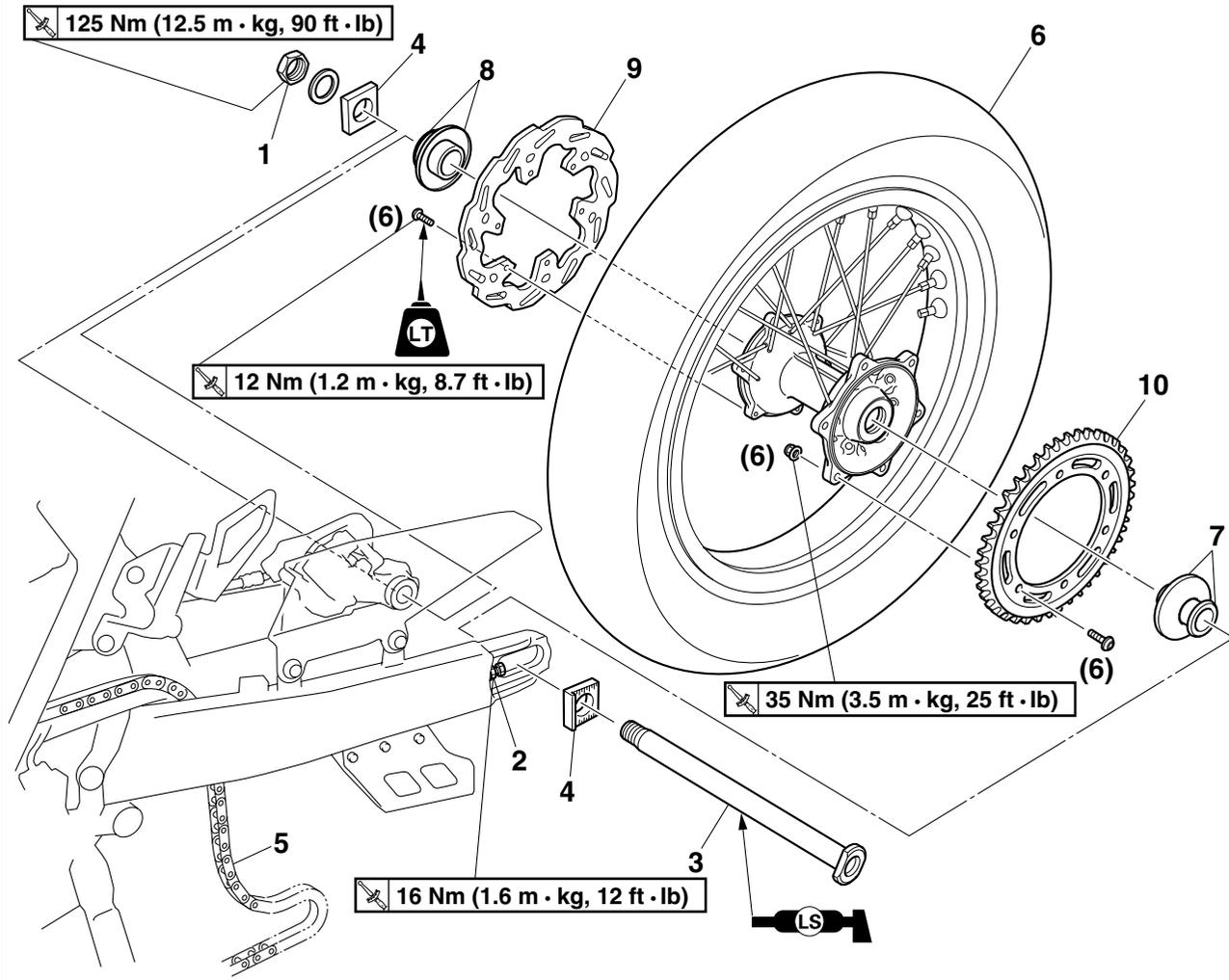


REAR WHEEL

EAS22020

REAR WHEEL

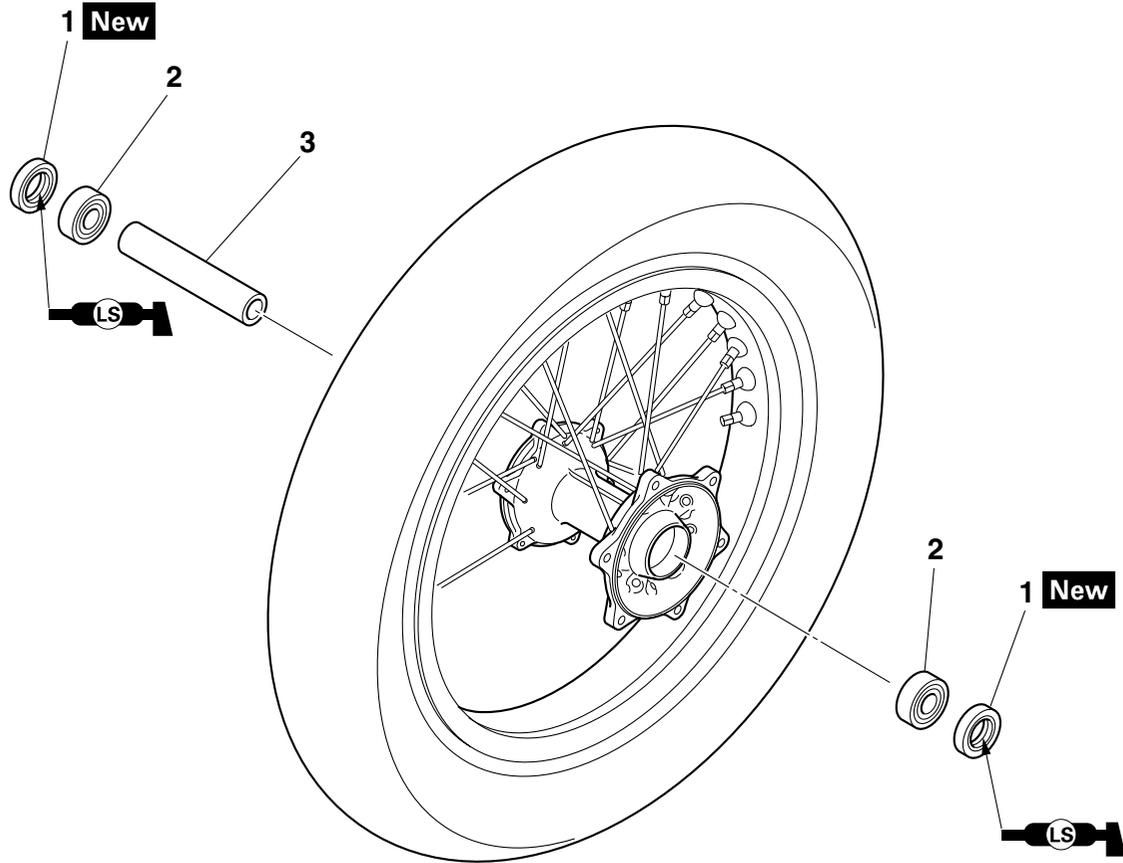
Removing the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
			Use a suitable stand to raise the front wheel off the ground.
1	Rear wheel axle nut	1	
2	Locknut	2	It loosens and adjusting bolt is tightened fully.
3	Rear wheel axle	1	
4	Chain puller (left/right)	1/1	
5	Drive chain	1	
6	Rear wheel assembly	1	
7	Collar left/Dust cover	1/1	
8	Collar right/Dust cover	1/1	
9	Rear brake disc	1	
10	Rear wheel sprocket	1	
			For installation, reverse the removal procedure.

REAR WHEEL

Disassembling the rear wheel



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

REAR WHEEL

- 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
35 Nm (3.5 m•kg, 25 ft•lb)

NOTE:

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

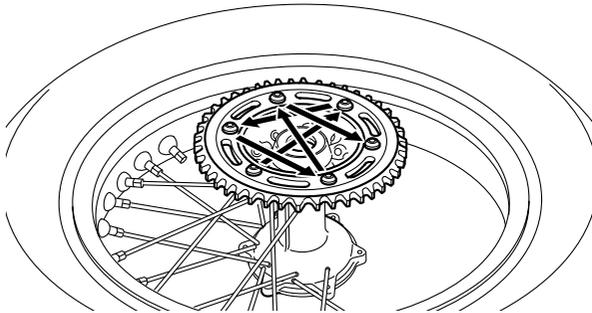


Drive chain slack
WR250R 38.0–48.0 mm
(1.50–1.89 in)
WR250X 40.0–50.0 mm
(1.57–1.97 in)

- 4. Tighten:
 - Wheel axle nut



Wheel axle nut
125 Nm (12.5 m•kg, 90 ft•lb)



EAS22140

ASSEMBLING THE REAR WHEEL

- 1. Install:
 - Wheel bearings
 - Oil seals **New**Refer to “ASSEMBLING THE FRONT WHEEL” on page 4-5.

EAS22160

INSTALLING THE REAR WHEEL (DISC)

- 1. Install:
 - Brake discRefer to “CHECKING THE REAR BRAKE DISC” on page 4-28
- 2. Lubricate:
 - Wheel axle
 - Oil seal lips



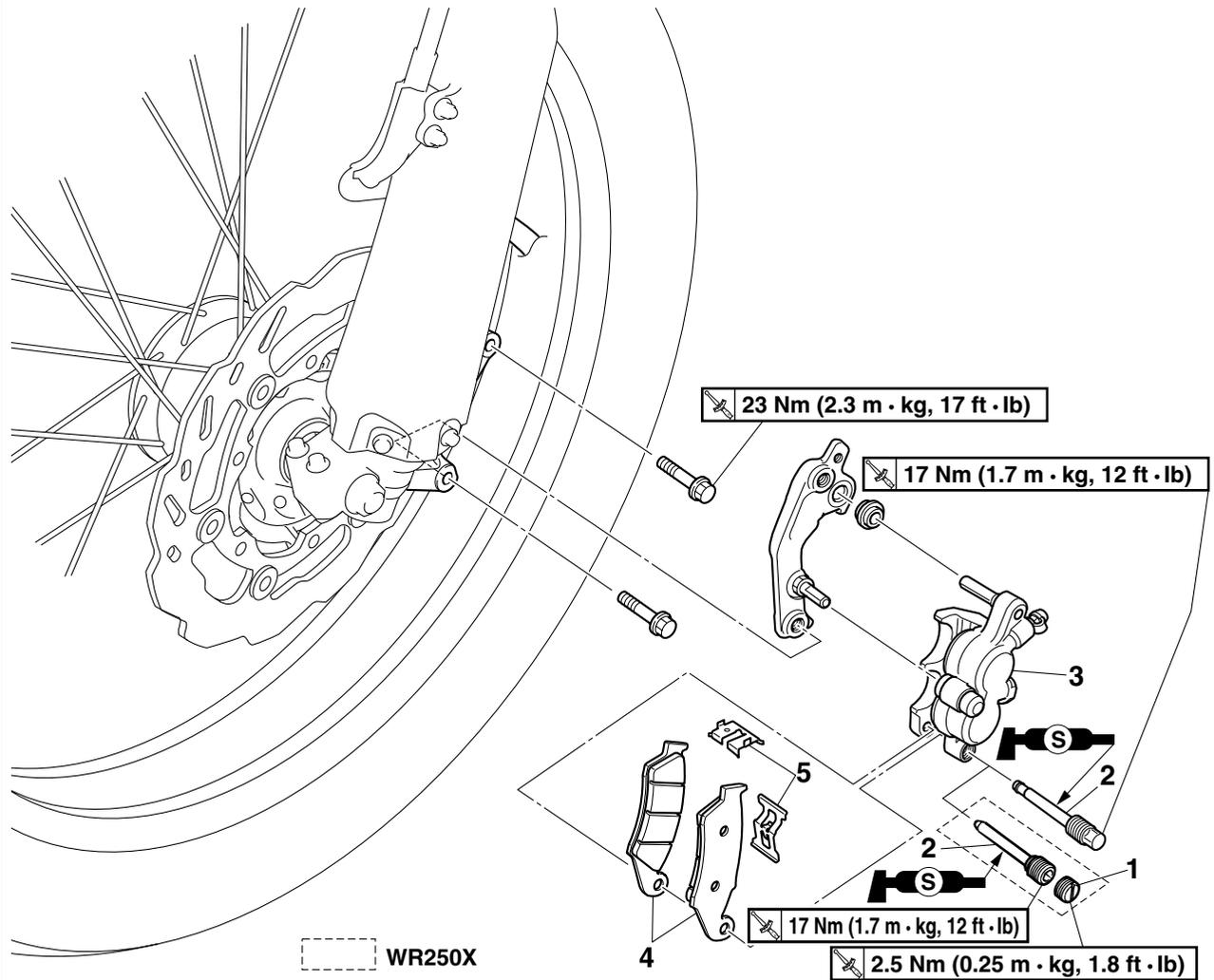
Recommended lubricant
Lithium-soap-based grease

- 3. Adjust:
 - Drive chain slackRefer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 1-26.

EAS22210

FRONT BRAKE

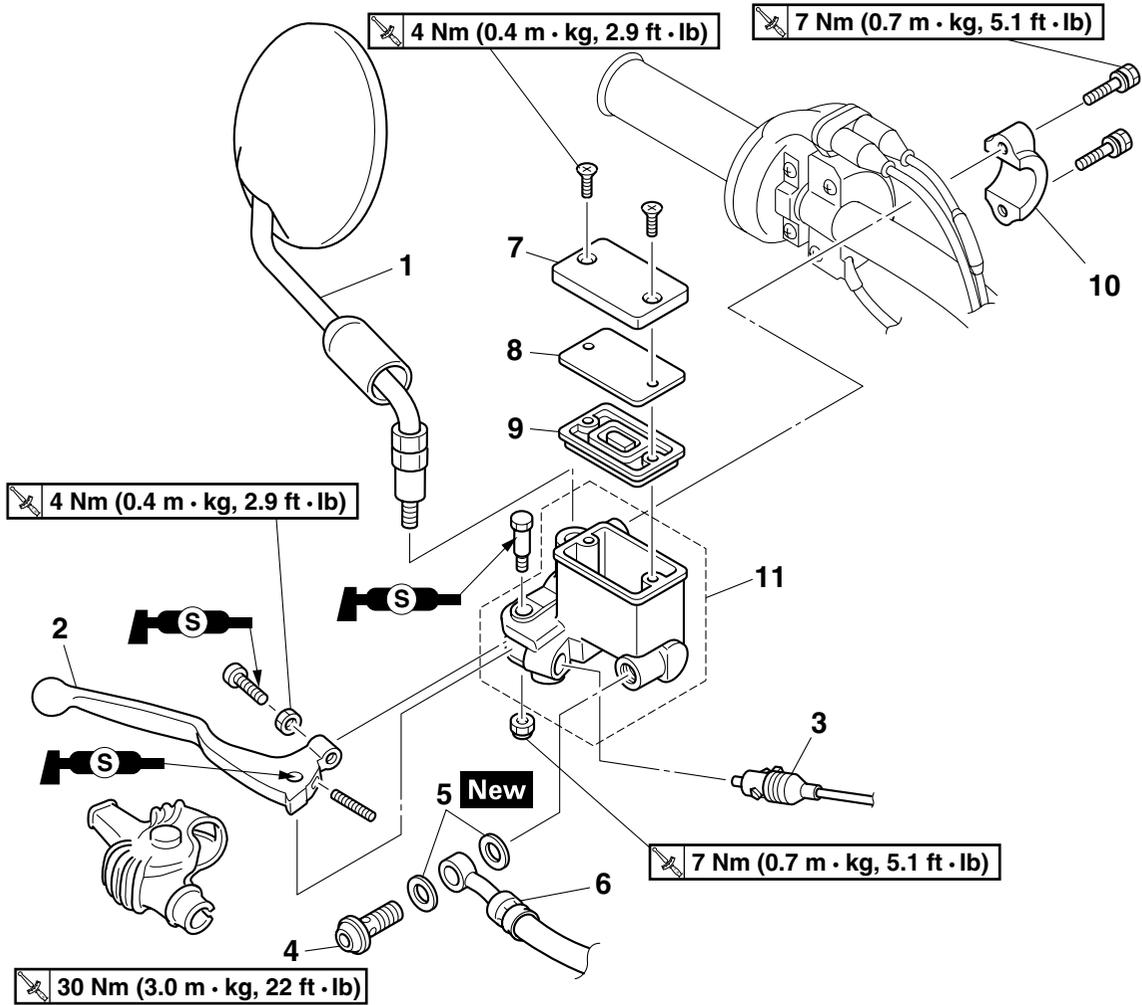
Removing the front brake pads



Order	Job/Parts to remove	Q'ty	Remarks
1	Pin plug	1	WR250X only
2	Front brake caliper support bolt	1	
3	Front brake caliper assembly	1	
4	Brake pad	2	
5	Brake pad spring	2	
			For installation, reverse the removal procedure.

FRONT BRAKE

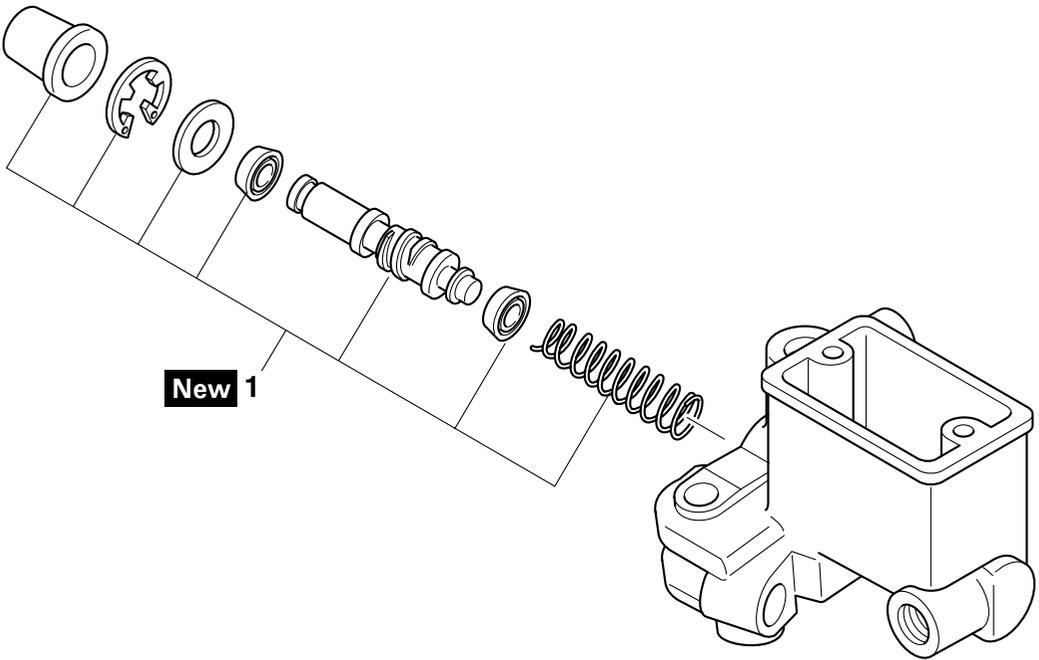
Removing the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 1-25.
1	Rear view mirror (right)	1	
2	Brake lever	1	
3	Front brake switch	1	
4	Union bolt	1	
5	Copper washer	2	
6	Front brake hose	1	
7	Brake master cylinder reservoir cap	1	
8	Brake master cylinder reservoir diaphragm holder	1	
9	Brake master cylinder reservoir diaphragm	1	
10	Front brake master cylinder holder	1	
11	Front brake master cylinder	1	
			For installation, reverse the removal procedure.

FRONT BRAKE

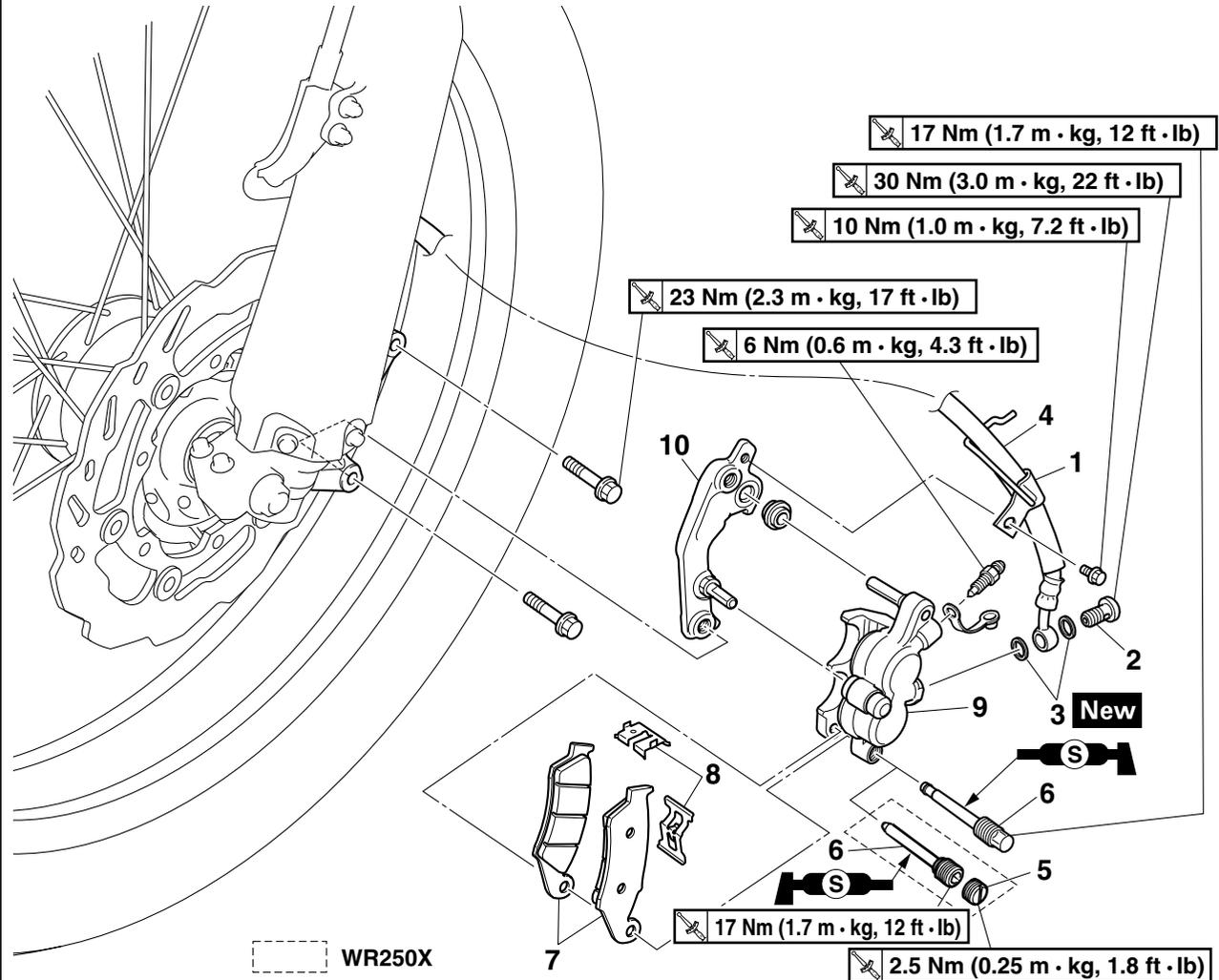
Disassembling the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Master cylinder kit	1	
			For assembly, reverse the disassembly procedure.

FRONT BRAKE

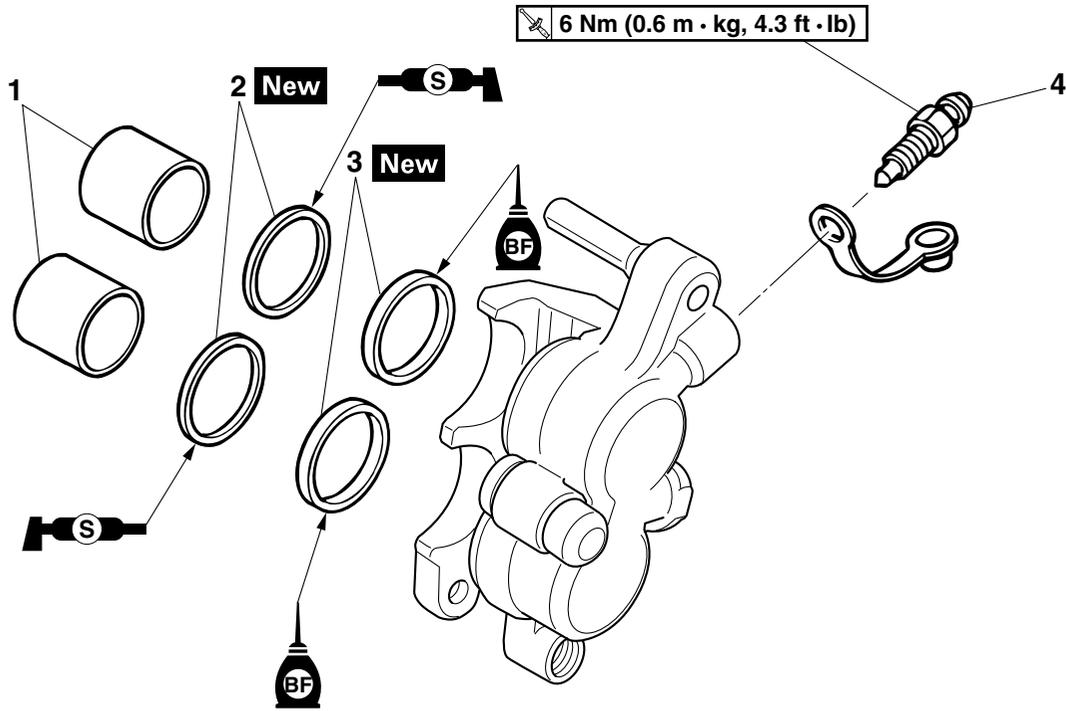
Removing the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 1-25.
1	Brake hose holder	1	
2	Union bolt	1	
3	Copper washer	2	
4	Front brake hose	1	
5	Pin plug	1	Only WR250X
6	Front brake caliper support bolt	1	
7	Brake pad	2	
8	Brake pad spring	2	
9	Front brake caliper assembly	1	
10	Front brake caliper bracket	1	
			For installation, reverse the removal procedure.

FRONT BRAKE

Disassembling the front brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake caliper piston	2	
2	Brake caliper dust seal	2	
3	Brake caliper piston seal	2	
4	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS22220

INTRODUCTION

EWA14100

WARNING

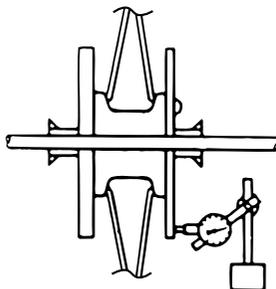
Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

- 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.

EAS22230

CHECKING THE FRONT BRAKE DISC

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



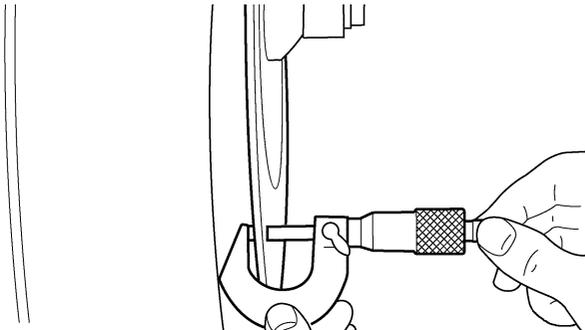
	Brake disc deflection limit 0.15 mm (0.0059 in)
---	---



- a. Place the vehicle on a suitable stand so that the front wheel is elevated.
- b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- c. Remove the brake caliper.
- d. Hold the dial gauge at a right angle against the brake disc surface.
- e. Measure the deflection front 10 mm (0.39 in), rear 7 mm (0.28 in) below the edge of the brake disc.



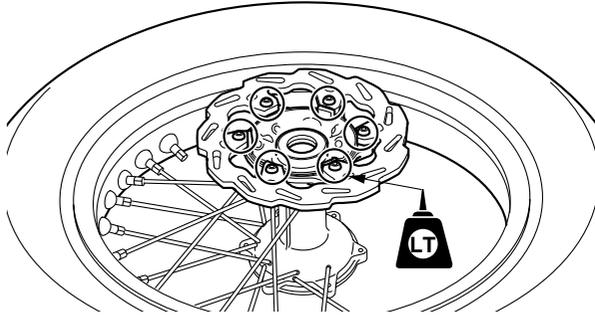
4. Measure:
 - Brake disc thickness
Measure the brake disc thickness at a few different locations.
Out of specification → Replace.



	Brake disc thickness limit WR250R 3.0 mm (0.12 in) WR250X 3.5 mm (0.14 in)
---	---

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

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



 **Brake disc bolt**
WR250R:12 Nm (1.2 m•kg, 8.7 ft•lb)
LOCTITE®
WR250X:23 Nm (2.3 m•kg, 17 ft•lb)
LOCTITE®

- 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 4-2.

EAS22280

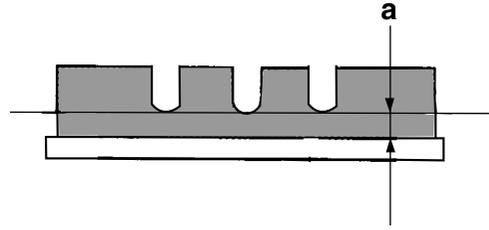
REPLACING THE FRONT BRAKE PADS

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)**
WR250R 4.8 mm (0.19 in)
WR250X 4.0 mm (0.16 in)
Limit
1.0 mm (0.04 in)
Brake pad lining thickness (outer)
WR250R 4.8 mm (0.19 in)
WR250X 4.0 mm (0.16 in)
Limit
1.0 mm (0.04 in)

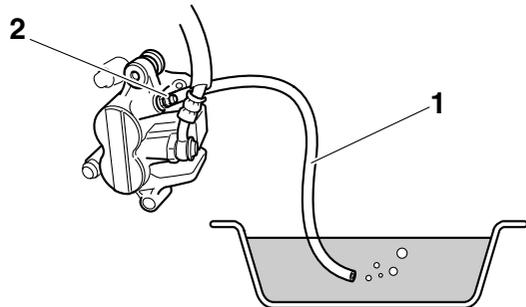


2. Install:
 - Brake pads
 - Brake pad spring

NOTE:

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

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



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

 **Bleed screw**
6 Nm (0.6 m•kg, 4.3 ft•lb)

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

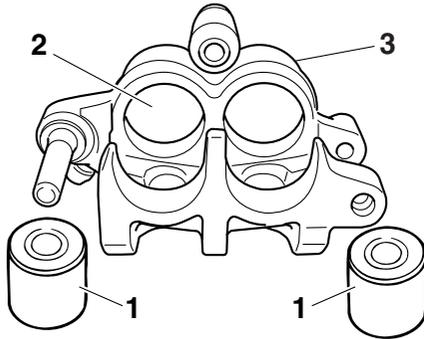


3. Install:
 - Brake pad pins
 - Brake pad clips
 - Brake pad cover
 - Brake caliper

 **Brake caliper bolt**
23 Nm (2.3 m•kg, 17 ft•lb)

FRONT BRAKE

- Brake caliper cylinders “2”
Scratches/wear → Replace the brake caliper assembly.
- Brake caliper body “3”
Cracks/damage → Replace the brake caliper assembly.
- Brake fluid delivery passages (brake caliper body)
Obstruction → Blow out with compressed air.



EWA13600

WARNING

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

2. Check:

- Brake caliper bracket
Cracks/damage → Replace.

EAS22400

ASSEMBLING THE FRONT BRAKE CALIPER

EWA13620

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



Recommended fluid
DOT 4

EAS22420

INSTALLING THE FRONT BRAKE CALIPER

1. Install:

- Front brake caliper bracket
- Front brake caliper (temporarily)
- Copper washers **New**
- Brake hose
- Union bolt



Front brake caliper bracket
23 Nm (2.3 m•kg, 17 ft•lb)
Brake hose union bolt
30 Nm (30. m•kg, 22 ft•lb)

EWA13530

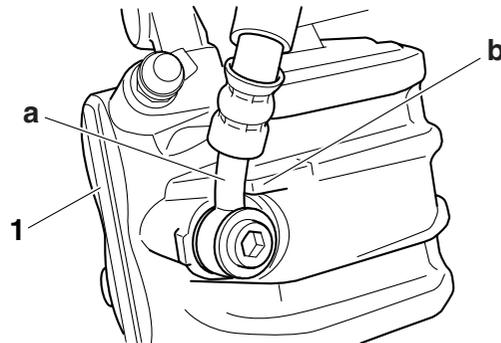
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-30.

ECA14170

CAUTION:

When installing the brake hose onto the brake caliper “1”, make sure the brake pipe “a” touches the projection “b” on the brake caliper.



2. Install:

- Front brake caliper
- Brake pad springs
- Front brake caliper support bolt
- Brake hose holder



Front brake caliper support bolt
17 Nm (1.7 m•kg, 12 ft•lb)
Brake hose holder
10 Nm (1.0 m•kg, 7.2 ft•lb)

Refer to “REPLACING THE FRONT BRAKE PADS” on page 4-17.

3. Fill:

- Brake master cylinder 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.

4. Bleed:
 - Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 1-25.
5. Check:
 - Brake fluid level
Below the minimum level mark → Add the recommended brake fluid to the proper level. Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 1-23.
6. Check:
 - Brake lever free play
Refer to “ADJUSTING THE FRONT DISC BRAKE” on page 1-22.
 - Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 1-25.

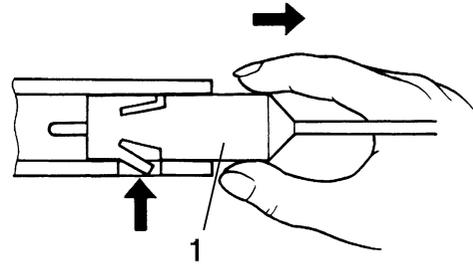
EAS22490

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:
 - Brake switch coupler “1”
(from the brake master cylinder)



2. Remove:
 - Union bolt
 - Copper washers
 - Brake hoses

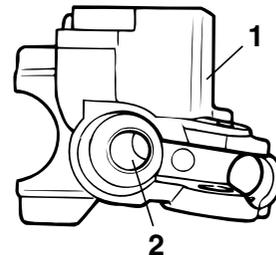
NOTE:

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



2. Check:
 - Brake master cylinder kit
Damage/scratches/wear → Replace.
3. Check:
 - Brake master cylinder reservoir cap
4. Check:
 - Brake master cylinder reservoir diaphragm holder
 - Brake master cylinder reservoir diaphragm holder
Cracks/damage → Replace.
5. Check:
 - Brake hoses
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
---	------------------------------------

1. Install:
 - Master cylinder cup
 - Master cylinder piston
2. Install:
 - Circlip "1" **New**
 - Dust boot "2" **New**



EAS22530

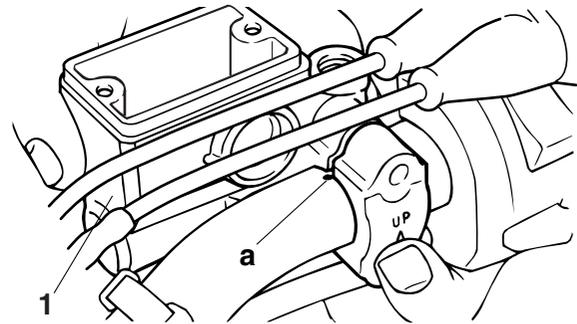
INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:
 - Brake master cylinder holder "1"

	Brake master cylinder holder bolt 7 Nm (0.7 m•kg, 5.1 ft•lb)
---	---

NOTE:

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



2. Install:
 - Copper washers "1" **New**
 - Brake hose "2"
 - Union bolt "3"

	Brake hose union bolt 30 Nm (30. m•kg, 22 ft•lb)
---	---

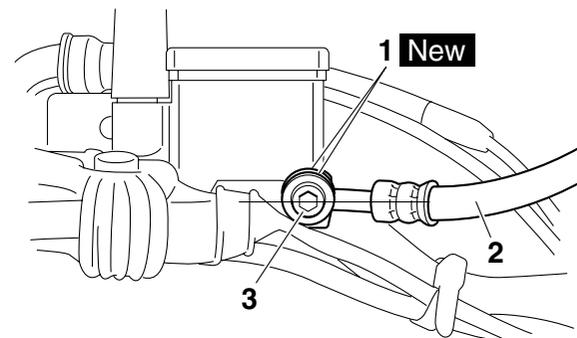
EWA13530

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-30.

NOTE:

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



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

	Recommended fluid DOT 4
---	------------------------------------

EWA13540

WARNING

- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor

brake performance.

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

ECA13540

CAUTION:

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

4. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 1-25.

5. Check:

- Brake fluid level
Below the minimum level mark → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 1-23.

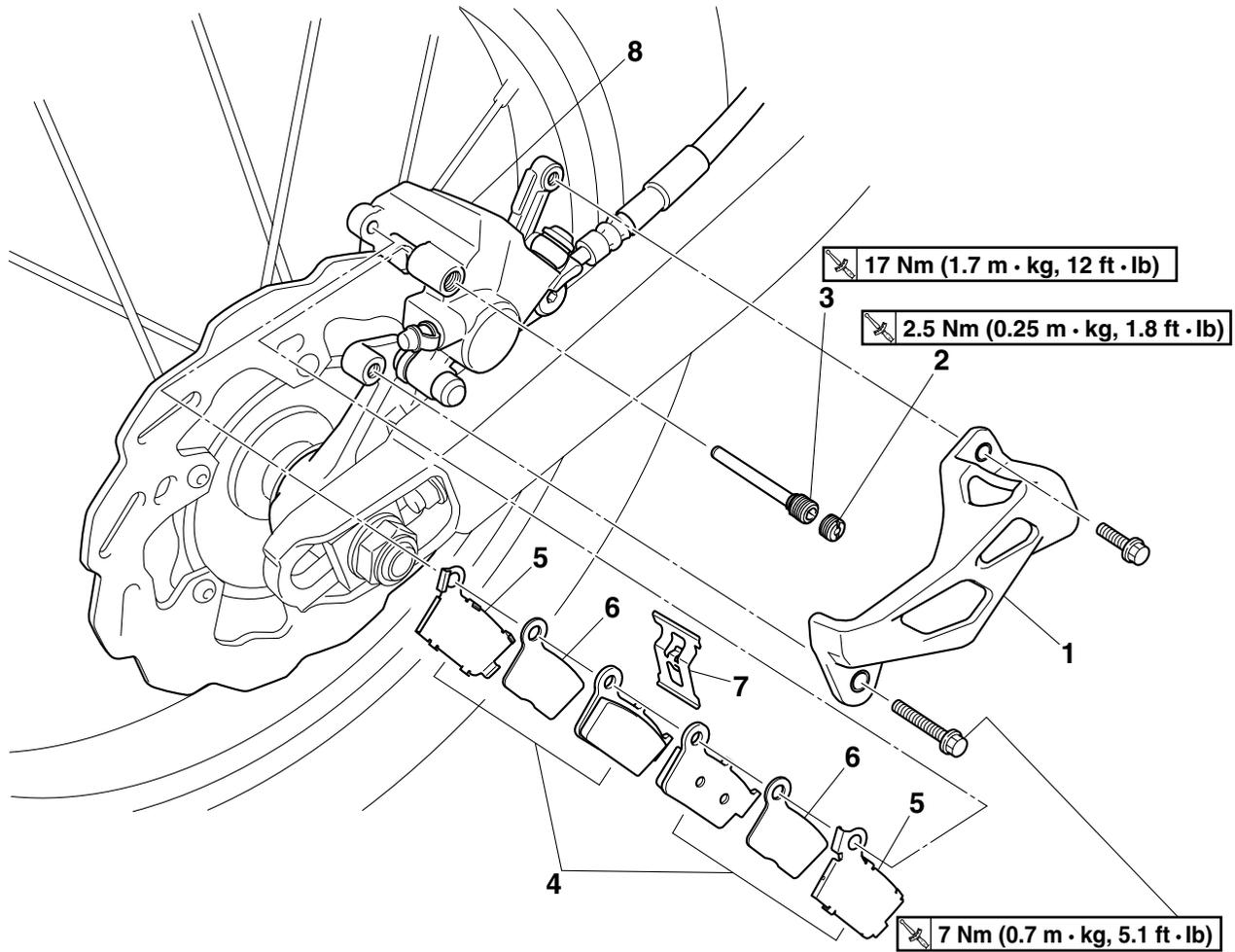
6. Check:

- Brake lever free play
Refer to “ADJUSTING THE FRONT DISC BRAKE” on page 1-22.
- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 1-25.

EAS22550

REAR BRAKE

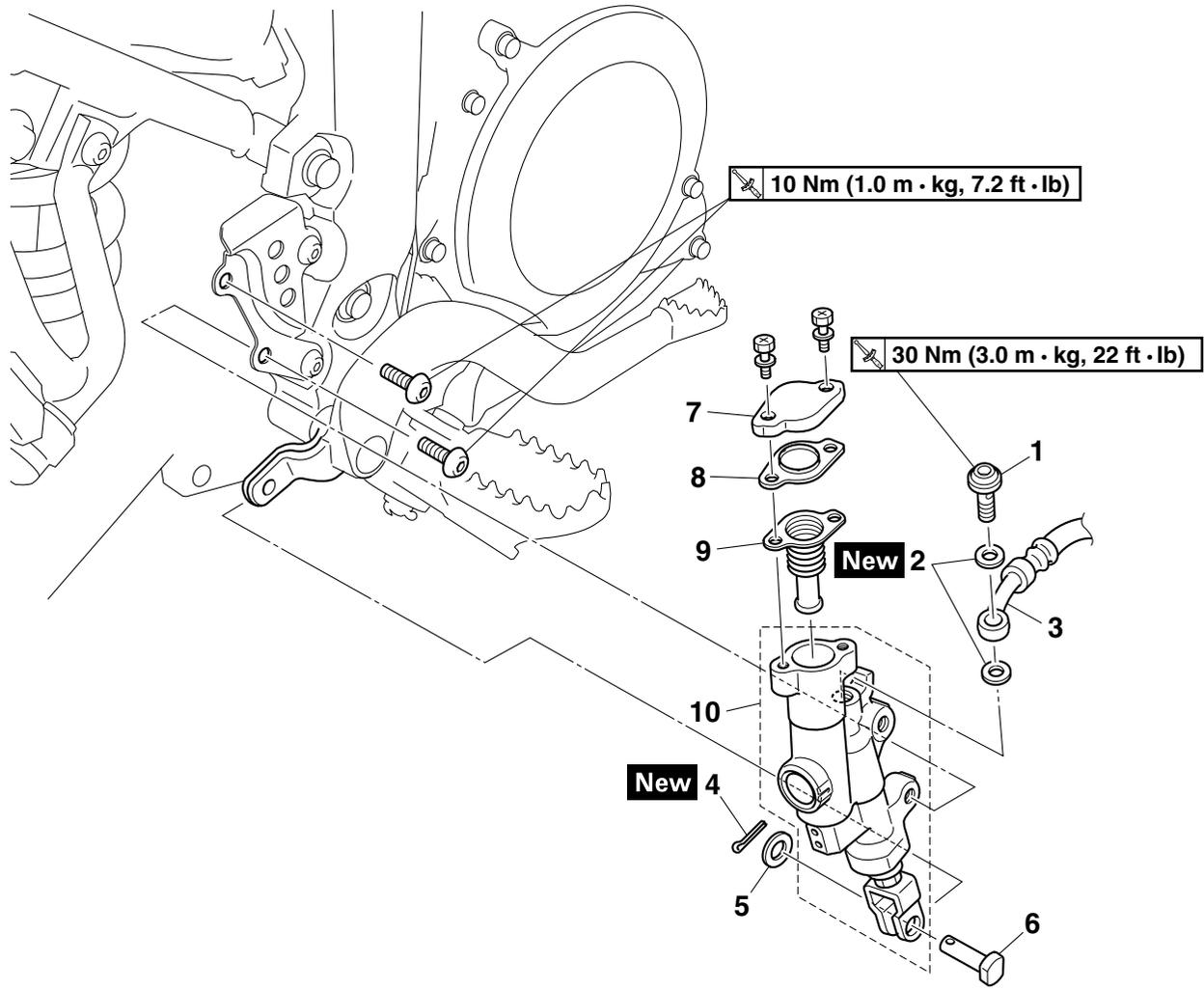
Removing the rear brake pads



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-7.
1	Protector	1	
2	Pin plug	1	
3	Brake pad support bolt	1	
4	Rear brake pad	2	
5	Pad shim	2	
6	Insulator	2	
7	Rear brake pad spring	1	
8	Rear brake caliper assembly	1	
			For installation, reverse the removal procedure.

REAR BRAKE

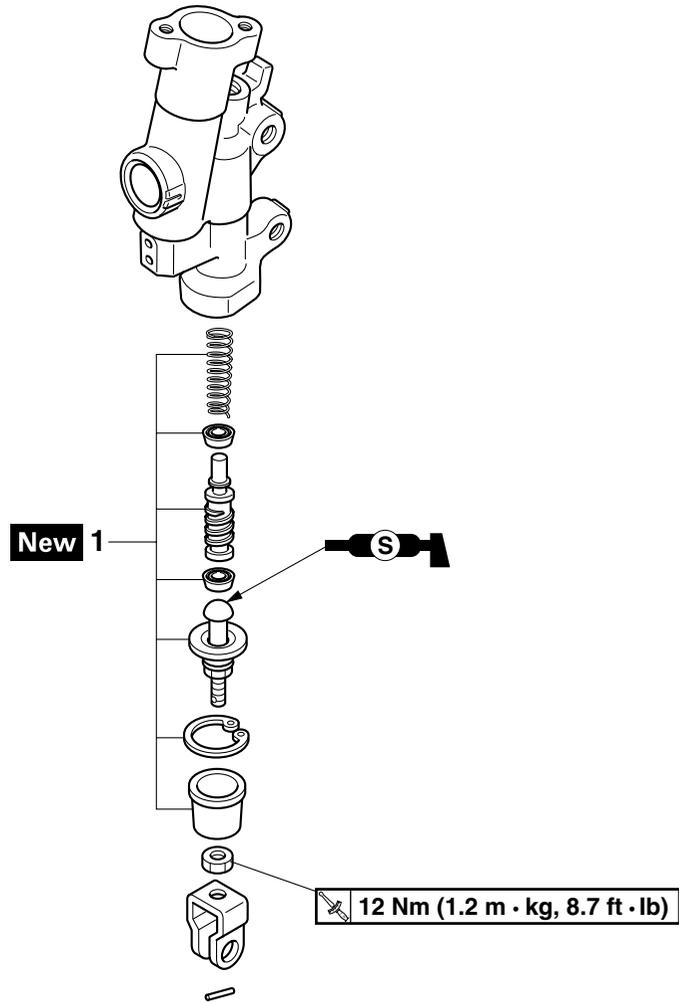
Removing the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 1-25.
1	Union bolt	1	
2	Copper washer	2	
3	Brake hose	1	
4	Split pin	1	
5	Plain washer	1	
6	Pin	1	
7	Brake master cylinder reservoir cap	1	
8	Brake master cylinder reservoir diaphragm plate	1	
9	Brake master cylinder reservoir diaphragm	1	
10	Rear brake master cylinder	1	
			For installation, reverse the removal procedure.

REAR BRAKE

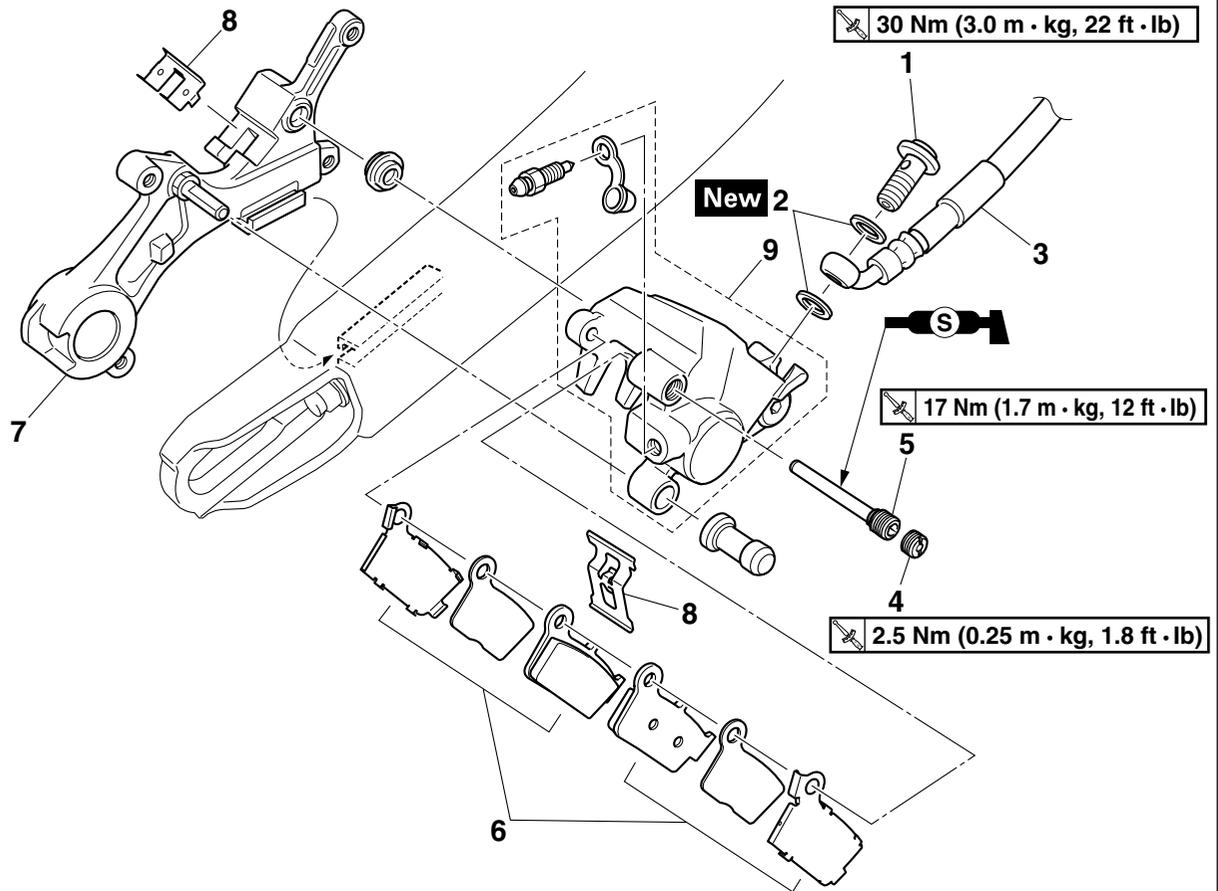
Disassembling the rear brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Master cylinder kit	1	
			For assembly, reverse the disassembly procedure.

REAR BRAKE

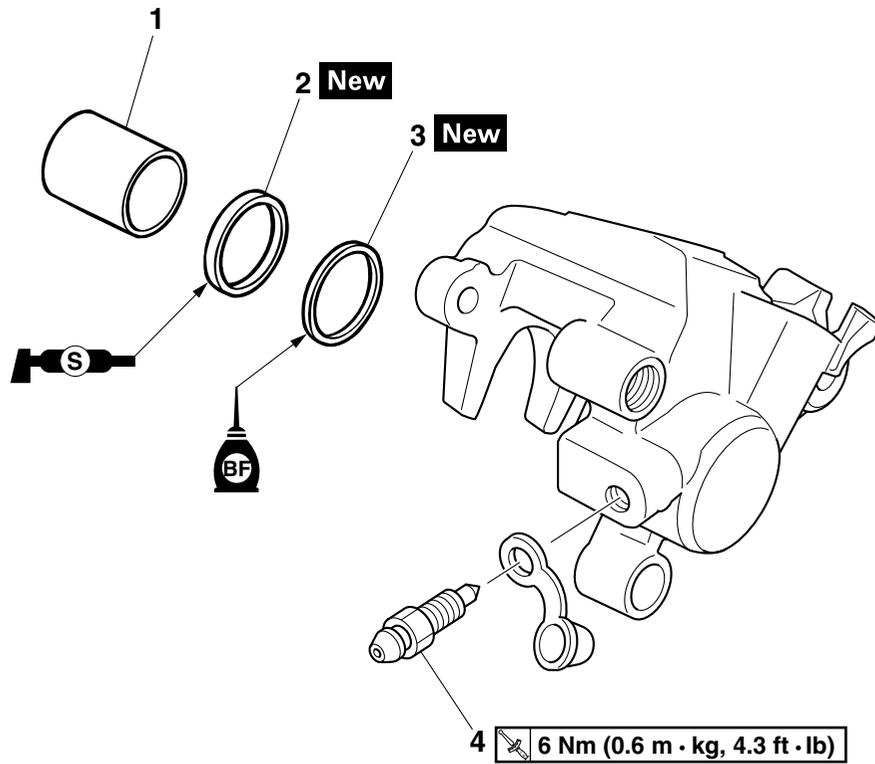
Removing the rear brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 1-25.
	Protector		Refer to "REAR BRAKE" on page 4-23.
1	Union bolt	1	
2	Copper washer	2	
3	Rear brake hose	1	
4	Pin plug	1	
5	Brake caliper support bolt	1	
6	Rear brake pad assembly	2	
7	Rear brake caliper bracket	1	
8	Brake pad spring	2	
9	Rear brake caliper assembly	1	
			For installation, reverse the removal procedure.

REAR BRAKE

Disassembling the rear brake calipers



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake caliper piston	1	
2	Brake caliper dust seal	1	
3	Brake caliper piston seal	1	
4	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 4-7.
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 4-16.

	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 4-16.

	Brake disc thickness limit 4.0 mm (0.16 in)
---	--

5. Adjust:
 - Brake disc deflection
Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-16.

	Brake disc bolt 12 Nm (1.2 m•kg, 8.7 ft•lb) LOCTITE®
---	---

6. Install:
 - Rear wheel
Refer to "REAR WHEEL" on page 4-7.

EAS22580

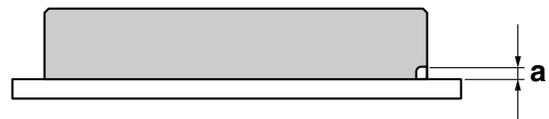
REPLACING THE REAR BRAKE PADS

NOTE:

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

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

	Brake pad lining thickness (inner) 6.4 mm (0.25 in) Limit 1.0 mm (0.04 in) Brake pad lining thickness (outer) 6.4 mm (0.25 in) Limit 1.0 mm (0.04 in)
---	--



2. Install:
 - Brake pad shims (onto the brake pads)
 - Brake pads
 - Brake pad spring

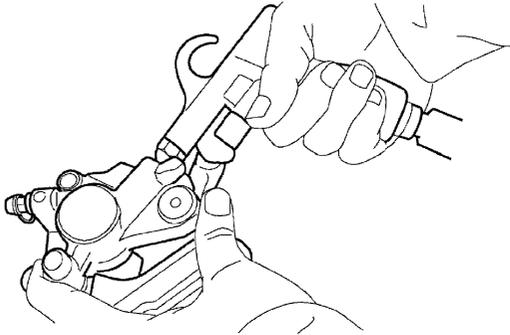
NOTE:

Always install new brake pads, brake pad shims,

EWA13550

⚠ WARNING

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



b. Remove the brake caliper dust seals brake caliper piston seals.

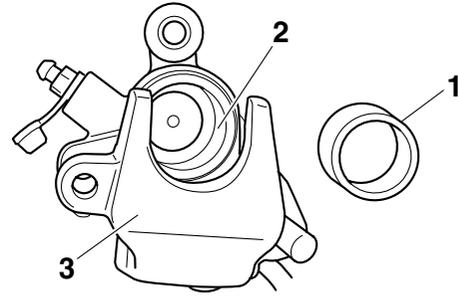


EAS22640

CHECKING THE REAR BRAKE CALIPER

Recommended brake component replacement schedule	
Brake pads	If necessary
Piston seals	Every two years
Brake hoses	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 pistons.
 - Brake caliper cylinders “2”
Scratches/wear → Replace the brake caliper assembly.
 - Brake caliper body “3”
Cracks/damage → Replace the brake caliper assembly.
 - Brake fluid delivery passages (brake caliper body)
Obstruction → Blow out with compressed air.



EWA13610

⚠ WARNING

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

2. Check:
 - Brake caliper brackets
Cracks/damage → Replace.

EAS22650

ASSEMBLING THE REAR BRAKE CALIPER

EWA13620

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

	Recommended fluid DOT 4
--	------------------------------------

EAS22670

INSTALLING THE REAR BRAKE CALIPER

1. Install:
 - Rear brake caliper
 - Rear brake caliper bracket
2. Install:
 - Rear wheel
Refer to “REAR WHEEL” on page 4-7.
 - Brake hose
 - Union bolt

	Union bolt 30 Nm (30. m•kg, 22 ft•lb)
--	--

EWA13530

⚠ WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CA-

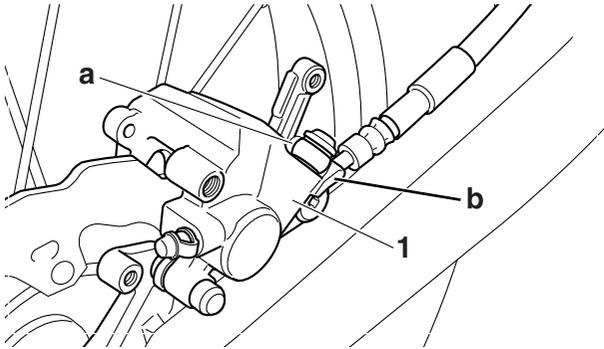
REAR BRAKE

BLE ROUTING” on page 2-30.

ECA14170

CAUTION:

When installing the brake hose onto the brake caliper “1”, make sure the brake pipe “a” touches the projection “b” on the brake caliper.



3. Install:

- Brake pad springs
- Brake pads
- Brake caliper support bolt
- Pin plug

Refer to “REPLACING THE REAR BRAKE PADS” on page 4-28.



Brake caliper support bolt
17 Nm (1.7 m•kg, 12 ft•lb)

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

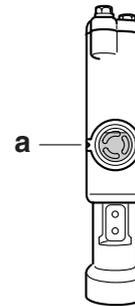
and plastic parts. Therefore, always clean up any spilled brake fluid immediately.

5. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 1-25.

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 1-23.



7. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 1-25.

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. Remove:

- 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.

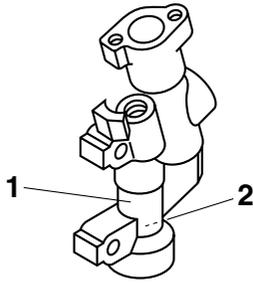
EAS22710

CHECKING THE REAR BRAKE MASTER CYLINDER

1. Check:

- Brake master cylinder “1”
Damage/scratches/wear → Replace.
- Brake fluid delivery passages “2”
(brake master cylinder body)

Obstruction → Blow out with compressed air.



2. Check:
 - Brake master cylinder kit
Damage/wear → Replace.
3. Check:
 - Master cylinder reservoir cap
Cracks/damage → Replace.
 - Brake master cylinder reservoir diaphragm holder
 - Brake master cylinder reservoir diaphragm
Cracks/damage → Replace.
4. Check:
 - Brake hoses
Cracks/damage/wear → Replace.

EAS22730

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

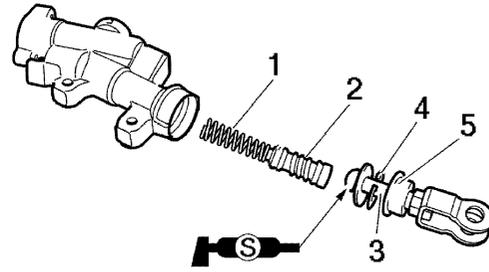
EWA13520

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
---	------------------------------------

1. Install:
 - Cylinder cup **New**
 - Master cylinder piston
2. Install:
 - Spring “1” **New**
 - Master cylinder piston “2” **New**
 - Adjusting rod “3” **New**
 - Circlip “4” **New**
 - Dust boot “5” **New**



EAS22750

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:
 - Copper washers **New**
 - Brake hoses
 - Union bolt

	Brake hose union bolt 30 Nm (30. m•kg, 22 ft•lb)
---	---

EWA13530

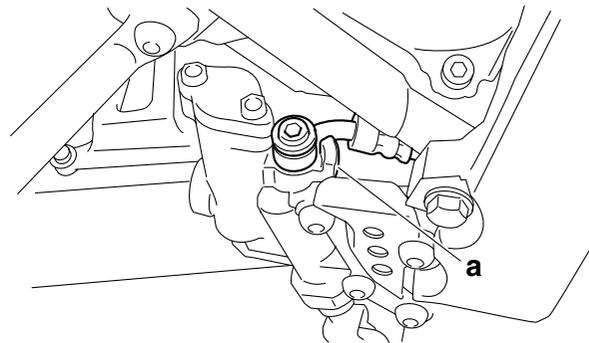
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-30.

ECA32D1002

CAUTION:

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



2. Fill:
 - Brake fluid reservoir

	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:

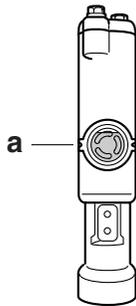
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

3. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 1-25.

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 1-23.



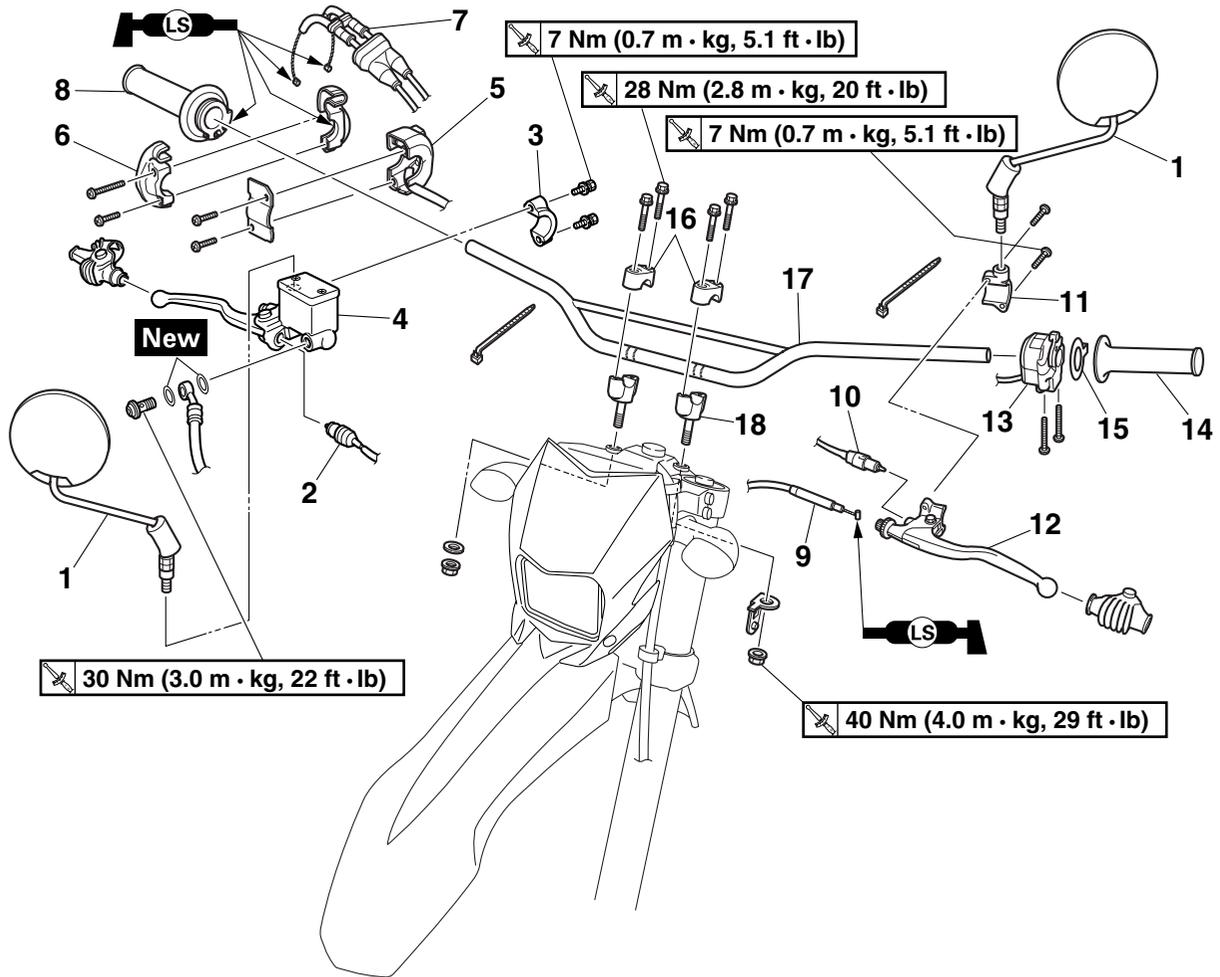
5. Check:

- Brake pedal operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 1-25.

EAS22840

HANDLEBAR

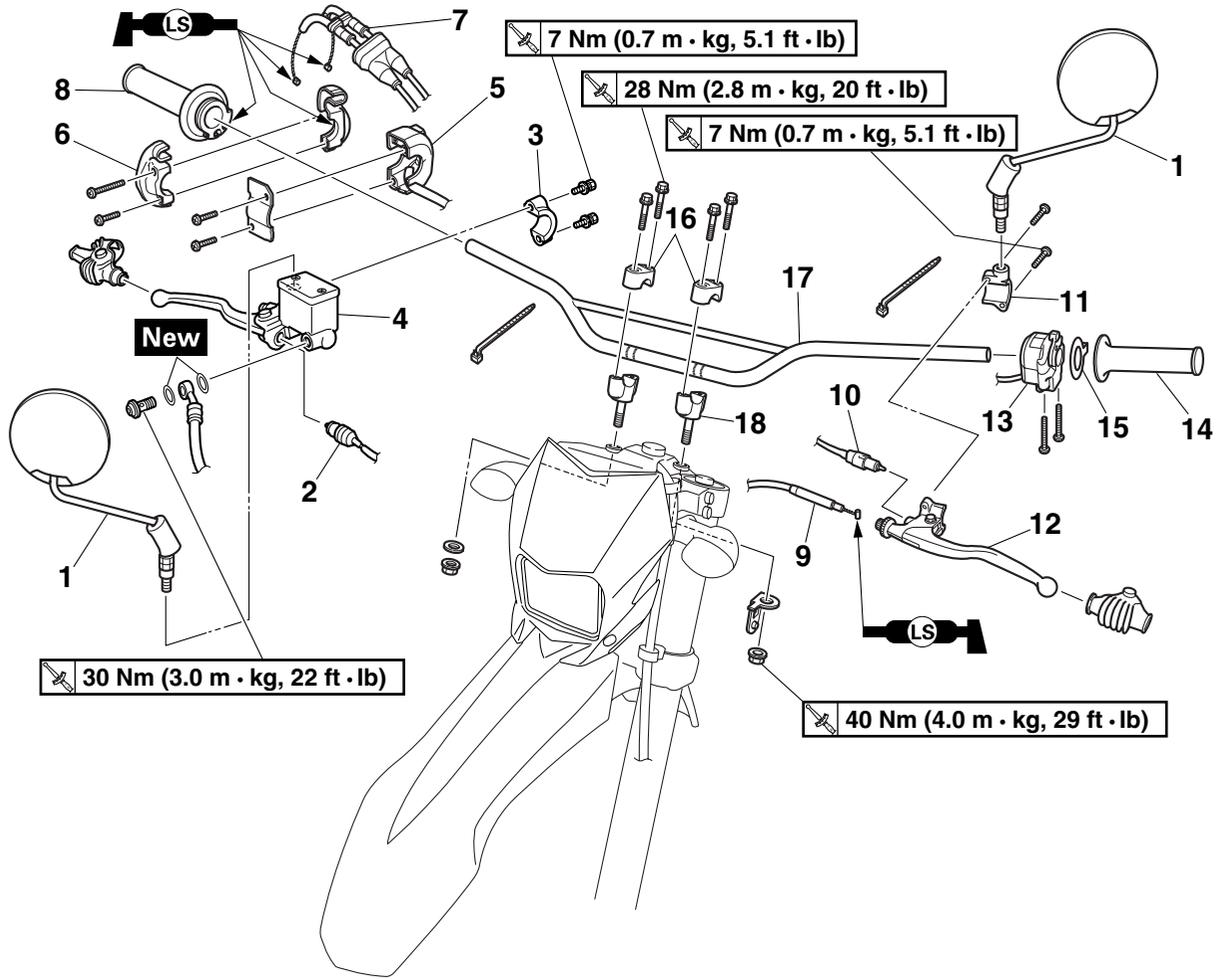
Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear view mirror (left/right)	1/1	
2	Front brake light switch	1	
3	Front brake master cylinder holder	1	
4	Front brake master cylinder assembly	1	
5	Right handlebar switch	1	
6	Throttle cable housing	1	
7	Throttle cable	2	
8	Throttle grip	1	
9	Clutch cable	1	
10	Clutch switch	1	
11	Clutch lever holder	1	
12	Clutch lever	1	
13	Left handlebar switch	1	
14	Handlebar grip	1	
15	Special washer	1	
16	Handlebar upper holder	2	
17	Handlebar	1	
18	Handlebar lower holder	2	

HANDLEBAR

Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
			For installation, reverse the removal procedure.

EAS22860

REMOVING THE HANDLEBARS

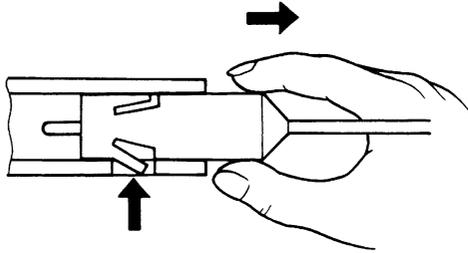
1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Remove:
- Front brake switch
 - Clutch switch



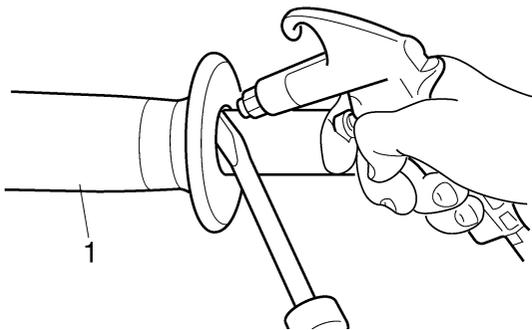
NOTE:

Press the projection, and remove them from front brake master cylinder assembly and clutch lever assembly.

3. Remove:
- Handlebar grip "1"

NOTE:

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



EAS22880

CHECKING THE HANDLEBAR

1. Check:
- Handlebar
Bends/cracks/damage → Replace.

EWA13690

WARNING

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

EAS22921

INSTALLING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Install:
- Handlebar "1"
 - Upper handlebar holders "2"



Upper handlebar holder bolt
28 Nm (2.8 m•kg, 20 ft•lb)

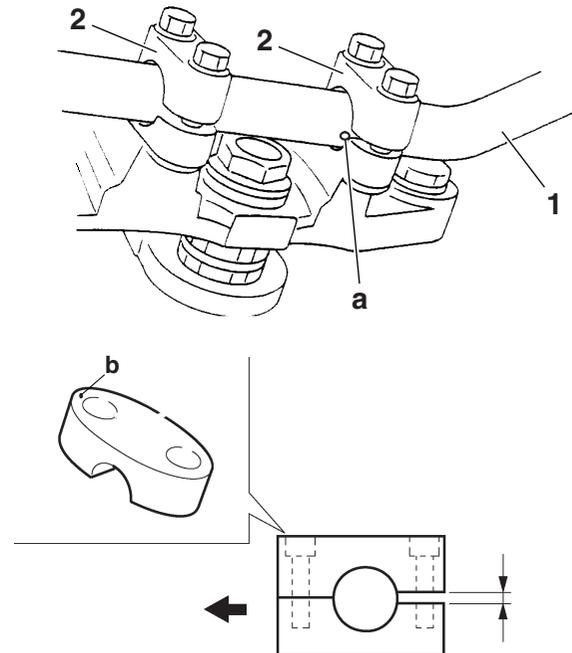
NOTE:

- Align the punch marks "a" on the handlebar with the upper surface of the lower handlebar holders.
- The upper handlebar holders should be installed with the punch marks "b" facing forward.

ECA14250

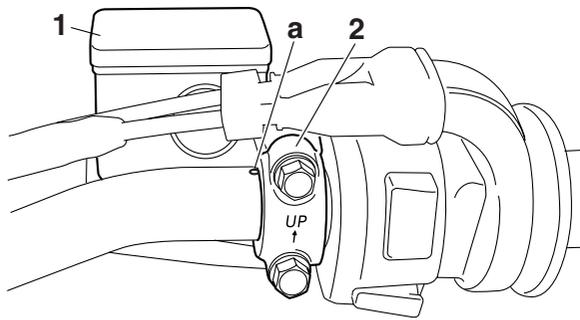
CAUTION:

- **First, tighten the bolts on the front side of the handlebar holder, and then on the rear side.**
- **Turn the handlebar all the way to the left and right. If there is any contact with the fuel tank, adjust the handlebar position.**



I2410303

3. Install:
- Special washer
 - Handle grip



9. Adjust:

- Clutch cable free play
Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” on page 1-14.



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

10. Adjust:

- Throttle cable free play
Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” on page 1-8.



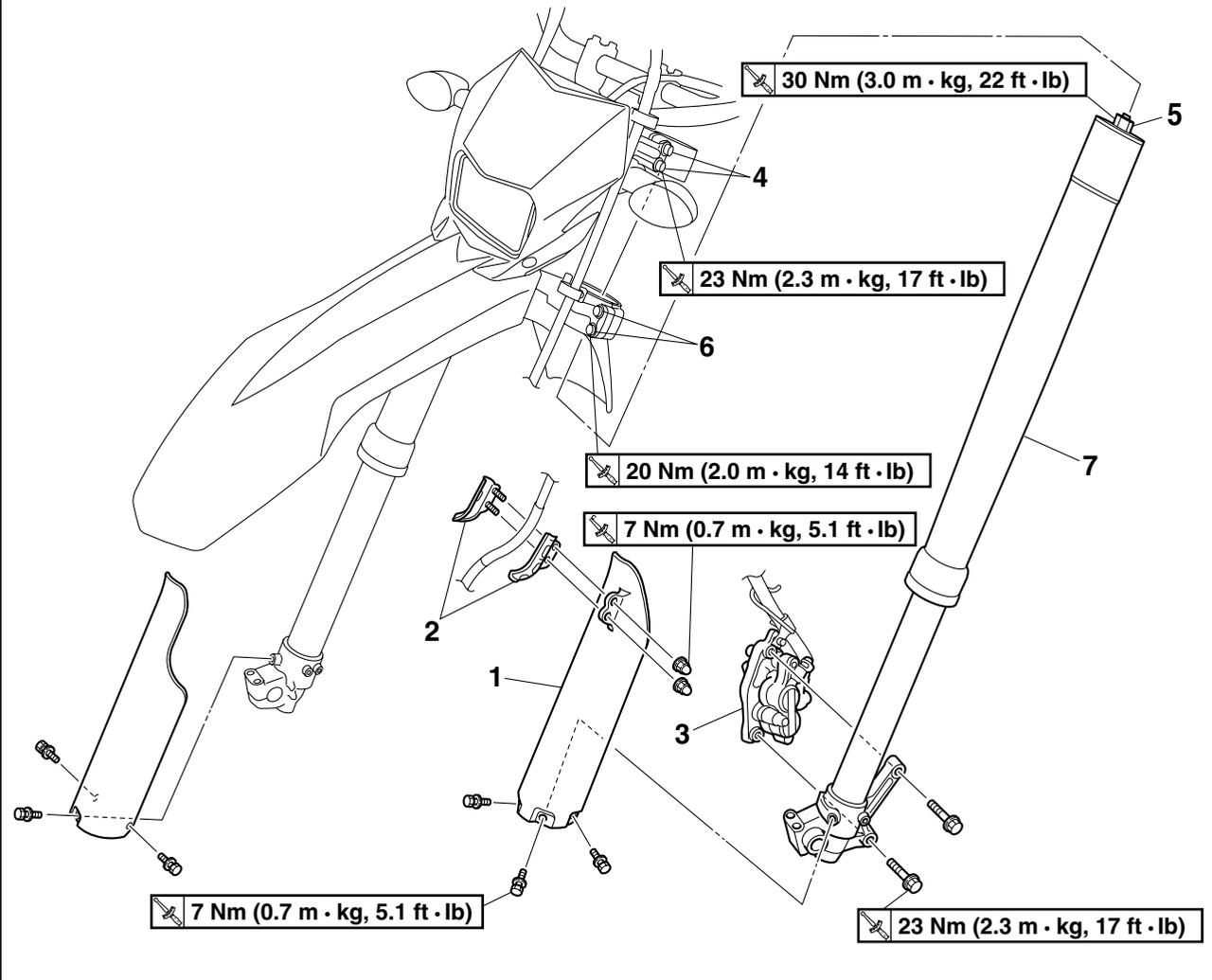
Throttle cable free play
3.0–5.0 mm (0.12–0.20 in)

FRONT FORK

EAS22950

FRONT FORK

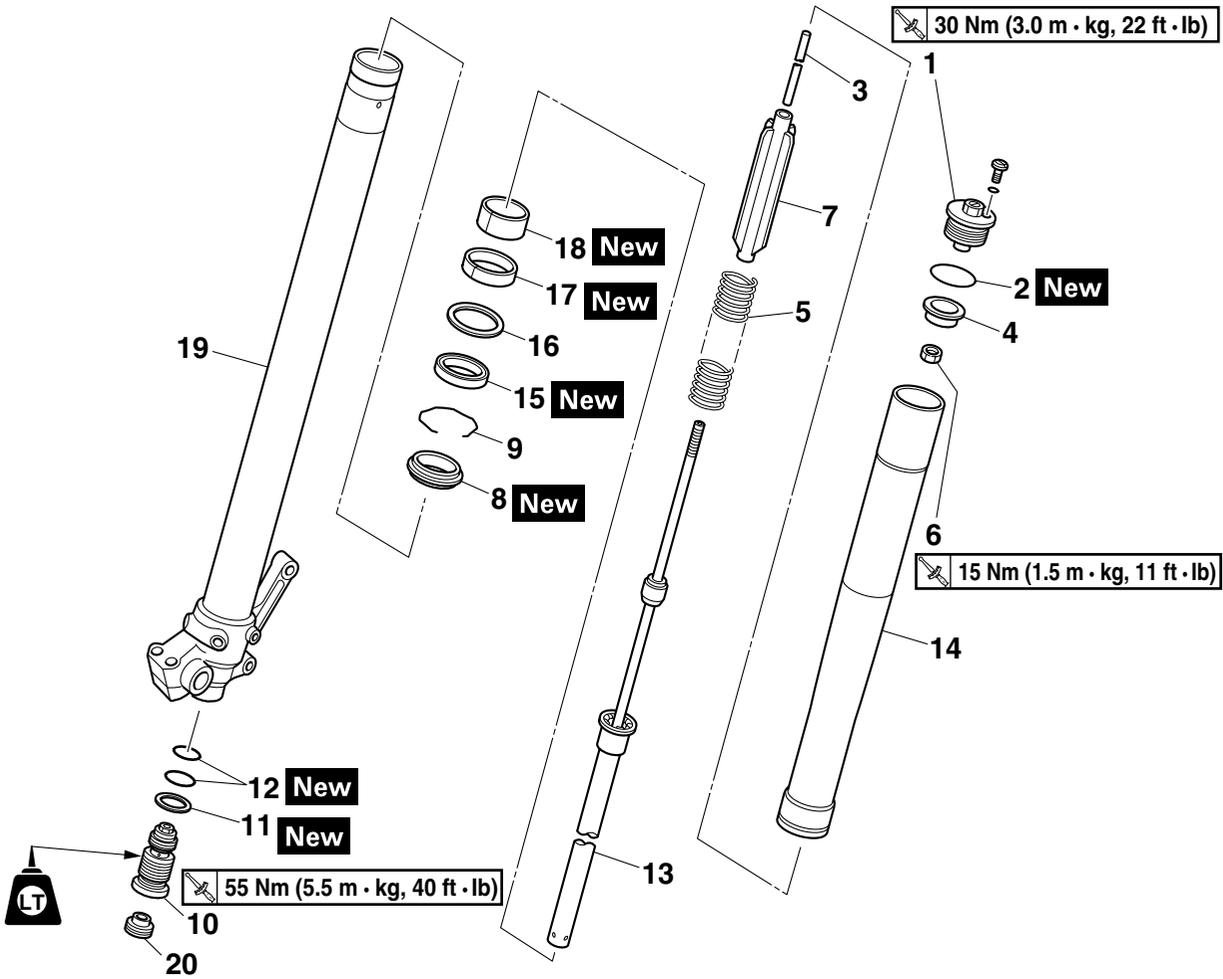
Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
	Front wheel		Refer to "FRONT WHEEL" on page 4-2.
1	Front fork protector	1	
2	Brake hose holder	2	
3	Front brake caliper	1	
4	Upper bracket pinch bolt	2	Loosen.
5	Front fork cap bolt	1	Loosen.
6	Lower bracket pinch bolt	2	Loosen.
7	Front fork	1	
			For installation, reverse the removal procedure.

FRONT FORK

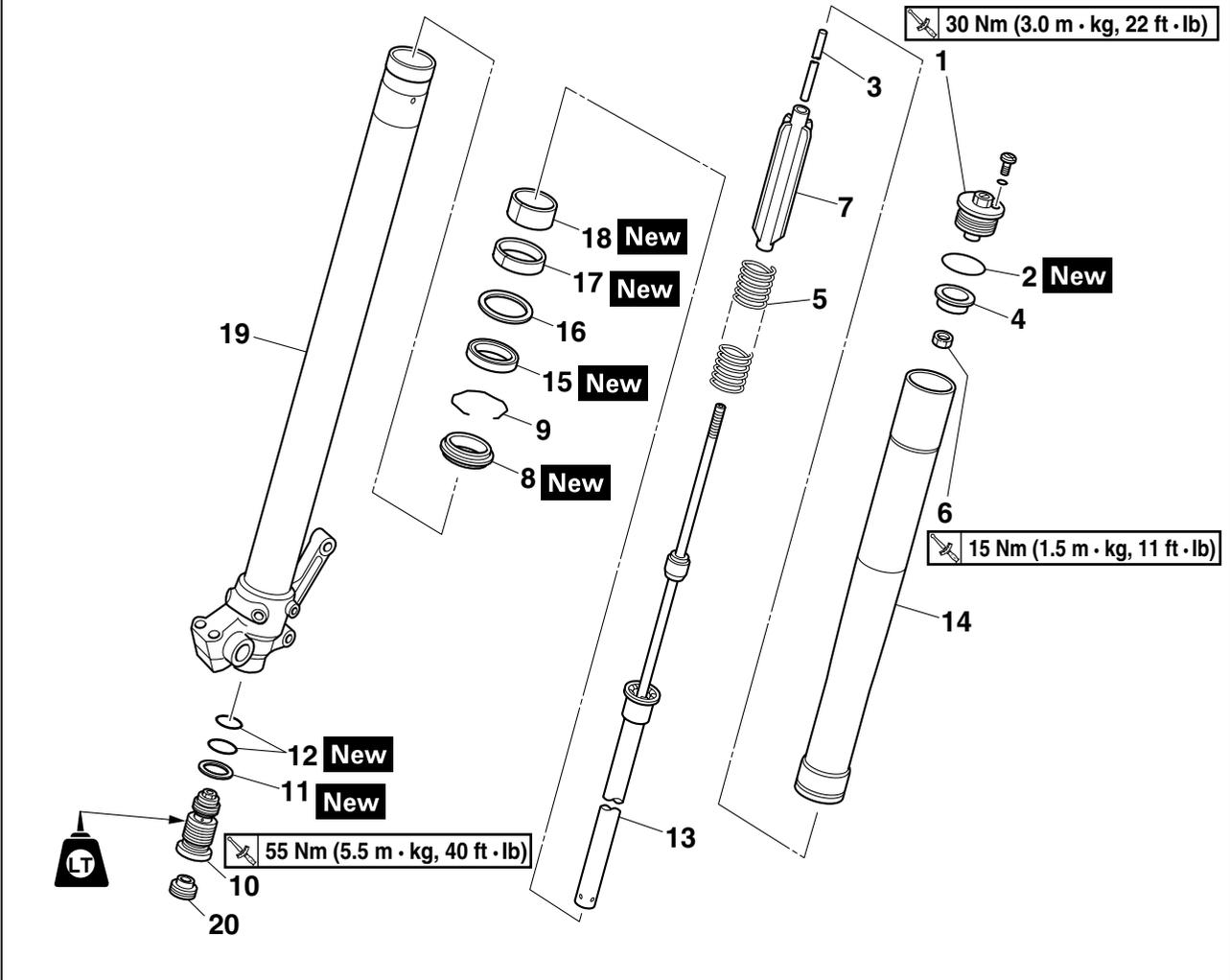
Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
1	Front fork cap bolt	1	
2	O-ring	1	
3	Rod	1	
4	Spring seat	1	
5	Fork spring	1	
6	Nut	1	
7	Spring guide	1	
8	Dust seal	1	
9	Stopper ring	1	
10	Base valve	1	
11	Copper washer	1	
12	O-ring	2	
13	Damper rod	1	
14	Outer tube	1	
15	Oil seal	1	
16	Oil sealWasher	1	
17	Slide metal	1	
18	Piston metal	1	
19	Inner tube	1	
20	Rubber cap	1	

FRONT FORK

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
			For assembly, reverse the disassembly procedure.

EAS22970

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.

NOTE:

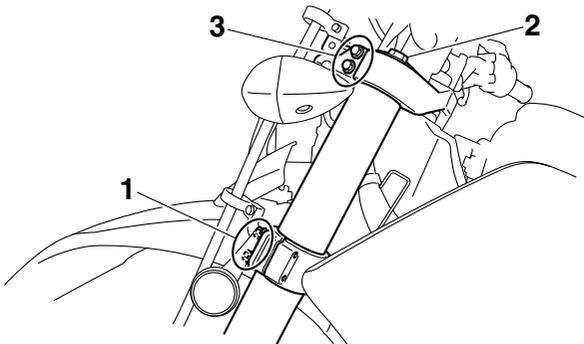
- Place the vehicle on a suitable stand so that the front wheel is elevated.
- Record the adjusting screw setting position before loosening the cap bolt.

2. Loosen:
 - Upper bracket pinch bolts "1"
 - Front fork cap bolt "2"
 - Lower bracket pinch bolts "3"

EWA13640

WARNING

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



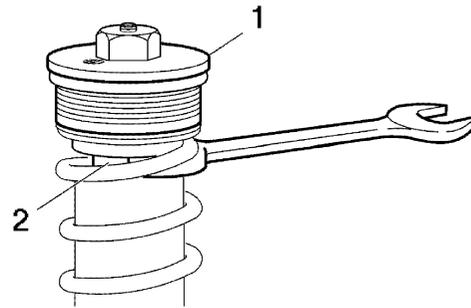
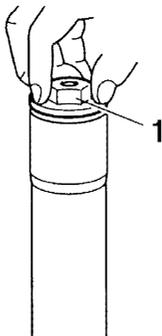
3. Remove:
 - Front fork leg

EAS22980

DISASSEMBLING THE FRONT FORK LEGS

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

1. Remove:
 - Cap bolt "1" (from outer tube) (by loosening the nut "2")



2. Remove:
 - Nut
 - Spring guide
 - Push rod
 - Front fork spring
 - Spring guide
3. Drain:
 - Fork oil

NOTE:

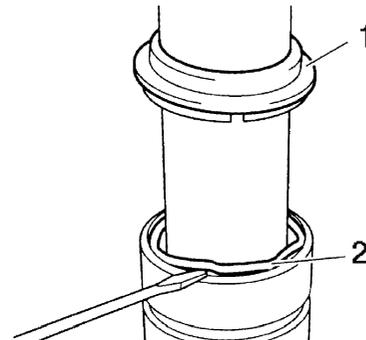
Drain the fork oil by stroking the inner tube several times.

4. Remove:
 - Dust seal "1"
 - Stopper ring "2" (with a flat-head screwdriver)

ECA14180

CAUTION:

Do not scratch the inner tube.

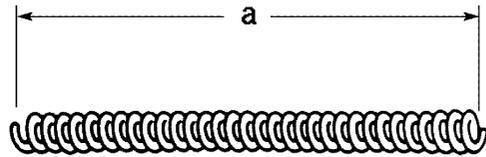
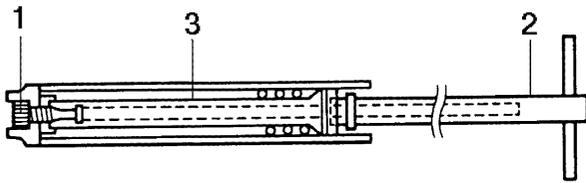


5. Remove:
 - Base valve "1"
 - Copper washer
 - Damper rod

NOTE:

While holding the damper rod assembly "3" with the damper rod holder "2", loosen the damper rod assembly bolt.

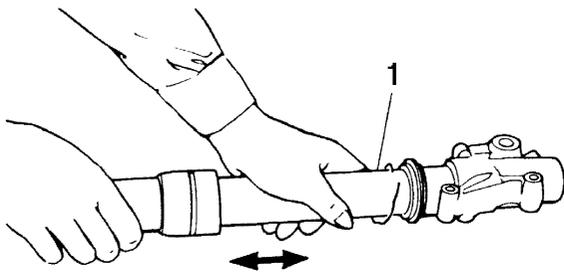




6. Remove:
- Inner tube "1"



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



EAS23010

CHECKING THE FRONT FORK LEGS

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

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

EWA13650

WARNING

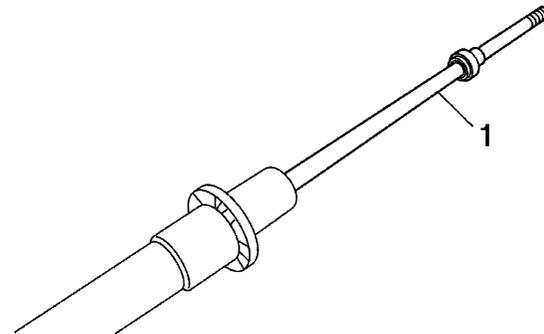
Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

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

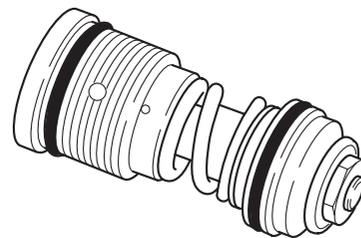


Fork spring free length
 450.0 mm (17.72 in)
Limit
 441.0 mm (17.36 in)

- Check:
 - Damper rod "1"
 Damage/wear → Replace.
 Obstruction → Blow out all of the oil passages with compressed air.



- Check:
 - Base valve
 Damage/wear → Replace.
 Obstruction → Blow out all of the oil passages with compressed air.



- Check:
 - Push rod
 Bends/damage/wear → Replace.
- Check:
 - Cap bolt
 Damage/wear → Replace.

EAS23020

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:
 - Piston metal
 - Slide metal
 - Oil seal
 - Dust seal
- Before assembling the front fork leg, make sure all of the components are clean.

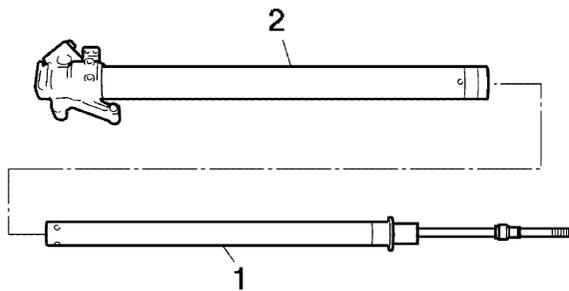
1. Install:

- Damper rod "1"
- Inner tube "2"

ECA14210

CAUTION:

Allow the damper rod assembly 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.



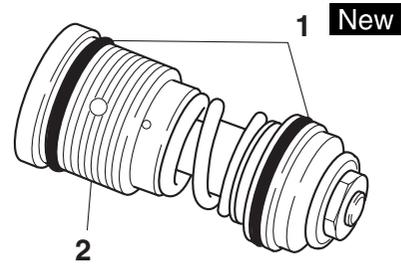
2. Lubricate:

- Inner tube's outer surface



3. Install:

- O-ring "1" **New**
- Copper washer **New**
- Base valve "2"



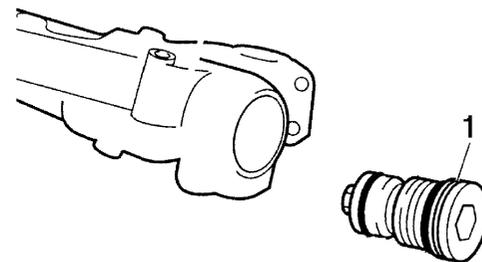
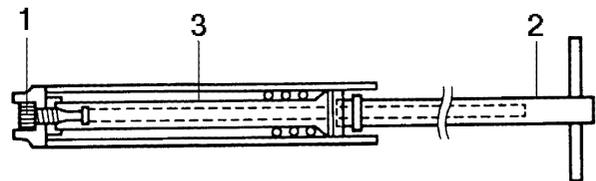
4. Tighten:

- Base valve "1"



NOTE:

While holding the damper rod assembly "3" with the damper rod holder "2", tighten the base valve.



5. Install:

- Dust seal "1"
- Stopper ring "2"
- Oil seal "3" **New**
- Oil seal washer "4"
- Slide metal "5" **New**
(on to the inner tube "6")

FRONT FORK

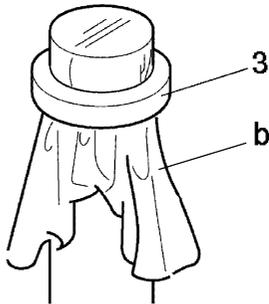
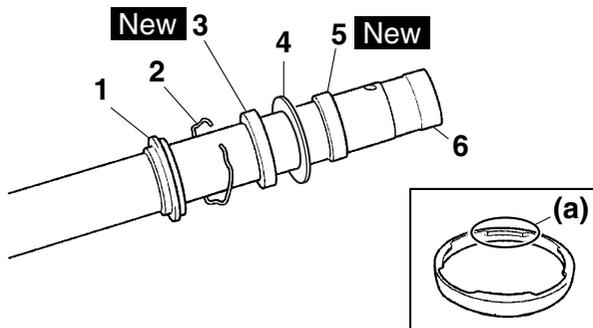
ECA32D1008

CAUTION:

Face stamp "a" of the oil seal toward the front caliper mount during assembling.

NOTE:

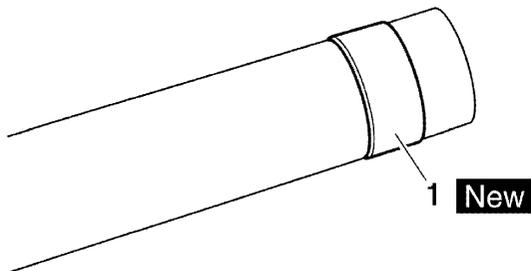
- Before installing the oil seal, lubricate its lips with lithium soap base grease.
- Lubricate the outer surface of the inner tube with fork oil.
- To protect the oil seal, cover it using polyethylene bag "b", and mount the oil seal.



12311310

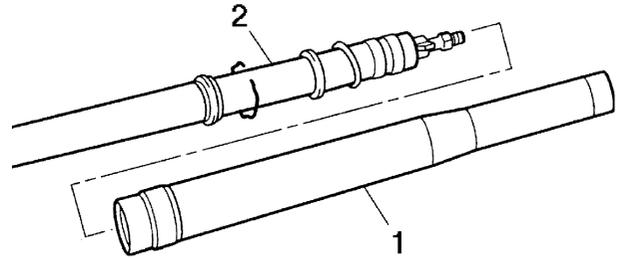
6. Install:

- Piston metal "1" **New**
(on the inner tube)



7. Install:

- Outer tube "1"
(on the inner tube "2")



8. Install:

- Slide metal "1"
- Oil washer "2"
(on the outer tube, using fork seal driver "3")

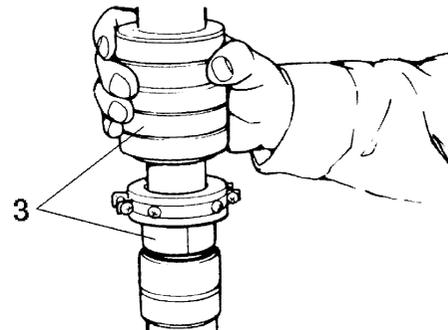
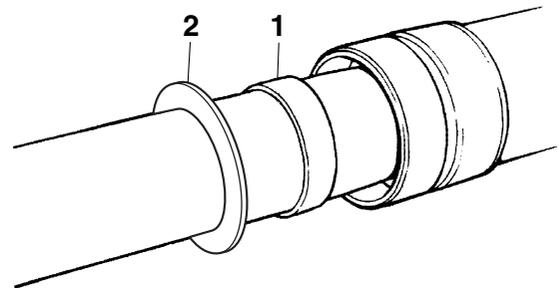


Fork seal driver

90890-01442

Adjustable fork seal driver (36–46 mm)

YM-01442



9. Install:

- Oil seal "1"
Using fork seal driver "2", hammer the seal until you see the stopper ring slot of outer tube.



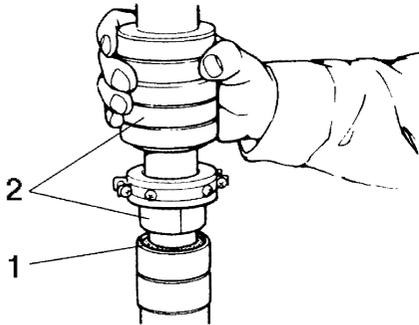
Fork seal driver

90890-01442

Adjustable fork seal driver (36–46 mm)

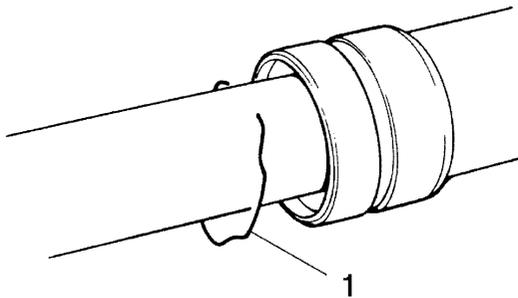
YM-01442

FRONT FORK



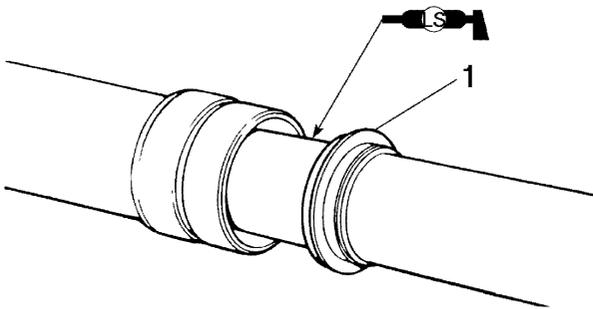
10. Install:

- Stopper ring "1"
(in the slot of outer tube)



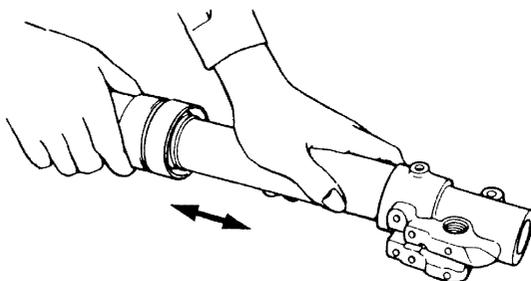
11. Install:

- Dust seal "1"
(Slightly apply grease to the inner tube.)



12. Check:

- Inner tube for sliding
Unsmooth sliding → Disassemble and check.



13. Lubricate:

- Front fork

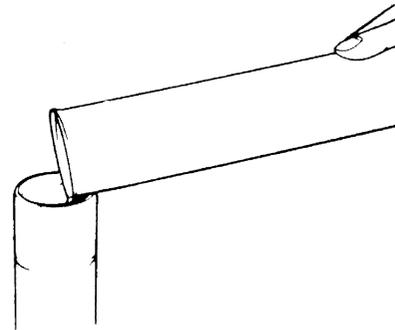
	Recommended oil Suspension oil 01
--	---

	Quantity 613.0 cm ³ (20.73 US oz) (21.62 Imp.oz)
--	---

ECA14230

CAUTION:

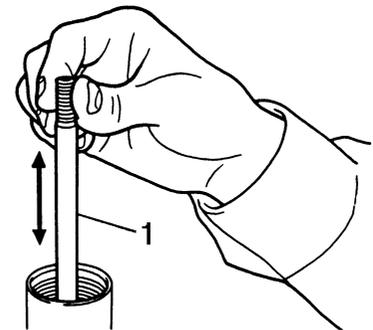
- Be sure to use the recommended fork oil. Other oils may have an adverse effect on front fork performance.
- When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.



14. When the front fork is filled with oil, slowly move dumper rod "1" up and down (at least 10 times) for lubrication of fork.

NOTE:

Move dumper rod slowly not to leak the fork oil.



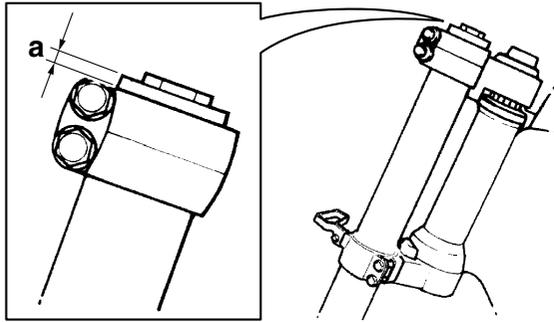
15. Slowly move the inner tube up and down for lubrication again. (1 stroke = Approx. 250 mm)

NOTE:

Do not move more than 250 mm as it causes an air insertion.

16. Wait for 10 minutes to sediment and deaer-

top face becomes 3 mm, and tighten it temporarily.



2. Tighten:

- Lower bracket pinch bolt “1”



Lower bracket pinch bolt
20 Nm (2.0 m•kg, 14 ft•lb)

3. Tighten:

- Cap bolt “2”



Cap bolt
30 Nm (30. m•kg, 22 ft•lb)

4. Tighten:

- Upper bracket pinch bolt “3”



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

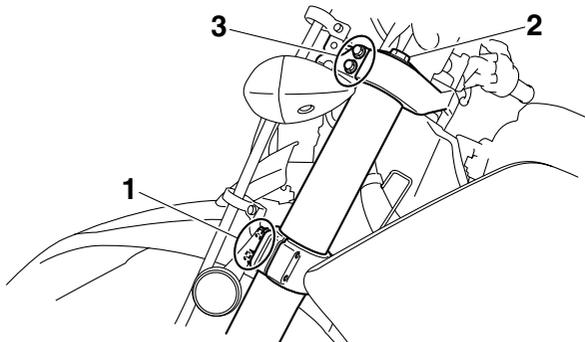
EWA32D1003



WARNING

Check to see that the brake hose is installed correctly.

Refer to “CABLE ROUTING” on page 2-30.



5. Adjust:

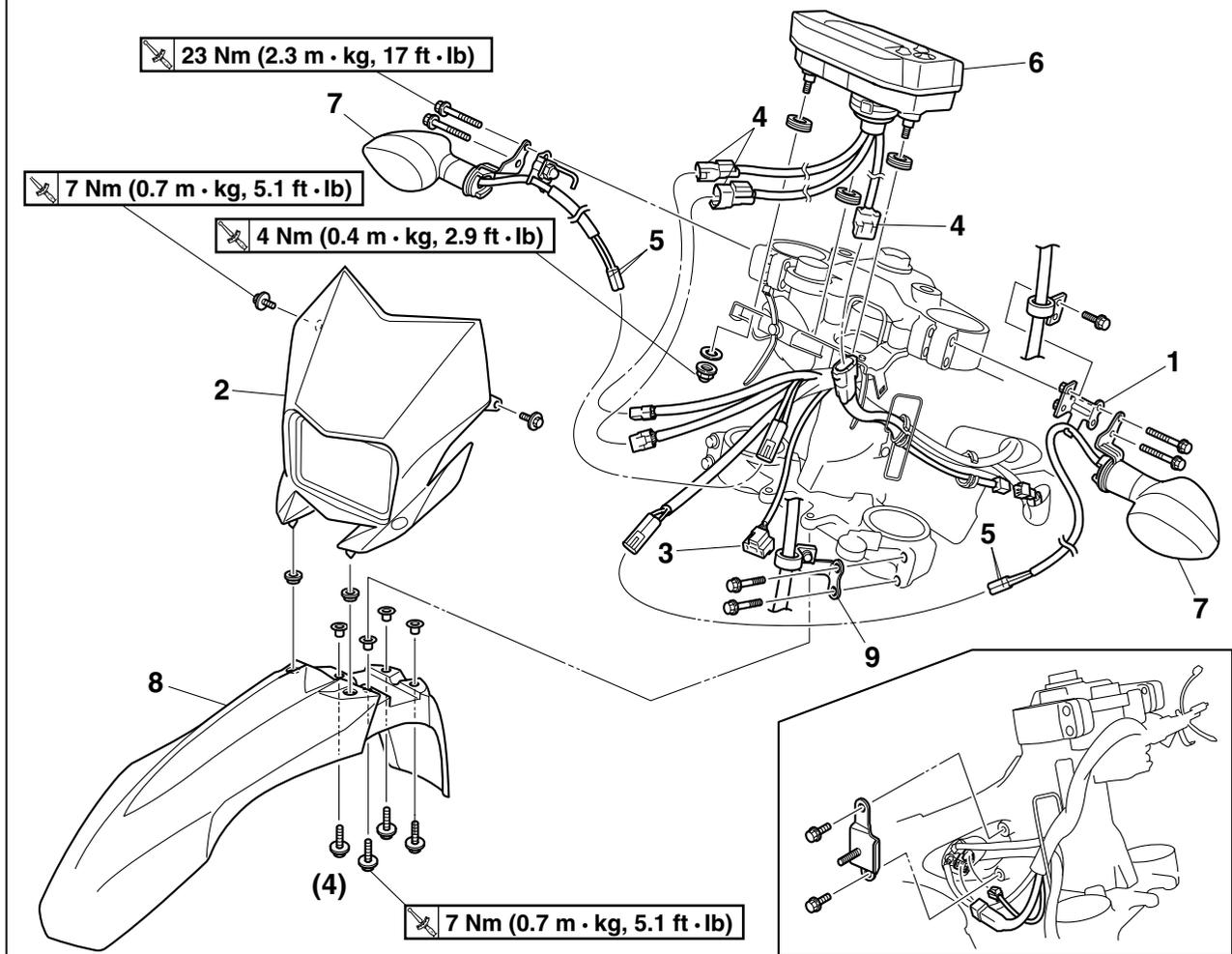
- Rebound damping
- Compression damping

Refer to “ADJUSTING THE FRONT FORK LEGS” on page 1-28.

EAS23090

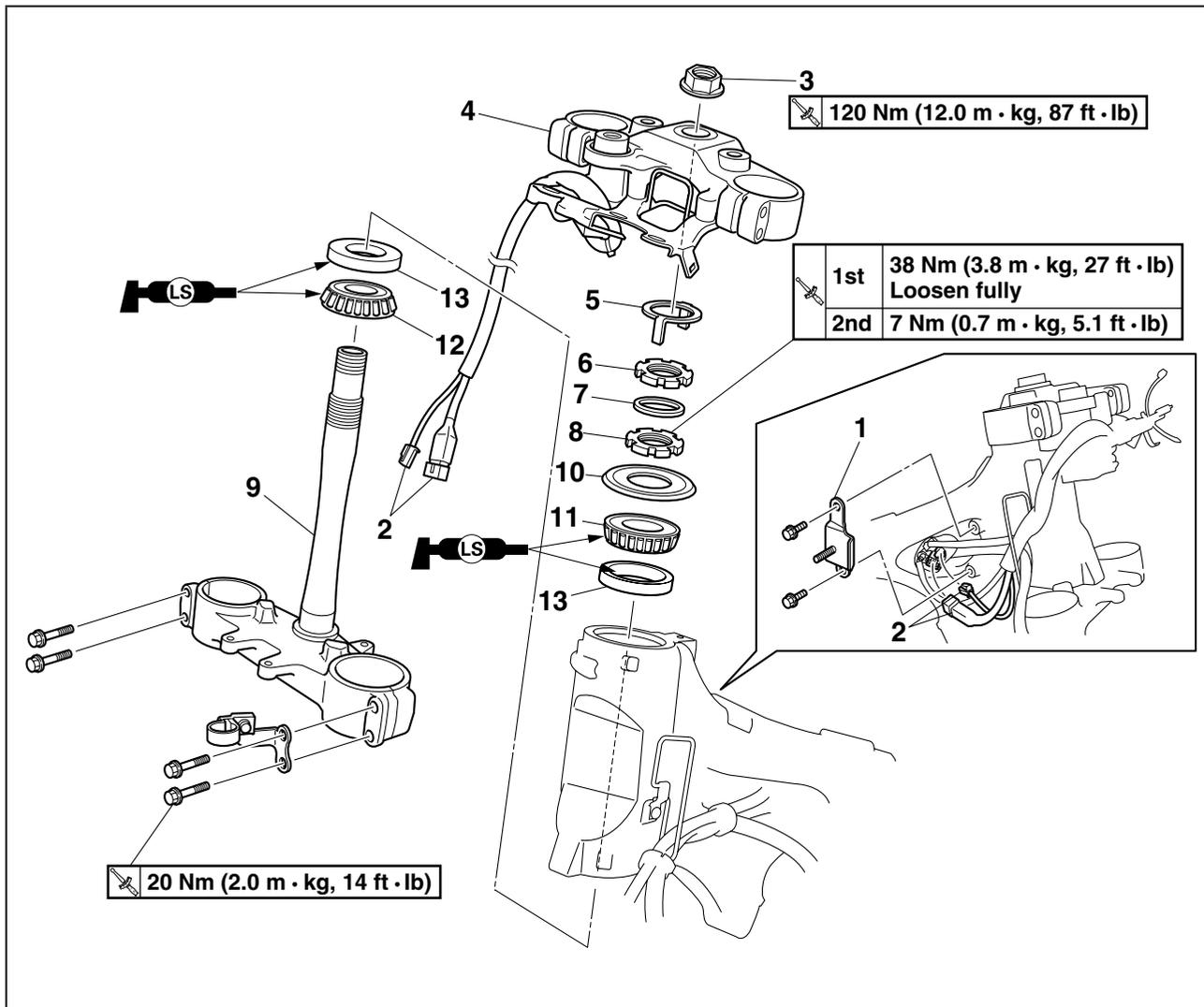
STEERING HEAD

Removing the headlight unit, meter assembly and front fender



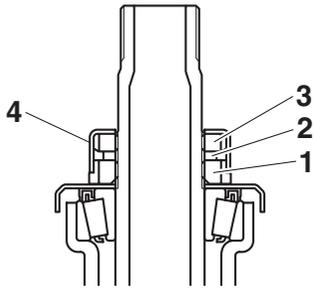
Order	Job/Parts to remove	Q'ty	Remarks
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Handlebar		Refer to "HANDLEBAR" on page 4-34.
	Front fork		Refer to "FRONT FORK" on page 4-39.
1	Brake hose guide	1	
2	Headlight assembly	1	
3	Headlight coupler	1	Disconnect.
4	Meter assembly coupler	3	Disconnect.
5	Front turn signal light connector (left/right)	2/2	Disconnect.
6	Meter assembly	1	
7	Turn signal light (left/right)	1/1	
8	Front fender	1	
9	Brake hose guide	1	
			For installation, reverse the removal procedure.

STEERING HEAD



Order	Job/Parts to remove	Q'ty	Remarks
	Headlight unit/Meter assemblies/Front fender		Refer to "STEERING HEAD" on page 4-49.
1	Bracket	1	
2	Main switch coupler	2	Disconnect.
3	Steering stem nut	1	
4	Upper bracket	1	
5	Special washer	1	
6	Upper ring nut	1	
7	Rubber washer	1	
8	Lower ring nut	1	
9	Lower bracket	1	
10	Bearing cover	1	
11	Upper bearing	1	
12	Lower bearing	1	
13	Bearing races	2	
			For installation, reverse the removal procedure.

Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" on page 1-27.



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 4-39.

NOTE:

Temporarily tighten the upper and lower bracket pinch bolts.

5. Tighten:

- Steering stem nut



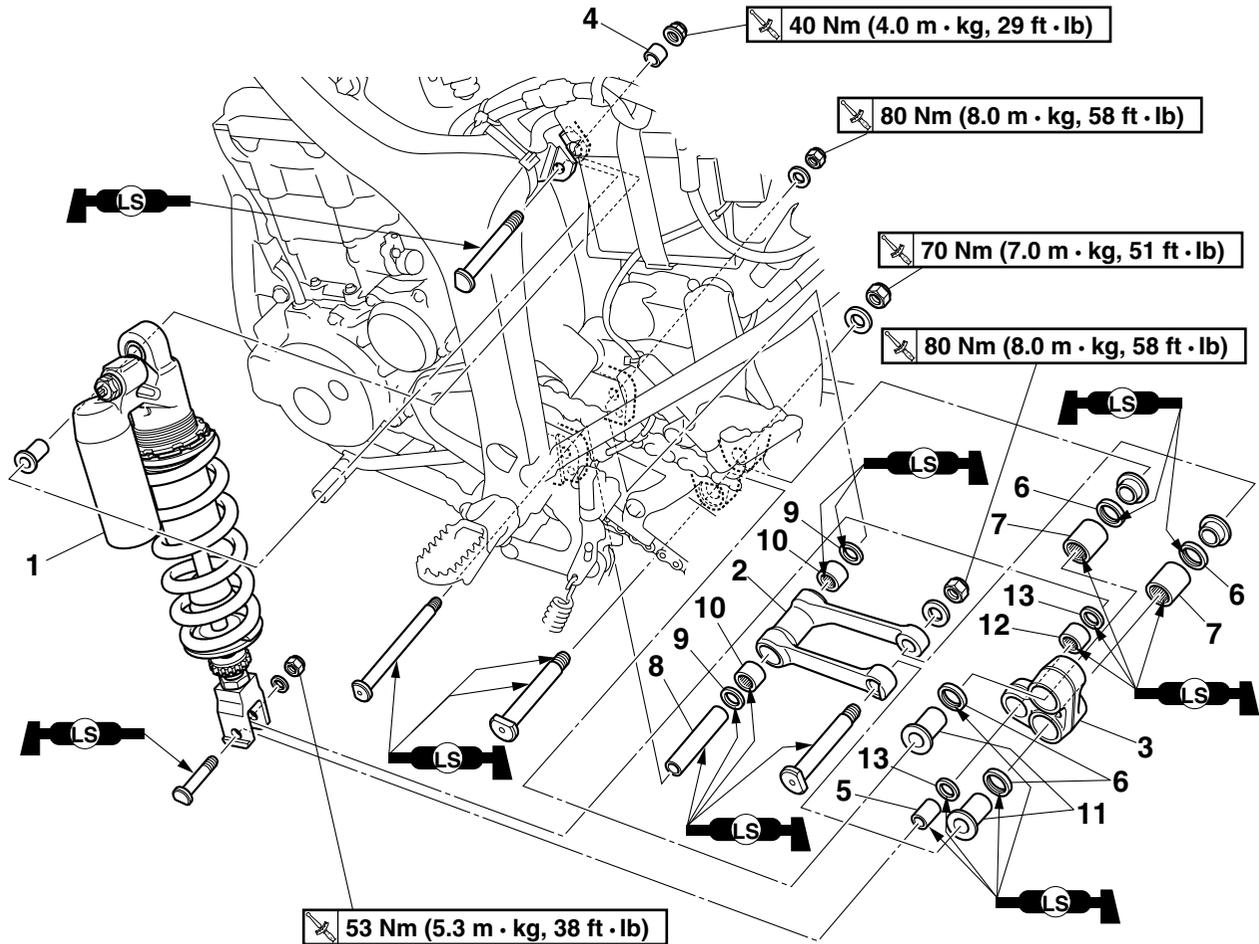
Steering stem nut
120 Nm (12.0 m•kg, 87 ft•lb)

REAR SHOCK ABSORBER ASSEMBLY

EAS23160

REAR SHOCK ABSORBER ASSEMBLY

Removing the rear shock absorber assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Left slide cover/Right slide cover		Refer to "GENERAL CHASSIS" on page 4-1.
	Drive chain tensioner top		Refer to "CHAIN DRIVE" on page 4-59.
1	Rear shock absorber assembly	1	
2	Connection rod	1	
3	Relay arm	1	
4	Collar (short)	1	
5	Collar (long)	1	
6	Oil seal	4	
7	Bearing	2	
8	Collar	1	
9	Oil seal	2	
10	Bearing	2	
11	Collar	1	
12	Bearing	1	
13	Oil seal	2	
			For installation, reverse the removal procedure.

REAR SHOCK ABSORBER ASSEMBLY

EAS23180

HANDLING THE REAR SHOCK ABSORBER

EWA13740

WARNING

This rear shock absorber contains highly compressed nitrogen gas. Before handling the rear shock absorber, read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear shock absorber.

- Do not tamper or attempt to open the rear shock absorber.
- Do not subject the rear shock absorber to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.
- Do not deform or damage the rear shock absorber in any way. Rear shock absorber damage will result in poor damping performance.

EAS23190

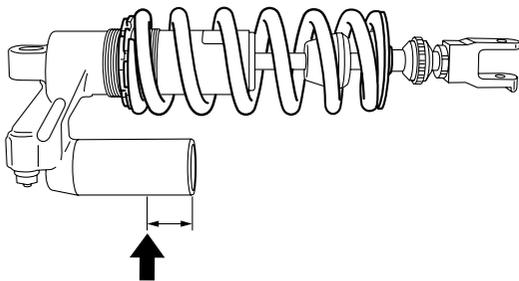
DISPOSING OF A REAR SHOCK ABSORBER

1. Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2–3-mm hole through the rear shock absorber at a point 30–35 mm from its end as shown.

EWA13760

WARNING

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



EAS23230

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

NOTE: _____

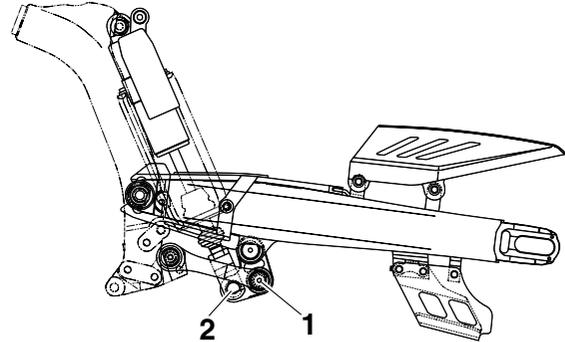
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Connecting arm bolt “1”
- Rear shock absorber assembly lower bolt “2”

NOTE: _____

While removing the rear shock absorber assembly lower bolt, hold the swingarm so that it does not drop down.



3. Remove:

- Rear shock absorber assembly upper bolt
- Rear shock absorber assembly

NOTE: _____

Raise the swingarm and then remove the rear shock absorber assembly from between the swingarm and relay arm.

EAS23240

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:

- Rear shock absorber rod
Bends/damage → Replace the rear shock absorber assembly.
- Rear shock absorber
Gas leaks/oil leaks → Replace the rear shock absorber assembly.
- Spring
Damage/wear → Replace the rear shock absorber assembly.
- Bushings
Damage/wear → Replace.
- Bolts
Bends/damage/wear → Replace.

EAS23260

CHECKING THE CONNECTING ARM AND RELAY ARM

1. Check:

- Connecting rod
- Relay arm

REAR SHOCK ABSORBER ASSEMBLY

Damage/wear → Replace.

2. Check:

- Bearings
 - Oil seals
- Damage/pitting → Replace.

3. Check:

- Collar
- Damage/scratches → Replace.

EAS23270

INSTALLING THE RELAY ARM

1. Lubricate:

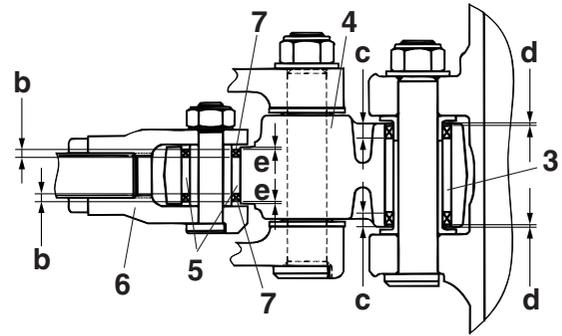
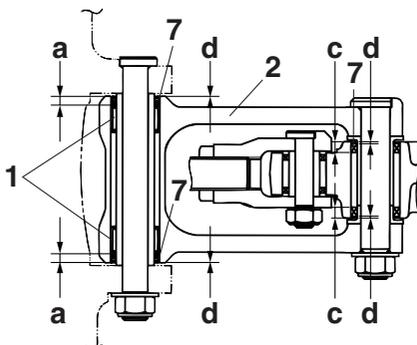
- Oil seal
- Bearings
- Collar

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

2. Install:

- Bearing “1”
(To connecting rod “2”)
- Bearing “3”
(To relay arm “4”)
- Bearing “5”
(To rear cushion lower position “6”)
- Oil seal “7”
(To the connecting rod, relay arm, and rear cushion lower position)

	<p>Installed depth (connecting rod bearing) “a” 5.0–5.5 mm (0.20–0.22 in)</p> <p>Installed depth (rear cushion lower bearing) “b” 4.0 mm (0.16 in)</p> <p>Installed depth (relay arm bearing) “c” 6 mm (0.24 in)</p> <p>Installed depth (connecting rod oil seal, relay arm oil seal) “d” 0–0.5 mm (0–0.02 in)</p> <p>Installed depth (rear cushion lower oil seal) “e” 0.5–1.0 mm (0.02–0.04 in)</p>
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EAS23310

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Install:

- Rear shock absorber assembly

NOTE:

- When installing the rear shock absorber assembly, lift up the swingarm.
- Install all bolts from the left side.

2. Tighten:

- Rear shock absorber assembly upper nut

	Rear shock absorber assembly upper nut 40 Nm (4.0 m•kg, 29 ft•lb)
--	--

- Nut (Frame and connecting rod)

	Nut (Frame and connecting rod) 80 Nm (8.0 m•kg, 58 ft•lb)
---	--

- Nut (Relay arm and connecting rod)

	Nut (Relay arm and connecting rod) 80 Nm (8.0 m•kg, 58 ft•lb)
---	--

- Nut (Relay arm and swingarm)

	Nut (Relay arm and Swingarm) 70 Nm (7.0 m•kg, 51 ft•lb)
---	--

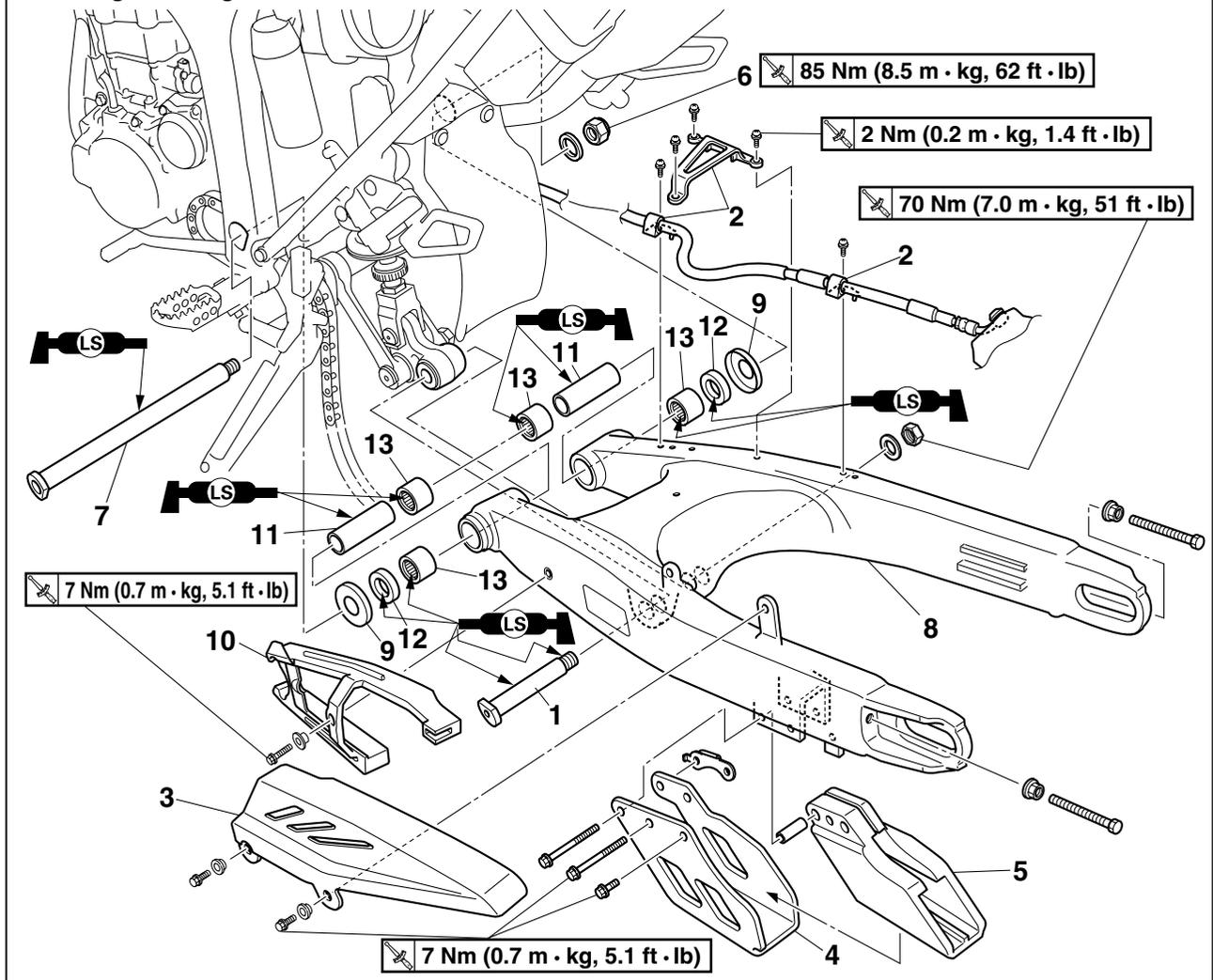
- Nut (Rear shock absorber assembly lower and Relay arm)

	Nut (Rear shock absorber assembly lower and Relay arm) 53 Nm (5.3 m•kg, 38 ft•lb)
---	--

EAS23330

SWINGARM

Removing the swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-7.
1	Bolt (Swingarm and relay arm)	1	
2	Brake hose holder	3	
3	Chain case	1	
4	Chain cover	1	
5	Chain support	1	
6	Pivot shaft nut	1	
7	Pivot shaft	1	
8	Swingarm	1	
9	Dust cover	2	
10	Front drive chain guide	1	
11	Collar	2	
12	Oil seal	2	
13	Bearing	4	
			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

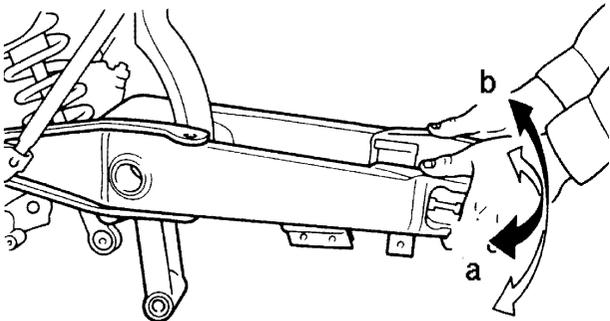


a. Measure the tightening torque of the pivot shaft nut.

	Pivot shaft nut 85 Nm (8.5 m•kg, 62 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, washers, and dust covers.
- d. Check the swingarm vertical movement “b” by moving the swingarm up and down. If swingarm vertical movement is not smooth or if there is binding, check the spacers, bearings, washers, and dust covers.

	Swingarm side play (at the end of the swingarm) 0 mm (0 in)
---	--



EAS23360

CHECKING THE SWINGARM

1. Check:

- Swingarm
Bends/cracks/damage → Replace.

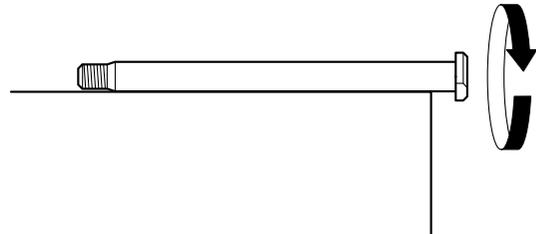
2. Check:

- 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
- Dust covers
- Collar
- Washers
- Bearings

	Recommended cleaning solvent Kerosene
---	--

4. Check:

- Dust covers
- Collar
- Washers
- Oil seals
Damage/wear → Replace.
- Bearings
Damage/pitting → Replace.

EAS23380

INSTALLING THE SWINGARM

1. Lubricate:

- Bearings
- Collar
- Dust covers
- Pivot shaft

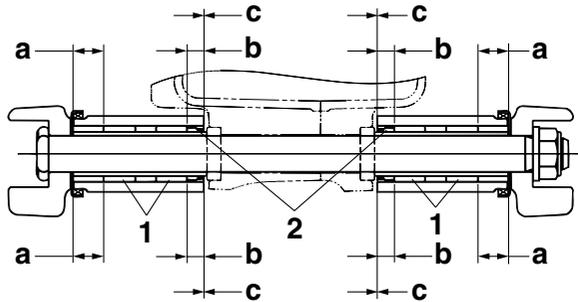
	Recommended lubricant Lithium-soap-based grease
---	--

2. Install:

- Bearing “1”
- Oil seal “2”
- Collar
(Swingarm)



Installed depth "a"
 15 mm (0.59 in)
Installed depth "b"
 8.5–9.0 mm (0.33–0.35 in)
Installed depth "c"
 0–0.5 mm (0–0.02 in)



3. Install:

- Rear shock absorber assembly
Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-53.

4. Install:

- Swing arm assembly



Pivot shaft nut
 85 Nm (8.5 m•kg, 62 ft•lb)

5. Install:

- Rear wheel
Refer to "REAR WHEEL" on page 4-7.

6. Adjust:

- Drive chain slack
Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 1-26.

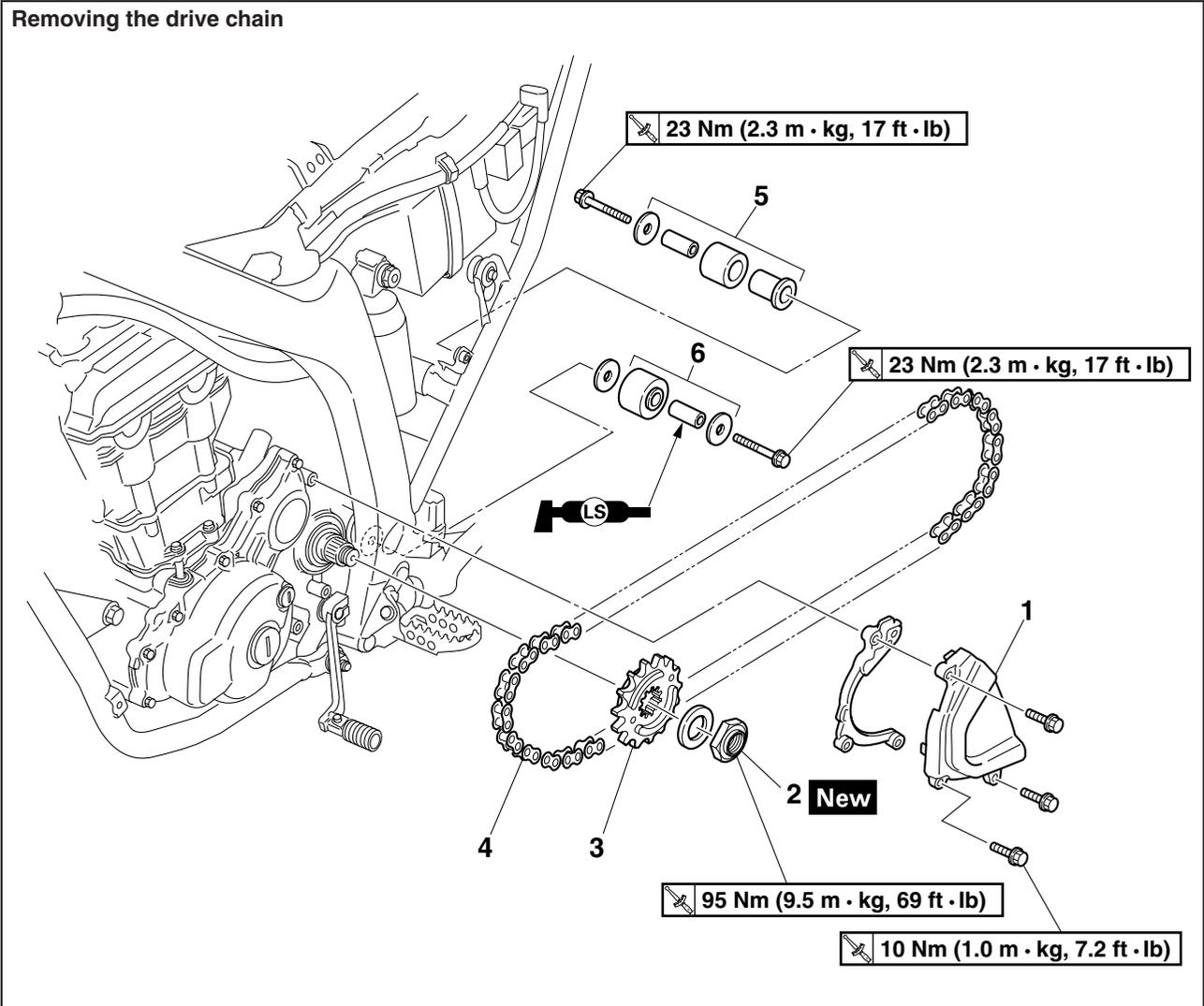


Drive chain slack
WR250R 38.0–48.0 mm
 (1.50–1.89 in)
WR250X 40.0–50.0 mm
 (1.57–1.97 in)

EAS23400

CHAIN DRIVE

Removing the drive chain



Order	Job/Parts to remove	Q'ty	Remarks
	Swingarm		Refer to "SWINGARM" on page 4-56.
1	Drive sprocket cover	1	
2	Drive sprocket nut	1	
3	Drive sprocket	1	
4	Drive chain	1	
5	Drive chain tensioner top	1	
6	Drive chain tensioner bottom	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:

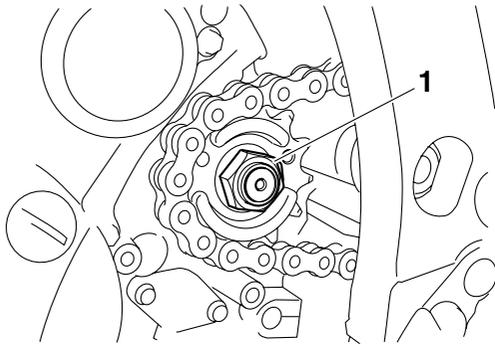
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Drive sprocket nut "1"

NOTE:

- Return the bent tab of the locknut.
- Operate the rear brake, and loosen the drive sprocket.
- After loosening the drive sprocket, remove the rear wheel and swingarm.



3. Remove:

- Rear wheel
Refer to "REAR WHEEL" on page 4-7.
- Rear shock absorber
Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-53.
- Swingarm
Refer to "SWINGARM" on page 4-56.

4. Remove:

- Drive chain

EAS23441

CHECKING THE DRIVE CHAIN

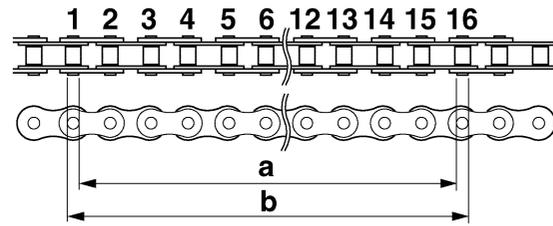
1. Measure:

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

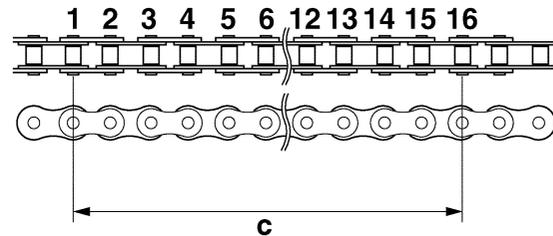
	15-link length limit 239.3 mm (9.42 in)
---	---

a. Measure the length "a" between the inner sides of the pins and the length "b" between the outer sides of the pins on a 15-link section

of the drive chain as shown in the illustration.



- b. Calculate the 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

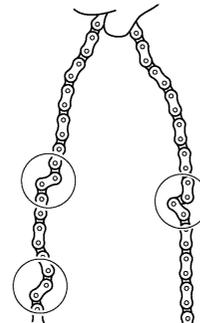


NOTE:

- 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. Check:

- Drive chain
Stiffness → Clean, lubricate, or replace.



3. Clean:

- Drive chain

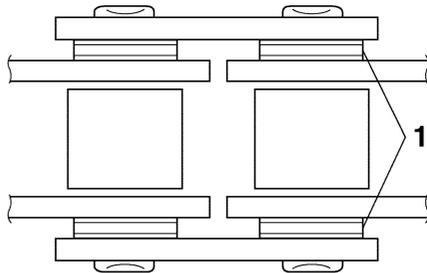
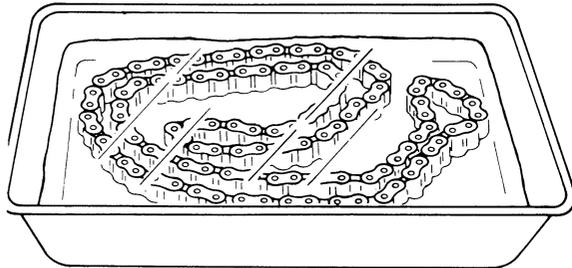
- a. Wipe the drive chain with a clean cloth.
b. Put the drive chain in kerosene and remove any remaining dirt.

c. Remove the drive chain from the kerosene and completely dry it.

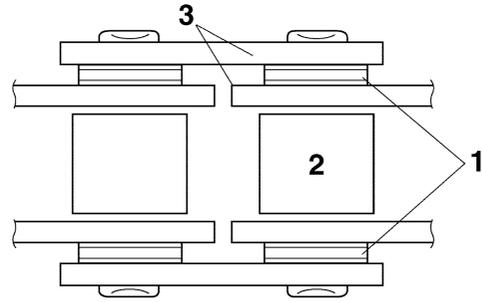
ECA14290

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.



4. 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.



5. Lubricate:
- Drive chain

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

EAS23460

CHECKING THE DRIVE SPROCKET

1. Check:
- Drive sprocket
Refer to “CHECKING AND REPLACING THE REAR WHEEL SPROCKET” on page 4-9.

EAS23470

CHECKING THE REAR WHEEL SPROCKET

Refer to “CHECKING AND REPLACING THE REAR WHEEL SPROCKET” on page 4-9.

EAS23490

INSTALLING THE DRIVE CHAIN

1. Lubricate:
- Drive chain

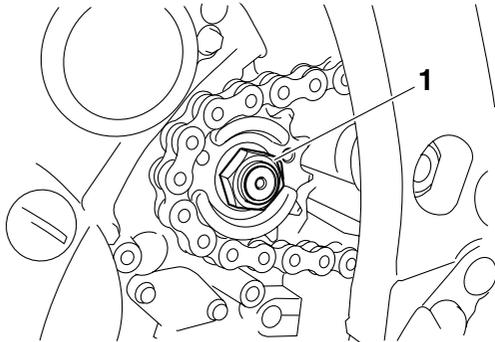
	Recommended lubricant Engine oil or chain lubricant suitable for O-ring chains
---	---

2. Install:
- Drive chain
 - Drive sprocket
 - Drive sprocket nut (temporarily)
3. Install:
- Swingarm
Refer to “SWINGARM” on page 4-56.
 - Rear wheel
Refer to “REAR WHEEL” on page 4-7.
4. Tighten:
- Drive sprocket nut “1”

	Drive sprocket nut 95 Nm (9.5 m•kg, 69 ft•lb)
---	---

NOTE:

- While applying the rear brake, tighten the drive sprocket nut.
- Stake the nut “1”.



5. Adjust:

- Drive chain slack
Refer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 1-26.



Drive chain slack
WR250R 38.0–48.0 mm
(1.50–1.89 in)
WR250X 40.0–50.0 mm
(1.57–1.97 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.

ENGINE

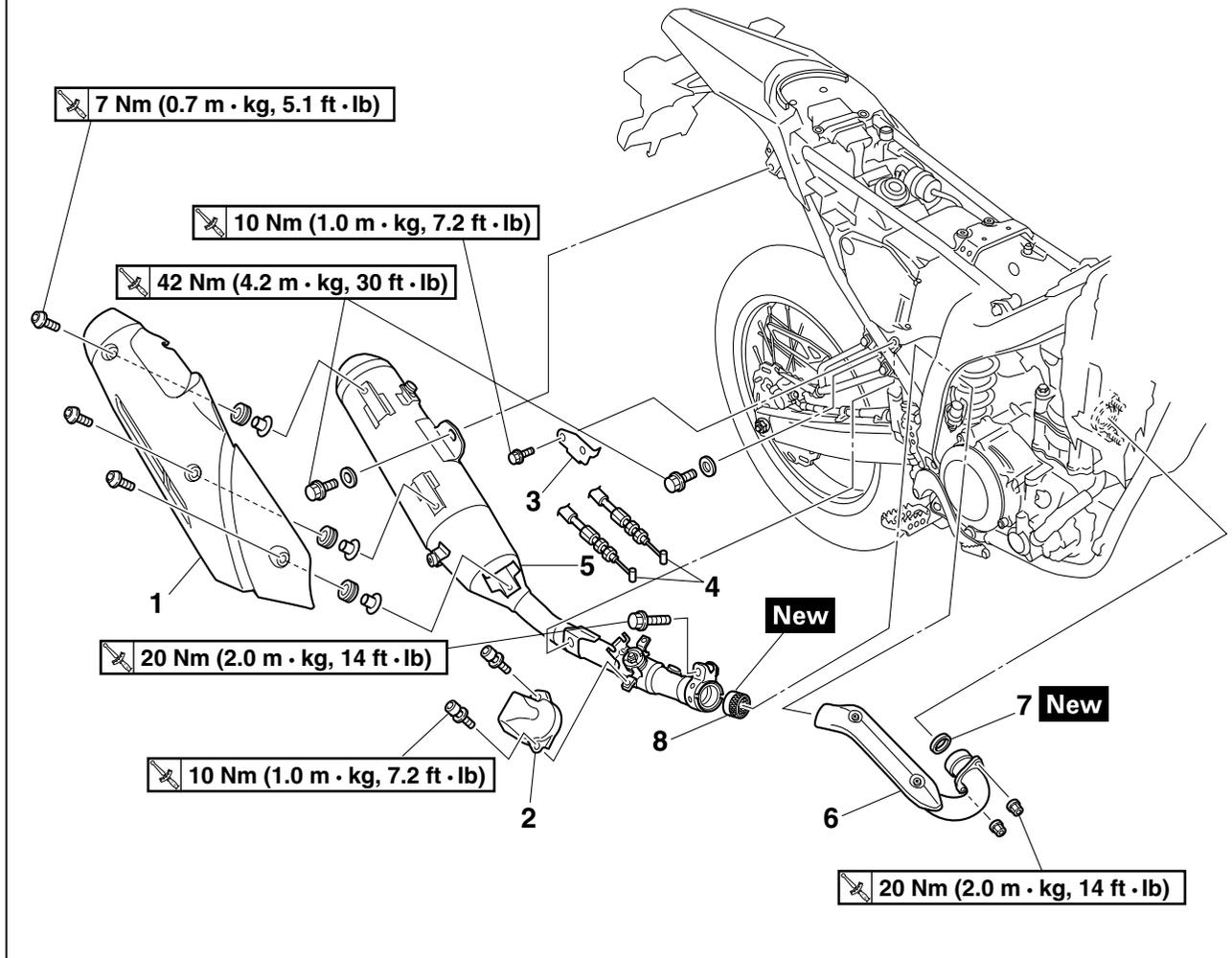
ENGINE REMOVAL	5-1
INSTALLING THE ENGINE	5-5
INSTALLING THE SHIFT PEDAL	5-5
CAMSHAFT	5-6
REMOVING THE CAMSHAFT	5-8
CHECKING THE CAMSHAFT	5-8
CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET	5-10
CHECKING THE TIMING CHAIN TENSIONERS	5-10
CHECKING THE DECOMPRESSION SYSTEM	5-11
INSTALLING THE CAMSHAFTS	5-11
CYLINDER HEAD	5-14
REMOVING THE CYLINDER HEAD	5-15
CHECKING THE CYLINDER HEAD	5-15
INSTALLING THE CYLINDER HEAD	5-15
VALVES AND VALVE SPRINGS	5-17
REMOVING THE VALVES	5-18
CHECKING THE VALVES AND VALVE GUIDES	5-19
CHECKING THE VALVE SEATS	5-20
CHECKING THE VALVE SPRINGS	5-22
CHECKING THE VALVE LIFTERS	5-23
INSTALLING THE VALVES	5-23
CYLINDER AND PISTON	5-25
REMOVING THE PISTON	5-26
CHECKING THE CYLINDER AND PISTON	5-26
CHECKING THE PISTON RINGS	5-27
CHECKING THE PISTON PIN	5-27
INSTALLING THE PISTON AND CYLINDER	5-28
STARTER MOTOR	5-30
CHECKING THE STARTER MOTOR	5-32
ASSEMBLING THE STARTER MOTOR	5-33
CLUTCH	5-34
REMOVING THE CLUTCH	5-38
CHECKING THE FRICTION PLATES	5-38
CHECKING THE CLUTCH PLATES	5-38
CHECKING THE CLUTCH SPRINGS	5-39
CHECKING THE CLUTCH HOUSING	5-39
CHECKING THE CLUTCH BOSS	5-39
CHECKING THE PRESSURE PLATE	5-39
CHECKING THE CLUTCH PUSH RODS	5-39
CHECKING THE PRIMARY DRIVE GEAR	5-40
CHECKING THE PRIMARY DRIVEN GEAR	5-40
INSTALLING THE CLUTCH	5-40

SHIFT SHAFT	5-43
CHECKING THE SHIFT SHAFT	5-44
CHECKING THE STOPPER LEVER	5-44
INSTALLING THE SHIFT SHAFT	5-44
OIL PUMP AND BALANCER GEAR	5-45
REMOVING THE OIL PUMP	5-47
CHECKING THE OIL PUMP	5-47
ASSEMBLING THE OIL PUMP	5-47
INSTALLING THE OIL PUMP AND BALANCER GEAR.....	5-48
GENERATOR AND STARTER CLUTCH	5-50
REMOVING THE GENERATOR.....	5-53
CHECKING THE STARTER CLUTCH.....	5-53
INSTALLING THE STARTER CLUTCH.....	5-54
INSTALLING THE GENERATOR	5-54
CRANKCASE.....	5-56
DISASSEMBLING THE CRANKCASE	5-59
CHECKING THE TIMING CHAIN, TIMING CHAIN GUIDE, OIL STRAINER, NOZZLE, DELIVERY PIPE	5-59
CHECKING THE CRANKCASE.....	5-59
ASSEMBLING THE CRANKCASE	5-59
CRANKSHAFT ASSEMBLY AND BALANCER SHAFT	5-61
REMOVING THE CRANKSHAFT ASSEMBLY	5-62
CHECKING THE CRANKSHAFT ASSEMBLY	5-62
INSTALLING THE CRANKSHAFT ASSEMBLY	5-62
TRANSMISSION	5-64
CHECKING THE SHIFT FORKS	5-67
CHECKING THE SHIFT DRUM ASSEMBLY.....	5-67
CHECKING THE TRANSMISSION.....	5-67
INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY	5-68
INSTALLING THE TRANSMISSION.....	5-69

EAS23710

ENGINE REMOVAL

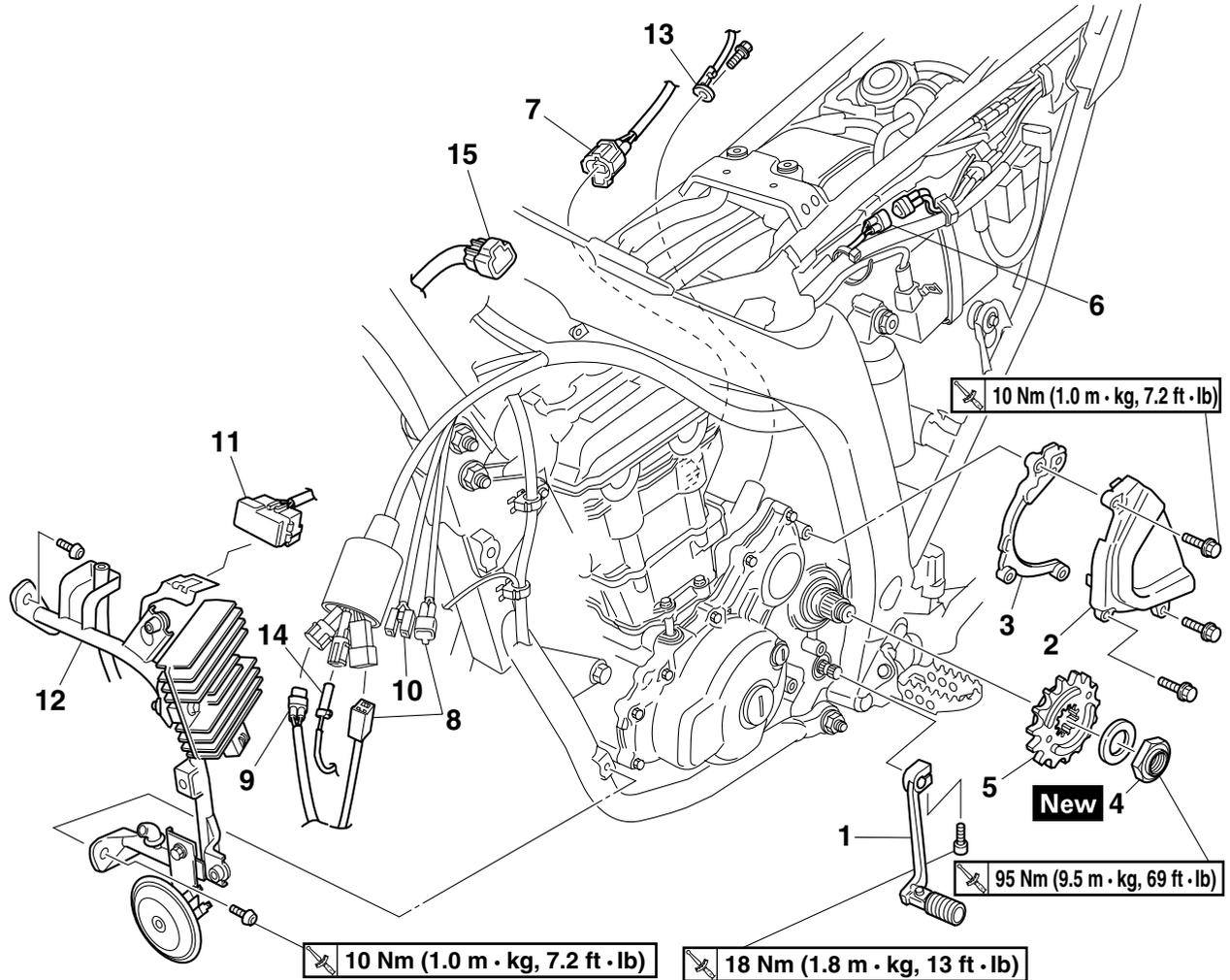
Removing the exhaust pipe



Order	Job/Parts to remove	Q'ty	Remarks
	Seat side cover (left/right)		Refer to "GENERAL CHASSIS" on page 4-1.
	Air scoop (left/right)		Refer to "GENERAL CHASSIS" on page 4-1.
1	Muffler protector	1	
2	EXUP pulley cover	1	
3	Side cover right stay	1	
4	EXUP cable	2	
5	Muffler	1	
6	Exhaust pipe	1	
7	Exhaust pipe gasket	1	
8	Muffler gasket	1	
			For installation, reverse the removal procedure.

ENGINE REMOVAL

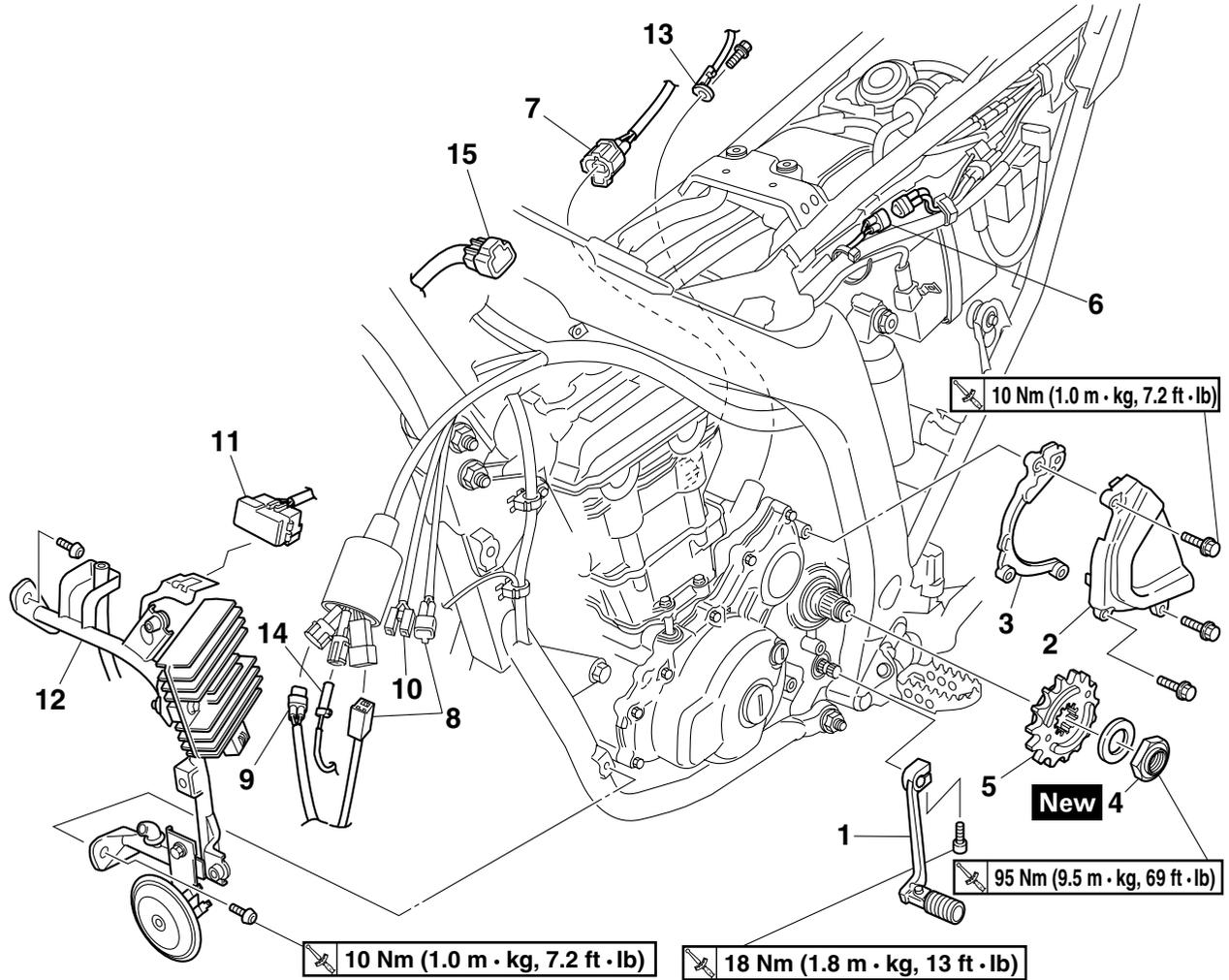
Removing the shift pedal, leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
	Radiator		Refer to "RADIATOR" on page 6-1.
	Starter motor		Refer to "STARTER MOTOR" on page 5-30.
1	Shift pedal	1	
2	Drive sprocket cover	1	
3	Gasket	1	
4	Drive sprocket nut	1	
5	Drive sprocket	1	
6	Speed sensor coupler	1	Disconnect.
7	Coolant temperature sensor coupler	1	Disconnect.
8	Generator coupler	2	Disconnect.
9	Crankshaft position sensor coupler	1	Disconnect.
10	Horn lead coupler	1	Disconnect.
11	Fuse box	1	
12	Side cover stay	1	
13	Ground lead	1	
14	Neutral switch lead	1	Disconnect.
15	Ignition coil lead coupler	1	Disconnect.

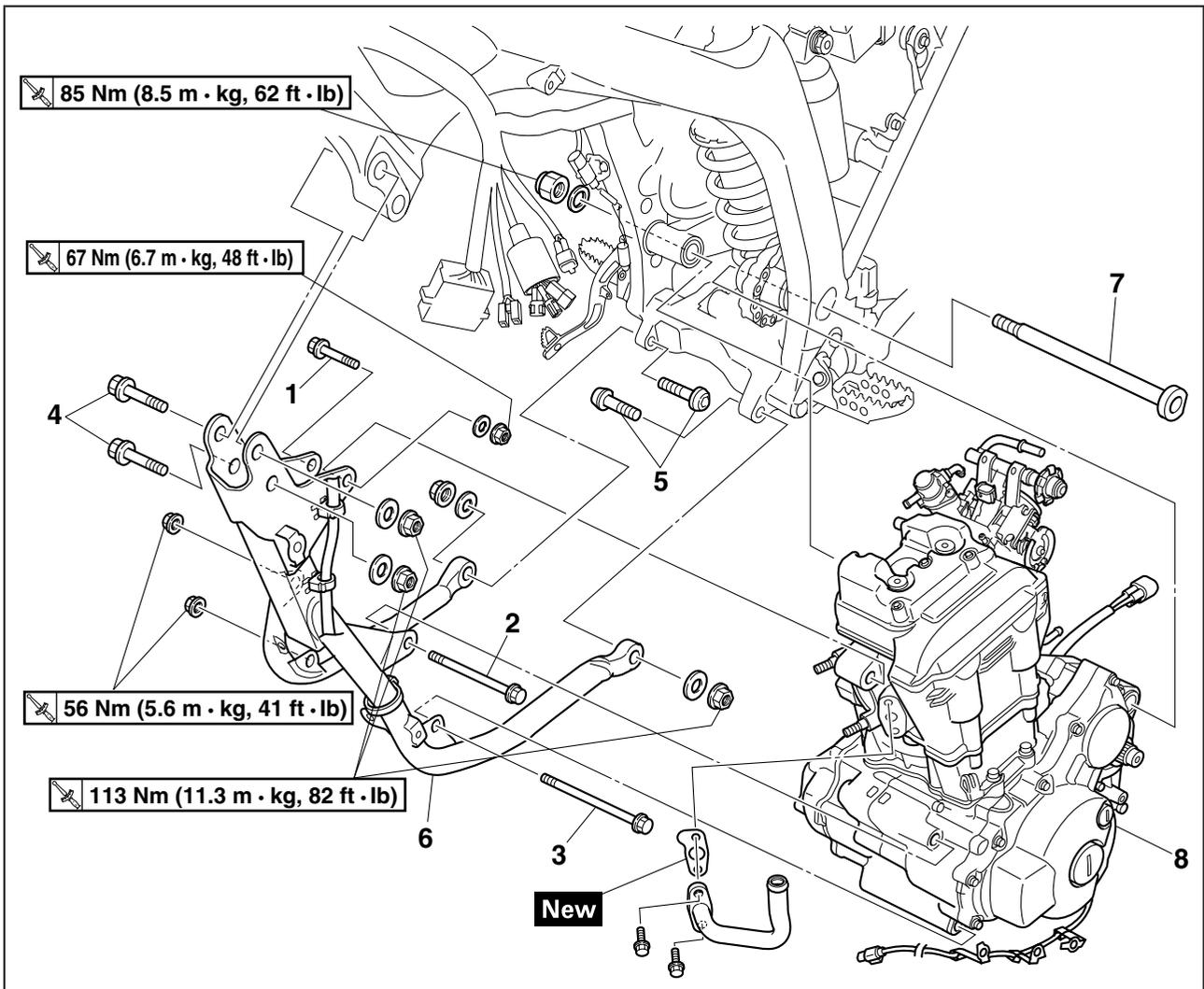
ENGINE REMOVAL

Removing the shift pedal, leads and hoses



Order	Job/Parts to remove	Q'ty	Remarks
			For installation, reverse the removal procedure.

ENGINE REMOVAL



Order	Job/Parts to remove	Q'ty	Remarks
			NOTE: _____ Use a suitable stand to supported the engine side.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-11.
1	Engine mounting bolt (front upper)	1	
2	Engine mounting bolt (front)	1	
3	Engine mounting bolt (front lower)	1	
4	Down tube bolts (front upper)	2	
5	Down tube bolts (rear lower)	2	
6	Down tube	1	
7	Pivot shaft	1	
8	Engine assembly	1	
			For installation, reverse the removal procedure.

ENGINE REMOVAL

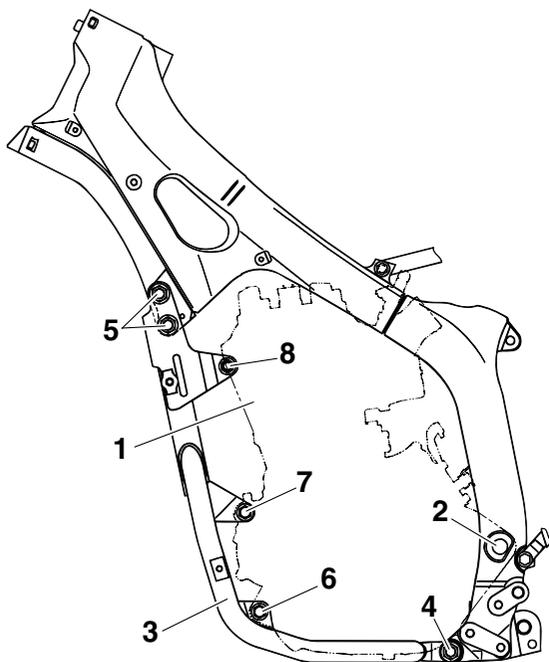
EAS23720

INSTALLING THE ENGINE

1. Install:
 - Engine assembly "1"
 - Pivot shaft "2"
 - Down tube "3"
 - Down tube bolt (rear lower side) "4"
 - Down tube bolt (front upper side) "5"
 - Engine mounting bolt (front lower side) "6"
 - Engine mounting bolt (front) "7"
 - Engine mounting bolt (front upper side) "8"

NOTE:

Do not fully tighten the bolts. (Temporarily tighten)



2. Tighten:

- Pivot shaft nut
- Downtube nut (rear lower side)
- Engine mounting nut



Pivot shaft nut
85 Nm (8.5 m•kg, 62 ft•lb)
Downtube nut (rear lower side)
113 Nm (11.3 m•kg, 82 ft•lb)
Downtube nut (front upper side)
113 Nm (11.3 m•kg, 82 ft•lb)
Engine mounting nut (front lower side)
56 Nm (5.6 m•kg, 41 ft•lb)
Engine mounting nut (front upper side)
67 Nm (6.7 m•kg, 48 ft•lb)
Engine mounting nut (front)
56 Nm (5.6 m•kg, 41 ft•lb)

EAS32D1009

INSTALLING THE SHIFT PEDAL

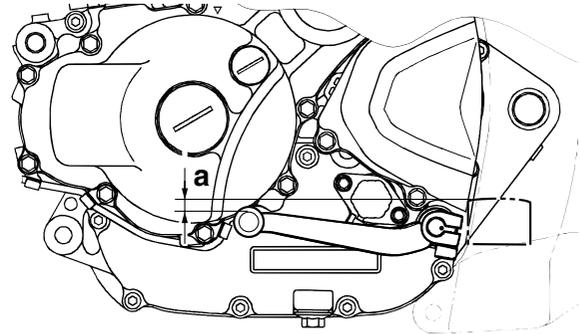
1. Install:
 - Shift pedal



Shift pedal bolt
18 Nm (1.8 m•kg, 13 ft•lb)

NOTE:

Install the shift pedal so that pedal top face "a" is 5 mm (0.20 in) lower than the footrest top face.

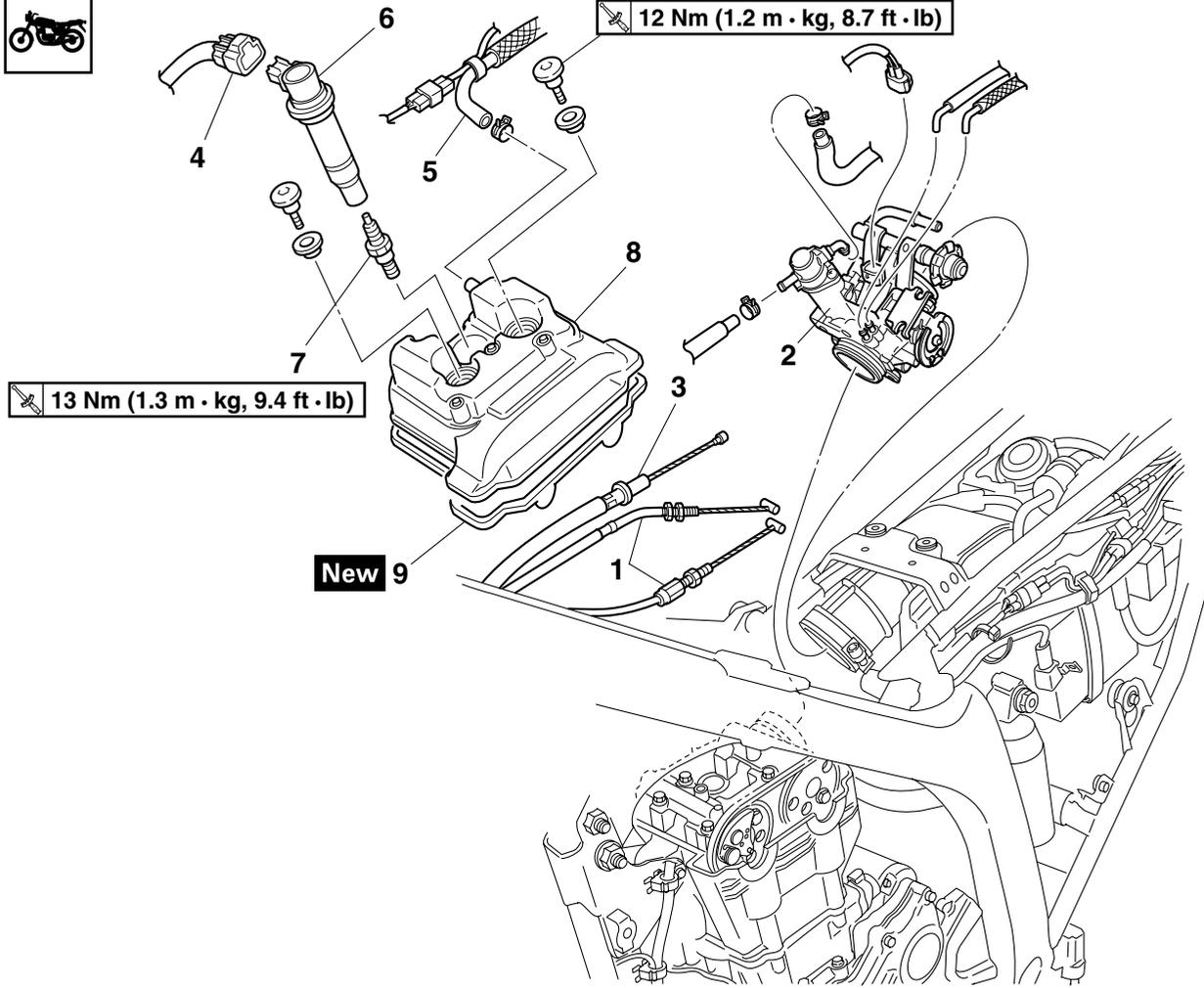


a. 5 mm (0.20 in)

EAS23730

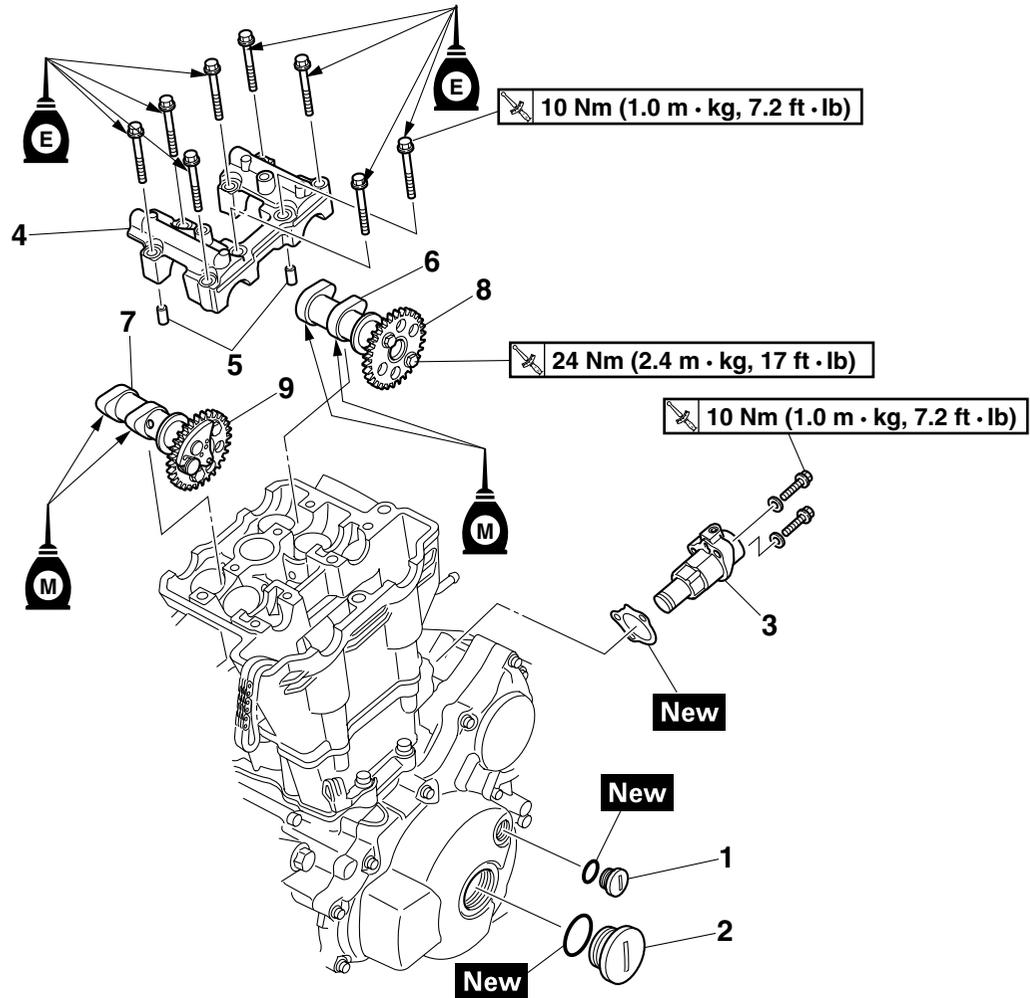
CAMSHAFT

Removing the cylinder head cover



Order	Job/Parts to remove	Q'ty	Remarks
	Side cover (left/right)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-11.
1	Throttle cable	2	
2	Throttle body	1	
3	Clutch cable	1	Disconnect.
4	Ignition coil coupler	1	Disconnect.
5	Cylinder head cover breather hose	1	
6	Ignition coil assembly	1	
7	Spark plug	1	
8	Cylinder head cover	1	
9	Cylinder head cover gasket	1	
			For installation, reverse the removal procedure.

REMOVING THE CAMSHAFT



Order	Job/Parts to remove	Q'ty	Remarks
1	Timing mark accessing screw	1	
2	Crankshaft end cover	1	
3	Timing chain tensioner assembly	1	
4	Camshaft cap	1	
5	Dowel pin	2	
6	Camshaft (IN)	1	
7	Camshaft (EX)	1	
8	Camshaft sprocket (IN)	1	
9	Camshaft sprocket (EX)	1	
			For installation, reverse the removal procedure.

EAS23800

REMOVING THE CAMSHAFT

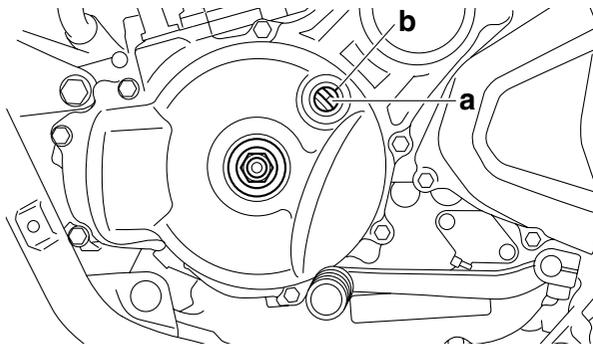
1. Remove:
 - Crankshaft end cover
 - Timing mark accessing screw
2. Align:
 - TDC on the generator rotor
(mark on the crankcase cover)



- a. Turn the crankshaft counterclockwise.
- b. When piston is at TDC on the compression stroke, align the mark “a” on the generator rotor with the mark “b” on the crankcase cover.

NOTE:

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

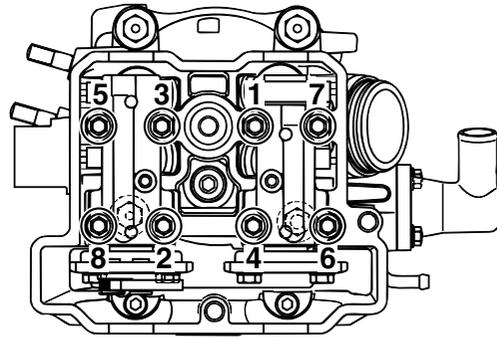


3. Remove:
 - Cylinder head cover
4. Loosen:
 - Camshaft sprocket bolt
5. Remove:
 - Timing chain tensioner assembly
 - Gasket
6. Remove:
 - Camshaft cap bolts
 - Camshaft cap

ECA32D1006

CAUTION:

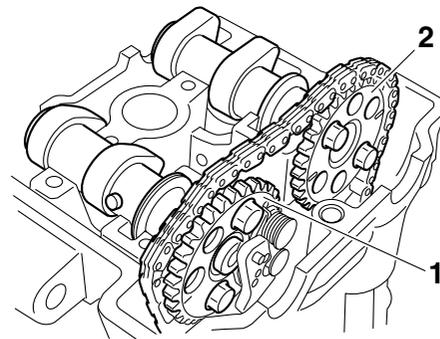
To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in order from 1 to 8.



7. Remove:
 - Intake camshaft “1”
 - Exhaust camshaft “2”

NOTE:

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



EAS23840

CHECKING THE CAMSHAFT

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



Camshaft lobe dimension limit

Intake A

34.550–34.650 mm
(1.3602–1.3642 in)

Limit

35.450 mm (1.3957 in)

Intake B

25.953–26.053 mm
(1.0218–1.0257 in)

Limit

25.853 mm (1.0178 in)

Exhaust A

34.850–34.950 mm
(1.3720–1.3760 in)

Limit

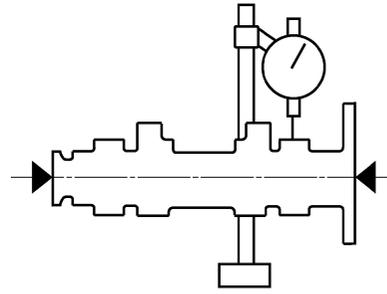
34.750 mm (1.3681 in)

Exhaust B

25.986–26.086 mm
(1.0231–1.0270 in)

Limit

25.886 mm (1.0191 in)



11151402

4. Measure:

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

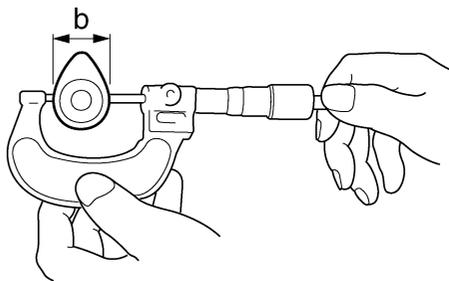
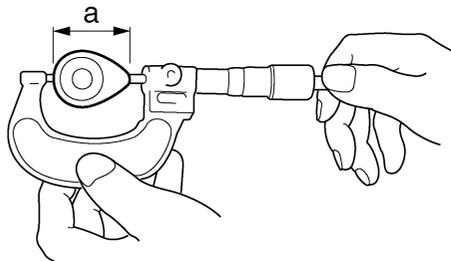


Camshaft-journal-to-camshaft-cap clearance

0.028–0.062 mm (0.0011–0.0024 in)

Limit

0.08 mm (0.0031 in)



3. Measure:

- Camshaft runout
Out of specification → Replace.

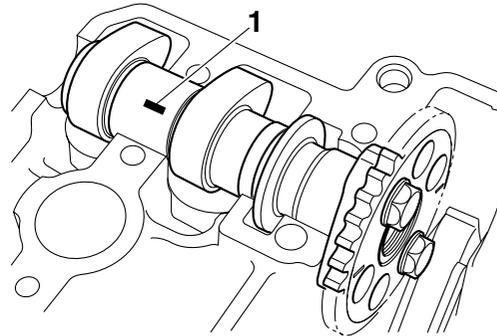


Camshaft runout limit

0.015 mm (0.00059 in) or less



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



- Install the dowel pins and camshaft caps.

NOTE:

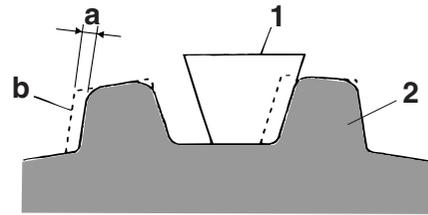
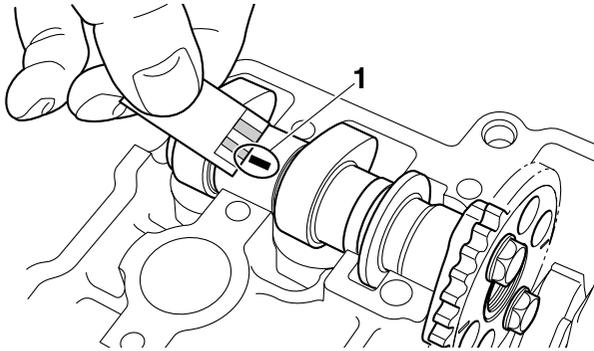
- Tighten the camshaft cap bolts in the order of the embossed numbers on the camshaft cap.
- Do not turn the camshaft when measuring the camshaft journal-to-camshaft cap clearance.



Camshaft cap bolts

10 Nm (1.0 m•kg, 7.2 ft•lb)

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



- a. 1/4 tooth
- b. Correct

1. Timing chain roller
2. Camshaft sprocket

EAS23960

CHECKING THE TIMING CHAIN TENSIONERS

The following procedure applies to both of the timing chain tensioners.

1. Check:
 - Timing chain tensioner
 - Cracks/damage → Replace.

- a. Using a finger, push and insert timing chain tensioner rod "1" into the timing chain tensioner housing.

NOTE:

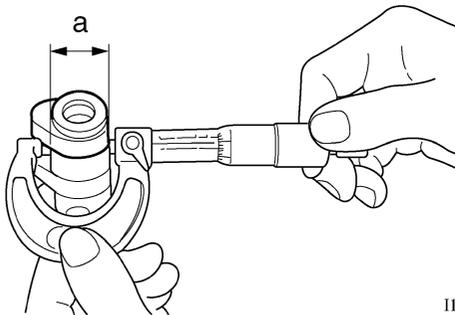
Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "2" in direction "b" until it stops.



5. Measure:

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

	<p>Camshaft journal diameter 21.959–21.972 mm (0.864–0.865 in)</p>
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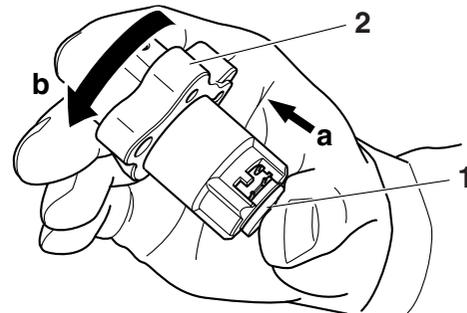


11151003

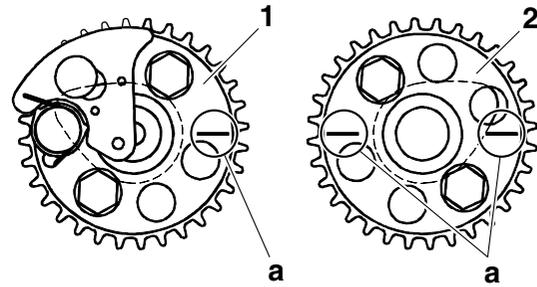
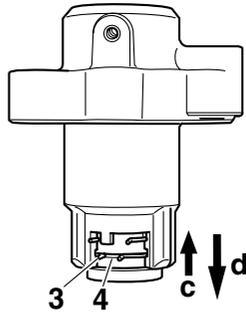
EAS23870

CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET

1. Check:
 - Timing chain "1"
 - Damage/stiffness → Replace the timing chain and camshaft and camshaft sprocket as a set.
2. Check:
 - Camshaft sprocket
 - More than 1/4 tooth wear "a" → Replace the camshaft sprocket and the timing chain as a set.



- b. Keep pressing the timing chain tensioner rod, mount clip "3" into groove "4", and lock the timing chain tensioner rod.
- c. Push the timing chain tensioner rod in direction "c".
- d. Make sure that the timing chain tensioner rod can smoothly move out from the timing chain tensioner housing in direction "d". If not smooth, replace the timing chain tensioner assembly.



EAS32D1001

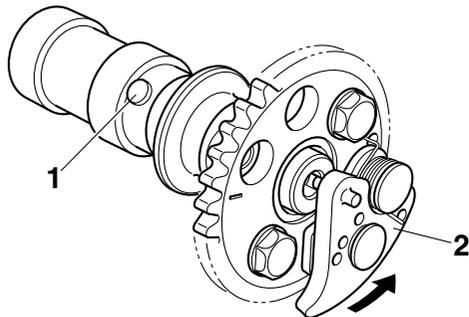
CHECKING THE DECOMPRESSION SYSTEM

1. Check:

- Decompression system



- Check that the decompressor lever pin "1" projects from the camshaft.
- Check that the decompressor cam "2" moves smoothly.



EAS24000

INSTALLING THE CAMSHAFTS

1. Install:

- Exhaust camshaft "1"
- Intake camshaft "2"



Camshaft sprocket bolt
24 Nm (2.4 m•kg, 17 ft•lb)

NOTE:

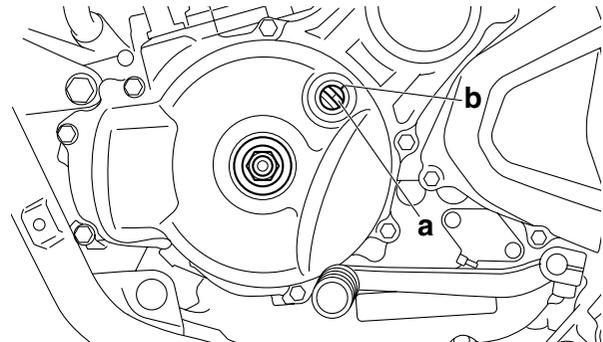
- Stamp line "a" of the camshaft sprocket must locate in the position as shown.
- Temporarily tighten the camshaft sprocket bolts.

2. Install:

- Intake camshaft sprocket
- Exhaust camshaft sprocket



- Turn the crankshaft counterclockwise.
- When piston is at TDC on the compression stroke, align the mark "a" on the generator rotor with the mark "b" on the crankcase cover.



- Install the timing chain onto both camshaft sprockets and then install the exhaust camshaft onto the cylinder head first.

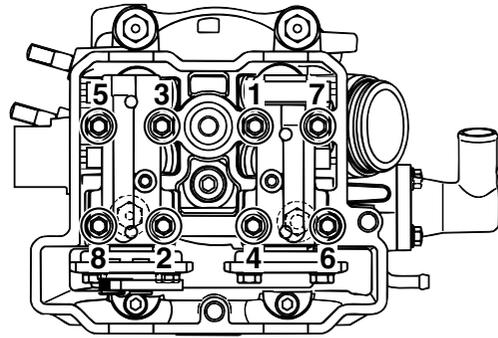
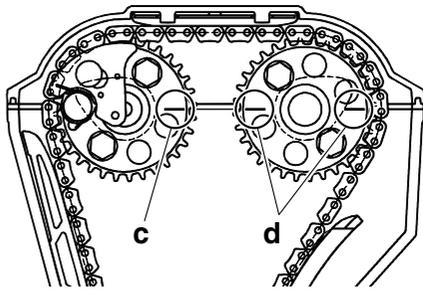
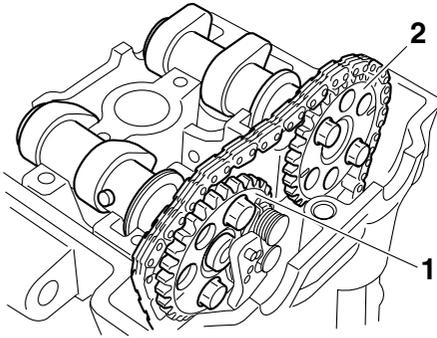
NOTE:

Locate mark "c" of exhaust system camshaft chain sprocket "1" and mark "d" of intake system camshaft chain sprocket "2" in the same position at the end of cylinder head as shown. This is the Top Dead Center (TDC).

ECA13740

CAUTION:

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



3. Install:

- Dowel pin
- Camshaft cap
- Camshaft cap bolts

NOTE:

- Lubricate the camshaft cap bolt threads with engine oil.
- Finger tighten the camshaft cap bolts.

4. Tighten:

- Camshaft cap bolts



Camshaft cap bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Tighten the camshaft cap bolts in the order of the embossed numbers on the camshaft cap.

ECA13730

CAUTION:

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

5. Install:

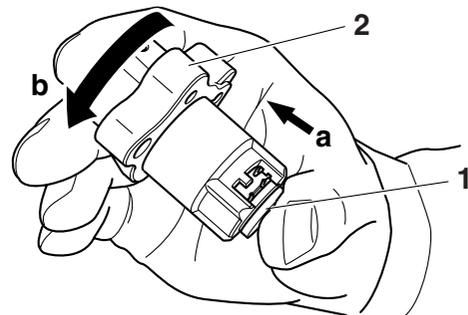
- Timing chain tensioner



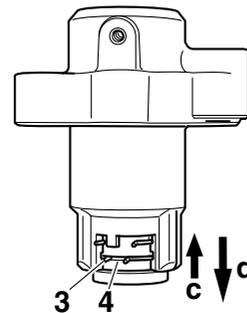
- Using a finger, push and insert timing chain tensioner rod "1" into the timing chain tensioner housing.

NOTE:

Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "2" in direction "b" until it stops.



- Keep pressing the timing chain tensioner rod, mount clip "3" into groove "4", and lock the timing chain tensioner rod.



- In the status of step "b", install the rod assembly in the cylinder block.

NOTE:

Always use a new gasket.



Timing chain tensioner bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

- d. Unlock the camshaft chain tensioner by turning the crankshaft counterclockwise, and tension the timing chain.

Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-4.



6. Turn:
- Crankshaft
(several turns counterclockwise)
7. Check:
- The TDC mark of rotor, and the mark of crankshaft case cover

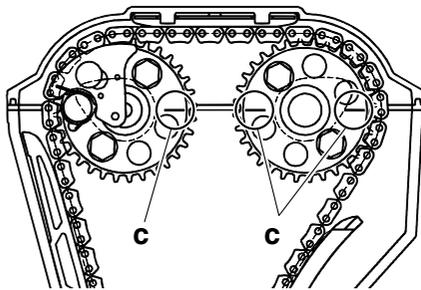
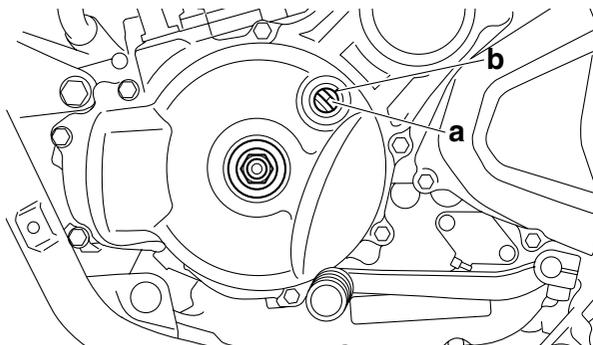


- a. Turn the crankshaft counterclockwise.
- b. When the piston is in the compression process, align TDC mark “a” of the rotor with mark “b” of crankshaft case cover.

NOTE:

You can check the TDC in compression process when the camshaft robes face outward.

- Punch mark on the camshaft
Check the matching of stamp line “c” of the camshaft punch mark timing chain sprocket and the cylinder head end.
Out of alignment → Reinstall.
Refer to the installation steps above.



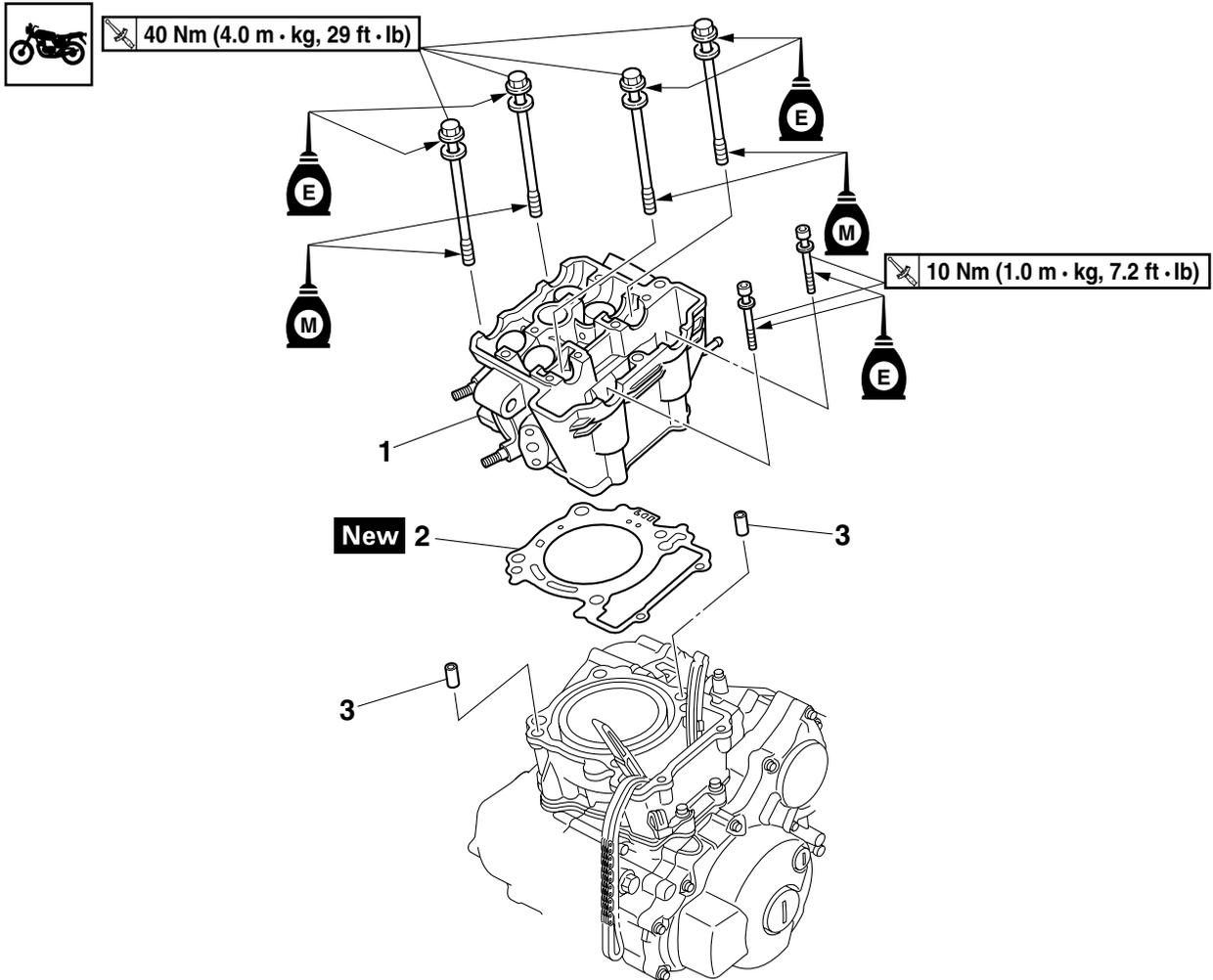
8. Measure:
- Valve clearance
Out of specification → Adjust.

CYLINDER HEAD

EAS24100

CYLINDER HEAD

Removing the cylinder head



Order	Job/Parts to remove	Q'ty	Remarks
	Camshaft		Refer to "CAMSHAFT" on page 5-6.
	Hose (thermostat cover)		Refer to "THERMOSTAT" on page 6-4.
	Coolant temperature sensor coupler		
	Thermostat		
	Air induction pipe		Refer to "AIR INDUCTION SYSTEM" on page 7-9.
1	Cylinder head assembly	1	
2	Cylinder head gasket	1	
3	Dowel pin	2	
			For installation, reverse the removal procedure.

CYLINDER HEAD

EAS24130

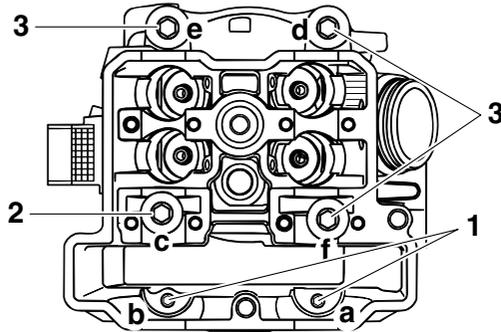
REMOVING THE CYLINDER HEAD

1. Remove:

- Cylinder head bolts "1" (M6×60)
- Cylinder head bolts "2" (M10×154)
- Cylinder head bolts "3" (M10×140)

NOTE:

Gradually loosen bolts "a" to "f" in this sequence in several times.



EAS24160

CHECKING THE CYLINDER HEAD

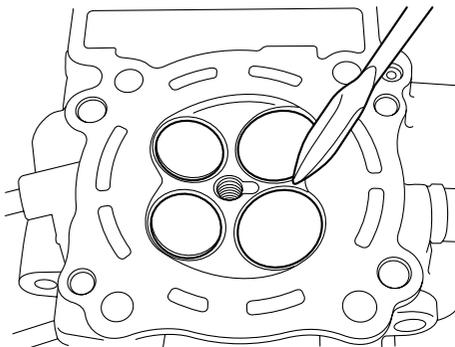
1. Eliminate:

- 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



2. Check:

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

3. Measure:

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

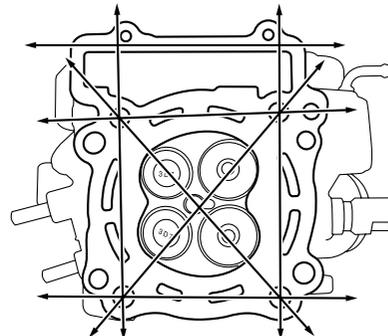
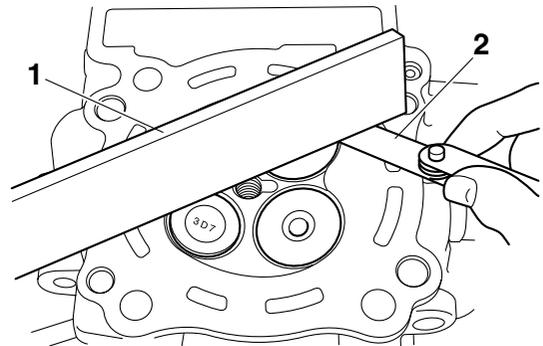
	Cylinder head warpage 0.05 mm (0.002 in)
--	---



- Place a straightedge "1" and a thickness gauge "2" across the cylinder head.
- Measure the warpage.
- If the limit is exceeded, resurface the cylinder head as follows.
- Place a 400–600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

NOTE:

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



- After resurfacing, out of specification → Replace the cylinder head.

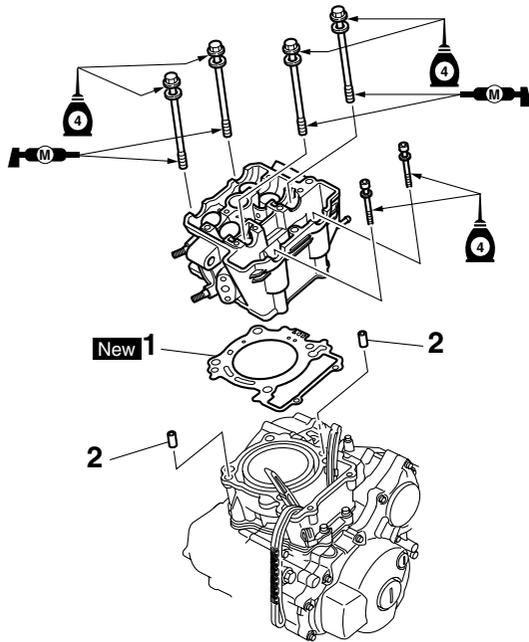


EAS24230

INSTALLING THE CYLINDER HEAD

1. Install:

- Cylinder head gasket "1" **New**
- Dowel pins "2"



2. Install:

- Cylinder head

NOTE:

Pass the timing chain through the timing chain cavity.

3. Tighten:

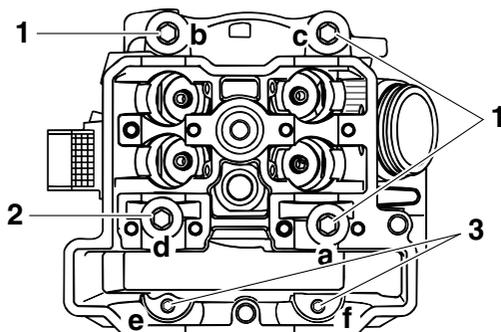
- Cylinder head bolts (M10×140) "1"
- Cylinder head bolts (M10×155) "2"
- Cylinder head bolts (M6×60) "3"



Cylinder head bolt (M10)
40 Nm (4.0 m•kg, 29 ft•lb)
Cylinder head bolt (M6)
10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

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

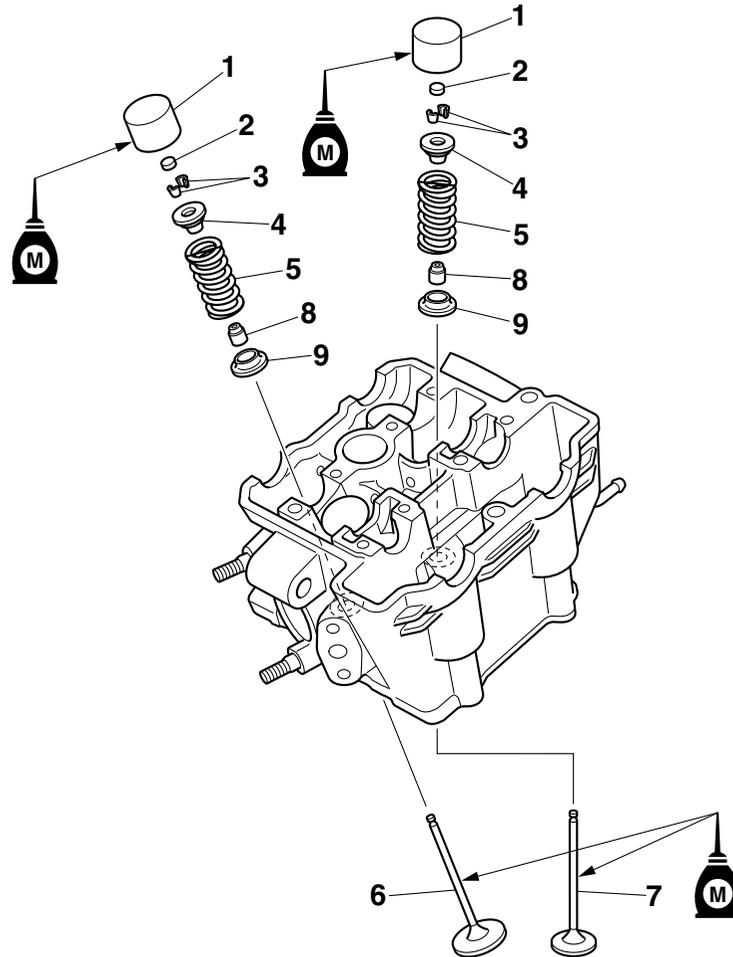


VALVES AND VALVE SPRINGS

EAS24270

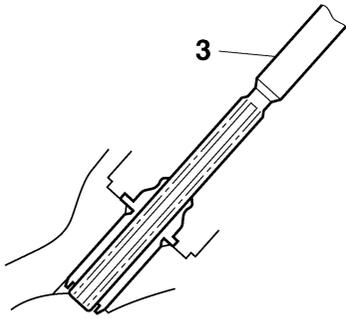
VALVES AND VALVE SPRINGS

Removing the valves and valve springs



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

VALVES AND VALVE SPRINGS



NOTE:
After replacing the valve guide, reface the valve seat.



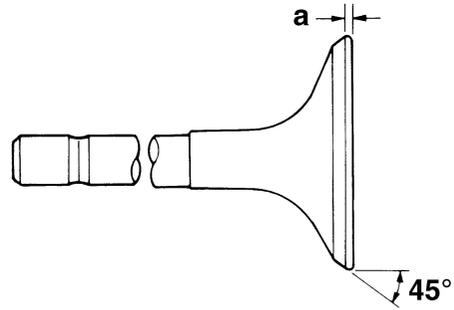
Valve guide remover (ø4.5)
90890-04116
YM-04116
Valve guide installer (ø4.5)
90890-04117
YM-04117
Valve guide reamer (ø4.5)
90890-04118
YM-04118



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 “a”
Out of specification → Replace the valve.



Valve margin thickness
Valve margin thickness D (intake)
1.15–1.45 mm (0.0453–0.0571 in)
Limit
1.00 mm (0.0394 in)
Valve margin thickness D (exhaust)
0.85–1.15 mm (0.0335–0.0453 in)
Limit
0.70 mm (0.0276 in)

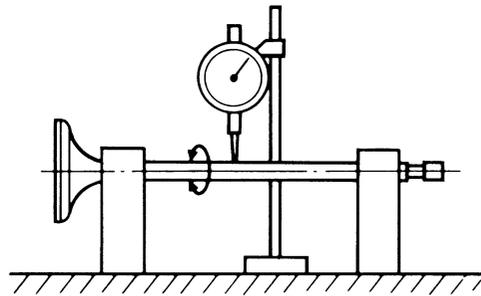


6. Measure:
 - Valve stem runout
Out of specification → Replace the valve.

- NOTE:**
- When installing a new valve, always replace the valve guide.
 - If the valve is removed or replaced, always replace the oil seal.



Valve stem runout
0.010 mm (0.0004 in)



EAS24300

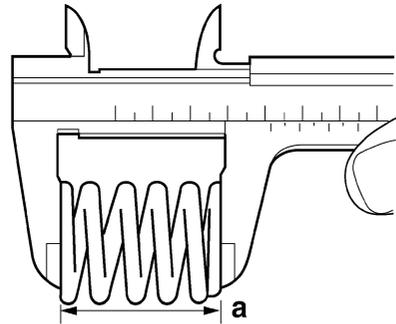
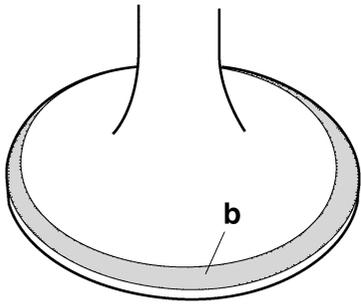
CHECKING THE VALVE SEATS

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 “a”
Out of specification → Replace the cylinder head.

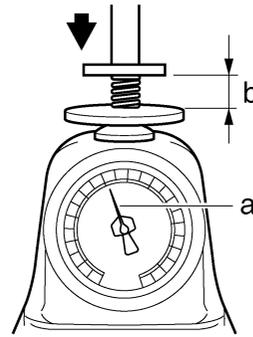
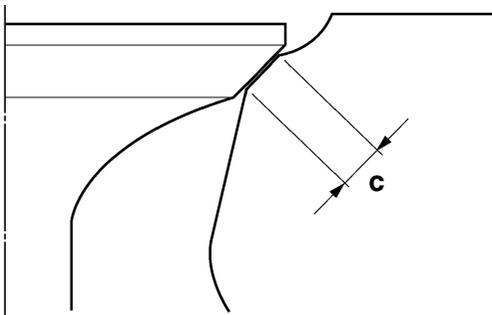


Valve seat width
Valve seat width C (intake)
0.90–1.10 mm (0.0354–0.0433 in)
Valve seat width C (exhaust)
0.90–1.10 mm (0.0354–0.0433 in)



- h. Install the valve into the cylinder head.
- i. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- j. Measure the valve seat width "c" again. If the valve seat width is out of specification, reface and lap the valve seat.

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



- a. Compressed valve spring force
- b. Installed length



EAS24310

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

- 1. Measure:
 - Valve spring free length "a"
 - Out of specification → Replace the valve spring.

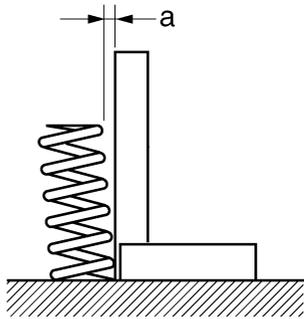
	Installed compression spring force (intake)
	147.00–169.00 N (33.05–37.99 lbf) (14.99–17.23 kgf)
	Installed compression spring force (exhaust)
	147.00–169.00 N (33.05–37.99 lbf) (14.99–17.23 kgf)
	Installed length
	31.00 mm (1.22 in)

	Valve spring free length
	Free length (intake)
	36.03 mm (1.42 in)
	Limit
	34.23 mm (1.35 in)
	Free length (exhaust)
36.03 mm (1.42 in)	
	Limit
	34.23 mm (1.35 in)

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

	Spring tilt limit
	Spring tilt (intake)
	2.5 °/1.6 mm
	Spring tilt (exhaust)
	2.5 °/1.6 mm

VALVES AND VALVE SPRINGS



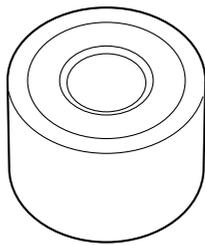
EAS24320

CHECKING THE VALVE LIFTERS

The following procedure applies to all of the valve lifters.

1. Check:

- Valve lifter
Damage/scratches → Replace the valve lifters and cylinder head.



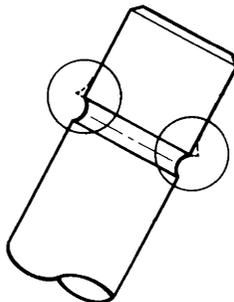
EAS24340

INSTALLING THE VALVES

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

1. Deburr:

- Valve stem end
(with an oil stone)

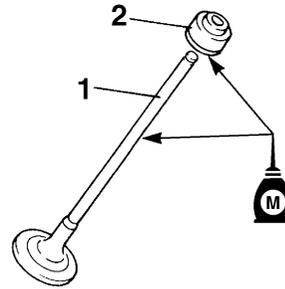


2. Lubricate:

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



Recommended lubricant
Molybdenum disulfide oil

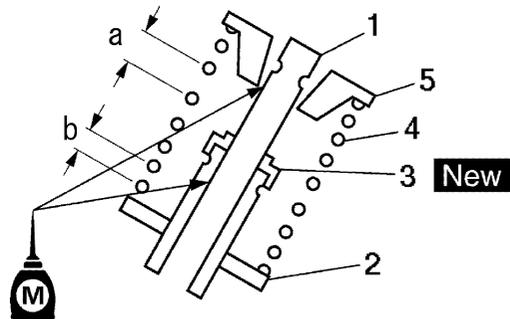


3. Install:

- Valve "1"
- Spring seat "2"
- Valve stem seal "3"
- Valve spring "4"
- Valve spring retainer "5"
(onto the cylinder head)

NOTE:

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



- a. Larger pitch
- b. Smaller pitch

4. Install:

- Valve cotters "1"

NOTE:

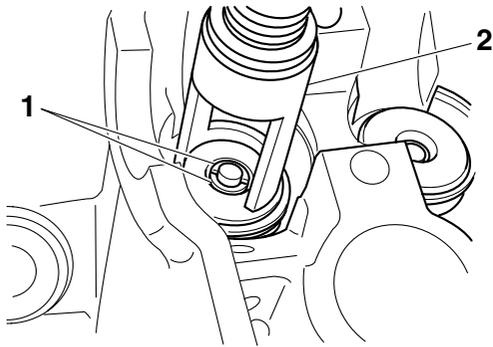
Install the valve cotters by compressing the valve spring with the valve spring compressor "2" and the valve spring compressor attachment.



Valve spring compressor
90890-04019
YM-04019

VALVES AND VALVE SPRINGS

stalled in its original position.

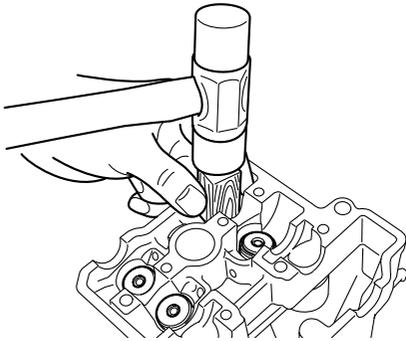


5. To fasten the valve cotters “1” onto the valve stem, lightly tap the valve tip with a soft-face hammer.

ECA13800

CAUTION:

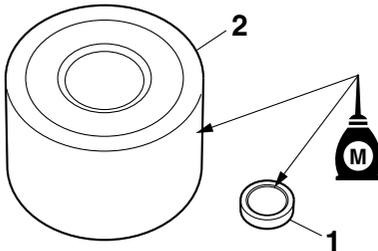
Hitting the valve tip with excessive force could damage the valve.



6. Lubricate:
- Valve pad “1”
 - Valve lifter “2”



Recommended lubricant
Molybdenum disulfide oil



7. Install:
- Valve pad
 - Valve lifter

NOTE:

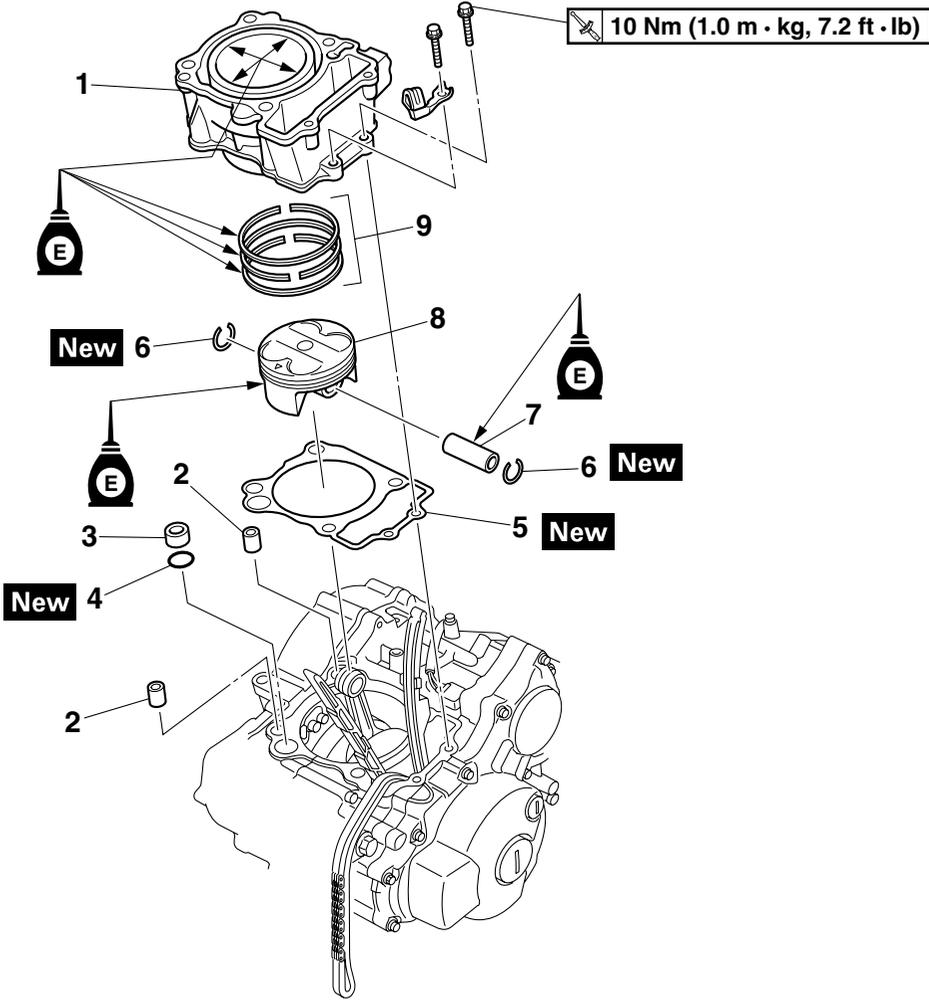
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be rein-

CYLINDER AND PISTON

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 5-14.
1	Cylinder	1	
2	Dowel pin	2	
3	Water pipe	1	
4	O-ring	1	
5	Cylinder gasket	1	
6	Piston pin clip	2	
7	Piston pin	1	
8	Piston	1	
9	Piston ring set	1	
			For installation, reverse the removal procedure.

CYLINDER AND PISTON

EAS24390

REMOVING THE PISTON

- Remove:
 - Piston pin clips “1”
 - Piston pin “2”
 - Piston “3”

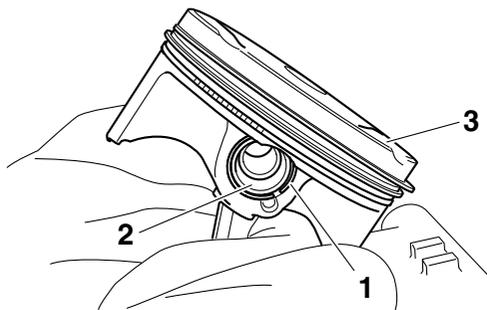
ECA13810

CAUTION:

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

NOTE:

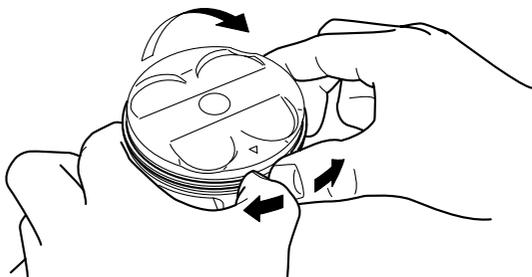
- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip’s groove and the piston’s pin bore area.



- 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

- Check:
 - Piston wall (Sidewall)
 - Cylinder wall

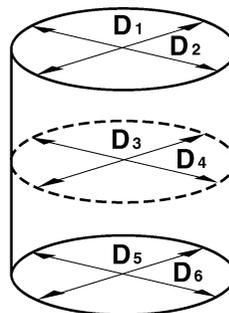
Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.

- Measure:
 - Piston-to-cylinder clearance

- Measure cylinder bore “D” with the cylinder bore gauge.

NOTE:

Measure cylinder bore “D” by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.



Cylinder bore “D”

77.000–77.010 mm (3.031–3.032 in)

Limit

77.100 mm (3.035 in)

Taper limit “T”

0.05 mm (0.002 in)

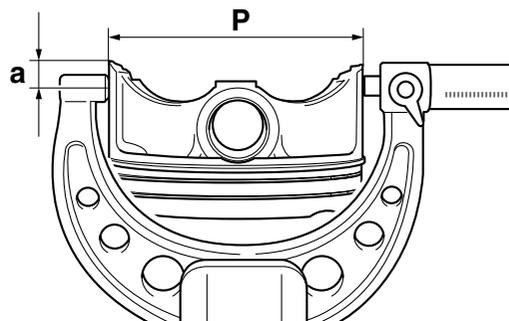
Out of round limit

0.05 mm (0.002 in)

“D” = maximum of D₁–D₆

“T” = (maximum of D₁ or D₂) - (maximum of D₅ or D₆)

- If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.
- Measure piston skirt diameter “P” with the micrometer.



- 12 mm (0.47 in) from the bottom edge of the piston

CYLINDER AND PISTON

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

Piston-to-cylinder clearance =
Cylinder bore "D" -
Piston skirt diameter "P"



Piston-to-cylinder clearance
0.010–0.035 mm (0.0004–0.0014 in)
Limit
0.10 mm (0.0039 in)

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



EAS24430

CHECKING THE PISTON RINGS

1. Measure:

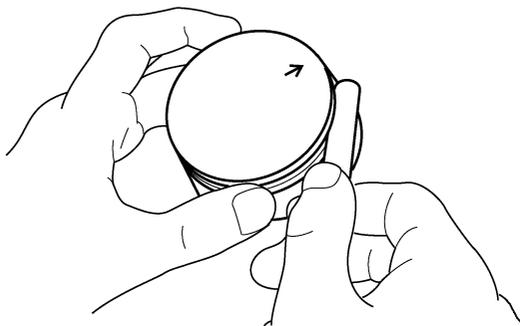
- Piston ring side clearance
 Out of specification → Replace the piston and piston rings as a set.

NOTE:

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



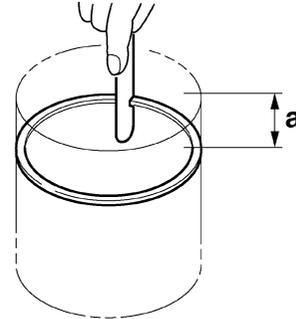
Piston ring side clearance
Top ring side clearance (installed)
0.030–0.065 mm (0.0012–0.0026 in)
Limit
0.115 mm (0.0045 in)
Second ring side clearance (installed)
0.020–0.055 mm (0.0008–0.0022 in)
Limit
0.115 mm (0.0045 in)



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's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.



Piston ring end gap
Top ring
End gap (installed)
0.15–0.25 mm (0.0059–0.0098 in)
Limit
0.50 mm (0.020 in)
2nd ring
End gap (installed)
0.30–0.45 mm (0.0118–0.0177 in)
Limit
0.80 mm (0.031 in)
Oil ring
End gap (installed)
0.10–0.40 mm (0.0039–0.0157 in)

EAS24440

CHECKING THE PISTON PIN

1. Check:

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

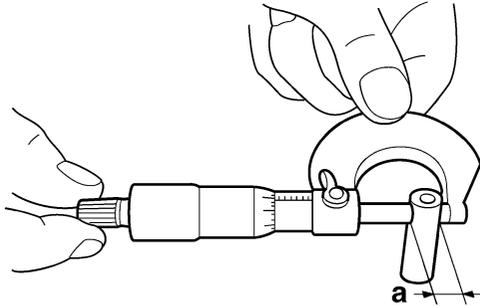
2. Measure:

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

CYLINDER AND PISTON



Piston pin outside diameter
 16.991–17.000 mm
 (0.6689–0.6693 in)
Limit
 16.971 mm (0.668 in)

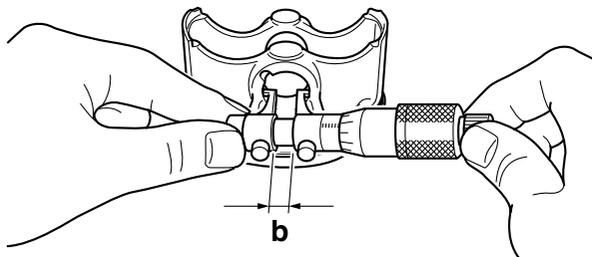


3. Measure:

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



Piston pin bore inside diameter
 17.002–17.013 mm
 (0.6694–0.6698 in)
Limit
 17.043 mm (0.670 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/piston pin hole clearance
 0.002–0.022 mm
 (0.00008–0.00087 in)

EAS24450

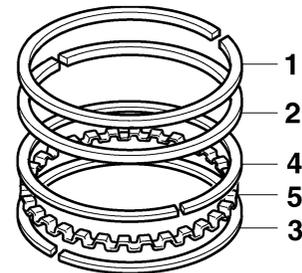
INSTALLING THE PISTON AND CYLINDER

1. Install:

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

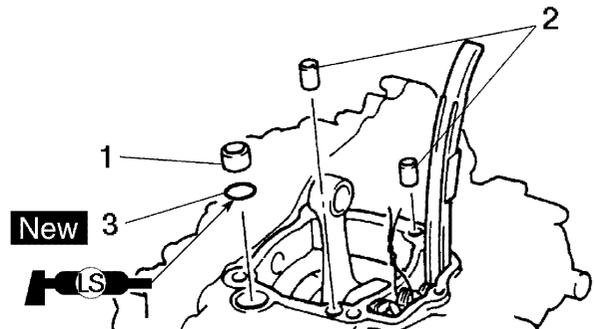
NOTE:

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



2. Install:

- Cylinder gasket **New**
- Water pipe “1”
- Dowel pins “2”
- O-ring “3” **New**

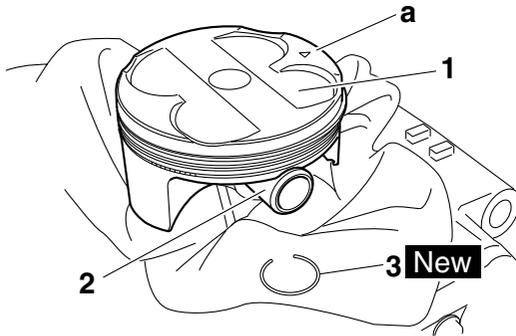


3. Install:

- Piston “1”
- Piston pin “2”
- Piston pin clips “3” **New**

NOTE:

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



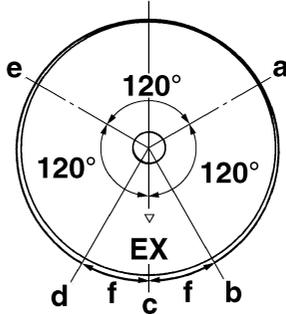
4. Lubricate:

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

	Recommended lubricant Engine oil
---	---

5. Offset:

- Piston ring end gaps



- a. Top ring
- b. Upper oil ring rail
- c. Oil ring expander
- d. Lower oil ring rail
- e. 2nd ring
- f. 20 mm

6. Install:

- Cylinder

	Cylinder bolt 10 Nm (1.0 m•kg, 7.2 ft•lb)
---	--

NOTE:

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

STARTER MOTOR

EAS24780

STARTER MOTOR

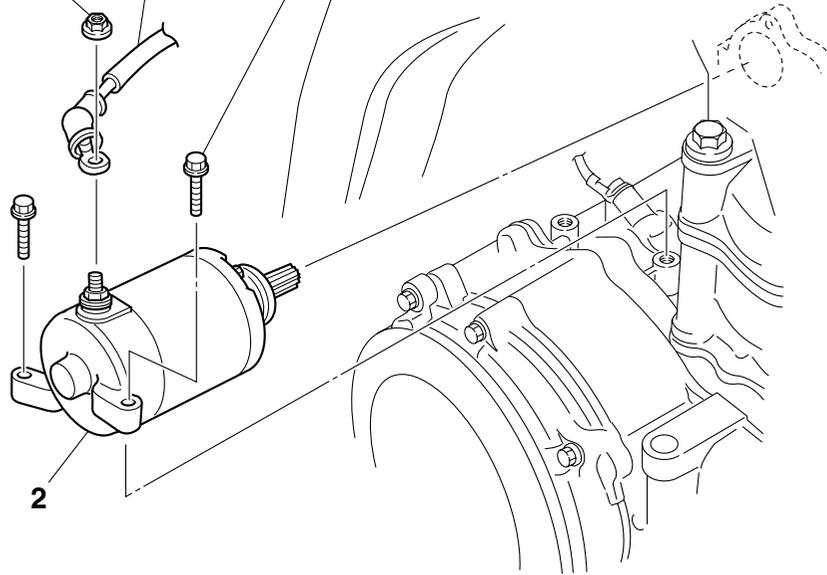
Removing the starter motor



5 Nm (0.5 m · kg, 3.6 ft · lb)

1

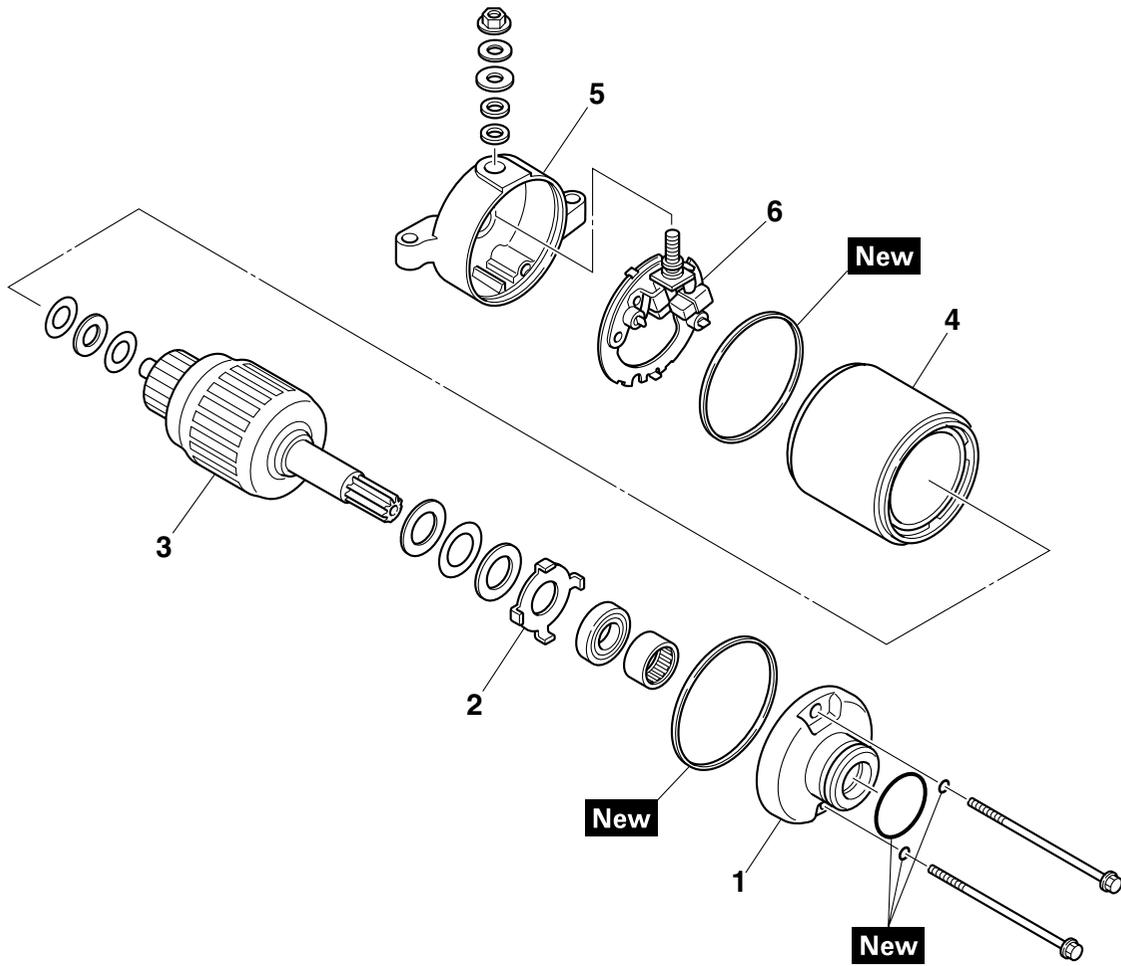
10 Nm (1.0 m · kg, 7.2 ft · lb)



Order	Job/Parts to remove	Q'ty	Remarks
	Seat/Air scoop (left/righth)		Refer to "GENERAL CHASSIS" on page 4-1.
	EXUP cable/Exhaust pipe/Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
1	Starter motor lead	1	Disconnect.
2	Starter motor	1	
			For assembly, reverse the disassembly procedure.

STARTER MOTOR

Disassembling the starter motor



Order	Job/Parts to remove	Q'ty	Remarks
1	Starter motor front cover	1	
2	Lock washer	1	
3	Armature assembly	1	
4	Starter motor yoke	1	
5	Starter motor rear cover	1	
6	Brush holder set	1	
			For assembly, reverse the disassembly procedure.

STARTER MOTOR

7. Check:

- Gear teeth
Damage/wear → Replace the gear.

8. Check:

- Bearing
- Oil seal
Damage/wear → Replace the defective part (s).

EAS24800

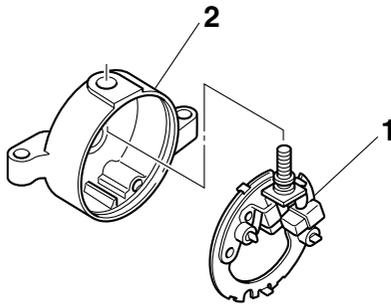
ASSEMBLING THE STARTER MOTOR

1. Install:

- Brush holder "1"

NOTE:

Align the tab on the brush seat with the slot in the starter motor rear cover "2".

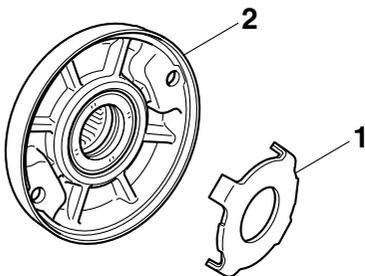


2. Install:

- Thrust support "1"

NOTE:

Align the tab of thrust support with the slot of stator motor front cover "2".

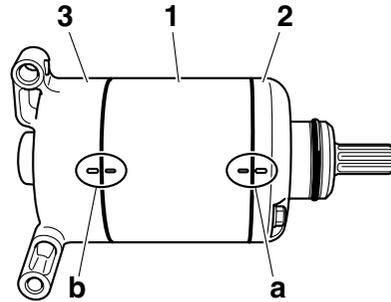


3. Install:

- Starter motor yoke "1"
- Starter motor front cover "2"
- Starter motor rear cover "3"

NOTE:

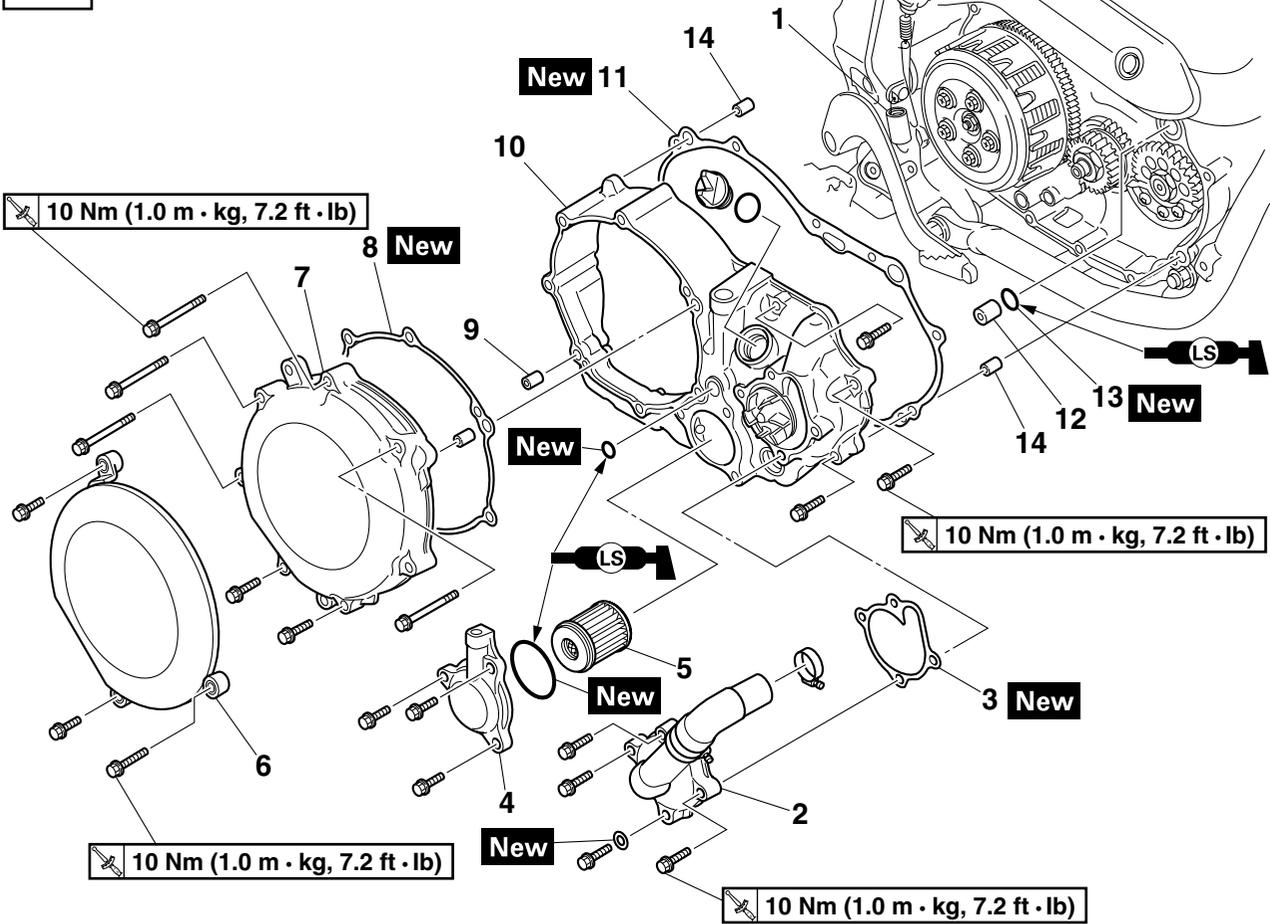
Align the match marks on the starter motor yoke with the match marks on the starter motor front cover "a" and starter motor rear cover "b".



EAS25061

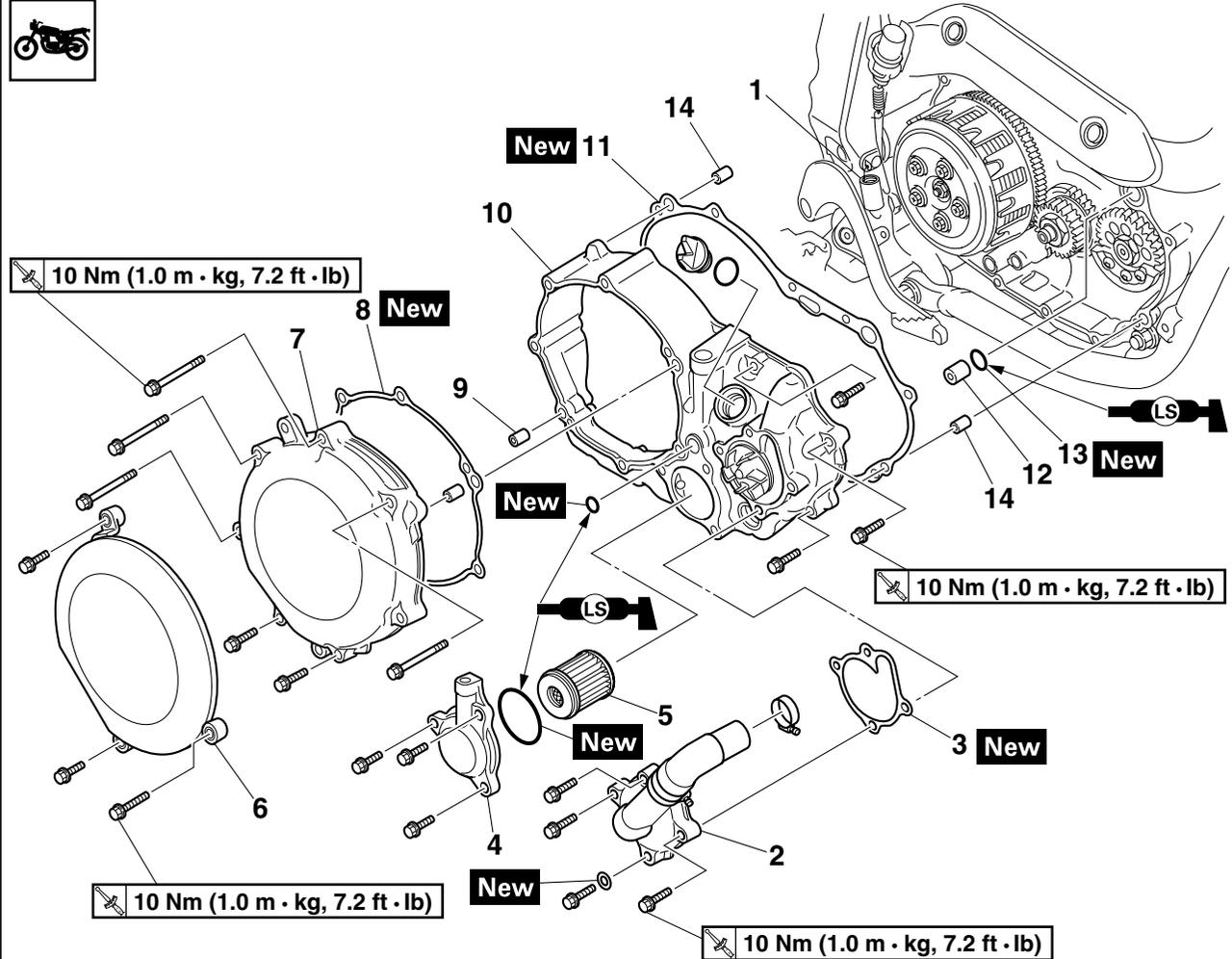
CLUTCH

Removing the clutch cover



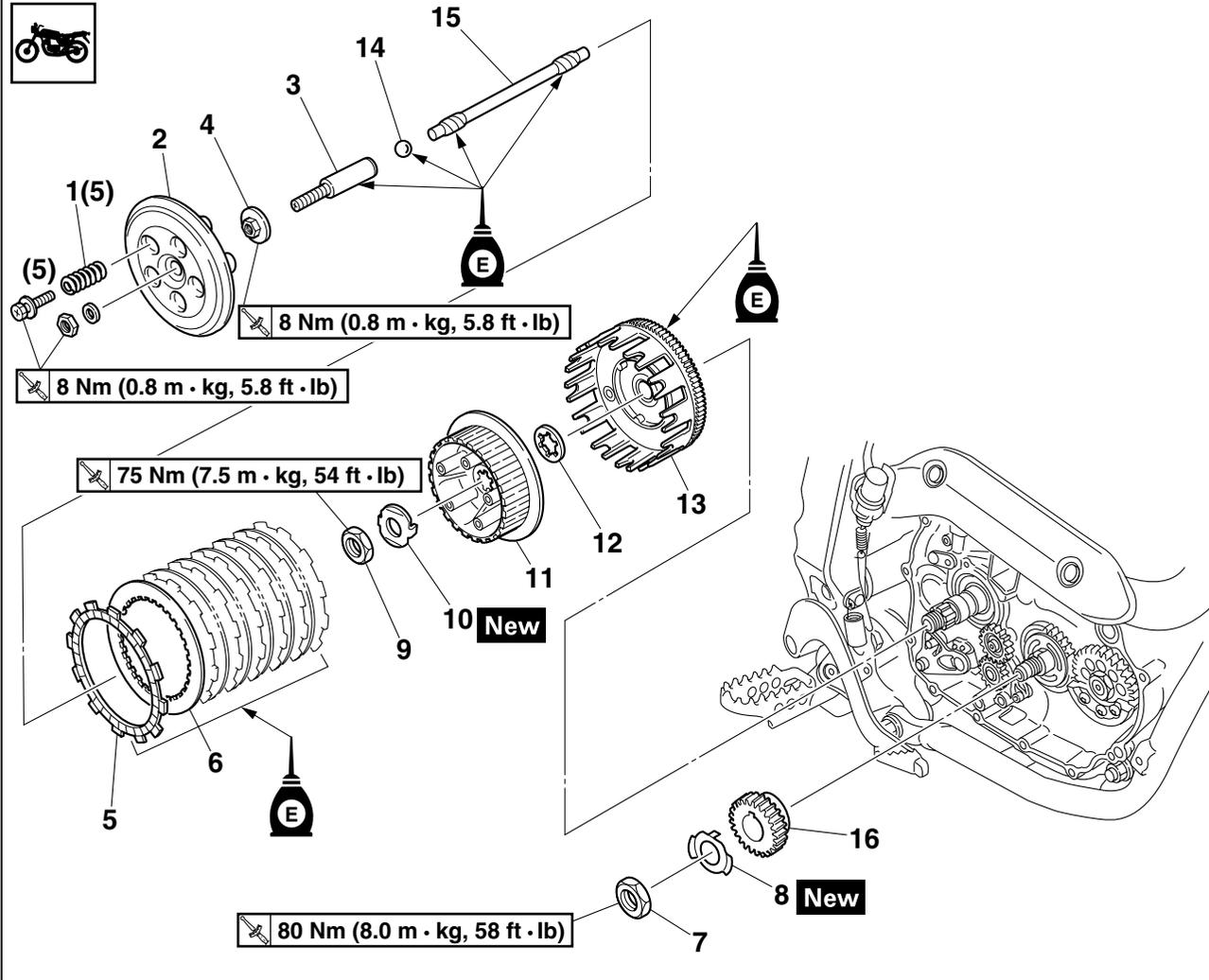
Order	Job/Parts to remove	Q'ty	Remarks
	Drain the engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-11.
	Drain the coolant		Refer to "CHANGING THE COOLANT" on page 3-18.
1	Brake pedal spring	1	Remove it from the frame mounting hook.
2	Water pump housing cover	1	
3	Gasket	1	
4	Oil cleaner element cover	1	
5	Oil cleaner element	1	
6	Cover	1	
7	Clutch cover	1	Remove the clutch cover only if you do not remove the primary drive gear.
8	Clutch cover gasket	1	
9	Dowel pin	2	
10	Crankcase cover (right)	1	
11	Crankcase cover right gasket	1	
12	Water pipe	1	
13	O-ring	1	
14	Dowel pin	2	

Removing the clutch cover



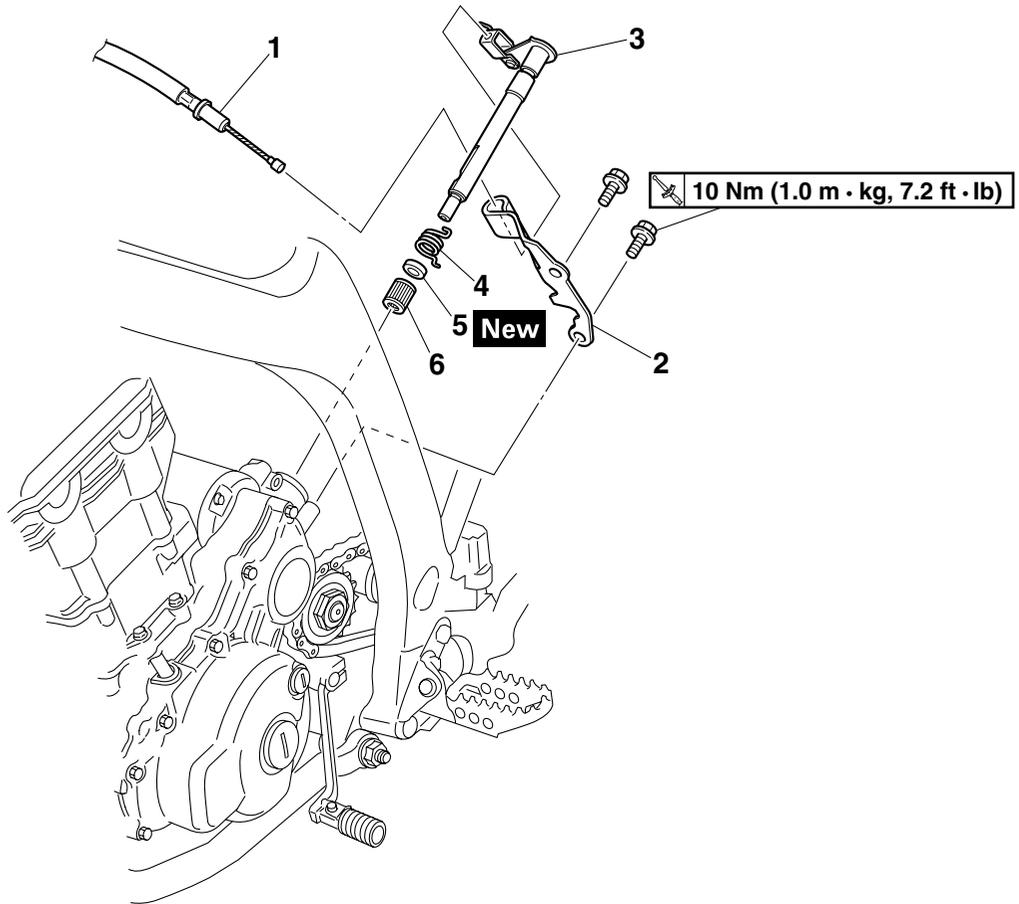
Order	Job/Parts to remove	Q'ty	Remarks
			For installation, reverse the removal procedure.

Removing the clutch



Order	Job/Parts to remove	Q'ty	Remarks
1	Clutch spring	5	
2	Pressure plate	1	
3	Push rod	1	
4	Locknut	1	
5	Friction plate	7	
6	Clutch plate	6	
7	Primary drive gear nut	1	
8	Lock washer	1	
9	Clutch boss nut	1	
10	Lock washer	1	
11	Clutch boss	1	
12	Thrust washer	1	
13	Clutch housing	1	
14	Ball	1	
15	Clutch push rod	1	
16	Primary drive gear	1	
			For installation, reverse the removal procedure.

Removing the push lever shaft



Order	Job/Parts to remove	Q'ty	Remarks
	Drive sprocket cover		Refer to "ENGINE REMOVAL" on page 5-1.
	Clutch		Refer to "CLUTCH" on page 5-34.
1	Clutch cable	1	
2	Clutch cable holder	1	
3	Push lever shaft	1	
4	Push lever spring	1	
5	Oil seal	1	
6	Bearing	1	
			For installation, reverse the removal procedure.

EAS25070

REMOVING THE CLUTCH

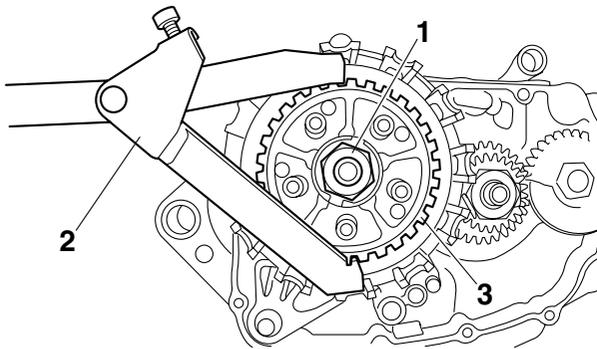
You need not drain the coolant and engine oil if you do not service the primary drive gear.

You can reach the clutch housing removal step by simply removing the cover and clutch cover.

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

NOTE:

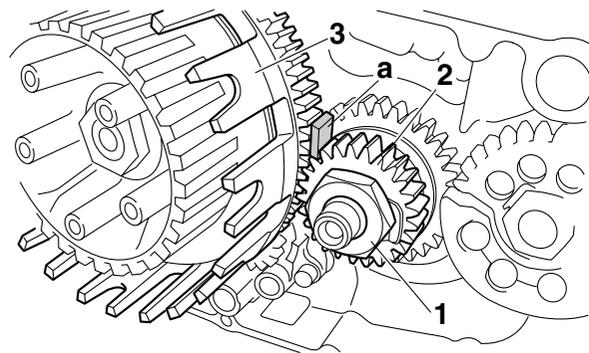
While holding the clutch boss "3" with the universal clutch holder "2", loosen the clutch boss nut.



3. Straighten the lock washer tab.
4. Remove:
 - Primary drive gear nut "1"
 - Lock washer

NOTE:

Insert aluminum plate "a" between primary drive gear "2" and clutch housing "3", and remove these parts by loosening the primary drive gear nut.



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:

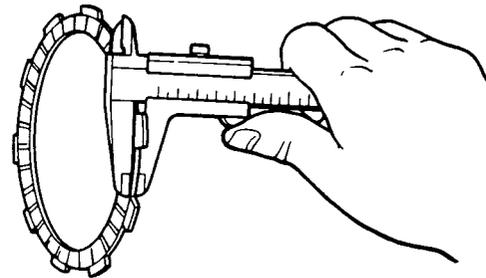
- Friction plate thickness
Out of specification → Replace the friction plates as a set.

NOTE:

Measure the friction plate at four places.



Friction plate thickness
2.90–3.10 mm (0.114–0.122 in)
Limit
2.80 mm (0.110 in)



EAS25110

CHECKING THE CLUTCH PLATES

The following procedure applies to all of the clutch plates.

1. Check:

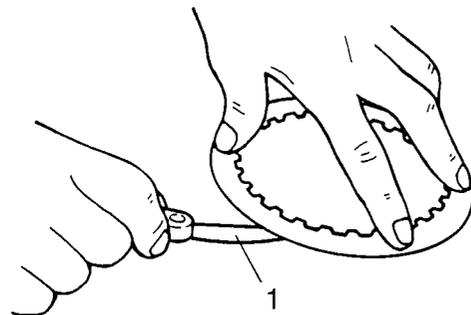
- Clutch plate
Damage → Replace the clutch plates as a set.

2. Measure:

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



Warpage limit
0.10 mm (0.0039 in)



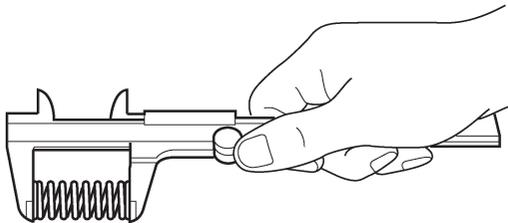
EAS25140

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
Out of specification → Replace the clutch springs as a set.

	Clutch spring free length
	41.20 mm (1.62 in)
	Limit
	39.14 mm (1.54 in)



I1412901

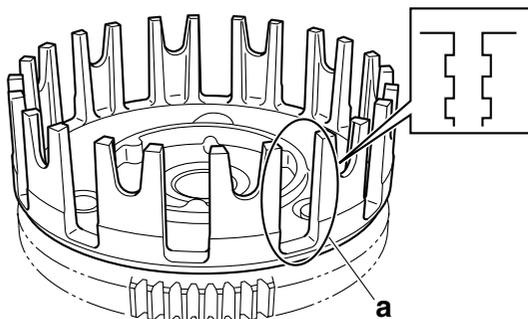
EAS25150

CHECKING THE CLUTCH HOUSING

1. Check:
 - Clutch housing dogs “a”
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.



EAS25160

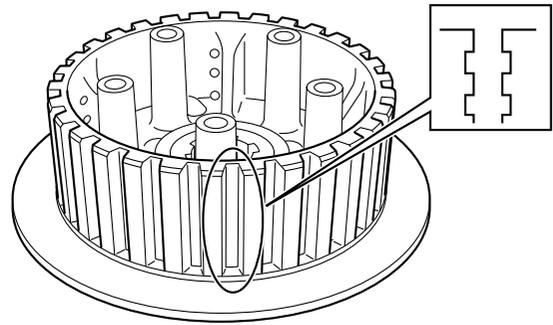
CHECKING THE CLUTCH BOSS

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

NOTE:

Pitting on the clutch boss splines will cause er-

atic clutch operation.



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

EAS25170

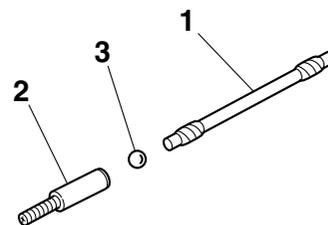
CHECKING THE PRESSURE PLATE

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

EAS25190

CHECKING THE CLUTCH PUSH RODS

1. Check:
 - Push rod “1”
 - Push rod “2”
 - Ball “3”
Cracks/damage/wear → Replace.



2. Measure:
 - Push rod bending limit
Out of specification → Replace the defective part (s).

	Push rod bending limit
	0.100 mm (0.004 in)

EAS25200

CHECKING THE PRIMARY DRIVE GEAR

1. Check:

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

EAS25210

CHECKING THE PRIMARY DRIVEN GEAR

1. Check:

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

EAS25260

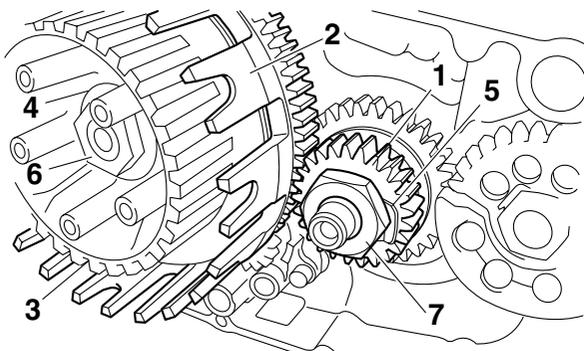
INSTALLING THE CLUTCH

1. Install:

- Primary drive gear "1"
- Clutch housing "2"
- Thrust washer
- Clutch boss "3"
- Lock washer "4" **New**
- Lock washer "5" **New**
- Clutch boss nut "6"
- Primary drive gear nut "7"

NOTE:

- Align the lock washer projection with the clutch boss slit during assembling.
- Install the primary drive gear by facing its flat face toward the crankcase.



2. Tighten:

- Clutch boss nut "1"

NOTE:

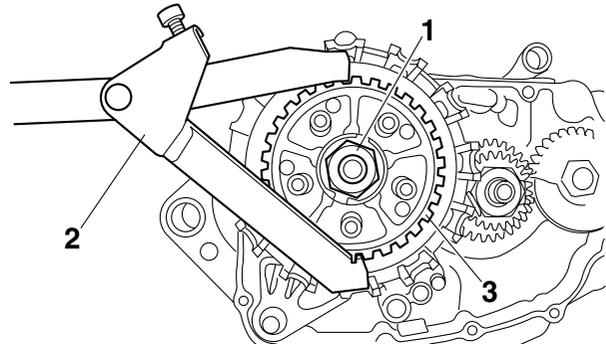
While holding the clutch boss "3" with the universal clutch holder "2", tighten the clutch boss nut.



Universal clutch holder
90890-04086
YM-91042



Clutch boss nut
75 Nm (7.5 m•kg, 54 ft•lb)



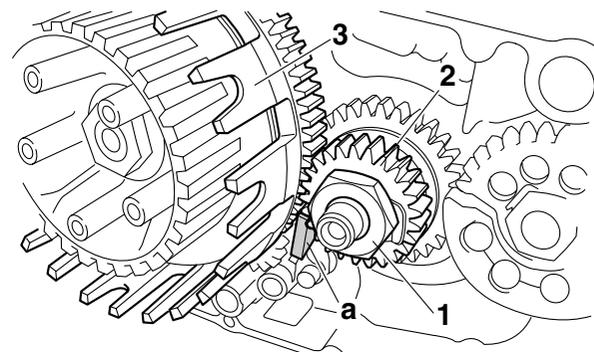
3. Bend the lock washer tab along a flat side of the nut.
4. Tighten:
 - Primary drive gear nut "1"

NOTE:

Insert aluminum plate "a" between primary drive gear "2" and clutch housing "3", and tighten the primary drive gear nut.



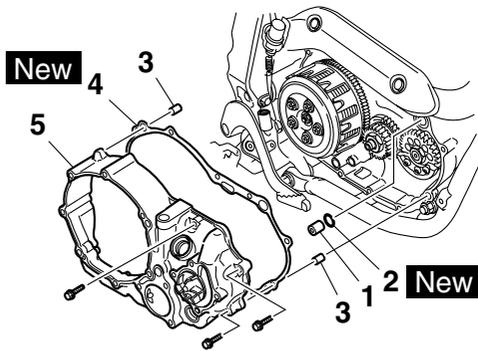
Primary drive gear nut
80 Nm (8.0 m•kg, 58 ft•lb)



5. Bend the lock washer tab along a flat side of the nut.
6. Lubricate:
 - Friction plates
 - Clutch plates (with the recommended lubricant)
 - Push rod
 - Push rod1
 - Ball



Recommended lubricant
Engine oil



14. Install:

- Oil cleaner element
Refer to “CHANGING THE ENGINE OIL” on page 3-11.

15. Install:

- Water pump housing cover
Refer to “WATER PUMP” on page 6-6.

16. Fill:

- Crankcase
(with the specified amount of the engine oil)
Refer to “CHANGING THE ENGINE OIL” on page 3-11.

17. Fill:

- Cooling system
(with the specified amount of the the coolant)
Refer to “CHANGING THE COOLANT” on page 3-18.

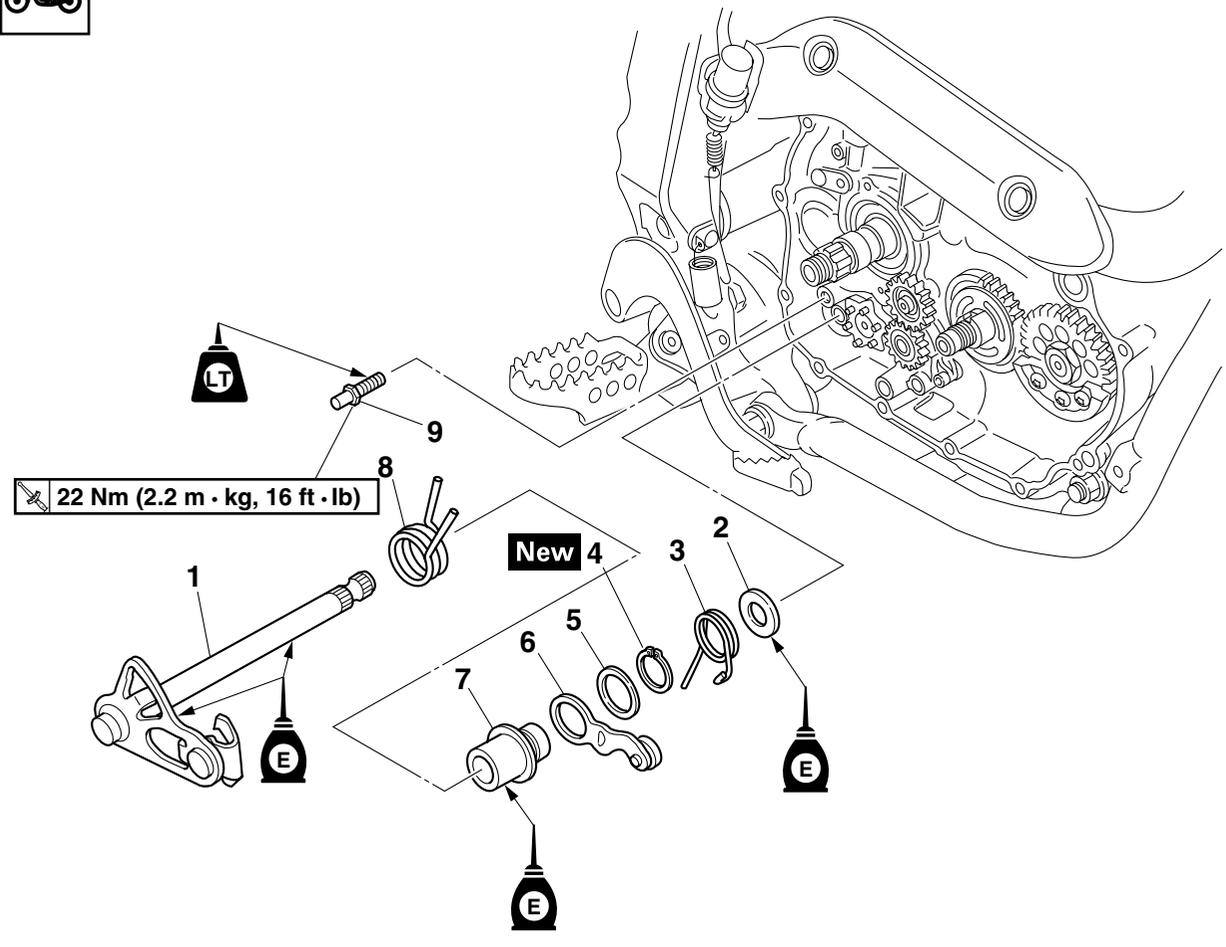
18. Install:

- Brake spring

EAS25410

SHIFT SHAFT

Removing the shift shaft and stopper lever



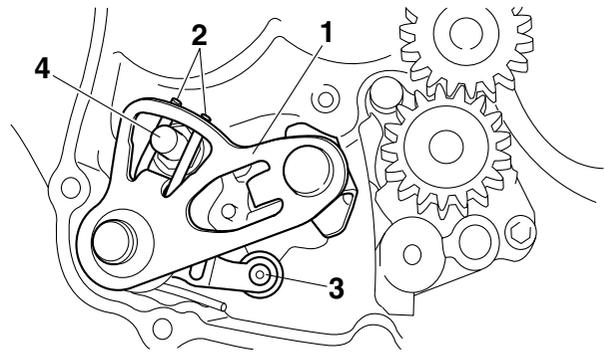
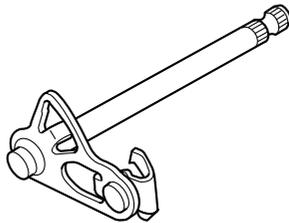
Order	Job/Parts to remove	Q'ty	Remarks
	Shift pedal		Refer to "ENGINE REMOVAL" on page 5-1.
	Clutch housing		Refer to "CLUTCH" on page 5-34.
1	Shift shaft	1	
2	Plate washer	1	
3	Stopper lever spring	1	
4	Circlip	1	
5	Plate washer	1	
6	Stopper lever	1	
7	Spacer	1	
8	Shift shaft spring	1	
9	Stopper screw	1	
			For installation, reverse the removal procedure.

EAS25420

CHECKING THE SHIFT SHAFT

1. Check:

- Shift shaft
- Shift lever
Bends/damage/wear → Replace.
- Shift lever spring
Damage/wear → Replace.



EAS25430

CHECKING THE STOPPER LEVER

1. Check:

- Stopper lever
Bends/damage → Replace.
Roller turns roughly → Replace the stopper lever.



EAS25450

INSTALLING THE SHIFT SHAFT

1. Install:

- Shift shaft “1”
- Shift shaft spring “2”
- Stopper lever “3”
- Stopper lever spring

NOTE:

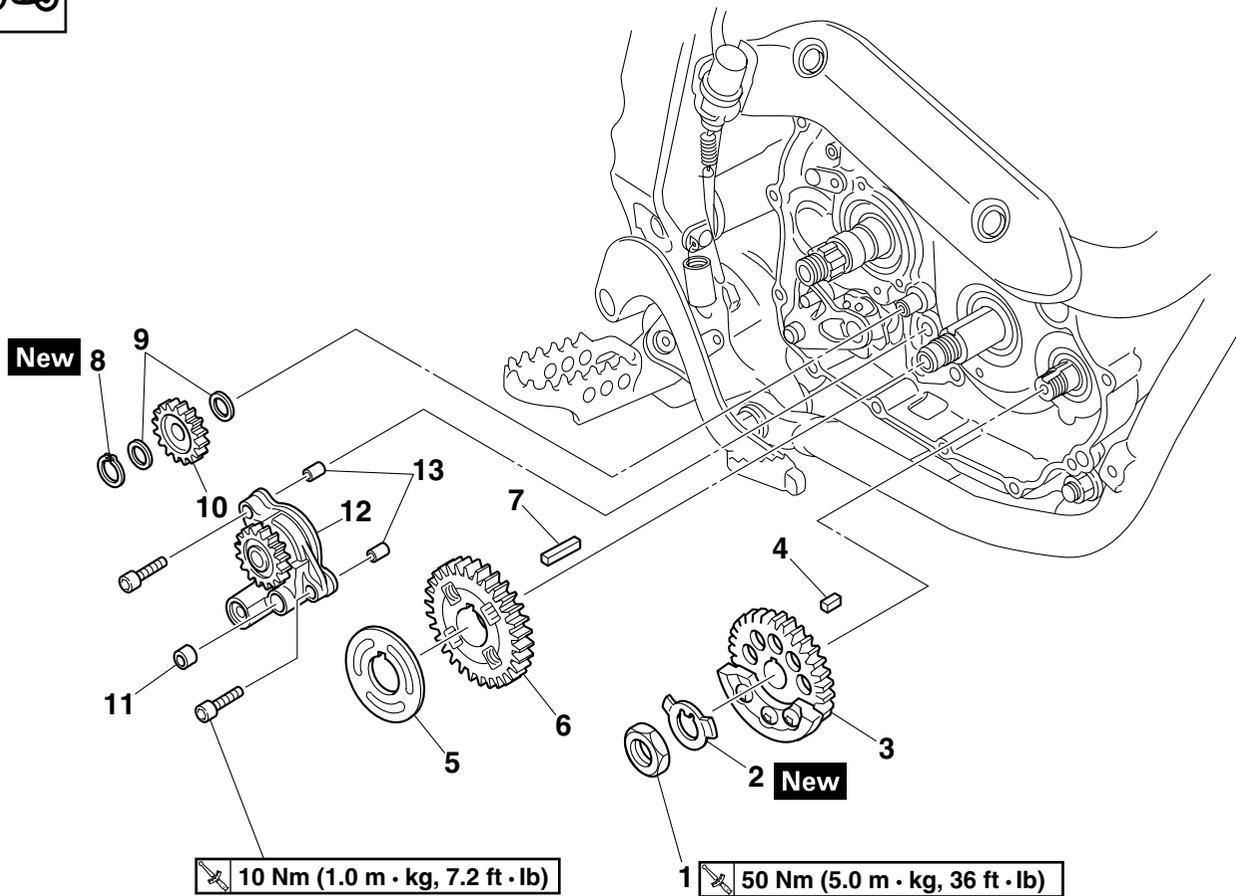
- Hook the ends “4” of the stopper lever spring onto the stopper lever and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.

OIL PUMP AND BALANCER GEAR

EAS24911

OIL PUMP AND BALANCER GEAR

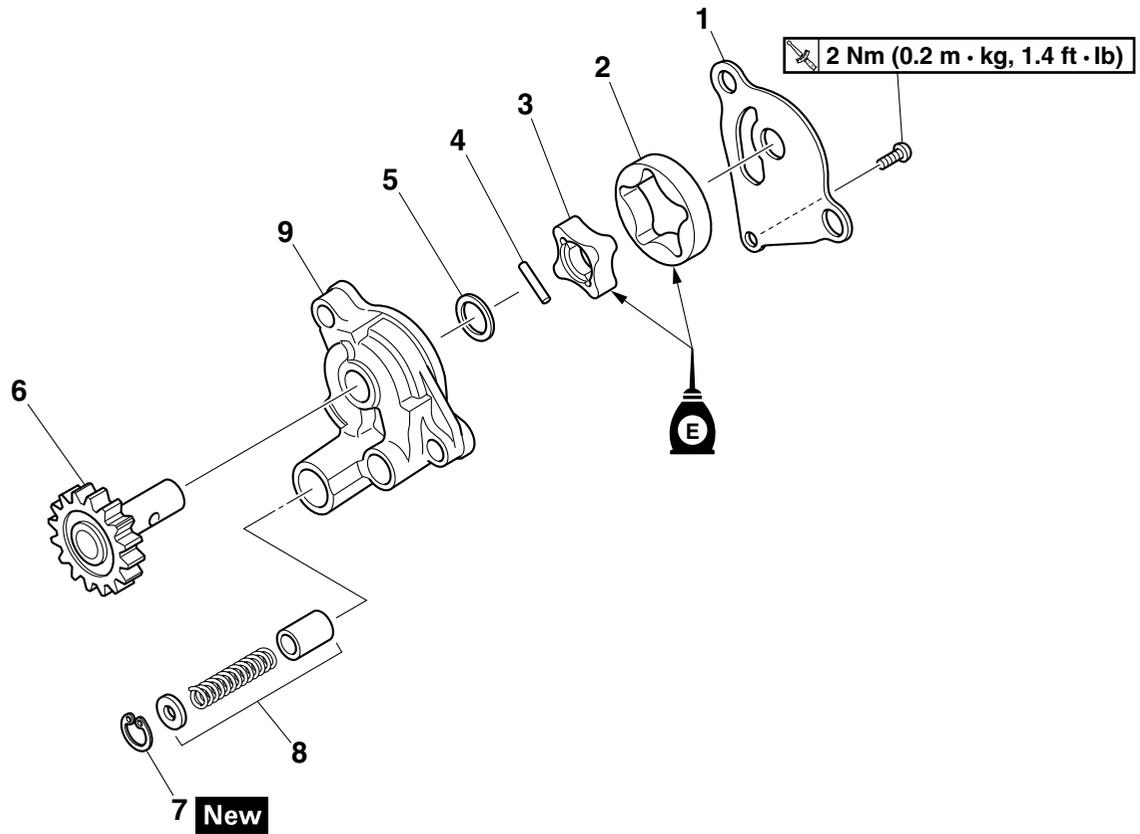
Removing the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch/Primary drive gear		Refer to "CLUTCH" on page 5-34.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-43.
1	Balancer weight gear nut	1	
2	Lock washer	1	
3	Balancer weight gear	1	
4	Straight key	1	
5	Absorber plate	1	
6	Balancer drive gear	1	
7	Straight key	1	
8	Circlip	1	
9	Plain washer	2	
10	Idle gear	1	
11	Gasket	1	
12	Oil pump assembly	1	
13	Dowel pin	2	
			For installation, reverse the removal procedure.

OIL PUMP AND BALANCER GEAR

Disassembling the oil pump



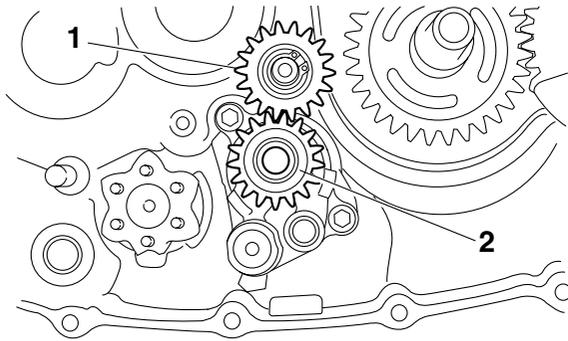
Order	Job/Parts to remove	Q'ty	Remarks
1	Pump cover	1	
2	Outer rotor	1	
3	Inner rotor	1	
4	Dowel pin	1	
5	Plain washer	1	
6	Driven gear	1	
7	Circlip	1	
8	Relief valve assembly	1	
9	Oil pump housing	1	
			For installation, reverse the removal procedure.

OIL PUMP AND BALANCER GEAR

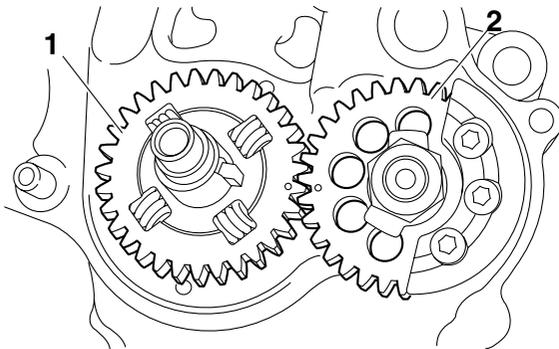
EAS24940

REMOVING THE OIL PUMP

1. Drain:
 - Engine oil
(completely from the crankcase)
Refer to "CHANGING THE ENGINE OIL" on page 3-11.
2. Remove:
 - Idle gear "1"
 - Oil pump assembly "2"



3. Remove:
 - Balancer weight gear "1"
 - Balancer drive gear assembly "2"



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.



Inner-rotor-to-outer-rotor-tip clearance

Less than
0.120 mm (0.0047 in)

Outer-rotor-to-oil-pump-housing clearance

0.090–0.160 mm (0.0004–0.0013 in)

Limit

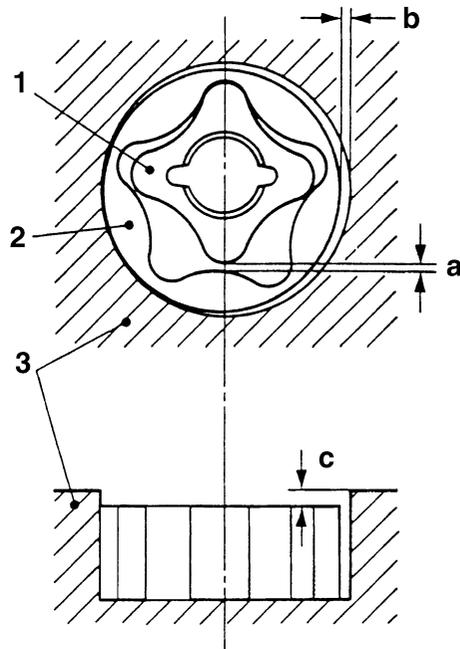
0.230 mm (0.0091 in)

Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance

0.030–0.100 mm (0.0012–0.0039 in)

Limit

0.170 mm (0.0067 in)



1. Inner rotor
2. Outer rotor
3. Oil pump housing

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:
 - Inner rotor
 - Outer rotor
 - Oil pump shaft
(with the recommended lubricant)

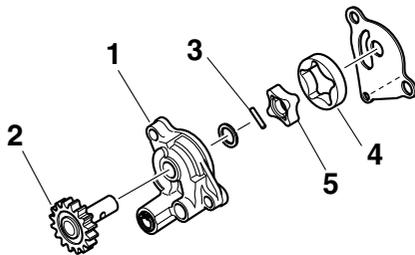
OIL PUMP AND BALANCER GEAR

	Recommended lubricant Engine oil
---	--

2. Install:

- Oil pump housing “1”
- Relief valve assembly
- Driven gear “2”
- Dowel pin “3”
- Outer rotor “4”
- Inner rotor “5”
- Oil pump cover

	Oil pump cover screw 2 Nm (0.2 m•kg, 1.4 ft•lb)
---	---



3. Check:

- Oil pump operation
Refer to “CHECKING THE OIL PUMP” on page 5-47.

EAS32D1008

INSTALLING THE OIL PUMP AND BALANCER GEAR

1. Install:

- Oil pump assembly

	Oil pump bolt 10 Nm (1.0 m•kg, 7.2 ft•lb)
---	---

ECA13890

CAUTION:

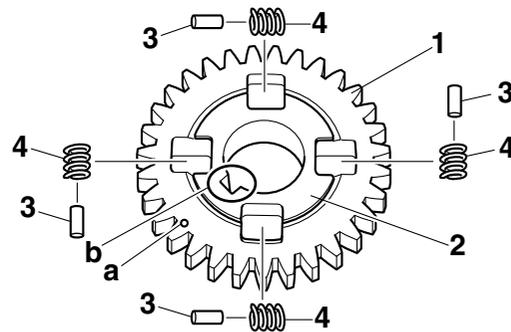
After tightening the bolts, make sure the oil pump turns smoothly.

2. Install:

- Drive gear “1”
- Buffer boss “2”
- Dowel pin “3”
- Spring “4”
(to driven gear)

NOTE:

- Align mark “a” of the drive gear with slot “b” of the buffer boss.
- Install the dowel pin on the spring as shown.

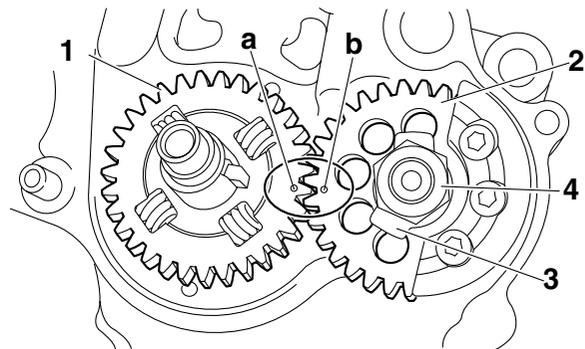


3. Install:

- Drive gear “1”
- Balancer weight gear “2”
- Lock washer “3” **New**
- Balancer weight gear nut “4”

NOTE:

Align mark “a” of the drive gear with mark “b” of the balancer shaft weight gear during assembling.



4. Tighten:

- Primary drive gear nut
Refer to “CLUTCH” on page 5-34.

5. Tighten:

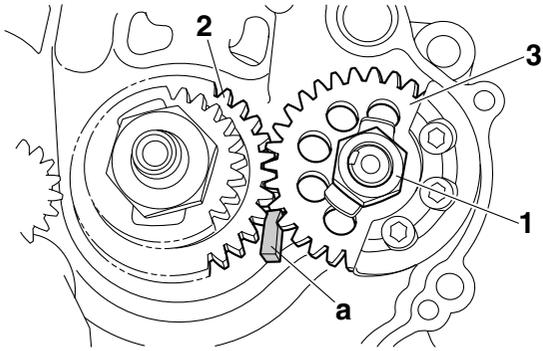
- Balancer weight gear nut “1”

	Balancer weight gear nut 50 Nm (5.0 m•kg, 36 ft•lb)
---	---

NOTE:

Insert aluminum plate “a” between drive gear “2” and balancer weight gear “3”, and tighten the primary drive gear nut.

OIL PUMP AND BALANCER GEAR



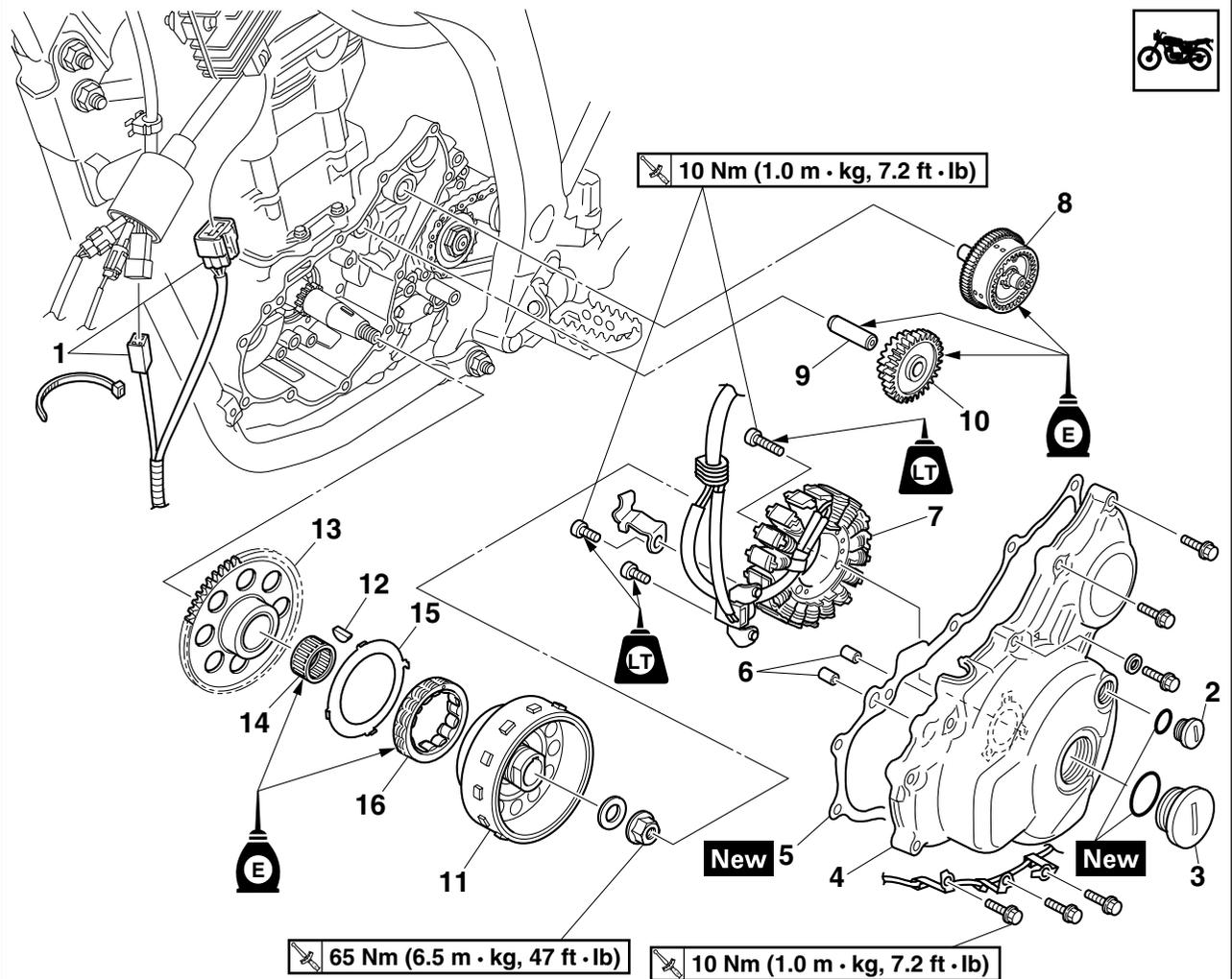
6. Install:
Be sure to bend the lock washer tab along to the nut side face.

GENERATOR AND STARTER CLUTCH

EAS24480

GENERATOR AND STARTER CLUTCH

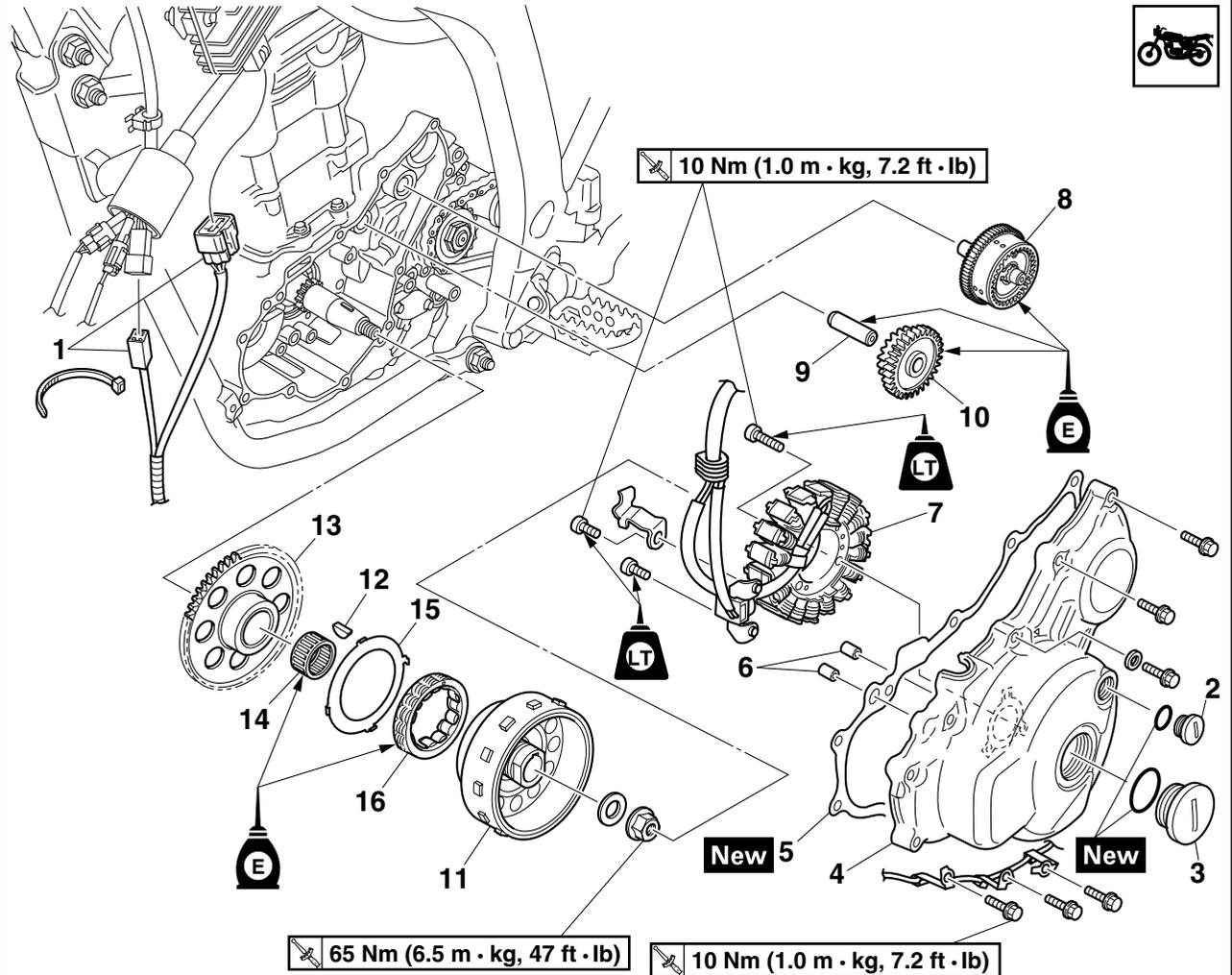
Removing the generator



Order	Job/Parts to remove	Q'ty	Remarks
	Drain the engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-11.
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Air scoop (left)		Refer to "GENERAL CHASSIS" on page 4-1.
1	Crankshaft position sensor coupler/Stator assembly coupler	1/1	
2	Timing mark accessing screw	1	
3	Crankshaft end cover	1	
4	Crankcase cover (left)	1	
5	Crankcase cover gasket (left)	1	
6	Dowel pin	1	
7	Stator assembly	1	
8	Damper assembly	1	
9	Starter idle gear shaft	1	
10	Starter idle gear	1	
11	Generator rotor	1	
12	Woodruff key	1	
13	Starter clutch gear	1	

GENERATOR AND STARTER CLUTCH

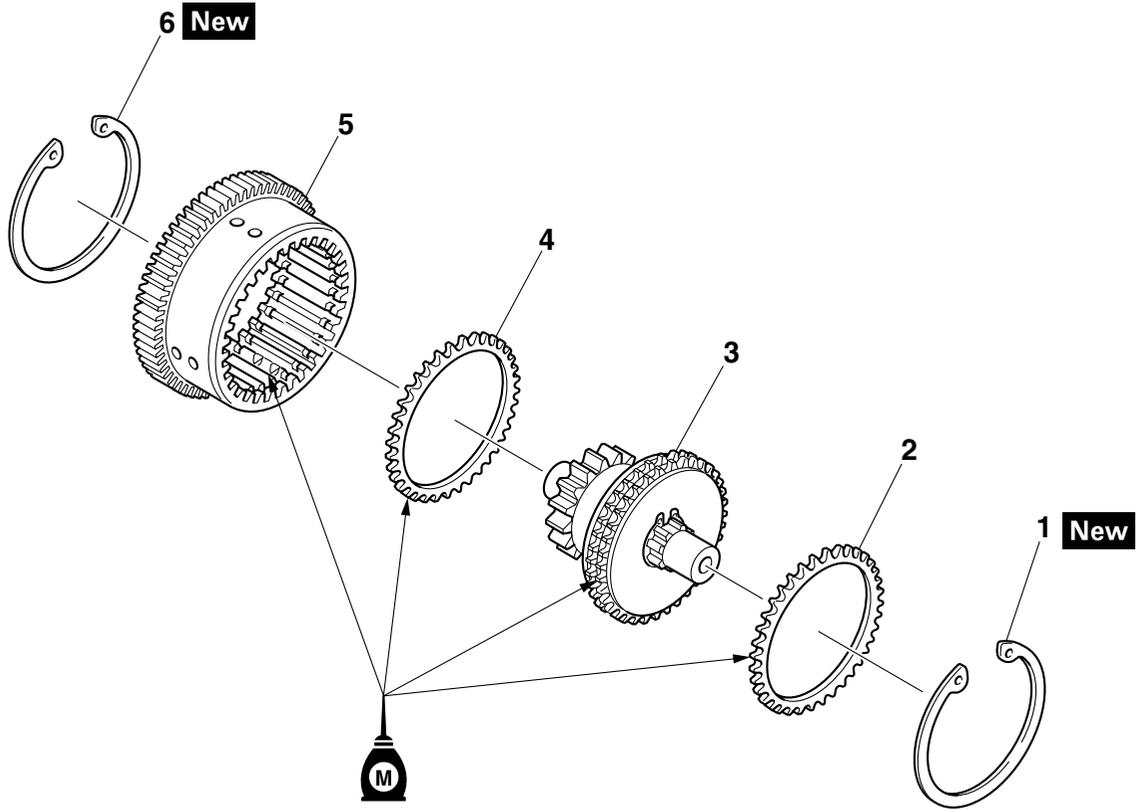
Removing the generator



Order	Job/Parts to remove	Q'ty	Remarks
14	Bearing	1	
15	Starter clutch side plate	1	
16	Starter clutch assembly	1	
			For installation, reverse the removal procedure.

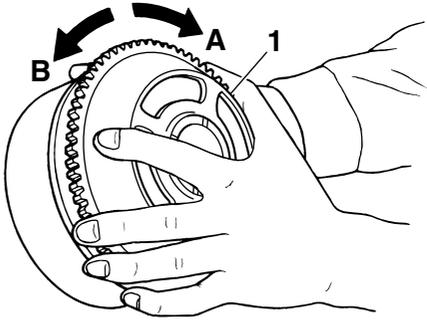
GENERATOR AND STARTER CLUTCH

Disassembling the damper assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Limiter disc	1	
3	Starter reduction gear	1	
4	Limiter disc	1	
5	Outer torque limiter	1	
6	Circlip	1	
			For installation, reverse the removal procedure.

GENERATOR AND STARTER CLUTCH

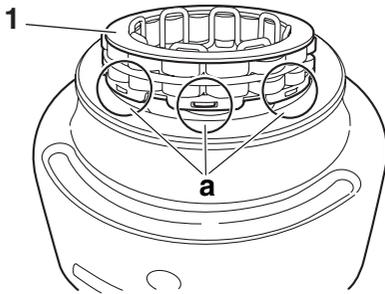


EAS24600

INSTALLING THE STARTER CLUTCH

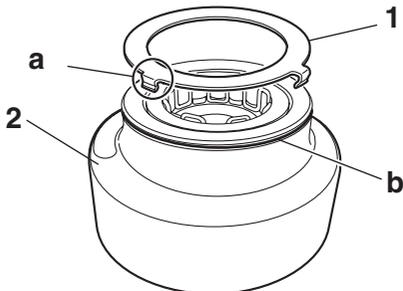
1. Install:

- Starter clutch assembly "1"
Push the starter clutch assembly strongly until bumping. (Turn the projection part "a" to the interior side.)



2. Install:

- Starter clutch side plate "1"
Set the 4 tabs "a" of the starter clutch side plate to the groove "b" of the generator rotor "2" securely.



EAS24500

INSTALLING THE GENERATOR

1. Install:

- Woodruff key
- Generator rotor
- Washer
- Generator rotor bolt

NOTE:

- Clean the tapered portion of the crankshaft and the generator rotor hub.
- When installing the generator rotor, make sure the woodruff key is properly sealed in the key-way of the crankshaft.

2. Tighten:

- Generator rotor nut "1"



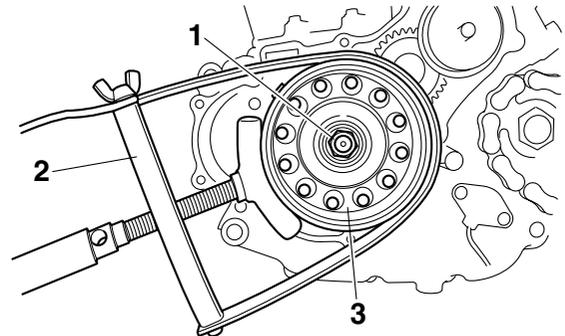
Generator rotor nut
65 Nm (6.5 m•kg, 47 ft•lb)

NOTE:

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



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



3. Install:

- Starter idler gears

4. Install:

- Left crankcase cover "1"

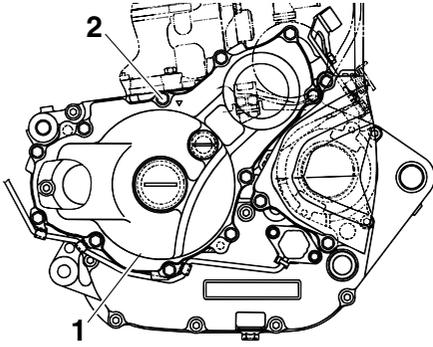


Crankcase cover bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

- Tighten bolts in a crisscross pattern.
- Use copper washer for part "2" only.

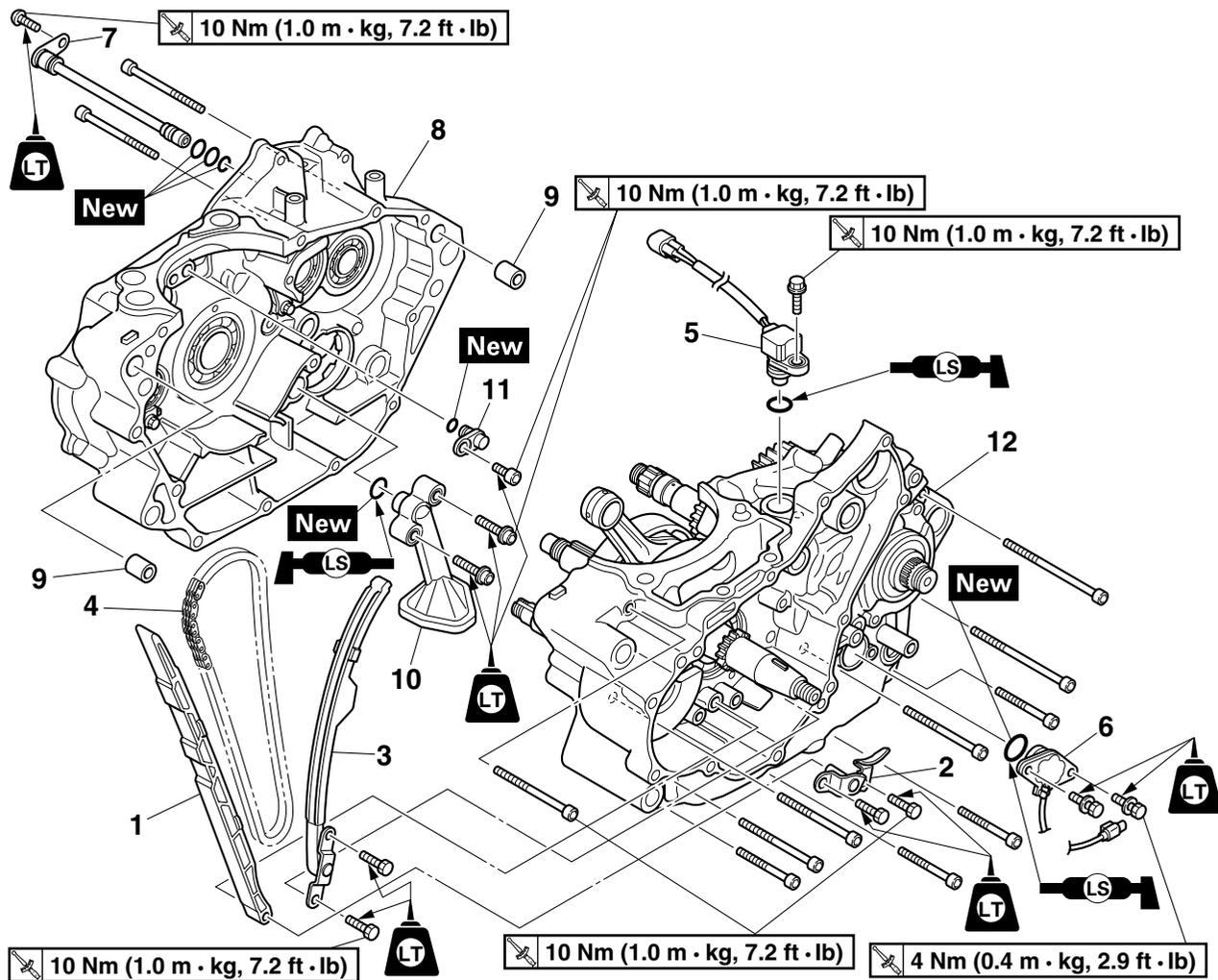
GENERATOR AND STARTER CLUTCH



EAS25540

CRANKCASE

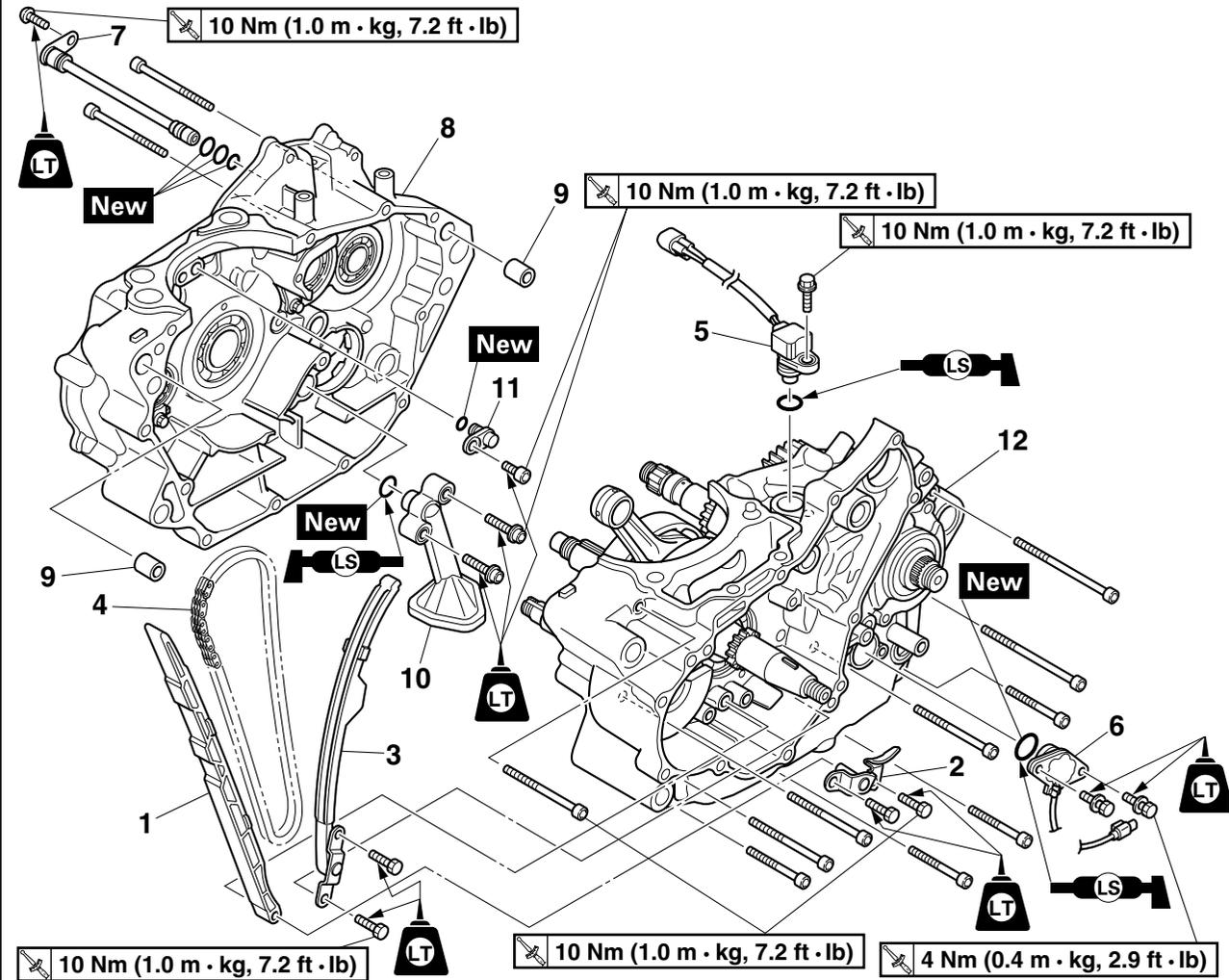
Separating the crankcase



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 5-14.
	Cylinder		Refer to "CYLINDER AND PISTON" on page 5-25.
	Starter motor		Refer to "STARTER MOTOR" on page 5-30.
	Clutch		Refer to "CLUTCH" on page 5-34.
	Balancer drive gear		Refer to "OIL PUMP AND BALANCER GEAR" on page 5-45.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-43.
	Oil pump, Balancer gear		Refer to "OIL PUMP AND BALANCER GEAR" on page 5-45.
	Generator rotor		Refer to "GENERATOR AND STARTER CLUTCH" on page 5-50.
1	Timing chain guide (intake side)	1	
2	Stopper guide plate	1	
3	Timing chain guide (exhaust side)	1	
4	Timing chain	1	
5	Speed sensor	1	
6	Neutral switch	1	
7	Delivery pipe	1	

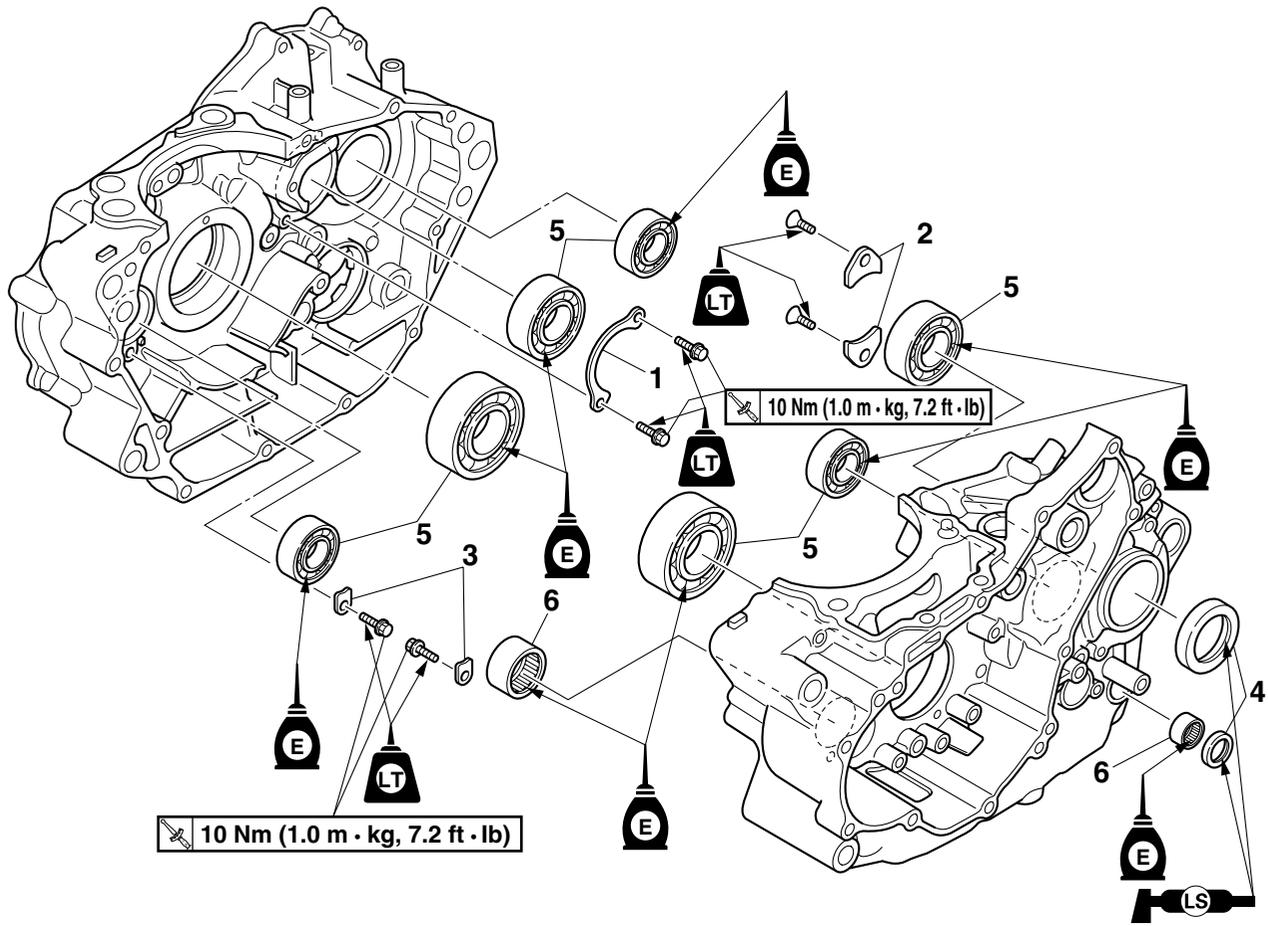
CRANKCASE

Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
8	Crankcase Right	1	
9	Dowel pin	2	
10	Oil strainer	1	
11	Nozzle	1	
12	Left crankcase	1	
			For installation, reverse the removal procedure.

Removing the bearing and oil seal



Order	Job/Parts to remove	Q'ty	Remarks
	Crankshaft assembly		Refer to "CRANKSHAFT ASSEMBLY AND BALANCER SHAFT" on page 5-61.
	Transmission assembly		Refer to "TRANSMISSION" on page 5-64.
1	Bearing cover plate	1	
2	Bearing cover plate	2	
3	Stopper plate	2	
4	Oil seal	2	
5	Bearing	7	
6	Needle bearing	2	
			For installation, reverse the removal procedure.

EAS25570

DISASSEMBLING THE CRANKCASE

1. Remove:
 - Crankcase bolts

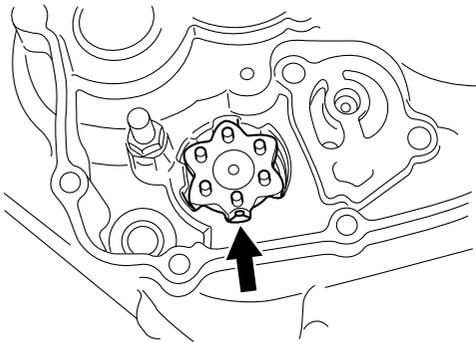
NOTE:

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

2. Turn:
 - Shift drum segment

NOTE:

Turn the shift drum segment to the position shown in the illustration. In this position, the shift drum segment's teeth will not contact the crankcase during crankcase separation.



3. Remove:
 - Right crankcase

ECA13910

CAUTION:

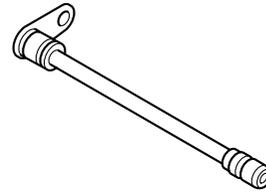
- **First check that the shift drum segment's teeth and the drive axle circlip are properly positioned, then remove the right crankcase.**
- **Do not damage the crankcase mating surfaces.**

EAS32D1015

CHECKING THE TIMING CHAIN, TIMING CHAIN GUIDE, OIL STRAINER, NOZZLE, DELIVERY PIPE

1. Check:
 - Timing chain
 - Stiffness → Replace the camshaft sprocket, timing chain and crankshaft sprocket as a set.
2. Check:
 - Timing chain guide
 - Damage/wear → Replace.
3. Check:
 - Oil strainer
 - Obstruction → Blow out with compressed air.
 - Cracks/damage → Replace.

4. Check:
 - Nozzle
 - Delivery pipe
 - Obstruction → Blow out with compressed air.
 - Bends/cracks/damage → Replace.



EAS25580

CHECKING THE CRANKCASE

1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
 - Crankcase
 - Cracks/damage → Replace.
 - Oil delivery passages
 - Obstruction → Blow out with compressed air.

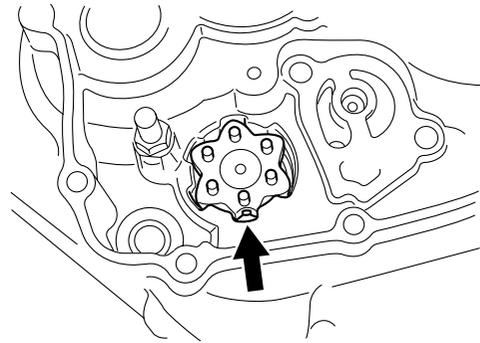
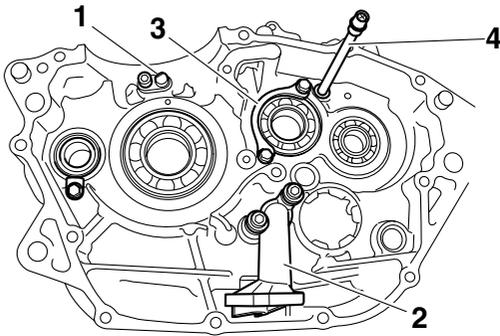
EAS25700

ASSEMBLING THE CRANKCASE

1. Install:
 - Nozzle "1"
 - Oil strainer "2"
 - Bearing cover plate "3"
 - Oil delivery pipe "4"



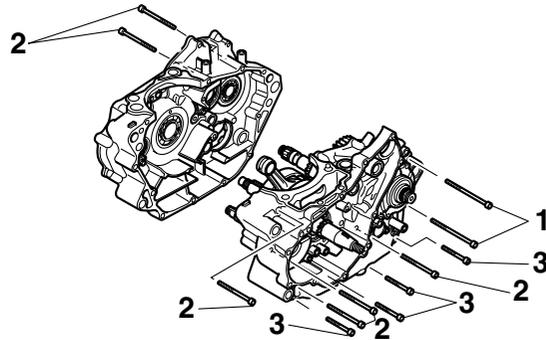
Nozzle bolt
 10 Nm (1.0 m•kg, 7.2 ft•lb)
 LOCTITE®
Oil delivery bolt
 10 Nm (1.0 m•kg, 7.2 ft•lb)
 LOCTITE®
Oil strainer bolt
 10 Nm (1.0 m•kg, 7.2 ft•lb)
 LOCTITE®
Bearing cover plate
 10 Nm (1.0 m•kg, 7.2 ft•lb)
 LOCTITE®



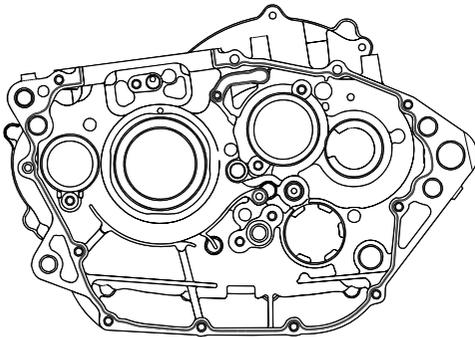
2. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
3. Apply:
 - Sealant
(onto the crankcase mating surfaces)



Yamaha bond No. 1215 (Three Bond No.1215®)
90890-85505



1. M6 × 90 mm
2. M6 × 65 mm
3. M6 × 45 mm



4. Install:
 - Crankcase (to the left crankcase)



Crankcase bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

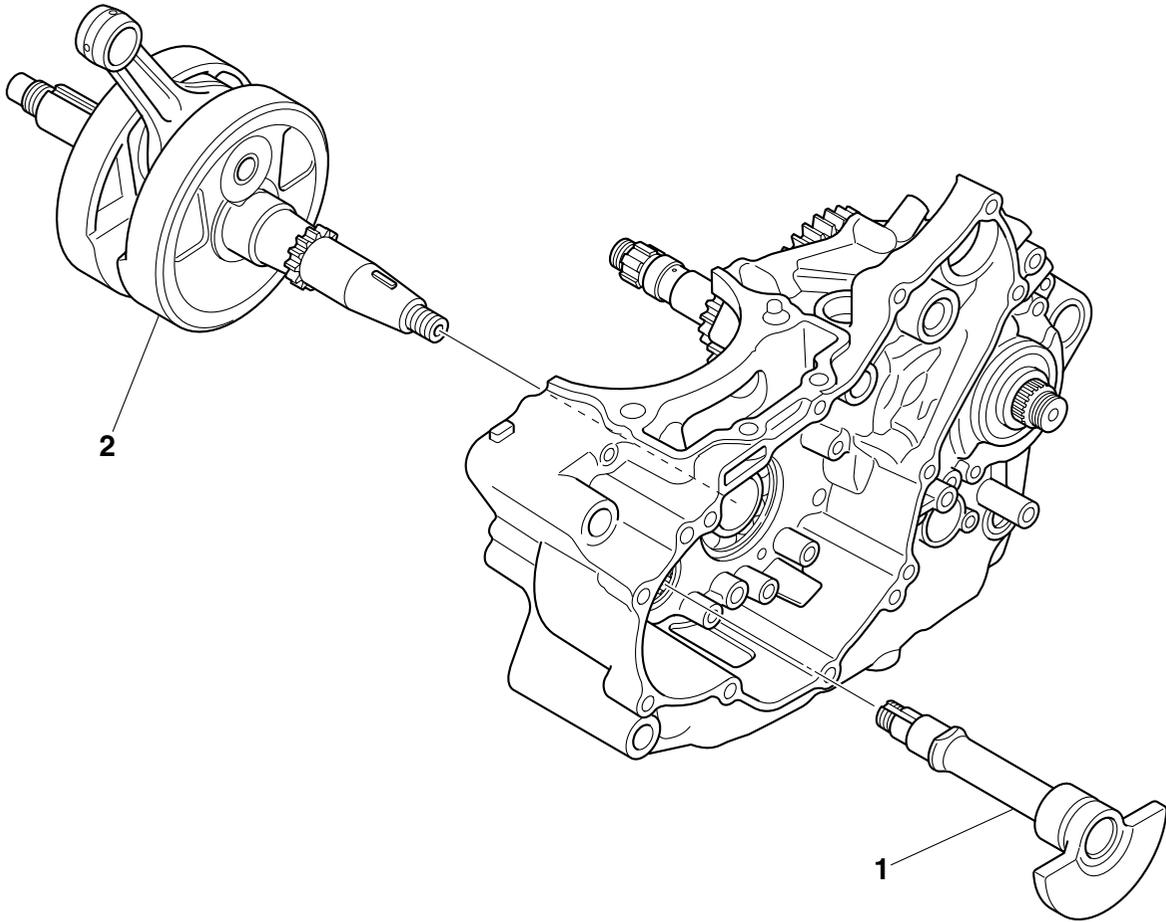
- Turn the shift drum segment as shown so that the shift drum segment teeth do not contact the crankcase during its assembling.
- Tighten the bolts in a crisscross pattern in two (2) stages, with 1/4 turn each.

CRANKSHAFT ASSEMBLY AND BALANCER SHAFT

EAS25970

CRANKSHAFT ASSEMBLY AND BALANCER SHAFT

Removing the crankshaft assembly and balancer shaft



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase.		Separate. Refer to "CRANKCASE" on page 5-56.
1	Balancer shaft	1	
2	Crankshaft assembly	1	
			For installation, reverse the removal procedure.

CRANKSHAFT ASSEMBLY AND BALANCER SHAFT

EAS26000

REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:

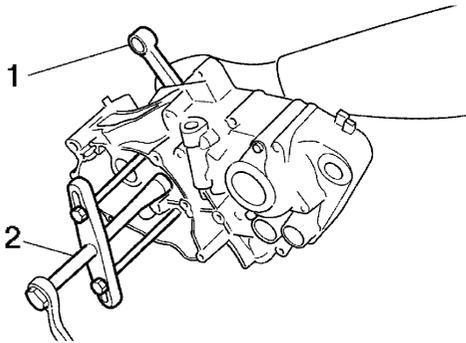
- Crankshaft assembly "1"

NOTE:

- Remove the crankshaft assembly by using the crankcase separating tool "2".



Crankcase separating tool
90890-01135
Crankcase separator
YU-01135-B



EAS26060

CHECKING THE CRANKSHAFT ASSEMBLY

1. Measure:

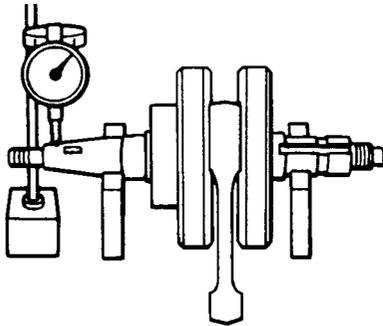
- Crankshaft runout
Out of specification → Replace the crankshaft, bearing or both.

NOTE:

Turn the crankshaft slowly.



Runout limit C
0.030 mm (0.0012 in)

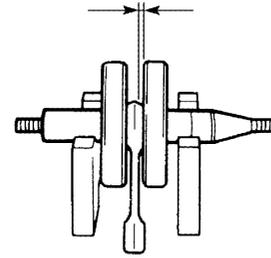


2. Measure:

- Big end side clearance
Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.



Big end side clearance D
0.350–0.650 mm (0.0138–0.0256 in)

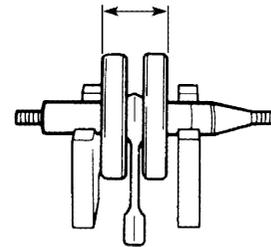


3. Measure:

- Crankshaft width
Out of specification → Replace the crankshaft.

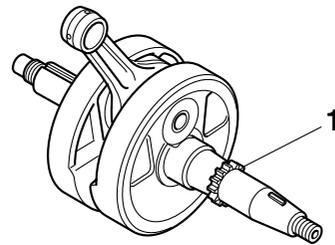


Width A
61.95–62.00 mm (2.439–2.441 in)



4. Check:

- Crankshaft sprocket "1"
Damage → Replace the crankshaft.



5. Check:

- Crankshaft journal oil passage
Obstruction → Blow out with compressed air.

EAS26210

INSTALLING THE CRANKSHAFT ASSEMBLY

1. Install:

- Crankshaft assembly

NOTE:

Install the crankshaft assembly with the crankshaft installer pot "1", crankshaft installer bolt

CRANKSHAFT ASSEMBLY AND BALANCER SHAFT

“2”, adapter (M12) “3” and spacer “4”.



Crankshaft installer pot “1”
90890-01274
Installing pot
YU-90058
Crankshaft installer bolt “2”
90890-01275
Bolt
YU-90060
Adapter (M12) “3”
90890-01278
Adapter #3
YU-90063
Spacer (crankshaft installer) “4”
90890-04081
Pot spacer
YM-91044

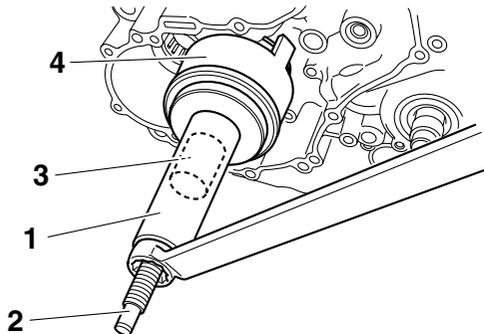
ECA13970

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:

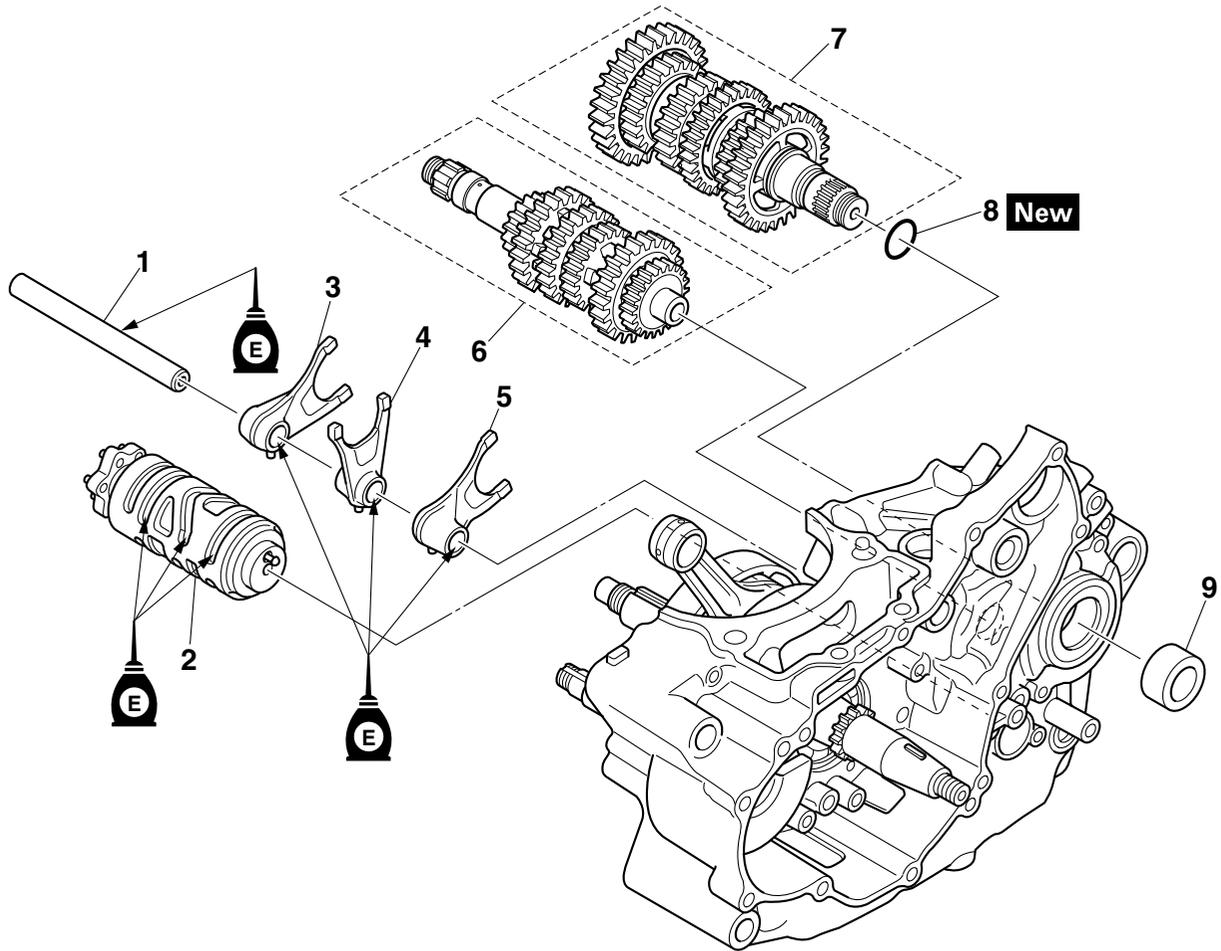
Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer bolt until the crankshaft assembly bottoms against the bearing.



EAS26241

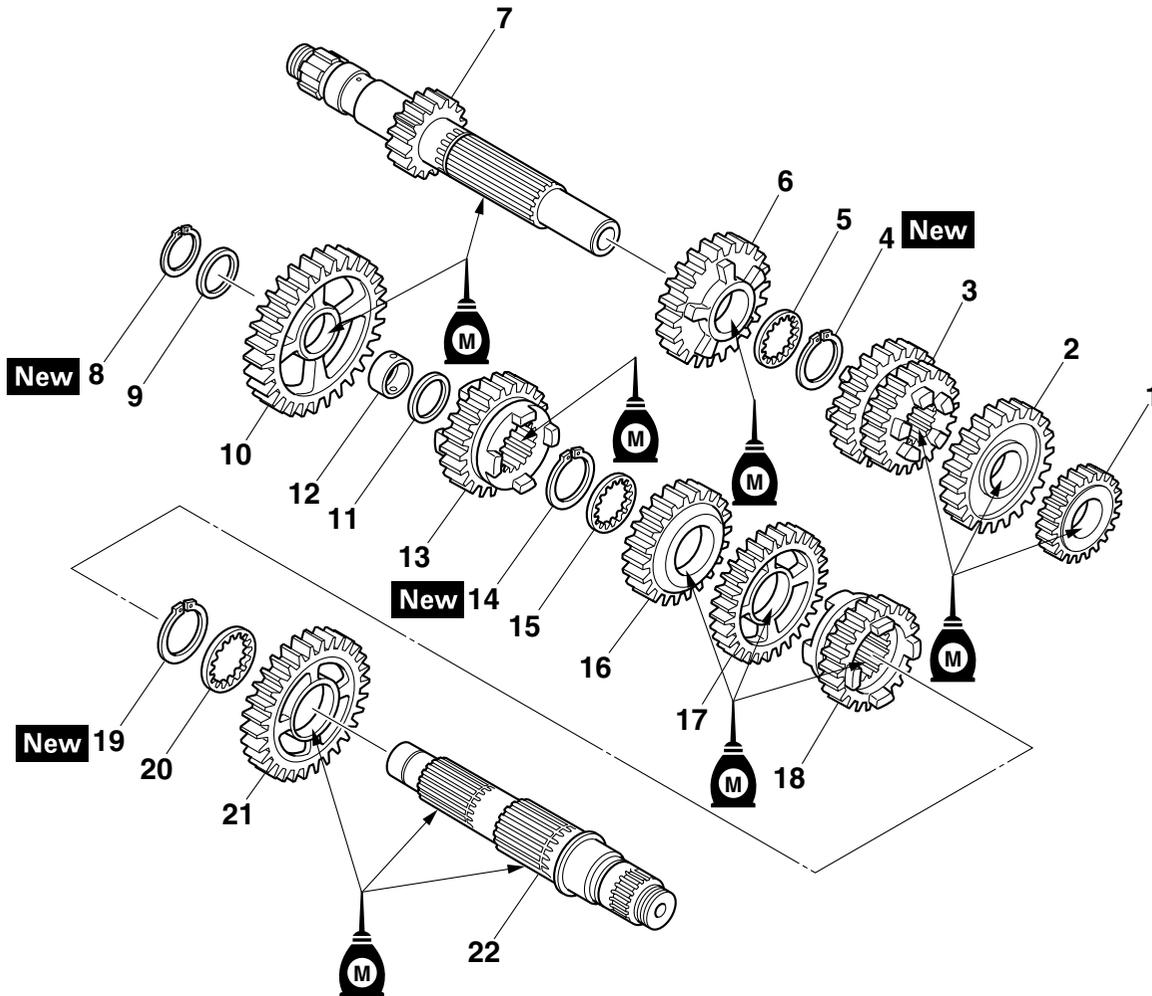
TRANSMISSION

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	Shift drum	1	
3	Shift fork-R	1	
4	Shift fork-C	1	
5	Shift fork-L	1	
6	Main axle assembly	1	
7	Drive axle assembly	1	
8	O-ring	1	
9	Collar	1	
			For installation, reverse the removal procedure.

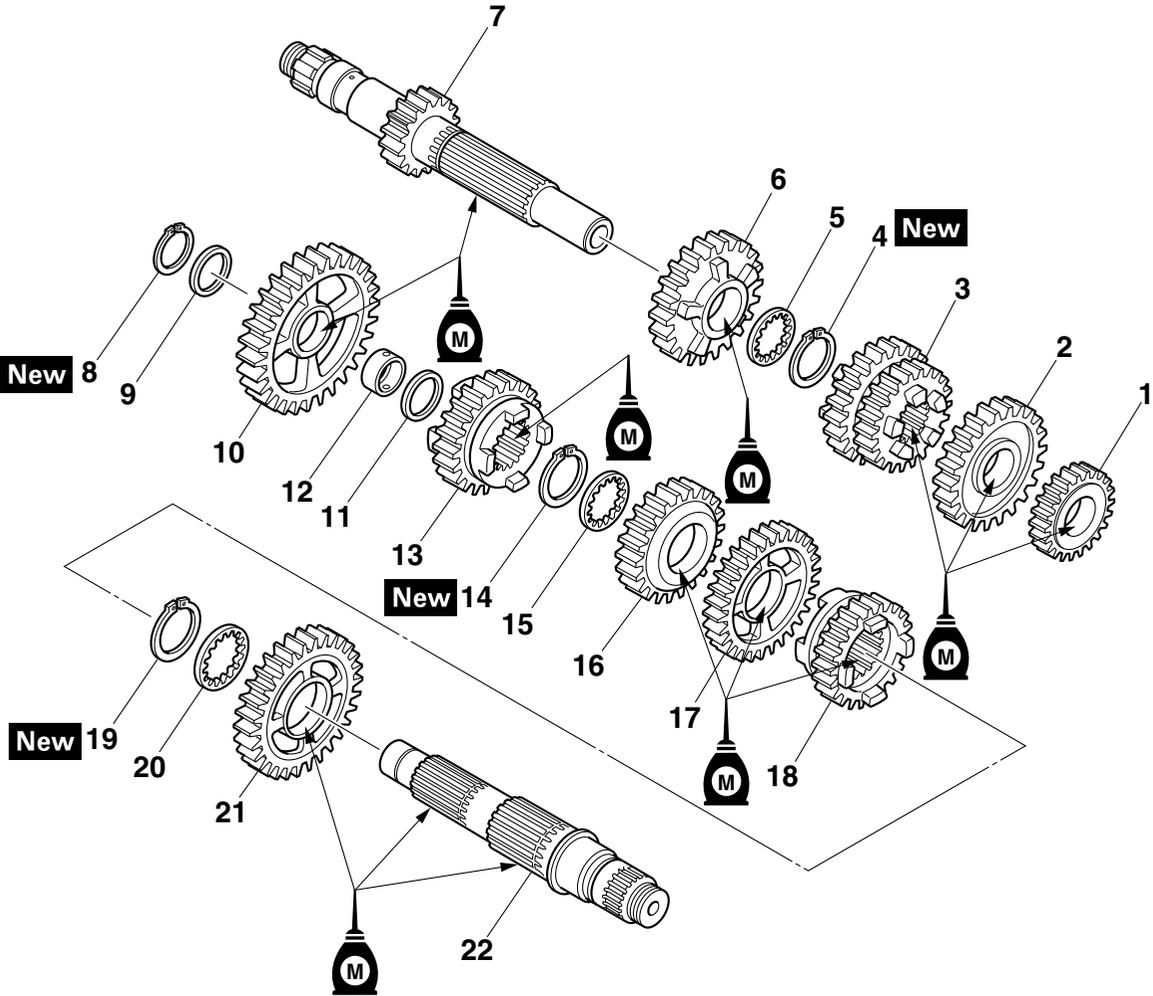
Disassembling the transmission



Order	Job/Parts to remove	Q'ty	Remarks
1	2nd pinion gear	1	
2	6th pinion gear	1	
3	3rd pinion gear	1	
4	Circlip	1	
5	Washer	1	
6	5th pinion gear	1	
7	Main axle	1	
8	Circlip	1	
9	Plain washer	1	
10	1st wheel gear	1	
11	Washer	1	
12	Collar	1	
13	5th wheel gear	1	
14	Circlip	1	
15	Washer	1	
16	4th wheel gear	1	
17	3rd wheel gear	1	
18	6th wheel gear	1	
19	Circlip	1	
20	Washer	1	
21	2nd wheel gear	1	

TRANSMISSION

Disassembling the transmission



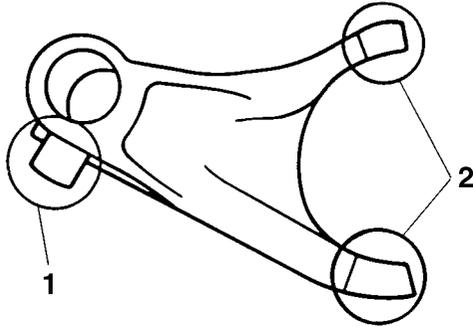
Order	Job/Parts to remove	Q'ty	Remarks
22	Drive axle	1	
			For installation, reverse the removal procedure.

EAS26260

CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

1. Check:
 - Shift fork pawl "2"
Bends/damage/scoring/wear → Replace the shift fork.
 - Shift fork cam follower "1"



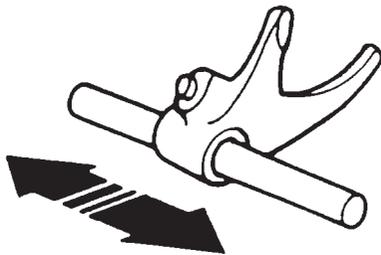
2. Check:
 - Shift fork guide bar
Roll the shift fork guide bar on a flat surface.
Bends → Replace.

EWA12840

WARNING

Do not attempt to straighten a bent shift fork guide bar.

3. Check:
 - Shift fork movement
(along the shift fork guide bar)
Rough movement → Replace the shift forks and shift fork guide bar as a set.

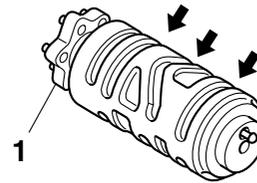


319-011

EAS26270

CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:
 - Shift drum groove
Damage/scratches/wear → Replace the shift drum assembly.
 - Shift drum segment "1"
Damage/wear → Replace the shift drum assembly.
 - Shift drum bearing
Damage/pitting → Replace the shift drum assembly.

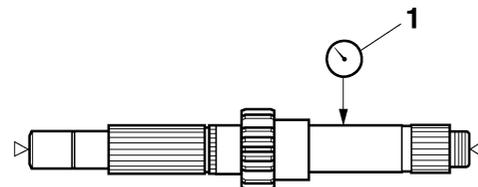


EAS26290

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)
---	---

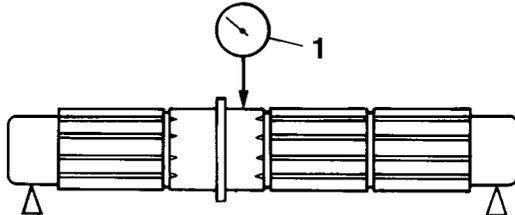


2. Measure:

- 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:

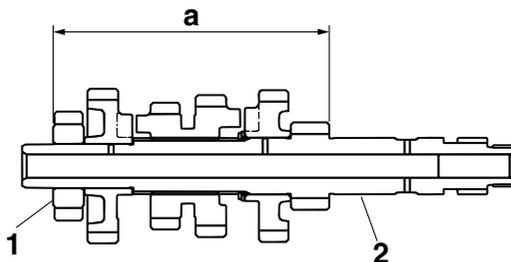
- Transmission gears
Blue discoloration/pitting/wear → Replace the defective gear (s).
- Transmission gear dogs
Cracks/damage/rounded edges → Replace the defective gear (s).

4. Check:

- Transmission gear engagement
(each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.

NOTE:

When reassembling the main axle, press the 2nd pinion gear "1" onto it "2" as shown.



a. 107.4–107.6 mm (4.228–4.236 in)

5. Check:

- Transmission gear movement
Rough movement → Replace the defective part (s).

EAS26320

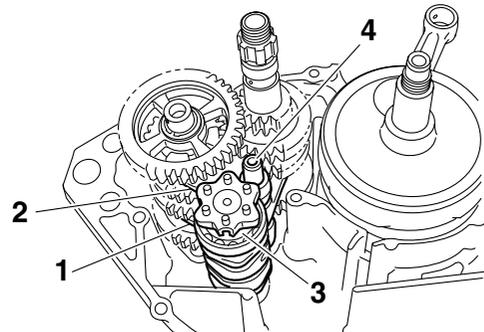
INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

1. Install:

- Shift fork guide bar "1"
- Shift fork-R "2"
- Shift fork-C "3"
- Shift fork-L "4"

NOTE:

The embossed marks on the shift forks should face towards the clutch side of the engine and be in the following sequence: "R", "C", "L".



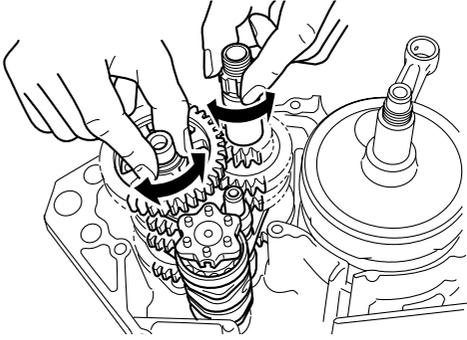
EAS26340

INSTALLING THE TRANSMISSION

1. Install:
 - Transmission
2. Check:
 - TransmissionRough movement → Repair.

NOTE: _____

Oil each gear, shaft, and bearing thoroughly.



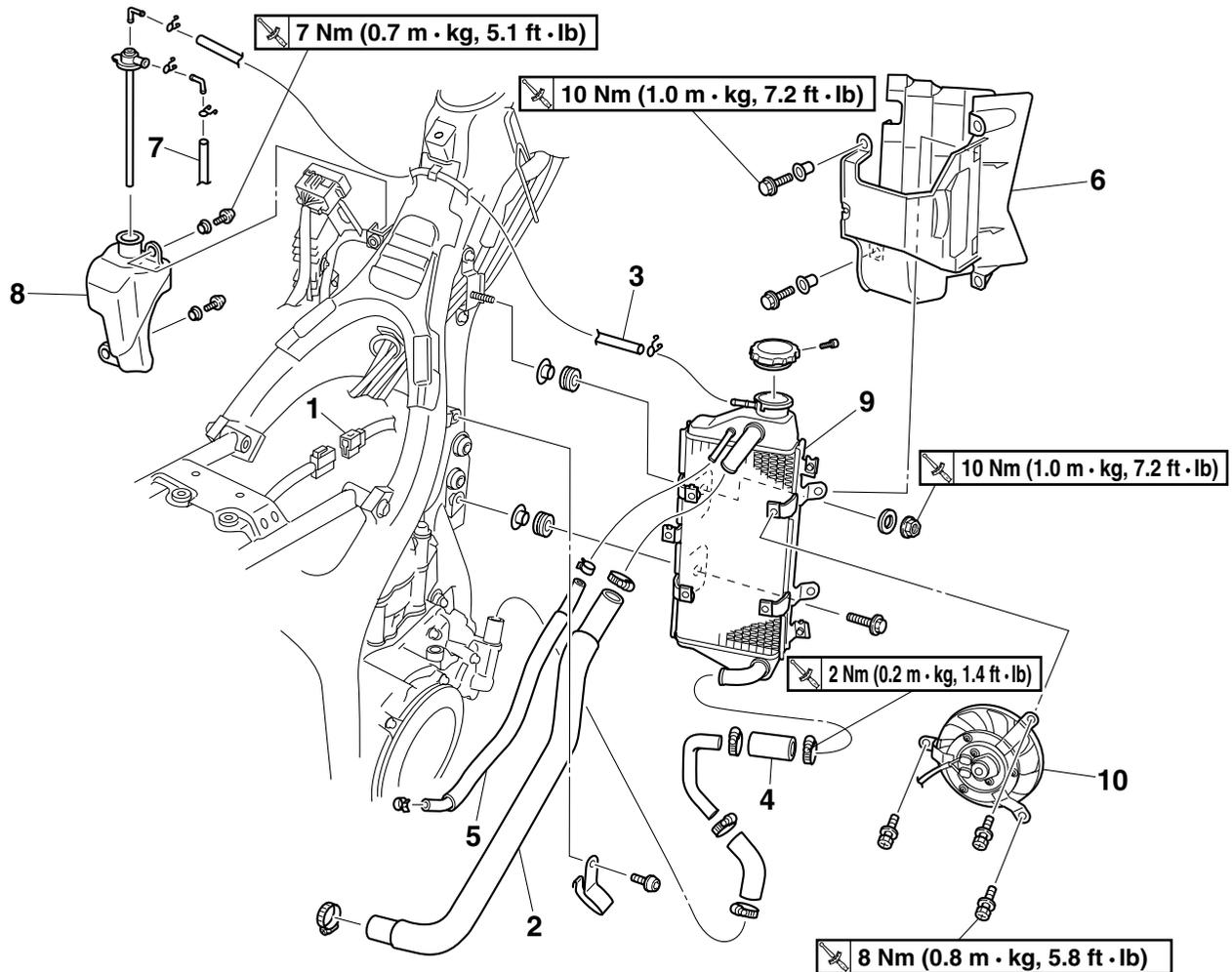
COOLING SYSTEM

RADIATOR	6-1
CHECKING THE RADIATOR.....	6-2
INSTALLING THE RADIATOR.....	6-2
THERMOSTAT	6-4
CHECKING THE THERMOSTAT	6-5
INSTALLING THE THERMOSTAT ASSEMBLY	6-5
WATER PUMP	6-6
CHECKING THE WATER PUMP	6-7
ASSEMBLING THE WATER PUMP	6-7

EAS26380

RADIATOR

Removing the radiator



Order	Job/Parts to remove	Q'ty	Remarks
	Seat/Air scoop (left/right)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
1	Radiator fan motor coupler	1	Disconnect.
2	Radiator inlet hose	1	Disconnect.
3	Coolant reservoir hose	1	Disconnect.
4	Radiator outlet hose	1	Disconnect.
5	FID Hose (radiator side)	1	
6	Radiator cover	1	
7	Breather hose	1	Disconnect.
8	Recovery tank	1	
9	Radiator	1	
10	Radiator fan	1	
			For installation, reverse the removal procedure.

EAS26390

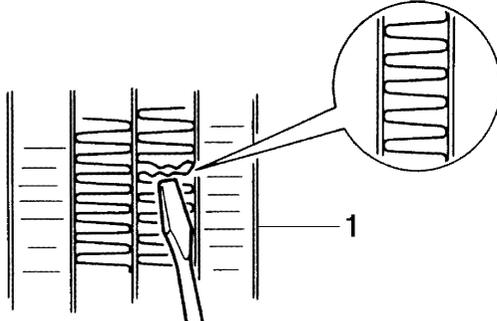
CHECKING THE RADIATOR

1. Check:

- Radiator fins “1”
Obstruction → Clean.
Apply compressed air to the rear of the radiator.
- Damage → Repair or replace.

NOTE:

Straighten any flattened fins with a thin, flat-head screwdriver.



2. Check:

- Radiator hoses (IN/OUT)
- Radiator pipes
Cracks/damage → Replace.

3. Measure:

- Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.

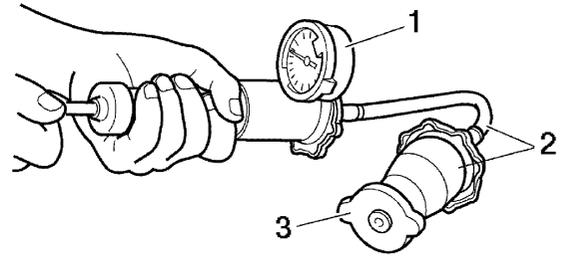


Radiator cap opening pressure
108.0–137.4 kPa (15.7–19.9 psi)
(1.08–1.37 kgf/cm²)

- a. Install the radiator cap tester “1” and radiator cap tester adapter “2” to the radiator cap “3”.



Radiator cap tester
90890-01325
Radiator pressure tester
YU-24460-01
Radiator cap tester adapter
90890-01352
Radiator pressure tester adapter
YU-33984



I4110202

- b. Apply the specified pressure for ten seconds and make sure there is no drop in pressure.

4. Check:

- Radiator fan
Damage → Replace.
Malfunction → Check and repair.
Refer to “COOLING SYSTEM” on page 8-25.

EAS26400

INSTALLING THE RADIATOR

1. Fill:

- Cooling system
(with the specified amount of the recommended coolant)
Refer to “CHANGING THE COOLANT” on page 3-18.

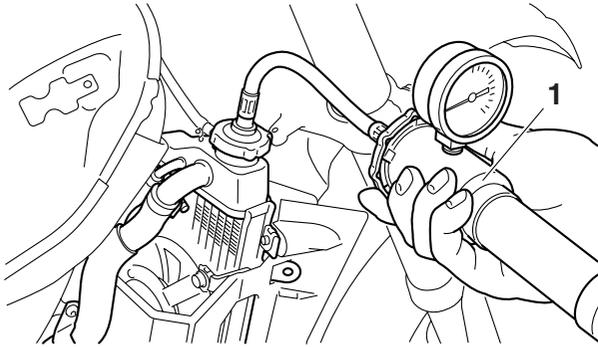
2. Check:

- Cooling system
Leakage → Collect or replace.

- a. Attach the radiator cap tester “1” to the radiator.



Radiator cap tester
90890-01325
Radiator pressure tester
YU-24460-01
Radiator cap tester adapter
90890-01352
Radiator pressure tester adapter
YU-33984



- b. Apply the 100 kPa (14.22 psi) (1.0 kg/cm²) pressure.
- c. Measure the indicated pressure with the gauge.

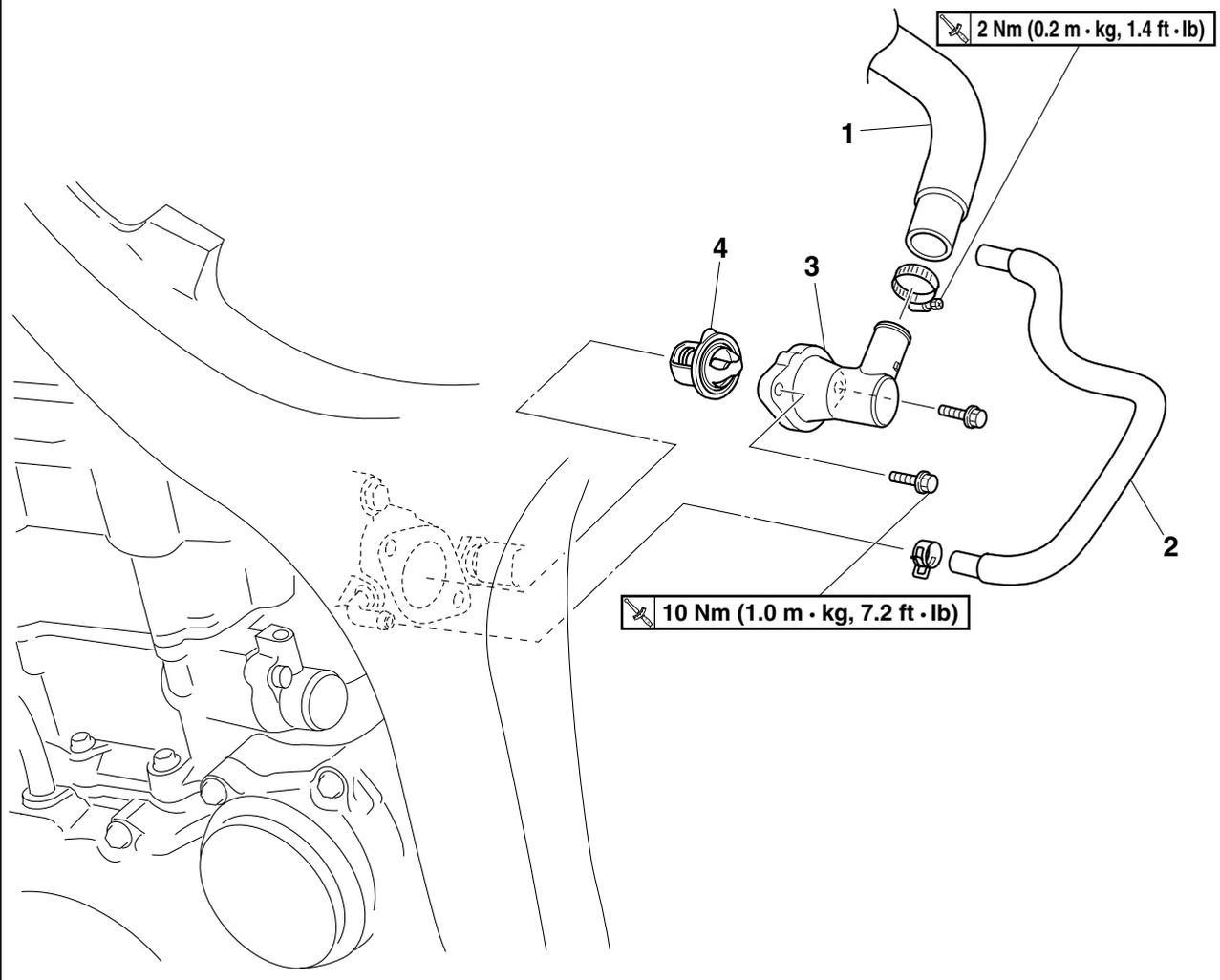


3. Measure:
 - Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to “CHECKING THE RADIATOR” on page 6-2.

EAS26440

THERMOSTAT

Removing the thermostat



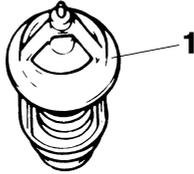
Order	Job/Parts to remove	Q'ty	Remarks
	Seat/Air panel (left/right)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Drains the coolant.		Refer to "CHANGING THE COOLANT" on page 3-18.
1	Radiator inlet hose	1	Disconnect.
2	FID hose (thermostat side)	1	Disconnect.
3	Thermostat cover	1	
4	Thermostat	1	
			For installation, reverse the removal procedure.

EAS26450

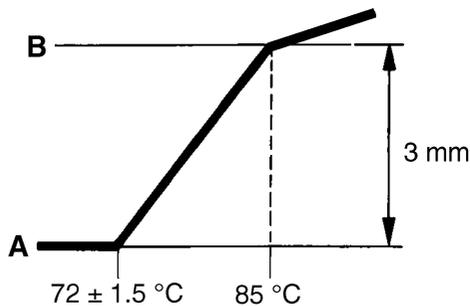
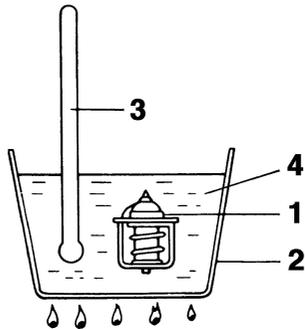
CHECKING THE THERMOSTAT

1. Check:

- Thermostat "1"
Does not open at 70.5–73.5°C
(158.9–164.3°F) → Replace.



- Suspend the thermostat "1" in a container "2" filled with water.
- Slowly heat the water.
- Place a thermometer "3" in the water "4".
- While stirring the water, observe the thermostat and thermometer's indicated temperature.



323-002

A. Fully closed

NOTE:

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.



2. Check:

- Thermostat housing cover
Cracks/damage → Replace.

EAS26480

INSTALLING THE THERMOSTAT ASSEMBLY

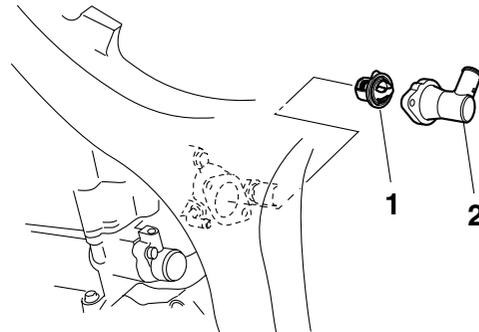
1. Install:

- Thermostat "1"
- Thermostat cover "2"

NOTE:

Install the thermostat by facing breather hole upward.

	Thermostat cover bolt 10 Nm (1.0 m•kg, 7.2 ft•lb)
---	--



2. Fill:

- Cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT" on page 3-18.

3. Check:

- Cooling system
Leaks → Repair or replace any faulty part.

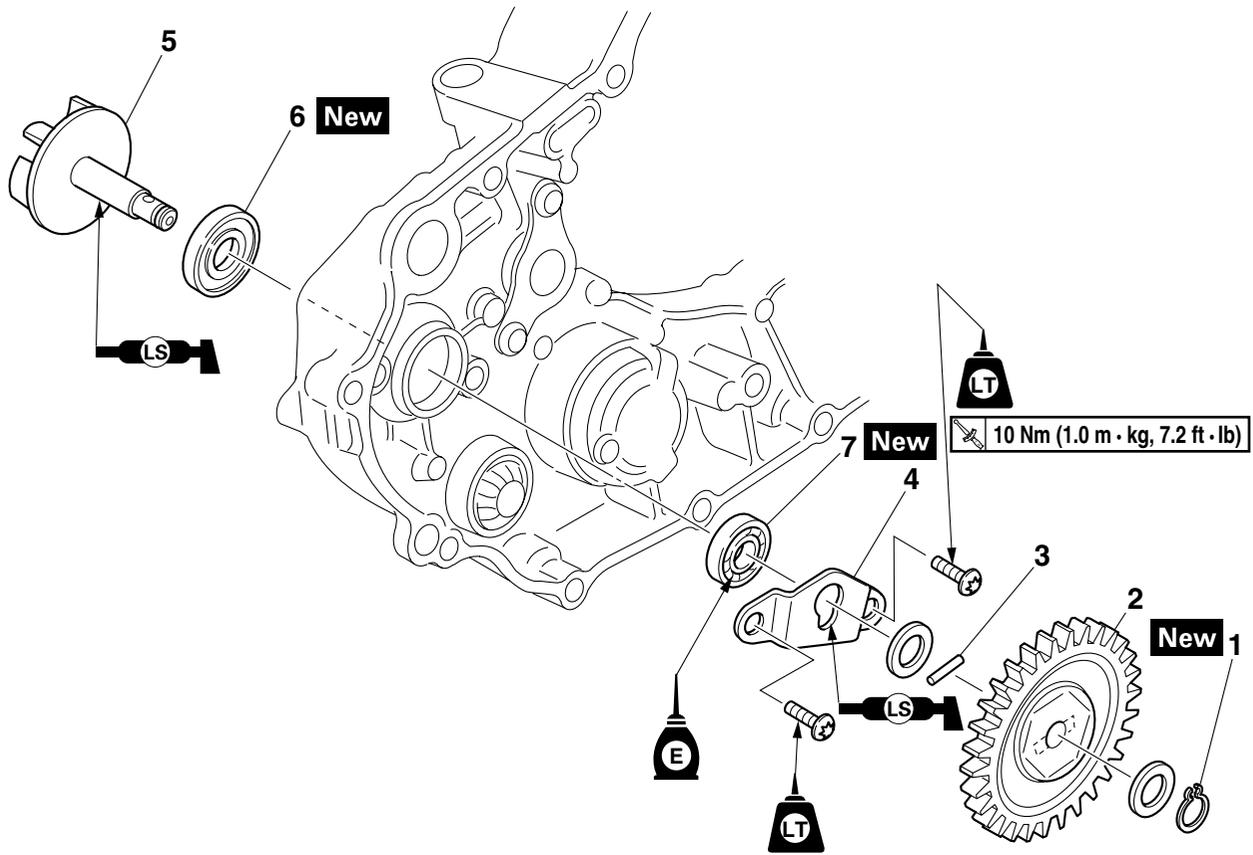
4. Measure:

- Radiator cap opening pressure
Below the specified pressure → Replace the radiator cap.
Refer to "CHECKING THE RADIATOR" on page 6-2.

EAS26500

WATER PUMP

Removing the water pump

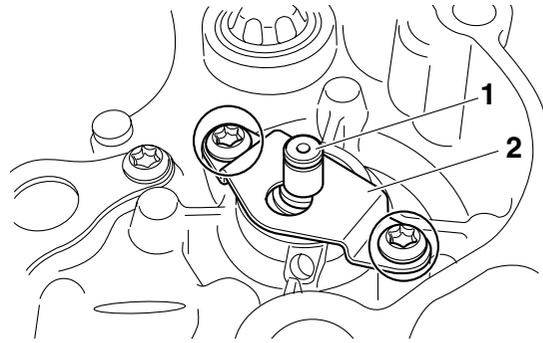


Order	Job/Parts to remove	Q'ty	Remarks
	Drains the coolant.		Refer to "CHANGING THE COOLANT" on page 3-18.
	Drains the engine oil		Refer to "CHANGING THE ENGINE OIL" on page 3-11.
	Water pump housing cover		Refer to "CLUTCH" on page 5-34.
	Crank case cover light		Refer to "CLUTCH" on page 5-34.
1	Circlips	1	
2	Impeller shaft gear	1	
3	Dowelpin	1	
4	Plate	1	
5	Impeller shaft	1	
6	Mechanical seal	1	
7	Bearing	1	
			For installation, reverse the removal procedure.

EAS26530

CHECKING THE WATER PUMP

1. Check:
 - Water pump housing cover
 - Impeller shaft
 - Plate
Cracks/damage/wear → Replace.
2. Check:
 - Impeller shaft gear
Cracks/damage/chips → Replace.



EAS26560

ASSEMBLING THE WATER PUMP

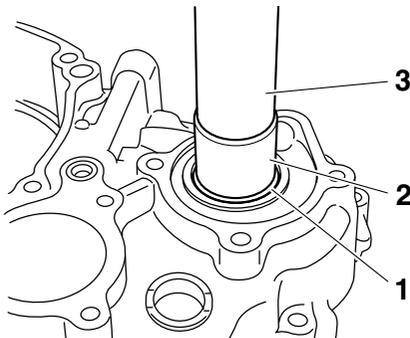
1. Install:
 - Bearing **New**
 - Mechanical “1” **New**
(to the right crankcase cover)

NOTE:

- Install the mechanical seal by facing stamp world “WATER SIDE” to the impeller housing cover.
- Install the mechanical seal by using mechanical seal installer “2” and middle driven shaft bearing driver “3”.



Mechanical seal installer
90890-04145
Middle driven shaft bearing driver
90890-04058



2. Lubricate:
 - Mechanical seal lip
 - Impeller shaft
3. Install:
 - Impeller shaft “1”
 - Plate “2”

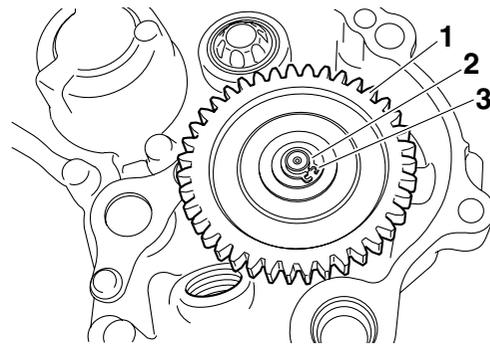
NOTE:

Tighten the plate bolt with applying the LOCTITE®.



Plate bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

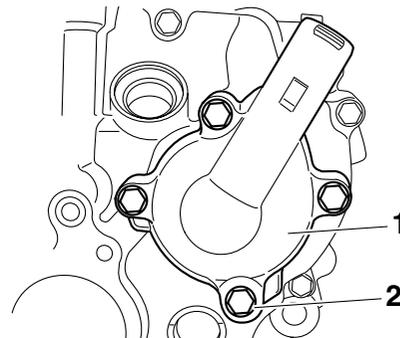
4. Lubricate:
 - Engine oil
(to the bearing)
5. Install:
 - Plate washer
 - Dowel pin
 - Impeller shaft gear “1”
 - Plate washer “2”
 - Circlip “3” **New**



6. Install:
 - Crankcase cover right gasket **New**
 - Crankcase cover (right)
Refer to “CLUTCH” on page 5-34.
7. Install:
 - Water pump housing cover gasket **New**
 - Water pump housing cover “1”
(Bolt “2” with new copper washer)



Water pump housing cover bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)



8. Fill:

- Crankcase
Refer to “CHANGING THE ENGINE OIL” on page 3-11.
9. Fill:
- Cooling system
Refer to “CHANGING THE COOLANT” on page 3-18.

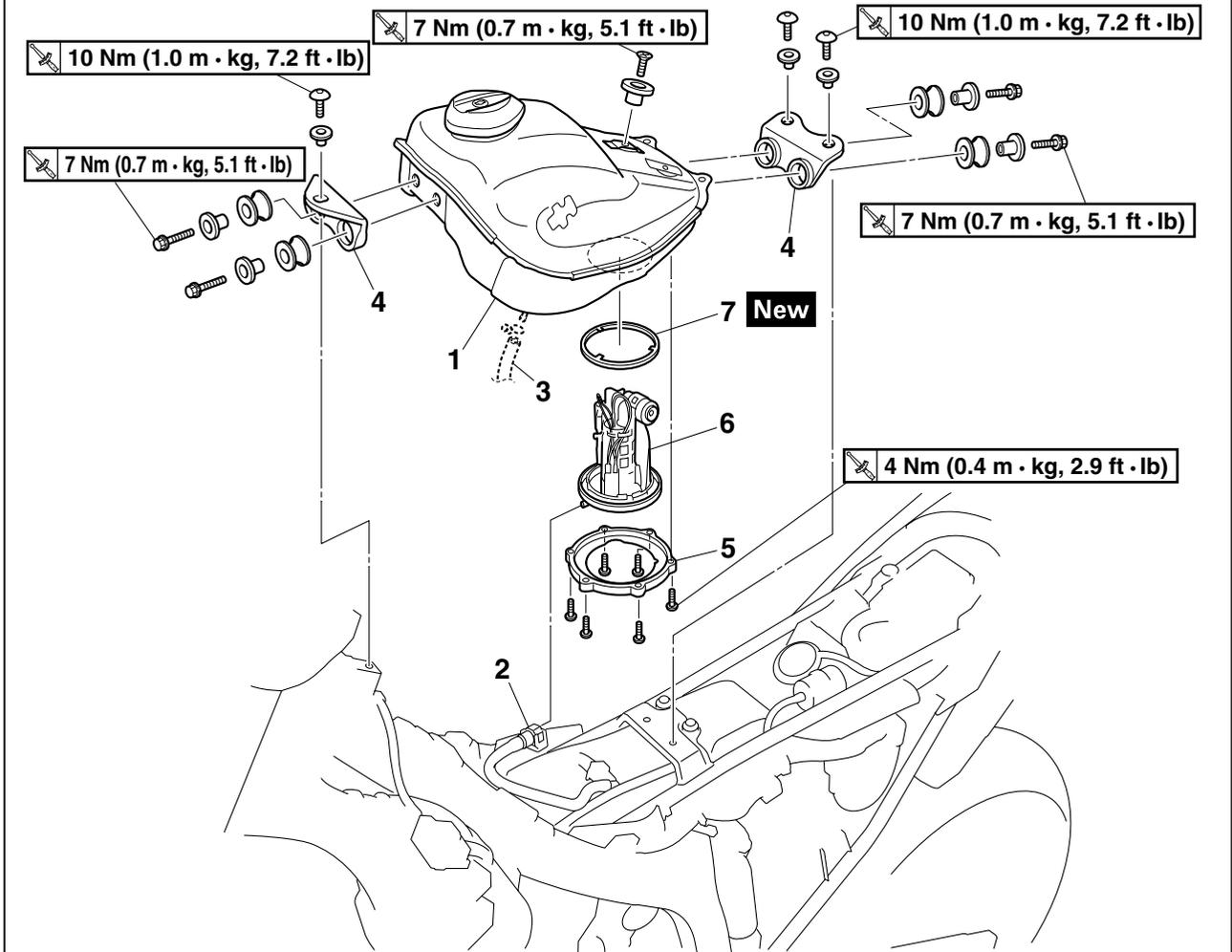
FUEL SYSTEM

FUEL TANK	7-1
REMOVING THE FUEL TANK.....	7-2
REMOVING THE FUEL PUMP	7-2
INSTALLING THE FUEL PUMP.....	7-2
INSTALLING THE FUEL TANK	7-2
THROTTLE BODIES.....	7-4
CHECKING THE INJECTORS.....	7-6
CHECKING THE THROTTLE BODIES.....	7-6
CHECKING THE PRESSURE REGULATOR	7-6
CHECKING THE PRESSURE REGULATOR OPERATION.....	7-6
ADJUSTING THE THROTTLE POSITION SENSOR	7-7
AIR INDUCTION SYSTEM.....	7-9
CHECKING THE AIR INDUCTION SYSTEM	7-12
CANISTER (FOR CALIFORNIA).....	7-13

EAS26620

FUEL TANK

Removing the fuel tank



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover (left/right)		
	Air scoop (left/right)		
1	Fuel tank	1	
2	Fuel hose coupler	1	Disconnect.
3	Hose (fuel tank-roll over valve)	1	Disconnect (for California)
4	Fuel tank bracket (front/rear)	1/1	
5	Fuel pump bracket	1	
6	Fuel pump assembly	1	
7	O-ring	1	
			For installation, reverse the removal procedure.

EAS26630

REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
 - Fuel hose coupler

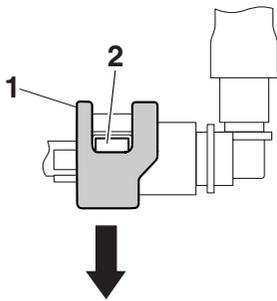
ECA14700

CAUTION:

Although the fuel has been removed from the fuel tank be careful when removing the fuel hoses, since there may be fuel remaining in it.

NOTE:

- Slide the fuel hose connector cover “1” in the direction of the arrow mark, and press the buttons “2” on both sides of the connector to remove the fuel hose.
- Disconnecting the hose is done by hand. There is no need to use tools.
- Before removing the fuel hose, place a few rags in the area under where it will be removed.



3. Remove:
 - Fuel tank

NOTE:

Do not set the fuel tank down so that the installation surface of the fuel pump is directly under the tank. Be sure to lean the fuel tank in an upright position.

EAS26640

REMOVING THE FUEL PUMP

1. Remove:
 - Fuel pump

ECA14720

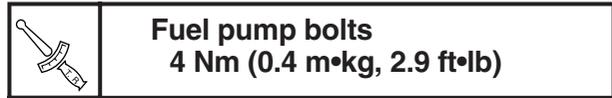
CAUTION:

- Do not drop the fuel pump or give it a strong shock.
- Do not touch the base section of the fuel sender.

EAS26700

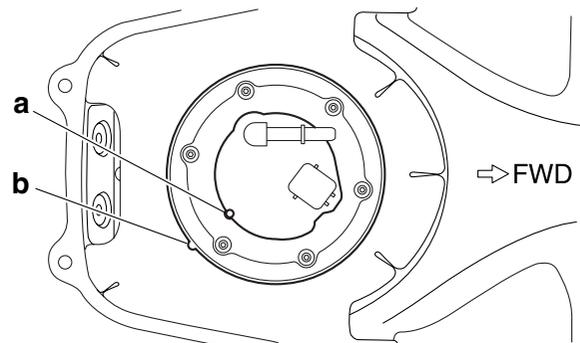
INSTALLING THE FUEL PUMP

1. Install:
 - Fuel pump



NOTE:

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump.
- Always use a new fuel pump gasket.
- Install the fuel pump as shown in the illustration.
- Align the projection “a” on the fuel pump with the slot in the fuel pump bracket.
- Align the slot “b” on the fuel tank damper with the projection “a” on the fuel pump.
- Tighten the fuel pump bolts in stages in a criss-cross pattern.



EAS32D1016

INSTALLING THE FUEL TANK

1. Install:
 - Fuel hose
 - Fuel return hose

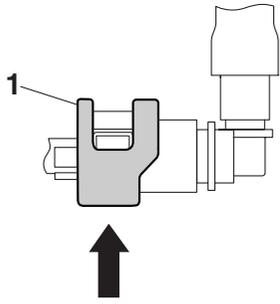
ECA14740

CAUTION:

When installing the fuel hose, make sure that it is securely connected, and that the fuel hose holders are in the correct position, otherwise the fuel hose will not be properly installed.

NOTE:

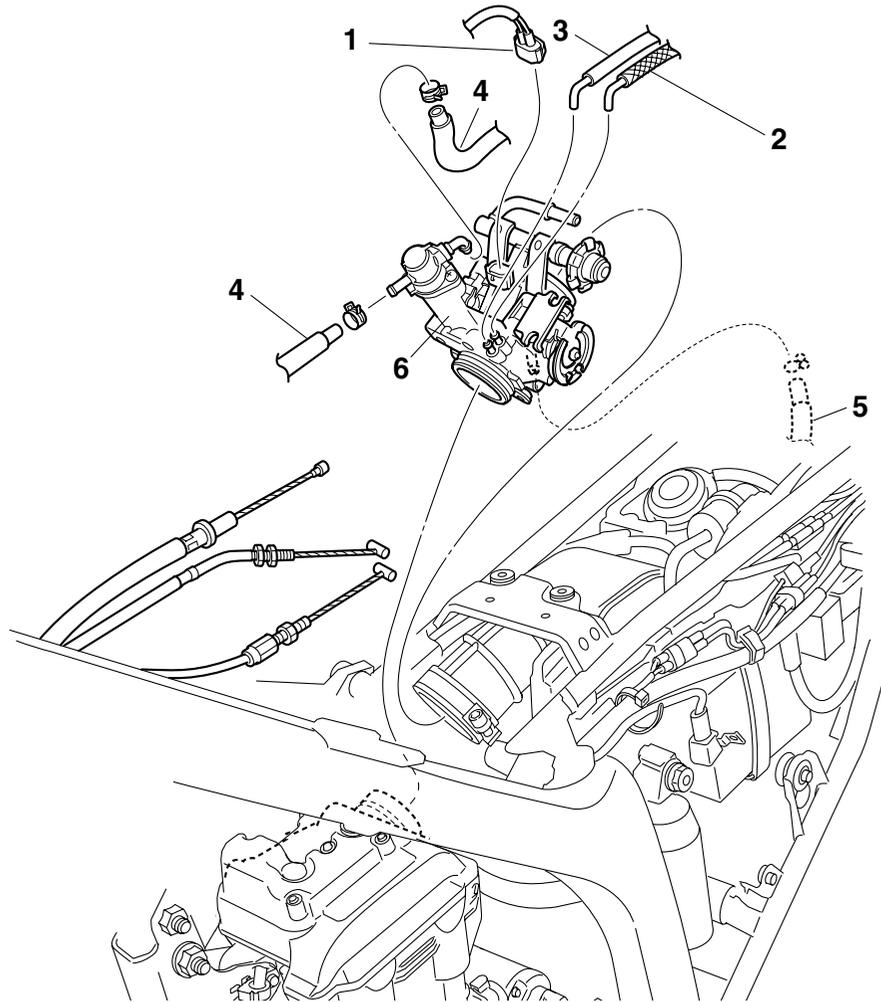
- Insert the fuel hose on the fuel pipe until you hear a definite “click”.
- Slide the fuel hose connector cover “1” at the fuel hose end in the direction of the arrow.



EAS26970

THROTTLE BODIES

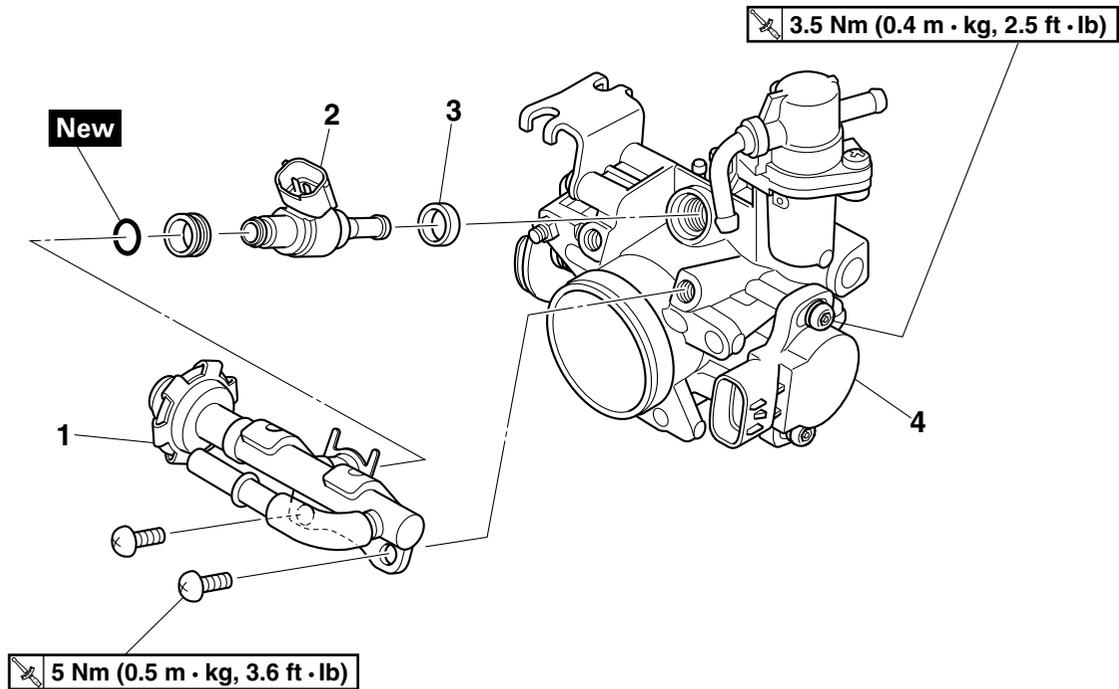
Removing the throttle bodies



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover (left/right)		
	Air scoop (left/right)		
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
	Throttle cable		Refer to "CAMSHAFT" on page 5-6.
	Clutch cable		
	Coolant		Drain. Refer to "CHANGING THE COOLANT" on page 3-18.
	Ignition coil lead		Refer to "CAMSHAFT" on page 5-6.
1	Injector coupler	1	Disconnect.
2	Vacuum hose	1	
3	ITS boost hose	1	
4	FID hose (Thermostat side/radiator side)	2	
5	Hose (canister-throttle body)	1	(for California)
6	Throttle bodies assembly	1	
			For installation, reverse the removal procedure.

THROTTLE BODIES

Disassembling the throttle body



Order	Job/Parts to remove	Q'ty	Remarks
1	Delivery pipe	1	
2	Injector	1	
3	Gasket	1	
4	Throttle position sensor	1	
			For installation, reverse the removal procedure.

THROTTLE BODIES

EAS26980

CHECKING THE INJECTORS

EWA32D1009



WARNING

Replace the fuel injector with a new one if you have dropped or impacted it.

1. Check:
 - Injectors
Damage → Replace.

EAS26990

CHECKING THE THROTTLE BODIES

1. Check:
 - Throttle bodies
Cracks/damage → Replace the throttle bodies as a set.
2. Check:
 - Fuel passages
Obstructions → Clean.

- a. Wash the throttle bodies in a petroleum-based solvent.
Do not use any caustic carburetor cleaning solution.
- b. Blow out all of the passages with compressed air.

EAS27000

CHECKING THE PRESSURE REGULATOR

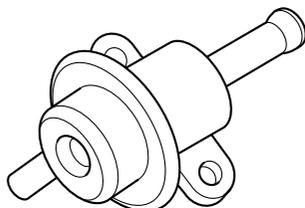
EWA32D1010



WARNING

Replace the pressure regulator with a new one if you have dropped or impacted it.

1. Check:
 - Pressure regulator
Damage → Replace.



EAS27010

CHECKING THE PRESSURE REGULATOR OPERATION

1. Check:
 - Pressure regulator operation

- a. Remove the fuel tank.
Refer to "FUEL TANK" on page 7-1.
- b. Connect the pressure gauge "1" and adapter "2" to the fuel injection pipe.



Vacuum/pressure pump gauge set

90890-06756

Mityvac brake bleeding tool

YS-42423

Pressure gauge

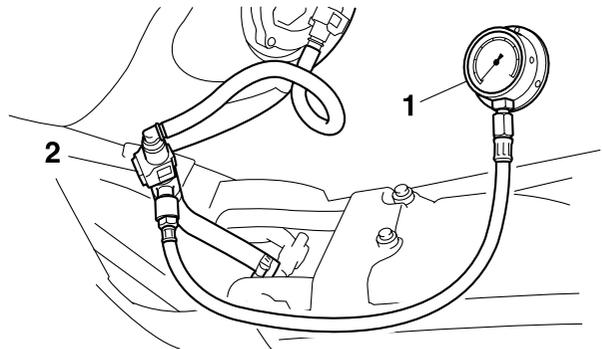
90890-03153

YU-03153

Fuel pressure adapter

90890-03176

YM-03176



- c. Install the fuel tank.
Refer to "FUEL TANK" on page 7-1.
- d. Start the engine.
- e. Measure the fuel pressure.



Fuel pressure

250 kPa (35.6 psi) (2.50 kg/cm²)

- f. Use the vacuum/pressure pump gauge set to adjust the fuel pressure in relation to the vacuum pressure as described below.

NOTE:

The vacuum pressure should not exceed 100 kPa (14.2 psi) (1.00 kg/cm²).

**Increase the vacuum pressure →
Fuel pressure is decreased
Decrease the vacuum pressure →
Fuel pressure is increased**

Faulty → Replace the pressure regulator.

EAS27030

ADJUSTING THE THROTTLE POSITION SENSOR

EWA32D1011



Replace the throttle position sensor with a new one if you have dropped or impacted it.

NOTE:

Before adjusting the throttle position sensor, the engine idling speed should be properly adjusted.

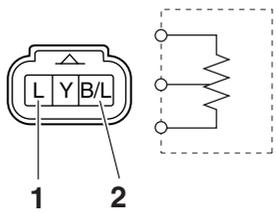
1. Check:
 - Throttle position sensor
Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 8-79.
2. Adjust:
 - Throttle position sensor angle

- a. Connect the throttle position sensor coupler to the wire harness.
- b. Connect the digital circuit tester to the throttle position sensor.

Positive tester probe
Blue “1”
Negative tester probe
Black/Blue “2”



Digital circuit tester
90890-03174
Model 88 Multimeter with tachometer
YU-A1927



- c. Measure the throttle position sensor voltage.
- d. Adjust the throttle position sensor angle so that the voltage is within the specified range.



Throttle position sensor
Output voltage (when the engine is idling)
0.63–0.73 V

- e. After adjusting the throttle position sensor an-

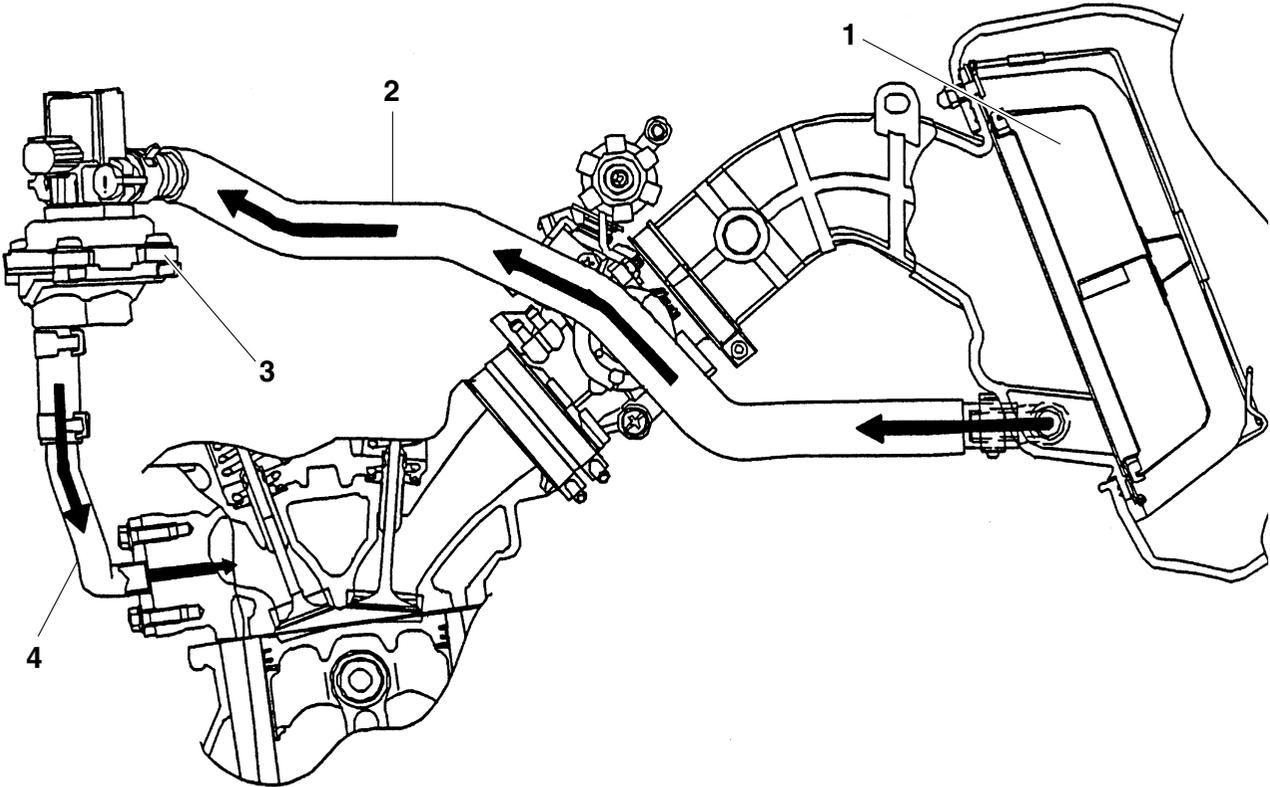
gle, tighten the throttle position sensor screws.



AIR INDUCTION SYSTEM

EAS27040

AIR INDUCTION SYSTEM

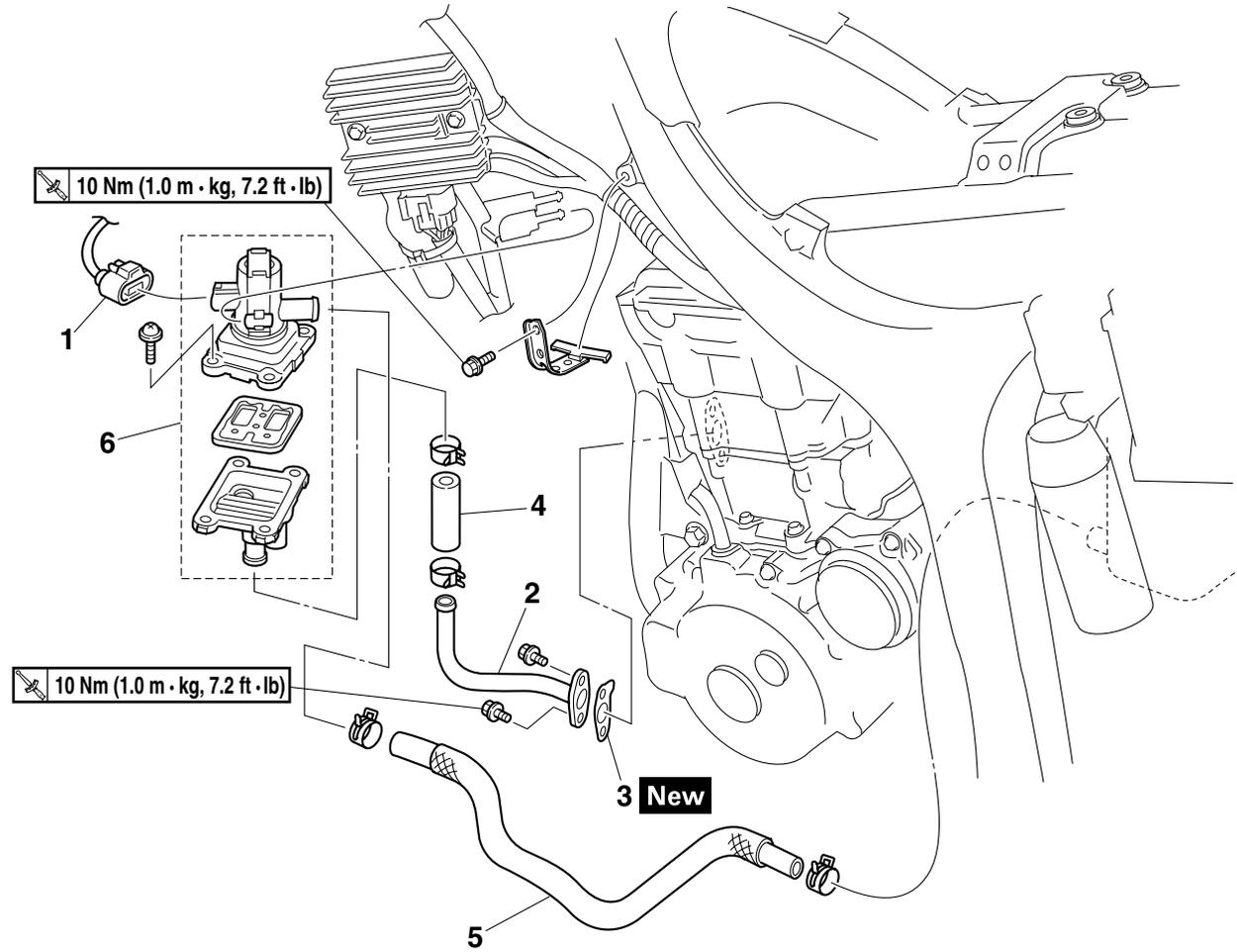


AIR INDUCTION SYSTEM

1. Air filter case
2. Air induction system hose
3. Air cut-off valve
4. Air induction system pipe

AIR INDUCTION SYSTEM

Removing the air cut-off valve assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover (left/right)		
	Air scoop (left/right)		
	Fuel tank		Refer to "FUEL TANK" on page 7-1.
1	Air induction coupler	1	Disconnect.
2	Air induction system pipe	1	
3	Gasket	1	
4	Pipe3	1	
5	Air induction system hose	1	
6	Air cut-off valve assembly	1	
			For installation, reverse the removal procedure.

EAS27060

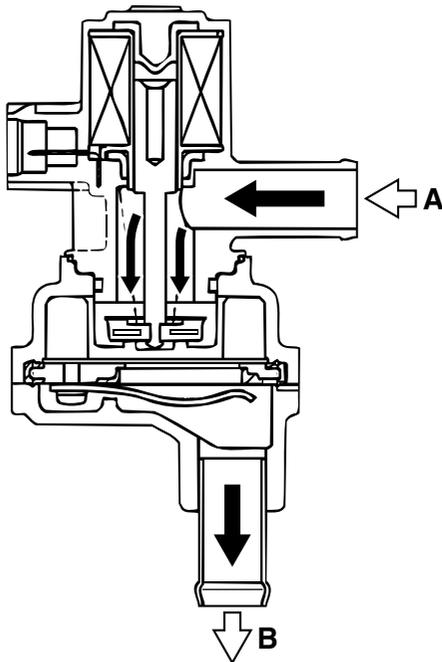
CHECKING THE AIR INDUCTION SYSTEM

Air induction

The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of hydrocarbons. When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700°C.

Air cut-off valve

The air cut-off valve is controlled by the signals from the ECU in accordance with the combustion conditions. Ordinarily, the air cut-off valve opens to allow the air to flow during idle and closes to cut-off the flow when the vehicle is being driven.



A. From the air filter
B. To the cylinder head

1. Check:

- Hoses
Loose connections → Connect properly.
Cracks/damage → Replace.
- Pipes
Cracks/damage → Replace.

2. Check:

- Reed valve
- Reed valve stopper
- Reed valve seat
Cracks/damage → Replace the reed valve.

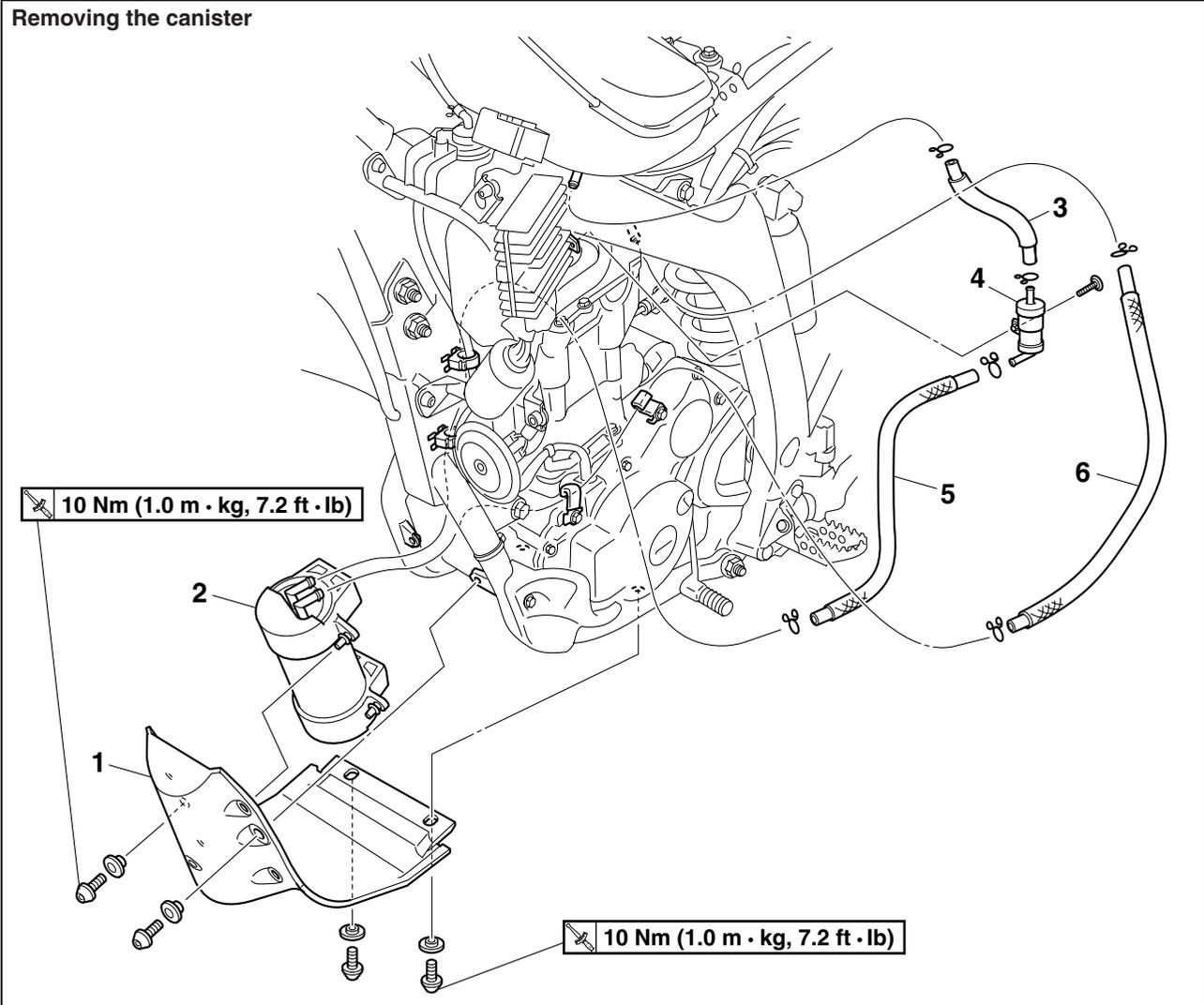
3. Check:

- Air cut-off valve
Cracks/damage → Replace.

EAS32D12011

CANISTER (FOR CALIFORNIA)

Removing the canister



Order	Job/Parts to remove	Q'ty	Remarks
1	Canister cover	1	
2	Canister	1	
3	Hose (fuel tank–roll over valve)	1	
4	Roll over valve	1	
5	Hose (roll over valve–canister)	1	
6	Hose (canister–throttle body)	1	
			For installation, reverse the removal procedure.

ELECTRICAL SYSTEM

IGNITION SYSTEM	8-1
CIRCUIT DIAGRAM	8-1
TROUBLESHOOTING	8-3
ELECTRIC STARTING SYSTEM	8-5
CIRCUIT DIAGRAM	8-5
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION.....	8-7
TROUBLESHOOTING	8-9
CHARGING SYSTEM	8-11
CIRCUIT DIAGRAM	8-11
TROUBLESHOOTING	8-13
LIGHTING SYSTEM	8-15
CIRCUIT DIAGRAM	8-15
TROUBLESHOOTING	8-17
SIGNALING SYSTEM	8-19
CIRCUIT DIAGRAM	8-19
TROUBLESHOOTING	8-21
COOLING SYSTEM	8-25
CIRCUIT DIAGRAM	8-25
TROUBLESHOOTING	8-27
FUEL INJECTION SYSTEM	8-29
CIRCUIT DIAGRAM	8-29
ECU SELF-DIAGNOSTIC FUNCTION.....	8-31
FAIL-SAFE ACTIONS (SUBSTITUTE CHARACTERISTICS OPERATION CONTROL)	8-32
TROUBLESHOOTING METHOD.....	8-34
DIAGNOSTIC MODE	8-34
TROUBLESHOOTING DETAILS	8-41
FUEL PUMP SYSTEM	8-55
CIRCUIT DIAGRAM	8-55
TROUBLE SHOOTING	8-57
ELECTRICAL COMPONENTS	8-59
CHECKING THE SWITCHES	8-63
CHECKING THE BULBS AND BULB SOCKETS	8-66
CHECKING THE FUSES	8-67
CHECKING AND CHARGING THE BATTERY.....	8-68
CHECKING THE RELAYS	8-71
CHECKING THE DIODE.....	8-73
CHECKING THE IGNITION SPARK GAP	8-74
CHECKING THE IGNITION COIL.....	8-74

CHECKING THE CRANKSHAFT POSITION SENSOR	8-75
CHECKING THE LEAN ANGLE SENSOR	8-75
CHECKING THE STATOR COIL	8-76
CHECKING THE RECTIFIER/REGULATOR.....	8-76
CHECKING THE HORN.....	8-77
CHECKING THE SPEED SENSOR.....	8-77
CHECKING THE FUEL SENDER (FUEL PUMP)	8-78
CHECKING THE COOLANT TEMPERATURE SENSOR	8-78
CHECKING THE RADIATOR FAN MOTOR.....	8-79
CHECKING THE THROTTLE POSITION SENSOR.....	8-79
CHECKING THE EXUP SERVO MOTOR	8-80
CHECKING THE INTAKE AIR PRESSURE SENSOR	8-80
CHECKING THE INTAKE AIR TEMPERATURE SENSOR.....	8-80
CHECKING THE INTAKE SOLENOID.....	8-81

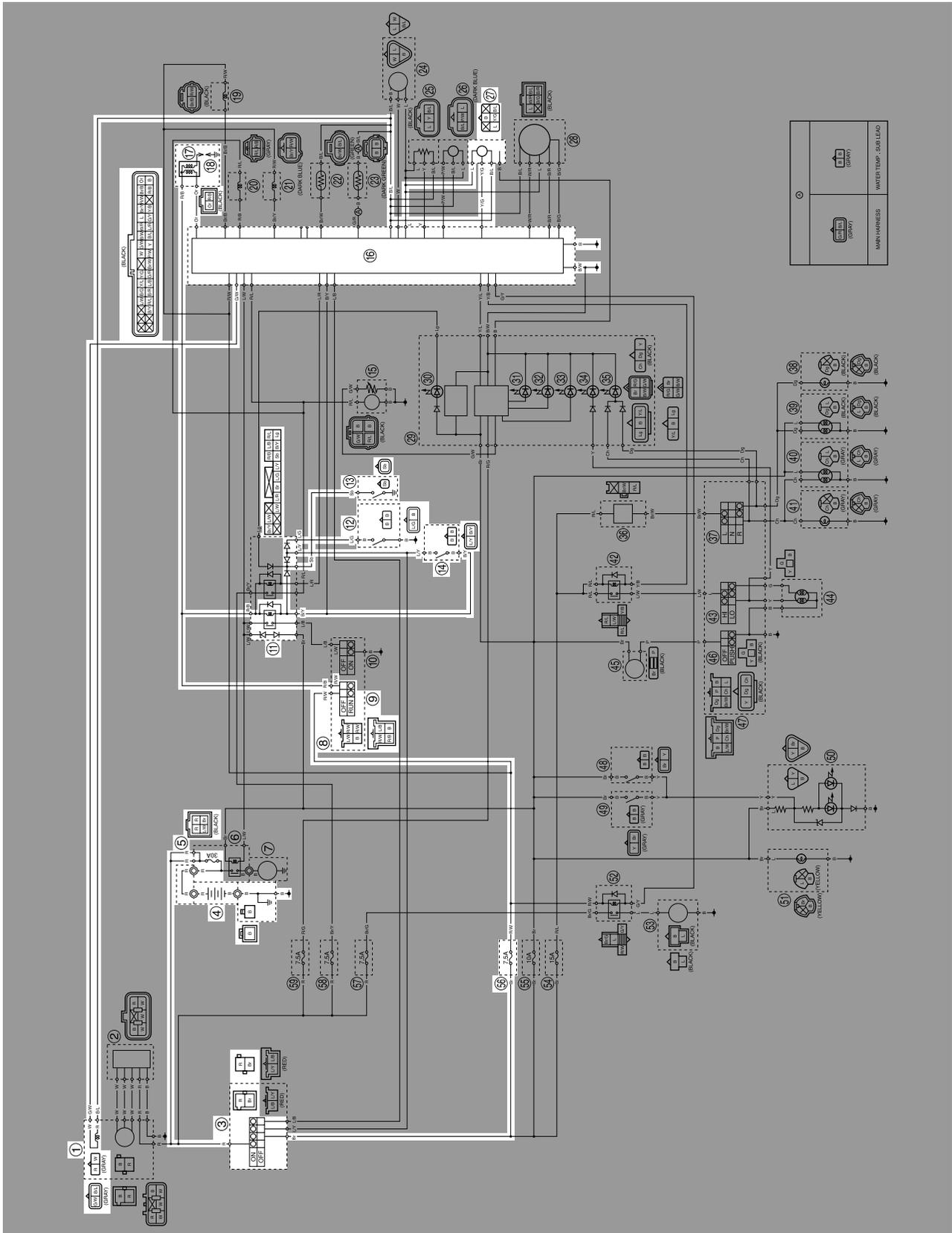


EAS27090

IGNITION SYSTEM

EAS27100

CIRCUIT DIAGRAM



1. AC magneto
3. Main switch
4. Battery
5. Main fuse
8. Right handlebar switch
9. Engine stop switch
11. Relay unit
12. Sidestand switch
13. Neutral switch
14. Clutch switch
16. ECU
17. Ignition coil
18. Spark plug
27. Lean angle sensor
56. Ignition fuse

EAS27130

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

NOTE:

Before troubleshooting, remove the following part (s):

1. Seat
2. Side cover (left)
3. Air scoop (left/right)
4. Fuel tank

<p>1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 8-67.</p>	NG→	<p>Replace the fuse (s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-68.</p>	NG→	<ul style="list-style-type: none"> ●Clean the battery terminals. ●Recharge or replace the battery.
OK↓		
<p>3. Check the spark plug. Refer to "CHECKING THE SPARK PLUG" on page 3-8.</p>	NG→	<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 8-74.</p>	OK→	<p>The ignition system is normal.</p>
NG↓		
<p>5. Check the ignition coil. Refer to "CHECKING THE IGNITION COIL" on page 8-74.</p>	NG→	<p>Replace the ignition coil.</p>
OK↓		
<p>6. Check the crankshaft position sensor. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 8-75.</p>	NG→	<p>Replace the stater assembly.</p>
OK↓		
<p>7. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace the main switch.</p>
OK↓		
<p>8. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace the right handlebar switch.</p>
OK↓		
<p>9. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace the neutral switch.</p>
OK↓		

IGNITION SYSTEM

10. Check the sidestand switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the sidestand switch.

OK↓

11. Check the clutch switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the clutch switch.

OK↓

12. Check the relay unit.
Refer to "CHECKING THE RELAYS" on page 8-71.

NG→

Replace the relay unit.

OK↓

13. Check the diode.
Refer to "CHECKING THE DIODE" on page 8-73.

NG→

Replace the relay unit.

OK↓

14. Check the lean angle sensor.
Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-75.

NG→

Replace the lean angle sensor.

OK↓

15. Check the entire ignition system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-1.

NG→

Properly connect or repair the ignition system's wiring.

OK↓

Replace the ECU.

ELECTRIC STARTING SYSTEM

3. Main switch
4. Battery
5. Main fuse
6. Starter relay
7. Starter motor
8. Right handlebar switch
9. Engine stop switch
10. Start switch
11. Relay unit
12. Sidestand switch
13. Neutral switch
14. Clutch switch
55. Signaling system fuse
56. Ignition fuse

ELECTRIC STARTING SYSTEM

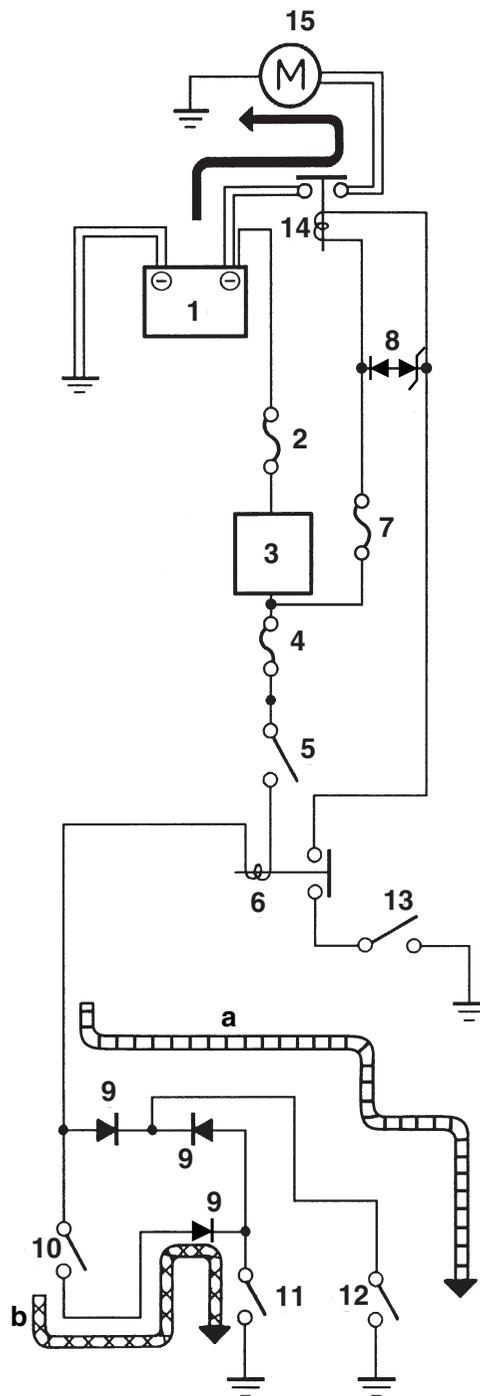
EAS27180

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 starter switch.



ELECTRIC STARTING SYSTEM

- a. WHEN THE TRANSMISSION IS IN NEUTRAL
 - b. WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR
1. Battery
 2. Main fuse
 3. Main switch
 4. Ignition fuse
 5. Engine stop switch
 6. Starting circuit cut-off relay
 7. Signal fuse
 8. Diode
 9. Diode
 10. Clutch switch
 11. Sidestand switch
 12. Neutral switch
 13. Start switch
 14. Starter relay
 15. Starter motor

ELECTRIC STARTING SYSTEM

EAS27190

TROUBLESHOOTING

The starter motor fails to turn.

NOTE:

Before troubleshooting, remove the following part (s):

1. Seat
2. Side cover (left)
3. Air scoop (left/right)
4. Fuel tank

1. Check the fuses. (Main, ignition and signal fuse) Refer to "CHECKING THE FUSES" on page 8-67.	NG→	Replace the fuse (s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-68.	NG→	<ul style="list-style-type: none">●Clean the battery terminals.●Recharge or replace the battery.
OK↓		
3. Replace the starter motor. Refer to "CHECKING THE STARTER MOTOR" on page 5-32.	NG→	Repair or replace the starter motor.
OK↓		
4. Check the relay unit. Refer to "CHECKING THE RELAYS" on page 8-71.	NG→	Replace the relay unit.
OK↓		
5. Check the diode. Refer to "CHECKING THE DIODE" on page 8-73.	NG→	Replace the relay unit.
OK↓		
6. Check the starter relay. Refer to "CHECKING THE RELAYS" on page 8-71.	NG→	Replace the starter relay.
OK↓		
7. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-63.	NG→	Replace the main switch.
OK↓		
8. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-63.	NG→	Replace the right handlebar switch.
OK↓		
9. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 8-63.	NG→	Replace the neutral switch.
OK↓		
10. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 8-63.	NG→	Replace the sidestand switch.

ELECTRIC STARTING SYSTEM

OK↓

11. Check the clutch switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the clutch switch.

OK↓

12. Check the start switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the right handlebar switch.

OK↓

13. Check the entire starting system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-5.

NG→

Properly connect or repair the starting system's wiring.

OK↓

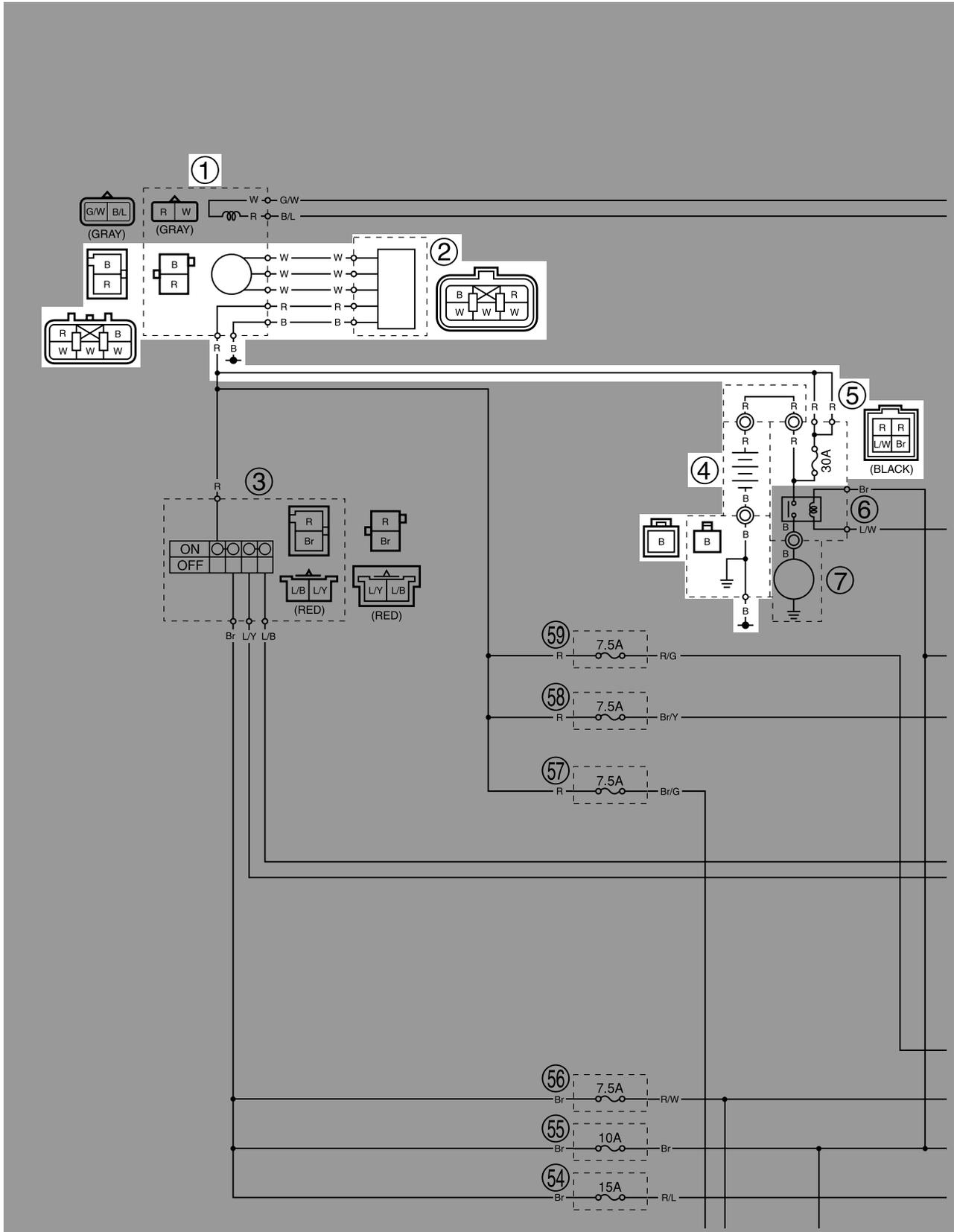
The starting system circuit is OK.

EAS27200

CHARGING SYSTEM

EAS27210

CIRCUIT DIAGRAM



CHARGING SYSTEM

1. AC magneto
2. Rectifier/regulator
4. Battery
5. Main fuse

EAS27220

TROUBLESHOOTING

The battery is not being charged.

NOTE:

Before troubleshooting, remove the following part (s):

1. Seat
2. Side cover (left)
3. Air scoop (left)

1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 8-67.	NG→	Replace the fuse.
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-68.	NG→	<ul style="list-style-type: none">●Clean the battery terminals.●Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to "CHECKING THE STATOR COIL" on page 8-76.	NG→	Replace the stator assembly.
OK↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 8-76.	NG→	Replace the rectifier/regulator.
OK↓		
5. Check the entire charging system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-11.	NG→	Properly connect or repair the charging system's wiring.
OK↓		
This circuit is OK.		

- 3. Main switch
- 4. Battery
- 5. Main fuse
- 16. ECU
- 34. High beam indicator
- 39. Front right turn signal/position light
- 40. Front left turn signal/position light
- 42. Headlight relay
- 43. Dimmer switch
- 44. Headlight
- 50. Tail/brake light
- 51. License light
- 54. Headlight fuse
- 55. Signaling system fuse

EAS27260

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, license light or meter light.

NOTE:

Before troubleshooting, remove the following part (s):

1. Seat
2. Side cover (left)
3. Air scoop (left/right)
4. Fuel tank

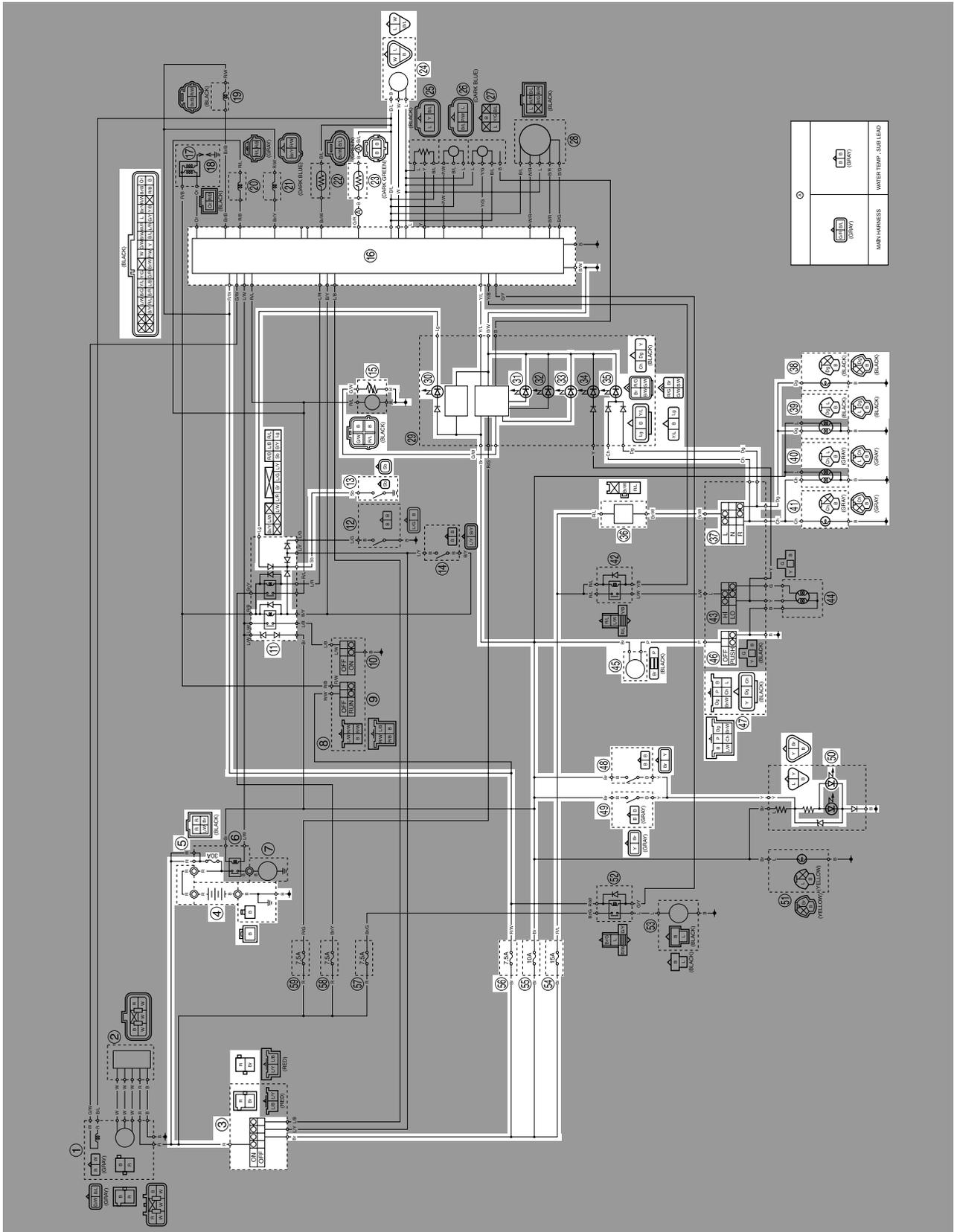
<p>1. Check the each bulbs and bulb sockets condition. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-66.</p>	NG→	<p>Replace the bulb (s) and bulb socket (s).</p>
OK↓		
<p>2. Check the fuses. (Main, headlight and signal) Refer to "CHECKING THE FUSES" on page 8-67.</p>	NG→	<p>Replace the fuse (s).</p>
OK↓		
<p>3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-68.</p>	NG→	<ul style="list-style-type: none"> ●Clean the battery terminals. ●Recharge or replace the battery.
OK↓		
<p>4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace the main switch.</p>
OK↓		
<p>5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace the left handlebar switch.</p>
OK↓		
<p>6. Check the headlight relay. Refer to "CHECKING THE RELAYS" on page 8-71.</p>	NG→	<p>Replace the headlight relay.</p>
OK↓		
<p>7. Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-15.</p>	NG→	<p>Properly connect or repair the lighting system's wiring.</p>
OK↓		
<p>Replace the ECU.</p>		

EAS27270

SIGNALING SYSTEM

EAS27280

CIRCUIT DIAGRAM



3. Main switch
4. Battery
5. Main fuse
11. Relay unit
13. Neutral switch
15. Fuel pump
16. ECU
23. Coolant temperature sensor
24. Speed sensor
30. Neutral indicator light
31. Coolant temperature warning light
33. Fuel level warning light
35. Turn signal indicator light
36. Turn signal relay
37. Turn signal switch
38. Rear right turn signal light
39. Front right turn signal/position light
40. Front left turn signal/position light
41. Rear left turn signal light
45. Horn
46. Horn switch
47. Left handlebar switch
48. Rear brake switch
49. Front brake switch
50. Tail/brake light
54. Headlight fuse
55. Signaling system fuse
56. Ignition fuse

EAS27290

TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light, turn signal indicator light and fuel level warning light.
- The horn fails to sound.
- The speedometer does not operate normally.
- The fuel indicator light does not come on.
- The coolant temperature warning light does not operate normally.

NOTE:

Before troubleshooting, remove the following part (s):

1. Seat
2. Side cover (left)
3. Air scoop (left/right)
4. Fuel tank

1. Check the fuses.
(Main, ignition, signaling and head-light)
Refer to "CHECKING THE FUSES" on page 8-67.

NG→

Replace the fuse (s).

OK↓

2. Check the battery.
Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-68.

NG→

- Clean the battery terminals.
- Recharge or replace the battery.

OK↓

3. Check the main switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the main switch.

OK↓

4. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

This circuit is OK.

Check the signaling system

The horn fails to sound.

1. Check the horn switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the left handlebar switch.

OK↓

2. Check the horn.
Refer to "CHECKING THE HORN" on page 8-77.

NG→

Replace the horn.

OK↓

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

SIGNALING SYSTEM

This circuit is OK.

The brake light fails to come on.

1. Check the front brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the front brake light switch.

OK↓

2. Check the rear brake light switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the rear brake light switch.

OK↓

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the tail/brake light.

The turn signal light, turn signal indicator light or both fail to blink.

1. Check the turn signal light bulb and socket.
Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 8-66.

NG→

Replace the turn signal light bulb, socket or both.

OK↓

2. Check the turn signal switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the left handlebar switch.

OK↓

3. Check the turn signal relay.
Refer to "CHECKING THE RELAYS" on page 8-71.

NG→

The turn signal relay is faulty and must be replaced.

OK↓

4. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The neutral indicator light fails to come.

1. Check the neutral switch.
Refer to "CHECKING THE SWITCHES" on page 8-63.

NG→

Replace the neutral switch.

OK↓

2. Check the diode.
Refer to "CHECKING THE DIODE" on page 8-73.

NG→

Replace the relay unit (Starting circuit cut-off relay).

OK↓

SIGNALING SYSTEM

3. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The speedometer fails to operate.

1. Check the speed sensor.
Refer to "CHECKING THE SPEED SENSOR" on page 8-77.

NG→

Replace the speed sensor.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The fuel level warning light fails to come.

1. Check the fuel sender.
Refer to "CHECKING THE FUEL SENDER (FUEL PUMP)" on page 8-78.

NG→

Replace the fuel pump assembly.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG→

Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter assembly.

The coolant temperature warning light fails to operate.

1. Check the coolant temperature sensor.
Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-78.

NG→

Replace the coolant temperature sensor.

OK↓

2. Check the entire signaling system's wiring.
Refer to "CIRCUIT DIAGRAM" on page 8-19.

NG→

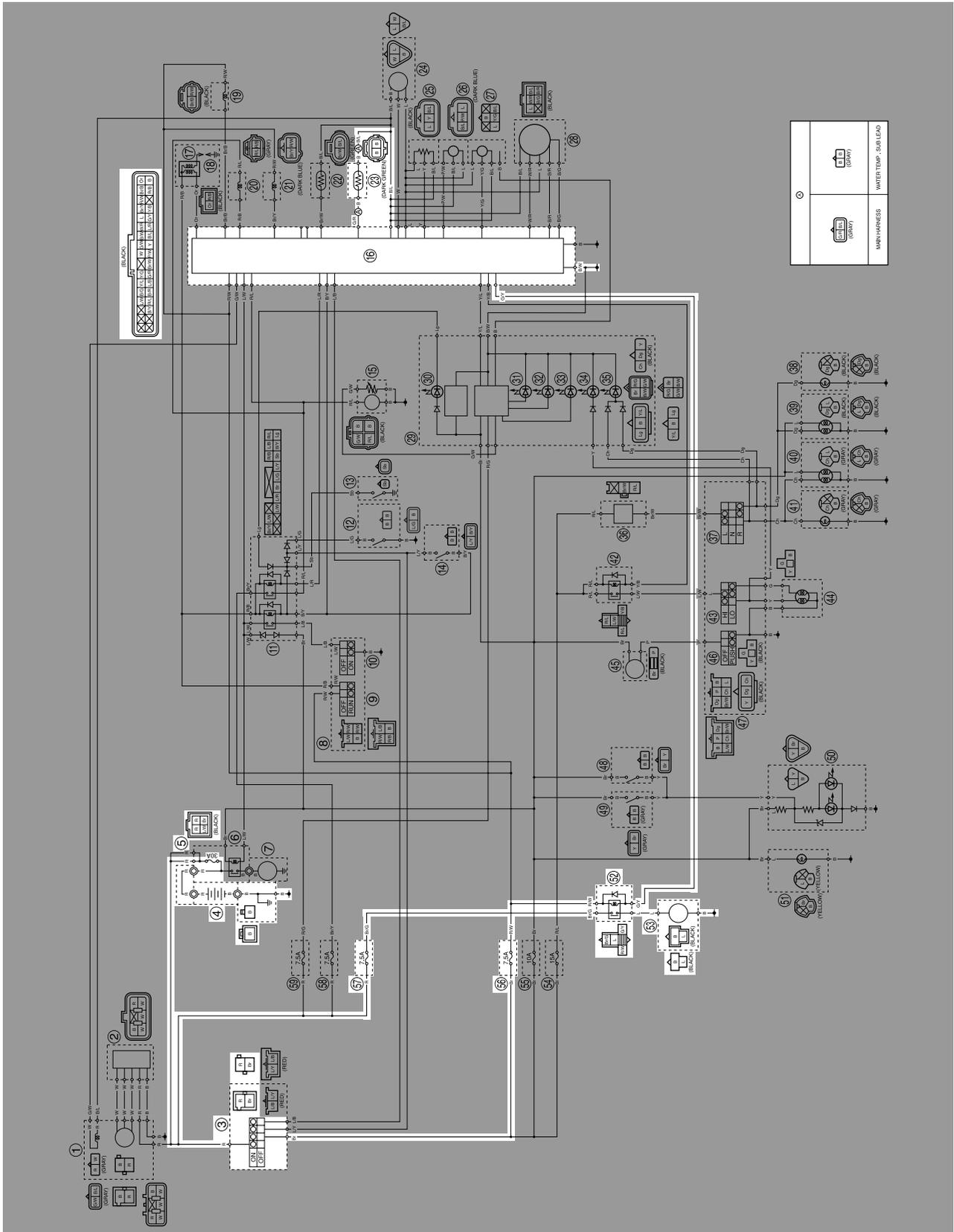
Properly connect or repair the signaling system's wiring.

OK↓

Replace the meter, ECU or both.

EAS27300
COOLING SYSTEM

EAS27310
CIRCUIT DIAGRAM



- 3. Main switch
- 4. Battery
- 5. Main fuse
- 16. ECU
- 23. Coolant temperature sensor
- 52. Radiator fan motor relay
- 53. Radiator fan motor
- 56. Ignition fuse
- 57. Radiator fan fuse

EAS27320

TROUBLESHOOTING

- The radiator fan fails to operate.

NOTE:

Before troubleshooting, remove the following part (s):

1. Seat
2. Side cover (left)
3. Air scoop (left/right)
4. Fuel tank
5. Radiator cover
6. Drain the coolant.

<p>1. Check the fuses. (Main, ignition and radiator fan fuse) Refer to "CHECKING THE FUSES" on page 8-67.</p>	NG→	<p>Replace the fuse (s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-68.</p>	NG→	<ul style="list-style-type: none"> ● Clean the battery terminals. ● Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace the main switch.</p>
OK↓		
<p>4. Check the radiator fan motor relay. Refer to "CHECKING THE RELAYS" on page 8-71.</p>	NG→	<p>Replace the radiator fan motor relay.</p>
OK↓		
<p>5. Check the radiator fan motor. Refer to "CHECKING THE RADIATOR FAN MOTOR" on page 8-79.</p>	NG→	<p>The radiator fan motor is faulty and must be replaced.</p>
OK↓		
<p>6. Check the coolant temperature. Refer to "CHECKING THE COOLANT TEMPERATURE SENSOR" on page 8-78.</p>	NG→	<p>Replace the coolant temperature sensor.</p>
OK↓		
<p>7. Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM" on page 8-25.</p>	NG→	<p>Properly connect or repair the cooling system's wiring.</p>
OK↓		
<p>Replace the ECU.</p>		

FUEL INJECTION SYSTEM

1. AC magneto
3. Main switch
4. Battery
5. Main fuse
6. Starter relay
8. Right handlebar switch
9. Engine stop switch
10. Start switch
11. Relay unit
12. Sidestand switch
13. Neutral switch
14. Clutch switch
15. Fuel pump
16. ECU
17. Ignition coil
18. Spark plug
19. ITS solenoid
20. Fuel injector
21. AI solenoid
22. Intake air temperature sensor
23. Coolant temperature sensor
24. Speed sensor
25. Throttle position sensor
26. Intake air pressure sensor
27. Lean angle sensor
28. EXUP servo motor
32. Engine trouble warning light
42. Headlight relay
52. Radiator fan motor relay
54. Headlight fuse
55. Signaling system fuse
56. Ignition fuse
58. EFI fuse
59. Backup fuse

FUEL INJECTION SYSTEM

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 appears on the clock LCD. Once a fault code has been displayed, it remains stored in the memory of the ECU until it is deleted.

Engine trouble warning light indication and FI system operation

Warning light indication	ECU operation	FI 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:

- | | |
|---|--|
| 12: Crankshaft position sensor | 41: Lean angle sensor (open or short-circuit) |
| 19: Sidestand switch (open circuit in the wire to the ECU) | 50: ECU internal malfunction (faulty ECU memory) |
| 30: Lean angle sensor (Latch up detected) | |
| 33: Ignition coil (Malfunction detected in the primary wire of the ignition coil) | |

Checking for a defective engine trouble warning light bulb

The engine trouble warning light comes on for 1.4 seconds after the main switch has been turned to "ON" and when the start switch is being pushed. If the warning light does not come on under these conditions, the warning light bulb may be defective.



- Main switch OFF
- Main switch ON
- Light OFF
- Light ON for 1.4 seconds

FUEL INJECTION SYSTEM

EAS27393

FAIL-SAFE ACTIONS (SUBSTITUTE CHARACTERISTICS OPERATION CONTROL)

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.

The ECU takes fail-safe actions in two ways: one in which the sensor output is set to a prescribed value, and the other in which the ECU directly operates an actuator. Details on the fail-safe actions are given in the table below.

Self-Diagnostic Function

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 (pipe system)	Intake air pressure sensor-pipe system malfunction (clogged or detached hose).	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)	The throttle position sensor is stuck.	Able	Able
17	EXUP servo motor circuit (open or short-circuit)	EXUP servo motor circuit open or short circuit.	Able	Able
18	EXUP servomotor (stuck)	EXUP servo motor is stuck.	Able	Able
19	Sidestand switch (open circuit wire harness to ECU)	Open circuit is detected in the input line from the sidestand switch to the ECU.	Unable	Unable
21	Coolant temperature sensor	Coolant temperature sensor-open or short circuit detected.	Able	Able
22	Intake air temperature sensor	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 (faulty ignition)	Malfunction detected in the primary wire of the ignition coil.	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
	Neutral switch	Open or short circuit is detected in the neutral switch.	Able	Able
43	Fuel system voltage (monitor voltage)	Supply power to the fuel injector and fuel pump is not normal.	Able	Able

FUEL INJECTION SYSTEM

Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
44	Error in writing the amount of CO adjustment on EEPROM	Error is detected while reading or writing on EEPROM (code re-registering key code and throttle valve fully closed notification value).	Able	Able
46	Vehicle system power supply (Monitor voltage)	Power supply to the ECU system relay is not normal.	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
70	Left idle control	After 20 minutes left idling, the ECU automatically stops the engine.	Able	Able
—	Start unable warning	Engine trouble warning light flashes when the start switch is turned ON. Relay is not turned ON even if the crank signal is input while the start switch is turned ON. When the start switch is turned ON while an error is detected with the fault code of No.12, 19, 30, 41 or 50.	Unable	Unable

Communication error with the multifunction meter

Fault code No.	Item	Symptom	Able / unable to start	Able / unable to drive
Er-1	ECU internal malfunction (output signal error)	No signals are received from the ECU.	Able*	Able*
Er-2	ECU internal malfunction (output signal error)	No signals are received from the ECU within the specified duration.	Able*	Able*
Er-3	ECU internal malfunction (output signal error)	Data from the ECU cannot be received correctly.	Able*	Able*
Er-4	ECU internal malfunction (input signal error)	Non-registered data has been received from the meter.	Able*	Able*

* If multiple malfunctions have been detected for the ECU, you may not be able to start or drive the vehicle.

EAS27400

TROUBLESHOOTING METHOD

The engine operation is not normal and the engine trouble warning light comes on.

1. Check:
 - Fault code number



- a. Check the fault code number displayed on the meter.
- b. Identify the system with the malfunction. Refer to "Self-Diagnostic Function table".
- c. Identify the probable cause of malfunction. Refer to "Diagnostic monitoring code table".



2. Checking and repair the probable case of malfunction.

Fault code No. YES	Fault code No. NO
Check and repair. Refer to "TROUBLESHOOTING DETAILS" on page 8-41. Monitor the operation of the sensors and actuators in the diagnostic mode. Refer to "Sensor operation table".	Check and repair. Refer to "TROUBLESHOOTING DETAILS" on page 8-41.

3. Perform ECU reinstatement action.
Refer to "Reinstatement method" of table in "TROUBLESHOOTING DETAILS".
4. Turn the main switch to "OFF" and back to "ON", then check the fault code number is not displayed.

NOTE:

If other fault code displayed, repeat steps (1) to (4) until all fault code number is not displayed.

5. The Malfunction history is stored even if the main switch is turned OFF. The malfunction history must be erased in the diagnostic mode. Refer to "Sensor operation table (Diagnostic code No.62)".

The engine operation is not normal but the engine trouble warning light does not come on.

1. Check the operation of following sensors and actuators in the Diagnostic mode. Refer to "Sensor operation table".

01: Throttle position sensor (throttle angle)
30: Ignition coil #1
36: Injector #1
48: AI solenoid

If malfunction the sensors or actuators, repair or replace it.

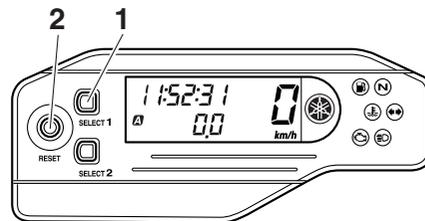
If not malfunction the sensors and actuators, check and repair the engine inner parts.

EAS27441

DIAGNOSTIC MODE

Setting the diagnostic mode

1. Turn the main switch to "OFF" and set the engine stop switch to "ON".
2. Disconnect the wire harness coupler from the fuel pump.
3. Simultaneously press and hold the "SELECT1" "1" and "RESET" "2" buttons, turn the main switch to "ON", and continue to press the buttons for 8 seconds or more.



NOTE:

- All displays on the meter disappear except the clock and tripmeter displays.
- "diag" appears on the clock LCD.

4. Press the "SELECT1" button to select the CO adjustment mode "CO" or the diagnostic mode "diag".
5. After selecting "diag", simultaneously press the "SELECT" and "RESET" buttons for 2 seconds or more to execute the selection.
6. Set the engine stop switch to "OFF".
7. Select the diagnostic code number that applies to the item that was verified with the fault code number by pressing the "SELECT1" and "RESET" buttons.

NOTE:

The diagnostic code number appears on the clock LCD (01-70).

- To decrease the selected diagnostic code number, press the "RESET" button. Press the "RESET" button for 1 second or longer to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the "SELECT" button. Press the "SELECT" button for 1 second or longer to automatically increase the diagnostic code number.

bers.

8. Verify the operation of the sensor or actuator.

- Sensor operation

The data representing the operating conditions of the sensor appears on the trip LCD.

- Actuator operation

Set the engine stop switch to “ON” to operate the actuator.

NOTE:

If the engine stop switch is set to “ON”, set it to “OFF”, and then set it to “ON” again.

9. Turn the main switch to “OFF” to cancel the diagnostic mode.

FUEL INJECTION SYSTEM

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 pickup rotor. ● Malfunction in ECU. ● Improperly installed sensor. 	—
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-pipe system malfunction (clogged hose).	<ul style="list-style-type: none"> ● Intake air pressure sensor hose 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 detected.	<ul style="list-style-type: none"> ● Stuck throttle position sensor. ● Malfunction in ECU. 	01
17	EXUP servo motor circuit open or short circuit.	<ul style="list-style-type: none"> ● Open circuit in wire harness. ● Defective EXUP servo motor. ● ECU is defective. 	53
18	EXUP servo motor is stuck.	<ul style="list-style-type: none"> ● Open circuit in wire harness. ● EXUP servo motor lockup (valve or motor) 	53
19	Open circuit is detected in the input line from the sidestand switch to the ECU.	<ul style="list-style-type: none"> ● Open or short circuit in wire harness. ● 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. 	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 intake temperature sensor. ● Malfunction in ECU. ● Improperly installed intake air temperature sensor. 	05
30	Latch up detected. No normal signal is received from the lean angle sensor.	<ul style="list-style-type: none"> ● The vehicle has overturned. ● Defective lean angle sensor. ● Malfunction in ECU. ● Improperly installed lean angle sensor. 	08
33	Malfunction detected in the primary wire of the ignition coil.	<ul style="list-style-type: none"> ● Open or short circuit in wire harness. ● Malfunction in ignition coil. ● Malfunction in ECU. ● Malfunction in a component of ignition cut-off circuit system. 	30
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

FUEL INJECTION SYSTEM

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 wiring harness. ● Defective speed sensor. ● Malfunction in vehicle speed sensor detected unit. ● Malfunction in ECU. 	07
	Open or short circuit in neutral switch.	<ul style="list-style-type: none"> ● Open circuit in wire harness. ● Defective neutral switch. ● ECU is defective. 	21
43	Supply power to the fuel injector and fuel pump is not normal.	<ul style="list-style-type: none"> ● Open circuit in wire harness. ● Malfunction in ECU. ● Defective relay unit (fuel pump). 	09
44	Error is detected while reading or writing on EEPROM.	<ul style="list-style-type: none"> ● Malfunction in ECU. (CO concentration adjustment valve cannot be correctly written to or read from internal memory) 	60
46	Power supply to the FI system relay is not normal.	<ul style="list-style-type: none"> ● Malfunction in charging system. 	—
50	Faulty ECU memory. (When this malfunction is detected in the ECU, the fault code number might not appear on the meter.)	<ul style="list-style-type: none"> ● Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.) 	—
70	Left idle control	<ul style="list-style-type: none"> ● After 20 minutes left idling, the ECU automatically stops the engine. 	—
Er-1	No signals are received from the ECU.	<ul style="list-style-type: none"> ● Open or short circuit in communication line. ● Malfunction in meter unit. ● Malfunction in ECU. 	—
Er-2	No signals are received from the ECU within the specified duration.	<ul style="list-style-type: none"> ● Open or short circuit in communication line. ● Malfunction in meter unit. ● Malfunction in ECU. 	—
Er-3	Data from the ECU cannot be received correctly.	<ul style="list-style-type: none"> ● Open or short circuit in communication line. ● Malfunction in meter unit. ● Malfunction in ECU. 	—
Er-4	Non-registered data has been received from the meter.	<ul style="list-style-type: none"> ● Open or short circuit in communication line. ● Malfunction in meter unit. ● Malfunction in ECU. 	—

Sensor operation table

Diagnostic monitoring code No.	Item	Meter display	Checking method
01	Throttle angle		
	<ul style="list-style-type: none"> ● Fully closed position 	15–19	Check with throttle fully closed.
	<ul style="list-style-type: none"> ● Fully opened position 	95–100	Check with throttle fully open.

FUEL INJECTION SYSTEM

Diagnostic monitoring code No.	Item	Meter display	Checking method
03	Pressure difference (atmospheric pressure-intake air pressure)	Displays the intake air pressure.	Set “○” the engine stop switch, and then push 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 intake air temperature with the meter display value. (*1)
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 changes (integrating) when the rear wheels are rotated.
08	Lean angle sensor <ul style="list-style-type: none"> ● Upright ● Overturned 	0.4-1.4 V 3.7-4.4 V	Remove the lean angle sensor and incline it more than 65 degrees.
09	Fuel system voltage (battery voltage)	Approximately 12.0 V	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	Set ON/OFF the sidestand switch. (with the transmission in gear)
21	Neutral switch <ul style="list-style-type: none"> ● Neutral ● In gear 	ON OFF	Shift the transmission.
60	EEPROM fault code display <ul style="list-style-type: none"> ● No fault ● History exists 	00 04 (Throttle valve fully open notification value is detected.)	—

FUEL INJECTION SYSTEM

Diagnostic monitoring code No.	Item	Meter display	Checking method
61	Malfunction history code display <ul style="list-style-type: none"> ● No history ● History exists 	00 12-70 (Fault detection code) <ul style="list-style-type: none"> ● (If code numbers more than one are 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 00-20 (Memory numbers of the fault detection)	— To erase the history, turn ON the engine stop switch.
63	Repeated display of trouble code <ul style="list-style-type: none"> ● No malfunction code ● Malfunction code exists 	0 Trouble code 24	—
70	Control number	00-255	—

*1 If it is not possible to check the intake temperature, use the ambient temperature as reference (use the compared values for reference).

Actuator operation table

Diagnostic monitoring code No.	Item	Actuation	Checking method
30	Ignition coil	Actuates the ignition coil for five times every second. Illuminates the engine trouble warning light.	Check the spark five times. <ul style="list-style-type: none"> ● Connect an ignition checker.
36	Injector	Actuates the injector for five times every second. Illuminates the engine trouble warning light.	Check the operating sound of the injector five times.
48	Air induction system solenoid	Actuates the air induction system solenoid for five times every second. Illuminates the engine trouble warning light. (Light OFF: Air induction system solenoid "ON", Light ON: Air induction system solenoid "OFF")	Check the operating sound of the solenoid five times.

FUEL INJECTION SYSTEM

Diagnostic monitoring code No.	Item	Actuation	Checking method
49	Intake solenoid	Actuates the intake solenoid for five times every second. Illuminates the engine trouble warning light.	Check the operating sound of the solenoid five times.
50	Fuel injection system relay	Actuates the fuel injection system relay for five times every second. Illuminates the engine trouble warning light. (The engine trouble warning light is OFF when the relay is ON, and the engine trouble warning light is ON when the relay is OFF).	Check the operating sound of the relay five times.
51	Radiator fan motor relay	Actuates the radiator fan motor relay for five times every second. (ON two seconds, OFF three seconds) Illuminates the engine trouble warning light.	Check the operating sound of the relay five times.
52	Headlight relay	Actuates the headlight relay for five times every five-second. (ON two seconds, OFF three seconds) Illuminates the engine trouble warning light five times.	Check the operating sound of the headlight relay five times.
53	EXUP servo motor	Turn the servo motor once in the open direction and then in the close direction. Illuminates the engine trouble warning light.	Check the operating sound of the EXUP motor.

FUEL INJECTION SYSTEM

Fault code No.	13	Symptom	Intake air pressure sensor-open or short circuit detected.	
Diagnostic monitoring code No.	03	Intake air pressure sensor		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Connected state of connector ● Intake air pressure 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. 	Turning the main switch 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 intake air pressure sensor coupler and ECU coupler (Black/Blue–Black/Blue) (Pink/White–Pink/White) (Blue–Blue) 		
3	Defective intake air pressure sensor	<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.03) ● Replace if defective. Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 8-80.		

Fault code No.	14	Symptom	Intake air pressure sensor-hose system malfunction (clogged hose).	
Diagnostic monitoring code No.	03	Intake air pressure sensor		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Intake air pressure sensor hose clogged.	<ul style="list-style-type: none"> ● Check the intake air pressure sensor hose condition. ● Repair or replace the sensor hose. 	Starting the engine and operating it at idle.	
2	Intake air pressure sensor malfunction at intermediate electrical potential.	<ul style="list-style-type: none"> ● Check and repair the connection. 		
3	Connected state of connector ● Intake air pressure 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. 		
4	Defective intake air pressure sensor	<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.03) ● Replace if defective. Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 8-80.		

FUEL INJECTION SYSTEM

Fault code No.	15	Symptom	Throttle position sensor-open or short circuit detected.	
Diagnostic monitoring code No.	01	Throttle position sensor		
Order	Item/components and probable cause	Check or maintenance job	Reinstatement method	
1	Installed condition of throttle position sensor.	<ul style="list-style-type: none"> ● Check the installed area for looseness or pinching. ● Check that is installed in the specified position. 	Turning the main switch ON.	
2	Connected state of connector <ul style="list-style-type: none"> ● Throttle 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 it securely. 		
3	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 throttle position sensor coupler and ECU coupler (Black/Blue-Black/Blue) (Yellow-Yellow) (Blue-Blue) 		
4	Throttle position sensor lead wire open circuit output voltage check.	<ul style="list-style-type: none"> ● Check for open circuit and replace the throttle position sensor. (Black/Blue-Yellow) 		
		Open circuit item		
		Ground wire open circuit	5 V	
		Output wire open circuit	0 V	
		Power supply wire open circuit	0 V	
5	Defective throttle position sensor.	<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.01) ● Replace if defective. Refer to "CHECKING THE THROTTLE POSITION SENSOR" on page 8-79.		

FUEL INJECTION SYSTEM

Fault code No.	16	Symptom	Stuck throttle position sensor detected.	
Diagnostic monitoring code No.	01	Throttle position sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Installed condition of throttle position sensor.		<ul style="list-style-type: none"> ● Check the installed area for looseness or pinching. ● Check that is installed in the specified position. 	Reinstated by starting the engine, operating it at idle. And then racing it.
2	Defective throttle position sensor.		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.01) ● Replace if defective. Refer to "CHECKING THE THROTTLE POSITION SENSOR" on page 8-79.	

Fault code No.	17	Symptom	EXUP servo motor circuit open or short circuit	
Diagnostic monitoring code No.	53	EXUP servo motor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector. <ul style="list-style-type: none"> ● EXUP servo motor 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 it securely. 	Turn 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 EXUP servo motor coupler and ECU coupler (Black/Blue–Black/Blue) (White/Red–White/Red) (Blue–Blue) 	
3	Defective EXUP servo motor		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.53) ● Replace if defective. 	

FUEL INJECTION SYSTEM

Fault code No.	18	Symptom	EXUP servo motor is stuck.	
Diagnostic monitoring code No.	53	EXUP servo motor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector. ● EXUP servo motor coupler ● Wire harness ECU coupler		● 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.	Turn the main switch to "ON".
2	Open or short circuit in wire harness.		● Repair or replace if there is an open or short circuit. ● Between EXUP servo motor coupler and ECU coupler (Black/Red-Black/Red) (Black/Green-Black/Green)	
3	Defective EXUP servo motor		● Execute the diagnostic monitoring mode. (Code No.53) ● Replace if defective.	
4	Defective EXUP valve, pulley and cable.		● Replace if defective.	

Fault code No.	19	Symptom	Open circuit is detected in the input line from the sidestand switch to the ECU.	
Diagnostic monitoring code No.	20	Sidestand switch		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector ● Main wire harness ECU coupler		● Execute the diagnostic monitoring 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 it securely.	If the transmission is in gear, retracting the sidestand. If the transmission is in neutral, reconnecting the wiring.
2	Open or short circuit in wire harness.		● Repair or replace if there is an open or short circuit. ● Between relay unit and main switch coupler. (Blue/Yellow-Blue/Yellow) ● Between ECU and main switch coupler. (Blue/Black-Blue/Black)	
3	Defective sidestand switch.		● Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-63.	

FUEL INJECTION SYSTEM

Fault code No.	21	Symptom	Coolant temperature sensor-open or short circuit detected.	
Diagnostic monitoring 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.		<ul style="list-style-type: none"> ● Check the installed area for looseness or pinching. 	Turning the main switch ON.
2	Connected state of connector <ul style="list-style-type: none"> ● Coolant temperature sensor coupler ● Main wire harness ECU coupler ● Sub-wire harness 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 and/or sub lead.		<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. (Black-Black/Blue) (Black-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 8-78.	

FUEL INJECTION SYSTEM

Fault code No.	22	Symptom	Intake air temperature sensor-open or short circuit detected.	
Diagnostic monitoring code No.	05	Intake air temperature sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Installed condition of intake air temperature sensor.		<ul style="list-style-type: none"> ● Check the installed area for looseness or pinching. 	Turning the main switch ON.
2	Connected state of connector <ul style="list-style-type: none"> ● Intake air 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 and/or sub lead.		<ul style="list-style-type: none"> ● Repair or replace if there is an open or short circuit. ● Between intake air temperature sensor coupler and ECU coupler. (Black/Blue–Black/Blue) (Brown/White–Brown/White) 	
4	Defective intake air temperature sensor.		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.05) ● Replace if defective. Refer to “CHECKING THE INTAKE AIR TEMPERATURE SENSOR” on page 8-80.	

Fault code No.	30	Symptom	Latch up detected. No normal signal is received from the lean angle sensor.	
Diagnostic monitoring code No.	08	Lean angle sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	The vehicle has overturned.		<ul style="list-style-type: none"> ● Raise the vehicle upright. 	Turning the main switch ON (however, the engine cannot be restarted unless the main switch is first turned OFF).
2	Installed condition of the lean angle sensor		<ul style="list-style-type: none"> ● Check the installed area for looseness or pinching. 	
3	Connected state of connector <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 it securely. 	
4	Defective lean angle sensor.		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.08) ● Replace if defective. 	

FUEL INJECTION SYSTEM

Fault code No.	33	Symptom	Malfunction detected in the primary wire of the ignition coil.	
Diagnostic monitoring code No.	30	Ignition coil		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector <ul style="list-style-type: none"> ● Ignition coil primary side coupler (Orange) ● 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. 	Starting the engine and operating it at idle.
2	Open or short circuit in wire harness or sub lead.		<ul style="list-style-type: none"> ● Repair or replace if there is an open or short circuit. ● Between ignition coil coupler and ECU coupler/main wire harness. (Orange-Orange) 	
3	Defective ignition coil		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.30) ● Test the primary and secondary coils for continuity. ● Replace if defective. Refer to "CHECKING THE IGNITION COIL" on page 8-74.	

Fault code No.	41	Symptom	Lean angle sensor-open or short circuit detected.	
Diagnostic monitoring code No.	08	Lean angle sensor		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector <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 it securely. 	Turning the main switch 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 switch coupler and ECU coupler. (Black/Blue-Black/Blue) (Yellow/Green-Yellow/Green) (Blue-Blue) 	
3	Defective lean angle sensor		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.08) ● Replace if defective. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 8-75.	

FUEL INJECTION SYSTEM

Fault code No.	42	Symptom	A. No normal signals are received from the speed sensor. B. Open or short circuit is detected in the neutral switch.	
Diagnostic monitoring code No.	A	07	Speed sensor	
	B	21	Neutral switch	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
A-1	Installed condition of speed sensor		<ul style="list-style-type: none"> ● Check the installed area for looseness or pinching. 	Starting the engine, and inputting the vehicle speed signals by operating the motorcycle at a low speed of 20–30 km/h.
A-2	Connected state of connector. <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 it securely. 	
A-3	Open or short circuit in speed sensor lead.		<ul style="list-style-type: none"> ● Repair or replace if there is an open or short circuit. ● Between sensor coupler and ECU coupler. (Blue–Blue) (White–White) (Black/Blue–Black/Blue) 	
A-4	Defective speed sensor.		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.07) ● Replace if defective. Refer to “CHECKING THE SPEED SENSOR” on page 8-77.	

FUEL INJECTION SYSTEM

Fault code No.	42	Symptom	A. No normal signals are received from the speed sensor. B. Open or short circuit is detected in the neutral switch.	
Diagnostic monitoring code No.	A	07	Speed sensor	
	B	21	Neutral switch	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
B-1	Installed condition of neutral switch		<ul style="list-style-type: none"> ● Check the installed area for looseness or pinching. 	Turn the main switch to "ON".
B-2	Connected state of connector. <ul style="list-style-type: none"> ● Neutral switch 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 it securely. 	
B-3	Open or short circuit in speed sensor lead.		<ul style="list-style-type: none"> ● Repair or replace if there is an open or short circuit. ● Between relay unit coupler and ECU coupler (Black/Yellow–Black/Yellow) ● Between neutral switch and relay unit coupler (Sky blue–Sky blue) 	
B-4	Defective neutral switch		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No.21) ● Replace if defective. Refer to "CHECKING THE SWITCHES" on page 8-63.	
B-5	Defective shift drum (neutral detection location)		<ul style="list-style-type: none"> ● Replace if defective. Refer to "TRANSMISSION" on page 5-64.	

FUEL INJECTION SYSTEM

Fault code No.	43	Symptom	Supply power to the fuel injector and fuel pump is not normal.	
Diagnostic monitoring code No.	09	Fuel system voltage		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector <ul style="list-style-type: none"> ● Relay unit coupler ● Fuel pump coupler ● Fuel injector coupler ● 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. 	Starting the engine and operating it at idle.
2	Open or short circuit in the wire harness.		<ul style="list-style-type: none"> ● Repair or replace if there is an open or short circuit. ● Between relay unit and ECU coupler (Red/Blue–Red/Blue) ● Between relay unit and fuse (EFI) (Brown/Yellow–Brown/Yellow) ● Between fuse (EFI) and battery (Brown/Yellow–Brown/Yellow) 	
3	Faulty battery voltage		<ul style="list-style-type: none"> ● Execute the diagnostic monitoring mode. (Code No. 09) ● Charge or replace if defective. 	

Fault code No.	44	Symptom	Error is detected while reading or writing on EEPROM (CO adjustment valve).	
Diagnostic monitoring code No.	60	EEPROM improper cylinder indication		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Malfunction in ECU		1. Execute the diagnostic monitoring mode. (Code No. 60) 2. Adjust the CO exhaust gas level, and set the abnormal exhaust gas level. Set until "0" is shown on the display. <ul style="list-style-type: none"> ● When defect cannot be repaired, replace the ECU. 	Turn the main switch to "ON". (When displayed again, readjust the exhaust gas.)

FUEL INJECTION SYSTEM

Fault code No.	46	Symptom	Power supply to the FI system relay is not normal.	
Diagnostic monitoring code No.	—	—		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector ● 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. 	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 8-68. 	
3	Malfunction of the 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 the wire harness.		Repair or replace if there is an open or short circuit. <ul style="list-style-type: none"> ● Between battery and main switch. (Red–Red) ● Between main switch and fuse (ignition) (Brown–Brown) ● Between fuse (ignition) and ECU (Red/White–Red/White) 	

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 meter.)	
Diagnostic monitoring code No.	—	—		
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Malfunction in ECU		<ul style="list-style-type: none"> ● Replace the ECU. 	Turning the main switch ON

FUEL INJECTION SYSTEM

Fault code No.	Er-1	Symptom	No signals are received from the ECU.	
Diagnostic monitoring code No.		—	—	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector ● 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. 	Reinstated if normal signal is received from the ECU when the main switch is turn to ON.
2	Open or short circuit in wire harness lead		<ul style="list-style-type: none"> ● Repair or replace if there is an open or short circuit. ● Between meter coupler and ECU coupler (Yellow/Blue–Yellow/Blue) 	
3	Malfunction in meter unit		<ul style="list-style-type: none"> ● Replace the meter unit. 	
4	Malfunction in ECU		<ul style="list-style-type: none"> ● Replace the ECU. 	

Fault code No.	Er-2	Symptom	No signals are received from the ECU within the specified duration.	
Diagnostic monitoring code No.		—	—	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector ● 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. 	Reinstated if normal signal is received from the ECU when the main switch is turn 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 meter coupler and ECU coupler (Yellow/Blue–Yellow/Blue) 	
3	Malfunction in meter unit		<ul style="list-style-type: none"> ● Replace the meter unit. 	
4	Malfunction in ECU		<ul style="list-style-type: none"> ● Replace the ECU. 	

FUEL INJECTION SYSTEM

Fault code No.	Er-3	Symptom	Data from the ECU cannot be received correctly.	
Diagnostic monitoring code No.		—	—	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector ● 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. 	Reinstated if normal signal is received from the ECU when the main switch is turn to ON.
2	Open or short circuit in wire harness lead.		<ul style="list-style-type: none"> ● Repair or replace if there is an open or short circuit. ● Between meter coupler and ECU coupler (Yellow/Blue–Yellow/Blue) 	
3	Malfunction in meter unit		<ul style="list-style-type: none"> ● Replace the meter unit. 	
4	Malfunction in ECU		<ul style="list-style-type: none"> ● Replace the ECU. 	

Fault code No.	Er-4	Symptom	Non-registered data has been received from the meter.	
Diagnostic monitoring code No.		—	—	
Order	Item/components and probable cause		Check or maintenance job	Reinstatement method
1	Connected state of connector ● 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. 	Reinstated if normal signal is received from the ECU when the main switch is turn to ON.
2	Open or short circuit in wire harness lead.		<ul style="list-style-type: none"> ● Repair or replace if there is an open or short circuit. ● Between sensor coupler and ECU coupler (Yellow/Blue–Yellow/Blue) 	
3	Malfunction in meter unit		<ul style="list-style-type: none"> ● Replace the meter unit. 	
4	Malfunction in ECU		<ul style="list-style-type: none"> ● Replace the ECU. 	

- 3. Main switch
- 4. Battery
- 5. Main fuse
- 8. Right handlebar switch
- 9. Engine stop switch
- 11. Relay unit
- 15. Fuel pump
- 16. ECU
- 56. Ignition fuse
- 58. EFI fuse

EAS27600

TROUBLE SHOOTING

The fuel pump fails to operate.

NOTE:

Before troubleshooting, remove the following part(s):

1. Seat
2. Side cover (left/right)
3. Fuel tank

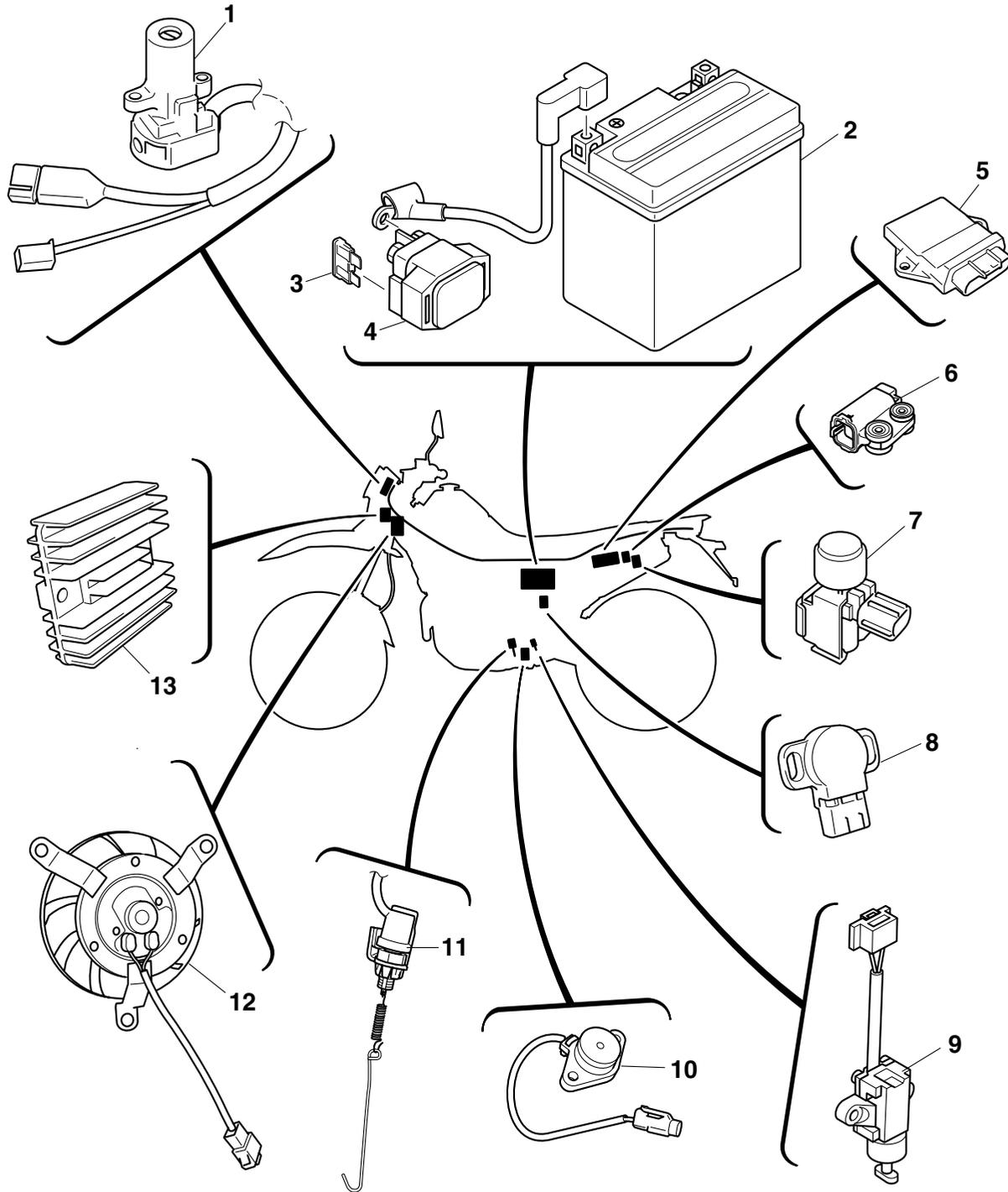
<p>1. Check the fuse (Main fuse, ignition fuse, EFI fuse) Refer to "CHECKING THE FUSES" on page 8-67.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 8-68.</p>	NG→	<ul style="list-style-type: none"> ●Clean the battery terminals. ●Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace the main switch.</p>
OK↓		
<p>4. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace the right handlebar switch.</p>
OK↓		
<p>5. Check the relay unit (fuel pump relay). Refer to "CHECKING THE SWITCHES" on page 8-63.</p>	NG→	<p>Replace relay unit (fuel pump relay)</p>
OK↓		
<p>6. Check fuel pressure Refer to "CHECKING THE PRESSURE REGULATOR" on page 7-6.</p>	NG→	<p>Replace the fuel pump.</p>
OK↓		
<p>7. Check the fuel pump system wire harness connections. Refer to "CIRCUIT DIAGRAM" on page 8-55.</p>	NG→	<p>Properly connect or repair the fuel pump system's wiring.</p>
OK↓		
<p>Replace the ECU.</p>		

ELECTRICAL COMPONENTS

EAS27971

ELECTRICAL COMPONENTS

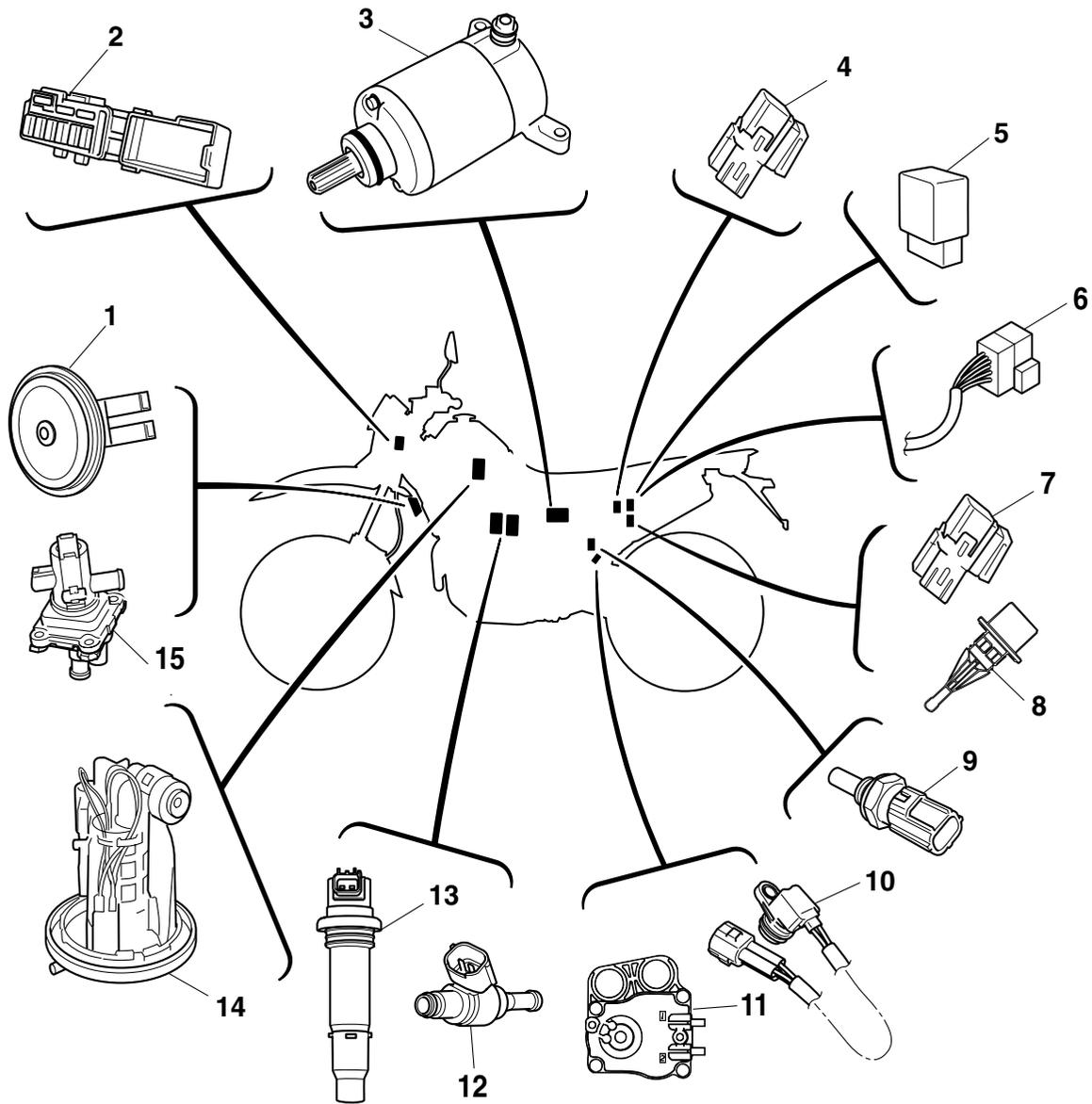
EAS32D1011



ELECTRICAL COMPONENTS

1. Main switch
2. Battery
3. Main fuse
4. Starter relay
5. ECU
6. Lean angle sensor
7. Intake solenoid
8. Throttle position sensor
9. Sidestand switch
10. Neutral switch
11. Rear brake switch
12. Fan motor
13. Rectifier/regulator

ELECTRICAL COMPONENTS



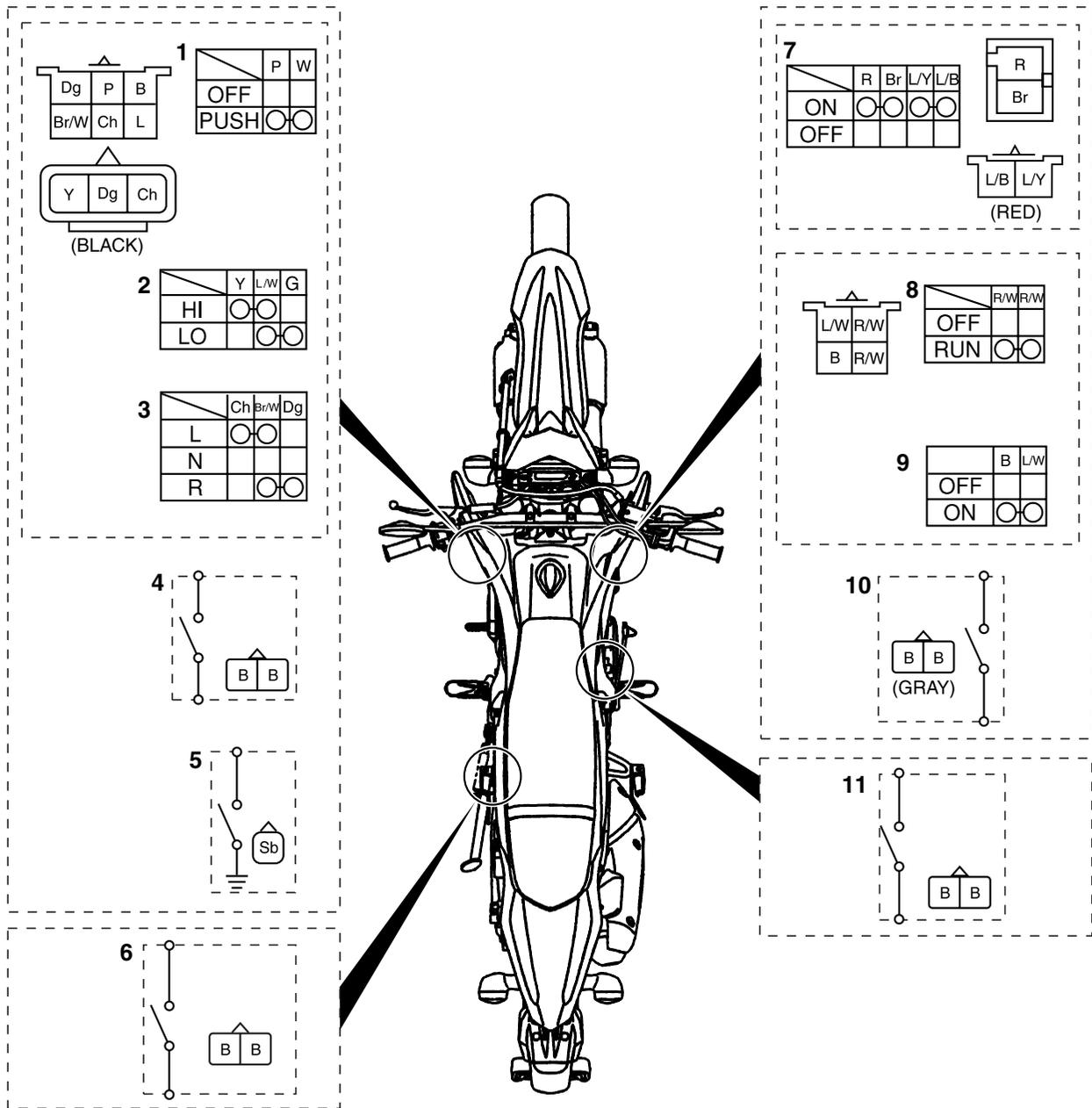
ELECTRICAL COMPONENTS

1. Horn
2. Fuse box
3. Starter motor
4. Radiator fan motor relay
5. Turn signal relay
6. Relay assembly
7. Headlight relay
8. Intake air temperature sensor
9. Coolant temperature sensor
10. Speed sensor
11. EXUP servo motor
12. Injector
13. Ignition coil
14. Fuel pump
15. Air cut-off valve

ELECTRICAL COMPONENTS

EAS27980

CHECKING THE SWITCHES



ELECTRICAL COMPONENTS

1. Horn switch
2. Dimmer switch
3. Turn signal switch
4. Clutch switch
5. Neutral switch
6. Sidestand switch
7. Main switch
8. Engine stop switch
9. Start switch
10. Front brake switch
11. Rear brake switch

ELECTRICAL COMPONENTS

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

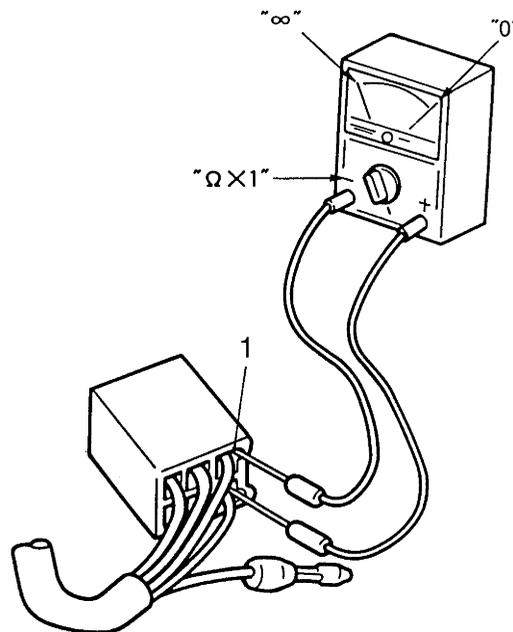
CAUTION:

Never insert the tester probes into the coupler terminal slots "1". Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

	<p>Pocket tester 90890-03112 Analog pocket tester YU-03112-C</p>
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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 terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on below.

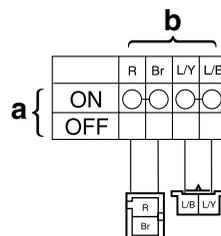
The switch positions "a" are shown in the far left column and the switch lead colors "b" are shown in the top row in the switch illustration.

NOTE:

"○—○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration below shows that:

There is continuity between red and brown blue/yellow and blue/black when the switch is set to "ON".



Checking the condition of the bulb sockets

The following procedure applies to all of the bulb sockets.

1. Check:
 - Bulb socket (for continuity)
(with the pocket tester)
No continuity → Replace.



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

NOTE:

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

- a. Install a good bulb into the bulb socket.
- b. Connect the pocket tester probes to the respective leads of the bulb socket.
- c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.



EAS28000

CHECKING THE FUSES

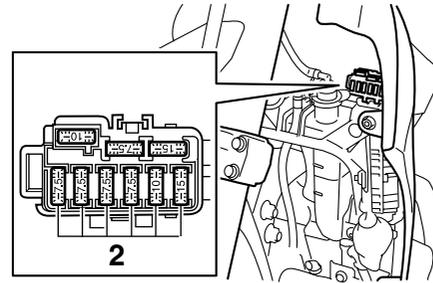
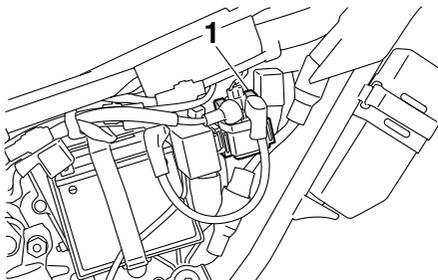
The following procedure applies to all of the fuses.

ECA13680

CAUTION:

To avoid a short circuit, always set the main switch to “OFF” when checking or replacing a fuse.

1. Remove:
 - Side cover (left)
 - Air scoop (left)
 Refer to “GENERAL CHASSIS” on page 4-1.
2. Check:
 - Main fuse “1”
 - Fuse box “2”



- a. Connect the pocket tester to the fuse and check the continuity.

NOTE:

Set the pocket tester selector to “ $\Omega \times 1$ ”.



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

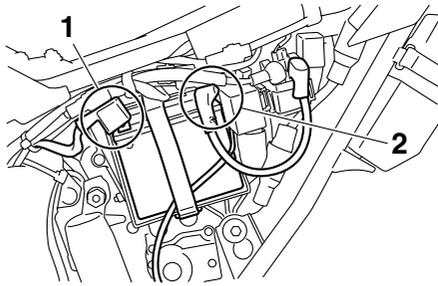
- b. If the pocket tester indicates “ ∞ ”, replace the fuse.



3. Replace:
 - Blown fuse

- a. Set the main switch to “OFF”.
- b. Install a new fuse of the correct amperage rating.
- c. Set on the switches to verify if the electrical circuit is operational.
- d. If the fuse immediately blows again, check the electrical circuit.

ELECTRICAL COMPONENTS



3. Remove:
 - Battery
4. Check:
 - Battery charge



- a. Connect a pocket tester to the battery terminals.

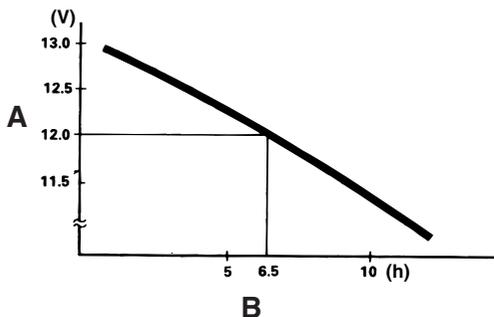
Positive tester probe →
positive battery terminal
Negative tester probe →
negative battery terminal

NOTE:

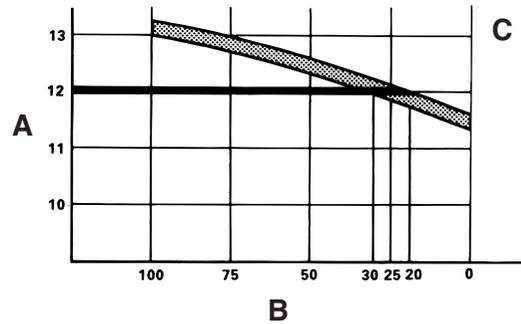
- The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

- b. Check the charge of the battery, as shown in the charts and the following example.

Example
 Open-circuit voltage = 12.0 V
 Charging time = 6.5 hours
 Charge of the battery = 20–30%



- A. Open-circuit voltage
- B. Charging time



- A. Open-circuit voltage
- B. Charge of the battery
- C. Temperature 20°C



5. Charge:
 - Battery

EWA13300

WARNING

Do not quick charge a battery.

ECA13670

CAUTION:

- **Never remove the MF battery sealing caps.**
- **Do not use a high-rate battery charger since it forces 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 battery 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 bat-**

ELECTRICAL COMPONENTS

6. Check:
 - Battery terminals
Dirt → Clean with a wire brush.
Loose connection → Connect properly.
7. Install:
 - Battery
8. Connect:
 - Battery leads
(to the battery terminals)
9. Lubricate:
 - Battery terminals



10. Install:
 - Battery band
11. Install:
 - Side cover (left)
Refer to "GENERAL CHASSIS" on page 4-1.

EAS28040

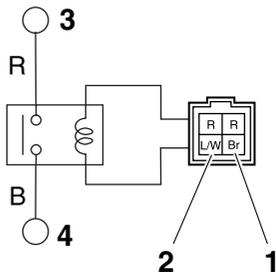
CHECKING THE RELAYS

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.



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.

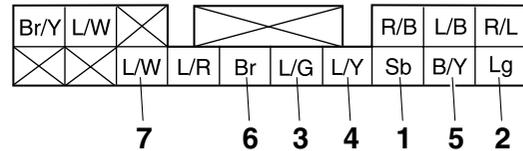
Starter relay



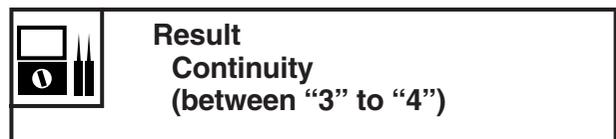
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



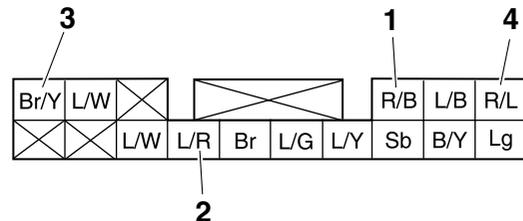
Relay unit (starting circuit cut-off relay)



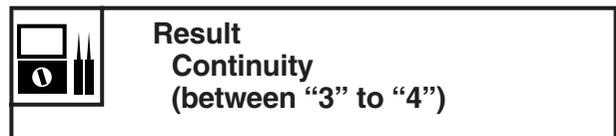
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



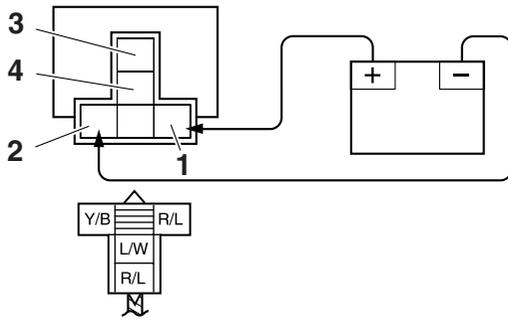
Relay unit (fuel pump)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Headlight relay



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result
Continuity
(between “3” to “4”)

Checking the turn signal relay

a. Check:

- Turn signal relay input voltage
Off specification → Repair wire harness connection failure from main switch to turn signal relay coupler



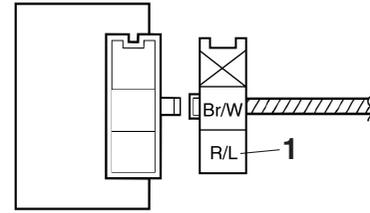
Turn signal relay input voltage
DC 12V

a. Connect the pocket tester (DC 20 V) to the turn signal relay terminal.



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

Tester positive probe
Red/Blue “1”
Negative tester probe
Ground



- b. Turn the main switch to “ON”.
- c. Measure turn signal relay applied voltage.

d. Check:

- Turn signal relay output voltage
Out of specification → Replace the defective part (s).



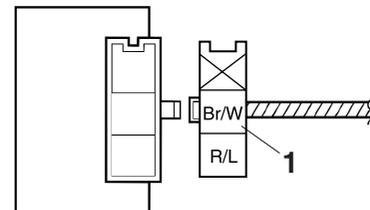
Turn signal relay output voltage
DC 12V

a. Connect the pocket tester (DC 20 V) to the turn signal relay terminal.



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

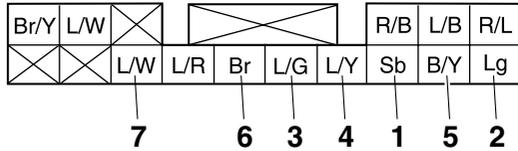
Tester positive probe
Brown/White terminals “1”
Negative tester probe
Ground



- b. Turn the main switch to “ON”.
- c. Measure turn signal relay applied voltage.

ELECTRICAL COMPONENTS

- c. Check the diode for continuity.
- d. Check the diode for no continuity.



EAS28930

CHECKING THE IGNITION SPARK GAP

1. Check:
 - Ignition spark gap
Out of specification → Perform the ignition system troubleshooting, starting with step *. Refer to "TROUBLESHOOTING" on page 8-3.

	Minimum ignition spark gap 6.0 mm (0.24 in)
--	---

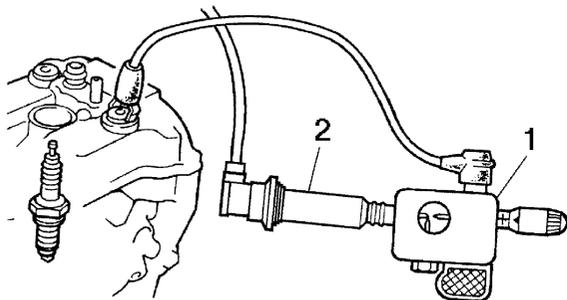
NOTE:

If the ignition spark gap is within specification, the ignition system circuit is operating normally.



- a. Disconnect the spark plug cap from the spark plug.
- b. Connect the ignition checker "1" as shown.

	Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487
---	--



1. Ignition checker
2. Spark plug cap

- c. Turn the main switch to "ON" and engine stop switch to "○".
- d. Measure the ignition spark gap "a".
- e. Crank the engine by pushing the start switch "⊕" and gradually increase the spark gap until a misfire occurs.



EAS28090

CHECKING THE IGNITION COIL

1. Check:
 - Primary coil resistance
Out of specification → Replace.

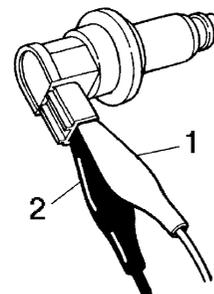
	Primary coil resistance 1.19–1.61 Ω
---	---



- a. Disconnect the ignition coil lead coupler from wire harness.
- b. Connect the pocket tester (Ω × 1) to the ignition coil as shown.

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

Tester positive probe Red/Black terminal "1"
Negative tester probe Orange terminal "2"



- c. Measure the primary coil resistance.



2. Check:
 - Secondary coil resistance
Out of specification → Replace.

ELECTRICAL COMPONENTS



Secondary coil resistance
8.50–11.50 k Ω

- a. Disconnect the spark plug cap from the ignition coil.
- b. Connect the pocket tester ($\Omega \times 1k$) to the ignition coil as shown.



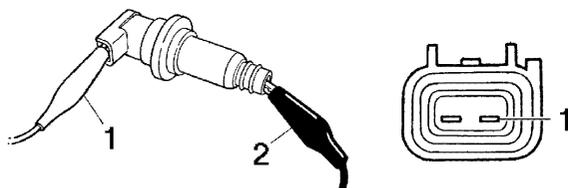
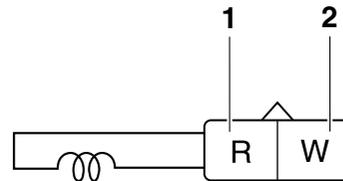
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

Positive tester probe
Red/Black "1"
Negative tester probe
Spark plug lead "2"



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

Positive tester probe
Red "1"
Negative tester probe
White "2"



- c. Measure the secondary coil resistance.

- b. Measure the crankshaft position sensor resistance.

EAS32D1002

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.



Crankshaft position sensor resistance
248–372 Ω (R–W)

- a. Connect the pocket tester ($\Omega \times 100$) to the crankshaft position sensor coupler as shown.

EAS28130

CHECKING THE LEAN ANGLE SENSOR

1. Remove:
 - Lean angle sensor (from the bracket.)
2. Check:
 - Lean angle sensor out put voltage
Out of specification → Replace.



Lean angle sensor out put voltage
Less than 65° "a" 0.4–1.4V
More than 65° "b" 3.7–4.4V

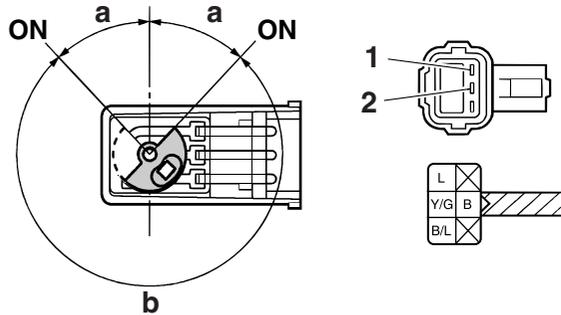
- a. Connect the lean angle sensor coupler to the wireharness.
- b. Connect the pocket tester (DC 20 V) to the lean angle sensor coupler as shown.



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

ELECTRICAL COMPONENTS

Tester positive probe
Blue "1"
Negative tester probe
Yellow/Green "2"



- c. Incline the lean angle sensor.
- d. Measure the lean angle sensor out put voltage.



EAS28150

CHECKING THE STATOR COIL

1. Disconnect:
 - Stator coil coupler (from the wire harness)
2. Check:
 - Stator coil resistance
 Out of specification → Replace the stator coil.

	Stator coil resistance 0.168–0.252 Ω (W-W)
--	--



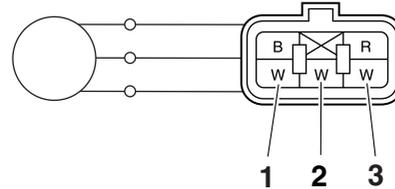
- a. Connect the pocket tester ($\Omega \times 1$) to the stator coil coupler as shown.

	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:
 - Charging voltage
 Out of specification → Replace the rectifier/regulator.

	Charging voltage 14 V at 5000 r/min
--	---

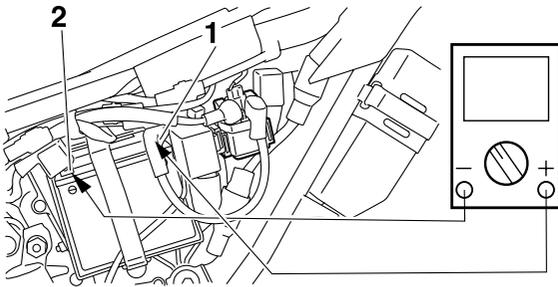


- a. Set the digital tachometer to the ignition coil of cylinder #1.
- b. Connect the pocket tester (DC 20 V) to the rectifier/regulator coupler as shown.

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

Positive tester probe
Positive battery terminal "1"
Negative tester probe
Negative battery terminal "2"

ELECTRICAL COMPONENTS



- c. Start the engine and let it run at approximately 5000 r/min.
- d. Measure the charging voltage.



EAS28180

CHECKING THE HORN

1. Check:
 - Horn resistance
Out of specification → Replace.

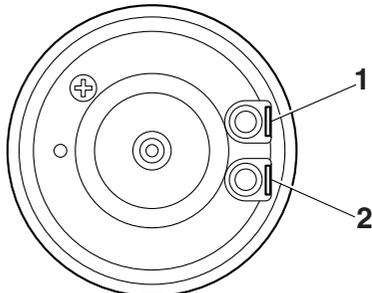
	Horn resistance 1.01–1.11 Ω at 20°C (68°F)
---	--



- a. Disconnect the horn leads from the horn terminals.
- b. 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"
--



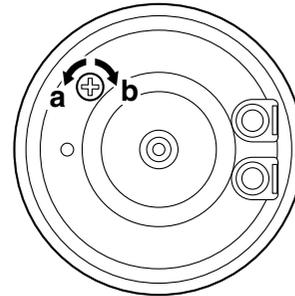
- c. Measure the horn resistance.



2. Check:
 - Horn sound
Faulty sound → Adjust or replace.



- a. Connect a battery (12 V) to the horn.
- b. Turn the adjusting screw in direction "a" or "b" until the specified horn sound is obtained.



EAS28240

CHECKING THE SPEED SENSOR

1. Check:
 - Speed sensor output voltage
Out of specification → Replace.

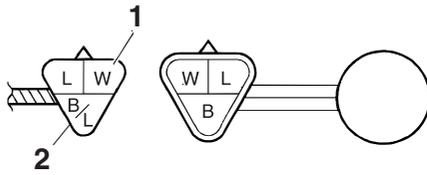
	Output voltage reading cycle 0 V–5 V–0 V–5 V–0 V
---	--



- a. Connect the pocket tester (DC 20 V) to the speed sensor coupler (wire harness side) as shown.

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

Positive tester probe White "1" Negative tester probe Black/Blue "2"



- b. Set the main switch to “ON”.
- c. Elevate the rear wheel and slowly turn it.
- d. Measure the voltage (DC 5 V) of white and black/blue. With the front wheel slowly rotating, voltage alternates between 0 V and 5 V.



EAS32D1012

CHECKING THE FUEL SENDER (FUEL PUMP)

Drain the gasoline.

1. Disconnect:
 - Fuel pump coupler (from the fuel pump)
2. Remove:
 - Fuel pump (from the fuel pump tank)
3. Check:
 - Fuel sender resistance
Out of specification → Replace the fuel pump.

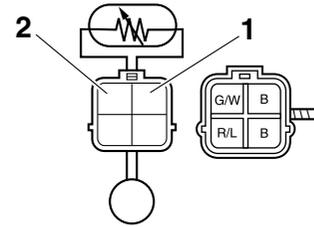
	Fuel sender resistance 0.94–1.88 kΩ
--	---



- a. Connect the pocket tester ($k\Omega \times 1$) to the fuel sender as shown.

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

Positive tester probe Green/White “1” Negative tester probe Black “2”
--



- b. Measure the resistance of the fuel sender.



EAS28260

CHECKING THE COOLANT TEMPERATURE SENSOR

1. Remove:
 - Coolant temperature sensor
Refer to “THERMOSTAT” on page 6-4.

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.

	Resistance 20°C (68°F) 2.32–2.59 kΩ Resistance 80°C (176°F) 310–326 Ω
--	--

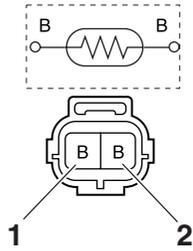


- a. Connect the pocket tester ($\Omega \times 100$) to the coolant temperature sensor as shown.

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

Positive tester probe Black “1” Negative tester probe Black “2”
--

ELECTRICAL COMPONENTS

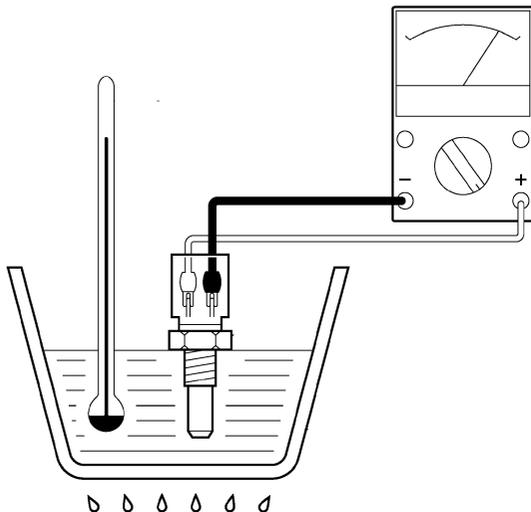


b. Immerse the coolant temperature sensor in a container filled with coolant.

NOTE:

Make sure the coolant temperature sensor terminals do not get wet.

- c. Place a thermometer in the coolant.
- d. Slowly heat the coolant, and then let it cool to the specified temperature indicated in the table.
- e. Check the coolant temperature sensor for continuity at the temperatures indicated in the table.



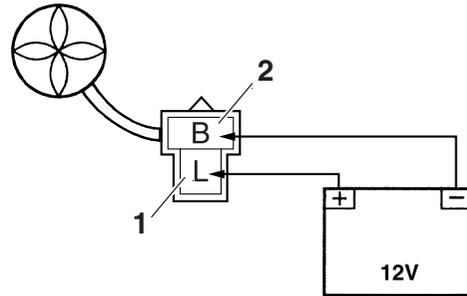
EAS28250

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.



EAS28300

CHECKING THE THROTTLE POSITION SENSOR

- 1. Check:
 - Throttle position sensor

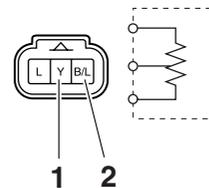


a. Connect the pocket tester (DC 20 V) to the throttle position sensor as shown.



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

Tester positive lead →
Yellow "1"
Tester negative lead →
Black/Blue "2"



b. While slowly turning the throttle position sen-

ELECTRICAL COMPONENTS

sor shaft, check that the throttle position sensor voltage is within the specified range. The voltage does not change or it changes abruptly → Replace the throttle position sensor.



Throttle position sensor output voltage
0.6–5.0 V



EAS28360

CHECKING THE EXUP SERVO MOTOR

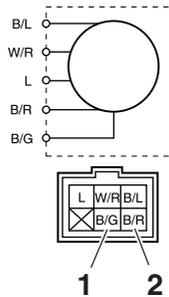
1. Check:

- EXUP servo motor operation
Out of specification → Replace.



- Disconnect the EXUP cables from the EXUP servo motor pulley.
- Disconnect the EXUP servo motor coupler from the wire harness.
- Connect the battery leads to the EXUP servo motor coupler as shown.

Positive battery lead
Black/Green “1”
Negative battery lead
Black/Red “2”



- Check that the EXUP servo motor pulley rotates several times.

ECA14390

CAUTION:

To prevent damaging the EXUP servomotor, perform this test within a few seconds of connecting the battery.



EAS28410

CHECKING THE INTAKE AIR PRESSURE SENSOR

1. Check:

- Intake air pressure sensor output voltage
Out of specification → Replace.



Intake air pressure sensor output voltage
3.75–4.25V

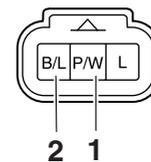
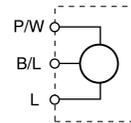


- Connect the pocket tester (DC 20 V) to the intake air pressure sensor coupler (wire harness side) as shown.



Digital circuit tester
90890–03174
Model 88 Multimeter with tachometer
YU-A1927

Positive tester probe
Pink/White “1”
Negative tester probe
Black/Blue “2”



- Set the main switch to “ON”.
- Measure the intake air pressure sensor output voltage.



EAS28420

CHECKING THE INTAKE AIR TEMPERATURE SENSOR

1. Remove:

- Intake air temperature sensor
(from the air filter case.)

EWA14110

WARNING

- Handle the intake air temperature sensor with special care.
- Never subject the intake air temperature

ELECTRICAL COMPONENTS

sensor to strong shocks. If the intake air temperature sensor is dropped, replace it.

2. Check:

- Intake air temperature sensor resistance
Out of specification → Replace.



Intake air temperature sensor resistance
2.21–2.69 k Ω 20°C



a. Connect the pocket tester ($\Omega \times 1k$) to the intake air temperature sensor terminal as shown.



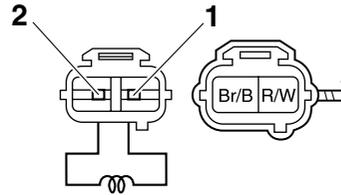
Digital circuit tester
90890-03174
Model 88 Multimeter with tachometer
YU-A1927

Positive tester probe
Brown/White "1"
Negative tester probe
Black/Blue "2"

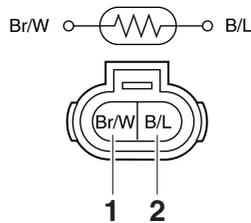


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

Tester positive lead
Red/White "1"
Tester negative lead
Brown/Black "2"



c. Measure the intake solenoid resistance.



EAS32D1013

CHECKING THE INTAKE SOLENOID

1. Check:

- Intake solenoid resistance
Out of specification → Replace.



Intake solenoid resistance
42–48 Ω 20°C



a. Disconnect the intake solenoid coupler from the wire harness.
b. Connect the pocket tester ($\Omega \times 10$) to the intake solenoid terminal as shown.

TROUBLESHOOTING

TROUBLESHOOTING	9-1
GENERAL INFORMATION	9-1
STARTING FAILURES.....	9-1
INCORRECT ENGINE IDLING SPEED	9-1
POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE.....	9-2
FAULTY GEAR SHIFTING.....	9-2
SHIFT PEDAL DOES NOT MOVE.....	9-2
JUMPS OUT OF GEAR	9-2
FAULTY CLUTCH	9-2
OVERHEATING	9-2
OVERCOOLING.....	9-3
POOR BRAKING PERFORMANCE.....	9-3
FAULTY FRONT FORK LEGS.....	9-3
UNSTABLE HANDLING.....	9-3
FAULTY LIGHTING OR SIGNALING SYSTEM.....	9-3

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 (s) and cylinder head (s)
 - 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 (s) and piston ring (s)
 - 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
 - Deteriorated or contaminated fuel
2. Fuel pump
 - Faulty fuel pump
3. Fuel cock
 - Clogged or damaged fuel hose
4. Throttle body
 - Clogged pilot air passage

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Fuse (s)
 - Blown, damaged or incorrect fuse

- Improperly installed fuse
3. Spark plug (s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug
 - Worn or damaged electrode
 - Worn or damaged insulator
 4. Ignition coil (s)
 - Cracked or broken ignition coil body
 - Broken or shorted primary or secondary coils
 5. Ignition system
 - ECU failure.
 - Faulty crankshaft position sensor
 - Broken generator rotor woodruff key
 6. Switches and wiring
 - Defective lean angle sensor
 - 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 (s) and cylinder head (s)
 - Incorrect valve clearance
 - Damaged valve train components
2. Air filter
 - Clogged air filter element

Fuel system

1. Throttle body
 - Air intake in throttle body joint
 - Improper throttle cable free play
 - Faulty air induction system

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Spark plug (s)
 - 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 (s)
 - Faulty ignition coil
 - Cracked or broken ignition coil
 4. Ignition system
 - ECU failure.
 - Faulty crankshaft position sensor

EAS28520

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
2. Throttle body
 - Defective throttle body
3. ECU
 - ECU failure.

EAS28530

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to "Clutch drags".

EAS28540

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- 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
 - 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

EAS28590

OVERHEATING

Engine

1. Cylinder head (s) and piston (s)
 - 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
 - Faulty thermostat
 - Damaged fan motor or disconnected coupler
 - Damaged hose
 - Improperly connected hose
 - Damaged pipe
 - Improperly connected pipe

Fuel system

1. Throttle body
 - Air intake in throttle body joint
2. Air filter

- Clogged air filter element

Chassis

1. Brake (s)
 - Dragging brake

Electrical system

1. Spark plug (s)
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
2. Ignition system
 - ECU failure
 - Faulty radiator fan motor relay
 - Faulty coolant temperature sensor

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
- Defective master cylinder kit
- 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 cap bolt O-ring

Malfunction

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS28690

UNSTABLE HANDLING

1. Handlebar
 - Bent or improperly installed handlebar
2. Steering head components
 - Improperly installed upper bracket
 - Improperly installed lower bracket (improperly tightened ring nut)
 - Bent steering stem
 - Damaged ball bearing or bearing race
3. 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
4. Swingarm
 - Worn bearing or bushing
 - Bent or damaged swingarm
5. Rear shock absorber assembly (-ies)
 - Faulty rear shock absorber spring
 - Leaking oil or gas
6. Tire (s)
 - Uneven tire pressures (front and rear)
 - Incorrect tire pressure
 - Uneven tire wear
7. Wheel (s)
 - Incorrect wheel balance
 - Broken or loose spoke
 - Damaged wheel bearing
 - Bent or loose wheel axle
 - Excessive wheel runout
8. Frame
 - Bent frame
 - Damaged steering head pipe
 - Improperly installed bearing race

EAS28710

FAULTY LIGHTING OR SIGNALING SYSTEM

Headlight does not come on

- Fuse open circuit
- 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
- Headlight bulb life expired

Tail/brake light does not come on

- Too many electrical accessories
- Incorrect connection

Turn signal does not come on

- Fuse open circuit
- 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 (Coil open circuit or damaged terminal)
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

WIRING DIAGRAM**WR250R(X)/WR250X(X)
2008 WIRING DIAGRAM**

- 1.AC magneto
- 2.Rectifier/regulator
- 3.Main switch
- 4.Battery
- 5.Main fuse
- 6.Starter relay
- 7.Starter motor
- 8.Right handlebar switch
- 9.Engine stop switch
- 10.Start switch
- 11.Relay unit
- 12.Sidestand switch
- 13.Neutral switch
- 14.Clutch switch
- 15.Fuel pump
- 16.ECU (electronic control unit)
- 17.Ignition coil
- 18.Spark plug
- 19.Intake solenoid
- 20.Fuel injector
- 21.Air induction solenoid
- 22.Intake air temperature sensor
- 23.Coolant temperature sensor
- 24.Speed sensor
- 25.Throttle position sensor
- 26.Intake air pressure sensor
- 27.Lean angle sensor
- 28.EXUP servo motor
- 29.Meter assembly
- 30.Neutral indicator light
- 31.Coolant temperature warning light
- 32.Engine trouble warning light
- 33.Fuel level warning light
- 34.High beam indicator light
- 35.Turn signal indicator light
- 36.Turn signal relay
- 37.Turn signal switch
- 38.Rear right turn signal light
- 39.Front right turn signal/position light
- 40.Front left turn signal/position light
- 41.Rear left turn signal light
- 42.Headlight relay
- 43.Dimmer switch
- 44.Headlight
- 45.Horn
- 46.Horn switch

- 47.Left handlebar switch
- 48.Rear brake switch
- 49.Front brake light switch
- 50.Tail/brake light
- 51.License plate light
- 52.Radiator fan motor relay
- 53.Radiator fan motor
- 54.Headlight fuse
- 55.Signal fuse
- 56.Ignition fuse
- 57.Radiator fan fuse
- 58.Fuel injection system fuse
- 59.Backup fuse

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/G	Black/Green
B/L	Black/Blue
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/G	Brown/Green
Br/L	Brown/Blue
Br/R	Brown/Red
Br/W	Brown/White
G/B	Green/Black
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
Gy/G	Gray/Green
Gy/R	Gray/Red
Gy/Y	Gray/Yellow
L/B	Blue/Yellow
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/B	Orange/Black
P/W	Pink/White
R/B	Red/Black
R/G	Red/Green
R/L	Red/Blue
R/W	Red/White
R/Y	Red/Yellow
Sb/W	Sky blue/White
W/B	White/Black
W/R	White/Red
W/Y	White/Yellow
Y/B	Yellow/Black
Y/G	Yellow/Green
Y/L	Yellow/Blue
Y/R	Yellow/Red





YAMAHA MOTOR CO., LTD.

2500 SHINGAI IWATA SHIZUOKA JAPAN

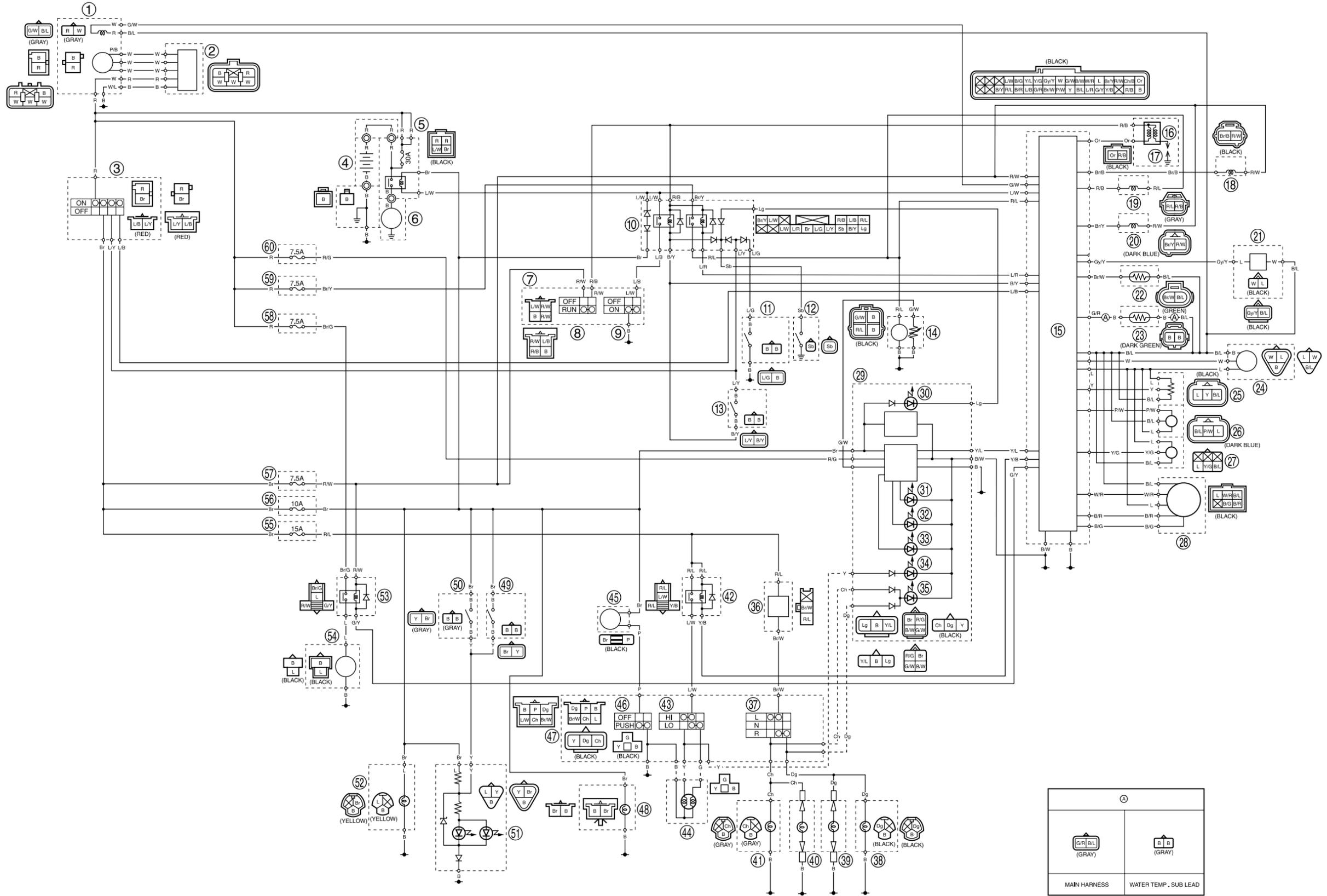
WR250RX/WR250XX 2008
WIRING DIAGRAM

WR250RX/WR250XX 2008
SCHÉMA DE CÂBLAGE

WR250RX/WR250XX 2008
SCHALTPLAN

SCHEMA ELETTRICO
WR250RX/WR250XX 2008

DIAGRAMA ELÉCTRICO DE LA
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